Burroughs L/TC

EQUIPMENT

REFERENCE MANUAL

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$5.00

PREFACE

The various sections of this manual describe the features for Series L 2000, L 3000, L 4000, L 5000, TC 500, TC 700, TC 1500 and TC 2500 systems. Not all the features are included in any one series or style. The Basic Feature (BF) pages and Style Specification (SS) pages of the Burroughs Equipment Price List summarize the features which are standard for the various styles.

In this manual, optional features are explained in the same section or subject as the related standard feature.

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SECTION 1
INTRODUCTION

1.00.00 GENERAL

The Series L/TC computer is a desk type, operator controlled, digital computer with compact electronic integrated circuitry and random access magnetic disk memory. It comes equipped with a typewriter keyboard for easy input of alpha or numeric data and may be used in conjunction with card or paper tape peripherals. The TC Series provides Data Communication capabilities in addition to all of the features of the Series L, whereas some of the L models require the use of the Data Communication option in order to function as a terminal computer. Flexibility of system design is optimized by means of programing control over every phase of the computer's operation including data input, computation, print formatting, forms movement, and peripheral input/output. Micrologic Programs, known as firmware, which eliminate the need for a multitude of expensive fixed electronic circuits, are used to implement a comprehensive instruction list and/or adapt it to varying hardware requirements.

1.00.01 L 2000

Memory: Memory is available in two sizes depending upon whether the machine is a standard 32 track machine or an extended memory 40 track machine. Eight tracks, each one containing 32 words and its own read-write head, comprise one block or 256 words so that the 32 track machine contains a maximum of 1024 words of 64 bits organized into 4 blocks of 8 tracks each, and the 40 track machine contains a maximum of 1280 words of 64 bits organized into 5 blocks of 8 tracks each. Systems with Data Communications potential use one block for the Data Comm Processor. The amount of user memory available varies depending on the memory options of a given style and the particular set of firmware. Memory can be loaded via paper tape, either through the program loader or through the paper tape reader, or in the case of Card Input Systems through the 80-column card reader.

Keyboard: The L 2000 keyboard is completely electrical, with no mechanical linkages between it and other sections of the computer. The keyboard may be subdivided functionally into three sections: the Typewriter, Numeric, and Program Select Keys (PK's).

In addition to the character keys and program select keys, the L 2000 keyboard also contains indicator lamps, power and ready mode switches, and service keys for data entry and machine operation. A keyboard buffer permits data entry operations to be performed concurrently with other machine operations.

Console Printer: The L 2000 is equiped with a 64 character serial printer. Positioning of the printer is programmatically controlled for all print positions. Printing speed is 20 characters per second and escapement is .10 inch. Both a red and black printing ribbon is provided, with programmatic selection of print color.

Forms and Forms Handler: The Forms Handler is designed to permit rear feeding of individual cut forms or continuous forms of various lengths and widths. Alignment and 1/6" vertical spacing may be programmatically, keyboard, or manually controlled. Both split and normal platens are provided to facilitate forms handling flexibility. To facilitate handling of continuous forms, a Continuous Forms Pin Feed Device is available in several styles allowing single synchronous, single independent, dual synchronous and dual pin feeding. The 15.5" platen provides for a 150 character print line.

Input/Output: The L 2000 may be used with the A 581 Punched Paper Tape/Edge Punched Card Reader and/or the A 562 Punched Paper Tape/Edge Punched Card Perforator. An 80-column card input and/or output configuration is also possible. The A 595 Card Reader and/or A 149 Card Punch may serve as adjuncts to the L 2000. Mixed I/O configurations are also available for the Series L for those applications which might require Paper Tape Input and 80-Column Card Output or 80-Column Card Input and Paper Tape Output. Data Communications potential for future field upgrading is optional on some of the L 2000 models.

Command: Firmware sets are available for the L 2000 for interpreting all macro instructions with the

exception of the Data Comm and Striped Ledger instructions. The applicable instruction list includes the Keyboard, Print, Forms Control, Arithmetic and Data Movement, Flag, Index Register, Branch and Decision, Check Digit, Paper Tape/Edge Punch Card I/O, 80-Column Card I/O. See Section 10 for a complete list and functional description of all commands available.

1.00.02 L 3000

The L 3000 computer is essentially the same as the L 2000 with the following exception:

Forms and Forms Handler: Design is for front feeding of forms rather than rear feeding. Other forms and forms handler considerations are basically the same as the L 2000. See Section 6 for a detailed explanation of the L 3000 forms handler.

1.00.03 L 4000

The L 4000 is essentially the same as the L 2000 with the following exceptions:

Keyboard: The L 4000 keyboard allows for 24 PK's rather than 16. Other keyboard features are the same as on the L 2000.

Console Printer: The L 4000 provides for 255 print positions. Other console printer features are the same as on the L 2000.

Forms and Forms Handler: The L 4000 is designed for front feed form insertion. In addition it is equipped with a 26" platen which provides a 255 character print line. Other forms and forms handler considerations are basically the same as for the L 2000. See Section 6 for a detailed description for the L 4000 Forms Handler.

1.00.04 L 5000

The L 5000 computer is similar to the L 2000 with the following exceptions:

Memory: Memory is available in only the 40 track size. User program memory may be loaded via magnetic unit records on the L 5000 system in addition to the modes discussed for the L 2000.

Keyboard: The L 5000 is equipped with 24 PK's rather than 16. Other keyboard features are the same as for the L 2000.

Forms and Forms Handler: The L 5000 is designed for front feed form insertion. It has a 26" platen providing a 255 character print line. In addition, the L 5000 has magnetic unit record capability. That is, the 26" Forms Handler, under program control, provides for semiautomatic random access of magnetic unit records. See Section 6 for a detailed description of the Magnetic Unit Record Forms Handler.

Input/Output: In addition to the I/O adjuncts available on the L 2000, the L 5000 provides I/O capability with magnetic unit records. Capability is provided for automatic serial processing of magnetic unit records using the A 4005 Magnetic Record Reader as well as semiautomatic random access of magnetic unit records on the L 5000 console. Other input/output features are the same as for the L 2000.

Commands: In addition to the commands which are executable on the L 2000, the L 5000 allows execution of the magnetic unit record macro instructions.

1.00.05 TC 500

The TC 500 has essentially all the features of the L 2000 plus Data Communications Capability. This additional feature results in the following specific changes:

Memory: One block (256 words) of memory is used for the Data Communication Processor for implementation of the control procedures for the transmission and receipt of messages. These control procedures are implemented by a stored micro program. Two of the eight tracks of this additional block of memory provide a 256-character transmit buffer and a 256-character receive buffer. In addition to

the modes of loading programs on the L 2000, the TC 500 allows programs to be loaded from a remote site over the line.

Input/Output: In addition to the I/O capabilities of the L 2000, the TC 500 is capable of transmitting and receiving messages over telephone lines at transmission speeds of up to 1200 bits/sec.

Commands: Firmware sets are available for the TC 500 for interpreting all of the GP 300 instructions which are operable on the L2000 plus the data comm instructions.

1.00.06 TC 700

The TC 700 is designed to function as a Teller Terminal Computer. Therefore, there exist several features which are different from the L 2000. The TC 700 has an upright cabinet for logic and memory to permit counter height operation. Data communications capability is provided along with a front feed passbook alignment capability.

These additional features result in the following specific differences from the L 2000:

Memory: The differences in memory features between the TC 700 and the L 2000 are the same as for the TC 500 discussed above.

Keyboards: The keyboard features are essentially the same as for the L 2000 except for the Power and Ready Mode buttons which are replaced by locks on the TC 700. In addition to these locks, the TC 700 is equipped with audit locks, a program halt and clear lock, and a journal cover lock.

Console Printer: The keyboard printer on the TC 700 is movable and cable connected to the Logic and Memory Cabinet. Offset punctuation for numeric printing is also a standard feature on the TC 700. Other console printer considerations are the same as for the L 2000.

Forms and Forms Handler: The TC 700 provides for front feed insertion rather than rear feed. In addition, the TC 700 is equipped with alignment chutes for front feed passbook insertion. Other forms and forms handler considerations are the same as for the L 2000.

Input/Output: Input/Output capability on the TC 700 consists of paper tape/edge punched card and data communication capability. The paper tape I/O utilizes the A 581 and A 562 as does the L 2000. Transmission of data can be accomplished with line speeds of up to 1800 bits/sec with the TC 700. Capability is also provided for 80-column card input using the A 595 Card Reader.

Commands: The commands available for execution on the TC 700 are the same as for the L 2000 except that the data comm instructions can be executed on the TC 700 but 80-column card output instructions cannot. Also, programing considerations are required for handling passbooks and teller security features.

1.00.07 TC 1500

The TC 1500 combines the features of the L 3000 and TC 500. The specific considerations are as follows:

Memory: The memory characteristics of the TC 1500 are the same as those of the TC 500.

Forms and Forms Handler: The TC 1500 has the front feed capability of the L 3000.

Input/Output: Input/Output characteristics are the same as those of the TC 500 with the additional optional feature of an 1800 bits/sec line transmission rate.

Commands: The instruction list available for execution on the TC 1500 is the same as that for the TC 500.

1.00.08 TC 2500

The TC 2500 combines the features of the L 4000 and TC 500. The specific considerations are as follows:

Memory: The memory characteristics of the TC 2500 are the same as those of the TC 500.

Forms and Forms Handler: The TC 2500 has the front feed capability and 26" Forms Handler of the L 4000.

Input/Output: Input/Output characteristics are the same as those of the TC 500 with the additional optional feature of an 1800 bits/sec line transmission rate.

Commands: The instruction list available for execution on the TC 2500 is the same as that for the TC 500.

SECTION 2
MEMORY

2.00.00 GENERAL DESCRIPTION

The memory of the Series L/TC consists of a magnetic disk of ceramic composition, which revolves at a speed of 6,000 RPM, or 10ms per revolution. The disk contains 1,280 words of 64 bits each, and is organized into 5 blocks of 8 tracks each, or a total of 40 tracks. Each track contains 32 words, and has its own read-write head. Only one side of the disk is utilized.

Each word in memory may be utilized in any of the following formats: It may consist of 15 digits plus sign; it may contain 8 alphanumeric characters; or it may contain four instructions of 4 digits each (in machine language coding). This flexibility permits memory to be used to store program instructions, numeric factors and constants, alpha characters and messages, printing formats to control printing and punching, and other information for control of the system such as flags and registers for indexing and forms control.

2.01.00 ALLOCATION OF MEMORY

Memory is divided into the Control area and the Normal area.

The CONTROL area of Memory contains Microprograms which determine the system control functions and which implement the instruction list. This area is not available to the programmer. Each instruction available for the use of the programmer, referred to as a Macro Instruction, is actually implemented by a Microprogram in the Control area; the Microprogram consists of a precise sequence of Micro Instructions. A Micro Instruction is executed by "hard" electronic circuitry and usually performs only one of many small steps necessary for the total function specified by a Macro Instruction. Thus a series of Micro Instructions are required to fulfill the Macro Instruction function. Hence, a Microprogram. The composite of all the Microprograms in the Control area constitutes what is referred to as "System Firmware" or just "Firmware". The System Firmware is supplied with the Series L/TC by Burroughs.

The NORMAL area of memory is used to store the user's programs (Macro Programs) which are written with the Macro Instructions provided by the Firmware. Macro Instructions are used to exercise all of the capabilities of the Series L/TC such as arithmetic, logical comparisons, printing, input/output (paper tape or cards), and data transmission. The NORMAL area is also used for storing constant data, messages, and for accumulating totals.

The amount of Memory available in the NORMAL area varies depending on the memory options of a given style and the particular set of Firmware.

2.01.01 SERIES L 2000, L 3000, L 4000

The Memory Processor of the Series L uses 32 tracks (or 1,024 words) of memory. Memory is divided into the CONTROL area and the NORMAL area (see Topic 2.01.00 above).

2.01.02 SERIES L 2000, L 3000, L 4000 WITH EXTENDED MEMORY

The Memory Processor of the Series L with extended memory (40 track L) uses 8 tracks of memory in addition to the 32 tracks of memory used by the Series L. Memory is divided into the CONTROL area and the NORMAL area (see Subject 2.01.00 above).

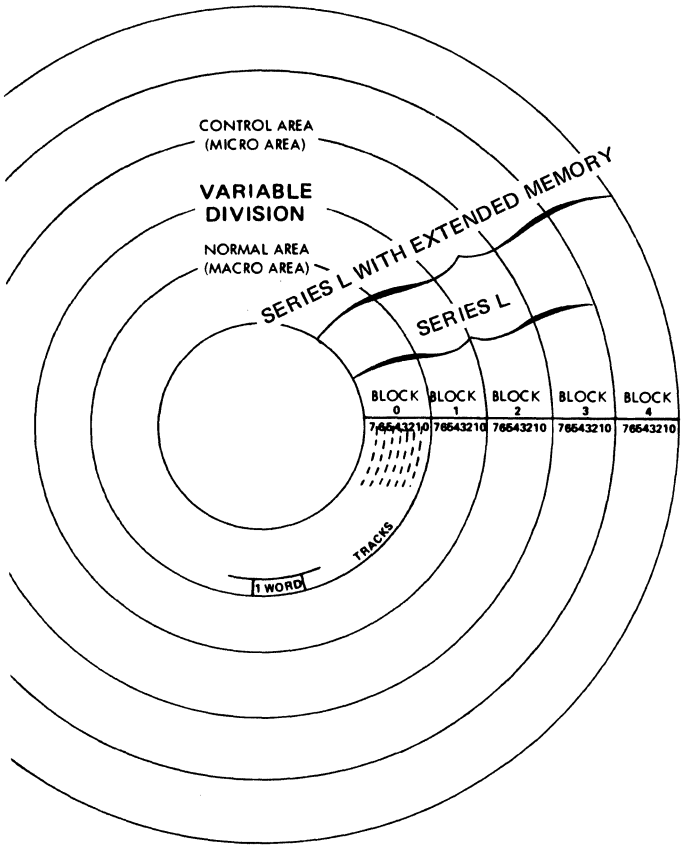


Figure 2.01.02-1 Example of Magnetic Disk Memory Organization for Series L and Series L with Extended Memory

2.01.03 SERIES TC

Memory in the Series TC may be considered in two major divisions; one part is reserved exclusively for the Data Communication Processor. The other is referred to as Main Memory and is accessed by the Main Memory Processor in fulfilling the local computing capability of the Series TC.

The Data Communication Processor uses 8 tracks (or 256 words) of memory to implement the control procedures for the transmission and receipt of messages. These control procedures are implemented by a stored program (micro program). Two of the eight tracks provide a 256-character transmit buffer and a 256-character receive buffer.

The Main Memory Processor uses the remaining 32 tracks (or 1,024 words) of memory and operates independently of the Data Communication Processor, except that it has the ability to transfer message data to and from the Data Communication Processor. This allows simultaneous processing in the Main Memory and Data Communication Processor. Main Memory is subdivided into the CONTROL area and the NORMAL area (see Subject 2.01.00 above).

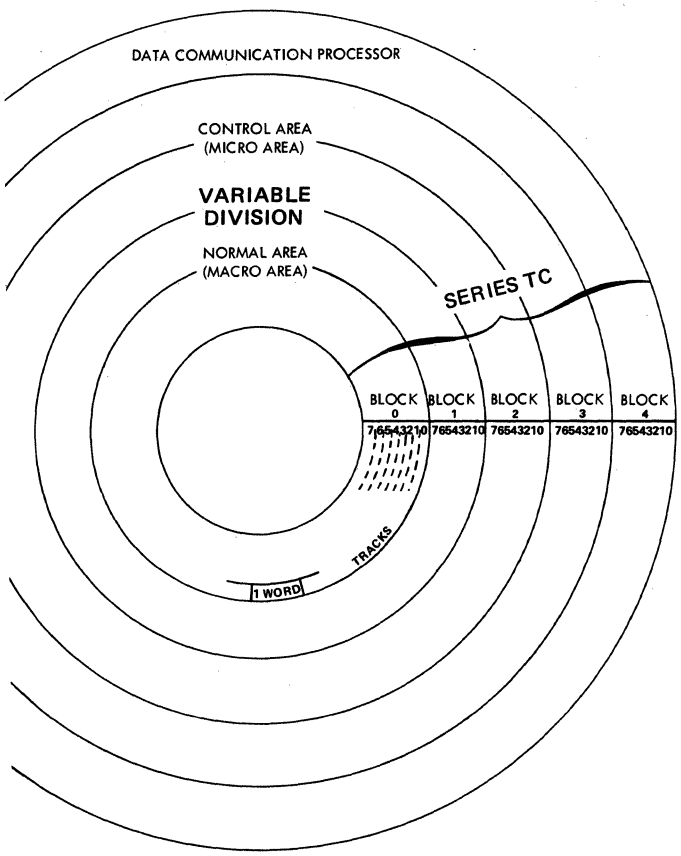


Figure 2.01.03-1 Example of Magnetic Disk Memory Organization for Series TC

2.02.00 TYPES OF MEMORY UNITS

Primary memory capacity is in block increments (256 words per block) designated blocks 0, 1, 2, 3 and 4. There are three types of memory units. Memory I consists of Blocks 0, 2, and 3. Memory II consists of Blocks 0, 1, 2, and 3 with or without Data Comm Processor. Memory III consists of Blocks 0, 1, 2, 3, and 4.

In a system with Memory I, there are no read/write heads in Block 1; therefore, it is impossible to upgrade the system.

In a system with Memory II, there is potential for upgrading the system to a full memory machine. Memory II is the memory unit installed in a TC or any 512 word machine.

Memory III is the memory unit installed in a 40 track machine. A system with Memory III can be field upgraded to Data Comm capability or potential.

The above are hardware definitions only, and therefore do not specify programable memory. Memory for this purpose is a function of both hardware and firmware content: firmware may take up more than the ordinary area (blocks 2 and 3, words 512-1,023 with Memory I or II; blocks 3 and 4, words 768-1,079 with Memory III) because of specific requirements such as Data Comm Message handling instructions or Tables of Code Conversion (for translating codes other than the L internal code – ASCII – or codes for 80-Column Card input and/or output).

In some cases there is a need for firmware extension into the available user memory area, reducing that area by one or more tracks, depending on the firmware set. Because of the memory requirements for the Data Comm Processor, memories used in models possessing either Data Comm capability or potential are one block (256 words) larger than the comparable Non-Data Comm model. It is important to note that all models providing 768 words of user memory have Data Comm potential. When this style is converted to a Data Comm machine, user memory is reduced to 512 words.

Each memory block (256 words) requires a Head Select Card to enable its use. To accommodate Firmware extentions below word 512 or the field upgrading of a machine to provide more user memory may require the exchange or addition of a head select card(s) to provide the desired memory configuration.

2.03.00 ACCUMULATOR

The computer contains one Accumulator which is used when data is entered in a numeric mode. Data can then be moved to any desired location (word) in the NORMAL area of memory. Any subsequent entering of data in the numeric mode destroys the contents of the Accumulator and replaces it by the newly entered data. The Accumulator is also used to print numeric data, as all numeric data to be printed must pass through the Accumulator.

The Accumulator serves as a working memory location for moving data from one word of memory to another.

The Accumulator is separate from the NORMAL area of memory and has a capacity of 15 digits plus a 16th position for flags (-, C,M, Special flag).

SECTION 3
KEYBOARDS

3.00.00 GENERAL

Under program control, alpha and numeric keyboard sections of the control console are used by an operator to manually index alpha and numeric information to the system. The program (PK) keys select the program starting, program loading, and utility routines; in addition, the program may enable the keys to select alternate program routines for an application. Operation control keys 1 through 4 are provided to terminate the keyboard entry and start the execution of the internal program again. In addition, the keys (OCK's) set flags which may be programed to select alternate routines of the object program. Certain keys have indicator lamps; therefore, the indicator lamps and the corresponding legend strip holder are considered part of the keyboard section.

The typewriter keyboards and ball printers are not the same for all Series L/TC's used in the United States, and special keyboards and ball printers are available for certain languages or countries which require special keyboard arrangements. See Subject 3.05.00 for keyboard arrangements which are available for the United States, and the position numbers of the typewriter and numeric keyboard.

For the purpose of explaining key functions and keyboard instruction, the console is considered as having three keyboards: typewriter, numeric, and program (PK) keys. From a design standpoint however, the console has one keyboard since there is no mechanical linkage between it and other sections of the computer. Key depressions activate magnetic core transducers, located apart from the keyboard assembly, which supply electrical signals to the computer. All keys on the keyboard have but one function and that is to transmit its own unique code to the computer's main memory processor. The use of that code is determined by the interpretation given to it by the system firmware, which may treat it as an alpha character, a numeric digit, or as a functional code such as to terminate an instruction, vertical space, or set a flag. Most firmware sets interpret the codes in accordance with the key markings with regard to printing but certain operating keys do not have a corresponding character on the ball printer (OCK's, reverse entry). The use of the keyboard does not provide any direct result, other than to enter codes into a keyboard buffer. A program instruction causes the indexed data to be accepted from the buffer into the system for processing and/or printing.

Alpha typing keys, numeric keys, and program (PK) keys are interlocked to prevent simultaneous depression.

When power is off to the machine, keys are not locked against depression. However, if the keys are depressed, no action will result from the depressed key or control when the power is turned on.

NOTE: The figures (pictures) in this section are of various Series or Styles L/TC models and the relative location of the described features may be different, but the functions are the same unless otherwise specified.

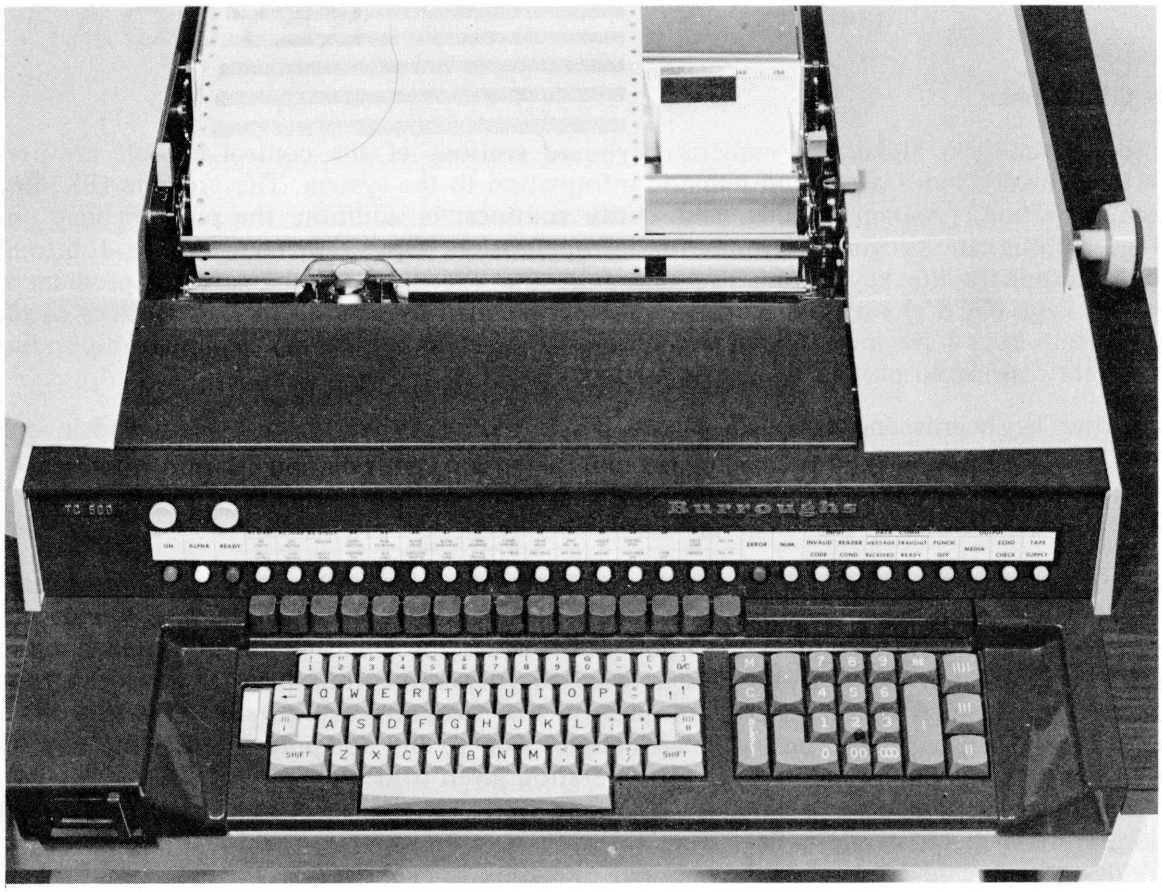


Figure 3.00.00-1 Domestic Data Communications Keyboard, Printer Carrier and 15½" Rear Feed Forms Handler

3.01.00 NUMERIC KEYBOARD

The Numeric Keyboard consists of 12 Numeral Indexing Keys, a Decimal-Fraction Key, three Accumulator Flag Keys (commonly used as Reverse Entry Key, Per Hundred Key and Per Thousand Key), Reset Key, and 4 Operation Control Keys (OCK's).

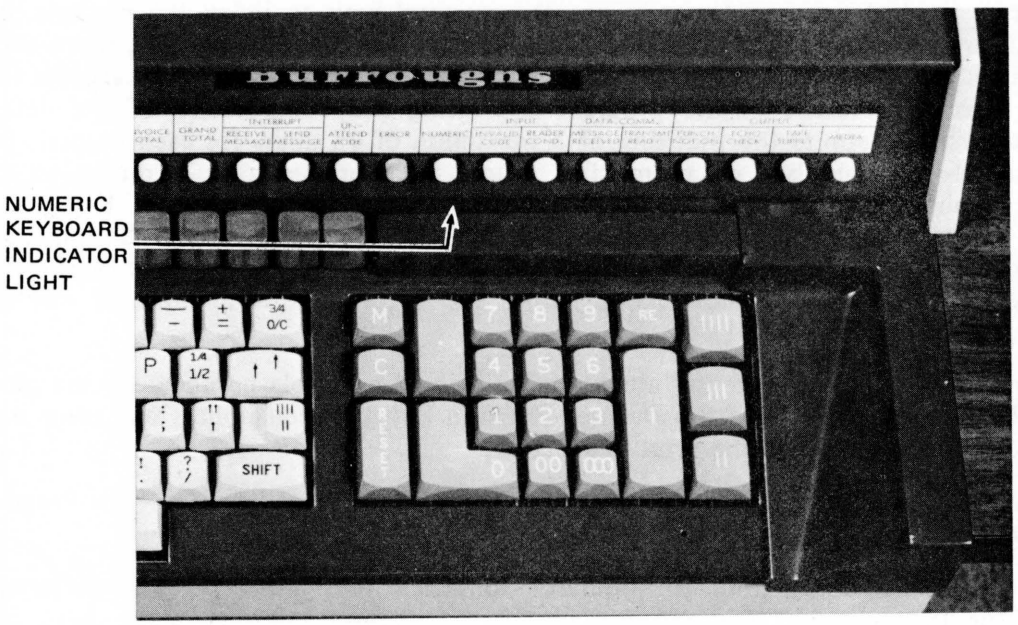


Figure 3.01.00-1 Numeric Keyboard and Indicator Light, 15½" Forms Handler

Each of the above keys delivers its own unique code to the keyboard buffer. If a Numeric Keyboard instruction is active in the program, the Numeric Indicator light is illuminated and the indexed codes are accepted from the buffer to perform a function as dictated by the System Firmware. If a Typewriter Keyboard instruction is being executed, the Numeric Keyboard codes (except OCK's) are rejected, the Keyboard Error light is turned "ON", and the Alarm Bell sounds once (see Figure 3.01.00-2). See Reset Key.

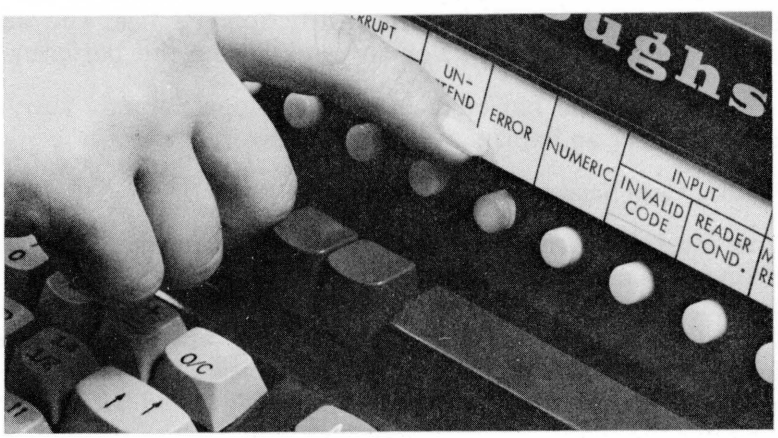


Figure 3.01.00-2 Error Indicator Light, Domestic Data Connumications Keyboard, 15½" Forms Handler

3.01.01 NUMERAL INDEXING KEYS, NUMERIC KEYBOARD

The 12 Numeral keys consist of keys for "0 through 9", a Two-Cipher key and a Three-Cipher key. The keys are marked with the corresponding numbers and ciphers. These keys may be used when the Numeric Indicator light is illuminated or prior to the illumination of the light.

Under program control an operator may use the numeral keys to index the numeric amounts to the keyboard buffer, most significant digit first. The Numeric Keyboard instruction, when active, stores and aligns the digits in respective positions of the accumulator. The instruction only accepts the digits, other instructions must be present in the program if printing and computation of the data are required. Although the system permits the indexing of a maximum of 15 digits for each numeric instruction, the program controls the number of permissible whole number digits in addition to controlling the permissible number of digits for fractional amounts. (See Decimal-Fraction Key.) The programing permits the indexing of whole number amounts without a fractional amount, the indexing of fractional amounts without whole numbers, or a combination of both. If indexing exceeds the programed capacity for either whole or fractional numbers, or both, the Error light is illuminated and the Alarm Bell sounds. See Reset Key, Topic 3.01.06.

Monetary amounts (dollars and cents) are normally treated as whole numbers for the purpose of listing the digits. Rather than depressing the Decimal-Fraction key between dollars and cents with each entry, the decimal point is inserted by the print instruction.

After the amounts, if any, are indexed either an Operation Control key (OCK) or Program (PK) key is depressed to continue the program execution.

The buffer functions also permit an operator to index the numeric keyboard keys prior to the illumination of the Numeric light. During normal operating condtions, seven keys may always be indexed to the buffer. However, a maximum of fifteen numeric keys may be indexed provided the indexing does not occur during the printing of a long alpha message, or during the extensive movement of the printer carrier.

All the numeric keys indexed to the buffer will align in the Accumulator when the numeric instruction becomes active, provided that the indexing does not exceed the capacity for the numeric entry nor exceed the capacity for the buffering function. A warning (Error light and alarm) will occur if the indexing exceeds either capacity. For a correction of an error the entry must be re-indexed after the depression of the Reset key. In addition, the functions for OCK's and PK's are also indexed to the buffer and may be used during the buffering stage. However, these keys should not be used until after the Numeric Indicator is illuminated if the operator has a choice of several operating routines which are selectable during the time the anticipated numeric instruction is active. The waiting period may prevent the hasty selection of an undesired routine. For an error during the buffering state, see Topic 3.01.06.

NOTE: More than 15 keys may be buffered, but for any one numeric entry 15 is the maximum for numeric keys. See Section 10 for an explanation of buffering.

Automatic Input with Punched Paper Tape or Edge Punched Card Reader

The buffering function must be considered when used with a reader for paper tape or edge punched cards. Generally, indexing to the buffer with this type of an application is not necessary but, if required, the possibility of a "Reader Condition" may occur. The "Reader Condition" illuminates a warning indicator when the tape or card is not being satisfactorily processed and reading is prevented. See Subject 9.01.00. When the condition occurs the buffer is cleared. In addition, the "input" instruction changes to a keyboard instruction when a key is depressed. If indexing to the buffer is required the indexing should occur after the input instruction or instructions are executed and prior to the execution of the anticipated keyboard instruction.

The instruction for a read with an 80-Column Punched Card Reader may create a "Reader Condition" but the instruction does not change to a keyboard instruction nor clear the buffer. Generally, buffering with this type of reader may be used without regard to the "Reader Condition". See Subject 9.03.00.

This system permits:

1. Semiautomatic Random Access of Magnetic Unit Records by the Forms Handler, or
2. Automatic Serial Processing of Magnetic Unit Records by the Magnetic Record Reader, an adjunct.

The instructions (RL, five combinations) for the Forms Handler have two phases, the first phase is for numeric indexing and the second phase is for the insertion of a Magnetic Unit Record or nonmagnetic forms; in addition, the instructions (RL) open the Forms Handler. An instruciton (one only) for processing (RL) by the reader adjunct does not have a numeric phase nor does the instruction open the handler. The numeric phase illuminates the Numeric light, and functions the same as a Numeric Keyboard instruction except for the following:

1. The "RE", "C", "M", Two-Cipher, Three-Cipher, and Decimal-Fraction keys may not be used and an error conditon occurs if used (Error light illuminates).
2. The numeric amount, if required, must be indexed prior to the depression of an Operation Control key (OCK) or Program (PK) key, or prior to the insertion of whichever Magnetic Unit Record or nonmagnetic form is required for semiautomatic handling by the right side of the Forms Handler. (The Forms Handler remains open until closed by an instruction or key which includes a closing function.) See Reset key and Operation Control keys, Topics 3.01.06 and 3.01.07 respectively, for error functions and termination of the numeric phase

3.01.02 DECIMAL-FRACTION KEY, NUMERIC KEYBOARD

This key is marked ".". The Numeric Keyboard entry is modified by the depression of the Decimal-Fraction Key. Each numeric key indexed prior to depression of the Decimal-Fraction Key causes digits contained in the Accumulator to shift one place to the left. Depression of the Decimal-Fraction Key terminates the left shifting in the Accumulator. The keys indexed following the depression of the Decimal-Fraction Key cause digits to be aligned in positions of the Accumulator reserved for decimals by the Numeric Keyboard instruction. If the key is <u>not</u> used all indexed numbers are properly aligned and are considered whole numbers. Also, if the key is used without subsequent numeric indexing of any other numbers, all numbers indexed prior to the decimal key are properly aligned and are considered whole numbers. In either case the area, if any, reserved for decimal amounts is clear. If the area reserved for the decimal amounts is greater than the number of digits indexed for the area, then each remaining digit position will be zero.

Alignment of digits during keyboard entry is controlled by the stored program, see Numeric Keyboard instructions, Section 10. An Alarm Bell sounds and Error light illuminates if the program does not permit the indexing of amounts subsequent to the indexing of the Decimal-Fraction Key, or if the subsequent indexed digits exceed the program capacity for fractional amounts. The alarm and error condition are also present if the digits to the left of the decimal are in excess of the number permitted. See Reset Key.

Example: A program permits entry of three whole number digits and two decimal number digits. Operator enters 456¼ decimally.

Sequence of Key Depressions	Alignment of Digits in Accumulator Locations 4 3 2 1 0	
4	4	
5	4 5	
6	4 5 6	
Decimal/Fraction Key	4 5 6	NOTE: The decimal point is not stored as a value or code in the Accumulator.
2	4 5 6 2	
5	4 5 6 2 5	

Magnetic Record Computer System, Decimal-Fraction Key

With this system the Decimal-Fraction Key may not be used with the numeric phase of an instruction (RL) which requires the insertion of a Magnetic Unit Record, or nonmagnetic form in the Forms Handler. If used an error condition occurs (Error light illuminates).

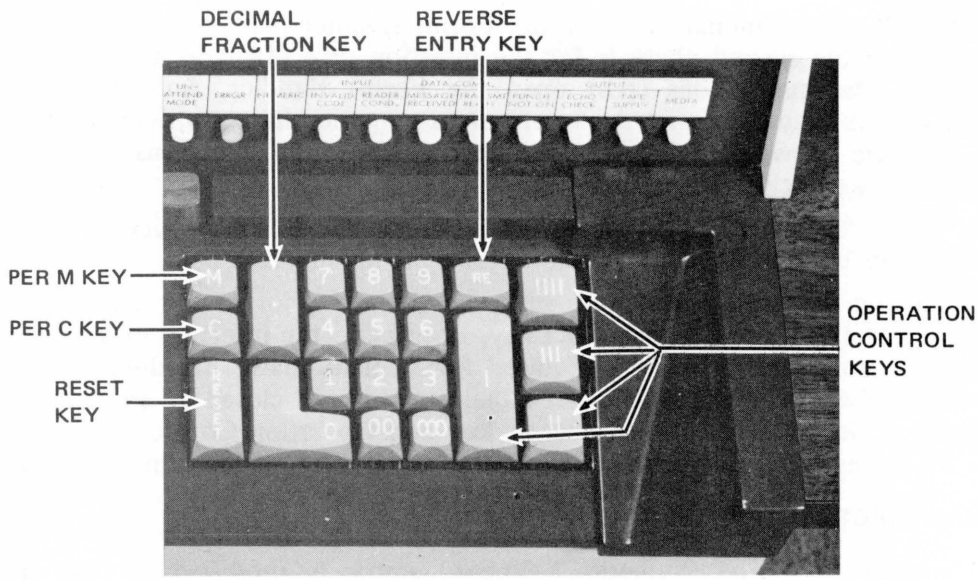


Figure 3.01.02-1 Numeric Keyboard, 15 ½" Forms Handler

3.01.03 REVERSE ENTRY KEY, NUMERIC KEYBOARD

A depression of this key changes the sign of the Accumulator to minus with or without an indexed amount for the programed instruction for a numeric entry. The use of this key causes the "Minus" flag in the flag position of the Accumulator to be set. This key enables the operator to override the programed arithmetic. In addition, the "Minus" flag may be used for selecting alternate program routines (branching). See Skip and Execute instructions for Accumulator flags. The key may be used only when programed, but it may be depressed prior to, in between, or subsequent to the indexing of the digits for the numeric entry. The use of the key without the enabling programing will cause the Error light to illuminate and the Alarm Bell to sound. See Reset Key. The key is marked "RE", but the two-letter character does not automatically print with the amount nor shift the ribbon on a print instruction. The shift of the ribbon and print of a symbol or character to indicate the use of the key is dependent upon programing. See instructions for Numeric Print and Print Character.

Magnetic Record Computer System, Reverse Entry Key

The "RE" key cannot be used during the numeric phase of the Read Ledger (RL) instructions (See Section 10) with a Magnetic Record Computer System. If used, the Error light illuminates and the Alarm Bell sounds. See Reset Key.

3.01.04 PER HUNDRED KEY, NUMERIC KEYBOARD

When the Per Hundred Key, marked "C", is depressed the "C" Flag in the flag position of the Accumulator is set. The key may be used only when enabled with a numeric instruction but it may be depressed prior to, in between, or subsequent to the indexing of the digits, if any, for the entry. The general purpose of the key is to permit an operator to override the programed shift routines for an application, but the key does not actually provide a shift function, it only sets a flag. The program instructions related to the Accumulator Flags, Shift Register, and Shift instructions must be present to actually accomplish the desired shift results or other results. In the absence of the enabling programing for the use of the "C" key on a numeric entry, the Error light illuminates and the Alarm Bell sounds. See Reset Key. The "C" character does not automatically print with the amount on a print instruction. The print of a symbol or character to indicate the use of the key is dependent upon the programing. See instructions for Numeric Print and Print Character.

Magnetic Record Computer System, "C" Key

The "C" key cannot be used during the numeric phase of the Read Ledger (RL) instructions (See Section 10) with a Magnetic Record Computer System. If used, the Error light illuminates and the Alarm Bell sounds. See Reset Key.

3.01.05 PER THOUSAND KEY, NUMERIC KEYBOARD

When the Per Thousand Key, marked "M", is depressed the "M" Flag in the flag position of the Accumulator is set. The key may be used only when enabled with a numeric instruction but it may be depressed prior to, in between, or subsequent to the indexing of the digits, if any, for the entry. The general purpose of the key is to permit an operator to override the programed shift routines for an application, but the key does not actually provide a shift function, it only sets a flag. The program instructions related to the Accumulator Flags, Shift Register, and Shift instructions must be present to actually accomplish the desired shift results or other results. In the absence of the enabling programing for the use of the "M" key on a numeric entry, the Error light illuminates and the Alarm Bell sounds. See Reset Key. The "M" character does not automatically print with the amount on a print instruction. The print of a symbol or character to indicate the use of the key is dependent upon the programing. See instructions for Numeric Print and Print Character.

Magnetic Record Computer System, "M" Key

The "M" key cannot be used during the numeric phase of the Read Ledger (RL) instructions (See Section 10) with a Magnetic Record Computer System. If used, the Error light illuminates and the Alarm Bell sounds. See Reset Key.

3.01.06 RESET KEY, NUMERIC KEYBOARD

The Reset Key, marked "RESET" is used by an operator to clear numeric indexing errors prior to terminating the programed numeric instruction, or to re-initiate the instruction. The error may occur with the instruction active or during the buffering stage. The key does not provide for automatic "reverse entry" of an incorrect amount after the program execution is continued. See Topic 3.01.07 for termination of numeric entries. See Reset Key with Typewriter Keyboard, Topic 3.02.09.

Errors with Numeric Instruction Active

The Numeric light is illuminated when a Numeric Keyboard instruction is active in the program and the Reset Key is used to clear the indexing error.

ERRORS WITHOUT A WARNING, NUMERIC INSTRUCTION ACTIVE, RESET KEY – The key permits the operator to clear the console of a numeric amount if an indexing error is noticed prior to the termination (depression of OCK or PK) of the Numeric Keyboard instruction. After the key is depressed, the correct indexing or operating procedure may follow. The enabled Program (PK) keys remain enabled until the numeric instruction is terminated.

ERRORS WITH A WARNING, NUMERIC INSTRUCTION ACTIVE, RESET KEY – Also the key may be used to clear Keyboard Error conditions which occur because of the programing safeguards. The error condition is accompanied by the illumination of the Error light and by the sounding of the Alarm Bell. After the error is cleared the correct indexing, or operating procedure may follow. The enabled program (PK) keys remain enabled until the numeric instruction is terminated. See Subject 3.03.00 for a summary of keyboard error conditions.

Errors During Buffering

If the indexing occurs prior to the illumination of the Numeric Indicator (Numeric instruction active) the amounts are buffered. See Topic 3.01.01.

BUFFERING WITHOUT A WARNING, RESET KEY – The Reset key will in effect void the buffered amount, if the key is depressed during this buffering stage or after the buffering stage. However, the Reset key must be used prior to the depression of the Operation Control (OCK) key or Program (PK) key. These "reset" functions and required operator procedures are the same as for "Errors without a Warning, Numeric Instruction Active".

BUFFERING WITH A WARNING, RESET KEY – The "Errors with a Warning" are cleared with the Reset key if the error occurs during the buffering stage. The warning (light and alarm) is present when the numeric instruction becomes active and occurs regardless of whether the indexing exceeds the capacity for the buffering functions or exceeds the programed capacity for the numeric instruction. These "reset" functions and required operator procedures are the same as for "Errors with a Warning, Numeric Instruction Active".

Magnetic Record Computer System, Reset Key

The Reset key may be used for the numeric phase of a Read Ledger (RL) instruction to clear keyboard errors during the numeric phase or, during the buffering stage. The conditions are the same as for any other system (nonmagnetic) except for an "Error without a Warning" during the numeric phase or buffering stage. If the numeric phase is terminated by an Operation Control (OCK) key, the read phase of the Read Ledger (RL) instruction for the Forms Handler remains, but the enabled Program (PK) keys are disabled by the OCK. When the Reset key is used, the numeric phase is re-initiated, the read phase remains, but the PK's remain disabled. The amount, if any, may be indexed correctly and the operating procedure continued. For an "Error with a Warning" the numeric phase would not be terminated; therefore, the PK's are not disabled and the enabled PK's remain enabled after the Reset key is used.

With this system the Reset key does not affect the read or write error conditions for the Magnetic Unit Record, nor may the key be used during a "Jam" condition, see Topic 3.04.06.

3.01.07 OPERATION CONTROL KEYS, NUMERIC KEYBOARD

The Operation Control (OCK) Keys 1, 2, 3 and 4 are marked "I", "II", "III" and "IIII" respectively; a corresponding symbol on the Ball Printer is not provided. The keys are located on the Numeric Keyboard and are used to terminate the alpha or numeric entry with or without indexed keys, thus allowing the program to continue to the next instruction in sequence. Each OCK has a flag which is set in the control section (firmware area) of the computer when the OCK is depressed. These flags ("K" Flags) are generally used by the program to select alternate routines or functions. See Skip and Execute instructions, Section 10. A code for an OCK does not store in memory nor in the Accumulator with a Numeric entry. If an OCK is used to terminate an Alpha Entry, the OCK does not affect the memory unless the Alpha Entry is for typing to memory. In the latter case the OCK enters the End of Alpha code in memory, which is USASCII code "NUL" (0/0). See Section 10 for programing and terminating of Alpha entries. Although OCK's must be counted with regard to the allowable buffering capacity (see Topic 3.01.01.), the keys may be indexed in addition to the number of allowable programed digits and characters for numeric and alpha instructions respectively.

Magnetic Record Computer System, Operation Control Keys

A Read Ledger (RL) instruction for the Forms Handler has two phases, the first phase is for numeric indexing and the second phase is for the insertion of a Magnetic Unit Record or nonmagnetic form in the right side of the Forms Handler. If an OCK is to be depressed because of subsequent programing for alternate functions based on OCK (K) Flag conditions, the OCK must be depressed after the indexing of the numeric amount (if any), and before the insertion of the "record" or "form" in the right side of the Forms Handler.

The numeric phase is terminated by the depression of an Operation Control (OCK) key, an enabled Program (PK) key, or insertion of a "record" or "form" whichever terminating function occurs first. Termination of the numeric phase with an OCK disables the PK's previously enabled but the read phase remains. A Program (PK) key would simultaneously terminate both the numeric and read phase, and would override the "record" or "form" required function, except with a Magnetic Record Reader. A keyboard error condition prevents the read phase, see Reset Key.

See Subject 3.03.00 for a summary of error conditions.

See Topic 3.05.06 for other markings for the OCK's.

3.02.00 TYPEWRITER KEYBOARD

The Typewriter Keyboard consists of 53 keys: 2 Shift keys, a Space Bar, a Backspace and Underscore key, an Open/Close and Right Bracket key, a Line Advance key, 2 Operation Control keys, a Memory Load switch and 44 other keys which may be marked with one or more characters. The key depression is similar to the touch of an electric correspondence typewriter. Sustained input of 15.5 digits or characters per second (186 words per minute) is possible. Keyboard entry of either numeric or alphanumeric data can be enforced by the program, and complete control over the maximum "size" (number of characters) of the data entered is available to the programmer. See Subject 3.05.00 for keyboards which are standard or optional for the United States, and the position numbers of the keyboard. The use of "Firmware Keyboard Modifiers" is also explained in the subject topic.

Figure 3.02.00-1 Domestic Data Communications Keyboard, 15½" Forms Handler

With a Magnetic Record Computer system, typing must not occur beyond Print Position 254 when printing on a Magnetic Unit Record, but without the "record" present, printing is permitted at Position 255. A warning for the operator does not occur at Position 254.

The Typewriter Keyboard is enabled only when a typewriter instruction is programed. The Typewriter Indicator Light (ALPHA) is illuminated. For the exceptions to this rule see the description for the Open/Close key, Line Advance key, and the numerals 0 through 9 of the Typewriter Keyboard.

When depressed, each of the Alpha Typewriter keys delivers its own unique code to the keyboard buffer. If a "Type" or "Type into Memory" instruction is being executed, these codes are accepted from the buffer and perform their assigned function. If a Numeric Keyboard instruction is being executed, the Alpha codes are rejected and the Keyboard Error light is turned ON, except when the numeral keys 0 through 9 on this keyboard are used, thus permitting entry of numeric data on this keyboard. The Reset key, on the Numeric Keyboard, is available for use during a Typewriter Keyboard instruction. See Topic 3.02.09.

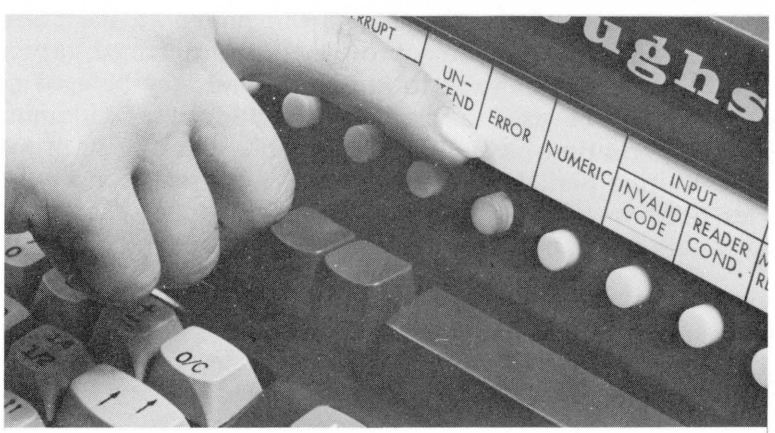


Figure 3.02.00-2 Error Indicator Light, Domestic Data Communication Keyboard, 15½" Forms Handler

If the typing begins at Print Position 1, a typing instruction permits a maximum field of 150 and 255 characters with a 15½" and 26" Forms Handler respectively. Typing beyond print positions 150 and 255 for a 15½" and 26" Forms Handler respectively is prevented. In addition, with an Alpha Typing instruction the maximum number of characters which may be entered is included in the program. If typing exceeds the programed capacity, the Error light illuminates and the Alarm Bell sounds. See Topic 3.03.04 for attempted typing and printing beyond Positions 150 and 255.

Figure 3.02.00-3 Typewriter Keys, Domestic Data Communications Keyboard

3.02.01 TYPING KEYS, 64-CHARACTER PRINTER

There are 26 alpha keys which transmit the same code whether in the shift or non-shift position; these keys are marked "A" through "Z" for the Domestic Data Communication Keyboard. There are 20 typing keys which include 10 Numerals and 28 Miscellaneous character keys, and each transmits a different code depending on whether they are used in a shift or non-shift position. (The markings for O/C key and Backspace key which do not print are included on two of the 20 keys.) Depression of any key sends its corresponding code to the buffer, and may result in printing, or storage in memory, or both depending upon the active or subsequent program instructions. (The Space Bar codes also store in memory.) If printing is programed to occur the printer carrier escapes 1/10" to the right with each of the 64 characters. See description of Hyphen and Equal key, plus Backspace and Underline key for the repeat functions of these keys. (The Open/Close key, Line Advance key and Backspace key do not store codes in memory nor print, and are not counted for the designation of the 64 character printer. See Topic 3.01.07 for the OCK's with regard to storage in memory with an Alpha instruction.)

The keyboard buffer functions also permit an operator to index alpha keyboard keys prior to the illumination of the Alpha light. During normal operating conditions, seven keys may always be indexed to the buffer. However, the buffering functions will accept any number of keys within a range of 19 through 35 provided the indexing does not occur during the printing of a long alpha message, or during the extensive movement of the printer carrier. Characters indexed after the buffer is "filled" are not accepted. Regardless of how many key codes are entered into the buffer, the following alpha print instruction will print the characters which were accepted by the buffer, but the message may or may not be completed. If the operator had not completed the indexing, the typing may continue. If the buffer capacity was exceeded, an error condition with a warning would occur after the print of the last accepted character. One depression of the Reset key will eliminate the error and the typing may be completed following the last printed character, provided the programed capacity is not exceeded. The functions for OCK's and PK's are also indexed to the buffer and may be used during the buffering stage. However, these keys should not be used until the Alpha Indicator is illuminated, if the operator has choice of several operating routines which are selectable during the time the anticipated alpha instruction is active. The waiting period may prevent the hasty selection of an undesired routine. These keys occupy a character position in the buffer and are counted as a character by the system logic with regard to determining whether or not the buffer is "filled". See Topic 3.02.09 for the Reset Key function.

Automatic Input with Punched Paper Tape or Edge Punched Card Readers

For buffering with these adjunct functions, see Topic 3.01.01.

Enter Alpha to Memory without a Print

An instruction for typing alpha characters to memory without printing (EAM) may be programed. The buffering function may be used in anticipation of the instruction. If the operator notices an error during buffering (no warning provided) one depression of the Reset key will re-initiate the instruction and the complete message may be re-entered. If an error condition with a warning occurs (Error light and Alarm) two depressions of the Reset key must be used to re-initiate the instruction and the complete message may be re-entered.

Typing with Paper Tape Output or Punched Card Output

See Reset Key, Topic 3.02.09 and Backspace Key, Topic 3.02.04.

Transaction Codes with Data Communication Systems

The typewriter keys may be labeled for a single-key transaction code, see Topic 3.05.05.

3.02.02 SHIFT KEYS, TYPEWRITER KEYBOARD

The 2 shift keys, marked "SHIFT", when depressed with any shift character key, sends the shift character code to the buffer. For keys with only one marking the character code is the same with or without the Shift key depressed.

Shifted-Numeric

Certain utility routines (Trace) use the Shifted Numeric function. For this function a Shift key is simultaneously depressed with a numeric key (1 through 9) on the numeric keyboard.

3.02.03 SPACE BAR, TYPEWRITER KEYBOARD

The Space bar, "unmarked", when depressed will send the Space code to the buffer, and cause the printer carrier to space 1/10" to the right if printing is enabled. When depressed to a second actuation point, it will send spacing codes until released or until the programed typing capacity is exceeded.

3.02.04 BACKSPACE AND UNDERSCORE KEY, TYPEWRITER KEYBOARD

Non-shifted Position, Backspace

The Backspace function occurs when this key is indexed without a Shift key. The marking for the Backspace is "←". When depressed, this key will cause the printer carrier to space 1/10" to the left if printing is enabled by an Alpha typing instruction. If the typing instruction is entering the data into memory with printing enabled, the Backspace key decrements memory one character position (equal to 2 digit positions) for each 1/10" backspace, in addition to spacing the printer carrier 1/10" left. If a typing instruction is programed to "Enter Memory without Print" the printer carrier does not backspace, but decrementing of the memory one character location will occur for each key depression. When the Backspace key is used with a Type instruction for "Enter to, or Type to Memory" the backspacing in effect erases one character in Memory for each 1/10" backspace function. When depressed and held to a second actuation point, the Backspacing will continue to space to the left until the carrier reaches the print position and/or memory character location where the original Type instruction was initiated or until the key is released, whichever is first. Backspacing to the left of programed Print Position 1 is not possible.

An erroneous code may be punched, if the Backspace key is used with an instruction for a manual alpha typing and punching for paper tape or punched cards. The Backspace key would function for the console, but the Punched Count Register would not decrement nor would the previously punched code or codes be erased from the tape or card. See Reset Key Topic 3.02.09.

Shifted Position, Underscore

The upper marking is an Underscore "___". With a Shift key indexed simultaneously the depression of the Backspace/Underscore key will cause the printer carrier to advance 1/10" and print if printing is enabled. When held to a second actuation point, the printer carrier will continue to advance and print until released, or until the programed typing capacity is exceeded.

3.02.05 LINE ADVANCE KEY, TYPEWRITER KEYBOARD

This key is marked with two vertical arrows to indicate upward movement for a form. When the key is depressed the platen of the Forms Handler rotates one increment. The rotation of the platen is commonly called vertical space, form space, or advance. The most common increment for the spacing is 1/6", but certain styles may have some other increment such as 1/5". If the Line Advance key is depressed to the second actuation point, it will cause the forms to space continually until released. Upon release of the key, the platen may continue to advance as many as 3 more spaces. This continued spacing also applies to each section of a split platen.

The primary purpose of this key is to permit the operator to occasionally advance the form or to use the key as instructed. The programing for an application provides for the normal and automatic movement of the form and excessive use or unrestricted use of the Line Advance key is not necessary. The form position may become out-of-step with the program if the key is carelessly indexed.

Split Platen

If the platen split is active (uncoupled) for a system with a split platen, the Shift key and Line Advance key are used simultaneously to advance (rotate) the right side of the platen. Without the Shift key depressed, the left side of the platen rotates. If the platen split is normalized (coupled) or if a solid platen is provided, the platen is spaced by the left space controls which are indexed by the Line Advance key without the depression of the Shift key.

The simultaneous depression of the Shift key and Line Advance Key will not advance a solid platen or normalized split platen; however, see Forms Count Register in following paragraph.

Forms Handler Considerations

Normally a form in the Forms Handler for the respective left or right platen will space when the Line Advance key is depressed, but the platen may rotate without spacing the form if present. Non-continuous forms (front-feed or rear-feed) do not advance if the Forms Handler is open. See Section 6 for Forms Handler capabilities.

Forms Count Register and Line Advance Key

The respective left and right Forms Count Register is incremented by 1 when the functions for the Line Advance key are indexed. The incrementing for the Forms Count Register or Registers occurs with or without forms present, and with the Forms Handler opened or closed. The Forms Count Registers are commonly used for programing of automatic form movement when the printing for the form or area of a form is completed (filled, end of page).

The Line Advance and Shift keys, simultaneously depressed, increment the right Forms Count Register, regardless of whether the platen is a solid platen, or whether it is a split platen which is normalized (coupled) or which is split (uncoupled).

If the Line Advance key is depressed without the Shift key indexed the left Forms Count Register is incremented.

Permissible Conditions for Line Advance Key

The Line Advance key may be used with the following conditions, or with the following program instructions present for execution.

1. A numeric keyboard entry, Numeric light illuminated.
2. A typing keyboard entry, Alpha light illuminated.
3. The numeric phase (Numeric light illuminated) of a Read Ledger instruction for a Magnetic Record Computer system, but not during the read phase of the instruction.
4. The Ready Mode is present. See following topic on Magnetic Record Computer also. (During the Ready Mode the Count registers are not incremented.)

5. Any Error condition for the system, except certain error conditions with a Magnetic Record Computer system. (The Line Advance key does not function during a "jam" condition, nor during a read or write error.)

Magnetic Record Computer System, Line Advance Key

In addition to the left and right Forms Count Registers, a Magnetic Record Computer system utilizes a Stripe Count Register. The form advance for a "record" or "form" aligned by the Magnetic Unit Record Modules is controlled by the program functions (AR) (ALR) (ARTO) which control the right platen space (advance) functions.

The Line Advance and Shift keys, simultaneously depressed, will space a Magnetic Unit Record or form (nonmagnetic) whichever is under control of the modules in the right area of the handler.

ADVANCE A – With the platen split (uncoupled), the orderly advance with the two keys depressed will occur with the handler opened or closed, and with the Front Pressure Rolls enabled or disabled. The forms on the left may be advanced by the Line Advance key without the Shift key simultaneously depressed. (Manual front feed forms require a closed handler.)

ADVANCE B – With the platen split normalized the orderly advance with the simultaneous depression of the two keys will occur with the handler opened or closed, provided the Front Pressure Rolls are disabled in front of the "record" or "form". The forms controlled by the left controls may be advanced by the Line Advance key without the Shift key depressed. (Manual front feed forms require a closed handler.)

ADVANCE C – With the platen split normalized and with the Front Pressure Rolls enabled in front of the "record" or "form", the handler should be opened before using the Line Advance key. With the handler open, the Line Advance key is depressed once without the Shift key to advance with the "left" controls, and depressed again with the Shift key to advance with the "right" controls. The manual front feed forms, if present normally would be re-aligned before continuing the operations.

With a "record" or "form" under control of the modules, the two keys simultaneously increment registers for the Stripe Count Register and the right Forms Register Count regardless of whether the above procedures are followed. However, only the Forms Count Register is incremented without a "record" or "form" controlled by the Modules.

A "jam" condition with the Magnetic Record Computer system prevents the use of the Line Advance key. Also, if the Line Advance and Shift keys are used to space the "record" or "form" beyond Line 46 or 47 a jam will occur. See Program Key A1 for explanation of the "jam", Subject 3.04.00.

During the Ready mode the Line Advance key does not move the document which is under control of the modules; however, other form movement may be indexed.

3.02.06 OPEN/CLOSE AND RIGHT BRACKET KEY, TYPEWRITER KEYBOARD

Shifted Position, Right Bracket

The shift position is the character for a right closing bracket and is marked "]".

Nonshifted Position, Open/Close Key

The marking for the nonshifted position is "O/C". The O/C key is used to manually open or close the Forms Handler.

Permissible Conditions for Open/Close Key

The O/C key may be used with the following conditions, or with the following program instructions present for execution.

1. A numeric keyboard entry, Numeric light illuminated.
2. A typing keyboard entry, Alpha light illuminated.
3. The numeric phase (Numeric light illuminated) of a Read Ledger instruction for a Magnetic Record Computer system, but not during the read phase of the instruction.

4. The Ready Mode is present.
5. Any Error conditon for the system, except certain error conditions with a Magnetic Record Computer system. (The O/C key does not function during a "jam" condition, or during a read or write error.)

If the O/C key is depressed prior to where the Forms Handler opening may occur, the O/C code is stored in the buffer until the system reaches the stage where opening of the Forms Handler is permitted by the systems control logic.

Rear Feed Forms Handler, Open/Close Key

The Open/Close key, when depressed, will cause the Front Pressure Rolls to open if closed, or to close if open. This assumes the pressure rolls are not disabled. In addition, this key will open the Form Heading Holder Bail from a closed position. When the Form Heading Holder Bail is in an open position, depression of the Open/Close key will not close the bail immediately, but the bail will automatically close after the next 10 line advances have occurred, or will close if the Form Heading Holder Bail lever is manually pushed rearward after the Front Pressure Rolls have closed. If, after the Front Pressure Rolls have closed and before 10 lines have advanced, the front rolls are re-opened and closed, the line on which the bail closes will still be the 10th line. When the handler is open the operator may manually remove a rear-fed form.

The manual opening of the Forms Handler may disturb the alignment of a Rear Feed form if present; a pin feed form or form around the platen is not disturbed.

Basic Front Feed Forms Handler, Open/Close Key

The Open/Close key will open the Front Feed Forms Handler if closed or close the handler if open.

When the Forms Handler is open the Front Pressure Rolls are open, and the Form Aligning Table and Form Guide Bridge are tilted forward. With the open position, front feed noncontinuous forms may be inserted or removed. Manual opening of the Forms Handler may disturb the alignment of the manually aligned front feed form if present; a pin feed form or form around the platen is not disturbed.

Magnetic Unit Record Forms Handler, Open/Close Key

The Open/Close key with this system opens and closes the handler the same as a Basic Front Feed Forms Handler, and affects the manually aligned front feed forms the same way. The manual opening of the Forms Handler does not disturb the alignment of a Magnetic Unit Record or nonmagnetic form controlled by the Magnetic Unit Record modules. Also, the modules retain control of the record or form and prevent operator removal of the module-controlled document. (Before the document may be removed, it must be positioned to the ejected position by program control, a "jam" condition, Power On condition or certain Ready Mode conditions. See Subject 6.14.00 for summary of module movement.)

Read Ledger Instructions for the Forms Handler automatically open the handler if closed. The O/C key will close or open the Forms Handler prior to the termination of a numeric phase when a Read Ledger instruction is active in the program. Since the code for the O/C key is capable of being buffered, and since a Read Ledger instruction for the Forms Handler indexes opening automatically, the Forms Handler will open when the Read Ledger instruction is active and then close because of the prior indexing of the O/C key. The O/C key must be used to open the handler after this erroneous closing to permit the insertion of the record or form for automatic handling by the modules. The Reset key may be used to re-initiate the instruction if the manual opening is not accomplished before the numeric phase is terminated with an Operation Control (OCK) key.

See Subject 6.14.00 for the erroneous insertion of a Magnetic Unit Record

3.02.07 HYPHEN/EQUAL KEY, TYPEWRITER KEYBOARD

The Hyphen Equal key, marked "=" sends a code for the appropriate symbol and has a second actuation point which causes the equal or hyphen key to send codes continuously until the key is

released or until the programed typing capacity is exceeded. The equal code results when the key is used with the Shift key. The Hyphen code is the nonshifted code.

3.02.08 NUMERAL KEYS, TYPEWRITER KEYBOARD

The numeral keys "0" through "9" in the nonshifted position have a dual function. When used with an alpha instruction, these keys send codes for typing; when used with a numeric instruction, they may be used in place of the numerals on the numeric keyboard. When the Shift key is used, each key sends a special character code to the buffer, acceptable only to an alpha instuction. See Subject 3.05.00 for the markings for the special characters.

3.02.09 RESET KEY, TYPEWRITER KEYBOARD

The depression of the Reset key, marked "RESET", will re-initiate a Typewriter Keyboard instruction and position the print head to the start position, if the system is not in a keyboard error condition. If the Reset key is used and accepted during the buffering stage (see Topic 3.02.01.) the instruction is re-initiated regardless of whether printing occurred when the alpha instruction became active. This assumes that the depression of the Reset key occurred prior to exceeding the capacity of the anticipated alpha instruction.

If the system is in Keyboard Error condition (Error light and Alarm), a depression of the Reset key will remove the error condition, and extinguish the Error indicator (Figure 3.02.00-2). The print head will not move. Usually the instruction is then terminated with an Operation Control (OCK) key or Program (PK) key because the programed capacity is exceeded. However, if the error occurred because the capacity of the buffering function was exceeded, the Reset key is depressed and the typing may be continued (see Topic 3.02.01.), provided the program capacity for the Alpha instruction is not exceeded. If the system is in an error conditon, and it is desired to re-initate the typewriter keyboard instruction, a second depression of the Reset key is required.

On the Typewriter Keyboard to Memory and Enter Alpha into Memory instructions, the Reset key will remove an error condition (error light and alarm) without moving the print head or erasing any part of the entry into memory. If the Reset key is depressed without a keyboard error condition present, or as a second depression following an error condition, the instruction is re-initiated; subsequent entry of data destroys and replaces the previously entered data. A Reset key which is depressed and accepted during the buffering state re-initiates the instruction provided the depression of the Reset key occurred prior to exceeding the capacity of the anticipated alpha instruction.

See Topic 3.03.03 for a summary of Typewriter Keyboard errors.

Manual Typing and Punching Paper Tape or Punching 80-Column Cards

If manual alpha typing and punching occur at the same time, the Reset key should not be used unless an error condition (error light and alarm) occurs. The Reset key would re-initiate the active instruction but does not affect the Punch Count Register. If punching for the tape or card occurred, the program most likely would be out of step. The instruction could be terminated.

If an error condition occurs (error light and alarm), one depression of the Reset key is permitted to eliminate the error, but the second depression would create an out-of-step condition as explained in above paragraph.

See Topic 3.02.04 for Backspace key functions.

3.02.10 OPERATION CONTROL (OCK) KEYS, TYPEWRITER KEYBOARD

The OCK's located on the Typewriter Keyboard are used to terminate Numeric or Alpha keyboard entries, thus allowing the program to continue to the next instruction in sequence. OCK 1, marked "$\overset{\text{I}}{\text{III}}$" with the Shift key depressed becomes OCK 3. OCK 2 marked "$\overset{\text{II}}{\text{IIII}}$" with the Shift key depressed becomes OCK 4. These OCK functions are the same as the Numeric Keyboard OCK's and may be used with numeric entries, alpha entries, or the numeric phase of a Read Ledger instruction. See Topic 3.01.07.

3.03.00 KEYBOARD ERROR SUMMARY.

During the execution of a keyboard instruction or numeric phase of a Read Ledger instruction, an error condition with a warning may occur as a result of an invalid key depression. When this occurs, the Error Indicator is illuminated and the Alarm Bell sounds. In all cases, depression of the Reset key removes the error condition. The causes and recovery from error conditions are described below.

3.03.01 NUMERIC KEYBOARD AND NUMERIC KEYBOARD INSTRUCITON

Causes

1. The entry exceeded the number of digits specified by the instruction. This would be for either a whole number or fractional number, or combination of both.
2. The "C" (per hundred) or "M" (per thousand) key was depressed when they were not programed.
3. The Reverse Entry key was depressed when it was not programed.
4. A typewriter key was depressed (other than Open/Close, Line Advance or Typewriter Numeric) during execution of any Numeric Keyboard instruction.
5. A nonenabled Program (PK) Key was depressed, see Topic 3.04.01.
6. The capacity of the keyboard buffering functions are exceeded.

Recovery

The Reset key, when depressed, will remove the error condition, turn off the Error Indicator and re-initiate the original keyboard instruction.

3.03.02 NUMERIC KEYBOARD AND NUMERIC PHASE OF READ LEDGER INSTRUCTION

Causes

1. Same as Items 1, 4, 5 and 6 of Topic 3.03.01.
2. The following key or keys are depressed: "C" (per hundred), "M" (per thousand), "RE" (reverse entry), "00" (two-cipher), "." (decimal-fraction), "000" (three-cipher).

Recovery

Same as Item 10 of Topic 3.03.01, except see Topic 3.01.06 for re-enabling of Program (PK) keys.

3.03.03 TYPEWRITER KEYBOARD AND TYPING OR ALPHA ENTRY.

Causes

1. The number of characters exceeded the maximum number of characters specified by the instruction. This may be printed characters or characters entered into memory with or without printing.
2. A key on the numeric keyboard was depressed, except Reset key, or Operation Control (OCK) keys.
3. A nonenabled Program (PK) key was depressed, see Topic 3.04.01.
4. The capacity of the keyboard buffering functions is exceeded.

Recovery

1. One depression of the Reset key will remove the error conditon, turn the Error Indicator OFF, and allow the execution of the instruction to be completed or terminated.
2. A second depression of the Reset key after an error condition but before the termination of the instruction will re-initiate the Type instruction including positioning the Ball Printer to the position it occupied at the beginning of the instruction. See Topic 3.02.09 for functions of Reset key without an error condition.

3.03.04 READY PUSH BUTTON AND AUTOMATIC RETURN TO READY MODE (SPECIAL ERROR CONDITION).

Numeric Keyboard

If the Ready push button (see Subject 5.02.00) is depressed while in an error condition with a numeric instruction, the error condition will be removed and the system will return to the Ready Mode. If the Reset key is depressed while in the Ready Mode, the instruction is re-initiated. See Topic 3.04.07 for enabled Program (PK) keys with an error condition with a numeric phase of a Read Ledger (RL) instruction.

Typewriter Keyboard

1. If the Ready push button is depressed while in an error condition with a typing instruction, the error condition is removed, and the system returns to the Ready Mode. If the Reset key is depressed while in the Ready Mode, the instruction is re-initiated and the Ball Printer is positioned to the position it occupied at the beginning of the instruction.
2. The Ready Mode also occurs if automatic printing or manual typing is attempted beyond Positions 150 and 255 for a 15½" and 26" Forms Handler respectively. The Reset key re-initiates the instruction and repositions the Ball Printer the same as above. This condition usually occurs only with erroneous programing.

3.04.00 PROGRAM (PK) KEYS, INDICATOR LIGHTS, AND LEGEND STRIP HOLDER

Program (PK) Keys, located immediately above the Typewriter and Numeric keyboards, permit operator selection of alternate routines or selection of assigned functions. The keytops are not marked but a Legend Strip may be used for identification, plus an Indicator light is present for each key. A maximum of 16 and 24 Program Keys are possible with a 15½" and 26" Forms Handler respectively. Less than the maximum are provided with certain models or styles. The PK's may also be identified as Program Select (PSK) keys. All PK's may be enabled by the programing, but PK A1, A2 and A3 are assigned the functions for starting a program, loading a program, and starting certain utility routines. These assigned functions are described in Section 5 because the functions are related to Power ON and Ready Mode. The failure of an indicator light does not prevent the use of the enabled PK. See Appendixes A through E for the number of Program Keys (PK) for each Series or Style.

In addition to the indicator lights for the PK's, other indicator lights are provided to indicate adjunct conditions and Data Communication message exchange conditions.

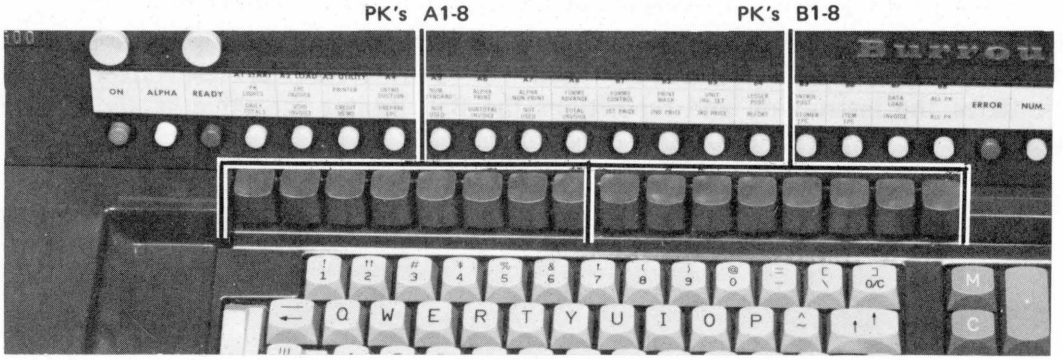


Figure 3.04.00-1 Program Keys, 15½" Forms Handler

3.04.01 PROGRAM (PK) KEYS, GENERAL

The PK's are usable only when the system is performing typewriter or numeric keyboard instructions (these "halt" the program allowing the operator to select a PK). However, the individual PK or PK's that are available at a keyboard instruction are determined in advance by programing an "Enabled PK" instruction. The "Enabled PK" instruction provides control over the use of these keys. (See PK's Section 10.)

For the purpose of setting up a key pattern, PK's are divided into two groups of eight keys each with a 15½" Forms Handler. Keys are numbered "1" to "8", from left to right within each group, A and B. The maximum additional eight keys for a system with a 26" Forms Handler are designated as the C group. For operator instructional purposes or for certain programing languages the keys may be designated with number 1 through 16 or 24 depending on the width of the Forms Handler.

An indicator light associated with each PK informs the operator which keys have been enabled. An identification strip is used to designate the individual lights and PK functions. Since PK functions can be changed from one application to another, the identification strip is designed to be easily changed by the operator. PK functions can be reassigned within the same program. The operator uses the keys as instructed for each program.

An interlock is provided to prevent simultaneous depression of PK's. The entire keyboard will remain interlocked until the PK is released. Depression of an inactive PK will cause an error condition. The Error light illuminates and the Alarm Bell sounds. The error condition may be cleared with the Reset key. The Reset key procedure used will depend upon whether the PK terminates a numeric instruction (Topic 3.01.06) or typing instruction (Topic 3.02.09).

See Topics 3.04.05 and 3.04.07 for Program Keys and Read Ledger Instructions for a Magnetic Record Computer system.

If less than the maximum 16 or 24 PK's are provided for a system, the indicator light for each omitted PK remains. The light may be illuminated by the program to signal the operator for various conditions for the application.

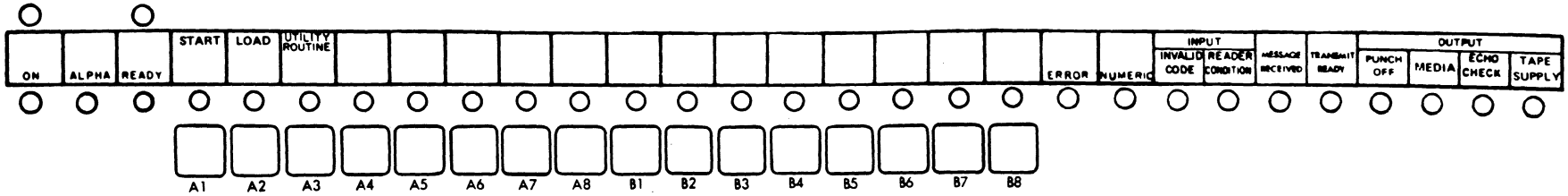


Figure 3.04.01-1 Program Keys, Legend Strip, and Indicator Lights – 15½" Forms Handler

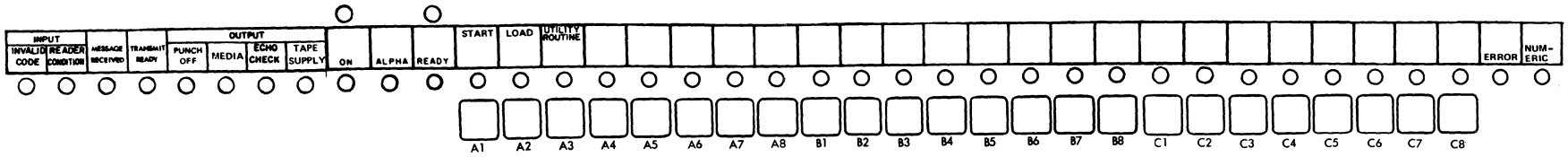


Figure 3.04.01-2 Program Keys, Legend Strip and Indicator Lights – 26" Form Handler

The markings for the Legend Strip are not the same for all Series L/TC's and special markings are assigned for different applications.

3.04.02 LEGEND STRIP HOLDER AND INSERT

The Legend Strip Holder is operator removable. The holder is held in place with a magnet. Two placement studs are on the back of the holder and the studs fit into holes on the face of the console to properly register the placement of the holder on the console. A removable transparent insert fits into the holder. The paper insert for the markings for Program key designations or indicator labels may be a maximum of 7/8" high. The label for each key or indicator is 3/4" wide. The overall length of the insert for a 15½" and 26" Forms Handler is 21¾" and 27¾" respectively. See Figures 3.04.01-1 and -2.

With a Magnetic Record Computer system, the holder if removed or replaced should avoid contact with an encoded Magnetic Unit Record in order to avoid a read error when the "record" is re-inserted.

3.04.03 INDICATOR LIGHTS OTHER THAN FOR PROGRAM KEYS

The lights to indicate Power ON, an Alpha entry instruction, and a Ready Mode condition are to the left of the first Program (PK) key indicator. The Error and Numeric indicator are to the right of the indicator for the 16th or 24th program key position depending whether the system has a 15½" or 26" Forms Handler. See Figures 3.04.01-1 and -2.

Indicator "D" Lights, (Buffer Lights)

Eight other indicator light positions are provided. Illumination of the lights is dependent upon one or more of the following:

1. The presence of an Indicator Buffer package (IB-1) in logic.
2. The presence of firmware for Data Communications system.
3. The presence of firmware for Input and Output capabilities.

The set of eight indicators is to the right of all other indicators for a system with a 15½" Forms Handler but the indicators are to the left of all other indicators for a system with a 26" Forms Handler. The positions are numbered 1 through 8.

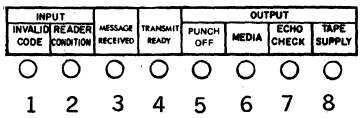


Figure 3.04.03-1 Sample Indicator "D" Lights and Position Numbers

The following is a summary of the functions of the 8 indicators in relation to the attached adjuncts or programing. Suggested or common labels are also listed; however, the legend stip may include any appropriate label.

Indicator Position 1, Invalid Code

1. The indicator illuminates when the attached Punched Paper Tape or Edge Punched Card Reader reads an "invalid code", see Subject 9.01.00. The Flag R-4 is also set.
2. The indicator illuminates when an "invalid code" for a numeric amount is transfered to the Accumulator from the card read-in area (TRCA), see Subject 9.03.00. The Flag R-4 is set. This may occur when an 80-Column Punched Card Reader is used with a system.
3. In the absence of a tape or card reader, this indicator may be used for other purposes. For example, with a Data Communications application the illuminated light may indicate that Teller A is assigned.
4. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag R-4 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may also be used.
5. With the Series L/TC Cobol Language the "Move Zero to Rdr-Err" is used to turn the indicator OFF.

Indicator Position 2, Reader Condition

1. The indicator illuminates when the attached Punched Paper Tape or Edge Punched Card Reader does not have media to read. See Subject 9.01.00. The Flag R-1 is also set.
2. With an 80-column card reader the Reader Condition indicates the same as for the above.
3. In the absence of a tape or card reader, this indicator may be used for other purposes. For example, with a Data Communications application the illuminated light may indicate that Teller B is assigned.
4. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag R-1 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions also may be used.

Indicator Position 3, Message Received.

1. With a Data Communications system, this light is turned ON to indicate a message has been received. The Flag R-2 is also set.
2. This indicator is commonly used to indicate that the program has arrived at an instruction which permits the insertion of a Magnetic Unit Record or nonmagnetic form for automatic handling by the Magnetic Unit Record Modules of a Magnetic Record Computer. See Topic 3.04.04.
3. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag R-2 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may be used also.
4. With the Series L/TC Cobol Language the "Move Zero to Rcv-Rdy" is used to turn the indicator OFF, and "Move One to Rcv-Rdy" is used to turn the indicator ON. The Flag R-2 is reset and set respectively.

Indicator Position 4, Transmit Ready

1. With a Data Communications system, this light is turned ON to indicate a message is ready for transmission. The Flag R-3 is also set.
2. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag R-3 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may also be used.
3. With the Series L/TC Cobol Language the "Move Zero to Xmt-Rdy" is used to turn the indicator OFF, and "Move One to Xmt-Rdy" is used to turn the indicator ON. The Flag R-3 is reset and set respectively.

Indicator Position 5; Punch OFF, Passbook Required

1. The indicator illuminates when the attached perforator for Punched Paper Tape or Edge Punched Cards is OFF or not connected when a punch instruction is being executed. The Flag P-4 is also set. See Subject 9.02.00. This "Punch OFF" warning occurs for all systems with perforator output except the Series TC 700. The "Punch OFF" warning is combined with other warnings which are indicated by Indicator Position 8 with a Series TC 700 system.
2. The indicator illuminates if the attached 80-Column Card Punch is turned OFF or the On-Line switch is not ON when a punch instruction is being executed. The Flag P-4 is also set. See Subject 9.05.00.
3. With a Series TC 700 system the light may be used to signal the operator that the insertion of a passbook is required. This indicator may be used for other purposes. For example, with a Data Communications application the indicator may be used to indicate a warning for a condition of an account. See Indicators 6, 7, and 8 also.
4. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag P-4 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may also be used.

5. With the Series L/TC Cobol Language the "Move Zero to Pb-Required" is used to turn the indicator OFF, and "Move One to Pb-Required" is used to turn the indicator ON. The Flag P-4 is reset and set respectively.

Indicator Position 6, Media, Alert

1. The indicator illuminates when a punch instruction is active and the trailing edge of a roll of tape has passed the Tape Depletion Sensor for a Punched Paper Tape Perforator. If Edge Punched Cards are being punched the light illuminates to indicate the absence of an Edge Punched Card. The Flag P-1 is also set. See Subject 9.02.00. This warning occurs for all systems with perforator output except the Series TC 700 systems. The "Media" warning is combined with other warnings which are indicated by Indicator Position 8 with a Series TC 700 system.
2. If 80-column cards are being punched with an attached Card Punch, the light illuminates when a punch instruction is active and a card is absent from the punch station.
3. For a Series TC 700 system the indicator may be used to warn the operator that an alert condition is present for an account, see Indicator Position 6 also. The indicator may be used for other purposes. For example, with a Data Communications application the light may indicate that a passbook must be turned to another page because the present page is filled.
4. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag P-1 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may be used also.

Indicator Position 7, Echo Check, Passbook Required

1. The indicator illuminates when a punching error is detected when an attached Punched Paper Tape or Edge Punched Card perforator is used, see Subject 9.02.00. The Flag P-2 is also set.
2. With an attached 80-Column Punched Card system the light indicates that certain malfunctions or mis-operations occurred at the Card Punch, see Subject 9.05.00. The Flag P-2 is also set.
3. In the absence of perforator output, this indicator may be used for other purposes. For example, the light may indicate that a passbook is required for a Data Communications application. See Indicator Position 5 also.
4. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag R-2 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may be used also.
5. With the Series L/TC Cobol Language the "Move Zero to Pch-Err" is used to turn the indicator OFF and reset Flag P-2.

Indicator Position 8, Tape Supply, Output Not Ready

1. The indicator illuminates when the tape supply is becoming exhausted with a Punched Paper Tape perforator. The Flag P-3 is also set, see Subject 9.02.00.
2. With a Series TC 700 system and attached Punched Paper Tape perforator the Flag P-3 is set and the light indicates any or all of the following conditions:
   a. The Punch OFF condition, see Indicator Position 5.
   b. The Media condition, see Indicator Position 6.
   c. The Tape Supply condition, this Indicator Position 8.
3. In the absence of perforator output with a Series TC 700 system, the light may be used for other purposes. For example, the light may indicate an "On-Line" status for the Terminal Computer. (See Subject 5.08.00 also.)
4. With the Series L/TC GP 300 Basic Language the Set and Reset instructions for Flag P-3 may be used to turn the indicator ON and OFF respectively. The Load (LOD) and Change (CHG) instructions may be used also.

3.04.04 INDICATOR LIGHTS AND LEGEND STRIP – MAGNETIC RECORD COMPUTER

The Indicators are the same as the lights for a Series L with a Basic 26" Front Feed Forms Handler except certain labels for the legend are changed and an additional light may be illuminated. The removable legend Strip Holder is held in place by a magnet. When the holder is removed or replaced it should not contact an encoded Magnetic Unit Record in order to avoid a read error when the "record" is re-inserted.

Reconstruct, Filled Sheet, Write Corrections

The legend for PK A1, PK A2, and PK A3 are labeled "RECONSTRUCT", "FILLED SHEET", and "WRITE CORR" respectively. These labels are in addition to the basic labels which are "START", "LOAD", and "UTILITY" for the respective numbered keys. See Program Keys, Topic 3.04.05.

Ledger Required

The legend is marked "LEDGER REQ'D" and the light, an operator signal, is the third light from the left or Position 3 (Positions for indicator "D" lights are numbered 1 through 8. See Topic 3.04.03.) The light may be programed to be turned ON by a Set instruction for Flag 2 of the "R" Group of flags (R-2). The light, if programed to be turned ON, must be programed to be turned OFF with the Reset (RST) instruction for the R-2 flag. The Read Ledger instructions do not illuminate this light. The "R" flag of the "S" Group (magnetic unit record read error) does not affect this light. (The Indicator Buffer Package (IB-1) must be present in the system to permit the illumination of the light, this package is standard for a Series L 5000.)

3.04.05 RECONSTRUCT, FILLED SHEET AND WRITE CORRECTION PROGRAM (PK) KEYS

For program standardization purposes the labels for Program keys A1, A2, and A3 are designated as "RECONSTRUCT", "FILLED SHEET" and "WRITE CORRECTION" respectively. The enabling of these keys for the suggested routine is a program function, plus the appropriate recovery routine for each function must be programed. The Systems Firmware does not automatically enable PK A1, A2, and A3 for a read error, filled sheet, and write error respectively, but the "R", "F" and "W" flags of the Magnetic Unit Record (S) group are set respectively.

3.04.06 PROGRAM KEY A1 – "JAM" RECOVERY, MAGNETIC RECORD COMPUTER

The Indicator light for Program Key A1 (Start) and the Error light are illuminated when the "jam" condition occurs during the time that the Magnetic Unit Record Modules are moving or attempting to move the "record" or "form". The Alarm Bell also sounds. All keys except PK A1 are nonoperative and the execution of the program is halted before the termination of the instruction which was in the process of being executed when the "jam" occurred.

Recovery

The one depression of PK A1 will correct most "jam" conditions. If the "jam" is not corrected with one depression of the key, then the operator must manually remove the "record" or "form" (document) and subsequently depress PK A1. If a form is in front of the module-controlled document, the front form should be removed prior to the depression of the PK A1.

Elimination of the "jam" with one depression of the PK A1 or the second depression after removal of the document opens the Forms Handler, ejects the document, if present, without writing and the jam flags (R and W) are set. The instruction in the process of execution when the "jam" occurred is terminated but the functional result for the document which is under control of the Magnetic Unit Record Modules may not have been completed. In addition the other form movement and incrementing of the Forms Count Register for forms around the platen, pin feed form, or front feed form may not be completed if the movement is programed to simultaneously occur with the advance of the document in the modules. The program interrogation of the "jam" Flags (R and W) with the Skip and Execute instructions must be present to satisfactorily recover from the "jam" conditions. Usually this provides for the re-entry of the form if undamaged or the introduction of a new or other form. If the programing does not provide for the re-entry of a form, the normal program execution continues but

the "jam" flags (R & W) remain set. A following Write Ledger or Eject Ledger instruction would create a systems block. The block and corrective procedure are described in Subject 6.14.00 Irregular Programing Control of Magnetic Unit Record Modules.

Reset Key

The Reset key functions are nonoperative during a "jam" condition. The procedure for the elimination or correction of a "jam" prevents the use of the Reset key to re-initiate the instruction which was in the process of execution when the "jam" occurred, see Ready Button.

Ready Button

The Ready Button if depressed during a "jam" condition (PK A1 and Error lights ON and keyboard entry disabled) does not return the system to the Ready Mode, the button is inactive until after the "jam" is eliminated.

Emergency Line Switch and Program Halt and Clear Button

Avoid the use of these controls. The Emergency Line Switch will turn the system OFF during a "jam" condition. When the system is turned ON again the "jam" condition may or may not still exist. See Section 5 for Program Halt button.

With the following conditions, the "jam" may occur for a document under control of the modules of the Forms Handler:

1. When the document movement is restricted because of a damaged or folded document, or the modules are moving at an abnormal speed.
2. The rearward movement of the modules in preparation for a Write Ledger operation, Eject Ledger operation or Align (re-align) is not equal to the prior total upward movement. (Total upward movement is equal to the number of lines used for alignment plus the number of lines the form is spaced by a function which is capable of incrementing the Stripe Count Register. The Ledger Align (LA) instruction for a document previously aligned is considered an alignment function since the document moves to the rearward position and then aligns upward to the line number value in the Stripe Count Register.)
3. The movement of the document beyond line 46 or 47 where the modules lose control of the document. This condition may occur with erroneous or lack of programing for filled sheet conditions or with excessive use of the Line Advance key. See Topic 3.02.05 also. This condition is also referred to as a "Tear" condition, but the operator function for the elimination of the "Tear" is the same as for the elimination of the "Jam".

3.04.07 PROGRAM KEYS AND READ LEDGER INSTRUCTION, MAGNETIC RECORD COMPUTER SYSTEM

The program enables the designated Program (PK) keys and their respective Indicator lights are illuminated. The basic features for Series L's provide that the keys may be programed to be enabled and used when numeric or typing instructions are active and an enabled PK will terminate the instruction. With a Magnetic Record Computer system the keys may be programed to be active with a Read Ledger (RL) instruction. The Read Ledger instruction has two phases: the first is a numeric phase, the second is a read ledger phase. See Numeric Keyboard, Topic 3.01.01. In addition to the functions assigned to the PK keys by programing for selection of alternate routines, the PK's have other functions with regard to a read instruction.

The Program keys do not supersede a Read Ledger instruction for the Forms Handler if the Magnetic Unit Record Modules are in the retracted position when a Read Ledger instruction becomes active in the program. See Retracted Position and Read Ledger Instruction, Subject 6.14.00.

Read Ledger Instructions, Forms Handler

A Program (PK) key, if enabled, will terminate the numeric phase with or without an amount indexed and will supersede the requirement for a document insertion (read ledger phase). If the numeric phase, with or without amount indexed, is terminated with an Operation Control (OCK) key, an enabled PK is

disabled. The insertion of a document terminates the numeric phase also. Since the termination of a numeric phase prevents the use of a PK, it cannot be used to prevent upward or downward movement after a document is satisfactorily inserted and received for movement by the Magnetic Unit Record Modules.

If the Ready Button is depressed prior to document insertion with a read instruction active, the system is returned to the Ready Mode. The depression of the Reset key re-initiates the Read Ledger instruction and all enabled PK's are active, except the PK's are not enabled again if the numeric phase of the instruction was terminated by an OCK prior to the depression of the Ready Button. The OCK termination also prevents the re-enabling of the PK's if the system is turned OFF with a second depression of the button even if power is turned ON again and the Reset key is used to start the program at the same active instruction (RL) where the Ready Mode occurred.

Magnetic Unit Record Present and Read Ledger Instruction

The enabled PK will function even though a document is present (abnormal) in the Magnetic Unit Record Modules, when a Read Ledger instruction becomes active for the Forms Handler, provided that the numeric phase is not terminated by an OCK. The document cannot be manually removed by the operator. See Topic 5.01.01, Note B, Items 4 and 5 for return to Ready Mode in the absence of an enabled Program (PK) key.

Read Ledger Instruction, Magnetic Record Reader

The Program (PK) keys do not supersede a Read Ledger instruction for the Magnetic Record Reader when the reader is ON because this instruction does not have a numeric phase. The condition is the same with or without a form present at the Read Station. When the "Reader" is turned OFF or disconnected the Read Ledger instruction for the "Reader" converts to a Forms Handler Read and Eject (non-align) instruction which opens the Forms Handler and includes a numeric phase; however, an amount may not be indexed. See Section 9 for the functions of the Magnetic Record Reader.

For an "End of Reader Routine" a Program key or keys may be enabled by the programing as part of the routine for a read by the "Reader". Program keys may be enabled during any part of the program but they will function only when an instruction for a numeric entry, a typing entry, or a Read Ledger for the Forms Handler is active. The PK remains enabled during the read of the records by the "Reader" but the function is reserved to be used with the converted read function. An enabled PK will supersede and terminate the converted read instruction, with or without a form in the Magnetic Unit Record Modules, provided the numeric phase is not terminated prior to the depression of the PK. The converted read instruction does not re-initiate to a read by the "Reader" if the "Reader" is turned back ON prior to the termination of the converted instruction. The instruction for a read by the "Reader" may become active again by turning the reader "ON" and then executing or re-starting the program to arrive back at the Read Ledger instruction for the "Reader". This execution may be programed or operator initiated by a designated PK.

The termination of Numeric and Typing entries, and a Read Ledger instruction for the Forms Handler also terminates the enabled condition for PK's. If the "Reader" routine or alternate functions (Reconstruct) includes any of these instructions the PK used for "End of Reader Routine" must be "re-enabled" during the appropriate routine or routines in order to provide the desired result.

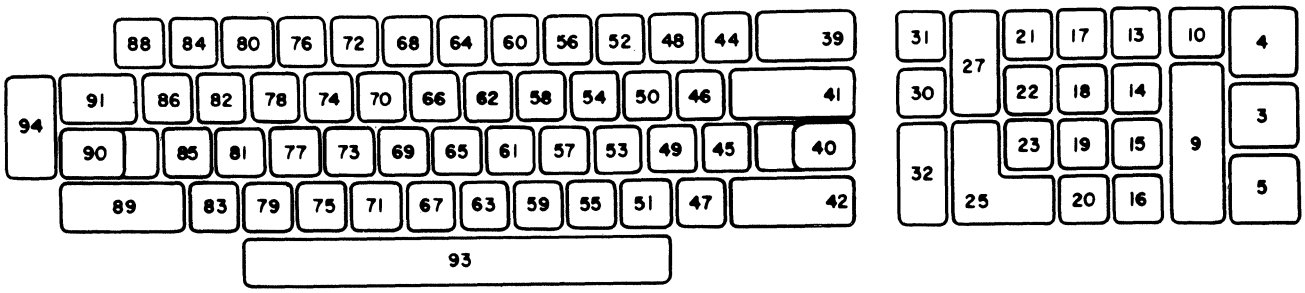
Once the read by the "Reader" is converted to a Read and Eject (non-align) for the Forms Handler, the depression of the Reset key, with or without the Ready Mode present, does not re-initiate a read by the "Reader" with the "Reader" turned back ON. The converted instruction re-initiates.

3.05.00 KEYBOARD POSITIONS AND TYPEWRITER KEYBOARDS

The Domestic Data Communications Keyboard is designated as standard for Series L's/TC's. Other keyboards are a modification of the subject keyboard. In addition to the firmware for a system, a Keyboard Modifier firmware is required for each keyboard. Special keyboards and ball printers are available for certain languages or countries which require special keyboard arrangements.

3.05.01 KEYBOARD POSITIONS

Each keyboard position is numbered for reference purposes. The numbered position may be used, rather than using the keyboard markings for reference.



3.05.01-1 Keyboard Positions

3.05.02 DOMESTIC DATA COMMUNICATIONS KEYBOARD, 64-CHARACTER

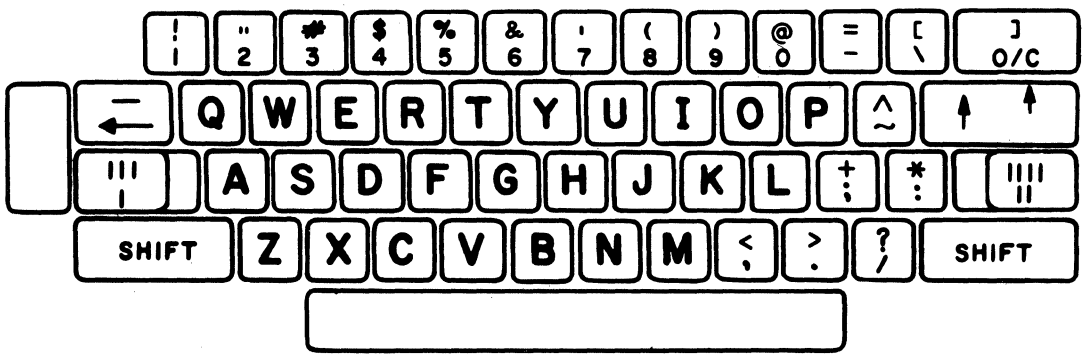


Figure 3.05.02-1 Domestic Data Communications Keyboard

The typewriter keyboard includes 64 markings for characters which may be printed. The Ball Printer, #011, has a like number of characters, see Section 4.

3.05.03 COMMERCIAL KEYBOARD, 64-CHARACTER

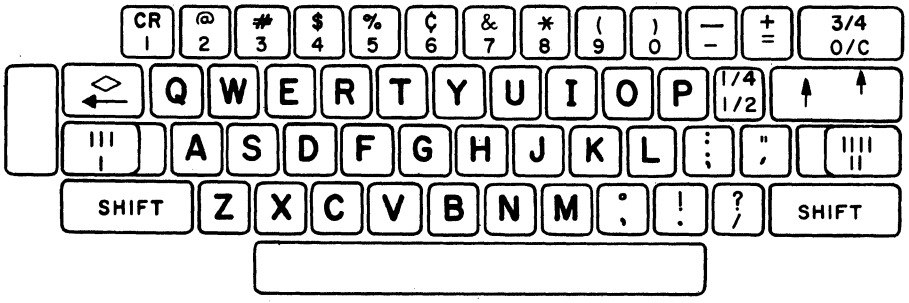


Figure 3.05.03-1 Commercial Keyboard

The typewriter keyboard includes 64 markings for characters which may be printed. The Ball Printer #001, has a like number of characters. See Section 4. The markings are different than those provided with the Domestic Data Communications Keyboard. The markings for 19 keys are changed because of the arrangement of the characters, and the replacement of only 7 printed characters as indicated below. If the Commercial Keyboard is used to replace the Print in Place Keyboard which is standard for a Style, the ball printer and various keys on the typewriter keyboard are replaced as required for the Commercial Keyboard. A standard set of 44 "keys and caps" are not available to utilize a Commercial Keyboard in place of a Financial Data Communications Keyboard (Topic 3.05.06). The programing of the print mask to utilize the Print in Place capability for punctuation of numeric amounts (Topic 3.05.04) cannot be used with the Commercial Ball Printer. The Commercial Keyboard and Ball Printer (Topic 3.05.02) may replace the Domestic Data Communications Keyboard and Ball Printer.

Domestic Character replaced		Commercial Position and Marking			
]	(right bracket)	88	Upper	CR	
[	(left bracket)	39	Upper	3/4	
\	(reverse virgule)	68	Upper	¢	cent sign
Λ	(circumflex)	55	Upper	°	degree sign
<	(greater than)	46	Lower	1/2	
>	(less than)	46	Upper	1/4	
~	(tilde)	91	Upper	◇	diamond

3.05.04 PRINT IN PLACE KEYBOARD, 62-CHARACTER

Two markings are removed from the Domestic Data Communications Keyboard for this 62-Character Keyboard. The Ball Printer, #012, has 64 characters. The characters removed from the keyboard are replaced on the Ball Printer with an offset period and offset comma.

Keyboard Position and Marking

64	Upper	' (apostrophe)	Replaced by blank
	Lower	7	Remains as a 7
47	Upper	?	Replaced by blank
	Lower	/ (virgule)	Replaced by ?

The 7 or ? is indexed with or without a Shift key depressed. The application for a machine must be considered, because the virgule and apostrophe are commonly used in between fractions and to designate measurements in feet respectively.

The Print in Place feature for numeric amounts is controlled by the programed print mask. Rather than use a 3/10" area for the print of two numbers separated by punctuation, the printing of the punctuation

with this feature active is condensed because two numbers separated by punctuation are printed in a 2/10" area. The extra "period" and "comma" commonly are referred to as being "off set" to permit printing between numbers rather than printing centered within a 1/10" area. The offset comma and period are for printing punctuation for numeric amounts only. The programed ability to print without condensing the punctuation is still permitted. The programing is not possible for the combination of Print in Place, and Suppress Punctuation (1/10" spaces between numbers).

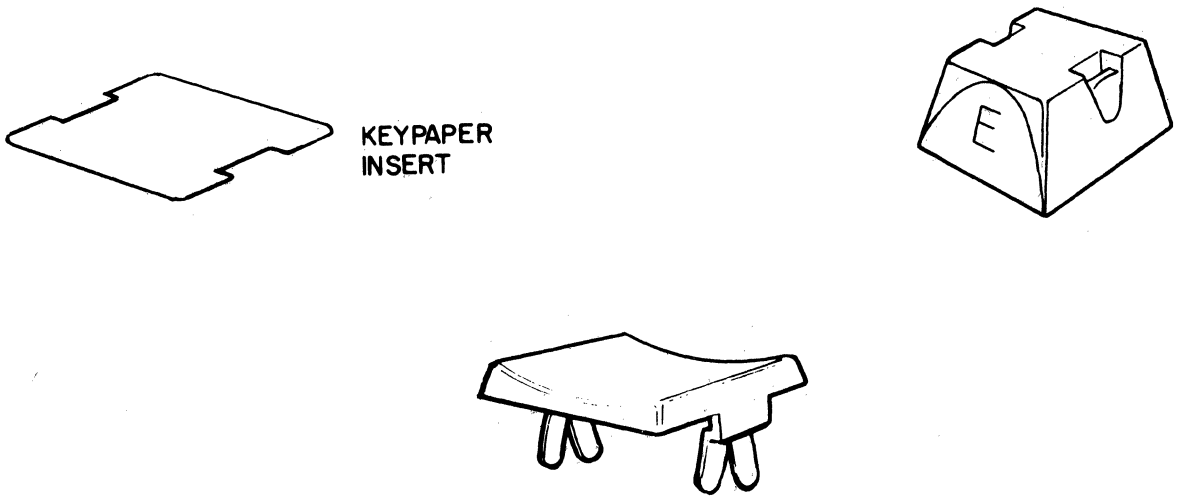
In addition to the Keyboard Modifier Firmware, the Firmware for the system must include the ability to program the print mask for Print in Place. Also this keyboard feature requires that the Indicator Buffer package (1B-1 kit) be present in the systems logic. See Section 10 for programing. See Topic 3.05.06 for the Financial Data Communications Keyboard which uses the Print in Place feature.

3.05.05 TYPEWRITER KEYS AND CAPS

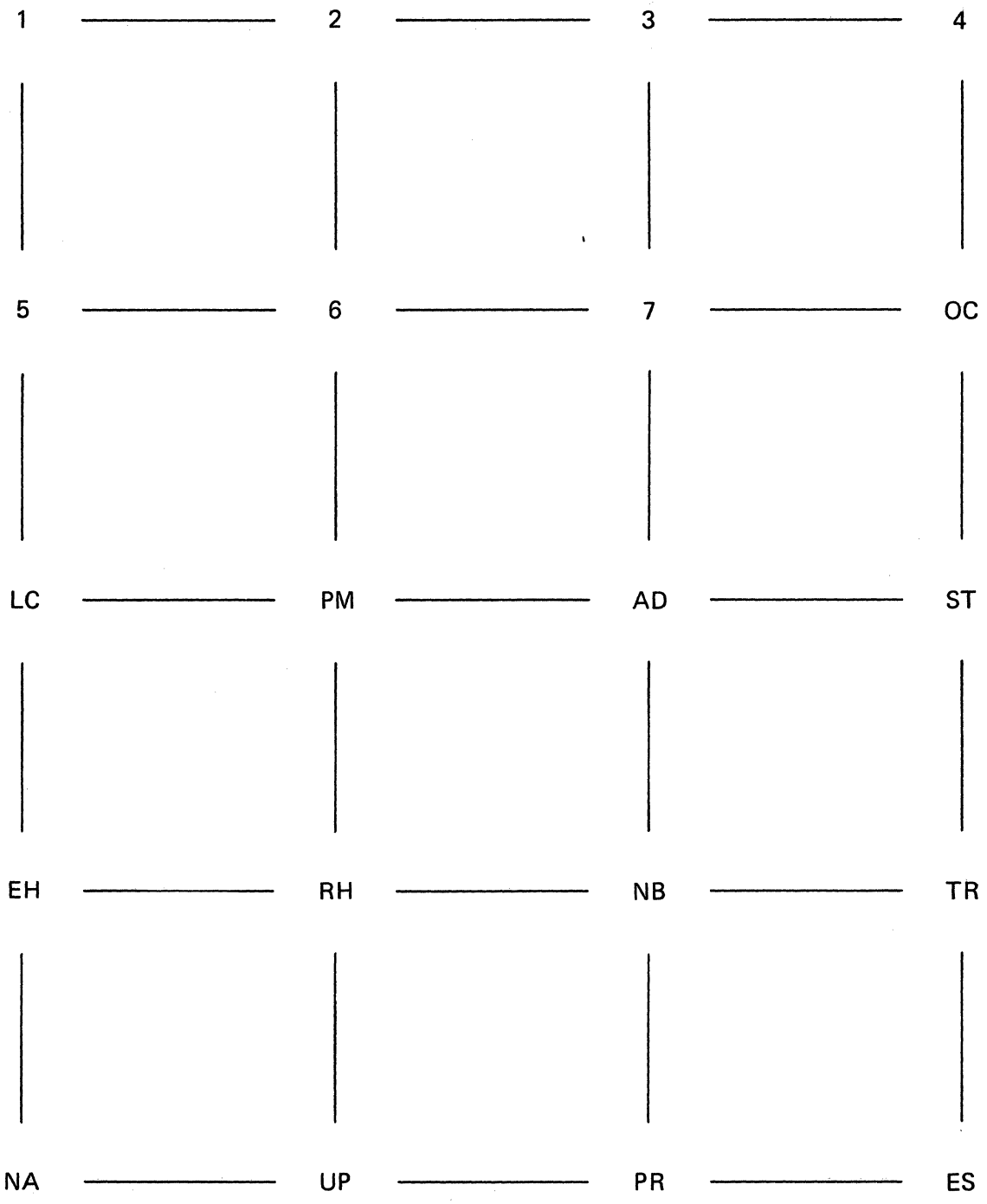
For certain applications or systems the typewriter keys require special markings. To permit this special marking a unique keytop is provided. The engraving is on the front side or face of the key. A transparent cap "snaps" onto the top of the key to hold a paper insert which has been marked as required.

The engraved keys and transparent caps are provided for only 44 keys of the 53 keys of the Typewriter keyboard. This excludes the "capping" of the odd-sized keys, such as Space Bar, Open/Close key, and others. A standard set of 44 are marked with characters required for the Financial Data Communications Keyboard, see Topic 3.05.06.

Usually the markings for the inserts designate Transaction Codes which enable an operator to identify a transaction with one key depression. Preprinted inserts are provided on 8½" x 11" sheets, also a sheet of blank inserts is available. See Figures 3.05.05-2 and -3. (Sheets are available through Field Engineering supply channels.) The inserts on the sheets are perforated for easy separation.

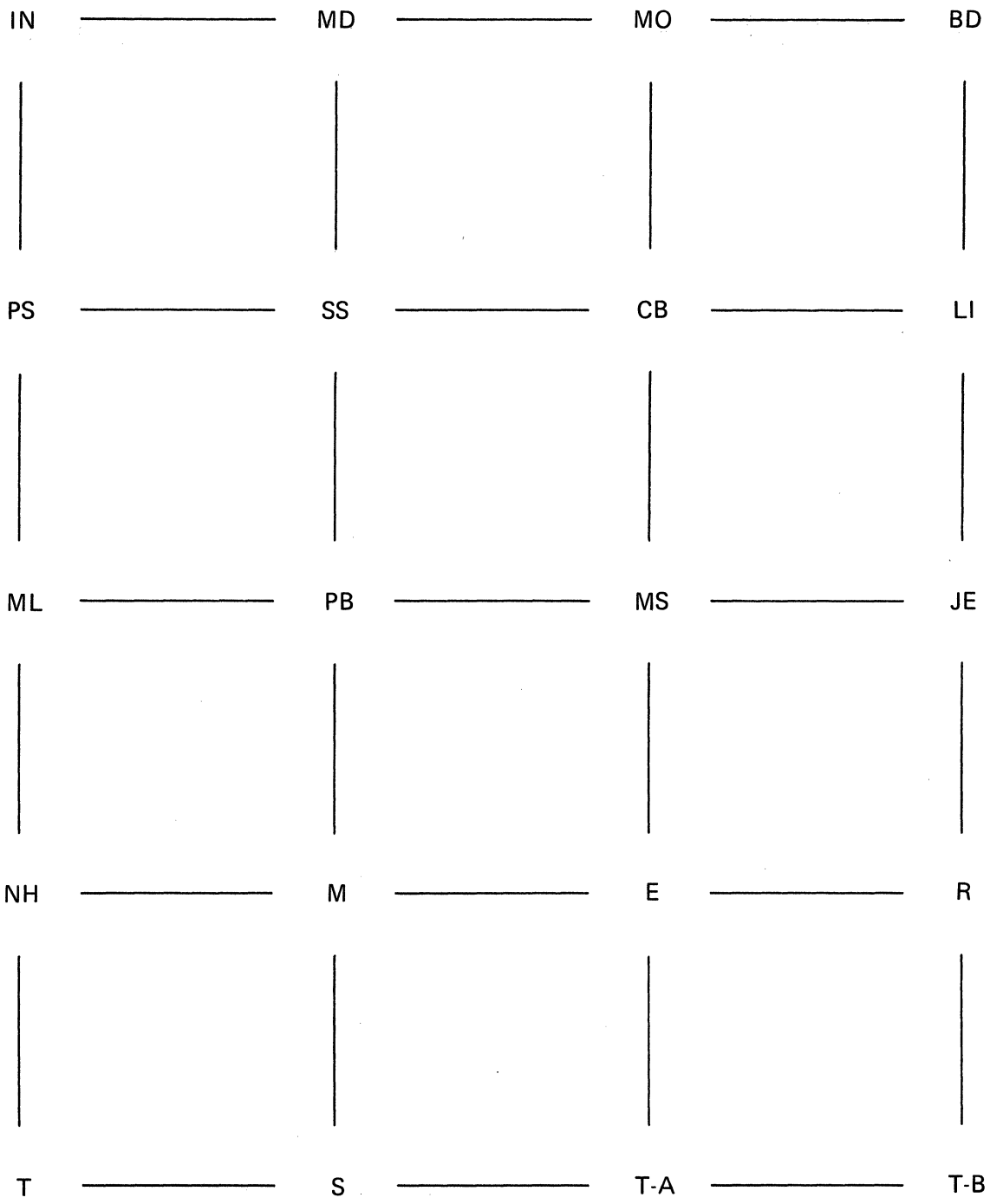


3.05.05-1 Typewriter Key and Cap



OC	Out-of-Town Check	NB	No Book
LC	Local Check	TR	Transfer
PM	Program Modify	NA	New Account
AD	Adjustment	UP	Update
ST	Status	PR	Principal
EH	Enter Hold	ES	Escrow
RH	Remove Hold		

Figure 3.05.05-2 Transaction Code Inserts, Sheet 1; Part 1479 4259



IN	Interest	LI	Life Insurance	E	Error
MD	Miscellaneous Deposit	ML	Mortgage Load	R	Re-entry
MO	Money Order	PB	Passbook	T	Teller
BD	Bond	MS	Miscellaneous	S	Supervisor
PS	Payroll Savings	JE	Journal Entry	T-A	Teller A
SS	School Savings	NH	No Hold	T-B	Teller B
CB	Club	M	Miscellaneous		

Figure 3.05.05-3 Transaction Code Inserts, Sheet 2; Part 1479 4267

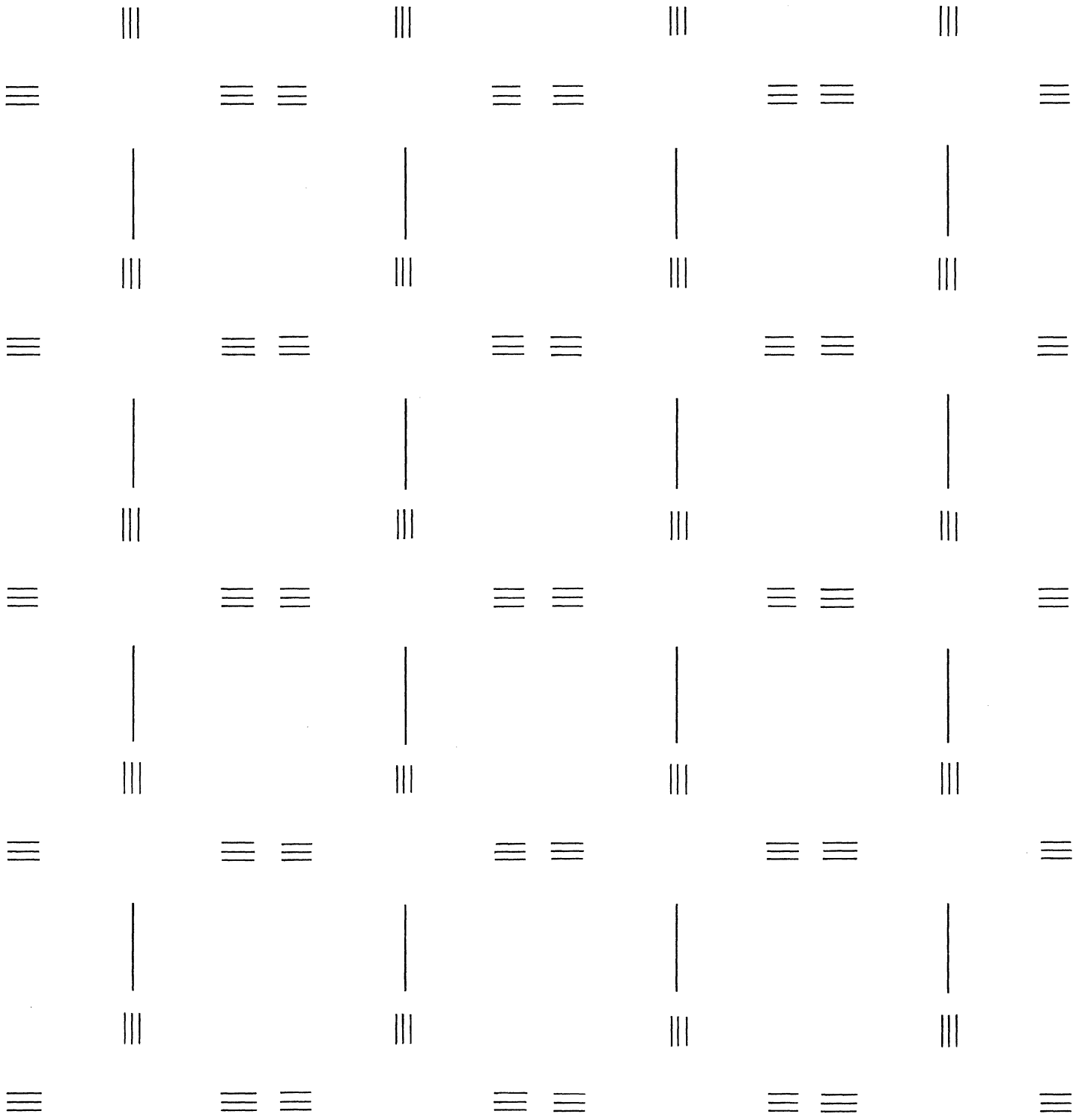


Figure 3.05.05-4 Blank Inserts for Key Caps, Part 1472 4275

3.05.06 FINANCIAL DATA COMMUNICATIONS KEYBOARD

The TC 700 is provided with special markings for certain keys on the keyboards but the functions for the keys remain the same.

This keyboard prints the same as for a Print in Place Keyboard with Print Ball #012 and includes the Typewriter keys and caps as specified in Topic 3.05.05.

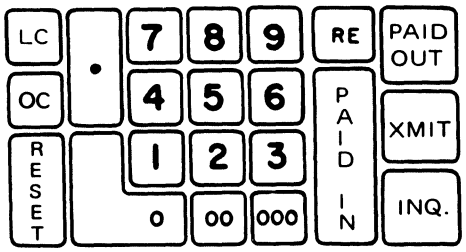


Figure 3.05.06-1 Numeric Keyboard Markings, TC 700

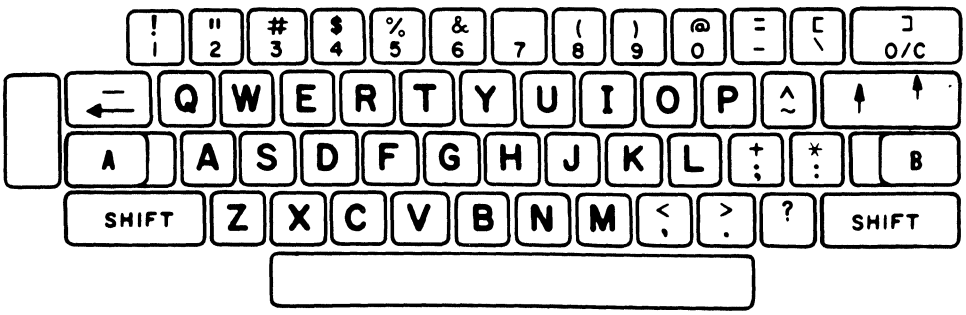


Figure 3.05.06-2 Typewriter Keyboard, TC 700

The markings, except for the odd-sized keys, are on the face of the keys rather than on the top because the keyboard includes "keys and caps".

The keys in the following positions are changed, see Keyboard Positions, Topic 3.05.01.

Numeric Position	Markings Standard	Replacement
31	M	LC (Local Check)
30	C	OC (Out-of-Town Check)
9 (OCK)	I	PAID IN
4 (OCK)	IIII	PAID OUT
3 (OCK)	III	XMIT (Transmit)
5 (OCK)	II	INQ. (Inquire)
Typewriter Positions		
90	III I	A (Teller)
40	IIII II	B (Teller)

SECTION 4
CONSOLE PRINTER

4.00.00 GENERAL

The console printer is a serial printer which includes a Ball Printer for the printing of characters, a carrier mechanism called a Servo device, and the necessary mechanism to hold a ribbon and to automatically reverse the direction for the rewinding of the ribbon.

The embossed characters on the ball print 10 alpha characters, punctuation marks, or symbols per inch at a rate of 20 per second. For a 64-character printer the overall height and width varies with the individual character; however, the nominal size of a printed character is .110" high X .082" wide. With the Print in Place keyboard, Topic 3.05.04, the commas and period for numeric punctuation may be programed to non-escape, or to permit escapement.

The positioning of the printer carrier and the printing of numeric or alpha characters must be programed. The setting of mechanical "tabs" or "stops" is not required. Escapement to the right or backspace to the left is in 1/10th inch increments. Printer escapement without a print may occur from the Typewriter Space Bar, a print instruction which provides for space punctuation in place of commas or periods (suppress punctuation), or with space codes in memory when typing from memory. Backspace may be from the Backspace key only. The printer positioning with a Position instruction may occur in either direction at a nominal speed of 20 inches per second.

The maximum print line is 150 and 255 characters for a 15½" and 26" Forms Handler respectively, provided that printing starts at Print Position 1. Although print positions may be programed for Position 1 through 150 or 255 depending upon the Forms Handler width, the Printer Carrier positions from Position 0 through 149 or 254. The print carrier actually escapes and then prints; therefore, the machine code for Print Position 1 is actually generated as a "0" but the character prints centered at Position 1 in relation to numeric scales on the Forms Handler. A character print at Position 12 in the program actually is printed within 11.5 and 12.5 with relation to the numeric scales. This should be considered in forms design, especially if vertical down lines are printed on the form. The carrier will position at machine code position 150 or 255 but a print is prevented because these positions would be program positions 151 and 256. See Subject 3.02.00.

The Ball Printer also has the ability to use a two-color ribbon; this is commonly called Ribbon Shift. The shift of the ribbon is under program control. An operator indexed ribbon shift is not possible.

For a Rear Feed Forms Handler the printer carrier includes a transparent shield which moves with the carrier. A horizontal line on the shield indicates the bottom edge of where characters print. Vertical lines in 1/10" increments are also provided.

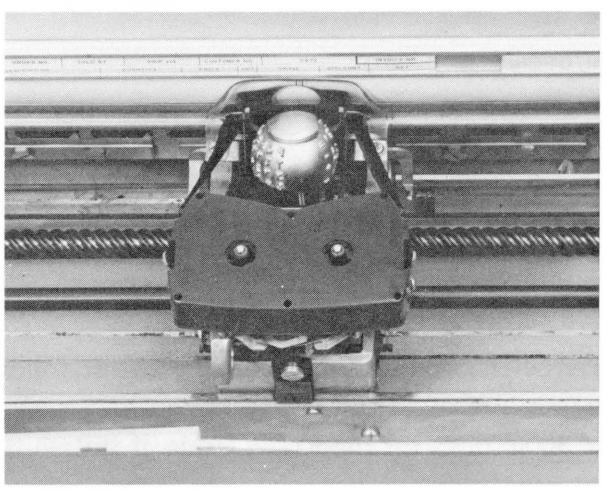


Figure 4.00.00-1 Ribbon Cartridge and Printer

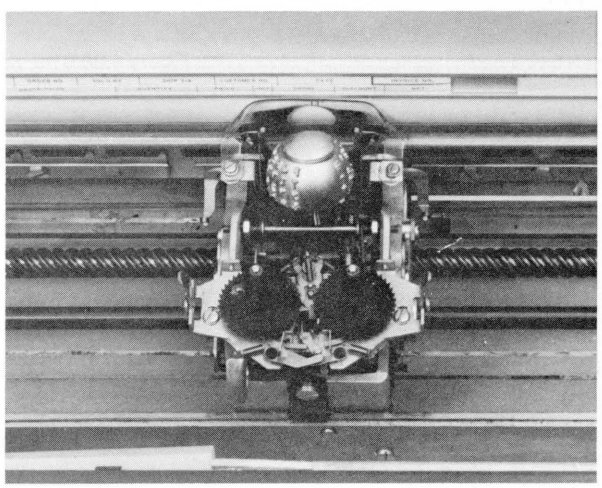
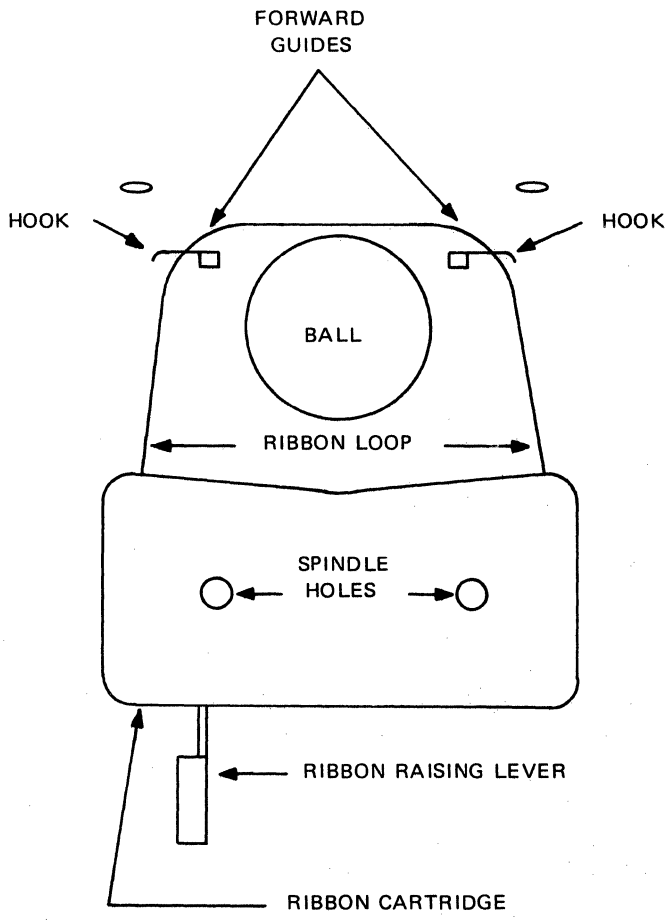


Figure 4.00.00-2 Printer with Ribbon Cartridge Removed

3. Depress PK A1 to position the print carrier away from the left limit, if located at the left limit.
4. Raise hinged cover which is above and slightly forward of the printer carrier.
5. Depress Ribbon Raising lever down and forward until snapped in place, this raises the forward ribbon guides.
6. Remove ribbon and plastic cartridge from the carrier by pulling up.
7. From the replacement cartridge pull the ribbon out to form a half-loop of approximately 3" from the cartridge. (Do not pull out excess ribbon.)
8. With red edge of the ribbon on the bottom, place the half-loop in the forward guides.
9. Fit plastic cartridge on the spindles provided for the holes of the ribbon cartridge and depress down until snapped in place.
10. Tuck the top edge of the ribbon under each upper retaining hook of the forward guides.
11. Pull the Ribbon Raising lever upward to release the lever, and lower the forward ribbon guides.
12. Lower the hinged cover.
13. The ribbon, if loose, will tighten when printing occurs.



4.00.03 PRINTING TOLERANCES FOR RULED LINES AND FORM EDGES

The design of a form must consider paper shrinkage, forms manufacturing tolerances, characteristics of various paper weights and grades, and the handling of forms by an operator. A certain amount of tolerance must be incorporated in the forms design to assure proper alignment and legible printing in all areas of the form. The Forms Specifications are described in Subjects 6.31.00, 6.32.00, 6.33.00, and 6.34.00 for the different types of Forms Handlers.

Left and Right Form Edges, Minimum .2" Print Clearance

The first print position from the left edge of a form or last print position from the right edge of a form should be a minimum of .2" from the programed position of the respective edge of a form. The .082" wide characters print centered in relation to the numeric scales and the programed print position. With this .2" minimum, the printed left and right edges of the characters would be 1½ tenths from the respective left and right edges of the form. See following paragraph for an exception.

Certain applications utilize a collated front feed ledger and statement which are collated to the desired print line by an operator and then inserted into the Forms Handler. The front form or forms are usually 1/8" less in width than the rear form. Usually this difference is near the right edge of the form, but it may be at the left. The 1/8" area is used to print a mark on the rear form to indicate the last used line for collating purposes. With this application the symbol to indicate the sign of an amount, with or without a ribbon shift (plus or minus), should be printed on the front form and rear form. The mark would appear only in the 1/8" area of the rear form. This indication mark should be printed a minimum of two times in order to provide for possible mis-registration of the form. Any character may be used for this mark such as a hyphen or underscore and for certain applications the mark should be in the same color ribbon of the previous amount (accounts receivable balance).

Vertical Ruled Lines, Minimum 1 or 1½ Tenths Print Clearance

Vertical ruled lines should be used only when necessary. For pin feed forms the programed position for a printed character near a vertical line should be a minimum of 1/10" from programed position of the vertical line. The characters print centered in relation to the program position; therefore the printed edge of the character prints approximately 1/20" from the vertical line. For all other forms the programed position for a character near a vertical line should be a minimum of 1½ tenths from the programed position of the vertical line. The distance between the printed edge of the character and the vertical line would be approximately 1/10". Vertical lines on carbon covered journals should be avoided, or the minimum distance between a programed print position and vertical line should be greater than 1½ tenths.

Different types of solid vertical lines, and vertical dotted or broken lines are available on forms. The selection of the proper width ruled line should be considered to provide the appearance of adequate clearance.

Horizontal Ruled Lines, Minimum 1/12" or 1/20", Print Clearance

Horizontal ruled lines should be used only when necessary. For line advance functions with a 1/6" increment, horizontal lines should be a minimum of 1/12" below the bottom edge of a desired line of print or 3/12" above. The nominal height of the printed characters is .110". For line advance functions with a 1/5" increment the horizontal lines should be a minimum of 1/2 of a tenth below the bottom edge of a desired line of print. The line above should be .2" which is the equivalent to a 1/5" line advance. A tolerance for the line above is not required with the 1/5" increment. The Financial Front Feed Forms Handler includes the 1/5" increment for the right section of the platen.

Screen bands (EZ read bands) for forms are a useful feature for the elimination of horizontal lines. The 1/2" screen generally provides the best results; however, screening is also available in 1/6" bands, or fine-line screening 1/2" apart. If the printed forms are copied with a reproducing machine, the reproduction will be the best when the ink of the ribbon is sufficient to provide a "dark" print in the screened area. (Change ribbon when print appears light.)

Left and Right Form Edges Behind Overlapping Forms, Minimum .2" Print Clearance

With certain applications a front form overlaps the edge of a rear form. A print should not occur in the area near the edge of the rear form. The programed print position should be a minimum of .2" on either or both sides of the programed position for the rear form. With this .2" minimum, the printed edge of the character would be 1½ tenths from the edge of the form. If the rear form is a pin feed form with the sprocket holes in the 1/2" margin, then a print should not be programed within the 1/2" margin.

If a single-part form overlaps the edge of another single-part form, a printed character on the front form in the programed position for the edge of the rear form is legible but the faulty print is also slightly noticeable. The same condition is evident if printing occurs in the area of the sprocket holes of the pin feed form.

Magnetic Record Computer System

Position 254 is the last allowable print position on a Magnetic Unit Record even though the right edge of the "record" is always at Position 258. An operator warning at Position 254 does not occur automatically. A print at Position 255 is the last allowable position for all other forms without a magnetic stripe on the back side at the right edge. If a form has a magnetic stripe on both sides (Head to Head Striping) the first allowable programed print position is .4" from the left edge of the "record". Without a stripe at the left edge of the form, the first programed print position should be at least .2" from the programed position of the left edge of the "record". The left edge of the characters would be approximately 3½ and 1½ tenths from the left edge for the .4" and .2" clearance respectively.

SECTION 5

OTHER SYSTEM CONTROLS

5.00.00 GENERAL

The other controls for the system permit the turning of Power ON or OFF, and the necessary functions to begin, re-start, or change programs. In addition, certain models include operator or supervisory protective features which require the use of a Lock with Key.

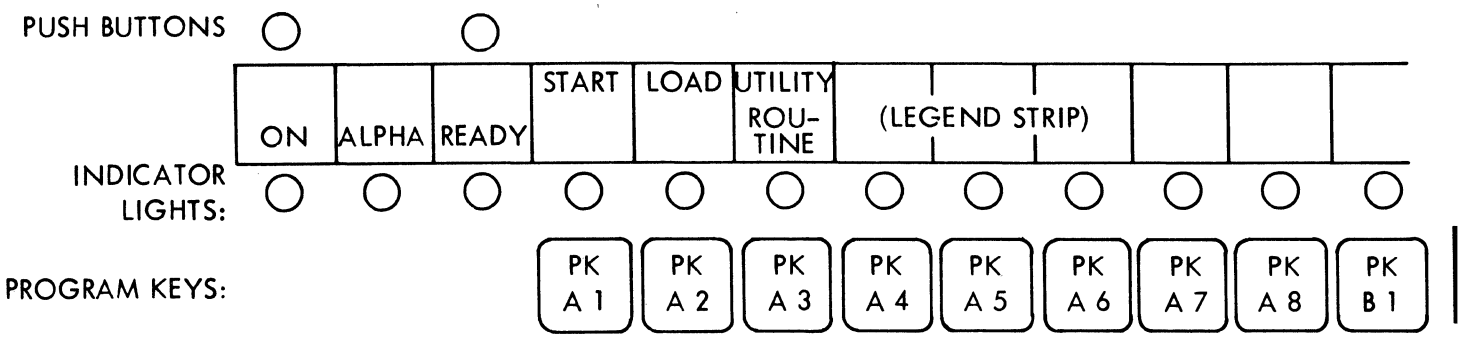


Figure 5.00.00-1 Basic Controls and Indicator Lights

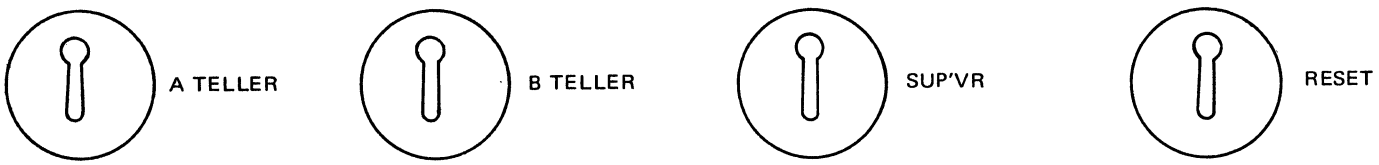


Figure 5.00.00-2 TC 700 Lock with Key Controls, Bottom of Keyboard Printer

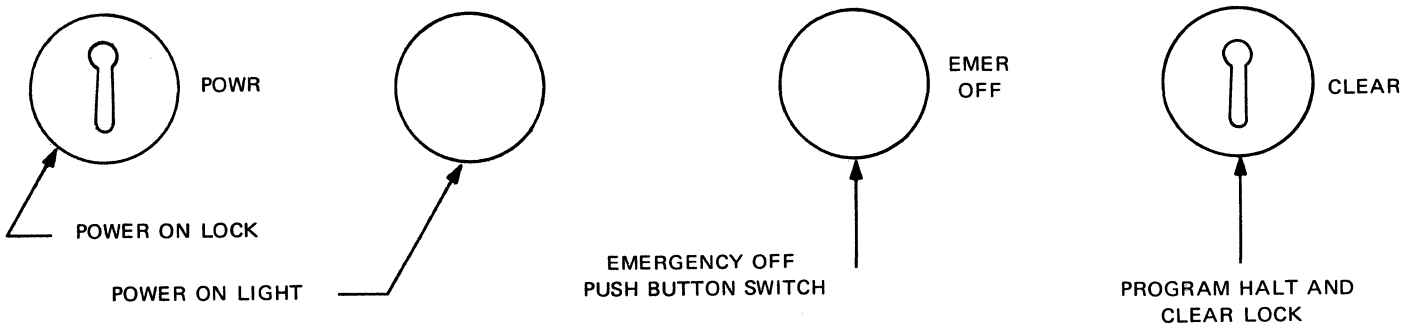


Figure 5.00.00-3 TC 700 Lock with Key Controls on Processor Unit

With the TC 700, Power ON and Ready push buttons are not provided, but the indicators remain.

5.01.00 POWER ON PUSH BUTTON, OR POWER ON LOCK WITH KEY

The Power ON push button switch and associated indicator (green) are located at the upper left end of the PK's. See Figure 5.00.00-1. The Legend Strip insert is marked ON. The Emergency ON-OFF toggle switch, if in the OFF position, must be turned ON before this button will function.

For the TC 700, the Power ON Lock with Key is labeled "POWR" and is located near the upper right-hand corner of the Processor Unit. The lock replaces the Power ON button. A 30° clockwise turn of the key turns the power ON and the key restores to the center position when released by the operator. The key may be inserted or removed in the center position. Both the Power ON Indicator near the Legend Strip and the light to the right of the lock illuminate when power is ON. In order to turn the Power ON with the key, the Emergency Push Button Line Switch (EMER OFF) must be depressed if the button was previously used to turn the power OFF. Key combination #1041F8 is provided as standard for the lock. See Figure 5.00.00-3. See Subject 5.06.00 for an explanation of locks with keys.

5.01.01 POWER ON WITH POWER OFF

The Power turn ON functions are different for a Magnetic Record Computer (MRC) than for other systems and the following steps which are applicable to the different systems are designated to the left of each step. For certain Data Communication systems the Ready light is replaced with a Line Activity light, see Subject 5.08.00. The following will occur when the button or key is used with the power OFF, or used with a procedure for Return to Power ON with Power Already ON, see Topic 5.01.02. See Note D for the Ready Mode conditions which use the following Steps 2 through 9, and Note E for manually aligned forms in the module area.

OCCURS FOR MRC	OTHERS		
Yes	Yes	1.	Power for the system is turned ON if OFF, or remains ON if ON and all connected Indicator lights illuminate for approximately 30 seconds.
Yes	Yes	2.	Approximately simultaneously the Alarm Bell sounds and all illuminated lights except the ON light or lights (TC 700) turn OFF. The lights for Ready Mode, PK A1, PK A2 and PK A3 are then turned ON.
Reader	NO		If the ON/OFF switch/light for the Magnetic Unit Record Reader does not illuminate, depress the switch/light if the reader is required for the application.
Yes	Yes	3.	The Printer Carrier starts moving to the right and during this time either one of the following operator functions may occur, but Option B or C if required must occur before Step 4.
Option	Yes		Option A – The operator waits until Step 9 is completed, see Note A.
Option	No		Option B – Depress Reset key, "Record" Retention Procedure with Re-start, see Note B.
Option	No		Option C – Depress Reset key, Retract Condition Retained with Re-start, see Note C.
Yes	Yes	4.	Printer Carrier arrives at the right.
Yes	Yes	5.	Forms Handler opens if closed.
Yes	No	6.	Magnetic Unit Record Modules are cycled to eject a "record" or "form", if present, and the modules end up in the forward position unless Option B or C is selected in Step 3 to prevent ejection or to retain the retract position.
Yes	Yes	7.	Printer carrier starts to move to the left, either Step 8 or 9 occurs.
Yes	No	8.	Printer Carrier positions to the position selected by the program if Option B or C is used in Step 3, the program instruction re-initiated by the Reset key is ready for execution, and the Ready light turns OFF. Step 9 is skipped.

Yes Yes 9. Printer carrier positions to the extreme left and the operator may select the desired routine with PK A1, PK A2, or PK A3, or the Reset key on the numeric keyboard may be used to re-initiate the keyboard instruction or numeric phase of Read Ledger instruction, whichever was last active when the system was returned to the Ready Mode. The Ready light turns OFF when the desired routine is selected or the program is re-entered.

After the program is re-entered at Step 8 or Step 9 with the Reset key function, or after the desired routine is selected with PK A1, the system is operated in accordance with programed application. PK A2 and PK A3 are for Memory loading and Utility routines, See Subject 5.03.00.

If the Power ON control for the following attached adjuncts is in the ON position when power is turned ON to the console system, the power for these adjuncts also is turned ON:

Paper Tape Perforator

Punched Tape or Card Reader

Power to an attached Card Punch is turned ON or OFF independently. Unlike the Magnetic Unit Record Reader, the sequence for turning power ON to these three adjuncts may occur anytime provided the adjunct is ON prior to beginning the operation of the program. See Section 9.

Note A: Option A is used in the absence of the necessity of Option B or C.

Note B, Magnetic Record Computer System Only: With this system there are several operating possibilities for the use of Option B of Step 3. Item 1 is the recommended condition for turning the power OFF and re-starting. Item 2 is the procedure to use if it is necessary to turn OFF the system with a document present in the modules. Items 3, 4, and 5 are recovery procedures for Item 2 if an operator error occurs when the system is turned back ON.

Note B, Item 1: A system for a Magnetic Unit Record application generally should be turned OFF only when the Forms Handler is free of front feed "forms" or "records". With this possibility Option B of Step 3 would not be used, only Option A would be used.

Note B, Item 2: When power is turned ON, Option B would be used only if a "record" or "form" is aligned in the Magnetic Unit Record Modules when the system had been turned OFF, and only if the presence of the document is required to complete the execution of the program starting at the instruction which is re-initiated by the Reset key. With Option B the operator may depress the Reset key in order to return to a keyboard instruction or numeric phase of a Read Ledger instruction in the program that was active when the system was turned OFF. The cycling of the modules (Step 6) is prevented and a "record" or "form", if present, remains. Steps 4, 5, 7, and 8 will follow when Option B is used. A "Read" by the Magnetic Record Reader does not have a numeric phase.

Note B, Item 3: In the absence of a programed recovery, a failure to execute Option B with the Reset key, to retain the document when the system is turned ON will require that the program be started again with PK A1 at Step 9. This assumes that the operator does not depress any keys at Step 3. See Items 4 and 5.

Certain data which was entered prior to turning the system OFF may require correction if a re-start with PK A1 is necessary. The data to be corrected would depend upon the programed instructions between the "start" instruction and the instruction which was active when the system was turned OFF. The correction, if required, would avoid a duplication of data when the program is re-executed from the "start" instruction.

Note B, Item 4: The erroneous depression of PK A1, A2 or A3 instead of the Reset key at Step 3 also prevents the cycling of the modules and the document is retained. In the absence of a programed recovery, for this type of error, the power must be turned OFF and then ON again to eject the document because a return to the Ready Mode from the program does not eject the document. The procedure for Return to Power ON may also be used, see Topic 5.01.02. The system must be re-started with PK A1 and the correction procedure as described for Note B, Item 3 may be necessary. If a programed recovery is provided, an enabled Program (PK) key could be used to select a program routine

to eject the document rather than turn the system OFF. The enabled PK will function even though a document is present (abnormal) on a Read Ledger instruction with a numeric phase.

Note B, Item 5: At Step 3, the erroneous depression of a key other than the Reset Key, PK A1, PK A2, or PK A3 retains the document, if present, in the modules and the system remains in the Ready Mode. If the operator intended to retain the document, the Reset key may be depressed to re-initiate the desired instruction which was active when the system was turned OFF. In the absence of a programed recovery for an error when the operator did not intend to retain the document the system must be turned OFF and then ON again to eject document. The procedure for Return to Power ON may be used, see Topic 5.01.02. PK A1 may be used to re-start the program, but the correction procedure as described for Note B, Item 3 may be necessary.

Note C, Magnetic Record Computer System Only: Option C is used only if the system is programed for manual insertion of a form in the area where a Magnetic Unit Record Module is present. The operator may depress the Reset key in order to return to the keyboard instruction in the program that was active when the system was turned OFF, and also prevent the module cycling (Step 6). Steps 4, 5, 7 and 8 will follow when Option C is used.

In the absence of a programed recovery procedure, a failure to execute Option C of Step 3 to non-cycle the modules in order to retain the retracted position will require that the system be returned to the Ready Mode (Ready Button) and that the program be started again with PK A1 after Step 9. The condition generally is not discovered until manual form alignment is attempted and the Ready Mode is not present.

Certain data which was entered prior to the return to the Ready Mode may require correction if a re-start with PK A1 is necessary in order to step through the program to retract the modules. The data to be corrected would depend upon the programed instructions between the "start" instruction and the instruction which was active when the system was returned to the Ready Mode. The correction, if required, would avoid a duplication of data when the program is re-executed from the "start" instruction. If a programed recovery is provided, an enabled Program (PK) key could be used to select a programed routine to retract the modules rather than return the system to the Ready Mode and then re-start.

Note D, All Systems: A Return to the Ready Mode will occur with the following conditions and Steps 2 through 9 of the Power ON functions will occur:

Return to Ready Mode from depression of Program Halt and Clear Button. See Subject 5.05.00.

Return to Ready Mode when attempting to type beyond Positions 150 and 255 for a 15½" and 26" Forms Handler respectively, see Topic 3.03.04.

Return to Ready Mode with programed STOP instruction, see Section 10.

For a Magnetic Record Computer System, the difference between the above three Ready Mode conditions and a Return to the Ready Mode from the Program (depression of Ready button) is that the "record" or "form", if present, is retained with a return from the program; otherwise, the document is ejected unless the operator quickly uses Option B in Step 3 of the Power ON functions. See. Subject 6.14.00 for a summary of module movement with Power ON and the Ready Mode function.

Note E, All Front Feed Systems: When the power is turned OFF to the system, the Forms Handler should be free of all "record" or forms which are front inserted for manual or automatic alignment. Forms around the platen and pin feed forms usually remain. For a Magnetic Record Computer system with the Forms Handler closed, the manually aligned form in the module area may be trapped when the power is turned ON unless Option C of Step 3 is used during the turn ON procedure.

5.01.02 RETURN TO POWER ON WITH POWER ALREADY ON

The Power ON button functions to turn Power ON when the Power to the system is OFF. In addition, the button functions to Return to Power ON when the system is in the Ready Mode if the Ready button is depressed within 30 seconds after the depression of the Power ON button.

Accidental depression of the Power ON button when an operator intends to turn the system OFF usually creates a Return to Power ON when the Ready button is subsequently depressed. The operator should not turn the Emergency Line Switch to OFF because of the assumption that a malfunction occurred.

With a TC 700 system the Ready push button and the Power ON push button are replaced with a Reset (Ready) Lock with key and a Power ON Lock with key respectively, but the functions will be the same when the key or keys are turned.

The procedure for Return to Power ON with Power Already ON occurs as follows:

1. Depress Ready push button if Indicator light is not illuminated. (Steps 1 through 7 of Subject 5.02.00 occur.)
2. After the above light illuminates or if already illuminated, depress the Power ON button.
3. The depression of the Power ON button sets the system for "potential" to Return to Power ON.
4. Within 30 seconds depress Ready button, the Power ON functions will occur and the system is returned to the Ready Mode. See Steps 1 through 9 of Topic 5.01.01. See other results after Step 3.

Other Results after Step 3

1. The system turns OFF if the Ready button is depressed after the 30 second duration.
2. PK A1, or PK A3 if depressed after Step 3 will function for the start of a program or utility routine; however, if the Ready button is subsequently depressed once to return to the Ready Mode and then again in the Ready Mode, Step 4 above will occur provided the second depression of the Ready button occurs within 30 seconds after Step 3 above. (PK A2, the load key, will function the same, its functions usually exceed the 30 second duration.)
3. After 30 seconds the "potential" to Return to Power ON does not exist. The system remains in the Ready Mode if not turned OFF, or the system operates in accordance with the functions for PK A1, A2, or A3 if one was depressed.

5.02.00 READY PUSH BUTTON, OR RESET (READY) LOCK WITH KEY

The Ready Push Button switch and associated indicator (green) are located at the upper left end of the Program (PK) keys. The legend strip insert is marked READY. See Figure 5.00.00-1.

For TC 700 Data Communication systems a Lock with key, labeled RESET, is provided instead of the button but the turning of the key provides the same function. Key combination #1041F8 is provided as standard. The key may be inserted or removed in the center position and a 45° clockwise turn operates the reset (ready) switch. When the turned key is released the key restores to the center position of the lock, but setting of the switch is not changed. This lock is generally used only by a supervisor when an irregularity occurs for the TC 700 or when turning Power OFF. The following description uses the term "Ready Button" but the turn of the key functions the same. See Subject 5.06.00 for an explanation of locks with keys.

Power OFF Function

If the Ready button is depressed when the system is in the Ready Mode, the button turns power OFF to the system. Power, if ON, for the following attached adjuncts is also turned OFF when the power to the system is turned OFF; however, each adjunct may be turned OFF independently, see Section 9:

Paper Tape Perforator

Punched Tape or Card Reader

Magnetic Record Reader

Power for an attached Card Punch is independently turned ON and OFF.

Return to Ready Mode from Program

If the button is depressed when the system is under control of the program, it returns the system to the Ready Mode upon encountering the next keyboard instruction. If the Ready button is depressed with a keyboard instruction active in the program, the system returns to the Ready Mode immediately. See Topic for Magnetic Record Computer system in a subsequent paragraph.

The execution of the program halts when a Ready Mode occurs; however, the Reset key on the numeric keyboard and Program (PK) keys A1, A2 and A3 will function in the Ready mode. See Open/Close key, and Line Advance key in Section 3. See Note D of Topic 5.01.01 for other Ready Mode conditions.

A return to the Ready Mode eliminates error conditions which occur from a keyboard entry.

The Ready Mode functions from the program mode are the same for all systems except as explained for Step 4 with a Magnetic Record Computer system. The following functions occur for a Ready Mode when a keyboard instruction or numeric phase for a read instruction is encountered or active.

1. Approximately simultaneously, the Alarm Bell sounds and all illuminated lights except the ON light or lights (TC 700) turn OFF, the lights for Ready Mode, PK A1, PK A2 and PK A3 turn ON.
2. Printer Carrier starts moving to the right; PK A1, PK A2, PK A3 or Reset key on the numeric keyboard may be depressed or the operator may wait for Step 7.
3. Printer Carrier arrives at right.
4. Forms Handler opens if closed. For a Magnetic Record Computer system the "record" or "form", if present in the Magnetic Unit Record Modules, remains aligned. (Modules do not move with or without form.)
5. Printer carrier starts to the left, either Step 6 or 7 occurs.
6. Printer Carrier positions to the position selected by the program instruction re-initiated by the depression of the Reset key in Step 2 or the program selected is dependent upon whether PK A1, PK A2 or PK A3 had been depressed in Step 2.
7. Printer Carrier positions to the extreme left and the operator uses the Reset key to re-initiate the same keyboard related instruction which was last active when the Ready Mode occurred or depresses the desired PK A1, PK A2, or PK A3. See Topic 5.03.04.

After the program is re-entered at Step 6 or Step 7 with the Reset key function, or after the desired routine is selected with PK A1, the system is operated in accordance with programed application. PK A2 and PK A3 are for Memory Loading and Utility routines, see Subject 5.03.00.

Magnetic Record Computer System, Ready Mode

The numeric phase of a Read Ledger (RL) instruction for the Forms Handler is considered a keyboard instruction with regard to the ability to Return to the Ready Mode or to re-initiate a keyboard instruction. When the numeric phase is re-initiated the read phase is also re-initiated. The read instruction for the Magnetic Record Reader does not have a numeric phase. The Ready button does not interrupt the "record" or "form" movement by the modules but if depressed during the movement, the Ready Mode occurs at the next keyboard instruction or numeric phase of a read instruction.

See Program Keys for Return to Ready Mode with a Read Ledger instruction, Topic 3.04.07. Read and write errors with a Magnetic Unit Record do not illuminate the Error Indicator and are not considered error conditions eliminated by a Return to the Ready Mode. A "Jam" condition illuminates the Error light but the recovery procedure eliminates the error prior to the returning to the Ready Mode. See Topic 3.04.06.

5.03.00 KEYS WITH SPECIAL FUNCTIONS ONLY WHEN IN THE READY MODE

The Ready Mode assigns special functions to Program Keys A1, A2, and A3 which are completely independent of the functions that may be given to these PK's under the Program Mode. Upon entering the Program Mode, these PK's operate according to the function given them by the Program currently in the Normal area of memory; but any time that the computer enters the Ready Mode, these PK's operate as special Control Keys whose functions are provided by the Firmware. Also, the Reset key on the numeric keyboard has a special function while the computer is in the Ready Mode.

5.03.01 PROGRAM KEY A1, START

Depression of this PK places the computer in the Program Mode and starts the execution of the user program, beginning with the instruction located in word 0 syllable 0.

5.03.02 PROGRAM KEY A2, LOAD SWITCH AND MEMORY LOADER

The subject keys and loader are used by an operator to load a program into the normal area of memory.

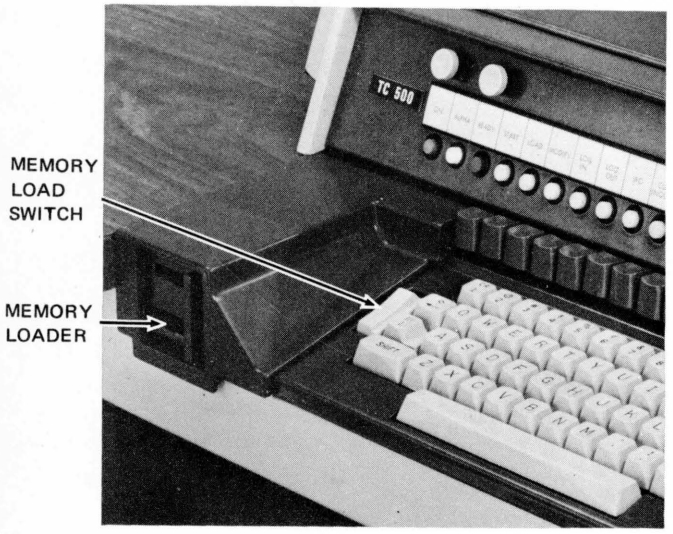


Figure 5.03.02-1 Memory Loader and Memory Load Switch

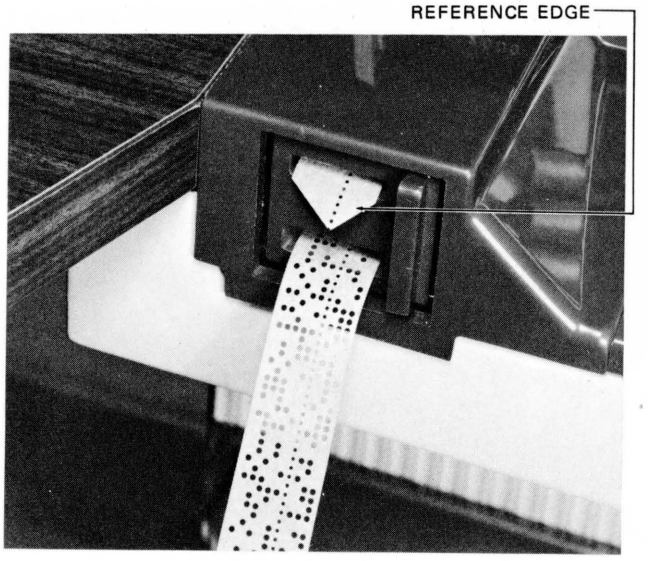


Figure 5.03.02-2 Program Loading

The following steps are used to load a program.

1. Turn Power ON if OFF, or return to Ready Mode with Ready Button function if in a Program Mode.
2. Remove Memory Loader from loader aperture, the loading drive-gear will be at the right front of loader.
3. Insert the leading end (usually V-shaped) of the program tape into the lower slot of the loader. The reference edge of the tape is to the right. (Reference edge is the edge with space for only 3 punched holes between the sprocket holes and tape edge. See Figure 5.03.02.-2.)
4. Move tape until the leading end contacts sprocket drive.
5. With the right hand, turn loading drive-gear counterclockwise until tape threads over the sprocket drive.
6. Insert Memory Loader back into Loader Aperture of the console.
7. Depress Program (PK) key A2 (LOAD), must occur before step 8 or a loading function will not occur.
8. Depress the one-color end of the rocker type Memory Load switch (unmarked) on left of Typewriter Keyboard to start the loader.
9. After loading is completed, depress the red and white end of the Memory Loader switch to turn off.
10. Depress Reset key to return to the Ready Mode.

During the loading the operator should make sure the program tape does not become tangled or fall to the floor. Usually a tape which falls to the floor will pick up foreign material which prevents satisfactory loading.

If the Alarm Bell sounds during loading a parity error may have occurred and another attempted load should be made. If an alarm sounds again a new program tape may be required. The attention of a service representative may be required if an alarm sounds, all indicator lights turn ON, and the Printer Carrier moves. The program loads at a rate of 15.5 characters per second. The program tape specifications are the same as for 8-channel paper tape for the Paper Tape Perforator, Subject 9.02.00. If the leading end of the program tape becomes damaged and threading becomes difficult because of repeated use, the end may be trimmed to remove the damaged area.

The area of memory which is to be loaded must be "unprotected", see Section 2. The loading of an object program replaces the prior contents of only the memory which receives the instructions for the ney program. Areas which are reserved for accumulation of data (regions) in accordance with a program are not normally cleared by the loading of a program. After the program is loaded the clearing of these areas may or may not be required in accordance with the operating procedure for the program. If clearing is required, the function is usually referred to as a "clear routine", or "totaling routine".

The Memory Loader is used only for initial loading of memory, changing of programs, or loading of a utility routine. It is not used for input of transaction data during a program operation. A punched-paper tape or punched-card reader is available for the reading of data during program operation; see I/O Devices, Section 9. The program loading with either of these adjuncts requires a utility routine. The rate for loading with an adjunct exceeds the rate for the loading with the Memory Loader. See Burroughs Series L/TC System Software Operation Guide, Form 1047818.

5.03.03 PROGRAM (PK) KEY A3, UTILITY ROUTINE

Depression of this PK starts the execution of a special utility routine residing in a reserved portion of control memory (such as the Memory Modify or Memory Punch routine). The resulting operation depends upon which of these utility routines has been loaded into memory (5.03.02). After completion of the utility routine, the Ready button will return the computer to the Ready Mode. Note that some utility routines are initiated by other means; refer to the specific operating instructions for each routine. See Burroughs L/TC, System Software Operation Guide, Form 1047818.

5.03.04 RESET KEY ON NUMERIC KEYBOARD AND READY MODE

Depression of the Reset key on the numeric keyboard when in the Ready Mode will re-initiate the last active keyboard related instruction.

The re-initiated instruction may be:

1. The keyboard instruction or numeric phase of a Read Ledger (RL) Instruction, whichever was active when the Ready Mode occurred.
2. The prior or last instruction for a keyboard entry or numeric phase of a Read Ledger (RL) instruction which was executed prior to the use of the Program Halt and Clear button or executed prior to the programed STOP instruction. See Subject 5.05.00 and Section 10.

A depression (the second) of the Ready push button when the system is in the Ready Mode turns the system OFF except when a Return to Power ON condition exists. See Topic 5.01.02. When the system is turned ON again as listed by the steps in Topic 5.01.01, the Reset key will re-initiate the same keyboard or numeric phase of Read Ledger instruction, whichever was last active when the Ready Mode occurred. (The above re-initiation of the instructions assumes that a new program had not been loaded into memory, see Topic 5.03.02.)

See the following functions and topics for the related functions of the Reset key.

1. Numeric Entry, Topics 3.01.01 and 3.01.06.
2. Typing or Alpha Entry, Topics 3.02.01 and 3.02.09.
3. Program (PK) keys, Topics 3.04.01 and 3.04.07.
4. Program Loading, Topic 5.03.02.
5. Utility Routine, Topic 5.03.03.

5.04.00 EMERGENCY LINE SWITCH

The Line switch is an ON-OFF toggle type switch and is located on the left side panel under the keyboard on all systems except TC 700. See Figure 5.04.00-1.

For the TC 700 an Emergency Line switch is provided both at the lower left-hand corner of the Keyboard Printer and in the upper right-hand corner of the Processor Unit. See Figures 5.04.00-2 and -3.

In the OFF position, power is off to the system. This switch normally remains ON, untouched by the operator. When the system is operating, **it should be used only in emergencies to turn off power,** and then only while holding the Program Halt and Clear button or key. See Subject 5.05.00. Otherwise, use of the Line switch alone may cause a parity error in the stored program and/or microprogram, and may cause malfunctioning of circuitry. Holding the Program Halt button depressed when turning the Line switch to OFF prevents these possibilities. A power failure or unplugging the line cord during system operation could also endanger the programs. If the program does not operate properly after such emergency action, a service attention by the supplier representative is required.

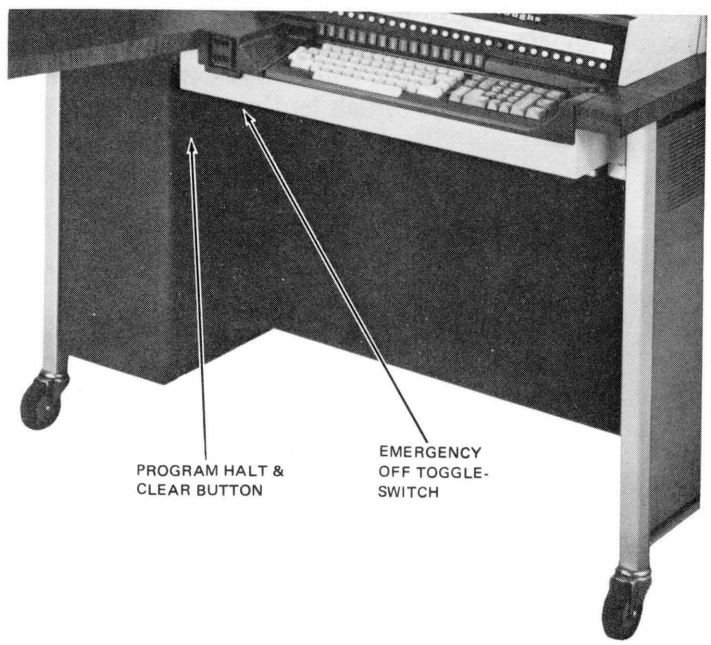


Figure 5.04.00-1 Emergency Switch and Program Halt and Clear Button, All Systems Except TC 700

Figure 5.04.00-2 Emergency Switch, Keyboard Printer of TC 700 System

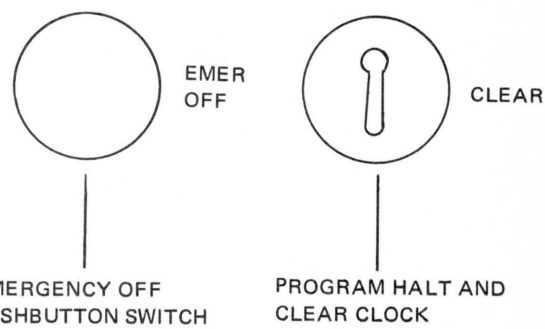


Figure 5.04.00-3 Emergency Switch, Processor Unit of TC 700 System.

5.05.00 PROGRAM HALT AND CLEAR BUTTON, OR PROGRAM HALT AND CLEAR LOCK WITH KEYS

For all systems except TC 700 systems, the button is a push button type switch located on the left inside panel just below the line switch, see Figure 5.04.00-1.

The Program Halt and Clear Lock with Key, labeled CLEAR, is in the upper right-hand corner of the Processor Unit. The 45° clockwise turn of the key activates the switch. Key combination 1041F8 is standard. The key may be inserted and removed when the lock is in the center position and the key restores to the center position when released by the operator. Master key combination CK 1024 fits this lock; see Supervisor Lock, Topic 5.06.03.

The Halt and Clear may be used when a program is in progress. When the button is depressed and released, or the key turned and released it will stop the program execution immediately and restore the system to the Ready Mode, with or without a keyboard instruction or Read Ledger instruction active. Steps 2 through 9 of the Power ON functions occur, Topic 5.01.01. With a Magnetic Record Computer system the "record" or "form", if present in the module, is ejected unless Option B of Step 3 is used.

The Reset key on the Numeric keyboard may be used to re-initiate a keyboard instruction, or numeric phase of a Read Ledger instruction. The re-initiated instruction is the prior or last instruction for a keyboard entry or numeric phase of a Read Ledger which was executed prior to the use of the halt and clear function. However, the Program (PK) keys which had previously been enabled with the re-initiated instruction are not re-enabled.

5.06.00 TELLERS AND SUPERVISORY LOCKS WITH KEYS, TC 700 SYSTEMS

The Tellers and Supervisory Locks with Keys are in the front of the Keyboard Printer near the base or below the keyboard area. See Figure 5.00.00-2. The two Locks with Keys for the tellers along with the lock for a supervisor will permit the TC 700 to be programed for accumulation of separate transaction data for each teller (stored teller totals). Normally this data is used for the "cash-balancing" operation and auditing procedure for each teller. The primary use of the lock with key is to prevent the operation of the console by an unauthorized person or by a person who is not assigned to operate the console. This operating procedure protects the interest of both the institution and the teller.

All three keys may simultaneously be in the "set" or turned ON position. The keys, two for each lock, do not turn the Power ON or OFF to the console. Only the appropriate Teller Flag is SET or turned ON. The Flag group is designated as the "V" group. The Skip and Execute instruction must be programed for the functions desired for each Teller or Supervisor. In addition to the assigned flags for each teller lock, the object program usually requires the assignment of a specific Operation Control (OCK) key on the Typewriter Keyboard for each teller. This assigned OCK may be designated as the Teller Identification key. The OCK's also SET flags; therefore, the Skip and Execute instructions may be programed to interrogate both the teller flags and OCK flags in order to accomplish the separate recording of the transaction data by the individual tellers. See keyboards, Topic 3.05.06.

The Teller Identification key may be other than an OCK but the program must still provide for the proper identification of each teller's transactions.

The Teller A, Teller B, and Supervisory locks are assigned Flags 1, 2, and 3 respectively for the Teller (V) flags.

5.06.01 TELLER A, LOCK WITH KEY

The first lock from the left is labeled A TELLER. The key may be inserted and removed with the key slot in the centered position (vertical). A 45° clockwise turn activates the switch and the key is not removable in the turned position. Key combination 1001F8 is provided as standard. The switch "sets" or turns ON the corresponding flag reserved for this lock position. The flag is "reset" or turned OFF when the operator turns the key back to the center position.

5.06.02 TELLER B, LOCK WITH KEY

The second lock from the left is labeled B TELLER. The key may be inserted and removed with the key slot in the centered position (vertical). A 45° clockwise turn activates the switch and the key is not removable in the turned position. Key combination 1021F8 is provided as standard. The switch "sets" or turns ON the corresponding flag reserved for this lock position. The flag is "reset" or turned OFF when the operator turns the key back to the center position.

5.06.03 SUPERVISOR, LOCK WITH KEY

The third lock from the left is labeled SUP'VR. The key may be inserted and removed with the key slot in the centered position (vertical). A 45° clockwise turn activates the switch and the key is not removable in the turned position. Lock combination 1043F8 is provided as standard. The key combination is for Master key CK 1024 and this key may be used for lock combinations 1001F8 through 1021F8 and combinations 1041F8 through 1100F8, see Topic 5.06.04. The switch "sets" or turns ON the corresponding flag reserved for this lock position. The flag is "reset" or turned OFF when the supervisor turns the key back to the center position.

5.06.04 EXPLANATION OF LOCKS WITH KEYS, TC 700 SYSTEMS

The key combination for each lock is marked on the visible area of each lock; in addition, the combination is marked on each key.

The following Locks with Keys have the same combination. The keys, two for each lock, are generally kept by a supervisor and not available to an operator:

Reset (Ready) Lock with Key, 1041F8

Power ON Lock with Key, 1041F8

Program Halt and Clear Lock with Key, 1041F8

The Journal Cover Lock (see Subject 6.13.00) uses combination 1042F8 and usually is kept by the supervisor.

The lock combination for the Supervisory lock is 1043F8; however, the two keys for this lock are the Master key combination CK 1024. The key may be used for lock combinations 1001F8 through 1021F8 and 1041F8 through 1100F8.

Optional combinations for the Tellers locks may use combination 1002F8 through 1020F8. In addition, combinations 1044F8 through 1100F8 may be used in place of the combinations 1001F8 through 1021F8 (tellers range of locks), and may be used to replace any of the other locks for combinations 1041F8 through 1043F8.

5.07.00 DECODER MOTOR, ON AND OFF CONTROL

The Decoder Motor ON/OFF Control may be used by an operator to turn the Power ON to the Decoder Motor, or to turn Power OFF if the OFF button is held depressed when a programed OFF instruction is executed. Normally the decoder is turned OFF to reduce the noise level when the teller or tellers are not using the console.

The unlabeled and unmarked ON and OFF push buttons are located on the front of the console in the upper right corner and above the Legend Strip Holder. The left button is the ON control, the right button is the OFF control.

This control is standard for a TC 700 system.

Turn ON (Left Button)

The ON push button may be depressed by the operator to turn power ON to the Decoder Motor.

A programed instruction for Power ON (PON) may be executed to turn the Power ON to the motor. If the motor power is ON when this instruction is executed the power remains ON.

Turn OFF (Right Button)

To turn Power OFF to the Decoder Motor, the operator must depress the OFF push button and hold the button depressed until the Power turns OFF. This occurs when the programed Power OFF (POF) instruction is executed. The instruction or button, if used separately, does not turn the power OFF.

When the Decoder Motor is OFF the execution of the functions for printing, keyboard buffering, keyboard indexing, and the Forms Handler are prevented. A systems block will occur if any of these programed functions are executed with the motor OFF.

When power to the system is turned ON the Decoder Motor also turns ON even though the motor was OFF when the system was turned OFF. This condition may occur if the Program Halt and Clear button or key is used to return the system to the Ready Mode and subsequently the system is turned OFF from the Ready Mode.

5.08.00 LINE/TERMINAL ACTIVITY INDICATOR, CERTAIN DATA COMMUNICATION SYSTEMS

The Line/Terminal Activity Indicator is used in place of the Ready Light with certain Data Communication systems. After Power to the Terminal is turned ON, the illumination of the light indicates that some type of communication signal is being received by a Terminal Computer or any other terminal connected to the same telephone line. For any one terminal, the light is automatically turned OFF when the terminal responds or transmits, or the light may be turned OFF by an operator function. This is an optional feature, see Appendix F. The necessary parts and logic for Line/Terminal Activity Indicator package (LTAI) must be included in the Terminal Computer to permit the illumination of the light.

Power ON with Power OFF

When the power for the system is turned ON, the Line/Terminal Activity Indicator Lamp will be illuminated for the first 30 seconds after the power is turned ON the same as the Ready Light illuminates, see Topic 5.01.01. However, when the system advances to the Ready Mode with Program (PK) keys A1, A2, and A3 enabled and the corresponding indicators illuminate, the Line/Terminal Activity Indicator will then automatically turn OFF.

Operation after Power is ON

After the program has been started the Line/Terminal Activity light is illuminated when the Terminal Computer or computers are receiving something across the telephone line. The design of systems logic for the light allows it to be used as an "activity on-us" and "activity on-the-line" light.

ACTIVITY ON-US – If the light turns ON and subsequently turns OFF without intervention by the operator, this terminal is being polled/selected. The "ON" indicates a receiving condition and the following automatic "OFF" indicates that the terminal has transmitted or responded.

ACTIVITY ON-THE-LINE – When the operator turns the Light OFF but the light re-illuminates and remains ON there is a receiving condition on the line but the data center is not addressing this terminal. (Some other terminal would be receiving.)

If the light remains ON it should be extinguished by the operator. A depression of the Reset key will normally be the most convenient method to turn the light OFF provided a keyboard instruction is active in the program when the Reset key is depressed.

Once the Line/Terminal Activity light is ON the following will turn the light OFF:

1. When the terminal transmits.
2. Termination of a keyboard instruction with a enabled Program (PK) key, Operation Control (OCK) key or the use of the Ready button or Reset (Ready) Lock with Key (TC 700). The lock is labeled "Reset".
3. When a key is depressed and a keyboard error condition occurs (Error Light and Alarm).
4. The depression of the Reset key with a keyboard instruction active.
5. The use of the Program Halt and Clear button or Program Halt and Clear Lock with Key (TC 700). The lock is labeled "CLEAR".

The length of time the light remains ON or OFF for any one terminal will depend upon the individual system. The light may be turned ON and be turned OFF frequently for a system with a limited number of terminals per line, with a low volume of messages, and with many polls from the Data Center. The light would remain ON or OFF for a longer duration for a system with many terminals per line, with a high volume of messages and with infrequent polls from the Data Center.

When the light remains OFF for a considerable time after being turned OFF by an operator function, or by an automatic transmission or response, the "OFF" condition will indicate an in-operative condition for the communication line. When the light remains ON beyond the time required for a transmission or response the "ON" condition may indicate the failure of the terminal to transmit or respond.

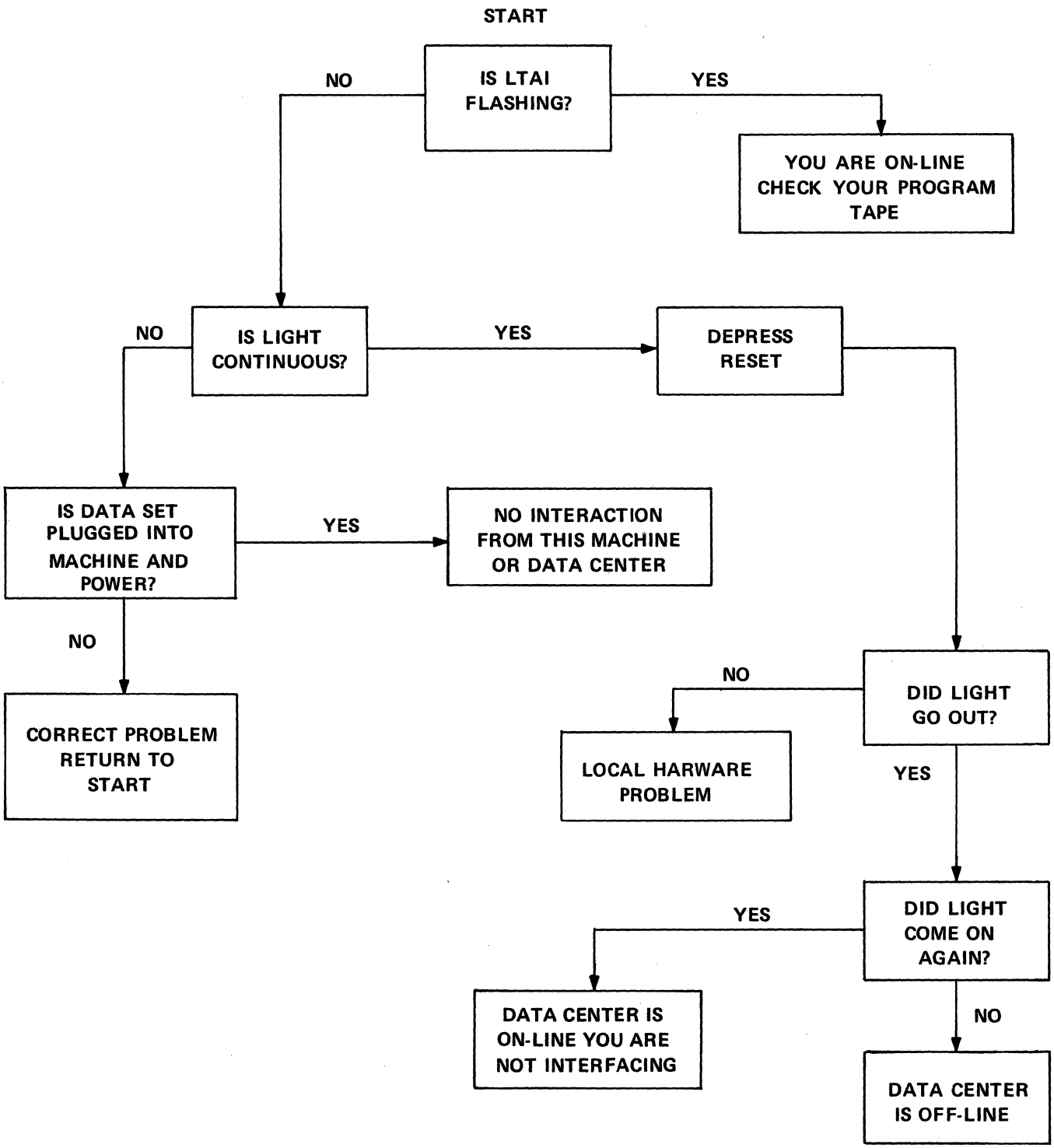


Figure 5.08.00-1 Flow Chart, Line/Terminal Activity Indicator

SECTION 6
FORMS HANDLERS

6.00.00 GENERAL DESCRIPTION

The various types of Forms Handlers are used to hold and control the advance of the single or multiple-part forms or records which are required for an accounting application.

Series L/TC Forms Handlers are classified as "stationary" handlers because the Ball Printer moves from position to position as programed for printing, but the platen and related mechanism do not move left and right.

The following types and widths of Forms Handlers are used on the various Series L/TC systems:

1. Rear Feed Forms Handler, 15½", Subject 6.11.00.
2. Basic Front Feed Forms Handler, 15½" and 26", Subject 6.12.00
3. Financial Front Feed Forms Handler, 15½", Subject 6.13.00.
4. Magnetic Unit Record Front Feed Forms Handler, 26", Subject 6.14.00.

A removable Pin Feed Device may be used on the Forms Handlers for the program control of one or two pin feed forms. Three variations of the Pin Feed Device are explained in Subjects 6.21.00, 6.22.00 and 6.23.00.

The line of print is visible to the operator and several different types of adjustable form guides and limits are available. The guides and limits assist the operator for the accurate placement of the forms in the handler, see Subject 6.40.00.

Several program combinations are permitted for the advance of the forms. All forms in the handler may be advanced simultaneously for the same number of lines. For certain form arrangements with either or both a split platen and pin feed device the forms may advance independently for the same number of lines or an unequal number.

6.01.00 LINE ADVANCE (VERTICAL SPACING) AND PLATEN

The line advance functions are used to space the form "up" from one line to the next line, or successive one-line advance functions (multiple-line) may be used to space the form for more than one increment between print lines. The line advance may be initiated by a programed instruction, indexed by an operator with the Line Advance Key (Topic 3.02.05), or manually advanced with the Platen Twirlers.

The increment for each line advance function is 1/6"; however, the Financial Front Feed Forms Handler (TC 700) which has a split platen at positions 85/86, provides a line advance increment of 1/6" for the left section of the platen, and provides for a 1/5" increment for the right section of the platen which is gear-driven. A single-line advance signal received from the computer advances the form one line in a maximum of 80 milliseconds. For succeeding advances with multiple-line advances, each succeeding line advances in a maximum of 50 milliseconds, or at 20 lines per second.

The standard platen is furnished with a 55 durometer hardness. An optional platen hardness of either 65 or 80 durometer is available.

With a solid platen or a normalized split platen the line advance for platen-controlled forms is controlled by controls for the "left". If a solid platen is furnished, the "right" advance control is furnished but the "right" control does not advance the platen-controlled forms. The "right" controls are available for use if the "Independent" advance functions are included for a single or dual Pin Feed Device if utilized for the forms handling. With a split platen the line advance functions for the platen controlled forms of the left and right sections of the platen are controlled by the respective "left" and "right" controls. The sections of the platen may be advanced independently or simultaneously. See Subject 6.03.00 for a split platen.

An attached Pin Feed Device advances the pin-feed-controlled form with the same increment as provided for the platen or section of a split platen which is "gear-connected" to a set of pin wheels of the Pin Feed Device. The line advance of a pin feed form may be independent or simultaneous with the platen advance depending upon which type of a Pin Feed Device is utilized, if any. See Subjects 6.21.00, 6.22.00, and 6.23.00 for the types of Pin Feed Devices. Also see following paragraphs.

With the Magnetic Unit Record Front Feed Forms Handler (Subject 6.14.00) the advance of a "record" or "form" is under control of the modules. The advance may be independent or simultaneous with the other forms and the increment for a single advance is 1/6". The advance of a "record" or "form" is initiated by programed instructions and the Line Advance Key functions for the "right" control regardless of whether the platen is solid, or split or a normalized split.

Programed Line Advance functions and the Line Advance key also increment the Forms Count Register or Registers, see Section 10. The Platen Twirlers do not increment the registers.

See Front Pressure Rolls (Subject 6.06.00) for the number of permissible Line Advance functions with Pin Feed forms when the pressure rolls are enabled.

Form movement may be initiated by either a left-controlled line advance or right-controlled line advance. The left and right advance may be used independently or simultaneously. Although the line advance functions initiate movement from one line to the next or initiate movement for more than one line, the forms or other documents are actually held and controlled by certain forms handling features. The features are the platen and related pressure rolls, a Pin Feed Forms device if provided, and the Magnetic Unit Record Modules for a Magnetic Record Computer system. For certain form arrangements in the Forms Handler, the line advance functions may initiate movement for forms which are under control of one or more of the features. A discussion of the different types of forms which utilize the features follows.

PLATEN-CONTROLLED REAR FEED FORMS are noncontinuous, either single or multiple-part forms which are fed from the rear of a Rear Feed Forms Handler. The initial automatic feeding and advance of the forms may occur only with the handler closed, because the Front Pressure Rolls must be in contact with the form. See Subject 6.06.00.

AROUND-THE-PLATEN CONTROLLED FORMS are either single or multiple-part journals which are used in a Front Feed or Rear Feed Forms Handler. The journals may be noncontinuous cut journals, or continuous roll journals. The forms may be advanced with the handler opened or closed.

PLATEN-CONTROLLED FRONT FEED FORMS are noncontinuous, either single or multiple-part forms which are manually aligned in a Front Feed Forms Handler. The advance of the forms may occur only with the handler closed, because the Front Pressure Rolls must be in contact with the form. See Subject 6.06.00. A passbook is a special type of a front feed form.

PIN-FEED-CONTROLLED FORMS are continuous, either single or multiple-part forms which include prepunched holes near both edges. The holes are used by the pin wheels of a Pin Feed Device for the advance of the forms. The forms may be advanced with the handler opened or closed.

MODULE-CONTROLLED DOCUMENTS are noncontinuous, either single or multiple-part Magnetic Unit Records or nonmagnetic forms which are automatically aligned by and ejected by the Magnetic Unit Record Modules of a Magnetic Record Computer system. The document may be advanced with "right" line-advance controls with the Forms Handler opened or closed. The modules actually move the document. See Subject 6.14.00.

The advance of the forms and the form arrangement in the handler must be considered when a Front Feed Forms Handler is used to advance different types of forms which may be platen-controlled, pin-feed-controlled, or module-controlled. The possibility that the forms may be advanced with the Line Advance key intentionally or accidentally may be a worthwhile consideration. See Advance E, Line Advance Operator Selected by a Program (PK) Key, Topic 6.01.05. The advance of platen-controlled front feed forms with the required closed handler also requires a simultaneous advance of the other forms which are in the area of the enabled Front Pressure Rolls which permit the advance of the front

feed forms. When the Front Pressure Rolls are enabled for an area of a platen, the "independent" advance functions for a pin feed form and a module-controlled document are affected. The advance of this type of form or document without the rotation of the platen in the area of the enabled rolls may occur with the handler opened, but not with the handler closed. See following paragraphs labeled "Advance C or D" for example. See Advance F (6.01.06) on subsequent pages for Sequence of Advance after Last Item for an Account. Review Subject 6.05.00 for the forms control or lack of control when the Forms Handler opens.

The area of the platen which may be occupied by forms is described for each Forms Handler; in addition, if more than one form is used in any one area, the front, intermediate, or rear forms when placed in a Forms Handler must follow a certain sequence. These subjects may be reviewed for the respective type of Forms Handler in Subjects 6.11.00, 6.12.00, 6.13.00 and 6.14.00. The following is a summary of the basic line advance possibilities.

6.01.01 ADVANCE A, SIMULTANEOUS LINE ADVANCE

The simultaneous line advance of all forms (including a module-controlled document) may be used with or without a split platen, and with or without pin feed forms.

6.01.02 ADVANCE B, SPLIT PLATEN, LEFT AND RIGHT FORMS CONTROLLED BY RESPECTIVE LEFT AND RIGHT ADVANCE CONTROLS

If a split platen is used, the forms to the left of the split may be advanced with the "left" controls and forms on the right may be advanced by the "right" controls. This may include a module-controlled document which is always controlled by the "right" controls. Pin Feed forms may be used also. The advance may occur simultaneously for both sections of the platen or independently. Following is a review of the type of line advance controls for a Pin Feed Device.

For a single Pin Feed Device the advance is designated as a Synchronous Pin Feed advance, or an Independent Pin Feed advance. A dual Pin Feed Device includes both the Synchronous and Independent advance functions. Although the designations are for "Synchronous" and "Independent", the uncoupling of the split for the platen actually changes the "Independent" advance to a "Synchronous" advance with the right section of a split platen when the "right" line-advance control is used. The "left" control advances the basic Synchronous Pin Feed advance.

See Subject 6.03.00 for special form arrangements with an overlap of the split platen. The overlap principle may be used with this (Advance B) type of form arrangement. See Advances C and D respectively for a nonsplit platen and other split platen arrangements.

6.01.03 ADVANCE C, NONSPLIT PLATEN, FRONT FEED FORMS HANDLER

A comprehensive line advance sequence and form arrangement usually is required if forms in the same area or part of the same area are to be independently advanced when the platen is solid or a split platen is normalized. This type of an advance requires a certain type of a Pin Feed Device. The modules of a Magnetic Record Computer also permit this independent advance which is controlled by the "right" advance control. The type of line advance controls for a Pin Feed Device are reviewed as follows:

A single Pin Feed Device may provide either a Synchoronous Pin Feed advance, or an Independent Pin Feed Advance. A dual Pin Feed device includes both the Synchronous and Independent advance functions.

Advance C-1, Nonsplit Platen, Synchronous Pin Feed

With a solid platen or normalized split platen the "left" line-advance control advances the entire platen and the single Synchronous Pin Feed, if provided. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document. See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

ADVANCE C-1 CAPABILITIES FOR PLATEN-CONTROLLED FORMS ONLY, NONSPLIT PLATEN – A left-controlled advance may occur for all of the platen-controlled forms with the handler

opened or closed except front feed forms do not advance with the handler open. A right-controlled advance will not advance the forms.

ADVANCE C-1 CAPABILITIES WITH A MAGNETIC RECORD COMPUTER, NONSPLIT PLATEN – A left-controlled advance may occur for all of the platen-controlled forms without advancing the module-controlled document.

For separate advance functions by each advance Control, the platen-controlled forms must be arranged as follows:

1. The front feed forms must be to the left of the document.
2. A journal may be placed behind or to the left of the document, or in both areas. (See pressure rolls in subsequent paragraph.)

A right-controlled advance may occur for the document without advancing the left-controlled forms. (A nonsplit platen does not rotate with a right control.)

These independent advance functions by each of the "left" and "right" controls may occur with the handler closed provided the Front Pressure Rolls are disabled in the area of the document. If the handler is open, the independent or simultaneous advance is also possible except the platen-controlled front feed forms in front of, or to the left of the document do not advance.

A simultaneous advance of the "left" and "right" controls may be programed with the handler closed. The simultaneous advance must be programed in order to permit an orderly advance while the handler is closed with Front Pressure Rolls enabled in front of the document. A front feed form in front of the document may require this simultaneous advance with the handler closed.

ADVANCE C-1 CAPABILITIES WITH SYNCHRONOUS PIN FEED, NONSPLIT PLATEN – A left-controlled advance may occur for all of the platen-controlled forms and a pin-feed-controlled form with the handler opened or closed except front feed forms do not advance with the handler open. A right-controlled advance will not advance the forms.

A cut journal and pin feed form may not occupy the same area nor partially overlap in any area.

ADVANCE C-1 CAPABILITIES WITH SYNCHRONOUS PIN FEED AND A MAGNETIC RECORD COMPUTER, NONSPLIT PLATEN – A left-controlled advance may occur for all of the platen-controlled forms and a pin-feed-controlled form without advancing the module-controlled document.

For separate advance functions by each advance control, the left-controlled forms must be arranged as follows:

1. A pin feed form may be in any forms area for the platen, see journal.
2. Front feed forms must be to the left of the document. (See pressure rolls in subsequent paragraphs.)
3. A journal may be placed behind or to the left of the document, or in both areas. A cut journal and pin feed form may not occupy the same area nor partially overlap in any area.

A right-controlled advance may occur for the document without advancing the left-controlled forms. (A nonsplit platen does not rotate with a right control.)

These independent advance functions by each of the "left" and "right" controls may occur with the handler closed provided the Front Pressure Rolls are disabled in the area of the document. If the handler is open, the independent or simultaneous advance is also possible except the platen-controlled front feed forms in front of, or to the left of the document do not advance.

A simultaneous advance of the "left" and "right" controls may be programed with the handler closed. The simultaneous advance must be programed in order to permit an orderly advance while the handler is closed with Front Pressure Rolls enabled in front of the document. A front feed form in front of the document may require this simultaneous advance with the handler closed.

NOTE: The maximum allowable thickness for the journals and pin feed forms which are behind a module-controlled document is less than the allowable maximum for other areas. See Subject 6.34.00. The document may be advanced with the handler opened or closed. See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

Advance C-2, Non-Split Platen, Independent Pin Feed, Front Feed Forms Handler

With a solid platen or normalized split platen the "left" line-advance control advances the entire platen and the "right" control advances the single Independent Pin Feed, if provided. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document.

ADVANCE C-2 CAPABILITIES FOR PLATEN-CONTROLLED FORMS ONLY, NONSPLIT PLATEN – The advance of the forms is the same as explained for Advance C-1 Capabilities for Platen Controlled Forms Only.

ADVANCE C-2 CAPABILITIES WITH A MAGNETIC RECORD COMPUTER, NONSPLIT PLATEN – The advance for the forms and module-controlled document is the same as explained for Advance C-1 Capabilities with Magnetic Record Computer.

ADVANCE C-2 CAPABILITIES WITH INDEPENDENT PIN FEED, NONSPLIT PLATEN – A left-controlled advance may occur for all of the platen-controlled forms without advancing the pin feed form.

For separate advance functions by each advance control the left-controlled forms must be arranged as follows:

1. The front feed forms may be on either side of the right-controlled pin feed form. The front feed forms may partially overlap the pin feed form as explained for Overlap C, Item 21 of Topic 6.03.00. (See pressure rolls in subsequent paragraph.)
2. A roll or cut journal may be in any area, except a cut journal and pin feed form may not occupy the same area, nor partially overlap in any area.

A right-controlled advance may occur for a pin feed form in any area without advancing the left-controlled forms. (A nonsplit platen does not rotate with a right control.)

These independent advance functions by each of the "left" and "right" controls may occur with the handler closed provided the Front Pressure Rolls are disabled in the area of the pin feed form. If the handler is open, the independent or simultaneous advance is also possible except the platen-controlled front feed forms in any area of the platen do not advance.

A simultaneous advance of the "left" and "right" controls may be programed with the handler closed. The simultaneous advance must be programed in order to permit an orderly advance while the handler is closed with Front Pressure Rolls enabled in front of the pin feed form. A front feed form in front of the pin feed form may require this simultaneous advance.

ADVANCE C-2 CAPABILITIES WITH INDEPENDENT PIN FEED AND A MAGNETIC RECORD COMPUTER, NONSPLIT PLATEN – A left-controlled advance may occur for all the platen-controlled forms without advancing the pin feed form and the module-controlled document.

For separate advance functions by each advance control, the left-controlled forms must be arranged as follows:

1. The front feed forms may be on either side of the right-controlled pin feed form, provided the front feed forms are also to the left of the document. The front feed forms may partially overlap the pin feed form as explained for Overlap C, Item 21 of Topic 6.03.00 (See pressure rolls in subsequent paragraphs.)
2. A roll or cut journal may be in any area, except a cut journal and pin feed form may not occupy the same area nor partially overlap in any area.

A right-controlled advance may occur for the pin feed form in any area and for the module-controlled document without advancing the left-controlled forms. (A nonsplit platen does not rotate with a right control.)

These independent advance functions by each of the "left" and "right" controls may occur with the handler closed provided the Front Pressure Rolls are disabled in the area of the pin feed form and document. If the handler is open, the independent or simultaneous advance is also possible except the platen-controlled front feed forms in any area of the platen do not advance.

A simultaneous advance of the "left" and "right" controls may be programed with the handler closed. The simultaneous advance must be programed in order to permit an orderly advance while the handler is closed with Front Pressure Rolls enabled in front of either or both the pin feed form and the document. A front feed form in front of either or both the pin feed form and document may require this simultaneous advance.

NOTE: The maximum allowable thickness for the journals and pin feed forms which are behind a module-controlled document is less than the allowable maximum for other areas. See Subject 6.34.00. The document may be advanced with the handler open or closed.

Advance C-3, Nonsplit Platen, Dual Pin Feed, Front Feed Forms Handler

With a solid platen or normalized split platen the "left" line-advance control advances the entire platen. If a dual Pin Feed Device is provided the Synchronous advance and Independent advance are controlled by the "left" and "right" advance controls respectively. If a module-controlled-document is included for a Magnetic Record Computer system, the "right" control advances the document.

If only one pin feed is used with or without a module-controlled document, see Advance C-1 for a Synchronous Pin Feed, and Advance C-2 for an Independent Pin Feed. See Advance C-1 for a Magnetic Record Computer system without a Pin Feed Device.

See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

ADVANCE C-3 CAPABILITIES WITH DUAL PIN FEED, NONSPLIT PLATEN – A left-controlled advance may occur for the platen-controlled forms and a synchronously-controlled pin feed form without advancing the independently-controlled pin feed form.

For separate advance functions by each advance control, the left-controlled forms must be arranged as follows:

1. Left-controlled pin feed form may be in any forms area for the platen and it may overlap with the second pin feed form, see Subject 6.23.00. (See pressure rolls in subsequent paragraph.)
2. Front feed forms may be on either side of the right-controlled pin feed form. The front feed forms may partially overlap the right-controlled pin feed form as explained for Overlap C, Item 21 of Topic 6.03.03.
3. A roll journal may be used in any area which is unoccupied by pin feed form, or may be used in any area which is behind either or both of the pin feed forms provided the pin feed forms do not overlap. If the two pin feed forms overlap, the roll journal may be behind the right-controlled pin feed form provided the roll journal does not occupy the area where the two pin feed forms overlap.
4. A cut journal may be used in any area which is unoccupied by a pin feed form; however, if a cut journal is used when two pin feed forms overlap, the left-controlled pin feed form must be single part, both would be placed side-by-side in the journal/pin feed path. See Subject 6.08.00. A cut journal should not be used in the same area of a pin feed form nor partially overlap.

A right-controlled advance of the independently-controlled pin feed form in any area will not advance the forms controlled from the left. (A nonsplit platen does not rotate with a right control.)

These independent advance functions by each of the "left" and "right" controls may occur with the handler closed provided the Front Pressure Rolls are disabled in the area of the right-controlled pin feed form. If the handler is open, the independent or simultaneous advance is also possible except the platen-controlled front feed forms in any area of the platen do not advance.

A simultaneous advance of the "left" and "right" controls may be programed with the handler closed. The simultaneous advance must be programed in order to permit an orderly advance while the handler is closed with Front Pressure Rolls enabled in front of the right-controlled pin feed form. A front feed form in front of the right-controlled pin feed form may require this simultaneous advance.

ADVANCE C-3 CAPABILITIES WITH DUAL PIN FEED AND A MAGNETIC RECORD COMPUTER, NONSPLIT PLATEN – A left-controlled advance may occur for the platen-controlled forms and a synchronously-controlled pin feed form without advancing the independently-controlled pin feed form and module-controlled document.

For separate advance functions by each advance control, the left-controlled forms must be arranged as follows:

1. Left-controlled pin feed form may be in any forms area for the platen and it may overlap with the second pin feed form, see Subject 6.23.00. (See pressure rolls in subsequent paragraph.)
2. Front feed forms may be on either side of the right-controlled pin feed form, provided the front feed forms are also to the left of the document. The front feed forms may partially overlap the right-controlled pin feed form as explained for Overlap C, Item 21 of Topic 6.03.03.
3. A roll journal may be used in any area which is unoccupied by a pin feed form, or may be used in any area which is behind either or both of the pin feed forms provided the pin feed forms do not overlap. If the two pin feed forms overlap, the roll journal may be behind the right-controlled pin feed form provided the roll journal does not occupy the area where the two pin feed forms overlap.
4. A cut journal may be used in any area which is unoccupied by a pin feed form; however, if a cut journal is used when two pin feed forms overlap, the left-controlled pin feed form must be single part, both would be placed side-by-side in the journal/pin feed path. See Subject 6.08.00. A cut journal should not be used in the same area of a pin feed form nor partially overlap.

A right-controlled advance for the independently-controlled pin feed form in any area and for the module-controlled document will not advance the forms controlled from the left. (A nonsplit platen does not rotate with a right control.)

These independent advance functions by each of the "left" and "right" controls may occur with the handler closed provided the Front Pressure Rolls are disabled in the area of the right-controlled pin feed form and document. If the handler is open, the independent or simultaneous advance is also possible except the platen-controlled front feed forms in any area of the platen do not advance.

A simultaneous advance of the "left" and "right" controls may be programed with the handler closed. The simultaneous advance must be programed in order to permit an orderly advance while the handler is closed with Front Pressure Rolls enabled in front of either or both the right-controlled pin feed form and the document. A front feed form in front of either or both the right-controlled pin feed form and document may require this simultaneous advance.

NOTE: The maximum allowable thickness for the journals and pin feed forms which are behind a module-controlled document is less than the allowable maximum for other areas. See Subject 6.34.00. The document may be advanced with the handler open or closed.

6.01.04 ADVANCE D, SPLIT PLATEN, LEFT AND RIGHT PIN FEED FORMS CONTROLLED BY RIGHT AND LEFT ADVANCE CONTROLS RESPECTIVELY

A comprehensive line advance sequence and form arrangement usually is required if forms in the same area or part of the same area are to be independently advanced when a split platen is used. This type of independent advance usually is required when the line advance for a platen-controlled form and pin feed form are in the same area for any one section of the split platen. A certain type of Pin Feed Device is also required. The "right" line-advance control for the modules of Magnetic Record Computer also permits an independent advance of the module-controlled document and a pin feed form which is advanced by a left-controlled Synchronous Pin Feed advance. The explanation of Advance B (Topic 6.01.02) assumes that all the forms will be placed to the left and right of the split and will be advanced by the respective "left" and "right" line-advance controls. The explanation of Advance D (this topic) assumes that a pin feed form and other forms will be combined in one section of a platen but will be advanced independently. For example, a left-controlled pin feed form may be to the right of the split along with a roll journal which is controlled by the right-controlled line advance. The types of line advance controls for a Pin Feed Device and split platen are reviewed with the explanation of Advance B.

The following advance functions with the split platen are listed to describe the full capabilities rather than list specific standard combinations. Therefore; any one or more of the forms may be omitted in accordance with the requirements for an application. The following combinations list a journal; however, the journal must be a roll journal if used in the same area of a pin feed form. The permissible areas for a cut journal are also explained.

Advance D-1, Split Platen, Synchronous Pin Feed, Front Feed Forms Handler

With an uncoupled split platen the "left" line-advance control advances the left section of the platen and the single Synchronous Pin Feed. The "right" control advances the right section of the platen. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document. The form combinations as specified for the left and right sections of the platen may be advanced simultaneously or under certain conditions may advance independently.

Advance From	Forms or Document: Left Platen	Forms or Document: Right Platen	Advance From
Left	Journal	Journal	Right
Left	Pin feed form to the right of split or on both sides		
		Module-Controlled Document	Right
Left	Front Feed	Front Feed	Right

A simultaneous advance by the "left" and "right" line-advance functions may be programed for the same number of increments with the handler closed. With the handler closed, the simultaneous advance would be required to permit the orderly advance if the Front Pressure Rolls are enabled in the area of the pin feed form which is to the right of the split. The enabled pressure rolls in the area of the pin feed form which is to the right of the split would be required only if a right-controlled front feed form is in the same area or part of the same area of the pin feed form. A front feed form in front of a module-controlled document would require the enabled pressure rolls but the enabled rolls are not required for the orderly advance of the document. (See independent advance in following paragraph for the utilization of a pressure-free area.) The simultaneous advance may occur with the handler open except front feed forms, if present in either section of the platen, will not advance. A document, if under control of the modules, will advance with the handler open or closed.

An independent advance by the "left" and "right" controls may occur with the handler open except the front feed forms, if present in either section of the platen will not advance. The module-controlled document will advance with the right control. The advance by the "left" and "right" controls would function at separate times for the same number of increments or an unequal number. The independent

advance is also possible with the handler closed provided the Front Pressure Rolls are disabled in the area of the pin feed form which is to the right of the split platen.

The independent advance with the handler closed is permitted if the right-controlled front feed form or forms are arranged to partially overlap the pin feed form in a pressure-free area near the split of a platen or in some other area. If the pin feed form arrangement overlaps the split to the right within a three-pressure-roll area near the split, see Overlap B, Item 14-2 of Topic 6.03.02. For an overlap by the front feed forms in some other area, see Overlap C, Item 22 of Topic 6.03.03.

The independent and simultaneous advance may occur with journals present. A roll journal may be in each section of the platen with or without a pin feed form in front; however, if either roll journal overlaps the split the pin feed form must not occupy the same pressure-free area where the roll journal overlaps the split. A cut journal may be used in either or both sections of the platen provided the pin feed form does not occupy any of the same area. Either one of the cut journals may overlap the split. For an overlap of the split, see Overlap B, Item 14 of Topic 6.03.02.

See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

Advance D-2, Split Platen, Independent Pin Feed, Front Feed Forms Handler

With an uncoupled split platen the "left" line-advance control advances the left section of the platen. The "right" control advances the right section of the platen and the single Independent Pin Feed. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document. The form combinations as specified for the left and right sections of the platen may be advanced simultaneously or under certain conditions may advance independently.

	Forms or Document		
Advance From	Left Platen	Right Platen	Advance From
Left	Journal	Journal	Right
	Pin feed form to the left of split or on both sides		Right
		Module-Controlled Document	Right
Left	Front Feed	Front Feed	Right

A simultaneous advance by the "left" and "right" line-advance functions may be programed for the same number of increments with the handler closed. With the handler closed, the simultaneous advance would be required to permit the orderly advance if the Front Pressure Rolls are enabled in the area of the pin feed form which is to the left of the split. The enabled pressure rolls in the area of the pin feed form which is to the left of the split would be required only if a front feed form overlaps the same area or part of the same area of the pin feed form. A front feed form in front of a module-controlled document would require the enabled pressure rolls, but the enabled rolls are not required for the orderly advance of the document. (See independent advance in following paragraph for the utilization of a pressure-free area.) The simultaneous advance may occur with the handler open except front feed forms, if present in either section of the platen, will not advance. A document under control of the modules will advance with the handler open or closed.

An independent advance by the "left" and "right" controls may occur with the handler open except the front feed forms, if present in either section of the platen, will not advance. The module-controlled document will advance with the right control. The advance by the "left" and "right" controls would function at separate times for the same number of increments or an unequal number. The independent advance is also possible with the handler closed provided the Front Pressure Rolls are disabled in the area of the pin feed form which is to the left of the split platen.

The independent advance with the handler closed is permitted if the left-controlled front feed form or forms are arranged to partially overlap the pin feed form in a pressure-free area near the split of a platen or in some other area. If the pin feed form arrangement overlaps the split to the left within a

three-pressure-roll area near the split, see Overlap B, Item 14-1 of Topic 6.03.02. For an overlap by the front feed forms in some other area, see Overlap C, Item 23 of Topic 6.03.03.

The independent and simultaneous advance may occur with journals present. A roll journal may be in each section of the platen with or without a pin feed form in front; however, if either roll journal overlaps the split the pin feed form must not occupy the same pressure-free area where the roll journal overlaps the split. A cut journal may be used in either or both sections of the platen provided the pin feed form does not occupy any of the same area. Either one of the cut journals may overlap the split. For an overlap of the split, see Overlap B, Item 14 of Topic 6.03.02.

Advance D-3, Split Platen, Dual Pin Feed, Front Feed Forms Handler

With an uncoupled split platen the "left" line-advance control advances the left section of the platen and the "right" control advances the right section of the platen. With the dual Pin Feed Device the Synchronous and Independent advance are controlled by the "left" and "right" advance controls respectively. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document. The form combinations as specified for the left and right sections of the platen may be advanced simultaneously or under certain conditions may advance independently. See Advances D-1 and D-2 if only one pin feed form is present. The combinations suggest that the pin feed forms overlap and only one journal may be used; however, the pin feed forms may be placed side-by-side in one section of the platen and two journals may be used.

Combination 1

Forms or Document

Advance From	Left Platen	Right Platen	Advance From
Left	Journal		
Left		Pin Feed Form	
		Pin Feed Form	Right
		Module-Controlled Document	Right
Left	Front Feed	Front Feed	Right

Combination 2

Forms or Document

Advance From	Left Platen	Right Platen	Advance From
		Journal	Right
Left	Pin Feed Form		
	Pin Feed Form		Right
		Module-Controlled Document	Right
Left	Front Feed	Front Feed	Right

Simultaneous advance by the "left" and "right" line-advance functions may be programed for the same number of increments with the handler closed. With the handler closed, the simultaneous advance would be required to permit the orderly advance for the following conditions:

1. The Front Pressure Rolls are enabled in the right section of the platen in an area which is also occupied by a left-controlled pin feed form.
2. The Front Pressure Rolls are enabled in the left section of the platen in an area which is also occupied by a right-controlled pin feed form.
3. For both of the above conditions, see overlap by pin feed forms in subsequent paragraphs.

The enabled pressure rolls in the area of the pin feed form or forms would be required only if the front feed form or forms are in the same area or part of the same area of the pin feed forms. A front feed form in front of a module-controlled document would require the enabled pressure rolls but the enabled rolls are not required for the orderly advance of the document. (See independent advance in following paragraph for the utilization of a pressure-free area.) The simultaneous advance may occur with the handler open except front feed forms, if present in either section of the platen, will not advance. A document, if under control of the modules, will advance with the handler open or closed.

An independent advance by the "left" and "right" controls may occur with the handler open except the front feed forms, if present in either section of the platen, will not advance. The module-controlled document will advance with the right control. The advance by the "left" and "right" controls would function at separate times for the same number of increments or an unequal number. The independent advance is also possible with the handler closed provided the Front Pressure Rolls are disabled in the area of the pin feed forms.

For Combination 1, the independent advance with the handler closed is permitted if the right-controlled front feed form or forms are arranged to partially overlap the left-controlled pin feed form in a pressure-free area. See Overlap C, Item 22 of Topic 6.03.03.

For Combination 2, the independent advance with the handler closed is permitted if the left-controlled front feed form or forms are arranged to partially overlap the right-controlled pin feed form in a pressure-free area. See Overlap C, Item 23 of Topic 6.03.03.

For either Combination 1 or 2 the pin feed forms may overlap the split; however, if the split is overlapped for a considerable distance or if a wide journal is required the use of a nonsplit platen should be considered, see Advance C-3 (Topic 6.01.03).

See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

Advance D-3, One Journal

The independent and simultaneous advance may occur with a journal present.

For Combination 1, a left-controlled roll journal may be overlapped by the right-controlled pin feed form provided the pin feed form overlaps the split to the left and the roll journal does not overlap the split to the right. A left-controlled cut journal may be present but it may not be overlapped by a pin feed form. If the cut journal is present the left-controlled pin feed form must be single part. See Subject 6.23.00. Both the left-controlled journal and pin feed form will advance the same number of increments but they may not overlap.

For Combination 2, a right-controlled roll journal may be overlapped by the right-controlled pin feed form provided that the right edge of the pin feed form is to the right of the split and the roll journal does not overlap the split to the left. Both will advance the same number of increments. A right-controlled cut journal may be present, but it may not be overlapped by a pin feed form. If a cut journal is present the left-controlled pin feed form must be single part. See Subject 6.23.00.

For Combinations 1 and 2, either a cut or roll journal may overlap the split provided the pressure-free area where the journal extends across the split is not occupied by a pin feed form. See Overlap B, Item 14 of Topic 6.03.02.

Advance D-3, Two Journals

The independent and simultaneous advance may occur with two journals present.

Depending upon the width of the pin feed forms for Combinations 1 and 2, the forms may be placed side-by-side in one section of a split platen. If this arrangement is selected, a roll journal may be behind one or both of the pin feed forms provided the roll journal and a pin feed form do not both overlap the split. Both pin feed forms may be multiple-part for this side-by-side arrangement even though a cut journal (fed through Journal/Pin Feed Path) is also present in an area which is unoccupied by the pin

feed forms. The pin feed forms both would feed through the Pin Feed Path. A second roll journal may be used instead of the cut journal.

6.01.05 ADVANCE E, LINE ADVANCE OPERATOR SELECTED BY A PROGRAM (PK) KEY, FRONT FEED FORMS HANDLER

For certain form arrangements and combinations for the independent and simultaneous advance functions, a Program (PK) key or keys may be enabled and the program provided to permit an operator to index an advance. The Line Advance key (Topic 3.02.05) may be used to advance the "left" or "right" line-advance controls independently but a simultaneous advance with the key is not possible. Without the simultaneous advance for certain form combinations, an advance indexed by the key may skew the forms or partially advance and skew certain forms. The forms may skew if the platen is split and platen-controlled forms or pin feed forms are on either side of the split, see Advance A (Topic 6.01.01). An irregular advance may be created if the Line Advance key is used when the handler is closed with a nonsplit platen and a right-controlled pin feed form behind left-controlled front feed forms. See Advances C and D. If the forms partially advance and skew this may be created by an attempt to independently advance the forms with the handler closed, but the normal program provides for the independent advance with the handler open. Usually this skew or partial advance would indicate that the Front Pressure Rolls are enabled in the area of the forms when the erroneous independent advance occurred. In addition, the programing sequence initiated by the enabled Program (PK) Key may satisfactorily include the Skip and Execute instructions to test for "end of page", "filled sheet", or other forms control considerations.

In the absence of the satisfactory line advance with the Line Advance key, or in the absence of a Program (PK) key line advance, the Platen Twirlers or left Platen Twirler and Variable Spacer for the Independent Pin Feed may be used, see Subject 6.02.00. Regardless of what combination for the forms is present, either of the following will permit a satisfactory advance of journals and pin feed forms by the operator.

Split Platen

1. Open the Forms Handler with the Open/Close key, if closed.
2. Rotate both the left and right Platen Twirlers simultaneously if a journal is present on both sides of the split, or independently, if not present.
3. Re-align the manually aligned front feed forms if required for the continued operations.
4. Close handler with the Open/Close key if front feed forms were re-aligned.

Nonsplit Platen or Normalized Split Platen

1. Open the Forms Handler with the Open/Close key, if closed.
2. Rotate the left Platen Twirler.
3. Rotate the Variable Spacer on the right of the Independent Pin Feed if used.
4. Re-align the manually aligned front feed forms if required for the continued operations.
5. Close handler with the Open/Close key if front feed forms were re-aligned.

The above operator steps will not advance the module-controlled document, it will remain aligned to its aligned position.

6.01.06 ADVANCE F, SEQUENCE OF ADVANCE AFTER LAST ITEM FOR AN ACCOUNT

A journal or pin feed form is usually behind a front feed form or module-controlled document to provide a duplicate copy or copies of the entries or items for a posting run for all the accounts posted. After the line of print for the last item or only item is completed to any one account, the Forms Handler is opened under program control to permit the insertion of the next account. Prior to the insertion of the form or document for the next account the duplicate copy is advanced. With a manually aligned front feed form this advance may occur prior to or after the opening of the handler and with or without the form removed. With a Magnetic Unit Record under the control of the modules, the advance must occur after the record is ejected by modules. (The advance with the record in the

modules will increment the line-count by one regardless of whether the handler is open or closed.) If the advance occurs with record present, a line would be skipped the next time the record is inserted for alignment. An eject control opens the handler automatically, see Subject 6.14.00.

If a nonmagnetic form is used in the modules the advance of the duplicate copy may occur prior to or after the opening of the handler.

For the programed function with a filled sheet see Section 10, the Forms Control instructions.

6.02.00 PLATEN TWIRLERS AND VARIABLE SPACER

With a solid platen or split platen which is normalized (coupled) the platen twirler at either end of the Forms Handler may be used to rotate the entire platen in either direction. See Rear Feed Forms Handler in this subject. The Variable Spacer button is in the center of each twirler with a split platen, but only the Variable Spacer for the left is provided with a solid platen. The operator may depress the button and simultaneously rotate the Platen Twirler to move the form less than a full increment ("1/6") of the line advance. This is called "fine adjustment" and is commonly, but only occasionally, used to accurately re-position the form which is already placed in the handler, except neither the twirlers nor variable spacer is capable of moving the magnetic unit record or nonmagnetic form which is under control of the Magnetic Unit Record Modules.

For a split platen which is uncoupled, the left and right twirlers may be used to manually rotate or to provide for "fine adjustment" of the left and right sections of the platen respectively except as described in the following paragraphs. The twirlers may rotate in either direction independently or simultaneously. See Platen Normalizing Lever, Subject 6.04.00.

The Platen Twirlers do not increment the Forms Count Register or Registers.

The Twirlers are not provided with a Financial Front Feed Forms Handler.

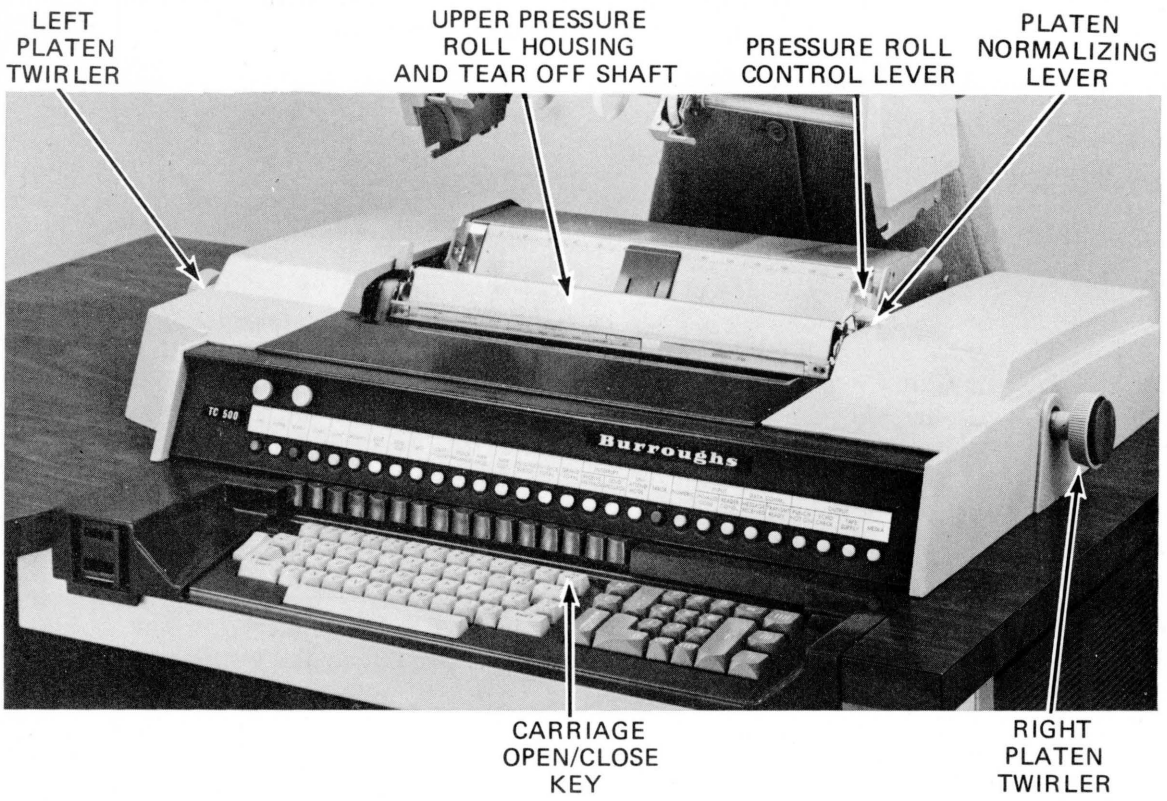


Figure 6.02.00-1 Forms Handler Controls, 15½" Rear Feed Forms Handler

Rear Feed Forms Handler

The reverse rotation (back spacing) with the twirler is prevented after the closing and until three line advance functions occur for a Rear Feed Forms Handler; these may be manual or automatic advance functions. The backspacing of a solid platen and normalized split platen is prevented, or the backspacing the left section of a split platen is prevented, until after the three required line advances occur. However, fine adjustment is not prevented.

Magnetic Unit Record Modules and Platen Twirlers

The platen twirlers at either end of the Forms Handler do not advance nor backspace the "record" or "form" in the modules. The twirler may move the other forms in either direction. For consistent results the Forms Handler should be opened when using the twirler or twirlers to move any forms which are behind the "record" or "form" in the modules. Only a Pin Feed form or a form around the platen may be behind the module-controlled document.

Pin Feed Forms

See Subject 6.20.00 for the Platen Twirler and Variable Spacer with the Pin Feed Device. The left Variable Spacer may be used for "fine adjustment" of both a platen-controlled form and pin feed form which are controlled from the left. The rotation of the left twirler moves both types of forms.

The right Variable Spacer cannot be used for "fine adjustment" of a pin feed form which is controlled from the right. The Pin Feed Device (Independent) has a separate Variable Spacer for the pin feed form controlled from the right. With the platen split, the rotation of the right twirler moves both the platen-controlled form and pin feed form controlled from the right. With a solid or normalized split platen the right twirler does not move the right-controlled pin feed form.

Journals and Pin Feed Form Advanced by Left Controls

The Forms Handlers are capable of advancing both a pin feed form and journal. However, if the pin feed form and journal are advanced by the left control, the alignment to the starting print line must be considered. Only one Platen Twirler with a Variable Spacer is provided to adjust the alignment of the forms. In order to select the different starting lines the following procedures must be used.

After the journal and pin feed form are placed in their respective places, the line for the pin feed form should be selected with the twirler or variable. The line for the journal may be selected without using the twirler or variable. The Top Pressure Roll Housing Assembly may be raised slightly to disengage the top pressure rolls. From the rear of the console a roll journal may be "rolled-back" to backspace to the desired line, or the leading edge may be pulled toward the rear of the console to advance the roll journal to the desired line. For a cut journal, the journal may be "pulled-back" at the bottom edge, or the leading edge may be pulled toward the rear of the console to select the desired line for the same conditions as for a roll journal. A cut journal should not be used in the area of a pin feed form but it may be used to the left or right of a pin feed form. A roll journal may not be behind a pin feed form in the area where two pin feed forms overlap.

A separate variable is provided for an "Independent" pin feed advance; therefore, the starting line for a right-controlled pin feed form and journal may be independently selected.

6.03.00 PLATEN, SPLIT AND NORMAL

The split and normal platen provides for a left and right section of the platen for the independent control of the line advance of two forms or two sets of forms. The split may be normalized also, see Subject 6.04.00.

The location of the split is in relation to the print position in that the split is located between print positions; therefore, printing may occur in print positions immediately to the left and immediately to the right of a split without impairment of any printed character. For example, a platen split specified as 110/111 for a 26" Forms Handler is in between print Positions 110 and 111. Only one split location per platen may be provided, and the split of the platen is also in between Front Pressure Roll positions, see Subject 6.06.00.

Various standard platen split locations and optional platen split locations are available for the various Series L's and TC's. The forms may be located near the split as described in the following parapraphs. The ability to disable the Front Pressure Rolls, which permits an overlap of the split, may under certain conditions eliminate the need for a change in location of the split. See Overlaps A, B, and C of this Subject.

When the split is uncoupled (Subject 6.04.00), the advance of two forms or two sets of forms of different types in the respective sections may be controlled separately. A set of forms may include front feed, journal, and pin feed forms. The advance of each section is independently controlled by the program or Line Advance key; however, both sections may be simultaneously advanced in accordance with the programing, but may not be simultaneously advanced with the Line Advance key. In addition, if a normalized split platen is utilized, a pin feed form may be advanced independent of the advance of the normalized split platen depending upon whether a dual Pin Feed Device is used (Subject 6.23.00) or whether an independent Pin Feed Device is used (Subject 6.22.00).

With a Front Feed Forms Handler and an uncoupled split platen, certain combinations of forms in any one section may be advanced independently of each other. The advance of a pin feed form in the left section of a platen and the advance of the platen-controlled form in the same section may occur independently of each other, or simultaneously with a programed function. The pin feed form advances from the "right" and the platen-controlled form advances from the "left" if the Independent Pin Feed advance is provided with either a single or dual Pin Feed Device. An uncoupled split with a Synchronous Pin Feed advance (Subject 6.21.00) of either a single or dual Pin Feed Device, provides for the advance of a pin feed form which is independent of the platen controlled forms in the right section of the platen. The "left" control advances the pin feed form, and the "right" control advances the platen controlled form; the advance may occur simultaneously with a programed function. The independent advance as described above assumes that the Front Pressure Rolls are disabled in the area of the pin feed form. See Overlap C (6.03.03) if a front feed form overlaps a pin feed form.

See Advances C and D of Topics 6.01.03 and 6.01.04 respectively for line advance with a Magnetic Record Computer system and other forms in the same area.

The split of the platen does not restrict the placement of a form in the handler, but the line advance of the form may be affected if the form improperly overlaps the split, see Overlaps A, B, and C in this Subject. The edge of a form may coincide with the location of the split or the form may overlap the split, as described in the following topics. However, if two nonoverlapping forms are placed side-by-side in the handler near the split or in any other location, the adjacent edges must be a minimum of .1" apart; a .2" minimum is recommended to provide for variations for form expansion because of change of climate. In addition, a required minimum distance is dependent upon the type of Forms Handler attachments which aid in the control of the form or forms. These attachments usually require a minimum distance greater than .1"; these minimum distances range from .4" to 5". See the various subjects for Roll Paper Holders, Front and Rear Form Guides, Pin Feed Device, and Magnetic Unit Record Modules.

If two overlapping forms (nonpin feed) are independently advanced a minimum overlap is required. The possible form overlap conditions for the forms are described in Items 14, 21, 22, and 23 on the subsequent pages. A left edge of a front feed form may overlap the right edge of either a roll journal,

cut journal or pin feed form, or a combination of any two. For another condition, the right edge of a front feed form may overlap the left edge of either a roll journal, cut journal or pin feed form, or combination of any two. For either of these conditions with the independent advance the forms must overlap for at least .2". The "term" front feed form includes the "record" or "form" which is under control of the Magnetic Unit Record Modules. See Subject 6.23.00 for the 5/8" minimum clearance required for the margin punched holes of two pin feed forms.

If the platen is split in order to use two forms or two sets of forms, the forms are programed to be placed side-by-side to the left and to the right of the split. However, under certain conditions a form may extend over and beyond (overlap) the split even though the platen is uncoupled, see Subject 6.04.00. The types of overlap are described for the following classifications on subsequent pages:

1. Overlap A (6.03.01) is for the overlap of the split of a platen for a Rear Feed Forms Handler. The overlap of forms except for pin feed forms (Item 2) is not permitted.
2. Overlap B (6.03.02) is for the overlap of the split of a platen for a Front Feed Forms Handler. Certain types of one or more forms may also overlap each other and be independently advanced when controlled by the line-advance controls on opposite ends of the platen.
3. Overlap C (6.03.03) is for the overlap of pin feed forms with front feed forms for independent advance capabilities. The overlap of the split may occur also.

6.03.01 OVERLAP A, OVERLAP OF SPLIT OF A PLATEN, REAR FEED FORMS HANDLER

The split of a platen, if uncoupled, may be overlapped with a form with the following possibilities.

Overlap A, Item 1: Simultaneous Line Advance of All Forms, Rear Feed Forms Handler

If only one rear feed form or if only one form around the platen is used, the form may occupy an area on both sides of an uncoupled split if both sections of the platen are advanced simultaneously. The Front Pressure Rolls remain enabled for these conditions, and the Top Pressure Roll for the form around the platen may be active on both sides of the split. See Subject 6.07.00. The Platen Twirlers, if used, must be rotated simultaneously; the Line Advance key does not permit a simultaneous advance. The advance function which is programed for Open Forms Handler (OC) will not provide a simultaneous advance when the handler closes, see Section 10.

Overlap A, Item 2: Pin Feed Form, Rear Feed Forms Handler

For a pin feed form, the form may occupy an area on both sides of the uncoupled split platen and the simultaneous advance of both sections of the platen is not required, the pin feed device advances the form. The Front Pressure Rolls are disabled by the Pressure Roll Control lever for this condition, see Subject 6.08.00. Two pin feed forms may be used also. See Subject 6.23.00 for overlapping Pin Feed forms.

Overlap A, Item 3: Form Edges Between Enabled Pressure Rolls, Rear Feed Forms Handler

A form, if other than a pin feed form, may overlap the split location of a platen without disabling the Front Pressure Rolls. The edge of the form near the split must be programed for an area in between the Front Pressure Rolls and the overlapped split. The areas between the rolls is a pressure-free area. See Figure 6.06.00-3 of Subject 6.06.00 for these areas.

With this type of an overlapping condition the Forms Handler may independently or simultaneously advance the following combinations of any two of the forms placed side-by-side in the Forms Handler:

1. Two rear feed forms,
2. Two forms around the platen, or
3. A rear feed form and a form around the platen.

ITEM 3-1, OVERLAP TO LEFT WITH ADVANCE CONTROLLED FROM RIGHT – For this overlap condition, the left edge of the form is programed for a position in this pressure-free area to the left of the uncoupled split and the right edge is positioned in the area for the right section of the platen. The

advance of the form would be controlled by the right section of the platen. A minimum clearance is required between the next pressure roll on the left and the left edge of the form; see following General Considerations. A rear feed form, or form around the platen may be placed in the left area of the platen, and the advance is controlled by the left section of the platen.

ITEM 3-2, OVERLAP TO RIGHT WITH ADVANCE CONTROLLED FORM LEFT – For this overlap condition, the right edge of the form is programed for a position in this pressure-free area to the right of the uncoupled split and the left edge is positioned in the area for the left section of the platen. The advance of the form would be controlled by the left section of the platen. A minimum clearance is required between the next pressure roll on the right and the right edge of the form; see following General Considerations. A rear feed form, or form around the platen may be placed in the right area of the platen and the advance is controlled by the right section of the platen.

OVERLAP A, ITEM 3, GENERAL CONSIDERATIONS, REAR FEED FORMS HANDLER – The form edge in the pressure-free area must be a minimum distance from the next Front Pressure Roll. The pressure roll would be to the left of the left edge of a form if the overlap is to the left, or to the right of the right edge of the form if the overlap is to the right. The left and right adjacent edges of two pressure rolls are approximately .6" apart. However, the edge of the form in the pressure-free area must be a minimum of .2" from the respective edge (left or right) of this next roll which does not control the form. This minimum is .5" from the center position of the subject pressure roll. The center position of the Front Pressure Rolls may be used to designate pressure roll positions, see Subject 6.06.00, Figure 6.06.00-3.

For example, a 15½" Rear Feed Forms Handler with a split at 114/115 may use a 4" form at the right. The roll to the left of the split is centered at Position 106 and the right edge is at 109; therefore, the left edge of the form may be at programed Position 111 and the right edge at Position 151 (152.5 is the maximum right point for forms). With this condition the left edge of the form would overlap the uncoupled split of the platen in the area from Position 111 through the actual platen split which is at 114.5. The form would advance with the advance controls for the right section of the platen. See Topics 6.11.10 (Roll Holders) and 6.11.07 (Rear Guides) for the minimum distances between adjacent edges of forms placed side-by-side in the handler.

Overlap A, Item 4: Pressure Rolls Disabled, Rear Feed Forms Handler

Two forms (nonpin feed) may be placed side-by-side in the Rear Feed Forms Handler and may be independently or simultaneously advanced even though one form around the platen overlaps the uncoupled split of the platen. With a pressure roll disabled, the form around the platen may overlap a greater area than specified for Item 3; however, a rear feed form may overlap only as described for Item 3 because a rear feed form may not be utilized in the area of a disabled pressure roll. The possible use of this condition would be for:

1. A rear feed form and a form around the platen
2. Two forms around the platen.

These forms control arrangements may be accomplished by permanently disabling a maximum of two Front Pressure Rolls for a certain area occupied by the form around the platen, and by properly placing the Top Pressure Rolls in relation to the form around the platen. See Top Pressure Rolls, Subject 6.07.00.

This disabling and placement of the rolls creates a "pressure-free area". If a form around the platen is in the pressure-free area the friction created by the pressure rolls between the platen and the form for that area does not exist; therefore, the form for the area is not under control of the platen for the same area. In addition, the area in between the pressure rolls is a permanent pressure-free area. See Subject 6.06.00. The permanent area and the area created by the disabling of the pressure rolls may be considered as one area with regard to overlapping the split.

ITEM 4-1, OVERLAP TO LEFT OF SPLIT WITH ADVANCE CONTROLLED FROM RIGHT – The first, or the first and second Front Pressure Rolls which are near and to the left of the uncoupled split location for the platen may be disabled to create a pressure-free area. For this overlap condition, the left

edge of the form is programed for a position in this pressure-free area to the left of the split and the right edge is positioned in the area for the right section of the platen. The advance of the form would be controlled by the right section of the platen. A minimum number of pressure rolls must be enabled in the right section, and a minimum clearance is required between the next enabled pressure roll on the left and the left edge of the form; see following General Considerations. A rear feed form may be placed to the left of the area where the pressure roll or rolls are disabled and the advance is controlled by the left section of the platen. In the absence of a rear feed form, a form around the platen may use this left area.

ITEM 4-2, OVERLAP TO RIGHT OF SPLIT WITH ADVANCE CONTROLLED FROM LEFT – The first, or the first and second Front Pressure Rolls which are near and to the right of the uncoupled split location for the platen may be disabled to create a pressure-free area. For this overlap condition, the right edge of the form is programed for a position in this pressure-free area to the right of the split and the left edge is positioned in the area for the left section of the platen. The advance of the form would be controlled by the left section of the platen. A minimum number of pressure rolls must be enabled in the left section, and a minimum clearance is required between the next enabled pressure roll on the right and the right edge of the form; see following General Considerations. A rear feed form may be placed to the right of the area where the pressure roll or rolls are disabled and the advance is controlled by the right section of the platen. In the absence of a rear feed form, a form around the platen may use this right area.

ITEM 4-3, OVERLAP OF SPLIT EITHER TO LEFT OR TO RIGHT – The first Front Pressure Rolls which are near and on each side of the uncoupled split platen location may be permanently disabled. With this arrangement, the capabilities are similar to the capabilities of Items 4-1 and 4-2, except additional flexibility is provided for the use of the forms. For example, with one application the form may overlap to the left, and for another application or for a subroutine of the same application the same form or another form may overlap to the right. The overlap of two forms in the pressure-free area must not occur simultaneously. However, the arrangement permits the use of a rear feed form or another form around the platen in the area which is unoccupied by the form which utilizes the overlap function. (See rear feed forms and disabled pressure roll in General Considerations.)

OVERLAP A, ITEM 4, GENERAL CONSIDERATIONS, REAR FEED FORMS HANDLER – The maximum of two disabled Front Pressure Rolls should be at adjacent positions. In addition, a minimum number of pressure rolls must be present and enabled for the section of the platen which controls the advance of the rear feed form. With one pressure roll disabled a minimum of two enabled pressure rolls must be used to control the form; the minimum form width would be 3" provided the form is placed in the area where the two enabled pressure rolls are able to contact the form. With two pressure rolls disabled a minimum of three enabled pressure rolls must be used to control the form; the minimum form width would be 3" plus the distance that the form overlaps the uncoupled split location. The form must be placed in the area where the three enabled pressure rolls are able to contact the form.

For forms around the platen, the form edge in the pressure-free area must be a minimum distance from the next enabled Front Pressure Roll. The enabled pressure roll will be to the left of the left edge of a form if the overlap is to the left, or to the right of the right edge of a form if the overlap is to the right. This edge of the form must be a minimum of .2" from the respective edge (left or right) of this next enabled pressure roll. This minimum is .5" from the center position of the subject pressure roll. The center position of the Front Pressure Rolls may be used to designate the pressure roll positions, see Subject 6.06.00, Figure 6.06.00-3. The .2" clearance rule for Item 4 is the same as for Item 3.

If a rear feed form is used, the Pressure Roll Control lever (Subject 6.08.00) must be in the rearward position (enabled position) for the operation of the Item 4 conditions, but the lever does not enable the permanently disabled Front Pressure Roll or Rolls.

Two rear feed forms may not be used because a rear feed form should not be fed into the area where a Front Pressure Roll is permanently disabled. (The disabled pressure roll is not able to raise the form sufficiently to permit the leading edge to by-pass the Form Limits, see Topic 6.11.03.)

The disabling of the Front Pressure Rolls is a Field Option. The Form Limits should not be disabled. The disabling of the limits would prevent the future use of the limits if the requirements for an application or system are changed.

6.03.02 OVERLAP B, OVERLAP OF SPLIT OF A PLATEN, WITH OR WITHOUT FORM OVERLAP, FRONT FEED FORMS HANDLERS

The uncoupled split of a platen may be overlapped with a form or forms with the following possibilities. The possibilities are similar for all Forms Handlers except for the 1/6" and 1/5" increments for line advance with the respective left and right sections of the platen with the Financial Forms Handler. The line-advance of the module-controlled document with a Magnetic Record Computer system is not dependent upon enabled Front Pressure rolls, see Subject 6.06.00. The module-controlled document, if present, would overlap the uncoupled split to the left, only if a split platen location was provided to the right of location 110/111. Whether or not the document overlapped the split would also depend upon the width of the document. The document may overlap a from which overlaps the split, see Items II and 14. The line advance functions for forms which overlap the split of a platen may occur simultaneously or independently as described for the following items.

Overlap B, Item 11: Simultaneous Line Advance of All Forms, Front Feed Forms Handlers

Any or all forms may occupy an area on both sides of an uncoupled split if both sections of the platen are advanced simultaneously. The Front Pressure Rolls may remain enabled for a manually aligned front feed form. The Top Pressure Rolls for the form around the platen may be active on both sides of the split. See Subject 6.07.00. The Lower Pressure Rolls remain enabled for a form around the platen. See Subject 6.08.00. The Platen Twirlers, if used, must be rotated simultaneously; the Line Advance key does not permit a simultaneous advance.

The simultaneous advance may include a module-controlled document, but the Platen Twirlers do not move the document. See Advance E of Topic 6.01.05.

This advance cannot be used for the Financial Front Feed Forms Handler because of the 1/6" and 1/5" increments for the line advance of the respective left and right sections of the platen.

Overlap B, Item 12: Pin Feed Form, Front Feed Forms Handlers

For a pin feed form, the form may occupy an area on both sides of the uncoupled split and the simultaneous advance of both sections of the platen is not required, the Pin Feed Device advances the form. The Front Pressure Rolls are individually disabled, and the Lower Pressure Rolls for the Journal/Pin Feed Path may be disabled by the Pressure Roll Control lever. See Subject 6.08.00. Two pin feed forms may be used also. See Subject 6.23.00 for Overlapping Pin Feed Forms.

For a Financial Front Feed Forms Handler the increment of advance will be 1/6" or 1/5" depending upon whether the left or right control is used to advance the form.

Overlap B, Item 13: Form Edges Between Enabled Front Pressure Rolls, Front Feed Forms Handlers

For any one section of a split platen, one or more forms near an uncoupled split location of a platen may overlap the split without disabling the Front Pressure Rolls. For the form or forms which overlap the split, the edge of the form or forms must be programed for an area in between the next enabled Front Pressure Roll and the overlapped split. The area between the rolls is a pressure-free area. The edges in this pressure-free area may or may not coincide; however, a set of forms near the split may include forms which overlap the split and forms which do not overlap the split. The form or forms for the one section of the platen may be advanced without advancing the form or forms for the opposite section of the platen. A programed simultaneous advance may also occur. (Note 1/6" and 1/5" line advance on TC 700). This is considered a "side-by-side" arrangement for the forms, because forms in separate sections do not overlap each other. For forms (journals) around the platen, pin feed forms, and the module-controlled document, the independent or simultaneous advance function may occur with the Forms Handler opened or closed; however, the advance of manually aligned front feed forms occurs only when the handler is closed. See Items 14, 22, and 23 for the overlap of the forms and the split.

The single or multiple-part form or forms which overlap the split of the platen without disabling pressure rolls may be any of the following types of forms:

1. Front Feed, see note (includes passbook)

2. Cut Journal
3. Roll Journal
4. Pin Feed, see note
5. Front Feed and either Pin Feed, Cut Journal or Roll Journal
6. Front Feed, Pin Feed, and Roll Journal, see note
7. Pin Feed and Roll Journal, see note
8. Module-controlled Document in combination with any of the above. (For Item 13 the left edge of a module-controlled document would not utilize the overlap of the uncoupled split; however, the forms which are used in combination with the document may overlap the split.)

Note: The overlap of the split of a platen by two pin feed forms as described for Item 13 will not occur because of the 5/8" clearance required for margins, Subject 6.23.00. A cut journal (usually preprinted) should not be used in the same area of a pin feed form. A second pin feed form (with or without preprinting) would provide for form handling conditions which are more efficient. For the purpose of the discussion of Item 13 a front feed form may include two or more forms which are front fed in the same area or part of the same area. For example:

1. Ledger and statement collated by the operator before being inserted.
2. Ledger and overlapping elongated form, check and payroll ledger.
3. A front feed form in front of the module-controlled document.

With Item 13, the form specifications for the different type of forms which may overlap the uncoupled split are the same as for the forms which do not overlap the split. See the form specifications for the respective Forms Handlers in Subjects 6.32.00, 6.33.00, and 6.34.00.

Although the margin of a pin feed form is not used for printing, the margin area must be considered as part of the form when locating the form in the permissible areas for adjacent forms, for overlapping forms, and for related forms handling features or functions.

ITEM 13-1, OVERLAP TO LEFT OF SPLIT WITH ADVANCE CONTROLLED FROM RIGHT – For this overlap condition, the left edge of one or two forms is programed for a position in this pressure-free area to the left of the uncoupled split. The right edge or edges are positioned in the area for the right section of the platen. The advance of the form or forms would be controlled by the right section of the platen. A minimum clearance is required between the next pressure roll on the left and the left edge of the form or forms; see following General Considerations. If two forms are in the pressure-free area the left edges of the forms may coincide, but the edges do not have to coincide. See Topic 6.20.01 for the permissible locations for the edge of a front feed form when the edge is near the ½" pin feed margin of a pin feed form. Another form or other forms may be placed in the left area of the platen, and the advance is controlled by the left section of the platen.

For Example: If a passbook width of 7" is used with the Series TC 700, the passbook may occupy an area from Position 82 through 152. The split of the platen at Positions 85/86 would be overlapped to the left.

ITEM 13-2, OVERLAP TO RIGHT OF SPLIT WITH ADVANCE CONTROLLED FROM LEFT – For this overlap condition, the right edge of one or two forms is programed for a position in this pressure-free area to the right of the uncoupled split. The left edge or edges are positioned in the area for the left section of the platen. The advance of the form or forms would be controlled by the left section of the platen. A minimum clearance is required between the next pressure roll on the right and the right edge of the form or forms; see following General Considerations. If two forms are in the pressure-free area, the right edges of the forms may coincide, but the edges do not have to coincide. See Topic 6.20.01 for the permissible locations for the edge of a front feed form when the edge is near the ½" margin of a pin feed form. Another form or other forms may be placed in the right area of the platen and the advance is controlled by the right section of the platen.

See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

OVERLAP B, ITEM 13, GENERAL CONSIDERATIONS; FRONT FEED FORMS HANDLERS – The form edge or edges in the pressure-free area must be a minimum distance from the next Front Pressure Roll. The pressure roll would be to the left of the left edge of the forms if the overlap is to the left, or to the right of the right edge of the forms if the overlap is to the right. The left and right adjacent edges of two pressure rolls are approximately .6" apart, see Subject 6.06.00. However, the edge or edges of the form in the pressure-free area must be a minimum of .2" from the respective edge (left or right) of this next pressure roll which does not control the form. This minimum is .5" from the center position of the subject pressure roll. The center position of the Front Pressure Rolls may be used to designate the pressure roll positions, see Figure 6.06.00-3.

Overlap B, Item 14: Front Pressure Rolls Disabled Near Split Platen Location, Front Feed Forms Handlers

The uncoupled split of a platen may be overlapped by a form or certain combinations of two forms plus a moduled-controlled document. With this arrangement the forms and document controlled by one section of the split platen may be advanced without advancing the form or forms for the opposite section of the platen. A programed simultaneous advance may also occur. (Note the 1/6" and 1/5" increments for line advance on TC 700.) With the Front Pressure Rolls disabled, the form or forms and document may overlap the opposite section of the platen for a greater area than specified for Item 13; however, only a front feed and one other form, plus a document may overlap the split in one direction (left or right). A combination for a journal and pin feed form may not overlap the split at the same time. See Items 14-1 and 14-2 on subsequent pages.

In addition, certain combinations of the forms in the opposite section of the split platen may utilize the pressure-free area to overlap the forms which overlap the split, or to be overlapped by a form which overlaps a split.

1. A front feed form or document, or both in the opposite section may overlap any form except another front feed form or a document.
2. A pin feed form may overlap or be overlapped by another pin feed form.
3. A journal or pin feed form in the opposite section of the platen may be overlapped by a front feed form or document which overlaps the split.
4. A roll journal in the opposite section of the platen and which does not overlap the split may be overlapped by a pin feed form which overlaps the split.

For forms (journals) around the platen, pin feed forms, and module-controlled documents, the independent or simultaneous advance function may occur with the Forms Handler opened or closed; however, the advance of manually aligned front feed forms occurs only when the handler is closed.

These forms control arrangements may be accomplished by disabling a maximum of three Front Pressure Rolls for an area near the split of the platen, and by properly placing the Top Pressure Rolls in relation to the form around the platen. See Top Pressure Rolls, Subject 6.07.00. This disabling and placement of the rolls creates a "pressure-free area". If a form or forms are in the pressure-free area the friction created by the pressure rolls between the platen and the form does not exist for that area; therefore, the form or forms for the area are not under control of the platen for the same area. In addition, the .6" area to the left and right of the Front Pressure Rolls is a permanent pressure-free area. See Subject 6.06.00. The permanent area and the area created by the disabling of the pressure rolls may be considered as one area with regard to overlapping the split. The Lower Pressure Rolls (see Subject 6.08.00) must be enabled if a cut journal is used; however, the overlap of split platen may be utilized as described for the following conditions even though these rolls remain enabled. If a Magnetic Unit Record or nonmagnetic form is under control the Magnetic Unit Record Modules with a Magnetic Record Computer System, the independent advance may also be used. The orderly advance of the module-controlled document does not require the enabled Front Pressure Rolls.

The forms for the overlap of the split may be single or multiple-part. See Item 13 (appears on prior pages) for a definition of the front feed forms. With Item 14, the form specifications for the different types of forms which may be in the pressure-free area at one time are the same as for forms which are in any other area, except that a multiple-part front feed form which extends into the pressure-free area must not be more than .016" in thickness for a Basic or Magnetic Unit Record Front Feed Forms

Handler. With a Financial Forms Handler the maximum thickness is .014". The combined thickness for a manually aligned front feed form and Module-controlled document must not exceed .016" in thickness. A single-part front feed form which extends in the pressure-free area should not exceed a thickness of .0075" (32 pound ledger is .006"). Consequently, the form specifications for Item 14 of Overlap B are the same as for Overlap C, Topic 6.03.03. The forms specifications for the respective Forms Handlers are also described in Subjects 6.32.00, 6.33.00, and 6.34.00.

The maximum thickness for front feed forms must be observed regardless of whether the form overlaps another journal or pin feed form in the area when an independent line advance is required with the handler closed. However, the front feed form may overlap the uncoupled split platen with a greater thickness if both sections are advanced simultaneously as described for Item 11. For example; a left-controlled front feed form and journal may overlap to the right and a pin feed form may be in the remaining right section of the platen. All three forms may be advanced simultaneously with the handler closed, but the journal and pin feed form may advance independently with the handler open or may advance independently with the handler closed after the front feed form in excess of .016" thickness is removed.

Although the margin of a pin feed form is not used for printing, the margin area must be considered as part of the form when locating the form in the permissible areas for adjacent forms, for overlapping forms, and for related forms handling features or functions.

Multiple-page passbooks are usually greater than the allowable maximum .014" or .016" thickness for a form overlap in the pressure-free area; however, the passbook may overlap the split in accordance with Item 13. Generally the narrow width of the passbook may not provide sufficient area for the minimum number of enabled pressure rolls plus a pressure-free area created by disabling the pressure rolls.

See Topic 4.00.03 for the printing in the area of overlapping forms.

OVERLAP B, ITEM 14-1, OVERLAP TO LEFT OF SPLIT WITH ADVANCE CONTROLLED FROM RIGHT – The first, the first two, or the first three Front Pressure Rolls which are near and to the left of the uncoupled split location for the platen may be disabled by the operator to create a pressure-free area. For this overlap condition, the left edge of one form or edges of a permissible combination of two forms are programed for a position in this pressure-free area to the left of the uncoupled split, and the right edge or edges are positioned in the area for the right section of the platen. The advance of the forms would be controlled by the right section of the platen. The following are explained in General Considerations for Overlap B in subsequent pages:

1. Minimum enabled pressure rolls for front feed forms, and
2. Minimum clearance of form edges in relation to the next enabled Front Pressure Roll or maximum pressure-free area which may be utilized.

If two forms of a permissible combination are in the pressure-free area, the left edges of the forms may coincide, but the edges do not have to coincide. In addition, the right section may control other forms which do not overlap the split. See Topic 6.20.01 for the permissible locations for the edge of a front feed form when the edge is near the ½" margin of a pin feed form.

For an overlap of forms in the pressure-free area the right hand area of certain forms which are controlled by the left section may overlap or be overlapped by the forms which overlap the split to the left. See the following chart.

The left section of the platen may be used to control the advance of forms which are placed entirely to the left of the pressure-free area (no overlap). Also a pin feed form (right-controlled) may overlap the split beyond the three-pressure-roll area and extend beyond the left edge of a front feed form, if present. See Overlap C, Item 23 (6.03.03) for the use of the left section of the platen. See Subject 6.07.00 for the placement of Top Pressure Rolls.

The module-controlled document, if present, would overlap the uncoupled split to the left, only if a split platen location was provided to the right of location 110/111. Whether or not the document overlapped the split would also depend upon the width of the document. If the document overlaps the

split to left, the document may overlap for a greater area than the three-pressure-roll area. The pressure rolls in the area to the left of the split which is occupied by the document must be disabled for the independent advance functions. Pressure rolls are normally disabled in the area of the document except when a front feed form is in front of the document. This front form may be used but the rules with regard to enabled and disabled rolls must be applied the same as for any other front feed form. Even though the document is beyond the three-pressure-roll area a form in front of the document must be within the pressure-free area which is permitted by the number of enabled pressure rolls, see General Considerations.

CHART FOR ITEM 14-1, FORM COMBINATIONS FOR OVERLAP TO LEFT OF SPLIT AND OVERLAP OF FORMS IN PRESSURE-FREE AREA NEAR SPLIT (ALLOWABLE THICKNESSES IN PARENTHESES)

Column 1 Left-Controlled Forms Entirely to Left of Split	Column 2 Right-Controlled Forms and Document which Overlap Split to Left
1. None which overlap in pressure-free area; however, forms may be to the left of the area. See Note at end of Chart.	Any of the following combinations listed in this column may overlap the split to the left without a left-controlled form in the pressure-free area.
2. Either a Cut Journal (.029"), Roll Journal (.012"), or Pin Feed form (.035") may be overlapped in front by the form listed in Column 2.	Front Feed (.016" or .014")
3. Both a Pin Feed form (.035") and Roll Journal (.012") may be overlapped in front by the form listed in Column 2.	Front Feed (.016" or .014")

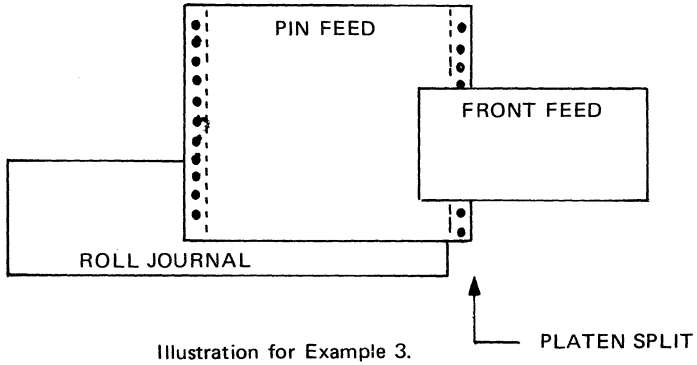


Illustration for Example 3.

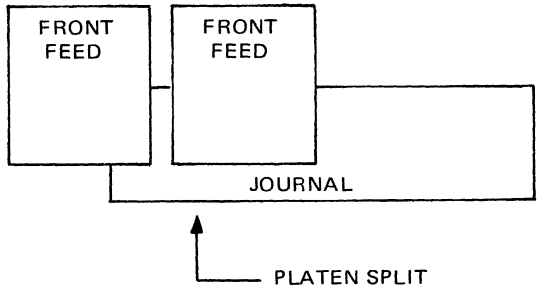


Illustration for Example 5.

4. A Front Feed form (.016" or .014") may overlap in front of one of the forms listed in Column 2.	Either a Cut Journal (.029"), Roll Journal (.012"), or Pin Feed (.035"). (Note: A Journal and Pin Feed form may not both overlap to the left in the pressure-free area.)
5. A Front Feed form (.016" or .014") may overlap in front of either the Cut or Roll Journal, or Pin Feed form listed in Column 2, provided the Journal or Pin Feed form extends beyond the left edge of the right-controlled Front Feed form.	Both a Front Feed (.016" or .014") and either a Cut Journal (.029"), Roll Journal (.012"), or Pin Feed (.035"). (Note: A left-controlled Front Feed form may not overlap a right-controlled Front Feed form in the pressure-free area.)

6. A Pin Feed Form (.035"), Cut Journal (.029"), or Roll Journal (.012") may be overlapped in front by a Front Feed form listed in Column 2, provided the Front Feed form extends beyond the left edge of the right-controlled Journal or Pin Feed Form.

   Both a Front Feed (.016" or .014") and either a Cut Journal (.029"), Roll Journal (.012"), or a Pin Feed (.035"). (Note: A Pin Feed Form for the left may not overlap a right-controlled journal in the pressure-free area. Journals may not overlap in the same area.)

7. Both a Pin Feed form (.035") and Roll Journal (.012") may be overlapped in front by the Front Feed form listed in Column 2, provided the Front Feed form extends beyond the edge of the right-controlled Journal or Pin Feed form.

   Both a Front Feed (.016" or .014") and either a Cut Journal (.029"), Roll Journal (.012"), or Pin Feed (.035").

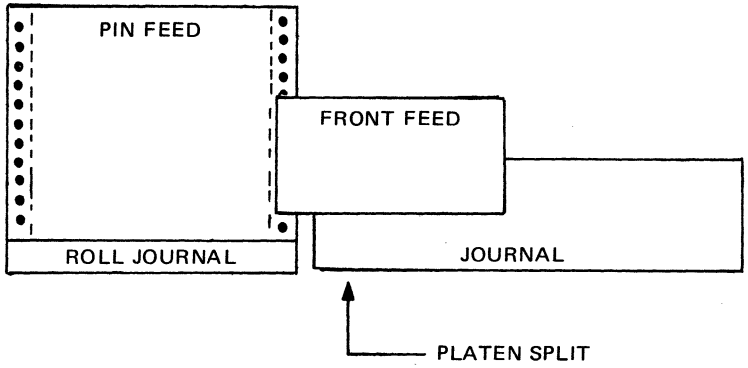


Illustration for Example 7.

8. A Pin Feed form (.035") may be overlapped by the form listed in Column 2.

   Pin Feed (.035") (Note: A journal may not occupy the overlapping area of two Pin Feed forms.)

9. A Pin Feed form (.035") may be overlapped in front by both forms listed in Column 2.

   Both a Front Feed (.016" or .014") and Pin Feed (.035"). See Examples 2 and 8 for overlap by one only.

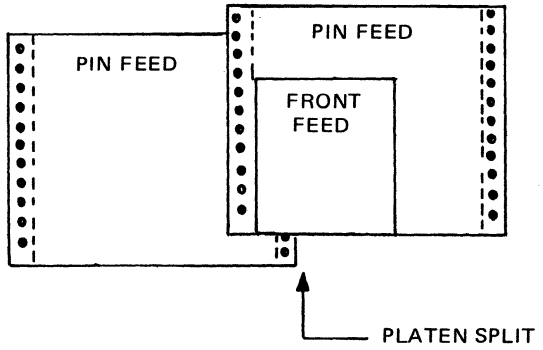


Illustration for Example 9.

10.	A Pin Feed Form (.035") which is overlapped and a Front Feed form (.016" or .014") which overlaps in front, both permit an overlap of the split with the form listed in Column 2.	Pin Feed (.035"). See Examples 4 and 8 for only one form on the left.
11.	A Roll Journal (.012") may be overlapped in front by the form listed in Column 2.	Pin Feed (.035")
12.	A Roll Journal (.012") which is overlapped and a Front Feed form (.016" or .014") which overlaps in front, both permit an overlap of the split with the form listed in Column 2	Pin Feed (.035"). See Examples 4 and 11 for only one form on the left.

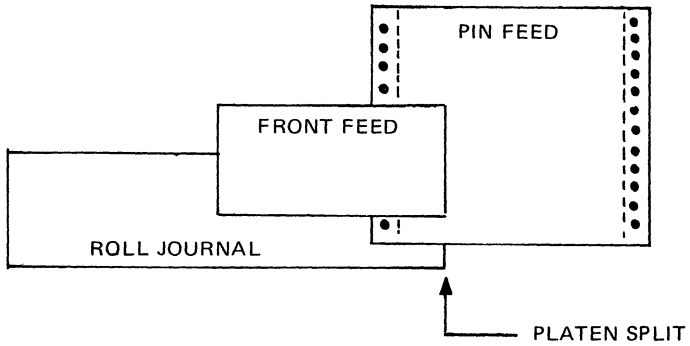


Illustration for Example 12.

13. A Cut Journal (.018"), Roll Journal (.012") or Pin Feed form (.018") may be overlapped by the right-controlled Document only, or by the Document and a Front Feed form. The maximum individual thicknesses for the Journals and Pin Feed forms are the same regardless of whether they are placed behind the document to the left or the right of the split. The maximum combined thickness of a combination of Pin Feed forms and Roll Journal behind the document is .018". (Note: A left-controlled Front Feed form may not overlap a right-controlled document for independent advance functions.)

NOTE; Reference to Form Specifications:

Basic Front Feed Forms Handler (6.32.01)

1. Combined thickness .055"
2. Front Feed .016"

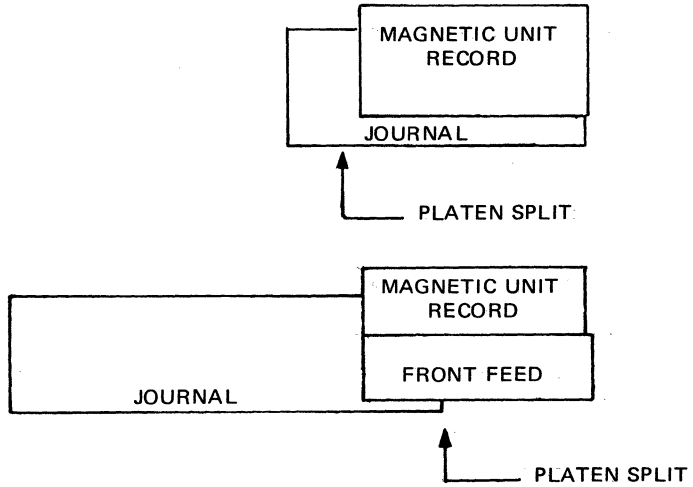
Magnetic Unit Record Forms Handler (6.34.01)

1. Combined thickness .055" with Item 2
2. Manual front feed .016"
3. Module-controlled document .016"
4. Combined Items 2 and 3 .016"
5. Combined thickness .034" with Items 3 and 4 (.018" plus .016")

Financial Forms Handler (6.33.01)

1. Combined thickness .045"
2. Front Feed .014"

A Module-controlled Document (.016") may be used on the right. The Document may be used in place of the Front Feed form in the above examples. Both a Front Feed form and Document with a combined .016" thickness may be used; the Front Feed form must be in front of the document, but the left edges may or may not coincide. See Examples 1, 2, 3, 5, 6, 7, and 9 above. See Subject 6.14.00 for the permissible locations, simultaneous advance, and print lines for the Front Feed form in front of the document.



Illustrations for Example 13.

OVERLAP B, ITEM 14-2, OVERLAP TO RIGHT OF SPLIT WITH ADVANCE CONTROLLED FROM LEFT – The first, the first two, or the first three Front Pressure Rolls which are near and to the right of the uncoupled split location for the platen may be disabled by the operator to create a pressure-free area. For this overlap condition, the right edge of one form or edges of a permissible combination of two forms are programed for a position in this pressure-free area to the right of the uncoupled split, and the left edge or edges are positioned in the area for the left section of the platen. The advance of the forms would be controlled by the left section of the platen. The following are explained in General Considerations for Overlap B in subsequent pages:

1. Minimum enabled pressure rolls for front feed forms, and
2. Minimum clearance of form edges in relation to the next enabled Front Pressure Roll or maximum pressure-free area which may be utilized.

If two forms of a permissible combination are in the pressure-free area, the right edges of the forms may coincide, but the edges do not have to coincide. In addition, the left section may control other forms which do not overlap the split. See Topic 6.20.01 for the permissible locations for the edge of a front feed form when the edge is near the ½" margin of a pin feed form.

For an overlap of forms in the pressure-free area the left-hand area of certain forms which are controlled by the right section may overlap or be overlapped by the forms which overlap the split to the right. See the following chart.

The right section of the platen may be used to control the advance of forms which are placed entirely to the right of the pressure-free area (no overlap). Also a pin feed form (left-controlled) may overlap the split beyond the three-pressure-roll area and extend beyond the right edge of a front feed form, if present. See Overlap C, Item 22 (6.03.03) for the use of the right section of the platen. See Subject 6.07.00 for the placement of Top Pressure Rolls.

The module-controlled document, if present, would not overlap the uncoupled split to the right as explained for other forms which overlap to the right. The document may overlap the split to the left in the same area with forms which overlap to the right. This overlap is actually for Item 14-3 which is an overlap for either to the left or right (appears on the following pages). An overlap to the left would occur only if a split platen location was provided to the right of location 110/111. Whether or not the document overlapped the split would also depend upon the width of the document. If the document overlaps the split to the left, journals or pin feed forms behind the document may still overlap the split to the right, provided the pressure rolls are properly disabled. A front feed form may not always overlap to same area as the other forms if the pressure rolls are disabled in front of the document for the independent advance functions. This shorter overlap distance for the front feed form would depend upon the location of the split and the width of the document; see General Considerations for minimum number enabled pressure rolls for front feed forms.

See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

CHART FOR ITEM 14-2, FORM COMBINATIONS FOR OVERLAP TO RIGHT OF SPLIT AND OVERLAP OF FORMS IN PRESSURE-FREE AREA NEAR SPLIT (ALLOWABLE THICKNESSES IN PARENTHESES)

	Column 1 Left-Controlled Forms which Overlap Split to Right	Column 2 Right-Controlled Forms and Document Entirely to the Right of Split
1.	Any of the following combinations listed in this column may overlap the split to the right without a right-controlled form in the pressure-free area.	None which overlap in pressure-free area; however, forms may be to the right of the area. See Note at end of Chart.
2.	Front Feed (.016" or .014")	Either a Cut Journal (.019"), Roll Journal (.012"), or Pin Feed form (.035") may be overlapped in front by the form listed in Column 1.
3.	Front Feed (.016" or .014")	Both a Pin Feed form (.035") and a Roll Journal (.012") may be overlapped in front by the form listed in Column 1.
4.	Either a Cut Journal (.029"), Roll Journal (.012"), or Pin Feed (.035"). (Note: A Journal and Pin Feed form may not both overlap to the right in the pressure-free area.)	A Front Feed form (.016" or .014") may overlap in front of one of the forms listed in Column 1.
5.	Both a Front Feed (.016" or .014") and either a Cut Journal (.012"), or Pin Feed (.035"). (Note: A right-controlled Front Feed form in the pressure-free area.)	A Front Feed form (.016" or .014") may overlap in front of either the Cut or Roll Journal, or Pin Feed form listed in Column 1, provided the Journal or Pin Feed form extends beyond the right edge of the left-controlled Front Feed form.
6.	Both a Front Feed (.016" or .014") and either a Cut Journal (.029"), Roll Journal (.012"), or a Pin Feed (.035"). (Note: A Pin Feed Form for the right may not overlap a left-controlled journal in the pressure-free area. Journals may not overlap in the same area.)	A Pin Feed Form (.035"), Cut Journal (.029"), or Roll Journal (.012") may be overlapped in front by a Front Feed form listed in Column 1, provided the Front Feed form extends beyond the right edge of the left-controlled Journal or Pin Feed form.

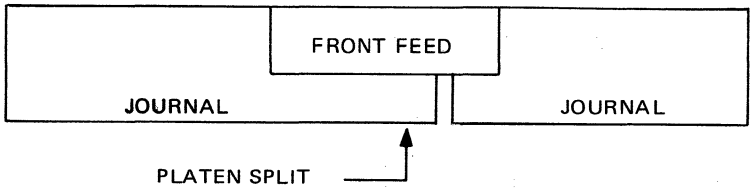


Illustration for Example 6.

7. Both a Front Feed (.016" or .014") and either a Cut Journal (.029"), Roll Journal (.012"), or Pin Feed (.035").	Both a Pin Feed form (.035") and a Roll Journal (.012") may be overlapped in front by the Front Feed form listed in Column 1, provided the Front Feed form extends beyond the right edge of the left-controlled Journal or Pin Feed form.
8. Pin Feed (.035") (Note: A Journal may not occupy the overlapping area of two Pin Feed forms.)	A Pin Feed form (.035") may overlap in front of the form listed in Column 1.
9. Both a Front Feed (.016" or .014") and Pin Feed (.035"). See Examples 2 and 8 for overlap by one only.	A Pin Feed form (.035") may overlap the left-controlled Pin Feed form and the left-controlled Front Feed form may overlap in front of the right-controlled Pin Feed form.
10. Pin Feed (.035"). See Examples 4 and 8 for only one form on the right.	Both a Pin Feed form (.035") and a Front Feed form (.016" or .014") may overlap in front of the form listed in Column 1.

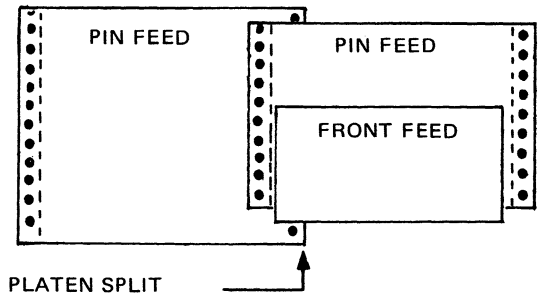


Illustration for Example 10.

11. Pin Feed (.035")	A Roll Journal (.012") may be overlapped in front by the form listed in Column 1.

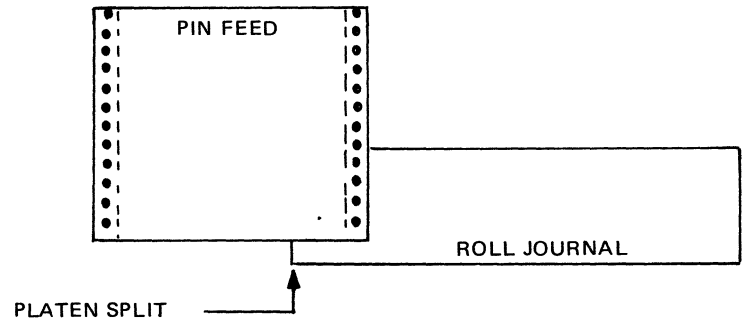
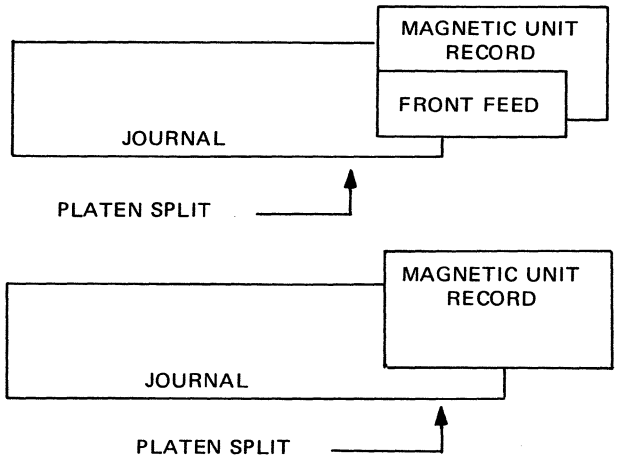


Illustration for Example 11

12. Pin Feed (.035"). See Examples 4 and 11 for only one form on the right.	A Roll Journal (.012") which is overlapped and a Front Feed form (.016" or .014") which overlaps in front, both permit an overlap of the split with the form listed in Column 1.

13. A Cut Journal (.018"), Roll Journal (.012") or Pin Feed form (.018") may be overlapped by the right-controlled Document only, or by the Document and a Front Feed form. The maximum individual thicknesses for the Journals and Pin Feed forms are the same regardless of whether they are placed behind the document to the left or the right of the split. The maximum combined thickness of a combination of Pin Feed forms and Roll Journal behind the document is .018". (Note: A left-controlled Front Feed form may not overlap a right-controlled document for independent advance functions.)



Illustrations for Example 13

A Module-controlled Document (.016") may be used on the right. The Document may be used in place of the Front Feed form in the above examples. Both a Front Feed form and Document with a combined .016" thickness may be used; the Front Feed form must be in front of the document, but the left edges may or may not coincide. See Examples 1, 4, 5, and 10 above. See Subject 6.14.00 for the permissible locations, simultaneous advance, and print lines for the Front Feed form in front of the document. The document may be entirely to the right of the split or overlap to the left depending upon the width and the split location.

NOTE: Reference to Form Specifications:

Basic Front Feed Forms Handler (6.32.01)

1. Combined thickness .055"
2. Front Feed .016"

Magnetic Unit Record Forms Handler (6.34.01)

1. Combined thickness .055" with Item 2
2. Manual front feed .016"
3. Module-controlled document .016"
4. Combined Items 2 and 3 .016"
5. Combined thickness .034" with Items 3 and 4 (.018" plus .016")

Financial Forms Handler (6.33.01)

1. Combined thickness .045"
2. Front Feed .014"

OVERLAP B, ITEM 14-3, OVERLAP OF SPLIT EITHER TO LEFT OR TO RIGHT, OR BOTH – For this overlap condition the Front Pressure Roll or Rolls near and on each side of the uncoupled split of a platen may be disabled. One Front Pressure Roll on one side of the split may be disabled and a maximum of two pressure rolls on the opposite side of the split may be disabled. The capabilities for this condition are similar to Items 14-1 and 14-2 except the pressure-free area is present on both sides of the uncoupled split.

With this arrangement one type of a form may overlap the uncoupled split to the left and another form may overlap to the right, both of which overlap each other. Each form may be independently advanced.

In addition, if the type of application or applications permit, the Front Pressure Rolls may be left disabled to avoid the enabling and disabling for each application. For example, with one application the form may overlap to the left, and for another application or for a subroutine of the same application the same form or another form may overlap to the right.

The form combinations in the left and right sections as listed for Items 14-1 and 14-2, may be used for the Item 14-3 overlap of the split of a platen in two directions (left and right); however, the rule for the overlap of the split with a roll journal in combination with a Pin Feed form must be closely observed:

1. A Roll Journal and Pin Feed form may not both overlap the split in the same direction. The Journal may occupy the pressure-free area up to the split location.

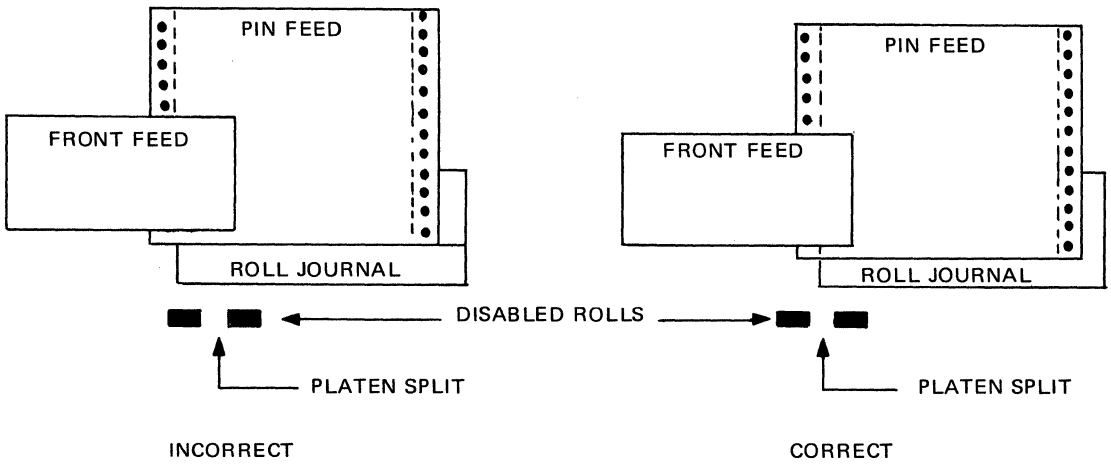


Illustration 1 of Overlap B, Item 14-3

2. The journal area which extends across the split from one direction may not be overlapped in the same area by a Pin Feed form from the other direction.

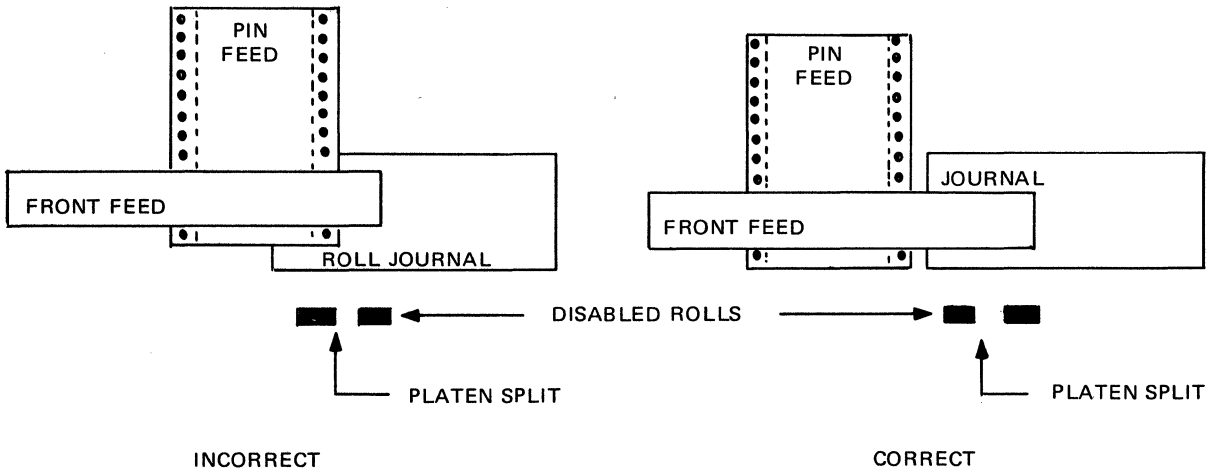


Illustration 2 of Overlap B, Item 14-3

Examples 3, 7, 11 and 12 for each of Items 14-1 and 14-2 list a combination for a Pin Feed form and a Roll Journal; therefore the above rules must be observed.

OVERLAP B, ITEM 14, GENERAL CONSIDERATIONS, FRONT FEED FORMS HANDLERS – The maximum of three disabled Front Pressure Rolls should be at adjacent positions in order to establish the pressure-free area. In addition, a minimum number of pressure rolls must be present and enabled for the section of the platen which controls the advance of the Front Feed form. (Pin Feed forms, or Cut or Roll Journals may be advanced without the Front Pressure Rolls enabled.) The disabling of one Front Pressure Roll creates a useable pressure-free area of 1.6". The disabling of each additional pressure roll will create an additional 1.2" of pressure-free area. Although the pressure rolls are separated .6" apart, this area may be considered as an enabled area when two adjacent rolls are enabled; therefore, each enabled Front Pressure Roll creates an enabled area of 1.2" except the last roll creates only a .6" area. (Formula: Rolls enabled multiplied by 1.2" less .6" equals enabled area.)

If a form in the enabled area contacts any part of a pressure roll, the roll may be counted as a roll with regard to determining the minimum enabled rolls.

The first of the following two charts specifies the number of Front Pressure Rolls which must be enabled in the area for the Front Feed form for each combination of the disabled pressure rolls. The chart also includes the minimum form width of front feed forms for the "enabled area", and the maximum width for the pressure-free area which may be used by all types of forms, except the useable area for pin feed forms may be greater, see Overlap C of Topic 6.03.03. The second chart specifies the useable pressure-free area if a journal overlaps the split,. With or without a front feed form in the pressure-free area, the Front Pressure Rolls must be disabled to create a pressure-free area for the independent advance of the journal which overlaps a split. Both charts are similar. See Subject 6.07.00, for Top Pressure Rolls. Figures 6.03.02-1, -2, and -3 may be used as a reference also.

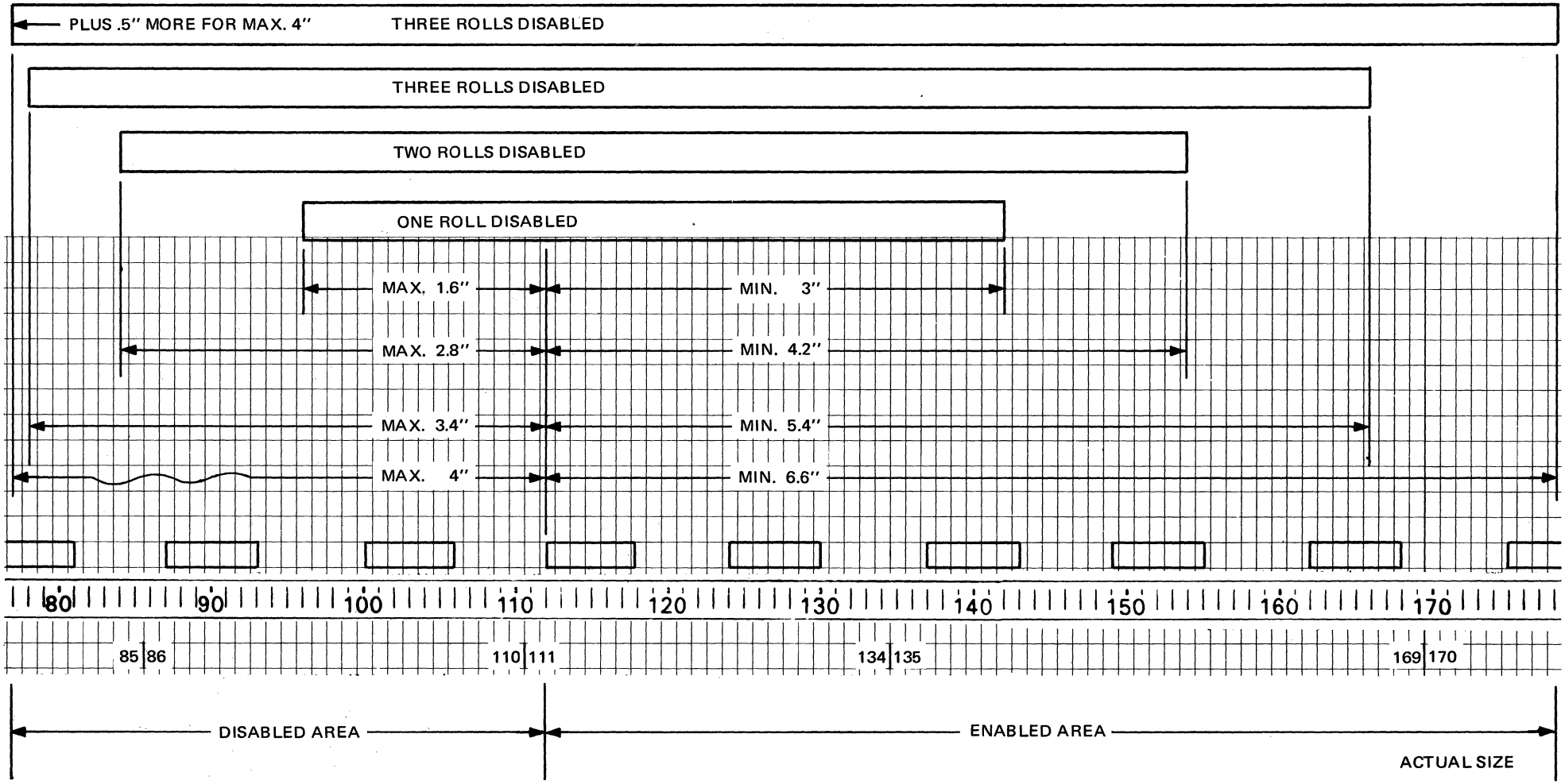


Figure 6.03.02-1 Overlap to Left of Split, Front Pressure Rolls Disabled for Pressure-Free Area and Enabled for Enabled Area.

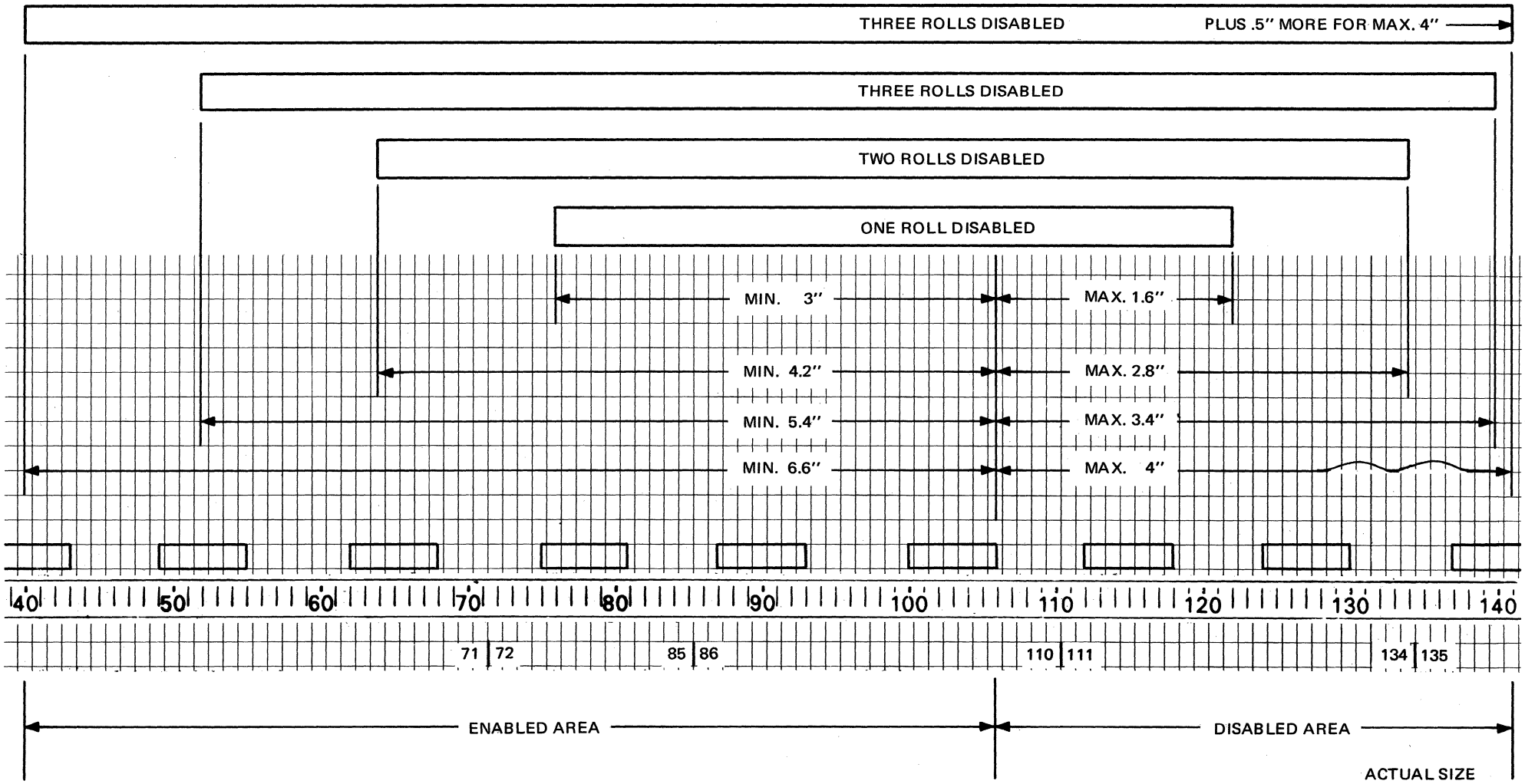


Figure 6.03.02-2 Overlap to Right of Split, Front Pressure Rolls Disabled for Pressure-Free Area and Enabled for Enabled Area.

OVERLAP B, ITEM 14, CHART 1: FRONT PRESSURE ROLLS ENABLED AND DISABLED FOR OVERLAP CONDITIONS WITH A PRESSURE-FREE AREA, FRONT FEED FORMS

Column 1 Rolls Disabled for Pressure-Free Area	Column 2 Maximum Form Width in Pressure-Free Area	Column 3 Maximum Width for Overlap of Form by Front Feed Form	Column 4 Minimum Rolls Enabled for Enabled Area	Column 5 Minimum Width of Front Feed Form in Enabled Area
1	1.6"	.8"	3	3"
2	2.8"	2"	4	4.2"
3	3.4"	2.6"	5	5.4"
3	4"	3.2"	6	6.6"

Note: Column 2 width minus .8" equals Column 3 width.

NOTE: The center to center distances for Front Pressure Rolls for the Financial Front Feed Forms Handler are different than for other Forms Handlers, therefore, the above chart is not applicable to the Financial Handler (TC 700). See Subject 6.06.00, Figure 6.06.00-3 for the location of the rolls. Figure 6.06.00-3 may be used to determine the width of the useable pressure-free area or the enabled area if the overlap function for the uncoupled split is required.

OVERLAP B, ITEM 14, CHART 2: TOP PRESSURE ROLLS AND JOURNALS FOR OVERLAP CONDITIONS IN PRESSURE-FREE AREA

Column 1 Rolls Disabled for Pressure-Free Area	Column 2 Maximum Area of Journal in Pressure-Free Area	Column 3 Minimum Top Rolls Enabled for Enabled Area	Column 4 Minimum Width of Journal in Enabled Area
1	1.6"	2	3"
2	2.8"	2	4.2"
3	3.4"	2	5.4"
3	4"	2	6.6"

FORM-EDGE RULES 1, 2, AND 3, OVERLAP B – The form edge or edges in the pressure-free area must be a minimum distance of either .2" or .8" from the next enabled Front Pressure Roll. The pressure roll will be to the left of the left edge of a form if the overlap is to the left, or to the right of the right edge of a form if the overlap is to the right. The required minimum .2" or .8" distance from this next enabled pressure roll is dependent upon the different types of forms in the pressure-free area, and whether or not the area is used for overlapping forms which are to be independently advanced by separate sections of the uncoupled split platen.

Rule 1. For an independent advance of two forms which overlap in the pressure-free area, the edge of the Pin Feed form or Journal must be a minimum of .8" from the next enabled pressure roll which controls the Front Feed form. The Front Feed form would overlap in front of either the Pin Feed form or Journal. See Rule 3 for the .2" minimum for the front feed form.

Rule 2. Without an overlap of two forms for an independent advance, the edge of the form or forms in the pressure-free area must be a minimum of .2" from the next enabled Front Pressure Roll.

Rule 3. If the edge of a Front Feed form in the pressure-free area is in front of a Journal or Pin Feed form the edge of the Front Feed form must be a minimum of .2" from the next enabled pressure roll. Rules 1 and 3 generally are applied for the same conditions; otherwise, Rule 2 applies.

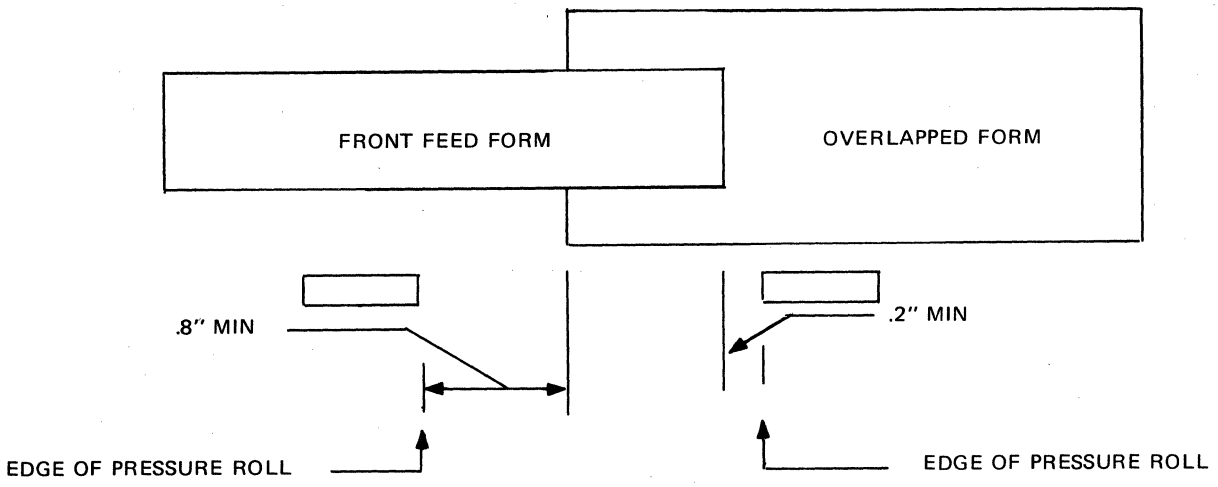


Figure 6.03.02-3 Illustration of Rules 1, 2, and 3 Near Enabled Front Pressure Rolls.

NOTE: For Rules 2 and 3 above, there is a possibility that the next pressure roll, as defined above, may also be disabled. This may occur if Journals or Pin Feed forms are used in the adjacent area instead of a Front Feed form. However, the utilization of the pressure-free area is restricted for Front Feed forms and Journals as specified for Charts 1 and 2 respectively. See Overlap C, Items 22 and 23 of Topic 6.03.03 for Pin Feed forms beyond the three-pressure-roll area.

See Subject 6.06.00 for the simultaneous line advance and enabled front pressure rolls when a Pin Feed form and Front Feed form occupy the same area where the pressure rolls are enabled.

6.03.03 OVERLAP C, FORM OVERLAP, WITH OR WITHOUT OVERLAP OF SPLIT OF A PLATEN, FRONT FEED FORMS HANDLER WITH PIN FEED DEVICE

If either a single or dual Pin Feed Device is used, an advance for a pin feed form may occur independently of an advance for a platen-controlled front feed form even though both forms occupy part of the same area of the platen, or part of the same area in one section of a split platen. This is a partial overlapping condition. This independent advance of either or both types of forms is accomplished by disabling certain front Pressure Rolls and leaving a minimum number of rolls enabled. A roll journal around the platen or another pin feed form in the pressure-free area would advance when the advance for the front feed form occurs.

This independent advance is different than the overlap of the split platen location as described in Item 14 of Overlap B in Topic 6.03.02, because the disabled pressure rolls may be in any area of the platen rather than near the split. However, the rules for the maximum number of disabled Front Pressure Rolls in the pressure-free areas are the same and both areas may be used for any one front feed form if a split platen is used. See following Items 22 and 23. Item 21 is for a solid or nonsplit platen.

The disabling of the rolls creates a "pressure-free area". If a form or forms are in the pressure-free area, the friction created by the pressure rolls between the platen and the form does not exist for that area; therefore, the form or forms for the area are not under control of the platen for the same area. A journal around the platen would be platen-controlled in the area of the disabled Front Pressure Rolls, but the Top Pressure Rolls in this area or to the right or left of the area control the journal. See Subject 6.07.00. In addition, the .6" area to the left and right of the Front Pressure Rolls is a permanent pressure-free area. See Subject 6.06.00. The permanent area and the area created by the disabling of the pressure rolls may be considered as one area with regard to this subject for independent advance. If a Magnetic Unit Record, or nonmagnetic form is under control of the Magnetic Unit Record Modules with a Magnetic Record Computer system, the independent advance may also be used. The advance of the

Module-controlled document does not require the enabled Front Pressure Rolls.

A maximum of three Front Pressure Rolls may be disabled in order to establish the pressure-free area. In addition, a minimum number of pressure rolls must be present and enabled for the platen or the section of the platen which controls the advance of the front feed form. (Pin feed forms, or cut or roll journals may be advanced without the Front Pressure Rolls enabled.) See the following General Considerations of Overlap C for the minimum and maximum rolls for a form. The areas of the forms which may overlap and utilize this pressure-free area are as follows:

1. The left edge of a manually aligned front feed form may overlap the right edge of a pin feed form.
2. The right edge of a manually aligned front feed form may overlap the left edge of a pin feed form.
3. A combination of two separate front feed forms near each edge of the pin feed form may be used depending upon the width of the forms.
4. The entire area for a module-controlled document may utilize the pressure-free area provided that a manually aligned front feed form is not in front of the document. If the manually aligned form is present, then the rules apply for the number of rolls which may be enabled or disabled for front feed forms. The enabled pressure rolls reduce the normal pressure-free area for the document.

With Overlap C, the form specifications for the different types of forms which may be in the pressure-free area at one time are the same as for forms which are in any other area, except that a multiple-part front feed form which overlaps the pin feed form in the pressure-free area must not be more than .016" in thickness for a Basic or Magnetic Unit Record Front Feed Forms Handler. With a Financial Forms Handler the maximum thickness is .014". The combined thickness for a manually aligned front feed form and Module-controlled document must not exceed .016" in thickness. A single-part front feed form which extends in the pressure-free area should not exceed a thickness of .0075" (32 pound ledger is .006"). Consequently, the form specifications for Overlap C conditions are the same as for Item 14 of Overlap B in Topic 6.03.02. The forms specifications for the respective Forms Handlers are also described in Subjects 6.32.00, 6.33.00, and 6.34.00. However, the front feed form may overlap the pin feed form with a greater thickness if both forms are advanced simultaneously. For example; a left-controlled front feed form may overlap a right controlled pin feed form in the left section of the platen. Both forms may be advanced simultaneously with the handler closed, but the pin feed form may advance independently with the handler open or may advance independently with the handler closed after the front feed form in excess of .014" or .016" thickness is removed.

For the purpose of the discussion of Overlap C, a front feed form may include two or more forms which are front fed in the same area or part of the same area. For example:

1. Ledger and statement collated by the operator before being inserted.
2. Ledger and overlapping elongated form, check and payroll ledger.
3. A front feed form in front of the module-controlled document.
4. A passbook, except multiple-page passbooks are usually greater than the allowable maximum .014" thickness for a form overlap in the pressure-free area. In addition, the generally narrow width of the passbook may not provide for the sufficient area for the minimum number of enabled pressure rolls plus a pressure-free area.

Although the margin of a pin feed form is not used for printing, the margin area must be considered as part of the form when locating the form in the permissible areas for adjacent forms, for overlapping forms, and for related forms handling features or functions.

See Topic 4.00.03 for the printing in the area of overlapping forms.

See Subject 6.02.00 if a journal and pin feed form are both advanced by the left line-advance control.

Overlap C, Item 21: Form Overlap Only, Solid or Normalized Split Platen, Front Feed Forms Handler and Independent Pin Feed

With a solid or normalized split platen the left line-advance controls may advance the platen-controlled forms independent of the pin feed form which is right-controlled by the Independent Pin Feed of a single or dual Pin Feed Device. See Subjects 6.22.00 and 6.23.00. The Front Pressure Rolls must be disabled in the area of the Pin Feed form. With this independent advance capability, the forms which may overlap and utilize this pressure-free area are as follows:

1. The left edge of a front feed form may overlap the right edge of a pin feed form.
2. The right edge of a front feed form may overlap the left edge of a pin feed form.
3. A combination of two separate front feed forms near each edge of the pin feed form may be used depending upon the width of the forms.
4. The entire area for a module-controlled document may utilize the pressure-free area provided that a manually aligned front feed form is not in front of the document. If the manually aligned form is present, then the rules apply for the number of rolls which may be enabled or disabled for front feed forms. The enabled pressure rolls reduce the normal pressure-free area for the document.

The advance may occur with the handler opened or closed except front feed forms do not advance with the handler open. The following are explained in General Considerations for Overlap C in subsequent pages:

1. Minimum enabled pressure rolls for front feed forms.
2. Minimum clearance for the edges of the pin feed form in relation to the next enabled pressure rolls or maximum pressure-free area which may be utilized.

If either a roll journal around the platen or a second pin feed form is present in the pressure-free area or in any other area of the handler, an advance for these forms would occur when the front feed form is advanced. A cut journal should not be used in the same area of a pin feed form but if present in some other area, the journal would advance with the front feed forms. A roll journal should not be present in the area where two pin feed forms overlap.

See Advances C-2 and C-3 of Topics 6.01.03 and 6.01.04 respectively for the form arrangements which use this independent advance capability with or without the pressure-free area.

For Illustration 1, the front feed forms and roll journal are advanced by the left control, independently of the right control which is used to advance the pin feed form.

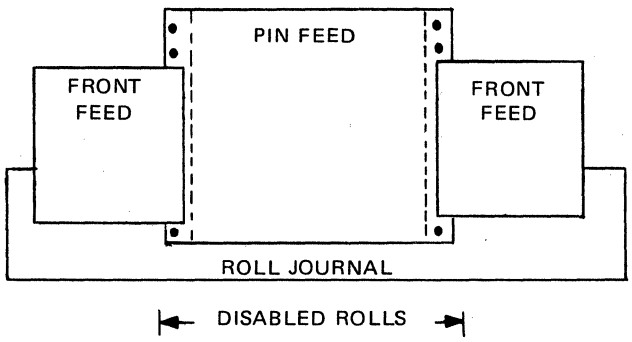


Illustration 1 of Overlap C, Item 21

For Illustration 2, the left control advances the front feed form and roll journal independent of the pin feed form and Magnetic Unit Record which are advanced from the right.

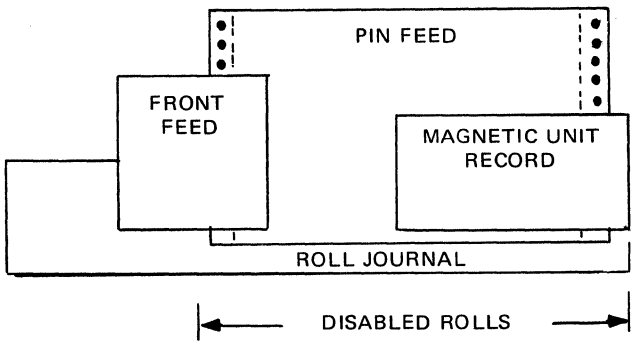


Illustration 2 of Overlap C, Item 21

Overlap C, Item 22: Form Overlap with or without Overlap of Split of a Platen, Front Feed Forms Handler and Synchronous Pin Feed

A left-controlled pin feed form may be in the area or part of the area of the right section of the uncoupled split platen. The synchronously controlled pin feed form may be advanced independently of the forms which are controlled by the right section of the platen provided the Front Pressure Rolls are disabled in front of the pin feed form. The advance may occur with the handler opened or closed except front feed forms do not advance with the handler open. The following are explained in General Considerations for Overlap C in subsequent pages:

1. Minimum enabled pressure rolls for front feed forms.
2. Minimum clearance for the edges of the pin feed form in relation to the rolls or maximum pressure-free area which may be utilized.

With an uncoupled split platen the "left" line-advance control advances the left section of the platen and the Synchronous Pin Feed. The "right" control advances the right section of the platen and the Independent Pin Feed, if provided. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document. See Advance D-1, Topic 6.01.04 for the form arrangements which use this independent advance capability with or without the pressure-free area described for this item.

See Item 14-2 of Topic 6.03.02 if the pin feed form overlaps the split to the right within the pressure-free area created by three disabled pressure rolls. If the right edge of the pin feed form is beyond the area near the split, the independent advance is also possible with or without platen-controlled front feed forms which partially overlap the pin feed form.

1. The Front Pressure Rolls may be disabled in the area of the pin feed form if other front feed forms are either absent from the right section, or are located entirely to the right of the Pin Feed form.
2. The left edge of the front feed form may overlap the right edge of the pin feed form in the pressure-free area. See General Considerations for Overlap C on subsequent pages.

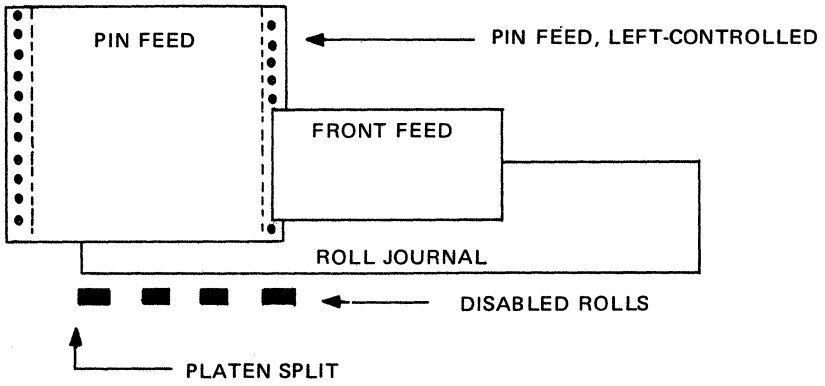


Illustration 1 of Overlap C, Item 22

If the pin feed form is entirely to the right of the split, either or both edges of the form may be overlapped by a platen-controlled front feed form.

1. The left edge of a front feed form may overlap the right edge of a pin feed form in the pressure-free area.
2. The right edge of a front feed form may overlap the left edge of a pin feed form in the pressure-free area. A minimum area would be required between the left edge of the pin feed form and the split of the platen. The left edge of the front feed form may overlap the split to the left in addition to overlapping the pin feed form. The left edge of a roll journal in the right section of the platen may overlap the split also.
3. Depending upon the width of the pin feed form, the form may be overlapped at each edge by a separate front feed form in the respective pressure-free area. The front feed form on the left and the left edge of a roll journal may overlap the split platen to the left as explained above.

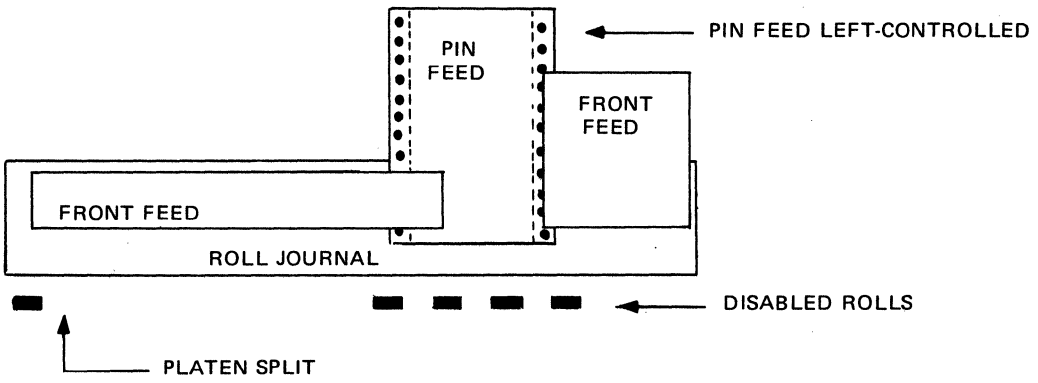


Illustration 2 of Overlap C, Item 22

A module-controlled document may overlap the pin feed form in any area except if a front feed form is used in front of the document. For this form arrangement the overlap of the pin feed form is possible, except the rules with regard to the number of enabled and disabled pressure rolls for the front feed form are the same as for any other front feed form.

An advance for the front feed forms in the right section of the platen will also advance a journal in the same section. In addition, the advance for a second pin feed form, if present in any area of the platen, would also occur with the front feed form advance, provided the enabled Front Pressure Rolls in the left section of the platen do not prevent the advance of the second pin feed form which is advanced from the right controls. A cut journal should not be used in any area of a pin feed form, nor should a roll journal be used in the area where two pin feed forms overlap.

Overlap C, Item 23: Form Overlap with or without Overlap of Split of a Platen, Front Feed Forms Handler and Independent Pin Feed

A right-controlled pin feed form may be in the area or part of the area of the left section of the uncoupled split platen. The independently-controlled pin feed form may be advanced independently of the forms which are controlled by the left section of the platen provided the Front Pressure Rolls are disabled in front of the pin feed form. The advance may occur with the handler opened or closed except front feed forms do not advance with the handler open. The following are explained in General Considerations for Overlap C in subsequent pages:

1. Minimun enabled pressure rolls for front feed forms.
2. Minimum clearance for the edges of the pin feed form in relation to the rolls or maximum pressure-free area which may be utilized.

With an uncoupled split platen the "right" line-advance control advances the right section of the platen and the Independent Pin Feed. The "left" control advances the left section of the platen and the Synchronous Pin Feed, if provided. If a module-controlled document is included for a Magnetic Record Computer system, the "right" control advances the document. See Advance D-2, Topic 6.01.04 for the form arrangements which use this independent advance capability with or without the pressure-free area described for this item.

See Item 14-2 of Topic 6.03.02 if the pin feed form overlaps the split to the left within the pressure-free area created by three disabled pressure rolls. If the left edge of the pin feed form is beyond the area near the split, the independent advance is also possible with or without platen-controlled front feed forms which partially overlap the pin feed form:

1. The Front Pressure Rolls may be disabled in the area of the pin feed form if other front feed forms are either absent from the left section, or are located entirely to the left of the pin feed form.
2. The right edge of the front feed form may overlap the left edge of the pin feed form in the pressure-free area. See General Considerations for Overlap C on subsequent pages.

If the pin feed form is entirely to the left of the split, either or both edges of the form may be overlapped by a platen-controlled front feed form:

1. The right edge of a front feed form may overlap the left edge of a pin feed form in the pressure-free area.
2. The left edge of a front feed form may overlap the right edge of a pin feed form in the pressure-free area. A minimum area would be required between the right edge of the pin feed form and the split of the platen. The right edge of the front feed form may overlap the split to the right in addition to overlapping the pin feed form. The right edge of a roll journal in the left section may overlap the split also.
3. Depending upon the width of the pin feed form, the form may be overlapped at each edge by a separate front feed form in the respective pressure-free area. The front feed form on the right may overlap the split platen to the left as explained above.

The advance for a module-controlled document, if present, will occur when the right-controlled pin feed form is advanced.

An advance for the front feed forms in the left section of the platen will also advance a journal in the same section. In addition, the advance for a second pin feed form, if present in any area of the platen, would also occur with the front feed form advance, provided the enabled Front Pressure Rolls in the right section of the platen do not prevent the advance of the second pin feed form which is advanced from the left controls. A cut journal should not be used in any area of a pin feed form, nor should a roll journal be used in the area where two pin feed forms overlap.

Overlap C, Form Overlap, General Considerations, Front Feed Forms Handlers

For the partial overlap of a front feed form and an independently advanced pin feed form, the maximum of three disabled Front Pressure Rolls should be at adjacent positions in order to establish the pressure-free area. In addition, a minimum number of pressure rolls must be present and enabled for the section of the platen which controls the advance of the front feed form. (Pin feed forms, or cut or roll Journals may be advanced without the Front Pressure Rolls enabled.) The disabling of one Front Pressure Roll creates a useable pressure-free area of 1.6". The disabling of each additional pressure roll will create an additional 1.2" of pressure-free area. Although the pressure rolls are separated .6" apart, this area may be considered as an enabled area when two adjacent rolls are enabled; therefore, each enabled Front Pressure Roll creates an enabled area of 1.2" except the last roll creates only a .6" area. (Formula: Rolls enabled multiplied by 1.2" less .6" equals enabled area.) This is the same for Item 14 of Overlap B (Topic 6.03.02) which describes the overlap of the split of a platen with or without form overlap near the split. If a form in the enabled area contacts any part of a pressure roll, the roll may be counted as a roll with regard to determining the minimum enabled rolls.

With a Magnetic Record Computer System the Front Pressure Roll at Position 228 is not provided. This must be counted as a disabled roll if the pressure-free area is in this right area. The roll may be counted as an enabled roll for the enabled area provided the form contacts the next enabled roll to the right at Position 240.

For Items 22 and 23 an independently advanced pin feed form may be overlapped by a front feed form provided a minimum number or pressure rolls are enabled for the front feed form. In addition, the opposite edge of an overlapping front feed form may overlap the split platen location. The latter condition would provide both a form overlap (Overlap C) and split overlap (Overlap B). The second overlap by a front feed form requires a greater minimum number of enabled pressures for the front feed form.

The overlapped edge of a pin feed form in the pressure-free area must be a minimum distance of .8" from the next enabled Front Pressure Roll which controls the overlapping front feed form. The pressure roll will be to the left of the left edge of the pin feed form if overlapped at the left, or to the right of the right edge of the pin feed form if overlapped at the right. See Figure 6.03.02-3 for an illustration of the .8" measurement. (The illustration is with Overlap B, Item 14 General Consideration of Topic 6.03.02.)

The following two charts specify the number of Front Pressure Rolls which must be enabled in the area for the Front Feed form for each combination of the disabled pressure rolls. One chart lists the form overlap possibilities and the other chart lists both the form overlap and split overlap capabilities. The charts also include the minimum form width of the front feed forms for the "enabled area", and the maximum width for the pressure-free area which may be used by the front feed forms. The General Considerations of Item 14 of Topic 6.03.02 should be reviewed if a front feed form utilizes a second overlap to overlap the split platen. The review may be necessary if a form is also present in the opposite section of the split platen.

CHART 1 FOR OVERLAP C, FORM OVERLAP ONLY IN PRESSURE-FREE AREA

Column 1 Rolls Disabled for Pressure-Free Area	Column 2 Maximum Area of Front Feed Form in Pressure-Free Area	Column 3 Maximum Width for Overlap of Pin Feed Form	Column 4 Minimum Rolls Enabled for Enabled Area	Column 5 Minimum Width of Front Feed Form in Enabled Area
1	1.6"	.8"	3	3"
2	2.8"	2"	4	4.2"
3	3.4"	2.6"	5	5.4"
3	4"	3.2"	6	6.6"

Note: Column 2 width minus .8" equals Column 3 width.

CHART 2 FOR OVERLAP C, FORM OVERLAP AND SPLIT PLATEN OVERLAP IN PRESSURE-FREE AREA

Column 1 Rolls Disabled for Pressure-Free Area Near Split	Column 2 Maximum Area of Overlap of Split in Pressure-Free Area near Split	Column 3 Maximum Width for Overlap of Forms on Opposite Side of Split	Column 4 Minimum Rolls Enabled for Enabled Area	Column 5 Minimum Width of Front Feed Form in Enabled Area	Column 6 Roll Disabled for Pressure-Free Area for Form Overlap	Column 7 Maximum Width of Front Feed Form in Pressure-Free Area	Column 8 Maximum Width for Overlap of Pin Feed Form
1	1.6"	.8"	4	4.2"	1	1.6"	.8"
1	1.6"	.8"	5	5.4"	1 or 2	2.8"	2"
1 or 2	2.8"	2"	5	5.4"	1	1.6"	.8"
1 or 2	2.8"	2"	6	6.6"	1 or 2	2.8"	2"
1 or 2	2.8"	2"	7	7.8"	1, 2 or 3	4"	3.2"
1, 2 or 3	4"	3.2"	7	7.8"	1 or 2	2.8"	2"

Note: Column 2 width minus .8" equals Column 3 width.
Column 7 width minus .8" equals Column 8 width.

6.04.00 PLATEN NORMALIZING LEVER

The Platen Normalizing lever is located on the right end of the Forms Handler. The operator must hold the lever depressed and simultaneously rotate the right Platen Twirler clockwise 90% (in the direction of paper advance) in order to couple (normalize) the platen, or rotate 90% counterclockwise to uncouple the platen. See Figure 6.02.00-1. The 90% rotation is equal to approximately seven 1/6" increments or line advances.

When the platen is uncoupled (split), both the right and left Platen Twirlers are variable. The Fine Adjustment buttons on the left and right are enabled.

See Subjects 6.01.00 and 6.03.00 for the forms control when the split is normalized or uncoupled.

When the platen is normalized (coupled), the right Fine Adjustment button is disabled. The left Fine Adjustment button is then used for adjusting the entire platen. See Platen Twirlers, Subject 6.02.00 for the movement of pin feed forms and module-controlled documents. When the platen is normalized, the advance of the platen-controlled forms may not occur with the "right" line-advance control but the "Independent" Pin Feed Advance, if provided, may occur. With a Magnetic Record Computer system the advance of the module-controlled document may be advanced by the "right" line-advance control regardless of the split or normalized split platen.

For the Financial Front Feed Forms Handler (TC 700) one lock with key is provided instead of the Platen Twirlers. The key is turned 45° clockwise to couple the platen, or 45° counterclockwise to uncouple the platen.

6.05.00 FORMS HANDLER OPEN AND CLOSE

The Forms Handler, if open, may be closed by the following functions:

1. Open/Close Key, see Topic 3.02.06.
2. Execution of a programed print instruction, see Section 10.
3. Execution of an instruction for a close of the Forms Handler (CC).

The Forms Handler, if closed, may be opened by the following functions:

1. Open/Close Key
2. Execution of an instruction to open the Forms Handler (OC).
3. With a Ready Mode condition, see Subjects 5.01.00 and 5.02.00.
4. Certain other instructions for a Magnetic Record Computer system, see Subject 6.14.00.

6.05.01 OPEN AND CLOSE WITH REAR FEED FORMS HANDLER

A Rear Feed Forms Handler is open when the Front Pressure Rolls are forward (not in contact with the platen) and the Form Heading Holder Bail is in the forward position. The manual or automatic opening of the Forms Handler may disturb the alignment of a Rear Feed form if present; a pin feed form or form around the platen is not disturbed. The rear feed form may be removed by the operator; but it may not be advanced under the control of the platen if the pressure rolls are in the open position. Pin feed forms or forms around the platen may be advanced with the Forms Handler opened or closed.

With the closed position the Front Pressure Rolls are rearward (in contact with the platen if not disabled), and the Form Heading Holder Bail is rearward. The pressure rolls, if not disabled by the Pressure Roll Control lever (Subject 6.08.00), will immediately close with a closing function, but the bail will not immediately close. The bail: 1) will automatically close after the next 10 line advances have occurred or 2) will close if the Form Heading Holder Bail lever (Topic 6.11.05) is manually pushed rearward after the Front Pressure Rolls have closed. If, after the Front Pressure Rolls have closed and before 10 lines have advanced, the front rolls are re-opened and closed, the line on which the bail closes will still be the 10th line. The Front Pressure Rolls, if disabled by the Pressure Roll Control lever, do not become enabled with the open and close of the Forms Handler. See Topic 6.02.00 for backspacing of the platen prior to three Line Advance functions after closing.

6.05.02 OPEN AND CLOSE WITH BASIC FRONT FEED FORMS HANDLER

A Front Feed Forms Handler is open when the Front Pressure Rolls are forward (not in contact with the platen), and the Form Aligning Table and Form Guide Bridge are tilted forward. Manual or automatic opening of the Forms Handler may disturb the alignment of the manually aligned front feed form if present; a pin feed form or form around the platen is not disturbed. With the open position, front feed forms may be inserted or removed, but they may not be advanced under the control of the platen. Pin feed forms or forms around the platen may be advanced with the Forms Handler opened or closed.

With the closed position the Front Pressure Rolls are rearward (in contact with the platen if not disabled), and the Form Aligning Table and Form Guide Bridge are rearward. Unlike the Rear Feed device, the closing positions for the features are accomplished simultaneously. A Front Pressure Roll or Rolls if disabled do not become enabled with the open and close of the Forms Handler. The Front Pressure Rolls must be enabled in the area where front feed forms are used. See Subject 6.06.00. An exception to this rule is possible when the manually aligned front feed form overlaps a split of the platen, or if the front feed form is controlled by a minimum number of pressure rolls, see Subject 6.03.00.

The open and close of the Financial Front Feed Forms Handler is the same as for a Basic Front Feed Forms Handler.

6.05.03 OPEN AND CLOSE WITH MAGNETIC RECORD COMPUTER FRONT FEED FORMS HANDLER

The open and close conditions for this type of Forms Handler are the same as for a Basic Front Feed Forms Handler, except for the following:

1. The alignment of the "record" or "form" controlled by the Magnetic Unit Record Modules is not disturbed (it remains aligned) by the opening of the Forms Handler with the Open/Close key, or the opening with a programed open instruction (OC) for the handler.
2. Module-controlled document may not be removed by the operator until the document is moved to the ejected position by the modules. See Subject 6.14.00 for a summary of the module movements.
3. The Module-controlled document as well as pin feed forms and forms around the platen may be advanced with the Forms Handler opened or closed. Manually aligned front feed forms do not advance with the handler open.

6.06.00 FRONT PRESSURE ROLLS

Front Pressure Rolls are visible in front of the platen and near the bottom of the platen. The pressure rolls are made of rubber and when closed the rolls create sufficient friction between the form and the platen to permit a form to be advanced with the rotation (advance) of the platen. The rolls open and close, if not disabled, with the respective open and close of the Forms Handler, see Subject 6.05.00.

The following steps may be used to disable or enable the individual pressure rolls for a Front Feed Forms Handler, see Figure 6.06.00-1:

1. Open the Forms Handler, if closed. The system must be ON to open the Forms Handler.
2. Raise hinged cover which is above and slightly forward of the printer carrier.
3. Disable: Push down on forward end of white plastic lever to the right of the selected pressure roll.

   Enable: Push forward on upper end of white plastic lever.

   A pencil type object may be used for either of the above procedures.
4. Lower the hinged cover.

See Subject 6.08.00 for disabling of Front Pressure Rolls for a Rear Feed Forms Handler and Lower Pressure Rolls for a Front Feed Forms Handler.

See Subject 6.07.00 for positioning Top Pressure Rolls for either type of Forms Handler.

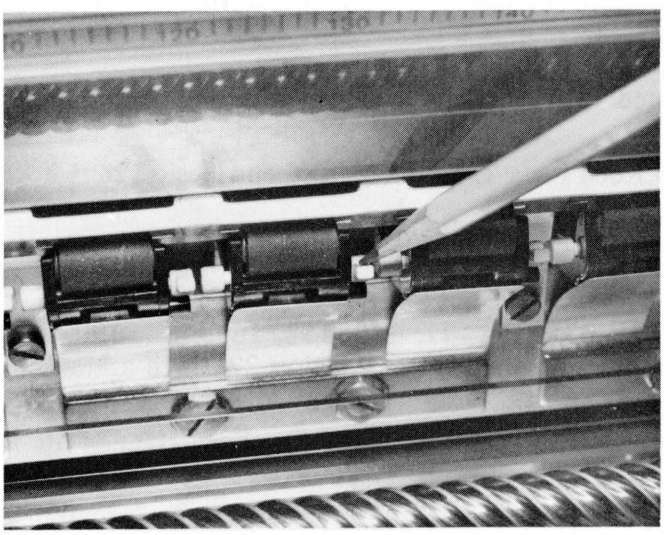


Figure 6.06.00-1 Front Pressure Roll Disabling

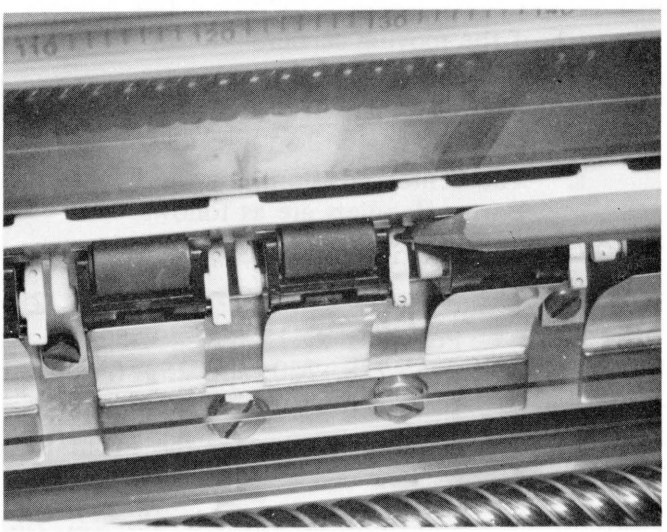


Figure 6.06.00-2 Front Pressure Roll Enabling

For rear feed forms or manually aligned front feed forms, the Front Pressure Rolls permit a last print line which is a minimum of 5/6" from the bottom edge of the form to the bottom edge of the printed characters. The pressure rolls lose control of the form if the form is advanced to a line which is less than 5/6" from the bottom edge of the form.

The Front Pressure Rolls, if enabled, do not completely control the bottom edge of a Pin Feed form, or cut or roll journal. See the following paragraphs for the last permissible print lines with these types of forms.

The Lower Pressure Rolls (Subject 6.08.00) for a cut journal permit a last print line which is a minimum of 1 5/6" from the bottom edge of the cut journal to the bottom edge of the printed characters. However, the continued use of the form may be possible with the following conditions. After a cut journal is advanced to a line which is less than 1 5/6" from the bottom of the form, the Lower Pressure Rolls lose control of the trailing edge. The trailing edge of the form rests on a slide but the cut journal may not be "back-spaced". Also the form may slightly bulge away from the platen. If these conditions are acceptable, the last print line may be a minimum of 1" from the bottom of the form instead of 1 5/6".

The trailing edge of a pin feed form or roll journal usually does not have to be considered for the last permissible print line. If a minimum for a last print line must be considered, this last line should be a minimum of 1" from the trailing edge of the form to the bottom edge of the printed characters.

The following topics and subjects should be reviewed for the specifications for other last print lines:

Magnetic Unit Records, Subject 6.14.00

Form Limits, Subject 6.40.00

Passbooks, Topic 6.13.06

Front feed forms should not be advanced completely out of the Front Pressure Rolls if movement of the Printer Carrier occurs following this advance. The bottom edge of a front feed form may drop into the path of the moving carrier.

The center of the pressure roll positions are designated in relation to the print positions and numeric scales, as follows:

1. The center positions for the Front Pressure Rolls for a 15½" Rear Feed and Basic Front Feed Forms Handlers are as follows:

   Positions 6, 19, 31, 44, 56, 69, 81, 94, 106, 119, 131, and 144.

2. The center positions for the Front Pressure Rolls for a 26" Forms Handler are as follows:

   Positions 2, 15, 28, 40, 52, 65, 78, 90, 103, 115, 127, 140, 152, 165, 178, 190, 202, 215, 228, 240, and 253. (A pressure roll is not provided at Position 228 with a Magnetic Record Computer System.)

3. The center positions for the Front Pressure Rolls for the Financial Front Feed Handler are as follows:

   Positions 6, 20, 34, 48, 62, 76, 92, 109, 127, and 145. Pressure Rolls centered at Positions 92, 109, 127, and 145 are gear-driven from the right.

The Front Pressure Roll positions in Figure 6.06.00-3 are centered to the nearest program position number. The figure may be used for determining the permissible locations for forms which overlap the split or for forms which use a pressure-free area, see Overlaps A, B, and C of Subject 6.03.00. However, when compared to an actual measurement, the center position as designated in Figure 6.06.00-3 may be ½ of one tenth inch different. This difference will not affect the placement of the forms which require either a .2" or .8" clearance in a pressure-free area. The figure may be used only as a guide for selecting positions in between pressure rolls which are used with certain optional rear form limits or guides for a Front Feed Forms Handler. The actual positions where the limits or rear guides may be placed are described in Subject 6.40.00 because certain arrangements require that the form edge be programed at a ½ tenth increment and an adjustment is not possible. The ½ tenth placement usually is required if the form uses a preset printing line which is between or at 1 2/6" and 5/6" from the bottom of the form.

Forms Area: 15½" Forms Handler, Scale Positions -2.5 to 152.5, except see Subject 6.13.00 for Forms Area of Financial Front Feed Forms Handler.
Forms Area: 26" Forms Handler, Scale Positions -2.5 to 257.5, except right edge of Magnetic Unit Record is fixed at Position 258.

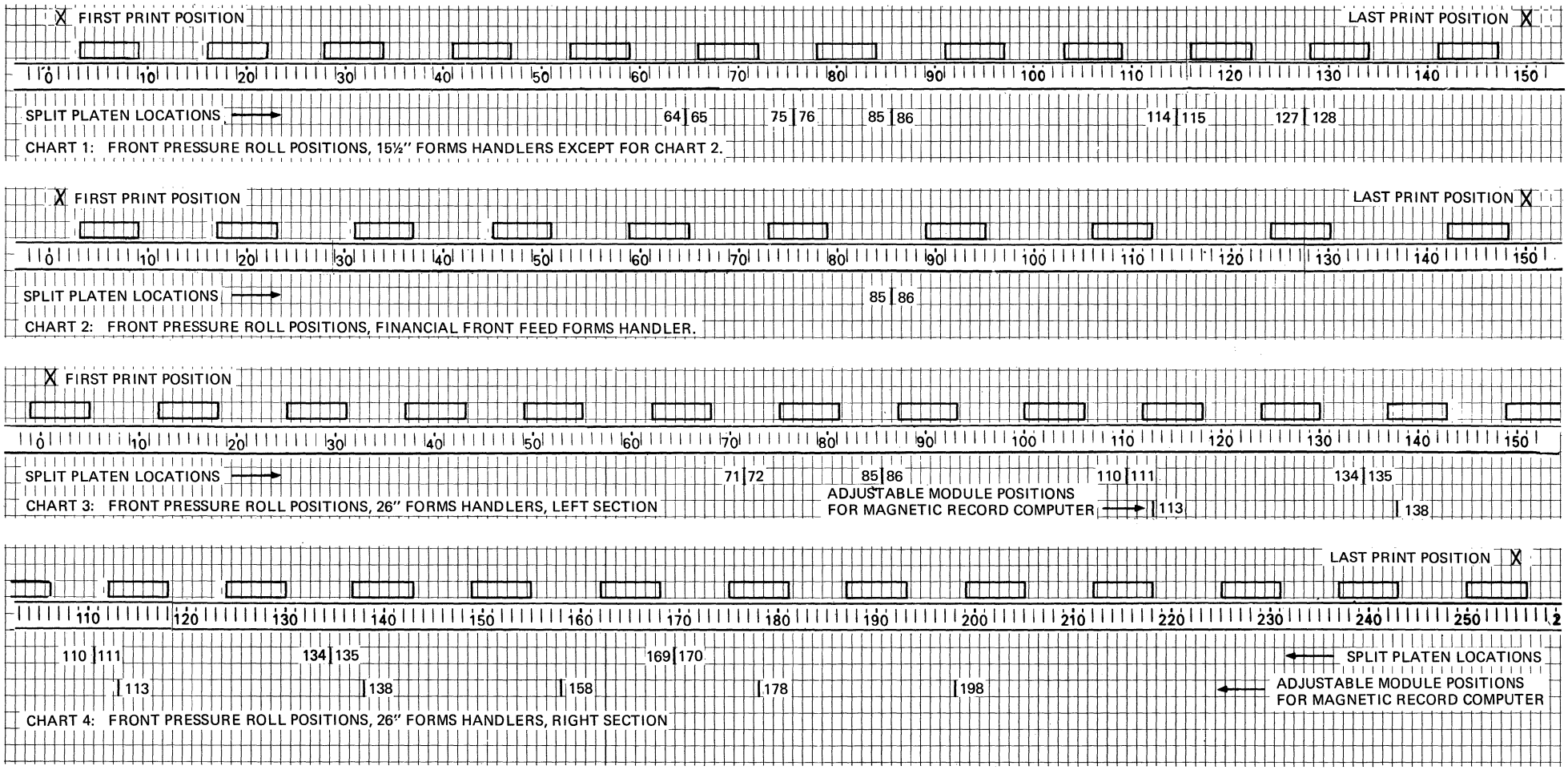


Figure 6.06.00-3 Front Pressure Roll Positions

6.06.01 SUMMARY OF GENERAL OPERATING CONDITIONS FOR PRESSURE ROLLS, REAR FEED FORMS HANDLER

The following is a summary specifying the enabled or disabled positions of the two types of pressure rolls. The specified condition must be selected by the operator in order to provide the most advantageous form handling results.

Item Col. 1	Type of Form Col. 2	Pressure Rolls Front Rolls Col. 4	Pressure Rolls Top Rolls Col. 5
1	Rear Feed	Enabled	N/A
2	Pin Feed	Disabled	N/A
3	Cut Journal	Enabled or Disabled	Enabled
4	Roll Journal	Enabled or Disabled	Enabled

See Overlap B of Subject 6.03.00 for disabling of Pressure Rolls for overlapping the split of a platen.

6.06.02 SUMMARY OF GENERAL OPERATING CONDITIONS FOR PRESSURE ROLLS, FRONT FEED FORMS HANDLER

The following is a summary specifying the enabled or disabled positions of the three types of pressure rolls. The specified condition must be selected by the operator in order to provide the most advantageous form handling results. With the Front Feed Forms Handler, forms of two or more different types may be in the same area at one time. The chart below assumes that if two or more types of forms are used that they are in the same area or part of the same area.

See Overlaps B and C of Subject 6.03.00 for disabling of pressure rolls for overlapping the split of a platen, and the overlapping of independently advanced forms.

Item Col. 1	Type of Form Col. 2	Pressure Rolls Front Rolls Col. 4	Pressure Rolls Top Rolls Col. 5	Pressure Rolls Lower Rolls Col. 6
1	Front Feed	Enabled	N/A	N/A
2	Roll Journal	Enabled or Disabled	Enabled	Enabled or Disabled
3	Cut Journal	Enabled or Disabled	Enabled	Enabled
4	Pin Feed in Pin Feed Path	Disabled	N/A	N/A
5	Pin Feed in Journal/Pin Feed Path	Disabled	N/A	N/A
6	Front Feed and Roll Journal	Enabled	Enabled	Enabled or Disabled
7	Front Feed and Cut Journal	Enabled	Enabled	Enabled
8	Front Feed and Pin Feed in Pin Feed Path	Enabled	N/A	N/A
9	Front Feed and Pin Feed in Journal/Pin Feed Path	Enabled	N/A	Disabled
10	Module Document (See Items 21 & 22)	Disabled	N/A	N/A
11	Module Document and Front Feed	Enabled	N/A	N/A
12	Module Document and Roll Journal	Disabled	Enabled	Enabled or Disabled
13	Module Document and Cut Journal	Disabled	Enabled	Enabled
14	Module Document and Pin Feed in Pin Feed Path	Disabled	N/A	N/A

15	Module Document and Pin Feed in Journal/Pin Feed Path	Disabled	N/A	Disabled
16	Module Document, Front Feed and Roll Journal	Enabled	Enabled	Enabled or Disabled
17	Module Document, Front Feed, and Cut Journal	Enabled	Enabled	Enabled
18	Module Document, Front Feed, and Pin Feed in Pin Feed Path	Enabled	N/A	N/A
19	Module Document, Front Feed, and Pin Feed in Journal/Pin Feed Path	Enabled	N/A	Disabled

20 See Subjects 6.12.00, 6.13.00, and 6.14.00 for an explanation of the Pin Feed Path and Journal/Pin Feed Path

21 For Items 10 through 19, the Module document is for a Magnetic Unit Record or nonmagnetic form which is controlled by the Magnetic Unit Record Modules, see Subject 6.14.00.

22 For Items 11, 16, 17, 18, and 19, the Front Feed form is the form which is manually inserted and aligned in front of a module-controlled document.

23 For Items 8, 9, 11, 16, 17, 18, and 19 the Forms Handler must be opened after 3 or 10 line advances when the Front Pressure Rolls are enabled, see Topic 6.06.03 "Front Pressure Rolls with Pin Feed Forms and Front-Inserted Documents or Forms".

24. If the application requires the disabling of the first Front Pressure Roll at the left, the pressure roll should be disabled and left disabled for all applications because the Printer Carrier, when at the left, prevents the easy disabling of the first pressure roll.

25 See Subject 6.08.00 for the enabled lower rolls if a pin feed form and a cut journal are side-by-side in the journal pin feed path.

6.06.03 FRONT PRESSURE ROLLS WITH PIN FEED FORMS AND FRONT-INSERTED DOCUMENTS OR FORMS, FRONT FEED FORMS HANDLER

A pin feed form may occupy the same area or part of the same area behind a manually aligned front feed form. A pin feed form may be behind a module-controlled Magnetic Unit Record or nonmagnetic form either of which is behind a manually aligned front feed form. For either of these forms control arrangements, certain Front Pressure Rolls must be enabled and the line advance functions in excess of 3 or 10 advances requires the opening of the Forms Handler.

Ten-Line Rule: Each Front Pressure Roll of the Forms Handler may be individually disabled and re-enabled by the operator. The rolls must remain enabled for areas where manually aligned front feed forms are used. The pressure rolls should be disabled in the area of a pin feed form if a manually aligned front feed form is not used in the same area. If a front feed manually aligned form is used in front of a pin feed form, the advance of the forms with the Forms Handler closed should not exceed 10 lines before the Forms Handler is opened either manually or automatically. It may be closed again to continue the operation, but the manually aligned front feed forms must be re-aligned if required for the continued operation.

Three-Line Rule: The Front Pressure Rolls should be disabled in the area occupied by a "record" or "form" which is under control of the Magnetic Unit Record Modules. However, if a form is manually inserted in front of the Module-controlled document, the pressure rolls must be enabled for the area occupied by the manually aligned front feed form. For this condition the advance (form space) of the forms with the Forms Handler closed should not exceed 3 lines before the handler is opened either manually or automatically. It may be closed again to continue the operation, but the manually aligned front feed form must be re-aligned if required for the continued operation.

For either the Ten- or Three-Line Rule, if the manually aligned front-inserted form occupies only part of the same area as a pin feed form, the utilization of the pressure-free area created by disabling the Front Pressure Rolls may be used. See Items 14, 21, 22, and 23 of Subject 6.03.00. If the line advance exceeds 10 lines without the manually aligned front feed form present the Front Pressure Rolls should be disabled when the programing does not provide for the opening of the handler after 10 line advances. This condition may occur when the posting for the application is completed, but the pin feed form in the area of the enabled pressure rolls is advanced to print a report, or print the "posting totals" on more than 10 lines.

See Topic 6.20.01 for the permissible locations for the edge of a front feed form when the edge is near the ½" pin feed margin of a pin feed form. The rule applies to a Magnetic Unit Record or nonmagnetic form which is under control of Magnetic Unit Record Modules also.

6.07.00 TOP PRESSURE ROLL HOUSING ASSEMBLY AND TEAR-OFF FOR JOURNAL

The Top Pressure Rolls are housed in an assembly which is above the platen. The rolls are used to hold the leading end of a form which feeds from the rear and automatically returns to the rear after advancing past the print area. This type of form is designated as a form around the platen, roll journal, or cut journal. The Top Pressure Rolls create sufficient friction to control the form movement when an advance occurs. The housing assembly may be raised or tilted rearward by an operator in order to permit the threading or placement of a form around the platen. After the form is placed, the housing must be lowered by the operator. The operator may move the individual Top Pressure Rolls left or right if a change is required for the roll position when changing from one type of form to another. Usually a change is not required. The rolls should be approximately equally spaced for the widths of the form or forms which are around the platen. If the platen is split to permit an independent advance function for two forms the rolls are usually positioned on both sides of the uncoupled split. The Top Pressure Rolls must not overlap a split location.

Four and six Top Pressure Rolls are provided with the 15½" and 26" Forms Handlers respectively.

6.07.01 OVERLAP OF THE SPLIT PLATEN

A form around the platen may overlap the uncoupled split for independent line advance functions as described in Subject 6.03.00. If this overlap occurs the required roll or rolls must be positioned to contact the form only in the area for the section of the platen that controls the advance of the form. The rolls must not contact the subject overlapping form on both sides of the split. Normally the Top Pressure Rolls are absent in the platen area for the corresponding pressure-free area which is created by the disabling of the Front Pressure Rolls.

6.07.02 REAR FEED FORMS HANDLERS, TOP PRESSURE ROLLS

The Pressure Roll Housing may be raised by tilting the housing up and rearward.

A Tear-Off Blade or edge for forms around the platen is provided to the rear of the Top Pressure Roll Housing assembly. The tear-off position is 2 2/6" from the bottom edge of the printed characters.

For a cut or roll journal the first print line may be a minimum of 2" from the top or leading edge of the form which is placed around the platen and under the Top Pressure Rolls. See Front Pressure Rolls for the last print line, Subject 6.06.00.

6.07.03 FRONT FEED FORMS HANDLERS, TOP PRESSURE ROLLS

The housing for the Top Pressure Rolls is raised and lowered with the Form Aligning Table and Form Guide bridge. The table and bridge have an open and closed position for the open and close of the Forms Handlers, but also have a raised position. (The movement of the table and bridge is inter-related; therefore, the positions are assumed approximately simultaneously.) The operator may position the table and bridge to the raised position. When the table and bridge are in the raised position the pressure between the Top Pressure Rolls and the platen is released. The rolls may be repositioned, or the leading edge of form around the platen may be inserted under the rolls. The lowering of the table and bridge by the operator restores the pressure for the Top Pressure Rolls. For a Financial Front Feed Forms Handler the Form Aligning Table may be transparent or nontransparent but the function and positions are the same.

The Tear-Off blade or edge for forms around the platen is behind the Form Guide Bridge. The position for the tear-off is measured from the bottom edge of the printed characters to the tear of the form, as follows:

1. The tear-off position for the Financial Front Feed Forms Handler is 4.6" from the line of Print.
2. The tear-off position for all other Front Feed Forms Handlers is 4.5" from the line of print.

For a cut or roll journal the first print line may be a minimum of 2" from the top or leading edge of the form which is placed around the platen and under the Top Pressure Rolls. See Front Pressure Rolls for the last print line, Subject 6.06.00.

6.08.00 PRESSURE ROLL CONTROL LEVER

The two-position Pressure Roll Control lever is near the right end of the platen and the lever may be latched in each position. See Figure 6.02.00-1. The plastic "pointed" top of the lever is near the Platen Normalizing lever which has a plastic "flat" top.

6.08.01 REAR FEED FORMS HANDLER

Forward Position, Disabled:

The lever, in the forward position, opens all the Front Pressure Rolls and holds them open during all operations. This position must be selected when Pin Feed forms are used.

Rearward Position, Enabled:

The lever, in the rearward position, permits all the Front Pressure Rolls to close during operations that close the handler and permits the pressure rolls to open during operations that open the handler. This position must be selected when noncontinuous forms are fed from the rear of the platen without being placed under the Top Pressure Rolls – a rear-feed form.

Either position may be used when either a roll journal or a cut journal is present. (Lower pressure rolls are not provided with a Rear Feed Forms Handler, but Top Pressure Rolls are included, see Subject 6.07.00.) See Front Pressure Rolls, Subject 6.06.00 for last print line.

6.08.02 FRONT FEED FORMS HANDLERS

Front Feed Forms Handlers include several Lower Pressure Rolls which are metal and are spaced for the entire platen area. The rolls are near the bottom of the platen and slightly to the rear (nonvisible). The rolls are required for cut journals around the platen.

Forward Position, Disabled:

The forward position of the lever disables the Lower Pressure Rolls and the rolls remain inactive during all closing and opening operations of the handler. The disabled position may be selected for a roll journal, and should be selected when a Pin Feed Form is fed through the Journal/Pin Feed Path without a cut journal present. See Subject 6.12.00, or Rearward Position. Usually this path is used when a second pin feed form is present and two pin feed forms overlap.

Rearward Position, Enabled:

With the lever in the rearward position, the Lower Pressure Rolls are active regardless of whether the handler is opened or closed. This position should be selected when a cut journal is used around the platen in conjunction with the Top Pressure Rolls, see Subject 6.07.00. A single or multiple part cut journal and a single-part pin feed form may be placed side-by-side (nonoverlapping) in the path and the rolls must be enabled. Without a pin feed form, a cut and roll journal either of which is any number of parts may be placed side-by-side and the rolls must be enabled.

See Subject 6.06.00 for the last print line for a journal and a summary of pressure roll capabilities for all forms.

6.09.00 MISCELLANEOUS FEATURES FOR FORMS HANDLERS

The following features are included with the Forms Handlers.

6.09.01 NUMERIC SCALES

Numeric Scales are provided in various areas of the Forms Handlers. These scales are used to register the placement of forms and form guides. Certain scales are painted on parts of the handlers and are not adjustable. Other scales are on strips or slides which are adjustable. The adjustable scales may be repositioned if they are accidentally moved.

1. If the handler has a split platen the edge of a form may be placed at the split then the scale may be adjusted to the edge of the form for the corresponding split platen location. Split locations are midway between the 1/10" increments of the numeric scales. See Subjects 6.03.00 and 6.06.00.
2. If the Forms Handler is provided without a split, a form may be inserted and a known print position may be used to print on the form. The scales may then be adjusted to the edge of the form in relation to the known print position and the distance to the edge of the form from that print position. The characters print centered in relation to the 1/10" numeric scale positions. See Section 4.

The markings for the increments on the numeric scales at both the left and right are greater in number than the Forms Area for a Forms Handler, and both the markings and forms area are also greater than the number of print positions. The numeric scales should not be used to determine the Forms Area, nor the available print positions. See the Forms Area for the respective Forms Handlers: Rear Feed (6.11.02), Basic Front Feed (6.12.02), Financial (6.13.02), and Magnetic Unit Record (6.14.02).

6.09.02 MOUNTING BRACKETS FOR CONTINUOUS FORM INTAKE RACKS

Brackets are included at the rear of the console to permit the attachment of one or two Intake Racks when a pin feed device is provided. See Subject 6.50.00.

6.10.00 FORMS HANDLER TYPES

The following types and widths of Forms Handlers are used on the various Series L/TC systems.

1. Rear Feed Forms Handler, 15½", Subject 6.11.00.
2. Basic Front Feed Forms Handler, 15½" and 26", Subject 6.12.00.
3. Financial Front Feed Forms Handler, 15½", Subject 6.13.00.
4. Magnetic Unit Record Front Feed Forms Handler, 26", Subject 6.14.00.

A removable Pin Feed Device may be used on the Forms Handler for the program control of one or two pin feed forms. Three variations of the Pin Feed Device are explained in Subjects 6.21.00, 6.22.00 and 6.23.00.

The following abbreviations may be and are used to designate the different types of Forms Handlers for various subjects and topics in this manual.

RF Rear Feed Forms Handler

BFF Basic Front Feed Forms Handler

FFF Financial Front Feed Forms Handler

MUR Magnetic Unit Record Front Feed Forms Handler

6.11.00 REAR FEED FORMS HANDLER, 15½ INCHES

The Rear Feed Forms Handler for the Series L/TC systems is used to control forms which are fed into the handler through the appropriate intake path which is behind the platen. When the forms are manually inserted or placed in the handler, the leading edge will always be the top edge of noncontinuous forms, or the beginning edge of continuous forms. The intake paths are described in Topic 6.11.11.

Continuous forms may be either roll journals or paper around the platen, or pin feed forms if a Pin Feed Device is provided. Noncontinuous cut journals may be used around the platen. Noncontinuous, rear-feed cut forms may be inserted in the rear-insertion path to a fixed limit and aligned to the print line under the control of the program and the platen. The different types of forms may be either single or multiple-part. Except for pin feed forms, two forms may not simultaneously occupy the same forms area. See Subject 6.23.00 for overlapping pin feed forms.

The print line is visible to the operator when the forms are in the handler. In addition, part of the area above and below the print line is visible. For the area above the print line the number of visible lines is dependent upon the type of forms used, see Topic 6.11.04.

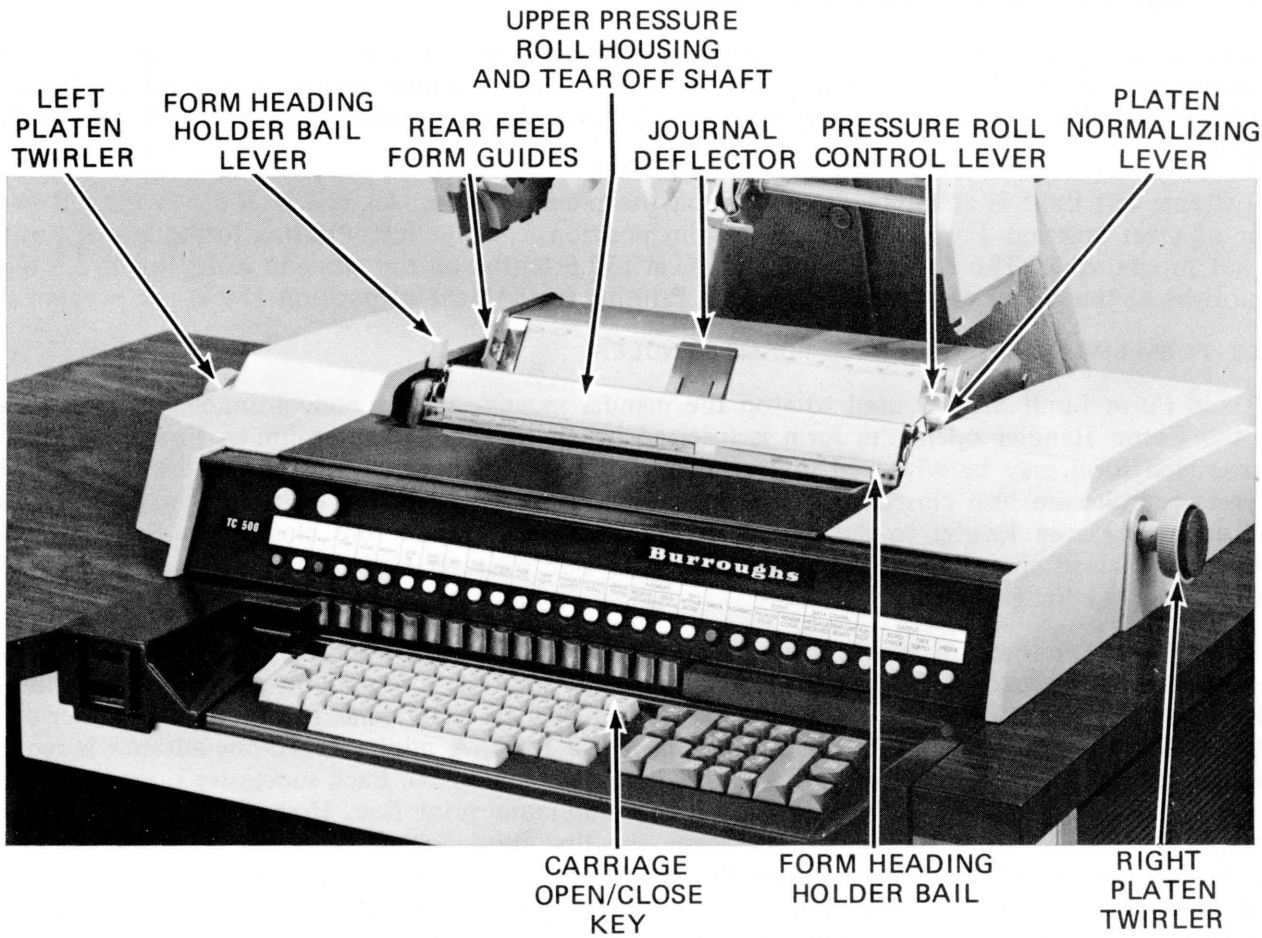


Figure 6.11.00-1 15½" Rear Feed Forms Handler

6.11.01 REAR FEED FORMS HANDLER FEATURES AND FUNCTIONS DESCRIBED IN OTHER TOPICS

The following features and functions are explained in the designated topics or subjects:

Line Advance (Vertical Spacing) and Platen, 6.01.00

Platen Twirlers, 6.02.00

Split and Normal Platen, Overlap A, Overlap of Split of a Platen. 6.03.00

Platen Normalizing Lever, 6.04.00

Forms Handler Open and Close, 6.05.00

Front Pressure Rolls, 6.06.00

Top Pressure Roll Housing and Tear-Off for Journal, 6.07.00

Pressure Roll Control Lever, 6.08.00

Numeric Scales, 6.09.00

Pin Feed Devices, 6.21.00, 6.22.00, and 6.23.00

Optional Form Handling Features, 6.41.00

Form Specifications, 6.31.00

6.11.02 FORMS AREA, REAR FEED FORMS HANDLER

The area of the platen which may be occupied by forms is specified in relation to the numeric scales of the forms handler and the programable print positions. The maximum width for a form is 15½", and the minimum width is dependent upon the type of form which is used. See Subject 6.31.00 for these minimums.

The extreme left limit is at minus 2.5 tenths on the numeric scale; this is 3.5 tenths to the left of the center of print position 1 which is the first print position from the left. Printing to the left of position 1 is not programable. The extreme right limit is at 152.5 tenths on the numeric scale; this is 2.5 tenths to the right of the center of print position 150. Printing to the right of position 150 is not programable.

6.11.03 FORM LIMIT STOP, REAR FEED FORMS HANDLER

The fixed Form Limit Stop is used to stop the manual movement of a noncontinuous, rear feed form. With the Forms Handler open, the form is inserted by an operator to these limits. From this position the rear feed form may be advanced under program control to the first print line of the form provided the pressure rolls are also closed. In the absence of a programed advance, the form may be manually advanced by a Platen Twirler to the first print line with the pressure rolls closed. See Subject 6.05.00 for open and close characteristics. The Pressure Roll Control lever must be in the rearward (enabled) position when the limit is used.

The fixed Form Limit is not visible to the operator but the limit is at each edge of each Front Pressure Roll and slightly forward of the roll. The first print line must be a minimum of 1 3/12" from the top of the form to the bottom edge of the desired line of printed characters. The horizontal center of the printed characters would be 1 1/6" from the top of the form. A minimum 10-line advance is required for initial feeding of the form to this first print line. See Section 10. Each successive print line may be 1/6" from this bottom edge of characters for this minimum print line. However, if the print line is greater than 1 3/12" from the top of the form, the first print line as measured from the top of the form to the bottom of the printed characters must still be measured to the nearest 1/12" increment unless a measurement in 1/6" increments is used to the horizontal center of the printed characters. The initial line advance from the fixed Form Limit must always be 3 increments more than the number of 1/6" increments to the horizontal center of the desired first line of print. For example, if the bottom edge of the printed characters for the first print line is to be 2 7/12" from the top of the form, the initial line advance must be for 18 increments.

1.	2"	=	12 increments
2.	6/12" (7/12 minus 1/12")	=	3 increments
3.	Plus 3	=	3 increments
			18 increments

See Subject 6.06.00, Front Pressure Rolls, for the minimum print line from the bottom edge of a form.

Rear Feed forms may not be used in the area of the permanently disabled Front Pressure Rolls, see General Considerations for Overlap A, Item 4 of Topic 6.03.01.

6.11.04 FORM HEADING HOLDER BAIL, STYLE 1, REAR FEED FORMS HANDLER

The removable bail includes a transparent insert to cover the column designations for a form which is used with an application. The paper insert for the column headings may be a maximum of 15/32" high and the width of the form; the visible area of the insert is 3/8" high. The column headings are a visual aid for the operator.

As an optional feature, see Appendix F, extra Form Heading Holder Bails may be provided for each application for any one Style L/TC. The bail is removed or replaced with the following steps:

Removal

1. Open the Forms Handler, if closed, with the Open/Close key.
2. Pull up on the bail until the lower studs disengage from the wire fasteners at each end.

Installation

1. Open the Forms Handler, if closed, with the Open/Close key.
2. Place the left and right upper studs on the bail in the retaining slots of the brackets at each end of the platen.
3. Push down on bail until lower studs are engaged in curved retaining area of the wire fasteners.

In addition to retaining the form headings, the bail tilts the used area of the rear feed form rearward. The bail automatically opens and closes with the open and close operation of the Forms Handler as explained in Subject 6.05.00. The bail may be manually closed with the Form Heading Holder Bail Lever, see Topic 6.11.05. If the handler and the bail are closed, the bail can be manually pulled to the open position. The subsequent depression of the Form Heading Holder Bail lever will close the bail if the handler is still closed.

See Subject 6.41.00 for the form guide which may be used on the Style 1 Form Heading Holder Bail.

The shaded area of Figure 6.11.04-1 displays the nonvisible area of the form in relation to the print line.

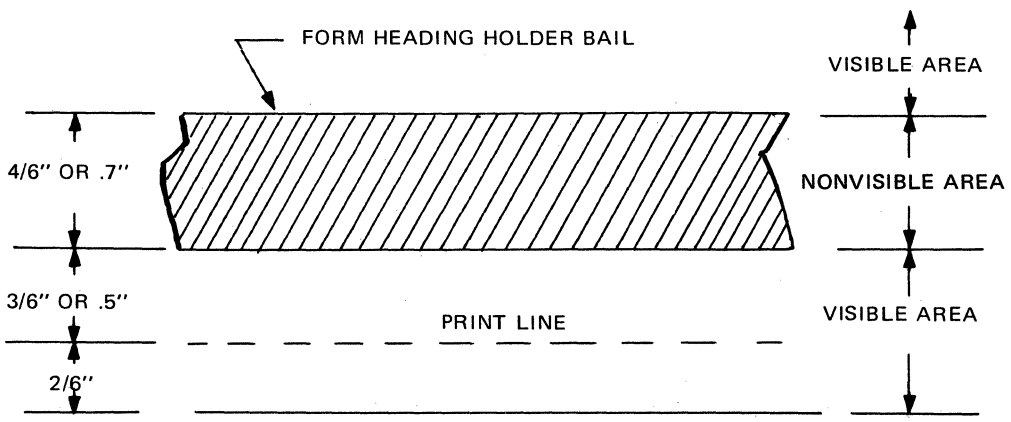


Figure 6.11.04-1 Visibility Considerations 15 1/2" Rear Feed Forms Handler, Open or Closed.

6.11.05 FORM HEADING HOLDER BAIL LEVER, REAR FEED FORMS HANDLER

The Form Heading Holder Bail lever is located on the left end of the platen, see Figure 6.11.00-1. The lever may be used to manually close the bail (if open) prior to a 10-line advance which automatically closes the bail. The manual closing usually would be required only if the Forms Handler is manually opened with the Open/Close Key while a rear feed form is present. The closing of the bail with the lever will occur as follows:

1. A depression of the lever will immediately close the bail if the Front Pressure Rolls are already closed.
2. If the Front Pressure Rolls are open, the depression of the lever and subsequent depression of the Open/Close key will close the bail.

A print with the Ball Printer may occur with the bail open. If the Front Pressure Rolls are disabled in the open position the bail opens and closes with the same steps even though the pressure rolls are held disabled in the partially opened position.

6.11.06 REAR FORM DEFLECTOR PANEL, REAR FEED FORMS HANDLER

The deflector which includes a numeric scale is behind the platen and the approximate width of the platen. The leading (top) edge of rear feed forms use the deflector to guide the form into the rear-insertion path behind the platen. A set of Rear Feed Form Guides may be attached to the deflector to guide the left and right edges of the rear feed form, see Topic 6.11.07.

If the cut or roll journals are used, the top of the deflector guides the journal as the used area of the journal exits to the rear. See Journal Deflector Topic 6.11.09.

6.11.07 REAR FEED FORM GUIDES, REAR FEED FORMS HANDLER

Removable Rear Feed Form Guides, which snap on the Rear Form Deflector Panel, are used to guide the left and right edges of the rear feed forms. Each guide is "reversible" because it may snap on to guide either the left edge or the right edge of the form (the reversible characteristic eliminates the need for a different part design for the right and the left). Usually a set of guides is used with a guide at the left and right edge of the form.

If two rear feed forms are placed side-by-side (nonoverlapping) in the Forms Handler, the minimum distance between the adjacent left and right edge of the two forms is .3". The location of the split of the platen and the initial Line Advance functions should be considered if two rear feed forms are simultaneously placed side-by-side in the Forms Handler. See Topics 6.01.02 and 6.03.01. A journal which is fed through the Journal/Pin Feed path to one side of a rear-feed form must be a minimum of .2" from the adjacent edge of the rear feed form. If the Rear Feed Guides are used for one application and a journal or pin feed form is used for another application in the same area, the guides do not interfere with the orderly advance of either form.

6.11.08 RIGID FORM DEFLECTOR LEVERS, REAR FEED FORMS HANDLER

The two-position, Rigid Form Deflector may be positioned by the metal levers at either end of the platen and behind the platen. The deflector latches in each position; however, either lever will position the deflector:

1. Forward Position, Deflects: The forward position of the levers should be selected if the rear feed forms are made of heavy or rigid ledger paper.
2. Rearward Position, No Deflection: The rearward position of the levers is selected if the rear feed forms are made of light or flexible paper.

Rigid forms may fail to feed if the levers are not in the forward position.

6.11.09 JOURNAL DEFLECTOR, REAR FEED FORMS HANDLER

The removable Journal Deflector snaps on the Rear Form Deflector Panel. Without the deflector present the used area of the journal around the platen may rewind around the platen rather than exit to the rear. The deflector should always be used with a roll journal; however, a cut journal may be used without the Journal Deflector. If the application requires the feeding of a cut journal in the rear-insertion path (same as for rear feed forms) the Journal Deflector cannot be used. The feeding of the cut journal in this path (Topic 6.11.11) is permitted except the operator should periodically check the leading edge of the journal to insure that it exits to the rear without rewind malfunction. Usually the cut journal will not rewind if it is a single-part form or if the leading edge of the journal is glued.

6.11.10 ROLL PAPER GUIDES AND HOLDER, STYLE 1, REAR FEED FORMS HANDLER

A removable "D" shaped shaft is inserted in the center hole of the roll and removable roll holder guides are placed at each end of the roll. The guides are held in place by locking levers which are attached to each guide. Each end of the shaft is supported by brackets at the rear of the Forms Handler. The flat side of the shaft is toward the front of the console when properly mounted and the locking lever handles point rearward. The roll journal or paper must unwind from the bottom of the roll.

Above and slightly forward of the roll paper area is a hinged cover which may be raised when the roll paper is changed or a new roll is installed. To install the roll the holder assembly should be removed from the brackets. Only one roll holder guide should be removed by unlocking the guide from the shaft, provided not more than two rolls are on the shaft. The lever is in the unlocked position when the lever is horizontal and is locked when the lever is at an angle. After the journal is placed on the shaft, to unwind from the bottom, the guide should be placed on the shaft and locked in place. The roll should rotate freely on the shaft. The assembly should be remounted in the appropriate brackets on the handler. See Topic 6.11.11 for the path of the roll paper.

The maximum diameter for the paper or journal roll is 3½". The minimum and maximum permissible widths of the rolls are 1 17/32" and 15½" respectively. The minimum diameter of the center hole for the roll is 3/8". See Subject 6.31.00 for paper thickness. For a width less than 2" the Top Pressure Rolls (Subject 6.07.00) should be carefully placed to prevent irregular feeding of the continuous roll.

The roll holder guides are "reversible" because the locking levers may be service assembled to provide a guide for either the left or right edge of the roll; however, a set of guides includes two levers and two guides.

Pin Feed forms which are supplied on a roll may utilize the Roll Paper Guides and Holder provided the diameter of the roll does not exceed 3½", or exceed the 15½" in width.

The Roll Paper Guides must be removed if a Pin Feed form is fed over the intake racks for the Pin Feed Path, see Topic 6.11.11. Usually this is required if two overlapping pin feed forms are used.

As an optional feature (see Appendix F) an extra set or sets of guides may be used on the roll paper shaft. The extra guides permit the use of another roll journal on the shaft. The minimum distance between the adjacent edges of the rolls is .6". More than two sets of guides may be used on any one shaft provided sufficient forms area is available; this will depend upon the roll widths. In addition, an extra set or sets of guides may be furnished with an extra shaft. This extra Roll Paper Holder Assembly will permit the change of the roll paper width or change of the roll combinations without repositioning the roll or rolls on a shaft. The change of width may be required if more than one application is programed for any one console.

6.11.11 FORM PATHS, REAR FEED FORMS HANDLER

For the Rear Feed Forms Handler the intake paths for the forms begin at the rear of the platen. The following figures are a side-view of the threading or advance of the form through the Forms Handler.

The following code-lines are used to trace the advance of the form in the respective paths.

Rear Feed Insertion Path	– – – – – – – – –	(Broken Line)
Journal/Pin Feed Path	———————	(Solid Line for Journal)
Journal/Pin Feed Path	– . – . – . – . – .	(Dash-Dot for Pin Feed)
Pin Feed Path	. . . . .	(Dots for Pin Feed)

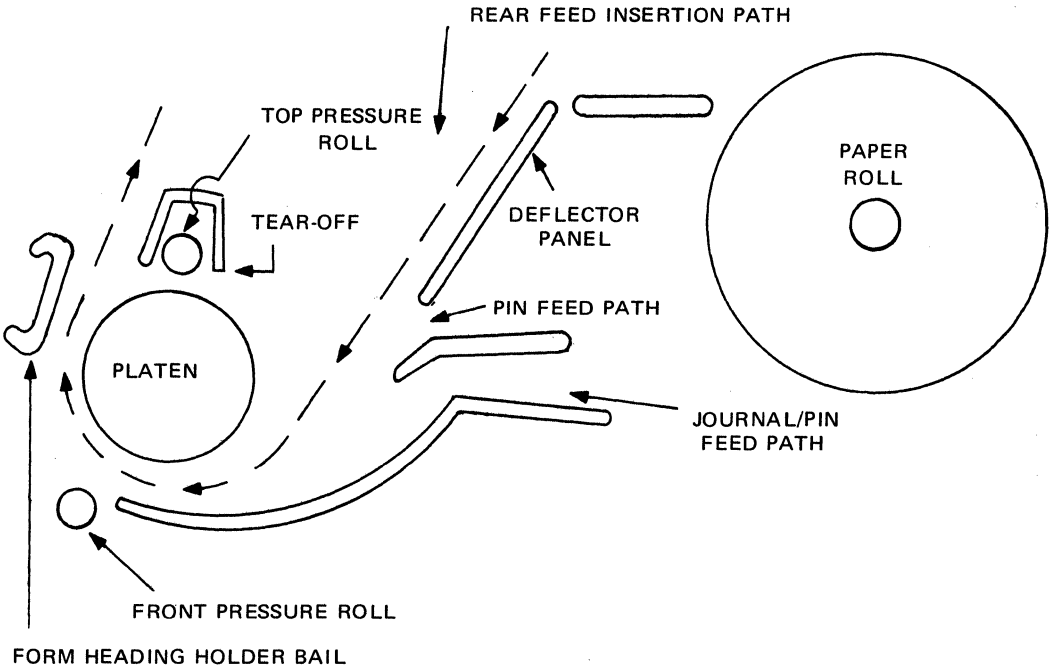


Figure 6.11.11-1 Rear Intake Paths, Rear Feed Forms Handler

Explanation of Figure 6.11.11-1 – Another rear feed form or a journal (Figure 6.11.11-2) may be placed on either side of the rear-feed form.

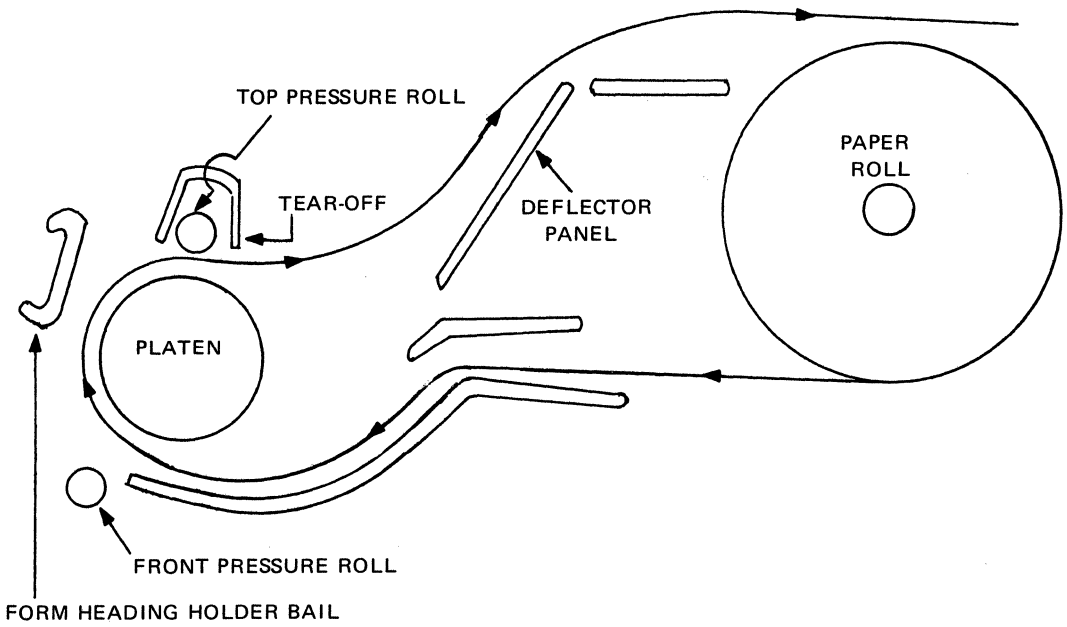


Figure 6.11.11-2 Journal Path, Rear Feed Forms Handler

Explanation of Figure 6.11.11-2 – A cut journal may use the above path or the rear insertion path described in Topic 6.11.09. A Pin Feed form (Figure 6.11.11-3) may be placed on either side of th journal. See Figure 6.11.11-1 for a rear feed form and journal.

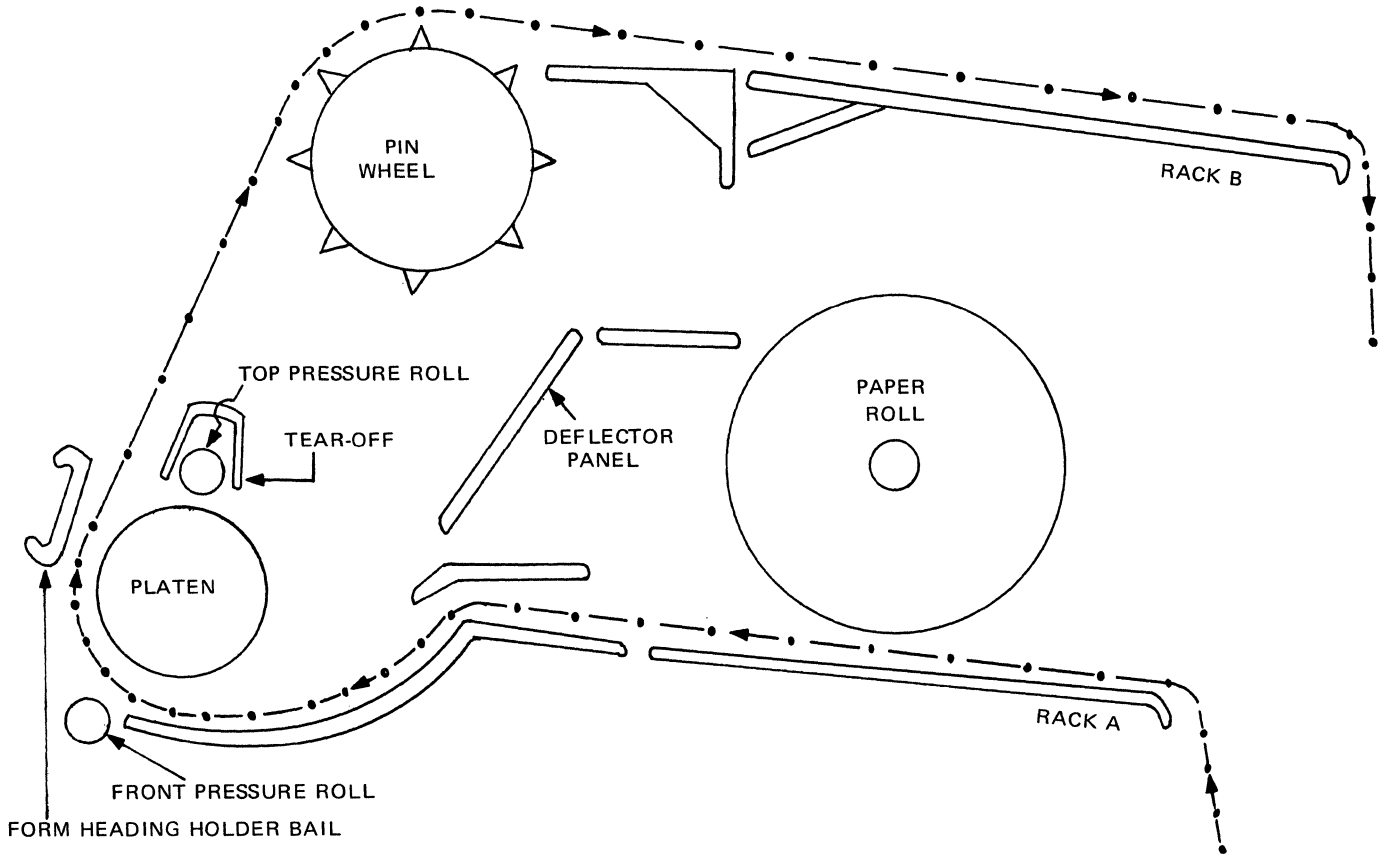


Figure 6.11.11-3 Pin Feed Path, Style 1 Intake and Exit Racks, Rear Feed Forms Handler

Explanation of Figure 6.11.11-3 – A journal (Figure 6.11.11-2) may be placed on either side of the pin feed form.

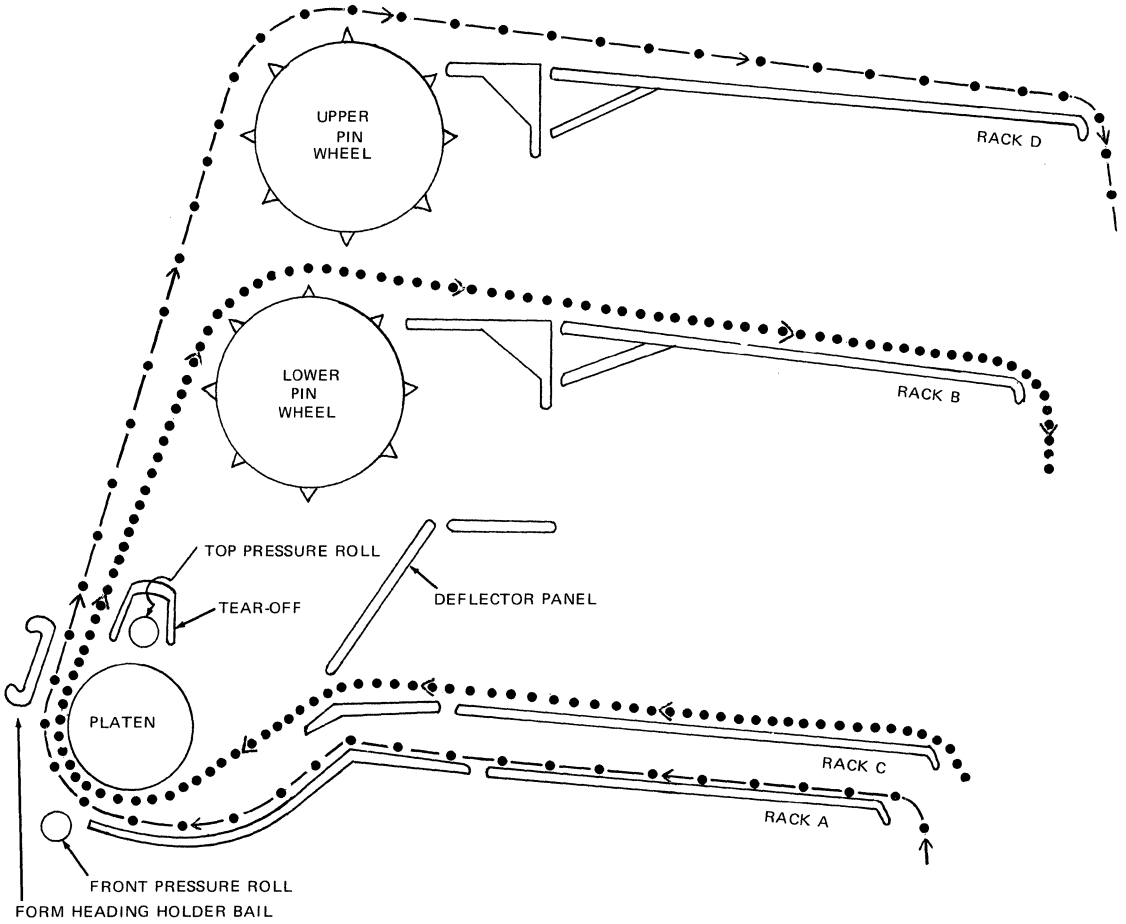


Figure 6.11.11-4 Path for Two Overlapping Pin Feed Forms, Style 1 Intake and Exit Racks, Rear Feed Forms Handler

Explanation of Figure 6.11.11-4 – The above example is for two overlapping pin feed forms. The lower and upper pin wheels are advanced by the left and right controls respectively. Two nonoverlapping forms (side-by-side) may use the same paths; however, both forms may feed and exit over Intake Rack A and Exit Rack B respectively and either Rack C or D, or both could be removed for a nonoverlapping condition. In addition, if the forms do not overlap, Rack C could be used for the form on the upper pin wheel and Rack A could be used for the form on the lower pin wheel. See Subject 6.20.00 for Continuous Form Intake Guides.

6.12.00 BASIC FRONT FEED FORMS HANDLER, 15½ AND 26 INCHES

The Front Feed Forms Handler for the Series L/TC is used to control forms which are fed into the handler in front of the platen or behind the platen. When noncontinuous front feed forms are manually inserted and aligned the leading edge will always be the bottom edge of the form. For other types of forms which are manually placed in the handler, the leading edge will always be the top edge of noncontinuous journals or the beginning edge of continuous forms.

Forms which are manually placed in the handler and fed from the rear may be any of the following:

1. Continuous roll journals or paper around the platen.
2. Continuous pin feed forms if a Pin Feed Device is provided.
3. Noncontinuous cut journals around the platen.

Front Feed forms of various types and sizes are manually inserted in front of the platen and aligned to the previously printed line, to other designated areas of the form, or to a preset form limit.

The different types of forms may be either single or multiple-part. With the Front Feed Forms Handler a combination of three different types of forms may be in any one area of the handler, see Topic 6.12.10.

The print line is visible to the operator when the forms are in the handler. In addition, part of the area above and below the print line is visible. For the area above the print line, the number of visible lines is dependent upon the types of forms used. see Topic 6.12.03.

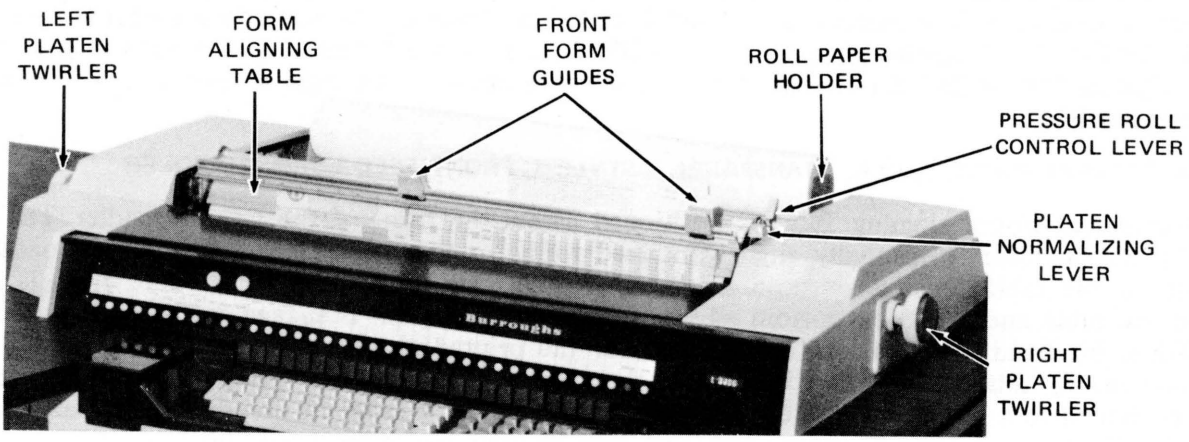


Figure 6.12.00-1 26" Front Feed Forms Handler

6.12.01 FRONT FEED FORMS HANDLER FEATURES AND FUNCTIONS DESCRIBED IN OTHER TOPICS

The following features and functions are explained in the designated topics or subjects:

Line Advance (Vertical Spacing) and Platen, 6.01.00

Platen Twirlers, 6.02.00

Split and Normal Platen, Overlaps B and C, Overlap of Split of a Platen With or Without Overlap of Forms, 6.03.00

Platen Normalizing Lever, 6.04.00

Forms Handler Open and Close, 6.05.00

Front Pressure Rolls, 6.06.00

Top Pressure Roll Housing and Tear-Off for Journal, 6.07.00

Pressure Roll Control Lever, 6.08.00

Numeric Scales, 6.09.01

Pin Feed Devices, 6.21.00, 6.22.00, and 6.23.00

Optional Form Handling Features, 6.42.00

Forms Specifications, 6.32.00

6.12.02 FORMS AREA, FRONT FEED FORMS HANDLER

The area of the platen which may be occupied by forms is specified in relation to the numeric scales of the forms handler and the programable print positions. The maximum width for a form is 15½" and 26" for the 15½" and 26" Forms Handlers respectively. The minimum width is dependent upon the type of form which is used. See Subject 6.32.00 for these minimums.

The extreme left limit is at minus 2.5 tenths on the numeric scale; this is 3.5 tenths to the left of the center of print position 1 which is the first print position from the left. Printing to the left of position 1 is not programable. The extreme right limit is at 152.5 tenths on the numeric scale for a 15½" Forms Handler and at 257.5 tenths for a 26" Forms Handler. This is 2.5 tenths to the right of the center of print position 150 or 255 for the respective handler. Printing to the right of positions 150 and 255 is not programable.

6.12.03 FORM ALIGNING TABLE, TRANSPARENT, STYLE 1, FRONT FEED FORMS HANDLER

The transparent Form Aligning Table is positioned across the front of the Forms Handler. The table is used by the operator to manually align front feed forms to the desired print line. A horizontal line is present on the table for this purpose. With the Forms Handler open, the front feed form is inserted behind the table and until the bottom edge of the last line of print is aligned to the horizontal aligning line. When the handler closes the bottom edge for the printed character will be 1/6" from the aligned position, usually this is the next print line. In the absence of a previously printed line of characters, the form is aligned to a horizontal line on the form or to the bottom edge of preprinted information on the form. See Figure 6.12.03-1. A preset form limit may be used, see Subject 6.42.00

The first print line for a front feed form may be a minimum of 5/6" from the top of the form to the bottom edge of the printed characters. However, the most commonly used Front Form Guides require a print line which is 1¼" from the top of the form. See Topic 6.12.11 for a summary of the first and last print lines for the various types of form guides.

The nonremovable Form Aligning Table has three positions: open, closed, and raised. The open and closed positions are explained in Subject 6.05.00. The operator may position the table in the raised position in order to install a form around the platen or to install a pin feed form. The operator must also lower the aligning table from the raised position, otherwise the normal open and close operation will not occur and a warning is not provided. The raising of the aligning table also raises the Form Guide Bridge (Topic 6.12.05) and the Top Pressure Roll Housing Assembly.

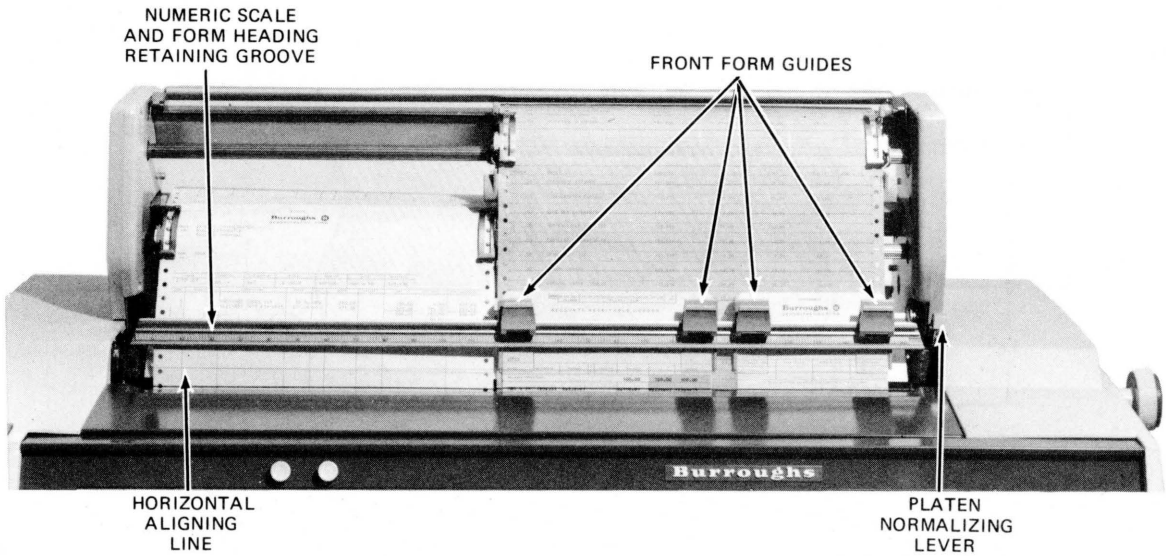


Figure 6.12.03-1 Form Aligning Table, 26" Front Feed Form Handler with Dual Pin Feed Device

The aligning table has a notched area which is used for the placement of removable Front Form Guides. The notches are provided in 1/20" increments. The guides are positioned to guide the edges of the forms which are front fed into the handler. Two types of Front Form Guides are available: front-mounting and rear-mounting. Front-mounting guides may be attached to the aligning table and rear-mounting guides may be attached to the Form Guide Bridge which is parallel to and behind the Form Aligning Table. Front feed forms and pin feed forms feed in between the table and bridge. A front-mounting guide must be used if a pin feed form and front feed form are in the same area. See Subject 6.42.00.

See Topic 6.12.04 for the form heading and numeric scale.

The shaded areas of Figures 6.12.03-2 and -3 display the nonvisible area of the form when the Forms Handler is closed and open.

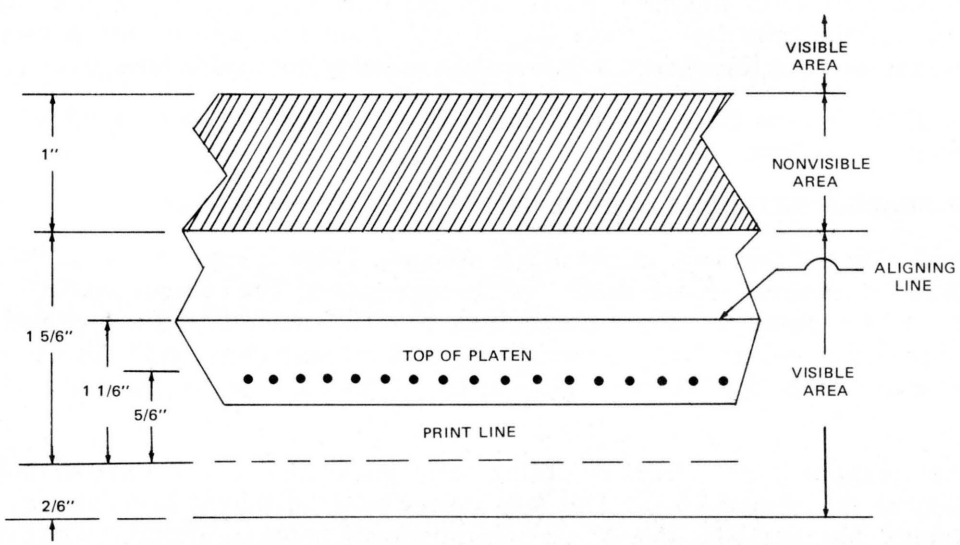


Figure 6.12.03-2 Form Aligning Table Visibility Considerations, Basic Front Feed Forms Handler, Closed Position

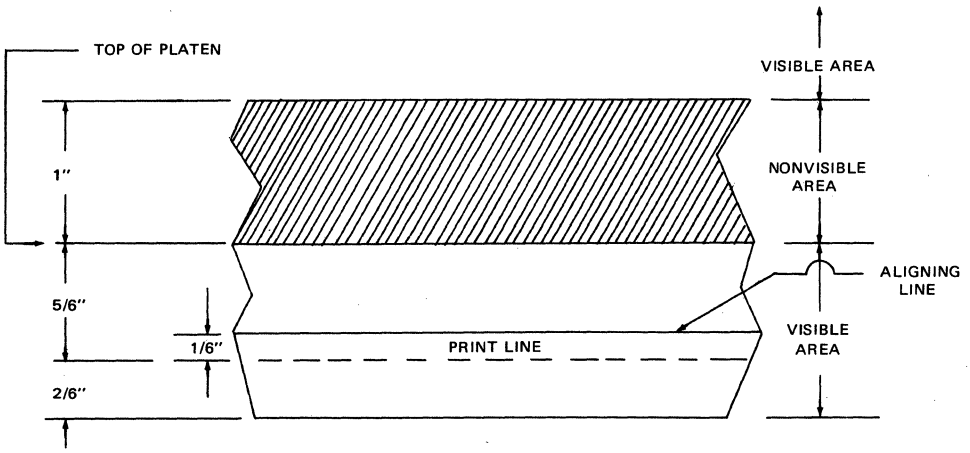


Figure 6.12.03-3 Form Aligning Table Visibility Considerations, Basic Front Feed Forms Handler, Open Position

Alignment to Top Edge of Form Aligning Table

The top edge of a form (payroll check) may be aligned even with the top edge of the Aligning Table. For this method of aligment the print line is 1 5/6" from the top of the form to the bottom edge of the desired print line. The heading area for this type of form should be a maximum of 1 7/12" from the top of the form. The difference of 3/12" for the two measurements provides a 1/6" print area and 1/12" recommended tolerance above the print area. The form design should also consider a 1/12" tolerance below the print if horizontal lines are used below the print area.

Aligning Line with Forms Handler Closed

When the Forms Handler is closed the horizontal aligning line on the Form Aligning Table is 1 1/6" (seven lines) above the bottom edge of the print line. A horizontal perforation for a pin feed form may be aligned to this aligning line when the handler is closed. If the bottom edge of the desired first print line for a length of the pin feed form is 1 1/6" from the perforation the form is aligned. If the desired first line is less than 1 1/6" from the perforation, the pin feed form may be turned back in 1/6" increments in order to select the desired line. The pin feed form may be advanced to arrive at the first desired print line if the print line is more than 1 1/6" from the perforations. A preprinted line on the pin feed form may be used for alignment rather than utilizing the perforation.

See Subject 6.02.00 for the Platen Twirlers and Variable Spacers which are used to manually turn back or advance the pin feed form.

6.12.04 FORM HEADING RETAINING GROOVE, FRONT FEED FORMS HANDLER

In front of and near the top edge of the Form Aligning Table is a grooved area which may be used to retain the columnar headings of the forms for the application. The column headings are a visual aid for the operator. In the center of the grooved area a 1/10" numeric scale is provided. The columnar headings are inserted in front of the numeric scale and a transparent insert for the heading area is not provided. The paper insert for the headings must be .5" high and the visible area is .4" high. See Figure 6.12.03-1.

For the proper placement of a front-mounting form guide, the outside edge should be placed to the desired position of the numeric scale. This will always be .1" different than the programed position for a front feed form. For example, if a 6" form is programed between positions 120 and 180, the outside edge of the left and right guides should be installed at positions 119 and 181 respectively.

6.12.05 FORM GUIDE BRIDGE, STYLE 1, FRONT FEED FORMS HANDLER

The Form Guide Bridge is parallel to and behind the Form Aligning Table. The nonremovable bridge is slightly above the platen and in front of the Top Pressure Roll Housing. Certain rear-mounting Front Form Guides (Subject 6.42.00) may be placed on the Style 1 bridge. A numeric scale marked in 1/10" increments is present on the bridge, plus a notched area for form guide installation is provided. The notches are in 1/20" increments.

The bridge opens and closes simultaneously with the Form Aligning Table. The raised position occurs with the raising of the Table, Topic 6.12.03.

Front feed forms and pin feed forms feed between the table and the bridge.

For the proper placement of the rear-mounting form guide, the outside edge should be placed to the desired position of the numeric scale. This will always be .1" different than the programed position for a front feed form. See example in Topic 6.12.04.

Rear-mounting Front Form Guides designed for the Style 2 bridge of a Financial Front Feed Forms Handler may not be attached to the Style 1 bridge.

6.12.06 LOWER PRESSURE ROLLS, FRONT FEED FORMS HANDLER

The Lower Pressure Rolls are not visible at the bottom of the platen. The rolls are used when a cut journal is around the platen. The Pressure Roll Control lever enables and disables the rolls as described in Subject 6.08.00. The last print line is specified in Subject 6.06.00.

6.12.07 HINGED COVER WITH LATCH AND RELEASE, FRONT FEED FORMS HANDLER

A nonremovable Hinged Cover is near the back of the Forms Handler. The recessed area of the cover is used for the installation of removable Roll Paper Holders. A numeric scale in 1/10" increments is also provided. The cover may be latched in a raised position to permit the installation of a pin feed form or Rear Form Guides and/or Limits in the area below the cover. The latch release in the rear edge of the cover must be pulled to release the cover from the raised position.

6.12.08 REAR LOWER SHIELD, STYLE 1, FRONT FEED FORMS HANDLER

Below the Hinged Cover is a shield with a retaining recess. This recess is used for the installation of rear Form Guides and Limits. The leading (bottom) edge of front feed forms occupy this area. A numeric scale in 1/10" increments is provided for a guide when the guides or limits are installed in this area.

6.12.09 ROLL PAPER HOLDERS, STYLE 2, FRONT FEED FORMS HANDLER

Removable Roll Paper Holders may be positioned in the recess of the Hinged Cover (Topic 6.12.07) to hold a supply roll of paper or journal. The holders are held in place by locking levers. With the locking lever pointed or angled toward the side of the console, the holder is released and it may be removed or repositioned. When the lever is pointed rearward, the holder is locked in place. A holder may be removed from or installed between two other holders without removing any other holder or holders. For the proper placement of a holder the inside edge (lever side) should be aligned to the desired position of the numeric scale.

To install a new roll, only one holder should be unlocked and moved approximately ½" to permit the removal of the core of the exhausted roll. The center hole of the new roll should be fixed onto the center-hole projection of the holders. The roll journal or paper should unwind from the bottom. The unlocked holder should be moved back to its position and locked in place. The roll should rotate freely. See Topic 6.12.10 for the path of roll paper. The roll holders are "reversible" because the locking levers may be turned 180 degrees to provide a guide for either the left or right edge of the roll. However, when properly installed, the locking levers are under the roll and the center-hole projections are pointed toward each other.

The maximum diameter for the paper or journal roll is 3½". The minimum permissible width of a roll is 2¼". The maximum width of a roll is 15½" and 26" respectively for a 15½" and 26" Front Feed Forms Handler respectively. The minimum diameter of the center hole for the roll is 3/8". The hole must be a minimum of ½" deep from each edge of the roll if not completely through the width of the roll. See Subject 6.32.00 for paper thickness.

The roll holders may be used with an attached pin feed device or the holder may be un-used and left in place if the pin feed form does not occupy the area over the Hinged Cover. A pin feed form which is fed through the Journal/Pin Feed Path to one side of the journal will pass over the Hinged Cover. For this condition a minimum of .2" clearance is required between the adjacent left and right edges (side-by-side) of the pin feed form and roll journal. This form arrangement may be required if two pin feed forms are used and one pin feed form in the Pin Feed path overlaps the other pin feed form or overlaps the journal and the other pin feed form. If an optional set of guides (Subject 6.42.00) is used for the journal then a minimum of .3" clearance is required for the adjacent edges.

As an optional feature an extra set or sets of holders may be used on the Hinged Cover. The extra holders permit the use of another roll. The minimum distance between the adjacent edges of the rolls is .2". More than two sets of guides may be used provided sufficient forms area is available; this will be dependent upon the roll widths.

6.12.10 FORM PATHS, BASIC FRONT FEED FORMS HANDLER

With the Basic Front Feed Forms Handler the intake paths for journals and pin feed forms are at the rear of the platen. The forms also exit to the rear. The intake path for a front feed form is in front of the platen and continues downward toward the back of the console. During the line advance or manual removal, the front feed form exits upward in front of the platen. See Subject 6.01.00 for line advance controls. The following figures display the use of the respective form paths for the different types of forms which may occupy the same area. Separate areas for the forms may be used also. Although the front path is illustrated with one dotted line the form may include two or more forms which are front fed in the same area or part of the same area. For example:

1. Ledger and statement collated by the operator before being inserted.
2. Ledger and overlapping elongated form, check and payroll ledger.

The following code-lines are used to trace the advance or insertion of the form in the respective paths:

Front Feed Path	– – – – – – – – –	(Dash)
Journal/Pin Feed Path	———————	(Solid Line for Journal)
Journal/Pin Feed Path	– . – . – . – . – .	(Dash-Dot for Pin Feed)
Pin Feed Path	. . . . .	(Dots for Pin Feed)

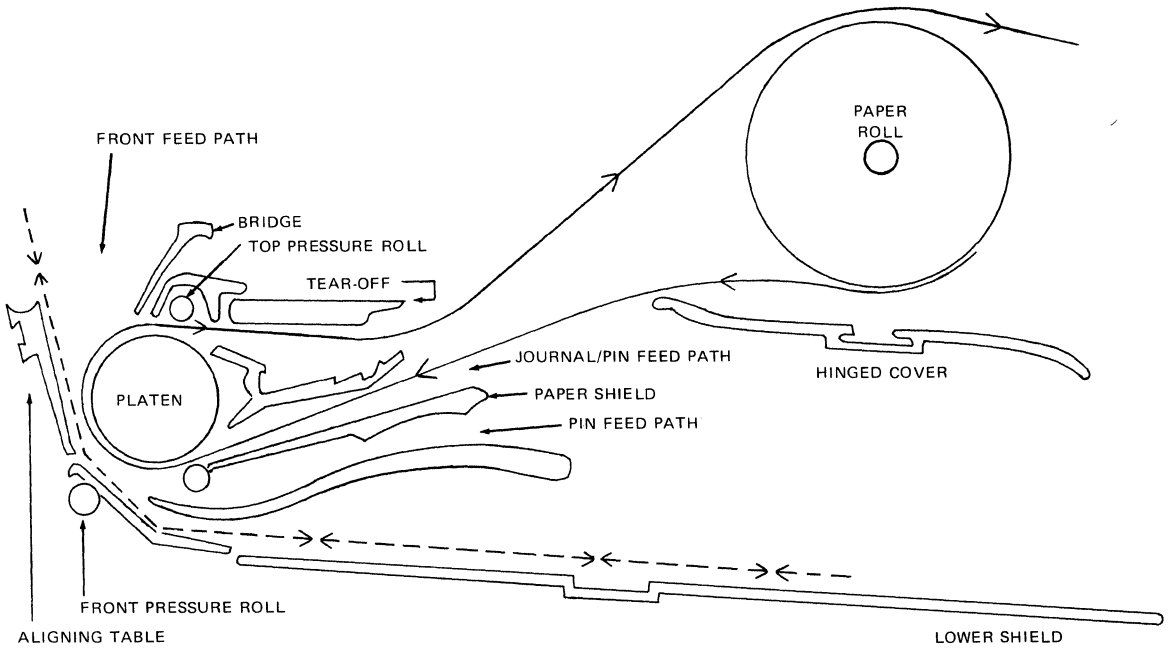


Figure 6.12.10-1 Front Feed and Journal Paths, Basic Front Feed Form Handlers

Explanation of Figure 6.12.10-1 – A cut journal may be used instead of the illustrated roll journal.

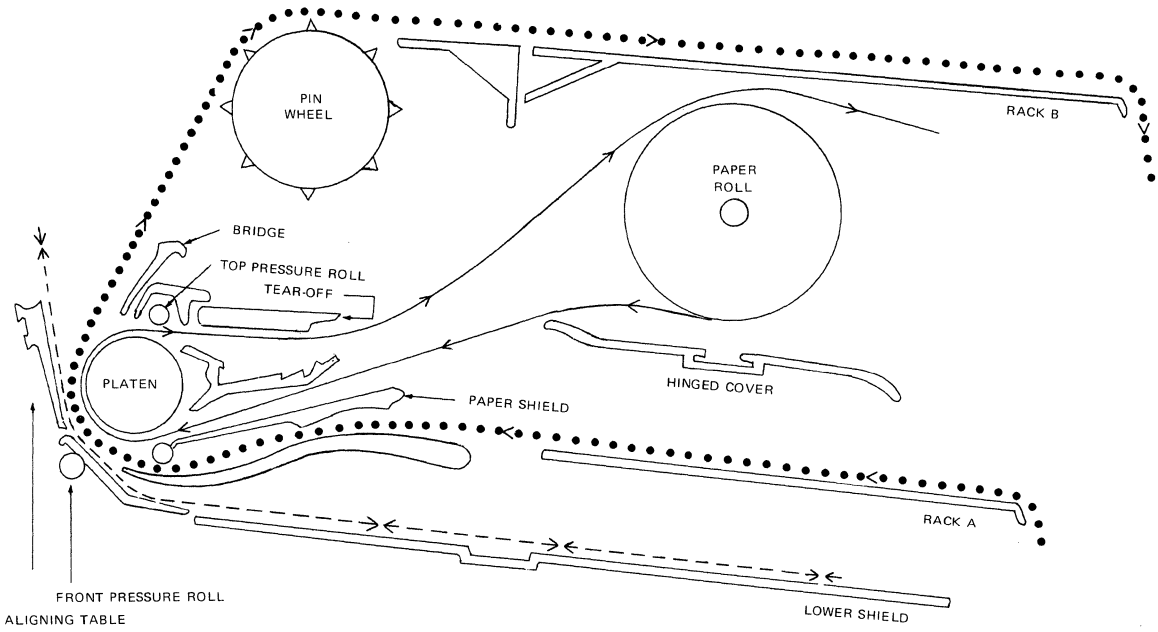


Figure 6.12.10-2 Paths for Front Feed, Roll Journal, and Pin Feed forms, Style 1 Intake and Exit Racks, Basic Front Feed Forms Handlers

Explanation of Figure 6.12.10-2 – A cut journal may be placed on either side of the pin feed form or roll journal. Two journals should not overlap, and a pin feed form and cut journal should not occupy the same area.

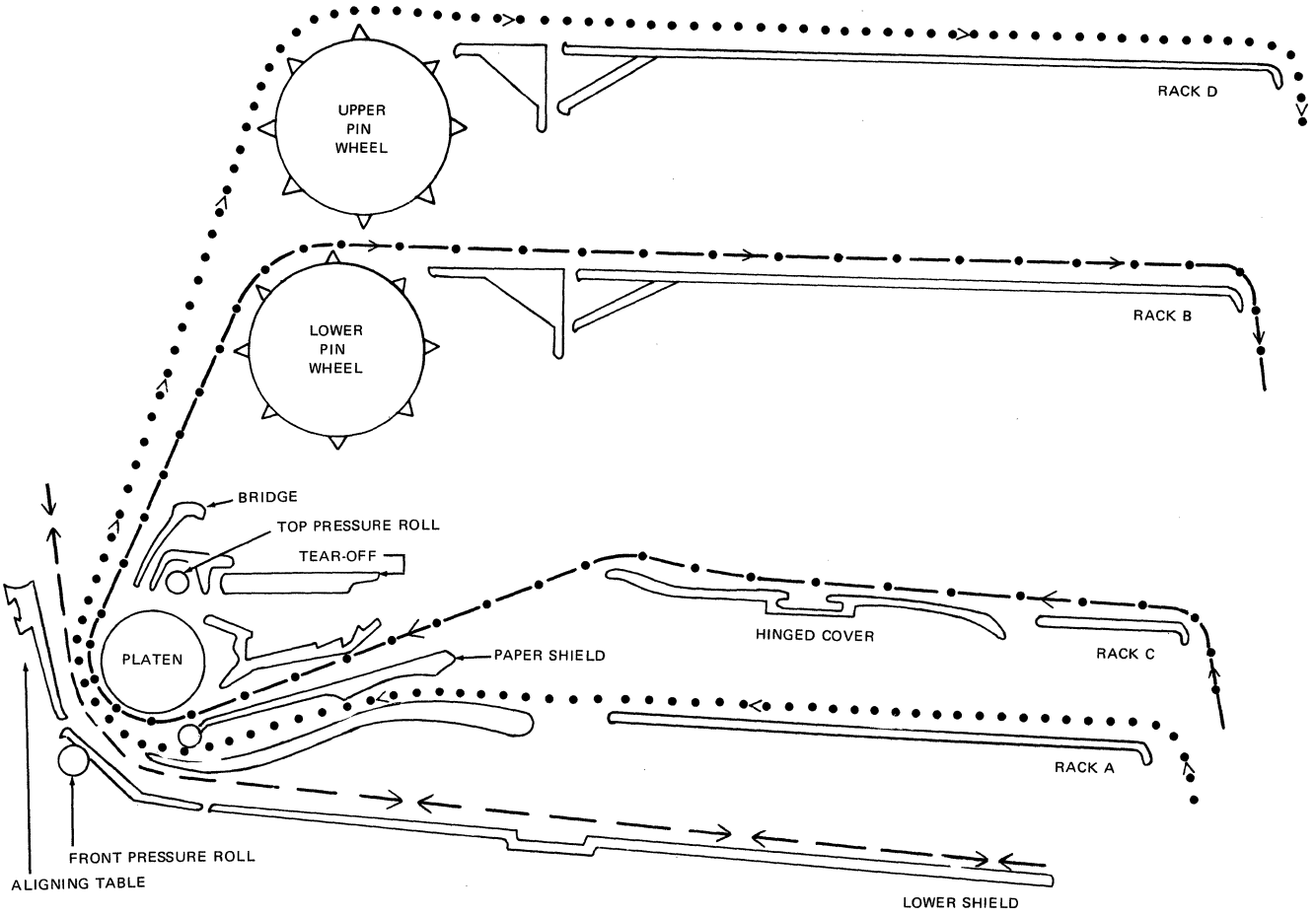


Figure 6.12.10-3 Paths for Front Feed Forms and Overlapping Pin Feed Forms, Style 1 Intake and Exit Racks, Basic Front Feed Forms Handler

Explanation of Figure 6.12.10-3 – The above example is for two overlapping pin feed forms with or without front feed forms. The lower and upper pin wheels are advanced by the left and right controls respectively. Two nonoverlapping pin feed forms (side-by-side) may use the same paths; however, both forms may feed and exit over Intake Rack A and Exit Rack B respectively and either Rack C or D, or both could be removed for a nonoverlapping condition. In addition, if the forms do not overlap, Rack C could be used for the form on the upper pin wheel and Rack A could be used for the form on the lower pin wheel. See Subject 6.20.00 for Continuous Form Intake Guides.

A journal, either cut or rolled, should not occupy the area where two pin feed forms overlap. A roll journal may occupy the same area of the pin feed form which is fed over Rack A provided the journal does not occupy any of the area where the two pin feed forms overlap. See Figure 6.12.10-2. For the line advance capabilities with a nonsplit platen see Advance C-3 of Topic 6.01.03, or with a split platen see Advance D-3 of Topic 6.01.04.

In addition, a roll journal may also occupy any area which is not occupied by a pin feed form. A cut journal may be used in any area which is not occupied by a pin feed form; however, if a cut journal is used when two pin feed forms overlap, the pin feed form which feeds over Rack C must be single-part; both would be placed side-by-side in the journal/pin feed path. See Pressure Roll Control Lever, Subject 6.08.00.

6.12.11 SUMMARY OF FIRST AND LAST PRINT LINES, BASIC FRONT FEED FORMS HANDLER

The first and last print lines are summarized in the following chart. The measurements are from the top or bottom edge of the form to the bottom edge of the printed characters.

Item	Type of Form	First Line Minimum From Top	First Line Maximum From Bottom	Last Line Minimum From Bottom
1	Cut Journal around Platen	2"		1 5/6" or 5/6"
2	Roll Journal tear-off	4½" from line of print		
3	Front Feed	1¼"	12¾" (15" Form)	5/6"
4	Item 3 with Style 1 rear guide	1¼"	13½"	5/6"
5	See Subject 6.42.00 for optional form limits.			
6	See Topic 6.12.03 for alignment to top of Form Aligning Table.			
7	See Subject 6.06.00 for explanation of Item 1			
8	Front Feed Forms may use an optional 5/6" first print line, see Subject 6.44.00.			

6.13.00 FINANCIAL FRONT FEED FORMS HANDLER, 15½ INCHES

The Financial Front Feed Forms Handler for the Series L/TC is similar to a Basic Front Feed Forms Handler except features are included to provide for an orderly, multiple-line advance with a passbook in the right section of the platen. A journal cover and rewind device is provided to safeguard the privacy of the financial transactions on the used part of the journal. The increment for the line advance is 1/6" and 1/5" for the respective left and right sections of the split platen. The form handling capabilities for a passbook include the ability to detect that the passbook has been inserted, the passbook has advanced or aligned to the horizontal center-fold area, and the passbook has advanced beyond the end of the page. These detected signals are called Passbook Flags and the program must include the desired routines to utilize the flag conditions.

The handler is used to control forms which are fed into the handler in front of the platen or behind the platen. When noncontinuous front feed forms and passbooks are manually inserted and aligned the leading edge will always be the bottom edge. For other types of forms which are manually placed in the handler, the leading edge will always be the top edge of noncontinuous journals or the beginning edge of continuous forms.

Forms which are manually placed in the handler and fed from the rear may be any of the following:

1. Continuous roll journals or paper around the platen
2. Continuous pin feed forms if a Pin Feed Device is provided
3. Noncontinuous Cut Journals around the platen with removed Journal Cover.

Front feed forms and passbooks of various types and sizes are manually inserted in front of the platen and aligned to the previously printed line, to other designated areas of the form, or to a preset form limit. From the preset limit the passbook is commonly advanced to the desired print line under program control.

The different types of forms may be either single or multiple-part. With the Financial Front Feed Forms Handler a combination of three different types of forms may be in any one area of the handler, see Topic 6.13.10. Because of the thickness and programed advance to a print line for the passbook, it usually will be in an area which is unoccupied by another form.

This print line is visible to the operator when the forms are in the closed handler. In addition, part of the area above and below the print line is visible. For the area above the print line, the number of visible lines is dependent upon the type of forms used, see Topic 6.13.03.

6.13.01 FINANCIAL FRONT FEED FORMS HANDLER FEATURES AND FUNCTIONS DESCRIBED IN OTHER TOPICS

The following features and functions are explained in the designated topics or subjects:

Line Advance (Vertical Spacing) and Platen, 6.01.00

Platen Twirler Key, 6.04.00

Split and Normal Platen, 6.03.00

Platen Normalizing Lever, 6.04.00

Forms Handler Open and Close, 6.05.00

Top Pressure Roll Housing and Tear-Off for Journal, 6.07.00

Pressure Roll Control Lever, 6.08.00

Numeric Scales, 6.09.01

Pin Feed Devices, 6.21.00, 6.22.00, and 6.23.00

Optional Form Handling Features, 6.43.00

Forms Specifications, 6.33.00

Lower Pressure Rolls, 6.12.06

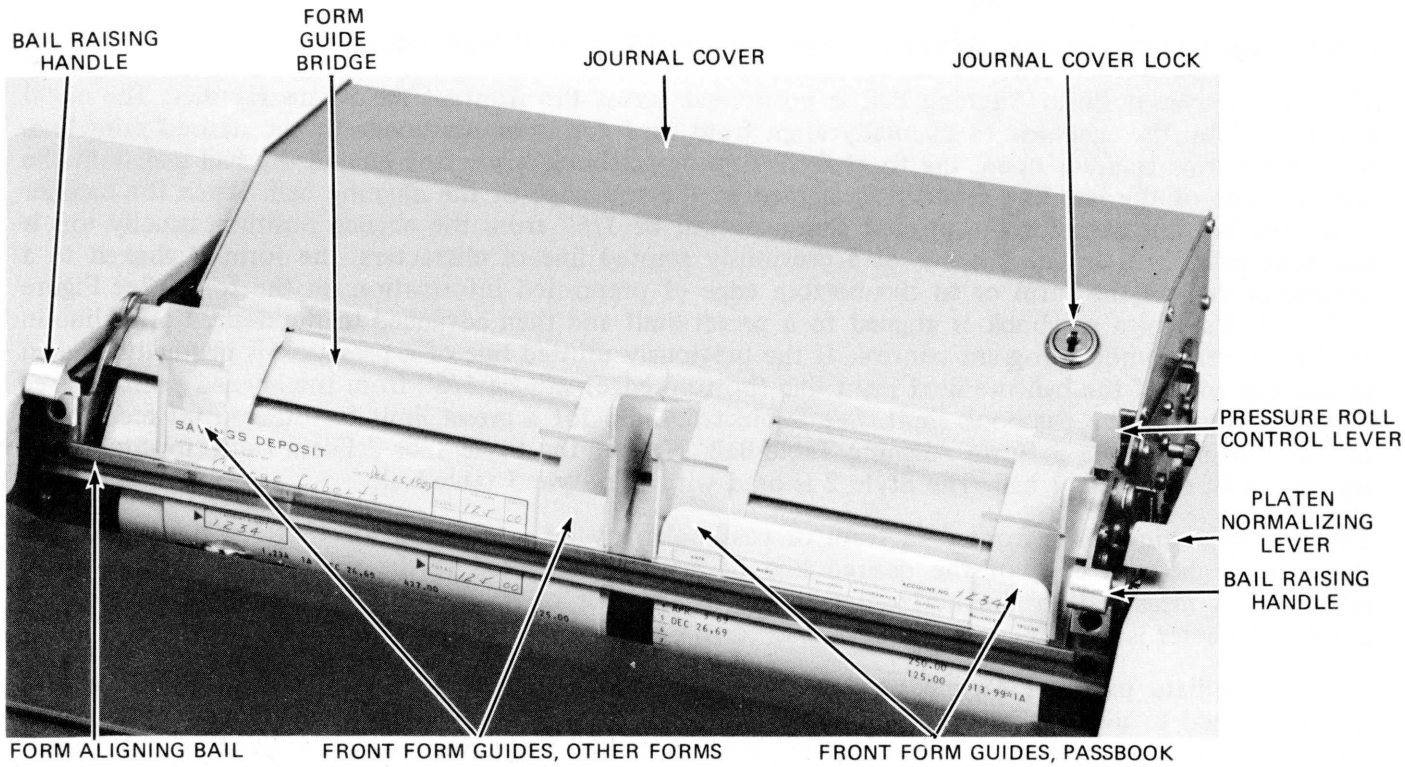


Figure 6.13.00-1 15½" Financial Front Feed Forms Handler

6.13.02 FORMS AREA, FINANCIAL FRONT FEED FORMS HANDLER

The area of the platen which may be occupied by forms is specified in relation to the numeric scales of the forms handler and the programable print positions. The maximum and minimum width is dependent upon the type of form which is used. See Subject 6.33.00 for these minimums. The maximum width is dependent upon which area is utilized by the form.

The extreme left limit is at minus 2.5 tenths on the numeric scale; this is 3.5 tenths to the left of the center of print position 1 which is the first print position from the left. Printing to the left of position 1 is not programable. The extreme right limit is at 152.5 tenths on the numeric scale; this is 2.5 tenths to the right of the center of print position 150. Printing to the right of position 150 is not programable.

The forms area for the different types of forms is as follows:

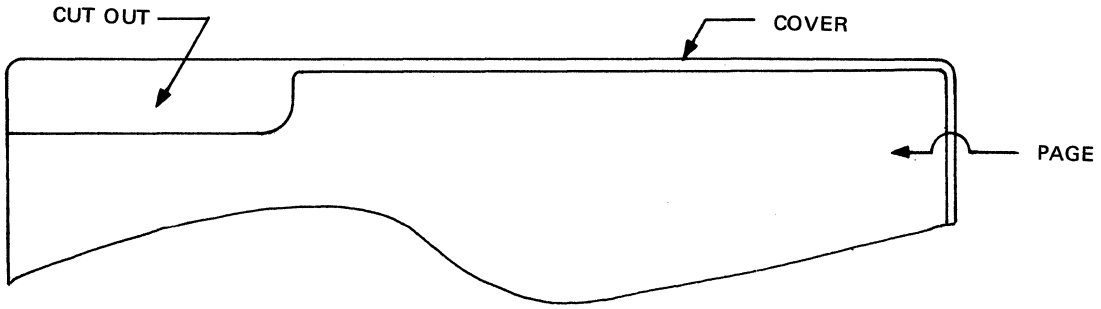
1. Passbook, Positions 81 through 152, maximum 7" width, right edge must be at Position 151 or 152, or in between.
2. Journal which is automatically rewound, from minus 2.5 tenths through 144.5 tenths, maximum is 14.7" in width.
3. For a pin feed form or journal which is not rewound the forms area is from minus 2.5 tenths to 152.5 tenths, maximum 15½" width.
4. For a front feed form other than a passbook, the forms area is from minus 2.5 tenths to 152 tenths, maximum 15.45" width.

6.13.03 FORM ALIGNING BAIL, STYLE 2, FINANCIAL FRONT FEED FORMS HANDLER

The nontransparent Form Aligning Bail is positioned across the front of the Forms Handler. The metal bail is used by the operator to manually align front feed forms or passbooks to the desired print line. With the Forms Handler open, the front feed form or passbook is inserted behind the bail and until the bottom edge of the last line of print is aligned to the top edge of the aligning bail. When the handler closes the bottom edge for the printed character will be 1/6" from the aligned position, usually this is the next print line. In the absence of a previously printed line of characters, the form is aligned to a horizontal line on the form or to the bottom edge of preprinted information on the form. See Figure 6.13.00-1. Usually a passbook is aligned to a preset limit and then advanced to the desired print line in 1/5" increments under program control. If the previously printed line of a passbook is manually aligned to the top edge of the bail the next print line (bottom edge) will be 1/6" from the aligned position. See Topic 6.13.06 for the passbook limit. See Subject 6.43.00 for a preset limit for other front feed forms and the optional Style 3 Form Aligning Table-Bail. Neither the Style 1 or 2 Form Deflector-Stabilizers are used with the Style 2 bail. The Style 2 is used with the Style 3 table-bail.

The first print line for a front feed form or passbook may be a minimum of 1" from the top of the form to the bottom edge of the desired line of print as measured to the nearest 1/5" or 1/6". The minimum as measured to the horizontal center of the line of print may be 7/8". The height of the printed character is .110".

The intermediate pages of certain passbooks are cut shorter than the cover or first page. This cutout usually is used to display the account number regardless of which page is opened. When the passbook is inserted the account number is at the top. For a minimum 1" first print line, a cut which is a maximum of 3/8" deep is permitted provided it does not extend for more than ½ the width of the top edge. If the cutout is greater than 3/8", the distance to the first permissible minimum print line must be increased by a like dimension in excess of the 3/8".



The nonremovable Form Aligning Bail has three positions: open, closed, and raised position. The open and closed conditions are explained in Subject 6.05.00. The operator may position the table in the raised position in order to install a form around the platen or to install a pin feed form. The operator must also lower the aligning table from the raised position otherwise the normal open and close operation will not occur and a warning is not provided. The raising of the aligning bail also raises the Form Guide Bridge (Topic 6.12.05) and the Top Pressure Roll Housing Assembly. Handles at each end of the bail are provided for the raising and lowering function.

The front bottom edge of the Style 8 Front Form Guides fits into the recessed top edge of the aligning bail.

The shaded areas of Figures 6.13.03-1 and -2 display the nonvisible area of the form when the Forms Handler is closed and open.

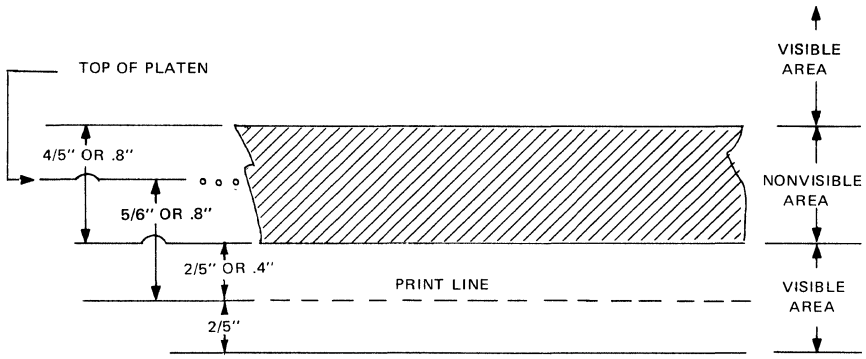


Figure 6.13.03-1 Form Aligning Bail, Financial Front Feed Forms Handler, Closed Position

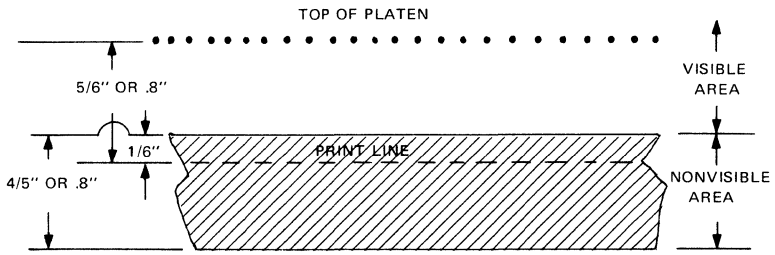


Figure 6.13.03-2 Form Aligning Bail, Financial Front Feed Forms Handler, Open Position

6.13.04 FORM GUIDE BRIDGE, STYLE 2, FINANCIAL FRONT FEED FORMS HANDLER

The Style 2 bridge serves the same purpose as the Style 1 bridge (Topic 6.12.05) except rear-mounting Front Form Guides designed for each bridge are not interchangeable from one bridge to the other. See Subject 6.43.00 for form guides which are applicable to the Style 2 bridge.

Rear-mounting guides for front feed forms prevent the use of pin feed forms in the same area. The optional Style 3 Form Aligning Table-Bail may be used with Style 3 Front Form Guides to permit pin feed and front feed forms in the same area. The forms would be in the left area of the platen, see Subject 6.43.00.

6.13.05 GEAR-DRIVEN FRONT PRESSURE ROLLS, FINANCIAL FRONT FEED FORMS HANDLER

With the Gear-Driven Front Pressure Rolls a passbook will be simultaneously advanced by the friction and rotation of both the power driven rolls in front of the passbook and by the platen behind the passbook. The pressure rolls centered in Positions 92, 109, 127 and 145 are gear-driven from the right and are to the right of split platen location 85/86. If the split platen is normalized the pressure rolls rotate but they are not power-driven. See Subject 6.06.00, Figure 6.06.00-3 for the locations of the pressure rolls. The bottom edge of characters for the last print line may be a minimum of 1" from the bottom of the form if measured to the nearest 1/5" increment. A tolerance of minus .180" may be used to provide a print line at .820" from the bottom of the passbook or form. See Subject 6.06.00 for the last print line for the left section of the split platen. See Subject 6.43.00 Form Limits for forms other than passbooks.

The gear-driven rolls may also be individually disabled if a pin feed form is used in the absence of a front feed form or passbook.

6.13.06 PASSBOOK FORM LIMIT-SWITCH, FIRST LINE, FINANCIAL FRONT FEED FORMS HANDLER

The Passbook Form Limit may be used to stop the manual movement of a passbook which is front fed into the Forms Handler. The limit also has a switch which turns on (sets) a Flag of the "W" Group. The limit-switch is contacted by the right bottom edge of the passbook approximately 1" from the right edge. The limit-switch is attached to the Style 3A Rear Form Guide. The guide is nonremovable except by a service representative, but the right edge of the passbook may be programed for position 151 or 152 or in between the positions. A limit without the switch is also used at the left bottom edge, see Subject 6.43.00 for this Rear Form Guide.

The flag remains set as long as the passbook is in contact with the switch. The Skip and Execute instruction may be programed to interrogate this flag and subsequently the execution of the program is continued based on the flag setting. Generally the program advances the passbook to the desired print line which is indexed by the operator or which is part of the program for a Data Communications system. In the absence of programing for an advance to a print line, the passbook may be manually aligned to the desired print line.

With this limit-switch the first print line as measured to the nearest 1/5" may be a maximum of 9" from the bottom of the passbook (form) to the bottom edge of the first desired print line, or a maximum of 9 1/8" if measured to the center of the print line. The character height is .110". The maximum passbook height (length) is 10". A service representative may set the limit-switch for a predetermined print line, or a first print line which is a minimum of 2.7" (2.75" to center of print) from the bottom of the passbook, provided the center-fold feature is removed. If the center-fold feature is used the minimum is greater than 2.7", see Topic 6.13.07.

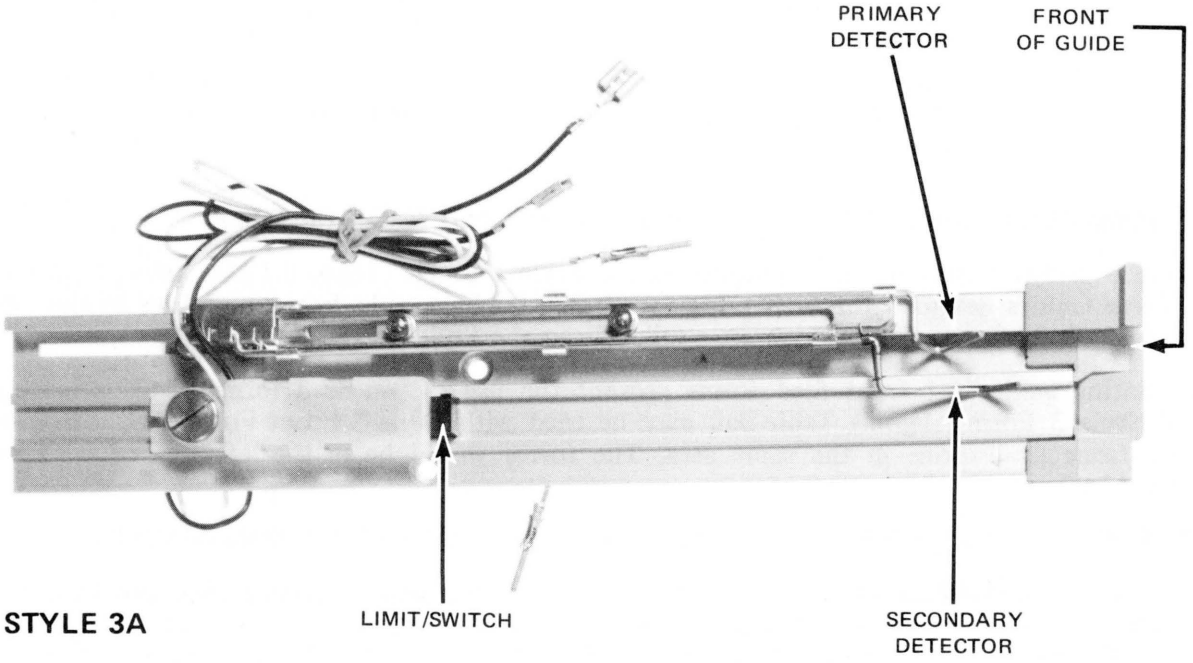


Figure 6.13.06-1 Passbook Limit and Center Fold Detectors

NOTE: The detectors in Figure 6.13.06-1 are set to provide for a by-pass of the center fold with two increments which is the factory standard for the assembly of this device, see Topic 6.13.07.

If the Forms Handler is used for an application which does not or cannot use the Style 3A form guide, the guide may be left in place. A back office console may require the preparation of passbooks plus some other application at a different time. The extreme right limit for a front feed form for the other application or applications is at position 130 or the right edge may be placed to the left of this position. A right rear guide Style 1, 3 or 4 may be used to guide the right edge of the front feed form.

If the passbook is inserted to the passbook limit and then advanced to the desired line number, the

minimum distance for the first print line in relation to the top edge must be considered. Certain programing routines require that the passbook be inserted to a line which is one line above the first print line and the passbook is advanced to the first line. If a minimum 1" first line was used with this routine the top edge of the passbook would not stay behind the Form Aligning Bail. The first line should be 1.2" from the top of the passbook for this type of a routine.

6.13.07 PASSBOOK CENTER-FOLD DETECTION, FINANCIAL FRONT FEED FORMS HANDLER

The center-fold detection is used to prevent the erroneous printing in the horizontal center-fold area of a passbook or to by-pass a minimum number of spaces in this area. Programing is required to actually accomplish the by-pass of the fold. A vertical center fold for a passbook is permitted instead of the horizontal, but the detectors are not applicable to the vertical fold. In addition to the Passbook Form Limit-Switch, the Style 3A rear guide includes the detectors for the horizontal center-fold area of a passbook, see Figure 6.13.06-1. Two detectors are present for this device, the primary and secondary detector. The detectors sense the back of the passbook to determine the presence or lack of a passbook in the passbook area. When the bottom edge of the passbook advances up past the primary detector a Flag of the "W" Group is turned on (set) provided the secondary detector is still in contact with the passbook. The flag is turned off (reset) when the bottom edge of the passbook advances past the secondary detector. The flag is turned off (reset) if both detectors sense the passbook or if the passbook is not present in the area of both detectors. The detector may be adjusted by a service representative for a by-pass of the center fold with one, two or three, 1/5" increments. The programing actually provides for the line advance based on the appropriate programing for the interrogation of the Flag setting. Usually the advance is accomplished by an instruction which advances one line and the instruction is re-executed based on the Skip and Execute instruction for the flag.

The center fold may be a maximum of 5" from the bottom of the passbook. The center fold may be a minimum of 3", 2.9", and 2.8" if the detectors are set to by-pass the fold area by one, two, and three increments respectively.

When the Passbook Form Limit-Switch is used for alignment or insertion to a first or starting line, this line must be a minimum distance above the center fold, as follows:

1. If one increment is used to by-pass the center fold, the bottom edge of the printed characters for the first print line must be a minimum of .945" from the fold. This is the same as 1" to the horizontal center of the printed characters. The minimum center fold is 3" from the bottom of the passbook.
2. If two increments are used to by-pass the center fold, the bottom edge of the printed characters for the first line must be a minimum of .845" from the fold. This is the same as .9" to the horizontal center of the printed characters. The minimum center fold is 2.9" from the bottom of the passbook.
3. If three increments are used to by-pass the center fold, the bottom edge of the printed characters for the first line must be a minimum of .745" from the fold. This is the same as .8" to the horizontal center of the printed characters. The minimum center fold is 2.8" from the bottom of the passbook.

The center-fold detection may be used without using the Passbook Form Limit-Switch, or without the programed interrogration of the Flag for the limit-switch.

The Flag of the center-fold detection will also set and then reset when the passbook is being manually inserted by the operator.

6.13.08 LAST PRINT LINE LIMIT-SWITCH, FINANCIAL FRONT FEED FORMS HANDLER

Under program control the limit-switch may be used to determine that the page of a passbook has been filled. When this condition occurs the operator turns to the next page or provides another passbook. The detector for the limit-switch senses the presence or lack of a passbook in the area when the Forms Handler is closed. When the bottom edge of the passbook advances up past the detector a Flag of the "W" Group is turned on (set). The limit is in the area of position 135 and between two Front Pressure Rolls. The limit is commonly described as the Passbook Present Flag.

The standard limit-switch provides for an adjustment range of .3". A service representative adjusts the limit-switch to any one desired setting. The switch may be set to detect a line which is between a minimum of .845" and a maximum of 1.145" from the bottom of the form to the bottom edge of the printed characters. The minimum and maximum are .9" and 1.2" respectively if the line is measured to the horizontal center of print for the .110" high characters. As an option the limit-switch may be provided to detect a line which is between a minimum of 1.145" and a maximum of 1.445" as measured to the bottom of the printed characters. This is the same as 1.2" and 1.5" as measured to the center line of print. With the .845" minimum last line, the passbook is still sufficiently controlled to permit a print on the last line after the Flag is set.

The Flag is always reset (turned off) when the Forms Handler is open with or without a front feed form or passbook present in the area (position 135) of the limit-switch. The Flag is always set when:

1. The handler is closed without a form or passbook present in the area of the limit-switch.
2. The closed handler advances the bottom edge of the passbook (form) up and beyond the limit-switch.

The limit-switch does not sense a pin feed form or journal, nor interfere with the use of either. Even though the Flag is set when the limit has detected the last line, continued advances of the passbook, if required, are possible because the limit does not restrict the movement of the passbook.

6.13.09 JOURNAL COVER AND REWIND DEVICE, FINANCIAL FRONT FEED FORMS HANDLER

A removable cover with a lock and key are provided to house the supply journal roll and the rewound part of the journal. Key combination 1042F8 is provided with the Journal Cover Lock with two keys, see Topic 5.06.04 for related protective locks.

The journal cover may be tilted rearward to install a journal roll or to remove the rewound part of the journal. The Roll Paper Guides and Holder, Style 1, are used for roll journals, see Topic 6.11.10. The Rewind Device will reroll a maximum of 25' of single-ply paper. The rewind function occurs with a left line-advance control. The width of the roll, one or two-ply, may be a minimum and maximum of 1 17/32" and 14.7" respectively. See Topic 6.13.02. The maximum diameter of the supply roll is 3 3/16". A separate intermediate carbon may not be used for a two-ply roll, but the back of the top copy may be carbon-coated or coated with some other duplicating characteristic.

The Journal Cover may not be tilted rearward when an attached Pin Feed device is present, but the cover may be removed or remain closed when the pin feed device is used. The use of cut journals is not recommended; however, if the Journal Cover is removed the rear-insertion of a cut journal is possible.

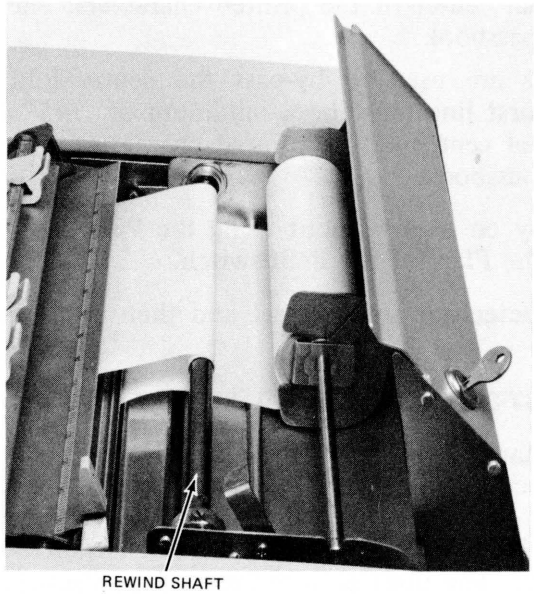


Figure 6.13.09-1 Open Journal Cover, Side View, Financial Front Feed Forms Handler

6.13.10 FORMS PATHS, FINANCIAL FRONT FEED FORMS HANDLER

With the Financial Front Feed Forms Handler the intake paths for journals and pin feed forms are at the rear of the platen. The forms also exit to the rear and a journal may be rewound. The intake path for a front feed form is in front of the platen and continues downward toward the back of the console. During the line advance or manual removal, the front feed form exits upward in front of the platen. See Subject 6.01.00 for line advance controls. The following figures display the use of the respective form paths for the different types of forms which may occupy the same area. Separate areas for the forms may be used also. The paths are similar to the Basic Front Feed Forms Handler, see Topic 6.12.10. Although the front path is illustrated with one dotted line the form may include two or more forms which are front fed in the same area or part of the same area. For example: Two receipts (extra copy) collated by the operator before being inserted.

The following code-lines are used to trace the advance or insertion of the form in the respective paths:

Front Feed Path	– – – – – – – – – –	(Dash) (Passbook)
Journal/Pin Feed Path	————————	(Solid Line for Journal)
Journal/Pin Feed Path	–.–.–.–.–.–.–.	(Dash-Dot for Pin Feed)
Pin Feed Path	.....	(Dots for Pin Feed)

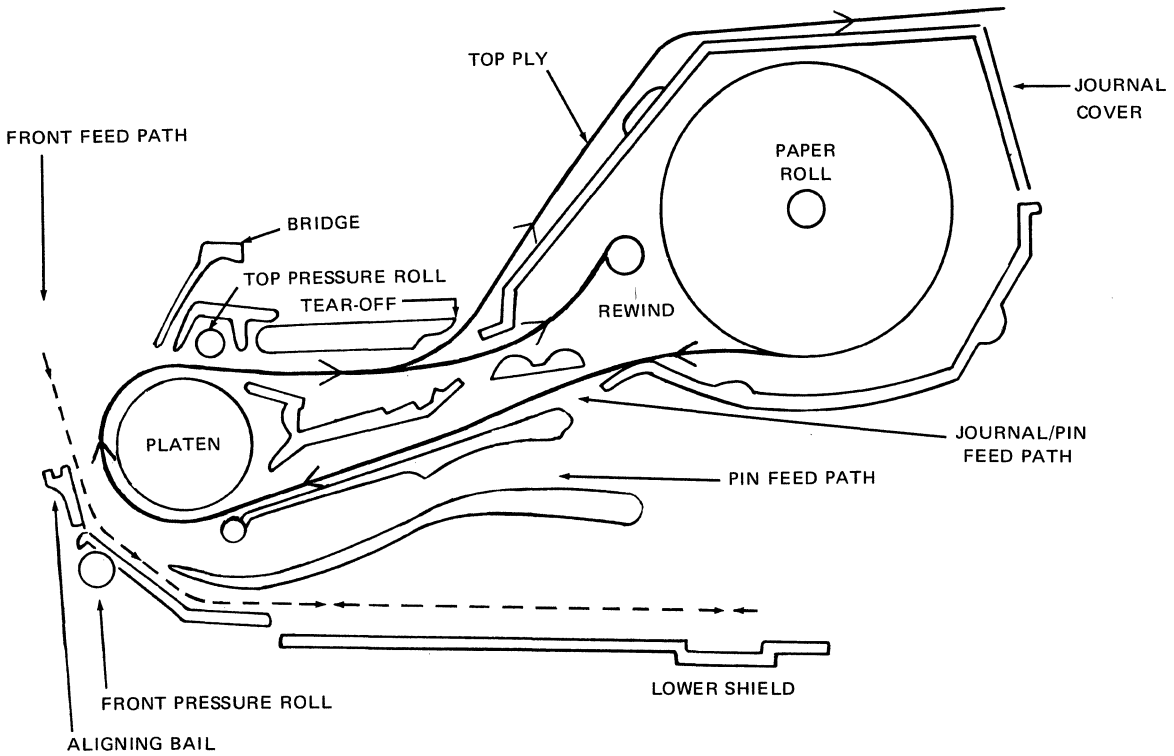


Figure 6.13.10-1 Front Feed, Passbook, and Journal Paths, Financial Front Feed Forms Handler

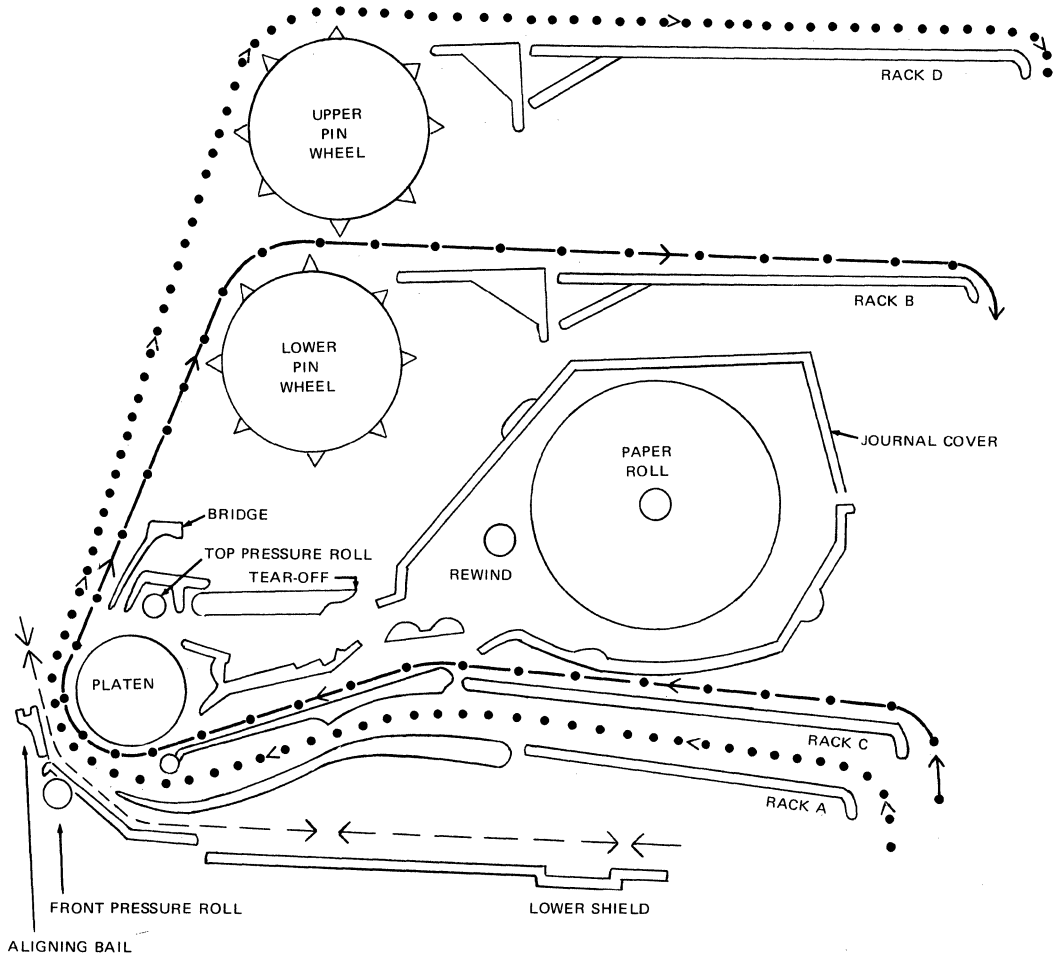


Figure 6.13.10-2 Paths for Front Feed Forms and Overlapping Pin Feed Forms, Style 1 Intake and Exit Racks, Financial Front Feed Forms Handler

Explanation of Figure 6.13.10-2 – The above example is for two overlapping pin feed forms with or without front feed forms. The lower and upper pin wheels are advanced by the left and right controls respectively. Two nonoverlapping pin feed forms (side-by-side) may use the same path; however, both forms may feed and exit over Intake Rack A and Exit Rack B respectively and either Rack C or D, or both could be removed for a nonoverlapping condition. In addition, if the forms do not overlap, Rack C could be used for the form on the upper pin wheel and Rack A could be used for the form on the lower pin wheel. See Subject 6.20.00 for Continuous Form Intake Guides. See Figure 6.12.10-2 for a single pin feed.

A journal, either cut or rolled, should not occupy the area where two pin feed forms overlap. A roll journal may occupy the same area of the pin feed form which is fed over Rack A provided the journal does not occupy any of the area where the two pin feed forms overlap. For the line advance capabilities with a nonsplit platen see Advance C-3 of Topic 6.01.03, or with a split platen see Advance D-3 of Topic 6.01.04. In addition, a roll journal may also occupy any area which is not occupied by a pin feed form.

A cut journal may be used in any area which is not occupied by a pin feed form; however, if a cut journal is used when two pin feed forms overlap, the pin feed form which feeds over Rack C must be single-part; both would be placed side-by-side in the journal/pin feed path. See Subject 6.08.00. The use of a cut journal is not recommended. See Topic 6.13.09.

See Topic 6.13.04 for Front Form Guide considerations if a front feed form and pin feed form are in the same area.

6.13.11 REAR LOWER SHIELD, STYLE 2, FINANCIAL FRONT FEED FORMS HANDLER

The Style 2 Rear Lower Shield holds Rear Form Guides the same as the Style 1 shield (Topic 6.12.08) except the Style 2 shield is not as large and a numeric scale is not provided.

6.14.00 MAGNETIC UNIT RECORD (MUR) FRONT FEED FORMS HANDLER, 26 INCHES

The Magnetic Unit Record Front Feed Forms Handler for the Series L is similar to a Basic Front Feed Forms Handler except one set of Magnetic Unit Record Modules are included to permit program control of automatic alignment of one Magnetic Unit Record or nonmagnetic front feed form. Also under program control, the system permits the reading and writing of data which is electronically encoded on the magnetic stripe. The modules are placed in the right area of the Forms Handler and under the Hinged Cover behind the platen. The module for the right edge of the form is stationary at Position 258. The adjustable module is accessible from the back of the system and is operator adjustable for "record" widths of 6", 8", 10", 12" and 14½", which are 11" high. A maximum of 46 visible print lines in 1/6" increments may be used for record updating.

The one stripe of the "record" has a capacity of 349 digits plus two line-find digits and one block check digit. This data is read in and written from a 22-word area of memory. The 349 digits are equal to 21, sixteen-digit words and one thirteen-digit word. The 349 digits may be programed to be formatted into a maximum of 64 different combinations or digit fields for any one "record". A numeric format may be for a minimum of 1 digit or a maximum of 15 digits plus sign. An alpha format may be a minimum of 2 digits for a 1-character message or a maximum of 126 digits for a 63-character message.

In addition, the handler is used to control forms which are fed into the handler in front of the platen or behind the platen. When noncontinuous front feed forms are manually inserted and aligned the leading edge will always be the bottom edge. For other types of forms which are manually placed in the handler, the leading edge will always be the top edge of noncontinuous journals or the beginning edge of continuous forms.

Forms which are maually placed in the handler and fed from the rear may be any of the following:

1. Continuous roll journals or paper around the platen.
2. Continous pin feed forms if a Pin Feed Device is provided.
3. Noncontinuous cut journals around the platen.

Front feed forms of various types and sizes are manually inserted in front of the platen and aligned to the previously printed line, to other designated areas of the form, or to a preset form limit.

Forms around the platen and pin feed forms may be used behind a Magnetic Unit Record, plus a front feed form in front of the "record" may be inserted for a print line a maximum of 2" from the bottom of the form. A front feed form behind the "record" is not permitted. Under the program control the Modules may be disabled (Retracted) and the area used to manually insert and align front feed forms without magnetic stripes, provided the application does not also use a "record" simultaneously in the handler. The use of forms to the left of the Module area (left of Position 95) are the same as for a Basic Front Feed Forms Handler.

The different types of forms may be either single or multiple-part. With the MUR Front Feed Forms Handler a combination of four different types of forms may be in any one area of the handler, see Topic 6.14.11.

The print line is visible to the operator when the forms are in the handler. In addition, part of the area above and below the print line is visible. For the area above the print line, the number of visible lines is dependent upon the type of forms used, see Topic 6.12.03.

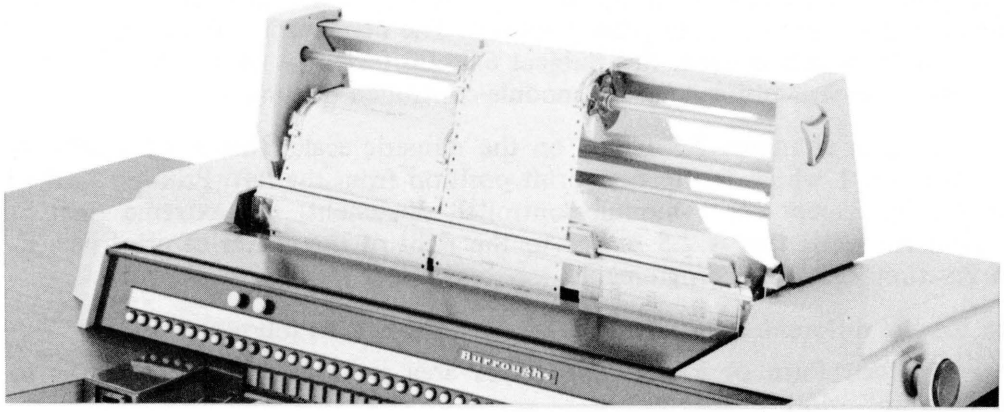


Figure 6.14.00-1 26" Forms Handler and Dual Pin Feed for Magnetic Record Computer.

See Figure 6.12.00-1, for the Forms Handler without the Pin Feed Device.

6.14.01 MUR FRONT FEED FORMS HANDLER FEATURES AND FUNCTIONS DESCRIBED IN OTHER TOPICS

The following features and functions are explained in the designated topics or subjects:

Line Advance (Vertical Spacing) and Platen, Advances A through F, 6.01.00.

Platen Twirlers, 6.02.00.

Split and Normal Platen, Overlaps B and C, Overlap of Split of a Platen with or without Overlap of Forms, 6.03.00.

Platen Normalizing Lever, 6.04.00.

Forms Handler Open and Close, 6.05.00.

Front Pressure Rolls, 6.06.00.

Top Pressure Roll Housing and Tear-Off for Journal, 6.07.00.

Pressure Roll Control Lever, 6.08.00.

Numeric Scales, 6.09.01.

Pin Feed Devices, 6.21.00, 6.22.00, and 6.23.00.

Optional Form Handling Features, 6.44.00.

Forms Specifications, 6.34.00.

Form Aligning Table, Transparent, Style 1, 6.12.03.

Form Heading Retaining Groove, 6.12.04.

Form Guide Bridge, Style 1, 6.12.05.

Lower Pressure Rolls, 6.12.06.

Hinged Cover with Latch and Release, 6.12.07.

Rear Lower Shield, Style 1, 6.12.08.

Roll Paper Holders, Style 2, 6.12.09.

Indicator Lights and Legend Strip, 3.04.04.

Program Key A1 – "Jam" Recovery, 3.04.06.

Program Keys and Read Ledger Instruction, 3.04.07.

Console Printer Near Magnetic Stripe, 4.00.03.

6.14.02 FORMS AREA, MUR FRONT FEED FORMS HANDLER

The area of the platen which may be occupied by forms is specified in relation to the numeric scales of the forms handler and the programable print positions. The maximum and minimum width is dependent upon the type of form which is used. See Subject 6.34.00 for these minimums. The maximum width is dependent upon which area is utilized by the module-controlled document.

The extreme left limit is at minus 2.5 tenths on the numeric scale; this is 3.5 tenths to the left of the center of print position 1 which is the first print position from the left. Printing to the left of Position 1 is not programable. Except for a module-controlled document, the extreme right limit is at 257.5 tenths on the numeric scale; this is 2.5 tenths to the right of the center of print position 255. Printing to the right of Position 255 is not programable.

The forms area for the different types of forms or documents is as follows:

1. For a pin feed form or journal the forms area is from minus 2.5 tenths to 257.5 tenths, maximum 26" width.
2. For a front feed form in the manual alignment area, the forms area is from minus 2.5 tenths to 95 tenths, maximum 9.75" width. This area is to the left of the Module area, see Item 3 below.
3. When the Magnetic Unit Record Modules are retracted, the forms area for manually aligned front feed forms in the module area is from 95 tenths to 258 tenths, maximum 16.3" width. Different types of Rear Form Guides are available for the areas to the left and right of Position 95. Scale Position 95 is the dividing line, but for the placement of Rear Form Guides the position may be considered within the module area if the left edge of a form is at Position 95, or it may be considered outside of the module area if the right edge of a form is at Position 95. See the following figures.
4. For a manually aligned front feed form which utilizes both of the above areas, the forms area is from minus 2.5 tenths to 258, maximum 26.05" width. See Topic 6.14.07 if the form will occupy an area in front of a nonretracted module, because the print line may be a maximum of 1½" or a maximum of 2". The locations of the rear guides is subject to the minimum module clearance as indicated in the following Figures 6.14.02-1 through -3.
5. For Magnetic Unit Records or nonmagnetic forms which are controlled by the modules, the right edge is fixed at Position 258. The left edge may be at Positions 198, 178, 158, 138 and 113 for widths of 6", 8", 10", 12" and 14½" respectively.

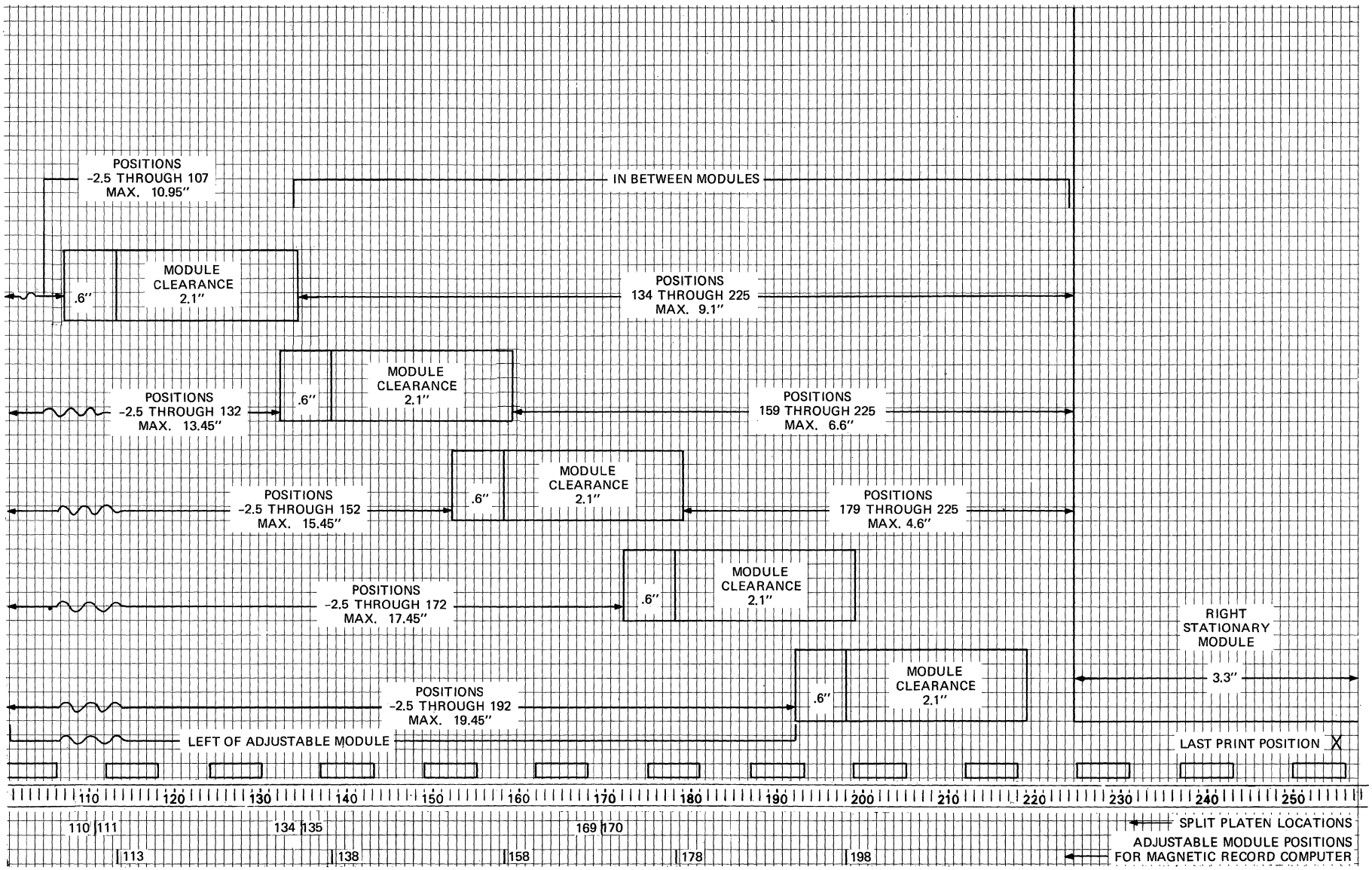


Figure 6.14.02-1 Front Feed Forms Area to Left of Adjustable Module or In Between Modules, MUR Front Feed Forms Handler

Explanation of Figure 6.14.02-1

Manually aligned front feed forms may be inserted and aligned to the left of the Adjustable Module, with or without a module-controlled document present. In absence of a module-controlled document, manually inserted forms may be in between the two modules with or without forms to the left of the adjustable module. A front feed form may be in the .6", 2.1", or 3.3" areas or all areas if the modules are retracted; however, a rear guide in these areas could not be used.

The .6" wide rectangles above the numeric scale of the figure represent Front Pressure Roll positions, Subject 6.06.00.

Forms Left of Adjustable Module

Manually aligned front feed forms are always permitted to the left of Position 95. For the module area (Positions 95 through 258), manually aligned front feed forms may be used in the left vacated area when the Adjustable Module is moved to the right. The right edge of a front feed form may be a minimum of .6" to the left of the programed position for the Adjustable Module. A Rear Form Guide may be used to guide the right edge. The first print line may be a maximum of 11" from the bottom of the form if any part of the form is to the right of Position 95. See Subjects 6.42.00 and 6.44.00 for the applicable Rear Form Guides which are used to the left and right of Position 95. The module may be retracted (inactive) or used for automatic alignment of a module-controlled document.

Forms Between Modules

Manually aligned front feed forms with a print line a maximum of 11" from the bottom of the form may be placed in certain specified positions in between the modules with or without the modules retracted. Rear Form Guides may also be present. The left edge of the form must be a minimum of 2.1" to the right of programed positions 113, 138 and 158 for the Adjustable Modules. The right edge of the form and rear guide may be at Position 225 or to the left of Position 225. With a Rear Form Guide present a module-controlled document and a manually aligned front feed form without Rear Form Guides may not be used in between the modules, because Front Form Guides for the front feed form may not be present in this area when the document is used, see Topic 6.14.06.

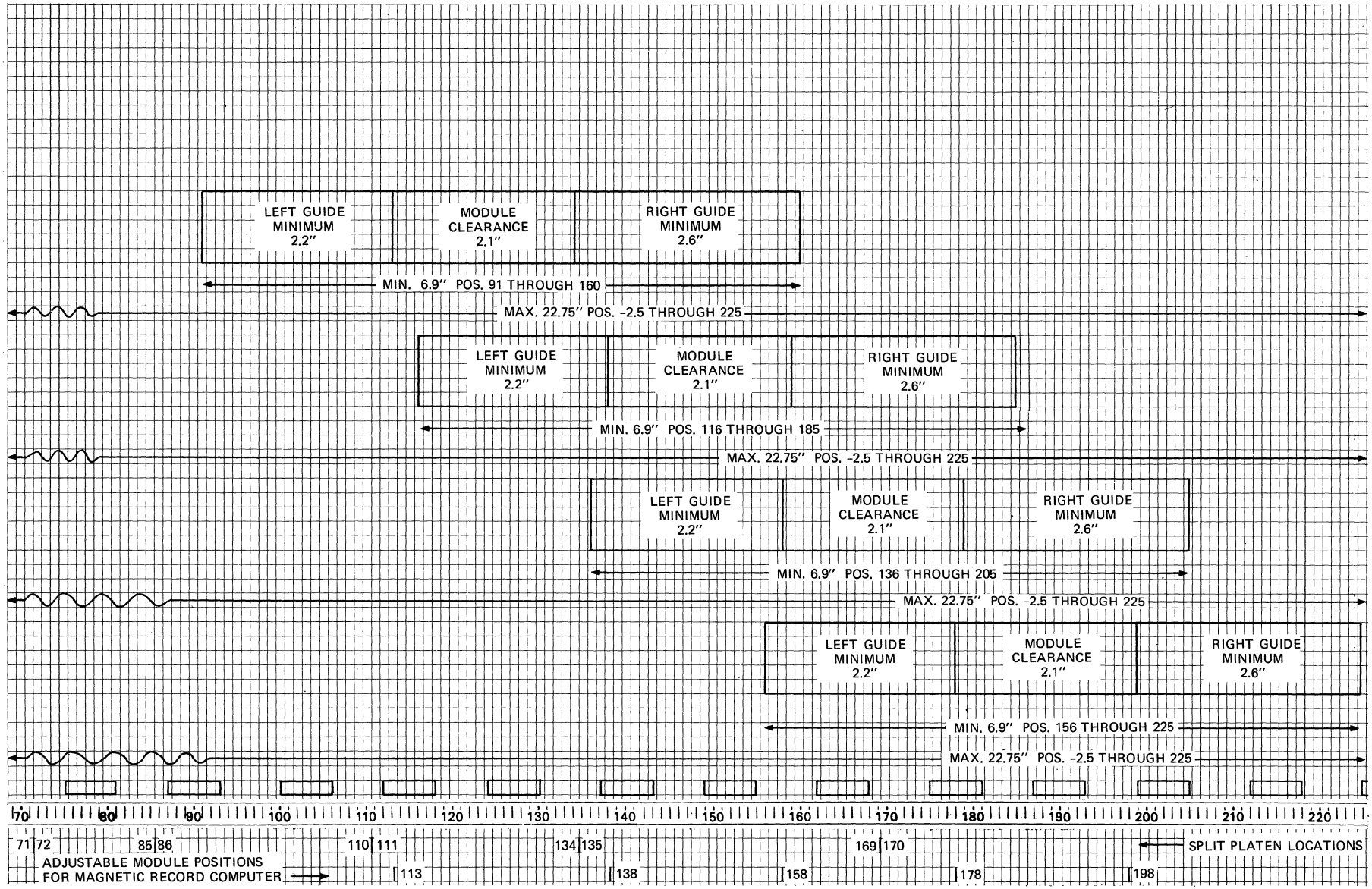


Figure 6.14.02-2 Front Feed Forms Area Utilizing Rear Guides On Opposite Sides of Adjustable Module, MUR Front Feed Form Handler

Explanation of Figure 6.14.02-2

The figure indicates the permissible locations for manually aligned front fed forms which may be guided by a Rear Form Guide when the modules are retracted. The left and right edge of the form would be on opposite sides of the retracted adjustable module. The left and right edge of a front feed form must be a minimum of 2.2" and 4.7" respectively from the programed Positions 113, 138, 158, and 178 for the Adjustable Module. The minimum form width is 6.9" between these two distances. The first print line may be a maximum of 11" from the bottom of the form. The edge of a front feed form may be placed in the 2.2", 2.1" or 2.6" areas or to the right of Position 225; however, a rear guide could not be used in these areas. See Topic 6.14.07 for a form in front of the nonretracted (active) Adjustable Module. The .6" wide rectangles above the numeric scale of the figure represent Front Pressure Roll positions, Subject 6.06.00.

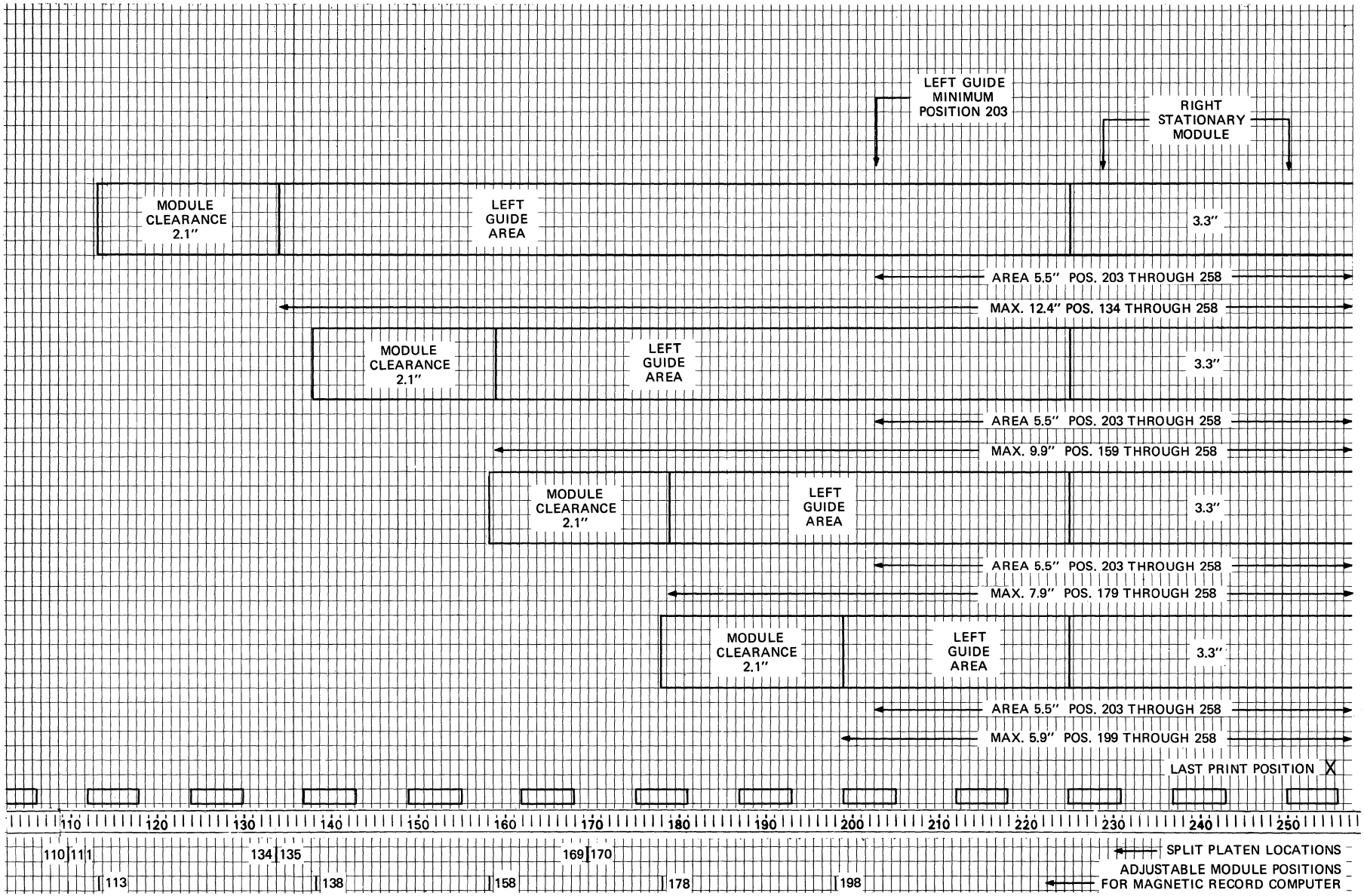


Figure 6.14.02-3 Front Feed Forms Area with Only the Left Rear Form Guide, MUR Front Feed Forms Handler

Explanation of Figure 6.14.02-3

The left edge of a front feed form may utilize a Rear Form Guide and the right edge may be placed in the 3.3" area of the retracted Right Stationary Module without a rear guide. The left edge of the form must be a minimum of 2.1" to the right of the Adjustable Module, and at Position 203 or to the left of Position 203. The left edge may be in the 2.1" area of the Adjustable Module without a rear guide. See Figure 6.14.02-1 for a form to left of the Adjustable Module or a form between the modules.

The .6" wide rectangles above the numeric scale of the figure represent Front Pressure Roll positions, Subject 6.06.00.

6.14.03 MAGNETIC UNIT RECORD MODULES

The modules are used to control the Semiautomatic Random Access of the Magnetic Unit Records by the Forms Handler.

The right edge of a module-controlled document must be at scale Position 258. The left module is operator adjustable for the following document widths.

Widths	Position of left edge	
6"	198	
8"	178	Form Height
10"	158	is 11".
12"	138	
14½"	113	

See Subject 6.34.00 for the various paper combinations, sizes, and thicknesses in the module area.

After the document is inserted in the module area by an operator, the document movement is under program control or under control of the systems logic. The document may be automatically aligned to any or all of 46 lines provided the print line is a minimum of 1" from the top of the document or the printing line is a minimum of 2½" from the bottom of the document. The measurements are to the bottom edge of the printed characters. This provides for a maximum of 46 lines on an 11" high document. The 1" minimum from the top is the first possible print line; however, for any one document the first print line may be programed to be greater than 1" from the top provided the distance is measured in 1/6" increments. See Line Numbers in Subject 6.34.00. The selection of the first line or any successive line or lines is a program function; however, the lines may be selected in nonsuccessive order. The use of the document may be terminated under program control, prior to using line 46 (filled sheet). A "jam" (operator warning) will occur if the module-controlled document is advanced beyond the 46th line, see Topic 3.04.06.

See Advance F of Topic 6.01.06 for advance after posting the "last item" which is different than a Filled Sheet condition.

Module Adjustment

The adjustable module is the left module in relation to the programing. From the back of the console it is the right module and is held in place at detented positions. The Module Release button is at the end of the module and easily accessible from the back. The button must be depressed and held to release and move the module from one position to another. When the button is released the movement may continue until the next detent position is reached. Or the button may be held depressed to by-pass a position or positions. The module must not be positioned in between the detent positions and for a satisfactory operation the module must be set for the document width used for the application.

A form must not be present in the modules when the Adjustable Module is repositioned. Manually aligned front feed forms should be clear of the module area also. See Note E of Topic 5.01.01 for Power ON and manually aligned forms in the module area.

Although Position 113 is the extreme left limit for documents under control of the modules the module area is from Position 95 through 258. This area is used for automatic alignment of the Magnetic Unit Records and it may be used for manually aligned forms. For these areas see Topic 6.14.02. See Topic 6.14.07 for the print lines with nonretracted modules.

Document Speed for Automatic Movement

The Magnetic Unit Record Modules move the record at 16" per second or 96 lines per second during an alignment, eject, or write operation. Each line is 1/6". The Magnetic Record Reader, an optional adjunct, feeds and reads at 45 records per minute.

The Line Advance speed (form space) is a maximum of 20 lines per second.

6.14.04 SEMIAUTOMATIC RANDOM ACCESSING, MUR FRONT FEED FORMS HANDLER

The semiautomatic random accessing functions are for program control of Read. Non-Read, Align, Non-Align, Write, and Eject. These functions are used in different combinations; for example, Read and Eject permits a read of the record but the record does not remain in the Forms Handler. Align refers to selection of a print line on the record which is different than Line Advance which spaces the record up. The functions for the accessing of the record do not advance or move a form around the platen, or a pin feed form in any area. The procedure in relation to other front feed forms must be properly considered. The Line Advance functions space all types of forms in accordance with capabilities of left and right platen controls. See Topic 3.01.01 for numeric indexing with these accessing functions.

Operator-Insertion and Removal

The leading edge (bottom) of a front-inserted document must be manually inserted approximately 3/4" below the Front Pressure Rolls before the handling functions control the document movement when Read Ledger instructions are programed. See Legend Strip, Topic 3.04.04. After a Write Ledger or Eject instruction, the document must be manually removed approximately 3/4" before the program execution is continued. See Topic 6.14.09 for a summary of Form Handler openings. Once the Modules accept control of the document (it is held by grippers) all document movement is under control of the program, the "jam" procedure, Line Advance key, or the functions for the Ready Mode and Power ON. A deliberate and persistent attempt by an operator to manually remove the document after alignment generally will create a damaged document before the removal is accomplished. An operator attempt to interrupt or prevent document movement may create read or write errors, or "jam" conditions. The program capabilities or systems logic provide a recovery procedure for these conditions, see Topic 3.04.05 and 3.04.06.

In the absence of a Read Ledger instruction, the erroneous or intentional insertion of a form to the ready position of the Forms Handler does not prevent continued operations regardless of whether the Forms Handler remains open or closed. The form is not accepted by the modules in the absence of a Read Ledger or Non-Read Ledger instruction. This insertion is generally not required during normal operating procedures. The form may be removed easily from the ready position if the handler is subsequently closed provided the Front Pressure Rolls (Subject 6.06.00) for the area are disabled. If the form is left in the ready position, it may or may not align when a Read Ledger instruction becomes active. This depends upon how far the form has been inserted. A programed re-insertion of a form after a write or eject operation requires that a form be removed approximately 3/4" and then be re-inserted. See Subject 6.34.00 for the position of the horizontal perforation if the Magnetic Unit Record is used in front of a pin feed form.

Automatic Movement

During alignment after insertion, the document moves to a rearward limit and then moves upward to align. During alignment from an aligned position (re-alignment) the document also moves rearward and aligns to the same line, or a higher or lower line in accordance with the program; the handler opens, if closed. During an eject or write operation the Forms Handler opens, if closed, and the document moves rearward to the same limit and then upward to the ejected position. The Forms Handler remains open until closed by an instruction or key which includes a closing function. See Topic 6.14.09.

Front Form and Automatic Movement

Forms which are to be manually aligned in front of the module-controlled document should not be inserted until after alignment is completed. If a verify routine or status condition (account verification) may subsequently eject the module-controlled document, the front form should not be introduced until these conditions are satisfied. A form which is manually aligned in front of a module-controlled document must be removed before the Write Ledger or Eject Ledger operation occurs.

Read Error and Filled Sheet Movement

The Magnetic Unit Record automatically ejects during a read error or a filled sheet condition which occurs when a document is initially inserted in the Forms Handler. After a read error, at least one re-attempt of the read function should occur if the form is not physically damaged.

Forms at Left

Front-inserted forms to the left of the module-controlled document may be inserted and aligned prior to or after the insertion of the document, because the Forms Handler is not closed by the automatic read or align functions for the handler.

The capabilities of the Forms Handler and related forms control functions determine the proper sequence for the alignment of these left forms. Once the left forms are aligned the forms remain aligned prior to the closing and during the closing of the Forms Handler. However, the alignment is disturbed during an opening of the Forms Handler. A proper sequence for the manual alignment of the left forms avoids any re-alignment of the left forms which is required because of the disturbance created by the opening with the automatic handling functions for the module-controlled document. (The Magnetic Record Reader does not open the Forms Handler.) In addition, the advance of a form or forms behind the left forms with the Forms Handler open will disturb the alignment of the left forms if these forms are manually aligned out of sequence.

Sequences for Forms Handler Records with Magnetic Record Reader

Certain applications require insertion of a Magnetic Unit Record in the Forms Handler and a read by the Magnetic Record Reader. Separate Read Ledger (RL) instructions permit this automatic function, but the execution is not simultaneous. Generally, the data read by the Magnetic Record Reader is transferred to the record in the handler or used as input for the programed computations for the application.

The read by the Magnetic Record Reader may occur prior to the insertion of a record in the Forms Handler. If a condition for a read error in the Reader, or a form out of sequence occurs, the condition may be corrected prior to the insertion of the record in the handler.

The read by the Magnetic Record Reader may occur after the insertion of a record in the Forms Handler. The operating procedure for a read error in the Reader or record out of sequence usually requires the programed ejection of the record in the handler. See Program Keys and Reader, Topic 3.04.07. The Filled Sheet procedure for a record in the Forms Handler is required but the Filled Sheet procedure for a record in the Reader is not generally required. Furthermore, the Filled Sheet condition (setting of S-F flag) which is signaled by the Reader should not erroneously execute a Filled Sheet routine for the Forms Handler.

6.14.05 MAGNETIC UNIT RECORD MODULES AND LINE ADVANCE AFTER ALIGNMENT

Once the document is received by the modules the document movement is controlled by the program controls for movement in the Modules or controlled by the systems logic for Power ON, Return to the Ready Mode, and "jam" procedures.

Platen Split (Uncoupled), and Line Advance

The Shifted position of the Line Advance key, and Line Advance (form space) functions (ALR) (AR) (ARTO) for the right platen controls will advance the module-controlled document with the Forms Handler open or closed, with or without enabled Front Pressure Rolls. The pressure rolls must be enabled to advance or use a form in front of the module-controlled document. See Subject 6.01.00 for Line Advance combinations and Topic 6.06.03 for the "Three-line" Rule if the pressure rolls are enabled.

Platen Split Normalized (Coupled), and Line Advance

With this selected condition, the Line Advance functions (AR) (ARTO) for only the right platen control, and the Shifted position of the Line Advance key do not function to advance the left or right section of the platen with or without a document. However, the module-controlled document and right-controlled pin feed form may be advanced without the rotation of the platen provided the Front Pressure Rolls are disabled if the advance occurs with the handler closed. An advance with the handler open is not affected by the rolls.

Magnetic Unit Record Modules and Platen Twirlers

The platen twirlers at either end of the Forms Handler do not advance nor "turn back" the module-controlled document. The twirlers may move the other forms in either direction. For consistent results the Forms Handler should be opened when using the twirler or twirlers to move any forms which are behind the document in the modules. See Advance E of Topic 6.01.05.

6.14.06 FRONT FORM GUIDES AND REAR FORM GUIDES, MUR FRONT FEED FORMS HANDLER

The Front Form Guides (Subject 6.44.00) for the front-inserted document which is automatically aligned in the modules are different than the guides used for the manually aligned front-inserted forms. The latter guides cannot be used at the edges or in front of the document which is automatically aligned. For the right guide of a module-controlled document, an adjustment screw limits and marks the right edge for the placement of the guide. If removed or repositioned the guide must be accurately replaced to this adjustment limit. The Style 2 rear guides are not used nor are any other rear guides required for automatic alignment. Furthermore, the Style 2 guides must not be present in the area where a document is automatically aligned. Instead the guides are used for manually aligned forms to the left of the adjustable module or used for manually aligned forms which are used in certain allowable positions in between the modules. The modules may or may not be retracted, see Topic 6.14.02. The bottom part or rear part of a manually aligned form slides under the module covers of the retracted modules when the form is inserted in front of the module area for a print line greater than 2" from the bottom of the form.

An overlapping form in front of a module-controlled document is not permitted if a pin feed form extends beyond the left edge of the document. Form guide combinations are not available for the left edge of the document, when both the front and pin feed forms overlap to the left of the document. See form guide Styles 5-L and 7-L of Subject 6.44.00.

A front feed form behind the module-controlled form is not permitted.

Front Form Guides, Manual Front Feed Forms Area

The Front Form Guides applicable to the Basic Front Feed Forms Handler are used in this Front Feed area (Positions -2.5 through 95) or between this area and to the left of an automatically aligned document. The guides may also be used in the Module Area when the area is used only for manual alignment of forms. These guides cannot be used to guide edges of a Magnetic Unit Record or nonmagnetic form which is automatically aligned by the Modules, nor used in front of the Magnetic Unit Record or nonmagnetic form aligned by the modules. See Subject 6.42.00 for these guides.

Rear Form Guides, Manual Front Feed Forms Area

Rear Form Guides for this area (-2.5 through 95) are the same as for a Basic Front Feed Forms Handler. See Subject 6.42.00.

The Style 2 Rear Form Guides used in the Module area may be used for this area also. See Subject 6.44.00.

6.14.07 NONRETRACTED MODULES AND PRINT LINE

If a manually aligned front feed form is placed in an area in front of the nonretracted (active) adjustable modules without an automatically aligned document present, the print line may be a maximum of 1½" from the bottom of the form to the bottom edge of the printed characters. Furthermore the form must occupy an area to the left of Position 225. This condition does not permit the subsequent alignment of an automatically aligned document after the manually aligned form is present. (If inserted to a depth greater than 1½" the automatic functions disturb the alignment.) A manually aligned form in front of an automatically aligned document may be inserted for a print a maximum of 2" from the bottom of the form, and the manually aligned form may be to the right of Position 225. For either condition the minimum print line is 5/6" from the bottom of the manually aligned front form.

The area in front of the nonretracted module is 2.1" to the right of the programed position of the adjustable module. The module program positions are at 113, 138, 158, 178, and 198. See illustrations in Topic 6.14.02.

6.14.08 IRREGULAR PROGRAMING CONTROL OF MAGNETIC UNIT RECORDS

The system operation is prevented when certain abnormal programed conditions for the Modules occur. These system blocks do not illuminate the Error Indicator. The blocks usually would occur only during the debugging of the program:

1. When the application requires the use of a Magnetic Unit Record and a front feed form in the module area at separate times.
2. When the application is used without a Magnetic Unit Record but a nonmagnetic form is automatically aligned by the modules.

See Note E of Topic 5.01.01 also.

Retracted Position and Read Ledger Instruction

A system block will occur when a Read Ledger instruction for the Forms Handler becomes active when the Modules are in the retracted position. The Retract (RET) instruction may have been executed to permit the use of the module area for the manual alignment of a front feed form more than 1½" form the bottom of the form. The Forms Handler does not open, a Program (PK) key (enabled or nonenabled) will not terminate the Read Ledger instruction. The "Program Halt and Clear" button may be used, see Subject 5.05.00. A Read in the Magnetic Record Reader may occur with the modules in the retracted position; however, if the Reader is turned OFF the Reader Read instruction converts to a Read and Eject (Non-Align) instruction for the Forms Handler and the system block occurs.

Eject Position and Eject Ledger or Write Ledger Instruction

A system block will occur when an Eject or Write instuction becomes active and the Modules are already in the forward position. The Forms Handler does not open, a Program (PK) key (enabled or nonenabled) will not eliminate the block. The Program Halt and Clear button may be used, see Subject 5.05.00.

Retract Position and Retract Instruction

A system block will occur when a Retract instruction becomes active and the Modules are already in the rearward (retracted) position. The Forms Handler does not open, a Program (PK) key (enabled or nonenabled) will not eliminate the block. The Program Halt and Clear button may be used, see Subject 5.05.00.

6.14.09 FORMS HANDLER OPEN AND CLOSE, MUR FRONT FEED FORMS HANDLER

The Forms Handler automatically closes, if open, with the execution of a print instruction, the Close Forms Handler (CC) instruction, or the handler may be closed manually with the Open/Close key when a numeric, typing or numeric phase of Read Ledger instruction is active, see Subject 6.05.00.

The Forms Handler may be opened, if closed, as summarized in the following chart.

Summary of Forms Handler Opening and Related Document Movement for Magnetic Unit Record Modules

FUNCTION OR INSTRUCTION	OPEN IF CLOSED	MOVEMENT
Open/Close Key depression	Yes	None
Read and Align to next line (line number encoded on stripe plus one)	Yes	Aligns when inserted.
Read and Align to number in Stripe Count Register	Yes	Aligns when inserted.
Read and Align to first possible line, 1" from top	Yes	Aligns when inserted.
Non-Read and Align to line number in Stripe Count Register	Yes	Aligns when inserted.
Read and Eject (Read and Non-Align)	Yes	In and Out when inserted.
Read in Record Reader with Record Reader ON	No	In Record Reader
Converts to Read and Eject with Record Reader OFF or disconnected	Yes	In and Out when inserted.
Write Ledger	Yes	Out, if present
Retract	Yes	None, malfunction if form is present.
Ledger Align to Number in Stripe Count Register, maybe higher or lower line than aligned form	Yes	Aligns form already aligned.
Eject Ledger	Yes	Out, if present
Open Forms Handler instruction, OC	Yes	None
Power ON when system if OFF	Yes	Out or remains aligned. See Topic 5.01.01.
Return to Ready Mode from program with Ready push button	Yes	None
"Jam" condition	Yes	Out, if present. See Topic 3.04.06.
Return to Ready Mode with Program Halt & Clear button	Yes	Out, or remains aligned. See Subject 5.05.00.
Return to Ready Mode with attempt to type beyond 255	Yes	Out, or remains aligned.
Return to Power ON state when system is ON	Yes	Out, or remains aligned. See Topic 5.01.02.

6.14.10 SUMMARY OF FIRST AND LAST PRINT LINE

The first and last print lines are summarized in the following chart. The measurements are from the top or bottom edge of the form to the bottom edge of the printed characters.

Item	Type of Form	First Line Minimum From Top	First Line Maximum From Bottom	Last Line Minimum From Bottom
1	Cut Journal around platen	2"		1 5/6" or 5/6"
2	Roll Journal tear-off	4½" from line of print		
3	Manual Front Feed to left of modules	1¼"	14¾" (15" Form)	5/6"
4	Item 3 with Style 1 rear guide	1¼"	13½"	5/6"
5	Manual Front Feed, module area with or without rear guides	1¼"	11"	5/6"
6	Magnetic Unit Record, 11"	1"	10"	2½"
7	Nonmagnetic Form, 11" (Auto. Aligned)	1"	10"	2½"
8	Manual Front Feed in front of Item 6 or 7	1¼"	2"	5/6"
9	See Subject 6.42.00 for optional form limits for Items 3 and 4.			
10	See Topic 6.12.03 for alignment to top of Form Aligning Table.			
11	See Subject 6.06.00 for explanation of Item 1.			
12	Manually Aligned Front Feed forms may use an optional 5/6" first line, see Subject 6.44.00.			
13	See Topic 6.14.07 for a 1½" first line.			

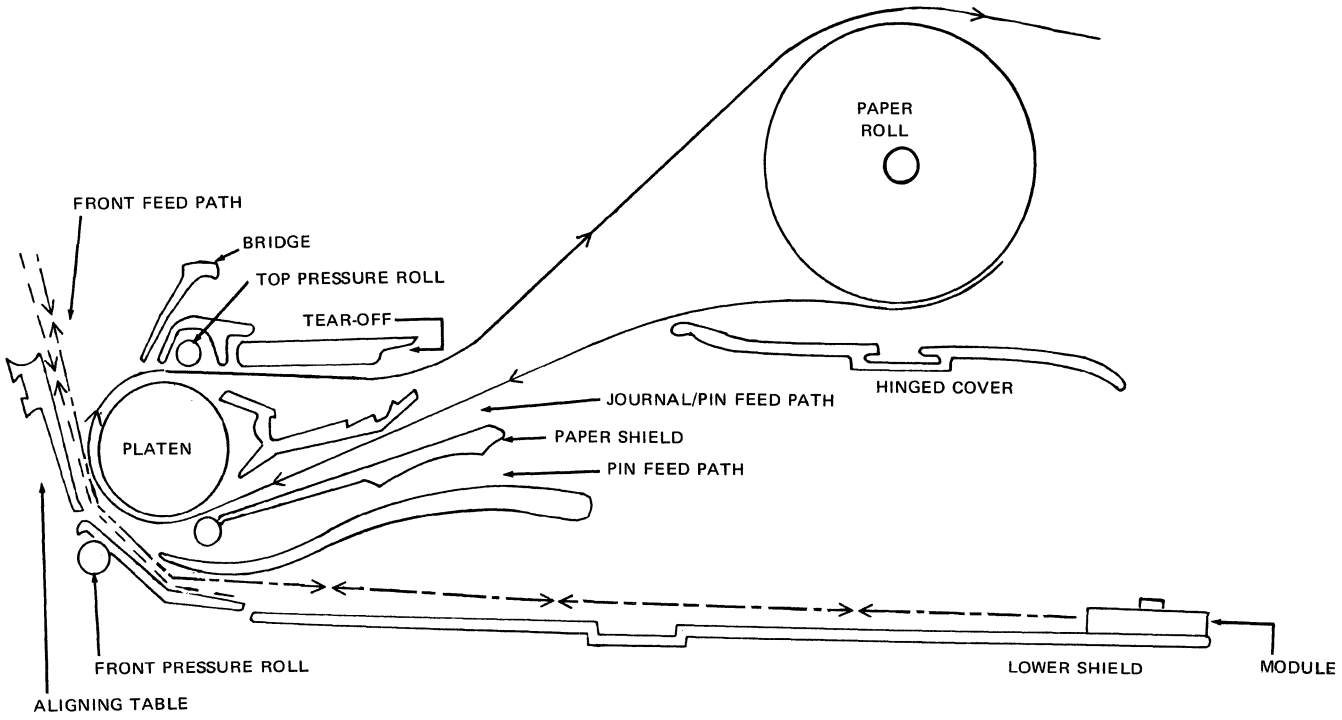
6.14.11 FORMS PATHS, MUR FRONT FEED FORMS HANDLER

With the MUR Front Feed Forms Handler the intake paths for journals and pin feed forms are at the rear of the platen. The forms also exit to the rear. The intake path for a front feed form or module-controlled document is in front of the platen and continues downward toward the back of the console. During the line advance or manual removal, the front feed form exits upward in front of the platen. During the line advance or automatic ejection, the module-controlled document also exits upward in front of the platen. See Subject 6.01.00 for line advance controls. The following figures display the use of the respective form paths for the different types of forms which may occupy the same area. Separate areas for the forms may be used also. The paths are similar to the Basic Front Feed Forms Handler, see Topic 6.12.10. Although the front path is illustrated with one dotted line the front feed form may include two or more forms which are front fed in the same area or part of the same area. For example:

1. Ledger and statement collated by the operator before being inserted.
2. Ledger and overlapping elongated form, check and payroll ledger.

A module-controlled document may also be in the front feed path; see Topic 6.14.07 for the maximum print line for a front feed form when the modules are nonretracted (active). The following code-lines are used to trace the advance or insertion of the form or document in the respective paths:

Front Feed Path	– – – – – – – – –	(Dash)
Journal/Pin Feed Path	———————	(Solid Line for Journal)
Journal/Pin Feed Path	– . – . – . – . – .	(Dash-Dot for Pin Feed)
Pin Feed Path	. . . . .	(Dots for Pin Feed)
Module-Controlled Document	- — - — - — - — -	(Broken line) (Magnetic Unit Record or nonmagnetic form)



Explanation of Figure 6.14.11-1

A cut journal may be used instead of the illustrated roll journal. The Magnetic Unit Record path is behind the front feed form, if present, and in front of the journal. See Figure 6.12.10-1 for the path of a front feed form if the module-controlled document is not used.

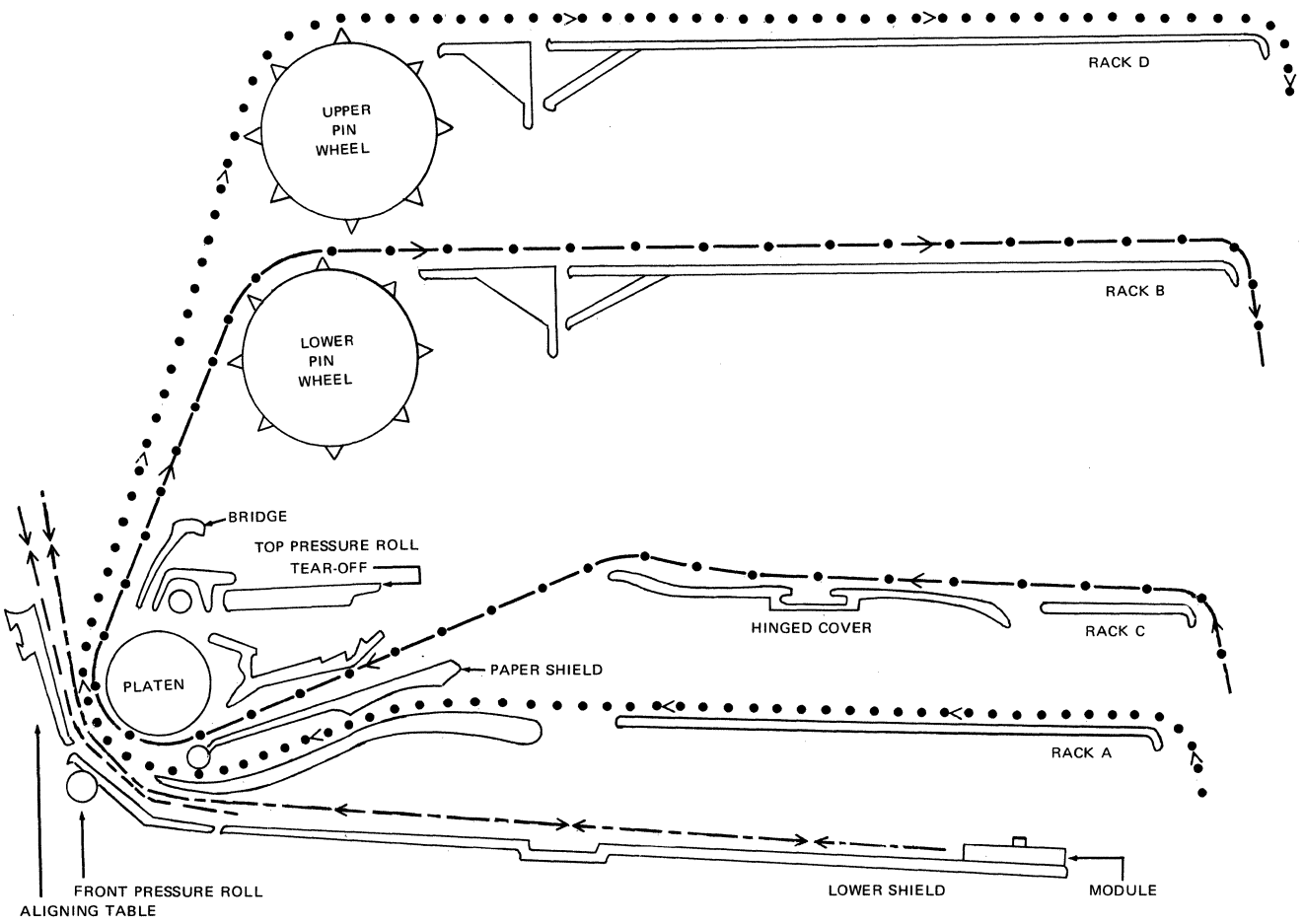


Figure 6.14.11-2 Paths for Front Feed Forms, Magnetic Unit Record, and Overlapping Pin Feed Forms, Style 1 Intake and Exit Racks, MUR Front Feed Forms Handler

Explanation of Figure 6.14.11-2

The above example is for two overlapping pin feed forms with or without front feed forms and Magnetic Unit Records. The lower and upper pin wheels are advanced by the left and right controls respectively. Two nonoverlapping pin feed forms (side-by-side) may use the same paths; however, both forms may feed and exit over Intake Rack A and Exit Rack B respectively, and either Rack C or D, or both could be removed for a nonoverlapping condition. In addition, if the forms do not overlap, Rack C could be used for the form on the upper pin wheel and Rack A could be used for the form on the lower pin wheel. See Subject 6.20.00 for Continuous Form Intake Guides.

A journal, either cut or rolled, should not occupy the area where two pin feed forms overlap. A roll journal may occupy the same area of the pin feed form which is fed over Rack A provided the journal does not occupy any of the area where the two pin feed forms overlap. See Figure 6.12.10-2 which is for a single pin feed form. For the line advance capabilities with a nonsplit platen see Advance C-3 of Topic 6.01.03, or with a split platen see Advance D-3 of Topic 6.01.04. In addition, a roll journal may also occupy any area which is unoccupied by a pin feed form.

A cut journal may be used in any area which is unoccupied by a pin feed form; however, if a cut journal is used when two pin feed forms overlap, the pin feed form which feeds over Rack C must be single-part; both would be placed side-by-side in the journal/pin feed path. See Pressure Control Lever, Subject 6.08.00.

The Magnetic Unit Record path is behind the front feed form, if present, and in front of the pin feed forms. See Figure 6.12.10-3 for the path of a front feed form if the module-controlled document is not used.

6.20.00 CONTINUOUS FORMS PIN FEED DEVICE FOR 15½" AND 26" FORMS HANDLERS

With the removable Pin Feed Device, single or multiple-part forms may be automatically fed from the rear of the Forms Handler to the print area of the platen and these completed forms restacked at the rear of the console. The operator does not have to handle the forms except for the initial installation of the supply package, and the removal of the completed forms. Under program control, the forms are advanced from one line to the next, slewed past an area which is equal to several single lines, or advanced from one segment (length or form) of the pin feed form to the next. Multiple-part forms commonly utilize the pin feed device.

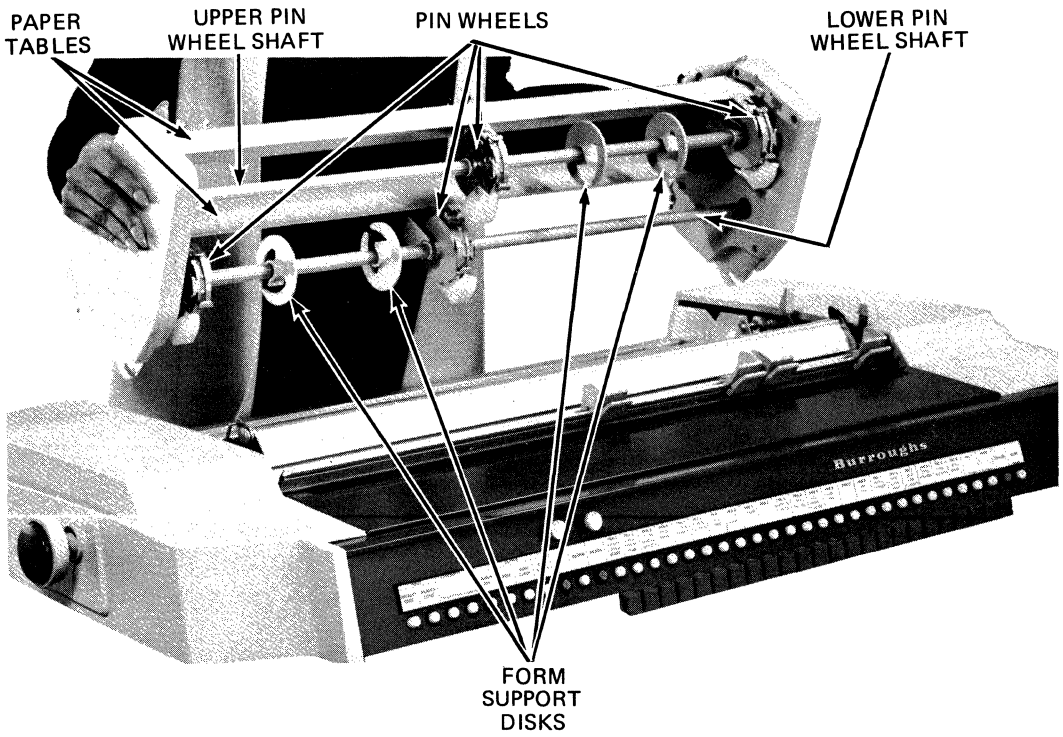


Figure 6.20.00-1 Continuous Forms Pin Feed Device, Dual, 26" Width

One of the purposes of the Pin Feed Device is to provide program control for the "slewing" of continuous forms. "Slewing" means to advance the forms several lines at a time automatically. For example, the advance of the pin feed form from the last line printed on one form (segment) to the first printing line on the next form, or to a specific line on a form from any previous line. Usually the segments are separated by horizontal perforations.

Another purpose of the Pin Feed Device is to prevent the "skewing" of the forms. This misalignment occurs when one side of the form advances ahead of the other, and the resulting printing is at an angle. Without a positive means of control, certain forms advanced several lines at a time may skew. The Pin Feed Device reduces this possibility.

If a Pin Feed Device is used with a Rear Feed Forms Handler a noncontinuous rear feed form may not be used. A front feed form and pin feed form may be in the same forms area with a Front Feed Forms Handler. See Topics 6.11.11, 6.12.10, 6.13.10 and 6.14.11 for the forms path with Rear Feed, Basic Front Feed, Financial, and Magnetic Unit Record Forms Handlers. Certain permissible combinations of journals and pin feed form in the same area are also explained in these topics.

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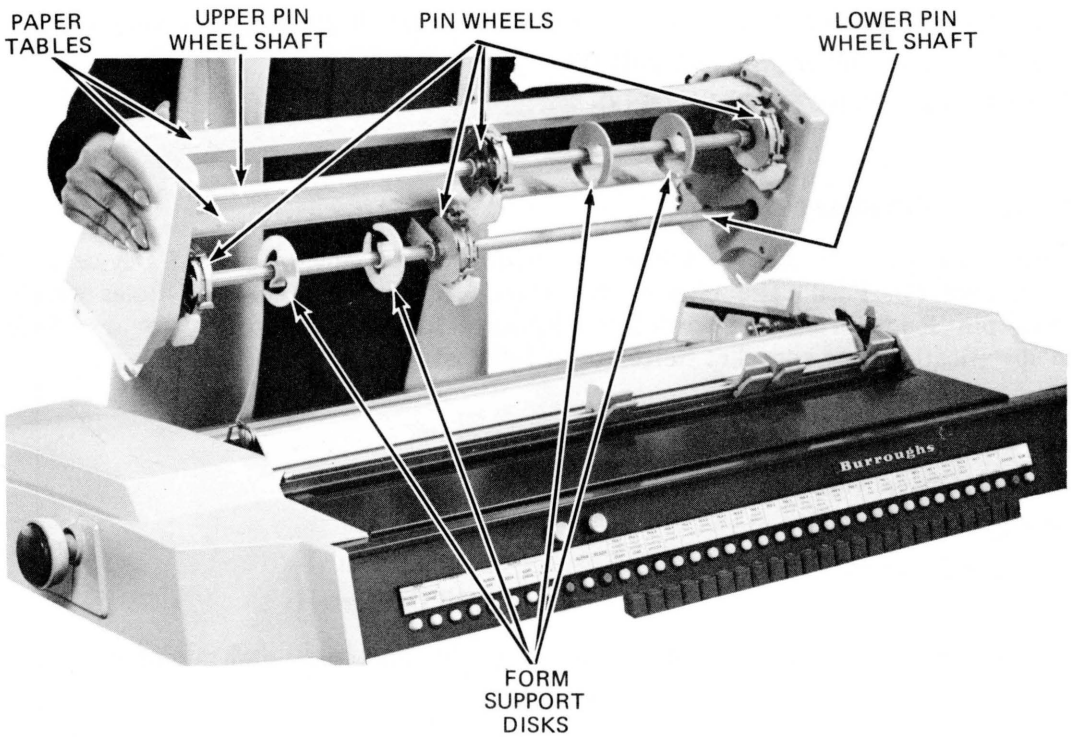

Figure 6.20.00-1 Continuous Forms Pin Feed Device, Dual, 26" Width

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Two models of the single Pin Feed Device are provided and one model of the dual Pin Feed Device is available:

1. Single, Synchronous Pin Feed Device, Subject 6.21.00
2. Single, Independent Pin Feed Device, Subject 6.22.00
3. Dual, Synchronous and Independent Pin Feed Device, Subject 6.23.00

The following Topics or Subjects may be used as a reference for the utilization of the Pin Feed Device:

1. Form Specifications for the respective Forms Handlers beginning with Subject 6.31.00.
2. Line Advance Controls, Subject 6.01.00.
3. Front Pressure Rolls, Subject 6.06.00.

6.20.01 PIN WHEELS AND SHAFT

A set of movable (Topic 6.20.02) Pin Wheels is provided for a single Pin Feed Device and two sets are provided for a dual Pin Feed. The pins of the wheels fit into the sprocket holes which are at each margin of the pin feed form. The Form Specifications for pin feed forms are described in Subject 6.30.00; the specifications for sprocket holes are as follows:

Margins for Pin Feed Form	
Sprocket hole diameter (nominal)	5/32"
Hole centers, vertical (nominal)	1/2"
Edge of paper to center of hole	1/4"
Edge of paper to a vertical perforation, if any	1/2" (Minimum)

The margin area must be included in the measurements for maximum and minimum widths for the pin feed forms.

See Topic 6.12.03 for the utilization of front-mounting form guides when a front feed form and pin feed form are in the same area for a Front Feed Forms Handler.

The minimum width for a form on the pin wheels is 2¼"; however, Continuous Form Intake Guides require a minimum 4" wide form. A supply roll of a pin feed form may be on the Paper Roll Holders if the form is less than 4" wide. See Topic 6.11.10, 6.12.09, and 6.13.09 for the maximum diameter roll. See Topic 6.20.08 if two nonoverlapping pin feed forms are fed over the same Intake Rack with a dual Pin Feed Device. See Form Specifications (Subject 6.34.00) for staples behind a Magnetic Unit Record and the position of the horizontal perforation when the record is inserted.

The power-driven pin wheels actually control the form and the platen has no control of the form when the Front Pressure Rolls are disabled. However, the pin feed form and platen are gear-related with regard to the increment for the line advance (1/6" or 1/5") which is controlled by the program (Subject 6.01.00) or by the Line Advance Key. Except for the Financial Front Feed Forms Handler the line advance increment is 1/6". The left and right sections of the split platen of the Financial Handler advances in 1/6" and 1/5" increments respectively; therefore, a right-controlled pin feed form advances in 1/5" increments. With the pin wheel and platen control of forms, certain models of the Pin Feed Device permit unequal line advance functions for forms which occupy the same forms area or different areas of the platen. A platen-controlled roll journal may be advanced one line between entries, but a pin feed form in the same area or other area may be advanced several lines. See Subjects 6.22.00 and 6.23.00 for independent pin feed.

Minimum Leading Edge of Pin Feed Forms

For the installation of the pin feed form on the pin wheels, the leading edge must be a minimum distance from the print line of the platen. For a single Pin Feed Device or the lower pin wheels of dual Pin Feed Device, the leading edge must be a minimum of 6 1/6" as measured to the bottom edge of a line of print. For the upper pin wheels of a dual device, the leading edge must be a minimum 9 2/6" as measured to the bottom edge of a line of print. This will permit the installation of the form with one sprocket hole fully fitted to the pin wheel and a following hole partially fitted. See Figure 6.20.01-1.

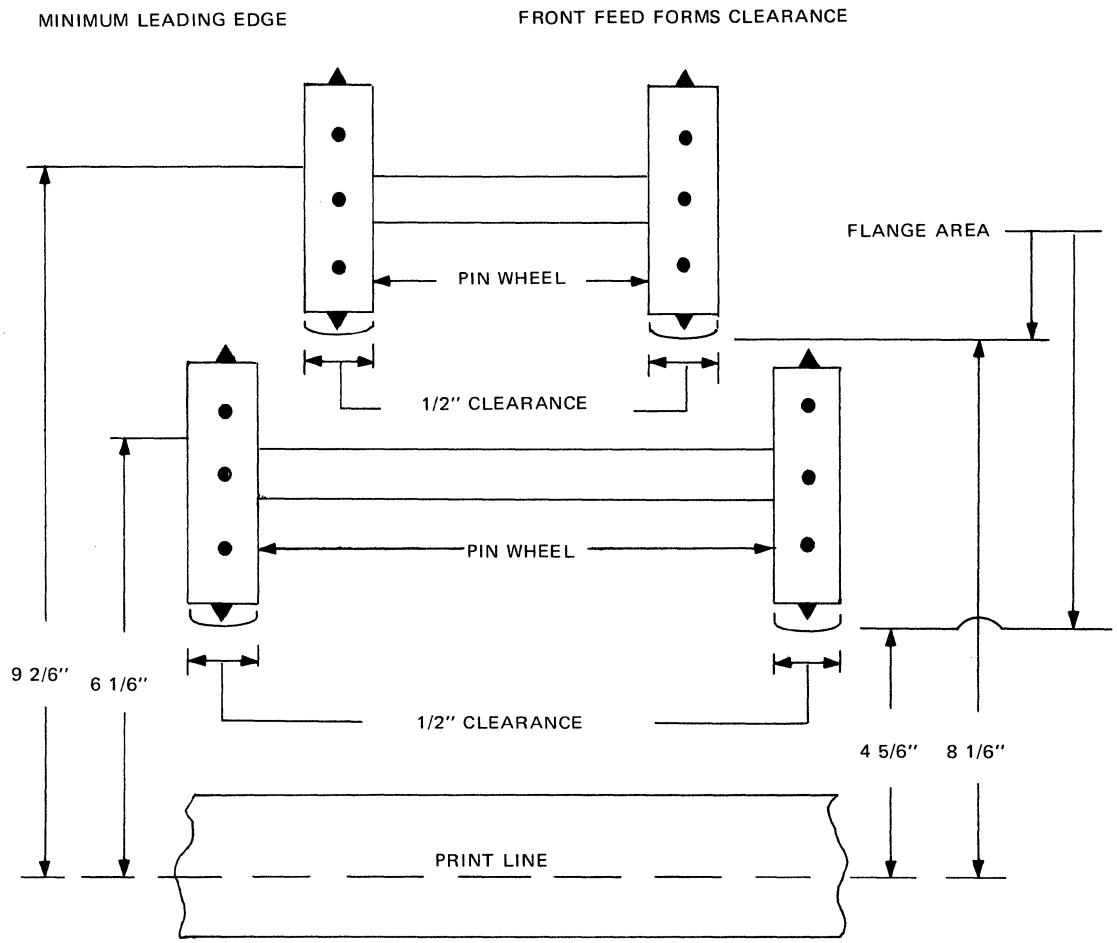


Figure 6.20.01-1 Minimum Leading Edge and Front Feed Form Clearance of Pin Feed Device

Front Feed Form or Document Clearance for Pin Wheel (Pin Wheel Rule)

Because of the flange on the Form Retaining Guide for the Pin Wheel (Topic 6.20.04) the edge of a front feed form must be properly placed in relation with the margin area of a pin feed form. See Figure 6.20.01-1. The edge or edges of a front-inserted form (manual or module-controlled document) may coincide at the same scale position as the edge for a pin feed form. Also the front-inserted form or document may overlap part or all of the pin feed form and the remaining area extend beyond the edge or edges of the pin feed form. A plastic deflector is provided below and to the outside edge of the Pin Wheel area to guide the front form past the pin wheel. However, the edges of the front-inserted forms or document should not be directly in front of the pin wheels. The right edge of a front-inserted form or document must not be programed to be placed within the ½" right margin area of the pin feed form, nor may a left edge of a front-inserted form or document be within the ½" margin area at the left of the pin feed form. In addition, the printing on a front-inserted form or document in an area directly in front of the margin holes may not be satisfactory. Except for the print quality, an exception to these rules is permitted for the following conditions:

1. The edge of a manually aligned front feed form may be programed in the margin area if the top edge is never advanced to the flange area. As measured from the bottom of the line of print upward to the flange, the flange area is 4 5/6" for a lower pin wheel and is 8 1/6" for an upper pin wheel. This exception may not be used for module-controlled documents for a Magnetic Record Computer.
2. The edge of a manually aligned front feed form may be programed in the margin area if the top edge of the form is never manually inserted below the flange area. The selected print line, as measured from the top of the form, would have to be greater than 4 5/6" for a lower pin wheel and 8 1/6" for an upper pin wheel. This exception may not be used for module-controlled documents.
3. If a pin feed form on the upper pin wheels overlaps the margin area or areas for the pin feed form on the lower pin wheels, the flange on the lower pin wheel or wheels is covered. The edge of a manually aligned form or module-controlled document may then be placed in the margin area of the pin feed form on the lower pin wheels. See 5/8" margin clearance for two overlapping pin feed forms in Subject 6.23.00.

6.20.02 PIN WHEEL RELEASE-LOCK LEVER, STYLES 1 AND 2

The pin wheel may be adjusted to any position of the forms area of the respective 15½" or 26" Forms Handler. The two-position release-lock lever for each pin wheel latches in each position and the lever must be in the released position before the pin wheel may be moved. Two types of release-lock levers have been provided.

Pointed-Top Lever, Style 2

The plastic pointed-top lever is located to the left and right of the outside edge of the respective left and right pin wheel and above the wheel. The lever must be positioned away from the pin wheel for the released position and the pin wheel may be moved left or right to the desired position. The movement of the lever back towards the pin wheel locks the wheel in place. See the optional Tear-Off Blade (Subject 6.42.00) for the reduced forms area when the blade is used. See Figure 6.20.02-1.

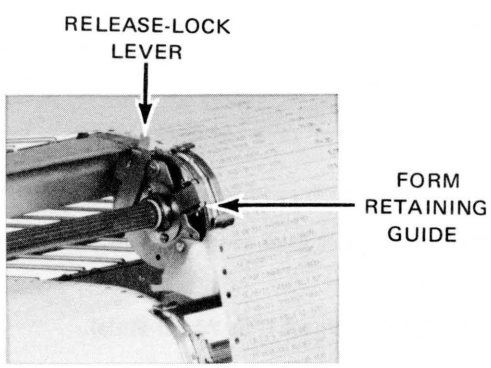


Figure 6.20.02-1 Pin Wheel Release – Lock Lever, Style 2, (Pointed-Top)

Flat-Surface Lever, Style 1

The plastic flat-surface lever is located below and near the front of each pin wheel. The lever must be pulled forward to release the lock and must be pushed rearward to lock the pin wheel. See Figure 6.20.02-2. (The flat-surface lever is not used with a Front Feed Forms Handler; however, either a flat-surface or pointed-top lever is used with a Rear Feed Forms Handler.)

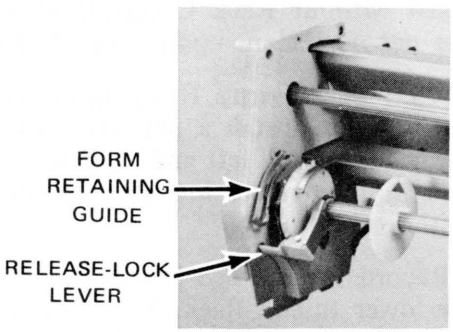


Figure 6.20.02-2 Pin Wheel Release-Lock Lever, Style 1 (Flat-Surface)

6.20.03 FORM SUPPORT DISKS

Two removable Form Support Disks are provided for a set of pin wheels. The disks may be repositioned on the pin wheel shaft by sliding the disk rather than removing the disks. The disks normally are spaced in between the pin wheels to support the middle area of the pin feed form. One or both disks may be removed if the form width is not sufficient to permit the disks between the wheels. See Figure 6.20.00-1.

6.20.04 FORM RETAINING GUIDE FOR PIN WHEEL

The two-position, hinged Form Retaining Guide for the pin wheel latches in each position. As the form feeds under the guides and over the pin wheel, the guide lightly holds the form onto the pin wheels. To open the guide the operator tilts the guide up and towards the outside edge of the pin wheel. See Figure 6.20.02-1. See Topic 6.20.01 for the clearance required for front feed forms.

6.20.05 MARKED NUMERIC SCALES

The Paper Table behind each set of pin wheels is marked in 1/10" increments. The scales may be used as a guide for the placement forms.

6.20.06 CONTINUOUS FORMS INTAKE RACKS

Wire racks, removable, are provided to support the form as the pin feed form feeds from the rear of the console. One Intake Rack, designated as Rack A, is provided with a single Pin Feed Device and two racks, designated as Racks A and C, are provided with a dual Pin Feed Device. See Figure 6.20.06-1. Racks B and D are Exit Racks, Topic 6.20.07. See the respective Forms Handlers for the paths of the forms in the handler, Subjects 6.11.00 through 6.14.00.

The Intake Rack extends from the back of the console a shorter distance than the corresponding Exit Rack in order to permit the restacking of the used or completed part of the forms. In addition, for a dual Pin Feed Device, the upper Intake Rack (C) also extends beyond the back of the console further than the lower Intake Rack (A). With a dual Pin Feed Device both Exit Racks (B and D) extend beyond the back of the console a greater distance than the Intake Racks. The upper Exit Rack (D) extends a greater distance than all other racks. This capability permits overlapping pin feed forms for the Forms Handler and the orderly restacking of the form or forms. If two pin feed forms do not overlap (side-by-side arrangement) the lower (A) Intake Rack may be used instead of using both Intake Racks. A set of continuous Form Intake Guides (Topic 6.20.08) should be used for the second form on the lower rack.

The racks are designated as A, C, B, and D reading from the bottom to the top on Figure 6.20.06-1, but the Intake Racks are not the same for all Forms Handlers. The appropriate racks are provided in accordance with the Style features of the Pin Feed Device which are compatible for a 15½" or 26" Forms Handler and compatible with the Forms Handler provided for an individual Style of the Series L/TC. The Exit Racks are the same except for the different widths required for the 15½" and 26" Forms Handlers.

Rack A (lower intake) may be used without Rack C (upper intake) but Rack C may not be used without Rack A. The Exit Racks are not dependent upon each other for support.

For the Rear Feed and Financial Front Feed Forms Handlers the upper Intake Rack (C) for a dual Pin Feed Device may be latched up in order to install a pin feed form on the lower Intake Rack (B). A triangled-shaped metal bracket is provided on the left and right for the mounting of the rack. A cut out at the top rear corner of the bracket is provided for the latch up convenience. The rack is arced upward and the forward cross-wire fits into the cut-out.

For the Basic and Magnetic Unit Record Front Feed Forms Handlers, the upper Intake Rack may be latched up to install a form on the lower Intake Rack. The Hinged Cover (Topic 6.12.07) may also be latched up and the cover must be raised before the upper Intake Rack may be raised. The rack snaps into a latch position when it is arced to an approximate perpendicular position.

See Topic 6.12.09 if a pin feed form feeds over Rack C when a journal is also used in the Basic or Magnetic Unit Record Front Feed Forms Handler.

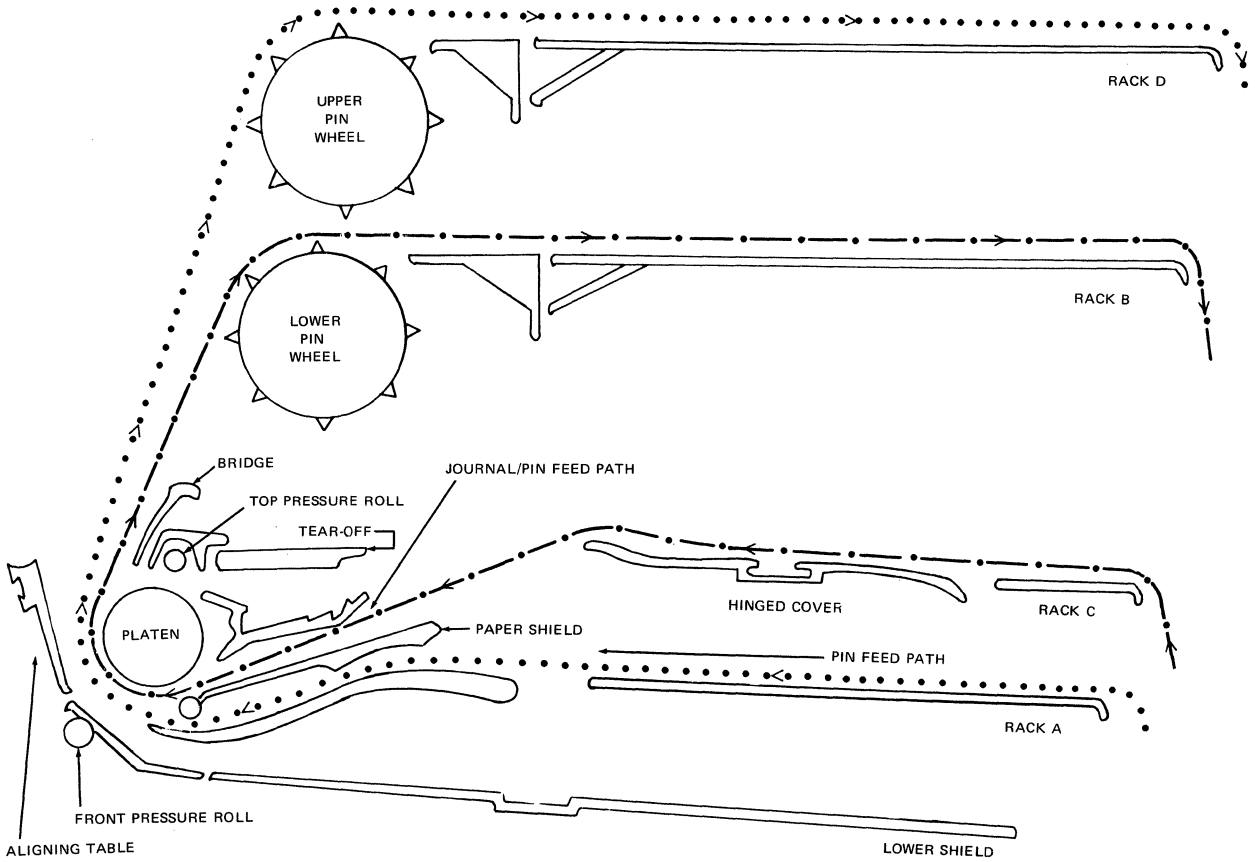


Figure 6.20.06-1 Style 1 Intake and Exit Racks for Pin Feed Forms, Basic Front Feed Forms Handler

6.20.07 CONTINUOUS FORMS EXIT RACKS

The racks are used to support the pin feed forms as the forms exit from the pin wheels to the rear of the console. The front of the wire racks mounts on brackets provided behind the pin wheels and the numeric scales; the racks are removable. One Exit Rack, designated as Rack B, is provided with a single Pin Feed Device and two racks, designed as B and D are provided with a dual Pin Feed Device. See Figure 6.20.06-1. Racks A and C are Intake Racks, Topic 6.20.06. See the respective Forms Handlers for the paths of the forms in the handler, Subjects 6.11.00 through 6.14.00.

See Topic 6.20.09 for the Safety Latch.

6.20.08 CONTINUOUS FORMS INTAKE GUIDES

Two types of removable guides are provided to keep the form in between the desired positions prior to feeding into the platen area. Style 1 guides are used on the Continuous Form Intake Racks except when the Style 2 guides are required. The Style 2 guides are required for the Basic, or Magnetic Unit Record, Front Feed Forms Handler when a Dual Pin Feed is provided. See the following explanation of the Style 1 and Style 2 guides.

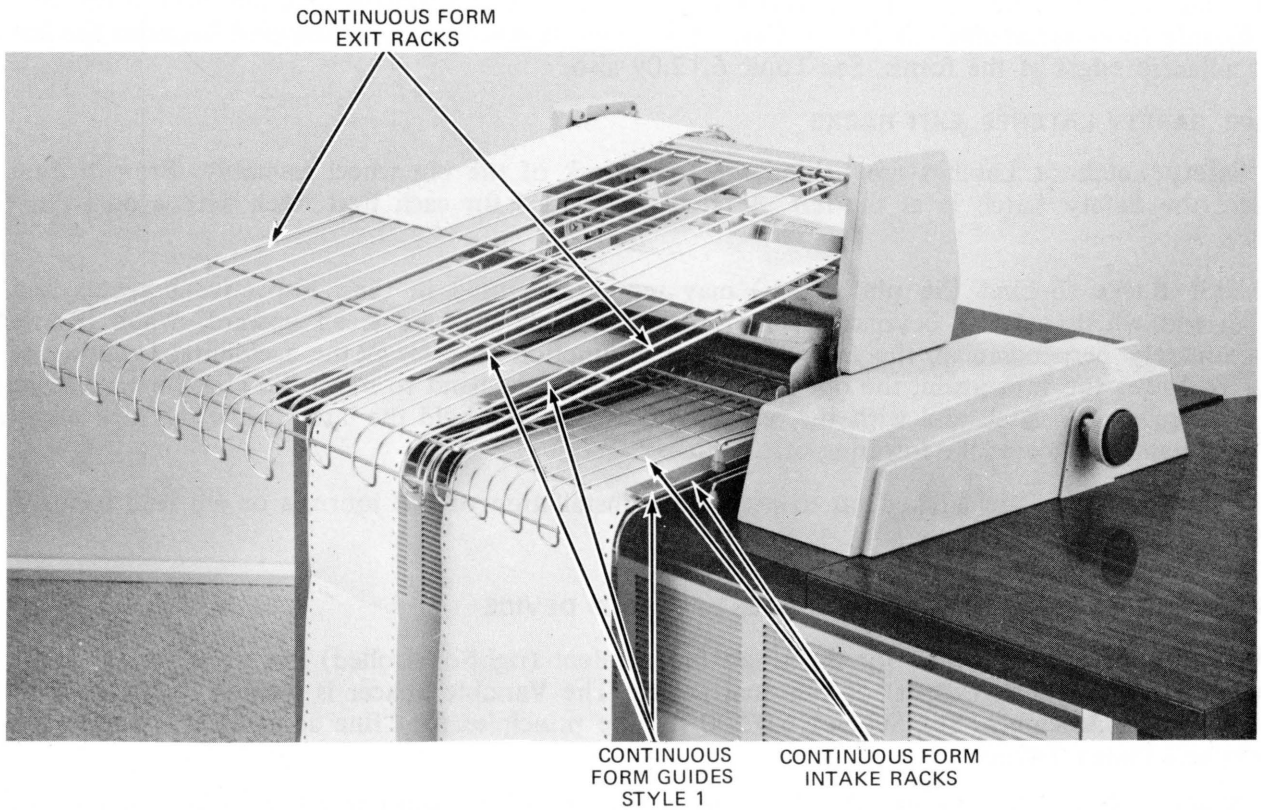


Figure 6.20.08-1 Dual Pin Feed Device, Style 1 Intake and Exit Racks, Rear View, 15½" Rear Feed Forms Handler

Style 1

The Style 1 left and right guides are approximately 10" long and the guides snap on to one cross-wire which is part of the rack. When properly installed the snap-device on the guide is near the front of the rack. A left guide is used for the left edge of the form and right guide is used for the other edge. The

Style 1-L and 1-R guides are used on the Intake Racks (A or A and C) with a Pin Feed Device for the Rear Feed and Financial Front Feed Forms Handlers. One set and two sets are provided for a single or dual pin feed respectively for these handlers. A set of Style 1 guides is also provided for one lower Intake Rack (A) for either a single or dual Pin Feed for the Basic and Magnetic Unit Record Front Feed Forms Handlers.

An optional set of Style 1 guides may be used if two side-by-side (nonoverlapping) pin feed forms are fed over the lower Intake Rack when a dual Pin Feed Device is used for a Basic or Magnetic Unit Record Front Feed Forms Handler. An extra set may be provided with a single Pin Feed Device for all Forms Handlers if the guides are left in place when a pin feed form is used in different areas for separate applications. The guides would not be repositioned each time the form is moved to a different area. A distance of .4" is required between the left and right adjacent from edges for the side-by-side arrangement.

Style 2

The Style 2, left and right, Continuous Form Intake Guides are approximately 3½" long. The guides snap on to the Paper Shield (Figure 6.20.06-1, which is in between the Journal/Pin Feed Path and Pin Feed Path. These guides are provided with a dual Pin Feed Device which is applicable to the Basic and Magnetic Unit Record Front Feed Forms Handlers.

As an option, a set or sets of the Style 2 guides may be used to guide a cut journal in the Journal/Pin Feed Path of the same handlers. If two cut journals, or a cut journal and pin feed form are used side-by-side (nonoverlapping) in the handler, a minimum distance of .3" is required between the left and right adjacent edges of the forms. See Topic 6.12.09 also.

6.20.09 SAFETY LATCHES, EXIT RACKS

The Safety Latch or Latches are behind the framework of the pin wheel assembly. From behind the console the Safety Latch is at the left. A latch is provided for each Exit Rack with a dual Pin Feed Device.

The Exit Racks (behind the pin wheels) may remain mounted in their respective brackets and the trailing end which extends beyond the rear of the console may be arced upward. When the rack is approximately perpendicular, the Safety Latch will function to prevent the accidental lowering of the rack. To lower the rack again, the operator must use the right hand to move the rack forward to relieve the pressure on the latch and with the left hand pull and then hold the latch below the rack edge until the right hand completes the lowering of the rack.

The racks commonly are latched up to permit the installation of roll journals or pin feed forms in the rear of the platen.

6.20.10 VARIABLE SPACER FOR INDEPENDENT PIN FEED DEVICE

A Variable Spacer is provided for the single independent (right-controlled) Pin Feed Device or for the Independent Pin Wheels (upper) of the dual device. The Variable Spacer is located at the right side of the Pin Wheel Assembly. See Subject 6.02.00 for the principles for "fine adjustment" with a Variable Spacer and Platen Twirler.

The Variable Spacer for the Pin Wheel Assembly will move the right-controlled (upper or independent) pin feed form but it will not move any of the other forms. If the Front Pressure Rolls are enabled in front of the right-controlled pin feed forms the variable should be used only when the Forms Handler is open.

With the platen split, the rotation of the right Platen Twirler at the right end of the platen moves both the platen-controlled form and pin feed form controlled from the right. With a solid or normalized split platen the right Platen Twirler does not move the right-controlled pin feed form.

6.21.00 SINGLE, SYNCHRONOUS PIN FEED DEVICE

This model permits the control of one pin feed form. The line advance is controlled by the left platen advance mechanism and is synchronous with the platen.

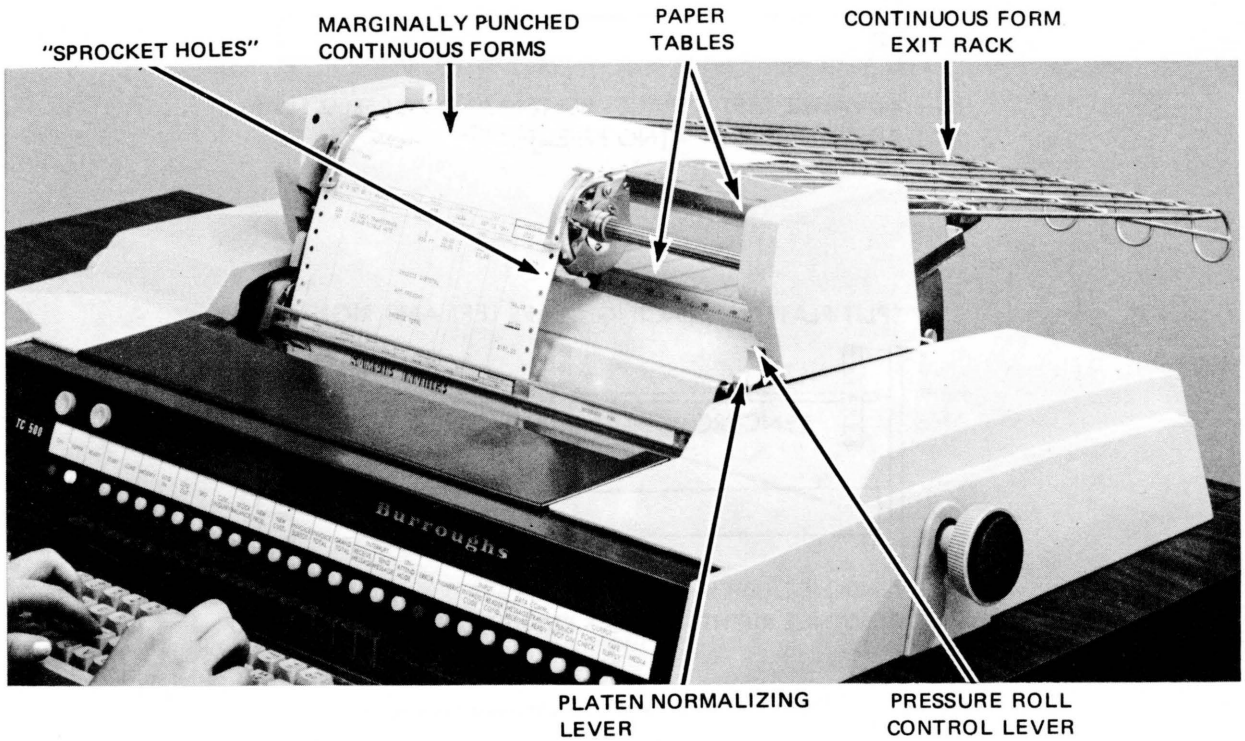
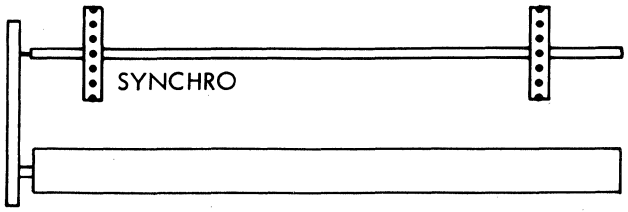


Figure 6.21.00-1 Single Pin Feed Device, Style 1 Exit Rack, 15½" Rear Feed Forms Handler

It is not necessary for the pin feed forms to physically be on the left side of the Pin Wheel Shaft to be activated by the left advance instruction; the forms may be located anywhere along the shaft. For the relationship to the advance of other forms with a Front Feed Forms Handler, see Advances C-1 and D-1 of Subject 6.01.00 for a nonsplit platen and split platen respectively.

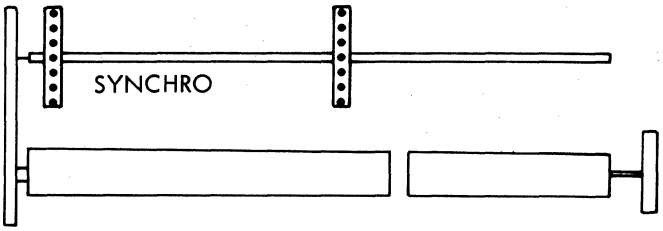
The illustration following indicates the advance function when either a solid platen or a split and normal platen is used with the single Synchronous Pin Feed Device.

SOLID PLATEN, LEFT SPACING GEAR ONLY
(OR SPLIT PLATEN NORMALIZED)



ADVANCE LEFT - SPACES PLATEN AND PIN FEED SHAFT.
ADVANCE RIGHT - (NO EFFECT)

SPLIT PLATEN (SPACING GEARS LEFT AND RIGHT)



ADVANCE LEFT - SPACES LEFT PLATEN AND PIN FEED SHAFT.
ADVANCE RIGHT - SPACES RIGHT PLATEN ONLY.

Figure 6.21.00-2 Single Synchronous Advance

6.22.00 SINGLE, INDEPENDENT PIN FEED DEVICE

The Independent Device is basically the same as the Synchronous Device except for the following:

1. The Line Advance is controlled by the right platen spacing mechanism rather than the left.
2. With the solid platen, the pin feed advance is independent of the advance of the platen. If a split platen is used, the pin feed forms will advance synchronously with the right section of the platen, independently of the left section of the platen.
3. If the split platen is normalized (joined to make a solid platen), an "Advance Right" instruction will advance the Pin Feed Device, while an "Advance Left" instruction will advance the entire platen, but not the Pin Feed Device.

For the relationship to the advance of other forms with a Front Feed Forms Handler, see Advances C-2 and D-2 of Subject 6.01.00 for a nonsplit platen and split platen respectively. (Note 1/5" line advance with Financial Forms Handler.)

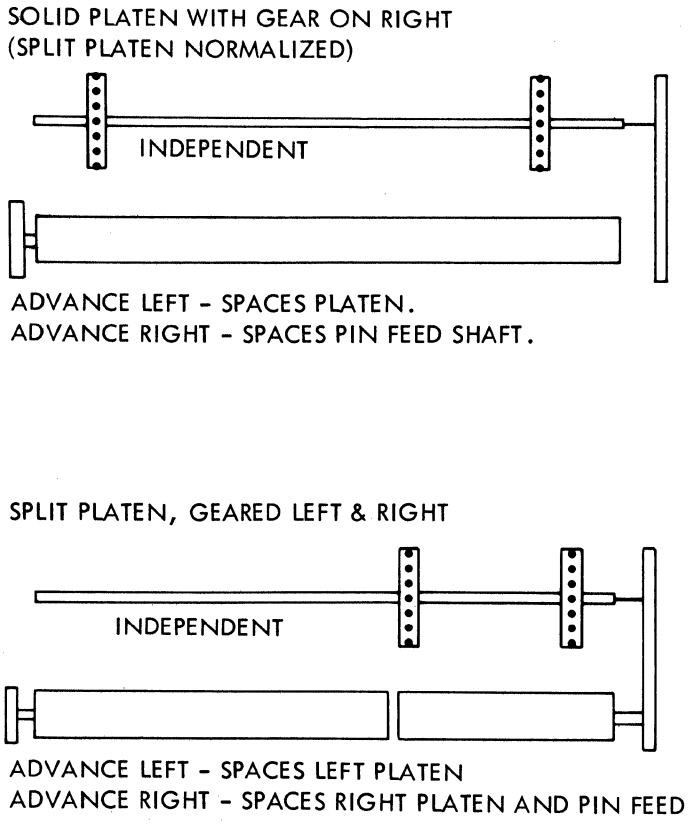


Figure 6.22.00-1 Single Independent Advance

6.23.00 DUAL, SYNCHRONOUS AND INDEPENDENT PIN FEED DEVICE

The dual Pin Feed Device permits the use of two pin feed forms which may be placed side-by-side in the handler or the forms may overlap. Two separate Intake Paths are provided on the Forms Handler to permit the feeding of the forms from the rear.

The line advance (synchronous) is controlled by the left platen advance mechanism. The line advance (independent) is controlled by the right advance mechanism. For the relationship to the advance of other forms with a Front Feed Forms Handler, see Advances C-3 and D-3 of Subject 6.01.00 for a nonsplit platen and split platen respectively. (Note 1/5" line advance with Financial Forms Handlers.)

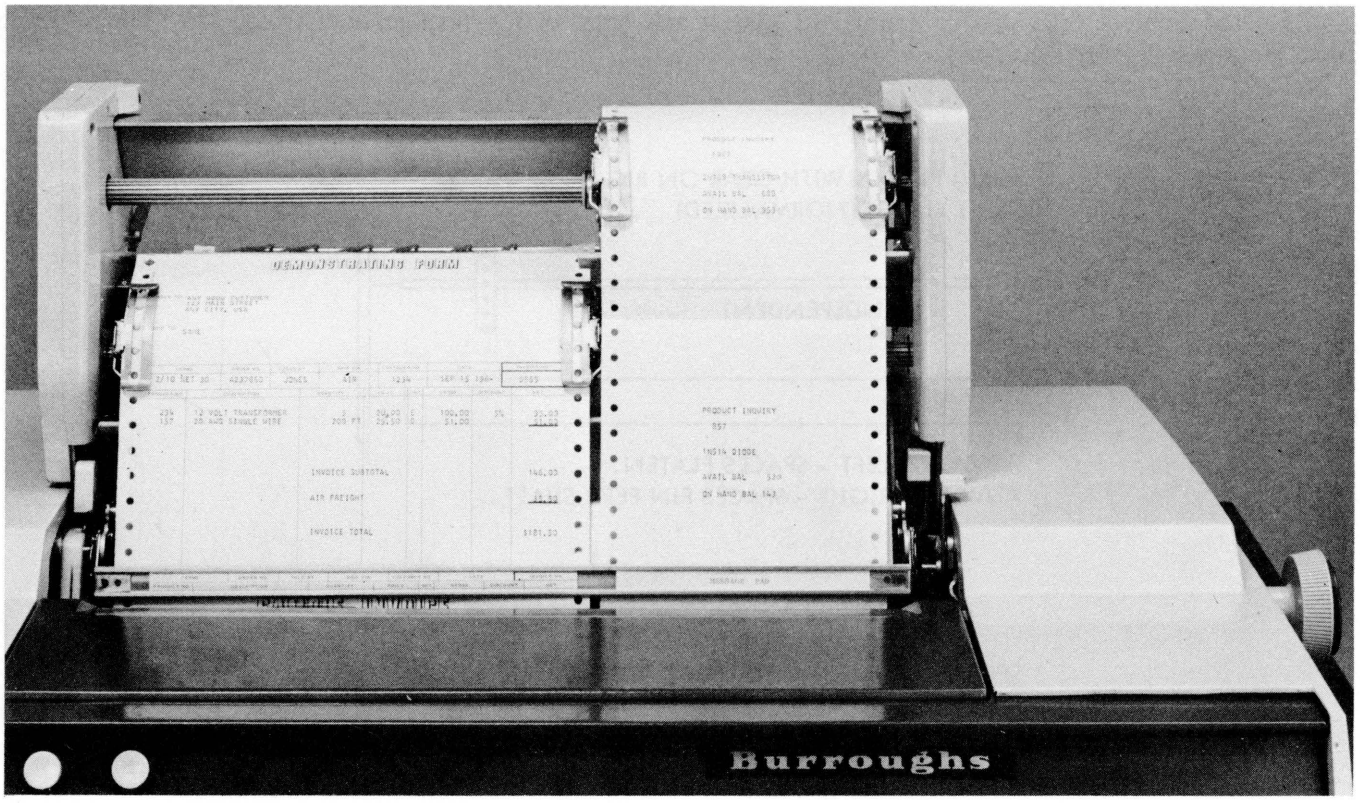
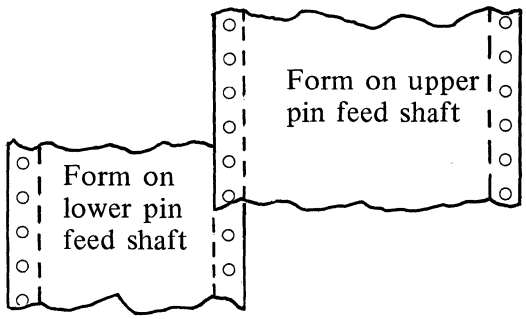


Figure 6.23.00-1 Dual Pin Feed Device, 15½" Rear Feed Forms Handler

With the dual Pin Feed Device, two separate pin feed forms may be located in any area along their respective Pin Wheel Shafts subject to the following considerations and the considerations for other forms in the same area.

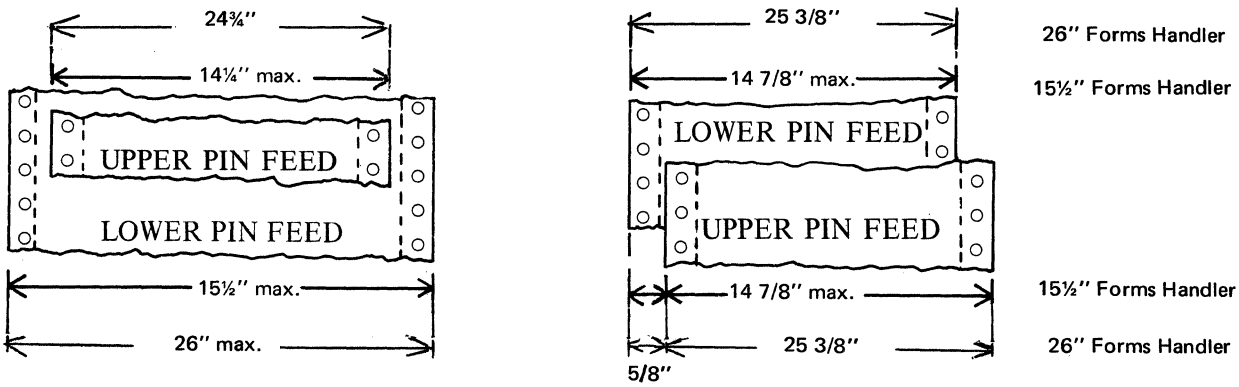
6.23.01 OVERLAPPING PIN FEED FORMS

1. Pin Feed forms may overlap provided the combined thickness of both pin feed forms or other forms in the same area do not exceed the permissible thicknesses for the respective Forms Handler. See Subjects 6.31.00 through 6.34.00.
2. When overlapped, the marginal punched holes centerline of the upper pin feed form must be at least 5/8" from the marginal punched holes centerline of the lower pin feed form. Otherwise, the sprocket holes may create irregular form movement.



Improper forms placement;
Centerlines of margins directly in line

3. Printing must not occur in the area of the upper pin feed form which is directly over the marginal punches of the lower form, see Topic 4.00.03.
4. The edge of one pin feed form should not coincide with the marginal (vertical) perforation of another pin feed form because the perforations may tear apart.



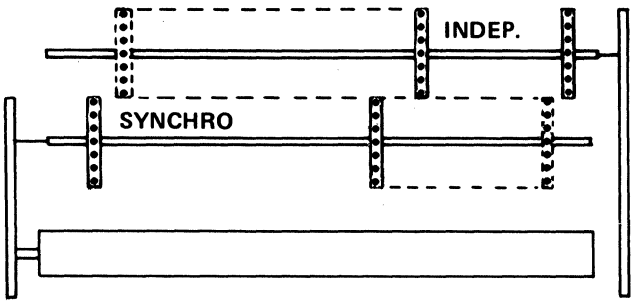
Maximum overlapping of forms; note that maximum sizes do not necessarily correspond to standard sizes available from printing companies, see Section 7.

With a dual Pin Feed Device two forms may overlap, and a Cut Journal may be placed in an area which is unoccupied by a pin feed form. A left-controlled pin feed form and cut journal would be side-by-side in the Journal/Pin Feed Path. For a Front Feed Forms Handler, the pin feed form must be a single-part form because the Lower Pressure Rolls must remain enabled. See Topic 6.08.00.

6.23.02 SIDE-BY-SIDE PIN FEED FORMS

The edge of one pin feed form should not be exactly flush with the edge of the other pin feed form nor any other form. The forms should be a recommended minimum of .2" apart. See Topic 6.03.00 for the minimum overlap of a form if other than pin feed.

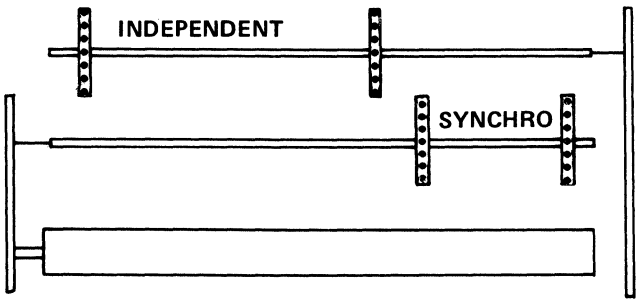
SOLID PLATEN WITH SPACING GEAR ON RIGHT,
(SPLIT PLATEN, DISABLED)



(OVERLAP PERMITTED)

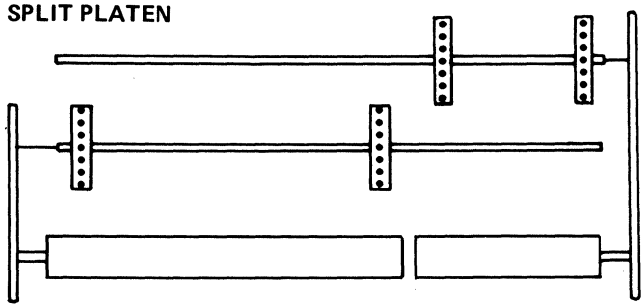
ADVANCE LEFT – SPACES PLATEN AND LOWER PIN FEED SHAFT.
ADVANCE RIGHT – SPACES UPPER PIN FEED SHAFT ONLY.

OR:



(OVERLAP PERMITTED)
note that location of forms on pin feed shafts do not need to correspond to the side from which spacing is controlled.

SPLIT PLATEN



ADVANCE LEFT – SPACES LEFT PLATEN & LOWER PIN FEED SHAFT.
ADVANCE RIGHT – SPACES RIGHT PLATEN & UPPER PIN FEED SHAFT

Figure 6.23.00-2 Dual Pin Feed, Synchronous and Independent Advance

6.30.00 FORM SPECIFICATIONS

The form specifications are described in the following subjects for each of the Forms Handlers of the Series L/TC. Form thickness, widths, and lengths for the various types of forms permit a wide range of forms which may be advantageously used in the Forms Handlers. Although the minimum and maximum measurements are listed, the applicable forms area for each Forms Handler must be considered. Certain forms must utilize predetermined areas of the handler. For example Passbook and Magnetic Unit Records for the respective Forms Handlers are used in the right-hand area. Forms Areas are described in Subjects 6.11.00 through 6.14.00.

The specifications are quite similar for any given type form (journals, pin feed, front feed); however, the special characteristics of a handler may require a difference because of the specialized charactertistics. For example, rear feed and front feed forms are similar except the leading edge of a multipe-part rear feed requires a different type of gluing. The minimum height for a front feed form with a Financial and Basic Front Feed Forms Handler are different. In addition certain optional forms handling limits for a front feed form may require a square corner rather than a normally utilized rounded corner. The form specifications for optional devices is explained with the topic for the device if the specifications are different.

6.31.00 FORM SPECIFICATIONS, REAR FORMS HANDLER

The forms for the Rear Feed Forms Handler may use any of the following types of forms which are single or multiple-part:

1. Noncontinuous Rear Feed Form
2. Pin Feed Forms, if Pin Feed Device is provided
3. Cut Journals
4. Roll Journals

The summary of minimum and maximum widths, heights (length) and thicknesses are specified in Topic 6.31.01. Additional information for forms is specified in the topic following Topic 6.31.01.

The minimum form thickness is .003" for a single-part and multiple-part forms; however, with a multiple-part, noncontinuous Rear Feed form the front copy should be a minimum of 20 pound paper stock. The maximum combined thickness of all forms in any one area is .055"; in addition, the thickness for any one form in the combination must not exceed the permissible thickness for the form. The number of printed copies required will be dependent upon the forms configuration in any one area. The Forms Handler is capable of controlling a combination of forms of a greater thickness than the number of original and duplicate copies which may be legibly printed. The inter-leafed carbon or other duplicating technique and thickness of each part must be carefully considered for the make-up of multiple-part or extra-copy forms. For example, a four-part form with each part .003" thick will be legible for all parts but a four-part form with each part .006" thick (32 lb. ledger) may or may not be legible for the fourth copy.

6.31.01 SUMMARY OF FORM SPECIFICATIONS, REAR FEED FORMS HANDLER

The following chart specifies the width, length, and thickness, (including carbon) of the forms. The column labeled "Refer.", if used, designates the topic number of Subject 6.31.00 which explains the item on the chart. For example, the number 03 is for a reference to Topic 6.31.03. The minimum first and last print lines for the Rear Feed Forms Handler may be reviewed in the following Topics or Subjects:

Last Line, Front Pressure Rolls, 6.06.00

Journal, First Line, Top Pressure Roll Housing and Tear-Off for Journal, 6.07.00

Form Limit Stop, 6.11.03

Pin Feed Form, First Line, 6.20.01

Optional Form Guide, 6.41.00

CHART FOR FORMS, REAR FEED FORMS HANDLER

			Width		Length (Height)			Thickness	
Item	Refer.	Type of Form	Min.	Max.	Min.	Max.	Min.	Max. Single	Max. Mult. Part
1	06	Cut Journal	3"	15½"	8½"		.003"	.005"	.029"
2	05	Roll Journal	1 17/32"	15½"	diam.	3½"	.003"	.005"	.012"
3	04	Pin Feed Includes Margin	4"	15½"	1"	11"	.003"	.0075"	.035"
4	03	Rear Feed	3"	15½"	3"	15"	.003"	.0075"	.045"
5	02	Maximum Combined Thickness							.055"

6.31.02 MAXIMUM COMBINED THICKNESS, REAR FEED FORMS HANDLER

The maximum combined thickness for two pin feed forms in the same area (overlapping) is .055". The maximum thickness for any one pin feed form is .035", see Chart of Topic 6.31.01.

6.31.03 REAR FEED FORMS, REAR FEED FORMS HANDLER

See Item 4 of chart for Topic 6.31.01. The top of a form which is rear-inserted should be free of any objects (metal or otherwise) that may become disengaged in the handler. The corners for the forms may be round or square. See Topic 6.11.03 for the Form Limit Stop.

Gluing and Multiple-parts

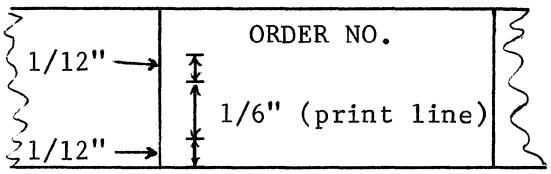
The top edge of the multiple-part form must be glued. The gluing must be effective for the number of times the form is used in the Forms Handler. The top edge must be sufficiently glued to prevent fraying after use. The gluing should be even with the top edge. The 1/16" gluing for the top edge is more satisfactory than other methods of gluing. The thickness for the gluing must not exceed the maximum .045" thickness for a multiple-part form. Excessive glue in the top area adds to rigidity of the form, and creates an area which is curved, uneven, or rippled. The rigidity of this area should not be more than 20% of the other areas of the form. Horizontal perforations may be used. The top copy of the multiple-part form should be 20 pound paper stock. Other than the top copy the other parts may be less than the minimum .003" thickness specified for the single-part form.

Tolerance for Vertical and Horizontal Lines

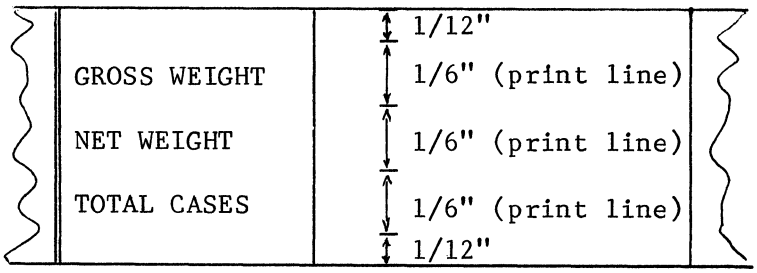
The design of a form must consider paper shrinkage, forms manufacturing tolerances, characteristics of various paper weights and grades, and the handling of forms by an operator. A certain amount of tolerance must be incorporated in the forms design to assure proper alignment and neat printing in all areas of the form. The following rules provide these tolerances:

1. Unit or System Sets, Rear Feed
   Horizontal lines for boxed-in print areas should be at least 1/12 inch above and below the characters for a print line. When a series of boxes are to be used vertically, horizontal ruling should not be used to separate them. Characters are .110" high.

Ex. a



Ex. b



   In addition, the vertical lines should have a minimum 1/20 inch allowance on each side of a print field within a box for a pin feed form. For a rear feed form or journal the tolerance should be at least 1/10". The characters print centered in relation to the 1/10" increments of the programed positions and numeric scales on the Forms Handlers. The characters are .082" wide.

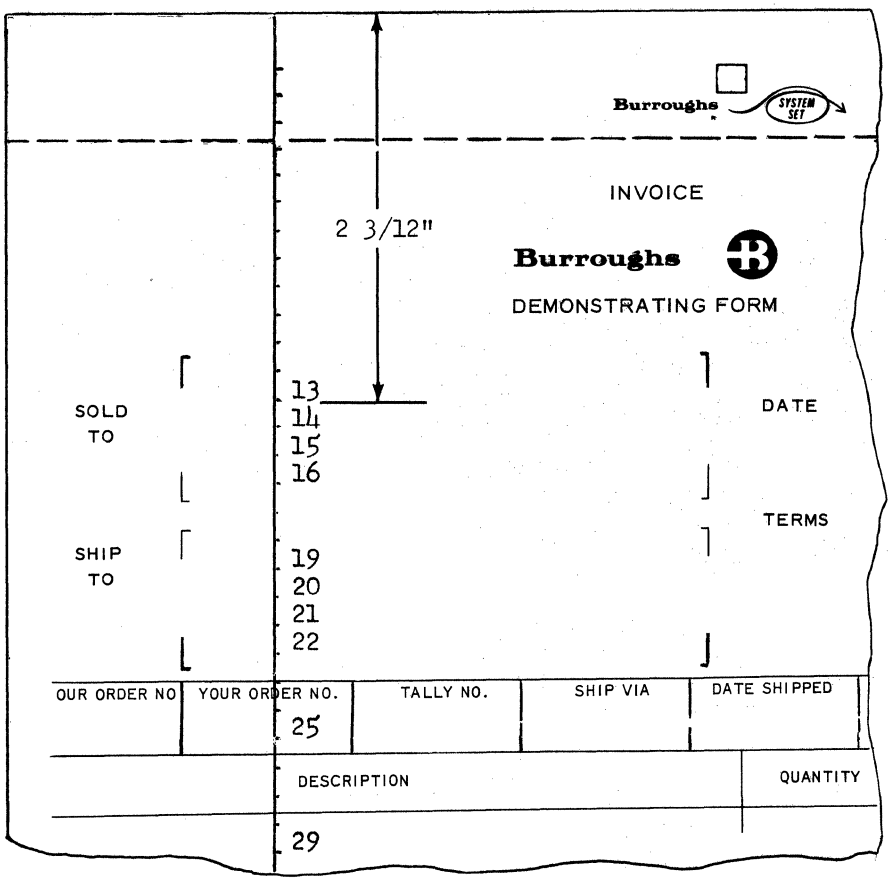
2. Continuous Pin Feed Forms
   Boxed-in print areas must include the same allowances above, below, and on each side as stated above. Although the pin feed device will eliminate form slippage, a slight variance must be anticipated. Also, other factors such as shrinkage and forms manufacture variances will be present.

   An example of correct and incorrect forms design is illustrated in Figure 6.31.03-1.

Correct Form Design:

Print areas have at least 1/12" leeway above and below print line to allow for forms discrepancies and alignment slippage. Boxed in print areas avoided on bottom of form.

In this and the following example, the form is scaled in 1/6" increments and the print lines are numbered to show their relationship to the rest of the form.



Incorrect Design:

Print areas are tightly boxed in with no leeway above or below print lines to allow for shrinkage, slippage, or other variances.

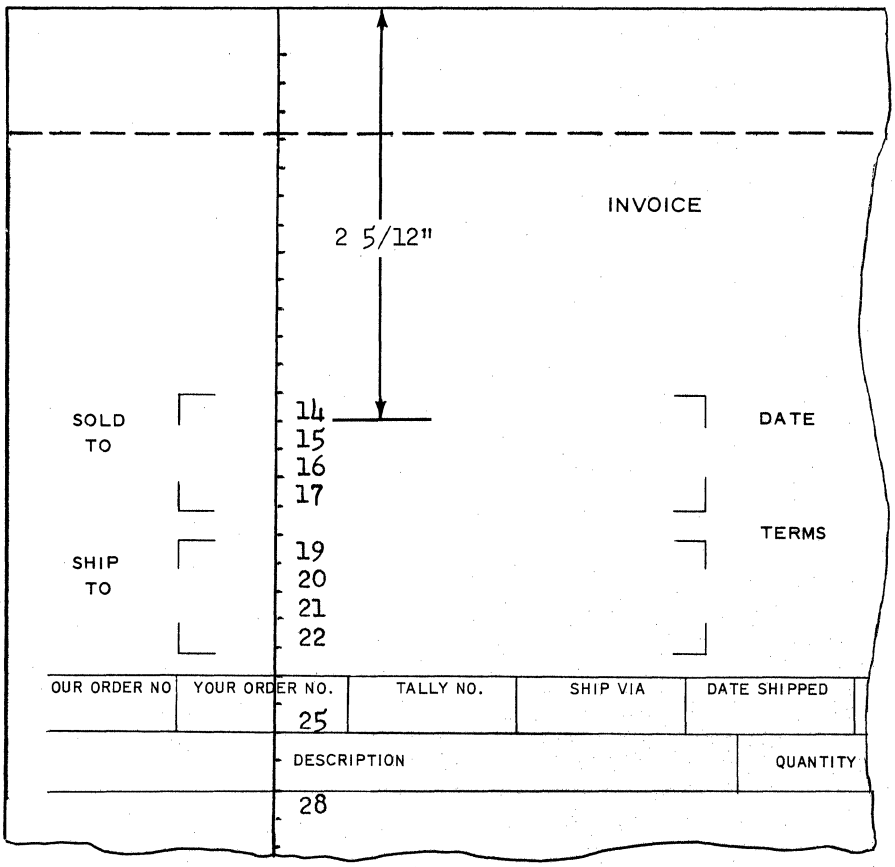


Figure 6.31.03-1 Form Design Tolerances

6.31.04 PIN FEED FORMS, REAR FEED FORMS HANDLER

See Item 3 of chart for Topic 6.31.01.

Minimum Width

The minimum width for a pin feed form may be 2½" if the forms are on a paper supply roll. If the forms are prefolded the minimum width is 4". See Pin Wheels, Topic 6.20.01. See Section 7 for commonly used widths.

Margins for Pin Feed Form

Hole diameter (nominal)	5/32"
Hole centers, vertical (Nominal)	½"
Edge of paper to center of hole	¼"
Edge of paper to the vertical perforation, if any	½" (minimum)

The printing on the front form of two overlapping pin feed forms in an area directly in front of the margin holes may not be satisfactory. Avoid printing in these areas. See Topic 4.00.03.

The thickness for the margin area of a multiple-part pin feed form must not exceed the allowable tolerance for pin feed forms. Gluing, crimping, and stapling which are permitted in the margin, may increase the thickness as much as .005", .008" and .017" respectively. For the most desirable results, forms should be attached at both margins for any form in excess of three parts; this is the general rule. The procedure for separating the multiple part forms usually determines the fastening method for the pin feed forms. The separation of the forms is not a Series L/TC function but is accomplished by hand or other equipment.

Horizontal Perforations

Pin feed forms are generally prefolded on the horizontal perforations. The minimum distance between perforations is one inch; minimum fold is 7", maximum fold is 11". Prefolding less than 7" and greater than 11" may prevent the orderly refolding of the forms after the forms exit to the rear of the console, see Exit Racks, Topic 6.20.07. The following distances between perforations are available: 2 5/6", 3½", 3 2/3", 4¼", 5½", 5 2/3", 7", 8½", 11", 14", and 17".

The 4¼" distance does not equate to an even 1/6" increment which is the increment for the line advance of the Forms Handler. The distance between perforations should be measurable to the nearest 1/6".

The folding with the 5 2/3" perforation distance may not be desirable because it would be less than 7" or greater than 11". The 14" and 17" perforation exceeds the 11" maximum for orderly restacking.

See Topics 4.00.03 and 6.31.03 for printing near the horizontal and vertical lines.

Continuous Pin Feed Punched Card Checks

Punched Card Checks, constructed as illustrated in Figure 6.31.04-1 violate the form specifications and may not feed correctly in the Rear Feed Forms Handler. There should be a minimum of 1" between perforations. The sample shown has two perforations ¼" apart separating one check from the next. These checks catch on the Form Limit Stop, Topic 6.11.03.

These checks are constructed in this manner due to the required dimensions of punched cards and due to standard sizes of press equipment. There are two possible solutions:

1. Use MICR encoded check numbers on regular check paper (pin feed) and utilize an MICR Sorter to sort the checks for reconciliation purposes.
2. Consider the use of a Series L/TC with a Front Feed Forms Handler.

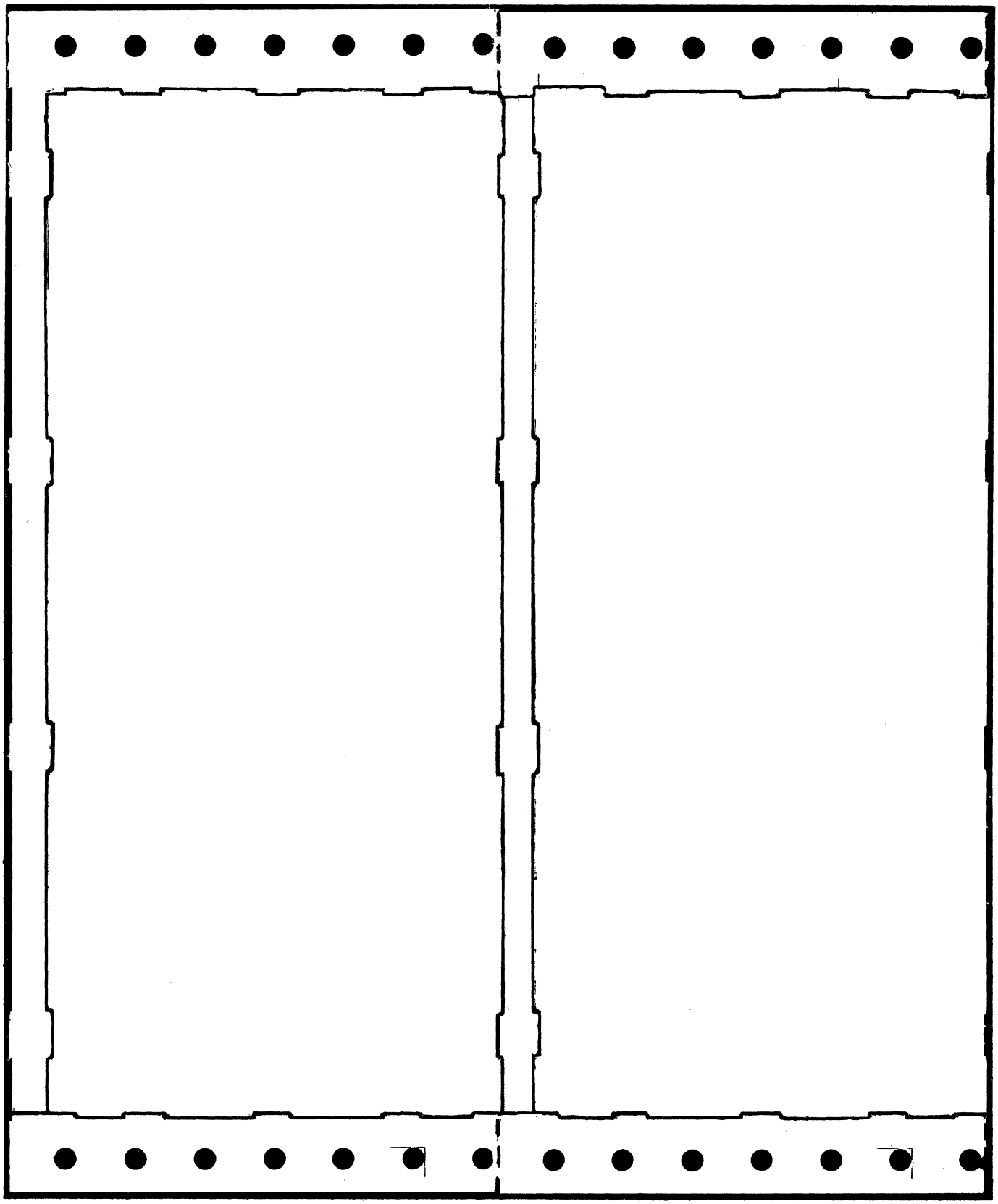


Figure 6.31.04-1 SAMPLE – Continuous Pin Feed Punched Card Checks

6.31.05 ROLL JOURNALS, REAR FEED FORMS HANDLER

See Item 2 of chart for Topic 6.31.01. Roll journals may include horizontal perforations or prepunched post-binder holes. See Topic 6.11.10 for minimum center hole for the roll.

6.31.06 CUT JOURNALS, REAR FEED FORMS HANDLER

See Item 1 of chart for Topic 6.31.01. The corners may be round or square. Multiple-part cut journals may be fastened by crimping, gluing and stapling provided the thickness does not exceed the permissible maximum. Warning marks or lines prior to the last print line should be included near the bottom of the journal to provide a warning for the last line. See Subject 6.06.00 for last print line.

6.32.00 FORM SPECIFICATIONS, BASIC FRONT FEED FORMS HANDLER

The forms for the Front Feed Forms Handler may use any of the following types of forms which are single or multiple-part:

1. Noncontinuous Front Feed Forms
2. Pin Feed Forms, if Pin Feed Device is provided
3. Cut Journals
4. Roll Journals

The summary of minimum and maximum widths, heights (length) and thicknesses are specified in Topic 6.32.01. Additional information for forms is specified in the topic following Topic 6.32.01.

The minimum form thickness is .003" for a single-part and multiple-part forms. The maximum combined thickness of all forms in any one area is .055"; in addition, the thickness for any one form in the combination must not exceed the permissible thickness for the form. The number of printed copies required will be dependent upon the forms configuration in any one area. The Forms Handler is capable of controlling a combination of forms of a greater thickness than the number of original and duplicate copies which may be legibly printed. The inter-leafed carbon or other duplicating technique and thickness of each part must be carefully considered for the make-up of multiple-part or extra-copy forms. For example, a four-part form with each part .003" thick will be legible for all parts, but a four-part form with each part .006" thick (32 lb. ledger) may or may not be legible for the fourth copy.

6.32.01 SUMMARY OF FORM SPECIFICATIONS, BASIC FRONT FEED FORMS HANDLER

The following chart specifies the width, length, and thickness of the forms; carbon thickness must be included. The column labeled "Refer." if used, designates the topic number of Subject 6.32.00 which explains the item on the chart. For example, the number 03 is for a reference to Topic 6.32.03. The minimum first and last print lines for the Basic Front Feed Forms Handler may be reviewed in the following Topics or Subjects:

Summary of First and Last Print Lines, 6.12.11

Pin Feed Form, First Line, 6.20.01

Optional Form Guides and Limits, 6.42.00

CHART FOR FORMS, BASIC FRONT FEED FORM HANDLER

			Width		Length (Height)		Thickness		
Item	Refer.	Type of Form	Min.	Max.*	Min.	Max.	Min.	Max. Single	Max. Mult. Part
1	06	Cut Journal	3"		8½"		.003"	.005"	.029"
2	05	Roll Journal	2¼"		diam.	3½"	.003"	.005"	.012"
3	04	Pin Feed Includes Margin	4"		1"	11"	.003"	.0075"	.035"
4	07	Front Feed Single line per each form insertion	4"		2½"	15"	.003"	.010"	.020"
5	07	Front Feed Multiple-Line	4"		2½"	15"	.003"	.009"	.055"
6	07	Front Feed Multiple-Part	4"		2½"	15"	.003"	.0075"	.055"
7	03	Front Feed for Overlap in Pressure-Free Area	See Refer.		2½"	15"	.003"	.0075"	.016"
8	02	Maximum Combined Thickness							.055"
9		*Maximum width for Items 1 through 6 is 15½" and 26" for respective Forms Handlers.							

6.32.02 MAXIMUM COMBINED THICKNESS, BASIC FRONT FEED FORMS HANDLER

Except when a .010" thick form is used, the maximum combined thickness of all forms in any one area is .055"; in addition, the thickness for any one form must not exceed the permissible thickness for that type of form. See Topic 6.32.07 for the maximum thickness if one form is .010" thick.

6.32.03 FRONT FEED FORM OVERLAP OF SPLIT OF PLATEN OR OTHER FORMS

See Item 7 of chart for Topic 6.32.01. The overlap of a split platen to a pressure-free area created by disabling the Front Pressure Rolls is described in Overlap B, Item 14 of Topic 6.03.02. The utilization of a pressure-free area to overlap a pin feed form with a front feed form is described in Overlap C of Topic 6.03.03. These principles are used to permit independent line advance functions for two overlapping forms, or independent advance functions for the separate sections of the platen with the forms overlapping the split. For the front feed form a minimum width must be in the area of the enabled pressure rolls and a maximum width is permitted in the pressure-free area. See Figures 6.03.02-1 and 6.03.02-2. The maximum thickness for a single-part front feed form in the pressure-free area is .0075", the multiple-part maximum is .016". The maximum thickness for Items 5 and 6 of the chart may be used for front feed forms which overlap other forms when the forms are simultaneously advanced (ledger and payroll check, or ledger and statement).

This maximum .016" thickness does not apply if the form overlaps the split with the edge in between enabled pressure rolls. The overlap usually is only for .2" to .3" and form specifications are the same (maximum .055") as for any other area of the Forms Handler. See Overlap B, Item 13 of Topic 6.03.02.

6.32.04 PIN FEED FORMS, BASIC FRONT FEED FORMS HANDLER

See Item 3 of chart for Topic 6.32.01. The following subjects described in Topic 6.31.04 for the Rear Feed Forms Handler are also applicable to the Basic Front Feed Forms Handler:

Minimum Width of 2¼"

Margins for Pin Feed Forms

Horizontal Perforations

6.32.05 ROLL JOURNALS, BASIC FRONT FEED FORMS HANDLER

See Item 2 of chart for Topic 6.32.01. Roll jounals may include horizontal perforations or prepunched post-binder holes. See Topic 6.12.09 for minimum center hole for the roll.

6.32.06 CUT JOURNALS, BASIC FRONT FEED FORMS HANDLER

See Item 1 of chart for Topic 6.32.01. The corners may be round or square. Multiple-part cut journals may be fastened by crimping, gluing and stapling provided the thickness does not exceed the permissible maximum. Sewed binders (journal-jackets) for carbon over the cut journals are used for certain applications. The sewed binding is at the top edge or top and bottom edge. The sewed binding of the cut journals should be the leading (top) edge when inserted in the Forms Handler from the rear and a trailing (bottom) edge may or may not be sewed. The combined thickness of the cut journal and binding must not exceed the allowable maximum thickness. Binders for cut journals are also furnished with a glued or pasted binding. The binder which includes a paper back and carbon front is installed over the journal and inserted in the Forms Handler. This type of journal does not include an attached carbon and the binder is reused for the next journal. As an alternate, cut journals may be supplied with one-time carbon attached even though the journal is a single-part. The multiple-part journals or single-copy with attached carbon may be attached at both the top and bottom. For rear-feeding they should be attached at the top.

For certain applications the carbon over the journal should have a light-colored surface (white-face) in order to permit a legible print directly on the front of the carbon. The printing may occur only occasionally for totals, zero proof, or reverse entries without the normally used front feed form present, but a dark surface journal is difficult to read. If the carbon covers the full width of the journal it is recommended that the program provide for a print for each line directly on the journal in some visible

area. This print will indicate the line position of the journal if the journal is manually rotated for some reason. This print would also be necessary if the journal is removed before completion and then reinserted subsequently.

Warning marks or line prior to the last print line should be included near the bottom of the journal with or without a carbon front to provide a warning for the last line. See Subject 6.06.00 for last print line. If carbon covers the full width of the journal a mark should be provided to indicate the first print line which is used when the journal is initially installed in the Forms Handler.

6.32.07 FRONT FEED FORMS, BASIC FRONT FEED FORMS HANDLER

See Items 4, 5, and 6 of chart for Topic 6.32.01. The corners for the front feed forms may be round or square. Round corners are preferred for forms which are inserted and removed several times before the form is filled. See Topic 4.00.03, Ruled Lines and Form Edges, also Topic 6.32.03.

Rigidity

For the most efficient forms handling results the single-part forms should be from a minimum of 20 pound paper stock to a maximum of 32 pound ledger. The form should be printed with the paper grain vertical from the top to the bottom of the form. The rigidity for clay-coated carbonless transfer forms usually is less than for a noncoated form of equal paper weight.

Multiple-part Forms

Multiple-part forms may be printed with carbon in between or the form may use the various types of chemically-treated paper which are used for duplicate copies. The types of paper and quality of carbon are the main factors in determining the number of legible copies. Forms of may copies should be tested for print quality. Certain chemically treated paper loses the ability to duplicate after a certain length of time; in addition, the print on the duplicate copies "fades out" as the form ages. Dampness, sun light, and excessive heat may also affect the printing results. If chemically-treated paper is used, the length of time that the forms are in service should be considered. If the form is in service for a short duration, chemically-treated paper is quite satisfactory and preferred by many users. The print quality for duplicate back copies with carbon usually is better than for the same number of chemically-treated copies.

Multiple-part forms may be attached at the top or bottom, or under certain conditions, at both the top and bottom. Front feeding of the form with only the top glued is permitted. The rounding of the corners should also be considered. All parts may be of equal width and length (height) or of unequal dimensions. Usually the back or last copy should be the full width of the form and also of greater rigidity and paper weight than the front copies.

Gluing should be effective for the number of times the form is to be handled in the Forms Handler and is to be handled for other clerical procedures.

Forms .010" Thick

Item 4 of the chart for Topic 6.32.01 specifies that a form may be .010" thick. With this thickness the form may be inserted for the print on one line. The line advance for this rigid form is not consistent. The maximum combined thickness for the .010" thick form and any other forms in the same area is .020" thick. If the backpart of a multiple-part form is .010" thick the front part or parts may be a maximum of .010" thick. A duplicate copy behind the .010" form may be illegible.

Collated Forms

The carbon between the forms which are collated and matched to a print line by the operator should not create excessive "smear" on the receiving form. "Soft" carbon may smear but the quality of the duplicate print is excellent. "Hard" carbon which does not smear may not provide a satisfactory duplicate print. The different grades of carbon are available to provide excellent results with regard to the number of copies desired and the ability to provide a "clean-copy".

6.33.00 FORM SPECIFICATIONS, FINANCIAL FRONT FEED FORMS HANDLER

The forms for the Financial Front Feed Forms Handler may use any of the following types of forms:

1. Passbooks with vertical or horizontal center folds
2. Noncontinuous Front Feed forms
3. Pin Feed forms, if Pin Feed Device is provided
4. Cut Journals with Journal Cover removed
5. Roll Journals with or without rewind capability

The summary of minimum and maximum widths, heights (length), and thicknesses are specified in Topic 6.33.01. Additional information for forms is specified in the topic following Topic 6.33.01.

For all forms except front feed forms the minimum form thickness is .003" for single-part and multiple-part forms. The minimum for a single-part and multiple-part front feed form is .004" and .006" respectively. The maximum combined thickness of all forms in any one area is .045"; in addition, the thickness for any one form in the combination must not exceed the permissible thickness for that type of form. Because of the thickness of a passbook, it usually occupies an area which is free of any other form. For the left hand area of the Forms Handler the number of printed copies required will be dependent upon the forms configuration in any one area. The Forms Handler is capable of controlling a combination of forms of a greater thickness than the number of original and duplicate copies which may be legibly printed. The inter-leafed carbon or other duplicating technique and thickness of each part must be carefully considered for the make-up of multiple-part or extra copy forms. The specifications for nonpassbook forms are similar to the forms used in a Basic Front Feed Forms Handler (Subject 6.32.00), but there are some differences. For example; the Financial Forms Handler requires a minimum height of 2¾" rather than 2½" for a Basic Front Feed, but a minimum first line is 1" rather than 1¼" or 5/6". The respective charts for forms may be compared for the differences. See Topics 6.32.01 and 6.33.01.

6.33.01 SUMMARY OF FORM SPECIFICATIONS, FINANCIAL FRONT FEED FORMS HANDLER

The following chart specifies the width, length, and thickness of the forms, carbon thickness must be included. The column labeled "Refer." if used, designates the topic number of Subject 6.33.00 which explains the item on the chart. For example, the number 03 is for a reference to Topic 6.33.03. The minimum first and last print lines, and center fold for the Financial Front Feed Forms Handler may be reviewed in the following Topics or Subjects:

First Line, 1" minimum, 6.13.03

Last Line, 5/6" minimum, 6.13.06

Center Fold, 2.8" minimum, 6.13.07

Pin Feed Form, First Line, 6.20.01

Optional Form Guides and Limits, 6.43.00

CHART FOR FORMS, FINANCIAL FRONT FEED FORMS HANDLER

			Width		Length(Height)		Thickness		
Item	Refer.	Type of Form	Min.	Max.	Min.	Max.	Min.	Max. Single	Max. Mult. Part
1	06	Cut Journal	3"	15½"	8½"		.003"	.005"	.029"
2	05	Roll Journal	1 17/32"	15½"	diam.	3 3/16"	.003"	.005"	.012"
3	05	Rewind Journal		14.7"					
4	04	Pin Feed Includes Margin	4"	15½"	1"	11"	.003"	.0075"	.035"
5	07	Front Feed Single-Part	4"	15.45"	2¾"	15"	.004"	.0075"	See Below

CHART FOR FORMS, FINANCIAL FRONT FEED FORMS HANDLER (CONTINUED)

Item	Refer.	Type of Form	Width Min.	Width Max.	Length (Height) Min.	Length (Height) Max.	Thickness Min.	Thickness Max. Single	Thickness Max. Mult. Part
6	07	Front Feed Multiple-Part	4"	15.45"	2¾"	15"	.006"	.0075"	.014"
7	08	Passbook	4"	7"	5"	10"	20 lb.	40 lb.	.045"
8	03	Front Feed For Overlap in Pressure-Free Area	See Refer.		2¾"	15"	.004" or .006"	.0075"	.014"
9	02	Maximum Combined thickness for Items 1 through 6 and 8							.045"

6.33.02 MAXIMUM COMBINED THICKNESS, FINANCIAL FRONT FEED FORMS HANDLER

The maximum combined thickness of all forms in any one area is .045"; in addition, the thickness for any one form must not exceed the permissible thickness for that type of form.

6.33.03 FRONT FEED FORM OVERLAP OF SPLIT OF PLATEN OR OTHER FORMS

See Item 8 of chart for Topic 6.33.01. The split location of the platen may be overlapped by a passbook if the width is greater than 6.8" or 6.7", but not more than 7". A passbook may not overlap another form. The principle for the overlap may be used for other forms. The overlap of a split platen in a pressure-free area created by disabling the Front Pressure Roll is described in Overlap B, Item 14 of Topic 6.03.02. For example, a 7½" wide temporary receipt in the right side of the handler may overlap the split to the left. The utilization of a pressure-free area to overlap a pin feed form with a front feed form is described in Overlap C of Topic 6.03.03. These principles are used to permit independent line advance functions for two overlapping forms: or independent advance functions for the separate sections of the platen with forms overlapping the split. For the front feed form a minimum width must be in the area of the enabled pressure rolls and a maximum width is permitted in the pressure-free area. See Figures 6.03.02-1 and 6.03.02-2. The maximum thickness for a single-part front feed form in the pressure-free area is .0075", the multiple-part maximum is .014" which is standard for a Financial Forms Handler, but the maximum .014" is increased to a maximum of .016" for a Basic Front Feed Handler.

6.33.04 PIN FEED FORMS, FINANCIAL FRONT FEED FORMS HANDLER

See Item 4 of chart for Topic 6.33.01. The following subjects described in Topic 6.31.04 for the Rear Feed Forms Handler are also applicable to the Financial Front Feed Forms Handler:

Minimum Width of 2¼"

Margins for Pin Feed forms

Horizontal Perforations, see following

The distances for horizontal perforations should be measured to the nearest 1/5" for a single Independent Pin Feed Device and the Independent Pin Feed of a Dual Device. The line advance for the right-controlled pin feed form advances in 1/5" increments; the left-controlled form advances in 1/6" increments. See Topic 6.13.09 for the removal of the Journal Cover when a Pin Feed Device is used.

6.33.05 ROLL JOURNALS, FINANCIAL FRONT FEED FORMS HANDLER

See Items 2 and 3 of chart for Topic 6.33.01. Roll journals may include horizontal perforations or prepunched post-binder holes. See Topics 6.11.10 and 6.13.09 for minimum center hole for the roll. If the journal is rewound a separate intermediate carbon may not be used for a two-ply roll, but the back of the top copy may be carbon-coated or coated with some other duplicating characteristic. The Rewind Device will reroll a maximum of 25' of single-ply paper. See the Forms Area for a rewound journal, Topic 6.13.02.

6.33.06 CUT JOURNALS, FINANCIAL FRONT FEED FORMS HANDLER

See Item 1 of chart for Topic 6.33.01. The use of cut journals is not recommended. If used, see Topic 6.13.09 for Journal Cover removal, and Topic 6.32.06 for the Basic Front Feed Forms Handler for the cut journal specifications. These specifications are applicable to the Financial Handler.

6.33.07 FRONT FEED FORMS, FINANCIAL FRONT FEED FORMS HANDLER

See Items 5 and 6 of chart for Topic 6.33.01. The minimum thickness for a single-part form is .004; however, the minimum for a multiple-part form is .006". A maximum .014" thickness may be used for a multiple-part form. Subject to the minimum and maximum thicknesses of Items 5 and 6 the front feed form for a Financial Handler may be the same as for a Basic Front Feed Forms Handler, see Topic 6.32.07. If a nonpassbook, front feed form is used with the limit-switch for the first line and center-fold detector the form must be a minimum of 20 pound paper stock. See Item 7 of the chart in Topic 6.33.01.

6.33.08 PASSBOOKS, FINANCIAL FRONT FEED FORMS HANDLER

See Item 7 of chart for Topic 6.33.01. The center fold for a passbook may be vertical or horizontal. The minimum horizontal center fold is 2.8" from the bottom of the opened passbook, if the Passbook Center-Fold Detector is used (Topic 6.13.07). The corners for the passbook must be rounded with a maximum ¼" radius. The center fold must be sewed and the sewing must not exceed the .045" maximum thickness.

For a minimum 1" first print line, a cutout which is a maximum of 3/8" deep is permitted provided it does not extend for more than ½ the width of the top edge. If the cutout is greater than 3/8", the distance to the first permissible minimum print line must be increased by a like dimension in excess of the 3/8". See illustration in Topic 6.13.03.

6.34.00 FORM AND UNIT RECORD SPECIFICATIONS, MAGNETIC UNIT RECORD (MUR) FRONT FEED FORMS HANDLER

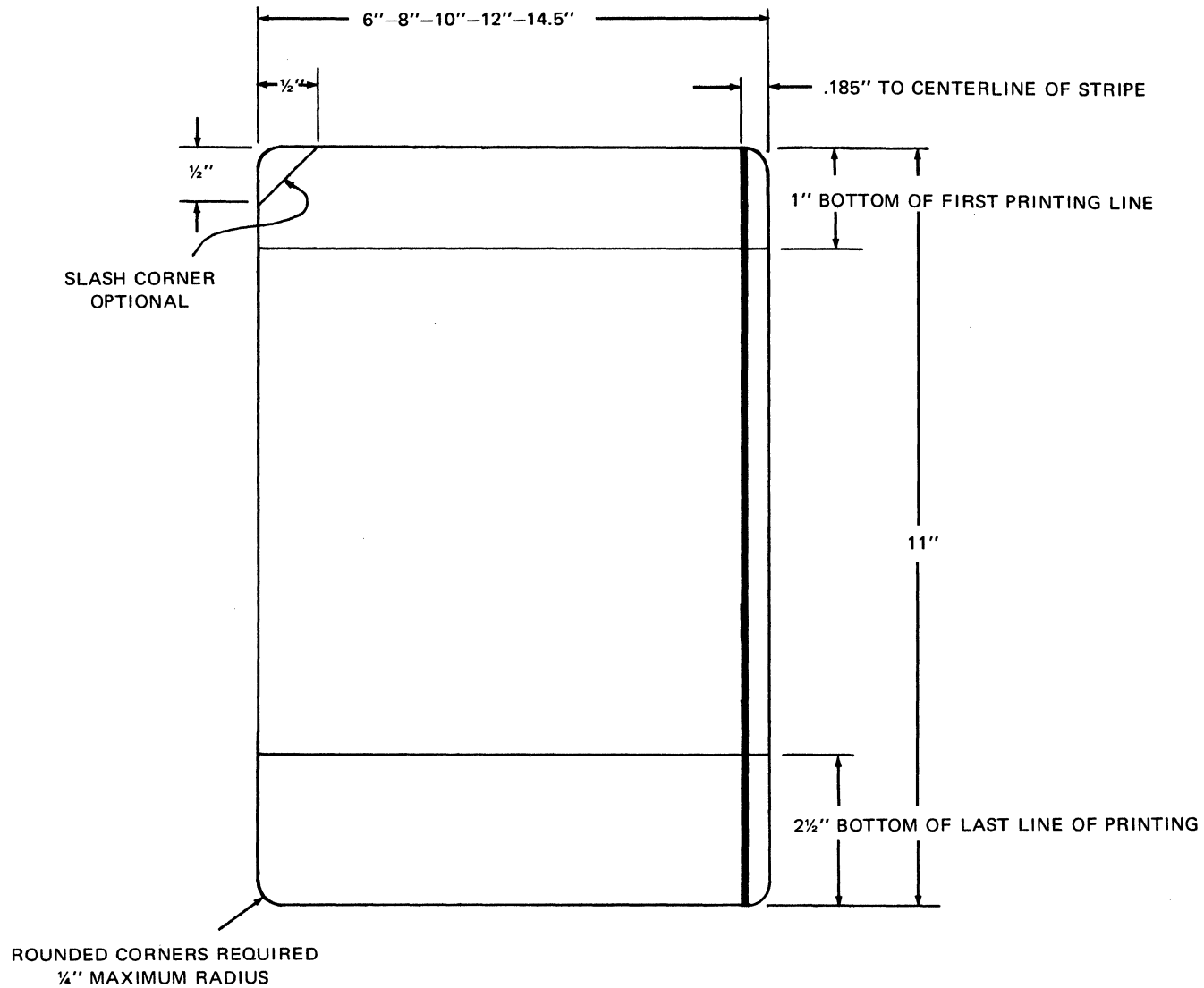
The forms for the MUR Front Feed Forms Handler may use any of the following types of forms which are single or multiple-part:

1. Magnetic Unit Records for the Magnetic Unit Record Modules
2. Nonmagnetic Forms controlled by the Modules
3. Noncontinuous Front Feed Forms
4. Pin Feed Forms, if Pin Feed Device is provided
5. Cut Journals
6. Roll Journals

The summary of minimum and maximum widths, heights (length) and thicknesses are specified in Topic 6.34.01. Additional information for forms, records, or documents is specified in the topic following Topic 6.34.01.

The minimum form thickness is .003" for single-part and multiple-part forms which are not controlled by the Magnetic Unit Record Modules. The maximum combined thickness of all forms in any one area is .055" without a module-controlled document present in the area. In addition, the thickness for any one form in the combination must not exceed the permissible thickness for that type of form. The combined thickness in the area of a module-controlled document is .049"; in addition, cut journals and pin feed forms behind the document may not be as thick as pin feed forms behind manually aligned front feed forms. The number of printed copies required will be dependent upon the forms configuration in any one area. The Forms Handler is capable of controlling a combination of forms of a greater thickness than the number of original and duplicate copies which may be legibly printed. The inter-leafed carbon or other duplicating technique and thickness of each part must be carefully considered for the make-up of multiple-part or extra copy forms. For example, a four-part form with each part .003" thick will be legible for all parts, but a four-part form with each part .006" thick (32 lb. ledger) may or may not be legible for the fourth copy.

A Magnetic Unit Record for the Magnetic Record Computer includes a marking to indicate the record is usable only with a Series L 5000 or Magnetic Record Reader (A 4005) for the Series L 5000. This is to differentiate for magnetic ledgers of other equipment (E 3000, E 1400) which also use a single stripe to read and encode data. The magnetic stripe content is different and the two types of records are not usable for the machine of a different Series.



SIZE

Width – 6" – 8" – 10" – 12" – and 14½"

Height – 11"

STOCK

32 lb. ledger

Pre-printed line numbers (1 through 46) must appear at right edge of record, see figure 6.34.00-2

STRIPING

Single stripe; if two-side striping is required it must be head to head. No printing may fall on any magnetic stripe.

CORNERS

All corners must be rounded, the maximum radius not to exceed ¼". The top left corner may be slashed ½" on ONE-SIDED records only to prohibit reading in the Magnetic Record Reader.

The magnetic stripe is a maximum of .120" wide and is centered .185" from the right edge of the record. The stripe is on the back of a record when only a single stripe is provided.

Figure 6.34.00-1 Single-Part Magnetic Unit Record

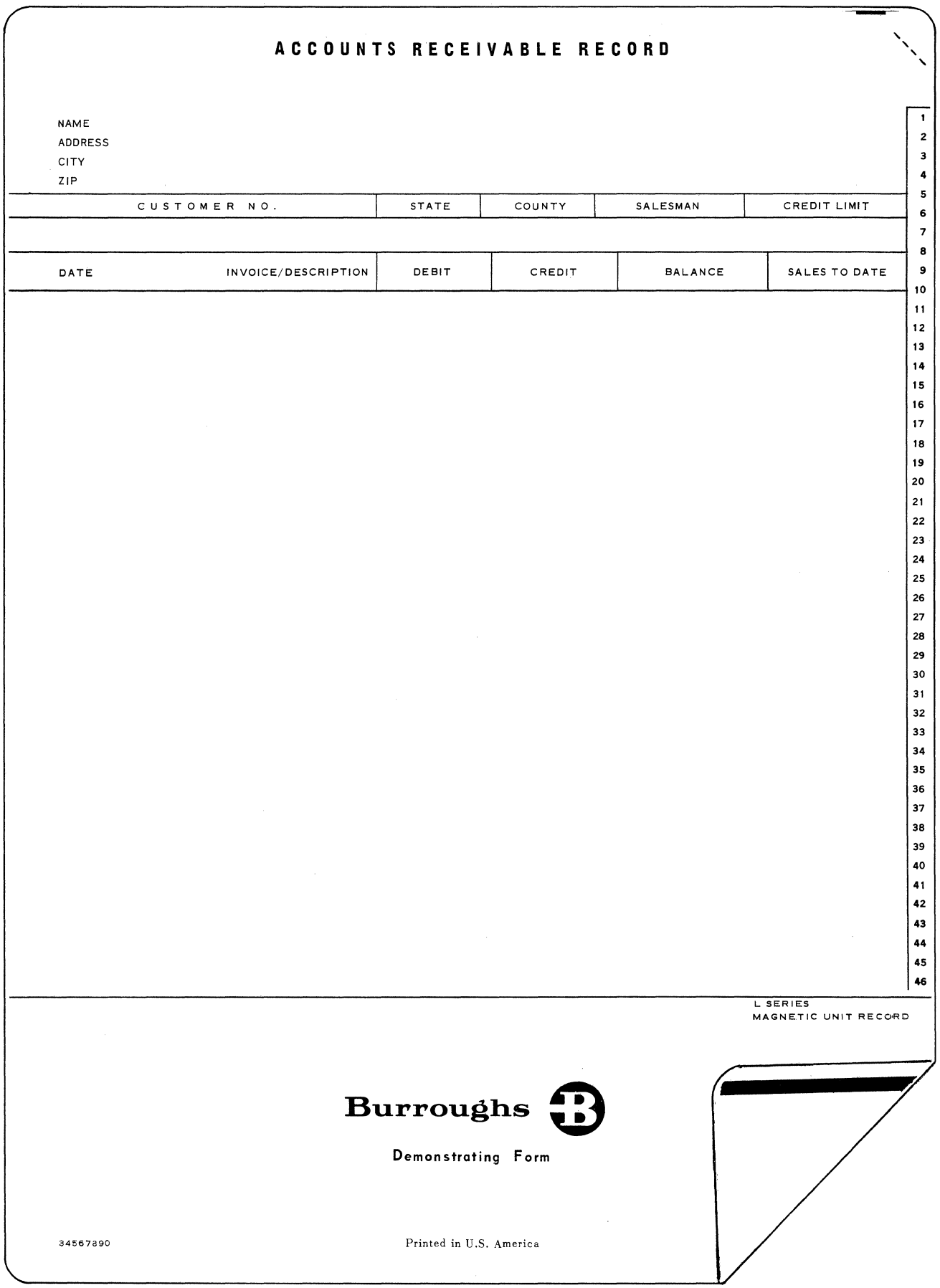


Figure 6.34.00-2 Magnetic Unit Record with Preprinted Line Numbers (Reduced size)

6.34.01 SUMMARY OF FORM AND UNIT RECORD SPECIFICATIONS, MUR FRONT FEED FORMS HANDLER

The following charts specify the width and length of the forms or records. Chart 2 is for the thickness of the forms or records, carbon thickness must be included. In Chart 1 the lengths and widths for the manually aligned front feed forms to left of the Adjustable Modules are listed. Also the maximum lengths are listed for the same forms with the modules retracted. See Topic 6.14.02 for the permissible locations for Rear Form Guide and for forms in between the modules.

The column labeled "Refer.", if used, designates the topic number of Subject 6.34.00 which explains the item on the charts. For example, the number 03 is for a reference to Topic 6.34.03. The minimum first and last print lines for the MUR Front Feed Forms Handler may be reviewed in the following Topics or Subjects:

Summary of First and Last Print Lines, 6.14.10

Pin Feed Form, First Line, 6.20.01

Optional Form Guides and Limits, 6.44.00

CHART 1 FOR FORM SIZE, MAGNETIC UNIT RECORD FRONT FEED FORMS HANDLER

							ADJUSTABLE MODULE	
			Width		Length (Height)		Program	Set for Record
Item	Refer.	Type of Form	Min.	Max.	Min.	Max.	Position	Width
1	06	Cut Journal	3"	26"	8½"		Any	
2	05	Roll Journal	2¼"	26"	Diam.	3½"	Any	
3	04	Pin Feed, includes Margin	4"	26"	1"	11"	Any	
4	07	Manual Front Feed Single or Multiple Part on Left	4"	19.45"	2½"	15"	198	6"
5		Same as Item 4	4"	17.45"	2½"	15"	178	8"
6		Same as Item 4	4"	15.45"	2½"	15"	158	10"
7		Same as Item 4	4"	13.45"	2½"	15"	138	12"
8		Same as Item 4	4"	10.95"	2½"	15"	113	14½"
9	07	Manual Front Feed, Modules Retracted	4"	26.05"	2½"	15"	Any	
10	07	Form in Front of Magnetic Unit Record or Item 12	4"	26.05"	2½"		Any	
11	08	Magnetic Unit Record	6", 8", 10" 12", 14½" Only		11" Only		See Above	
12	09	Nonmagnetic Form Auto. Aligned	6", 8", 10" 12", 14½" Only		11" Only			
13	08	Magnetic Unit Record Reader	5"	14½"	11" Only			

CHART 2 FOR FORM THICKNESSES, MAGNETIC UNIT RECORD FRONT FEED FORMS HANDLER

Item	Refer.	Type of Form	Min.	Max. Single	Max. Mult. Parts in Area Without Module-Controlled Document		Max. Mult. Parts in Area With Module-Controlled Document
1	06	Cut Journal	.003"	.005"	.029"	or	.018"
2		Max. parts for Item 1					6
3	05	Roll Journal, see Item 23	.003"	.005"	.012"	or	.012"
4		Max. parts for Item 3					6
5	04	Pin Feed, includes margins	.003"	.0075"	.035"	or	.018"
6		Max. parts for Item 5					6
7	07	Manual Front Feed Single line per insertion		.010"	.020"		
8	07	Manual Front Feed Multiple-Line	.003"	.009"	.055"		
9	07	Manual Front Feed Multiple-Part	.003"	.0075"	.055"		
10	08	Magnetic Unit Record (MUR) Single-Part	.0057"	.0063"			
11	08	MUR, Multiple-Part	.0057" (Back Part)	.0063"			.016" (All widths)
12		Other thicknesses for Item 11					.018" (10", 8", 6" widths) .020" (8", 6" widths)
13	09	Nonmagnetic Form Auto. Aligned, Single-Part	.0057"	.0063"			
14	09	Multiple-Part for Item 13	.0057" (Back Part)	.0063"			.016" (All widths)
15		Other thicknesses for Item 14					.018" (10", 8", 6" widths) .020" (8", 6" widths)
16	08	Translucent, MUR	.0051"	.0056"			
17	07	Manual Front Feed in front of Items 10–16	.003"	.0075"			
18	07	Multiple-Part for Item 17 For Overlap in Pressure-Free Area:	.003"	.0075"			.015"
19	03	Manual Front Feed	.003"	.0075"	.016"		
20	03	Record or nonmagnetic Form	.0057"	.0063"			.016"
21	03	Combination of two above					.016"
22	02	Maximum combined thickness			.055"	or	.049"
23	04	Roll Journal and Pin Feed Form Combination			.047"	or	.018"
24	04	Maximum parts for Item 23					6

6.34.02 MAXIMUM COMBINED THICKNESS, MUR FRONT FEED FORMS HANDLER

Area with Module-Controlled Document

The maximum combined thickness of all forms and documents in this area is .049"; in addition, the thickness for any one form or document must not exceed the permissible thickness for that type of form or document. See Topic 6.34.04 for combined thickness of a pin feed form and a roll journal.

Area without Module-Controlled Document

Except when a .010" thick form is used, the maximum combined thickness of all forms in any one area is .055"; in addition, the thickness for any one form must not exceed the permissible thickness for that type of form. See Topic 6.32.07 for the maximum thickness if one form is .010" thick.

6.34.03 FRONT FEED FORM OVERLAP OF SPLIT OF PLATEN OR OTHER FORMS

See Items 19, 20 and 21 of Chart 2 for Topic 6.34.01. The overlap of a split platen with or without form overlap by a front feed form in a pressure-free area created by disabling the Front Pressure Rolls is described in Overlap B, Item 14 of Topic 6.03.02. The utilization of a pressure-free area to overlap a pin feed form with a front feed form is described in Overlap C of Topic 6.03.03. See Topic 6.32.03 for a summary of the functions which are more commonly used for manually aligned front feed forms. The module-controlled document normally uses a pressure-free area because the Front Pressure Rolls may be disabled for the area, see Subject 6.06.00.

If a combination of a manually aligned front feed form and module-controlled document is used in the pressure-free area for the overlap of a pin feed form or split platen, the combined thickness for the two is .016". See General Considerations for Overlap C of Topic 6.03.03 if the enabled area for the pressure rolls includes the omitted pressure roll Position 228.

This maximum .016" thickness does not apply if the manually aligned form overlaps the split with the edge in between enabled pressure rolls. The overlap usually is .2" to .3" and form specifications are the same (maximum .055") as for any other area of the Forms Handler which is unoccupied by a document. See Overlap B, Item 13 of Topic 6.03.02. A module-controlled document would not utilize the Item 13 overlap.

6.34.04 PIN FEED FORMS, MUR FRONT FEED FORMS HANDLER

See Item 3 of Chart 1 and Items 5 and 23 of Chart 2 for Topic 6.34.01. The following subjects described in Topic 6.31.04 for the Rear Feed Forms Handler are also applicable to the MUR Front Feed Forms Handler, except for the maximum thickness and the position of a horizontal perforation when the module-controlled document is inserted:

Minimum Width of 2¼"

Margins for Pin Feed Forms, see following also

Horizontal Perforations, see following also

Horizontal Perforations, Module-Controlled Document Area

The position of the horizontal perforation on certain pin feed forms must be considered when used in the area behind a module-controlled document. The openings, if created when the perforation advances to the insertion area near the front of the platen, may interfere with the orderly insertion of the document. To avoid this interference, the perforation should be a minimum of 1/6" above, or minimum of 1" below the selected print line of the pin feed form when a document insertion is attempted. The same rule applies to openings which may occur for a form around the platen. The openings created by the perforations do not occur with all continuous forms, but usually occur with the forms which are made of a rigid (stiff) paper stock, such as punched card checks.

Staples in Margin

A staple in the pin feed form behind the Magnetic Unit Record must not be in the area of the magnetic stripe. The right edge of a pin feed form with a stapled margin must be a minimum of .3" from the right edge of the Magnetic Unit Record; right edge for the record is stationary at Position 258. This rule does not apply to the left edge, with or without a magnetic stripe present, but the rule does apply to both pin feed forms and forms around the platen at the rear. (The maximum thickness of .018" behind the record usually does not require staples for satisfactory fastening.)

Thickness of Pin Feed Forms

The maximum thickness for a pin feed form or forms behind the module-controlled document is .018" and not in excess of six parts. The maximum combined thickness for a pin feed form and roll journal in the same area is also .018"; the combination must not exceed 6 parts.

Cut Journals and pin feed forms should not be used in the same area.

6.34.05 ROLL JOURNALS, MUR FRONT FEED FORMS HANDLER

See Item 2 of Chart 1 and Items 3 and 23 of Chart 2 for Topic 6.34.01. Subject to the maximum thickness of .012" a roll journal behind the module-controlled document must not exceed 6 parts. In other areas only the .012" maximum applies. The explanation for a Basic Front Feed Forms Handler (Topic 6.32.05) is also applicable to the MUR Forms Handler. The maximum combined thickness for a roll journal and pin feed form in the same area is .018"; the combination must not exceed 6 parts.

6.34.06 CUT JOURNALS, MUR FRONT FEED FORMS HANDLER

See Item 1 of Charts 1 and 2 for Topic 6.34.01.

Area with Module-Controlled Document

A cut journal behind the document must not exceed a thickness of .018" or be in excess of 6 parts. See Topic 6.34.04 for staples in a journal behind a document. A clearance area is required near the magnetic stripe.

Sewed binders for journals are described in Topic 6.32.06. If the bottom edge is sewed, the binding should not advance to the area which would interfere with the insertion or movement of the document. The last line for the journal should be a minimum of 1½" from the bottom of the journal. See Subject 6.06.00 for last print line for a journal. Although the maximum thickness for a cut journal behind a document is .018", the binding may be a maximum of .029" in thickness, because the binding is never directly in the area of the document.

Area without Module-Controlled Document

A cut journal in an area which is unoccupied by a document, may be used the same as for the Basic Front Feed Forms Handler, Topic 6.32.06.

6.34.07 MANUAL FRONT FEED FORM, MUR FRONT FEED FORMS HANDLER

See Items 4 and 10 of Chart 1 and Items 7, 8, 9 and 17 of Chart 2 for Topic 6.34.01.

The manually aligned front feed forms in front of the Module-controlled document must not exceed a combined thickness of .015". A single-part .010" form should not be used in front of the document. The permissible first print lines are listed in Topic 6.14.10. See Topic 6.34.03 if the form utilizes a pressure-free area in combination with the document.

The explanation for the forms of a Basic Front Feed Forms Handler (Topic 6.32.07) are also applicable, except the permissible Forms Area near the Magnetic Unit Record Modules is described in Topic 6.14.02.

6.34.08 MAGNETIC UNIT RECORD

See Items 11 and 13 of Chart 1 and Items 10, 11, 12 and 16 of Chart 2 for Topic 6.34.01. The Magnetic Unit Record is also referred to as a module-controlled document, or record in this manual when the functions for the handling are described. See Topic 6.14.02 for the area where this record may be placed in the Forms Handler.

Magnetic Stripe

The hot melt stripe is a maximum of .120" wide and is centered .185" from the right edge of the record. The stripe extends the full height of the record. The stripe on the back is only .0002" higher than the surface of the paper. See Figure 6.34.00-1 and head to head printing of the record.

Cutting Tolerances

The allowable cutting tolerance for the Magnetic Unit Record is ± 1/32". See requirement for preprinted line numbers in a subsequent paragraph. Round corners are ¼" maximum radius.

Head to Head Striping

With head to head striping, a stripe is included on both sides of the record. One stripe is located near the left edge (front) and the other is located near the right edge of the opposite side (back) of the record. This is the only combination for two stripes on a record. See Cut Corner.

Translucent Magnetic Unit Records

Translucent Magnetic Unit Records may be used on one side.

Preprinting in Area of Magnetic Stripe

Preprinting on the record on the opposite side of the magnetic stripe area is permissible provided a nonmagnetic ink is used and the printing does not create an emboss. (Generally offset printing does not cause embossment.) Any printing directly on the stripe is prohibited. See Section 4 for Series L print.

Cut Corner, ½" for Filled Sheet

The ½" diagonal cut may be on the left corner; this is used for a signal for the Magnetic Record Reader to ignore the record. This cut is optional. In the absence of a cut, a diagonal line is usually printed in the right corner. The operator uses the line as a guide to cut the corner for a filled sheet. The diagonal cut is not provided for a record with a magnetic stripe on both sides. The filled sheet condition may also be determined in accordance with the programing by the interrogation of the Flag for filled sheet, see Sections 9 and 10.

Multiple-Part Magnetic Unit Records

The back copy of the multiple-part Magnetic Unit Record must include the magnetic stripe. The multiple-part records are not used in the Magnetic Record Reader. The parts in front of the back part must be the same width and same height as the back part. Preprinted line numbers, 1 through 46, may be on all parts, but they must be on the back part and the front part or included on the intermediate part or parts if, after removal of the front part or front and intermediate parts, the remaining intermediate part serves as the front part. The allowable Series L print positions on the front and intermediate parts are the same as if only a single-part is used. See Section 4.

Multiple-part records may use the 6", 8", 10", and 12" widths, but not the 14½" width.

The bottom edge of the multiple-part record must be glued and the top edge must not be glued. The gluing must be effective for the number of times the record is used in the Forms Handler. The bottom edge must be sufficiently glued to prevent fraying after use. The thickness for the gluing must not exceed the maximum .016" thickness for a multiple-part record. The corners are rounded. Excessive glue in the bottom area adds to rigidity of the form, and creates an area which is curved, uneven, or rippled. The rigidity of this area should not be more than 20% of the other areas of the form. Multiple-part records must not include horizontal or vertical perforations.

Carbonless Transfer (CLT or clay coated) paper may not be used for the part that includes the magnetic stripe. The other two parts may use the chemically-treated paper but a carbon must be in between the back part and other parts. The use of "Action Paper" may be substituted for the CLT paper.

Preprinted Line Numbers

Preprinted Line Numbers are included on all Magnetic Unit Records. During a reconstruct routine the operator may be required to index the line number desired in the absence of certain reconstruct routines which do not require the indexing of the line number. The numbers will be preprinted 1 through 46, regardless of the design of the form. The number 46 should be centered 2.570" from the bottom of the form, and each successive preceding number will be centered 1/6" above. The height of the preprinted number should be a minimum of .040" or a maximum of .070". Horizontal lines in between each line number should not be used. See Figure 6.34.00-2.

The preprinted line numbers should be printed within .3" from the right edge of the record. The preprinting would occur on the opposite side of the record from the side of the stripe, but the ink used must be nonmagnetic and preprinting must not create any embossment. If records are striped on both sides, the preprinted numbers must be on both sides.

Multiple-part records must also include the preprinted numbers on the back (striped) copy, plus the numbers on the front copy. If any part or parts of the multiple-part record is removed prior to completion of the posting on the record, the remaining front part must still include the preprinted numbers. Other than the back part, any other parts which will never be considered the front part may or may not include the preprinted numbers.

Secreen bands (EZ read bands) may be used on the forms and screening, if present, is helpful for wide forms. Usually the screening appears in the "accounting area" of the form. Screening is available in 1/6" bands, ½" bands, or a fine-line screen ½" apart. An attempt to match the screening with the 1/6" increment of the preprinted line numbers is not required, although it may match depending upon the form design. The ½" screen generally provides the best results. If the records are copied with a reproducing machine, the reproduction will be the best when the ink of the ribbon is sufficient to provide a "dark" print in the screened area. (Change ribbons when print appears light.)

Figure 6.34.00-1 illustrates the last printing line at 2½" (2.500) from the bottom of the record. This is a nominal measurement. The system is designed to print the bottom edge of the character at 2.515" (±.015") from the bottom of the record to avoid printing on a horizontal line drawn at 2½" from the bottom. Therefore, the center line for the .110" high character is actually at 2.570" or 2.515" plus .055" to the bottom of the record. With the 2.570" center line location for preprinted line number 46, the center line location for the Series L print and preprinted line number should approximately match. A measurement of 2.583" for the location of the center of the preprinted line 46 should not be used. (2.500" plus ½ of 1/6" = 2.583). The center line for the first line would be at .930" from the top of the form. See Topic 4.00.03 for printed and ruled lines.

Sizes for Magnetic Record Reader

The Reader is capable of reading a record which is 11" high and a minimum of 5" and maximum of 14½" in width. Certain applications use a single-part record to print identical information in two areas of a record. This may be a statement area and a ledger area for accounts receivable. A financial institution may print information in an area which is detached before the statement is sent out. A cutting process is used to separate the two areas, and the remaining area with the magnetic stripe may be used in the Reader provided the height remains 11" and the width is a minimum of 5". Once the records are cut they may not be used in the Forms Handler. The round corners for the cut edge are not required for the Reader, but the round corners for the edge near the magnetic stripe must remain.

Reproducing or Copying Machine

Equipment which is used to produce a copy of a Magnetic Unit Record must not generate excessive heat. Temperatures in excess of 150° Fahrenheit will damage the magnetic stripe. An infra-red process generates temperatures in this range and should not be used. Certain equipment may be below 150° limit when initially turned on but after continued operations the temperature rises. The "Thermofax Secretary" machine will damage the stripe due to its high heat.

The .0002" high hot melt stripe is different than an earlier .0006" high aqueous stripe; therefore, if a copying machine operates near the 150° limit, the machine may or may not be suitable for copying records with the hot melt stripe.

Printing Below the Last Line

The last possible line (46) which may be used with the module controls is 2½" from the bottom. The Series L Ball Printer may print in this area provided the record is manually aligned to the desired print line. Printing in the area of the magnetic stripe is not permitted. A jam (Topic 3.04.06) occurs if the record is advanced beyond Line 46; therefore, the program may not advance the record to line 46 under module control and continue to advance beyond line 46 under platen control. The record must be removed and reinserted for manual alignment.

Perforations for Tearing or Separation

Perforations (which are used for the separation or tearing apart of the records or forms) are not permitted on the Magnetic Unit Record or other parts of a multiple-part combination.

Post Holes, Angle Cuts, Die-Cuts or Other Edge Cuts

Angle cuts other than ½" Filled Sheet signal are not permitted (Visible-record forms). Post Holes for binding may not be present. Die cutting in any area is not permissible.

Edged Punched Perforations

The punching of data with an Edge Punch Perforator is not permitted.

Paper Clips, Signals, and Staples

Paper clips, metal signals and staples should not be present on the Magnetic Unit Record or multiple-parts when inserted for automatic alignment. Furthermore these objects should not be attached in the magnetic stripe area during any other time.

Labels

Adhesive labels or signals on the Magnetic Unit Record increases the total thickness of the record and may signal a double document condition if present when the record is read in the Magnetic Record Reader. In addition, the labels create an "uneven" stack of the records both at the Feed Table and Receiving Hopper. Avoid the use of labels or signals.

Environment for Magnetc Unit Records

Storage: Record may be stored under the following environmental conditions:

1. Temperature 50° to 100° Fahrenheit
2. Relative Humidity 10% to 90%

Conditioning: The records must be allowed to condition to equipment environmental conditions for a minimum of 24 hours before they are used.

Shipping: Records may be shipped under the following environmental conditions:

1. Temperature -40° to +120° Fahrenheit
2. Relative Humidity 10% to 90%

6.34.09 NONMAGNETIC FORM CONTROLLED BY MODULES

See Item 12 of Chart 1 and Items 13, 14 and 15 of Chart 2 for Topic 6.34.01. The nonmagnetic form is also referred to as a module-controlled document in this manual when the functions for the handling are described. See Topic 6.14.02 for the area where this record may be placed in the Forms Handler.

The specifications for nonmagnetic forms are the same as a Magnetic Unit Record with regard to thickness and size. The nonmagnetic form does not utilize the magnetic stripe for reading and writing of data, and is not used in the Magnetic Record Reader. Printing at position 255 is permitted. Chemically-treated paper (CLT or action paper) may be used for all parts of the multiple-part module-controlled document. See the following subjects described in Topic 6.34.08.

Cutting Tolerances
Multiple-part Specifications
Preprinted Line Numbers
Printing Below Last Line
Perforation for Tearing or Separation
Post Holes, Angle Cuts, Die-Cuts, or Other Edge Cuts
Edge Punched Perforations
Paper Clips, Signals and Staples
Labels

6.40.00 FORMS HANDLING FEATURES AND ACCESSORIES FOR FORMS HANDLERS

The following subjects describe the forms handling features or accessories which are not described in any other areas in this manual. Usually these features are optional; however, certain features are provided as standard but the features are described in these subjects in order to group the similar features in one area of the manual.

Generally the features are for front form guides and rear form guides which are required as extra features or for different combinations than are furnished as standard. The features for each type of Forms Handler are in separate subjects. Many features for the Front Feed Forms Handler are inter-changeable with the Magnetic Unit Record Front Feed Forms Handler. The "01" topic of each subject includes a list of features which are compatible with the Forms Handler for the assigned subject but the features are described in some other topic or subject of the manual. For example, the Style 1 Front Form Guide is compatible with the Magnetic Unit Record Front Feed Forms Handler, but the feature is explained in the subject for the Basic Front Feed Forms Handler.

6.41.00 FORMS HANDLING FEATURES AND ACCESSORIES, REAR FEED FORMS HANDLER

The forms handling accessories or features for the Rear Feed Forms Handler are listed in the following topics. Topic 6.41.01 is an alphabetic list of optional features or accessories which are compatible with this Forms Handler but are described in other topics or subjects of this manual. Certain features on this list are standard features but extra sets or parts, replacements or different combinations may be required for certain applications.

The "front" and "rear" classifications are established for the orderly presentation of the features which are not listed in Topic 6.41.01. The Forms Handler features which are used in the general area near the front of the console are described beginning with Topic 6.41.02.

6.41.01 SUMMARY OF OPTIONAL FORMS HANDLER ACCESSORIES AND FEATURES, REAR FEED FORMS HANDLER

The following optional features or accessories as described in the designated topics or subjects are compatible with the Rear Feed Forms Handler. See topics following Topic 6.41.01 for other features and accessories.

Continuous Form Intake Guides, Style 1, extra set, removable, 6.20.08

Form Guides, Rear Feed, extra set, removable, 6.11.07

Form Heading Holder Bail, Style 1, extra, removable, 6.11.04

Journal Deflector, extra, removable, 6.11.09

Pin Feed Device, 15½" included if not standard or; replaces standard, removable, 6.20.00:

- Single, Synchronous, Style PF 1, 6.21.00
- Single, Independent, Style PF 2, 6.22.00
- Dual, Synchronous and Independent, Style PF 3, 6.23.00

Platen Durometer Harness, replaces standard harness, 6.01.00

Platen, Solid, replaces Split and Normal Platen, 6.01.00

Platen, Split and Normal, replaces standard split, 6.03.00

Roll Paper Guides and Holders, Style 1, removable, 6.11.10:

- Extra Set of guides only
- Extra set of guides and shaft

Tear Off Blade, 15½", for Single Pin Feed or upper Pin Wheel Assembly of Dual Pin Feed, removable, 6.42.02

6.41.02 UNIT TICKET GUIDES, STYLE 9, REAR FEED FORMS HANDLER

The left and right Unit Ticket Guides clip on to the rear of the Form Heading Holder Bail, Style 1, and the guides are operator installable. The plastic part of the guides are towards the side of the console when properly installed to guide the left and right edges of the ticket. The metal clip fasteners are toward each other. See Topic 6.11.04 for the bail. Only one line of posting ½" from the bottom of the ticket to the bottom of the line of print is permitted on the ticket.

The unit ticket is inserted behind the closed bail (closed Forms Handler) and plastic line-indicator on the Ball Printer until the insertion is stopped by a deflector in front of the Front Pressure Rolls. The Printer carrier must always be in the area of the unit ticket when inserting or removing the unit ticket. The movement of the Printer carrier must be programed so that it is always in front of the unit ticket as long as the ticket is in the Forms Handler. Before inserting the unit ticket, the handler and Forms Heading Holder Bail must be closed.

The minimum and maximum height for the unit ticket is 2½" and 5" respectively. The ticket should be single-part, and a maximum of 8" in width. More than one set of guides may be used on the bail but

only one ticket may be present in the handler at the same time. If two sets are used the left and right adjacent edges (side-by-side) of two forms must be programed to be placed a minimum of .4" apart. A journal, pin feed, or rear feed form may be used in the same area behind the ticket.

6.42.00 FORMS HANDLING FEATURES AND ACCESSORIES, BASIC FRONT FEED FORMS HANDLER

The forms handling accessories or features for the Basic Front Feed (BFF) Forms Handler are listed in the following topics. Topic 6.42.01 is an alphabetic list of optional features or accessories which are compatible with this Forms Handler but are described in other topics or subjects of this manual. Certain features on this list are standard features but extra sets or parts, replacements or different combinations may be required for certain applications.

The "front" and "rear" classifications are established for the orderly presentation of the features which are not listed in Topic 6.42.01. The Forms Handler features which are used in the general area near the front of the console are described beginning with Topic 6.42.02. Features for the rear of the console are described beginning with Topic 6.42.50.

In the following explanations abbreviations are used to designate the different types of Forms Handlers:

BFF	Basic Front Feed Forms Handler
FFF	Financial Front Feed Forms Handler
MUR	Magnetic Unit Record Front Feed Forms Handler

Features for the Front Area

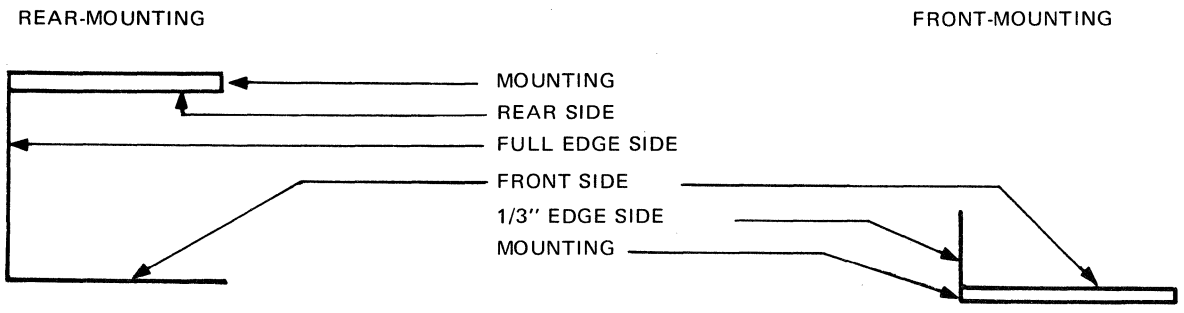
The features for the front of the Forms Handler are mainly front form guides which are used for front feed forms. The guides are placed at predetermined positions which are designated for the forms area of an application.

The guides are held in place by a spring-pressure device at the notched areas reserved for the respective guides. The handles of the guides are pinched together to remove or reposition the guides. See Figure 6.42.00-1.

Rear-mounting front form guides which have a slightly curved rear side attach to the Form Guide Bridge (Topic 6.12.05). The front-mounting guides which have a straight front side attach to the Form Aligning Table (6.12.03). The rear bridge and front table are parallel to each other for the width of the handler, but they are a greater distance apart (front to rear) at the top than they are at the bottom near the Front Pressure Rolls. A side-view of this area presents a V-shaped area or chute where the forms are inserted.

The form guides are placed in the V-shaped area with the edge sides perpendicular to the bridge and table. The edge side of the guides limit the left and right edges of the forms. The forms area becomes "boxed-in".

Front form guides are available with two sides or three sides. A guide will always have an edge side and either a front side or rear side for a "two-sided" guide, or will have all three sides for a "three-sided" guide. The functions for the guides are explained in the following topics of this Subject. The edge side of a guide may occupy the full V-shaped area or only part of the area if overlapping front feed forms or pin feed forms are used. The following are illustrations of symbols of the guides in relation to the top view. These symbols are used for various examples in the following topics. The double line indicates the position of the mounting bracket for a representative outline for a top view of a guide.



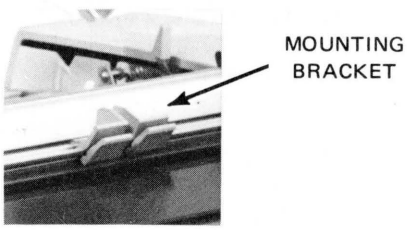
Features for the Rear Area

Rear Form Guides are used to "channel" the bottom of a front feed form as the bottom edge moves rearward when the operator inserts the form for alignment. The guides also assist to maintain the proper position of the form when several line advance functions occur.

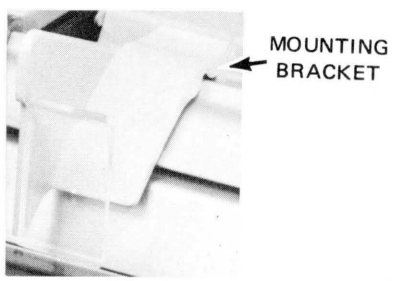
Form limits are provided to limit the downward movement of the form at a predetermined first print line or to some other selected print line. Usually a form guide also includes an adjustable form limit; however, other devices are available to provide for a form limit only.

The removable guides or limits are attached to a lower shield behind the platen and below the Hinged Cover. The Hinged Cover may be latched up while removing or repositioning the guides. A scale marked in 1/10" increments is provided for assisting in the placement of certain guides.

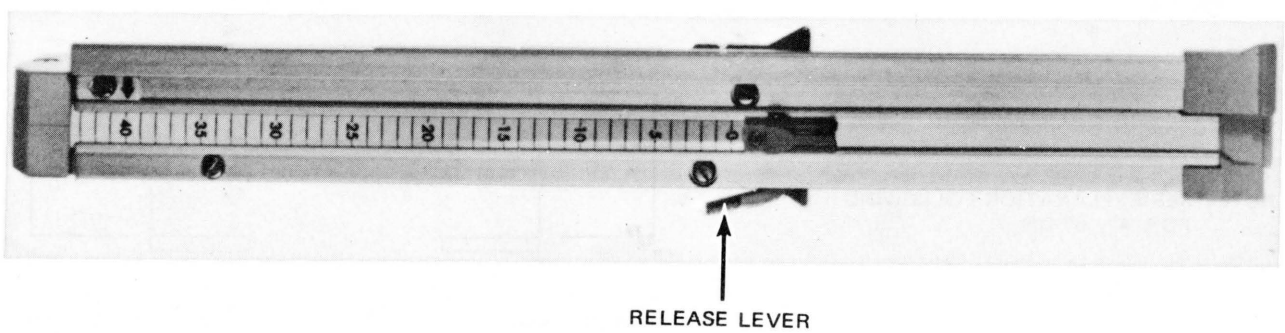
The removable guides and limits include a locking device with a Release lever. The locking device holds the guide or limit in place on the lower shield and the Release lever is used to disengage the lock for movement or removal of the guides or limits. The Release lever is assembled on the left or right depending on the type of guide or limit used. This lever may be repositioned to the opposite side with the aid of a screwdriver. For certain combinations of guides and limits it may be advantageous to reverse the lever to permit adequate "finger room" for removing or repositioning the guides. See Figure 6.42.00-1 for the Release lever.



FRONT-MOUNTING FRONT FORM GUIDE

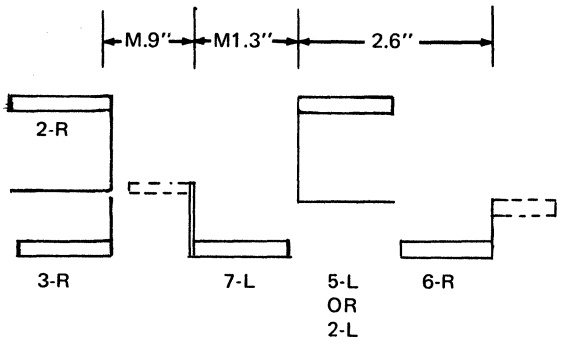


REAR-MOUNTING FRONT FORM GUIDE

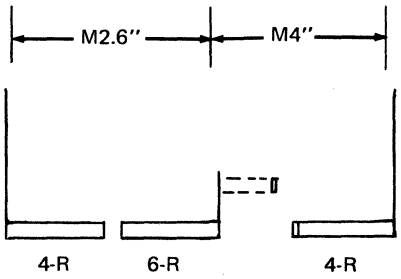


RELEASE LEVER FOR REAR FORM GUIDES AND LIMITS

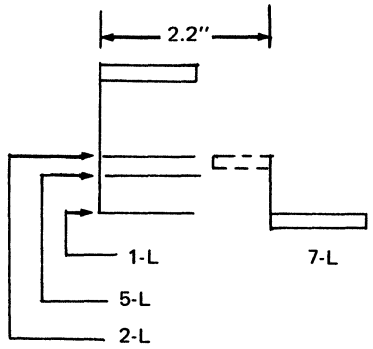
Figure 6.42.00-1 Mounting Devices for Guides and Limits, Front Feed Forms Handlers



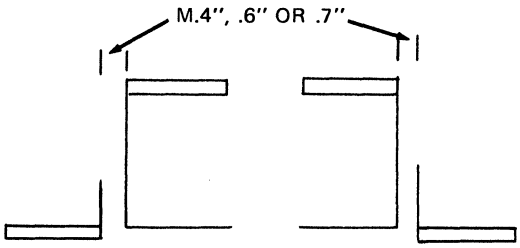
Example 1



Example 2

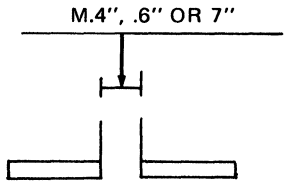


Example 3



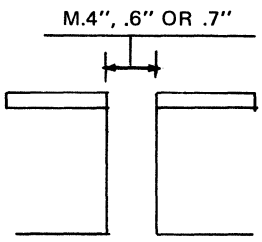
FRONT AND REAR MOUNTING
ANY COMBINATION EXCEPT
FOR EXAMPLE 1, 2 AND 3

Example 4



FRONT-MOUNTING
ANY COMBINATION EXCEPT
FOR EXAMPLES 1 AND 3

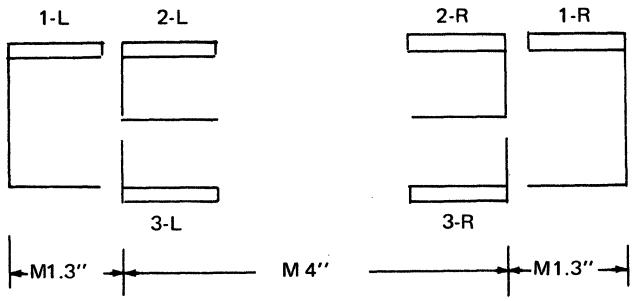
Example 5



REAR-MOUNTING
ANY COMBINATION

Example 6

NOTE: SEE EXPLANATION FOLLOWING
FOR .4", .6" OR .7"



Example 7

CODE: 1-R, 7-L, ETC. = STYLE AND LEFT OR RIGHT GUIDE
M = MINIMUM

Figure 6.42.00-2 Minimum Clearance for Front Feed Forms

Explanation for Figure 6.42.00-2

The minimum distance between the left and right adjacent edges for forms front-inserted side-by-side is .7" if rear guides are used. If rear guides are not required or a suitable combination of form limits is possible, the minimum distance may be reduced to .4". The right edge of a manually aligned front feed form with a rear guide may be a minimum of .6" to left of the programed position for a module-controlled document with a Magnetic Record Computer system. See Topic 6.43.03 for minimums when the Style 3, Form Aligning Table-Bail is used with Financial Front Feed Forms Handler.

M = MINIMUM

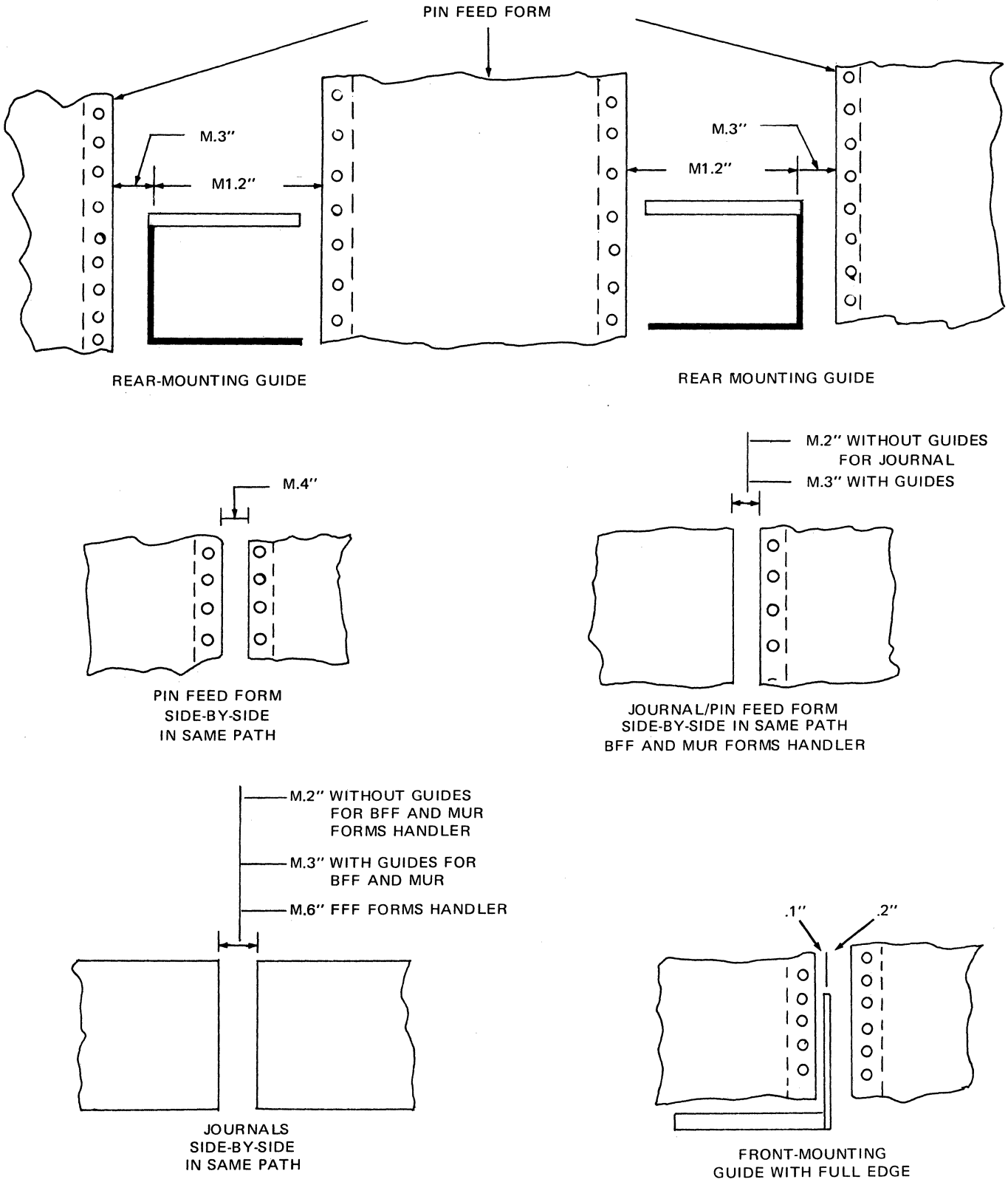


Figure 6.42.00-3 Minimum Clearance for Journals and Pin Feed Forms, Front Feed Forms Handlers

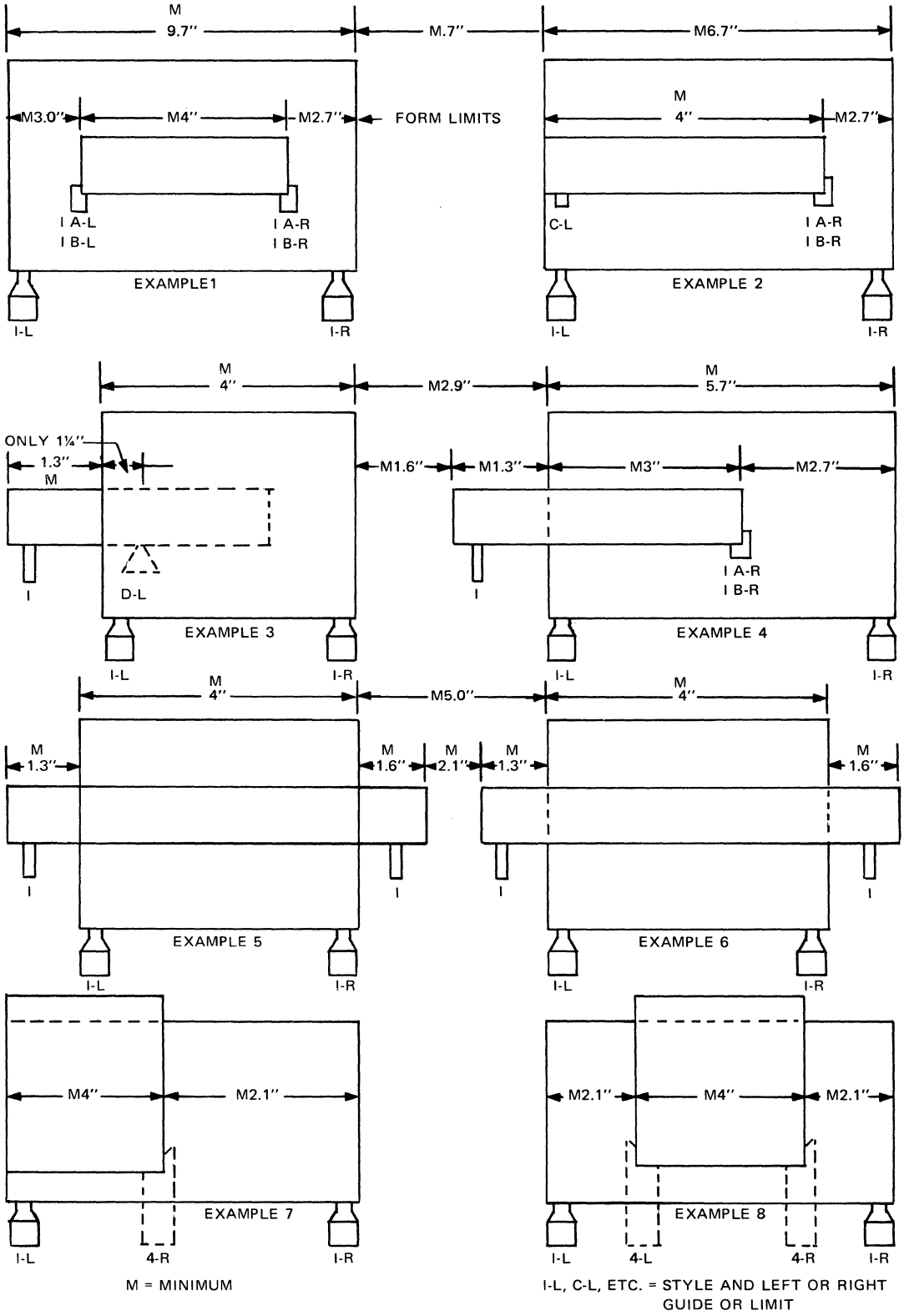


Figure 6.42.00-4 Minimum Clearance for Form Limits, Front Feed Forms Handler

Explanation for Figure 6.42.00-4

The examples of the Form Limits and Guides are for a Basic Front Feed Forms Handler; however, certain examples are applicable for other Front Feed Forms Handlers.

Financial Front Feed Forms Handler

The Styles 3-L and 3-R Rear Form Guides may be substituted for the Styles 1-L and 1-R respectively in all the examples except for the following:

1. Example 2, a Style C-L Coincident Edge is not applicable to the FFF Forms Handler.
2. Example 3, a Style D-L, Scoot-Under Form Limit is not applicable to the FFF Forms Handler.
3. Examples 1, 2, and 4, the Styles 1A and 1B Scoot-Over Form Limits are not applicable to the FFF Forms Handler.

Magnetic Unit Record Front Feed Forms Handler

The Styles 2-L and 2-R Rear Form Guides may be substituted for the Styles 1-L and 1-R respectively in all the examples except for the following:

1. Examples 2 and 3, the Styles C-L and D-L must be at or to the left of Position 95 and be attached to a Style 1 Rear Form Guide.
2. Form Limits Styles 1, 1A, and 1B may be used only at or to the left of Position 95.
3. Styles 1 and 4 rear guides are not used to the right of Position 95.

6.42.01 SUMMARY OF OPTIONAL FORMS HANDLER ACCESSORIES AND FEATURES, BASIC FRONT FEED FORMS HANDLER

The following optional features or accessories as described in the designated topics or subjects are compatible with the Basic Front Feed (BFF) Forms Handler. See topics following Topic 6.42.01 for other features and accessories.

Continuous Forms Intake Guides, Style 1, removable, 10", for pin feed form on lower intake rack for Dual Pin Feed Device, extra, 6.20.08

Continuous Form Intake Guides, Style 2, removable, 3½", for forms around platen, 6.20.08

Form Guides, Front, left or right as specified, removable, extra:

Style 4-L or 4-R, two-sided with nontransparent front, front-mounting, 5/6" minimum first print line, 6.44.02

Style 5-L, three-sided with nontransparent front, rear-mounting, 5/6" minimum first print line, for areas of overlapping front feed forms, 6.44.03

Style 6-R, two-sided with transparent front, front-mounting, 1¼" minimum first print line, for areas of overlapping front feed form, 6.44.04

Style 7-L, two-sided with nontransparent front, front-mounting, 5/6" minimum first print line, for areas of pin feed form, 6.44.05

Form Guide, Rear, Style 2, left or right, removable, operator adjustable limit for print line a minimum of 2" to a maximum of 11" from bottom of form, 6.44.50

Pin Feed Device, removable, included if not standard or, replaces standard; 6.20.00:

Single, Synchronous, Style PF 4, 15½", 6.21.00

Single, Independent, Style PF 5, 15½", 6.22.00

Dual, Synchronous and Independent, Style PF 6, 15½", 6.23.00

Single, Synchronous, Style PF 7, 26", 6.21.00

Single Independent, Style PF 8, 26", 6.22.00

Dual, Synchronous and Independent, Style PF 9, 26", 6.23.00

Platen Durometer Harness, replaces standard harness, 6.01.00

Platen, Solid, replaces Split and Normal Platen, 6.01.00

Platen, Split and Normal, replaces standard split, 6.03.00

Roll Paper Holders, Style 2, attach left or right, removable, extra set, 6.12.10

6.42.02 TEAR-OFF BLADE FOR PIN FEED FORMS; RF, BFF, FFF, AND MUR FORMS HANDLERS

A removable Tear-Off Blade for 15½" or 26" Forms Handlers may be used on a single Pin Feed Device or the upper Pin Wheel Assembly of a Dual Device. The 1/8" oval-head projections on the fastening clips for each end of the blade fit in the holes in the plastic upright covers for the Pin Wheel Assembly. The tear-off edge is placed above and parallel to the Paper Table behind the Pin Wheels. See Figure 6.20.00-1 for the Paper Table. A 15½" or 26" pin feed form for the respective Forms Handler may be placed between the table and blade for the Pin Feed Device with the Style 1 Pin Wheel Release-Lock Levers (Topic 6.20.02). If the Style 2 (pointed-top) Release-Lock Levers are provided the maximum width pin feed form may be 14½" and 25" for the respective Forms Handler. The forms area for the form is from print or program positions 2.5 to 147.5 for a 15½" handler (147.5 minus 2.5 = 145 tenths). For a 26" Forms Handler the positions are from 2.5 to 252.5 (252.5 minus 2.5 = 250 tenths).

6.42.03 FRONT FORM GUIDE, STYLE 1; BFF AND MUR FORMS HANDLERS

The three-sided, Style 1 left and right form guides attach to the Style 1 Form Guide Bridge with a rear-mounting bracket. The guides may be removed or adjusted by the operator. The guides have a transparent front and the edge side occupies the full V-shaped area between the rear bridge and the front Form Aligning Table.

Style 1 guides are normally used for manually aligned front feed forms unless the application requires a pin feed form, or requires another front-inserted form in the same area. With this guide the first desired print line must be a minimum of 1¼" from the top of the form to the bottom edge of the printed characters. If the form is inserted for a print line less than 1¼" from the top of the form, the front of the guide loses control of the form when the Forms Handler closes. A line advance function or Forms Handler opening may "trap" the top of the form. See the Style 4 guide (Subject 6.44.00) for a 5/6" first line. The minimum width for a front feed form between a set of Style 1 guides is 4".

A front feed form or another guide may not be placed in between the Form Aligning Table and the 1.3" wide front side of the guide (no overlapping of forms). See Style 2 guides for overlapping forms. A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 1 guide. See Figure 6.42.00-2 for the minimum clearance between forms and figure 6.42.00-3 for the clearances for pin feed forms.

Style 1 guide is not compatible with the FFF Forms Handler. The guide may not be used for a module-controlled document with the MUR Forms Handler but it is used for other front feed forms with the handler.

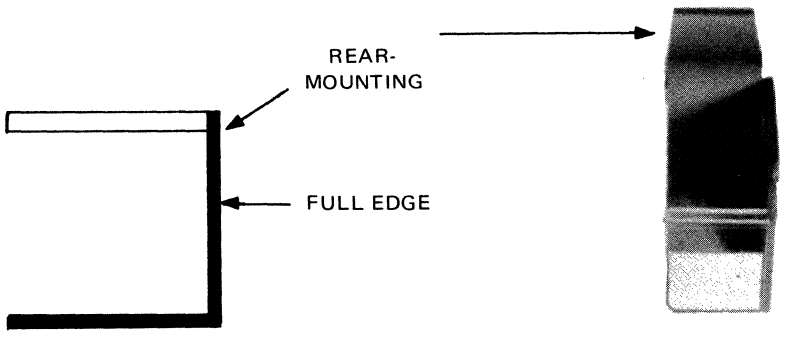


Figure 6.42.03-1 Front Form Guide, Style 1

6.42.04 FRONT FORM GUIDES, STYLE 2; BFF AND MUR FORMS HANDLERS, WITH MANUALLY ALIGNED OVERLAPPING FORMS

The three-sided, Style 2 left and right form guides attach to the Style 1 Form Guide Bridge with a rear-mounting bracket. The guides may be removed or adjusted by the operator. The guides for front feed forms have a nontransparent front and the edge side occupies approximately 2/3 of the V-shaped area from the rear bridge toward the Form Aligning Table. The remaining 1/3 area in between the Front Form Aligning Table and the front side of the Style 2 guide is sufficient for the insertion of an overlapping front feed form. The area is also sufficient for the placement of the edge side of a Style 3 guide directly in front of the 1.3" wide front of the Style 2 guide.

This Style 2 guide is used primarily to guide the rear, front feed form if two front-inserted forms occupy all or parts of the same area. Generally the Style 2 guide is used in combination with the Style 3 guides. The Style 2 guide holds the form approximately ¼" away from the alignment line on the aligning table. The alignment of the form using Style 2 guide generally should be with a preset limit if the rear form cannot be properly aligned with the alignment line. If only one Style 2 guide is used with the form, the other edge may contact the Form Aligning Table sufficiently to permit accurate alignment. Both of the edges for the rear form may be in between the left and right edges of the front form or the edges of both forms may coincide. The front and rear forms may overlap the edges of each other also.

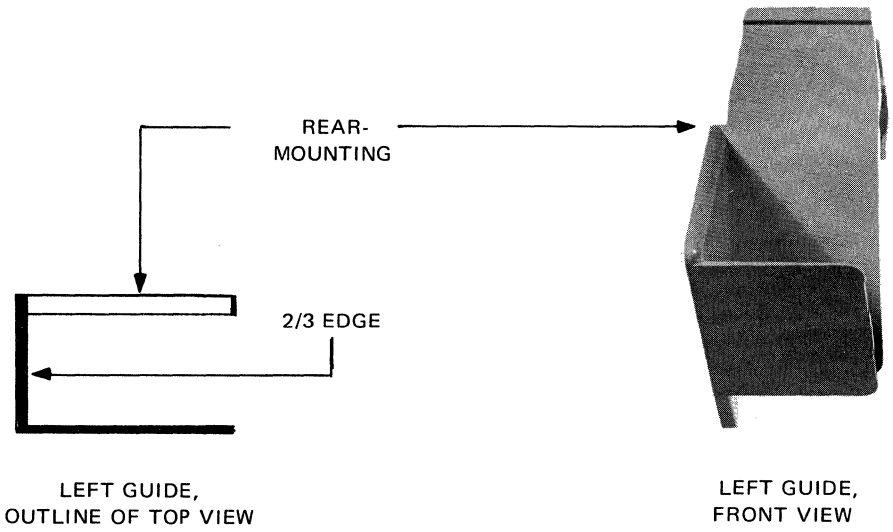
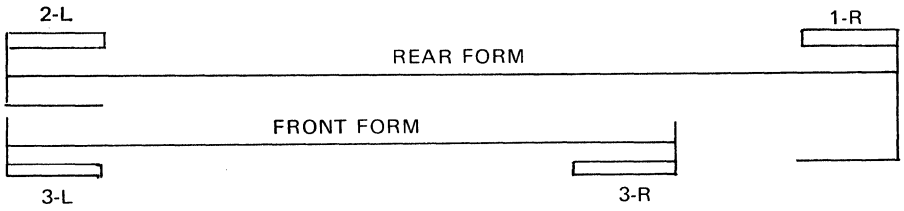


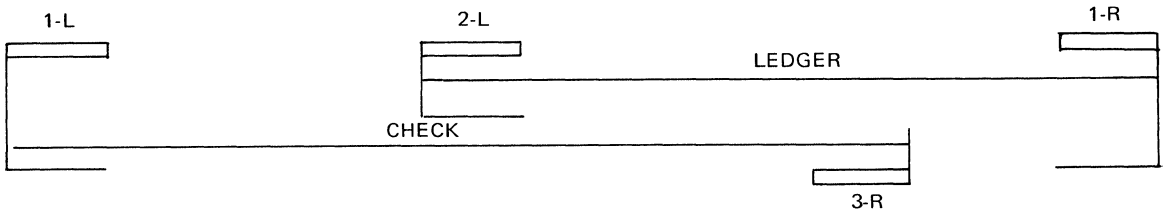
Figure 6.42.04-1 Front Form Guide, Style 2

If the rear form of two forms uses the Style 2 guide, the first desired print line may be a minimum of 5/6" from the top of the form to the bottom edge of the printed characters. However, if a Style 3 guide is used in an area in front of the rear form or if the rear form uses a Style 1 guide at one edge, then the minimum first print line should be 1¼" from the top of the form. See form guides Styles 1 and 3 for the "trap" condition which may occur for a first print line less than 1¼". With normal conditions the Style 2 guide releases the control of the form if the first print line is less than 2 1/6" from the top of the form. This is permissible, because the top of the form falls against the front form or falls against the Form Aligning Table in the absence of a front form. The Form Aligning Table, without any form guides present for the forms, permits a 5/6" minimum first line. See the Style 5-L guide (Subject 6.44.00) for a 5/6" minimum print line. The minimum width for a front feed form between a set of Style 2 guides is 4".

Example 1:



Example 2:



A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 2 guide. A Style 1 and Style 2 guide may not be in the same forms area. See Figure 6.42.00-2 for minimum clearance between forms and Figure 6.42.00-3 for the clearances for pin feed forms.

The Style 2 guide is not compatible with the Style 2 Form Guide Bridge for the FFF Forms Handler. The guide may not be used for a module-controlled document with the MUR Forms Handler but it is used for other front feed forms with the handler.

The Styles 3-L and 3-R and Styles 7-L and 6-R guides (Subject 6.44.00) are respectively similar, but the Style 7-L and 6-R guides for a module-controlled document may not be placed in front of the Style 2 guides, like the Style 3 guides may be placed.

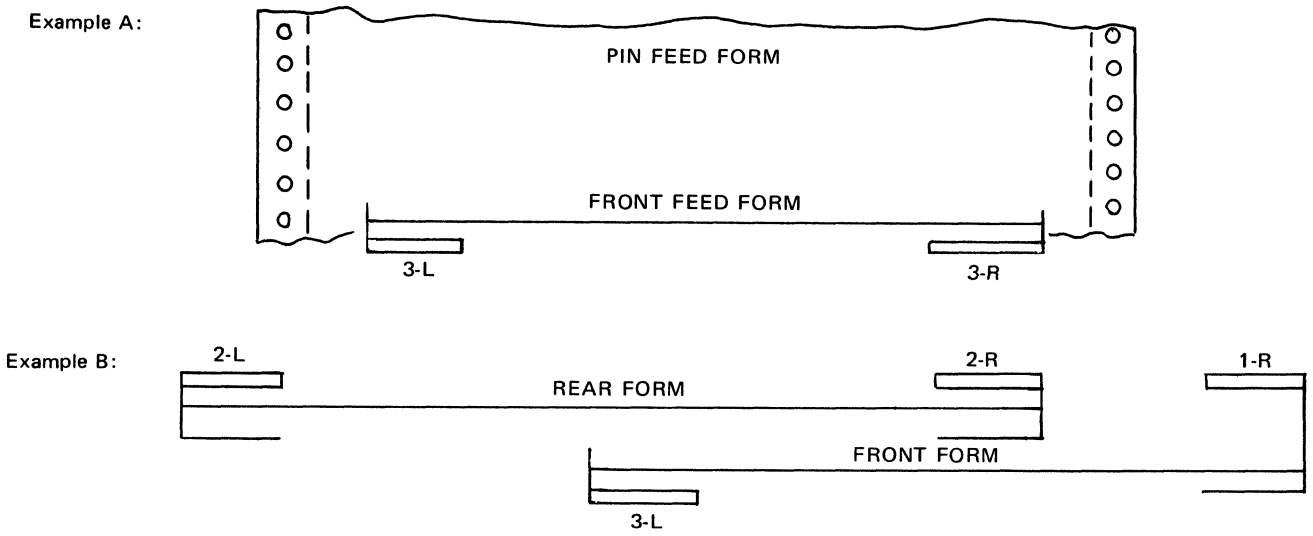
6.42.05 FRONT FORM GUIDE, STYLE 3; BFF AND MUR FORMS HANDLERS, WITH PIN FEED FORMS OR MANUALLY ALIGNED OVERLAPPING FORMS

The two-sided, Style 3 left and right form guides attach to the Style 1 Form Aligning Table with a front-mounting bracket; the guide does not have a rear side. The guides for front feed forms may be removed or adjusted by the operator. The guides have a transparent front and the edge side occupies approximately 1/3 of the V-shaped area from the front table towards the Form Guide Bridge. The remaining 2/3 area between the front of the Form Guide Bridge and behind the edge side of the front-mounting Style 3 guide (no rear side) is sufficient to permit a pin feed form behind the edge side or an overlapping front feed form in the area or a combination of both.

The first desired print line must be a minimum of 1¼" from the top of the form to the bottom edge of the printed characters. If the form is inserted for a print line less than 1¼" from the top of the form, the front of the guide loses control of the form when the Forms Handler closes. A line advance function or Forms Handler opening may "trap" the top of the form. See The Style 7-L guide (Subject 6.44.00) for a 5/6" first line. The minimum width for a front feed form between a set of Style 3 guides is 4".

This Style 3 guide is required when a pin feed form is used in the area which also requires an edge guide for a manually aligned front-inserted form. This permits the pin feed form to be in front (a requirement) of the Form Guide Bridge with the front-inserted form in front of the pin feed form. The pin feed form prevents the use of rear-mounting guides on the bridge. Therefore, the Style 2 guide for the rear form for overlap conditions with front feed forms cannot be used in the area of a pin feed form.

This Style 3 guide is also used for the front form for any application requiring the front-insertion of two forms in the same area or parts of the same area. The edges of both forms may coincide or both edges of one form may be within the edges of the other form. Also one form may overlap the edges of the other form; elongated forms such as checks and employee earning records may use this principle. The elongated form may be inserted in front of or behind the ledger. Generally the Style 3 guide for the front form is used in combination with the Style 2 guide for the rear form if the front form overlaps the edge of a rear form or if the edges coincide. However, the Style 3 guide for the front form may be used in combination with Style 1 guide for the rear form if the edges for the front form are between the edges of the rear form. In this case a minimum distance between adjacent form edges for the different guides is 1.3". This is equal to certain minimums for rear form guides, if rear guides are also required for the related edges of the form. See Figure 6.42.00-4. The Style 2 guide could be used in place of the Style 1 guide to eliminate this placement restriction (1.3") for the front guides. See Topic 6.42.04. See following examples.



The Style 3 guide is not compatible with the Style 2 Form Aligning Bail of the FFF Forms Handler. The guide may not be used for a module-controlled document with the MUR Forms Handler and may not be placed in front of the document with or without a form present in the front of the document. See the Style 6-R and 7-L guides, Subject 6.44.00. The Style 3 guide may not be placed in front of the Style 5-L which is similar to a Style 2 guide.

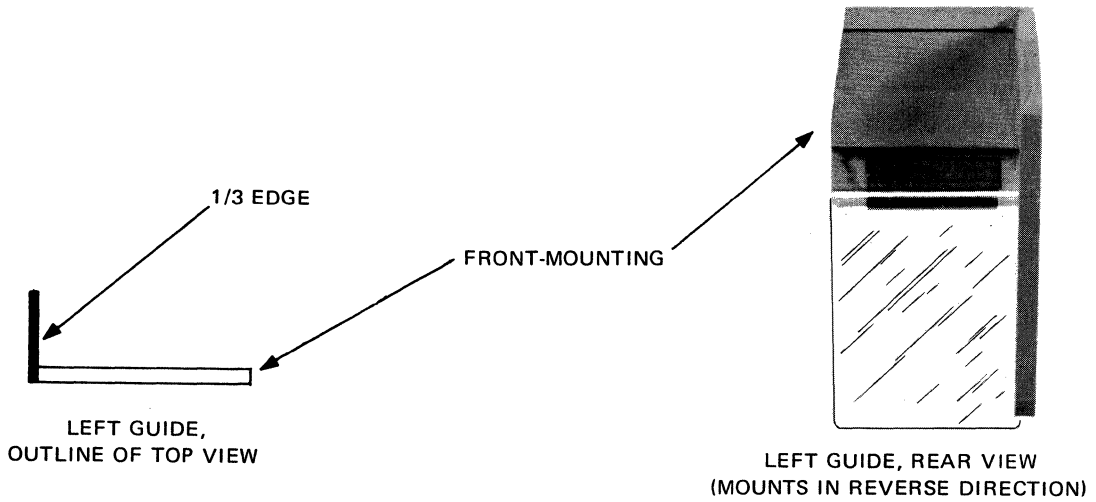


Figure 6.42.05-1 Front Form Guide, Style 3

6.42.06 FRONT FEED FORM DEFLECTOR-STABILIZER, STYLE 1, BFF AND MUR FORMS HANDLERS

The Deflector-Stabilizer, Style 1, attaches to the Style 1 Form Guide Bridge and is usually between a set of form guides. The Deflectors are removable and may be repositioned the same as the front guides. After the front feed form is aligned and before the handler closes the device holds the alignment of forms which have a low rigidity (light or thin forms) or holds the form which is manually aligned to a line near the bottom edge.

A lever is provided to adjust for the pressure for the different form thicknesses. The lever is moved up to decrease the pressure and is lowered to increase the pressure. Usually only one deflector-stabilizer is required per form; however, more than one may be used for wide forms.

The deflector-stabilizer may not be present in the area of a pin feed form. The Style 1 Deflector-Stabilizer is not compatible with the Style 2 Form Guide Bridge for the FFF Forms Handler. (The conformation of the bridges is slightly different.)

With a MUR Forms Handler the deflector is not used with a module-controlled document and must not be present in the same area.

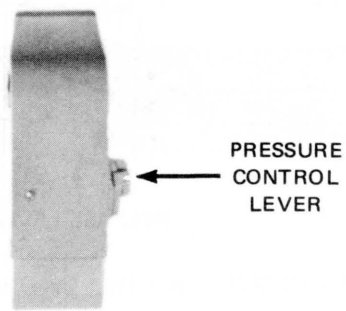


Figure 6.42.06-1 Form Deflector-Stabilizer, Style 1

A general rule is not established for the number of Deflector-Stabilizers which must be used on a front feed form. The last possible print line, the size of the form, and the number of parts for the form will determine the number of stabilizers required. For example, an elongated form which overlaps a ledger may be aligned in the left area to preset form limits, but the greater width of the area in front of the ledger is unsupported by a preset limit. The operator inserts and aligns the form, but prior to the closing of the Forms Handler the right area drops down. A second deflector-stabilizer may be required in the left area to provide for the lack of a form limit in the right area.

6.42.50 REAR FORM GUIDE, STYLE 1; BFF, FFF AND MUR FORMS HANDLERS

The left and right removable guides are used for manually aligned front feed forms unless some other guide or limit is required for a special condition. The left and right edges of the form are guided by the retaining edges of the guides after the bottom edge of a form is inserted approximately 2½" below the print line. The guides are installed, repositioned, or removed at the rear of the console. The adjustable form limit, which is part of the guide assembly, may be preset by the operator for a print line between a minimum of 2" and a maximum of 13½" from the bottom of the form. The distance is measured to the bottom of the line of print. The retractable scale permits the setting of the form limit without removing the guide from its place. The form limit is attached to the retractable scale. A release lever must be depressed and held before the scale and limit may be repositioned; it locks in place when the pressure is released. Two adjacent nonoverlapping forms must be a minimum of .7" apart, see Figure 6.42.00-2. Minimum form width is 4".

The front end of the retaining edge of the guide prevents the downward movement of a front feed form. If a front feed form is inserted in front of the retaining edge of the guide, the maximum distance for the first print line is 2" from the bottom of the form. (A form is in front of the guide when the left and right edges are on opposite sides of the guide.) Elongated forms (payroll checks) commonly are inserted in front of the Style 1 rear guide. See scoot-over guide, Topic 6.42.51 for other overlap conditions.

A slide, held in place by a screw, has an elongated hole and is marked with an arrow. This is a calibration device which is used when the desired first print line for a form is not an even 1/6" distance from the bottom of the form. The form is aligned to the desired first line, and the limit on the retractable scale is set at the bottom edge of the form. The arrow is adjusted to the nearest 1/6" line on the scale. Every five lines also include a numeric marking, 0 through 75. The 0 is on the front of the scale near the limit. A position aperture is at the outside edge near the back end of the guide. The aperture is used to place the guide at the desired position in relation to the numeric scale on the lower shield. See Topic 6.09.01 Numeric Scales.

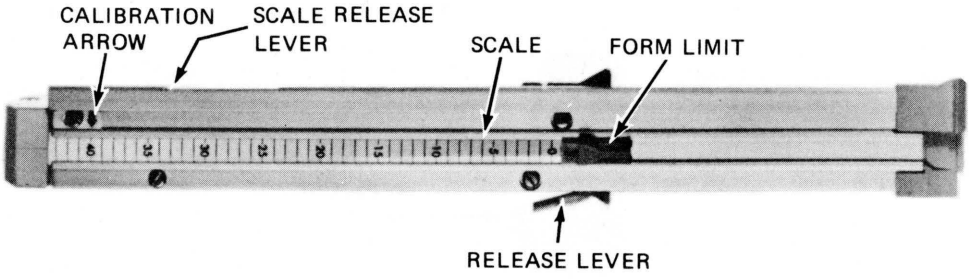


Figure 6.42.50-1 Rear Form Guide, Style 1

FFF Forms Handler

The Style 1-R guide may be used to guide the right edge of a form which is to the left of, or at Position 130 for a FFF Forms Handler, or the Style 1-L guide may be used to guide the left edge of a form to the left of, or at either Position 111 or 112 depending upon where the Style 3A guide is set, Topic 6.13.06. The Style 1 guide extends 4" beyond the back of the console.

MUR Forms Handler

The Style 1 guides may be used in the left Manual Front Feed area with this handler. The Style 1-R guides may be used for the right edge of a form which is to the left of, or at Position 95. The Style 1-L guides may be used for the left edge of a form which is to the left of, or at Position 80. See the Style 2 rear guides of Subject 6.44.00.

NOTE: The front end of the Style 1 guide should not be used to provide a form limit of 2". The actual print line selected may be more than 2" depending upon the allowable tolerances for manufacturing purposes.

6.42.51 SCOOT-OVER REAR FORM GUIDE, STYLE 4; BFF, FFF, AND MUR FORMS HANDLERS

The left and right, removable scoot-over guides are installed and removed from the rear of the console. A form limit with a retractable scale is also provided as described for the Style 1 guide, Topic 6.42.50. The guide is used when the front feed forms in the same area are not collated and both forms are aligned to a print line greater than 2" from the bottom of the forms. The front end of the scoot-over guide is provided with an incline (skid) which deflects the bottom edge of a front feed form over the top of the retaining edge of the guide, when the left and right edges of the form are on opposite sides of the guide. The retaining edge is used for a form which is placed in the scoot-over guide.

If two forms are used in the same area with the guide, the following combinations are permissible.

1. The form in the scoot-over guides should be the front form and should be the second form to be inserted. See Examples 7 and 8 of Figure 6.42.00-4.
2. The form in the scoot-over guide may be the front form and the first form to be inserted if a second form is inserted in part of the area behind the form in the scoot-over guides. This condition may occur if the rear form extends beyond the edge or edges of the front form. The rear form would not have a rear guide for the edge behind the front form.

One front-inserted form may be wider than another form if two forms are used in the same area and both may use rear guides. The scoot-over guide permits the alignment of a wide form without being restricted by the regular Style 1 guide for the other form in the same area. With the scoot-over feature the narrow form is provided with a scoot-over guide or a set of scoot-over guides. See Examples 7 and 8 of Figure 6.42.00-4 for the minimum adjacent form edges. Minimum form width is 4".

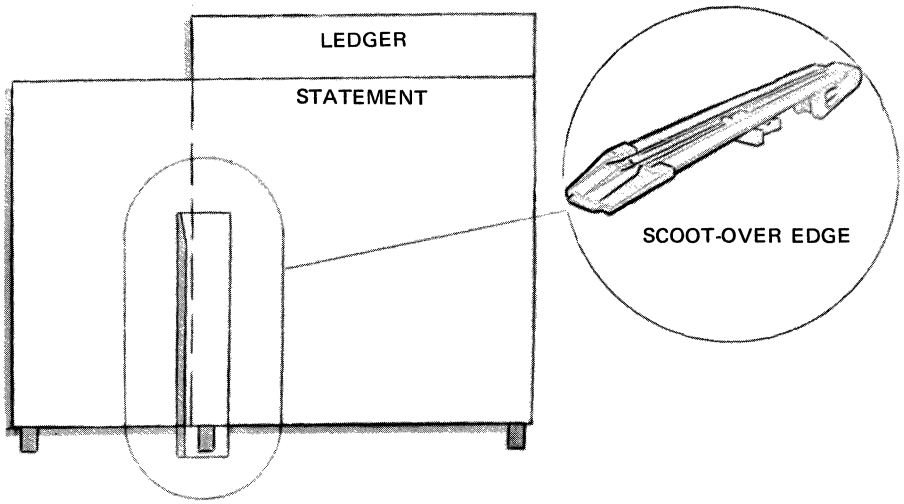


Figure 6.42.51-1 Scoot-Over Rear Guide, Style 4

If the preset limit is used for the scoot-over guide, the limit will also limit the form which passes over the scoot-over guide. Usually with manually aligned long forms, the preset form limit is not used for the scoot-over guide and it is retracted. The form limit may be used when the preset limit for a line on the form in the scoot-over guide is a greater distance from the bottom of the form than for a print line on a form which passes over the scoot-over guide. The bottom edge of the form which "scoots-over" would not reach the limit.

The Style 4 scoot-over guide may be used with the FFF Forms Handler but the guide extends 4" beyond the back of the console. The guide may be used with the MUR Forms Handler to the left of Position 95, but it may not be to the right of Position 95 with or without Magnetic Unit Record Modules retracted. The permissible locations for the Style 4 rear guides are the same as for the Style 1, see Topic 6.42.50.

6.42.52 SCOOT-OVER FORM LIMIT ASSEMBLY, SHORT FORM, STYLES 1A AND 1B; BFF AND MUR FORMS HANDLERS

The left and right removable form limits are installed and removed from the rear of the console. These form limits were formerly designated as the Styles A and B limits, but the designations are now Styles 1A and 1B respectively. The functions are unchanged.

The front feed form which uses this type of limit must have a square corner, but the form which bypasses the limit (scoots over) may use square or round corners. The front of the limit contacts the form within a .1" area near the edge of the form. The Style 1B permits a preset printing line within a minimum and maximum of 1 2/6" and 2" respectively from bottom of the form to the bottom of the line of print. With the Style 1A limit, the minimum may be either 5/6" or 1 2/6" and the maximum may be 2". This is dependent upon where the edge of the form is placed.

Style 1A is installed between the pressure rolls and Style 1B is installed behind them. Style 1B has more possible locations. See Figure 6.42.52-1 and following paragraphs.

The limiting devices are used if a preset limit is required within the area where another form is front fed to a point beyond the limit. The scoot-over function permits the insertion of a form similar to the Style 4 Scoot-Over Rear Form Guide where the edges do not coincide, Topic 6.42.51. The form edges must not coincide with these limits. The second form is aligned in front of the first form, but the bottom edge is stopped by the limit. See Examples 1, 2, and 4 of Figure 6.42.00-4. The limits also provide an edge guide for a short distance. Front form guides should be used with the second form as well as the first form. Payroll applications may use these limits.

Two variations are provided and both are included in the assembly of parts, but only one may be installed at a time. These limits are not operator adjustable, but they may be removed or repositioned by an operator.

The permissible locations are dependent upon whether a 15½" or 26" Forms Handler is used. The following locations are designated in relation to the center line of the print positions.

1. STYLE 1A-R, PRINT LINE BETWEEN 5/6" TO 2", 15½" BFF FORMS HANDLER

   The right edge of the form may be located at the following positions for the above print line limits:

   49.5, 62, 74.5, 87, 99.5, 112, 124.5, and 137.

2. STYLE 1A-R, PRINT LINE BETWEEN 1 2/6" TO 2", 15½" BFF FORMS HANDLER

   The right edge of the form may be located at the following positions for the above print line limits ("-" means through and including):

   48.5-50.5, 61-63, 73.5-75.5, 86-88, 98.5-100.5, 111-113, 123.5-125.5, and 136-138.

   The inclusive locations for this paragraph are actually .1" to the left and right of the respective position listed in Paragraph 1.

3. STYLE 1A-L, PRINT LINE BETWEEN 5/6" TO 2", 15½" BFF FORMS HANDLER

   The left edge of the form may be located at the following positions for the above print lines:

   13.5, 26, 38.5, 51, 63.5, 76, 88.5, and 101.

4. STYLE 1A-L, PRINT LINE BETWEEN 1 2/6" TO 2", 15½" BFF FORMS HANDLER

   The left edge of the form may be located at the following positions for the above print lines ("-" means through and including):

   12.5-14.5, 25-27, 37.5-39.5, 50-52, 62.5-64.5, 75-77, 87.5-89.5, and 100-102.

   The inclusive locations for this paragraph are actually .1" to the left and right of the respective positions listed in Paragraph 3.

5. STYLE 1B-R, PRINT LINE BETWEEN 1 2/6" TO 2", 15½" BFF FORMS HANDLER

   The right edge of the form may be located at the following positions for the above print line limit ("-" means through and including):

   39-47, 52-59.5, 64-72, 77-84.5, 89-97, 102-109.5, 114-122, 127-134.5, and 139-146.

6. STYLE 1B-L, PRINT LINE BETWEEN 1 2/6" TO 2", 15½" BFF FORMS HANDLER

   The left edge of the form may be located at the following positions for the above print line limits ("-" means through and including):

   9-11, 16-23.5, 28-36, 41-48.5, 53-61, 66-73.5, 78-86, 91-98.5, and 103-111.

7. STYLE 1A-R, PRINT LINE BETWEEN 5/6" TO 2", 26" BFF FORMS HANDLER

   The right edge of the form may be located at the following positions for the above print line limits:

   45.5, 58, 70.5, 83, 95.5, 108, 120.5, 133, 145.5, 158, 170.5, 183, 195.5, 208, 220.5, 233, and 245.5.

8. STYLE 1A-R, PRINT LINE BETWEEN 1 2/6" TO 2", 26" BFF FORMS HANDLER

   The right edge of the form may be located at the following positions for the above print line limits ("-" means through and including):

   44.5-46.5, 57-59, 69.5-71.5, 82-84, 94.5-96.5, 107-109, 119.5-121.5, 132-134, 144.5-146.5, 157-159, 169.5-171.5, 182-184, 194.5-196.5, 207-209, 219.5-221.5, 232-234 and 244.5-246.5.

   The inclusive locations for this paragraph are actually .1" to the left and right of the respective positions listed in Paragraph 7.

9. STYLE 1A-L, PRINT LINE BETWEEN 5/6" TO 2", 26" BFF FORMS HANDLER

   The left edge of the form may be located at the following positions for the above print line limits:

   9.5, 22, 34.5, 47, 59.5, 72, 84.5, 97, 109.5, 122, 134.5, 147, 159.5, 172, 184.5, 197, and 209.5.

10. STYLE 1A-L, PRINT LINE BETWEEN 1 2/6" TO 2", 26" BFF FORMS HANDLER

    The left edge of the form may be located at the following positions for the above print line limits ("-" means through and including):

    8.5-10.5, 21-23, 33.5-35.5, 46-48, 58.5-60.5, 71-73, 83.5-85.5, 96-98, 108.5-110.5, 121-123, 133.5-135.5, 146-148, 158.5-160.5, 171-173, 183.5-185.5, 196-198, and 208.5-210.5.

    The inclusive locations for this paragraph are actually .1" to the left and right of the respective positions listed in Paragraph 9.

11. STYLE 1B-R, PRINT LINE BETWEEN 1 2/6" TO 2", 26" BFF FORMS HANDLER

    The right edge of the form may be located at the following positions for the above print line limits ("-" means through and including):

    38-43, 48-55.5, 60.5-68, 73-80.5, 85.5-93, 98-105.5, 110.5-118, 123-130.5, 135.5-143, 148-155.5, 160.5-168, 173-180.5, 185.5-193, 198-205.5, 210.5-218, 223-230.5, 235.5-243, and 248-250.

12. STYLE 1B-L, PRINT LINE BETWEEN 1 2/6" TO 2", 26" BFF FORMS HANDLER

    The left edge of the form may be located at the following positions for the above print line limits ("-" means through and including):

    12-19.5, 24.5-32, 37-44.5, 49.5-57, 62-69.5, 74.5-82, 87-94.5, 99.5-107, 112-119.5, 124.5-132, 137-144.5, 149.5-157, 162-169.5, 174.5-182, 187-194.5, 199.5-207, and 212-217.

The Styles 1A and 1B Form Limits may not be used with the FFF Forms Handler. The limits may be used with the manually aligned forms in the left area of the MUR Forms Handler provided the form edge is to the left, or at Position 95. See the above Paragraphs 7 through 12 for these locations. The limits may not be used to the right of Position 95 with or without the Magnetic Unit Record Modules retracted.

The back end of the limit assembly does not contact the numeric scale on the lower shield.

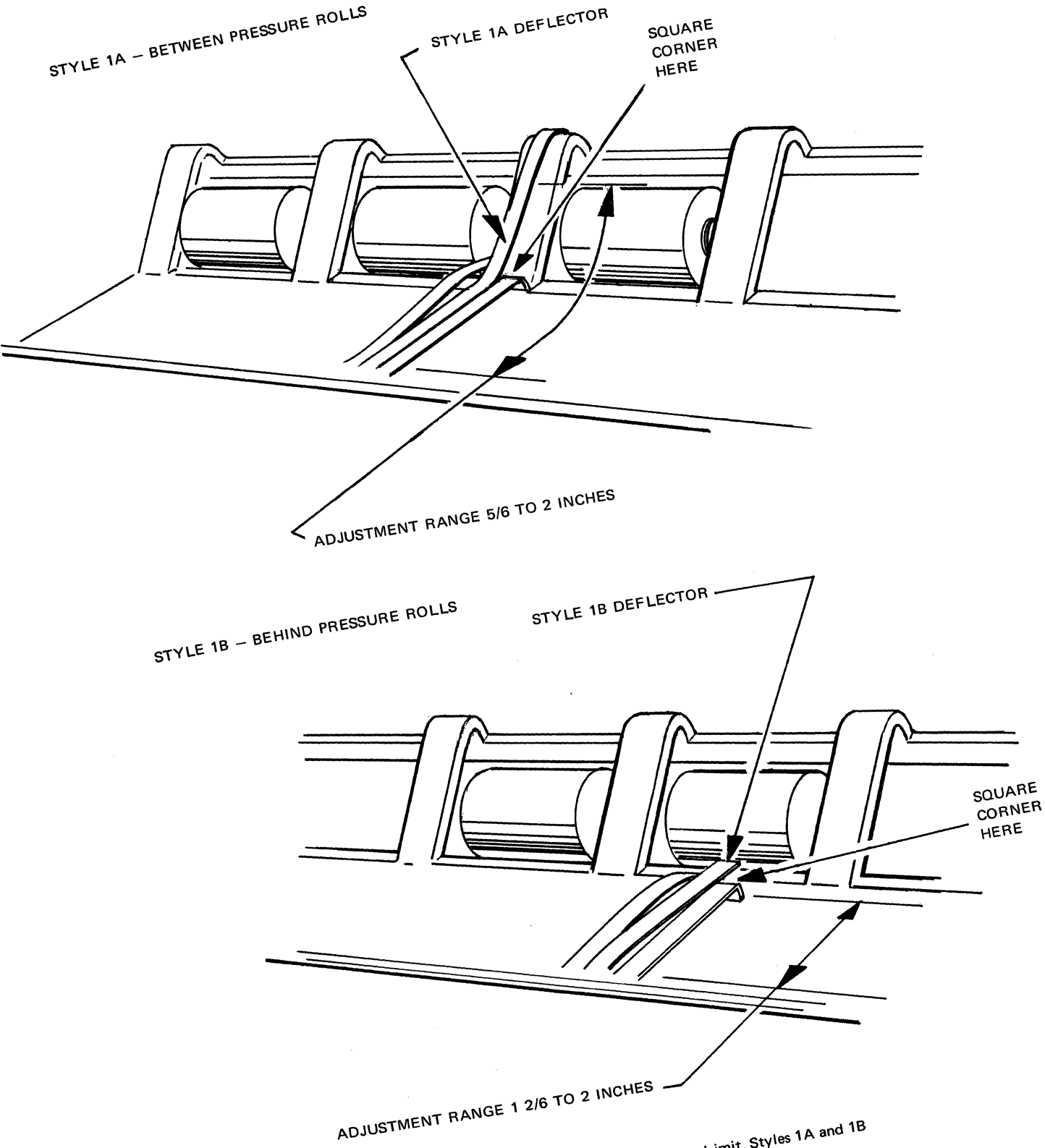


Figure 6.42.52-1 Scoot-Over Form Limit, Styles 1A and 1B

6.42.53 COINCIDENT EDGE GATE AND LIMIT ASSEMBLY, SHORT AND LONG FORM, STYLE C; BFF AND MUR FORMS HANDLERS

The coincident guide and limit may be required when the edge or edges of two front feed forms are at the same position and each require a separate preset form limit. The first form, which should be the long form (more printing lines), is inserted without being restricted by the limit for the short form. The second form is inserted in front of the first form. The gate switches to the short form channel after the first form is inserted. The gate is ready for the first form again after both forms are removed. The short form limit is attached to a Style 1 Rear Form Guide and is removable with the guide. The gate replaces a front pressure roll and the operator may disable the gate the same as a pressure roll is disabled. After the gate is disabled, forms may be inserted the same as if the feature had not been installed. If the rear guide is not removed when the gate is disabled the short limit is active and it cannot be bypassed. The short limit for the second form (front) may be set by a service representative for a print line from 1" to 2" from the bottom of the form to bottom of the print line. See Figure 6.42.53-1 and Example 2 of 6.42.00-4.

Only single-part forms within the minimum and maximum thickness of .003" and .009" respectively may use the gate. A limit for the long form must not be set for a print line which is closer to the bottom of the form than the distance for the preset print line of the short form.

Front Form Guides Styles 2 and 3 generally are used for the coincident edges of the two forms. See Topic 6.06.00 for the enabling and disabling of the Front Pressure Rolls.

The permissible locations are dependent upon whether a 15½" or 26" Forms Handler is utilized. The following locations are designated in relation to the center line of the print (Program) positions.

1. BFF FORMS HANDLER, 15½"

   Style C, Left Edge – The left edge of a form may be located at or within the following positions ("-" means through and including):

   7-8.5, 19.5-21, 32-33.5, 44.5-46, 57-58.5, 69.5-71, 82-83.5, 94.5-96, and 107-108.5.

   Style C, Right Edge – The right edge of a form may be located at or within the following positions ("-" means through and including):

   41.5-43, 54-55.5, 66.5-68, 79-80.5, 91.5-93, 104-105.5, 116.5-118, 129-130.5, and 141.5-143.

2. BFF AND MUR FORMS HANDLERS, 26"

   Style C, Left Edge – The left edge of a form may be located at or within the following positions ("-" means through and including):

   3.5-5, 16-17.5, 28.5-30, 41-42.5, 53.5-55, 66-67.5, 78.5-80, 91-92.5, 103.5-105, 116-117.5, 129.5-131, 142-143.5, 153.5-155, 166-167.5, 178.5-180, 191-192.5, 203.5-205, and 216-217.

   Style C, Right Edge - The right edge of a form may be located at or within the following positions ("-" means through and including):

   38-39, 50-51.5, 62.5-64, 75-76.5, 87.5-89, 100-101.5, 112.5-114, 125-126.5, 137.5-139, 150-151.5, 162.5-164, 175-176, 187.5-189, 200-201.5, 212.5-214, 225-226.5, 237.5-239, and 250-251.5.

The Style C Gate and Form Limit may not be used with the FFF Forms Handler. The Gate and Limit may be used with the manually aligned forms in the left area of the MUR Forms Handler provided the form edge is to the left or at Position 95. See the above Paragraph 2 for these locations. The Gate and Limit may not be used to the right of Position 95 with or without the Magnetic Unit Record Modules retracted.

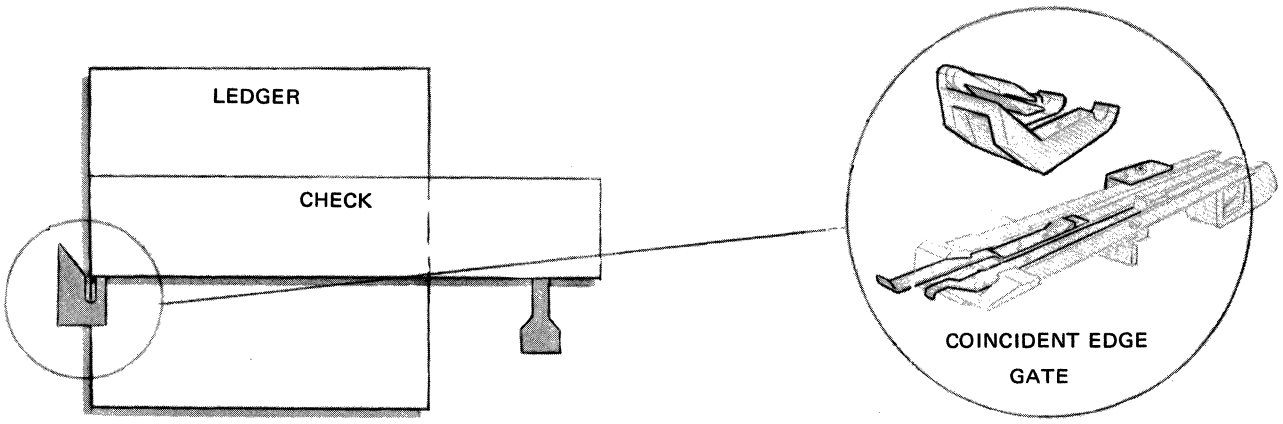


Figure 6.42.53-1 Coincident Edge Gate and Limit, Style C-L

6.42.54 SCOOT-UNDER FORM LIMIT ASSEMBLY, SHORT FORM, STYLE D; BFF AND MUR FORMS HANDLERS

The removable scoot-under limit permits the insertion of a long front feed form (more print lines) in front of the short front feed form. (Check behind ledger.) The limit is attached to a Style 1 rear guide and is removable with the guide. The long form must be inserted first. The printing line for the short limit may be set for a print line which is a minimum of 5/6" or a maximum of 2" from the bottom of the form to the bottom of the line of print.

The preset limit for the print line of the long form must not be less than 2" from the bottom of the form; in addition, the last manually selected print line on the long form must be ½" more than the distance to the print line which is predetermined for the short form limit. The line advance after the Forms Handler is closed does not have to be considered for this ½" limitation. For example, if the print line for a check is 1½" from the bottom of the form then the last aligned line for the long form must be at least 2" from the bottom of the form. The forms may be advanced for additional lines when the Forms Handler is closed, but the long form could not be reinserted if the Style D limit is to be active again. The limit would not be active if the last line of the long form was aligned closer than 2" from the bottom. The maximum 13½" first print line with the Style 1 rear guide is permitted.

This limit may be used at any forms area of the BFF Forms Handler, see following paragraph. The short limit is 1¼" from the edge of the form which uses the rear guide to which the limit is attached. See Example 3 of Figure 6.42.00-4.

A Style 2 Front Form Guide may be used to guide the form edge which is behind the long form.

The Style D Scoot-Under Form Limit may not be used with the FFF Forms Handler. The limits may be used with the manually aligned forms in the left area of the MUR Forms Handler. A Style D-R limit may be used with the right edge of a long form which is to the left of, or at Position 95. A Style D-L limit may be used with the left edge of a long form which is to the left of, or at Position 80. The limit may not be used to the right of Position 95 with or without the Magnetic Unit Record Modules retracted.

The parts for this limit are the same regardless of whether the limit is used on the right or left. The limit is service assembled to provide the left or right limit. The operator may not adjust the limit.

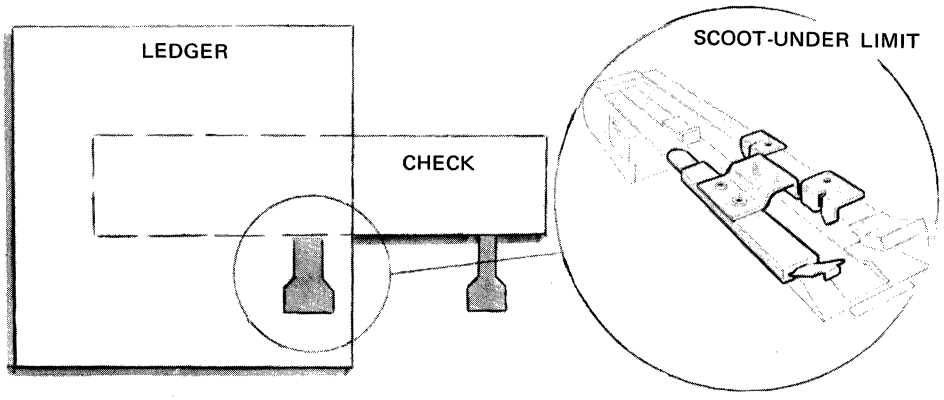


Figure 6.42.54-1 Scoot-Under Form Limit, Style D-R

6.42.55 FORMS LIMIT ASSEMBLY, SHORT FORM, STYLE 1; BFF, FFF AND MUR FORMS HANDLERS

The removable form limit for front feed forms is installed, repositioned, or removed at the rear of the console by the operator. This form limit was formerly designated as the Style E limit, but the designation is now Style 1. The functions are unchanged.

The limit is used for a form which requires a preset limit for a print line which is near the bottom of the form. The limit is used in an area which is unoccupied by another front feed form, because it does not include any scoot-over or bypass features which are provided with the Styles 1A and 1B Scoot-Over Limits (Topic 6.42.52).

See Examples 3, 4, 5 and 6 of Figure 6.42.00-4 for the minimum form width required if the Style 1 limit is used near the left or right edges of another front feed form.

The limit may be set by a service representative for a print line which is a maximum of 2" from the bottom of the form to the bottom edge of the desired line of print. The minimum distance for the print line from the bottom of the form is 5/6", or 1 2/6" depending upon whether the limit is installed between the Front Pressure Roll positions or in some other area for the BFF and MUR Forms Handlers. The permissible locations are also dependent upon the handler width. The preset limit may be set for a minimum 1 1/6" print line for the FFF Forms Handler. The permissible locations for the respective print lines are specified in relation to the center line of the print (program) positions.

1. BFF FORMS HANDLER, 15½"

   For this 15½" Forms Handler, the Style 1 Form Limit may be at any of the following listed positions for the corresponding designated print line limits.

   Print Line Between 1 2/6" to 2" – Positions 8 through 147.

   Print Line Between 5/6" to 2" (between pressure rolls) – Positions 12-13.5, 24.5-26, 37-38.5, 49.5-51, 62-63.5, 74.5-76, 87-88.5, 99.5-101, 112-113.5, 124.5-126, and 137-138.5.

2. BFF FORMS HANDLER, 26"

   For this 26" Forms Handler the Style 1 Form Limit may be at any of the following listed positions for the corresponding designated print line limits:

   Print Line Between 1 2/6" to 2" – Positions 8 through 252.

   Print Line Between 5/6" to 2" (between pressure rolls) – Positions 8-9.5, 20.5-22, 33-34.5, 45.5-47, 58-59.5, 70.5-72, 83-84.5, 95.5-97, 108-109.5, 120.5-122, 133-134.5, 145.5-147, 158-159.5, 170.5-172, 183-184.5, 195.5-197, 208-209.5, 220.5-222, 233-234.5 and 245.5-247.

3. FFF FORMS HANDLER, 15½"

   For this 15½" Forms Handler the Style 1 Form Limit may be at any of the following listed positions for the corresponding designated print line limits:

   Print Line Between 1 1/6" to 2" – Positions 8 through 125.

4. MUR FORMS HANDLER, 26"

The Style 1 Form Limit may be used for a manually-inserted form in the left area of the MUR Forms Handler provided the selected position is to left, or at Position 95. See the above Paragraph 2 for these locations. The limit may not be used to the right of Position 95 with or without the Magnetic Unit Record Modules retracted.

The back end of the Style 1 Form Limit does not contact the numeric scale on the Lower Shield. The limit is made of flexible metal with one prong which contacts the bottom edge of the form.

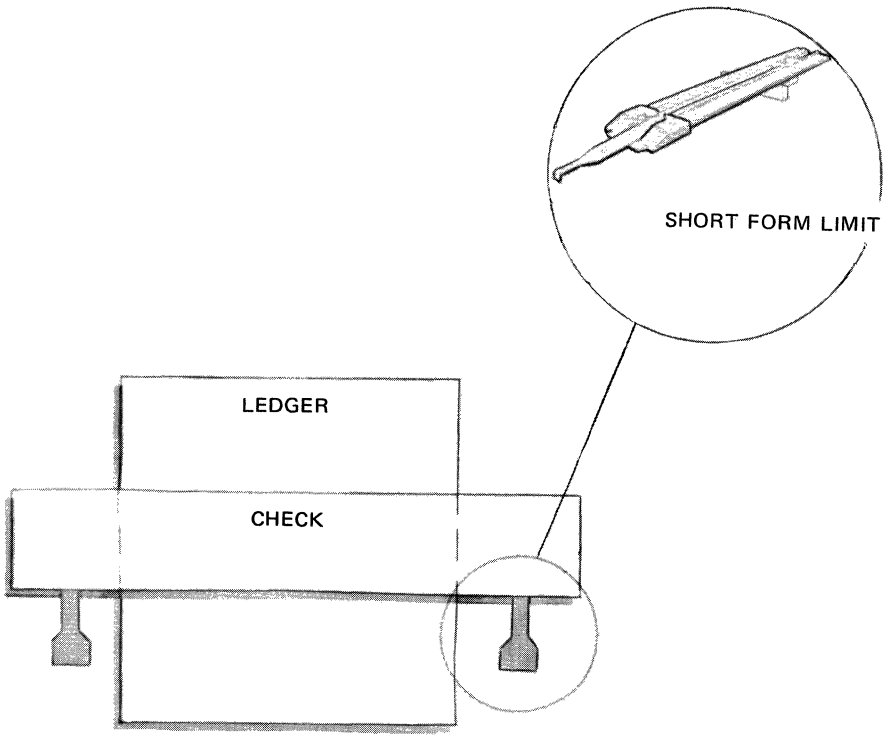


Figure 6.42.55-1 Form Limit, Style 1

6.43.00 FORMS HANDLING FEATURES AND ACCESSORIES, FINANCIAL FRONT FEED FORMS HANDLER

The forms handling accessories and features for the Financial Front Feed (FFF) Forms Handler are listed in the following topics. Topic 6.43.01 is an alphabetic list of optional features or accessories which are compatible with this Forms Handler but are described in other topics or subjects in this manual. Certain features on this list are standard features but extra sets or parts, replacements or different combinations may be required for certain applications. Features which are standard for the various styles of the Series L/TC are listed in the summaries in Appendixes A, B, C, D and E.

The "front" and "rear" classifications are established for the orderly presentation of the features which are not listed in Topic 6.43.01. The Forms Handler features which are used in the general area near the front of the console are described beginning with Topic 6.43.02. Features for the rear of the console are described beginning with Topic 6.43.50.

In the following explanations abbreviations are used to designate the different types of Forms Handlers:

BFF Basic Front Feed Forms Handler

FFF Financial Front Feed Forms Handler

MUR Magnetic Unit Record Front Feed Forms Handler

Features for the Front Area

The features for the front of the Forms Handler are mainly front form guides which are used for front feed forms. The guides are placed at predetermined positions which are designated for the forms area of an application. The front area is similar to the BFF Forms Handler except a metal Form Aligning Bail is used rather than a transparent Form Aligning Table; therefore, the front form guides are different.

Features for the Rear Area

Rear Form Guides are used to "channel" the bottom of a front feed form or passbook as the bottom edge moves rearward when the operator inserts the form or passbook for alignment. The guides also assist to maintain the proper position of the form when several line advance functions occur.

The explanation for the BFF Forms Handler describes the general characteristics for each area, Subject 6.42.00 and Figure 6.42.00-1.

6.43.01 SUMMARY OF OPTIONAL FORMS HANDLER ACCESSORIES AND FEATURES, FFF FORMS HANDLER

The following optional features and accessories as described in the designated topics or subjects are compatible with the FFF Forms Handler. See topics following Topic 6.43.01 for other features and accessories.

Continuous Forms Intake Guide, Style 1, removable, 10", for pin feed form on lower intake rack with dual pin feed, extra, 6.20.08

Form Guides, Front, Style 3, left or right, removable, two-sided with transparent front, front-mounting, 1¼" minimum first print line, for areas of pin feed forms and overlapping front feed forms, requires Style 3 table-bail, 6.42.03

Form Guides, Rear, left or right as specified, removable, extra or in place of standard:

Style 1-L or 1-R, operator adjustable form limit with retractable 1/6" scale for print line a minimum of 2" to a maximum of 13½" from bottom of form, 6.42.50

Style 2-L or 2-R, removable, operator adjustable limit for print line a minimum of 2" to a maximum of 11" from bottom of form, 6.44.50

Style 4-L or 4-R, Scoot-over, operator adjustable form limit same as Style 1 rear guide, 6.42.51

Form Limits, Rear, Short Form, Style 1 (formerly Style E), left or right, service adjustable for print line a minimum of 1 1/6" to a maximum of 2" in all areas, distance is to bottom of form, 6.42.55

Journal Cover Lock, with two keys, lock combination change, 5.06.04

Last Print Line Limit-Switch, service adjustable to detect a last print line a minimum of 1.145" to a maximum of 1.445" from botton of passbook, 6.13.08

Pin Feed Device, 15½" removable, 6.20.00

Single, Synchronous, Style PF 10, 6.21.00

Single, Independent, Style PF 11, 6.22.00

Dual, Synchronous and Independent, Style PF 12, 6.23.00

Platen Durometer Harness, replaces standard harness, 6.01.00

Plate, Solid, replaces Split and Normal Platen, 1/6" Line Advance from left, 6.01.00

Roll Paper Guides and Holders, Style 1, attach left or right, removable, 6.11.10:

Extra set of guides only

Extra set of guides and shaft

Tear Off Blade, 15½", removable, for Single Pin Feed or upper Pin Wheel Assembly of Dual Pin Feed, 6.42.02

6.43.02 FRONT FORM GUIDE, STYLE 8; FFF FORMS HANDLER

The three-sided Style 8, left and right form guides attach to the Style 2 Form Guide Bridge with a rear-mounting bracket. The guides may be removed or repositioned by the operator. The guides have a transparent front and the bottom edge of the front side fits into the Form Aligning Bail, Style 2.

Style 8 guides are normally used for manually aligned front feed forms on the left and the passbook on the right. With this guide, the first desired print line must be a minimum of 1" from the top of the form to the bottom edge of the printed characters, if measured to the nearest 1/5" or 1/6". If the form is inserted for a print line less than 1" from the top of the form, the front of the bail loses control of the form when the Forms Handler closes. The minimum width for a front feed form between a set of Style 8 guides is 4". The minimum distance between the left and right adjacent edges for forms front-inserted side-by-side is .7". This is the same for rear guides. If rear guides are not required or a suitable combination of form limits is possible, the minimum distance may be reduced to .4". See Topic 6.13.03 for a minimum if the first line is measured to the center of the printed character.

A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 8 guide. See Figure 6.42.00-3 for the clearances for pin feed forms.

Style 8 guide is not compatible with the Style 1 Form Guide Bridge for the BFF and MUR Forms Handlers. The guide is not compatible with the Style 3 Form Aligning Table-Bail, Topic 6.43.03.

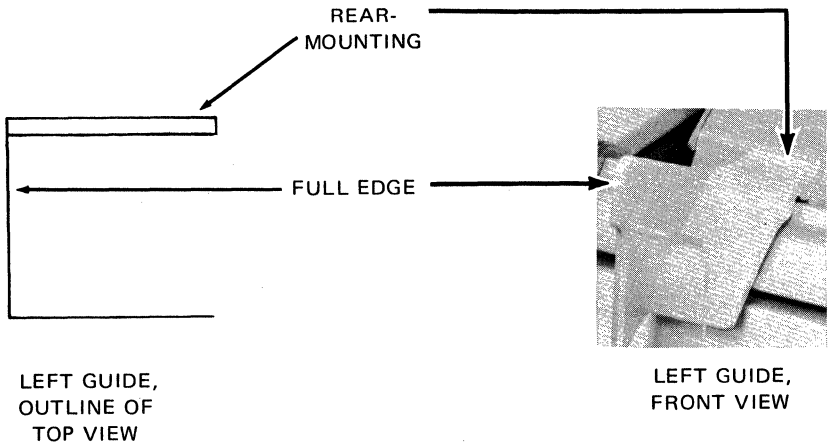
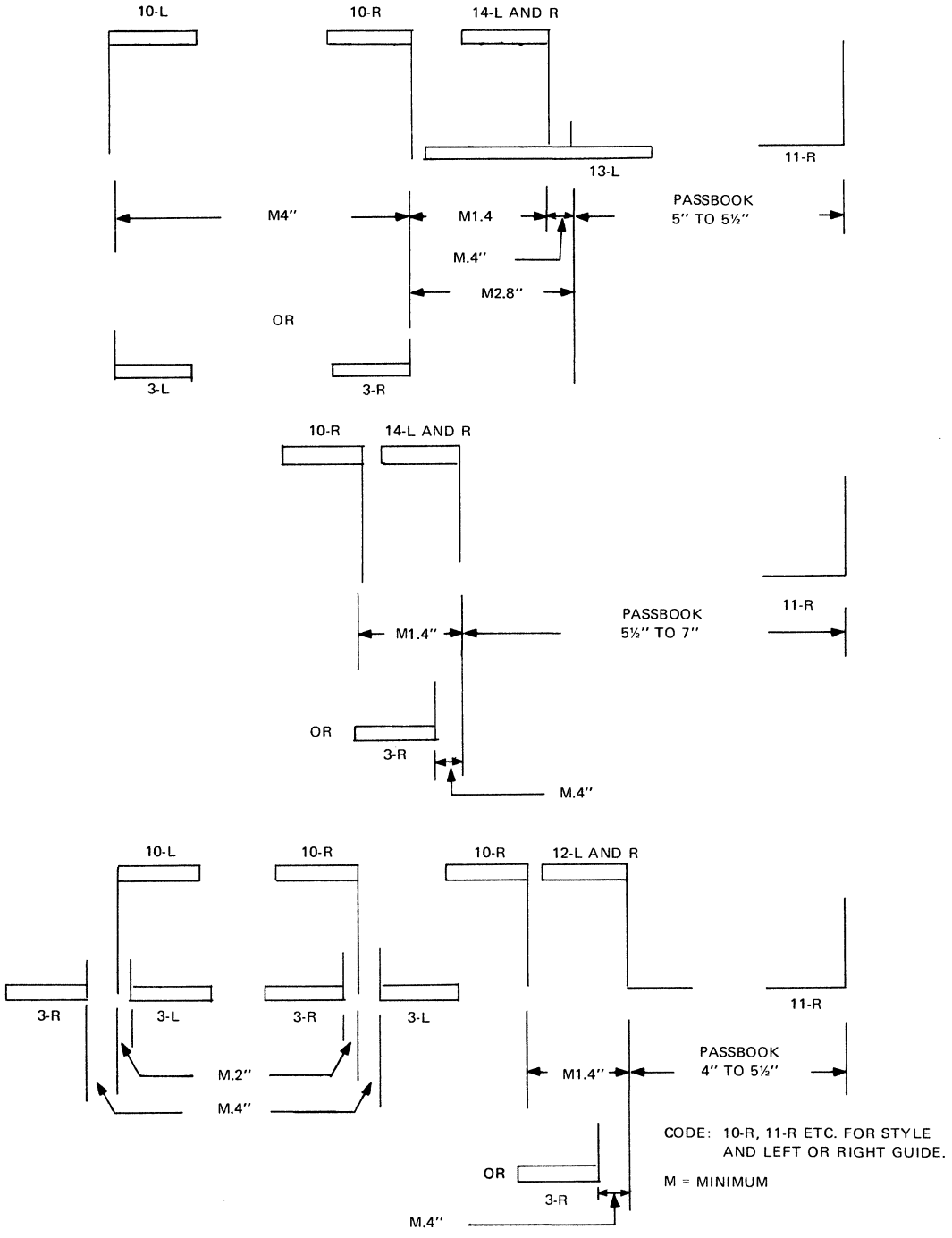


Figure 6.43.02-1 Front Form Guides, Style 8

6.43.03 FORM ALIGNING TABLE-BAIL, STYLE 3, FFF FORMS HANDLER

The nonremovable Style 3 table-bail is a combination transparent Form Aligning Table on the left and a metal Form Aligning Bail on the right. See Figure 6.43.03-2.

The area of the table is similar to the Style 1 table for the Basic Front Feed Forms Handler (Topic 6.12.03) and the area of the bail is similar to the Style 2 bail which is provided as standard for the Financial Front Feed Forms Handler (Topic 6.13.03). The Style 3 table-bail replaces the Style 2 bail. The front form guides which are compatible with this table-bail are described in the following topics. See Figure 6.43.03-1 for the form guide arrangements. See Topic 6.43.07 for the ability to use the passbook area for a passbook with one transaction and to use the same area for a form of a different width with another transaction.



6.43.03-1 Form Guide Arrangements for Style 3 Form Aligning Table-Bail

The following features indicated with a reference to the topics are provided as standard or optional with the Style 3 table-bail.

Standard Front Form Guides

Left and right Style 10, Nonpassbook, 6.43.04

One Style 11-R, nonremovable, passbook, 6.43.05

One Style 13-L, removable, passbook 5" to 5½", 6.43.07

One Style 14-L and R, removable, nonpassbook, or passbook 5½" to 7", 6.43.07

One Form Deflector-Stabilizer, Style 2, nonpassbook, 6.43.04

Optional for the Style 3 Table-Bail

Style 12-L and R Front Form Guide, removable, used in place of Styles 13-L and 14-L and R, passbook 4" to 5½", 6.43.06

Aligning Clip with manual alignment of passbook, 6.43.08

Style 3-L and 3-R, Front Form Guide, removable, nonpassbook, 6.42.05

See the Forms Area (on subsequent pages) which may be utilized by the guides.

Form Aligning Table, Transparent

The Form Aligning Table is transparent from the left end through print Position 87. The table is used by the operator to manually align front feed forms to the desired print line. A horizontal line is present on the table for this purpose. With the Forms Handler open, the front feed form is inserted behind the table and until the bottom edge of the last line of print is aligned to the horizontal aligning line. When the handler closes the bottom edge for the printed character will be 1/6" from the aligned position, usually this is the next print line. The first print line for a front feed form may be a minimum of 1" from the top of the form to the bottom edge of the printed characters. The table includes a Form Heading Retaining Groove (Topic 6.12.04) with a numeric scale in the center. The scale is marked from left to right in 1/10" increments up through the marking for Position 91. (The forms area begins at minus 2.5 tenths, see Topic 6.13.02.)

The aligning table has a notched area which is used for the placement of front-mounting, removable Front Form Guides. The notches are provided in 1/20" increments. Form guide Style 13-L attaches to the table and the Style 3-L and 3-R guides for the BFF Forms Handler may be used. The Styles 3-L and 3-R guides permit a front feed form in the area of a pin feed form, see Topic 6.42.05. Form guide Styles 10-L, 10-R, 12-L and R, and 14-L and R are removable, rear-mounting guides and are attached to the Style 2 Form Guide Bridge which is parallel to and behind the Style 3 Form Aligning Table-Bail. Front Feed forms and pin feed forms feed in between the table and bridge. See Topic 6.12.03 for Alignment to Top Edge of Form Aligning Table.

Form Aligning Bail

The Form Aligning Bail is nontransparent to the right of Position 87. The metal bail is used by the operator to manually align passbooks to the desired print line. With the Forms Handler open, the passbook is inserted behind the bail and until the bottom edge of the last line of print is aligned to the top edge of the aligning bail. When the handler closes the bottom edge for the printed characters will be 1/6" from the aligned position, usually this is the next print line. Usually a passbook is aligned to a preset limit and then advanced to the desired print line in 1/5" increments under program control. The first print line for a passbook may be a minimum of 1" from the top of the form to the bottom edge of the desired line of print as measured to the nearest 1/5". The minimum as measured to the horizontal center of the line of print may be 7/8". The height of the printed character is 110".

The form specifications for the passbook are the same except the combination for the front form guides will determine the minimum and maximum width, see Topics 6.43.06 and .07.

The top edge of the passbook may include a cutout as specified for Topic 6.13.03. See the same subject for the opening, closing and raising functions which may occur with the Style 3 table-bail.

The Style 8 Front Form Guides for the FFF Handler are not compatible with the Style 3 table-bail. The shaded areas of Figures 6.43.03-2 and -3 display the nonvisible area of the form or passbook when the Forms Handler is closed and open.

See Topic 6.13.06 for the 1.2" minimum first print line if the passbook is inserted to a preset limit and then advanced to the desired print line.

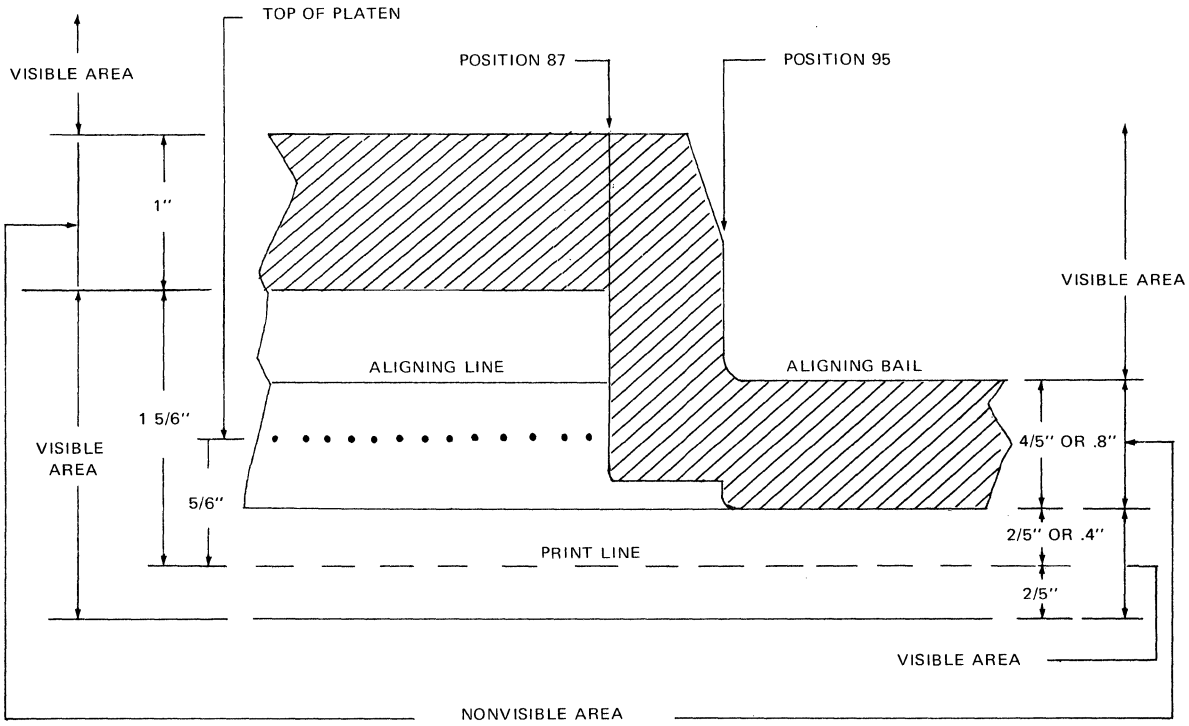


Figure 6.43.03-2 Form Aligning Table-Bail, Style 3, Financial Front Feed Forms Handler, Closed Position.

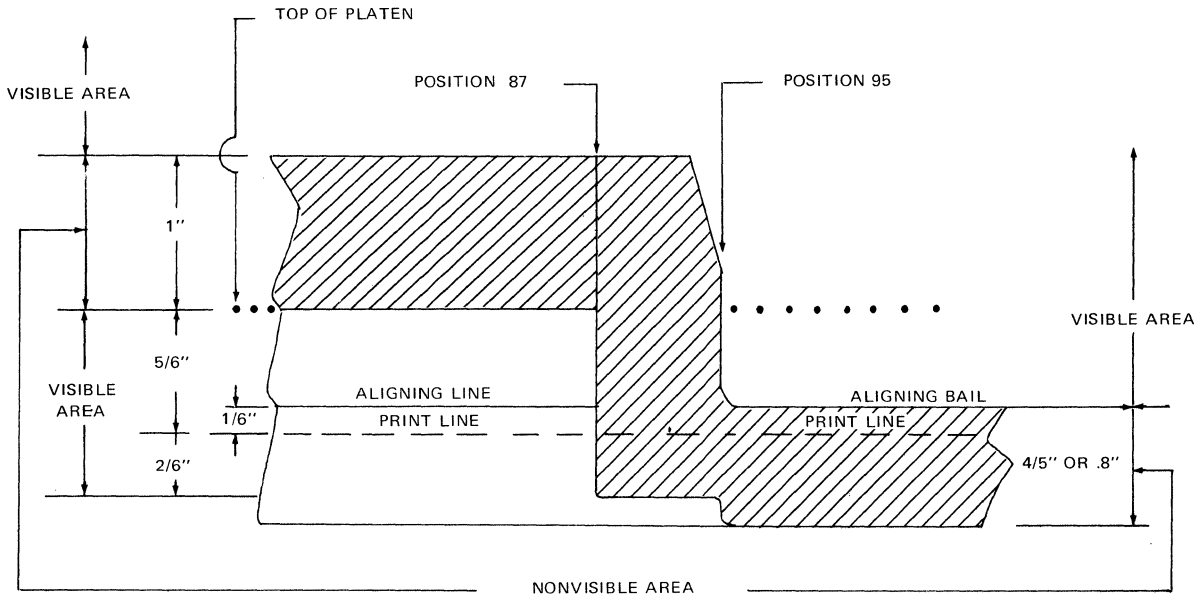


Figure 6.43.03-3 Form Aligning Table-Bail, Style 3, Financial Front Feed Forms Handler, Open Position.

Forms Area for Edges of Form and Passbook

The following specifies possible locations for the respective edge for a passbook or front feed form. The positions are in relation to the forms area (Topic 6.13.02) and the program positions. These are the maximum locations possible; the number of forms present and the minimum distance between forms will actually determine which area is utilized. The right edge of a passbook is at either Position 151 or 152, or in between the positions.

Guide	Nonpassbook Positions From	To	Passbook Width Min	Max	Passbook Left Edge Positions From	To
10-L (left edge)	-2.5	80				
10-R (right edge)	37.5	91				
3-L (left edge)	-2.5	80				
3-R (right edge)	37.5	91				
11-R (passbook right edge 151-152)						
12-L and R (passbook left edge, nonpassbook right edge, 1/10" apart)	95	111	4"	5½"	96	112
13-L (left edge)			5"	5½"	96	102
14-L and R (passbook left edge, nonpassbook right edge, 1/10" apart)	80	96	5½"	7"	81	97
14-L and R (left edge) When used with Style 13-L	11.5	97				

6.43.04 FRONT FORM GUIDE, STYLE 10; FFF FORMS HANDLER

The two-sided, Style 10 left and right form guides attach to the Style 2 Form Guide Bridge with a rear-mounting bracket, and are used with the Style 3 table-bail, Topic 6.43.03. The guides may be removed or repositioned by the operator. The guides do not have a front side, but the transparent table serves as a front. The edge side occupies the full V-shaped area between the rear bridge and the front Form Aligning Table. The top of the edge also hooks onto the table.

Style 10 guides are normally used for manually aligned front feed forms in the left area unless the application requires a pin feed form. With this guide the first desired print line must be a minimum of 1" from the top of the form to the bottom edge of the printed characters. If the form is inserted for a print line less than 1" from the top of the form, the control of the form is lost when the Forms Handler closes. The minimum width for a front feed form between a set of Style 10 guides is 4". A Style 2 Form Deflector-Stabilizer may be used between the guides.

The right edge of a form in the Style 10-R guide must be a minimum distance from the left edge of a passbook or form on the right hand area, see Figure 6.43.03-1.

1. The right edge of the form must be a minimum of 2.8" from the left edge of the passbook with or without the Style 14-L and R guide present between the Styles 10-R and 13-L guide. For Example:

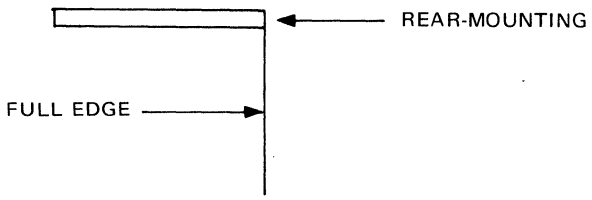
Right Edge of Form	Passbook Left Edge
73	101, 5" passbook
68	96, 5½" passbook

2. With 14-L and R guide present, the right edge of the form in the Style 10-R guide must be a minimum of 1.4" from the left edge of the form which uses the Style 14-L and R guide. The right edge of the form in the Style 10-R guide must also be a minimum of 2.8" from the left edge of the passbook. The left edge of a form which uses a Style 14-L and R guide must always be a minimum of .4" to the left of the left edge of a passbook.

3. If the Style 12-L and R is used for the left edge of the passbook the right edge of the form in the Style 10-R guide must be a minimum of 1.4" to the left of the left edge of the passbook.
4. The same rules apply if the Style 3-R optional Front Form Guide is used in place of Style 10-R.

A front feed form or another guide may not be placed in between the Form Aligning Table and the front side of the Style 10 guide (no overlapping of forms). A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 10 guide. See Figure 6.42.00-2 for the minimum clearance between forms and Figure 6.42.00-3 for the clearances for pin feed forms.

Style 10 guide is not compatible with Style 1 Form Guide Bridge for the MUR and BFF Forms Handlers. The guide may not be used with the Style 2 Form Aligning Bail for the FFF Forms Handler.

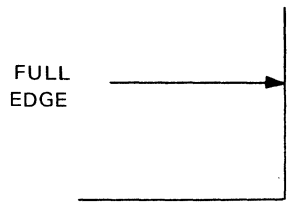


RIGHT GUIDE, OUTLINE OF TOP VIEW

Figure 6.43.04-1 Front Form Guide, Style 10

6.43.05 FRONT FORM GUIDE, STYLE 11-R; FFF FORMS HANDLER

The two-sided Style 11-R right form guide is nonremovable from the Style 3 Form Aligning Table-Bail. The guide is used for the right edge of a passbook; however, the guide may be service adjusted for Position 151 or 152, or in between the positions. The guide has a transparent front. See Topic 6.43.03.



RIGHT GUIDE, OUTLINE OF TOP VIEW

Figure 6.43.05-1 Front Form Guide, Style 11-R

6.43.06 FRONT FORM GUIDE, STYLE 12-L AND R; FFF FORMS HANDLER

The three-sided Style 12-L and R combination left and right form guide attaches to the Style 2 Form Guide Bridge with a rear-mounting bracket. The guide may be removed or repositioned by the operator. The guide has a transparent front and the edge side occupies the full V-shaped area between the rear bridge and the front Form Aligning Table-Bail, Style 3. The bottom of the front side fits into the top of the metal bail. See Topic 6.43.03 for the forms area with this guide. Style 12-L and R guide (optional for the Style 3 bail) is used to guide the left edge of a passbook with a width of a minimum of 4" to a maximum of 5½". A Style 11-R guide is used on the right. See Topic 6.43.07 for a width of 5" to 7". The opposite side of the guide may be used for the right edge of a form which is .1" to the left of the left edge of a passbook. With this guide the first desired print line must be a minimum of 1" from the top of the form to the bottom edge of the printed characters as measured to the nearest 1/5". See Topic 6.13.03 for the minimum first print line if measured to the center of the printed character.

See Topic 6.43.04 for the minimum distance between forms when a form in the Style 10-R form guide is present on the left. A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 12-L and R guide. See Figure 6.42.00-3 for the clearances for pin feed forms. The Style 12-L and R guide is not required if the Style 13-L guide is used.

Style 12-L and R guide is not compatible with the Style 1 Form Guide Bridge for the MUR and BFF Forms Handlers.

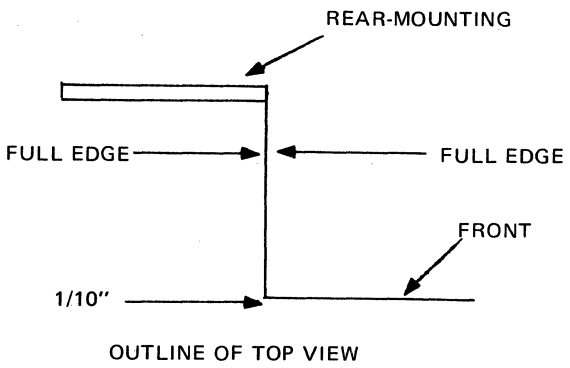


Figure 6.43.06-1 Front Form Guide, Style 12-L and R

6.43.07 FRONT FORM GUIDES, STYLE 13-L AND STYLE 14-L AND R; FFF FORMS HANDLER

The Style 13-L and the Style 14-L and R front feed forms guides each have two sides. Both guides may be removed or repositioned by the operator. The guides are designed for the Style 3 Form Aligning Table-Bail. See Topic 6.43.03.

The guides may be used separately or in combination. If the guides are used in combination, the right hand area of the Forms Handler may be used for a passbook in between the Style 13-L and 11-R guides with one transaction and for the next transaction, a wider form (minimum .4" wider) may be inserted behind the edge side of the Style 13-L guide. The wider front feed form would be inserted with the left edge at the Style 14-L and R guide and the right edge at the Style 11-R guide. See Figure 6.43.03-1. This capability permits an overlapping condition in the passbook area. The wider form could be inserted behind the passbook or form; however, a duplicate print may not be legible behind the passbook because of the thickness. Usually a temporary receipt or other media is prepared on the wider form rather than using the left hand area of the Forms Handler for this procedure. With this overlap condition the forms configuration for the left hand area may be used without providing for an area for the exception items (receipts and the media).

With these guides the first desired print line must be a minimum of 1" from the top of the form to the bottom edge of the printed characters as measured to the nearest 1/5 or 1/6". See Topic 6.13.03 for the minimum first print line if measured to the center of the printed character. If the rear (wider) form is inserted in front of the Style 3, Rear Form Guide (Topic 6.43.50) the last print line must be a maximum of 2" from the bottom of the form to the bottom edge of the printed characters. For a scoot-over rear guide, see Topic 6.42.51.

Style 13-L Front Form Guide, Passbook 5" to 5½"

The two-sided Style 13-L guide is front-mounting and attaches to the notched area of the transparent aligning table. The front of the guide is transparent and the guide is used for the left edge of a passbook with a width which is a minimum of 5" and a maximum of 5½". The mounting bracket for the guide is offset approximately 2½" to the left of the edge side of the guide. See Topic 6.43.04 for the minimum distance between form edges if a form is on the left.

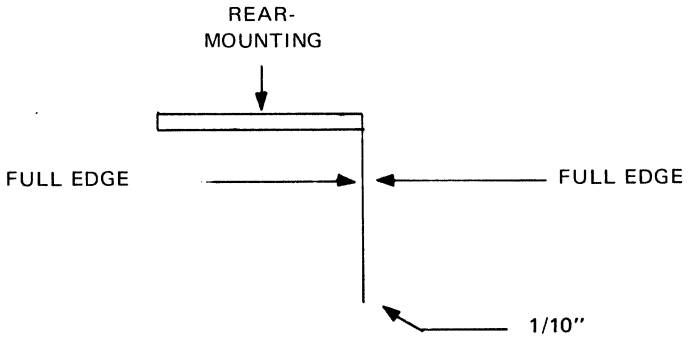


Figure 6.43.07-1 Front Form Guide, Style 13-L

Style 14-L and R Front Form Guide, Passbook 5½" to 7", or Nonpassbook Form

The two-sided Style 14-L and R guide is rear-mounting and attaches to the Style 2 Form Guide Bridge. The guide does not have a front side but the transparent table serves as a front-side. The guide is used for the left edge of a passbook with a width which is a minimum of 5½" and a maximum of 7". The guide may be used for a nonpassbook form provided the left edge is a minimum of .4" to left of the left edge of the passbook. The guide may be used for the right edge of a form which is 1/10" to the left of the left edge of the passbook. See Topic 6.43.04 for the minimum distance between form edges if the right edge of a form on the left of the passbook uses either a Style 10-R or 3-R front guide.

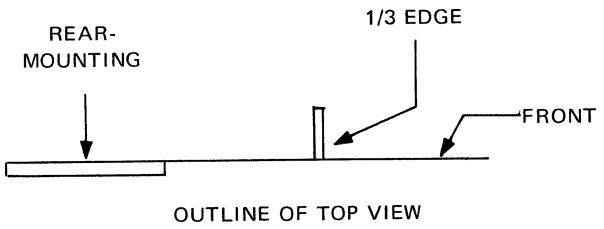


Figure 6.43.07-2 Front Form Guide, Style 14-L and R

General Considerations

A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 14-L and R guide. See Figure 6.42.00-3 for the clearance for pin feed forms. Neither the Style 13-L nor 14-L and R guide is compatible with the BFF and MUR Form Handlers nor are the guides required when the Style 12-L and R guide is used. If a form overlaps the split platen to the left, see Item 14-1 of Overlap B in Topic 6.03.02.

6.43.08 PASSBOOK ALIGNING CLIP, FFF FORMS HANDLER

The clip attaches to the metal bail of the Style 3 Form Aligning Table-Bail, Topic 6.43.03. The clip is installed by a service representative in the approximate center of the passbook area.

The clip is an optional feature for the Style 3 table-bail and is required only if the passbook is manually aligned to each desired print line. After the passbook is aligned and before the handler closes the clip holds the passbook which is manually aligned to a line near the bottom edge. Usually only one clip is required per passbook; however, more than one may be used for wide passbooks.

The clip is not used with the standard Style 2 Form Aligning Bail for the FFF Forms Handler.

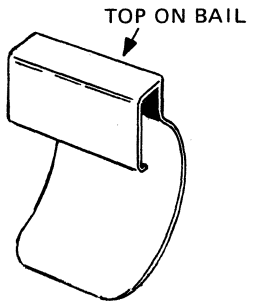


Figure 6.43.08-1 Passbook Aligning Clip

6.43.09 FRONT FEED FORM DEFLECTOR-STABILIZER, STYLE 2, FFF FORMS HANDLER

The Deflector-Stabilizer, Style 2, attaches to the Style 2 Form Guide Bridge and is usually between a set of Front Form Guides on the left when the Style 3 Form Aligning Table-Bail is provided, Topic 6.43.03. The deflector is removable and may be repositioned the same as the front guides. After the front feed form on the left is aligned and before the handler closes the device holds the alignment of forms which have a low rigidity (light or thin forms) or holds the form which is manually aligned to a line near the bottom edge.

A lever is provided to adjust for the pressure for the different form thicknesses. The lever is moved up to decrease the pressure and is lowered to increase the pressure. Usually only one deflector-stabilizer is required per form; however, more than one may be used for wide forms.

The deflector-stabilizer may not be present in the area of a pin feed form. The Style 2 Deflector-Stabilizer is not compatible with the Style 1 Form Guide Bridge for the BFF and MUR Forms Handlers. (The conformation of the two bridges is slightly different.) The Style 2 deflector is not used with the standard Style 2 Form Aligning Bail for the FFF Forms Handler.

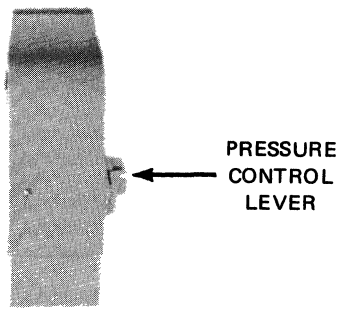


Figure 6.43.09-1 Form Deflector-Stabilizer, Style 2

6.43.50 REAR FORM GUIDE, STYLE 3; FFF FORMS HANDLER

The left and right rear guides are removable except for the Style 3A guide for the right edge of the passbook, see Topic 6.13.06. The guides are used for manually aligned front feed forms and passbooks unless some other guide or limit is required for a special condition. The left and right edges of the form are guided by the retaining edges of the guides after the bottom edge of a form is inserted approximately 2½" below the print line. The removable guides (not 3A) are installed, repositioned, or removed at the rear of the console. The form limit for the Styles 3-L and 3-R is part of the guide assembly. The limit may be preset by a service representative for a print line between a minimum of 2¾" and a maximum of 11" from the bottom of the form. The distance is measured to the bottom of the line of print. However, when the passbook is used in combination with the Style 3A rear guide the maximum is 9", and minimum is greater than 2¾" if the center-fold detector is used. Two adjacent nonoverlapping forms must be a minimum of .7" apart. Minimum form width is 4".

The front end of the retaining edge of the guide prevents the downward movement of a front feed form. If a front feed form is inserted in front of the retaining edge of the guide, the maximum distance for the first print line is 2" from the bottom of the form. (A form is in front of the guide when the left and right edges are on opposite sides of the guide.) Elongated forms commonly are inserted in front of the Style 3 rear guide. See Scoot-Over Guide, Topic 6.42.51 for other overlap conditions.

A numeric scale is not provided on the lower shield for the placement of rear guides.

The Style 3A guide may be set to guide the right edge of a passbook which is at Position 151 or 152, or in between the positions.

BFF and MUR Forms Handlers

The Styles 3-L and 3-R should not be used in the BFF and MUR Forms Handlers.

NOTE: The front end of the Style 3 guide should not be used to provide a form limit of 2". The actual print line selected may be more than 2" depending upon the allowable tolerances for manufacturing purposes.

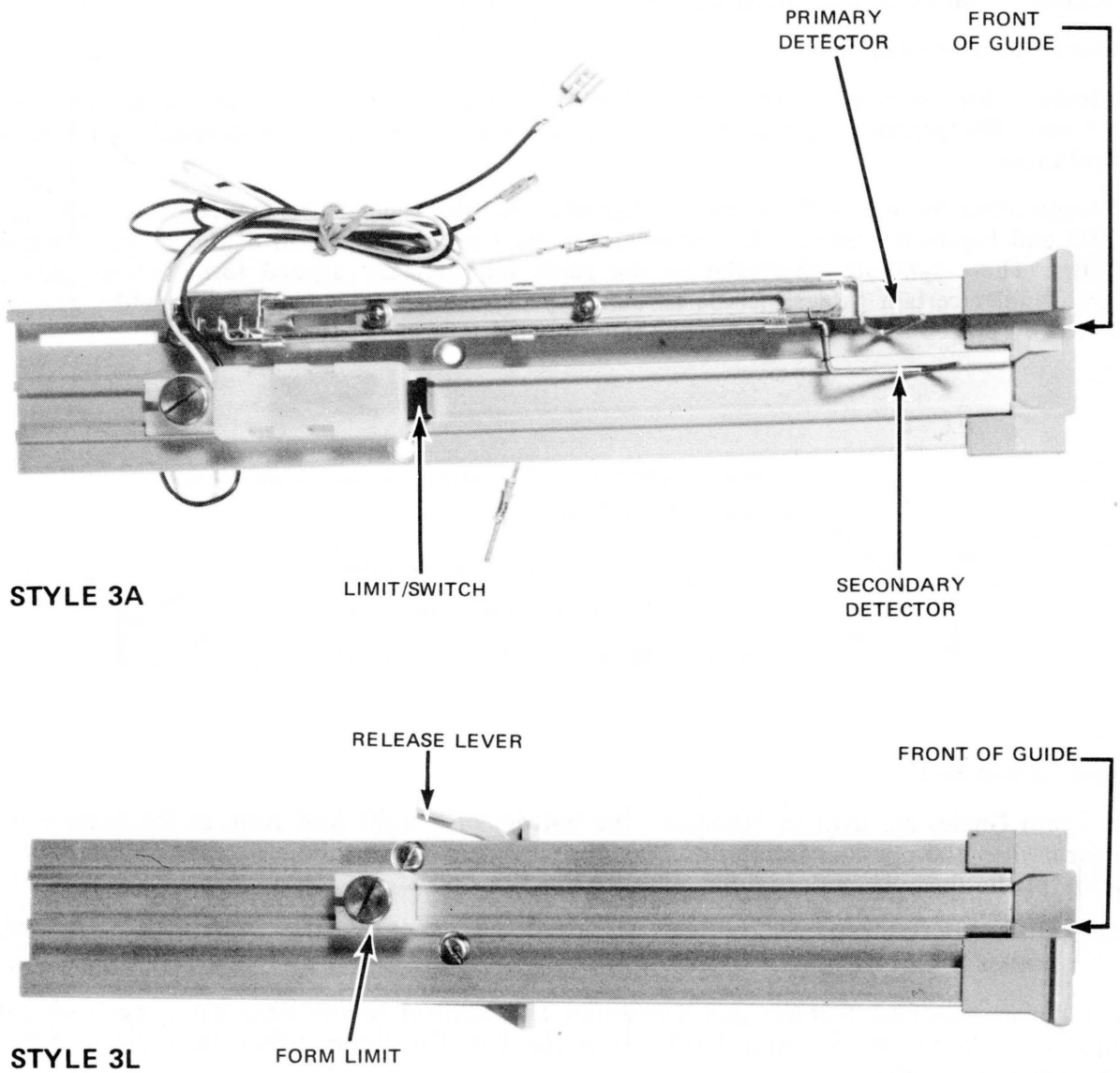


Figure 6.43.50-1 Rear Form Guides, Style 3

6.44.00 FORMS HANDLING FEATURES AND ACCESSORIES, MAGNETIC UNIT RECORD (MUR) FRONT FEED FORMS HANDLER

The forms handling accessories and features for the MUR Front Feed Forms Handler are listed in the following topics. Topic 6.44.01 is an alphabetic list of optional features and accessories which are compatible with this Forms Handler but are described in other topics or subjects of this manual. Certain features on this list are standard features but extra sets or parts, replacements or different combinations may be required for certain applications. Features which are standard for the various tyles of the Series L/TC are listed in the summaries in Appendixes A, B, C, D and E.

The "front" and "rear" classifications are established for the orderly presentation of the features which are not listed in Topic 6.44.01. The Forms Handler features which are used in the general area near the front of the console are described beginning with Topic 6.44.02. Features for the rear of the console are described beginning with Topic 6.44.50.

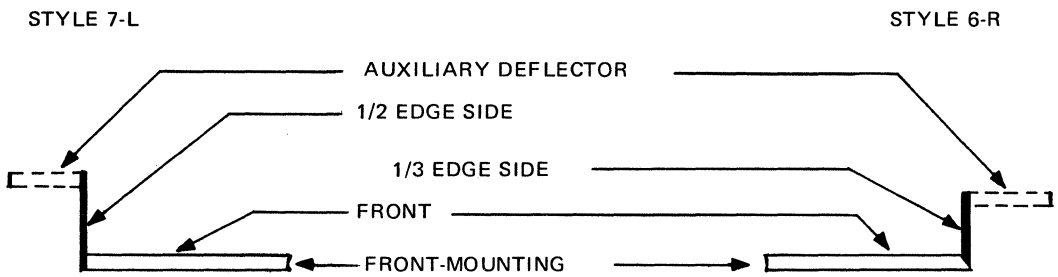
In the following explanations abbreviations are used to designate the different types of Forms Handlers:

BFF	Basic Front Feed Forms Handler
FFF	Financial Front Feed Forms Handler
MUR	Magnetic Unit Record Front Feed Forms Handler

Features for the Front Area

The features for the front of the Forms Handler are mainly front form guides which are used for front feed forms. The guides are placed at predetermined positions which are designated for the forms area of an application.

The explanation for the BFF Forms Handler describes the general characteristics for each area, Subject 6.42.00 and Figure 6.42.00-1. The following are illustrations of symbols of the guides in relation to the top view. These symbols are similar to the guide for manually aligned forms except with the MUR Forms Handler certain guides include an auxiliary deflector on one side of the guide. The deflector is indicated by dotted lines. The double line indicates the position of the mounting.



Features for Rear Area

Rear Form Guides are used to "channel" the bottom of a front feed form as the bottom edge moves rearward when the operator inserts the form for alignment. The guides also assist to maintain the proper position of the form when several line advance functions occur.

6.44.01 SUMMARY OF OPTIONAL FORMS HANDLER ACCESSORIES AND FEATURES, MUR FRONT FEED FORMS HANDLER

The following optional features and accessories as described in the designated topics or subjects are compatible with the MUR Front Feed Forms Handler. See topics following Topic 6.44.01 for other features and accessories.

Coincident Edge Gate and Limit, Style C, left or right, manual front feed, short and long single-part forms, gate replaces pressure roll, limit attaches to Style 1 rear guide and is service

adjustable for print line a minimum of 1" to a maximum of 2" from bottom of short form, long form limit same as for Style 1 guide, gate nonremovable but operator may disable, for roll positions to left of Position 95, 6.42.53

Continuous Forms Intake Guides, Style 1, removable, 10", for pin feed form on lower intake rack with dual pin feed, extra, 6.20.08

Continuous Form Intake Guides, Style 2, removable, 3½", for forms around Platen, 6.20.08

Form Deflector-Stabilizer, Style 1, removable, rear-mounting, manual front feed forms only, extra, 6.42.06

Form Guides, Front, left or right as specified, removable, designated for Manual Front Feed (MFF) or for Magnetic Unit Record (MUR) which includes automatically aligned nonmagnetic form, extra or in place of standard:

Style 1-L or 1-R, MFF, three-sided with transparent front, rear-mounting, 1¼" minimum first print line, 6.42.03

Style 2-L or 2-R, MFF, three-sided with nontransparent front, rear-mounting, 1¼" minimum first print line, for areas of overlapping MFF forms, 6.42.04

Style 3-L or 3-R, MFF, two-sided with transparent front, front-mounting, 1¼" minimum first print line, for areas of overlapping MFF forms and pin feed forms, 6.42.05

Form Guides, Rear, left or right as specified, removable, manual front feed (MFF) only, for areas to left of Position 95, extra or in place of standard:

Style 1-L or 1-R, MFF, operator adjustable form limit with retractable 1/6" scale for print line a minimum of 2" to a maximum of 13½" from bottom of form, 6.42.50

Style 4-L or 4-R, Scoot-Over, MFF, operator adjustable form limit same as Style 1 rear guide, 6.42.51

Form Limits, Rear, left or right as specified, manual front feed (MFF) only, for permissible areas to left of Position 95:

Short Form, Style 1 (formerly Style E), MFF, service adjustable for print line a minimum of 5/6" to a maximum of 2" if between pressure rolls, or a minimum of 1 2/6" to a maximum of 2" in other areas, distance is to bottom of form, 6.42.55

Scoot-Over, Style 1A-L or 1A-R, (formerly Style A), MFF, Short Form, service adjustable for print line a minimum of 5/6" to a maximum of 2" if between pressure rolls, or a minimum of 1 2/6" to a maximum of 2" if behind pressure rolls, distance is to bottom of form, 6.42.52

Scoot-Over, Style 1B-L or 1B-R, (formerly Style B), MFF Short Form, service adjustable for print line a minimum of 1 2/6" to a maximum of 2" from bottom of form, 6.42.52

Style C, see Coincident Edge Gate

Scoot-Under, Style D, attaches left or right, MFF Short Form, limit attaches to Style 1 rear guide and is service adjustable for print line, a minimum of 5/6" to maximum of 2" from bottom of form, long form uses limit for Style 1 guide, 6.42.54.

Pin Feed Device, removable, included if not standard, or replaces standard; 6.20.00:

Single, Synchronous, Style PF 7, 26", 6.21.00

Single, Independent, Style PF 8, 26", 6.22.00

Dual, Synchronous and Independent, Style PF 9, 26", 6.23.00

Platen Durometer Harness, replaces standard harness, 6.01.00

Platen, Solid, replaces Split and Normal Platen, 6.01.00

Platen, Split and Normal, replaces standard split, 6.03.00

Roll Paper Holders, Style 2, attach left or right, removable, extra set, 6.12.09

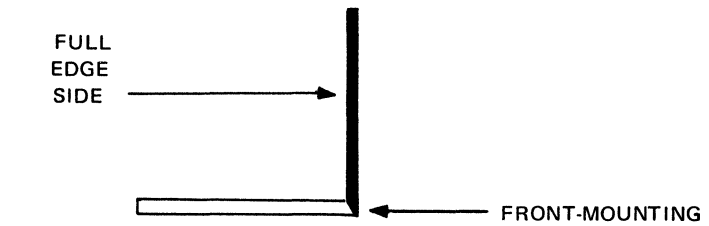
Tear Off Blade, removable, 26", for Single Pin Feed or upper Pin Wheel Assembly of Dual Pin Feed, 6.42.02

6.44.02 FRONT FORM GUIDE, STYLE 4; BFF AND MUR FORMS HANDLERS

The two-sided Style 4 left and right form guides attach to the Style 1 Form Aligning Table with a front-mounting bracket. The guides are used for the Magnetic Unit Record and may be removed or repositioned by the operator. The guides have a metal front and the edge side occupies the full V-shaped area between the front table and the rear Form Guide Bridge.

The Style 4 right guide is always used for the right edge of a module-controlled document at Position 258. An adjustment screw limits and marks the right edge for the placement of the guide. If removed or repositioned the guide must be accurately replaced to this adjustment limit. The Style 4 left guide is used for the left edge of the document unless the application requires a pin feed form, or requires another front-inserted form in the same area. A front feed form or another guide may not be placed in between the Form Guide Bridge and the edge side (no rear side) of the guide (no overlapping of forms). See the Style 5-L guides for overlapping manually aligned forms. A pin feed form may not be present in front of the Form Guide Bridge in the .2" area which is occupied by the edge side of the Style 4 guide. See Figure 6.42.00-2 for the minimum clearance between forms and Figure 6.42.00-3 for the clearances for pin feed forms.

The Style 4 guide is not compatible with the FFF Forms Handler. The guide may be used for other manually aligned front feed forms with either the BFF or MUR Forms Handlers provided the 1" wide nontransparent front near the edge of the form is acceptable. If this guide is used with a manually aligned front feed form the first desired print line must be a minimum of 5/6" from the top of the form to the bottom edge of the printed characters.



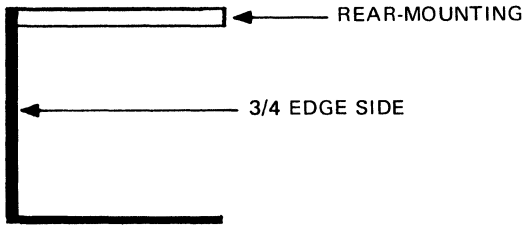
RIGHT GUIDE, OUTLINE OF TOP VIEW

Figure 6.44.02-1 Front Form Guide, Style 4

6.44.03 FRONT FORM GUIDE, STYLE 5-L, BFF AND MUR FORMS HANDLERS, WITH MANUALLY ALIGNED OVERLAPPING FORMS

The three-sided Style 5-L left form guide attaches to the Style 1 Form Guide Bridge with a rear-mounting bracket. The guide is used for the left edge of the Magnetic Unit Record and may be removed or adjusted by the operator. The guide has a metal front and the edge side occupies approximately ¾ of the V-shaped area from the rear bridge toward the Form Aligning Table. The remaining ¼ area in between the front Form Aligning Table and the front side of the Style 5-L guide is sufficient for the insertion of a front feed form in front of the record and the front form may extend to the left of the record.

Generally the Style 5-L guide is used in combination with the Style 6-R guide for the right edge of the front form. A guide at the left edge of the front form may be any of the front guides described in Subject 6.42.00 for the BFF Forms Handler. The document must be inserted prior to the insertion of the front form and the order is reversed during the removal sequence. See Example 2 in Topic 6.42.04 for an overlap condition.



LEFT GUIDE, OUTLINE OF TOP VIEW

Figure 6.44.03-1 Front Form Guide, Style 5-L

The first print line for the overlapping form may be a maximum of 2" from the bottom of the form. The last line may be a minimum of 5/6". The minimum distance for the first print line from the top of the form is 1¼" if the Style 6-R form guide is used at the right edge of the front form. The minimum may be 5/6" if a Style 4-L, or 7-L front guide is used at the left edge but a guide is not available at the right edge to permit the 5/6" print line.

A pin feed form may not be present in front of the Form Guide Bridge in the 1.3" area which is occupied by the rear side of the Style 5-L guide. Another form guide may not be placed in front of the 1.3" wide, front side of the guide. See Figure 6.42.00-2 for minimum clearance between forms and Figure 6.42.00-3 for the clearances for pin feed forms.

The Style 5-L guide is not compatible with the Style 2 Form Guide Bridge for the FFF Forms Handler. The guide may be used for other manually aligned front feed forms with either the BFF or MUR Forms Handler provided the 1" wide nontransparent front near the edge of the form is acceptable. If this guide is used with a manually aligned front feed form, the first desired print line must be a minimum of 5/6" from the top of the form to the bottom edge of the printed characters.

6.44.04 FRONT FORM GUIDE, STYLE 6-R; BFF AND MUR FORMS HANDLERS, MANUALLY ALIGNED OVERLAPPING FORMS

The two-sided Style 6-R right form guide attaches to the Style 1 Form Aligning Table with a front-mounting bracket. The guide does not have a rear side; however, an auxiliary deflector is attached to the right of the guide. The guide is used to guide the right edge of a front feed form in front of the module-controlled document. Except for the auxiliary deflector the guide has a transparent front and the edge side occupies approximately 1/3 of the V-shaped area from the front table towards the Form Guide Bridge. The remaining 2/3 area between the front of the Form Guide Bridge and behind the edge side of the front-mounting Style 6-R guide (no rear side) is sufficient to permit a module-controlled document behind the edge side with or without a pin feed form behind the document. The Style 6-R guide generally is used when the Style 5-L guide is used.

The edge of the front form which uses this guide must be a minimum of 2.6" and 4" from the left and right edges respectively of the module-controlled document. The first desired print line must be a minimum of 1¼" from the top of the form or a maximum of 2" from the bottom of the form. The last line may be a minimum of 5/6" from the bottom of the form. These measurements are to the bottom edge of the printed characters. If the front form is inserted for a print line less than 1¼" from the top of the form, the front of the guide loses control of the form when the Forms Handler closes. A line advance function or Forms Handler opening may "trap" the top of the form.

The Style 6-R is not compatible with the FFF Forms Handler. The guide may be used with other manual forms; however, the Style 3-R guide is available for similar conditions without a module-controlled document present.

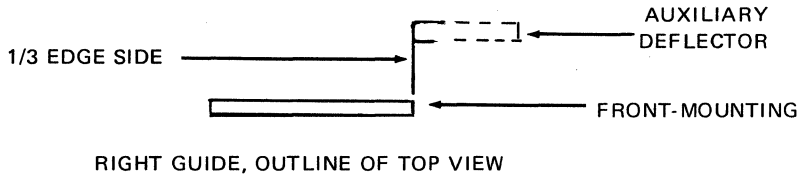


Figure 6.44.04-1 Front Form Guide, Style 6-R

6.44.05 FRONT FORM GUIDE, STYLE 7-L; BFF AND MUR FORMS HANDLERS, WITH PIN FEED FORMS

The two-sided Style 7-L left form guide attaches to the Style 1 Form Aligning Table with a front-mounting bracket. The guide does not have a rear side; however, an auxiliary deflector is attached to the left of the guide. The guide is used for a module-controlled document and may be removed or repositioned by the operator. The guide has a metal front and the edge side occupies approximately ½ of the V-shaped area from the front table towards the Form Guide Bridge. The remaining ½ area between the front of the Form Guide Bridge and behind the edge side of the front-mounting Style 7-L guide (no rear side) is sufficient to permit a pin feed form behind the edge side.

This Style 7-L guide is required when a pin feed form is used in the area. This permits a pin feed form in front (a requirement) of the Form Guide Bridge with the module-controlled document in front of the pin feed form. The pin feed form prevents the use of rear-mounting guides in the same area on the bridge. A form guide may not be placed on the Form Guide Bridge in the area of the document or behind the area of the Style 7-L form guide, see Figure 6.42.00-2.

Style 7-L guide is not compatible with the FFF Forms Handler. The guide may be used for other manually aligned front feed forms with either the BFF or MUR Forms Handler provided the 1" wide, nontransparent front near the edge of the form is acceptable. If this guide is used with a manually aligned front feed form the first desired print line must be a minimum of 5/6" from the top of the form to the bottom edge of the printed characters.

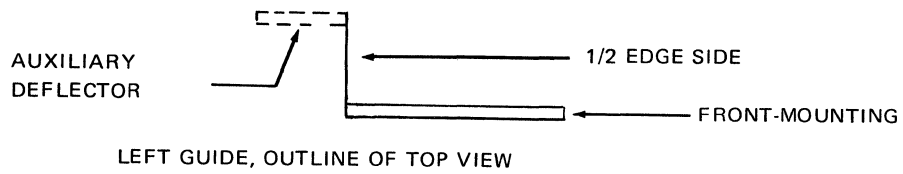


Figure 6.44.05-1 Front Form Guide, Style 7-L

6.44.50 REAR FORM GUIDE, STYLE 2; BFF, FFF, AND MUR FORMS HANDLERS

The left and right removable guides may be used for rear guides with manually aligned front feed forms in the module area. This area is to the right of Position 95 as described for the Forms Area in Topic 6.14.02. The left and right edges of the form are guided by the retaining edges of the guides after the bottom edge of a form is inserted approximately 2½" below the print line. The guides are installed, repositioned, or removed at the rear of the console.

The Style 2-L and 2-R rear guides are similar to the respective Style 1-L and 1-R (Topic 6.42.50) guides except a retractable scale is not provided and the print line limits are different. The first print line may be a maximum of 11" from the bottom edge of the form. An operator adjustable form limit is included with each guide. The limit includes a metal slide with a plastic limit block attached on one end. A removable clamp attaches to the retaining edge of the guide. The clamp is used to hold the slide and block in place. With the slide towards the front of the console and the limit block to the rear, the print line may be set for a minimum and maximum of 7½" and 11" respectively from the bottom of the

form. For this condition the clamp is placed on the limit block to hold the slide and block in place. If the slide is reversed in the recess of the guide, the print line may be a minimum and maximum of 2" and 7½" respectively. For this condition the clamp is placed on the slide to hold the slide and block in place. These measurements are to the bottom edge of the printed characters. A minimum 5/6" print line is permitted on the form with or without the utilization of the limit.

The Style 2 rear guides must not be present in between the modules when automatic handling or random accessing is required, but the guides may be present to the left of the module-controlled document. Certain areas do not permit the placement of rear form guides, but forms may be inserted without the rear guides present. The permissible locations for the manually aligned forms are described in Topic 6.14.02 and the placement of the guides is also displayed.

The front end of the retaining edge of the guide prevents the downward movement of a front feed form. If a front feed form is inserted in front of the retaining edge of the guide, the maximum distance for the first print line is 2" from the bottom of the form. (A form is in front of the guide when the left and right edges are on opposite sides of the guide.) Elongated forms (payroll checks) commonly are inserted in front of the Style 2 rear guide. See Scoot-Over Guide, Topic 6.42.51 for other overlap conditions. A position aperture is at the outside edge near the back end of the guide. The aperture is used to place the guide at the desired position in relation to the numeric scale on the lower shield. See Topic 6.09.01, Numeric Scales.

A Retract or Eject instruction should not be executed when a manually aligned form is in the area of a module or modules.

FFF Forms Handler

The Style 2-R rear guide may be used to guide the right edge of a form which is to the left of, or at Position 130 for a FFF Forms Handler, or the Style 2-L guide may be used to guide the left edge of a form to left or, or at either Position 111 or 112 depending upon where the Style 3A guide is set, Topic 6.13.06. The guide extends 2" beyond the back of the console. The Style 2 rear guide may be used if an operator adjustable limit is required in place of the Style 3 guide with a limit which is not adjustable by the operator. In addition, the Styles 2 and 3 limits may be set for a minimum of 2" and 2¾" respectively. A Style 1 rear guide may also be used if the 4" extension to the rear of the console is acceptable.

MUR Forms Handler

The Style 2 rear guides may be used in the left Manual Front Feed area with this handler, Positions -2.5 through 95. Two adjacent nonoverlapping forms must be a minimum of .7" apart, see Figure 6.42.00-2. This is the same as for a Style 1 rear guide. Minimum form width is 4".

NOTE: The front end of the Style 2 rear guide should not be used to provide a form limit of 2". The actual print line selected may be more than 2" depending upon the allowable tolerances for manufacturing purposes.

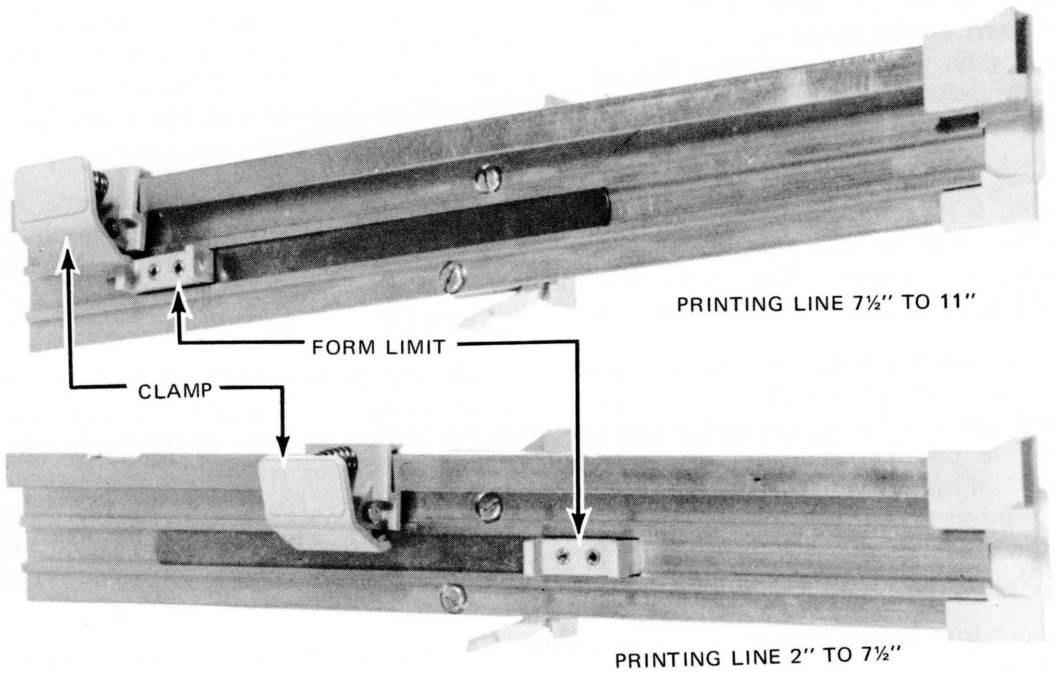


Figure 6.44.50-1 Rear Form Guide, Style 2

6.50.00 MANUAL THREADING OF PIN FEED FORMS

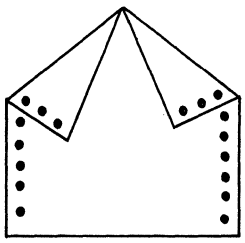
The following topics are a step-by-step procedure for the installation of pin feed forms. The procedure used is dependent upon whether a Rear Feed Forms Handler is used or whether a Front Feed Forms Handler is provided. Two methods are presented for each Forms Handler. With these procedures the pin feed forms may be installed with the Power ON or OFF provided the Forms Handler is open. If the Power is ON the console may be in Program mode or Ready mode.

6.51.00 PREPARATION OF LEADING EDGE OF PIN FEED FORM

The following methods are normally used to prepare the leading edge for insertion from the rear. The method actually used may be determined by operator preference or the forms configuration.

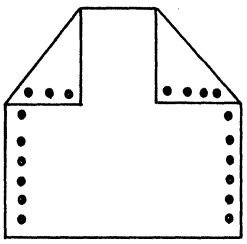
1. Double Fold to a V-Shape
   With the front of the form face-down, the corners of each edge may be folded back. The fold may create a sharp point or straightedge point. See Examples 1 and 2. This method may be used provided the thickness of a multiple-part form is not in excess of .020".

SHARP POINT



Example 1

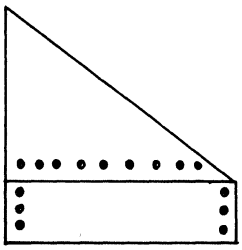
STRAIGHTEDGE POINT



Example 2

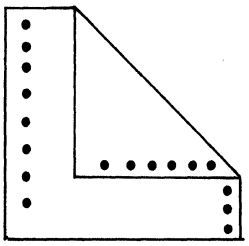
2. Single Fold to a V-Shape
   With the front of the form face-down, one corner of the form may be folded back. The fold may create a sharp point or straightedge point. See Examples 3 and 4. This method may be used provided the thickness of a multiple-part form is not in excess of .020".

SHARP POINT



Example 3

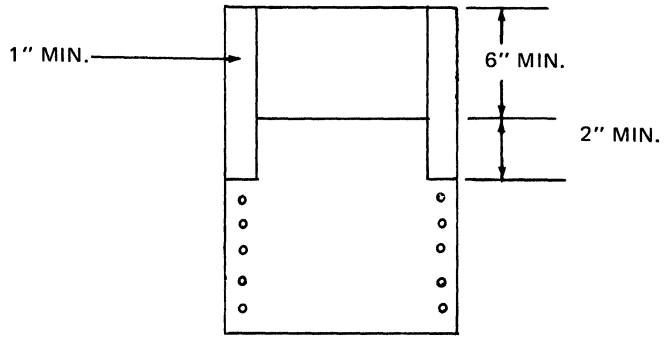
STRAIGHTEDGE POINT



Example 4

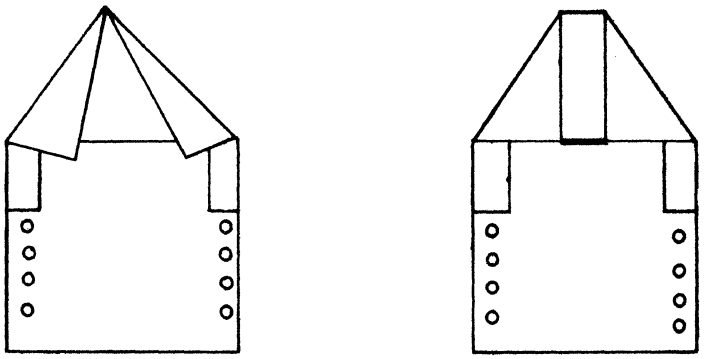
3. Unfolded Form
   The leading edge of a form may be unfolded. This method is satisfactory for single-part forms provided the edge is free of tears. The rigidity of the form should be sufficient to permit the insertion from the rear. A form which is approximately 20 pound in paper weight is sufficient for this type of leading edge.
4. V-Shaped Leader Shield
   For multiple-part forms a single or double-ply of paper may be folded over the left and right edges of the pin feed form. The paper may be stapled in the margin of the sprocket holes. The paper which provides a shield may be folded to a sharp point or straightedge point. The shield is removed prior to placing the form in the Pin Wheels. The paper should be a minimum of 2" wider than the pin feed form. This will provide for a 1" fold over at each left and right edge. A paper shield should be a minimum of 8" in length for a 6" leader and 2" for the fold on the pin feed form. See the following examples.

   With the pin feed form face-down on the paper shield fold the paper over the edges of the pin feed form.



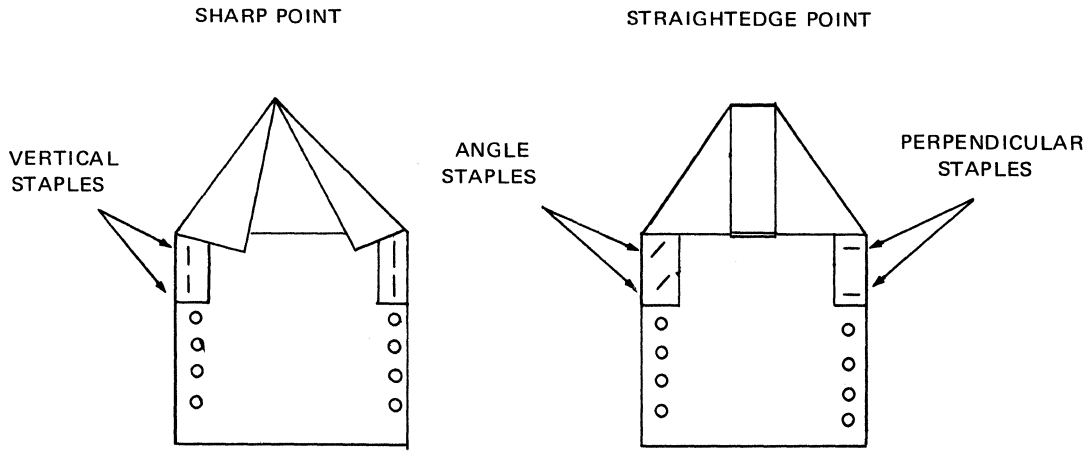
Example 5

The fold for the leader area may be to a sharp point, or straightedge point.



Example 6

Staple each fold to the pin feed form in the margin. One staple at each edge may be sufficient for "light" forms, however, two staples may be required for "heavy" forms. With small staples the manual feeding is easier. The staples may be vertical, at an angle, or perpendicular to the length of the form. The perpendicular stapling is the most desirable.



Example 7

6.51.01 REAR FEED FORMS HANDLER, METHOD 1, ONE FORM OR NONOVERLAPPING FORMS

This method may be used for the installation of one pin feed form or two nonoverlapping pin feed forms. For a review of the Form Paths, see Topic 6.11.11. The pin feed features are described in Subject 6.20.00.

1. Open the Forms Handler, if closed, with the Open/Close key. If the power is OFF and the handler is closed, depress the Power ON button and after a 30 second delay the handler automatically opens.
2. From the rear of the console the Exit Rack or Racks may be arced up and latched in an approximate perpendicular position by the Safety Latches. Before the racks are raised a form, if present, on an Exit Rack should be separated at the perforation near the Paper Table (scale).
3. Raise the Hinged Cover above the Intake Racks. The upper Intake Rack, if present, may be latched up in order to install a form on the lower rack. The Roll Paper Holder must be removed if two pin feed forms are used.
4. Prepare the leading edge of the form as described in Subject 6.51.00. Place the supply of forms at the rear of the console.
5. Lower the upper Intake Rack if it was latched up in Step 3 to install the first of two forms. Place the form face-down on the desired Intake Rack. If the Intake Guides are present place the form between them. Use the Forms Area as designated for the application. This will be approximate if the guides are not previously positioned.
6. Push the form forward in the intake path until the leading edge or point is at least ½" in front of the platen.
7. From the front of the console, pull the form up behind the Form Heading Holder Bail.
8. If the Pin Wheels are not properly positioned move the Release-Lock Lever for the wheels and move the Pin Wheels to the approximate Forms Area for the application.
9. Open the Form Retaining Guides on the set of Pin Wheels and place the form on the Pin Wheels. Close the Form Retaining Guide.
10. If the Pin Wheels were not previously positioned, position the edges of the form to the numeric scale positions. These are prescribed for each application.
11. Position the rear Intake Guides at the edge of the forms if not previously positioned.
12. Repeat the procedure from Step 4 if another pin feed form must be installed, otherwise, go to Step 13.
13. After the one form or both forms are installed, the upper Intake Rack may be lowered if not previously lowered plus the Hinged Cover may be lowered. Next, lower the Exit Rack or Racks. With the right hand move the Exit Rack forward to relieve the pressure on the Safety Latch, and with the left hand pull and hold the latch below the front edge of the rack until the right hand completes the lowering of the rack.
14. Rotate the left Platen Twirler to align the left-controlled form on a single device or the lower Pin Wheels of the dual device. Use the pin feed Variable Spacer (on right) to align the right-controlled form on a single device or the upper Pin Wheels of a dual device.

6.51.02 REAR FEED FORMS HANDLER, METHOD 2, OVERLAPPING FORMS

This method may be used for the installation of two overlapping pin feed forms. For a review of the Form Paths, see Topic 6.11.11. The pin feed features are described in Subject 6.20.00. The pin feed form in front must be on the upper Pin Wheels and is placed on the wheels after the rear form is placed.

1. Open the Forms Handler, if closed, with the Open/Close key. If the power is OFF and the handler is closed, depress the Power ON button and after a 30 second delay the handler automatically opens.

2. A form, if present on an upper Exit Rack, should be separated at the perforation near the Paper Table (scale).
3. A form, if present on the upper Pin Wheels, should be removed from the Pin Wheels by opening the Form Retaining Guide. The form should be laid forward over the front of the console.
4. From the rear of the console the upper Exit Rack may be arced up and latched in an approximate perpendicular position by the Safety Latches.
5. A form, if present on the lower Exit Rack, should be separated at the perforation near the Paper Table (scale) and then the rack may be arced up the same as for Step 4.
6. Raise the Hinged Cover above the Intake Racks with or without a form present.
7. Prepare the leading edge of the form or forms as described in Subject 6.51.00. Place the supply of forms at the rear of the console.
8. Either of the following may be executed at this Step; however, select Step 8a if two forms must be installed or if the rear form is already present.

Installation of Front Form (upper Pin Wheels)	Installation of Rear Form (Lower Pin Wheels)
a. The upper Intake Rack may be latched up with or without a form present in order to install a form on the lower rack. Go to Step 9a.	b. Go to Step 9b.
9. a. Place form face-down on lower rack. If the Intake Guides are present place the form between them. Go to Step 10.	b. Lower the upper Intake Rack if it was latched up in Step 8a to install the front form. Place form face-down on upper Intake Rack. If the Intake Guides are present, place the form between them. Go to Step 10.

10. Either form, push the form forward in the intake path until the leading edge is at least ½" in front of the platen.
11. From the front of the console, pull the form up approximately 4" behind the Form Heading Holder Bail. Go to Step 12a and 12b for front and rear forms respectively.

Front Form	Rear Form
12. a. Place leading edge of form over front of console and go to Step 9b if rear form must be installed, otherwise, go to Step 13a.	b. Go to Step 13b.
13. a. Same as 13b for this front form, then go to Step 14a.	b. If the Pin Wheels are not properly positioned move the Release-Lock Lever for the wheels and move the Pin Wheels to the approximate Forms Area for the respective form, go to Step 14b.
14. a. Same as 14b for this front form, then go to Step 15b.	b. Open the Form Retaining Guides on the set of Pin Wheels and place the form on the Pin Wheels. Close the Form Retaining Guide, go to Step 15b.
15. a. Same as 15b for this front form then go to Step 17.	b. If the Pin Wheels were not previously positioned position the edges of the form to the numeric scale positions. These are prescribed for each application. Go to Step 13a if front form is initially installed, or go to Step 16 if it had been removed in Step 3.

16. Reinstall front form removed in Step 3.
17. Position the rear Intake Guides at the edge of the forms if not previously positioned. Lower upper Intake Rack if not previously lowered.
18. After the one form or both forms are installed, the Exit Racks may be lowered. With the right hand move the Exit Rack forward to relieve the pressure on the Safety Latch, and with the left hand pull and hold the latch below the front edge of the rack until the right hand completes the lowering of the rack.
19. Rotate the left Platen Twirler to align the left-controlled form on a single device or the upper Pin Wheels of a dual device. Use the pin feed Variable Spacer (on right) to align the right-controlled form on a single device or the upper Pin Wheels of a dual device.

6.51.03 FRONT FEED FORMS HANDLER, METHOD 3, ONE FORM OR NONOVERLAPPING FORMS

This method may be used for the installation of one pin feed form or two nonoverlapping pin feed forms. For a review of the Form Paths, see Topics 6.12.10, 6.13.10, and 6.14.11. The pin feed features are described in Subject 6.20.00.

Front feed forms should be removed from handler, including a module-controlled document for a Magnetic Record Computer system. However, they may be left in place, if necessary, except the alignment of the manually aligned forms will be disturbed.

A front feed form should be inserted a minimum of 2" directly in front of the area where the leading edge or point will first appear when the pin feed form is pushed to the area in front of the platen. This is designated as a "deflector form" in the following steps.

1. Open the Forms Handler, if closed, with the Open/Close key. If the power is OFF and the handler is closed, depress the Power ON button and after a 30 second delay the handler automatically opens. Insert "deflector form", see above.
2. From the rear of the console the Exit Rack or Racks may be arced up and latched in an approximate perpendicular position by the Safety Latches. Before the racks are raised a form, if present on an Exit Rack, should be separated at the perforation near the Paper Table (scale).
3. Raise and latch up the Hinged Cover and upper Intake Rack, if present, in order to install a form on the lower rack. The cover is not present with a Financial Forms Handler.
4. Prepare the leading edge of the form as described in Subject 6.51.00. Place the supply of forms at the rear of the console.
5. Lower the upper Intake Rack and Hinged Cover if they were latched up in Step 3 to install the first of two forms. Place the form face-down on the desired Intake Rack. If the Intake Guides are present place the form between them. Use the Forms Area as designated for the application. This will be approximate if the guides are not previously positioned.
6. From the rear of the console push the Pressure Roll Control lever forward to disable the lower pressure rolls if form is inserted in the Journal/Pin Feed path. Push the form forward in the intake path until the leading edge or point is at least ½" in front of the platen. The point deflects on the deflector form.
7. From the front of the console, pull the form up between the Form Aligning Table or Bail and in front of the Form Guide Bridge.
8. If the Pin Wheels are not properly positioned move the Release-Lock Lever for the wheels and move the Pin Wheels to the approximate Forms Area for the application.
9. Open the Form Retaining Guides on the set of Pin Wheels and place the form on the Pin Wheels. Close the Form Retaining Guide.
10. If the Pin Wheels were not previously positioned, position the edges of the form to the numeric scale positions. These are prescribed for each application.
11. Position the rear Intake Guides at the edge of the forms if not previously positioned.

12. Repeat the procedure from Step 4 if another pin feed form must be installed, otherwise, go to Step 13.
13. After the one form or both forms are installed, the upper Intake Rack may be lowered if not previously lowered plus the Hinged Cover may be lowered. Next, lower the Exit Rack or Racks. With the right hand move the Exit Rack forward to relieve the pressure on the Safety Latch, and with the left hand pull and hold the latch below the front edge of the rack until the right hand completes the lowering of the rack.
14. Rotate the left Platen Twirler to align the left-controlled form on a single device or the lower Pin Wheels of the dual device. Use the pin feed Variable Spacer (on right) to align the right-controlled form on a single device or the upper Pin Wheels of a dual device.

6.51.04 FRONT FEED FORMS HANDLER, METHOD 4, OVERLAPPING FORMS

This method may be used for the installation of two overlapping pin feed forms. For a review of the Form Paths, see Topics 6.12.10, 6.13.10, and 6.14.11. The pin feed features are described in Subject 6.20.00. The pin feed form in front must be on the upper Pin Wheels and is placed on the wheels after the rear form is placed.

Front feed forms should be removed from handler, including a module-controlled document for a Magnetic Record Computer system. However, they may be left in place, if necessary, except the alignment of the manually aligned forms will be disturbed.

A front feed form should be inserted a minimum of 2" directly in front of the area where the leading edge or point will first appear when the pin feed form is pushed to the area in front of the platen. This is designated as a "deflector form" in the following steps.

1. Open the Forms Handler, if closed, with the Open/Close key. If the power is OFF and the handler is closed, depress the Power ON button and after a 30 second delay the handler automatically opens. Insert "deflector form", see above.
2. A form, if present on an upper Exit Rack, should be separated at the perforation near the Paper Table (scale).
3. A form, if present on the upper Pin Wheels, should be removed from the Pin Wheels by opening the Form Retaining Guide. The form should be laid forward over the front of the console.
4. From the rear of the console the upper Exit Rack may be arced up and latched in an approximate perpendicular position by the Safety Latches.
5. A form, if present on the lower Exit Rack, should be separated at the perforation near the Paper Table (scale) and then the rack may be arced up the same as for Step 4.
6. Raise and latch-up the Hinged Cover above the Intake Racks with or without a form present in order to install a form on the lower rack. The cover is not present with a Financial Forms Handler.
7. Prepare the leading edge of the form or forms as descried in Subject 6.51.00. Place the supply of forms at the rear of the console.
8. Either of the following may be executed at this Step; however, select Step 8a if two forms must be installed or if the rear form is already present.

Installation of Front Form (Upper Pin Wheels)	Installation of Rear Form (Lower Pin Wheels)
a. The upper Intake Rack may be latched up with or without a form present in order to install a form on the lower rack. Go to Step 9a.	b. From the rear of the console push Pressure Roll Control Lever forward to disable lower pressure rolls if form is inserted in the Journal/ Pin Feed Path. Lower Hinged Cover if latched up in Step 6, go to Step 9b.

9. a. Place form face-down on lower rack. If the Intake Guides are present place the form between them. Go to Step 10.

   b. Lower the upper Intake Rack if it was latched up in Step 8a to install the front form. Place form face-down on upper Intake Racks. If the Intake Guides are present, place the form between them. Go to Step 10.

10. Either form, push the form forward in the intake path until the leading edge or point is at least ½" in front of the platen. The point deflects on the deflector form.

11. From the front of the console, pull the form up approximately 4" between the Form Aligning Table or Bail and the Form Guide Bridge. Go to Step 12a and 12b for front and rear forms respectively.

12 a. Front Form

   Place leading edge of form over front of console and go to Step 8b if rear form must be installed, otherwise, go to Step 13a.

   b. Rear Form

   Go to Step 13b.

13. a. Same as 13b for this front form, then go to Step 14a.

   b. If the Pin Wheels are not properly positioned move the Release-Lock Lever for the wheels and move the Pin Wheels to the approximate Forms Area for the respective form, go to Step 14b.

14. a. Same as 14b for this front form, then go to Step 15b.

   b. Open the Form Retaining Guides on the set of Pin Wheels and place the form on the Pin Wheels. Close the Form Retaining Guide, go to Step 15b.

15. a. Same as 15b for this front form, then go to Step 17.

   b. If the Pin Wheels were not previously positioned, position the edges of the form to the numeric scale positions. These are prescribed for each application. Go to Step 13a if front form is initially installed, or go to Step 16 if it had been removed in Step 3.

16. Reinstall front form removed in Step 3.

17. Position the rear Intake Guides at the edge of the forms if not previously positioned. Lower upper Intake Rack if not previously lowered.

18. After the one form or both forms are installed, the Exit Racks may be lowered. With the right hand move the Exit Rack forward to relieve the pressure on the Safety Latch, and with the left hand pull and hold the latch below the front edge of the rack until the right hand completes the lowering of the rack.

19. Rotate the left Platen Twirler to align the left-controlled form on a single device or the upper Pin Wheels of a dual device. Use the pin feed Variable Spacer (on right) to align the right-controlled form on a single device or the upper Pin Wheels of a dual device.

SECTION 7

FORMS

7.00.00 FORMS CONSIDERATIONS

The selection of the right type of forms for a system is equally as important as the programing for the application. This section includes illustrations for certain forms which have been standardized; in addition, the minimum and maximum sizes for nonstandard forms are specified. The forms in this section are available from the Burroughs Business Forms and Supplies Group. The representatives of the Forms Group should be contacted for samples and any additional assistance with regard to the forms, any modification of the forms, or original design of a form for a special application. The utilization of a standard form is a time saver. The forms in this section also provide a good example for the design of nonstandard forms. Pictures of posting trays, index tabs and envelopes are also included.

Certain forms have been available and utilized for many years with a wide range of Burroughs Accounting Machines. These forms are equally adaptable to the Series L/TC for comparable applications. Forms which are designed as part of a program package for the Business Machines Group are listed for the applicable package and not included in this section.

In addition to the above two references for Forms, the Field Engineering Department of the Business Machines Group is a source of supply for roll paper or journals, sewed or pasted carbon journal binders, paper tape for punched tape perforators, and various other office equipment supplies.

Although the forms are generally acceptable for a Series L/TC, the form specifications for the Series L/TC must be observed for certain types of forms or modified configurations. The form specifications are described in Subjects 6.31.00, 6.32.00, 6.33.00 and 6.34.00 for various Forms Handlers.

The illustrations are assigned a Figure number which is consistent with the numbering system for this manual. The form numbers assigned by the Business Forms and Systems Group are also present on most illustrations. The forms and posting equipment are classified into the following major groups and are arranged in the same order:

7.01.00 FORM THICKNESS SAMPLES

The following are sample thicknesses of various forms and carbon.

WEIGHT	THICKNESS	TYPE
	.0035"	PLAIN ROLL PAPER, ONE-PLY
	.003"	PIN FEED PAPER, ONE-PLY
	.007"	CARBON COATED (PLS), TWO-PLY ROLL JOURNAL
	.008"	CARBONLESS TRANSFER (CLT), TWO-PLY ROLL JOURNAL
	.004"	CARBONLESS PRESSURE-SENSITIVE (SPC), ONE PLY ROLL JOURNAL
	.004"	PERFORATED PUNCHED AND PRINTED, CARBONLESS PRESSURE-SENSITIVE (PPP), ONE-PLY ROLL JOURNAL
10 lb.	.0024"	BOND
12 lb.	.0026"	BOND
13 lb.	.0027"	BOND
15 lb.	.0032"	BOND
20 lb.	.0043"	BOND
24 lb.	.0045"	BOND
16 lb.	.0024"	TRANSLUCENT BOND
24 lb.	.0045"	LEDGER
28 lb.	.0051"	LEDGER
32 lb.	.0063"	LEDGER
36 lb.	.0066"	LEDGER
38 lb.	.0069"	CARBONLESS TRANSFER-CFF
15 lb.	.0028"	CARBONLESS TRANSFER-CF
15 lb.	.0032"	CARBONLESS TRANSFER-CB
17 lb.	.0034"	CARBONLESS TRANSFER-CFB
20 lb.	.0039"	GUMMED STOCK
80 lb.	.0070"	MOBILE TAG
9 lb.	.0013"	CARBON TISSUE-BLACK P 997
7 lb.	.0012"	CARBON TISSUE-BLACK P 708
7 lb.	.0012"	CARBON TISSUE-BLUE

The average thickness of glue used to attach 2 sheets in a multiple part form – .0003". The thickness refers to each application of glue and accordingly should be multipled by 2, 3 or 4 depending on the number of plies in the multiple form.

Two examples of figuring total caliper of multiple-part forms are shown.

Example 1	Ply 1 –	32# Ledger	.0063"
		P 708 Carbon	.0012"
		Glue Line	.0003"
	Ply 2 –	10# Bond	.0024"
		P 708 Carbon	.0012"
		Glue Line	.0003"
	Ply 3 –	10# Bond	.0024"
		P 708 Carbon	.0013"
		Glue Line	.0003"
	Ply 4 –	10# Bond	.0024"
		P 708 Carbon	.0012"
		Total	.0192"

Note: Only 3 glue lines required to be considered in the total caliper.

Example 2	Ply 1 –	15# CLTCB	.0032"
		Glue Line	.0003"
	Ply 2 –	17# CFB	.0034"
		Glue Line	.0003"
	Ply 3 –	17# CFB	.0034"
		Glue Line	.0003"
	Ply 4 –	15# CF	.0028"
		Total	.0137"

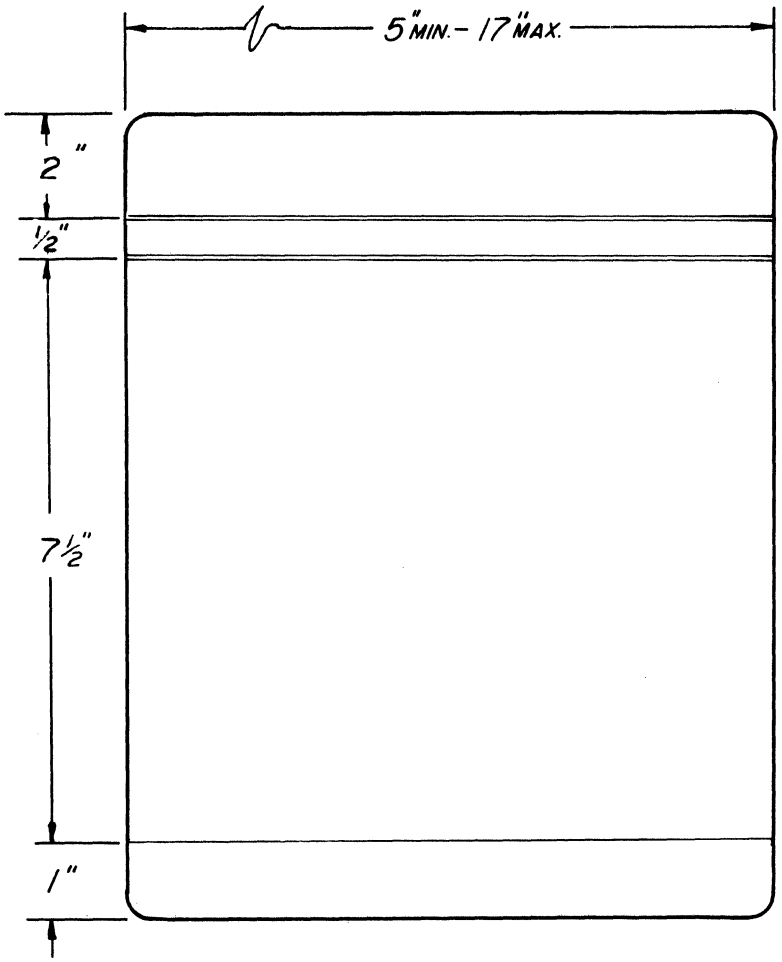
7.02.00 LEDGERS AND STATEMENTS

The following topics are samples of available ledgers and statements. See Subject 7.09.00 for envelopes which are available. The specifications for the ledgers may be used for accounts payable ledgers also. The following three topics are used to describe the forms:

1. General Characteristics for Ledgers
2. Accounts Receivable Forms
3. General Characteristics for Statements

7.02.01 GENERAL CHARACTERISTICS FOR LEDGERS

The following illustrations may be used as a guide for the design of nonstandard forms.



SIZE: 5" to 17" x 11"
STOCK: 32# Buff or 32# Green
INK: Standard Brown only
CORNERS: 4 round Corners 3/8" radius
BACK PRINTING: Tumblehead only. - "I" to "II" only Change Front to Back.

TYPE STYLES

UPPER CASE — Upper And Lower Case

12 Point, 660

JONES CONSTRUCTION CO. — Jones Construction Co.

12 Point, 670

JONES CONSTRUCTION CO. — Jones Construction Co.

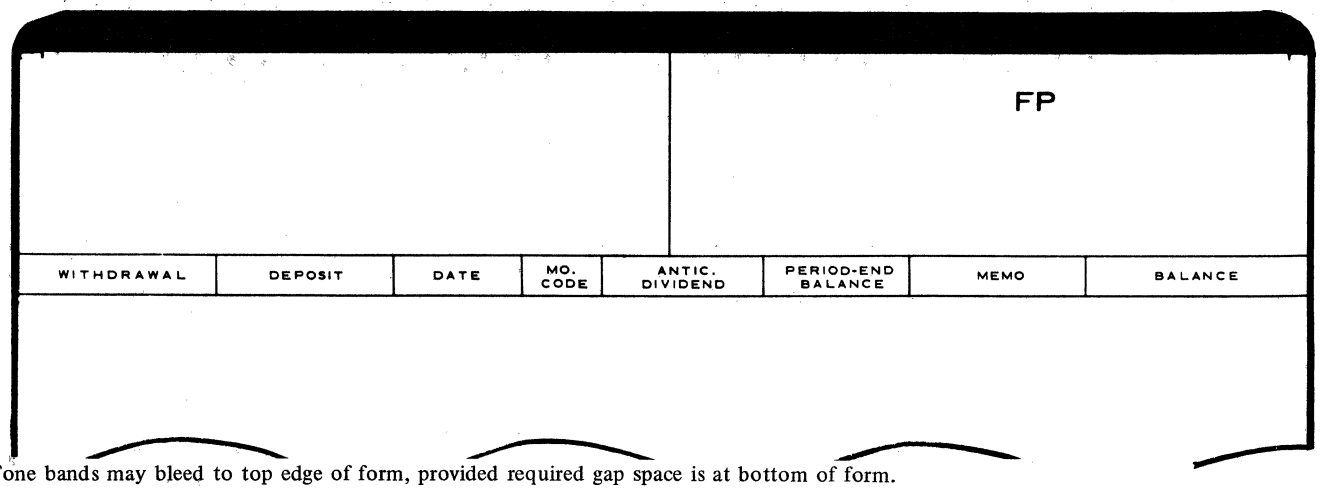
12 Point, 780

JONES CONSTRUCTION CO. — Jones Construction Co.

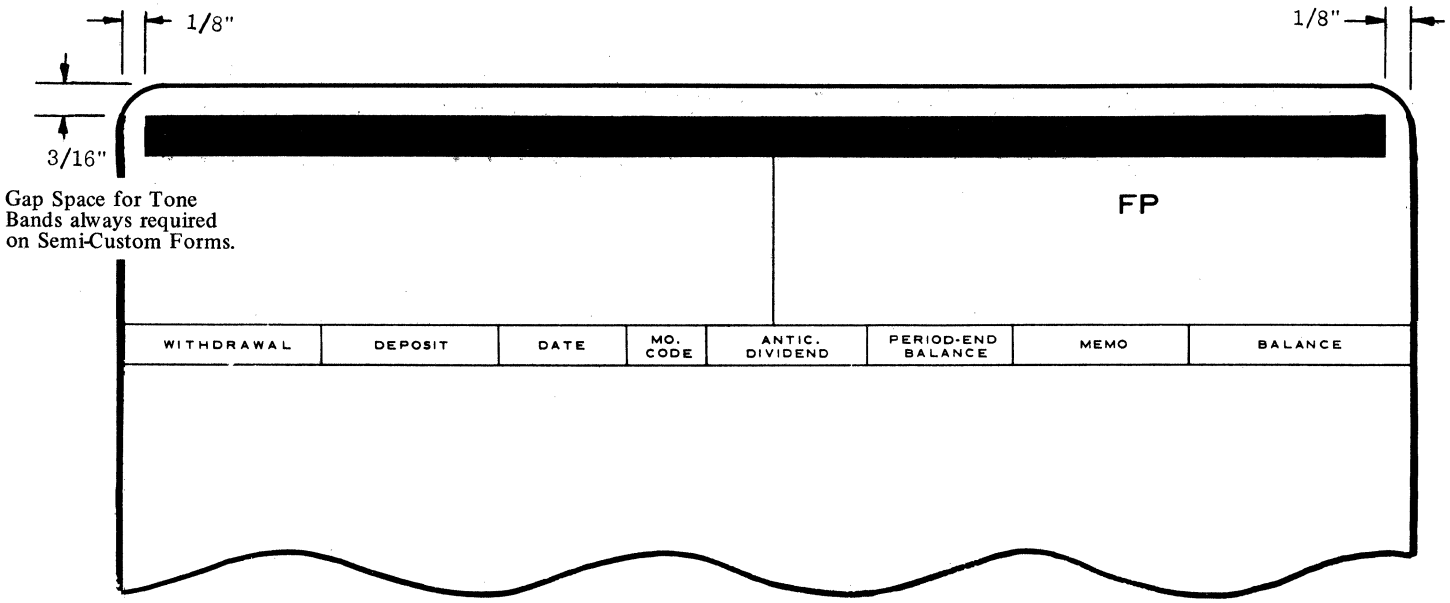
6 Point, 2000

1500 MAIN ST.
ANYTOWN, U.S.A.

Figure 7.02.01-1 Standardized Ledger



Tone bands may bleed to top edge of form, provided required gap space is at bottom of form.



Gap Space for Tone Bands always required on Semi-Custom Forms.

Figure 7.02.01-2 Tone Bands

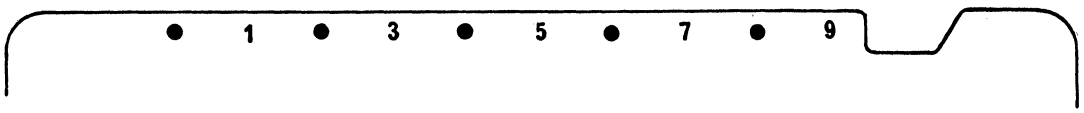


FIG. #1

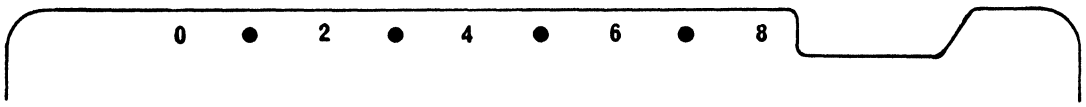


FIG. #2

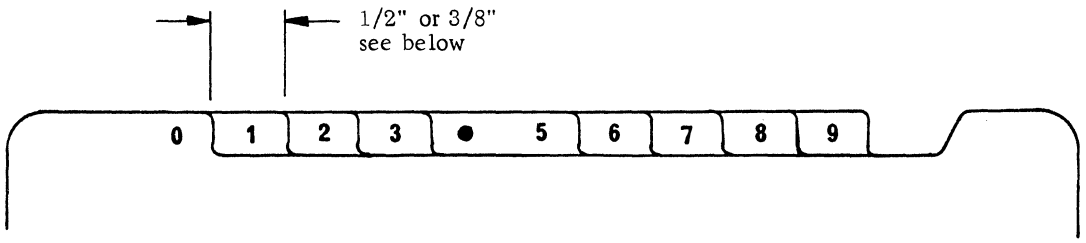


FIG. #3

In order to print the ledger cards for the Terminal Digit Filing feature it is necessary to have two sets, an odd numbered set (Figure 1) and an even numbered set (Figure 2). When the cards are die cut and collated in numerical order 0-9, the fact that a card is missing or misfiled is easily spotted because the black dot shows in place of the number (Figure 3).

This feature is ideally suited for installations where the ledger cards are filed numerically rather than alphabetically since it provides a means for rapid random access and refiling thereby increasing the overall efficiency of the machine installation.

The feature is available with 3/8" tabs or 1/2" tabs. If 3/8" tabs are used, it will take 4-1/8" to print and die cut, with 1/2" tab the space required is 5-1/2". Unless otherwise noted on your copy, the feature will be centered on the form.

To order, show the words, "Terminal Digit Filing Feature With (1/2" or 3/8") Tabs" in the position where you want the feature printed and die cut.

Figure 7.02.01-3 Terminal Digit Filing Feature

7.02.02 ACCOUNTS RECEIVABLE FORMS

Examples of accounts receivable ledgers and statements are included in the following pages. Statements may be used with an original ledger or collated ledger and statement. See Topic 7.02.03 for the general characteristics of statements.

In addition the following forms are available as listed with the designated form numbers and brief description.

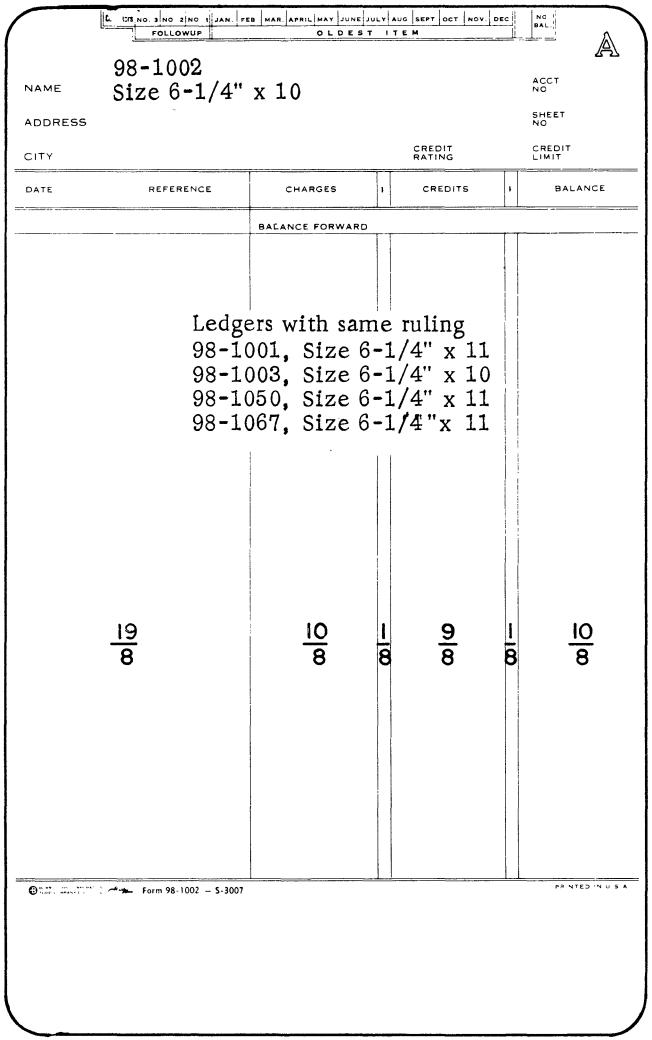
98-1084, 32 lb. Buff Ledger, Brown Ink, Head to Head Printing

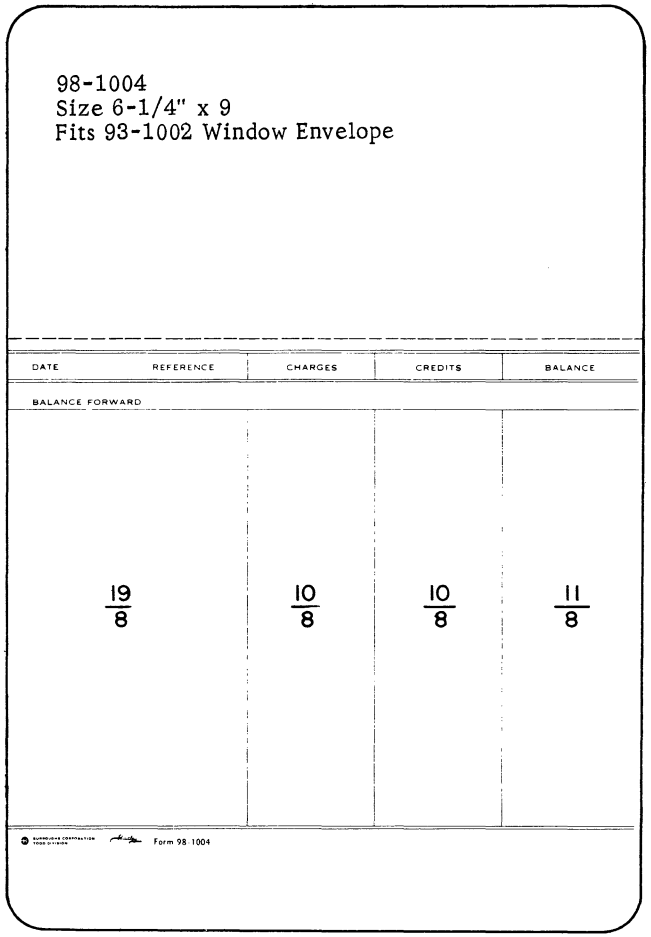
98-1085, 28 lb. White Original Statement, Blue Ink

98-1077, 32 lb. Buff Ledger, Brown Ink, includes Sales to Date and Proof columns at right edge

98-3003, 20 lb. Manifold Bond – White Statement, Brown Ink, includes carbon for collated ledger and statement

98-5001, 28 lb. Buff Ledger, Brown Ink, includes markings on top for months of the year.





Statement ..... Form 98-1004

Stock: 28# White Machine Bookkeeping Ledger
Ink: Blue

Registers with all ledgers mentioned on this page and with ledgers 98-1031, 98-1032, 98-1084. Matching journals are 98-1006 & 98-1009.

Ledger (Master-Patch) ..... Form 98-1001

Ledger ..... Form 98-1002

Ledger (Master-Patch ..... Form 98-1003

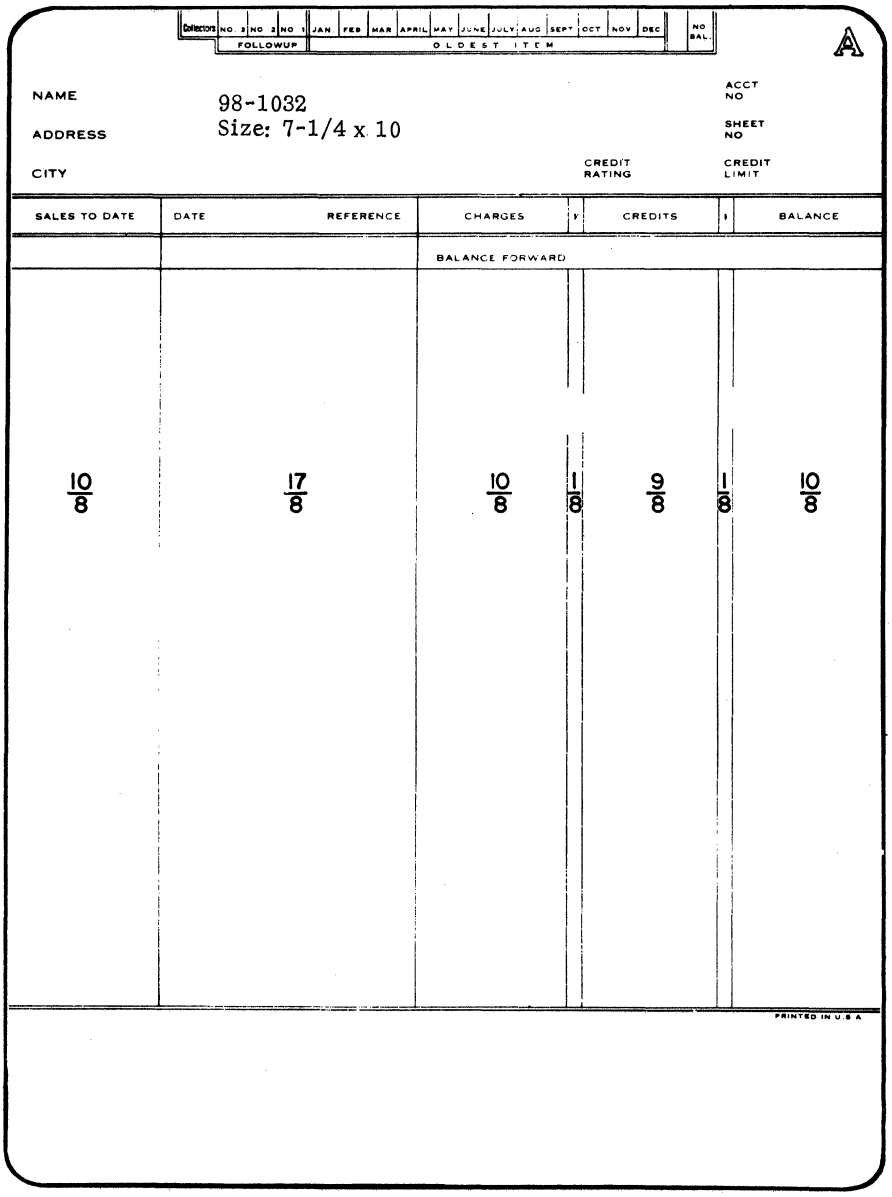
Ledger ..... Form 98-1050

Stock: 32# Buff Machine Bookkeping Ledger
Ink: Brown
Tumble Head Printing

Ledger .....Form 98-1067

Stock: 32# Green Machine Bookkeeping Ledger
Ink: Brown

Figure 7.02.02-1 Accounts Receivable Ledgers and Statements



LEDGER (Master-Patch).....Form 98-1031

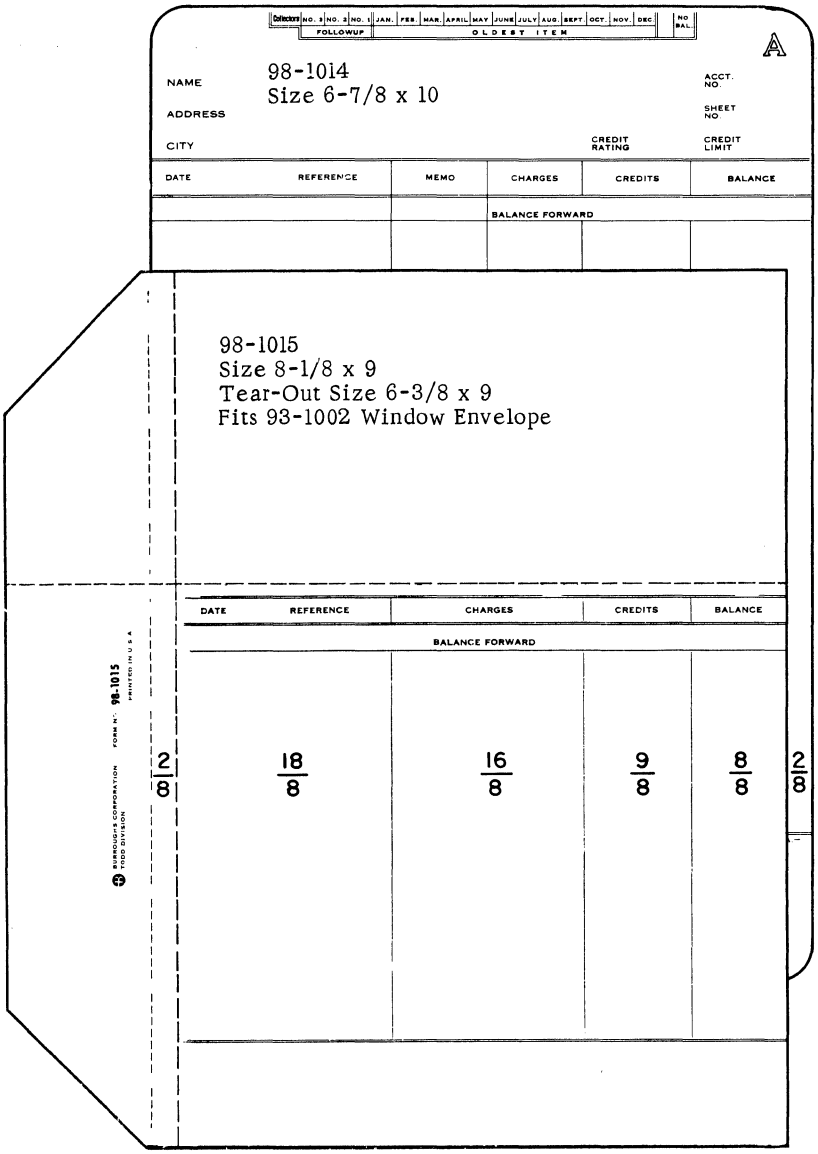
LEDGER.....Form 98-1032

STOCK: 32# Buff Machine Bookkeeping Ledger

INK: Brown

These ledgers register with Statement 98-1004

7.02.02-2 Accounts Receivable Ledger



STATEMENT (Carb-In).....Form 98-1005

STOCK: 20# White Manifold Bond

INK: Blue

LEDGER.....Form 98-1014

STOCK: 32# Buff Machine Bookkeeping Ledger

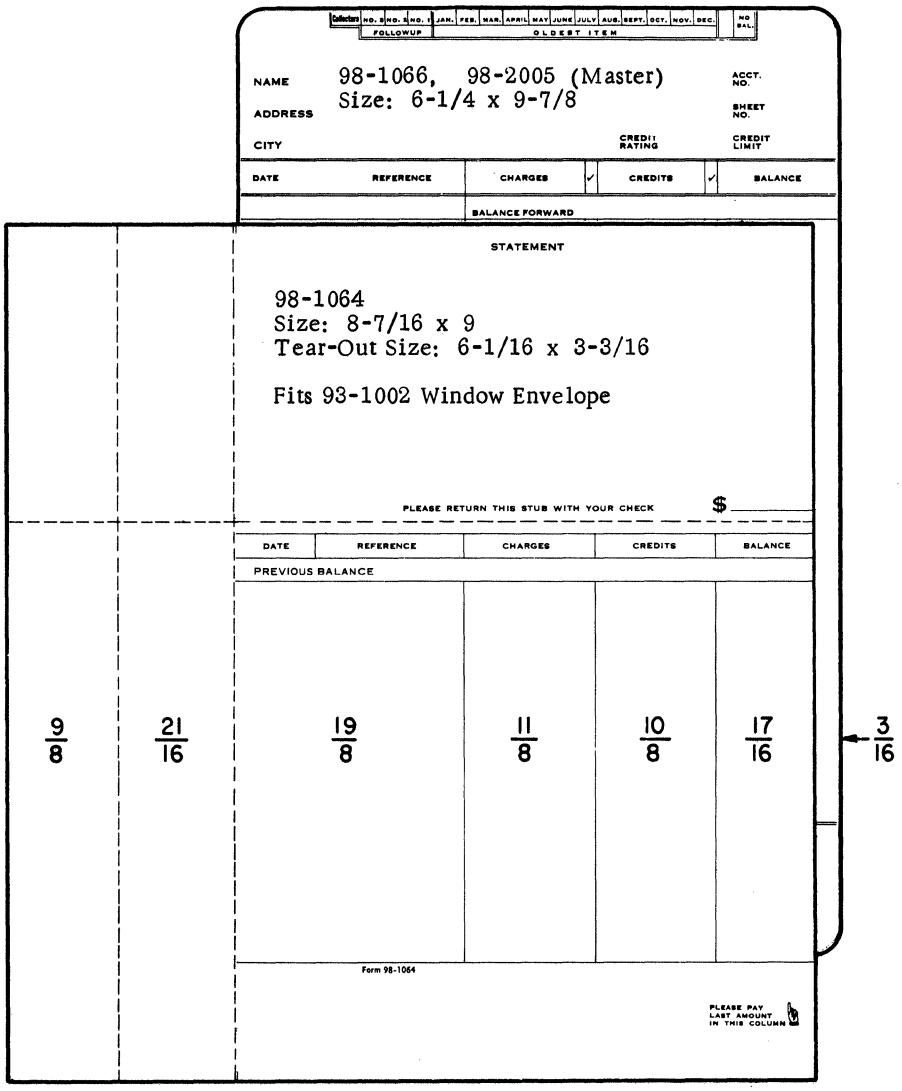
INK: Brown

LEDGER (Master-Patch).....Form 98-1013

STOCK: 32# Buff Machine Bookkeeping Ledger

INK: Brown

Figure 7.02.02-3 Ledger and Statement



CARBONLESS STATEMENT.....Form 98-1064

STOCK: 20# Coated Back White

NK: Blue

CARBONLESS LEDGER.....Form 98-1066

STOCK: 38# Coated Face (2 sides) Green

INK: Brown

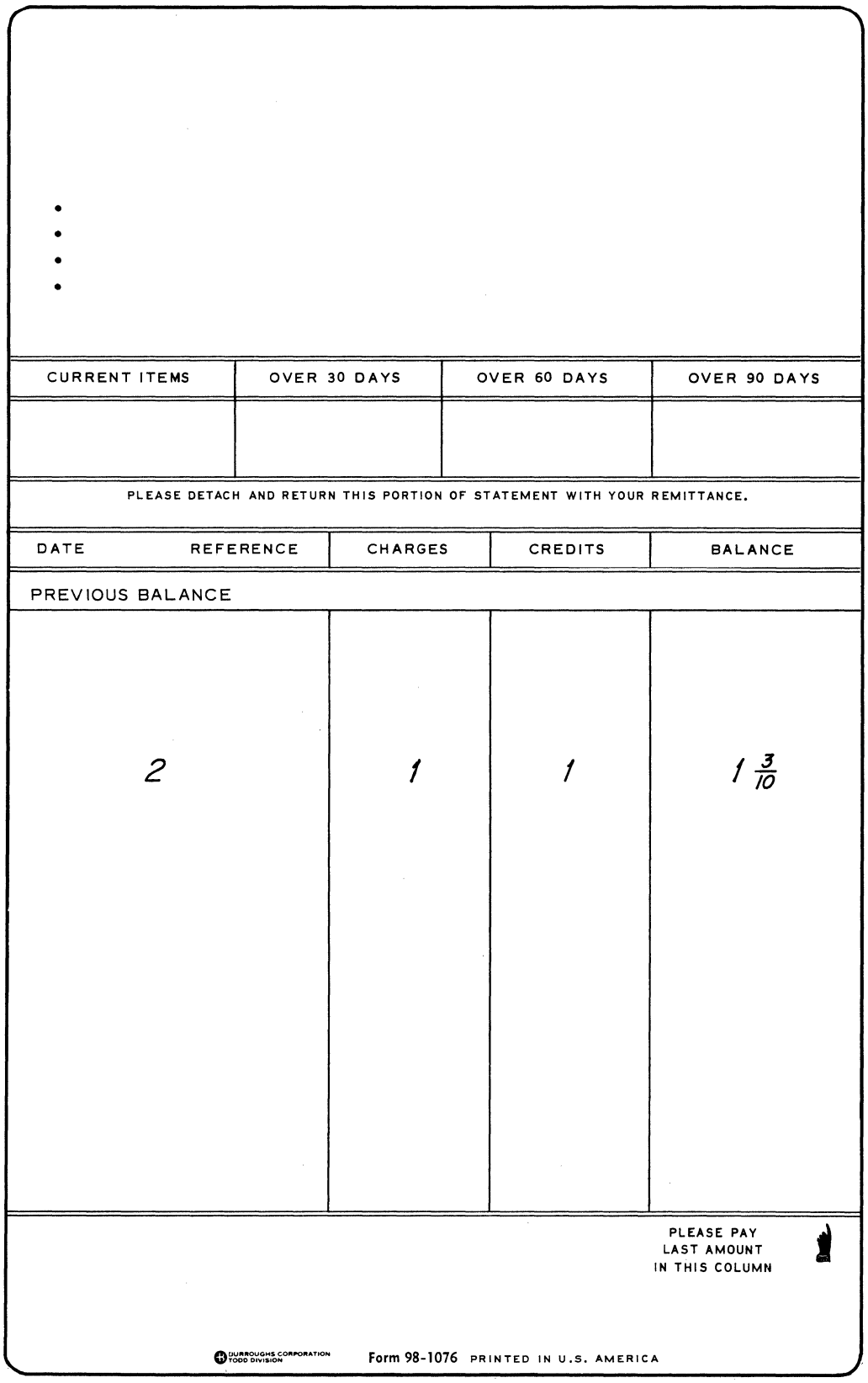
CARBONLESS MASTER LEDGER.....Form 98-2005

STOCK: 38# Coated Face (2 sides) Green

INK: Brown

Figure 7.02.02-4 Ledger and Statement

This portion may be deleted, if required, at no additional charge.



Statement.....Form 98-1076

Stock: 28# White Ink: Blue

Figure 7.02.02-5 Accounts Receivable Statement

7.02.03 GENERAL CHARACTERISTICS FOR STATEMENTS

The following illustrations may be used as a guide for the design of nonstandard forms.

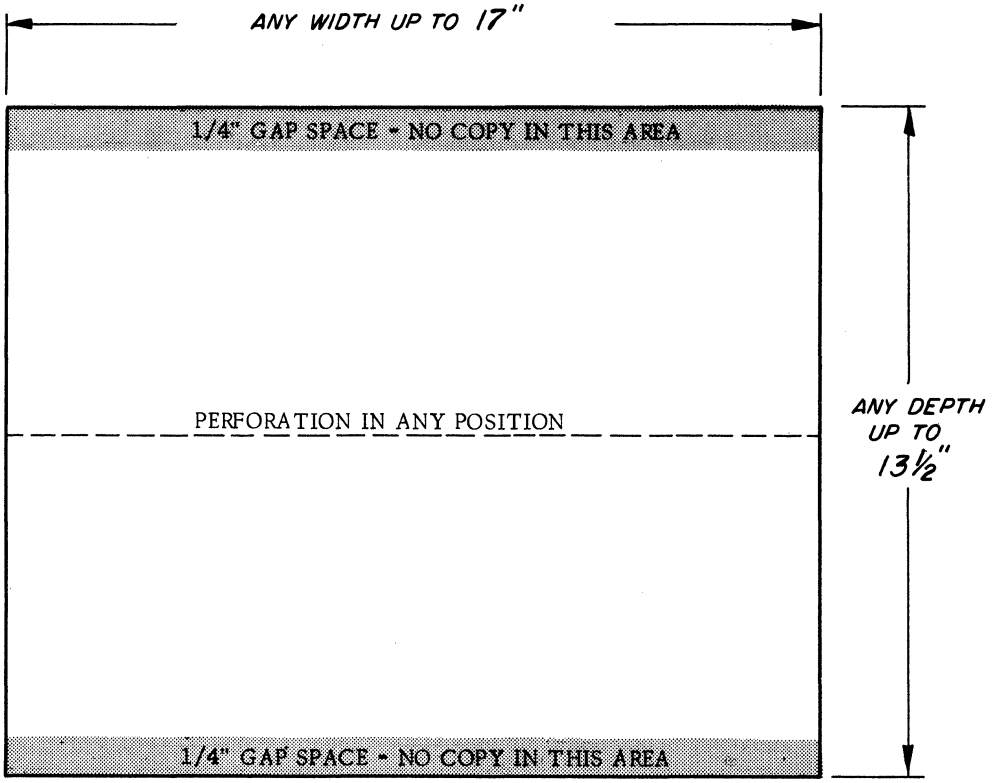
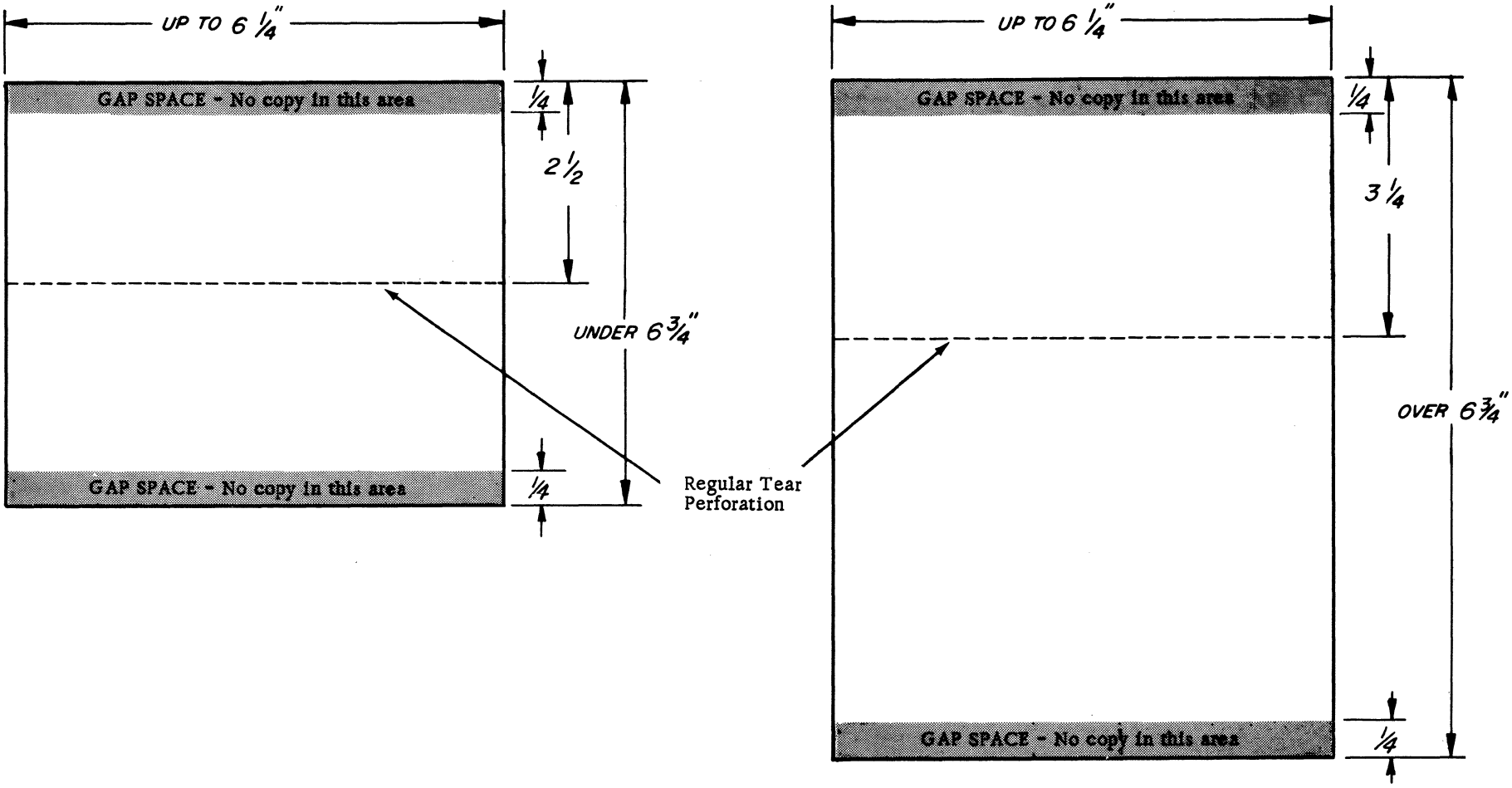


Figure 7.02.03-1 Semi-Custom Statement Forms



Both available in white 28# ledger or 26# CB CLT stock.

Figure 7.02.03-1 Standardized Statement Forms

7.03.00 ACCOUNTS PAYABLE AND VOUCHER CHECKS

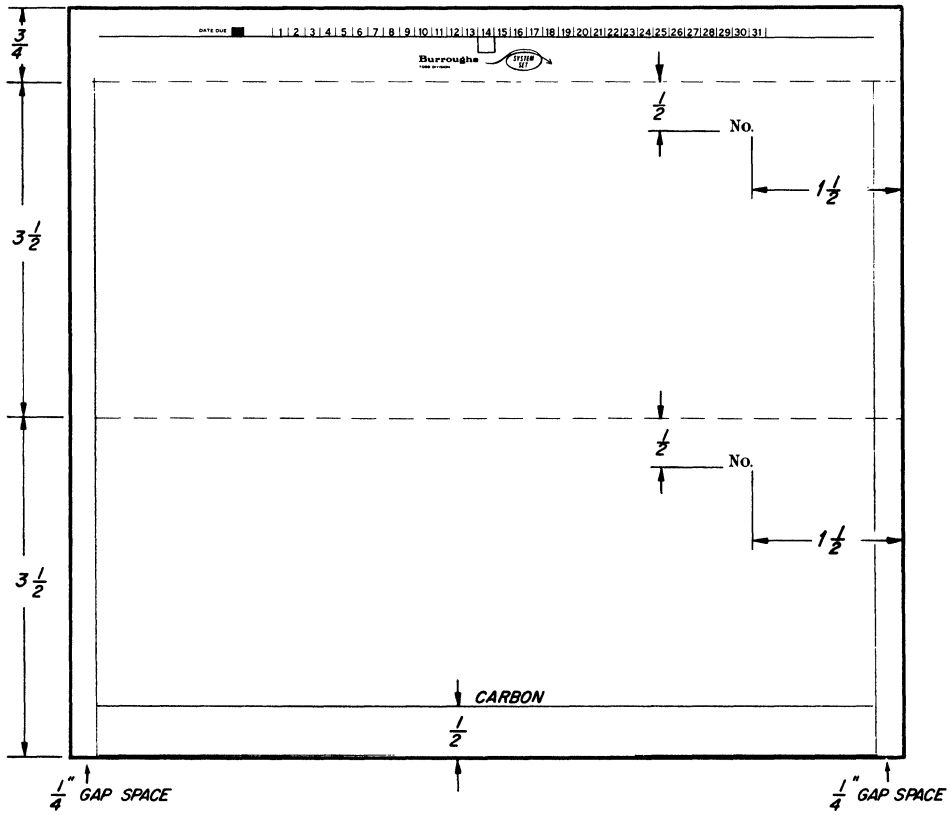
The following topics are samples of available voucher checks. See Subject 7.09.00 for envelopes which are available. See Topic 7.02.01 for the specifications for the ledgers which may be used for accounts payable systems also. The following three topics are used to describe the forms:

1. General Characteristics for Voucher Checks.
2. Accounts Payable

If the completed checks are to be used on a check writer machine or signature machine the design of the check should also allow an area for the use of these machines. These types of machines are not described in this manual. For information on this type of equipment contact the representative for the Business Forms and Supplies Group.

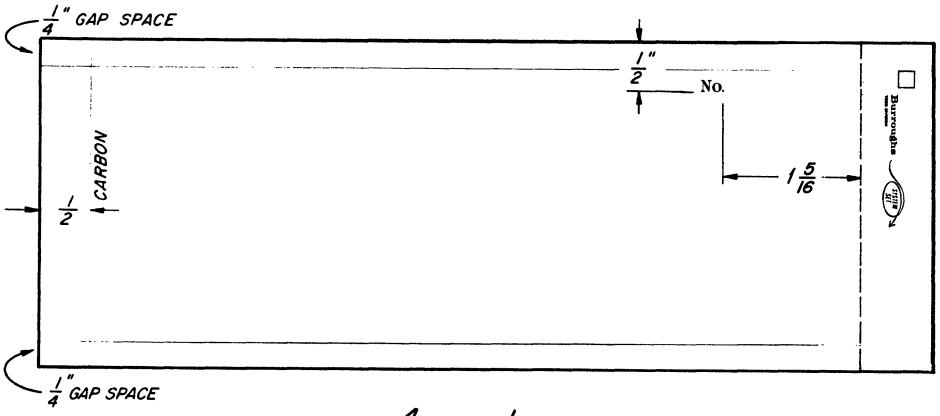
7.03.01 GENERAL CHARACTERISTICS FOR VOUCHER CHECKS

The following illustrations may be used as a guide for the design of nonstandard voucher checks. See Subject 7.04.00 for the encoding of magnetic ink characters on the checks.



$8\frac{1}{2} \times 7\frac{3}{4}$

8-1/2" Stub Length
24# Grey Greenbac
12# Canary Bond
12# Pink Bond



$3\frac{4}{10} \times 9\frac{1}{4}$

3-4/10" Stub Length
Ply 1 - 24# Blue Greenbac
Ply 2 - 12# Canary Bond
Ply 3 - 12# Pink Bond

Figure 7.03.01-1 Standardized System Set Checks

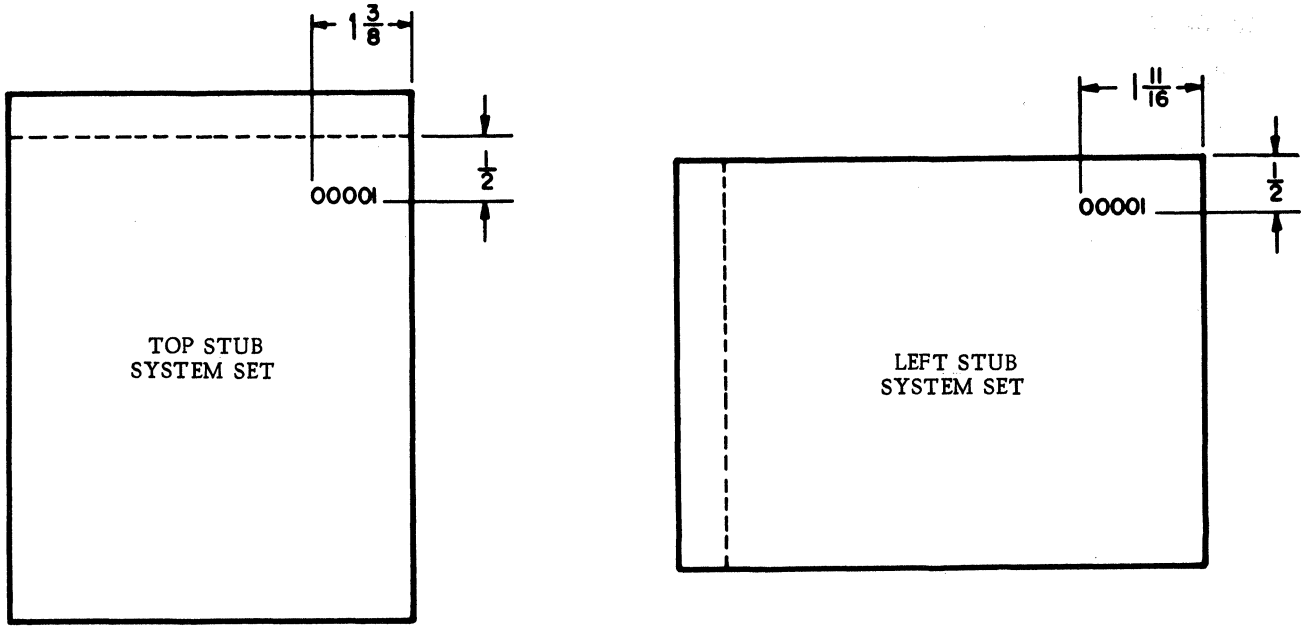
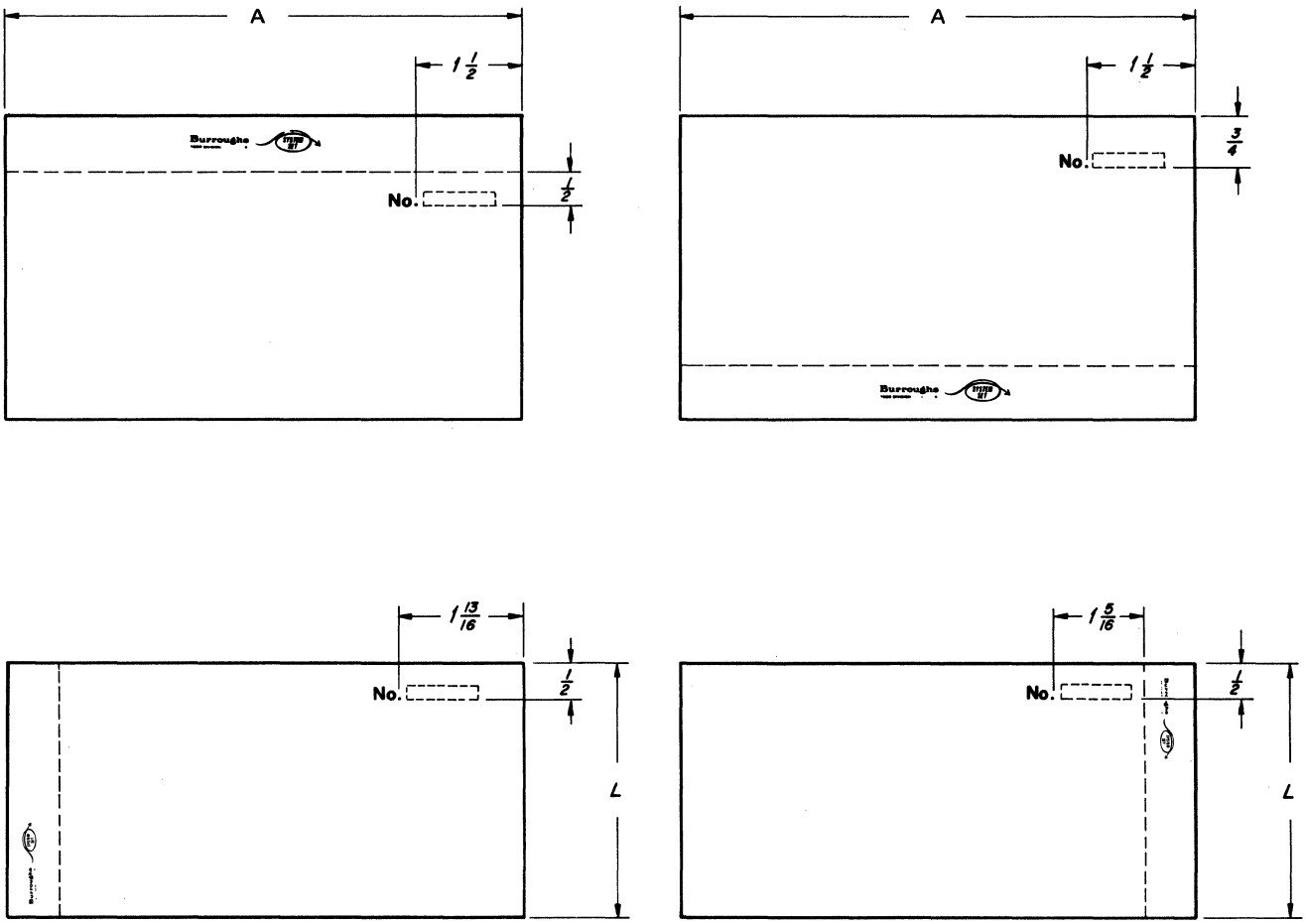


Figure 7.03.01-2 Standard Positions for Numbering Standardized Burroughs System Sets



Dimension A, Minimum of 6", Maximum of 8¾"
Dimension B, Minimum of 2¾", Maximum of 3¾"

Figure 7.03.01-3 Standard Numbering Positions for Semi-Custom System Set Checks

7.03.02 SAMPLE VOUCHER CHECKS

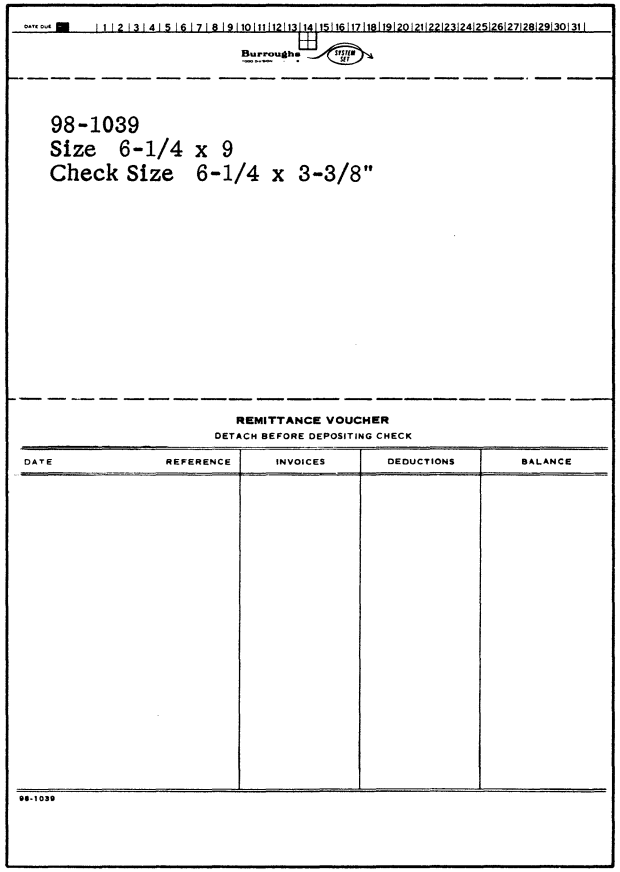
The following standard Accounts Payable forms are available.

See Figure 7.03.01-2 for the position of the numbers for the following sets. Also the visible area of the Forms Handler should be considered if the number will be manually indexed with an application. The visibility considerations may be reviewed in the following topics.

6.11.04 Rear Feed Forms Handler

6.12.03 Basic and Magnetic Unit Record Front Feed Forms Handlers

6.13.03 and 6.43.03 Financial Front Feed Forms Handler



CHECK (Triplicate)..... Form 98-1039

STOCK: 98-1039 Gray
Orig..... 24# Gray Greenbac
Dup..... 15# White Manifold Bond
Trip..... 15# B lue Manifold Bond

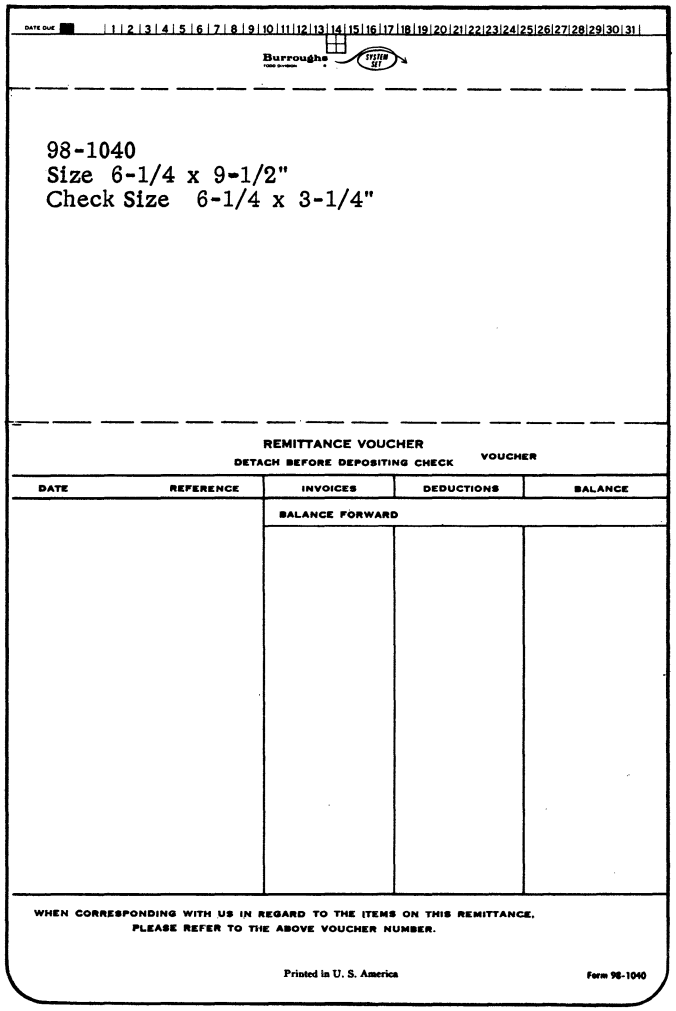
98-1039 Pink
Orig..... 24# Pink Greenbac
Dup..... 15# White Manifold Bond
Trip..... 15# Buff Manifold Bond

INK: Black

PUNCHING: No Copies Punched

NOTE: Carbon is 1/2" shorter at end opposite stub on all copy plies.

Figure 7.03.02-1 Voucher Check



CHECK (Quad)..... Form 98-1040

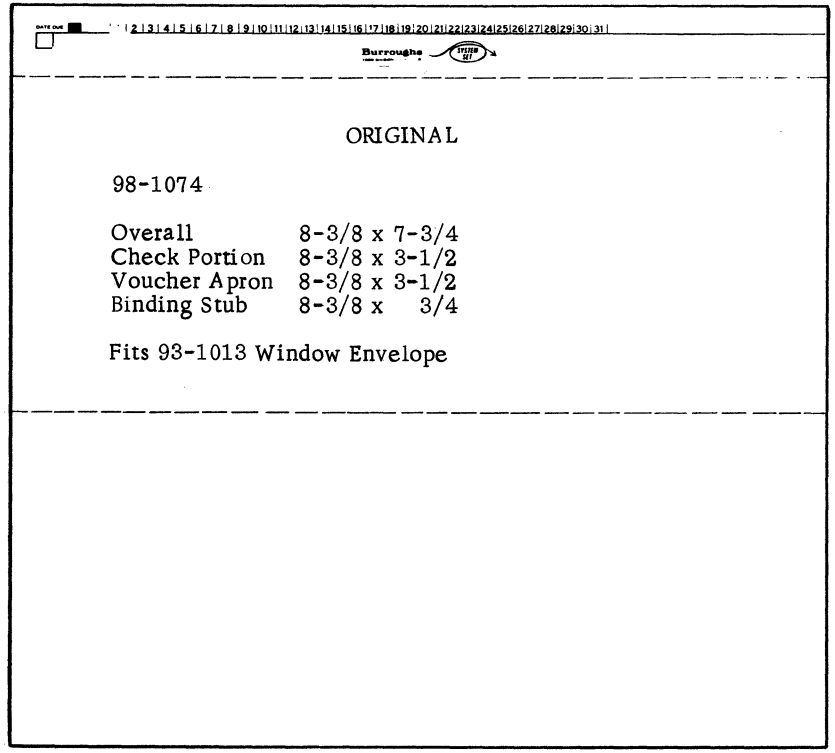
STOCK: Orig..... 24# Tan Greenbac
Dup..... 15# White Manifold Bond
Trip..... 15# Yellow Manifold Bond
Quad..... 15# Pink Manifold Bond

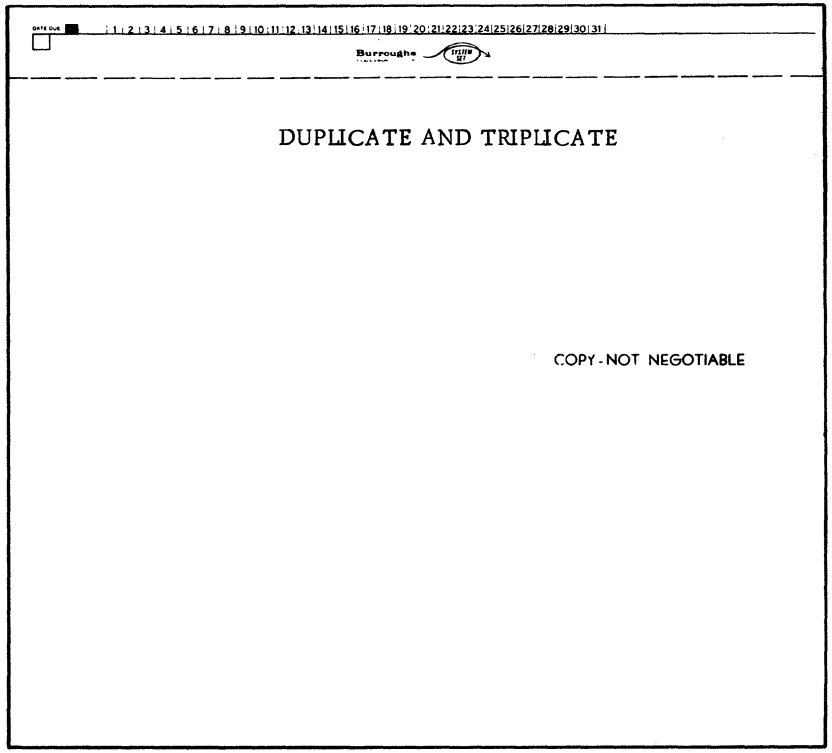
INK: Black

PUNCHING: Dup and Quad Only.
Two 1/4" holes, 4-1/4" C to C at Bottom

Carbon 1" shorter at end opposite stub on all copy plies.

7.03.02-2 Voucher Check

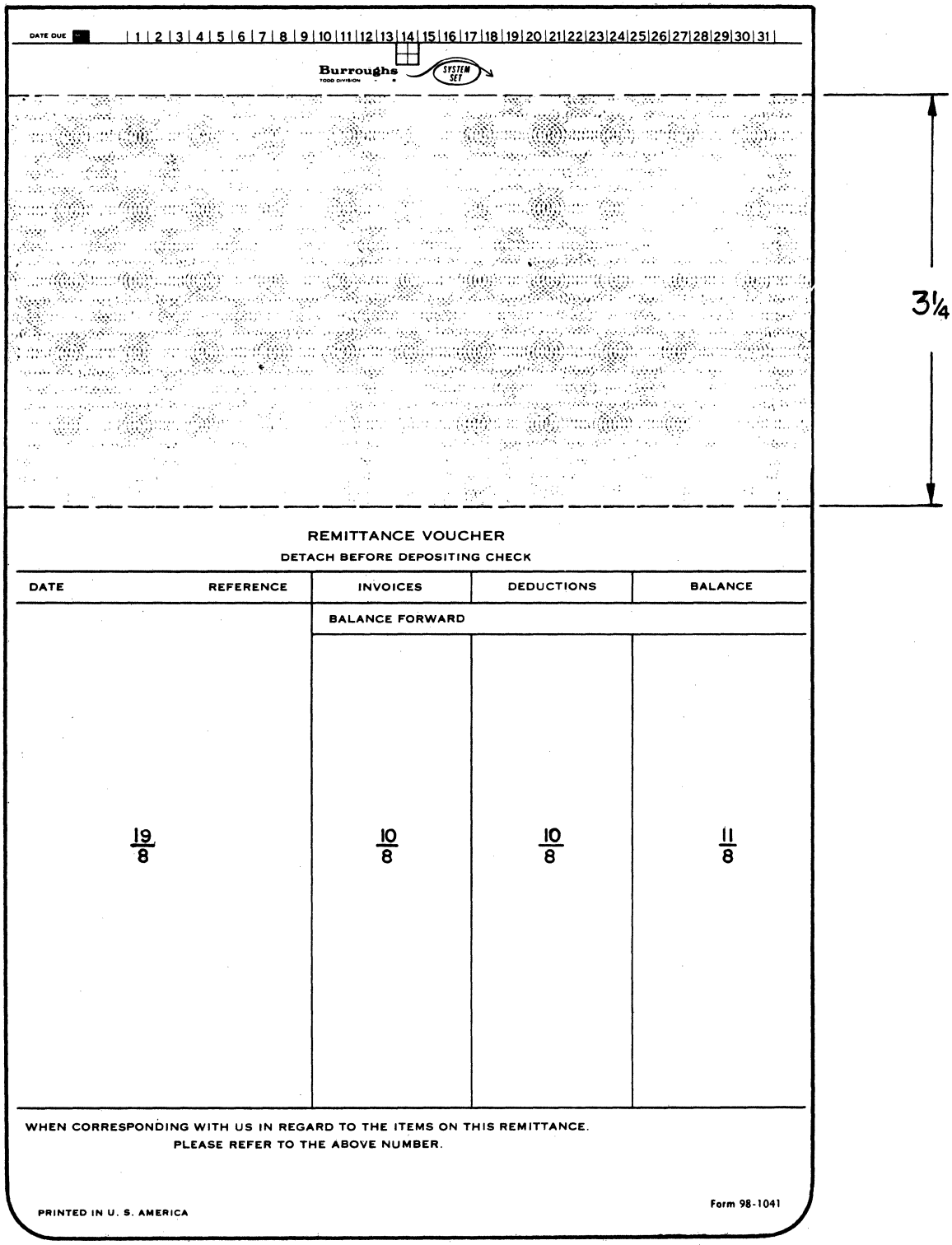




Orig. 24# Blue Super-Safety
Dup. 12# White Bond
Trip. 12# Blue Bond

(Imprint appears on all copy parts by carbon impression.)

Figure 7.03.02-3 Triplicate Super-Safety Voucher Check



Form.....98-1041

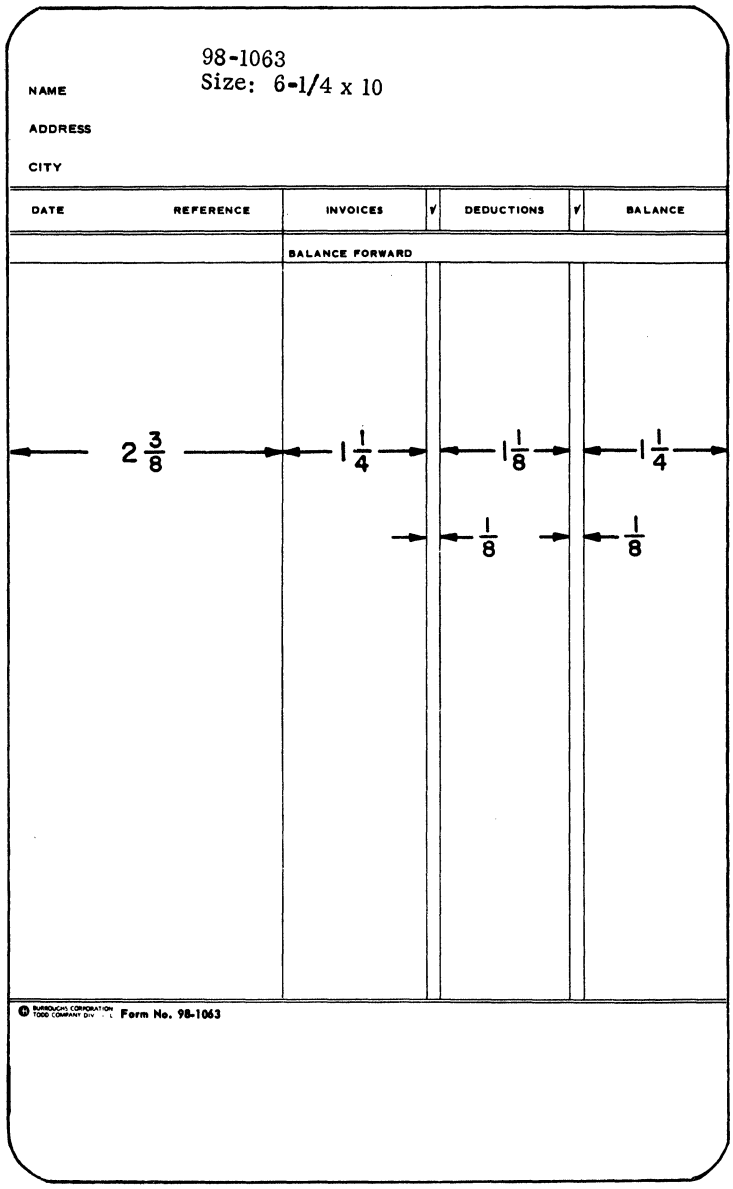
SIZE: 6-1/4"x 9-3/4"

PAPER: Ply 1 - 26# White CB
Ply 2 - 17# Green CFB
Ply 3 - 17# Yellow CFB
Ply 4 - 15# Pink CF

INK: Black
Green pantagraph on Ply 1, on check portion only.

PUNCHING: Two 1/4" Dia., 4-1/4" C to C at bottom on plies 2, 3, 4.

Figure 7.03.02-4 Quadruple Carbonless Voucher Check



Ledger . . . . . Form 98-1063
Stock: 32# Buff Machine Bookkeeping Ledger
Ink: Brown

Ledger . . . . . Form 98-1065
Stock: 32# Green Machine Bookkeeping Ledger
Ink: Brown

Figure 7.03.02-5 Accounts Payable Ledger

7.04.00 PAYROLL CHECKS, MANUALLY ALIGNED

The following illustrations may be used for the design of manually aligned payroll checks. See Topic 7.02.01 for the minimum and maximum sizes for the ledgers. Envelopes, if required, are described in Subject 7.09.00.

The visible area of the Forms Handler should be considered if the check number is manually indexed or if information on the top of the ledger must be visible. A check in front of the ledger may cover the information on the top of the ledger if the information is not properly located. The visibility considerations may be reviewed in the following topics:

6.11.04 Rear Feed Forms Handler

6.12.03 Basic and Magnetic Unit Record Front Feed Forms Handlers

6.13.03 and 6.43.03 Financial Front Feed Forms Handler

If the completed payroll checks are to be used on a check writer machine, or signature machine, the design of the check should also allow an area for the use of these machines. These types of machines are not described in this manual. For information on this type of equipment contact the representative for the Business Forms and Supplies Group.

A minimum 7" wide check is required if the check numbers are encoded with Magnetic Ink Character Recognition (MICR) for numeric sorting purposes. These characters are placed at the bottom and near the left edge of the check. See Figure 7.04.00-1. The 7" minimum would permit a maximum check number of 5 digits and a Stop Code to the left of the number. A ¼" minimum is required between the left edge of the check and the Stop Code. With a 7 5/8" wide check the maximum check number may be 10 digits. The minimum 5/8" clear band at the bottom of the check is used for MICR encoding. Without MICR encoded check numbers the minimum check width is 6".

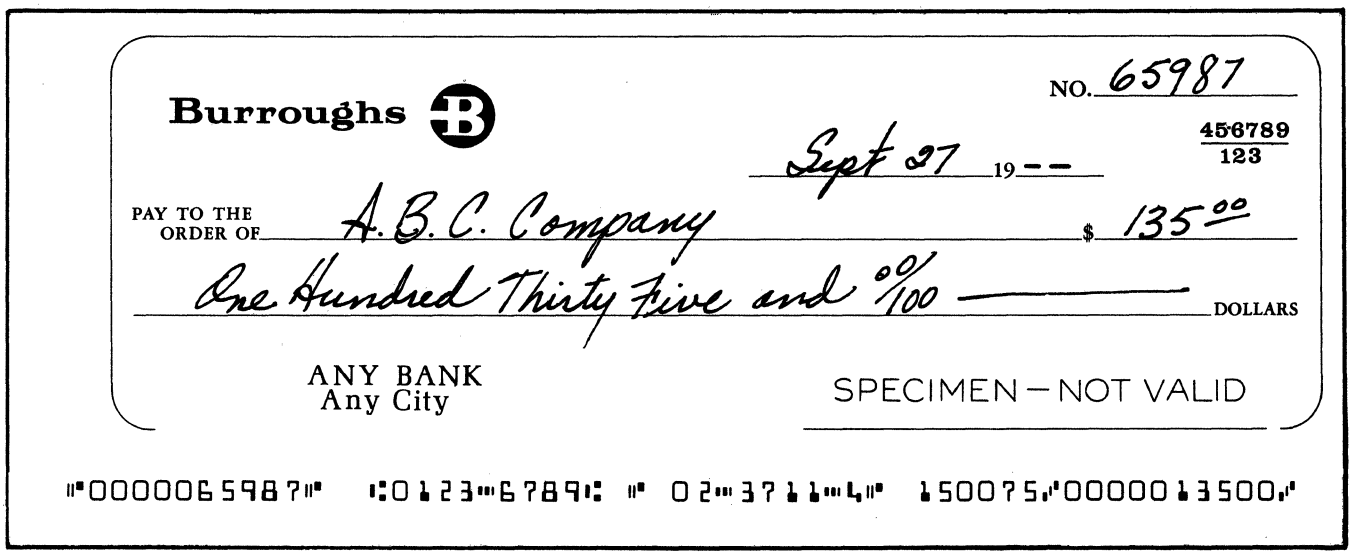


Figure 7.04.00-1 MICR Encoding

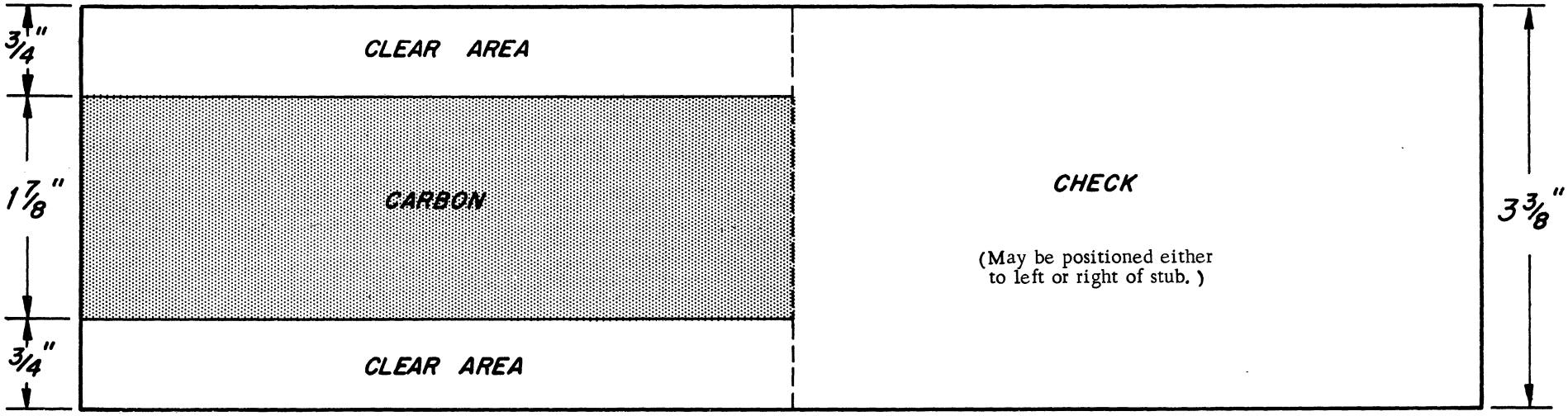


Figure 7.04.00-2 Standard Tissue Strip Carbon

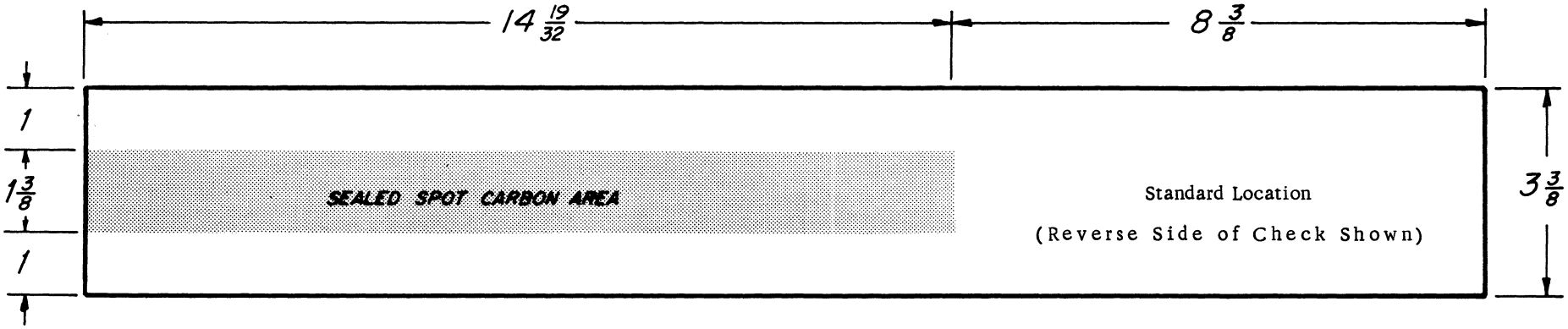
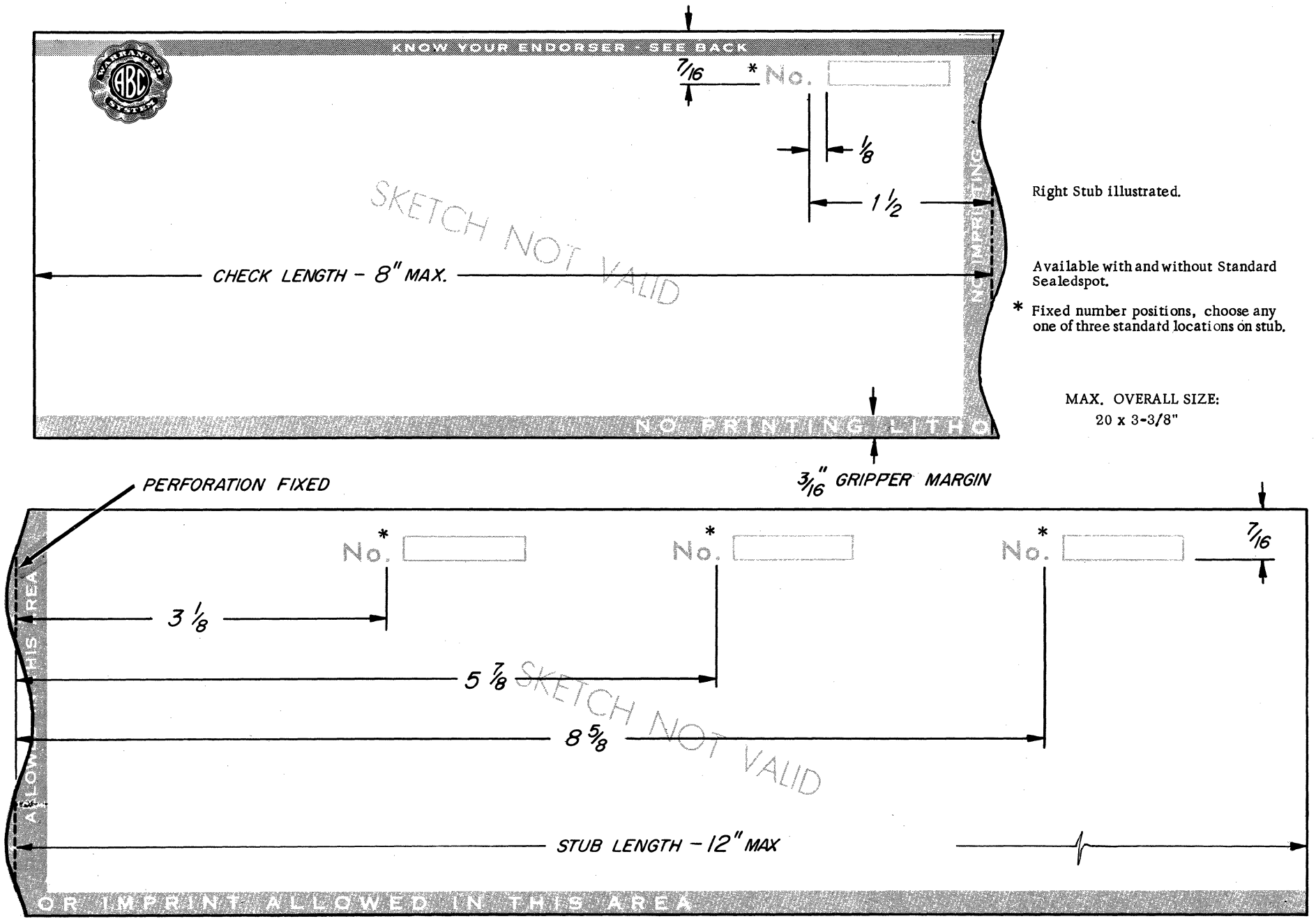


Figure 7.04.00-3 Sealed Spot Carbonizing



Right Stub illustrated.

Available with and without Standard Sealedspot.

* Fixed number positions, choose any one of three standard locations on stub.

MAX. OVERALL SIZE:
20 x 3-3/8"

Figure 7.04.00-4 Standardized or Semi-Custom Checks

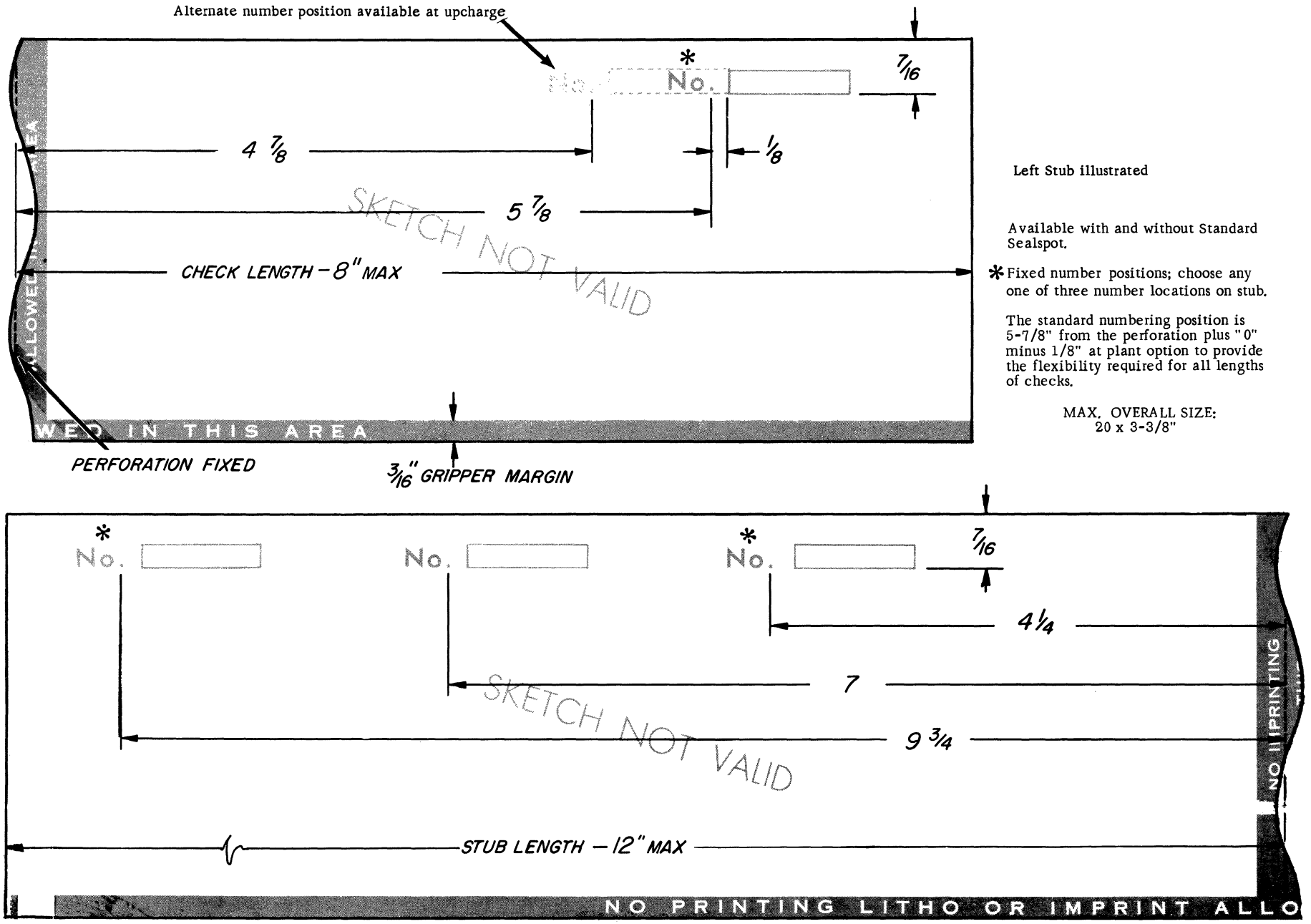


Figure 7.04.00-5 Standardized or Semi-Custom Checks

Form Number	Overall Size Width Length	Marginal Perfs			Lines Per Inch	Color Of Ink	Number of Plies					
		None	Right Side	Both Sides			1	2	3	4	5	6
N-582	5¾ x 8½	•			2*	Green	•					
N-510-PP†	5¾ x 1			•	Blank	—	•					
N-630-PP	6 x 3			•	Blank	—	•					
N-830	8½ x 3½	•			Blank	—	•	•				
N-850-P	8½ x 5½		•		Blank	—	•	•	•	•		
N-1083-P	10⅝ x 8½		•		3	Gray	•	•	•	•		
N-1183-P	11¾ x 8½		•		3	Gray	•	•	•	•		
N-1186-P	11¾ x 8½		•		6	Gray	•	•	•	•		
N-6118-P	11¾ x 8½		•		2*	Green	•	•	•			
N-1482-P	14⅞ x 8½		•		2	Gray	•	•	•	•		
N-1483-P	14⅞ x 8½		•		3	Gray	•	•	•	•		
N-8110-P	8½ x 11		•		Blank	—	•	•	•	•	•	•
N-8113-P	8½ x 11		•		3	Gray	•	•	•	•		
N-9113-P	9⅞ x 11		•		3	Gray	•	•	•	•		
N-9510-PP	9½ x 11			•	Blank	—	•	•	•	•		
N-9513-PP	9½ x 11			•	3	Gray	•	•	•	•		
N-10113	10⅝ x 11	•			3	Gray	•	•	•	•	•	•
N-10113-P	10⅝ x 11		•		3	Gray	•	•	•	•	•	•
N-61011	10⅝ x 11	•			2*	Green	•	•	•	•		
N-61011-P	10⅝ x 11		•		2*	Green	•	•	•	•		
N-31011	10⅝ x 11	•			6*	Gray	•	•	•	•		
N-11113-P	11¾ x 11		•		3	Gray	•	•	•	•		
N-12113-P	12$^{27}/_{32}$ x 11		•		3	Gray	•	•	•	•		
N-13113-P	13⅝ x 11		•		3	Gray	•	•	•	•		
N-61311-P	13⅝ x 11		•		2*	Green	•	•	•	•		
N-31311	13⅝ x 11	•			6*	Gray	•	•	•	•		
N-31311-P	13⅝ x 11		•		6*	Gray	•	•	•	•		
N-14110	14⅞ x 11	•			Blank	—	•	•	•	•		
N-14110-P	14⅞ x 11		•		Blank	—	•	•	•	•		
N-14113	14⅞ x 11	•			3	Gray	•	•	•	•	•	•
N-14112-P	14⅞ x 11		•		2	Gray	•	•	•	•	•	•
N-14113-P	14⅞ x 11		•		3	Gray	•	•	•	•	•	•
N-14116-P	14⅞ x 11		•		6	Gray	•	•	•	•	•	•
N-61411	14⅞ x 11	•			2*	Green	•	•	•	•	•	•
N-61411-P	14⅞ x 11		•		2*	Green	•	•	•	•	•	•
N-214113-P**	14⅞ x 11		•		3	Gray	•					
N-31411	14⅞ x 11	•			6*	Gray	•	•	•	•	•	•
N-31411-P	14⅞ x 11		•		6*	Gray	•	•	•	•	•	•
N-1411-13	14⅞ x 11	•			4	Green	•					
N-16113-P	16 x 11		•		3	Gray	•	•	•	•		
N-61611-P	16 x 11		•		2*	Green	•	•	•	•		
N-31611	16 x 11	•			6*	Gray	•	•	•	•		
N-1611-13	16 x 11	•			4	Gray	•					

*E-Z Read Band Tint
†Gum Label
**20 Lb. White Bond
All Marginal Perfs ½"

Figure 7.05.02-1 Standard Pin Feed Forms

Standard Rulings and EZ Read Band Tints

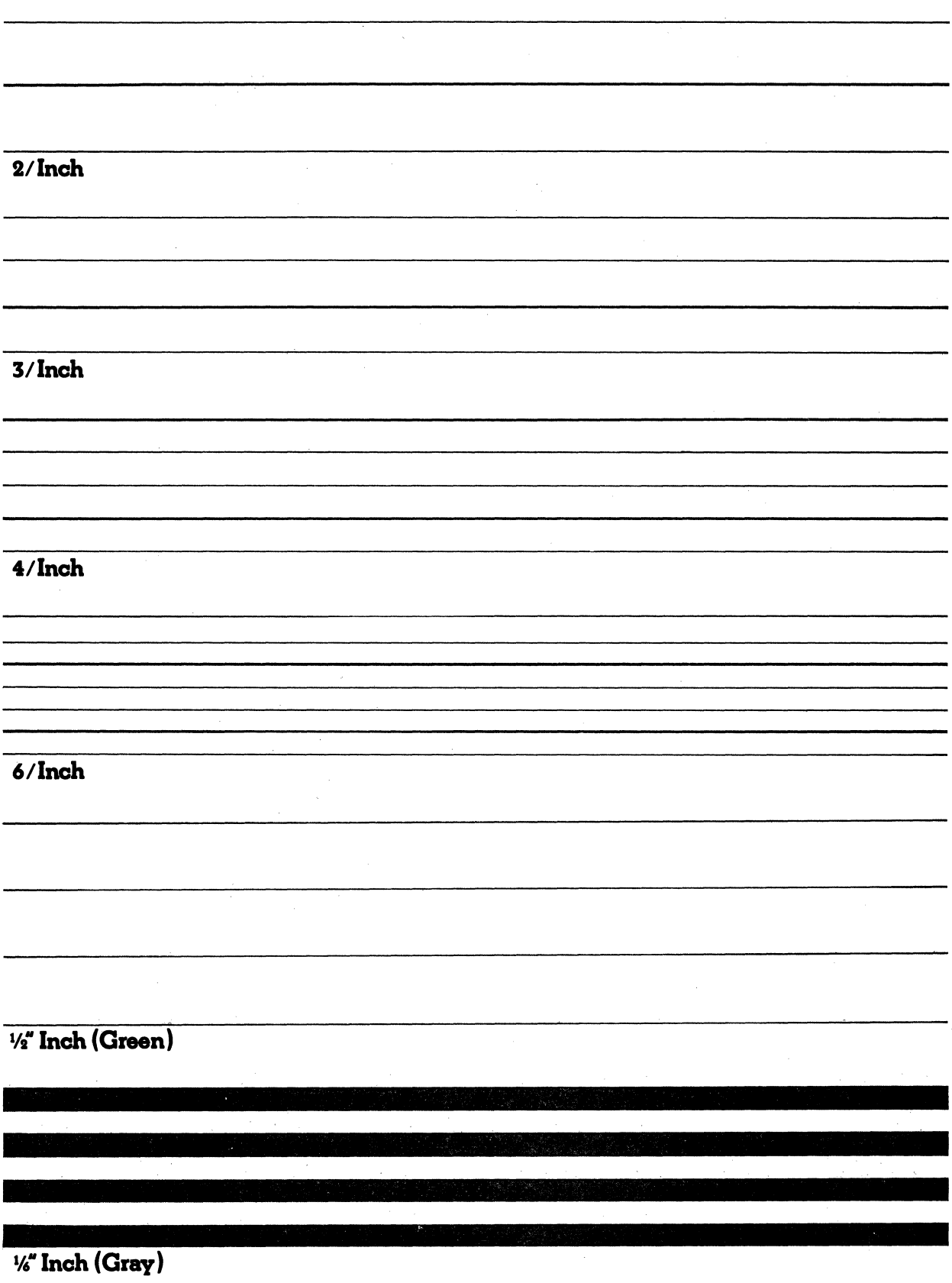
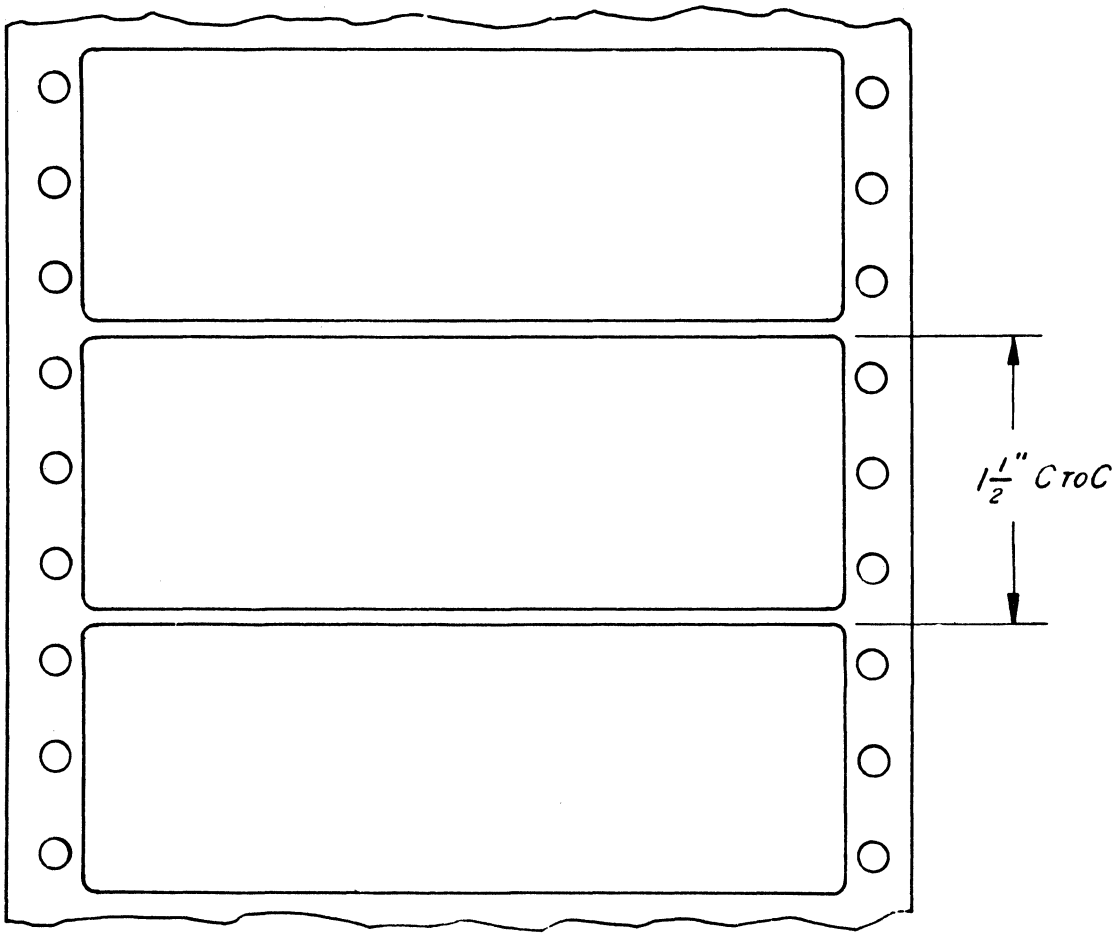


Figure 7.05.02-2 Standard Rulings and EZ Read Band Tints



LABEL No. 98-7075

Size: 4" x 1-7/16"

White, Adhesive backed Labels, Available in rolls of 1000

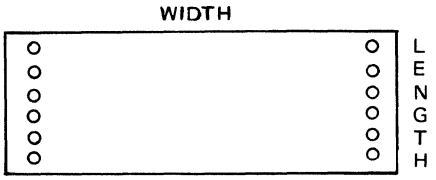
Figure 7.05.02-3 Gummed Label

7.05.00 CONTINUOUS PIN FEED FORMS

Continuous Pin Feed forms are available for certain standard widths and lengths. The width of the pin feed form includes the margin area for the sprocket holes. The length of a pin feed form is the distance between horizontal perforations. Vertical perforations ½" from the edge of the form may be at both edges, or at either edge. The forms may be provided without perforations also. The perforation or perforations usually are not provided if the pin feed form is bound at the left or right edge after it is used. See Topic 6.31.04 for restacking considerations.

7.05.01 CUSTOM CONTINUOUS FORMS

Custom continuous forms may be provided in minimum quantities of 5,000 lengths. See Topic 7.05.02 for noncustom pin feed forms. The following widths, lengths and paper stock are available.



1. Standard lengths are: 2 5/6", 3½", 3 2/3", 4¼", 5½", 5 2/3", 7", 8½", 11", 14" and 17". These lengths may not be changed; other lengths are not available.
2. Single-copy standard widths for payroll or other checks are: 5¾", 6½", 8", 8½", 9", 9½", 9 7/8", 10 5/8", 11", 11¾", 12", 12 27/32", 13 5/8", 14 7/8", 15½", 16", 16¾", 17 25/32" and 20". In between widths are available at a greater cost and longer delivery. Carbon in front of a check is not considered as a part. See paragraph 3 for multiple-part checks which are a maximum of 17 25/32" wide.
3. Multiple-part forms with or without check paper may be provided with a maximum of 10 parts for the following widths: 5¾", 6½", 8", 8½", 9", 9½", 9 7/8", 10 5/8", 11", 11¾", 12", 12 27/32", 13 5/8", 14 7/8", 15½", 16", 16¾" and 17 25/32". The maximum 20" width is not provided; however, in between widths less than 17 25/32" are available at a greater cost and longer delivery.
4. Color and Stock Paper Weights.

Bond	10 lb.	11 lb.	12 lb.	15 lb.	20 lb.
White	X	X	X	X	X
Canary	X	X	X	X	X
Pink	X	X	X	X	X
Goldenrod	X	X	X	X	
Green	X	X	X	X	X
Buff	X	X	X	X	
Salmon				X	
Blue	X	X	X	X	

100 lb. Tag: White or Natural

Carbon: Processed or nonprocessed Black or Blue

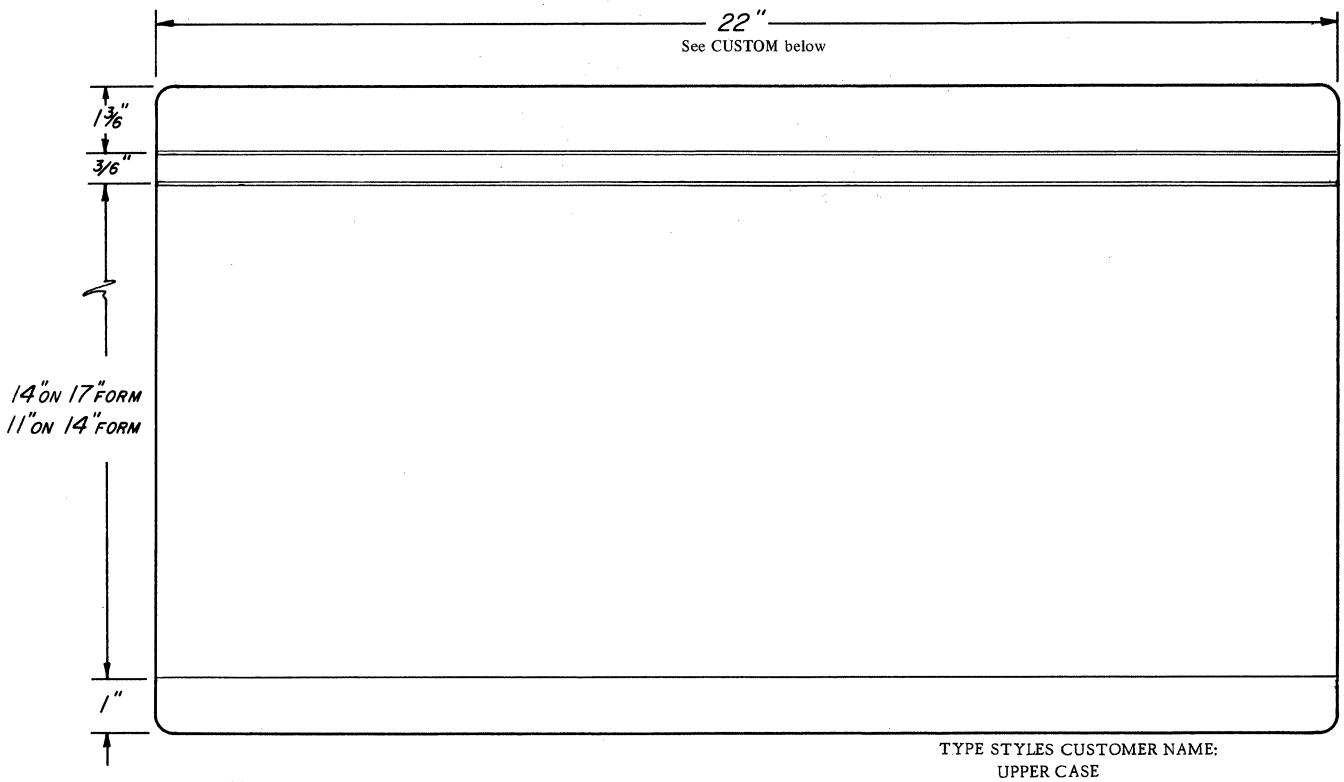
Fastenings: Crimp – Glue – Staple

7.05.02 TAB STOCK PIN FEED FORMS

Standard pin feed forms are available without printing; however, screen bands and screen lines are available. The maximum width and maximum number of parts are designated in the following charts. Standard labels are also available.

7.06.00 CUT JOURNALS

The illustrations for cut journals are displayed in the following figures. See Topic 6.32.06 if a carbon is used in front of the journal.



SIZE: 22 x 17 or 22 x 14. - Width can be trimmed.

STOCK: 20# White or Buff Bond
INK: Standard Brown only
CORNERS: 4 round Corners 3/8" radius
E-Z READ BANDS: Included - No Upcharge
WHITE-FACE CARBON: Full Size only glued Top and Bottom
PUNCHING: Standard round Hole Binder Punching Top only.
ONE-SIDE PRINTING ONLY

CUSTOM:

WIDTH, Maximum 26"
HEIGHT, Maximum 22" (length)

6 Point, 2000

1500 MAIN ST.
ANYTOWN, U.S.A.

TYPE STYLES CUSTOMER NAME:
UPPER CASE

JONES CONSTRUCTION CO. 12 Point, 670

JONES CONSTRUCTION CO. 12 Point, 660

JONES CONSTRUCTION CO. 12 Point, 780

Upper And Lower Case

Jones Construction Co. 12 Point, 670

Jones Construction Co. 12 Point, 660

Jones Construction Co. 12 Point, 780

Figure 7.06.00-1 Standardized Journal

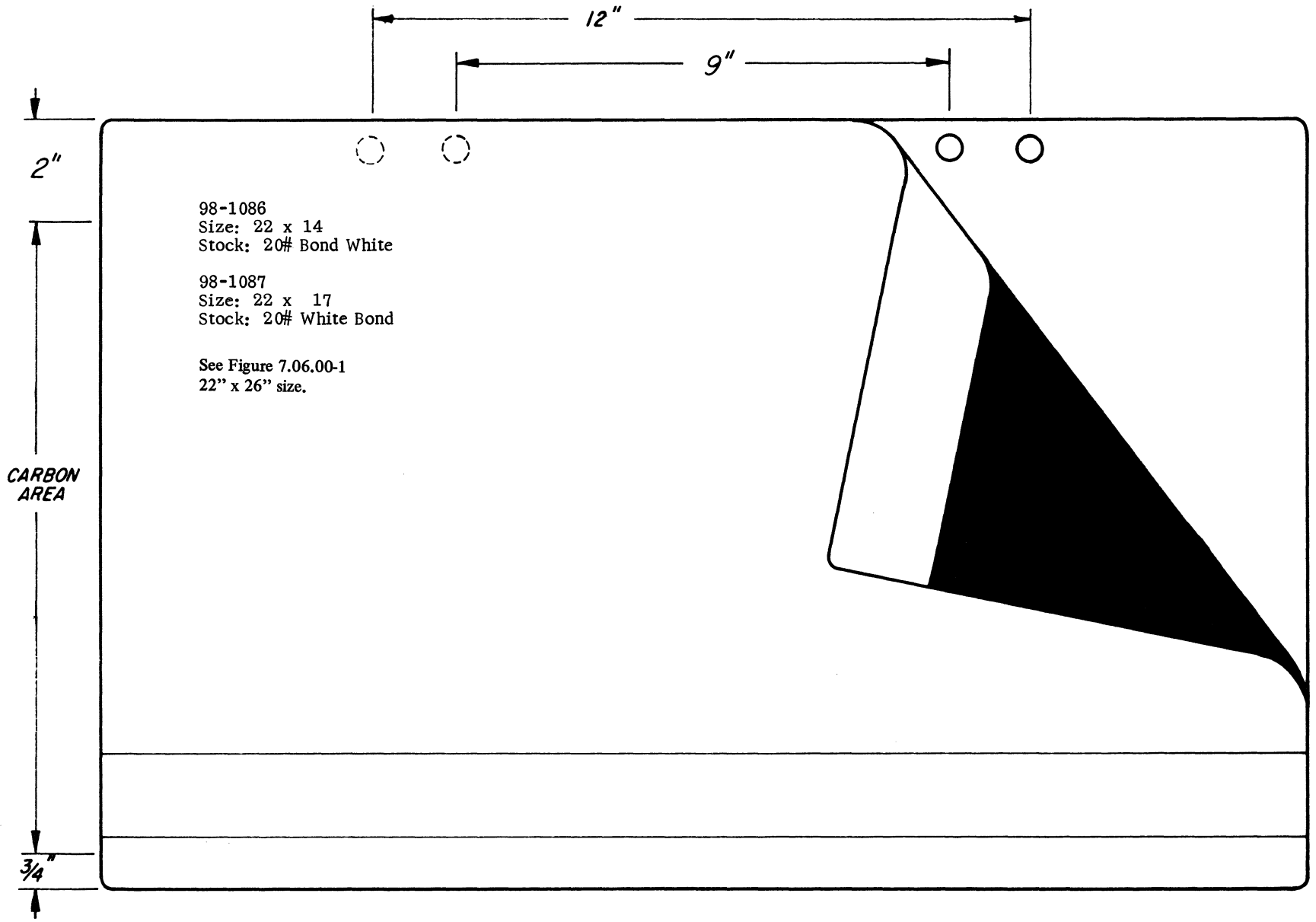


Figure 7.06.00-2 Blank Journal with Whiteface Carbon

7.07.00 SYSTEM SETS

System sets are a special classification for noncontinuous multiple-part forms. The system sets for voucher checks are explained in Subject 7.03.00. Usually these forms are front feed forms; however, the forms may be rear feed forms with a Rear Feed Forms Handler, see Topic 6.11.03. The forms are joined together by a glued "stub". A horizontal stub is used if the forms are glued on the top or bottom. A vertical stub is used if the forms as glued on the left or right edge. Topic 7.07.02 is a basic description of a "Set Mat".

7.07.01 STANDARD STUB SIZES AND GAP

When the size ordered is not a standard size, increased forms cost results because of added trimming operations and excess paper waste. Any stub length or opposite dimension can be trimmed for in between sizes. This will result in an upcharge for the forms.

1. The standard stub sizes are:
   2 5/6", 3.4", 3 2/3", 4¼", 5½", 5 2/3", 7 1/3", 8½" and 11".
2. Opposite Dimension which includes the usual ¾" stub may be any of the following:
   6¼". 7¾", 9¼", 11¾", 14¾".

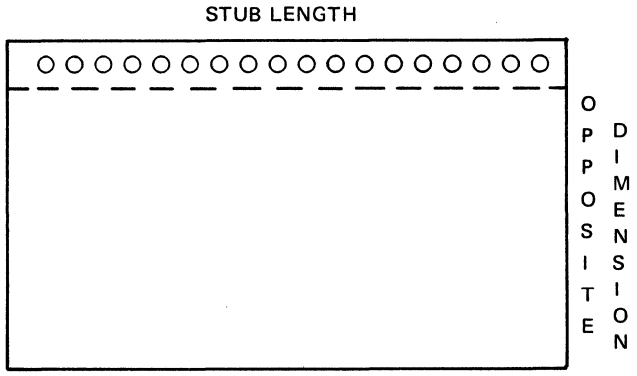


Figure 7.07.01-1 Systems Set Illustration

3. Standards for the printing industry require a ½" gap space for System Sets. This is necessary for manufacturing the form. When selecting the standard form size, consideration must be given to this requirement. Preprinting (copy) by the printing supplier is not permitted in the gap space; however, the Ball printer of the console may be programed to print in the area. See Topic 4.00.03 for printing near the edge of the form. The gap may be divided equally, unequally, or one side only, but must total ½".

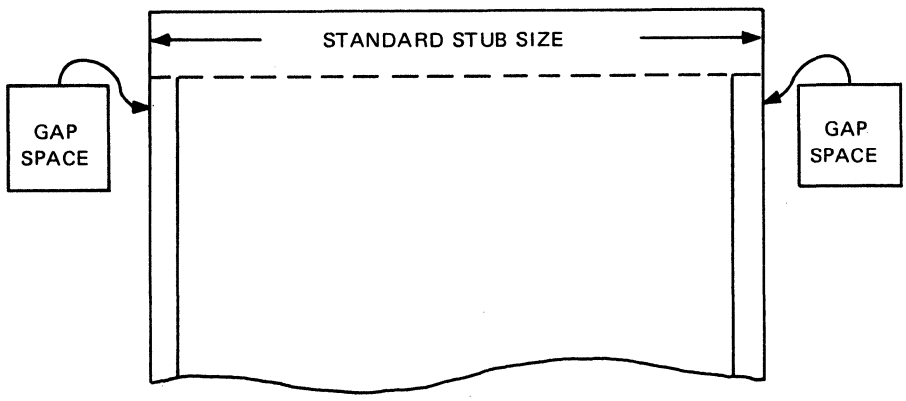


Figure 7.07.01-2 Gap Space

7.07.02 SET MATS

The term SETMAT identifies fixed, preset composition (photo negatives) for litho reproduction which corresponds to typical, commonly used business forms as illustrated in the following pages. A SETMAT is not a form – it is a means of facilitating the basic design of a form by the use of preset composition.

For the SETMAT, the BODY is the area between the PANEL and the FOOT LINE as indicated in the following illustration.

Standard production of the form provides for the following:

1. Composition to customer specifications is permitted above the PANEL and below the FOOT LINE.
2. Prefix "No." for standard consecutive number is fixed and cannot be moved to accommodate a nonstandard number.
3. The printing is in black ink with consecutive collator number in red.

Nonstandard production of the form for an additional charge is permitted for certain areas as indicated for the following:

1. Lithoing (text only – no rules) is permitted in the body or on the stub of the format.
2. Two-color black and red or one-color other than black is available for SETMAT forms.

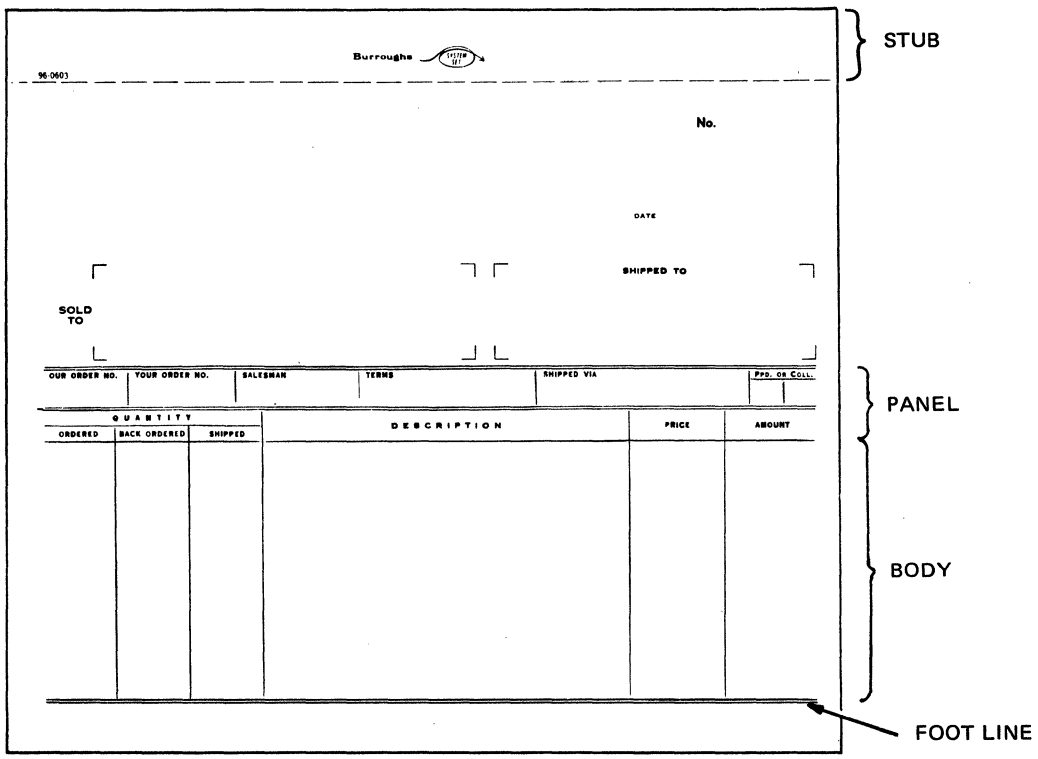
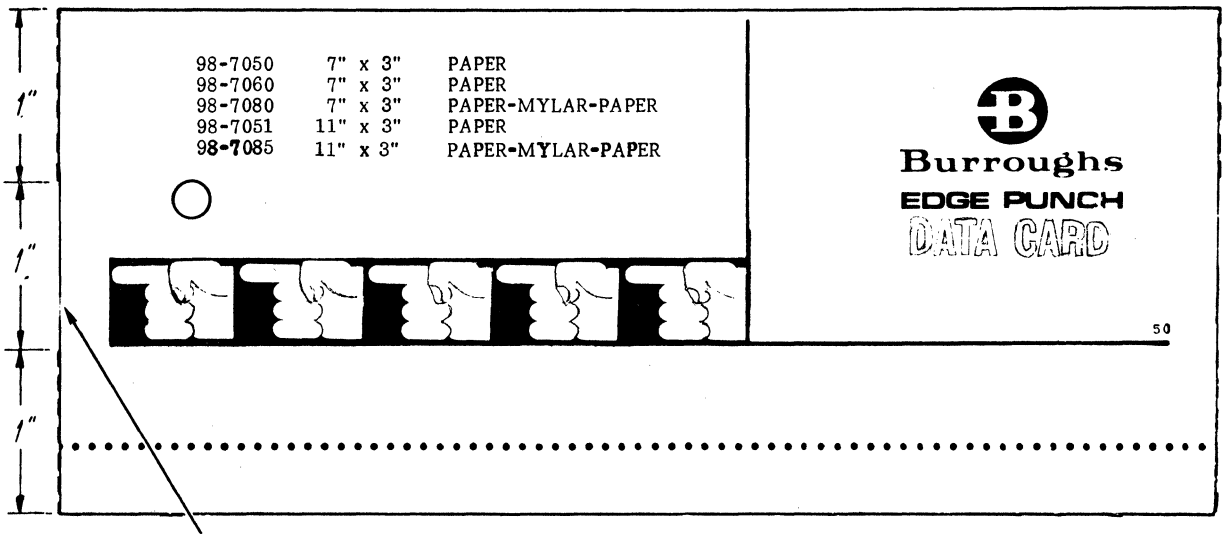


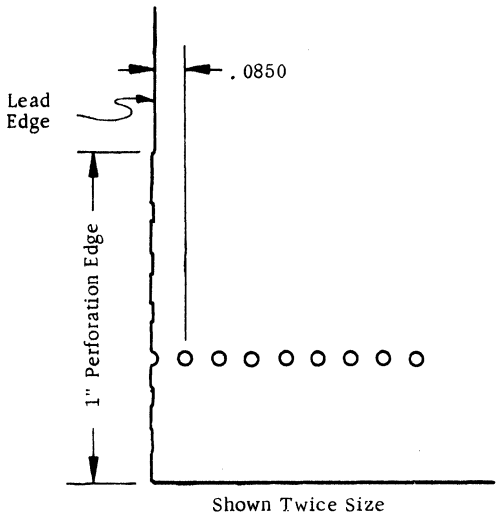
Figure 7.07.02-1 System Set

7.08.00 EDGE PUNCHED CARDS AND LEDGERS

The following figures illustrate available edge punched cards and ledgers plus related equipment.



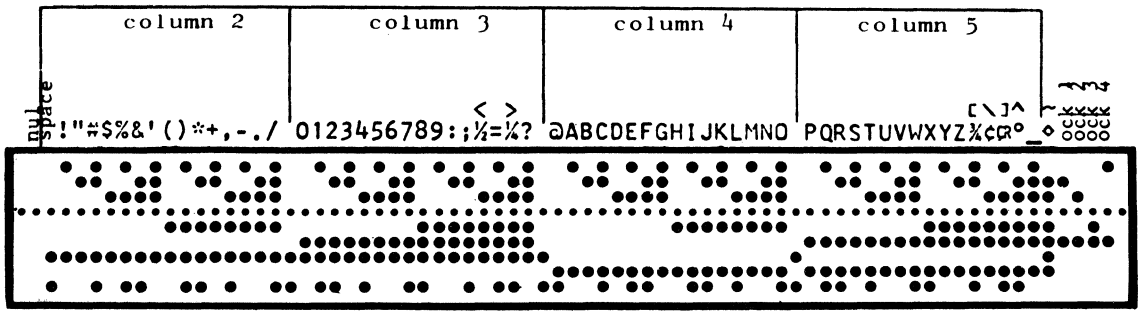
This is a precision cut for lead edge reference to first feed hole. See illustration below for lead edge specification.



Shown Twice Size

1. The Burroughs A562 Punched Paper Tape/Edge Punched Card Perforator is capable of feeding and perforating the following types of Edge Punched Cards:
   a) Burroughs Edge Punched Data Cards, 7" x 3" or 11" x 3"
   b) Hollerith Edge Punched Data Cards, 7.375" x 3.250"
   c) Visi-Record type of Edge Punched Cards, 10" x 4-1/2" or 5"
   d) Fan-Fold Cards of type "a" above joined together at a perforation
   e) Mylar Reinforced Edge Punched Cards
   f) Edge Punched Cards (Ledger Cards) wider than those listed above up to 14" x 11" with punching along the 14" edge
2. Card Specifications:
   a) Center Line of Sprocket Holes to Reference Edge . 392"
   b) Leading Edge of Card to First Complete Sprocket Hole . 0875"
   c) Card Thickness . 005" to . 0075"

SERIES L CODES FROM USASCII (U. S. A. STANDARD CODE FOR INFORMATION INTERCHANGE) 67



This code is used on 8 track paper tape or on edge punch cards.
The hole pattern identifies the letter, number or symbol encoded.

Figure 7.08.00-1 Edge Punched Data Card

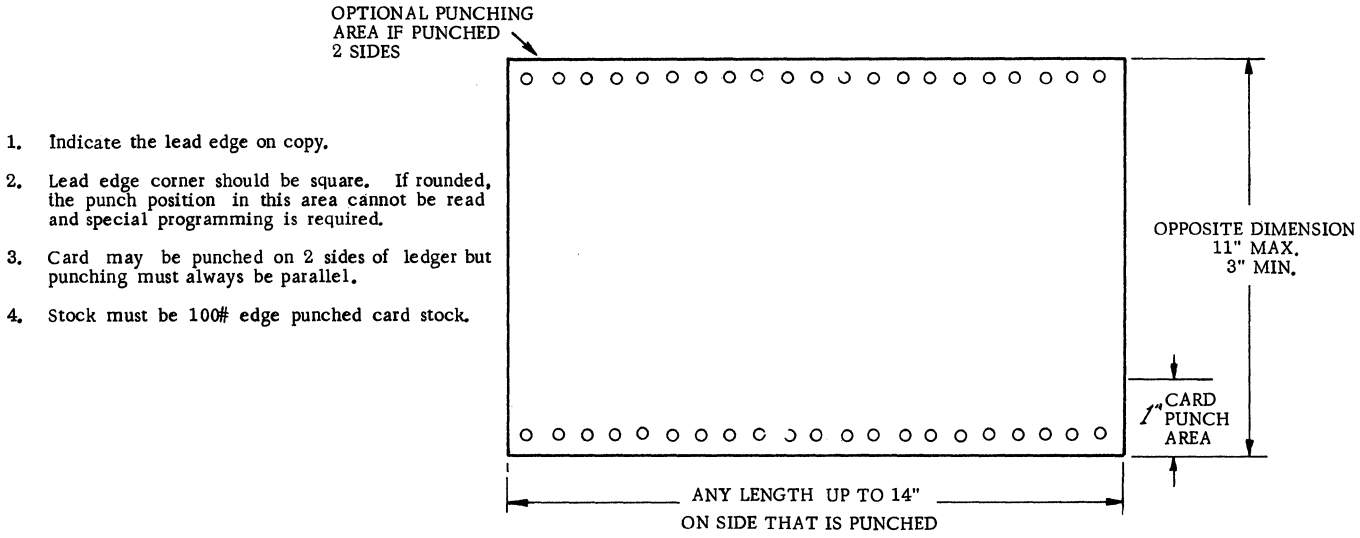


Figure 7.08.00-2 Custom Edge Punched Card Specifications

STOCK NO.	COLOR	SIZE		TAB POSITIONS
		A	B	
44-0713	BLUE	7-3/8	3-1/4	3
44-0703	GOLD	7	3	3
44-1103	GOLD	11	3	5

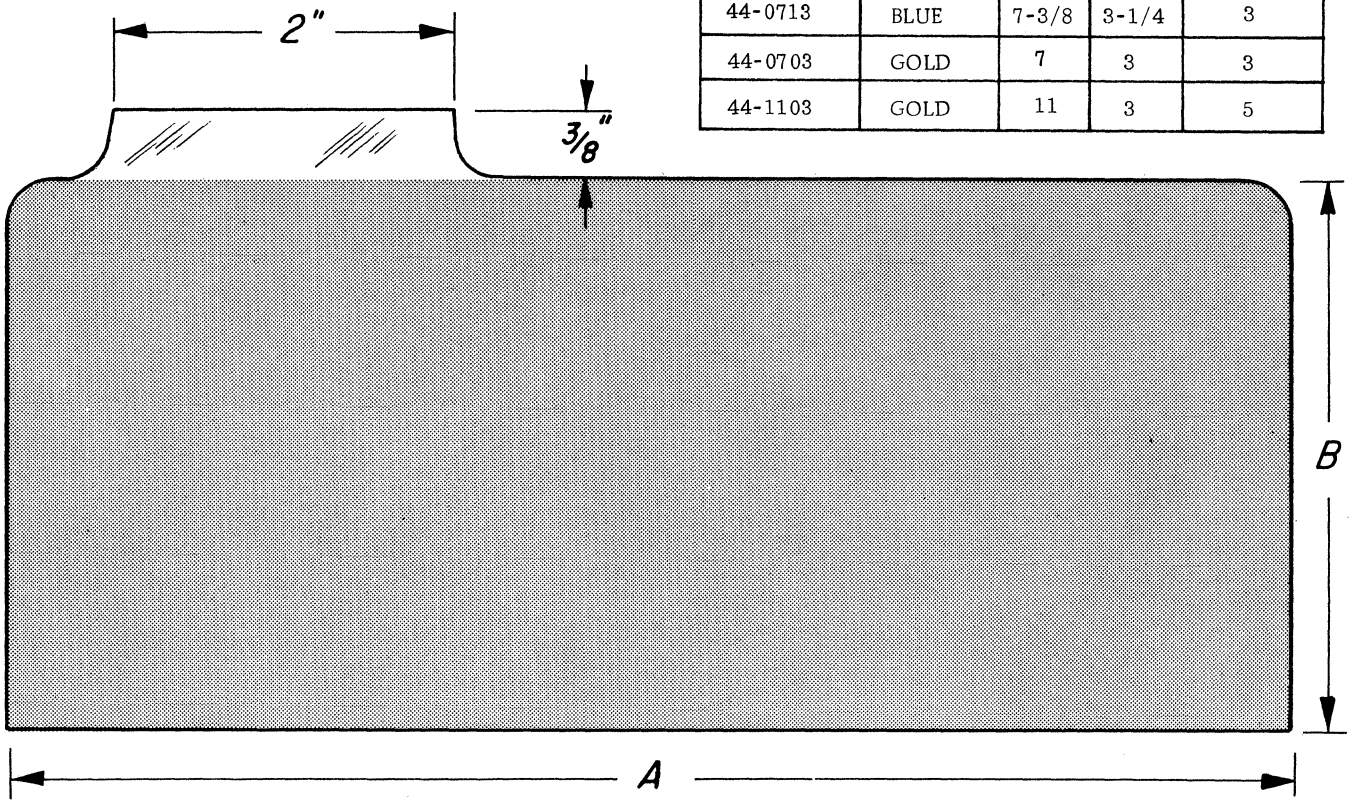
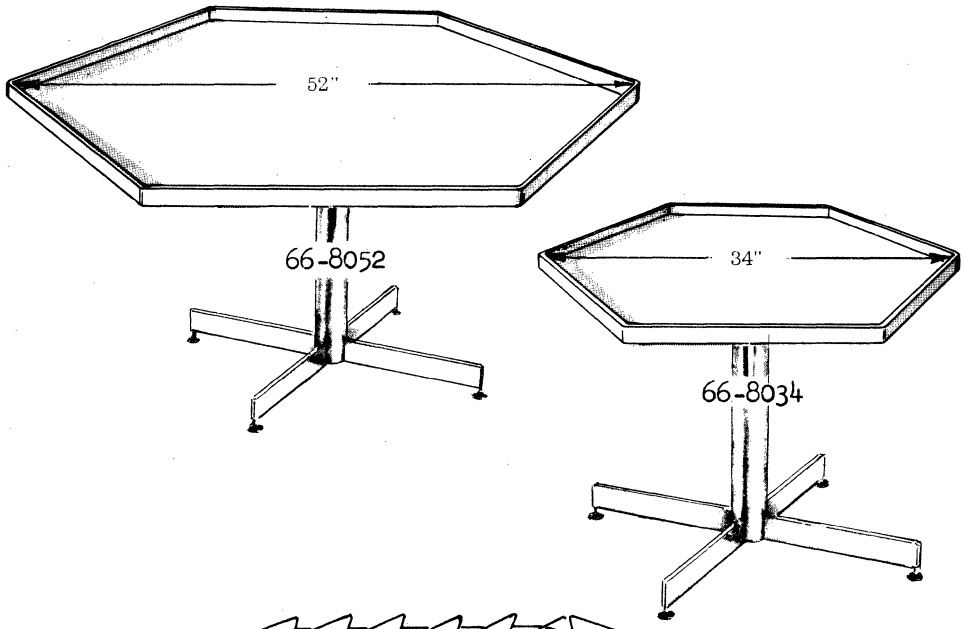
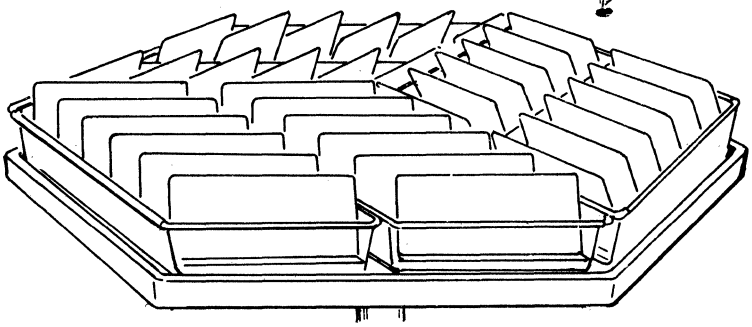


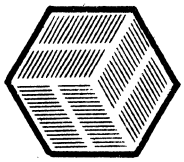
Figure 7.08.00-3 Edge Punched Card Mylar Index





THIS ILLUSTRATES A 66-8034 WITH 6 66-7034 TRAYS FULLY LOADED THIS WILL HOUSE UP TO 8,100 78-7050 CARDS AND INDEXES.

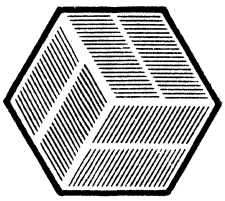
66-8034



INDEXED CARD CAPACITY

7,500–8,100 7" CARDS

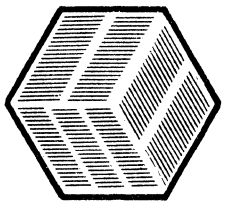
66-8052



INDEXED CARD CAPACITY

13,350–13,950 11" CARDS

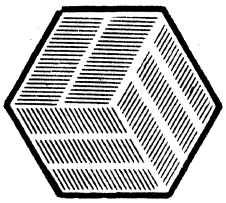
66-8052



INDEXED CARD CAPACITY

6,600–6,975 7" CARDS
8,900–9,300 11" CARDS

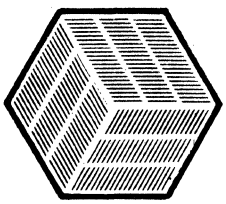
66-8052



INDEXED CARD CAPACITY

13,350–13,950 7" CARDS
4,450–4,650 11" CARDS

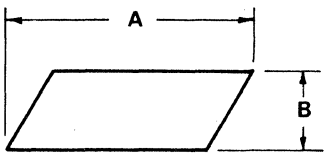
66-8052



INDEXED CARD CAPACITY

20,000–20,925 7" CARDS

CHART INDICATES TRAY DIMENSIONS AND QUANTITY OF TRAYS ROLLING TABLE WILL ACCOMMODATE.



TRAY NUMBER	DIMENSION		ROLLING TABLE						
	A	B	53 - 1518 (14½ × 19½	53 - 1521 (14½ × 22½	53 - 1623 (16¼ × 24½	53 - 1923 (19¼ × 24½	53 - 2228 (22½ × 29	53 - 2240 (22½ × 40	53 - 3060 (30 × 60)
66-7034	20-3/4	7-3/4	1	2	2	2	3	4	5
66-7052	29-3/4	7-3/4					2	2	5
66-7152	29-3/4	11-3/4					1		3
66-7152 & 66-7034 or 66-7052								1 1	2 or 1 1 | 3
			TABLE CAPACITY						

Figure 7.08.00-4 Series 66 Card Housing Equipment

7.09.00 ENVELOPES

Envelopes may be required for payroll checks, accounts payable vouchers, and mailing of statements. Envelopes are available with or without windows and certain envelopes may have two windows. The illustrations for this subject display the various types of windows. In addition the following is a list of envelopes and assigned numbers. A sample of the envelope may be obtained from a representative of the Business Forms and Supplies Group. An illustration in this subject is not provided except when "illustration included" is noted. The windows are not always the same size nor in the same place of the envelope.

1. Envelopes without Window

   93-2001, 6" x 3½"

   93-2008, 6½" x 3 5/8"

   93-2009, 8 7/8" x 3 7/8"

   93-2010, 9½" x 4 1/8"

2. Envelopes with Multiple-Line, Single Windows

   The following window envelopes may be used to display more than one line of print. The size of the envelope and window are designated for each number.

	Size	Window
93-1002	6½" x 3 5/8"	4¾" x 1 1/8"
Illustration included, Figure 7.09.00-1		
93-1004	6¾" x 3¾"	4¾" x 1 1/8"
93-1005	6½" x 3 5/8"	3" x 1"
93-1006	7½" x 3 5/8"	3½" x 1 1/8"
93-1007	7½" x 3 7/8"	4¾" x 1 1/8"
93-1009	8" x 4¼"	3¼" x 1 1/8"
93-1013	8 5/8" x 3 5/8"	3 15/16" x 1"
Illustration included, Figure 7.09.00-2		
93-1015	8¾" x 3 5/8"	3 5/8" x 13/16"
93-1017	8 7/8" x 3 7/8"	3 5/8" x 3/4"
93-1018	8 7/8" x 3 7/8"	4¾" x 1 1/8"
93-1019	9½" x 4 1/8"	4¾" x 1 1/8"
93-1021	8 5/8" x 3¼"	3 5/8" x 1"
Illustration included, Figure 7.09.00-3		
93-1022	10" x 4¾"	3½" x 1"

3. Envelopes with One-Line Single Window

   The following window envelopes may be used to display one line of print. The size of the envelope and window are designated for each number.

	Size	Window
93-1008	7 5/8" x 3 5/8"	3¼" x 3/8"
93-1016	8 13/16" x 3½"	3¼" x 7/16"
93-1024	9½" x 3½"	4½" x 3/8"
Illustration included, Figure 7.09.00-4		
93-1030	9½" x 3½"	4½" x 3/8"

4. Envelopes with Two Windows

The following double-window envelopes may be used to display printed information through two windows – return address and receiving address. The size of the envelope and both windows are designated for each number.

	Size	Window	Window
93-1026	7½" x 3 5/8"	3 5/8" x 3/4"	3½" x 1 1/8"
	Illustration included, Figure 7.09.00-5		
93-1027	6 3/8" x 3 5/8"	3 5/16" x 3/4"	3 7/16" x 1 1/8"
93-1028	8 5/8" x 3 5/8"	3 5/8" x 3/4"	3½" x 1 1/8"

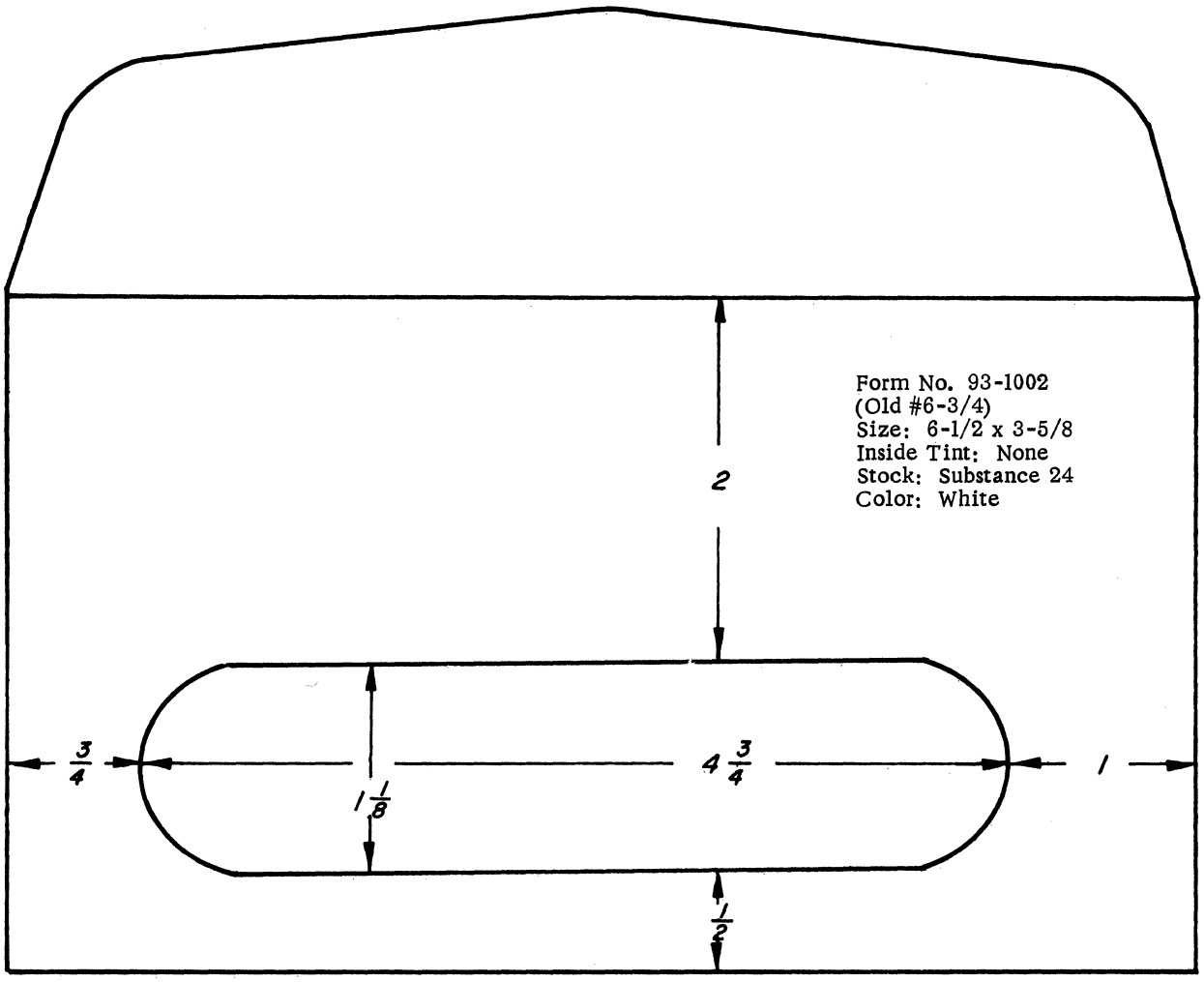


Figure 7.09.00-1 Multiple-Line Window Envelope

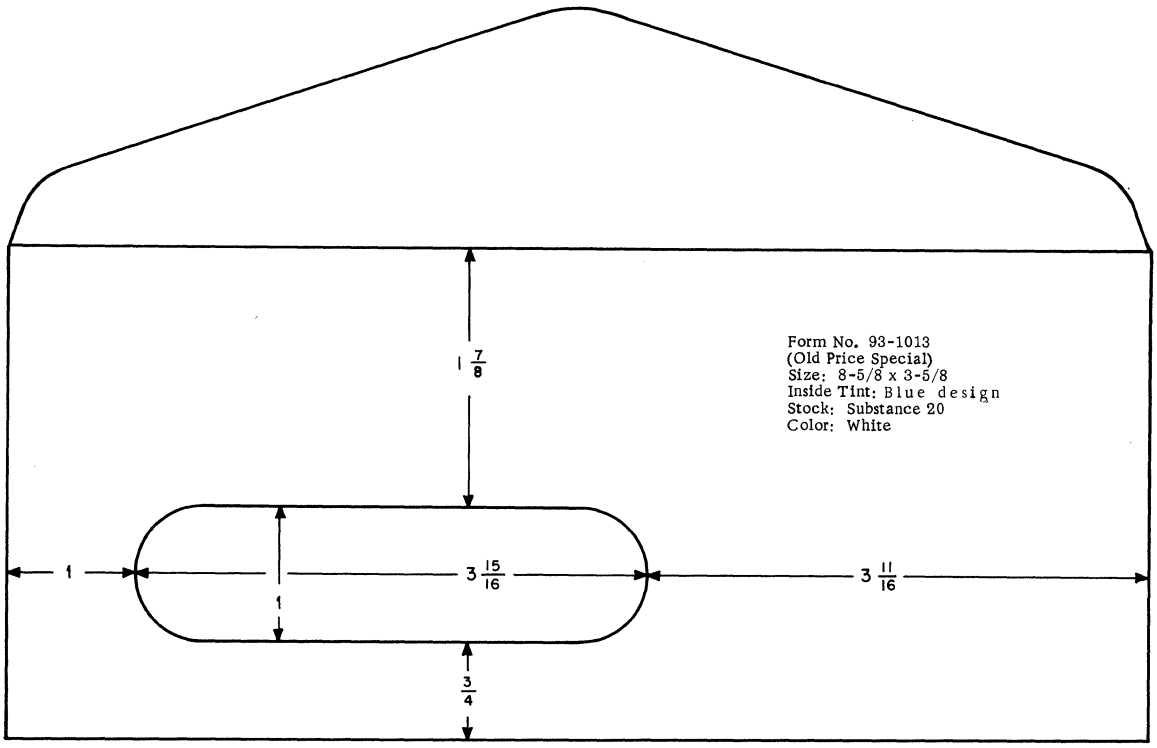
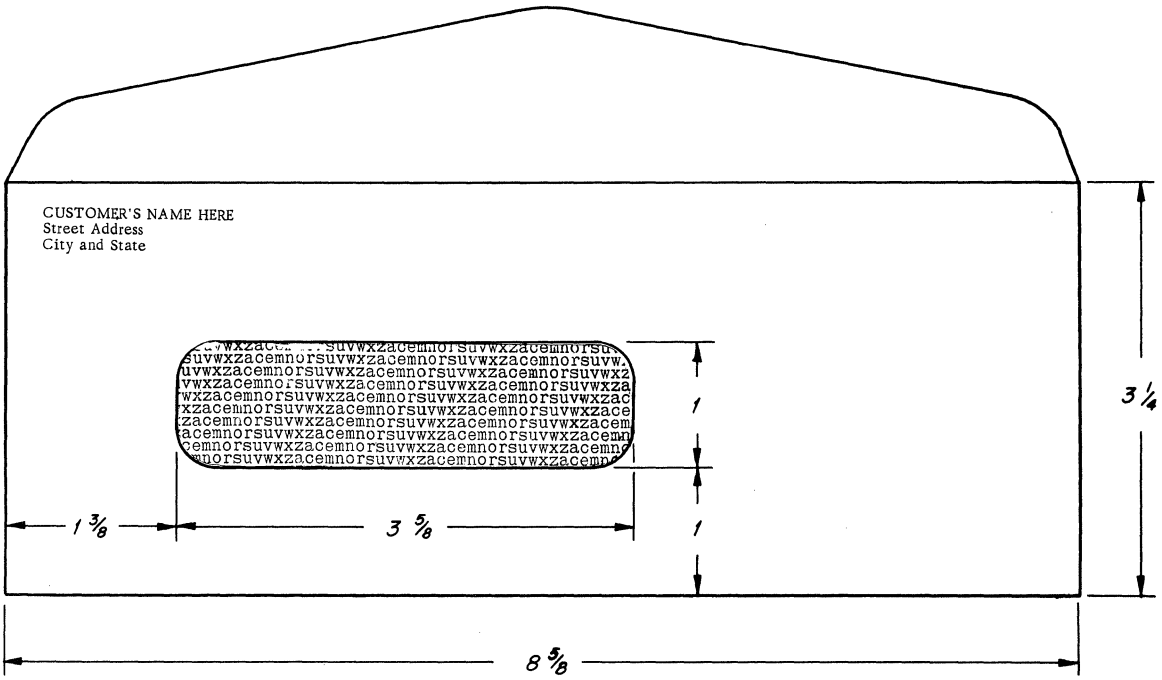


Figure 7.09.00-2 Multiple-Line Window Envelope



FORM NO. 93-1021 (Old WE-1)

Inside printed to assure privacy in mailing. Customer's name and address imprinted in upper left corner.

Figure 7.09.00-3 Window Envelope for Business Checks and Voucher Checks

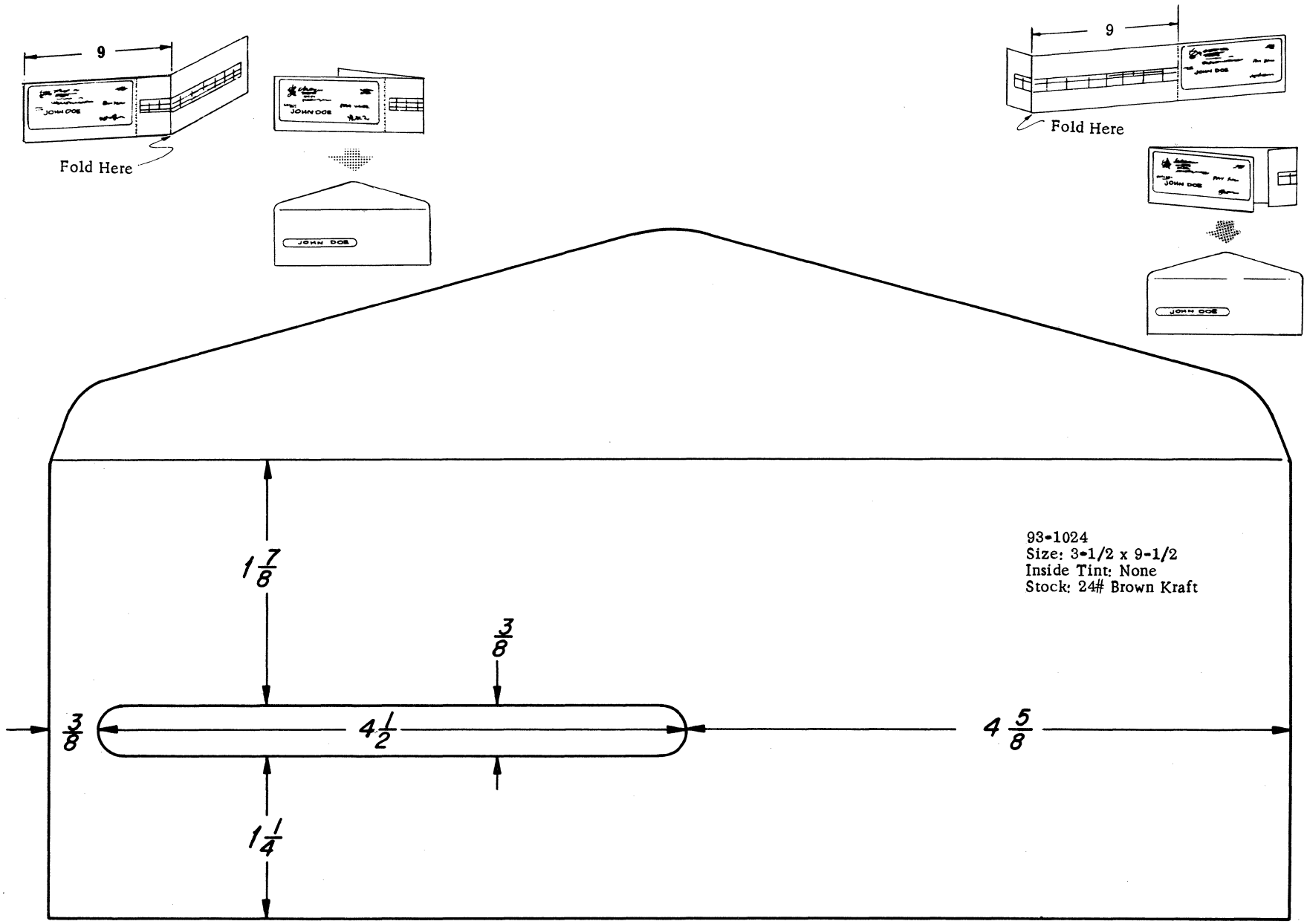
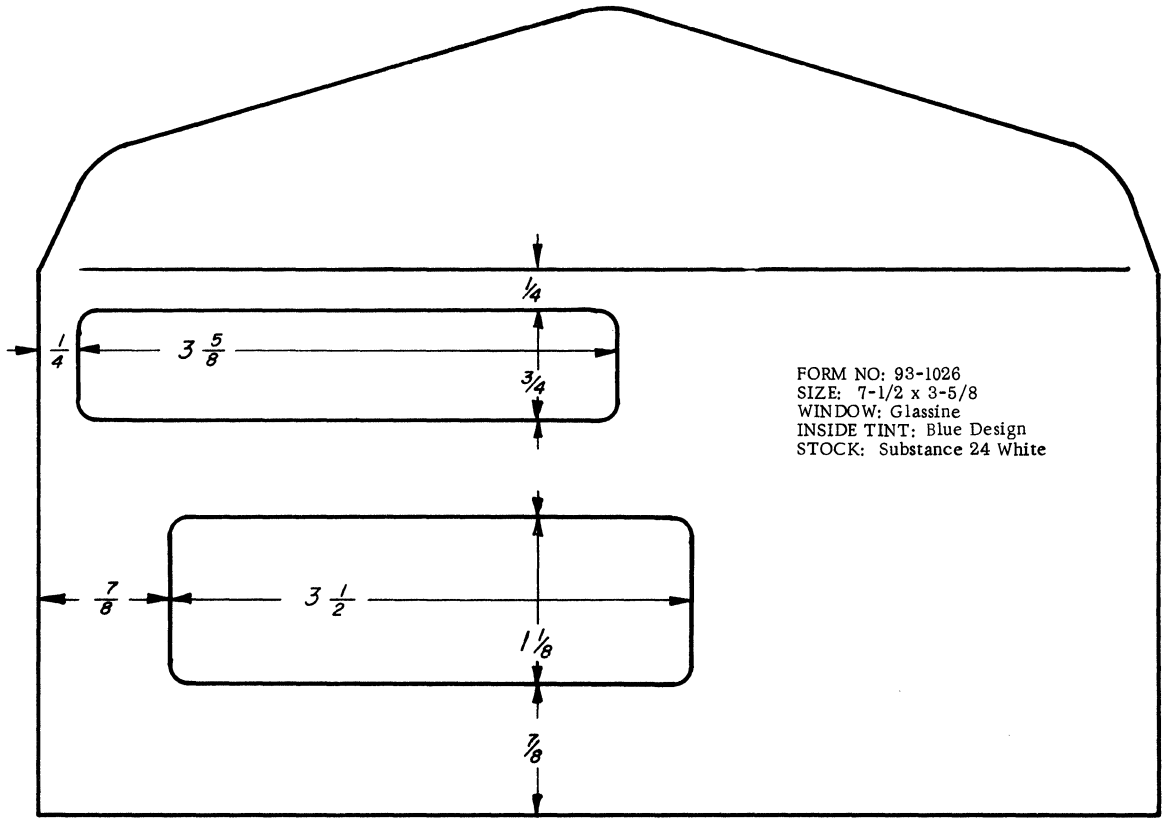


Figure 7.09.00-4 Single-Line Window Envelope



This envelope can also be used effectively with Accounting Machine Checks, Voucher Checks and System Sets. Copy on forms must be positioned to show mailing address and return address in both windows.

Figure 7.09.00-5 Double Window Envelope

7.10.00 MAGNETIC UNIT RECORDS

The Magnetic Unit Record is illustrated in Figures 6.34.00-1 and 6.34.00-2. The record may be printed on Buff, Green, White or Pink paper. Brown ink is used.

7.11.00 SPEED POSTING TRAYS AND INDEX TABS

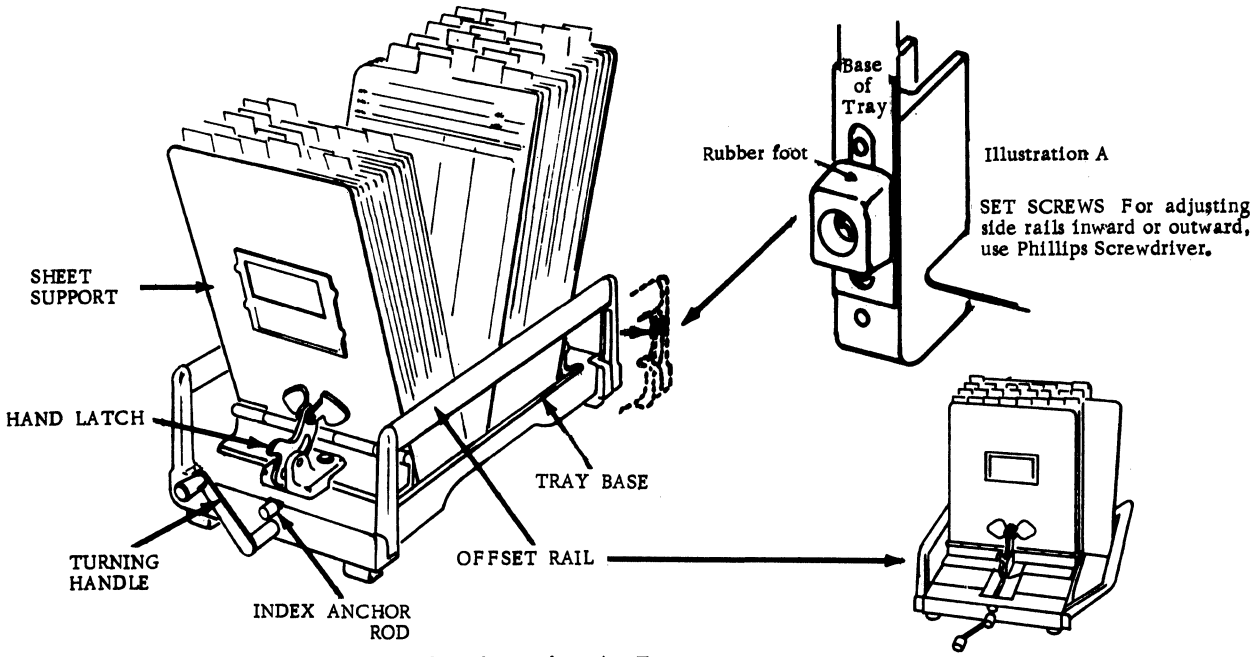
The following illustrations are for posting trays and indexes. See Subject 7.05.00 for related equipment for edge punched cards.

Constructed of steel with Burroughs Sunland Beige #129 finish.

Offset rails extend for offset posting by simple lift and drop action. The offset rails may be adjusted outward as much as 1-1/2" on each side, or inward as much as 7/16" on each side. (See Illustration A below)

Capacities can be varied by a worm-driven mechanism operated by a turning handle.

A hand latch allows adjustment of each sheet support to positions as illustrated below. All sheet supports 14" and wider are equipped with two latches. Sheets rest on non-slip material attached to top surface of base.



PLASTIC DUST COVER included with each Speed Posting Tray

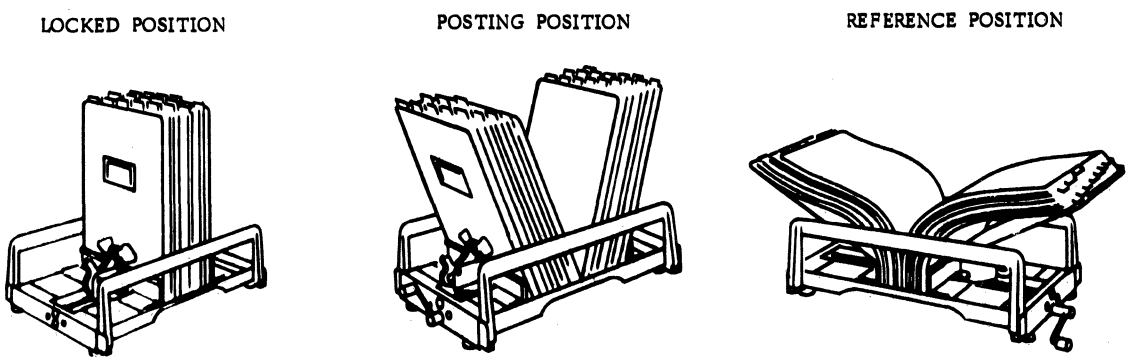
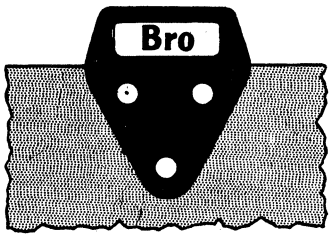


Figure 7.11.00-1 Speed Posting Tray

Proper indexing adds immeasurably to the efficiency of any bookkeeping system installation. When a tray is frequently used in the reference position, flexible indexes are necessary. Where reference is not important, heavy pressboard indexes with metal tabs are usually preferred. For best efficiency, do not exceed 20 forms between each index. For example, a tray which houses 1000 forms should have at least a 50 division index. Since much of the time consumed in a posting operation involves location of the proper form, less searching will be required and faster posting will result when fewer forms are placed between guides.

PRESSBOARD INDEXES



Vertical Type Metal Tab
(Style VM)

Metal Tabs

Both vertical (VM) and angle type (ATM) metal tabs are available in two sizes. All are triangle-triple riveted to the Indexes as illustrated.

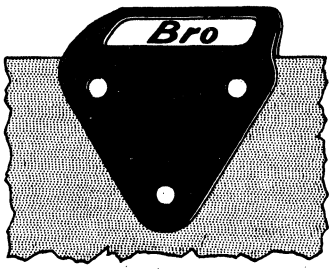
SIZES

TAB NO. 0.5

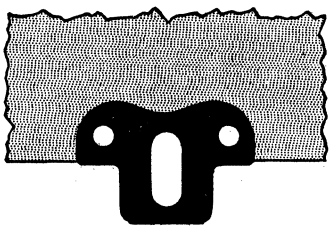
Vertical Extension	5/8"
Visible Opening	7/8" wide x 7/16"
Overall Width	1-7/16"

TAB NO. 2

Vertical Extension	5/8"
Visible Opening	1-3/4" wide x 7/16"
Overall Width	2-1/2"



Angle Type Metal Tab
(Style ATM)



Metal Anchor

Anchoring

Heavy metal anchors, double riveted as illustrated. Indexes can be supplied with no anchoring if preferred. The anchoring of every fourth index is recommended. *

Available Tab Inserts include:
- Plain
- Special Lettered
- Alphabetical
- Daily
- Monthly
- Numerical

*It is not necessary to anchor all indexes. If every fourth index is anchored there will be no tendency for the contents of the tray to ride upward in the middle or to bulge upward when the tray is locked. Anchoring of every fourth index will also prevent the contents of the tray from spilling out if a locked tray is accidentally tipped over while being moved.

Figure 7.11.00-2 Standard Tray Index Tabs and Anchors

SECTION 8

DATA COMMUNICATION PROCESSOR

8.00.00 GENERAL

The interface of a TC into a communications network is accomplished by means of a separate Data Communication Processor (DCP) within the TC. This processor utilizes 8 tracks (256 words) of memory and operates independently of and concurrently with the Main Memory (arithmetic) processor.

The communication control discipline implemented on a TC is determined by a Micro Logic program (firmware) stored in the DCP. Also within the DCP are two 256 character buffers, one of which is used for the receipt and the other for transmission of all messages. Thus, transmission or receipt of messages may take place automatically while other work is being performed concurrently in the Main Memory Processor.

A variety of DCP Fimware sets are provided by Burroughs which allow the user to choose the Line Control Procedure which best fits his applicational and system configuration requirements.

The DCP Firmware Sets provided are as follows:

1. Burroughs Standard Poll/Select
2. Group Poll (2 Methods)
3. Point to Point
4. Central TC Controller (CPU Emulator)
5. IBM 2260/2848 Emulator

The Line Control procedures implemented in these Firmware sets are discussed in detail in Subjects 8.06.00 – 8.13.00.

The constructing and processing of messages is accomplished by user programs stored in the Main Memory Processor portion of the TC. A variety of Main Memory Data Communication firmware sets are provided which allow the Main Memory processor to receive data from and pass data to the DCP under program control.

All data communication capabilities discussed in this section apply to all styles of TC's except where specifically noted.

Data Communication Processor Interface characteristics:

Signaling Speed	1200 bps standard, 600 bps and 1800 bps* optional
Clock (Asynchronous)	Provided in interface
Character Length	7 data bits, 1 parity bit (even)
Start Bit	1 bit
Stop Bit	1 bit
Data Code	ASCII X3.4 - 1967
Bit Sequence	LSB first
Longitudinal Parity	Even 7 bits (excludes parity track) Even parity on BCC
Data Sets	Burroughs Series TA Data Sets or Western Electic 202D on duplex line (nonsimultaneous), or 2 wire leased line Western Electric 202C on 2 wire switched line

*1800 bps available on TC 700, TC 1500 and TC 2500 models only.

8.01.00 SYSTEM CONFIGURATIONS

A wide variation of system configurations is possible with the Series TC terminal computer. Some configurations can be implemented solely with hardware while others require a combination of Hardware and Firmware.

One or several TC's may be connected to a single Data Set at a remote location. The remote TC's may be addressed individually or, if desired, as a group (where all TC's connected to a particular data set constitute a group). Every data set on a communication line makes up a station, or drop, on that line. The Data Set may be the only station, or one of several stations in a multi-drop network.

8.01.01 NETWORK CONFIGURATIONS

Remote TC's may be connected to the data center or a Central TC by a variety of communication links. The communication link may be through telephone company facilities using switched or leased lines, or the link may be an in-house facility either direct connect or through data sets.

The network configurations possible with the TC depend on the line control discipline to be implemented and in some instances on the physical distance of the terminals from the CPU. The following line control disciplines are available and are described in detail in later sections: Burroughs Standard Poll/Select, Group Poll (two methods), Point to Point, Central TC Controller (TC assumes functions of CPU), and IBM 2848/2260 Emulator. With the exception of Point to Point, all TC line disciplines provide for Multi-drop networks.

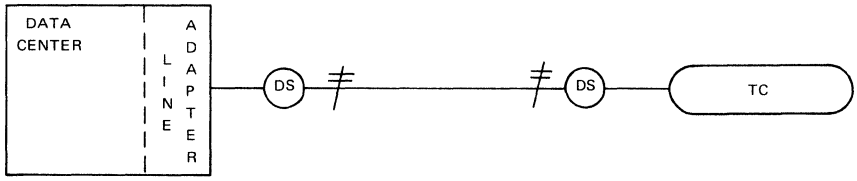
In a Multi-drop leased-line network, Data Sets from several remote sites may be connected to a multi-drop communication channel through a central office bridge. This central office bridge may, in turn, be connected to other central office bridges, all connecting into a single multi-drop line.

The number of TC's and Data Sets connected in this manner is limited only by the requirement to provide an acceptable response time for transactions handled by all TC's on that particular network, including those terminals at other sites connected to the same line with a central office bridge(s). Thus, only the volume and size of transactions need be considered in determining the number of terminals that may be placed on one line.

In switched line, time-sharing, or batch networks either the Burroughs Standard Poll/Select or Point to Point line control discipline may be utilized. If the Poll/Select discipline is utilized the Remote site should be operator attended. (In this environment, although the TC can automatically answer an incoming call if the auto answer feature is implemented on the Data Set, it cannot automatically disconnect without turning its own power off.) If a Point to Point line discipline is implemented, the remote TC may be equipped with an Auto Answer/Auto Disconnect feature (optional feature, SDTR Kit) to enable unattended operation.

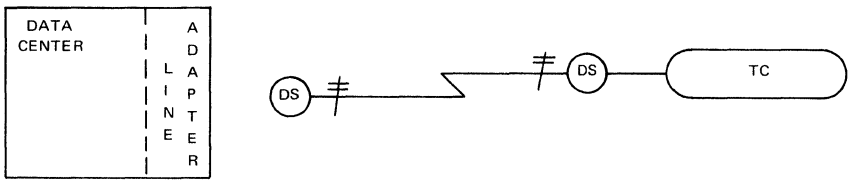
SINGLE TERMINAL INSTALLATION – LEASED LINE

*LCD – POLL/SELECT, GROUP POLL, POINT TO POINT, 2260



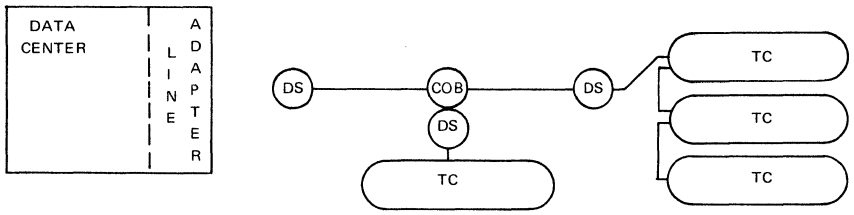
SINGLE TERMINAL INSTALLATION – SWITCHED LINE

*LCD – POLL/SELECT, POINT TO POINT



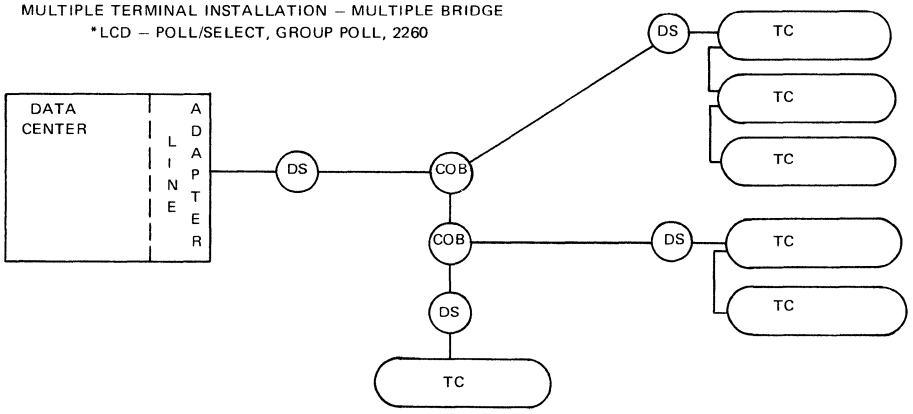
MULTIPLE TERMINAL INSTALLATION – SINGLE BRIDGE

*LCD – POLL/SELECT, GROUP POLL, 2260



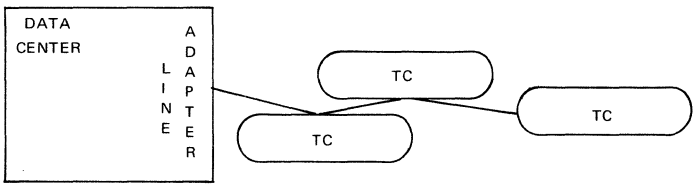
MULTIPLE TERMINAL INSTALLATION – MULTIPLE BRIDGE

*LCD – POLL/SELECT, GROUP POLL, 2260



MULTIPLE TERMINAL – DIRECT CONNECT

* LCD Poll/Select, Group Poll



*LCD = Line Control Discipline

Figure 8.01.01-1 Example of System Configurations

8.02.00 REMOTE CONFIGURATIONS

Multiple TC'c can be connected to one data set by connecting the line from the receptacle on one of the TC's to the Data Set, then connecting a line from a second receptacle on that TC to another TC and that TC to another, etc., forming a chain or a "concatenation" of terminals to the Data Set.

Generally, the number of TC's using one Data Set can be increased at any future time by connecting one or more TC's and establishing addresses in the polling system for these additional TC's. The exceptions are:

1. Group Poll configurations where the limit is 8 machines per drop (Data Set)
2. Networks utilizing a Point to Point line control discipline in which case only one TC can be connected to a Data Set
3. Direct Connect configurations where the limit is 9 TC's

8.02.01 REMOTE INTERFACE KITS

The exact type of configuration desired at a remote site is obtained by installing the correct DCP firmware for the line discipline being implemented and the proper Interface kit(s) for implementing the desired Hardware Configuration and line disciplines. The Remote Interface kits are divided into the 4 major groups listed below:

Group 1: Printed Circuit Interface Logic kits

Group 2: Transmission Adjunct Internal Cable kits

Group 3: Transmission Adjunct External Interface Cable kits

Group 4: Data Transmission Speed

8.02.02 PRINTED CIRCUIT INTERFACE LOGIC KITS

This group of kits provides the TC with the necessary hardware interface logic to operate in the environment being implemented.

DSI-1 Kit – This kit is applicable to TC 500's operating in a Poll/Select, Point to Point (without Auto Answer/Disconnect), CTCC, or 2260 emulator line control discipline. It is installed in the last machine of a concatenated series or in a single machine drop.

DSI-7 Kit – This kit is applicable to TC 700, TC 1500, TC 2500 styles operating in a Poll/Select, Point to Point (without Auto Answer/Disconnect), CTCC, or 2260 emulator line control discipline. It is installed in the last machine of a concatenated series or in single terminal drops.

CLC-1 Kit – This kit is applicable to style TC 500's operating in a Poll/Select, or 2260 emulator line control discipline. It is installed in all but the last machine of a concatenated series.

CLC-6 Kit – This kit is applicable to TC 700, TC 1500 and TC 2500 styles operating in a Poll/Select, or 2260 emulator line control discipline. It is installed in all but the last machine in a concatenated series.

*MTCC-4 Kit – This kit is applicable to all TC styles operating in a Group Poll line control discipline. It is installed in all machines in the network.

*SDTR-2 Kit – This kit is applicable to all Series TC styles operating in a Point to Point line control discipline. It is required to implement the Auto Answer/Disconnect feature.

*TDI-1 Kit – This kit is applicable to all Series TC styles and is required in direct connecting a TC to a CPU via a two wire twisted pair. TDI-1 is compatible with Poll/Select, Group Poll and Point to Point line control disciplines.

8.02.03 TRANSMISSION ADJUNCT INTERNAL CABLE KITS

A Transmission Adjunct Internal kit is required for all remote TC configurations except Direct Connect for the following Styles TC 700, TC 1500, and TC 2500.

* Optional Feature

TAIC-1 Kit – This kit is applicable to TC 700, TC 1500 and TC 2500 styles. Its function is to provide the necessary connections for interfacing the backplane logic to various external cables. It is compatible with all Printed Circuit Interface Logic kits and all Transmission Exchange External Cable kits for Styles TC 700, TC 1500 and TC 2500.

TAIC-2 Kit – This kit is applicable to TC 700, TC 1500 and TC 2500 styles. Its function is to provide the necessary connector for interfacing the backplane logic to compatible External cables. It is compatible with DSI-7 and SDTR-2 Printed Circuit Interface Logic kits and the following Transmission Exchange External Cable kits:

TAEC 17, TAEC 18, TAEC 19, and TAEC 20.

8.02.04 TRANSMISSION EXCHANGE EXTERNAL CABLE KITS

External Cable kits provide the necessary linkage between the Series TC and the data set or between two concatenated TC's.

TAEC-5 Kit – This kit is applicable to the Style TC 500. It provides an operator disconnect plug for hooking up to the TC and a service connection for connecting to a data set. The TAEC-5 cable is 15 feet in length and is compatible with Printed Circuit Interface logic kits for Style TC 500. A TAEC-5, TAEC-6, TAEC-7 or TAEC-8 is required for interfacing a Style TC 500 to the data set being used except for those styles of Burroughs Data Sets which receive their power from the TC 500.

*TAEC-6 Kit – The TAEC-6 kit is identical to the TAEC-5 kit except the cable length is 25 feet.

*TAEC-7 Kit – The TAEC-7 kit is identical to the TAEC-5 kit except the cable length is 50 feet.

*TAEC-8 Kit – The TAEC-8 kit is identical to the TAEC-5 kit except the cable length is 100 feet.

TAEC-17 Kit – This kit is applicable to TC 700, TC 1500 and TC 2500 styles. It provides an operator disconnect plug for hooking up to the TC and a service connection for connecting to a data set. The TAEC-17 cable is 15 feet in length and is compatible with all Printed Circuit Interface Logic kits for the above mentioned styles. A TAEC-17, TAEC-18, TAEC-19, or TAEC-20 kit is required for interfacing TC 700, TC 1500, or TC 2500 styles to the data set being used except for those styles of Burroughs Data Sets which receive their power from the TC.

*TAEC-18 Kit – The TAEC-18 kit is identical to the TAEC-17 kit except cable length is 25 feet.

*TAEC-19 Kit – The TAEC-19 kit is identical to the TAEC-17 kit except cable length is 50 feet.

*TAEC-20 Kit – The TAEC-20 kit is identical to the TAEC-17 kit except cable length is 100 feet.

TACC-1 Kit – The TACC-1 kit is applicable to all Series TC styles. It contains an operator disconnect plug on either end of the cable and is used to connect one TC to another in forming a concatenation. The TACC-1 kit is compatible with CLC-1, CLC-6 and MTCC-4 Printed Circuit Interface logic kits. The cable length is 15 feet.

*TACC-2 Kit – The TACC-2 kit is identical to the TACC-1 kit except the cable length is 25 feet.

*TACC-3 Kit – The TACC-3 kit is identical to the TACC-1 kit except the cable length is 50 feet.

8.02.05 DATA TRANSMISSION RATE KITS

Data Transmission Rate kits consist of a Printed Circuit Oscillator card and are inserted into the backplane of the Series TC computer. A Data Transmission rate of 1200 bps is provided standard with the machine.

*DTR-600 – Provides the TC with a transmission speed of 600 bps. The DTR-600 kit is compatible with all TC styles.

DTR-1200 – Provides the TC with a 1200 bps transmission speed and is compatible with all TC styles.

*DTR-1800 – Provides the TC with an 1800 bps transmission speed and is compatible with all style TC's except the TC 500.

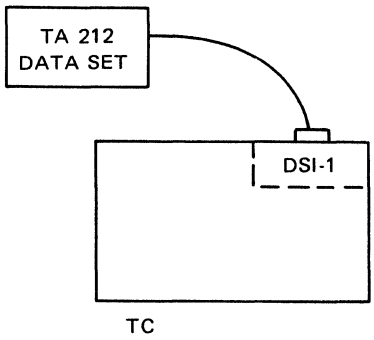
*Optional feature

8.02.06 SAMPLE CONFIGURATIONS

The TC can be configurated in many different combinations of Hardware and Line Disciplines. The samples given below are intended to illustrate the kits required in the various types of configurations and to present any physical limitations that are common to any remote configuration.

Single Machine Drop – TC 500

Burroughs Nonpowered Data Set – 600 or 1200 bps

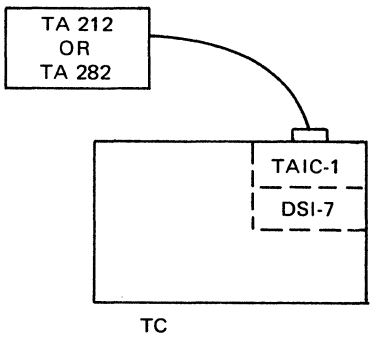


Required Kits: 1 DSI-1 kit.
Transmission Speed: DTR 600 for 600 bps.
Compatible Line Disciplines: Poll/Select, Point to Point, CTCC, 2260 Emulator.
Comments: Cable connecting data set to TC is provided with data set.

Figure 8.02.06-1 Single Machine Drop – TC 500

Single Machine Drop – TC 700, TC 1500 or TC 2500

Burroughs Nonpowered Data Set – 600, 1200 or 1800 bps

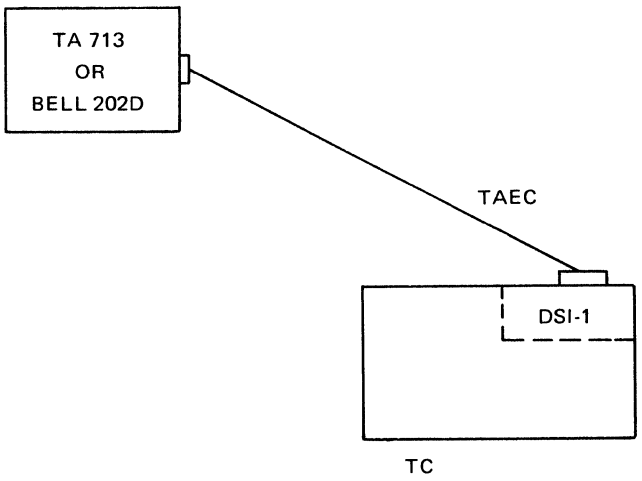


Required Kits: 1 TAIC-1, 1 DSI-7.
Transmission Speed: 600 bps – DTR 600, 1800 bps – DTR 1800.
Data Sets: TA 212 – 600 or 1200 bps, TA 282 – 1800 bps.
Compatible Line Disciplines: Poll/Select, Point to Point, CTCC (1200 bps only) 2260 Emulator (1200 bps only).
Comments: Cable connecting data set and TC is provided with the data set; maximum length 15 feet.

Figure 8.02.06-2 Single Machine Drop – TC 700, TC 1500 or TC 2500

Single Machine Drop – TC 500

Burroughs Powered Data Set or Equivalent – 600 or 1200 bps



Required Kits: 1 TAEC kit, 1 DSI-7 kit.

Transmission Speed: 600 bps – DTR-600 kit.

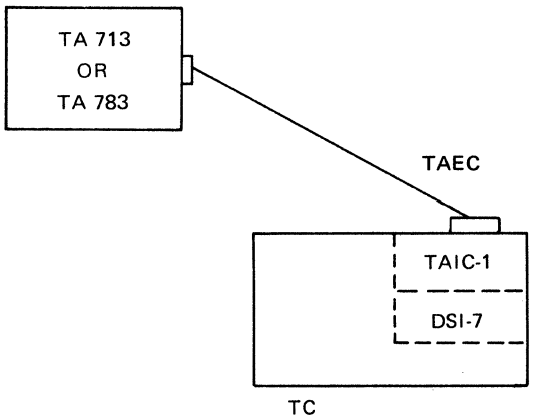
Compatible Line Disciplines: Poll/Select, Point to Point, 2260 Emulator, CTCC.

Comments: Exact TAEC kit required (TAEC-17, TAEC-18, TAEC-19, TAEC-20) depends on distance between data set and TC 500; maximum 100 feet.

Figure 8.02.06-3 Single Machine Drop – TC 500

Single Machine Drop – TC 700, TC 1500 or TC 2500

Burroughs Powered Data Set or Equivalent – 600, 1200 or 1800 bps



Required Kits: 1 TAEC, 1 TAIC – 1 kit, 1 DSI-7 kit.

Transmission Speed: 600 – DTR 600, 1800 bps – DTR 1800.

Data Sets: TA 713 1200 bps, TA 783 1800 bps or 202D 1200 bps.

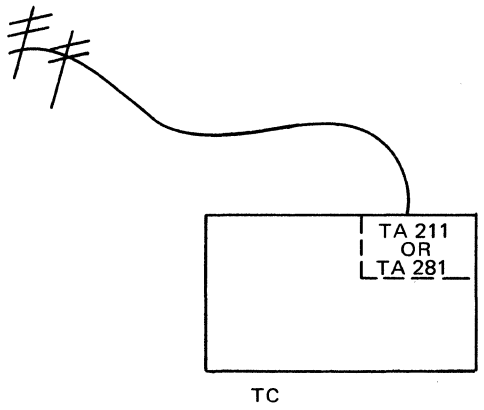
Compatible Line Disciplines: Poll/Select, Point to Point, 2260 Emulator (1200 bps only).

Comments: Exact TAEC kit required (TAEC-17, TAEC-18, TAEC-19, TAEC-20) depends on distance between data set and TC; maximum distance 100 feet.

Figure 8.02.06-4 Single Machine Drop – TC 700, TC 1500 or TC 2500

Single Machine Drop – TC 700, TC 1500 or TC 2500

Burroughs Internal Data Set – 600, 1200 or 1800 bps



Kits Required: None

Transmission Speed: 600 bps – DTR 600, 1800 DTR – 1800.

Data Sets: TA 211 – 1200 bps, TA 281 – 1800 bps.

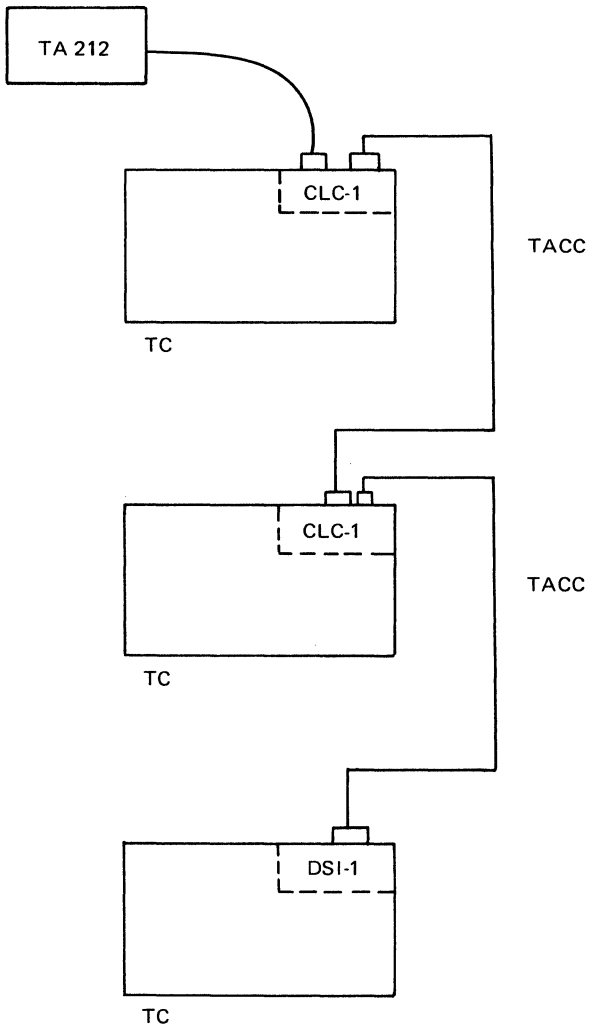
Compatible Line Disciplines: Poll/Select, Point to Point, CTCC (1200 bps only) or 2260 Emulator (1200 bps only).

Comments: No concatenation possible.

Figure 8.02.06-5 Single Machine Drop – TC 700, TC 1500 or TC 2500

Multiple Machine Drop – TC 500

Burroughs Nonpowered Data Set – 600 or 1200 bps



Required Kits: *N-1 TACC kits, N-1 CLC-1 kits, 1 DSI kit.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Compatible Line Disciplines: Poll/Select, 22600 Emulator.

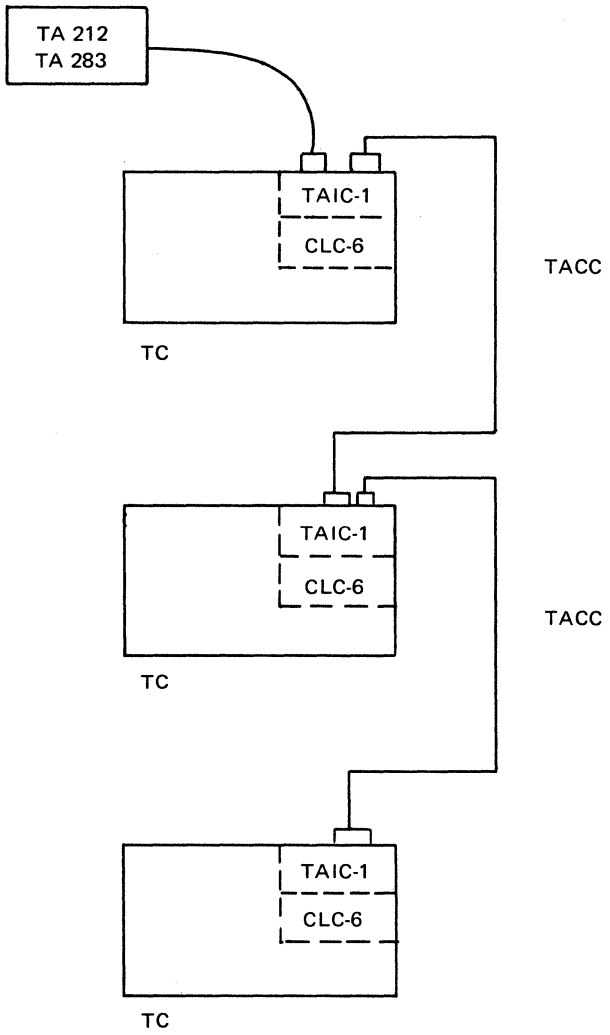
Comments: Exact TACC kits (TACC-1, TACC-2, TACC-3) depends on distance between TC's; maximum 50 feet. Total combined cable length cannot exceed 380 feet. Cable connecting data set to first TC is provided with data set, standard length 3.5 feet, optional length 15 feet.

* N = Number of terminals in Drop.

Figure 8.02.06-6 Multiple Machine Drop – TC 500

Multiple Machine Drop – TC 700, TC 1500 or TC 2500

Burroughs Nonpowered Data Set – 600, 1200 or 1800 bps



Required Kits: *N-1 TAIC – 1 kits, N-1 TACC kits, N-1 CLC-6 kits, 1 DSI-7 kit.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Data Sets: TA 212 – 1200 bps, TA 283 – 1800 bps.

Compatible Line Disciplines: Poll/Select, 2260 Emulator (1200 bps only).

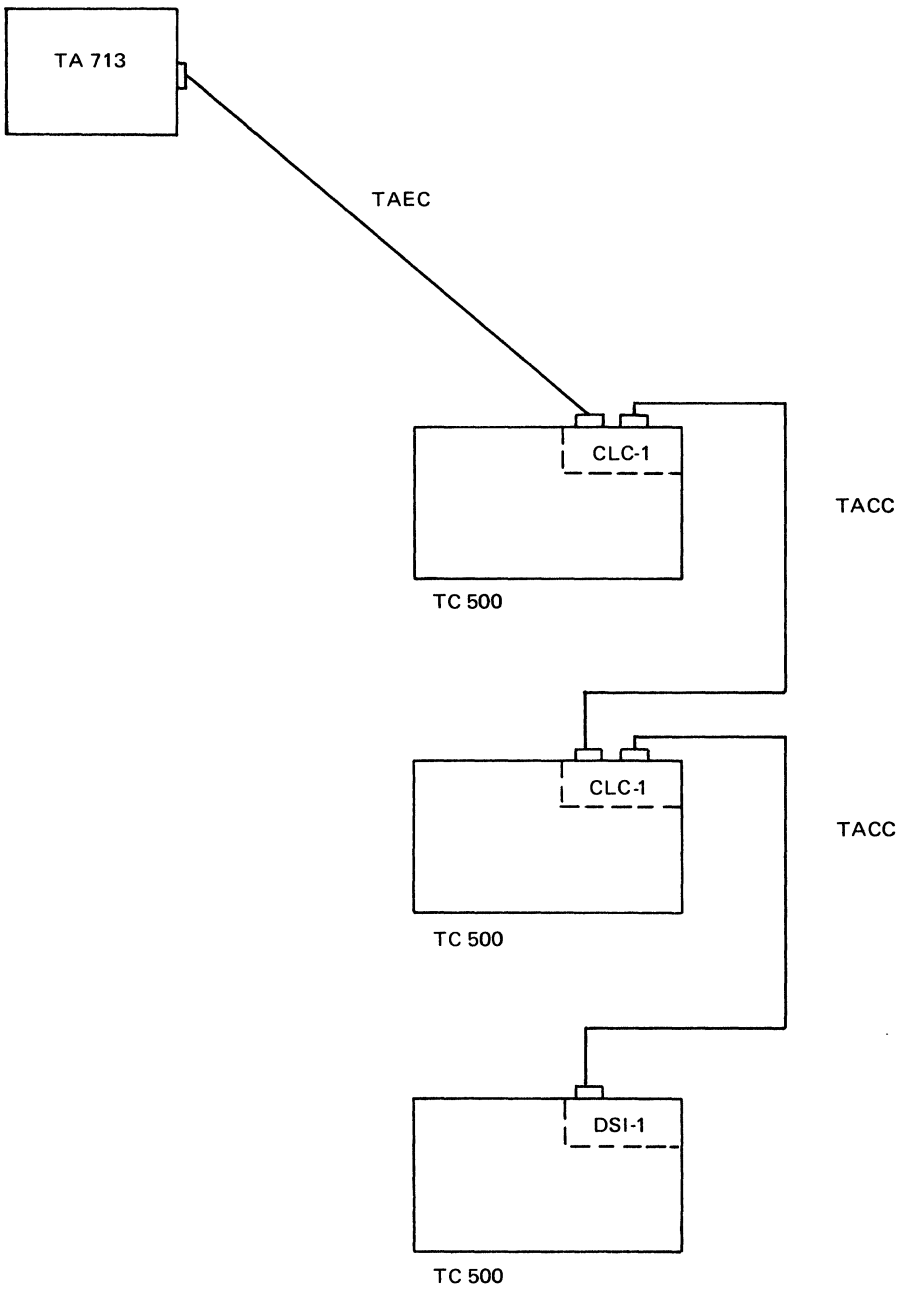
Comments: Exact TACC kit (TACC-1, TACC-2, TACC-3) depends on distance between TC's; maximum 50 feet. Total combined TACC cable length cannot exceed 950 feet at 1200 bps or 400 feet at 1800 bps. Cable connecting data set to first TC is provided with data set, standard length 3.5 feet, optional length 15 feet.

*N = Number of terminals in Drop.

Figure 8.02.06-7 Multiple Machine Drop – TC 700, TC 1500, TC 2500

Multiple Machine Drop – TC 500

Burroughs Powered Data Set or Equivalent – 600 or 1200 bps



Required Kits: 1 TAEC kit, *N-1 TACC kits, N-1 CLC-1 kits, 1 DSI-1 kit.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Compatible Line Disciplines: Poll/Select, 2260 Emulator.

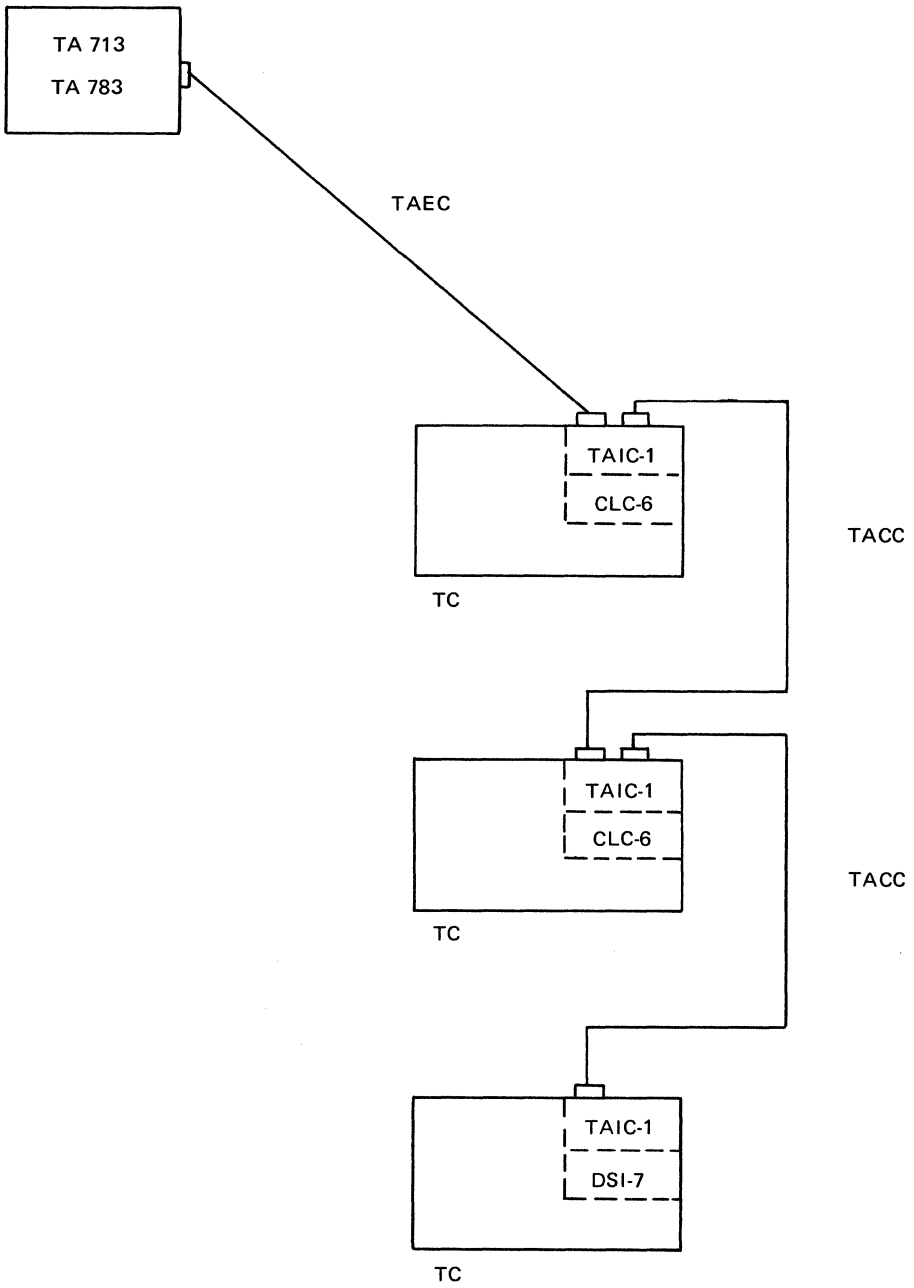
Comments: Exact TAEC Kit (TAEC-5, TAEC-6, TAEC-7 or TAEC-8) depends on distance between data set and first TC; 100 feet maximum. Exact TACC kit (TACC-1, TACC-2 or TACC-3) depends on distance between TC's; 50 feet maximum. Total combined length of TAEC and TACC cables cannot exceed 350 feet.

* N = Number of terminals in Drop.

Figure 8.02.06-8 Multiple Machine Drop – TC 500

Multiple Machine Drop – TC 700, TC 1500 or TC 2500

Burroughs Powered Data Set or Equivalent – 600, 1200 or 1800 bps



Required Kits: 1 TAEC kit, *N-1 TAIC-1 kits, N-1 TACC kits, N-1 CLC-6 kits, 1 DSI-7 kit.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Data Sets: TA 713 – 1200 bps, TA 783 – 1800 bps.

Compatible Line Disciplines: Poll/Select, 2260 Emulator (1200 bps only).

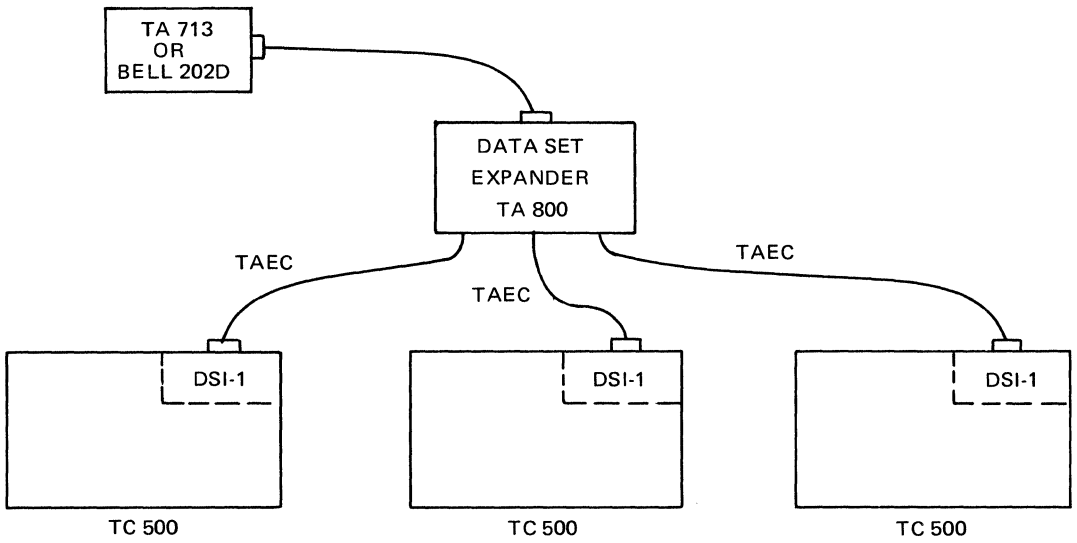
Comments: Exact TAEC (TAEC 17, TAEC 18, TAEC 19, TAEC 20) depends on distance between data set and first TC; maximum 100 feet. Exact TACC (TACC-1, TACC-2, TACC-3) depends on distance between TC's; maximum 50 feet. Total combined cable length cannot exceed 950 feet at 1200 bps or 400 feet at 1800 bps.

* N = Number of terminals in Drop.

Figure 8.02.06-9 Multiple Machine Drop – TC 700, TC 1500, TC 2500

Multiple Machine Drop – TC 500

Data Set Expander, Burroughs Powered Data Set or Equivalent



Required Kits: *N TAEC kits, *N DSI-1 kits.

Transmission Speed: 600 bps DTR-600.

Compatible Line Disciplines: Poll/Select, 2260 Emulator.

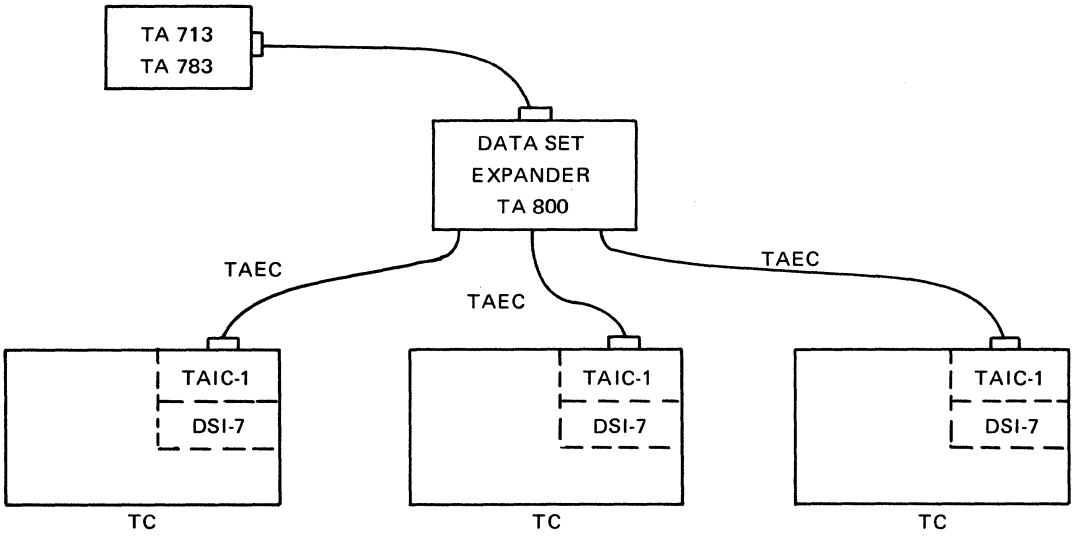
Comments: Exact TAEC kit (TAEC 17, TAEC 18, TAEC 19 or TAEC 20) depends on distance between data set expander and TC; maximum 100 feet. Cable connecting data set and data set expander is ordered with data set expander; maximum 50 feet.

* N = Number of TC's in drop – 16 maximum

Figure 8.02.06-10 Multiple Machine Drop – TC 500

Multiple Machine Drop – TC 700, TC 1500 or TC 2500

Data Set Expander, Burroughs Powered Data Set – 600, 1200 or 1800 bps



Required Kits: *N TAEC kits, N TAIC-1 kits, N DSI-7 kits.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Data Sets: TA 713 1200 bps, TA 783 1800 bps.

Compatible Line Disciplines: Poll/Select, 2260 Emulator (1200 bps only).

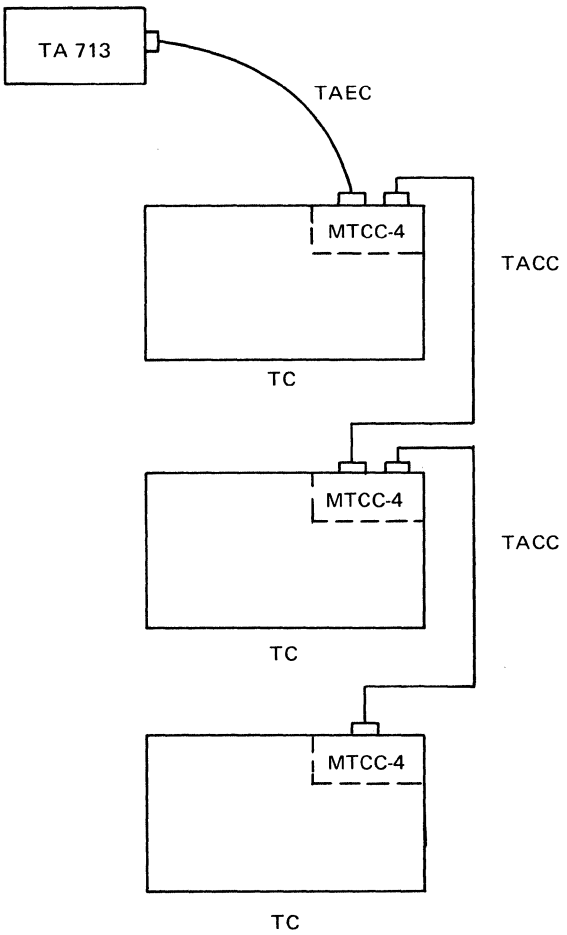
Comments: Exact TAEC kit (TAEC-17, TAEC-18, TAEC-19 or TAEC-20) depends on distance between data set expander and TC; maximum 100 feet. Cable connecting data set and Data Set Expander is ordered with Data Set Exapnder; maximum 50 feet.

* N = Number of TC's in drop; 16 maximum

Figure 8.02.06-11 Multiple Machine Drop – TC 700, TC 1500, TC 2500

Group Poll – TC 500

Burroughs Powered Data Set – 600, 1200 bps



Required Kits: 1 TAEC kit, *N MTCC-4 kits, N-1 TACC kits.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Compatible Line Disciplines: Group Poll-1, Group Poll-2.

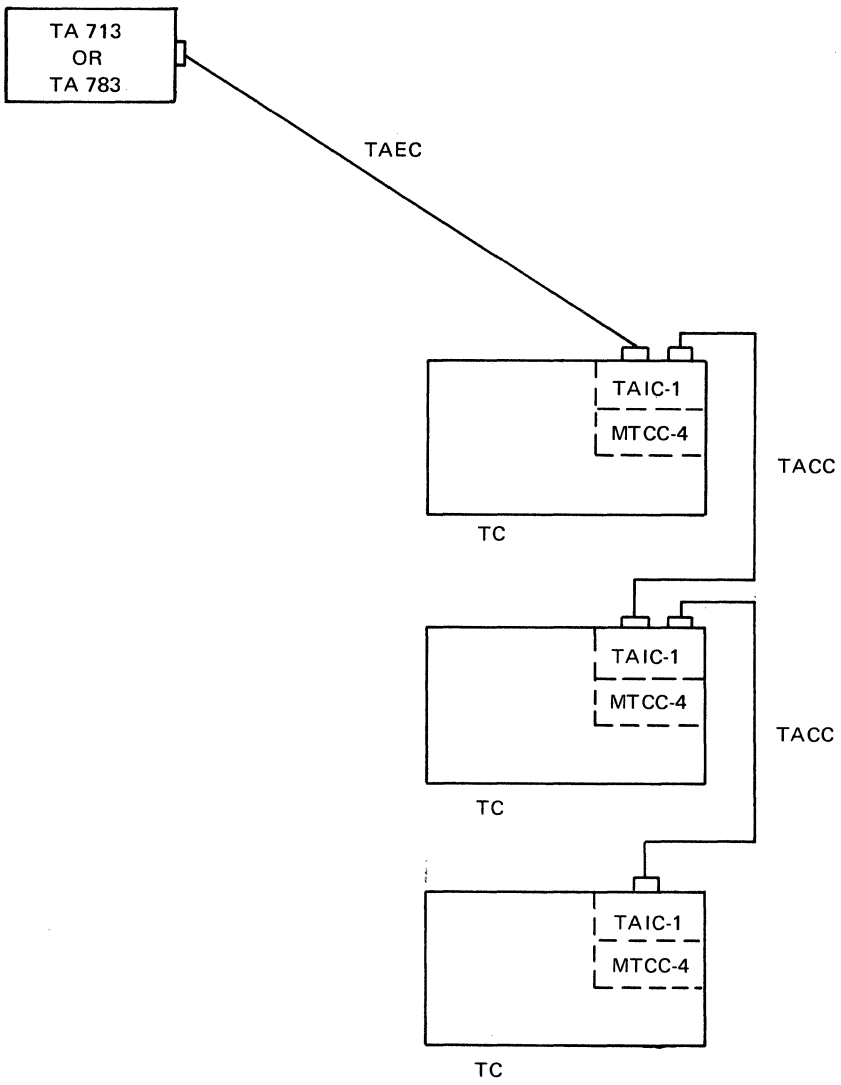
Comments: Exact TAEC kit (TAEC-17, TAEC-18, TAEC-19, TAEC-20) depends on distance between data set and first TC; maximum distance 100 feet. Exact TACC kit (TACC-1, TACC-2, or TACC-3) depends on distance between TC's; maximum 50 feet. Maximum of 8 machines per concatenated group.

*N = Number of TC's in drop.

Figure 8.02.06-12 Group Poll – TC 500

Group Poll – TC 700, TC 1500, TC 2500

Burroughs Powered Data Set – 600, 1200 or 1800 bps



Required Kits: *N TAIC-1 kits, N-1 TACC kits, N MTCC-4 kits, 1 TACC kit.

Transmission Speed: 600 bps DTR-600, 1800 bps DTR-1800.

Data Sets: TA 713 – 1200 bps, TA 783 – 1800 bps.

Compatible Line Disciplines: Group Poll-1, Group Poll-2.

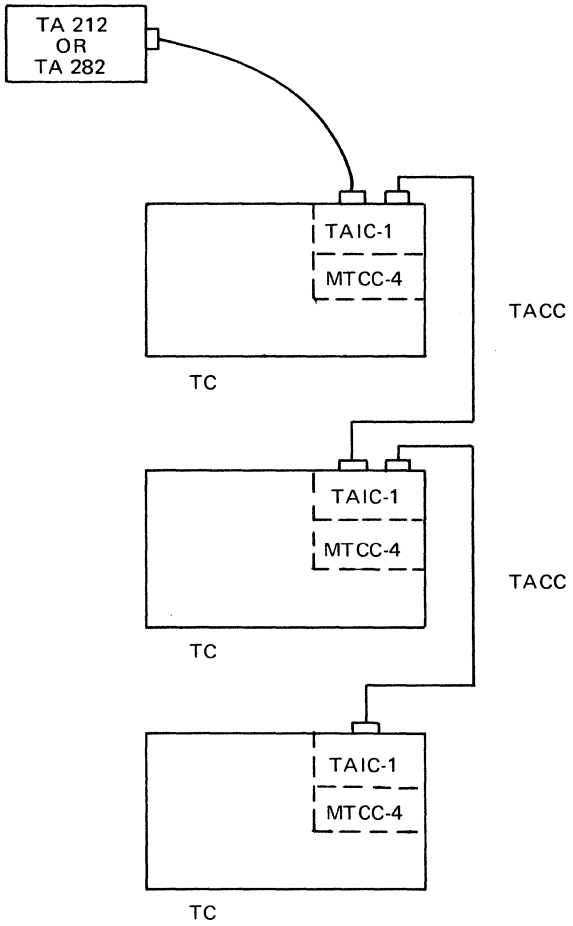
Comments: Exact TAEC kit (TAEC-17, TAEC-18, TAEC-19, TAEC-20) depends on distance between data set and first TC; maximum 100 feet. Exact TACC kit (TACC-1, TACC-2, TACC-3) depends on distance between TC's; maximum 50 feet. Maximum of 8 machines per group (drop). Total combined length of TAEC and TACC cables cannot exceed 900 feet at 1200 bps or 400 feet at 1800 bps.

* N = Number of TC's in Group

Figure 8.02.06-13 Group Poll – TC 700, TC 1500, TC 2500

Group Poll – TC 700, TC 1500, TC 2500

Burroughs Nonpowered Data Set – 600, 1200 or 1800 bps



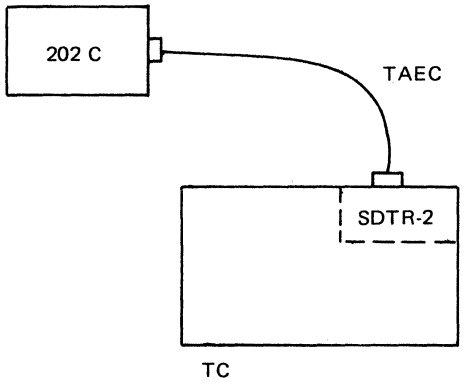
Required Kits: *N TAIC-1 kits, N-1 TACC kits, N MTCC-4 kits.
Transmission Speed: 600 bps – DTR-600, 1800 bps – DTR-1800.
Data Sets: TA 212 – 1200 bps, TA 282 – 1800 bps.
Compatible Line Disciplines: Group Poll-1, Group Poll-2.
Comments: Exact TACC kit (TACC-1, TACC-2, TACC-3) depends on distance between TC's; maximum distance 50 feet. Maximum 8 TC's per group (drop). Total combined length of TACC cables cannot exceed 950 feet at 1200 bps or 400 feet at 1800 bps. Cable connecting data set and first TC is provided with data set; maximum length 15 feet.

*N = Number of TC's in group (drop).

Figure 8.02.06-14 Group Poll – TC 700, TC 1500, TC 2500

Auto Answer/Disconnect – TC 500

Bell 202C Data Set – 600 or 1200 bps

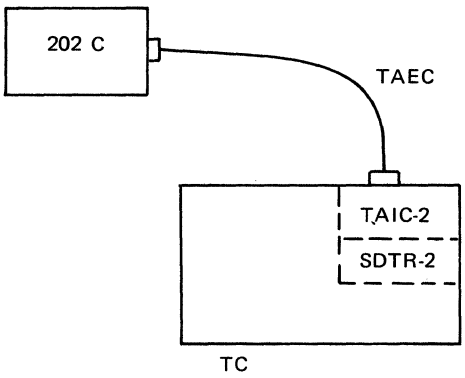


Required Kits: 1 TAEC, 1 SDTR-2 kit.
Transmission Speed: 600 bps DTR-600.
Data Set: Bell 202C with Auto Answer feature.
Compatible Line Discipline: Point to Point
Comments: Exact TAEC kit (TAEC-17, TAEC-18, TAEC-19, TAEC-20) depends on distance between data set and TC; maximum distance 100 feet.

Figure 8.02.06-15 Auto Answer/Disconnect – TC 500

Auto Answer/Disconnect – TC 700, TC 1500, or TC 2500

Bell 202C Data Set – 600 or 1200 bps

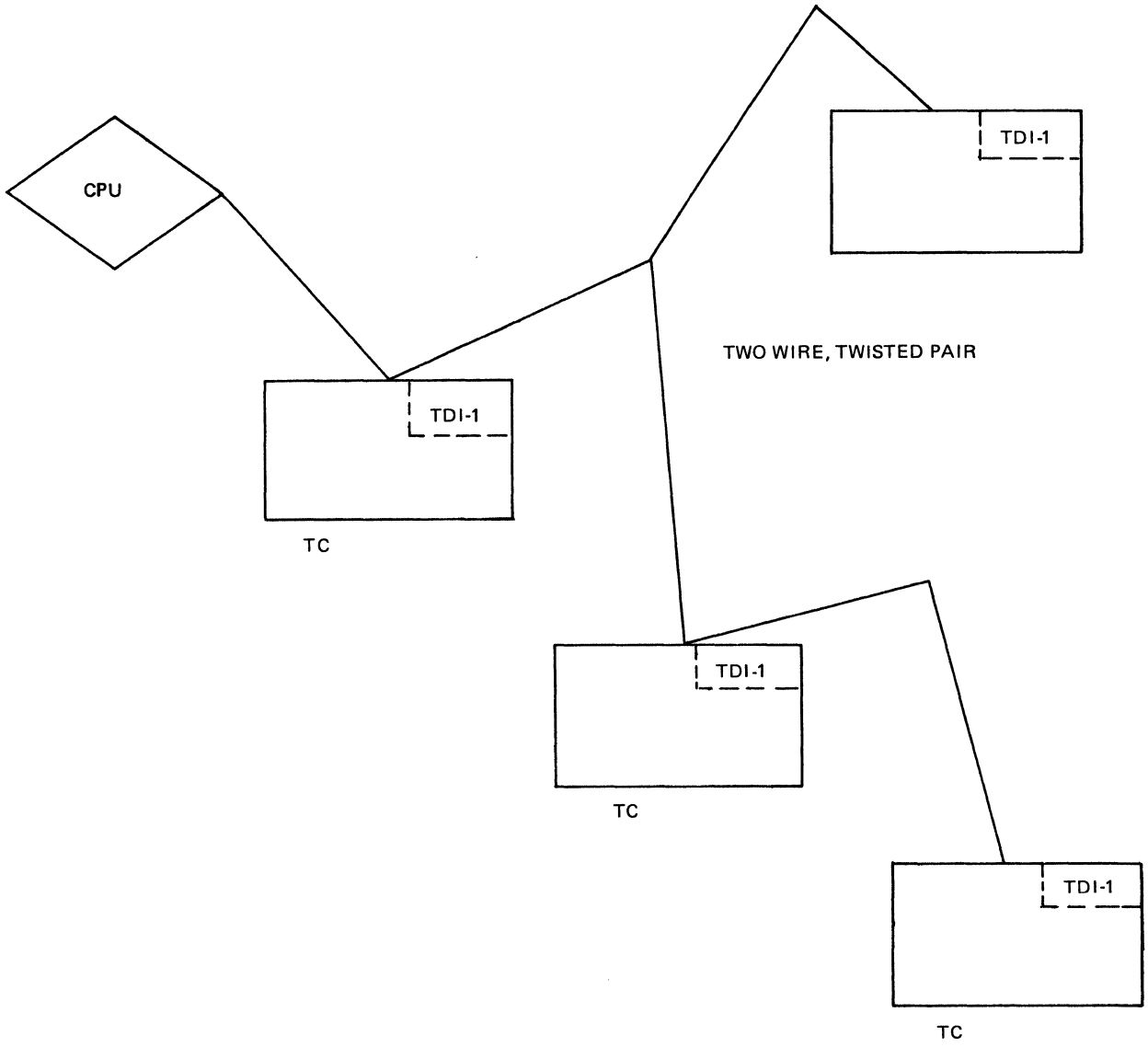


Required Kits: 1 TAEC kit, 1 TAIC-2 kit, 1 SDTR-2 kit.
Transmission Speed: 600 bps, DTR-600.
Data Set: Bell 202C with Auto Answer feature.
Compatible Line Disciplines: Point to Point.
Comments: Exact TAEC kit (TAEC-17, TAEC-18, TAEC-19, TAEC-20) depends on distance between data set and TC; maximum distance 100 feet.

Figure 8.02.06-16 Auto Answer/Disconnect – TC 700, TC 1500, TC 2500

Multiple Machine – Direct Connect

All TC Styles – 600, 1200 or 1800 bps



Required Kits: *N TDI-1 kits.
Transmission Speed: 600 bps DTR-600, 1800 bps (TC 700, TC 1500, TC 2500 only) DTR-1800.
Data Sets: None
Compatible Line Disciplines: Poll/Select, Group Poll-1, Group Poll-2.
Comments: Maximum total combined wire length 1000 feet. Maximum 9 TC's. If Group Poll, each TC must be addressed as a separate group.

*N = Number of TC's – maximum of 9.

Figure 8.02.06-17 Multiple Machine – Direct Connect

8.02.07 DATA COMMUNICATIONS UPGRADE KITS

Series L machines with Data Communications Potential can be field upgraded to Data Communication Capability by installation of the applicable upgrade kit. The available kits are as follows:

DCP-1 – The DCP-1 kit contains the necessary Printed Circuit cards for upgrading Series L 2000 machines with a 50 Card Backplane from Data Communication Potential to Data Communication Capability with a transmission speed of 1200 bps.

DCP-3 – The DCP-3 kit contains the necessary printed circuit cards for upgrading L 3000, L 4000, and L 2000 (with 60 Card Backplane) styles from Data Communication Potential to Data Communication Capability with a transmission speed of 1200 bps.

DCP-5 – The DCP-5 kit contains the necessary printed circuit cards for upgrading L 3000, L 4000 and L 2000 (with 60 Card Backplane) styles from Data Communication Potential to Data Communication Capability with a transmission speed of 1800 bps.

8.02.08 NUMBER OF MACHINES PER DROP

The number of machines operating in a Poll/Select or 2260 Emulator line control discipline is limited by the total combined TACC cable length or by the maximum allowable circuit and cable signal distortion.

TC 500 – The number of TC 500's which may be concatenated cannot exceed eight (8) machines or a maximum combined TACC cable length of 350 feet.

TC 700, TC 1500, TC 2500 – The TC's which can be concatenated may be determined as follows:

1. 600/1200 bps
   a. If all TACC cables 15 feet – 29 machines
   b. If all TACC cables 25 feet – 25 machines
   c. If all TACC cables 50 feet – 20 machines
2. 1800 bps
   a. If all TACC cables 15 feet – 13 machines
   b. If all TACC cables 25 feet – 11 machines
   c. If all TACC cables 50 feet – 8 machines
3. Mixed Cable Lengths:

   If mixed length of TACC cables are required, the following formula can be used to determine the number of machines which may be concatenated:

   $(n-1)\ t_s + 1t_c = t_d$

   n = number of machines to be concatenated

   t_s = circuit delay per unit (0.9 usec)

   t_c = cable delay per foot (0.016 usec/foot)

   1 = total feet of cable

   t_d = maximum allowable delay due to sum unit delay and cable delay.

Maximum 1200 bps	32.5 usec
Maximum 1800 bps	13.3 usec

   Example: 13 TC's – 15' cable (195 feet)
   2 TC's – 25' cable (50 feet)
   9 TC's – 50' cable (450 feet)

   (24-1) (0.9 usec) + (695) (.016)

   20.7 + 11.1 = 31.8 usec

   In this example the configuration is within limits for 1200 bps since 31.8 usec is less than the 1200 bps limit of 32.5 usec. The configuration is not within limits for 1800 bps operation because 31.8 usec is greater than the 13.3 usec limit for 1800 bps.

8.03.00 DATA SET REQUIREMENTS

8.03.01 DATA PHONE * SERVICE (BELL TELEPHONE SWITCHED NETWORK)

1. Western Electric 202C5 (Replaces 202C1 which is still applicable with:

Feature Option		Requirement
Answer	–	Attended only or
	–	Selective if STDR-2 Kit installed
Bit Rate	–	Greater than 900 bits
Interface	–	EIA Voltage
Reverse Channel	–	No (Out)
ACU	–	Not provided
Carrier Soft Turn-Off	–	Yes (In) (feature is standard in 202C1)
Clamp	–	Yes (In)
Squelch	–	Yes (In)
2 Wire	–	Yes (In)
Amplitude Equalizer		
Delay Equalizer	–	Options determined by the Telephone Co.

*Data Phone is a trademark of the Bell System.

2. Other Manufacturer equivalents of the Western Electric 202C5 Data Set may be substituted in some states. In those cases where substitution is allowed, Bell requires the use of a Data Access Arrangement device. Contact your local Bell System Communication Consultant for specifics.

8.03.02 LEASED LINE SERVICE

Burroughs Series TA Data Sets can be used with Leased Line Service.

Burroughs Data Sets operating at either 1200 or at 1800 bps require FCC type 3002 unconditioned duplex lines.

Western Electric 202D3 – 1200 bps or 1800 bps (Replaces 202D1 which is still acceptable) with:

Feature Option		Requirement
Bit Rate	–	Greater than 900 bits
Interface	–	EIA Voltage
Reverse Channel	–	No (Out)
804A	–	Not provided
Carrier Soft Turn-Off	–	Yes (In) (Feature is standard in 202D1)
Clamp	–	Yes (In)
Squelch	–	No (Out)
Amplitude Equalizer		
Delay Equalizer	–	Options determined by the Telephone Co.
Type of Line	–	1200 bps – FCC type 3002 unconditioned duplex line (in some environments C1 conditioning may be required)
	–	1800 bps – FCC type 3002 C2 conditioned duplex lines.

8.04.00 DATA COMMUNICATION INDICATOR LIGHTS

Two lights are provided on the TC keyboard which indicate the status of the TC when operating in an on-line mode. The lights, located as indicated in the figure below, are the MESSAGE RECEIVED light and the TRANSMIT READY light.

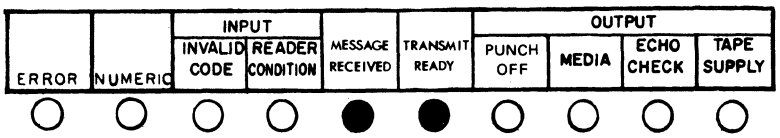


Figure 8.04.00-1 Data Communication Indicator Lights

8.04.01 MESSAGE RECEIVED LIGHT

This light is turned on automatically by the main memory firmware after interrogating a Flat set by the Data Communication Processor which indicates having successfully received a good message (correct parity and proper control characters). In addition, a Message Received Flag, associated with this light, is set which permits the user program in the TC to determine when a message has been received so that it may proceed with processing and/or printing the message data. The Message Received light is turned off as a result of resetting the Message Received Flag by the user program.

8.04.02 TRANSMIT READY LIGHT

This light is turned on automatically as a result of setting the Transmit Ready Flag. The Transmit Ready Flag is set by the user program when it is known that a message has been completed and is ready for transmission. The light remains on until a Poll is received from the data center and the Data Communications Processor completes a successful transmission. The Transmit Ready Flag is reset and the light is turned off automatically by the main memory firmware after interrogating a flag set by the Data Communication Processor which indicates a successful transmission.

8.05.00 MESSAGE TRANSMISSION CODE

The ASCII 7-bit code is the standard transmission code set for TC systems. These codes consist of two general categories: Graphic Characters and Control Characters. There are 32 control characters, 95 graphic characters, and the code DEL (delete). The 95 graphics include both upper and lower case alphabetic characters, the numerals zero to nine, 32 punctuation marks and special symbols, and SP (space).

AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE (ASCII)

b_7 →					0	0	0	0	1	1	1	1
b_6 →					0	0	1	1	0	0	1	1
b_5 →					0	1	0	1	0	1	0	1
Bits	b_4 ↓	b_3 ↓	b_2 ↓	b_1 ↓	Column → / Row ↓	0	1	2	3	4	5	6	7
	0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
	0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
	0	0	1	0	2	STX	DC2	"	2	B	R	b	r
	0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
	0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
	0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
	0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
	0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
	1	0	0	0	8	BS	CAN	(	8	H	X	h	x
	1	0	0	1	9	HT	EM	)	9	I	Y	i	y
	1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
	1	0	1	1	11	VT	ESC	+	;	K	[	k	{
	1	1	0	0	12	FF	FS	,	<	L	\	l	|
	1	1	0	1	13	CR	GS	-	=	M	]	m	}
	1	1	1	0	14	SO	RS	.	>	N	^	n	~
	1	1	1	1	15	SI	US	/	?	O	—	o	DEL

Figure 8.05.00-1 Standard Code for Information Interchange (ASCII X3.4 – 1967)

The standard 7-bit character representation is shown below; b_7 is the high order bit, and b_1 is the low order bit:

b_7	b_6	b_5	b_4	b_3	b_2	b_1
1	0	0	1	1	0	1

The example shows the bit representation for the character "M", located in column 4, row 13. "M" may also be represented by its position in the code table by the notation "column 4, row 13" or simply as "4/13". The column number is formed by the decimal equivalent of the binary number for bits b_7, b_6, and b_5; the row number is formed by the decimal equivalent of the binary number for bits b_4, b_3, b_2, and b_1. Columns are sometimes referred to as "sticks".

8.06.00 POLL/SELECT LINE CONTROL DISCIPLINE

The Data Communication Processor in a Poll/Select environment is designed for utilizing multi-drop points on a network of private or switched lines. Central Office bridging is permitted and is expected to be a normal part of the operation of this system.

Polling, directed from the data center, is continuous. The frequency of polling is a function of the Data Center. The polling frequency may vary during the day without affecting the TC's basic operation other than to change the frequency of transmitting and receiving messages.

The user program assembles a message in the TC memory. When the message is complete and the system is in a Transmit Ready condition, it waits for a Poll from the data center to activate the transmission of this message.

A message from the Data Center is received by the TC if it is in a Receive Ready condition, and is stored in memory; printing and/or processing of the received data is delayed until the incoming message is complete and has been parity checked.

Batches of data, (punched paper tape or punched cards,) may be transmitted to the Data Center by reading the data into the TC memory (in groups based on available memory) and storing it until the TC is polled. As memory is cleared by successful transmission, additional punched paper tape or cards are read and stored, ready for the next poll.

TC's and their peripheral devices such as card or tape readers, when connected to a communication network, can be operated in an unattended mode. After loading media into the input device, the user program in the Normal area of memory in the TC can cause the unattended transmission of that data as Polls are received from the Data Center.

A TC operating on a program which is dependent on transmission to or receipt of data from the Data Center is in an on-line mode. If a TC is operating on a program that does not require communication with the Data Center, even though the Data Center is operating, it is in an off-line mode. A TC in this mode is capable of acknowledging a selection and of receiving a message. This can be brought to the attention of the TC operator to initiate the printing and/or processing of the message when convenient; or, the received message can be automatically processed immediately. The user program must make these provisions. The TC when operating on programs independently of the Data Center, is not inhibited in any of its functions by the fact that it has the capability to function on-line also.

8.06.01 COMMUNICATION CONTROL CHARACTERS: POLL/SELECT

Communication Control Characters can be separated into two groups: Message Format characters and Intra-Line Control characters. A brief description of the function of the Communication Control Characters implemented in this system follows:

1. MESSAGE FORMAT CHARACTERS: There are three message format characters in ASCII. A complete description of their ASCII defined functions can be found in ASA publication X3.3.4/121. Their functions in this system are as follows:

   SOH – Start of Heading: The SOH character appears as the first code in all messages, except polling, selection and single character messages. Note: The heading is defined as that portion of the message that begins with SOH and includes a sequence of characters which constitute the address of a remote or routing information.

   STX – Start of Text: The STX character appears as the first code following the heading in all messages containing text. STX identifies all characters that follow, up to but not including ETX, as the text of the message.

   ETX – End of Text: The ETX character serves to terminate the text portion of all messages containing text. The ETX character always precedes the BCC (block check character).

2. INTRA-LINE CONTROL CHARACTERS: There are 7 intra-line control characters in ASCII. A complete description of their ASCII defined functions can be found in ASA publications X3.3.4/121. Those used by the TC and their function in this system are as follows:

   ACK – Acknowledgement: The affirmative response to selections and messages directed to the TC is the transmission of a message containing an ACK character. Messages transmitted by the TC to the Data Center are acknowledged by the Data Center. The TC recognizes and takes action on messages containing an ACK character received from the Data Center.

   NAK – Negative Acknowledge: The TC transmits a message containing a NAK character when either of the following two conditions prevails: a) A selection is recognized and the TC is not ready to receive. b) A message containing text is received but does not check. The TC recognizes and takes action on messages containing a NAK character received from the Data Center.

   ENQ – Inquiry: This character is always used to end a poll or selection message and requires a reply from the remote station. It may not be sent by a remote.

   EOT – End of Transmission: This character normally indicates the end of a transmission. However, in this control procedure, it is used as the first character in a poll or selection message. The Data Center (which is designated as the control station), by transmitting this code, sets all remotes in the control state (that is, listening for a poll or selection). If a TC is polled and is not ready to transmit it responds with EOT.

8.06.02 SPECIAL INSTRUCTION CODES

These codes, selected from the graphics of the ASCII set, have a special meaning when they appear in specified messages. Their designation and functions in this system are as follows:

1. POLL CHARACTER (LOWER CASE LETTER "P"): This character is part of a Polling message, and it inquires of an addressed remote location whether it is ready to transmit to the Data Center. It is ignored by all but the addressed remote and causes that station to reply with an EOT if it is not ready to transmit, or with the message if it is ready to transmit.
2. SELECTION CHARACTER (LOWER CASE LETTER "Q"): This character is part of a selection message, and it inquires of an addressed remote location whether it is ready to receive a message from the Data Center. It is ignored by all but the addressed station and causes that station to reply with a negative acknowledgement (NAK) if it is not ready to receive a data message from the Data Center, or with an ACK, if it is ready to receive a message.

8.06.03 TERMINAL ADDRESS (AD1, AD2)

A two-character identification address or "number" for each terminal is included in all messages. This permits a terminal to identify messages directed to it, and permits the Data Center to identify which terminal is sending a message to it. The address of a TC is established by the user program operating in Normal memory. As such, it can be changed at any time by the user program. Provisions are included to permit use of separate addresses for Polls and Selections when desired.

AD1 and AD2 are not unique ASCII codes in themselves, but represent the 2 characters of a terminal address. They may consist of any ASCII characters in columns 2 through 6, except the "circumflex" (column 5, row 14) or "underline" (column 5, row 15) characters. This provides 78 unique characters or a potential of 6,084 terminal addresses on a single communications channel.

8.06.04 BLOCK CHECK CHARACTER (BCC)

The Block Check Character is included in all data messages. It is used for error detection in the transmission of a data message to check the longitudinal parity of the characters. The BCC is not a unique character since it is generated based on a binary summation and, therefore, may become any character.

BCC is generated by independently summing each of the 7 individual levels (channels) of the codes transmitted. The BCC causes the sum of the number of "on" bits in each of these levels of the transmitted codes to be even. Longitudinal parity is, therefore, even. A character parity bit is then generated for the BCC which is even, conforming to the individual character parity scheme being employed by the TC. The summation to obtain BCC starts with the first character following SOH in the message being transmitted. With the exception of SOH, all characters in the message are included in the summation. BCC follows the ETX character and always appears as the last character in a data message. Generation of BCC is an automatic function of the TC Data Communication Processor for all data messages transmitted to the Data Center; checking the BCC on all data messages received from the Data Center is likewise an automatic function.

8.06.05 MESSAGE FORMATS AND LENGTH

Poll Messages

The purpose of the Poll Message is to inquire of the terminal if it is ready to transmit a message. The terminal must receive a poll before it can begin transmission. The Poll Message starts with EOT, followed by the address of the terminal (AD1, AD2), followed by the Poll character (POL = p), and is terminated with ENQ.

Select Messages

A Select Message inquires of the terminal if it is ready to receive a message from the Data Center. It begins with EOT, followed by the address of the terminal (AD1, AD2), followed by the Select character (SEL = q), and is terminated with ENQ.

Data Messages

Data messages are messages containing data that are transmitted to the Data Center or are received from the Data Center. Data Messages begin with Start of Header (SOH), followed by the terminal address (AD1, AD2), the transmission number (TR#), Start of Text (STX), the text of the message, and are terminated with End of Text (ETX) and the Block Check Character (BCC).

Message Length

Poll and Selection messages have a defined length of 5 characters.

Data Messages have a defined number of control and format characters of from 7 to 9 characters. The text of a message may contain from 1 to 255 characters; the text portion consists of everything following STX up to ETX (does not include ETX and BCC).

Certain response messages will consist of a single character.

8.06.06 MESSAGE CONVENTIONS

Polling and Selecting is directed by the Data Center, and consists of the Data Center transmitting a Poll Message or a Select Message to the terminal.

A remote will ignore any poll or selection that is not addressed to it or that contains a parity error.

A remote that is anticipating a single character response will ignore any single character message received (ACK, NAK or EOT) that contains a parity error.

If the Data Center is anticipating a single character response and it fails to receive a good character, it will time out, terminate the sequence and reinitiate the transaction.

8.06.07 POLL

A Poll will be acknowledged by the terminal transmitting a data message if the remote is output ready. A Poll to a terminal that is not output ready will result in the automatic transmission of EOT by that TC.

Data messages transmitted to the Data Center will be acknowledged by a single character ACK if received properly or by a single character NAK if not properly received.

Receipt by the remote of a single character ACK from the Data Denter (resulting from receipt at the Data Center of a good data message) will cause the remote to transmit a single character EOT. When the Data Center receives this it will transmit EOT and reinitiate the polling/selection routine.

Receipt by the remote of a single character ACK from the Data Center (resulting from receipt of a good data message) will cause the remote to reset the Transmit Ready condition flag, thus freeing the output buffer for reloading by the operator (user program).

Receipt by the remote of a single character NAK from the Data Center (resulting from failure of the Data Center to receive a good data message) will cause the remote to retransmit the message. The remote will retransmit the message as many times as it receives a NAK from the Data Center. The data message will be retained in the Transmit buffer by the remote and the Transmit Ready Flag will not be reset until receipt of ACK from the Data Center.

Failure of the Data Center to receive a message or an EOT from a polled remote will result in the Data Center timing out, ending the sequence and transmitting an EOT, either as a single character of as a part of a new poll or selection. If the polled remote had been Transmit ready, it will still have its assembled message and will be ready to transmit when next polled.

8.06.08 SELECT

A selection will be acknowledged by a remote transmitting a single character ACK if it is receive ready. A remote may, by the user program, not acknowledge a selection. This allows a selected remote to indicate that it requires a poll.

Selection of a remote that is not receive ready will result in the transmission of a single character NAK by the remote. This will cause the Data Center to transmit an EOT character either as a single character or as it continues its polling and/or selecting routine.

Data messages transmitted to the remote will be acknowledged by a single character ACK if received properly, or by a single character NAK if not properly received.

Receipt by the Data Center of a single character ACK from a remote resulting from receipt at the remote of a good data message will cause the Data Center to re-establish the control state by transmitting a single character EOT or an EOT that is the first character of a poll or selection. The other remotes in this same network will now become sensitive to the polling/selection routine which will now be reinitiated by the Data Center.

Receipt at the Data Center of a single character NAK from a remote resulting from failure of a remote to receive a good data message following selection will cause the Data Center to retransmit the message. Continued retransmission resulting in receipt of NAK's up to "n" times, by data center count, will result in transmission by the Data Center of EOT either as a single character or as part of a poll or selection.

Failure of the Data Center to receive an ACK or a NAK in a specified period of time from a remote following selection results in the Data Center timing out and transmitting EOT either as a single character or as the first character of a reselection, or a new poll or selection.

Failure of the remote to receive a message from the Data Center following selection will mean that the remote will transmit neither ACK nor NAK. The absence of this reply will be detected at the Data Center and the remote will be reselected.

8.06.09 TRANSMISSION NUMBERS (TR#)

As an optional convention, all data messages transmitted to and from a TC may contain a transmission number to permit verifying that all messages are sent or received in sequence. The Transmission Number may consist of from 1 to 3 characters and is located in the header portion of the data message, following the terminal's address and preceding the STX character:

Example: SOH, AD1, AD2, TR# (up to 3 char.), STX, (..text..), ETX, BCC

The Transmission Number utilizes the ASCII numerals 0 to 9. (ASCII 3/0 to 3/9).

Polling, Selecting, or single character messages do not use a transmission number.

When transmission numbering is not desired in a system, it is omitted by a firmware option.

8.06.10 SEND TRANSMISSION NUMBER

In this convention, all messages transmitted by the TC to the Data Center are given a transmission number by the Data Communication Processor. When the transmission is successful (TC has received "ACK" from Data Center), the number is automatically incremented by one (1). Retransmissions of the message (receipt of "NAK" or no response from the Data Center) do not increment the number. It is the function of the Data Center to check this number to assure that messages are received in sequence. If the number is not in sequence, the Data Center would so notify the terminal. Program instructions are provided for the TC user program to both check the present number and load a new number.

When the send transmission number has been incremented to its limit (9, 99 or 999 depending on the number of characters implemented by the Data Communications firmware), the next incrementation automatically resets the number to zero (hexadecimal value of ASCII "0" is 3/0).

8.06.11 EXPECTED TRANSMISSION NUMBER

In this convention, the Data Communication Processor maintains an "Expected Transmission Number" which it compares to the actual number contained in messages received from the Data Center. If the "actual" transmission number agrees with the "expected" number, the expected transmission number is then incremented by one (1) automatically by the Data Communication Processor, if the message is correct in other respects. If the two numbers do not agree, the expected transmission number is not incremented, and the Transmission Failure Flag is set (Flag D1 in the Data Communication Processor). In this case, the message is still allowed to be received and the Data Communication Processor will send an ACK to the Data Center (if the message is correct in other respects).

Program Instructions are provided for the TC user program to examine the present expected transmission number, to load a new number, and also to check the status of the Transmission Failure Flag. It is the function of the user program to check that messages are received in sequence, and to notify either the operator or the Data Center in the event that the sequence has been broken.

When the Expected Transmission number has been incremented to its limit (9, 99 or 999 depending on the number of characters implemented by the Data Communications firmware), the next incrementation automatically resets the number to zero (hexadecimal value for ASCII "0" is 3/0).

8.06.12 TIME OUT RECOVERY

If the terminal fails to respond, the Data Center should time out. No response will ordinarily be the result of one of four conditions being present:

1. The addressed terminal is not on line.
2. The EOT, POL, or SEL, or SOH characters are corrupted.
3. The address AD1, AD2 following the EOT is corrupted thereby preventing any TC on line from recognizing the address.
4. The ETX character is corrupted. If the ETX character was lost the addressed TC continues looking for the ETX or an EOT. Therefore, one of the following two methods should be used by the Data Center when recovering from the time out.
    a. If the Data Center wishes to readdress the TC which just caused the time out, it should first transmit a single EOT. The EOT will return this TC to the ready to receive message state if the ETX had been corrupted. The Data Center should delay approximately 50 milliseconds before attempting to poll, select, fast select, etc. this terminal. This one character, EOT, insures against another time out if condition 4 occurred as the TC is unable to recognize a poll, select, fast select, etc. if it is waiting for an ETX.

b. If the Data Center wishes to address another terminal on the same line as the TC which timed out, it may proceed with the EOT, AD1, AD2, etc. sequence of the communications procedure, for only the terminal addressed in the previous sequence will be looking for the ETX. The EOT of this sequence will return a TC waiting for an ETX to the "ready to receive control message state" and prevent a time out on the next transmission to the TC which caused the time out.

8.06.13 CHECKING AND ERROR DETECTION FUNCTIONS

Each message is examined by the Data Communication Processor to determine if it is intended for this TC. If the message cannot be identified as being for this TC, it will be ignored. A message, once identified, is examined to see if it is a poll, selection, or data message.

All characters in a message are parity checked by the TC. Data messages (those beginning with SOH) will also be checked for longitudinal parity (BCC).

8.06.14 READY TO RECEIVE CONTROL MESSAGE STATE

If a poll is received, the Data Communication Processor checks the following and reacts as indicated.

Is the Poll for this TC?	Is Parity of each Character Correct?	Is the TC Transmit Ready?	TC Reaction
Yes	Yes	Yes	Transmit data message and go to "Polling Message Response" state.
Yes	Yes	No	Send EOT and stay in "Ready to Receive Control Message" state.
Yes	No		Ignore and stay in "Ready to Receive Control Message" state.
No			Ignore and stay in "Ready to Receive Control Message" state.

Note: A polling or selecting sequence must be received in one continuous transmission. It will be invalid if any of the 5 characters are separated by a stop bit, longer than 3.5 milleseconds (1200 bps operation).

If a selection is received, the Data Communication Processor checks the following and reacts as indicated.

Is the Selection for this TC?	Is Parity of each Character Correct?	Is the TC Receive Ready?	TC Reaction
Yes	Yes	Yes	Send ACK and go to "Select Message" state.
Yes	Yes	No	Send NAK and remain in "Ready to Receive Control Message" state.
Yes	No		Ignore and remain in "Ready to Receive Control Message" state.
No			Ignore and remain in "Ready to Receive Control Message" state.

Note: User programing may inhibit any responses to selections.

8.06.15 POLLING MESSAGE RESPONSE STATE

Following the transmission of a data message to the Data Center, the remote is in the "polling message response" state. In that state, it anticipates receipt of an acknowledgement (ACK or NAK). If any other type of message is received, the terminal returns to the "ready to receive control message" state and waits for a control message.

Response Received	Is Parity of each Character Correct?	TC Reaction
ACK	Yes	Reset transmit ready flag, send EOT and return to "ready to receive control message" state.
NAK	Yes	Retransmit* "n" times
Invalid Message of any kind		Ignore*

*Note: Data is retained in the Transmit buffer until an ACK is received. Retransmission will contain original message number and if original transmission was received, the Data Center can detect this and take appropriate action.

"n" is dependent on the number of NAK's transmitted by the Data Center.

8.06.16 SELECT MESSAGE STATE

Following the selection of a remote by the Data Center and the remote having indicated its ability to receive, by sending an ACK, the remote will check the message sent by the Data Center and react as follows:

Is the Message for this TC?	Do All Characters Parity Check?	Is BCC Okay and No Character Time Outs Have Occurred?	TC Reaction
Yes	Yes	Yes	Send ACK, set message received flag and return to "ready to receive control message" state.
Yes	Yes	No	Send NAK and stay in "select message" state.
Yes	Heading Yes/Text No	–	Send NAK and stay in "select message" state.
No or	Heading No	–	Ignore and return to "ready to receive control message" state.

If a remote is operating on a program where it is independent of the Data Center and it is polled by the Data Center, an automatic EOT will be sent provided the transmit ready flag is not set.

If a remote is operating on a program where it is independent of the Data Center and it is selected by the Data Center and the receive buffer is available, the remote will transmit an ACK and the data message can be received. When properly received the message received lamp will be lit and, if the user Program is so programed, the audible alarm will sound. If the receive buffer is not available when selected (receive ready flag not set) the remote will transmit a NAK to the Data Center.

If a polled remote is output ready and replies to a poll by transmitting a data message and that message is not received by the Data Center, the Center can repoll that location. However, the remote is in the state where it anticipates receiving ACK or can detect NAK to cause retransmission. If the Data Center sends a poll to cause retransmission, the remote is capable of detecting the EOT character at the beginning of the poll message and will retransmit that message. A similar condition applies in a selection sequence following transmission by a remote of the ACK to the selection control message. If that ACK is lost and the Data Center reselects the remote, the fact that this message, which begins with EOT, is another selection and not a data message is recognized and the ACK is retransmitted.

Turning power on and bringing the TC to the Ready mode puts the Data Communication Processor on-line and includes the resetting of both the transmit ready and the message receive flag (both lamps are off). The terminal is not ready to send but is ready to receive. Upon commencing execution of the user program, the use of the "Ready" button to return the base machine to the Ready Mode will not change the state of the flags.

8.06.17 BREAK FUNCTION

In the event that a remote is transmitting and the Data Center wishes to terminate the transmission, or shut off the remote, the TC is sensitive, though transmitting, to the carrier signal from the Data Center going to continuous spacing for a period of 25ms. This causes the TC to return to the "ready to receive control message" state. The message is retained and can be retransmitted with the same transmission number. Receipt of a new poll or selection beginning with EOT is anticipated. The break function is applicable only to those networks utilizing duplex lines.

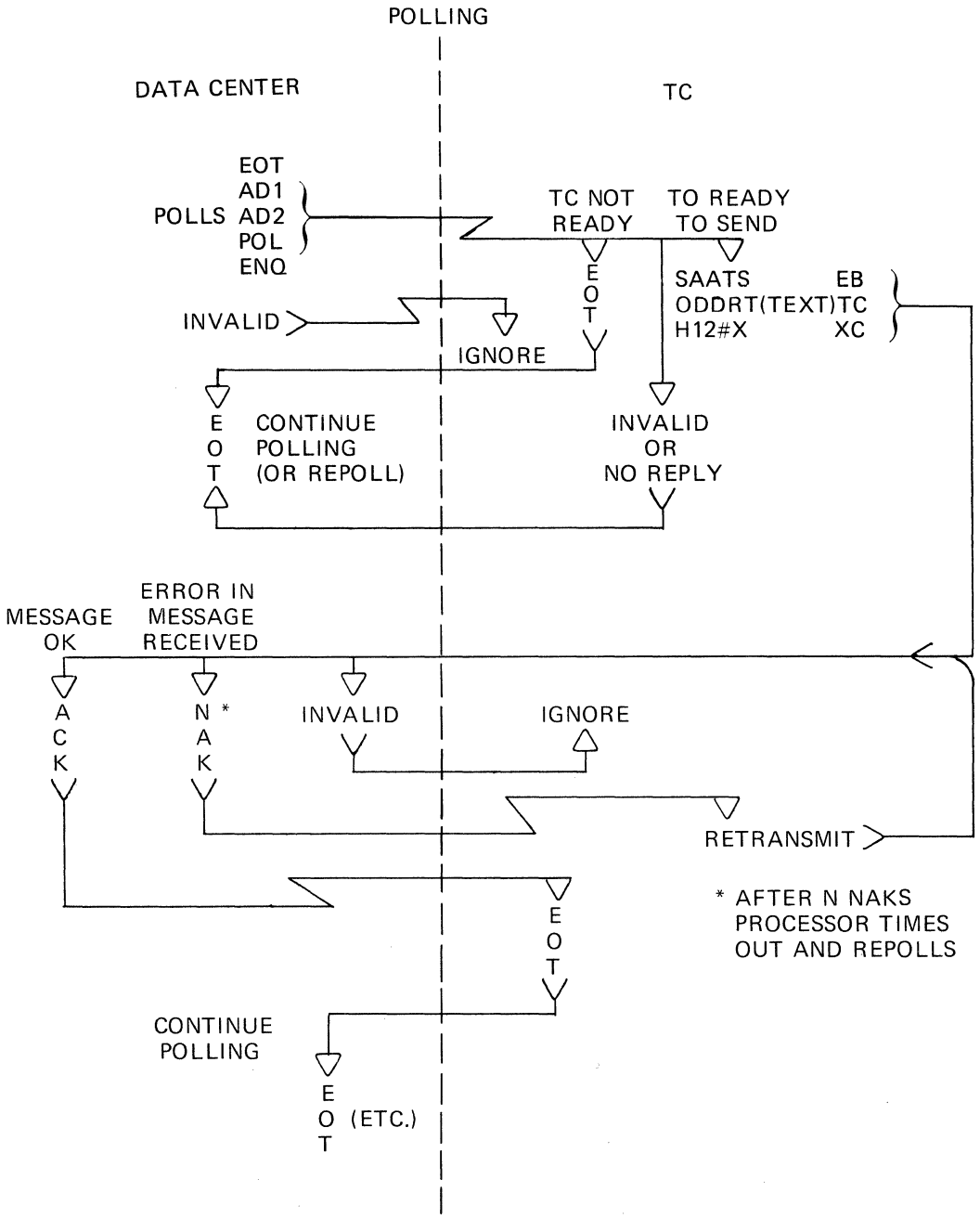


Figure 8.06.17-1 Polling

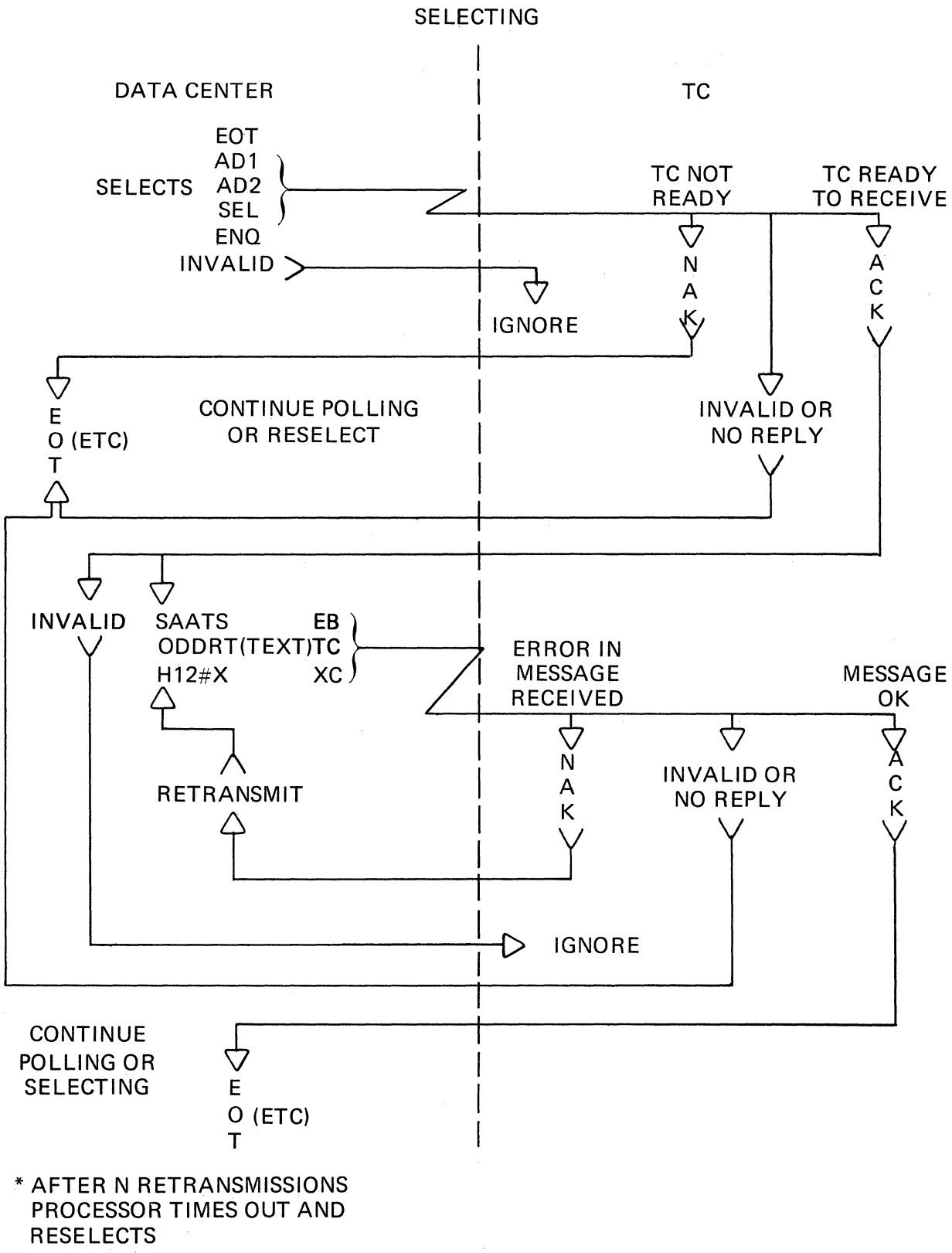


Figure 8.06.17-2 Selecting

8.07.00 GROUP POLL

Group Poll capability in remote TC's requires the Multiple Terminal Computer Controller (MTCC-4 Kit) control feature to be installed in all remote TC's. Two methods of Group Poll line disciplines are available:

1. Single Poll Method – Upon receipt of a single poll at the remote locations, all TC's in the group that are transmit ready will send their messages one at a time without the central processor having to issue another poll. If no TC is transmit ready a single EOT response is made.
2. Modified Poll Method – Upon receipt of a special poll at the remote location a single EOT response is made if no TC is transmit ready. If one or more TC's are transmit ready only one TC will respond with Text and an additional Poll(s) must be made to determine if other TC's in the group are transmit ready.

The advantage of Group Poll lies in its ability to reduce line control activity between a central computer and a remote site. More specifically the implementation of the MTCC feature significantly reduces the number of polls per group and thus allows the central computer to handle more terminals on a line without impairing response time. Up to eight (8) TC's containing the MTCC feature can be attached to a single data set.

Recovery procedures are identical to those listed in Topics 8.06.12 – 8.06.16.

8.07.01 HARDWARE/FIRMWARE REQUIREMENTS

The MTCC feature is compatible with all style TC's and is capable of operating at transmission rates up to 1200 bits per second with TC 500's and up to 1800 bits per second with TC 700, TC 1500 and TC 2500 styles.

A Group Poll firmware set is required in the Data Communications Processor of each TC using the Multiple TC Control feature. No changes are required in the Main Memory Firmware sets nor is the application program affected in any manner except for the addressing conventions discussed later. Selection of a TC is handled by the group poll firmware sets in the same manner as the Poll/Select line discipline discussed previously.

Two different methods of handling the group polling functions of the Multiple TC Control feature are provided. Each of these two methods requires its own firmware set in the Data Communications Processor.

8.07.02 GROUP POLL 1 – SINGLE POLL METHOD

A single poll from the Central Processor addressed to a group of TC's (i.e. TC's attached to a single data set) will cause one of three responses from the remote location:

1. A single EOT is transmitted by one of the machines if there are no terminals in that group ready to transmit. Polling of the remaining groups may then continue.
2. A single message is transmitted if only one terminal is transmit ready upon receipt of the poll. Following acknowledgement from the Data Center, this terminal will then transmit an EOT and polling may continue.
3. If more than one TC is transmit ready upon receiving the poll, one of the units will gain control of the line and transmit first. On receipt of the ACK from the Central Processor, the TC that just transmitted will return to the "ready to receive control message" state and another TC that is output ready will gain control and transmit. When the last output ready TC has transmitted and its message has been acknowledged, it will send an EOT thus permitting the Data Center to restart its polling sequence. If a NAK is received from the Central Processor in reply to a message sent by a remote TC, the TC that just transmitted will transmit.

Once a poll is received, the MTCC is insensitive to a change in status; not output ready to output ready, of any TC other than those indicated when the poll was first received. For example, if upon receipt of a poll, machine four and five were transmit ready, the remaining terminals in that group would not be able to transmit even if they became ready before end of transmission.

The following addressing conventions within a group of remote TC's must be adhered to when using either group poll method.

1. All AD1 values within any one group must be identical.
2. All AD2 values within any one group must come from the same column in the ASCII chart. Furthermore, within the column, AD2 must be a character from either rows 0-7 or rows 8-15. Either all AD2's within a group must come from rows 0-7 or they all must be from rows 8-15. They cannot be mixed.

Between groups of remote TC's, the machine addresses can differ in one of two ways:

1. A unique AD1 value for each group.
2. If it is necessary to duplicate AD1 values, then AD2 must be separate multiples of 8. For example, if a group of four TC's have addresses of A0 to A3, a second group of four must use the addresses beginning at A8. The address values A4-A7 cannot be used as addresses unless additional TC's are added to the first group.

See Figure 8.07.02-1 for a graphical representation of the Single Poll Method.

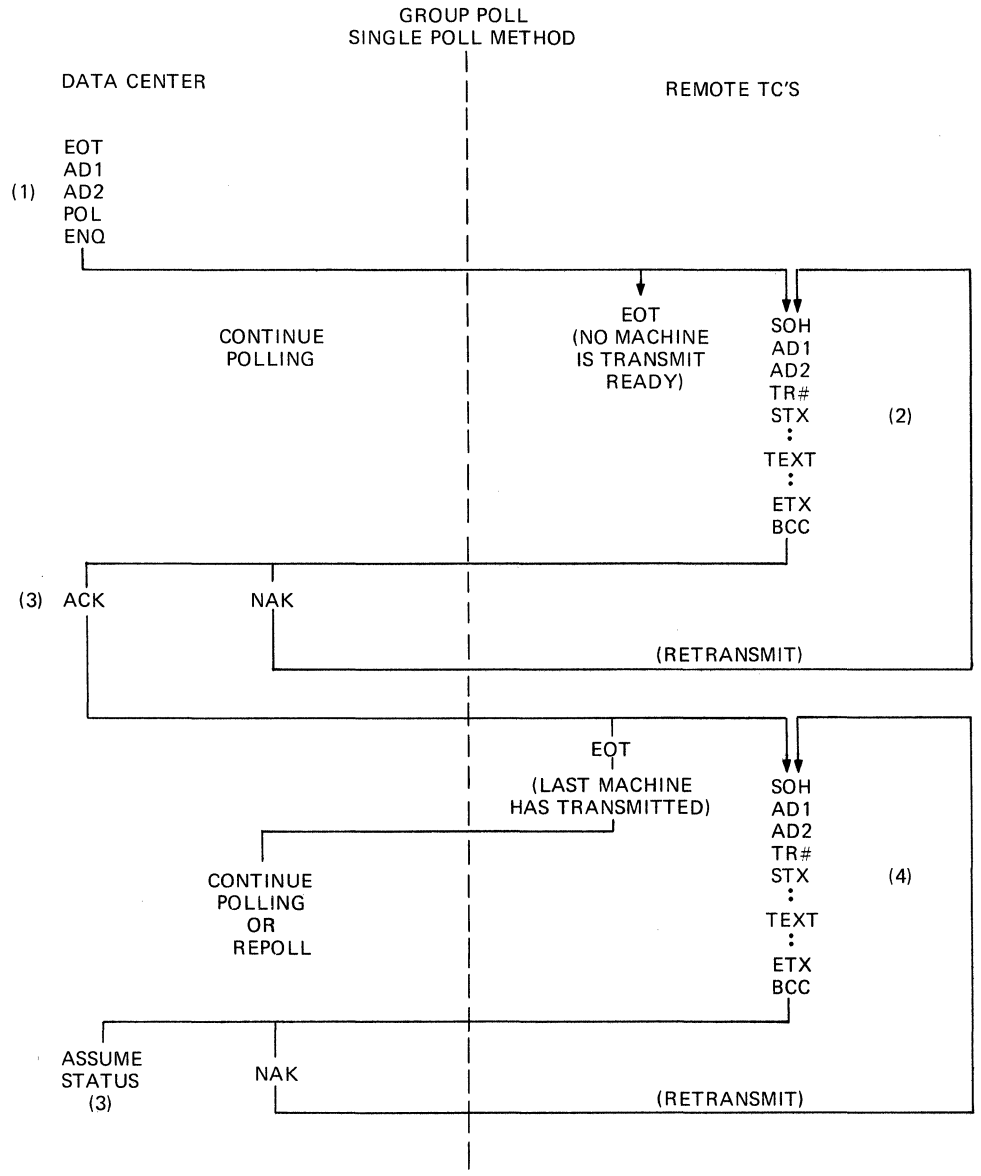


Figure 8.07.02-1 Single Poll Method

8.07.03 GROUP POLL 2 – MODIFIED POLL METHOD

A reset poll from the Data Center which contains a special address will cause one of the following responses from the TC group being addressed:

1. A single EOT will be sent by one of the machines to the Data Center if no machine in that group is output ready. Reset polling of the remaining groups may then continue.
2. If one or more TC's are transmit ready upon receiving the reset poll, one of the units will gain control of the line and transmit first. Upon receiving the acknowledgement (ACK) to its message, the terminal will transmit an EOT and set a flip-flop which will not allow the TC to transmit again until it receives another reset poll. The central site may then poll a different group or issue a secondary poll (termed a holding poll) to the same group of TC's. On the succeeding poll to the same group, again an output ready TC will gain control and transmit. Again the Data Center will acknowledge (ACK) the message and the TC that transmitted will respond with an EOT and remove itself from contention until the polling reverts to another reset poll. Should the Data Center transmit a negative response to a message it receives, the remote TC that sent the message will retransmit.

On succeeding polls within a group, all terminals that were output ready before the reset poll will contend for the line. Also, any terminal that has become output ready since the initiation of the last poll will contend for the line provided its flip-flop is not set.

The addressing conventions discussed in the Single Poll method of Group Poll are identical to those required under the Modified Poll Method plus the following:

1. Reset Poll – A reset poll is defined as containing the value "000" in the last three bits of AD2. It must be the first poll issued to a group as its function is to reset the flip-flop on the machines, thus allowing a TC which has previously transmitted to transmit again. If the machine addresses within a group are from rows 0 to 7 on the ASCII chart, the value of AD2 in a reset poll must be the row 0 value. If the machine addresses are from rows 8 to 15, the value of AD2 in the reset poll must be the row 8 value.
2. Holding Poll – A holding poll is defined as any value other than "000" in the last three bits of AD2. It can be a constant value (e.g. "001") or it can be incremented on each succeeding poll and thus serve as a counter.

   It is possible to receive an EOT instead of a message as a reply to a holding poll. This would occur when there are no other TC's within the group ready to transmit. The next poll to the specific group following an EOT response from that group to a holding poll should be a reset poll.

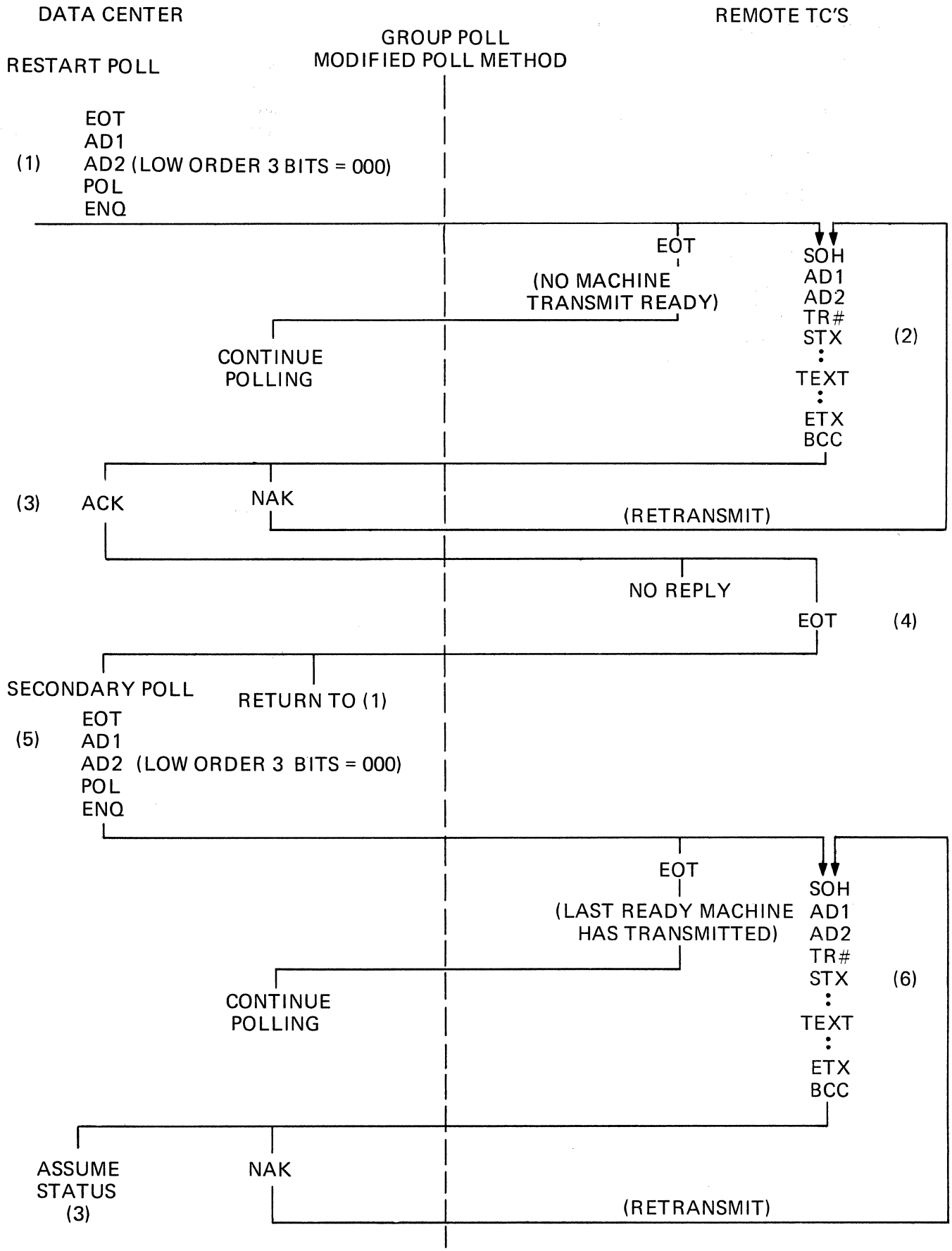


Figure 8.07.03-1 Group Poll

8.08.00 FAST SELECT

The Fast Select procedure is used when it is desired to transmit a message to a terminal whose status is known to be receive ready or when the Data Center does not wish to test the receive status of the terminal. The character 7/3 ("s") of ASCII Standard Code for Information Interchange (X3.4, July, 1967) is used to indicate the fast select procedure. This character is normally referred to as the fast select (FSL) character.

Fast Select capability is present in Burroughs Standard Poll/Select DCP Firmware and in both Group Poll DCP Firmware Sets.

8.08.01 LINE DISCIPLINE

The addressed terminal will respond with ACK or NAK to a fast select. ACK indicates the TC received the message correctly; NAK indicates an error occurred or the TC was not receive ready. If the reply is NAK, the Data Center may retransmit "n" times ("n" may equal zero). Figure 8.08.01-1 shows the character sequences used by the fast select communications procedure.

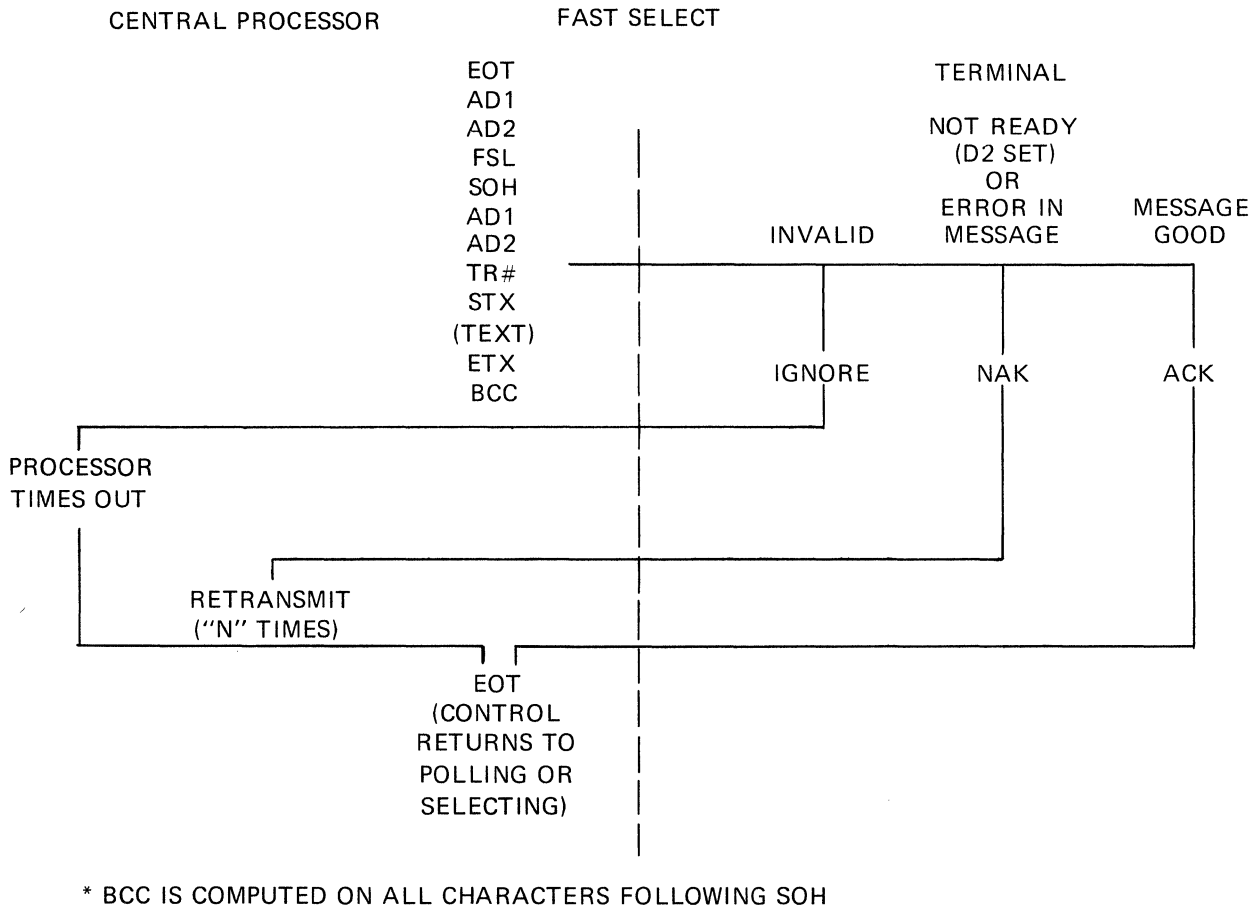


Figure 8.08.01-1 Fast Select

8.08.02 TIME OUT RECOVERY

If the terminal fails to respond, the Data Center should time out. No response will ordinarily be the result of one of four conditions being present:

1. The addressed terminal is not on line.
2. The EOT, FSL, SOH characters are corrupted.
3. The address AD1, AD2 following the EOT is corrupted thereby preventing any TC on line from recognizing the address.
4. The ETX character is corrupted. If the ETX character was lost the addressed TC continues looking for the ETX or an EOT. Therefore, one of the following two methods should be used by the Data Center when recovering from the time out.
   a. If the Data Center wishes to readdress the TC which just caused the time out, it should first transmit a single EOT. The EOT will return this TC to the "ready to receive control message" state if the ETX had been corrupted. The Data Center should delay approximately 50 milliseconds before attempting to poll, select, fast select, etc. this terminal. This one character EOT insures against another time out if condition 4 occurred as the TC is unable to recognize a poll, select, fast select, etc. if it is waiting for an ETX.
   b. If the Data Center wishes to address another teminal on the same line as the TC which timed out, it may proceed with the EOT, AD1, AD2, etc. sequence of the communications procedure, for only the terminal addressed in the fast select will be looking for the ETX. The EOT of this sequence will return a TC waiting for an ETX to the "ready to receive control message" state and prevent a time out on the next transmission to this TC.

      Figure 8.08.02-1 provides information as to the TC reaction to a fast select.

8.08.03 TRANSMISSION NUMBERS

If the communications system includes transmission numbers in messages, a set of Expected Transmission Numbers will be maintained by the DCP.

Whenever the TC receives a message under the fast select communications procedures it compares the transmission numbers in the message with the expected transmission numbers. If they are equal the expected number is incremented and D1, transmission failure flag, is reset. If the numbers are not equal the expected numbers remain unchanged and D1 is set.

FAST SELECT

Can TC Recognize EOT, SOH, FSL	Is Message for this TC	Is TC Receive Ready	Can TC Recognize STX	Does AD1, AD2 (Following EOT) Equal AD1, AD2 (Following SOH)	Text less than 256 Char	ETX Recognize	BCC Good	All Char even Parity	Reaction
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Message Good receive message, set D2, compare TR no., transmit ACK, and go to ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Error in Message Receive Message, transmit NAK and go to ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No		"
Yes	Yes	Yes	Yes	Yes	Yes	No			TC continues looking for ETX or EOT which will return it to the ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	No				Error in Message TC waits for transmission to end, sends NAK, and goes to ready to receive control message state.
Yes	Yes	Yes	Yes	No					Error in Message TC waits for transmission to end, sends NAK, and goes to ready to receive control message state. Must recognize ETX.
Yes	Yes	Yes	No						"
Yes	Yes	No							"
Yes	No								TC Ignores
No									"

Figure 8.08.02-1 Fast Select

8.09.00 GROUP SELECT

Group Select is a fast select of a group of terminals. The FSL character of the fast select procedure is replaced by the Group Address in this communications procedure. The Group Address, called the Group Select (GSL) character, may be any agreed upon character from ASCII columns 2 through 6. The address in the message is now the group address plus the individual address of one of the terminals in the group.

To use group select the group address must be added to TC's address. It can either be entered into the Permanent Machine Address (word 1064) by Field Engineering or the Receive Machine Address (word 1201) via the LRA instruction. The GSL character is placed into digit positions 11 and 10 of either address word.

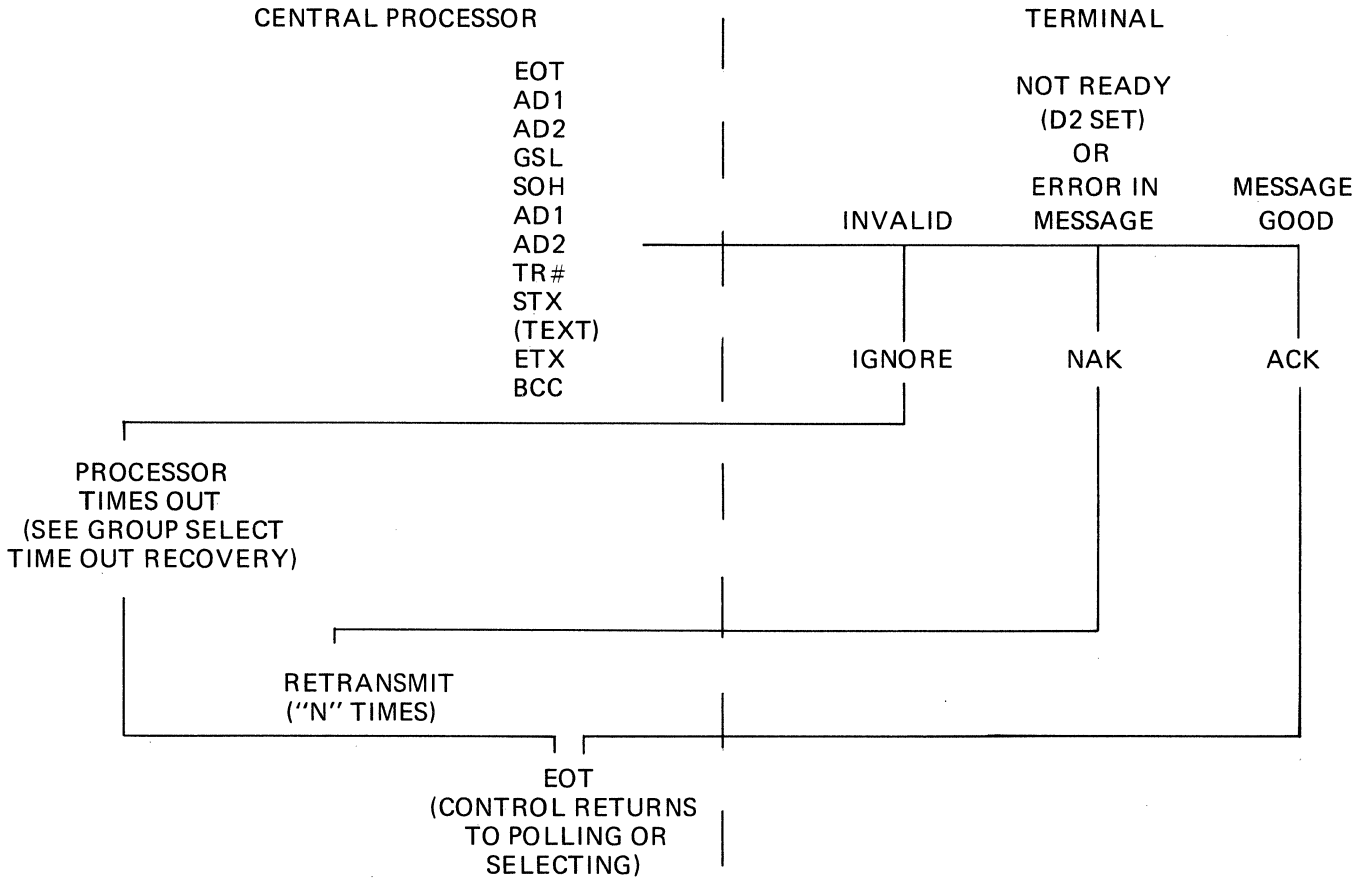
15	14	13	12	11	10
AD1	AD2	AD2		GSL	

As part of the Receive Machine Address it can be handled programmatically in the same manner as AD1, and AD2.

Group Select capability is provided in Burroughs Standard Poll/Select DCP Firmware and in both Group Poll DCP firmware sets.

8.09.01 LINE PROCEDURE

Those terminals having the group address matching the one in the message will receive the message (if they are receive ready). Only terminal AD1, AD2 of the group will respond with ACK or NAK as the case may be. ACK indicates the TC whose address is AD1, AD2, GSL received the message correctly; NAK indicates the addressed TC recognized an error in the procedure or was not receive ready. If the reply is NAK, the Data Center may retransmit "n" times ("n" may equal zero). Figure 8.09.01-1 shows the character sequences used by the group select communications procedure.



* BCC IS COMPUTED ON ALL CHARACTERS FOLLOWING SOH.

Figure 8.09.01-1 Group Select

8.09.02 TIME OUT RECOVERY

If the terminal fails to respond, the Data Center should time out. No response will ordinarily be the result of one of four conditions being present:

1. The addressed (AD1, AD2, GSL) terminal is not on line.
2. The EOT, GSL, or SOH characters are corrupted.
3. The address AD1, AD2 following the EOT is corrupted thereby preventing any TC on line from recognizing the two characters.
4. The ETX character is corrupted. If the ETX character was lost the addressed TC continues looking for the ETX or an EOT. Therefore, one of the following two methods should be used by the Data Center when recovering from a time out. These methods are based on the assumption that the time out occurred due to the loss of the ETX (Condition 4).
   a. If the Data Center wishes to address a TC which belongs to the group of terminals which caused the time out it should first transmit a single EOT. The EOT will return any TC's in the group to the "ready to receive control message" state if condition 4 has occurred. The Data Center should delay approximately 50 milliseconds before attempting to group select or poll, select, fast select, etc. terminals in this group. This one character EOT insures against another time out if condition 4 occurred as the TC is unable to recognize a poll, select, fast select, etc. if it is waiting for an ETX.
   b. If the Data Center wishes to address another terminal on this same line but not belonging to the group which just caused the time out, it may proceed with the EOT, AD1, AD2, etc., sequence of the communications procedure for only those terminals whose group address does not match those looking for an ETX. The EOT of the sequence will return any TC's waiting for an ETX to the "ready to receive control message" state and prevent a time out due to the TC being unable to recognize a poll, select, fast select, etc. on the next transmission to these TC's.

   Figure 8.09.02-1 provides information as to the TC reaction to a group select.

GROUP SELECT

Can TC Recognize EOT, SOH	Does GSL Match	Is TC Receive Ready	Can TC Recognize STX	Does AD1, AD2 (Following EOT) Equal AD1, AD2 (Following SOH)	Text Less Than 256 Char	ETX Recognized	BCC Good	All Char Even Parity	Reaction
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Message Good Receives Message, sets D2, compares TR No., addressed TC transmits ACK* and goes to ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Error in Message Receives message, addressed TC transmits NAK*, and goes ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No		"
Yes	Yes	Yes	Yes	Yes	Yes	No			TC continues looking for ETX or EOT. EOT will return TC to the ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	No				Error in Procedure TC waits for transmission to end, addressed TC sends NAK* and goes to ready to receive control message state.
Yes	Yes	Yes	Yes	No					Error in Procedure TC waits for transmission to end, addressed TC sends NAK*, and goes to ready to receive control message state. Must recognize ETX.
Yes	Yes	Yes	No						"
Yes	Yes	No							"
Yes	No								Ignore-Invalid
No									"

*NOTE: Only the addressed TC (AD1, AD2, GSL match) will respond to the Group Select Message. All other TC's in the Group (GSL match only) which are receive ready will accept the message, but will not respond.

Figure 8.09.02-1 Group Select

8.09.03 TRANSMISSION NUMBERS

In those systems with a transmission number in the messages a set of Expected Group Select Transmission Numbers is maintained. When the TC receives a message under the group select procedure, the data communication processor compares the received transmission number with the expected group select transmission numbers. If they are equal the expected number is incremented and D1 is reset. If the numbers are not equal the expected numbers remain unchanged and D1 is set.

Since only the TC whose address is AD1, AD2, GSL will answer a group select the Data Center will not immediately know if every machine in the group was able to receive the message (some machines in the group may be off line, or have a message in the receive buffer, D2 set). However, by using certain techniques this uncertainty can be removed. First, many systems will have times when the Data Center knows the receive condition of the machine and can transmit under group select assured that all machines in the group are receive ready. Second, by using an addressing scheme which results in the AD1-AD2 at some time corresponding to each machine in the group, a response should be received from each TC verifying that it is on line. Third, by checking transmission numbers, any lost or duplicated message can be detected. If it is determined that a message has been lost or received previously, recovery from the condition must be defined by the communications system.

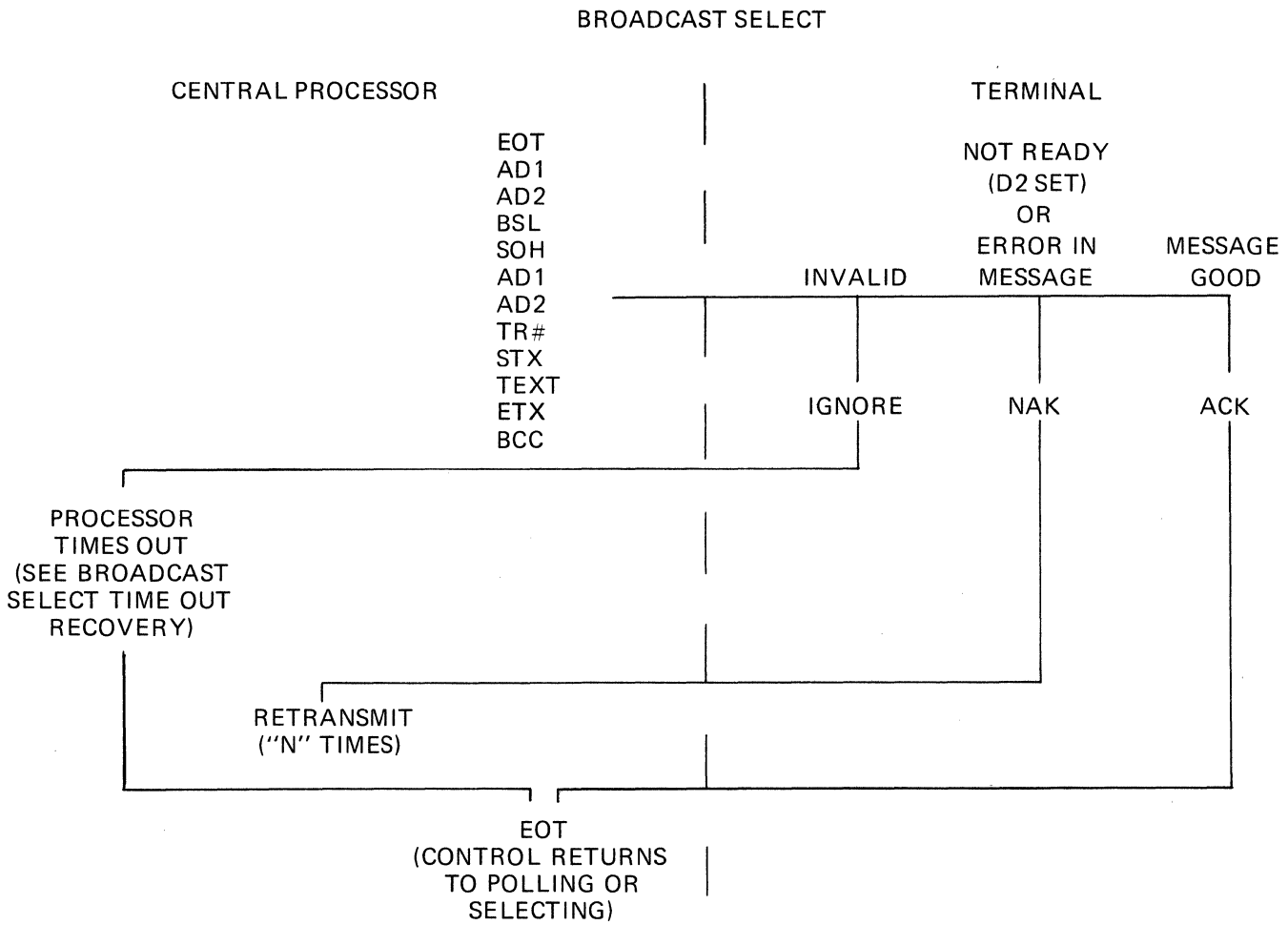
8.10.00 BROADCAST SELECT

This procedure is used when it is desired to transmit a message to all terminals on a line. A special Broadcast Select (BSL) character, the character 7/4 ("t") of the ASCII Standard Code for Information Interchange (X3.4, July, 1967), is used in the selection sequence to indicate to all terminals that this is a broadcast message and all are to accept the message. This code is followed by the start of heading (SOH) of the message. No acknowledgement of the select portion of the message is made.

Broadcast Select capability is provided in Burroughs Standard Poll/Select DCP Firmware and in both Group Poll DCP firmware sets.

8.10.01 LINE DISCIPLINE

The address AD1, AD2 in the line procedure identifies the terminal which will acknowledge receipt of the message. The response of the addressed terminal is ACK or NAK. ACK indicates this TC received the message; NAK indicates this TC was not receive ready or an error occurred in transmission. If the reply is NAK the Data Center may retransmit "n" times ("n" may equal zero). If the terminal fails to respond, the Data Center should time out. Figure 8.10.01-1 shows the character sequences used by the broadcast select communications procedure.



* BCC IS COMPUTED ON ALL CHARACTERS FOLLOWING SOH.

Figure 8.10.01-1 Broadcast Select

BROADCAST SELECT

Can TC Recognize EOT, BSL, SOH	Is TC Receive Ready	Can TC Recognize STX	Does AD1, AD2 (Following EOT) Equal AD1, AD2 (Following SOH)	Text Less Than 256 Char	ETX Recognized	BCC Good	All Char Even Parity	Reaction
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Message Good Receives message, sets D2, compares TR No., addressed TC transmits ACK*, and goes to ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Error in Message Receives message, addressed TC transmits NAK* and goes to ready to receive control message state.
Yes	Yes	Yes	Yes	Yes	Yes	No		"
Yes	Yes	Yes	Yes	Yes	No			TC continues looking for ETX or EOT. EOT will return TC to the ready to receive control message state.
Yes	Yes	Yes	Yes	No				Error in Procedure TC waits for transmission to end, addressed TC sends NAK* and goes to ready to receive control message state.
Yes	Yes	Yes	No					Error in Procedure TC waits for transmission to end, addressed TC sends NAK*, and goes to ready to receive control message state. TC must recognize ETX.
Yes	Yes	No						"
Yes	No							"
No								INVALID – Ignore

*NOTE: Only the addressed TC will respond to the Broadcast Select message. All other TC's which are receive ready will accept the message but will not respond.

Figure 8.10.01-2 Broadcast Select

8.10.02 TIME OUT RECOVERY

No response will ordinarily be the result of one of four conditions being present:

1. The addressed terminal is not on line.
2. The EOT, BSL, or SOH characters are corrupted.
3. The address AD1, AD2 following the EOT is corrupted, thereby preventing any TC on line from recognizing the address.
4. Corruption of the ETX character. When this happens all TC's unable to recognize an ETX will continue looking for an ETX or an EOT.

Since all machines on a line listen to a broadcast select message if the loss of the ETX character is responsible for the time out, all machines will be unable to recognize a poll select, fast select, etc. It is therefore suggested that a one character EOT be transmitted by the Data Center whenever a time out occurs to insure that the machines on the line are not in the state described in 4. The EOT will return the machine to the "ready to receive control message" state allowing recognition of a next poll, select, fast select, etc. sent by the Data Center. The Data Center must delay a minimum of 50 milliseconds between the single character EOT and the next control message.

8.10.03 TRANSMISSION NUMBERS

For those systems with transmission numbers in the messages, the DCP will mainatain a set of Expected Broadcast Select Transmission Numbers. Whenever the TC receives a message under the broadcast select line procedure, the data communications processor compares the received transmission number with the expected broadcast select transmission numbers. If they are equal the expected number is incremented and D1 is reset. If the numbers are not equal the expected number remains unchanged and D1 is set.

It must be recognized that some stations may not be able to receive a broadcast select due to operational considerations (receive buffer not available, power off, etc.). The Data Center will receive a response from only the TC it addressed and will not immediately know whether all other terminals received the message. Under this condition, the system should adhere to the guide lines presented for group select, namely:

1. Using this transmission procedure when it is known that all TC's are on line and receive ready.
2. Rotating the address in the header so as to address all terminals that are to be on line.
3. Checking transmission numbers.

Once again, the action the TC and Data Center take as a result of discovering that a message has been lost or received previously must be part of the system definition.

8.11.00 CENTRAL TC CONTROLLER (CTCC)

Central TC Controller (CTCC) is a Data Communications Processor (DCP) firmware set which allows a TC to assume the Data Communication I/O functions of a central processing unit in a polling and selecting environment. A TC which utilizes the Central Controller DCP Firmware can control from 1 to 16 remote TC's in an on-line application environment.

The Central TC Controller operates in a standard Polling and Selecting line control environment. In addition to standard selection of remote units the following types of special select formats are provided:

Fast Select, Group Select, and Broadcast Select.

The polling or selecting of the various terminals in a network is controlled by a series of 16 control words which are stored in the memory of the Data Communications Processor. These control words can easily be accessed and manipulated as required by macro programing techniques thus giving the user program positive operational control of the network.

In addition to controlling the polling and selecting operations, the line discipline of the Central TC (the term used to describe the TC loaded with the CTCC firmware) can also be controlled. This is possible because the line discipline of a Central TC is not buried in the program codes of the DCP. Instead, it is specified and controlled by a collection of Line Procedure Format Registers. A degree of flexibility of line discipline is thus achieved because a change of line discipline does not require a change in the firmware.

The controller will function via a switched, leased or direct connect line configuration.

The following sections are discussed in detail: the line disciplines of a Central TC as controlled by the Format Registers; the Datacom Processor operations of polling and selecting as controlled by the Control Registers; and the Main Memory firmware requirements.

8.11.01 LINE DISCIPLINE FORMAT REGISTERS

Several disciplines are made possible through the use of the Central TC Controller firmware. The line procedures that can be implemented by this new Datacom firmware are: poll, select, fast select, group select, and broadcast select.

Each line procedure uses two Format Registers. Each register consists of one word or eight (8) characters. The most significant character position is called the Data Character Counter (DCC) and is used to specify the number of significant characters contained in the Format Register (this is indicated in digit position 14) along with other information (digit position 15). The seven (7) remaining character positions accommodate the necessary format character which must be right justified. Dummy characters are used as substitutes for the address (AD1, AD2, and group address) and the transmission number (TR1, TR2, and TR3). The actual terminal address and transmission number will be fitted in by the Controlled firmware during the actual transmission.

The dummy characters used in each of the Format Registers are further defined:

	Character	Dummy Hexadecimal Value
	AD1	80
	AD2	81
	AD3 (Group)	82
These values must be used in a three (3) TR # system.	TR1	88
	TR2	89
	TR3	8A
Must be used in a two (2) TR # system.	TR1	89
	TR2	8A
Value in a one (1) TR # system.	TR1	8A

All of the actual characters to be transmitted from each of the Format Registers have their normal ASCII format with their parity bits equal to zero (0). Their correct parity bits are generated by hardware as each character goes out on the line.

The succeeding sections specify the formats of the individual pairs of Format Registers used with the various line disciplines supported by the Central TC Controller.

8.11.02 POLL FORMAT REGISTERS

These two registers are the Poll Message Register and the Expected Header Register.

The Poll Message Register is located in word 1155 and consists of the actual (and dummy) characters, right justified and in their proper sequence, that are used to poll the slave terminal(s). The Data Character Counter (DCP) in character position eight (8) of the Poll Register contains a value from zero (0) to six (6) depending on the number of characters in the poll message. A poll message one (1) character in length would have a DCC value of zero (0). A poll message seven (7) characters in length would have a DCC value of six (6).

EXAMPLE: Poll Message Register containing the standard TC polling characters.

Character Position	8	7	6	5	4	3	2	1
Word 1157	04	00	00	04	80	81	70	05
	DCC			EOT	AD1	AD2	POL	ENQ

The Expected Header Register is located in word 1154 and consists of the actual (and dummy) characters, right justified and in correct sequence, that are in the header portion of the remote terminal's message. A comparison is made using only the first and last character of the actual received header against the first and last character of the expected header. The DCC in character position eight (8) of the Expected Header Register again contains a value from zero (0) to six (6) depending on the number of characters loaded into the register. The BCC is computed, starting with the second significant character in the Expected Header Register.

EXAMPLE: Expected Header Register containing the standard TC header for a three digit transmission number system.

Character Position	8	7	6	5	4	3	2	1
Word 1154	06	01	80	81	88	89	8A	02
	DCC	SOH	AD1	AD2	TR1	TR2	TR3	STX

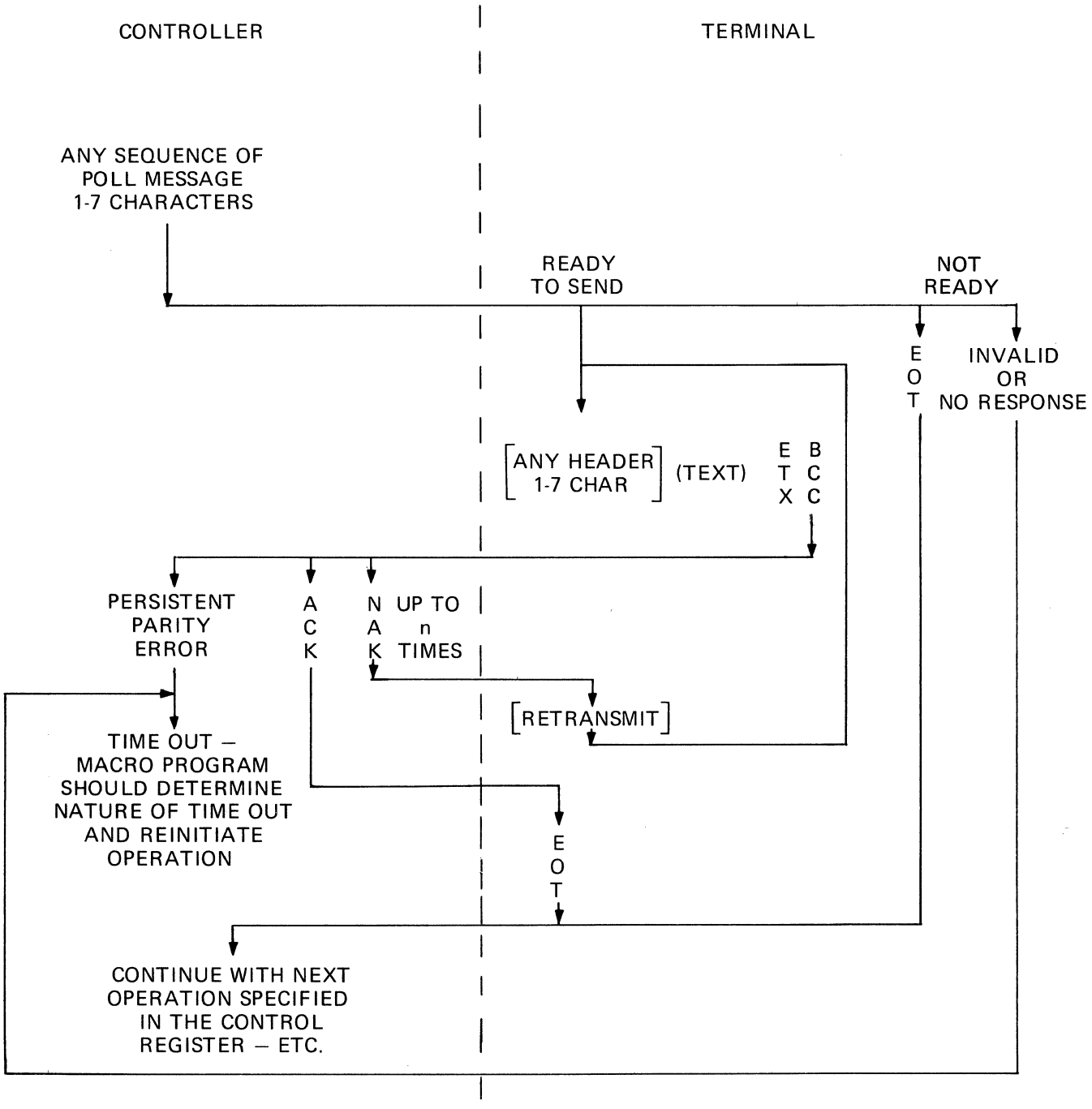


Figure 8.11.02-1 Poll

8.11.03 SELECT FORMAT REGISTERS

There are two select registers; the Select Message Register and the Header Format Register.

The Select Message Register is located in word 1157 and contains the characters (both actual and dummy) that are used to select the slave terminal(s).

EXAMPLE: Select Message Register with standard TC select characters.

Character Position	8	7	6	5	4	3	2	1
Word 1157	04	00	00	04	80	81	71	05
	DCC			EOT	AD1	AD2	SEL	ENQ

The Header Format Register is located in word 1156. It contains the characters (actual and dummy) that are in the header portion of the Central TC's message. Depending on the number of characters in the header, character position eight (8) of the Header Register contains one of the following hexadecimal values for the DCC.

No. of Characters in Header	DCC Value
1	08
2	09
3	0A
4	0B
5	04
6	05
7	06

The BCC is computed, starting with the second significant character in the Header Register.

EXAMPLE: Header Format Register containing the standard TC header for a no transmission number system.

Character Position	8	7	6	5	4	3	2	1
Word 1156	OB	00	00	00	01	80	81	02
	DCC				SOH	AD1	AD2	STX

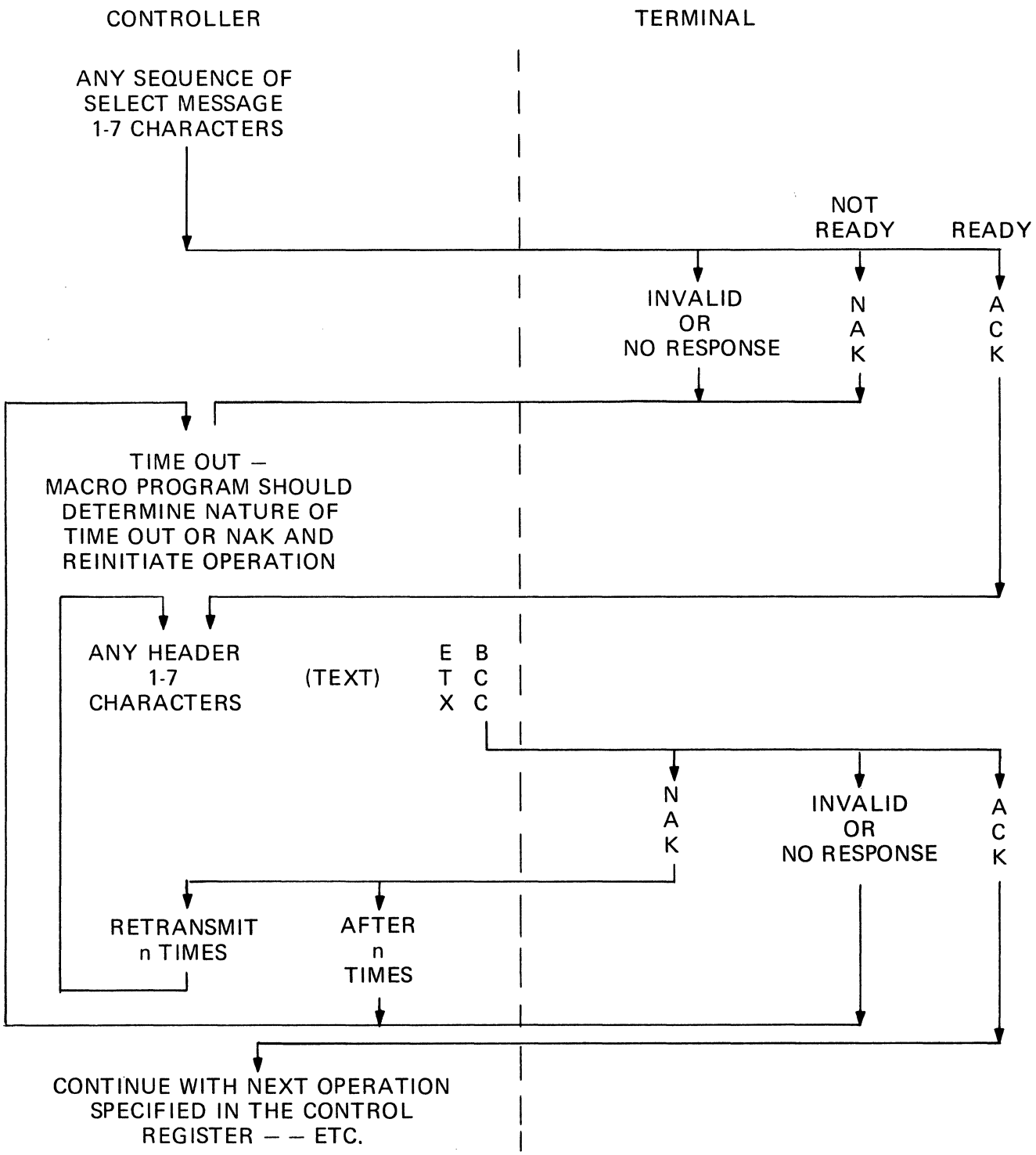


Figure 8.11.03-1 Select

8.11.04 FAST SELECT (FSL) FORMAT REGISTERS

The characters used in implementing the fast select line discipline are defined as those characters that precede the actual message text. They are further defined as consisting of a first half (all character up to and including the SOH) and a second half (all characters following the SOH up to and including the STX). Each half of the fast select discipline has a separate format register.

The first half is located in word 1159. Character position eight (8) of word 1159 contains both the Data Character Counter (in digit position 14) and special information (digit position 15) peculiar to halved line discipline formats. Depending on the number of characters in the first half register, digit position 14 contains one of the following hexadecimal values for the DCC.

No. of Characters in First Half	DCC Value
1	8
2	9
3	A
4	B
5	4
6	5
7	6

Digit position 15 contains one of three possible hexadecimal values. A hex 4 indicates there is no second half. In this case, the actual message text is transmitted immediately after the first half. A hex 8 indicates the characters in the first half register are not to be transmitted; proceed to inspect the second half. Hex 0 implies normal (first and second half) fast select.

The BCC computation does not include any of the characters in the first half register.

EXAMPLE: Fast Select Format Register (first half) indicating no second half.

Character Position—	8	7	6	5	4	3	2	1
Word 1159	44	00	00	04	80	81	73	01
	DCC			EOT	AD1	AD2	FSL	SOH

The second half of the fast select format is located in word 1158. Again character position eight (8) contains both the DCC (digit position 14) and special information (digit position 15). The possible hexadecimal values for the DCC are the same as those outlined for the first half register. Digit position 15 of the second half register contains one of four possible values.

- Hexadecimal 0 – Implies normal mode.
- Hexadecimal 2 – Indicates the first half register contains four (4) characters or less.
- Hexadecimal 4 – Indicates there is no first half.
- Hexadecimal 8 – The characters in this register are not to be transmitted; proceed to transmit actual message text.

The BCC is computed, starting with the first significant character in the second half register.

EXAMPLE: Fast Select Format Register (second half) indicating that the first half contained 4 characters or less.

Character Position	8	7	6	5	4	3	2	1
Word 1158	25	00	80	81	88	89	8A	02
	DCC		AD1	AD2	TR1	TR2	TR3	STX

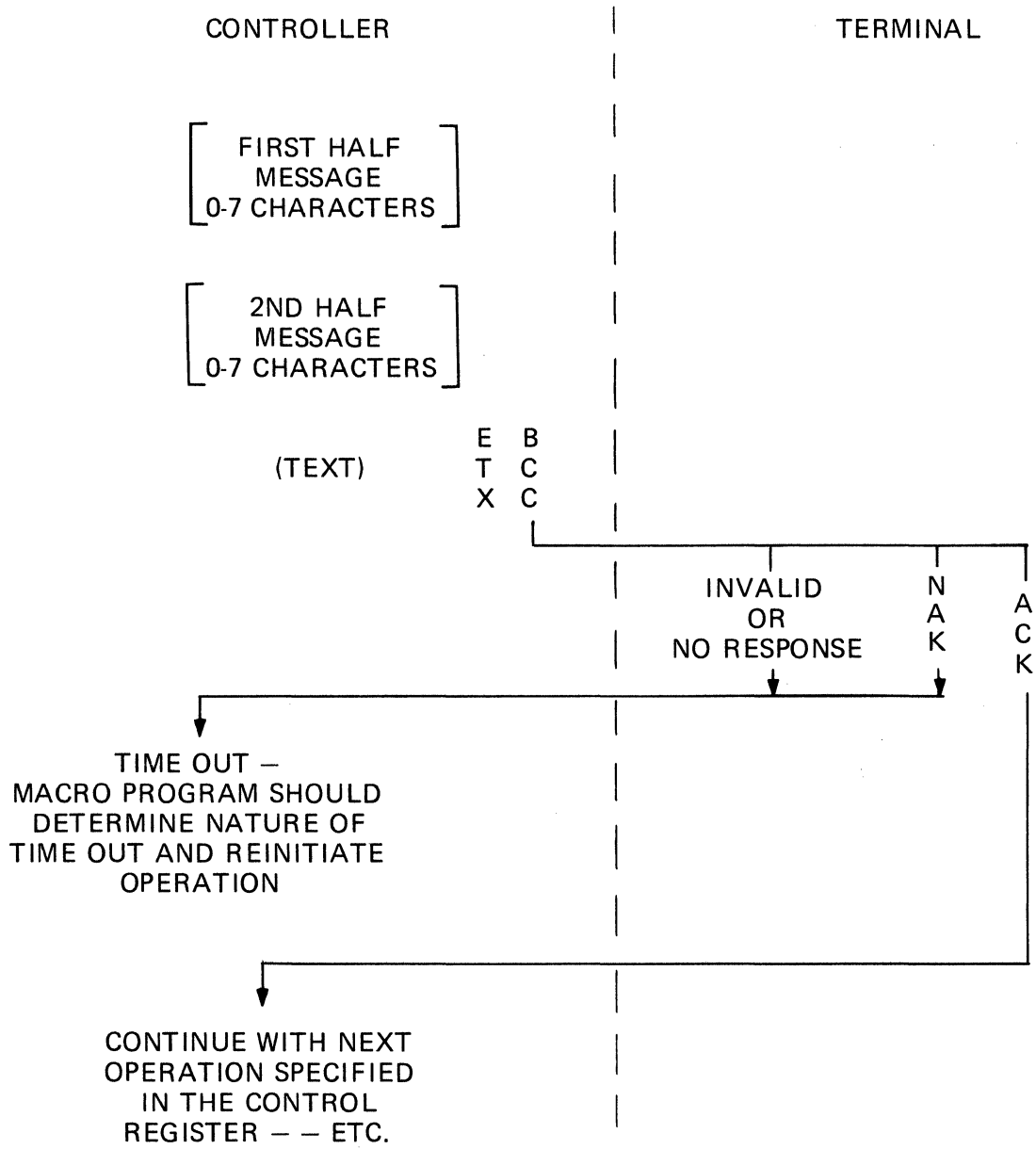


Figure 8.11.04-1 Fast Select, Group Select, and Broadcast Select

8.11.05 GROUP SELECT (GSL) FORMAT REGISTERS

The GSL Format Registers also specify a first half and a second half. The first half is located in word 1161, the second half in word 1160. Their structures are identical to those of the first and second halves respectively, of the Fast Select Format Registers.

Broadcast (BSL)

The Broadcast Format Registers again specify a first half (located in word 1163) and a second half (located in word 1162). Their structures are also identical to those of the first and second halves, respectively, of the Fast Select Format Registers.

Summary

When the Central TC Controller firmware is first loaded into the machine, all format registers become initialized to their corresponding standard (3 transmission numbers) TC line disciplines. These disciplines can be changed to meet most non-Burroughs standards by altering the contents of the appropriate Format Register(s).

However, in spite of this scheme to seek flexibility, certain basic structures of line disciplines have to be adhered to. Figures 8.11.02-1, 8.11.03-1 and 8.11.04-1 illustrate these basic structures for polls, selects, fast selects, group selects, and broadcast selects.

8.11.06 DATACOM PROCESSOR OPERATIONS

The operation of the Datacom Processor of a Central TC is dictated by the contents of sixteen (16) Control Registers. Since each terminal connected to a Central TC requires the use of only one (1) Control Register, the CTCC firmware can handle up to sixteen (16) terminals at any one time.

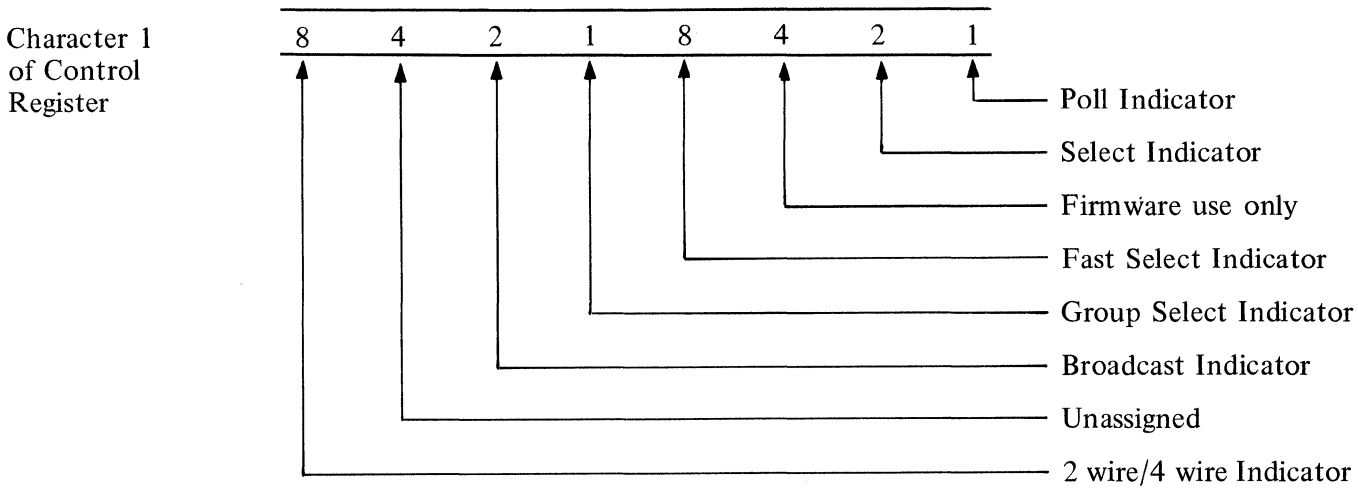
These registers occupy memory words 1184-1199 in the DCP memory. Each register is one (1) word in length and contains:

1. The address (AD1, AD2, and group address) of its associated terminal. This information is contained in character positions 8, 7 and 6 respectively.
2. The beginning transmission number of the outgoing message to this terminal in a three (3) transmission number system, character positions 5, 4 and 3 of the Control Register are used for the TR numbers. In a two (2) TR number system, character positions 4 and 3 are used. A one (1) TR number system uses character position 3. In a zero TR number system, character positions 5, 4 and 3 must be cleared.
3. Operation Indicators to service this terminal. These are located in character position 1.

The Control Registers are placed in memory in the form of a list. The Datacom Processor will process this list of sixteen (16) Control Registers one at a time, in sequence, beginning at Control Register 1 which is located at word 1184. It will perform the functions(s) indicated by the Operation Indicator(s) contained within the Control Register. Thus, the terminals will be serviced in the sequence in which their corresponding Control Register is placed. When the 16th Control Register is processed, operation will return to the top of the list. Should less than sixteen terminals be connected to a Central TC, an AD1 hexadecimal value of 00 in the first unused Control Register causes the Datacom Processor to return to the register at the top of the list. Any column 0 code from the ASCII chart (except 00) or any column 1 code used in place of AD1, causes the current register to be skipped. Operation then proceeds to the next Control Register in the list.

8.11.07 OPERATION INDICATORS

As mentioned, Operation Indicators occupy the least significant character position of a Control Register. Their individual bit allocations are shown:



If any of the above operations result in no response, strange response, or inability to transmit a message, due to some condition at the remote termainal, the DCP times out and goes into an idle state. A special flag (D1) is set and the exact cause of the time out is contained in a special Time Out Register. This register is available to the macro program. (See section on Datacom Processor Time Out.)

1. Poll Indicator

   The Poll Indicator is normally reset. To poll a terminal, the Main Processor sets the Poll Indicator of a Control Register, as specified by the macro program. The input buffer of the DCP should be empty and D2 should be reset. The Processor will not poll any terminal unless D2 is reset. After a successful poll, the Poll Indicator will be reset, and the Message Received Flag (D2) set. A special register (called the Header Register) containing the received message header, right justified, is available. This allows the macro program to retrieve the address of the terminal from which the message came, and the transmission number of the message received. By numbering the terminals sequentially, and organizing the Control Register list in the same manner, the address in the Header Register serves as a pointer to its corresponding Control Register. Upon completion of a poll procedure, the DCP will not time out, but will proceed to interrogate the other bits in the Operation Indicators to continue to service that terminal.

2. Select Indicator

   This indicator is normally reset. To transmit a message to a terminal, the macro program must transfer the message to the output buffer, set the Transmit Ready Flag, and set the Select Indicator in the appropriate Control Register. The DCP then selects this terminal when its Control Register is processed. The Select Indicator is reset by firmware after a successful Select.

3. Fast Select Indicator

   This indicator is normally reset. To transmit a message to a terminal via Fast Select, the macro program must set up the output message, set the Transmit Ready Flag, and set the Fast Select Indicator in the appropriate Control Register. The DCP then Fast Selects this terminal when its Control Register is processed. The FSL Indicator is reset by the DCP after a successful Fast Select.

4. Group Select and Broadcast Indicators

   Both of these indicators perform their respective functions in the identical manner of the Fast Select Indicator.

5. 2 Wire/4 Wire Indicator

   This indicator must be set by the macro program for a 2 wire system. It must be reset (0) for a 4 wire system.

The following example illustrates the initial format of the Control Register in a three (3) terminal, 4 wire, network using a two digit TR number.

Character Position	8	7	6	5	4	3	2	1
Word 1184	31	41	31	00	30	30	00	01
	AD1	AD2	GSL		TR1	TR2		POL

Character Position	8	7	6	5	4	3	2	1
Word 1185	31	42	31	00	30	30	00	02
	AD1	AD2	GSL		TR1	TR2		SEL

Character Position	8	7	6	5	4	3	2	1
Word 1186	31	43	31	00	30	30	00	01
	AD1	AD2	GSL		TR1	TR2		POL

Character Position	8	7	6	5	4	3	2	1
Word 1187	00	00	00	00	00	00	00	00
	* AD1	AD2	GSL					

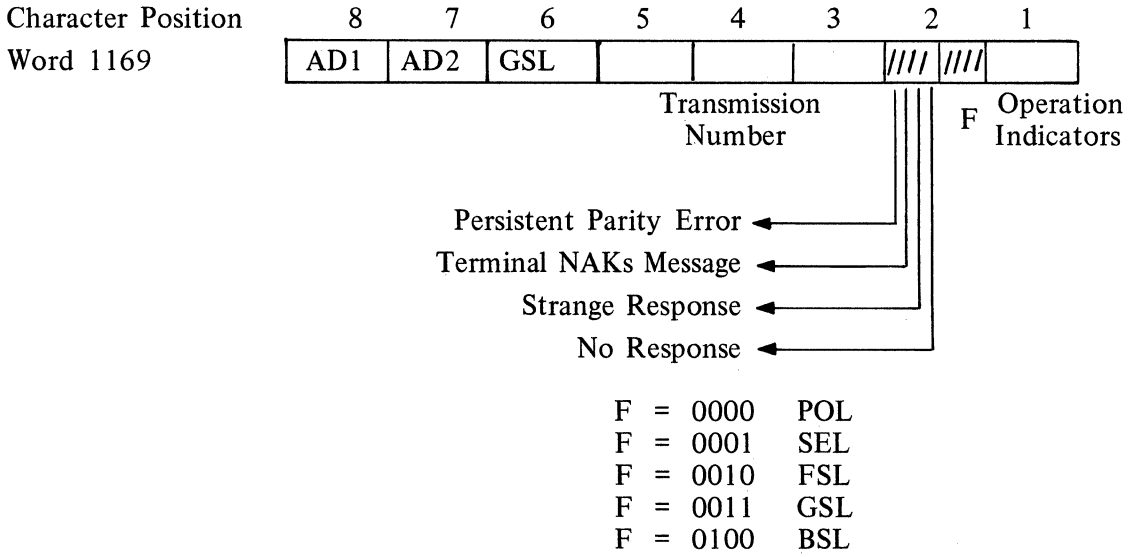
* The AD1 hexadecimal value of 00 causes the Datacom Processor to return to word 1184.

8.11.08 DATA COMMUNICATIONS PROCESSOR TIME OUT

The following situations cause the DCP to time out:

1. The Central TC receives no response from a terminal to any of the following: poll, select, fast select, group select, or broadcast select.
2. The Central TC receives a strange response from a terminal to any of the following: poll, select, fast select, group select, or broadcast select.
3. The terminal NAK's a select, fast select, group select or a broadcast select.
4. Persistent parity error occurs between the Central TC and the terminal.

As previously discussed, while the DCP is in the time out condition, D1 is set and a register is available for interrogation. This register, called the Time Out Register, is located in word 1169 and is actually a replica of the Control Register that is involved at the time, supplemented by information stored in character position 2 as shown:



When the DCP times out and goes into an idle state due to one of the above conditions, the macro program must retrieve the Time Out Register and, after examining its contents, clear it. This must be done prior to reinitiating the Datacom Processor to its normal operation. Reinitiating the DCP also resets the D1 flag.

The Time Out Register serves no purpose if the idle state of the DCP is initiated by the macro program as there is no indicator in the register to reflect such a condition.

8.12.00 BASIC POINT TO POINT LINE CONTROL DISCIPLINE

Point to Point is a contention type line control discipline which allows Series TC Computers to communicate on an equal basis with another Data Communications Unit (CPU or another TC). The basic Point to Point line discipline does not provide a terminal addressing scheme nor a transmission number sequence. Since an address scheme is not provided only two units can be listening to the line at any given time. When operating in this mode the TC can communicate with a CPU or another TC. When this Line Discipline is implemented either unit on the line can initiate transmissions without previously being interrogated (TC does not have to be polled).

In a Point to Point environment, the TC must normally contend for control of the line before it can transmit a message. After a successful transmission is completed, control of the line is given to the receiving unit. The receiving unit may then, if transmit ready, transmit a message without having to contend for control. If the receiving unit is not transmit ready the sequence is terminated.

A TC can operate in a switched line, leased line or a direct connect communication network when utilizing Point to Point discipline.

Those functions discussed in this section pertaining to the answering and disconnecting of telephone company facilities are valid only if the Auto Answer/Disconnect feature is installed in the TC.

8.12.01 COMMUNICATION CONTROL CHARACTERS

1. Message Format Characters

   Two ASCII characters are used in a Point to Point line discipline to format messages. The characters and functions are as follows:

   STX – Start of Text: The STX character appears as the first character in all messages containing text. STX identifies all characters that follow up to, but not including ETX, as text of the message.

   ETX – End of Text: The ETX character serves to terminate the text portion of all messages containing text. The ETX always precedes the block check character.

2. Intra-link Control Characters

   The Intra-link Control Characters used by the TC when operating in a Point to Point environment are:

   ENQ – Inquiry: The purpose of this character is to interrogate the second unit on the line to determine if it is receive ready. The ENQ requires a response from the receiving station. An ENQ is sent when the TC is transmit ready and the previous transmitting sequence has been terminated.

   ACK – Acknowledgement: The affirmative response by the unit receiving an Inquiry (ENQ) message or a Text message.

   NAK – Negative Acknowledgement: A NAK response is sent by a unit under the following conditions.

   a. In response to an ENQ message when the unit is not receive ready.
   b. In response to a Text message when the unit is not receive ready.
   c. In response to a Text message when character parity or the Block Check Character does not check.

   EOT – End of Transmission: The character indicates the end of a successful transmission of text. The unit which received the text will respond in one of two manners when it receives the EOT.

   a. If transmit ready: The unit will respond with the STX sequence (the unit does not go through the ENQ sequence).
   b. If not transmit ready: The unit will transmit an EOT which terminates the sequence.

8.12.02 MESSAGE FORMATS AND LENGTHS

Inquiry Message

The purpose of the inquiry message is to determine if the remote unit is receive ready. The inquiry message consists of one ENQ character. The inquiry message must be sent when the previous transmitting sequence has been terminated.

Data Message

Messages containing Data that are transmitted or received have the following format:

Start of Text (STX), TEXT, End of Text (ETX), and Block Check Character (BCC).

The length of the TEXT Portion of the Data message can be from 1 to 255 characters.

Message Processing

The instructions and procedures required to build, transmit, receive and unpack messages using Point to Point DCP Firmware are identical to those instructions and procedures used with POLL/SELECT DCP Firmware sets.

8.12.03 POINT TO POINT FLOWCHARTS

The narrative and schematic flowcharts which follow explain and illustrate the basic logic and sequence of events that occur in the Point to Point firmware set.

1. Idle State

   The Idle State routine is the "basic loop" in the Point to Point firmware. The purpose of this routine is to (1) "listen" to the line for incoming inquiries and (2) determine if the TC is transmit ready. All other routines connect to this routine.

   STEP 1

Has this TC Received and ENQ?	Is the TC Receive Ready?	Reaction
Yes	Yes	Transmit ACK and go to Receive Message State.
Yes	No	Transmit NAK and proceed to Step 2 in Idle State.
No		Proceed to Step 2 in Idle State.

   STEP 2

Is this TC Transmit Ready?	Reaction
No	Go to Step 3 in the Idle State.
Yes	Transmit ENQ and proceed to Step 1 of Transmit Ready State.

   STEP 3

Is idle line Time Out Limit Reached?	Reaction
No	Return to Step 1 in Idle State.
Yes	Transmit DLE-EOT message and go on Hook.

2. Receive Message State

   The TC enters the Receive Message State when one of the following occurs:

   a. The TC receives an ENQ and it is receive ready.

b. The TC has successfully completed a Transmission.

STEP 1

Is the TC Receive Ready?	Is Parity OK?	Reaction
Yes	Yes	Store Text, transmit ACK and proceed to Step 2 Receive Ready State.
Yes	No	Transmit NAK and stay in Receive Message State.
No		Ignore Message and Transmit NAK – stay in Receive Message State.

STEP 2

Response Received from ACK Message	Is TC Transmit Ready?	Reaction
EOT	Yes	Transmit Text message and go to Step 2 of Transmit Ready State.
EOT	No	Transmit EOT and return to Step 1 of Idle State.
Invalid or no response		Return to Step 1 of Idle State.

3. Transmit Ready State

The TC enters the Transmit Ready State when one of the following occurs:

a. After transmitting an Inquiry message (ENQ).

b. The TC is Transmit Ready when it receives an EOT in response to the affirmative acknowledgement (ACK) of a message received.

STEP 1

Response Received from ENQ message	Do all Characters Parity Check?	NAK/NO Response Limit Reached	Response
ACK	Yes		Transmit Text message proceed to Step 2.
NAK	Yes	No	Go to Idle State.
NAK	Yes	Yes	Set Trouble and Indicator Flags and go to Time Out State.
Invalid			Set Trouble and Indicator Flags and go go to Idle State.
No Response		No	Go to Idle State.
No Response		Yes	Set Trouble and Indicator Flags and go go to Time Out State.

STEP 2

Response Received from TEXT message	Do all Characters Parity Check?	NAK/NO Response Limit Reached	Response
ACK	Yes		Reset Transmit Ready Flag, transmit EOT and proceed to Step 3.
NAK	Yes	No	Retransmit Text message and stay at Step 2.
NAK	Yes	Yes	Set Trouble and Indicator Flags and go to Time Out State.

STEP 2 (Cont'd)

Response Received from TEXT message	Do all Characters Parity Check?	NAK/NO Response Limit Reached	Response
INVALID			Set Trouble and Indicator Flags and go to Idle State.
No Response		No	Retransmit Text message and stay at Step 2.
No Response		Yes	Set Trouble and Indicator Flags and go to Time Out State.

STEP 3

Response Received from EOT message	Do all Characters Parity Check?	Response
EOT	Yes	Go to Idle State.
Text Message		Go to Receive Message State.
No Response		Go to Idle State.
Invalid		Set Trouble and Indicator Flags and go to Idle State.

4. Time Out State

In the Time Out State, the TC will delay for 2 seconds and then return to Idle State. This delay is provided to allow the other unit on the line, if Transmit ready, to transmit an ENQ if it has been sending NAK's due to its receive buffer being full.

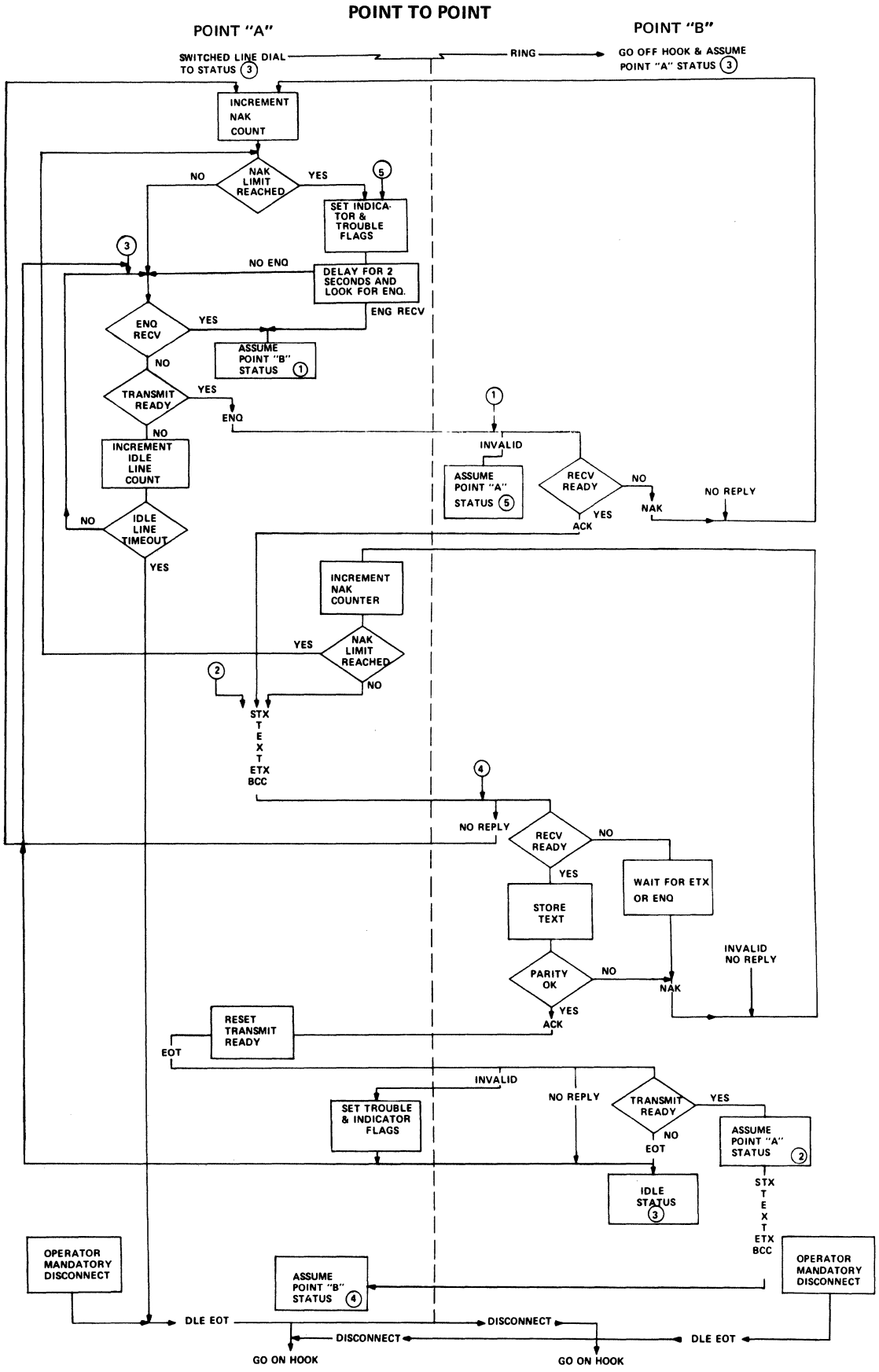


Figure 8.12.03-1 Point to Point

8.13.00 IBM 2260/2848 EMULATOR LINE CONTROL DISCIPLINE

The IBM 2260/2848 Emulator is a line control discipline which provides Series TC terminals a method of interfacing to IBM Systems 360 Tele-communication systems. The interfacing requirements are handled entirely within the Data Communications Processor of the TC. Therefore, hardware or system software modifications are not required in the System 360. The TC is capable of operating with either BTAM or a QTAM generated message control program operating under IBM's Operating System (OS) supervisor or their Disk Operating System (DOS) supervisor.

8.13.01 HARDWARE REQUIREMENTS

1. TC – The Hardware requirements for the TC vary according to the exact style being utilized and the remote configuration desired. See Subject 8.02.00 "Remote Configurations" to determine exact requirements.
2. System 360 – The System 360 requires an IBM 2701 Data Adapter Unit interfaced to the System 360 via a Multiplexor (MPX) channel. The Number of 2701's on a system is dependent on the number of MPX channels available. The 2701 configuration is dependent on the number of lines the 2701 is servicing (2 lines maximum).

   A single line 2701 configuration requires a 4656 Terminal Adapter Type III.

   A two line configuration requires one 3855 Expansion Feature, one 3815 Expanded Capability Feature and two 4656 Terminal Adapter Type III's.

8.13.02 COMMUNICATION CONTROL CHARACTERS

The Communication Control characters defined in Section 8.06.01 for Poll/Select Line Control discipline also apply to the 2260 Emulator Line Control Discipline, except the SOH and STX characters which are listed below:

SOH – The SOH character is not used in the 2260 Emulator line control discipline.

STX – The STX character appears as the first code in all messages containing text. STX identifies all characters that follow (except the AD1 value immediately following STX), up to but not including ETX, as the text of the message. In an OS-BTAM environment the STX character is also the first character in all Poll or Select inquiry messages.

8.13.03 SPECIAL INSTRUCTION CODES

These codes, selected from the graphics of the ASCII set, have a special meaning when they appear in specified messages. Their designation and functions in the 2260 Emulator line control discipline are as follows:

1. Poll Character (Space 2,0 ASCII X3.4-1967): This character is part of a Polling message, and it inquires of an addressed remote location whether it is ready to transmit to the Data Center. It is ignored by all but the addressed remote and causes that station to reply with an EOT if it is not ready to transmit, or with the message if it is ready to transmit.
2. Select Character ("@" 4,0 ASCII X3.4-1967): This character is part of a select message, and it inquires of an addressed remote location whether it is ready to receive a message from the Data Center. It is ignored by all but the addressed station and causes that station to reply with a negative acknowledgement if it is not ready to receive a data message from the Data Center, or with an ACK if it is ready to receive a message.

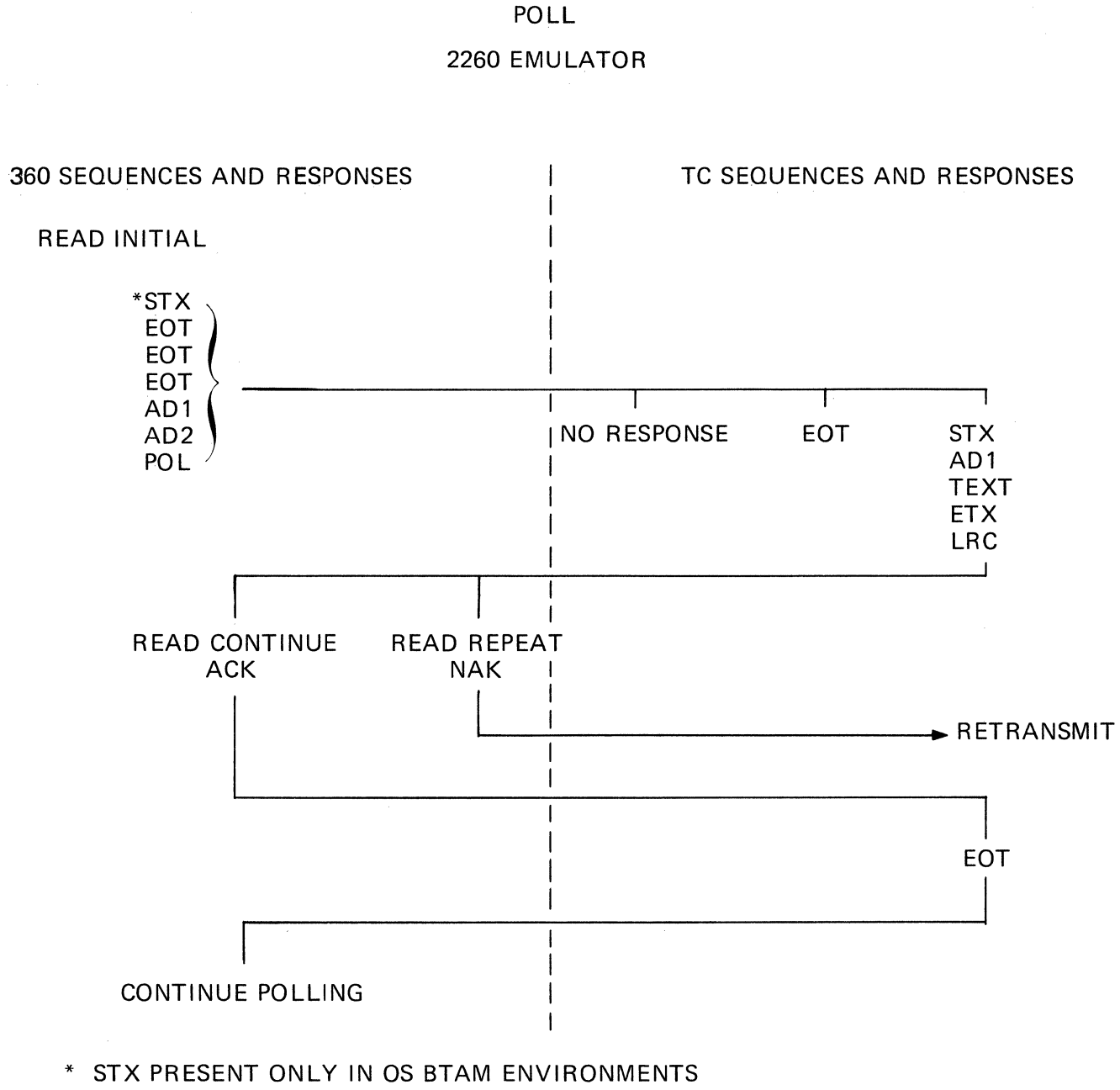


Figure 8.13.03-1 Poll, 2260 Emulator

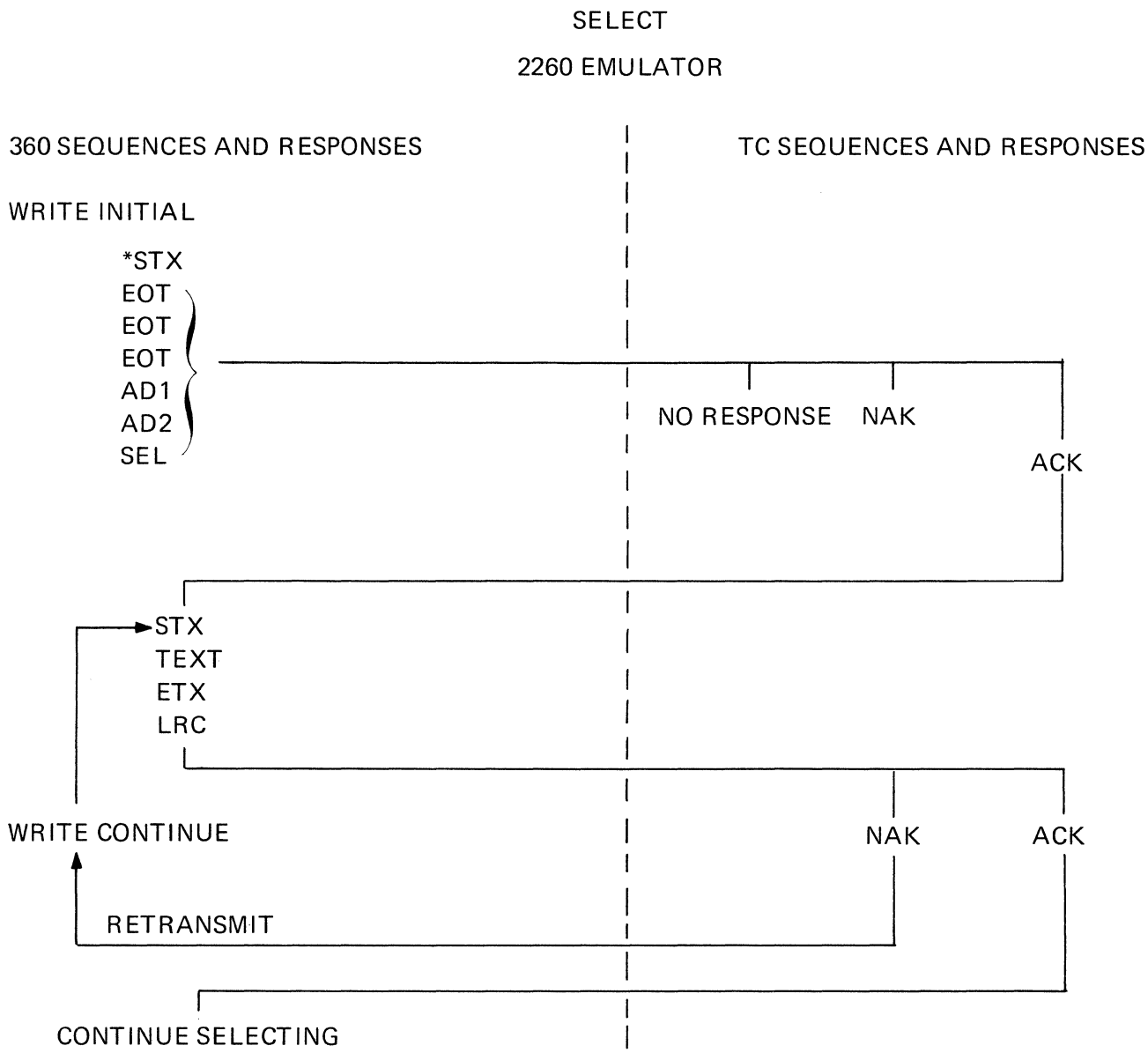


Figure 8.13.03-2 Select, 2260 Emulator

SECTION 9

I/O DEVICES

9.00.00 GENERAL DESCRIPTION

An I/O Device is a unit which may be cable-connected to any L/TC that has Input and Output (I/O) capability. The device is controlled by the internally stored program in the Series L/TC.

9.01.00 STYLE A 581 PUNCHED PAPER TAPE/EDGE PUNCHED CARD READER

The A 581 Punched Paper Tape/Edge Punched Card Reader is a small, compact unit which may be cable-connected to any L/TC that has Input and Output (I/O) capability. Hereafter, it will be referred to as the "Paper Tape" or "Tape" Reader. It provides automatic input to the System by reading either paper tape (roll, strips, or fan-fold) or edge punched cards (individual or fan-fold).

The Paper Tape Reader has the ability to read 5, 6, 7 or 8 channel codes based upon a table of code assignments that may be loaded into memory as a part of the Program Load procedure. In addition to the table, 5 channel code requires separate firmware.

The Paper Tape Reader is capable of reading up to 40 codes per second. Reading is controlled by a programed Read instruction and requires that proper Reader conditions are present (see Topics 9.01.02, 9.01.04, and 9.01.06).

The alignment of the feed path is on a flat, horizontal (to the desk top) plane and feeding of tape or card is from right to left. The feeding mechanism permits codes to be read at the first full sprocket hole from the referenced leading edge of the card and the last full sprocket hole from the trailing edge of the card. Alternate use of tape or cards is possible without modification of the Reader. However, programing may vary.

The power for the Tape Reader is provided by the System. A malfunction occurring in the Tape Reader that might cause the Reader to become inoperable does not prohibit continued operation of the System with other devices. The Reader can be a field addition to any L/TC with I/O capability.

Figure 9.01.00-1 Style A 581 Punched Paper Tape/Edge Punched Card Reader

9.01.01 CONTROL PANEL

The control panel is located on the top of the Reader in the front. It contains four control keys as shown in the following illustration.

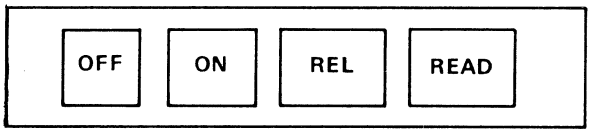


Figure 9.01.01-1 PPT/EPC Reader Control Panel

9.01.02 POWER ON KEY

The Power On key is marked "ON". When it is depressed, it turns on power to the Reader and illuminates the Read station light.

When a Read instruction has been initiated and the Reader power is off, execution of the instruction is halted, the Reader Condition indicator light on the keyboard is turned on, and the Reader Condition flag is set. If power is then turned on and the Read key (see Topic 9.01.05) is depressed, it permits the Read instruction to be executed (other Reader conditions permitting) and the Reader Condition light and flag to be turned off and reset respectively.

9.01.03 POWER OFF KEY

The Power Off key is marked "OFF". When it is depressed, it turns off power to the Reader and extinguishes the Read station light. Turning off power to the Reader does not affect the System until the next Reader instruction is initiated. At that time, the Reader Condition indicator light on the keyboard would be turned on and the Reader Condition flag would be set (see Topic 9.01.02).

9.01.04 MEDIA CLAMP RELEASE KEY

The Media Clamp Release key is marked "REL". When it is depressed, it releases the media clamp which holds the paper tape or edge punched card in position.

When a Read instruction has been initiated and the Media Clamp is open, reading is prevented, the Reader Condition indicator light on the keyboard is turned on, and the Reader Condition flag is set. If the media clamp is then closed and the Read key is depressed, it permits the Read instruction to be executed and the Reader Condition light and flag to be turned off and reset respectively.

9.01.05 READ KEY

The Read key is marked "READ". If a "media not present", "media clamp open", or "power off" condition exists on a Read instruction, reading is prevented. If the condition is then corrected, depression of the Read key will permit execution of the Read instruction.

9.01.06 MEDIA NOT PRESENT DETECTOR

The Media Not Present Detector is a mechanism which detects the absence of media in the Reader when a Read instruction has been initiated. It causes the Reader Condition indicator light on the keyboard to illuminate and sets the Reader Condition flag. The System remains in a read cycle until the condition has been corrected (see Topic 9.01.05). When media is put in position and the media clamp is closed, a depression of the Read key permits reading and causes the Reader Condition light to be turned off and the Reader Condition flag to be reset.

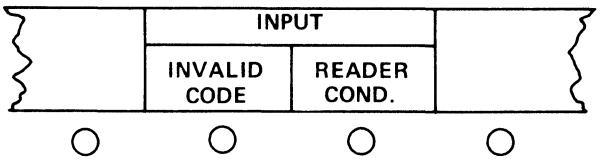


Figure 9.01.06-1 Keyboard Indicator Lights for Input Adjuncts

9.01.07 INVALID CODE

When reading punched paper tape or edge punched cards, the System will detect an invalid code. If an invalid code occurs, the "Invalid Code" indicator light on the keyboard is turned on and the Reader Invalid Code flag is set; however, reading is not inhibited. The Invalid Code light remains lit until the next Read instruction at which time it is turned off, or until the Reader Invalid Code flag is reset by the user program.

9.01.08 MEDIA CLAMP

The Media Clamp holds the punched paper tape or edge punched card firmly against the alignment table when closed. It is manually closed. It may be opened by programing or by the Media Clamp Release key (see Topic 9.01.04).

When a Read instruction has been initiated and the Media Clamp is open, reading is prevented, the Reader Condition indicator light on the keyboard is turned on, and the Reader Condition flag is set. If the Media Clamp is then closed and the Read key is depressed, it permits the Read instruction to be executed and the Reader Condition light and flag to be turned off and reset respectively.

9.01.09 TAPE FEED WHEEL

The Tape Feed Wheel is used to manually advance or backspace the paper tape or edge punched card. It is located on the right side of the Reader.

To engage the Tape Feed Wheel with the feed sprocket requires depressing the wheel. The wheel may be turned in either direction. Turning the wheel towards the rear of the machine (clockwise) will advance the media. Turning the wheel towards the front of the machine (counterclockwise) will backspace the media.

9.01.10 READ STATION

Reading is accomplished by a photoelectric device (using solar cells) and reads frame by frame. The frame in the read station and two frames to the left and two frames to the right of the read station are visible to the operator. In the event of a burnt out bulb in the reading device, the Reader Condition indicator light on the keyboard is turned on, and reading and feeding are halted.

9.01.11 TAPE SYSTEM

A supply and rewind mechanism for roll paper tape is provided as an option to the basic Tape Reader. The spindle of the supply mechanism accommodates up to an 8-inch reel or an inside-out cone feeder.

A power driven take-up reel is also provided. The reel may be from 5 to 8 inches in diameter. A roll of paper tape may be removed from the reel without having to remove the reel itself. The reels accommodate tape widths of 11/16 (.686) inch to 1 inch.

When the supply and take-up mechanism is used, it does not in any way interfere with the use of strip tape or edge punched cards.

9.01.12 TAPE GUIDE

The Tape Guide is located on the right side of the unit. The guide is a 1" slot and is used when reading punched paper tape to straighten the tape before it enters the read station. The slot is open at the rear to allow easy insertion.

9.01.13 EDGE PUNCHED CARD SYSTEM

Insertion and alignment of edge punched cards is manual and can be accomplished with one hand. Alignment is to a fixed limit.

The Tape Reader will accommodate individual and continuous fan-fold edge punched cards in widths up to 11 inches. Fan-fold EPC must have the leading edge trimmed for proper alignment in the Reader.

The feeding mechanism permits the reading of codes at the first and last full sprocket holes from the leading and trailing reference edges of the card. (See Topic 9.01.16.)

Individual edge punched cards are readable for 500 passes without deterioration to the card caused by the reader mechanism. However, the care used by the operator in handling the cards is the most significant factor in card life.

9.01.14 EDGE PUNCHED CARD GUIDE

The Edge Punched Card Guide is located in the front and on the right side of the unit. The guide is used when reading edge punched cards.

9.01.15 EDGE PUNCHED CARD SUPPORT

A support for edge punched cards is provided as an option to the basic Tape Reader. If the edge punched cards are in excess of the basic width, the adjustable support located on the right side of the unit is used. A locking lever is provided to lock the support in the position at which the support is set.

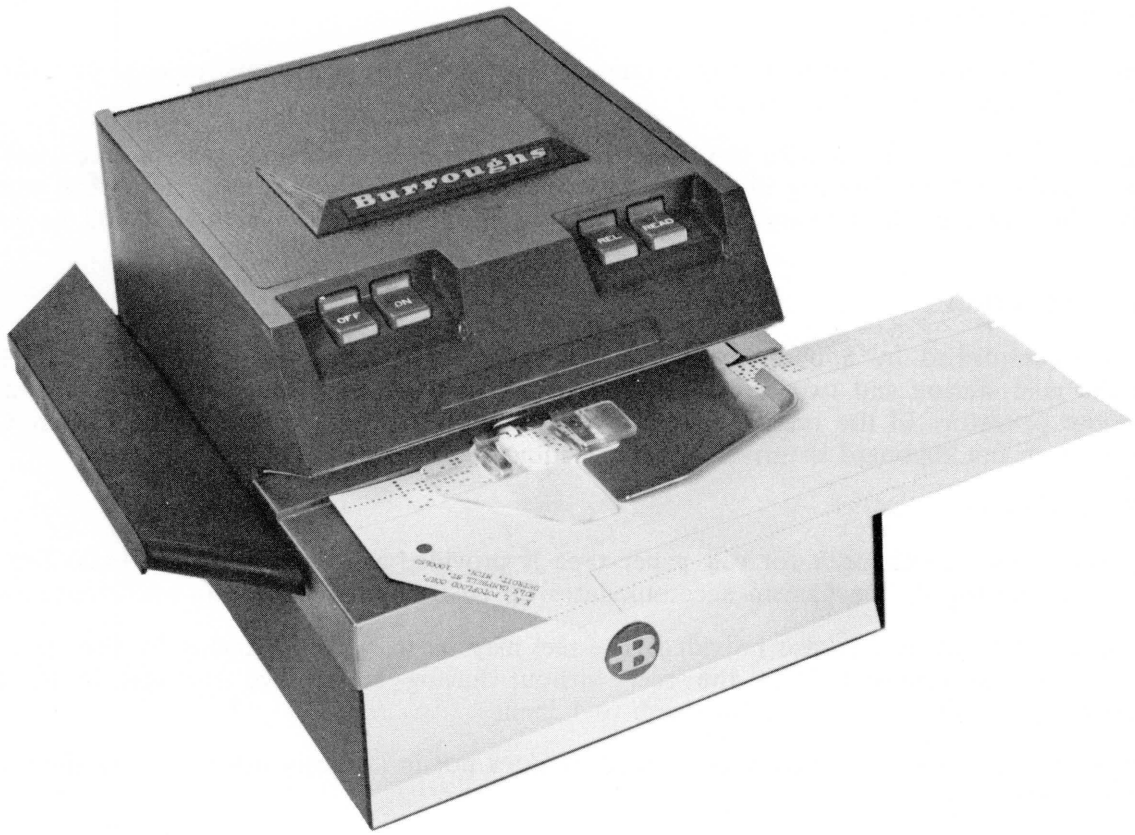


Figure 9.01.15-1 Reading Edge Punched Cards

9.01.16 PROGRAMING CONSIDERATIONS: EDGE PUNCHED CARDS

The successful use of edge punched cards in a Series L system installation depends a great deal on the care used by the operator in handling the cards during filing and especially during insertion in the Reader. It is possible to insert the card askew and latch the Reader Clamp in such a way that the sprocket wheels do not engage the card. During a Read instruction the sprocket wheels will "spin", not moving the card, but causing incorrect codes to be read and resulting in incorrect data with either the card or program getting out of step.

Therefore, it is recommended that edge punched cards be created with a minimum of two blank frames (feed codes or NUL codes) on the leading end of each record (customer name/address card, stock item card,. etc.). Thus, if the wheels spin, any codes read will be ignored because firmware does not recognize a NUL code at the beginning of a Read instruction. Normally, the feed wheels will engage the card after spinning 1 or 2 frames, which then permits the card to be read and the instruction executed correctly. If the feed wheels do not engage, there is no problem since the card is standing still on a NUL code. In this case, the correct reinsertion of the card will permit the instruction to be completed.

Another factor of importance is the greater wear which occurs on leading sprocket holes. Cards will last longer if at least 2 frames are feed codes.

When fan-fold edge punched cards are created, the first three frames should contain NUL or feed codes since the 1st frame will be trimmed off during separation of the cards. In addition, two frames should contain NUL – feed – codes on the trailing edge of each record, when using fan-fold edge punched cards. One frame is trimmed off when the records are separated.

9.01.17 DIMENSIONS

The Tape Reader dimensions are as follows:

Width	9.75	inches	(24.8 centimeters)
Width with take up reel	10.7	inches	(27 centimeters)
Length	11	inches	(27.9 centimeters)
Length with take up reel	13	inches	(33.0 centimeters)
Height	7	inches	(17.8 centimeters)
Weight	15	pounds (approximate)	(6.8 kilograms)

9.01.18 ENVIRONMENTAL CONDITIONS

The environmental conditions are the same as specified in Section 11 of this manual for the basic System.

9.01.19 ELECTRICAL SPECIFICATIONS

Power for the Reader is obtained from the System through a cable 9 feet in length. The cable is nondetachable from the Reader, and requires service to connect it to the System. The cable enters into the System in the upper right-hand corner at the back of the machine. (This is the upper left-hand corner from the back of the machine.)

The standard electrical specifications are 120 volts, (range 107-127), 60 cycles ± 1% frequency variation (a Reader used with a System with 50 cycles requires 50 cycles, also).

9.01.20 PUNCHED PAPER TAPE AND EDGE PUNCHED CARD MEDIA SPECIFICATIONS

The A 581 Tape Reader is capable of feeding and reading any of the types and sizes of paper tape and edge punched cards produced by the A 562 Paper Tape Perforator. Refer to Topics 9.02.18, 9.02.19, 9.02.20, and 9.02.21 for complete specifications. Paper Tape or Cards produced by other equipment may be read if it meets the specifications listed in Topics 9.02.18, 9.02.19, 9.02.20, and 9.02.21.

9.02.00 STYLE A 562 PUNCHED PAPER TAPE/EDGE PUNCHED CARD PERFORATOR

The A 562 Punched Paper Tape/Edge Punched Card Perforator is a small, compact unit which may be cable-connected to any L/TC that has Input and Output (I/O) capability. Hereafter, it will be referred to as the "Paper Tape" or "Tape" Perforator. It provides automatic output from the System by punching either paper tape or edge punched cards. The basic tape perforator will accept paper tape, or edge punched cards up to 11 inches in width.

The Paper Tape Perforator has the ability to punch 5, 6, 7, or 8 channel codes based upon a table of code assignments that may be loaded into memory as a part of the Program Load procedure. In addition to the table, 5 channel code requires separate firmware.

The Paper Tape Perforator is capable of punching up to 40 codes per second. Punching is controlled by a programed Punch instruction and requires that proper Perforator conditions are present. For the use of the Reset key and the Backspace key see Topics 3.02.09 and 3.02.04.

The paper path through the Perforator is from left to right and perpendicular to the table top. The feeding mechanism permits codes to be punched at the first full sprocket hole from the referenced leading edge of the card and the last full sprocket hole from the trailing edge of the card. Alternate use of tape or cards is possible without modification of the Perforator. However, programing may vary.

The power for the Tape Perforator is provided by the System. A malfunction occurring in the Tape Perforator that might cause the Perforator to become inoperable does not prohibit continued operation of the System with other devices. The Perforator can be a field addition to any L/TC with I/O Capability.

Figure 9.02.00-1 A 562 Punched Paper Tape/Edge Punched Card Perforator

9.02.01 CONTROL PANEL

The control panel is located on the left side of the front of the Perforator. It contains an indicator lamp and four control keys as shown in the following illustration.

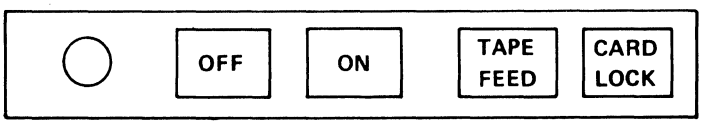


Figure 9.02.01-1 PPT/EPC Perforator Control Panel

9.02.02 POWER ON INDICATOR LAMP

The Power On Indicator lamp color is natural and is illuminated when power is turned on.

9.02.03 POWER ON KEY

The Power On key is marked "ON". When it is depressed, it turns on power to the Perforator and illuminates the indicator lamp.

9.02.04 POWER OFF KEY

The Power Off key is marked "OFF". When it is depressed, it turns off power to the Perforator and extinguishes the indicator lamp.

When a Punch instruction has been initiated and the Perforator power is off, punching is inhibited, the "Punch Off" indicator light on the keyboard is turned on, and the Punch Off flag is set. If power is turned on, the Punch Off light on the keyboard remains on. On the next Punch instruction the light is extinguished and the Punch Off flag is reset.

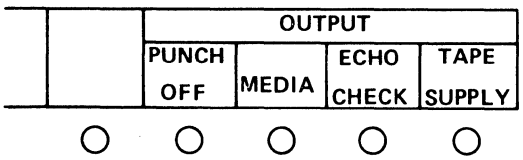


Figure 9.02.04-1 Keyboard Indicator Lights for Output Devices

9.02.05 TAPE FEED KEY

The Tape Feed key is marked "TAPE FEED". When it is depressed, it causes continuous punching of sprocket holes until it is released. This function can be modified by service to permit the Tape Feed key to punch any combination of contiguous codes in the tape feed punch cycle (rather than only sprocket holes) if desired.

9.02.06 CARD LOCK KEY

The Card Lock key is marked "CARD LOCK". To correct a "media not present" condition requires that a card be placed in the punch station and that the Card Lock key be depressed. This permits the execution of the Punch instruction, (see Edge Punched Card Detector, Topic 9.02.08) turns off the Media indicator light on the keyboard and resets the Punch Media flag.

9.02.07 TAPE PRESENCE DETECTOR

The Tape Presence Detector is a device which detects the absence of paper tape in the Perforator when a Punch instruction has been initiated. It causes the Media indicator light on the keyboard to illuminate and sets the Punch Media flag. The System remains in a punch cycle until the condition has been corrected. When the condition is corrected, punching is permitted, the Media indicator light is extinguished and the Punch Media flag is reset.

9.02.08 EDGE PUNCHED CARD DETECTOR

The Edge Punched Card Detector is a device which detects the absence of an edge punched card in the Perforator when a Punch instruction has been initiated. It causes the Media indicator light on the keyboard to be illuminated and sets the Punch Media flag. The System remains in a punch cycle until the condition has been corrected. (See Card Lock Key, Topic 9.02.06.)

When an edge punched card is present in the Perforator, the punching of sprocket holes is inhibited (function of control logic).

9.02.09 ECHO CHECK

The Echo Check feature assures that the data transmitted from the System to the Perforator is the same as that punched. If it is not the same, the Echo Check indicator light on the keyboard of the System is illuminated and the Punch Echo flag is set. The Echo Check feature will not detect a broken punch pin.

Echo Check will not inhibit the punch instruction. The Echo Check indicator light remains illuminated until the Punch Echo flag is reset by the user program.

9.02.10 TAPE SUPPLY DETECTOR

The Tape Supply Detector is a device which warns the operator that the tape is nearing depletion (approximately 20 feet of tape remains). The Tape Supply indicator light on the keyboard of the System is illuminated and the Tape Supply flag is set. This condition does not prevent punching. When the condition has been corrected, the next punch instruction causes the Tape Supply indicator light to be turned off and the Tape Supply flag to be reset.

9.02.11 TAPE FEED WHEEL

The Tape Feed Wheel is used to manually advance or backspace the paper tape or edge punched card. It is located in the front and center of the Perforator.

In the normal position, the wheel may be moved freely in either direction without moving the tape. To engage the Tape Feed Wheel with the feed sprocket requires depressing the wheel. The wheel may be turned in either direction. Turning the wheel to the right (counterclockwise) will advance the media. Turning the wheel to the left (clockwise) will backspace the media.

9.02.12 TAPE SYSTEM

The tape supply holder will accommodate a full 8 inch roll of unpunched paper tape. A power drive take-up reel is provided which produces a roll of tape 8 inches in diameter with a 3 inch inside diameter. The take-up reel permits the removal of a roll of tape. The reels accommodate tape widths of 11/16 inch to 1 inch, and are accessible to the operator for easy installation and removal of tapes. Optional take-up reels of 5.5" and 7" diameter are available that are compatible with Burroughs Group III Paper Tape Equipment.

A tape tear-off blade is located on the right end of the tape feed gate. The gate is located to the right of the punch station. A tape threading instruction label is located on the cover of the Chad box. The tape supply holder has the inscription "Empty Chad Box when Reloading Tape". This is to alert the operator to empty the chad box when a new roll of paper tape is to be placed on the Perforator.

9.02.13 EDGE PUNCHED CARD SYSTEM

The Tape Perforator accommodates individual or continuous fan-fold edge punched cards in widths up to 11 inches. The insertion and alignment of individual edge punched cards to a fixed limit is a manual operation.

A Supply Tray to supply continuous edge punched cards to the punch, and a stacking tray to hold finished continous edge punched cards, are available as an option to the basic Tape Perforator.

When the Edge Punched Card Detector (see Topic 9.02.08) has sensed that a card is in the Perforator, the punching of sprocket holes is inhibited.

The use of individual or continous fan-fold edge punched cards is not hindered by the presence of the tape supply and take-up mechanisms.

Figure 9.02.13-1 Punching Continuous Fan-Fold Edge Punched Cards

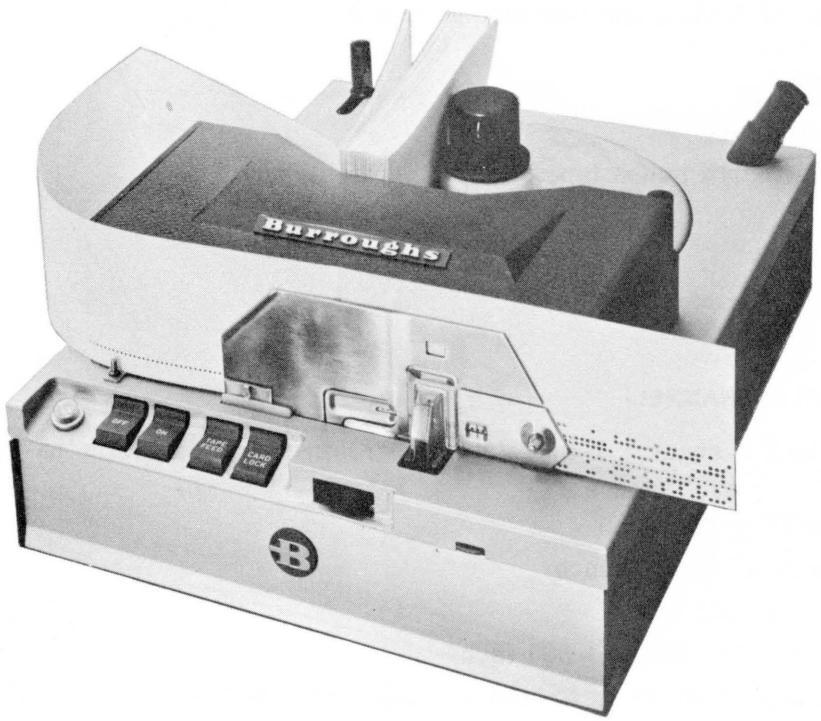


Figure 9.02.13-2 Punching Unit Edge Punched Cards

9.02.14 CHAD BOX

The Chad Box is located inside the Perforator and is attached to the front panel. A locking device prevents the removal of the box. To release the lock, a lever is provided on the right side and near the top of the Perforator. When the lever is depressed, the Chad Box can easily be removed.

The Perforator must be turned off before removing the Chad Box. The Chad Box will hold the chads from an 8" roll of paper tape.

9.02.15 DIMENSIONS

The Tape Perforator dimensions are as follows:

Width	11 5/8 inches	(29.5 centimeters)
Length	15 1/4 inches	(38.7 centimeters)
Height	6 inches	(15.2 centimeters)
Weight	21 pounds (approximate)	(9.5 kilograms)

9.02.16 ENVIRONMENTAL CONDITIONS

The environmental conditions are the same as specified in Section 11 of this manual for the basic System.

9.02.17 ELECTRICAL SPECIFICATIONS

Power for the Perforator is obtained from the System through a cable 9 feet in length. The cable is nondetachable from the Perforator, and requires service to connect it to the System. The cable enters into the System in the upper right-hand corner at the back of the machine (this is the upper left-hand corner from the back of the machine).

The standard electrical specifications are 120 volts, (range 107-127), 60 cycles ± 1% frequency variation.

9.02.18 TAPE STOCK MEDIA SPECIFICATIONS

The Perforator is capable of feeding and perforating the following tape stock in widths of 1.000 inch (8 channel) and .686 inch (5 channel):

1. Oil impregnated tape
2. Resin impregnated tape
3. Any style of Burroughs punch tape or any comparable tape
4. Dry tape
5. One ply mylar tape
6. Aluminized mylar tape
7. Fan-fold tape

9.02.19 TAPE DIMENSIONS (8 CHANNEL)

Following are the standard 8 channel 1 inch tape dimensions (these conform to the proposed ASA standards):

1. Tape width 1.000" ± .003 inch
2. Tape thickness .004" ± .0003 inch
3. Code hole .072" ± .002 inch
4. Sprocket hole .046" + .002 or -.001 inch
5. Horizontal distance from center to center of adjacent code holes .100" ± .002 inch
6. Vertical distance from center to center of adjacent holes .100" ± .002 inch

7. Center line of sprocket holes to reference edge (bottom, or 3-track edge) of tape .392" ± .003 inch
8. Cumulative spacing error: Up to ± .015" in 6.0 inches

9.02.20 TAPE DIMENSIONS (5 CHANNEL)

Following are the standard 5 channel tape dimensions (these conform to the proposed ASA standards):

1. Tape width .686" ± .003 inch
2. Center line of sprocket hole to reference edge (bottom or three-track edge) of tape .392" ± .003 inch
3. Other dimensions are the same as for the 8 channel tape

9.02.21 EDGE PUNCHED CARD MEDIA SPECIFICATIONS

The Perforator is capable of feeding and perforating the following types of Edge Punched Cards, if the card stock contains prepunched sprocket feed holes:

1. Friden type Edge Punched Cards, 3 x 7 inches
2. Hollerith Edge Punched Cards, 3.250 x 7.375 inches
3. Visi-Record type of Edge Punched Cards, 4½ or 5 x 10 inches
4. Fan-fold cards of type "1" above joined together at a perforation
5. Mylar reinforced Edge Punched Cards of type "1" above
6. Edge Punched Cards (ledger cards) wider than those listed above up to 11 x 14 inches with the punching along the 14 inch edge.

Card stocks must have prepunched sprocket feed holes, as the punching of these is inhibited when using EPC. The distance from the center line of the sprocket holes to the reference edge of the card is .392" ± .003". The thickness of edge punched cards can vary from .005 inches to .0075 inches and applies to all cards listed above. The maximum thickness at the base of the fold is 1½ times the base card.

When continuous edge punched cards are used, it is necessary to trim the leading edge of the first card. The edge punched card trimmer will trim the leading edge of the card to the first complete sprocket hole .085 ± .008 inch. If precision die cut cards are used, trimming is not required.

In the use of single edge punched cards, if precision die cut cards are used, trimming is not required.

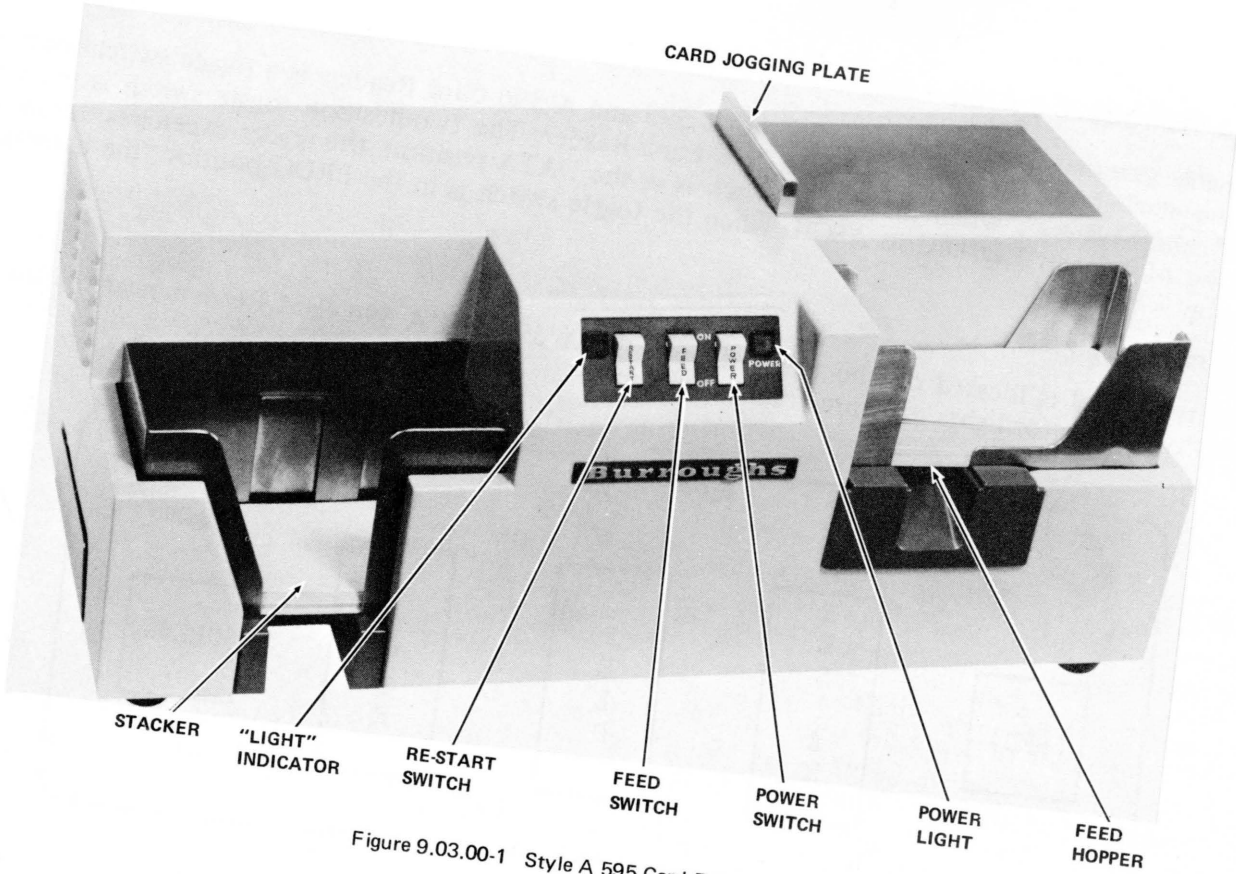


Figure 9.03.00-1 Style A 595 Card Reader

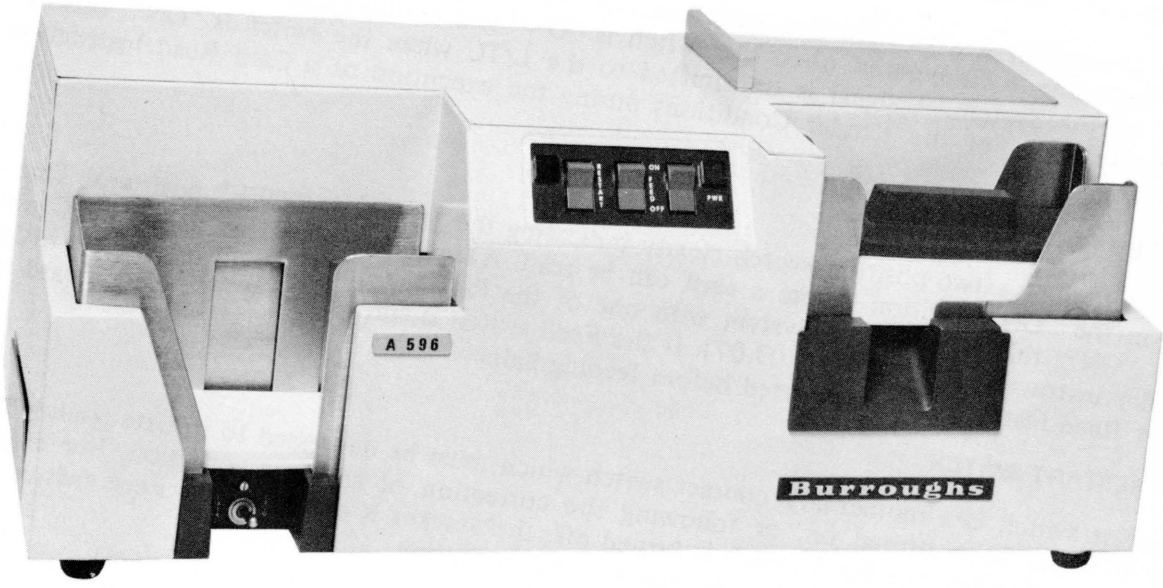


Figure 9.03.00-2 Style A 596 Card Reader

9.03.00 STYLE A 595 AND A 596 80-COLUMN CARD READERS

The A 595 and A 596 80-Column Card Readers are compact units which may be cable-connected to L/TC's which have Input/Output capability and a regular service cable connection. A Reader may be supported on a table or other office equipment stand. It provides input to the system by reading transaction cards and program data formatted in 80-column cards.

The card readers consist of a feed hopper, a read station, a stacker and a transport mechanism to move the input card from the feed hopper through the read station into the stacker.

Firmware provides the ability to read 80-column cards punched in Burroughs Common Language (BCL). The A 595 utilizes a Table of Code Assignments which converts the input card code into L/TC internal code (ASCII). The table may be loaded with the user program. EBCDIC (Extended Binary Coded Decimal Interchange Code) may be read with the A 596 card reader. However, firmware permits printing and punching of BCL only. The A 596 provides a fast hardware translation of BCL or EBCDIC into L/TC internal code.

Card reading is at the rate of up to 100 cards per minute. Reading is performed serially, column by column. An output signal is provided for each of the 80 card columns from a series of photo-electric cells. Decoding in the A 595, and formatting in both the A 595 and A 596, is provided by firmware.

A single 80-column card is read by means of a Card Read instruction in the user program. The codes for all 80-columns of the card are stored directly in memory from the A 595 reader. These codes, stored in a fixed 10-word area of memory, are then translated into internal code by the firmware using the previously stored Table of Code Assignments. The A 596 reader, with hardware translation, has an option which allows object programs to bypass the hardware translation. In the DATA mode, the code for each column of the 80-column input card is translated into L/TC internal code (ASCII) and is stored in an input area specified by the programmer. The input area of memory, when using the A 596 card reader, is limited to Block 0 for the L/TC. 80-column card instructions can be used to access data only in Track 0 (words 1-31). In accessing data above Track 0, the programmer should arrange card formats to begin data fields on word boundaries. Data Comm instructions may be used to access data at any location in Block 0; however, if the TSB instruction is to be used, the data to be transmitted must begin on a track boundary. Explicit memory locations within the stated firmware limits are specified by the L/TC programmer.

The power for both the A 595 and A 596 80-column card readers is provided by the System each serves. A malfunction occuring in the card reader that might cause the reader to be inoperable does not prohibit contined operation of the System with other devices. However, the System will halt when it attempts to execute the next Card Read (RCD) instruction and will remain in a halt state until the reader malfunction has been corrected. Either the A 595 or the A 596 80-Column Card Reader can be a field addition to any L/TC with I/O potential.

9.03.01 A 596 TOGGLE SWITCH

The primary external distinction between the A 595 and A 596 Card Readers is a toggle switch located below the stacker on the front of the A 596 Card Reader. The two-position toggle switch is marked "DATA" and "PROG". When the toggle switch is in the DATA position, the reader excercises hardware translation of BCL or EBCDIC to ASCII. When the toggle switch is in the PROG position, the hardware translation is bypassed.

9.03.02 CONTROL PANEL

The control panel is located on the front of both the A 595 and A 596 Card Readers near the top. It contains two indicator lights and three control switches.

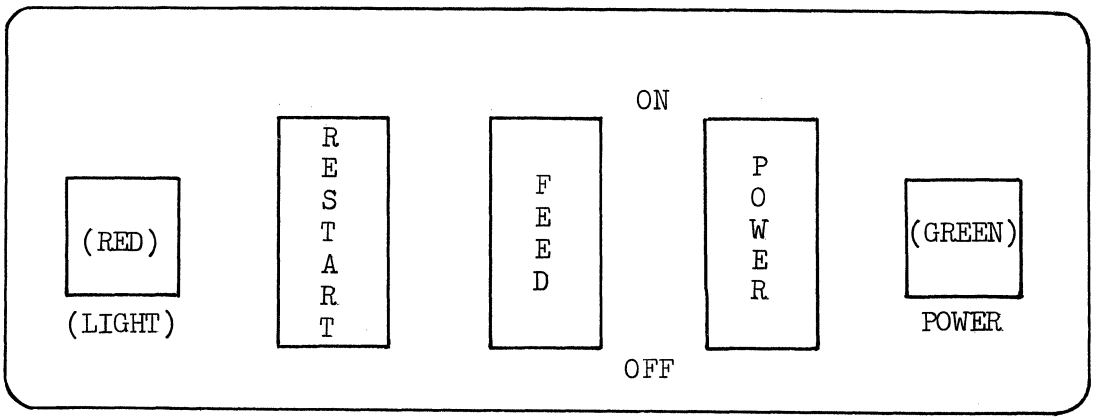


Figure 9.03.02-1 Reader Control Panel

9.03.03 POWER ON SWITCH AND INDICATOR (GREEN)

The Power On switch is a two-position switch clearly indicating the "ON" and "OFF" positions. The Power On Indicator is illuminated when the switch is "ON" and extinguished when it is "OFF". Power is supplied by the System. A signal is transmitted to the L/TC when the switch is "ON"; this provides the System with one of the Reader Conditions during the execution of a Card Read instruction (see Topic 9.03.07).

9.03.04 FEED SWITCH

The Feed switch is a two-position switch clearly indicating the "ON" and "OFF" positions. This switch must be in the "ON" position before a card can be read. A signal is transmitted to the L/TC when the switch is "ON"; this provides the System with one of the Reader Conditions during the execution of a card reader instruction (see Topic 9.03.07). If the Feed switch is turned to "OFF" while a card is being read, that Read instruction is completed before feeding halts.

9.03.05 RESTART SWITCH

The Restart switch is a momentary contact switch which must be depressed to initiate reading after the Feed switch has been turned on, or following the correction of an error condition. For example, to unload a filled Stacker, the Feed switch is turned off, the Stacker is unloaded, the Feed switch is turned on, and the Restart switch is depressed to continue the operation.

9.03.06 INDICATOR LIGHT (RED)

The indicator light (red) is illuminated if a photocell light has burned out. The correction of the condition turns off the indicator light.

9.03.07 CONDITIONS REQUIRED TO READ

The following conditions permit reading to occur:

1. The Power On switch must be "ON". Power is supplied from the L/TC, so its power must be "ON". A separate line cord is not used.
2. A Read instruction must be executed by the internally stored program.
3. A card must be present in the Read Station and the Feed switch must be in the "ON" position. If the Reader Condition indicator light on the console keyboard is lit, the Read instruction is held up. The subsequent placing of cards in the Feed Hopper and depression of the Restart switch on the Card Reader causes the Read instruction to be executed.

9.03.08 MEDIA DETECTOR

A Media Detector is a mechanism which detects whether or not a card has been transferred to the Read Station when a Card Read instruction has been initiated. When the Reader fails to transfer a card to the Read Station during execution of a Card Read instruction, a signal is sent to the L/TC which halts execution of the instruction, the Reader Condition indicator light on the keyboard is illuminated and the Reader Condition flag is set. After placing cards in the Feed Hopper and turning the Reader "ON", a depression of the Restart switch completes the execution of the Card Read instruction and causes the Reader Condition light to be turned off and the Reader Condition flag to be reset.

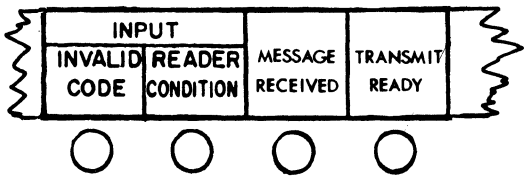


Figure 9.03.08-1 Input Indicator Lights

9..03.09 FEED HOPPER

The Feed Hopper consists of a card feed mechanism for a standard size 80-column card and the necessary mechanism to prevent release of the card to the Read Station until a card feed signal is received. Only 80-column cards can be accommodated. Cards are placed in the Feed Hopper face down with the column 1 end leading. Cards are fed from the front of the card deck by inverting the entire stack into the hopper (first card goes first into the hopper face down, 9-edge in).

The Feed Hopper permits manual card feeding and also the resupplying of cards to enable uninterrupted card feeding. It has a capacity of 350 cards.

9.03.10 READ STATION

The Read Station is a single column data reader which reads each card serially, column by column. Photoelectric cells read the 12 punch positions in a single card column simultaneously. Failure of a photoelectric cell causes the Indicator Light (red) on the control panel of the Card Reader to be illuminated.

9.03.11 FEED MECHANISM

The single feed path mechanism transports cards from the Feed Hopper through the Read Station into the Stacker. A card moves from the Feed Hopper when a Card Read instruction is executed. The feed mechanism moves the card through the Reader at the rate of up to 100 cards per minute.

9.03.12 STACKER

The Stacker is a receiving hopper for stacking cards as they leave the Read Station. The cards are stacked by a gravity method in the same sequence in which they are fed. It has a capacity of 350 cards.

9.03.13 DIMENSIONS

The 80-Column Card Reader dimensions are as follows:

Width	24 1/2"	(62.2 centimeters)
Depth	10 1/2"	(26.7 centimeters)
Height	10 3/8"	(26.4 centimeters)
Weight	45 Lbs.	(20.4 kilograms)

9.03.14 ENVIRONMENTAL CONDITIONS

The environmental conditions are the same as specified in Section 11 of this manual for the basic System.

9.03.15 ELECTRICAL SPECIFICATIONS

Power for the Reader is obtained from the System through a cable 9 feet in length. The cable is nondetachable from the Reader, and requires service to connect it to the System. The cable enters into System in the upper right-hand corner at the back of the machine (this is the upper left-hand corner when facing the back of the machine).

The standard electrical specifications are 120 volts (range 107-127), 60 cycles ± 1% frequency variation. Options for voltage and cycles that apply to the L/TC also apply to the Reader, as the Reader must be compatible.

9.03.16 PUNCHED CARD SPECIFICATIONS

The A 595 and A 596 80-Column Card Readers use standard 80-column tabulating cards. Other lengths are not acceptable.

Dimensions – Width of cards is 3.250" (+ .007" or - .003"); length of cards is 7.375" (+.005"); thickness of card paper stock is .007" (+.0004").

Corner Cuts – There are no restrictions on standard corner cuts or standard rounded corners.

Edge Characteristics – The leading edge of punched cards should be clear (free of notches, indentations, or protrusions) in an area .470" high in the center of the card (between an area slightly above the "3" row punch and slightly below the "4" row punch). Notches within this area of the leading card edge may cause feed jams. The trailing edge of the card, for the same reasons as above, should be clear in an area .126" in the center of the card. Notches in this area may cause improper reading of cards. Although all notches in the card edges are somewhat susceptible to "dog-earing", which may cause problems, this should not be a problem with reasonable handling.

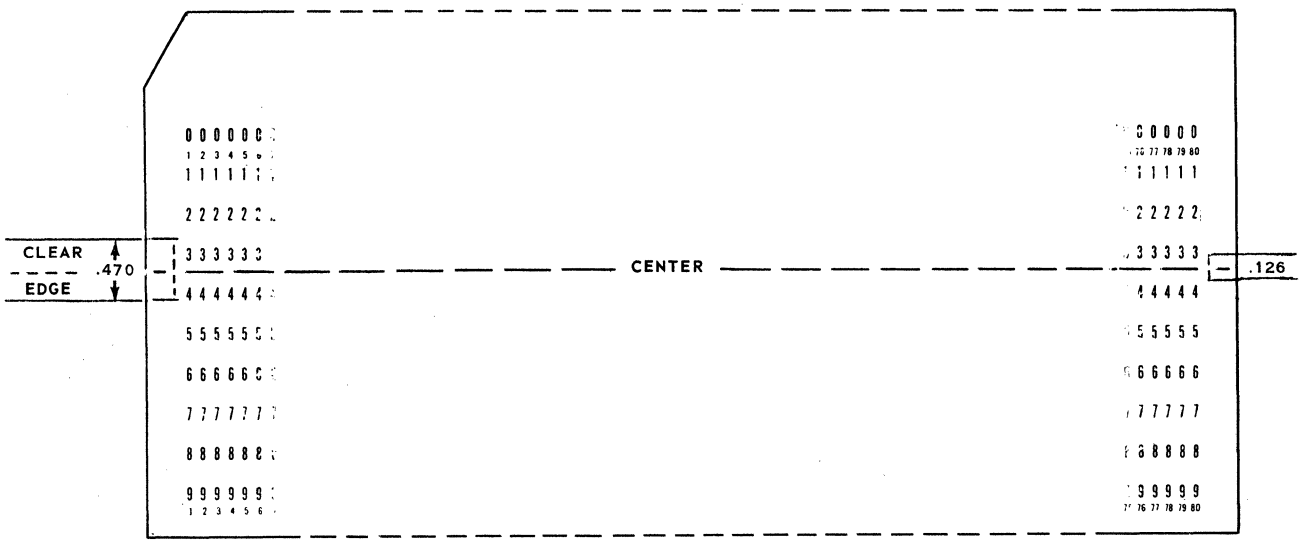
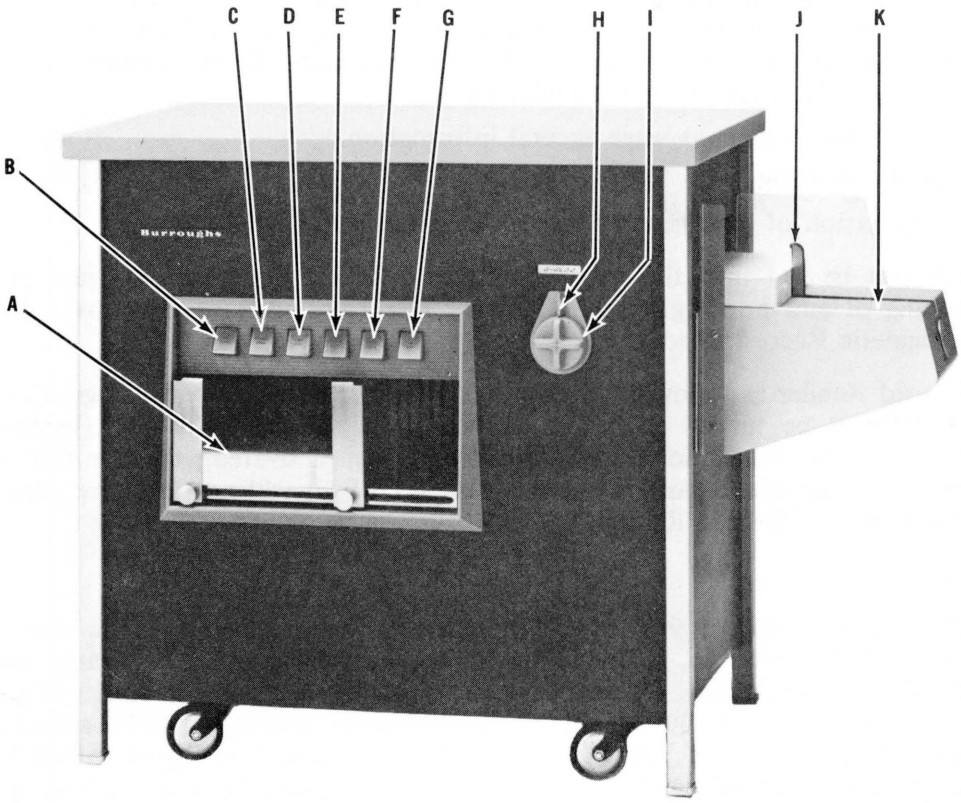


Figure 9.03.16-1 Card Edge Clear Area



A. RECEIVING HOPPER
B. NO FEED ALERT LAMP
C. DOUBLE FORM SWITCH
D. STOP FEED SWITCH
E. SINGLE FEED SWITCH
F. AUTO FEED SWITCH
G. ON/OFF SWITCH
H. FEED TABLE THUMB RELEASE
I. FEED TABLE ELEVATING KNOB
J. FORM LIMIT POST
K. FEED TABLE

Figure 9.04.02-1 Magnetic Record Reader

9.04.00 MAGNETIC RECORD READER

The Magnetic Record Reader provides an automatic method for retrieving data stored in the magnetic memory record file. The automatic input capability of the Magnetic Record Reader may be used for many jobs which could be very time consuming if done manually. Some applications which can utilize the Magnetic Record Reader with excellent results are:

Input of variable data – such as wage accural information.

Automatic Trial Balancing.

Automatic preparation of management and statistical reports.

Magnetic Records can be fed into the Magnetic Record Reader and read at a rate of 45 records per minute. All encoding of and printing on the Magnetic Record is performed by the L 5000 and is not a function of the Magnetic Record Reader.

The Magnetic Record Reader is a movable unit and is joined to the Electronic Logic Center by a plug-in cable. The L 5000 must be turned on before depression of the On/Off switch (green – labeled G in Figure 9.04.02-1) on the Magnetic Record Reader. When activated, the On/Off switch lamp is illuminated. When the Magnetic Record Reader is turned OFF, it will not interfere with operations that do not require the Magnetic Record Reader.

9.04.01 FEEDING

A Feed Table (labeled K in Figure 9.04.02-1) is located on the right side of the unit. The records are stacked on the Feed Table, face up, with the top of the record toward the operator and the right edge toward the Magnetic Record Reader. The unit can accommodate various size stacks of records; however, the maximum capacity is a stack 4½" thick, or approximately 500 records. To adjust the unit to the variation of stacked heights, a Feed Table Elevating Knob (labeled I in Figure 9.04.02-1) is located on the front of the Reader which raises the table to the desired height. Once it is raised, a Thumb Release (labeled H in Figure 9.04.02-1) just above the Feed Table Elevating Knob will lower it.

Only single part forms 11" high and from 5" to 14.5" in width can be used.

To prevent the stack from slipping away from the feed rollers, an adjustable Form Limit Post (labeled J in Figure 9.04.02-1) is located at the center of the Feed Table.

After the records are read, they are dropped into a Receiving Hopper (labeled A in Figure 9.04.02-1). Since the ledger goes into the hopper face down, the last record read is on the top of the stack, and all are still in sequence.

A small stack can be removed from the Receiving Tray within the Receiving Hopper by partially extending the tray. The tray can be completely removed for use as a tray to transport a large stack of forms. Additional trays are available (as Service Supply item).

9.04.02 CONTROL SWITCHES

There are three switches on the console of the Reader which pertain to the feeding of the records. These are labeled "Auto Feed" (green), "Single Feed" (green), and "Stop Feed" (red). (Labeled F, E, and D respectively in Figure 9.04.02-1.) In the sequence given, these switches provide automatic feeding, single feeding, and stop the feeding of the records.

When the Auto Feed switch is depressed, it causes the continuous feeding of the records until the end of the stack or the feeding process is halted by the operator or a misoperation. The Auto Feed is normally used whenever all of the records in the Feed Table are processed continuously, or all of the records inserted in the console handler require additional information from the records in the Magnetic Record Reader.

However, if the use of the records in the Magnetic Record Reader is interrupted by records in the handler for which information is not required, then depression of the Single Feed switch will cause the feeding of a single record for processing. If this switch is depressed after the Auto Feed switch has been depressed, then the Single Feed switch will not be activated.

9.05.02 CONTROL PANEL, CARD PUNCH

See the related manual (Form 1042215) for the control panel functions. The following controls are the same, see Figure 9.05.01-1.

1. Power ON
2. Power OFF
3. Auto Feed
4. Printer
5. Punch On Line, see Program Switch (P2, 0, P1)
6. Punch Reject

For the Release key on the Control Panel the following functions are present.

On Line – The Release key does not function when the Punch On Line switch/light is active (illuminated). See "REL" on keyboard in Topic 9.05.04.

Off Line – When the Release switch/light on the control panel is depressed the card in the Read Station will be ejected in the Regular Stacker (if Punch Reject switch not previously depressed), and the card in the Punch Station will be released to the Read Station. The light also illuminates.

9.05.03 PROGRAM DRUMS

When the Card Punch is operated on-line, Program Drum 2 is always used, and Program Drum 1 may be used.

Program Drum 1 – Print Suppress is the only function which may be controlled by a Program Card on Drum 1. A malfunction may occur if any other off-line functions are included in the card on Drum 1. Printing by the Card Punch printer does not occur when a "3" code is present in each column of the corresponding field of the program card. The console may be programed to print but the "3" code prevents a print on the card being punched even though the Printer switch/light is active. Usually the Print Suppress function is used when a special code is punched into the card because the printed character is not available on the Card Punch. See keyboard also. A card without punched holes should be on Drum 1 if the Print Suppress function is not used.

Program Drum 2 – The Card Punch provides a synchronization signal to the console to enable the firmware to keep a column count in the Punch Count Register. This is accomplished with Program Drum 2, using a drum card with all 80 columns alternately punched with 12 and 11 punches (12 punch in column 1, 11 punch in column 2, 12 punch in column 3, etc.). It does not matter whether a 12 or 11 punch begins the alternating sequence. See Card Punch Keyboard for exceptions.

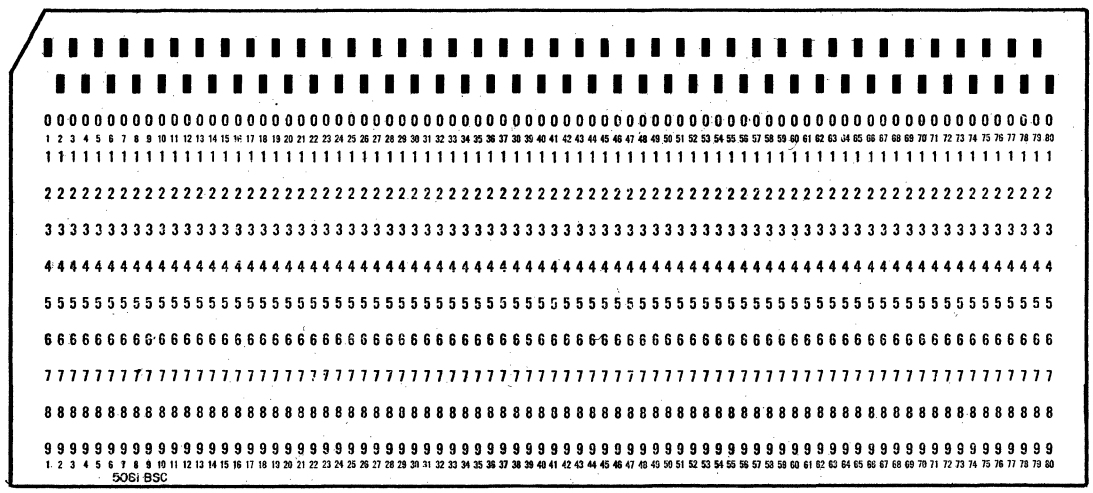


Figure 9.05.03-1 Drum 2 Program Card

9.05.04 CARD PUNCH KEYBOARD

Except as described for the following features the keyboard for the Card Punch does not function when the Punch On-Line switch/light is active (illuminated). The keyboard is used for off-line operation.

Program Switch (P2, 0, P1) – The toggle switch may be set in any of the three positions when the punch is on-line because the on-line function disables the Program Switch. Position 0 is the recommended position.

ERR REL, REL, DUP, and SKIP – The subject keys on the Card Punch Keyboard will function when the punch is on-line; however, the key should not be used unless the following conditions or program capabilities are present:

CONDITION 1 – The program is restarted after one of the keys is used. (This assumes that the program reloads the Punch Count Register to 1, or the instruction to Skip to Card Column 1 is executed.)

CONDITION 2 – The program is not restarted, but includes a recovery routine with an instruction to reload the Punch Count Register to 1, or includes the instruction to Skip to Card Column 1.

CONDITION 3 – The cards in the Punch Station and Read Station are registered at Card Column 1. (This assumes that cards were registered at the respective stations with the punch Count Register set at 1.)

See Section 10 for an explanation of the Punch Count Register and other irregular program functions which may create an out-of-step condition.

RESET – The Reset key illuminates and is accompanied by an audible alarm when certain conditions on the Card Punch require operator attention. A depression of the key extinguishes the light and turns off the alarm. Usually this alarm is an indication that cards are not properly registered for an orderly advance, or the Manual Insertion lever is out of position. See Reset Key in Topic 9.05.05 and Echo Check in Topic 9.05.06

Keyboard and Printer – The Card Punch Keyboard includes 48 markings for keys which index printing from the 47-character printer. The keys index printing for the corresponding marking except the key marked for eleven and dash prints a dash only. A "12" punch prints an ampersand. The console may index and punch more than the 47 available characters for the Card Punch in accordance with the table of Output Codes (Section 10). The Print Suppress, Code 3, on Drum 1 may be used to prevent a printing when the character is not present on the Card Punch Printer if the Printer switch/light is active. The print for some other character may otherwise occur or the print is illegible.

9.05.05 RESET KEY AND BACK SPACE KEY ON CONSOLE

The Reset Key and Back Space Key on the console are not normally used when the operator is indexing alpha information with an instruction which is simultaneously punching. See Topics 3.02.04 and 3.02.09 for explanation of the subject conditions.

9.05.06 OUTPUT INDICATOR LIGHTS AND FLAGS

Three of the Output Indicator Lights on the Console are used to warn the operator of the operating status of the Card Punch. In addition, one of the Punch Flags (P-4) associated with the Indicator Lights enables the program to provide alternate procedures depending on Card Punch conditions. See Topic 3.04.03 also.

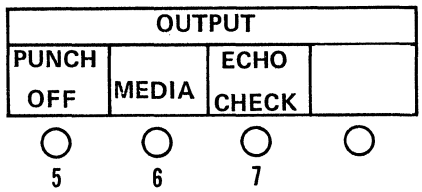


Figure 9.05.06-1 Indicator Lights on Console

When the Stop Feed switch is depressed, the Magnetic Record Reader will complete the processing of the active record, then will halt and the Stop Feed lamp is illuminated. Under Auto Feed, a form will be at the ready station. The Single Feed or Auto Feed switch will restart the record feeder and extinguish the Stop Feed lamp.

A Double Form switch and indicator lamp (red) (labeled C in Figure 9.04.02-1) is illuminated whenever the adjustable double form mechanism senses a thickness greater than one record. This added thickness can be caused either by feeding two records or a multilated record into the Reader. This type of error causes a machine block and the feeder is stopped, with the Double Form lamp being illuminated. No form reading or printing will occur. Depression of the Double Form switch completes the transport cycle by stacking the records which caused the error into the receiving hopper thus allowing the operator to recycle the unread records. It also extinguishes the Double Form lamp and illuminates the Stop Feed lamp with the records which caused the error returned to the feeder. The Single Feed or Auto Feed switch is used to restart the feeder.

The Magnetic Record Reader also contains a No Feed (red) indicator lamp. (Labeled B in Figure 9.04.02-1.) Two conditions will cause this indicator lamp to illuminate. One, if the end of the stack is reached; and the other, if the feeder is too far away from the stack so as to be unable to reach the records. Two consecutive attempts are made to feed the record, and if both fail, the Magnetic Record Reader will stop and a No Feed indicator lamp is illuminated. This lamp stays on until the Single Feed or Auto Feed switch is depressed.

9.04.03 OPERATION

The Magnetic Record Reader should be located at the operator's right when seated at the printer. The records will be placed on the Feed Table face up with the right edge toward the Magnetic Record Reader. The adjustable Form Limit Post is brought up against the forms. The table is raised to the pickup position of the transport. The ON-OFF switch is turned on, and the reader is started by depressing either the Auto Feed or Single Feed switch. The form is picked up and transported through the read head to the Receiving Tray, face down, with the bottom of the form toward the operator, and with the last form fed always on top in the Receiving Tray. When the Feed Table is empty, the Magnetic Record Reader stops feeding.

9.04.04 FORMS SPECIFICATIONS

The Feed Table can handle single part forms 11" high only, and from 5" to 14½" in width. Some applications combine the statement and record on one striped form, with the statement being cut off and mailed after month-end closing. In this case, an institution may desire to furnish statements as soon after the closed statement has been released. This requires that the balance transfer be made from the stub record containing the stripe.

The A 4005 Magnetic Record Reader is capable of processing a stub as narrow as five (5) inches providing the stub meets the following specifications:

a. The cut must be accurate within a plus or minus of 1/32" within any one group of forms being loaded on the Feed Table at one time.

b. The cut is made to the left of the stripe, and the stripe must not be damaged in cutting.

If dividers are used to replace index cards (which must be removed when processing through the Magnetic Record Reader) they must have the upper right corner cut and be of the same weight as the forms.

9.04.05 FILLED FORMS OR TRANSFERRED BALANCES

For the simplest procedure, filled forms should be removed from the record tray as soon as the balance is forwarded to a new form.

In many cases the customer may desire to maintain all of the forms pertaining to each record in the record tray, although all but the current posting sheets have been filled. The Magnetic Record Reader is

unable to determine whether the last balance on the form has been forwarded to a continuation form. For this reason it will be necessary to identify all forms on which the balance has been forwarded, in order that the amounts on forwarded sheets will not be accumulated in the trial balance, or forwarded again in the balance transfer operation. Several methods may be used to accomplish this objective.

1. Forms striped on the back only may be purchased from the supplier with the left corner diagonally cut ½ inch in from the top left corner and ½ inch down from the top on the left edge.

   When a form is filled the operator will reverse the filled form in the record tray putting the cut corner on the right side. When the forms are processed by the Magnetic Record Reader, a sensing mechanism will determine the absence of the corner, allowing the form to pass without reading the stripe.

2. If the user does not want to reverse the filled forms in the record tray, it will then be necessary for the operator to make a minimum diagonal clip off the top right hand corner of the form, ½" to the left of the right edge and ½" down from the top. It is suggested that this clipping be simplified by having the supplier imprint the line of the diagonal cut on the top right corner of all forms. This will enable the operator to cut with an ordinary scissors or similar method without making accurate measurements of the minimum dimension required.

The absence of the corners can be sensed by the Magnetic Record Reader in the same manner outlined in the preceding paragraph 1.

Punch Off Indicator, Position 5 – The Punch Off Indicator Light is turned on and Punch Flag P-4 is set if the Card Punch On-Line switch is not on, or if the On/Off switch is not on while a card punching instruction is attempted. The punch portion of the instruction does not occur and the instruction is executed in the manner of its counterpart keyboard or print instruction. The program does not halt. An instruction involving no other functions but punching is executed as a NOP instruction. The correction of the condition by turning on the punch and placing it in the On-Line mode will cause the indicator to be turned off and Punch Flag P-4 to be reset on the next punch instruction.

To avoid the possibility of the operator failing to turn on the punch when beginning an operation, it is recommended that during the program initialization a card be released (SKP 1) and the Punch Off Flag P-4 be examined. If a master card is used a Duplicate instruction (DUP through Card Column 80) may be used. If the P-4 Flag is set, the program routine may warn the operator (with the Alarm or by printing a warning message) and in addition may prohibit further processing or halt to allow an operator decision as to whether the following group of transactions requires card output.

Card Not Present Indicator (Media), Position 6 – If the program attempts to execute a punch instruction and a card is not registered in the Punch Station, the instruction is held up, the Media Indicator light is turned on, and Punch Flag P-1 is set. Correction of the condition by registering a card in the Punch Station with the Auto Feed switch/light permits the instruction to be executed, at which time the indicator light is turned off and Punch Flag P-1 is reset.

A Skip or Execute instruction may not be programed to interrogate the set P-1 Flag. The media condition must be corrected in order to continue the procedure or the Card Punch may be turned OFF.

Error Indicator (Echo Check), Position 7 – The Error Indicator Light is turned on and Punch Flag P-2 is set if a Card Punch malfunction or misoperation occurs. If this condition occurs, the Card Punch is not operative, the RESET key (switch-light) on the Card Punch is turned on, and the program is held up on the punch instruction. A depression of the RESET key removes the error condition and permits execution of that instruction to be completed or terminated and the program to continue, Punch Flag P-2 and the indicator light are turned off. Usually an operator attended alternate routine is provided for this type of condition.

The depression of the RESET key does not change the fact that mispunching may have occured, or that a newly registered card may be out of synchronization with the Punch Count Register.

NOTE: Indicator at Position 8 is not used with 80-column card output nor may Flag P-3 be set, reset or interrogated by the program.

9.05.07 PUNCH CARD SPECIFICATIONS, 80-COLUMN

The width of the card must be 3.250" with a permissible tolerance of plus .007" and minus .003".

The length of the card is 7.375" with a permissible tolerance of plus or minus .003".

Thickness of the Card Paper stock is .007" with a permissible tolerance of plus or minus .0004".

The size of the rectangular punched hole is .125" high and .055" wide.

The distance from the left edge of the card to the center of column 1, and the distance from the center of the last column to the right edge of the card are both ¼". The horizontal distance for holes in adjacent columns is .087" plus or minus .007" as measured from the right edge to right edge of adjacent holes.

The vertical distance from center to center of the twelve vertical punches and from the top and bottom of the card to the center of the "12" and "9" holes respectively is ¼".

9.05.08 DIMENSIONS, ELECTRICAL, AND ENVIRONMENTAL SPECIFICATIONS

Electrical

The standard electrical specification is 115 volts plus or minus 10% and 60 cycle with a frequency variation of plus or minus 1%. This requires 4.3 amperes. As an option 50 cycles may be provided with the same tolerance. Optional voltages are available for 95, 105, 127, 200, 220, and 249 with a plus or minus 10% tolerance.

The three-wire nondetachable, power line cord for the Card Punch is 9' in length. The cord is anchored approximately centered between the left and right ends near the bottom of the back side of the punch.

The connecting cable from the Card Punch to console is 9' in length, and may be disconnected by the operator at the console. The anchoring for the connecting cable at the punch end is near the right-rear corner and bottom of the back side. (This is the left corner when standing behind the punch.)

The connection on the console is at the right-rear corner near the top of the desk. (This is the left corner when standing behind the console.)

Dimensions and Weight

The overall dimensions are as follows:

Height, 44", or 111.8 centimeters

Width, 48½", or 123.2 centimeters

Depth, 35", or 88.9 centimeters

The weight is approximately 400 pounds or 181 kilograms.

Environmental Conditions, Operating

The recommended temperature range is 66°F to 87°F at a relative humidity of 35% to 65%. This range is equivalent to 18.8° to 30.5° centigrade.

This operating range is slightly less than for the console, see Section 11.

Chad Box

The removable Chad Box is located under the work area top and forward of the leg-room area.

9.05.09 OPERATOR DISCONNECT, OD 509 KIT, OPTIONAL FEATURE

The purpose of the Operator Disconnect kit is to provide the ability to use one Card Punch, at separate times, with another console (Series L/TC). The connecting cable (provided with the Control Unit A 509 package) of the Card Punch is moved from one console to the other. The disconnect kit is required for each of the second and the additional consoles, and provides the necessary internal cables and circuit cards to provide Card Output capabilities when the Card Punch connecting cable is attached. The first (one) console receives the internal cable and circuit cards provided by the A 509 Control Unit.

The Indicator Buffered package (IB-1 kit) must be included in the second or additional consoles if the kit is not already present.

With this OD kit installed one Card Punch may be used at different times with any one of several consoles. The consoles may be programmed for the same application or different applications.

9.05.00 CARD PUNCH, 80-COLUMN, STYLE A 149

The Card Punch cable-connected to certain Series L/TC's may be used to Punch Hollerith holes in 80-column punched cards. As the Series L/TC program executes, certain selected data is punched into the card as the data is generated by the console or indexed on the console keyboard by the operator. The combined system requires the installation of certain parts of a Card Punch Control Unit package (Style A 509) in both the console and card punch. The installation of the Control Unit in a console with Input and Output Potential will provide a console with the Input and Output Capability. See Topic 9.05.09 for an optional feature for the console only.

The cards are punched serially a field at a time under the control of the program in user memory. The Card Output instructions provide for punching numeric and alpha data from a keyboard entry, numeric from the accumulator, or alpha from a memory location. The data in memory or from the keyboard (8 bits per character) is translated into the proper card code with an output code translation table. In addition, an 80-Column Card Reader or Punched Paper Tape/Edge Punched Card Reader may be attached to the system. Unlike a system with PPT/EPC Perforator and a Reader, the 80-column cards may not be read by a Reader and another card punched by the Card Punch with the execution of only one instruction. However, PPT or EPC's may be read and 80-column cards punched with one instruction. The ability to provide input and output is dependent upon the memory size and firmware.

Card Output firmware sets have a code translation table with a 64 character capacity, in accordance with the 64 character set of the console. The table includes code values with a standard interpretation of each code (BCL). A program instruction which does not reference the output table is provided to create card codes which may be required but which are not in the internal character set. In addition, the table may be changed by the programmer to provide a different interpretation of any given code(s).

The Series L program has complete control over the field format of a card, and does not rely on a card punch drum program for this purpose. Thus, any number of card formats may be punched within the same program. All of the usual card punch functions (skip, duplication, card release, etc.) can be accomplished in the program; in addition, the selection of either the regular or alternate card stacker for each output card is under program control. See Section 10.

The Burroughs Style A 149 and A 150 Card Punch Operator Manual, Form 1042215 may be used for a detailed description of the Style A 149 Card Punch.

The following topics describe the functions of the card punch and console when the two are connected.

Figure 9.05.00-1 Style A 149 Card Punch

9.05.01 POWER ON SEQUENCE

The Series L/TC and Card Punch each have separate electrical line cords; therefore, each must be turned off by separate controls.

The following procedures may be used to turn both units ON or start the operating procedure. See Topic 5.01.00 for Console Power ON and Figure 9.05.01-1 for Card Punch controls.

1. Place program cards on Drums 1 and 2 if not present.
2. Install "master card" or "lead card" in Read Station if required for the application, use Manual Insertion lever.
3. Set Program Switch at 0 (toggle switch on Card Punch keyboard).
4. Place cards in Card Punch Feed Hopper, if empty.
5. Depress Power (green) ON on Card Punch.
6. Depress "Auto Feed" switch/light on Card Punch (cards feed and register at punch station if not previously present).
7. Depress "Printer" switch/light if not illuminated on Card Punch.
8. Depress "Punch On Line" switch/light if not illuminated.
9. Turn power ON with Power ON push button on console.

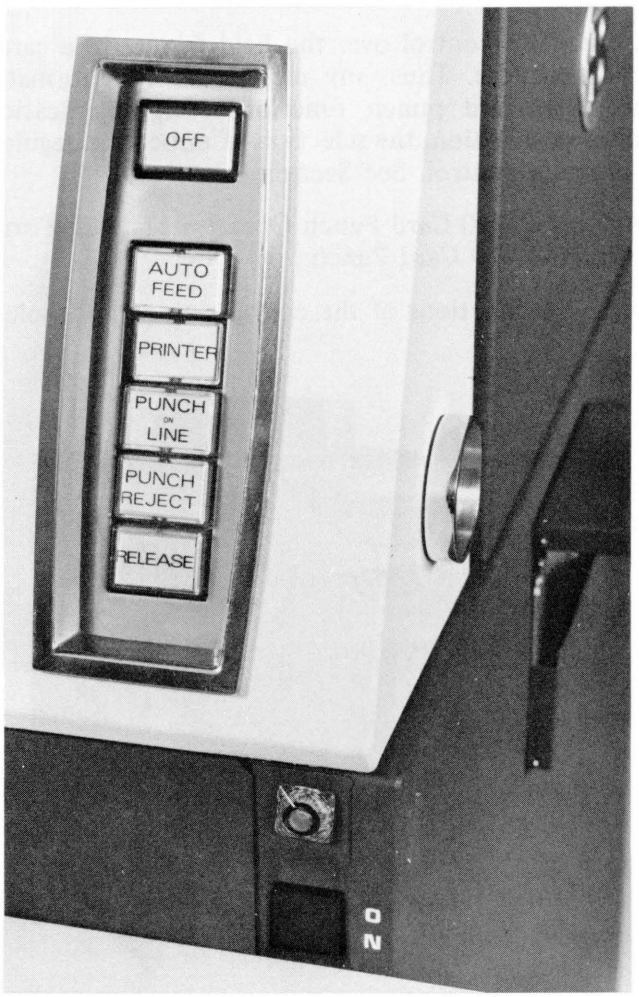


Figure 9.05.01-1 Style A 149 Control Panel

SECTION 10
COMMANDS

10.00.00 GENERAL

The instructions defined apply to the Series L/TC machines. For parameters and an explanation of how each instruction may be used within a program see the Basic Assembler Manual.

10.01.00 KEYBOARD INSTRUCTIONS

The keyboard instructions will light the Alpha or Numeric indicator lamp when they are to be executed. They will also cause the enabled Program Key indicator to be lit. If an invalid key is depressed or more than the specified number of keys are depressed the Error Indicator lamp will be illuminated and the alarm will sound. Depression of the Reset key will relieve the error condition, thereby allowing the keyboard entry to be completed. The left or right line advance keys may be depressed, thereby causing the left or right form to be advanced one line for each key depression. The O/C key will open or close the Forms Handler. If the Ready push button is depressed, the machine will return to the Ready Mode. If Ready Mode has already been established, depression of the Ready button will cause the machine to turn power off. Alpha and Numeric key depressions are controlled according to the specifications of the keyboard commands.

10.01.01 NUMERIC KEYBOARD (NK)

The Numeric Keyboard instruction allows an entry of up to 15 digits through the keyboard as specified by the program. Depression of any OCK or enabled PK will terminate the instruction. If no numeric keys are depressed a zero entry is automatically made. Printing is not a part of the Numeric Keyboard instruction. Numeric digits may be entered after the depression of the Decimal key if this has been specified by the instruction. The numeric digit values, or zero if no key were depressed, would be placed into the accumulator.

Execution time = 40 ms per digit
80 ms per OCK

10.01.02 NUMERIC KEYBOARD, REVERSE ENTRY (NKR)

The NKR instruction is the same as the NK instruction with the exception that the use of the RE key will be allowed. The RE (Reverse Entry) key depression will set the minus or sign flag of the accumulator.

Execution time = 40 ms per digit
80 ms per OCK

10.01.03 NUMERIC KEYBOARD, C AND M KEYS (NKCM)

The NKCM instruction is the same as the NK instruction with the exception that the use of the C and M keys will be allowed. Depression of either or both of these keys will set the corresponding flag(s) in the accumulator. These flags may be used to indicate per hundred or per thousand. They may also be used as special code indicators for program control.

Execution time = 40 ms per digit
80 ms per OCK

10.01.04 NUMERIC KEYBOARD, REVERSE ENTRY, C AND M KEYS (NKRCM)

The NKRCM is the same as the NK instruction, but also allows the RE, C and M keys to be used. Depression of these keys will set their respective flags in the accumulator as explained above.

Execution time = 40 ms per digit
80 ms per OCK

10.01.05 TYPE (TK)

The TK instruction will enable typing up to 150 alphanumeric characters on machines with the 15½" Forms Handler and up to 255 on machines with the 26" handler. The number of characters that may be typed is controlled by program and hardware limitations. The position that the characters will be printed is controlled by the value that is placed in the Position Register. The Position Register is used to control the physical location of the print ball. The characters will be printed in black unless a Red Ribbon instruction has been programed prior to the TK instruction. The TK instruction can be terminated with any OCK or an enabled program key.

Keyboard entry speed: 15.5 characters per second

Processing of keyboard codes from buffer is independent of and overlaps keyboard entry time:

20 to 50 ms base
50 ms per character
100 to 110 ms per OCK
130 to 140 ms per PK

10.01.06 TYPE INTO MEMORY (TKM)

The TKM instruction differs from the Type (TK) instruction in that in addition to printing alphanumeric characters, it also stores these characters in memory. The designated storage is controlled by keyboard registers. The codes for Open/Close, Line Advance, OCK's, and program keys are not stored in memory.

Keyboard entry speeds: 15.5 characters per second

Processing of keyboard codes from buffer is independent of and overlaps keyboard entry time:

20 to 50 ms base
50 ms per character
100 to 110 ms per OCK
130 to 140 ms per PK
30 ms to store each 8 characters in memory

10.01.07 ENTER ALPHA INTO MEMORY (EAM)

The EAM instruction is like the TKM instruction but no printing will occur. The print ball and position register are not affected by this instruction.

Keyboard entry speed: 15.5 characters per second

Processing of keyboard codes from buffer is independent of and overlaps keyboard entry time:

20 to 50 ms base
60 ms per character
100 to 110 ms per OCK
130 to 140 ms per PK
30 ms to store each 8 characters in memory

10.01.08 LOAD KEYBOARD BASE REGISTER (LKBR)

The LKBR instruction loads a value into a register that is used to specify the starting word location at which alphanumeric and control characters are stored in memory. It is incremented by one each time that 8 characters have been stored. In a Data Comm environment, when this register is loaded, the Send Character Pointer register is also loaded with zero.

Execution time = 20 ms

10.01.09 ENABLE PROGRAM KEYS GROUP A (PKA)

This instruction loads a register with a value that is used to light an indicator lamp or enable a program key that may be used to terminate a keyboard entry. The values will identify any of the eight program keys in group A. If a program key is to be used to terminate an instruction the Load Program Key Base Register must be programed prior to this instruction. An enabled program key may only be used to terminate a keyboard instruction. Depression of a nonenable program key will cause a keyboard error condition. The PKA instruction must be programed prior to a keyboard instruction. Upon depression of an enable program key after a keyboard instruction the next instruction executed will be taken from the Program Key Table.

Execution time = 20 ms

10.01.10 ENABLE PROGRAM KEYS GROUP B (PKB)

This instruction works in the same manner as PKA except that it relates to the eight program keys in Group B.

Execution time = 20 ms

10.01.11 ENABLE PROGRAM KEYS GROUP C (PKC)

This instruction works in the same manner as PKA except that it relates to the eight program keys in Group C on systems with 24 PK's.

Execution time = 20 ms

10.01.12 LOAD PROGRAM KEY REGISTER (LPKR)

The LPKR loads the beginning word location of the program keys instruction table. Each group of program keys (A, B, C) requires two words with four instructions in each that will be executed when a program key is depressed. A program may have more than one program key table.

Execution time = 20 ms

10.02.00 PRINT INSTRUCTIONS

10.02.01 LOAD POSITION REGISTER (POS)

The POS instruction loads a register with a value that corresponds to the actual value to which the printer is to be positioned when characters are to be printed. The print ball will not be moved until a keyboard or print instruction is executed.

Execution time = 300 ms if positions 0-6 or 300 ms + 5 ms for each position beyond 6 if positions 6-150.

10.02.02 REVERSE RIBBON (RR)

The RR instruction is used to change the ribbon color of the next printing instruction. The ribbon color will be opposite (not necessarily red) to the color normally expected from the data print of the next instruction. After the instruction to print has been executed the effect of the RR will be removed.

Execution time = 20 ms

10.02.03 PRINT ALPHANUMERIC (PA)

The PA instruction will print alphanumeric data that has been stored in memory as specified by this instruction.

Execution time = 50 ms per character

10.02.04 PRINT NUMERIC (PN)

The PN instruction will print a specific number of digits from the accumulator. The digits will be printed in a format that is specified by a print mask from the Print Mask Table. Printing may not occur if zero suppression is specified. A maximum of 15 digits may be printed and must be placed into the accumulator prior to the PN instruction.

Execution time = 90-120 ms for first digit or punctuation
50 ms all succeeding places
10 ms per digit or punctuation suppressed

10.02.05 PRINT NUMERIC – SHIFT RIBBON IF MINUS (PNS-)

This instruction works like the PN except that if the accumulator sign flag is set the ribbon will be shifted to the opposite color.

Execution time = 90-120 ms for first digit or punctuation
50 ms all succeeding places
10 ms per digit or punctuation suppressed

10.02.06 PRINT NUMERIC – SHIFT RIBBON IF PLUS (PNS+)

This instruction works like the PN except that if the accumulator sign flag is reset the ribbon will be shifted to the opposite color.

Execution time = 90-120 ms for first digit or punctuation
50 ms all succeeding places
10 ms per digit or punctuation suppressed

10.02.07 LOAD PRINT NUMERIC BASE REGISTER (LPNR)

The Print Numeric Base Register is loaded with a base word address for a print mask table that is used in conjunction with the Print Numeric instructions. A word in this table will contain codes that are used to control the print format of numeric values. A table may contain 16 different print formats. The flag position in a print format is also used to control edge-punched card or paper tape output. These codes also control the escapement of the print ball.

Execution time = 30 ms

10.02.08 PRINT CHARACTER (PC)

When this instruction is executed a specified character will be printed unconditionally.

Execution time = 30-70 ms

10.02.09 PRINT CHARACTER PREVIOUS RIBBON (PCP)

Execution of this instruction will cause a specified character to print unconditionally in the same color ribbon as that for the previous printing.

Execution time = 30-70 ms

10.02.10 PRINT CHARACTER IF ACCUMULATOR IS MINUS (PC-)

This instruction will cause a specified character to be printed if the accumulator minus flag is set.

Execution time = 10 ms if no print occurs
30-70 ms if print occurs

10.02.11 PRINT CHARACTER IF ACCUMULATOR IS PLUS (PC+)

This instruction will cause a specified character to be printed if the accumulator minus flag is reset.

Execution time = 10 ms if no print occurs
30-70 ms if print occurs

10.03.00 OPEN/CLOSE FORMS HANDLER INSTRUCTIONS

10.03.01 OPEN FORMS HANDLER (OC)

The Open Forms Handler instruction is used to open the forms mechanism in order to insert or remove a document. This instruction also indicates the number of lines that will be advanced on the left after the forms mechanism is closed before printing begins. The forms handler may be closed by depression of the O/C key on the keyboard, before printing occurs by firmware or programmatically using the Close Forms Handler (CC) instruction. Some of the instructions for magnetic unit records also cause the forms handler to open and close. On L 4000 styles the OC instruction will open the handler only, the line advancement is ignored.

Execution time = 210-280 ms

10.03.02 CLOSE FORMS HANDLER (CC)

The Close Forms Handler instruction will cause the Forms Handler to be closed. The number of lines as specified by the Open Forms Handler instruction will be advanced on the left platen. The left line count register is incremented 1 for each line advancement.

Execution time = 210-280 ms

10.04.00 FORMS CONTROL INSTRUCTIONS

10.04.01 LOAD LEFT PLATEN COUNT REGISTER (LLCR)

This instruction will load a value into a register that is used as a left forms line count. This count is changed when printing occurs after an OC instruction, AL, ALTO, ALR, and CC instructions are executed. The register is also changed when the left line advance key is depressed. When the contents of the Left Count Register exceeds the contents of the Left Limit Register the Forms Limit Flag is set.

Execution time = 30 ms

10.04.02 LOAD RIGHT PLATEN COUNT REGISTER (LRCR)

This instruction will load a value into a register that is used as a right form line count. This count is changed when AR, ARTO, ALR instructions are executed. The register is also changed when the right line advance key is depressed. When the contents of the the Right Count Register exceeds the contents of the Right Limit Register the Forms Limit Flag is set.

Execution time = 30 ms

10.04.03 LOAD LEFT LIMIT REGISTER (LLLR)

This instruction loads a register with a value that is used to indicate a total number of lines on a form that is used in conjunction with the left forms mechanism. This register may contain a value of zero through 255.

Execution time = 30 ms

10.04.04 LOAD RIGHT LIMIT REGISTER (LRLR)

This instruction loads a register with a value that is used to indicate the total number of lines on a form that is used in conjunction with the right forms mechanism. This register may contain a value of zero through 255.

Execution time = 30 ms

10.04.05 ADVANCE LEFT PLATEN (AL)

Execution of this instruction will cause the left platen or pin feed device to be advanced 1/6" for a specified number of lines. The left count register will be incremented by 1 for each line advancement.

Execution time = 20 ms, plus 80 ms for the first line
and 50 ms each succeeding line

10.04.06 ADVANCE RIGHT PLATEN (AR)

Execution of this instruction will cause the right platen, pin feed device, or magnetic unit record to be advanced 1/6" for a specified number of lines. The right count register will be incremented by 1 for each line advancement. If a magnetic unit record is present it is advanced and the Stripe Count Register is incremented.

Execution time = 20 ms, plus 80 ms for the first line
and 50 ms each succeeding line

10.04.07 ADVANCE LEFT AND RIGHT PLATENS (ALR)

This instruction will cause both left and right line advance mechanisms to be advanced an equal number of lines as specified by this instruction. Both left and right count registers are incremented by the number of line advancements. If a magnetic unit record is present it will be advanced and the Stripe Count Register incremented.

NOTE: If the Stripe Count Register is incremented one beyond the Stripe Limit Register the Filled Sheet Flag will be set.

Execution time = 20 ms plus 80 ms for the first line
and 50 ms each succeeding line

10.04.08 ADVANCE LEFT PLATEN TO (ALTO)

This instruction will advance the left platen and increment the left count register until the left count register is equal to the value that is specified by this instruction. An attempt to advance to line "0" or to a line number larger than the value of the left limit register will give erroneous results.

Execution time = 20 ms, plus 80 ms for the first line
and 50 ms each succeeding line

10.04.09 ADVANCE RIGHT PLATEN TO (ARTO)

This instruction will advance the right platen and increment the right count register until the right count register is equal to the value that is specified by this instruction. An attempt to advance to line "0" or to a line number larger than the value of the right limit register will give erroneous results. If a magnetic unit record is present it will be advanced by the same number of lines and the stripe count register will be incremented.

Execution time = 20 ms, plus 80 ms for the first line
and 50 ms each succeeding line

10.05.00 ARITHMETIC AND DATA MOVEMENT INSTRUCTIONS

The overflow flag will be set whenever an arithmetic operation results in more than 15 significant digits. Care should be taken to interrogate this flag for overflow conditions shortly after arithmetic has been executed as this flag is also used to indicate other error type conditions. The minus or sign flag will be set or reset according to the algebraic result of the arithmetic operation. Both the overflow flag and the accumulator flags are tested automatically within any arithmetic operation.

10.05.01 ADD TO ACCUMULATOR (ADA)

This instruction algebraically adds to the accumulator an amount that is stored in a specified location in memory. The value in memory is retained in its original state. The specific memory location referenced must be stored somewhere in words 0-511.

Execution time = 50 ms

10.05.02 ADD TO MEMORY (ADM)

This instruction algebraically adds the value in the accumulator to a value that is stored in the specified location in memory. The value in the accumulator is retained in its original state.

Execution time = 70 ms

10.05.03 SUBTRACT FROM ACCUMULATOR (SUA)

This instruction will algebraically subtract the amount in the accumulator from the amount stored in the specified location in memory. The amount in the accumulator is retained in its original state. The SUA instruction can access data stored in words 0-511 only.

Execution time = 50 ms

10.05.04 TRANSFER TO ACCUMULATOR (TRA)

The TRA instruction will transfer the contents of the specified location in memory to the accumulator. The contents of memory will remain the same.

Execution time = 30 ms

10.05.05 TRANSFER TO MEMORY (TRM)

The TRM instruction will transfer the contents of the accumulator to the specified location in memory. The contents of the accumulator will remain the same.

Execution time = 30 ms

10.05.06 CLEAR ACCUMULATOR AND INSERT CONSTANT (CLA)

This instruction clears the prior contents of the accumulator, resets all accumulator flags, and allows the insertion of a constant of 0-9 or A-F in the specified digit location.

Execution time = 20 ms

10.05.07 CLEAR MEMORY WORD (CLM)

This instruction will place all zeros in the specified word location in memory. The CLM instruction will access words 0-511 only. The accumulator must first be cleared, then the TRM instruction can be used to clear memory words above 511.

Execution time = 40 ms

10.05.08 INSERT CONSTANT INTO ACCUMULATOR (INK)

The INK instruction places a value of 0-9 or A-F in a specified digit location in the accumulator.

Execution time = 20 ms

10.05.09 ADD CONSTANT TO ACCUMULATOR (ADK)

The ADK instruction provides algebraic addition of a digit (0-9) to a specified digit in the accumulator.

Execution time = 30 ms

10.05.10 SUBTRACT CONSTANT FROM ACCUMULATOR (SUK)

The SUK instruction provides algebraic subtraction of a digit (0-9) from a specified digit in the accumulator.

Execution time = 30 ms

10.05.11 LOAD SHIFT REGISTER (LSR)

The LSR instruction loads a specified value into the shift register. This value is used in conjunction with the multiply and divide instructions to determine how the product or quotient will be scaled.

Execution time = 20 ms

10.05.12 MULTIPLY (MUL)

This instruction will multiply the value in the accumulator by a value in a specified word in memory. The product will be placed in the accumulator. The multiplier in memory will remain the same. If the product exceeds 15 digits after scaling, the overflow flag will be set. The product may be positive or negative which is determined by the multiplicand and multiplier. The multiplier specified must reside somewhere in words 0-511.

Execution time:

1. Set down scale factor
2. When scale factor is not equal to zero
   a. Examine the accumulator contents for timing purposes.
   b. For each accumulator digit starting least significant digit.
      For digit = 0 to 6 set down 10 ms
      For digit = 6 to 9 set down 20 ms
   c. Subtract 1 from scale factor and repeat steps 2a, b, c, until scale factor becomes zero.

10.05.13 MULTIPLY AND ROUND (MULR)

This instruction is the same as MUL except that a 5 is added to the least significant digit in the product before it is shifted off. (If product is negative, a -5 is added.) If the shift register is loaded with zero the rounding off will not occur. The multiplier specified must reside somewhere in words 0-511.

Execution time:

1. Set down scale factor
2. When scale factor is not equal to zero
   a. Examine the accumulator contents for timing purposes.
   b. For each accumulator digit starting least significant digit.
      For digit = 0 to 6 set down 10 ms
      For digit = 6 to 9 set down 20 ms
   c. Subtract 1 from scale factor and repeat steps 2a, b, c, until scale factor becomes zero.

10.05.14 DIVIDE (DIV)

The DIV instruction divides the value in the accumulator by a value that is stored in memory as specified by this instruction. The number of decimal digits in the quotient is determined by the value of the shift register. The negative or positive quotient is placed in the accumulator. The divisor will remain

the same in memory. The unsigned, undivided remainder may be retrived after division with the REM instruction. An attempt to divide by zero produces an undeterminable quotient and the overflow flag will be set. The Divisior specified must reside somewhere in words 0-511.

Execution time:

1. Set down dividend (15 digits) followed by 15 zeros.
2. Subtract divisor from dividend and repeat until dividend is smaller than divisor.
3. Using the number of successful subtractions:

   For no = 0 to 3 set down 10 ms

   For no = 4 to 8 set down 20 ms

   For no = 9, 10, 11 set down 30 ms
4. Shift divisor one place to the right and repeat steps 1, 2, 3, 4 for 15 times.
5. Add base timing of 170 ms to total obtained above.
6. Multiply scale factor by 10 ms and add to total obtained in 5.

10.05.15 RETRIEVE REMAINDER (REM)

The remainder, as a result of division, will be placed in the accumulator when the REM instruction is executed. The sign of the remainder is not stored, and therefore the sign flag as well as the S, C, and M flags will be reset.

Execution time = 30 ms

10.05.16 SHIFT LEFT RIGHT OFF (SLRO)

The SLRO instruction first causes the 15 digits in the accumulator to be shifted left-off a specified number of positions. The 15 digits will then be shifted right-off a specified number of digits. If a nonzero digit is shifted left-off the overflow flag will be set.

Execution time:

Base	=	30 ms
0-3 Shifts	=	10 ms
4-6 Shifts	=	20 ms
7-9 Shifts	=	30 ms
10-12 Shifts	=	40 ms
13-15 Shifts	=	50 ms

Compute number of shifts left and number of shifts right.

10.05.17 SHIFT LEFT RIGHT OFF WITH SIGN (SLROS)

This instruction is like the SLRO except that the accumulator flags are also shifted left and right off.

Execution time:

Base	=	30 ms
0-3 Shifts	=	10 ms
4-6 Shifts	=	20 ms
7-9 Shifts	=	30 ms
10-12 Shifts	=	40 ms
13-15 Shifts	=	50 ms

Compute number of shifts left and number of shifts right.

10.06.00 FLAG INSTRUCTION

10.06.01 FLAGS

There are several groups of flags. They may be set and reset programmatically. Some of the flags will be set or reset by firmware to indicate hardware conditions and validity of data. The purpose of a group of flags may vary by the type of hardware that will use them. The following table lists the flags by group with the corresponding symbols.

FLAG	SYMBOL
Group A – Accumulator Flags	
Sign	–
Special	S
Per Hundred (C)	C
Per Thousand (M)	M
Group T – Test Flags	
Accumulator Overflow	O
Forms Limit	L
Index Register	I
Unassigned	U
Group K – Operator Control Keys Flags	1 2 3 4
Group X – General Purpose X Flags	1 2 3 4
Group Y – General Purpose Y Flags	1 2 3 4
Group R – Reader Flags	1 2 3 4
Group P – Punch Flags	1 2 3 4
*Group S – Error Flags for Magnetic Unit Records	
Read Error	R
Write Error	W
Filled Sheet	F

*On L 5000 Only

10.06.02 LOAD FLAGS (LOD)

The Load Flags instruction will set the specified flags of the group specified. The remaining flags in that group will be reset as a result of this instruction.

Execution time = 30 ms.

10.06.03 SET FLAGS (SET)

The Set Flags instruction will set specified flags in the specified group of flags. Flags not specified are left unaltered.

Execution time = 20 ms

10.06.04 RESET FLAGS (RST)

The Reset Flags instruction will reset specified flags in the specified group of flags. Flags not specified are left unaltered.

Execution time = 20 ms.

10.06.05 CHANGE FLAGS (CHG)

The Change Flags instruction will change the flag status to set if reset or to reset if set for specified flags in the specified group of flags. Flags not specified are left unaltered.

Execution time = 20 ms

10.07.00 INDEX REGISTER INSTRUCTIONS

10.07.01 LOAD INDEX REGISTER (LIR)

The LIR instruction loads a value of 0 to 255 in one of four index registers.

Execution time = 20 ms

10.07.02 INCREMENT INDEX REGISTER (IIR)

The IIR instruction will add 1 to the value in the specified index register. The index register flag is set when the value in the specified index register is equal to an amount as specified by this instruction before incrementing. When the index register value is incremented past 255 the register will be turned back to zero.

Execution time = 20 ms

10.07.03 DECREMENT INDEX REGISTER (DIR)

The DIR instruction will subtract 1 from the value in the specified index register. The index register flag is set when the value in the specified index register is equal to the amount as specified by this instruction before decrementing. When the index register value is decremented below zero the index register value will be set back to 255.

Execution time = 20 ms.

10.07.04 ADD TO INDEX REGISTER (ADIR)

The ADIR instruction will add the specified amount (0-255) to the specified index register. If the sum of the value contained in the index register plus the amount that is added to it is greater than 255 the index register test flag is set. If the sum is greater than 255 the difference between the sum and 255 less 1 will be contained in the index register.

Execution time = 20 ms

10.07.05 TRANSFER ACCUMULATOR TO INDEX REGISTER (TAIR)

The TAIR instruction will transfer the three or four least significant digits in the accumulator to the specified index register. The decimal value of 0-255 will be converted to a two digit hexadecimal value and placed into index register 1, 2 or 4. Index register 3 may contain a value of 0 to 1023 in hexadecimal representation.

Execution time = 50 ms.

10.07.06 MODIFY BY INDEX REGISTER (MOD)

The MOD instruction will add the contents of a specified index register to the parameter of the next instruction in a program sequence. Care must be taken that the modification will not inadvertently change the identity of the instruction being modified.

Execution time = 30 ms.

10.08.00 BRANCH INSTRUCTIONS

10.08.01 BRANCH UNCONDITIONALLY (BRU)

The BRU instruction will cause the program to unconditionally branch to a different segment of a program.

Execution time = 20 ms.

10.08.02 SUBROUTINE JUMP (SRJ)

The SRJ instruction will allow the program to unconditionally branch to a program segment, and then return to the next instruction following the SRJ by using a SRR instruction after a predetermined number of instructions in a segment has been executed. A maximum of four Subroutine Jump instructions may be stacked at any one time to assure correct return to the next instruction after the SRJ instruction.

Execution time = 40 ms.

10.08.03 SUBROUTINE RETURN (SRR)

The SRR instruction will return to one of four next locations after the SRJ instruction as specified by this instruction. When a SRJ is executed the return address will be stored at four different levels. The SRR therefore will specify which level or return address is to be used after execution of one to four program segments.

Execution time:

Stack Address 0 = 50 ms
Stack Address 1 = 60 ms
Stack Address 2 = 70 ms
Stack Address 3 = 80 ms

10.09.00 SKIP EXECUTE INSTRUCTIONS

10.09.01 SKIP IF ANY FLAGS (SK)

This instruction is used to test the status of one or more specified flags in the specified flag group. If any of the specified flags are set, the designated number (1-4) of sequential instructions is skipped.

Execution time = 20 ms.

10.09.02 SKIP IF EVERY FLAG (SKE)

This instructions is used to test the status of one or more specified flags in the specified flag group. Only if every specified flag is set will the designated number (1-4) of sequential instructions be skipped.

Execution time = 20 ms.

10.09.03 EXECUTE IF ANY FLAG (EX)

This instruction is similar to the SK instruction with the exception that the designated number of instructions will be executed rather than skipped.

Execution time = 20 ms.

10.09.04 EXECUTE IF EVERY FLAG (EXE)

This instruction is similar to the SKE instruction with the exception that the designated number of instructions will be executed rather than skipped.

Execution time = 20 ms.

10.09.05 SKIP IF DIGIT LESS THAN CONSTANT (SKL)

This instruction will test if a specified digit in the accumulator is less than a specified digit (0-9, A-F). If the specified accumulator digit is less than the specified digit, the designated number (1-4) of sequential instruction will be skipped.

Execution time = 20 ms.

10.09.06 EXECUTE IF DIGIT LESS THAN CONSTANT (EXL)

This instruction will test if a specified digit in the accumulator is less than a specified digit (0-9, A-F). If the specified accumulator digit is less than the specified digit, the designated number (1-4) of sequential instructions will be executed.

Execution time = 20 ms.

10.09.07 SKIP IF ACCUMULATOR ZERO (SKZ)

The SKZ instruction will cause the designated number (1-4) of sequential instructions to be skipped if the value in the accumulator is zero.

Execution time = 20 ms.

10.09.08 EXECUTE IF ACCUMULATOR ZERO (EXZ)

The EXZ instruction will cause the designated number (1-4) of sequential instructions to be executed if the value in the accumulator is zero.

Execution time = 20 ms.

10.09.09 COMPARE ALPHANUMERIC (CPA)

The CPA instruction will compare the contents of the accumulator with the contents of a specified word in memory. Depending on whether the contents are equal, greater than, or less than, one of the next three sequential instructions will be executed. The word specified by the CPA instruction must be located somewhere in words 0-511.

Execution time = 60 ms.

10.10.00 MISCELLANEOUS INSTRUCTIONS

10.10.01 ALARM (ALARM)

The ALARM will cause the alarm bell to be sounded once. It will be used to alert an operator that special attention is required.

Execution time = 20 ms.

10.10.02 NO OPERATION (NOP)

No operation is performed with the NOP instruction.

Execution time = 10 ms.

10.10.03 STOP (STOP)

The STOP instruction halts the program in progress and returns the computer to READY MODE.

Execution time = 10 ms.

10.11.00 DATA COMMUNICATIONS INSTRUCTIONS

10.11.01 LOAD RECEIVE BUFFER REGISTER (LRBR)

The LRBR instruction loads a register with a value that indicates the starting word location from which data will be transferred in memory in a Data Comm environment. It is incremented by one each time that 8 characters have been moved. When this register is loaded the RCP register is loaded with zero.

Execution time = 50 ms.

10.11.02 SET RECEIVE CHARACTER POINTER (RCP)

The RCP instruction loads a value into a register that is used to specify the starting character position relative to the starting word location (LRBR) from which data is transferred in a Data Comm environment. The RCP is incremented for each character that is transferred by a transfer instruction. If the RCP is incremented past 255 the overflow test flag is set and the instruction that caused the RCP to be incremented past its limit will be terminated.

Execution time = 50 ms.

10.11.03 INCREMENT RECEIVE CHARACTER POINTER (IRCP)

The IRCP instruction increments the Receive Character Pointer a specified number of positions or until a delimiter is found. Each time that a word boundary is passed the LRBR will be incremented by one.

Execution time = 50 ms + 10 ms/char + 20 ms/word boundary.

10.11.04 SET SEND CHARACTER POINTER (SCP)

The SCP instruction loads a value into a register that is used to specify the starting character position relative to the starting word location (LKBR) into which data is stored in memory in a Data Comm environment. The SCP is incremented by one for each character or delimiter that is stored. If the value of the Send Character Pointer is incremented past 255 the Overflow Test Flag is set.

Execution time = 50 ms.

10.11.05 TRANSFER RECEIVE BUFFER (TRB)

The TRB instruction transfers the contents of the Data Communications Receive Buffer to a specified Receive Record Area in main memory. This is a transfer of 32 words that reside in one track.

Execution time = 40 ms.

10.11.06 TRANSFER TO ACCUMULATOR AS NUMERIC (TRBA)

The TRBA instruction will transfer a specified number of characters from memory, as specified by the LRBR and RCP pointers, to the accumulator. The characters 0-9, : ; > = < ? are valid. If any other character is transferred the accumulator S Flag will be set. The + and - characters may be used to indicate plus or minus amounts. If a delimiter is found before the specified number of characters is transferred it will terminate the transfer and set specified flag patterns.

Execution time = 50 ms + 10 ms/char + 20 ms/word boundary.

10.11.07 TRANSFER ALPHA (TRF)

The TRF instruction will transfer a specified number of alphanumeric characters from the memory location specified by the LRBR and RCP pointers to another memory location as specified by the LKBR and SCP pointers. The transfer is terminated when the exact number of characters is transferred or when a delimiter code is found. If a delimiter is found a specified flag pattern will be set, but the delimiter will not be transferred.

Execution time = 120 ms + 10 ms/char transferred + 20 ms/word boundary.

10.11.08 PRINT ALPHA FROM RECEIVE BUFFER (PAB)

The PAB instruction prints a specified number of characters from a memory location as specified by the LRBR and RCP pointers. The printing will be terminated when the exact number of specified characters is printed or when a delimiter code is found. If a delimiter is found a specified flag pattern is set.

Execution time = 20 char/sec + 30 ms base time.

10.11.09 TRANSFER SEND RECORD AREA (TSB)

The TSB instruction will transfer a specified track (32 words) of data that has been prepared for transmission in main memory to the transmit buffer area. The Data Communication Processor will place the ETX character after the last actual character of text at transmission time.

Execution time = 40 ms.

10.11.10 TRANSFER ACCUMULATOR TO SEND RECORD AREA (TRAB)

The TRAB instruction will transfer a specified number of digits, a maximum of 15, to the transmit record area or transmit buffer as ASCII characters. The LKBR and SCP pointers will control the exact location to which the characters are transferred.

Execution time = 100 ms + 10 ms/digit transferred + 20 ms/word boundary.

10.11.11 TRANSFER CHARACTER (TRCB)

The TRCB will transfer a specified character or delimiter to the transmit record or buffer area as specified by the LKBR and SCP pointers.

Execution time = 140 ms to 180 ms (Avg. 150 ms).

10.11.12 RETRIEVE SEND ADDRESS (RSA)

The RSA instruction will transfer the machine's send address from a word located in the Data Communication Processor area to the accumulator. The address is represented by two ASCII characters which will be placed into the four most significant digit positions of the accumulator's 16 digit positions.

Execution time = 30 ms.

10.11.13 RETRIEVE RECEIVE ADDRESS (RRA)

The RRA instruction will transfer the machine's receive address from a word located in the Data Communication Processor area to the accumulator. The address is represented by two ASCII characters which will be placed into the four most significant digit positions of the accumulators 16 digit positions.

Execution time = 30 ms.

10.11.14 LOAD SEND ADDRESS REGISTER (LSA)

The LSA instruction will transfer the machine's ASCII two-character send address which has been placed in the accumulator's four most significant digit positions to a word located in the Data Communication Processor area.

Execution time = 30 ms.

10.11.15 LOAD RECEIVE ADDRESS REGISTER (LRA)

The LRA instruction will transfer the machine's ASCII two-character receive address which has been placed in the accumulator's four most significant digit positions to a word located in the Data Communication Processor area.

Execution time = 30 ms.

10.11.16 RETRIEVE EXPECTED TRANSMISSION NUMBER (RTN)

The RTN instruction transfers the 1, 2, or 3 ASCII numeric characters "Expected Transmission Number" from a word located in the Data Communication Processor area to the 2, 4, or 6 most significant digit positions of the accumulator.

Execution time = 30 ms.

10.11.17 RETRIEVE HEADER TRANSMISSION NUMBER (RTH)

The RTH instruction will transfer to the accumulator a word of data located in the Data Communication Processor area containing the transmission header. The programmer must manipulate this data to isolate the 1, 2, or 3-digit ASCII numeric character transmission number.

Execution time = 30 ms.

10.11.18 LOAD EXPECTED TRANSMISSION NUMBER REGISTER (LTN)

The LTN instruction will transfer the "Expected Transmission Number" which has been placed in the accumulator's most significant digit positions as ASCII numeric characters to a word located in Data Communitation Processor area. The "Expected Transmission Number" may be zero, 1, 2 or 3 characters.

Execution time = 30 ms.

10.11.19 RETRIEVE SEND TRANSMISSION NUMBER (RSN)

The RSN instruction will transfer the 1, 2, or 3 numeric character Send Transmission Number which has been placed in the accumulator's most significant digit positions as ASCII numeric characters to a word located in the Data Communication Processor area. The Send Transmission Number may be zero, 1, 2, or 3 characters.

Execution time = 30 ms.

10.11.20 RETRIEVE CHARACTER POINTER REGISTER (RPR)

The RPR instruction will transfer the Character Pointer Register to the accumulator. This register, a word in memory, contains the LKBR, LRBR, SCP AND RCP values which are used when characters and data are transferred to, from, and within memory.

Execution time = 30 ms.

10.11.21 LOAD CHARACTER POINTER REGISTER (LPR)

The LPR instruction will transfer the contents of the accumulator to the word in memory reserved for the Character Pointer Register. The values that are to be used by the LKBR, LRBR, SCP and PCP pointers must be placed in the accumulator prior to the execution of this instruction.

Execution time = 30 ms.

10.11.22 LOAD POLLED FLAGS REGISTER (LPF)

The LPF instruction transfers the contents of the accumulator flag position to the Polled Flags register in the Data Communication Processor area. This register is not available in all Terminal Computers.

Execution time = 30 ms.

10.11.23 RETRIEVE POLLED FLAGS (RPF)

The RPF instruction will transfer the Polled Flags register to the accumulator's flag position. This register is not available in all Data Communication Processors.

Execution time = 30 ms.

10.11.24 LOAD TWO/FOUR WIRE CONTROL WORD (LTF)

The LTF instruction will transfer the accumulator to the Two/Four Wire Control Register. The M flag set will indicate four wire mode of operation. The M flag reset will indicate a two wire mode of operation. If this register is not loaded a two wire mode of operation is assumed.

Execution time = 30 ms.

10.11.25 RETRIEVE TWO/FOUR WIRE CONTROL WORD (RTF)

This RTF instruction will transfer the Two/Four Wire Control Word to the accumulator from the Data Communication Processor area.

Execution time = 30 ms.

10.11.26 RETRIEVE EXPECTED BROADCAST TRANSMISSION NUMBER (RBN)

The RBN instruction transfers the zero, 1, 2, or 3 ASCII numeric character Expected Broadcast Transmission Number from a word located in the Data Communication Processor area to the 2, 4, or 6 most significant digit positions of the accumulator.

Execution time = 30 ms.

10.11.27 LOAD EXPECTED BROADCAST TRANSMISSION NUMBER (LBN)

The LBN instruction will transfer the Expected Broadcast Transmission Number which has been placed in the accumulator's most significant digit positions as ASCII numeric characters to a word located in the Data Communication Processor area. The Expected Broadcast Transmission Number may be zero, 1, 2, or 3 numeric characters.

Execution time = 30 ms.

10.11.28 RETRIEVE EXPECTED GROUP TRANSMISSION NUMBER (RGN)

The RGN instruction will transfer the zero, 1, 2, or 3 ASCII numeric character Expected Group Transmission Number from a word located in the Data Communication Processor area to the 2, 4, or 6 most significant digit positions of the accumulator.

Execution time = 30 ms.

10.11.29 LOAD EXPECTED GROUP TRANSMISSION NUMBER (LGN)

The LGN instruction will transfer the Expected Group Transmission Number which has been placed in the accumulator's most significant digit positions as ASCII numeric characters to a word located in the Data Communication Processor area. The Expected Group Transmission Number may be zero, 1, 2, or 3 numeric characters.

Execution time = 30 ms.

10.11.30 TURN POWER OFF (OFF)

The OFF instruction will turn off all power to the TC 500.

Execution time = 10 ms.

10.11.31 TURN KEYBOARD OFF (POF)

The POF instruction turns off power to the keyboard unit. This op-code requires special hardware and firmware applicable to the TC 700 only.

Execution time = 20 ms.

10.11.32 TURN KEYBOARD ON (PON)

The PON instruction turns power on to the keyboard unit. This is applicable only to the TC 700.

Execution time = 20 ms.

10.12.00 PUNCHED CARD INSTRUCTIONS

10.12.01 80-COLUMN PUNCHED CARD I/O INSTRUCTIONS

In the following discussion, the instructions available for reading and punching 80-column cards are functionally described. Cards are read by the 80-Column Card Reader and punched by the 80-Column Card Punch.

If on a read instruction (RCD), a card is not present in the Card Reader, the instruction is held up until this condition is corrected. Placing a card in the Card Reader and depressing the Restart switch on the Card Reader will enable the instruction to be completed and allow program execution to resume.

On a punch instruction, if the punch is turned off or off-line, the instruction will execute in accordance with its keyboard counterpart if one exists. If a keyboard counterpart does not exist, the instruction operates as a NOP. If there are no cards in the punch card feed hopper, a punch instruction will be held up until the condition is corrected.

10.12.02 LOAD MEMORY FROM CARD (LCD)

This instruction is used to read in the specified number of object program cards for program overlay. The new object program is stored in the memory locations specified in the program cards. This instruction utilizes the Card Reader Memory Load Routine which must be resident in the Utility Track.

10.12.03 READ CARD (RCD)

This instruction causes an 80-column card to be read into words 1-10 of memory. All 80 columns, including blank columns, are read and placed in memory. The Accumulator is used during the execution of this command.

Execution time = 600 ms.

10.12.04 LOAD CARD FORMAT REGISTER (LCFR)

This instruction loads into the Card Format Register the address of the Card Format Table specified by label. A Card Format Table may contain up to 16 different labeled card field formats, which refer to data in the card input area (words 1-10). If more than 16 fields are necessary, additional tables may be used and their addresses loaded into the Card Format Register prior to their use. Each entry in the Card Format Table specifies the beginning card column as well as the number of columns in the punched card field. Reference to one of these 16 possible entries for the table currently being used is made in the PBA, XPBA, XBA, TRCA, and TRCM instructions (discussed below).

10.12.05 PRINT ALPHA FROM CARD READ AREA (PBA)

This instruction prints from the card read area the contents of the specified field. The field is specified in this instruction by referencing an entry of the Card Format Table, the address of which is currently in the Card Format Register.

Execution time = 50 ms/char + 30 ms base

10.12.06 PRINT AND PUNCH ALPHA FROM CARD READ AREA (XPBA)

This instruction is similar to the PBA instruction except that the data is also punched in an 80-column card as alphanumeric. The instruction is terminated after printing and punching the number of characters specified by the field length of the referenced format.

Execution time = 100 ms/char + 30 ms base

10.12.07 PUNCH ALPHA FROM CARD READ AREA, NONPRINT (XBA)

This instruction is similar to the XPBA instruction except that printing does not occur.

Execution time = 50 ms/char + 30 ms base

10.12.08 TRANSFER CARD FIELD TO ACCUMULATOR AS NUMERIC (TRCA)

This instruction is used to transfer the field of data, as specified by the referenced format, from the Card Read Area to the Accumulator. The instruction is terminated after the number of characters, as specified by the format, have been transferred. The data is right justified in the Accumulator with the minus flag set if an "11" overpunch is present in any column of the field being transferred, and the Invalid Code Flag (R4) is set if an invalid card code was transferred.

Execution time = 20 ms/char + 30 ms base

10.12.09 TRANSFER CARD COLUMNS TO MEMORY AS ALPHA (TRCM)

This instruction is used to transfer the field specified by the referenced format to the memory location designated by the prior use of an LKBR instruction. The instruction is terminated when the number of characters specified by the format has been transferred. The characters are left justified in the receiving memory location with space codes inserted for blank card columns and on "End of Alpha" code inserted in memory following the last code transferred.

Execution time = 30 ms/char + 30 ms base

10.12.10 TYPE AND PUNCH (XTK)

This instruction functions like a TK instruction except that 80-column card punching also occurs. Also the use of the Backspace Key is prohibited, and the termination of this instruction with an OCK or a PK does not cause a code to punch.

Execution time = 15.5 char/sec

10.12.11 TYPE INTO MEMORY, PUNCH AND PRINT (XTKM)

This instruction functions like the TKM instruction with the additional function of punching into an 80-column card. Also, the use of the Backspace Key is prohibited, and the termination of this instruction with an OCK or a PK does not cause a code to punch but does place an "End of Alpha" code in memory.

Execution time = 15.5 char/sec

10.12.12 ENTER ALPHA INTO MEMORY AND PUNCH, NONPRINT (XEAM)

This instruction functions exactly like the XTKM instruction except that printing does not occur.

Exectuion time = 15.5 char/sec

10.12.13 PRINT ALPHA AND PUNCH (XPA)

This instruction functions exactly like the PA instruction with the additional function of punching into an 80-column card. The End of Alpha code is not punched in the card.

Execution time = 20 char/sec

10.12.14 PUNCH ALPHA FROM MEMORY, NONPRINT (XA)

This instruction functions like the XPA instruction except that printing does not occur.

Execution time = 25 char/sec

10.12.15 PRINT AND PUNCH NUMERIC (XPN)

This instruction functions like a PN instruction with the additional function of punching into an 80-column card. The mask code P controls the punching of leading zeros. If the Accumulator Minus Flag is set, an "11" overpunch is punched with the right most digit of the Accumulator (digit 0) unless the mask inhibits the punching of this digit.

Execution time = 20 char/sec followed by punching at 25 char/sec

10.12.16 PRINT AND PUNCH NUMERIC, SHIFT RIBBON IF MINUS (XPNS-)

This instruction is the same as the XPN instruction except that the ribbon color is changed if the Accumlator Sign Flag is set (minus).

Execution time = 20 char/sec followed by punching at 25 char/sec

10.12.17 PRINT AND PUNCH NUMERIC, SHIFT RIBBON IF PLUS (XPNS+)

This instruction is the same as the XPN instruction except that the ribbon color is changed if the Accumulator Sign Flag is reset (plus).

Execution time = 20 char/sec followed by punching at 25 char/sec

10.12.18 PUNCH NUMERIC, NONPRINT (XN)

This instruction is the same as the XPN instruction except that no printing occurs.

Execution time = 25 char/sec

10.12.19 PUNCH CODE (XC)

This instruction permits outputting any desired single card code (without it being resident in memory) or any special punch pattern in a card column. Printing does not occur with this instruction.

Execution time = 50 ms

10.12.20 LOAD PUNCH COUNT REGISTER (LXC)

This instruction is used to load the value of 1 into the Punch Count Register. The Punch Count Register is automatically incremented for every column punched or escaped in order to control the location of the card and maintain synchronization. This Register should be set to the value of 1 by the use of the LXC instruction during the initialization routine.

Execution time = 20 ms

10.12.21 SKIP TO COLUMN (SKP)

This instruction causes the card to skip to the specified card column. A skip to column 1 functions as a release and a new card is registered at column 1. The Punch Count Register is correctly adjusted unless the specified card column is less than the column number of the card's present location. The SKP instruction is normally used after each punch-alpha instruction, since the punching is usually of variable length.

Execution time = 20 ms

10.12.22 DUPLICATE THROUGH COLUMN (DUP)

This instruction causes data from the card in the Read Station to be duplicated into the corresponding columns of the card in the punch station. The duplication function starts at and is performed through the card columns specified by this instruction. The Punch Count Register is correctly adjusted unless duplication takes place through a column number less than the column number of the card's present location. Duplication through column 80 causes the card to be duplicated, released, and a new card registered at column 1.

Execution time = 20 ms

10.12.23 ALTERNATE STACKING POCKET (ALTP)

This instruction causes the card in the Punch Station to be routed to the Alternate Stacking Pocket after it has been released from both the Punch Station and the Read Station. When the Alternate Stacker is not programed, the Regular Stacker is automatically selected.

Execution time = 20 ms

10.13.00 PUNCHED PAPER TAPE INSTRUCTIONS

10.13.01 PUNCHED PAPER TAPE/EDGE PUNCHED CARD I/O INSTRUCTIONS

All reference to "paper tape" in the following discussion applies equally well to edge punched cards. The paper tape reader instructions function as "read" instructions when tape reading conditions exist; i.e., the reader is on, the photo-electric light is on, and media is present. If any of these conditions do not exist, the read instruction reverts to its keyboard counterpart and the keyboard buffer is cleared. Since the buffer is cleared, manual entry of data must be held up until the keyboard light (alpha or numeric) comes on.

10.13.02 READ ALPHA AND PRINT (RTK)

This instruction causes the specified number of characters to be read from paper tape and printed and is terminated when the specified number of characters has been read or upon reading a field identifier code.

Execution time = 18 char/sec

10.13.03 READ ALPHA INTO MEMORY AND PRINT (RTKM)

This instruction causes the specified number of characters to be read into memory and printed. The instruction is terminated when the specified number of characters has been read or when a field identifier code has been read. The base memory location affected must have been specified previously by an LKBR command.

Execution time = 18 char/sec

10.13.04 READ ALPHA INTO MEMORY, NONPRINT (REAM)

This instruction causes the specified number of characters to be read into memory but not printed. The instruction is terminated upon reading the specified number of characters or by reading a field identifier code. The base memory location affected must have been specified previously by an LKBR command.

Execution time = 27 char/sec

10.13.05 READ ALPHA, PRINT AND PUNCH (RXTK)

This instruction causes the specified number of characters to be read, printed, and punched on paper tape. The instruction is terminated upon reading the specified number of characters or upon reading a field identifier code.

Execution time = approximately 12 char/sec

10.13.06 READ ALPHA INTO MEMORY, PRINT AND PUNCH (RXTKM)

This instruction causes the specified number of characters to be read into memory, printed, and punched on paper tape. The instruction is terminated upon reading the specified number of characters or upon reading a field identifier code. The base memory location affected must have been specified previously by an LKBR command.

Execution time = approximately 12 char/sec

10.13.07 READ ALPHA INTO MEMORY, PUNCH (RXEAM)

This instruction functions like the REAM instruction except that punching occurs.

Execution time = approximately 16 char/sec

10.13.08 READ NUMERIC INTO ACCUMULATOR (RNK)

This instruction causes the specified number of digits (up to 15) to be read into the accumulator. The accumulator flags are set when their corresponding codes are read from the tape. This instruction is terminated when the specified number of digits has been read or upon reading a field identifier code.

Execution time = approximately 38 char/sec

10.13.09 RELEASE MEDIA CLAMP (REL)

This instruction will cause the Paper Tape Reader media clamp to open, thus halting any further reading until the clamp is manually closed.

Execution time = 10 ms

10.13.10 PAPER TAPE PUNCH INSTRUCTIONS

The Paper Tape Punch Instructions are designed to function in three ways:

1. When proper tape punching conditions exist, punching will occur according to the specifications of the instructions.
2. If the perforator is not connected or is turned off, the punch portion of the instruction is inhibited and the instruction is executed in accordance with its counterpart keyboard or print instruction. Thus, although the program may provide for punching, the perforator may be turned off without affecting the operation of the rest of the system.
3. If the perforator is turned on but does not have media loaded, execution of the punch instruction is held up until the condition is corrected.

10.13.11 TYPE AND PUNCH (XTK)

This instruction functions like a TK instruction except that punching occurs with it. The termination of this instruction with an OCK or PK does not cause a code to punch.

Keyboard entry speed: 15.5 char/sec

Processing of keyboard codes from buffer is independent of and overlaps keyboard entry time:

20 to 50 ms base
50 ms per character
100 to 110 ms per OCK
130 to 140 ms per PK

10.13.12 TYPE INTO MEMORY, PUNCH AND PRINT (XTKM)

This instruction functions like a TKM instruction except that punching also occurs. The termination of this instruction with an OCK or PK places and End Alpha code in memory but does not cause a code to punch.

Keyboard entry speed: 15.5 char/sec

Processing of keyboard codes from buffer is independent of and overlaps keyboard entry time:

20 to 50 ms base
50 ms per character
100 to 110 ms per OCK
130 to 140 ms per PK
30 ms to store each 8 characters in memory

10.13.13 ENTER INTO MEMORY AND PUNCH (XEAM)

This instruction functions like the XTKM instruction except that printing does not occur.

Keyboard entry speed: 15.5 char/sec

Processing of keyboard codes from buffer is independent of and overlaps keyboard entry time:

20 to 50 ms base
50 ms per character
100 to 110 ms per OCK
130 to 140 ms per PK
30 ms to store each 8 characters in memory

10.13.14 PRINT ALPHA AND PUNCH (XPA)

This instruction operates like the PA instruction except that punching occurs. The instruction is terminated upon reaching an End of Alpha code in the data, but this code is not punched.

Execution time = 20 char/sec

10.13.15 PUNCH ALPHA FROM MEMORY, NONPRINT (XA)

This instruction functions like the XPA instruction except that printing does not occur.

Execution time = 40 char/sec

10.13.16 PUNCH CODE (XC)

This instruction causes the specified high and low order bit patterns to be punched into tape. In the case of ASCII code, the appropriate column and row number of the ASCII table would comprise the parameters of this instruction.

Execution time = 50 ms

10.13.17 PRINT AND PUNCH NUMERIC (XPN)

This instruction functions like the PN instruction except that punching occurs. The mask character P controls the punching of leading zeros.

Execution time = punch at 40 char/sec followed by print at 20 char/sec

10.13.18 PRINT AND PUNCH NUMERIC, SHIFT RIBBON IF MINUS (XPNS-)

This instruction is the same as the XPN instruction except that the ribbon color is changed if the Accumulator Sign Flag is reset (plus).

Execution time = punch at 40 char/sec followed by print at 20 char/sec

10.13.19 PRINT AND PUNCH NUMERIC, SHIFT RIBBON IF PLUS (XPNS+)

This instruction is the same as the XPN instruction except that the ribbon color is changed if the Accumulator Sign Flag is reset (plus).

Execution time = punch at 40 char/sec followed by print at 20 char/sec.

10.13.20 PUNCH NUMERIC, NONPRINT (XN)

This instruction is the same as the XPN instruction except that printing does not occur.

Execution time = 40 char/sec

10.13.21 LOAD PUNCH COUNT REGISTER (LXC)

This instruction will load the specified number into the punch count register. The punch count register is provided to count the number of holes punched. It is automatically incremented by one for each code which is punched by a punch instruction. When this register reaches a value of 255, incrementing causes it to be set to 0.

Execution time = 20 ms

10.13.22 MODIFY BY PUNCH COUNT REGISTER (XMOD)

This instruction will cause the parameter field of the next instruction in sequence to be increased by the current value of the punch count register. The XMOD is generally used to modify the parameters of the XB instruction (discussed below).

Execution time = 20 ms

10.13.23 PUNCH FEED HOLES (XB)

This instruction causes feed (sprocket) holes to be punched in the tape. The number of holes punched will be the difference between the number specified in this instruction and 255. When edge punched cards are the output media, the punching of sprocket holes is inhibited. The card is just advanced without sprocket holes punching.

Execution time = 40 char/sec

10.14.00 MAGNETIC UNIT RECORD INSTRUCTIONS

The magnetic unit record instructions provide the ability to read data from, or write data on, a single magnetic stripe on a magnetic unit record. Timings for the execution of these instructions are not available.

10.14.01 LOAD STRIPE FORMAT REGISTER (LSFR)

The LSFR instruction loads into the Stripe Format Register the memory location of the Stripe Format Table specified by a label. The Stripe Format Register establishes the base address of the Stripe Format Table. A format table for a magnetic unit record is 16 words in length, and may contain up to 64 formats. A magnetic unit record format specifies the starting digit location and the length of a data field within the Magnetic Unit Record Input/Output Area. More than 1 format table may be used; however, when replacing a table currently in use, the base address of the replacement table must be initialized by an LSFR (Load Stripe Format Register) instruction.

10.14.02 READ LEDGER (RL)

The RL instruction provides the ability to read the magnetic stripe on a magnetic unit record from the console mechanism, or from the Magnetic Record Reader. This instruction is comprised of two operational phases. Phase one is a numeric keyboard operation and phase two is a read and/or align operation. When the instruction is initiated, the numeric keyboard indicator is turned on and the number of digits specified by the program may be entered. (The numeric keyboard phase is a standard keyboard operation, except that the 00, 000, RE, C and M keys are not valid). The numeric keyboard phase of the RL instruction may be terminated by an OCK, by a PK, or by the insertion of a magnetic unit record. Initiation of the read and/or align phase of the instruction opens the console mechanism. It is not closed when the magnetic unit record is inserted.

10.14.03 PRINT ALPHA FROM MAGNETIC UNIT RECORD BUFFER (PAS)

The PAS instruction prints the number of alpha characters specified by the referenced format. The PAS instruction is terminated by the printing of the number of characters specified by the selected format, or by the presence of NUL (0.0) codes in the data field.

10.14.04 ADD FROM MAGNETIC UNIT RECORD BUFFER TO ACCUMULATOR (ADB)

The ADB instruction adds the number of digits specified by the referenced format to the Accumulator. This instruction also indicates whether the selected data field is signed or unsigned. The sign digit is contained in the least significant digit position of the data field defined by the format.

10.14.05 SUBTRACT MAGNETIC UNIT RECORD BUFFER FROM ACCUMULATOR (SUB)

The SUB instruction subtracts the number of digits specified by the referenced format from the Accumulator. This instruction also indicates whether the selected data field is signed or unsigned. The sign digit is contained in the least significant digit position of the data field defined by the format.

10.14.06 TRANSFER NUMERIC FROM MAGNETIC UNIT RECORD BUFFER TO ACCUMULATOR (TSBA)

The TSBA instruction transfers the number of digits specified by the referenced format into the Accumulator. This instruction also indicates whether the selected data field is signed or unsigned. The sign digit is contained in the least significant digit position of the data field defined by the format. It is inserted into the sign position of the Accumulator during the transfer process. The sign digit is considered to occupy a digit position in the field defined by the format.

10.14.07 TRANSFER ALPHA FROM MAGNETIC UNIT RECORD BUFFER TO MEMORY (TSBM)

The TSBM instruction transfers the number of alpha characters specified by the referenced format into memory. An LKBR instruction must precede this instruction, since the value contained is the memory location of the first word of the transfer. The TSBM instruction is terminated by the transfer of the number of characters specified by the selected format. NUL (0,0) codes will be inserted into memory following the last character of the transfer. If the data does not completely occupy the last word of

memory addressed in the transfer process, the balance of the word is filled with NUL (0,0) codes. If data completely fills the last word of memory addressed in the data transfer process, the next sequential memory word is filled with NUL (0,0) codes.

10.14.08 WRITE LEDGER (WL)

The WL instruction writes the data from the Magnetic Unit Record Buffer onto the magnetic stripe on the magnetic unit record. The line number contained in the Stripe Count Register is written in the line-find-digits area of the stripe. The initial phase of execution will open the console mechanism if closed. The data is written on the stripe while the magnetic unit record is being ejected.

10.14.09 TRANSFER FROM ACCUMULATOR TO MAGNETIC UNIT RECORD BUFFER (TASB)

The TASB instruction transfers the number of digits specified by the referenced format from the Accumulator into a data field in the Magnetic Unit Record Buffer. The location of the data field within the Magnetic Unit Record Buffer is also specified by the selected format. This instruction also indicates whether the sign of the Accumulator should be transferred or ignored. If the sign is to be transferred, it is transferred into the least significant digit position of the data field and is considered a digit transfer.

10.14.10 TRANSFER ALPHA FROM MEMORY TO MAGNETIC UNIT RECORD BUFFER (TMSB)

The TMSB instruction transfers the number of alpha characters specified by the referenced format from memory to a data field in the Magnetic Unit Record Buffer. The location of the data field within the Magnetic Unit Record Buffer is also specified by the selected format. The memory location of the starting word of the transfer is contained in the Keyboard Base Register. To specify an intended memory location the TMSB instruction must be preceded by an LKBR instruction. The instruction is terminated by transferring the number of characters specified by the selected format.

10.14.11 LEDGER ALIGN (LA)

The LA instruction provides the ability to move the magnetic unit record handling mechanism from its current position to the line number contained in the Stripe Count Register.

10.14.12 EJECT LEDGER (EL)

The EL instruction ejects the ledger that is in the magnetic unit record handling mechanism. This is the only operation performed. The Magnetic Unit Record Buffer is not affected. If the console mechanism is closed, it is opened for the execution of the EL instruction.

10.14.13 RETRACT LEDGER (RET)

The RET instruction causes the magnetic unit record modules to travel down and to the rear of the console until a fixed limit is reached. The RET instruction moves the modules to this fixed limit, opening the console mechanism if closed, to permit the insertion and manual alignment of a magnetic unit record or form. The modules will remain retracted until an EL instruction moves them back to the forward limit. If the modules are in the retracted position when the power is turned on, the power-on routine will move them to the forward position.

10.14.14 LOAD STRIPE COUNT REGISTER (LSCR)

The LSCR instruction loads a value into the Stripe Count Register. When a Write Ledger (WL) instruction is executed, the contents of the Stripe Count Register are written on the stripe in the area reserved for the line-find-digits. The maximum value which may be loaded into the Stripe Count Register, 46, is determined by the maximum number of posting lines on an 11" record. In the Magnetic Unit Record Firmware, the forms-control instructions AR, ALR, and ARTO are modified to increment the Stripe Count Register in addition to incrementing the Forms Count Register for each line advance, if a magnetic unit record is in the Magnetic Unit Record Forms Handler. If a magnetic unit record is not present, only the Forms Count Register will be incremented. When the Stripe Count Register is incremented one beyond the Stripe Limit Register, the Filled Sheet Flag will be set. The flag will be reset when this condition does not exist.

10.14.15 LOAD STRIPE LIMIT REGISTER (LSLR)

The LSLR instruction loads a value into the Stripe Limit Register. This register may contain a value of 1 through 46.

10.14.16 STRIPED LEDGER FORMAT (SLF)

The SLF instruction is used to format the Magnetic Unit Record Data (read from a magnetic unit record) during a transfer from the input area into either memory or the Accumulator, or is used to format data transferred to the output area prior to a Magnetic Unit Record Write instruction. This instruction specifies the starting digit location of a data field, and the length of that data field within the Magnetic Unit Record Input/Output Area. Signs for signed numeric data require a digit. Alpha characters require two digits. The values entered are assembled into one syllable as part of the Stripe Format Table which begins at the location designated by the use of the LSFR instruction (Load Stripe Format Register). The table may contain up to 64 field formats; if more than 64 are required, another table must be designated with LSFR. The table must begin with syllable 0 of the designated word; therefore, it should be preceded with the "WORD" pseudo instruction to assure proper assembly.

SECTION 11

ENVIRONMENTAL SPECIFICATIONS

11.00.00 GENERAL

Dimensions, Electrical, and Environmental Specifications and the applicable options are described in the following Subjects. An optional Desk Top Work Area and Extension Legs are specified in Subject 11.04.00

11.01.00 DIMENSIONS

The various dimensions are described in the following topics.

11.01.01 DIMENSIONS, SERIES L 2000 AND TC 500

HEIGHT – 29 7/8" (75.9 centimeters) floor to upper surface of Desk Top Work Area

DEPTH – 25" (63.5 centimeters) from each end of frame, front to back

WIDTH – 44" (111.8 centimeters) and 46" (116.8 centimeters) respectively for 50 Card and 60 Card Back Plane respectively; from each end of frame, side to side (Styles with a "0" in the third digit of the Style Number are 50 Card and Styles with a "4" in the third digit are 60 Card)

DESK TOP WORK AREA – five-sided, walnut wood-grain finish, 1¼" (3.2 centimeters) thick, 16" (40.6 centimeters) wide and 41" (104.1 centimeters) in depth at left edge

CASTERS – four swivel, 3" (7.6 centimeters) in diameter

WEIGHT – approximately 400 pounds (181 kilograms) for 50 Card Back Plane, 410 pounds (186 kilograms) for 60 Card Back Plane

An additional 24" (61 centimeters) are required at the rear of the console for an area for the forms and the Style 1 Exit Racks when a Pin Feed Device is used.

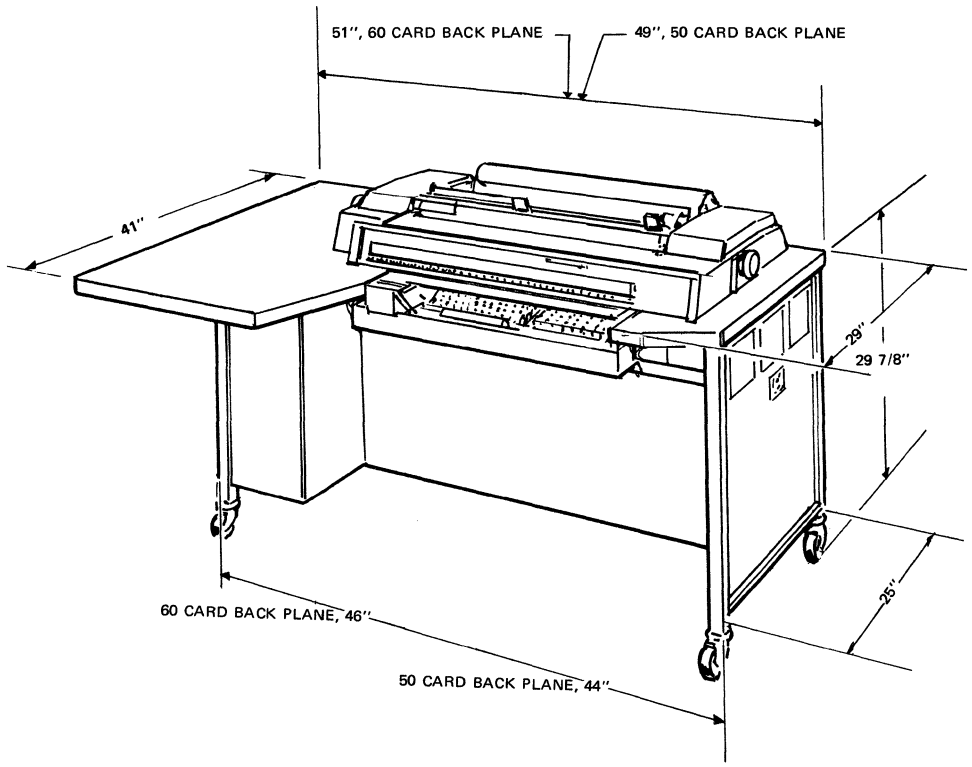


Figure 11.01.01-1 Dimensions, Series L 2000 and TC 500

11.01.02 DIMENSIONS, SERIES L 3000 WITH BASIC FRONT FEED FORMS HANDLER AND TC 1500

HEIGHT – 29 7/8" (75.9 centimeters) floor to upper surface of Desk Top Work Area

DEPTH – 25" (63.5 centimeters) from each end of frame, front to back

WIDTH – 46" (116.8 centimeters) from each end of frame, side to side

DESK TOP WORK AREA – five-sided, walnut wood-grain finish, 1¼" (3.2 centimeters) thick, 16" (40.6 centimeters) wide and 41" (104.1 centimeters) in depth at left edge

CASTERS – four swivel, 3" (7.6 centimeters) in diameter

WEIGHT – approximately 410 pounds (186 kilograms)

An additional 24" (61 centimeters) are required at the rear of the console for an area for the forms and the Style 1 Exit Racks when a Pin Feed Device is used.

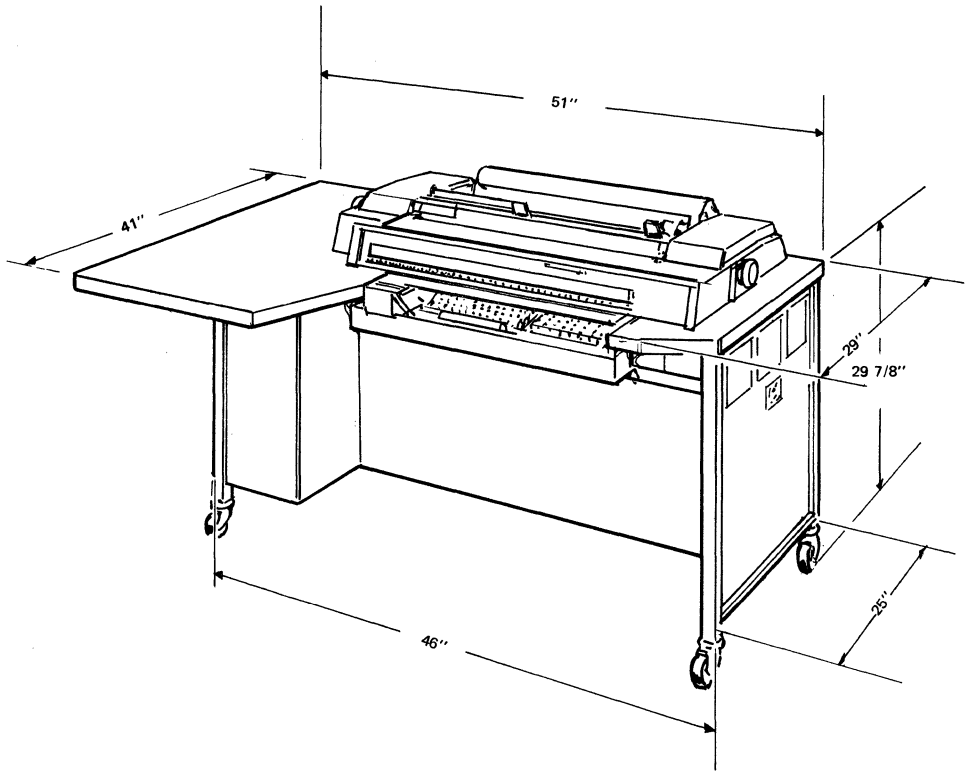


Figure 11.01.02-1 Dimensions, Series L 3000 with Basic Front Feed Forms Handler and TC 1500

11.01.03 DIMENSIONS, SERIES L 4000, L 5000 AND TC 2500

HEIGHT – 29 7/8" (75.9 centimeters) floor to upper surface of Desk Top Work Area

DEPTH – 25" (63.5 centimeters) from each end of frame, front to back

WIDTH – Series L 4000 and TC 2500, 55" (139.7 centimeters), from each end of frame, Series L 5000, 57¼" (145.4 centimeters), from side of left frame to side of extended right side panel

DESK TOP WORK AREA – five-sided, walnut wood-grain finish, 1¼" (3.2 centimeters) thick, 16" (40.6 centimeters) wide and 41" (104.1 centimeters) in depth at left edge

CASTERS – four swivel, 3" (7.6 centimeters) in diameter

WEIGHT – Series L 4000 and TC 2500, approximately 422 pounds (191 kilograms), Series L 5000, approximately 440 pounds (200 kilograms)

An additional 24" (61 centimeters) are required at the rear of the console for an area for the forms and the Style 1 Exit Racks when a Pin Feed Device is used.

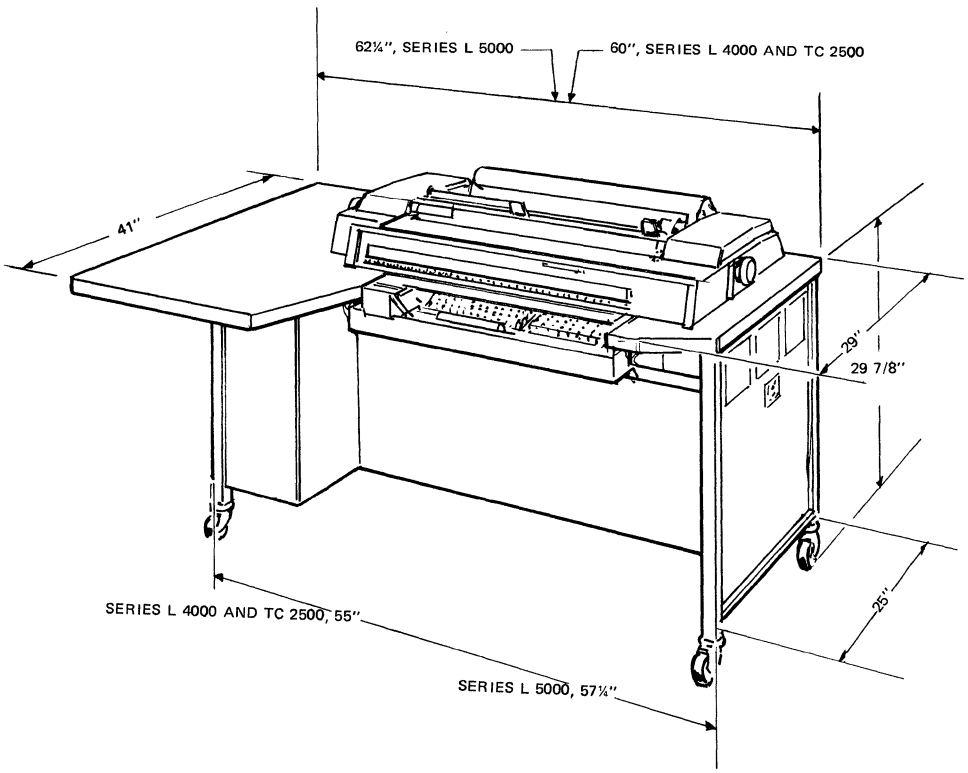


Figure 11.01.03-1 Dimensions, Series L 4000, L 5000 and TC 2500

11.01.04 DIMENSIONS, SERIES L 3000 WITH FINANCIAL FRONT FEED FORMS HANDLER AND TC 700

The subject two-piece systems include a Console (keyboard printer) and a Processor (logic and memory unit). The Console may be placed on the Processor, or the Console may be supported by a built-in counter or similiar support. As standard 5' cables (three) are provided to connect the Console and Processor. Optional connecting cables are available as specified in Topic 11.04.04 if the two units must be placed in separate areas.

HEIGHT – Processor 37" (93.9 centimeters) floor to top, Console 14" (35.6 centimeters) to top of Journal Cover key, two combined 51" (129.5 centimeters) without pin feed device

DEPTH – Processor, 30¼" (76.8 centimeters) not including 2" (5.1 centimeters) wall clearance, Console, 27 1/8" (68.9 centimeters), use 30¼" depth plus wall clearance if Console is placed on Processor

WIDTH – Processor, 25 3/8" (64.5 centimeters), see optional casters, Console, 30" (76.2 centimeters), use 30" width if Console is placed on Processor

CASTERS – four swivel, 3" (7.6 centimeters) in diameter, see Topic 11.04.03 for optional casters

WEIGHT – Processor, approximately 275 pounds (125 kilograms), Console, approximately 175 pounds (79 kilograms)

An additional 25 7/8" (65.7 centimeters) are required at the rear of the console for an area for the forms and the Style 1 Exit Racks when a Pin Feed Device is used.

The base of the console is not as wide as the area of the keyboard; therefore the base may set in a "well" of a counter and the upper sides may extend over the counter top. See this 2¼" (5.7 centimeters) dimension in Figure 11.01.04-1. See Topic 11.04.01 for the optional Extension Legs.

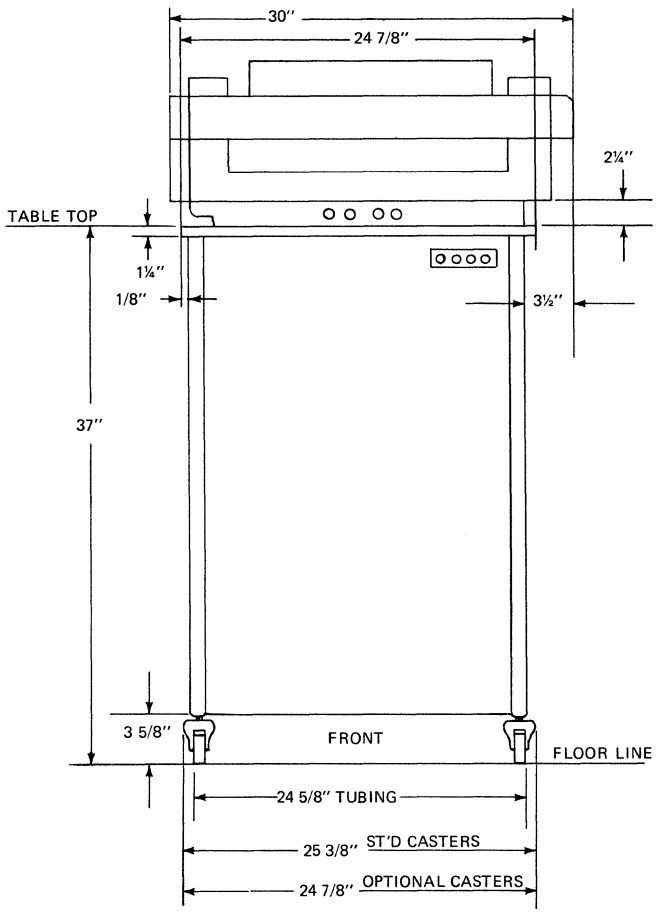


Figure 11.01.04-1 Dimensions, Front View, Series TC 700 and L 3000 Window Accounting Computer

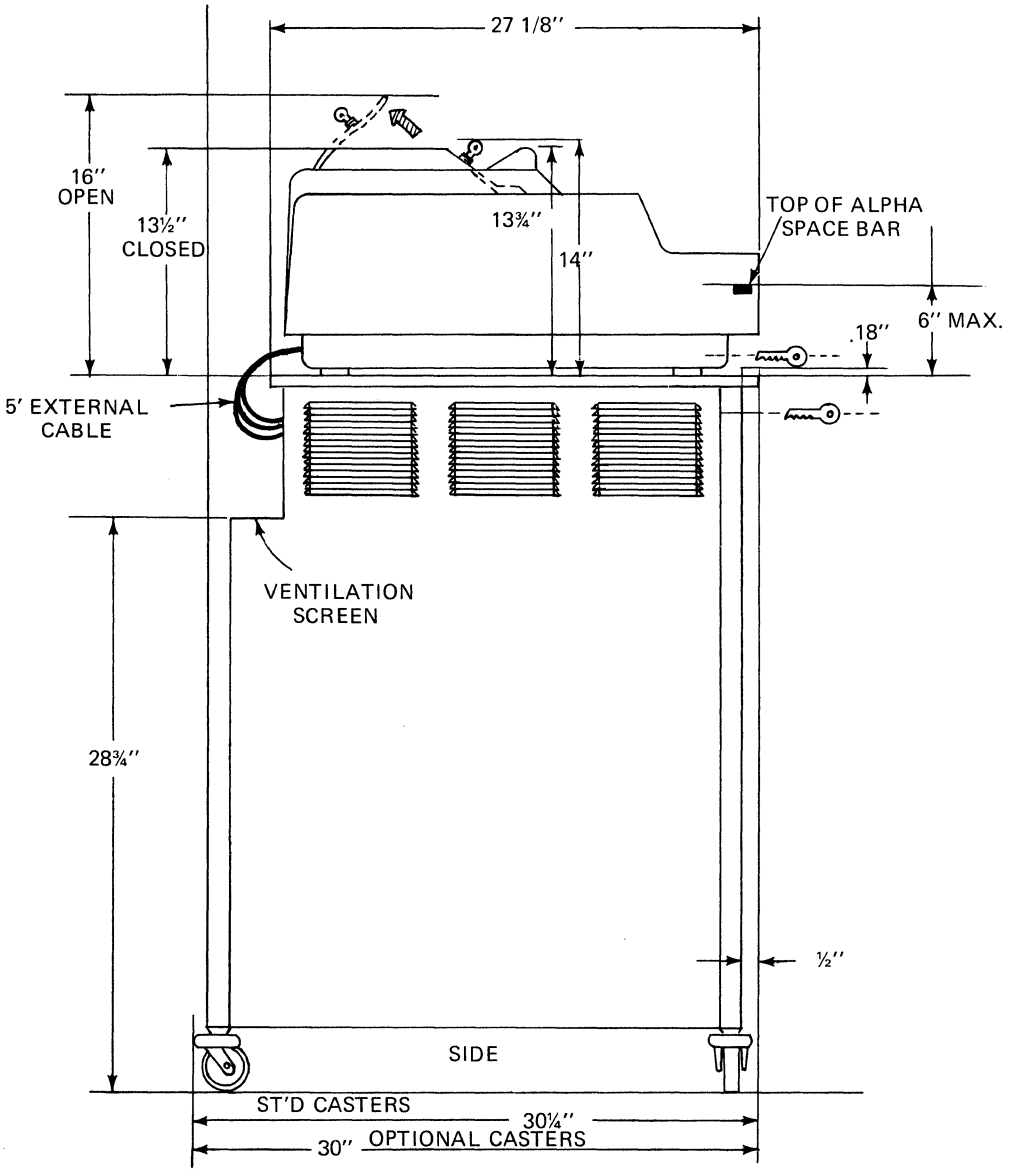


Figure 11.01.04-2 Dimensions, Side View, Series TC 700 and L 3000 Window Accounting Computer

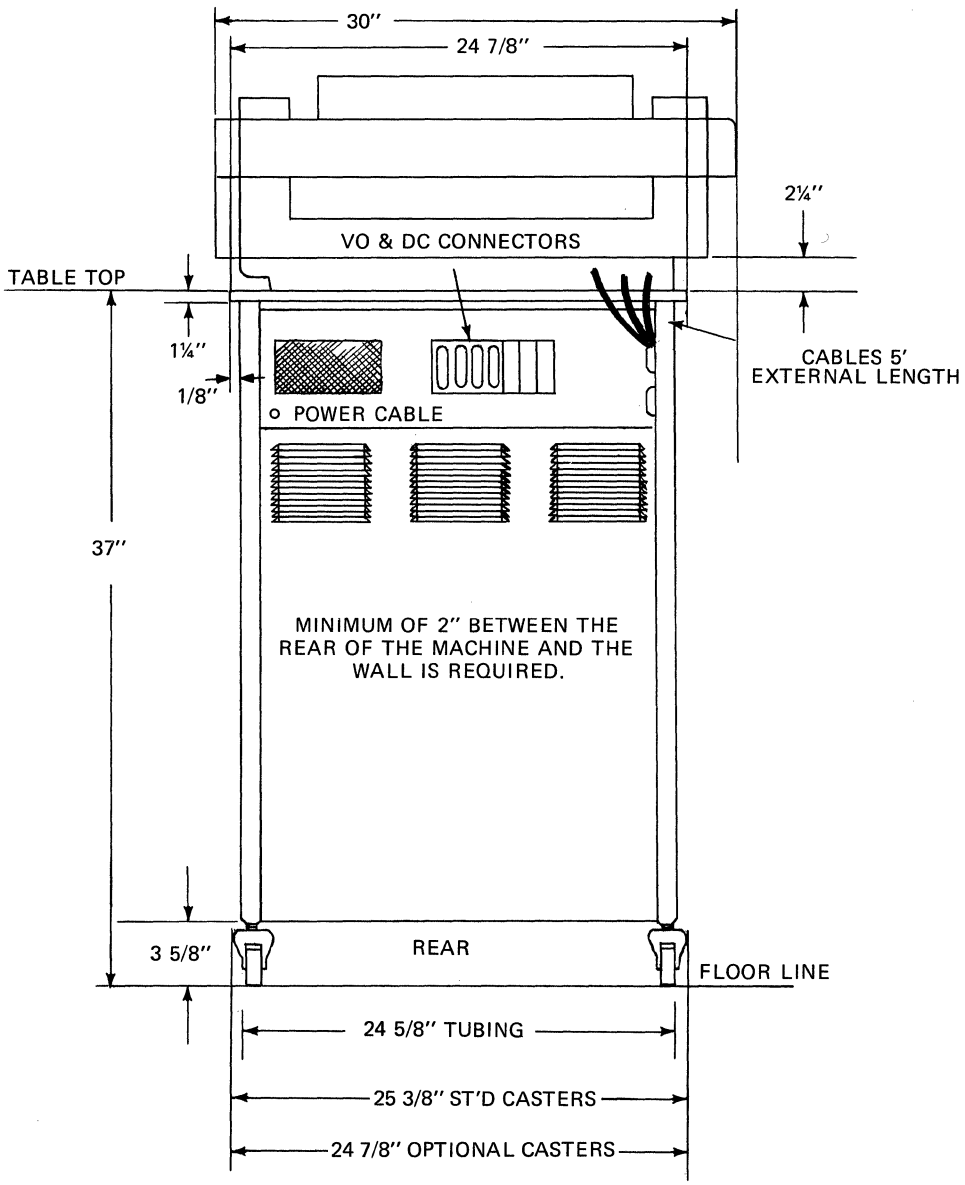


Figure 11.01.04-3 Dimensions, Rear View, Series TC 700 and L 3000 Window Accounting Computer

11.02.00 ELECTRICAL SPECIFICATIONS

The standard electrical specification is 120 volts (range 107-127), 60 cycles with a frequency variation of plus or minus 1%.

The Magnetic Record Computer systems require 8.2 amperes but only 8.0 amperes are required for all other systems. This is subject to modification as specified for the Line Branch Circuit Loading as specified in a subsequent topic. An attached input/output device requires the following amperes:

Magnetic Record Reader, 6.2 amperes

Card Punch, 80-Column, 4.3 amperes

Paper Tape/Edge Punched Card Perforator, none

Paper Tape/Edge Punched Card Reader, none

Card Reader, 80-Column, none

See Section 9 for a description of the I/O devices.

A three-wire, nondetachable line cord, with an 8' 6" external length is provided with NEMA wall plug. For the two-piece Console and Processor systems the cord is connected at the right-rear corner near the top of the Processor. (This is the left corner when standing behind the Processor.) For the one-piece consoles the cord is connected at the left-rear corner near the bottom of the desk. (This is the right corner when standing behind the desk.)

If other than the standard 120 volt, 60 cycle current is required, one of two types of constant voltage transformer and one type of auto transformer are available as specified in the following topics. The column labeled "circuit loading" is the Line Branch Circuit Loading. The Line Branch Circuit Loading Currents are 12.5% greater than specified on the Electrical Specification plate. The number of systems that can be connected to a line branch circuit is limited by the ampere capacity of the circuit. The ampere rating as shown on the chart is multiplied by the number of systems. The sum of the amperes must not exceed the line branch ampere capacity.

The British Thermal Units per hour (BTU/HR) are also specified in the following topics. The calculation of BTU's/HR is based on the maximum watts multiplied by the factor 3.413 (BTU's per watt). For example, a system with 720 watts, the 720 multiplied by 3.413 equals 2457 BTU's/HR. These calculations represent maximum BTU's per hour. The actual BTU's may be less by an undeterminable amount because of the idle time between the printing and dependent upon whether or not an I/O device is attached. Systems which receive the power from the console do not increase these maximum BTU's: Punched Paper Tape/Edge Punched Card Perforators and Readers, or 80-Column Card Readers. The following have a separate line cord; therefore, the BTU's/Hour are increased when used with a system:

1. Magnetic Record Reader, additional 1,365 BTU's/HR
2. Card Punch, 80-Column, additional 1,707 BTU's/HR

11.02.01 OPTIONAL CONSTANT VOLTAGE TRANSFORMER, 60-CYCLE, EXCEPT SERIES L 5000

The cycle tolerance is plus or minus 1%.

Voltage Nominal	Voltage Range	Max. WATTS	MAX BTU's Per Hour	Single System AMPS	Circuit Loading AMPS
100	90 – 105	730	2,492	10.8	12.2
110	99 – 115.5	720	2,457	9.0	10.1
115	103.5 – 121	720	2,457	8.4	9.5
120	108 – 126	700	2,389	8.0	9.0

Nominal	Voltage Range	Max. WATTS	MAX BTU's Per Hour	Single System AMPS	Circuit Loading AMPS
127	114 – 133	720	2,457	7.7	8.7
208	193 – 220	720	2,457	4.7	5.3
220	198 – 231	720	2,457	4.5	5.1
230	207 – 244	720	2,457	4.4	5.0
240	214 – 254	720	2,457	4.2	4.7

11.02.02 OPTIONAL CONSTANT VOLTAGE TRANSFORMER, 50-CYCLE, EXCEPT SERIES L 5000

The cycle tolerance is plus or minus 1%.

Nominal	Voltage Range	Max. WATTS	MAX BTU's Per Hour	Single System AMPS	Circuit Loading AMPS
100	90 – 105	780	2,662	11.8	13.3
110	99 – 115.5	770	2,628	9.9	11.1
115	103.5 – 121	770	2,628	9.2	10.4
120	108 – 126	750	2,560	8.8	9.9
127	114 – 133	770	2,628	8.5	9.6
220	198 – 231	770	2,628	4.8	5.4
230	207 – 244	770	2,628	4.7	5.3
240	214 – 254	770	2,628	4.5	5.1

11.02.03 OPTIONAL AUTO TYPE TRANSFORMER

The cycle frequency may be 50 or 60.

Nominal	Voltage Range
100	90 – 105
110	99 – 115.5
115	103.5 – 121
120	108 – 126
127	114 – 133
208/220	193 – 231
230	207 – 244
240	214 – 254

11.02.04 OPTIONAL CONSTANT VOLTAGE TRANSFORMER, 60-CYCLE, SEREIS L 5000

The cycle tolerance is plus or minus 1%

Nominal	Voltage Range	Max. WATTS	MAX BTU's Per Hour	Single System AMPS	Circuit Loading AMPS
100	90 – 105	750	2,560	11.0	12.4
110	99 – 115.5	740	2,526	9.2	10.4
115	103.5 – 121	740	2,526	8.6	9.7

Nominal	Voltage Range			Max. WATTS	MAX BTU's Per Hour	Single System AMPS	Circuit Loading AMPS
120	108	–	126	720	2,457	8.2	9.2
127	114	–	133	740	2,526	7.9	8.9
208	193	–	220	740	2,526	4.8	5.4
220	198	–	231	740	2,526	4.6	5.2
230	207	–	244	740	2,526	4.5	5.1
240	214	–	254	740	2,526	4.4	4.9

11.02.05 OPTIONAL CONSTANT VOLTAGE TRANSFORMER, 50-CYCLE, SERIES L 5000

The cycle tolerance is plus or minus 1%.

Nominal	Voltage Range			Max. WATTS	MAX BTU's Per Hour	Single System AMPS	Circuit Loading AMPS
100	90	–	105	800	2,730	12.0	13.5
110	99	–	115.5	790	2,696	10.1	11.4
115	103.5	–	121	790	2,696	9.4	10.6
120	108	–	126	770	2,628	9.0	10.1
127	114	–	133	790	2,696	8.7	9.8
220	198	–	231	790	2,696	4.9	5.5
230	207	–	244	790	2,696	4.8	5.4
240	214	–	254	790	2,696	4.6	5.2

11.03.00 ENVIRONMENTAL CONDITIONS

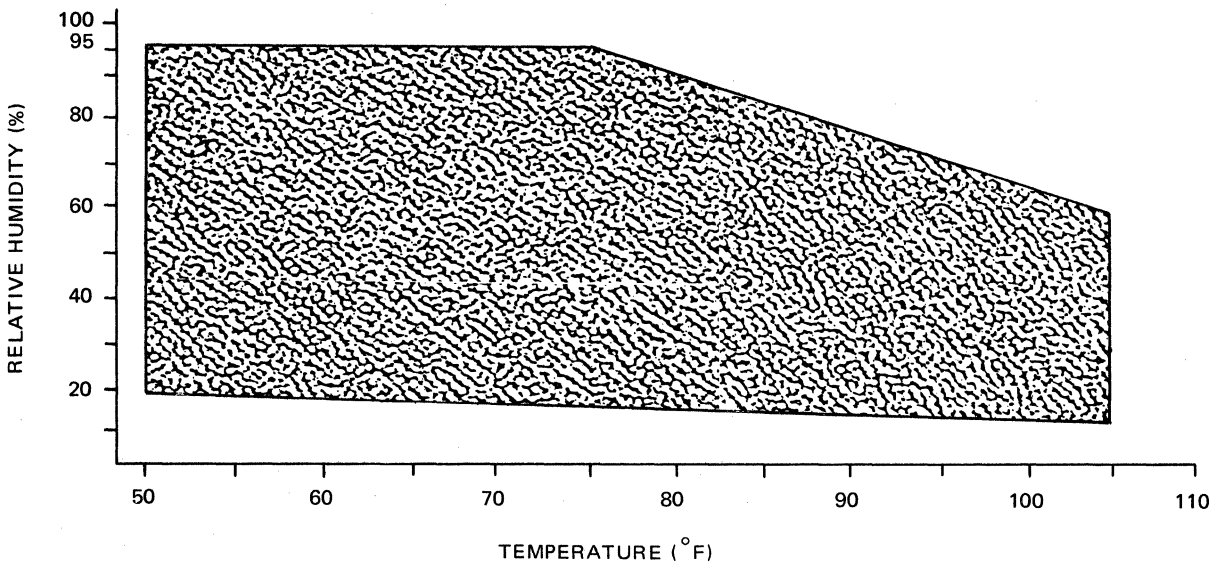
The permissible environment for a system is dependent upon whether or not the system is being operated. See Topic 6.34.08 for the environmental conditions for Magnetic Unit Records.

11.03.01 ENVIRONMENTAL CONDITIONS, OPERATING

The System is operable within the ranges of the enviornmental conditions specified in the following paragraphs:

Temperature		Relative Humidity	
Minimum	50°F. (10° centigrade)	Minimum	5%
Maximum	105°F. (41° centigrade)	Maximum	95%

The relative humidity may vary from minimum to maximum within the termperature range shown except that humidity changes from one extreme of the operating range to the other may not be made in less than 4 hours.



Temperature and Humidity Operating Range

Barometric Pressure 32 to 20.58 inches of mercury (sea level to approximately 10,000 feet altitude).

11.03.02 ENVIRONMENTAL CONDITIONS, NONOPERATING

As long as the System is not being operated, the following environmental conditions may exist. Mode of shipment or storage may be affected by these conditions:

Temperature		Relative Humidity	
Minimum	- 50°F. (-45° centigrade)	Minimum	5%
Maximum	160°F. (71° centigrade)	Maximum	100%

Barometric Pressure 32 to 8.88 inches of mercury (sea level to approximately 30,000 feet altitude).

11.04.00 OPTIONAL FEATURES RELATED TO DESK HEIGHT, SIZE AND PLACEMENT

The height of the console and the work area for the desk may be altered by the following features.

11.04.01 EXTENSION LEGS

Extension legs for each corner of the desk frame may be installed to increase the height of the console. The extensions increase the height by 1", 2" or 9", or by a combination of any two or three extensions. The extension legs which are square tubular metal pieces are installed in between the casters and bottom of the corner posts for the desk frame. (The casters are not disabled).

Usually the 9" extension is used to permit the operation of "sit-down" consoles from a standing position. See Figure 11.04.01.

The 1" or 2" extensions or both are commonly used to adjust to the height of the built-in window counters for financial institutions which use the "stand-up" console, such as the Series TC 700 and Series L 3000 Window Accounting Computer. See Topic 11.01.04.

Figure 11.04.01-1 Extension Legs and Four-Sided, Desk Top Work Area

11.04.02 FOUR-SIDED, DESK TOP WORK AREA

A Four-Sided Desk Top Work Area may be installed at the left area of the desk of certain Series L/TC styles. The top is 29" (72.8 centimeters) in depth rather than the 41" depth of the five-sided top which is replaced. The top is a walnut wood-grain finish. See Figure 11.04.01-1.

Less floor area is required for a console with the four-sided top. The top is commonly used with a console which is operated from a standing position when extension legs are also used.

The four-sided tops are not the same for all consoles; therefore, the console style must be specified when the top is ordered. The top is not compatible with the two-piece financial systems which include a Console (keyboard) Printer and Processor (Logic and Memory Unit), Series TC 700's and Series L 3000 Window Accounting Computers.

11.04.03 OPTIONAL CASTERS FOR PROCESSOR

The standard caster hubs extend beyond the sides of the Processor (Logic and Memory Unit). This extension actually increases the width and depth of the processor. An optional set of casters is available to decrease the actual width and depth, see Figures in Topic 11.01.04.

Standard		Optional	Decrease
Width:	25 3/8"	24 7/8"	1/2"
Depth:	30 1/4"	30"	1/4"

This feature is normally used on two-piece stand-up Processors which fit into window counter areas.

11.04.04 CONSOLE AND PROCESSOR CONNECTING CABLES, TWO-PIECE SYSTEMS

For the Series TC 700 and Series L 3000 Window Accounting Computer, the 5' connecting cables may be replaced by cable lengths of 10', 50', 100' and 150'. There are three cables to a set and the additional lengths may be required when the Console and Processor are placed in separate areas. See Topic 11.01.04.

ALPHABETICAL INDEX

D

E

F

ALPHABETICAL INDEX (continued)

ALPHABETICAL INDEX (continued)

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