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OS Release 21

IBM System/360 Operating System Operator's Guide for Display Consoles

This book tells system operators how to use cathode ray tube (CRT) display devices as operators' consoles to run MFT or MVT configurations of the IBM System/360 Operating System. The display devices supported are:

- Model 85 Display Console (Feature 5450)
- Model 165 Display Console
- 2250 Display Unit
- Model 91 Display Console
- Model 195 Display Console
- 2260 Display Station (local attachment)

After summarizing how to use display devices as operator consoles, the manual describes in detail the operating techniques for each of the devices. A glossary is included.

Instructions are given for each device telling how to: start the system, enter commands, delete messages, and control the screen using the CONTROL command.

The book must be used in conjunction with IBM System/360 Operating System: Operator's Reference, GC28-6691 and IBM System/360 Operating System: Operator's Procedures GC28-6692, because a knowledge of the MFT and MVT operating techniques is required.



Second Edition (March 1972)

This edition applies to Release 21 of IBM System/360 Operating System, and to all subsequent releases until otherwise indicated in new editions or Technical Newsletters. This is a major revision and makes obsolete GC27-6949-0 and TNLs GN27-1356 and GN27-1362. Changes are continually made to the specifications herein; before using this publication in connection with the operation of IBM systems, consult the latest SRL Newsletter, GN20-0360, for the editions that are applicable and current.

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PREFACE

This book is a guide and reference manual for system operators. It describes the procedures for operating an MFT or MVT system using one of the following display devices as an operator console:

- Model 85 Display Console (Feature 5450)
- Model 165 Display Console
- 2250 Display Unit
- Model 91 Display Console
- Model 195 Display Console
- 2260 Display Station (Local Attachment)

ORGANIZATION OF THIS BOOK

This manual has four chapters:

1. Introduction: general information about display consoles.
2. Model 85 and Model 165 Display Consoles: describes the techniques for operating the system using a Model 85 or Model 165 display console.
3. 2250, Model 91, and Model 195 Display Consoles: describes the techniques for operating the system using a 2250 display unit, a model 91, or a model 195 display console.
4. 2260 Display Station: describes the techniques for operating the system using a 2260 display station.

A summary of the CONTROL command operands is also provided, and a glossary is included at the end of this book.

HOW TO USE THIS MANUAL

If you are operating a display console for the first time, read the introduction to become familiar with the basic capabilities of display consoles. Next, read the chapter that discusses the console

you are to use. Note the format and general location of the information in the chapter; correlate the procedures described for the display console with the procedures that you have used in the past to operate typewriter consoles like the 1052.

As you become familiar with the display console, use the table of contents and the index provided with each chapter to locate descriptions of specific procedures. Use the CONTROL command summary in Appendix A as a quick reference to determine the command format for each procedure.

CONVENTIONS USED IN THIS MANUAL

Examples of system messages and operator commands are shown in a box:

```
IEE152I *ENTER* *CANCEL* *D C,K*
```

System messages shown in this manual are intended only as examples; for details of message formats, consult IBM System/360 Messages and Codes, GC28-6631.

The only operator command described in detail in this book is the CONTROL command. For detailed descriptions of the other operator commands, refer to IBM System/360 Operating System: Operator's Reference, GC28-6691.

REQUIRED PUBLICATIONS

To operate a system with MFT or MVT, you must be familiar with the material contained in the following publications:

IBM System/360 Operating System:

Operator's Procedures, GC28-6692.

Operator's Reference, GC28-6691.

Messages and Codes, GC28-6631.

SUMMARY OF MAJOR CHANGES

Release 21

<u>Item</u>	<u>Description</u>	<u>Pages</u>
Display areas	A facility has been added to allow the operator to designate one or more areas of the screen for display of status displays.	Model 85: 23-25 2250: 58-60 2260: 88-91
Output-only Consoles	The input function of the 2260 display console can now be temporarily disabled so that the console can be used exclusively for the display of messages or status displays.	97-100
Program function keyboard command entry	The program function keyboard (available on the 2250 display console) can now be used by the operator to enter commands.	40,42-46
Light pen command entry	The light pen (available on the 2250 display console) can now be used by the operator to enter commands.	46-47

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A display console is an operator's console that displays the operator's messages on a cathode-ray tube (CRT) instead of printing them on paper. Operating a system using a display console is similar to operating a system using a typewriter console such as the IBM 1052 Printer-Keyboard. You type commands and replies to system messages on an alphameric keyboard, and most of the commands that you use are the same commands that you use on the 1052.

ADVANTAGES OF DISPLAY CONSOLES

Display consoles can improve your efficiency in controlling the system because:

- Messages are displayed faster, allowing you to respond more quickly to the system's needs.
- Special indicators highlight different types of messages; the system marks messages requiring action and keeps them on the screen until you respond to them.
- The light pen and the program function keyboard (these devices are optional on certain consoles) enable you to enter many commands at one time, with one simple action.

SYSTEM CONSIDERATIONS

Display consoles may be used with the MFT (multiprogramming with a fixed number of tasks) and MVT (multiprogramming with a variable number of tasks) system configurations. Multiple console support (MCS) is a required feature. Through MCS, more than one device-type can be used with each system. For example, a 2250 display unit, a 1052 printer-keyboard, and several 2260 display stations might be used as operator consoles in the same system with a model 85 display console.

DISPLAY CONSOLE CHARACTERISTICS

The basic feature common to all display consoles is the cathode-ray tube (CRT).

Most display consoles also include a device such as a typewriter keyboard that enables the operator to communicate with the system, and some display consoles have special devices, such as light pens and program function keyboards, that help the operator control the system. Figure INTRO-1 summarizes the features available on each display console.

Display consoles are characterized as full-capability consoles or output-only consoles. A full-capability console has both input and output capability (it can be used to enter commands and to display messages); an output-only display console can be used to display either messages or status displays (but not both at the same time).

The Display Screen: The display screen of a full-capability console is divided into five functional areas (see Figure INTRO-2):

- **Message area:** This area contains system and problem program messages and copies of certain operator commands. The size of the message area depends on the console.
- **PFK Display Line:** This line contains a display of program function keyboard (PFK) key numbers that is used when entering commands with the light pen. The PFK display line is blank on consoles not equipped with a light pen.
- **Instruction Line:** This line is used to display system messages pertaining to control of the console.
- **Entry Area:** These two lines are used by the operator for entering commands and replying to messages.
- **Warning Line:** This line is used to warn the operator of conditions that may require action.

The display screen of an output-only console consists of a message area and a warning line, as shown in Figure INTRO-2.

	Full-capability Mode	Output-Only Mode	Light Pen *	Audible Alarm *	Program Function* Keyboard (PFK)	Visual Alarm
2250, Model 91, and Model 195	YES	NO	YES	YES	YES	NO
2260	YES	YES	NO	NO	NO	NO
Model 85 and 165	YES	NO	NO	YES	NO	YES
* Optional Feature						

Figure INTRO-1. Summary of display console features

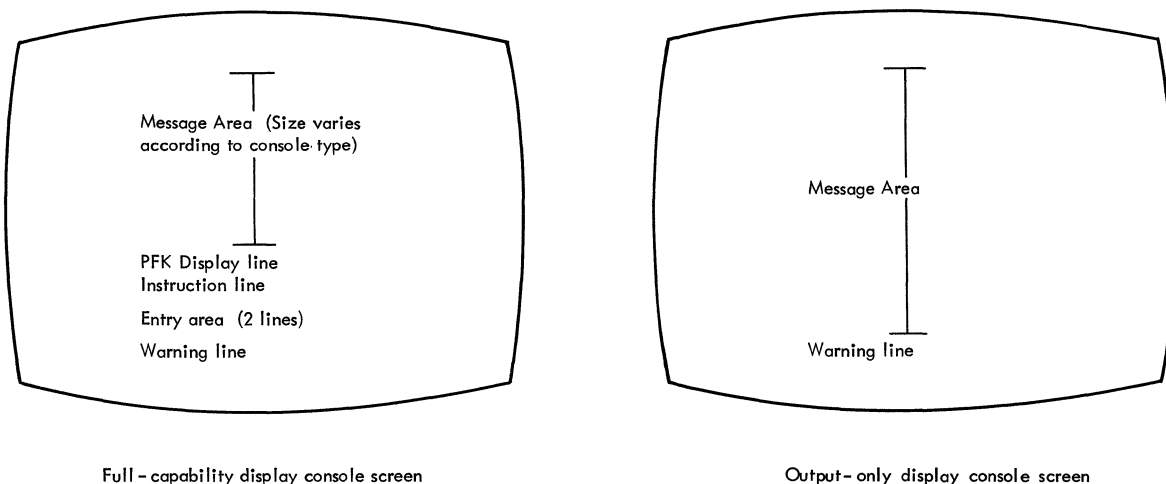


Figure INTRO-2. Comparison of the display screens of full-capability display consoles and output-only display consoles

The Keyboard: Each full-capability display console has a typewriter keyboard. The keyboard is used to type commands and responses to messages and to signal the system that information is being entered.

The Cursor: Each full-capability display console has a cursor. The cursor appears on the screen as a moveable point of light (it may be an underscore or a horizontal or vertical bar). The cursor designates the position on the screen that the system will examine for the next operator action. The action may involve positioning a typed character, entering a command, requesting message deletion, or requesting a display. Cursor movement is controlled by special keys located on the console keyboard.

The Light Pen: The light pen (or selector pen) is a light-sensitive device that is available with certain display consoles. When the pen is placed over specific areas of the display console screen, it senses the light from the screen and signals the system. The system then determines the screen location over which the pen has been positioned and takes action according to the way it has been programmed. In the operator console mode, this action may involve entering operator commands, deleting messages from the screen, canceling processes, or presenting displays.

The Program Function Keyboard: The program function keyboard (PFK) is an input device that is available on certain display consoles. Each PFK key can be associated with one or more operator commands; the operator can enter these commands by pressing the key.

Alarms: Visual and audible alarms are available on certain display consoles. These alarms are activated by the system when certain changes in console status take place or when certain error conditions occur.

HARDCOPY LOGS

A hardcopy log, which is either a printed copy or a direct access storage record of system messages, is required whenever display consoles are included in a system. The hardcopy log insures that a permanent record of messages is made; display consoles do not make a permanent copy of the messages that are sent to them.

OPERATING PROCEDURES

The basic operating procedures -- interpreting messages and entering commands -- produce the same results on the typewriter console and the display console. However, display consoles require that you perform these basic procedures in slightly different ways:

- Interpreting Messages: Several special screen characters inform you of the status of certain messages. Also, the location of the message on the screen tells you certain things about the message; for example, messages in the instruction line usually pertain to console control, and messages in the warning line usually describe conditions that require action.
- Command Entry: To enter commands, you use the cursor, the entry area, and the typewriter keyboard on all consoles, and the PFK and the light pen on some consoles. You must become familiar with procedures for changing information in the entry area and entering commands in conversational mode (wherein the system writes the command in the entry area, and you change it as required before entering it).

Display consoles require you to perform several procedures that have no counterparts on typewriter consoles. These unique procedures include:

- **Message Deletion:** Because the display console screen has a limited number of lines, only a limited number of messages can be displayed on the screen at one time. To make room for additional messages, you must delete old messages and messages for which action has been taken.
- **Controlling Status Displays:** On typewriter and printer consoles, status displays are written to the console in response to the DISPLAY command. On display consoles, you may set up display areas, route displays to the areas, examine the displays, and erase the displays when you no longer need them; you may also display status displays in the general message area of the screen. You should also become familiar with the procedures for controlling time-interval updated displays.

After you learn to operate the system with one type of display console, you will find it easy to switch to another type. The programming is basically the same for each device. Because of certain hardware differences, however, some specific operations differ from device to device. Read through the "Console Characteristics" section of the appropriate chapter whenever you require information about a new device.

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MODEL 85 AND MODEL 165 DISPLAY CONSOLES

This chapter explains how to use the model 85 display console (Feature 5450) and the model 165 display console as operator's consoles. The physical characteristics of the consoles are described, and all important procedures are described in the order in which you will normally perform them.

The model 85 and model 165 operator consoles operate only in full-capability (input/output) mode; you cannot use them as output-only display consoles. Other operator consoles (display and non-display) can be active in the same system with a model 85 or a model 165 display console, and you can use the model 85 and model 165 consoles to control output-only consoles.

CONSOLE CHARACTERISTICS

The model 85 and model 165 display consoles are composed of a display screen and a typewriter keyboard. The screen and keyboard are normally part of the CPU control board as shown in Figure 85/165-1. The display screen is a cathode ray tube with 2,800 character positions.

SCREEN FORMAT

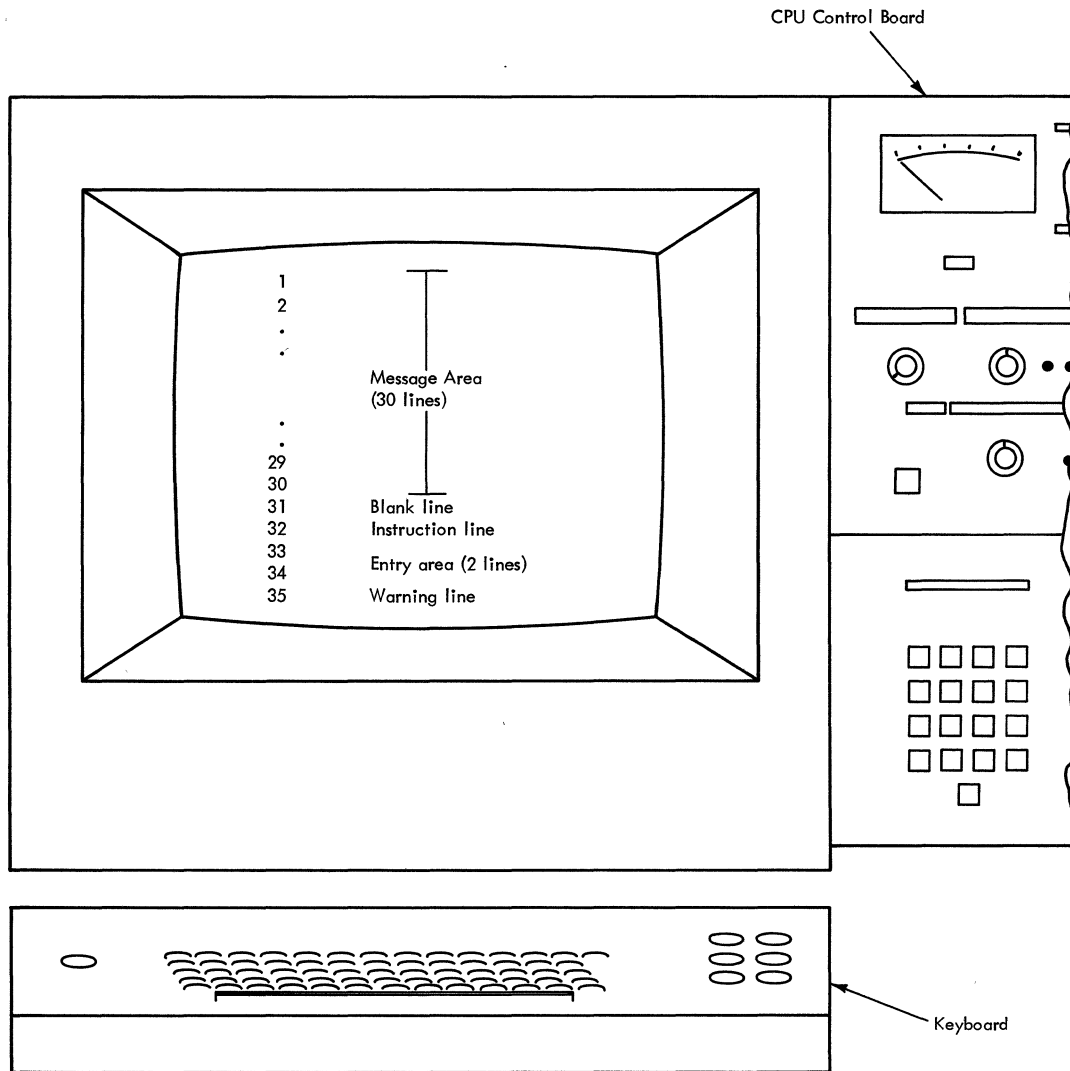
The display screen format is shown in Figure 85/165-1. The screen is divided into four functional areas:

- Message Area: This area has 30 lines of 80 character positions each. The first two character positions in each line contain the number assigned to the message line (if message numbering is in effect), or the number of messages waiting to be displayed (if roll mode is in effect). Positions three and four contain the action-required indicator (*), the no-action-required indicator (-), and the action-has-been-taken indicator (|). Positions 5-76 contain the text of system messages, operator commands (except the CONTROL command), and system status displays. The following is a sample message area line.

```
06 *IEE101A READY
```

- Instruction Line: This line is used to display system messages relating to control of the console.
- Entry Area: You use these two lines, in conjunction with the typewriter keyboard, for entering commands and replying to system messages. Each entry area line has 80 character positions; commands that are too large to fit in the first line are split at the 80th character and continued in the second line (no special continuation indicator is required). The maximum command length is 126 characters.
- Warning Line: This line is used to display messages that warn you of conditions that may require action.

Note: The PFK display line (line 31) is blank on the model 85 and model 165 display consoles, because these consoles do not support light pen command entry.



Note: The labels do not appear on the screen.

Figure 85/165-1. Model 85 and model 165 display console

SPECIAL SCREEN CHARACTERS

The model 85 and model 165 display consoles use three special screen characters to inform you of the status of certain screen messages. These special indicators appear in position three or four of the lines in the message area:

- A vertical line (|) in position three indicates that required action has been taken for the message or that you have designated the message for deletion.
- A horizontal bar (-) in position three indicates that the message is for information only and requires no action by the operator.
- An asterisk (*) in position four indicates that the message requires action by the operator.

THE CURSOR

The position of the cursor on the console screen indicates to the system:

- Where to position the next character that you type.
- What pre-defined action you want the system to take.
- What messages you want to delete from the screen.

On the model 85 and model 165 display consoles, cursor movement is not restricted (that is, the cursor can be positioned anywhere on the screen), but its position is meaningful only in the following locations:

- Any position on a nonaction message line for deleting all messages above that line.
- The asterisk on an action message for deleting action messages.
- The indicators in a status display control line for framing, updating, and erasing the display.
- Any position within the entry area for entering a command.

The four cursor control keys are advance →, backspace ←, up ↑, and down ↓. Pressing a key once moves the cursor one character position in the indicated direction; holding the key down moves the cursor continuously in the indicated direction.

THE AUDIBLE ALARM

The audible alarm is an optional feature of the model 85 and model 165 display consoles. It is sounded for one second under the following circumstances:

- When you make an error entering a CONTROL command.
- When the screen is full and another message is waiting to be displayed.
- When an action message appears on the screen.
- When the console is placed in roll mode for message deletion.

Response: If the alarm sounds while you are entering a CONTROL command, check the instruction line to see if an error message was issued. If so, follow the procedures given in the message explanation in Messages and Codes, GC28-6631.

If the alarm sounds and the following message appears in the warning line:

```
-----  
IEE159E MESSAGE WAITING  
-----
```

delete some messages from the message area using the procedures described under "Message Deletion" in this chapter.

THE VISUAL ALARM

The visual alarm is located on the control panel. It is activated at the same time that the audible alarm is sounded. The visual alarm must be turned off manually whenever it is activated; however, if you leave the visual alarm on, the audible alarm will sound again if one of the conditions listed above occurs. Respond to the visual alarm in the same way that you respond to the audible alarm.

HOW TO ENTER COMMANDS

To enter a command, you must arrange the information in the proper format and then signal to the system that information is ready to be passed.

ENTERING COMMANDS WITH THE KEYBOARD

1. Move the cursor to the first position in the entry area.
2. Type in the command.
3. Press the END key.

As you type each character of the command, the corresponding character is displayed in the entry area, and the cursor is advanced to the next character position. When the end of the first entry area line is reached, the cursor advances automatically to the first character position of the next line, permitting continuation of the command. The maximum number of characters that can be entered is 126, but only one command can be entered at a time.

Uppercase and Lowercase: Most commands can be entered in lowercase or uppercase. The system converts the commands to uppercase, if required. However, information within a command that is contained in single quotes (for example, a reply to a WTOR message) is not converted to uppercase. If the information within the single quotes is required by the system in uppercase, be sure to type it in uppercase when you enter the command. Since all information is displayed on the screen in uppercase, you will not be able to determine whether information was entered in uppercase or lowercase by looking at the screen.

Pressing the END Key: When you press the END key to enter the information that is in the entry area, the cursor must also be located in the entry area, but it need not be located at the end of the command. Pressing the END key causes the command to be read into storage and processed by the system. For commands other than the CONTROL command, the command will disappear from the entry area and reappear in the message area. If the message area is full, the command may not appear immediately, and to display it you may have to delete some messages from the screen (see "How to Delete Messages" in this chapter). The CONTROL command is not moved to the message area; it remains in the entry area until the requested action takes place. When the entry area contains nothing but the cursor, pressing the END key moves the cursor to the first position in the entry area.

Commands Entered with Errors: If you enter a CONTROL command with errors, the audible alarm sounds (if the console is equipped with an audible alarm), and the command is displayed in the entry area. The location of the cursor indicates the source of the error:

- If the error is an invalid operand, the cursor is placed under the invalid operand:

```
K  X,N
```

- If the error is an invalid erase request, the cursor is placed under the first character after the E:

```
K  E,31,19
```

- If the CONTROL command exceeds 126 characters, the cursor is positioned at location 127 in the entry area.

To correct any of these errors, use the procedures described in this chapter under "How To Change Information in the Entry Area."

If an error is detected in a command other than the CONTROL command, the command is written in the message area along with an appropriate error message. Follow the procedures indicated for the message in Messages and Codes, GC28-6631.

HOW TO CHANGE INFORMATION IN THE ENTRY AREA

You may want to change information in the entry area to correct a typing error or to change a command form that the system has displayed there during conversational message deletion. You may also wish to blank the message area without entering a command to the system.

Character Substitution: To substitute one or more characters for characters that are already in the entry area:

1. Move the cursor back to the location of the first character that you want to change.
2. Type in the correct characters.

For example, if you typed in the following reply to a WTOR message:

```
R  22,'DISLPAY REQUESTED'
```

and then noted (before you pressed the END key) that the P and the L in DISPLAY were transposed, you could correct the error by positioning the cursor under the L and typing PL. The response would then read:

```
R  22,'DISPLAY REQUESTED'
```

Clearing the Entry Area: If you want to clear the entire entry area without passing the information in the entry area to the system, press the CANCEL key. Pressing the CANCEL key causes the following to occur:

- The entry area is blanked and the cursor is moved to the first data entry position.
- All message lines are rewritten to the screen.

- If a deletion request is pending, all deletion indicators (|) are removed.
- If message line numbers are displayed, the line numbers are removed (unless K D,N,HOLD is specified).

HOW TO START THE SYSTEM

To start the system using the model 85 or model 165 display consoles, follow the same procedures that you follow for the 1052 typewriter console:

- Set the LOAD UNIT dials to the unit address of the SYSRES volume, and press the LOAD key on the control panel.
- Respond to the system parameter messages that appear on the screen.
- Set the system time and date.
- Start the system input readers and system output writers.
- Vary devices offline as appropriate.

During nucleus initialization (NIP), the first messages appear on the top line of the screen, and subsequent messages are displayed on succeeding lines. When the number of lines displayed reaches eight, as each new line is displayed, the oldest (top-most) message is removed from the screen to provide room for the new message. You do not have to delete any messages during NIP.

Initial Console Specifications: When the console is initialized, the following message deletion specifications are in effect:

```
DEL=Y
SEG=22
CON=Y
RTME=60
RNUM=30
```

For an explanation of these values, see "How to Delete Messages" in this chapter.

HOW TO DELETE MESSAGES

As programs execute during system operation, the message area of the screen gradually fills with messages. To make room for more messages, you should delete nonaction messages and messages for which action has been taken.

You may delete messages from the message area of the model 85 or model 165 console screen manually by using the cursor or the CONTROL command, or you can delete messages automatically by requesting automatic mode, roll mode, or roll-deletable mode. (Note: Procedures for deleting system status displays are described in the section of this chapter called "System Status Displays," under the heading "How to Erase Status Displays.")

Deletion by cursor is useful for providing screen space quickly; the CONTROL command is more flexible for deleting messages selectively. Automatic message deletion is most useful when messages appear frequently, and when it is important that messages not back up on system queues while waiting for screen space.

MANUAL MESSAGE DELETION IN NONCONVERSATIONAL MODE

In nonconversational mode, message deletion is accomplished when you request the deletion. (In conversational mode, the system allows you to confirm each request before the deletion takes place.)

How to Delete Nonaction Messages with the Cursor in Nonconversational Mode

1. Move the cursor to any position within a nonaction message in the message area.
2. Press the END key, deleting the indicated message and all nonaction messages above it.

In addition to deleting the messages, pressing the END key blanks the entry area and repositions the cursor to the first data entry position. All messages in the message area are moved toward the top of the screen to fill the lines that were occupied by the deleted messages. The message lines that become available at the bottom of the message area are filled by any messages that were waiting for screen space.

How to Delete Action Messages with the Cursor in Nonconversational Mode

1. Move the cursor to the asterisk (position 4) in the action message that you want to delete.
2. Press the END key, deleting the designated action message.

In addition to deleting the message, pressing the END key blanks the entry area and repositions the cursor to the first data entry position. Messages below the deleted message are moved up on the screen to fill the line that was occupied by the deleted message.

How to Delete Messages with the CONTROL Command in Nonconversational Mode

The CONTROL command can be used to delete one message, a segment of messages, or flagged messages.

Deleting One Message: To delete a single message (action or nonaction):

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL E,nn command, where nn is the line number of the message to be deleted.
3. Press the END key.

For example, to delete message number 10, which appears on the screen as follows:

```
10 *IEE101A  READY
```

enter:

```
K E,10
```

Deleting a Segment of Messages: To delete the nonaction messages from a segment of messages:

1. Move the cursor to the first position in the entry area.
2. Type in CONTROL E,SEG or CONTROL E,nn,nn. SEG indicates that the message lines previously specified in the CONTROL S,SEG=nn command are to be erased; nn,nn specifies the range of messages to be erased.
3. Press the END key.

For example, if SEG=5 has been established using the CONTROL S,SEG= command (see "Establishing Message Deletion Defaults") you could delete the nonaction messages in message lines 1 through 5 by entering:

```
K E,SEG
```

You could delete the nonaction messages in message lines 4-10 by entering:

```
K E,4,10
```

Any action messages within the block of messages would remain on the screen.

Deleting All Flagged Messages: To delete all flagged messages (messages marked with a vertical or horizontal line in position 3):

1. Move the cursor to the first position of the entry area.
2. Type in the CONTROL E,F command.
3. Press the END key.

MANUAL MESSAGE DELETION IN CONVERSATIONAL MODE

Conversational mode of message deletion allows you to verify all messages that you have selected for deletion by cursor or CONTROL command. Conversational mode is requested by means of the CONTROL S,CON=Y command (see "How to Establish Message Deletion Specifications").

To delete messages in conversational mode:

1. Follow the procedures described for the nonconversational mode of message deletion by cursor or CONTROL command, as appropriate.
2. After you enter the request, a vertical line appears in position 3 of each message (all other vertical lines are temporarily removed from the screen), and the following message appears in the instruction line:

```
IEE157E DELETION REQUESTED
```

Message line numbers are also written for all messages on the screen.

3. The deletion request appears in the entry area in CONTROL command form.
4. Enter the command by pressing the ENTER key.

What Appears in the Entry Area: If your deletion request was made by cursor, or was a CONTROL E,nn,nn or CONTROL E,SEG command, the CONTROL E,nn,nn command form appears in the entry area. For example, if SEG had been defined as 10 (see "How to Establish Message Deletion Specifications"), and you enter CONTROL E,SEG, the following appears:

```
-----  
K E,1,10  
-----
```

If you position the cursor on the fifth message line and press the END key, that message and all nonaction messages above it are marked with vertical bars, and the following appears in the entry area:

```
-----  
K E,1,5  
-----
```

If your deletion request was a CONTROL E,F command, the following appears in the entry area:

```
-----  
K E,F  
-----
```

Verifying the Deletion: The system now requires verification of whatever deletion request appears in the entry area. To provide this verification:

1. Make certain that the indicated messages are the ones that you want to delete. If you want to make any changes, use the procedures described in "How to Change Information in the Entry Area." If you want to cancel the deletion request, press the CANCEL key.
2. When the command is in the proper form, press the END key.

Messages selected for deletion are removed from the message area, and any remaining messages are moved up toward the top of the screen. Whether you signal END or CANCEL, message line numbers are removed, and any flags that existed prior to the request are restored. Also, the entry area is blanked, and the cursor is repositioned to the first data entry position.

AUTOMATIC MESSAGE DELETION

Automatic message deletion is a means of deleting messages from the screen without operator intervention. There are three modes of automatic message deletion:

- Automatic Mode: In this mode, all flagged messages are removed from the screen whenever the screen becomes full.
- Roll Mode: In this mode, a specified number of messages are deleted if the screen is full when a specified time interval elapses.
- Roll-deletable Mode: In this mode, the flagged messages in a specified group of messages are deleted if the screen is full when a specified time interval elapses.

Automatic Mode

Automatic mode of message deletion is in effect when the console is initialized. In automatic mode, messages are deleted whenever the message area is full and a message is waiting to be displayed, or when a

status display is overlaying messages in the bottom portion of the message area.

Messages flagged with a vertical line (|) in position 3 are the only messages removed under automatic mode. Flagged messages include:

- Action messages for which the action has been taken.
- System or problem program messages that are marked deletable by the issuer.
- Messages that are indicated as deletable at job step end.
- WTOR messages that have been answered.
- WTOR messages that have not been answered, but are associated with a job step that has ended.

If there are no messages marked with a vertical line when a message is waiting to be displayed, the following message appears in the warning line:

```
-----  
IEE159E MESSAGE WAITING  
-----
```

You must then delete messages with the CONTROL command.

Note 1: In rare instances the screen could become full of action messages that require a reply. Messages are not marked for deletion until the accepted reply is displayed on the screen. For this reason, it is possible that you may have replied to some messages, but your reply has not appeared on the screen and, therefore, not caused the messages to be marked for deletion. In this situation, automatic message deletion does not operate, and you must delete action messages one at a time to get rid of the backlog.

Note 2: Intervention required messages (IEA000A INT REQ) are not marked for deletion when the required action is taken; they are marked when the screen becomes full. If automatic deletion is in effect, intervention required messages marked as deletable are removed from the screen.

Roll Mode

Roll mode is a form of automatic message deletion in which the system deletes a specified number of messages from the screen when a time interval elapses. Deletion occurs only if the screen is full and messages are waiting to be displayed.

Roll mode is specified by the DEL=R operand of the CONTROL S command, and the number of messages removed and the time interval are set by the RNUM and RTIME operands of the same command. (These specifications are described in this chapter under "How to Establish Message Deletion Specifications.")

Roll-deletable Mode

Roll-deletable mode is a form of automatic message deletion in which the system deletes a specified number of flagged messages from the screen when a time interval elapses. Deletion occurs only if the screen is full and messages are waiting to be displayed. (Flagged messages are described above under "Automatic Mode.")

Roll-deletable mode is specified by the DEL=RD operand of the CONTROL S command, and the number of messages removed and the duration of the

time interval are set by the RNUM and RTIME operands of the same command. (These specifications are described in this chapter under "How to Establish Message Deletion Specifications.")

Note 1: For roll mode or roll-deletable mode to be operational, the system interval timer must be set during IPL. If it is not set, entering a CONTROL S,DEL=R or CONTROL S,DEL=RD command causes the following message to appear in the instruction line:

```
IEE165I  DEL UNCHANGED, NO TIMER
```

If the timer is shut off after IPL, roll mode does not function, and no message is issued. The only indication you have is that messages are not being removed. If this occurs and you still want roll mode or roll-deletable mode, reset the timer; otherwise, you can change DEL to either Y (automatic mode) or N (no automatic message deletion).

Note 2: A hardcopy device must be in service when roll mode is in effect. If the hardcopy device goes out of service, the system switches to conversational mode (CON=Y), without automatic message deletion.

The following message is issued at this time and also when you enter a request for roll mode or roll-deletable mode when there is no hardcopy device in the system:

```
IEE155I  NO HARDCOPY - CON=Y, DEL=N
```

Procedures for specifying hardcopy devices are contained in Operator's Reference, GC28-6691.

Note 3: When a console is operating in roll mode, messages are not numbered. Instead, a two-digit number is displayed in the first new message line on the screen after each roll. This number indicates the number of messages waiting to be displayed (including any messages that are hidden by a status display).

Note 4: Roll mode is not recommended for normal operator console use because:

- Messages may be lost before you see them.
- System overhead may be increased.

Roll mode is useful for consoles that are used to monitor system messages (for example, in a tape or disk library).

HOW TO ESTABLISH MESSAGE DELETION SPECIFICATIONS

The CONTROL S command is used to establish the message deletion specifications. The specifications that may be established are:

- Deletion Mode: automatic mode, roll mode, or roll-deletable mode (DEL)
- Conversational Mode: in effect or not in effect (CON)
- Segment: the number of lines in the segment (SEG)
- Roll number: the number of lines to be rolled (RNUM)

- Roll time interval: the number of seconds between removal of messages in roll mode (RTME)

Deletion Mode: The deletion mode may be established as automatic mode, roll mode, or roll-deletable mode. Also, since automatic mode is in effect when the console is initially brought into service, automatic message deletion may be canceled. To request automatic message deletion, enter the following command:

```
K S,DEL=Y
```

To request roll mode, enter:

```
K S,DEL=R
```

To request roll-deletable mode, enter:

```
K S,DEL=RD
```

To cancel automatic message deletion (including automatic mode, roll mode, or roll-deletable mode), enter:

```
K S,DEL=N
```

Conversational Mode: To request conversational mode, enter:

```
K S,CON=Y
```

To request nonconversational mode, enter:

```
K S,CON=N
```

Segment: To define the size of the message segment (number of message lines to be deleted when CONTROL E,SEG is entered), enter:

```
K S,SEG=nn
```

nn is any number from one to 29. For example, to specify SEG equal to ten screen lines, enter:

```
K S,SEG=10
```

Roll Number: To define the number of lines to be removed from the screen by roll mode or roll-deletable mode, enter:

```
K S,RNUM=nn
```

nn is any number from three to 29. For example, to have three lines removed each time that the roll mode time interval elapses, enter:

```
K S,RNUM=3
```

Roll Time: To establish the time interval for roll mode or roll-deletable mode, enter:

```
K S,RTME=nnn
```

nnn is any number from one to 999. It specifies the number of seconds between roll actions. For example, to set the interval at 30 seconds, enter:

```
K S,RTME=30
```

Establishing Several Specifications at Once: You need not enter a separate CONTROL command for each specification. You can define all or any portion of the specifications whenever you enter a CONTROL S command. For example, if roll mode is in effect with five messages being deleted every 20 seconds, and you want to change to roll-deletable mode with the same number of messages being deleted every 30 seconds, you can enter:

```
K S,DEL=RD,RTME=30
```

In response to this command, roll-deletable mode becomes effective and the time interval changes to 30 seconds; the roll number (RNUM) value remains five and the SEG and CON values remain unchanged.

Checking the Specifications: To determine which specifications are in effect, enter:

```
K S,REF
```

In response to this command, the following display appears in the entry area:

```
K S,DEL=x,SEG=xx,CON=x,RNUM=xx,RTME=xxx
```

In the actual display, each x is replaced by the specifications currently in effect. You can change any specification at this time by following the procedures described for changing information in the entry area (see "How to Change Information in the Entry Area"). For example, if the following appears as a result of a CONTROL REF command:

```
K S,DEL=RD,SEG=05,CON=N,RNUM=05,RTME=040
```

You can change the roll mode time interval to 30 seconds by positioning the cursor at the 4 after RTME and typing 3. If the display now shows

the specifications that you want, enter the changes by pressing the END key.

Note: When you enter CONTROL S,REF and you want to retain the values as they are shown, press the END key.

NUMBERING MESSAGES

You can request that message numbers appear in positions one and two of the message area lines. Consecutive numbers will appear for each message line, including continuation lines, for all messages except status displays being displayed in a display area.

Message numbering is useful in determining which messages to delete with the CONTROL E,nn command or the CONTROL E,SEG command.

HOW TO REQUEST TEMPORARY MESSAGE NUMBERING

To request a temporary display of message numbers to assist you in determining which messages to delete:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,N command.
3. Press the END key.

The message numbers that appear are intended to assist you in one message deletion; they are removed when you perform any form of message deletion or when you cancel the request by pressing the CANCEL key. If automatic message deletion occurs (in automatic mode, roll mode, or roll-deletable mode), the messages remaining on the screen after the deletion are renumbered.

HOW TO REQUEST CONTINUAL MESSAGE NUMBERING

To have message numbers displayed at all times:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,N,HOLD command.
3. Press the END key.

The CONTROL D,N,HOLD command causes numbers to be displayed permanently. When you delete messages while CONTROL D,N,HOLD is in effect, messages are automatically renumbered.

HOW TO STOP CONTINUAL MESSAGE NUMBERING

To stop the continual display of message numbers:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL E,N command.
3. Press the END key.

Note: A message roll (in roll mode or roll-deletable mode) also stops message numbering requested by the CONTROL D,N,HOLD command.

SYSTEM STATUS DISPLAYS

A status display is a formatted, multiple-line display of information about some part of the system. It is written to the operator's console in response to a DISPLAY or MONITOR command.

Status displays can be used to obtain information about such things as the status of system devices, the identification of active jobs, and the availability of system queue space. This information can help you decide how to best use the system resources. The operands of the DISPLAY and MONITOR commands are described in Operator's Reference, GC28-6691.

A status display is either static or dynamic. A status display is static if it remains the same until it is removed from the screen. A dynamic status display is updated by the system each time that a preset time interval elapses. The different procedures required for dynamic displays are discussed under "Dynamic Status Displays."

DISPLAY AREAS

Display areas are blocks of screen lines designated to receive status displays. They enable you to define the location and the number of screen lines that will be used for status displays. Display areas are defined beginning with the bottom lines of the message area and working toward the top. For example, two display areas are defined for the screen in Figure 85/165-2; the first (bottom-most) area is six lines long, and the second is four lines long. Status displays can be routed (using the L=cca operand of the DISPLAY or MONITOR command) to area A or B, or to the general message area.

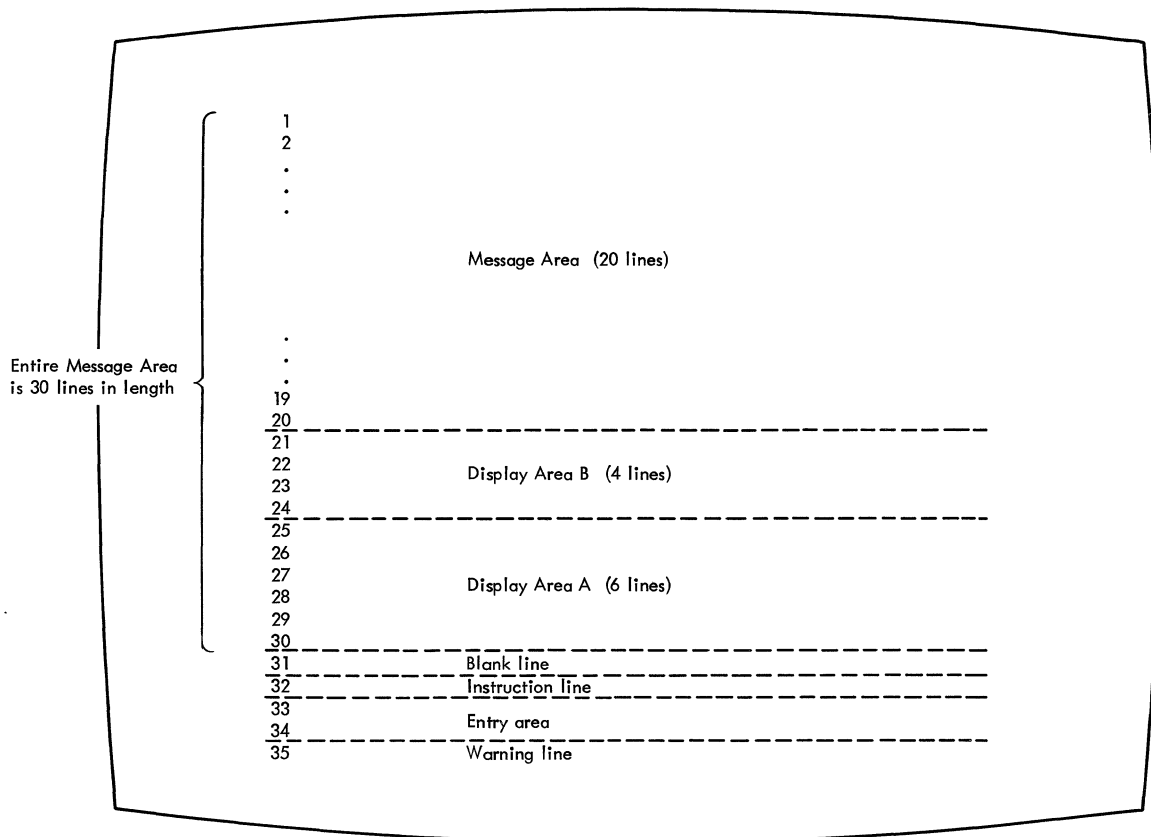


Figure 85/165-2. Screen format showing two display areas

The alphabetic display area identifiers are assigned by the system. The bottom-most area is assigned identifier A and additional areas are assigned identifiers in alphabetic order, working toward the top of the screen. The identifier Z always refers to the general message area.

Establishing Display Areas

Display areas can be established during system generation; you can alter the original specification, or establish new specification, using the CONTROL A command.

To establish display areas:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL A,nn[,nn] command, where nn specifies the number of lines in each display area.
3. Press the END key.

The first nn defines the bottom-most area on the screen; additional nn's define additional areas, working toward the top of the screen. The minimum nn value is four, and the maximum is the number of lines in the message area (30). The total of all nn specifications for a screen cannot exceed 30.

To establish two display areas, the first of eight lines and the second of four lines, enter the following command:

```
K A,8,4
```

You can check the display area specifications in effect at any time by entering:

```
K A,REF
```

This displays the specifications in the entry area in the CONTROL command form. For example, if three display areas of eight, four, and four lines were defined for a screen, entering K A,REF would cause the following to appear in the entry area:

```
K A,8,4,4
```

You could then change the specifications by following the procedures described elsewhere in this chapter, under the heading "How to Change Information in the Entry Area". To change the specification in the above example to two display areas of four and six lines, position the cursor at the 8, type in 4,6; blank the remainder of the area, and enter the command.

Establishing Display Areas for Output-only Consoles: To establish display areas for consoles other than the one you are using, use the CONTROL A command with the L=cc operand. For example, to establish two display areas of four and eight lines for a console with the system assigned identifier of 10, enter the following:

```
K A,4,8,L=10
```

The L operand can also be used with the REF operand to determine the display area specifications for any output-only console in the system.

Using Display Areas

Display areas can be thought of as addressable blocks of message area lines that overlay of parts of the message area.

The blocks of lines assigned to a display area function as message area lines until a status display is written to them. When this happens, any messages occupying the lines of the display area are replaced by the status display. If these messages are general operator messages, they are not lost; they will reappear, higher up on the screen if screen lines above the status display become available. When messages are overlaid by a status display the following message appears in the warning line:

```
-----  
IEE160I UNVIEWABLE MESSAGE  
-----
```

Erasing a status display from a display area restores the display area lines to general message use. Unless there are other status displays above the restored display area, any messages that were overlaid by the erased display reappear. If there are status displays in display areas above the restored area, the lines of the restored area remain blank. General message traffic is not displayed in any line in the message area below a display area containing a status display.

Note: It is good practice to erase status displays from display areas when the displays are no longer required. The undisplayed portions of lengthy status displays tie up buffers which may be needed for other messages.

HOW TO REQUEST STATUS DISPLAYS

1. Select the status display you wish to see.
2. Move the cursor to the first position in the entry area.
3. Type in the appropriate DISPLAY or MONITOR command, including the location operand (L=cca) if you wish to specify the display area in which the display is to be presented.
4. Press the END key.

For example, to request a display of active jobs in display area B of console 12, enter:

```
-----  
D A,L=12B  
-----
```

Status displays can be routed to specific display areas on the screen of the console that you are using to enter the command. They can also be routed to output-only consoles. However, status displays cannot be routed to a full-capability console other than the one you are using to enter the command.

You can avoid entering the L=cca operand each time that you request a display by establishing defaults for the message routing operands. Use the MSGRT command for this purpose; it is described in Operator's Reference, GC28-6691.

HOW TO FRAME STATUS DISPLAYS

Depending on the size of the display and the number of lines available in the message area or display area, status displays may be divided into two or more frames. The title line of each frame contains a frame number, and the last frame contains FRAME LAST.

Framing by CONTROL Command: To move a status display forward to the next frame:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,F command, with the appropriate location operands (L=cca).
3. Press the END key.

For example, to display the next frame of a status display in display area B of console 12, enter the following:

```
K D,F,L=12B
```

Framing by Cursor: The title line of a status display contains a framing indicator which appears as *F on the screen. To frame by cursor:

1. Position the cursor at the *F indicator.
2. Press the END key.

Note: You can frame only forward through a display; to re-examine previous frames of the display you must enter a request for a new display.

HOW TO ERASE STATUS DISPLAYS

Status displays require different deletion methods depending on whether they are displayed in the message area of the screen (in-line) or in a defined display area (out-of-line).

Erasing In-line Status Displays: A status display that is in the general message area of the screen (rather than in a display area) is erased by the message deletion methods used for other in-line messages (that is, CONTROL E,SEG; CONTROL E,nn,nn; or cursor). These methods are described under "How to Delete Messages" in this chapter.

An in-line status display that has not been completely displayed (that is, a display that is in progress) can be deleted by entering the K C,D command. For example, to erase the status display with identification number 121, which is in progress in the general message area of console number 10, enter:

```
K C,D,121,L=10Z
```

Because of the speed of display consoles, this command has limited usefulness in erasing in-line displays from display console screens. It is used primarily to halt displays in progress on hard-copy consoles, such as printers.

Erasing an Out-of-line Display: To erase an out-of-line status display (one that is presented in a display area):

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL E,D,L=cca command, specifying the console (cc) and display area (a) containing the display you want erased.
3. Press the END key.

For example, to erase the display in display area A of console number 12, enter the following:

```
K E,D,L=12A
```

You can also erase out-of-line status displays by positioning the cursor at the *C indicator in the control line and pressing the END key.

Note: It is not necessary to erase a status display from a display area in order to present another status display in that area. If a status display is routed to an area that already contains a status display, the new display replaces the old. To avoid tying up buffers, erase status displays from display areas when you no longer need the displays.

DYNAMIC STATUS DISPLAYS

A dynamic status display is one that is requested once by the operator and then updated and redisplayed by the system each time a preset time interval elapses. The MONITOR command is used to request a dynamically updated display; this command is explained in Operator's Reference, GC28-6691.

Display Areas: Dynamic status displays can only be presented in display areas. Also, once the dynamic display appears in an area, it has exclusive use of the area until it is terminated; it cannot be overlaid by another status display.

Requesting a Dynamic Status Display: To request a dynamic status display:

1. Move the cursor to the first position in the entry area.
2. Type in the MONITOR command with the appropriate routing location operands (L=cca).
3. Press the END key.

For example, to request a dynamic display of active jobs in display area A on console 12, enter the following command:

```
MN A,L=12A
```

Dynamic displays require use of the system interval timer. If you enter a MONITOR A command when the timer is inoperative, the system issues the following message:

```
IEE921I MN A REJECTED - NO TIMER
```

How to Request Hold Mode: You can suspend updating of a dynamic display by placing the display in hold mode:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,H command with the routing location operands (L=cca).
3. Press the END key.

For example, to suspend updating of a dynamic display in area A of console 12, enter the following:

```
K D,H,L=12A
```

You can also place a dynamic display in hold mode by positioning the cursor at the *H indicator in the control line and pressing the END key.

How to Resume Updating: To resume updating of the display:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,U command with the routing location operands (L=cca).
3. Press the END key.

For example, to resume updating of the display in display area A of console 12 (assuming that you have previously requested hold mode for the display), enter the following:

```
K D,U,L=12A
```

You can also request that updating be resumed by positioning the cursor under the *U indicator in the control line of the display and pressing the END key. (The *U indicator appears in the control line only when the display is in hold mode.)

How to Frame a Dynamic Display: To frame a dynamic display:

1. Place the display in hold mode by following the procedures described under "How to Request Hold Mode".
2. Move the cursor to the first position in the entry area.
3. Type in the CONTROL D,F command with the routing location operands (L=cca).
4. Press the END key.
5. Resume updating of the display by following the procedures described under "How to Resume Updating."

For example, to frame a dynamic display in display area A of console 12, first place the display in hold mode by entering:

```
K D,H,L=12A
```

Then display the next frame by entering:

```
K D,F,L=12A
```

When you want to resume updating of the display, enter:

```
K D,U,L=12A
```

Updating resumes when the next time interval elapses, and the first frame of the updated display appears on the screen at that time.

You can also perform the same hold-frame-update function by means of the cursor:

1. Place the display in hold mode by positioning the cursor at the *H indicator in the control line.
2. Press the END key.
3. Display the next frame by positioning the cursor at the *F indicator (the *F indicator appears only when the display is in hold mode).
4. Press the END key once for each frame that you want to see.
5. Resume updating of the display by positioning the cursor at the *U indicator in the control line (the *U indicator appears only when the display is in hold mode).
6. Press the END key.

How to Erase a Dynamic Display: A dynamic display initiated by a MONITOR command is terminated by means of the STOPMN (PM) command:

1. Move the cursor to the first position in the entry area.
2. Type in the STOPMN A command with the routing location operands (L=cca).
3. Press the END key.

For example, to terminate and erase a dynamic display in display area A of console 12, enter the following:

```
PM A,L=12A
```

You can terminate and erase a display by positioning the cursor at the *PM indicator in the control line of the display and pressing the END key. The *PM indicator does not appear when the display is in hold mode.

Note: You can establish default message routing operands for the STOPMN command by means of the MSGRT command. MSGRT and STOPMN are described in the Operator's Reference, GC28-6691.

How to Change the Time Interval for Display Updating: To change the time interval for updating dynamic displays:

1. On the master console, position the cursor to the first command entry position in the display area.
2. Type in the CONTROL M,UTME=nnn command, where nnn is a decimal number from 30 to 999 indicating the number of seconds in the time interval.
3. Press the END key.

There is only one time interval for all of the dynamic displays on all of the consoles in the system. To set the time interval so that the dynamic display will be updated by the system every two minutes (120 seconds), enter the following command:

```
K M,UTME=120
```

You can check the current time interval by entering:

```
K M,REF
```

This will cause the current time interval to be displayed in the entry area in control command form; for example:

```
K M,UTME=120
```

You can then change the time interval by using the procedures described in this chapter under the heading "How to Change Information in the Entry Area". To change the time interval in the above example to 60 seconds, position the cursor at the 1, type in 60, blank the remainder of the entry area, and press the END key.

Note 1: If the master console is not a display console, the system responds to the K M,REF command by displaying the following message:

```
IEE922I K M,UTME=nnn
```

where nnn is the current time interval. You can then change the time interval by entering another K M,UTME=nnn command.

Note 2: If there are dynamic displays in progress when you change the time interval, the new interval will not take effect until the current interval elapses.

ERROR CONDITIONS

Several types of errors may occur that directly affect the operation of display consoles. In some cases, the error is made apparent by a sudden screen failure, the appearance of an error message, or the locking of the keyboard. In other cases, the error may not be immediately apparent. In general, errors may be caused either by a programming problem (system error) or a console malfunction (hardware error).

SYSTEM ERRORS

When certain types of system errors occur, the screen is blanked, and an error message appears in the center of the screen. Other types of system errors are characterized by an abnormal lack of console activity.

Blank Screen and Error Message

If the error message indicates that a recoverable system error has occurred, perform the action specified by the error message, and then press the CANCEL key. This should restore the screen. It is good prac-

tice to review the messages at this time to make certain that no messages were lost during error recovery.

If the error message indicates that an unrecoverable system error has occurred, the system must be loaded again. Follow normal procedures for initial program load, and notify the programmer responsible for the system.

Console Inactivity

Console inactivity is characterized by a lack of messages or system response to commands. It may be due to the level of system activity, or it may be the result of a problem in the message handling portion of the control program.

One function of the message handling portion of the control program is to check for the end line of a status display or other multiple-line message. If for some reason the system fails to detect the end line of either a status display or a multiple-line message to the operator, your console may be put into a condition of inactivity, awaiting completion of the display or message. This situation occurs because the system is designed to present all of the lines of a status display or multiple-line message, once it is begun, before presenting any other message on the console.

If your console seems to be abnormally inactive, check the system response by requesting a display of the time:

```
-----  
D   T  
-----
```

The system should respond immediately (within a few seconds) with the time and date. If it does not respond, cancel any status displays being presented on the inactive console using the procedure for erasing a status display. If this does not return the console to normal activity, cancel any jobs that have written multiple-line messages to the console.

If neither of these procedures returns the console to normal activity, assume that there is some other problem related to the console. Check for a console hardware error. If possible, switch control to another console. If the system must be loaded again, follow normal procedures for initial program load. Report the occurrence of this problem to the programmer responsible for the system.

CONSOLE HARDWARE ERRORS

If a console hardware error occurs, one or more of the following conditions may exist:

- An error message is centered on the screen (the remainder of the screen is blank).
- The screen is completely blank.
- The keyboard is locked, and command entry is not possible.

Error Message Response

If a console error occurs, the following message may appear on the screen:

```
IEE170E RETRYABLE ERROR. RECENT ACTION MAY NEED TO BE REPEATED.  
IEE170E PRESS THE CANCEL KEY TO RESTORE THE SCREEN.
```

Perform the indicated action (press the CANCEL key). This should restore the screen, including messages displayed in the message area, the instruction line, and the warning line. The entry area is blanked, and the cursor is positioned to the first position in the entry area. Message numbering is terminated (if it was previously in effect).

Note: If you do not press the CANCEL key, the system will automatically rewrite the screen (same effect as CANCEL) after about 30 seconds have elapsed. If a console hardware error results from keyboard input, the system will always regard it as a temporary error. If it becomes apparent to you that the error is permanent, switch control to an alternate console (procedures for console switch are described in the Operator's Reference, GC28-6691). If you request a console switch, all messages except status displays are moved to the new console.

Blank Screen Response

If the console screen goes blank, a console switch is probably taking place. The following message should appear on the new console:

```
IEE143I OLD=xxx, NEW=xxx, VALDCMD=xx  
IEE143I ROUTCDE=xx[,xx] T=x H=x
```

In the actual message, the appropriate values appear in place of the x's. Use the alternate console to continue operating the system, and have the old console checked for the source of the error.

Locked Keyboard Response

Sometimes the system is unable to blank the screen. If you find that you cannot enter commands through a console that appears normal otherwise, try to restore the keyboard by performing a CANCEL action.

If a console switch has taken place, operate the system from the alternate console, and have the old console examined for the source of the error.

Note: Inhibited input, with or without keyboard locking, may also occur when the system goes into an ABEND wait state or when a problem occurs in the message handling portion of the control program. Check the procedures described for console inactivity under "System Errors."

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2250 DISPLAY DEVICE AND THE MODEL 91 AND MODEL 195 DISPLAY CONSOLES

This chapter explains how to use the 2250 display device and the model 91 and model 195 display consoles as operator's consoles. The physical characteristics of the consoles are described, and all important procedures are described, including the procedures that involve optional features, such as the selector pen.

The 2250 display device and the model 91 and model 195 display consoles operate only in full/capability (input/output) mode; you cannot use them as output-only consoles. Other operator consoles (display and non-display) may be used in the same system with the 2250, model 91, and model 195 display consoles; you can use the 2250, model 91 and model 195 consoles to control monitor consoles.

CONSOLE CHARACTERISTICS

The 2250 display device and the model 91 and model 195 display consoles are composed of a display screen and a typewriter keyboard. The display screen is a cathode ray tube with 3848 character positions. The keyboard has 53 keys, including 4 cursor control keys. The light pen, the program function keyboard, and the audible alarm are optional features.

SCREEN FORMAT

The display screen format is shown in Figure 2250-1. The screen is divided into five functional areas:

- Message Area: This area has 47 lines of 74 character positions each. The first two positions in each line contain the number assigned to the message line, if message numbering is in effect, or the number messages waiting to be displayed, if roll mode is in effect. Positions three and four contain the action-required indicator (*), the no-action-required indicator (-), and the action-has-been-taken indicator (|). Positions 5-74 contain the text of system messages, operator commands (except the CONTROL command), and system status displays. The following is a sample message area line:

```
0 6 * IEE101A READY
```

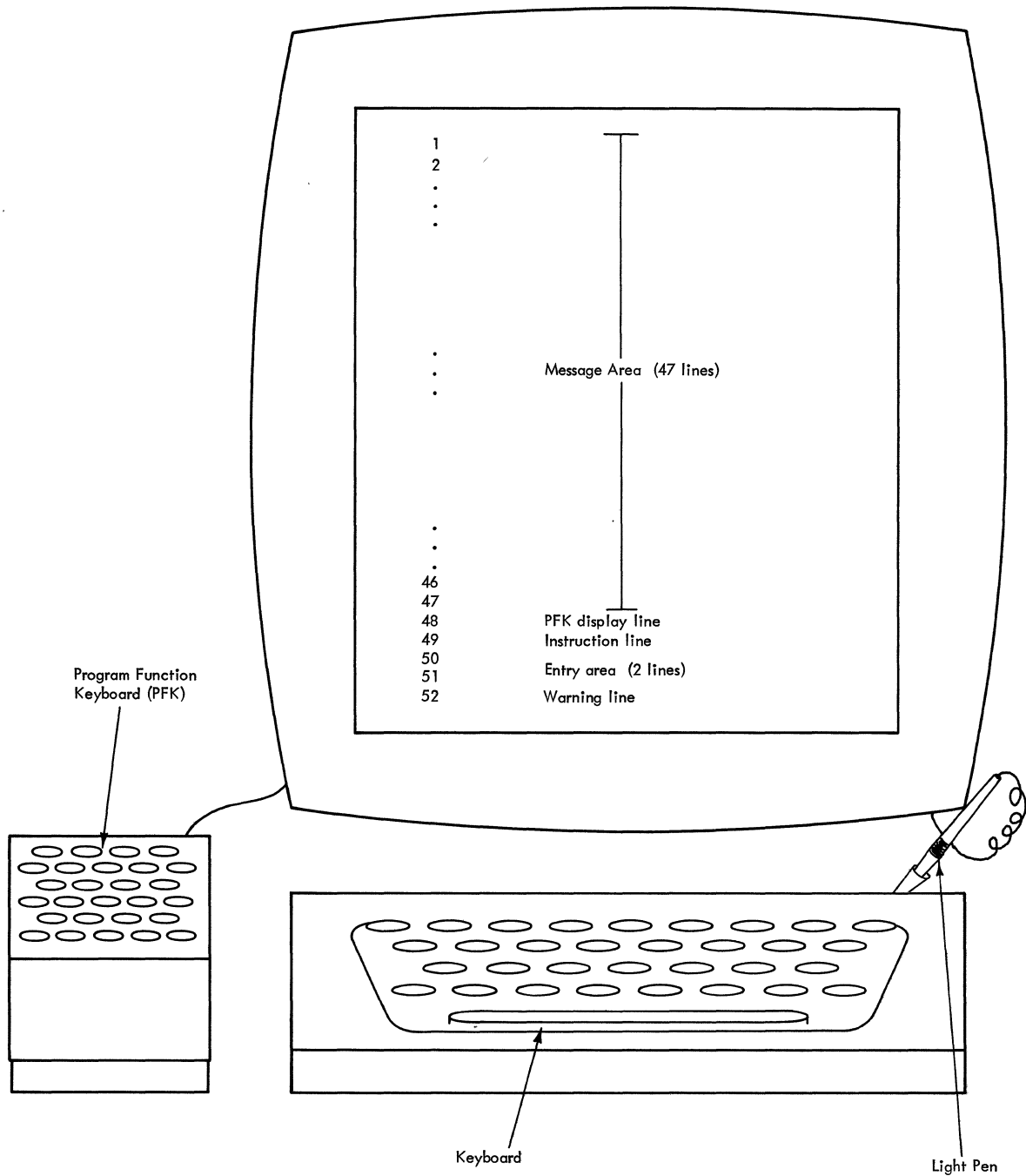
- PFK Display Line: This line is used for displaying program function keyboard (PFK) key numbers that you use to enter commands with the selector pen. When the display is requested, the line appears as follows:

```
1 2 3 4 5 6 7 8 9 10 11 12
```

This line is blank and separates the message area and the instruction line when the light pen is not in use.

- Instruction Line: This line is used for system messages pertaining to control of the console.

- **Entry Area:** You use these two lines, in conjunction with the typewriter keyboard, to enter commands and to reply to messages. You type the information in positions 1-70 of each line; commands and replies longer than 70 characters are continued in the first position of the second line.
- **Warning Line:** This line contains messages that warn you of conditions that may require action.



Note: The labels shown do not appear on the screen.

Figure 2250-1. 2250, model 91, and model 195 display consoles

SPECIAL SCREEN CHARACTERS

The system uses three special screen characters to indicate the status of certain screen messages. These special indicators appear in position three or four of the lines in the message area:

- A vertical line (|) in position three indicates that required action has been taken for the message or that the message can be deleted.
- A horizontal bar (-) in position three indicates that the message is for information only and requires no action by the operator.
- An asterisk (*) in position four indicates that the message requires action by the operator.

THE CURSOR

The position of the cursor on the console screen tells the system where the next character that you type is to be positioned, the cursor cannot be moved out of the entry area.

Cursor movement is controlled by the ADVANCE, BACKSPACE and CONTINUE keys, which are located on the right side of the typewriter keyboard, and by the JUMP key, which is located on the left side of the typewriter keyboard:

- The ADVANCE key moves the cursor one character position to the right.
- The BACKSPACE key moves the cursor one character position to the left.
- The CONTINUE key, when pressed at the same time as either the BACKSPACE or ADVANCE KEY, moves the cursor continuously to the left or to the right.
- The JUMP key moves the cursor to the first position in the entry area.

THE LIGHT PEN

The light pen is an optional feature of the 2250, model 91, and model 195 display consoles. The light pen is a light-sensing device that you can use to identify a portion of the screen for system action. To use the pen, position it on the screen over the area that you are identifying, and activate the light-sensing mechanism. The pen is activated either by pressing a foot switch or by pressing the pen against the screen (depending on the type of light pen that you are using).

The light pen can be positioned anywhere on the screen, but its position is recognized as valid only in the following areas:

- On a nonaction message line, to delete all messages above that line.
- On the asterisk in an action message line, to delete that message.
- On *F, *H, *U, *E, or *PM in the control line of a status display, to frame, hold, update, or erase the display.
- On *ENTER*, *CANCEL*, or *D C,K* in the instruction line, to enter a command, cancel a command, or to request a display of the CONTROL command operands.
- On a number displayed in the PFK display line, to enter a command.

If the light pen is positioned in an invalid location, the following message is displayed in the instruction line:

```
IEE164I  ILLEGAL LIGHT PEN OPERATION
```

THE PROGRAM FUNCTION KEYBOARD

The program function keyboard (PFK) is an optional feature available on the 2250, model 91, and model 195 display consoles. It consists of a board of keys that send a signal to the system whenever one of the keys is pressed. The system responds to the signal according to the way it has been programmed. In the operator console mode, up to twelve PFK keys can be associated with operator commands.

THE AUDIBLE ALARM

The audible alarm is an optional feature of the 2250 and the model 91 and model 195 display consoles. It is sounded for one second under the following conditions:

- When you make an error entering a CONTROL command.
- When the screen is full and another message is waiting to be displayed.
- When an action message appears on the screen.
- When the console is placed in roll mode for message deletion.

Response: If the alarm sounds while you are entering a CONTROL command, check the instruction line to see if an error message was issued. If so, follow the procedures given in the message explanation in Messages and Codes, GC28-6631.

If the alarm sounds and the following message appears in the warning line:

```
IEE159E  MESSAGE WAITING
```

delete some messages from the message area using the procedures described under "How to Delete Messages" in this chapter.

HOW TO ENTER COMMANDS

Commands can be entered using the keyboard, the program function keyboard, or the light pen.

ENTERING COMMANDS WITH THE KEYBOARD

1. Move the cursor to the first position in the entry area.
2. Type in the command.
3. Enter the command by holding down the ALT key (located on the left side of the keyboard) and pressing the END key (numeric 5). You can also enter the command by positioning the light pen over the *ENTER* indicator in the instruction line.

As you type each character of the command, the corresponding character is displayed in the entry area, and the cursor is advanced to the next character position. When the end of the first entry area line is reached, the cursor advances automatically to the first character position of the next line, permitting continuation of the command. The maximum number of characters that can be entered is 126; but only one command can be entered at a time.

Uppercase and Lowercase: Most commands can be entered in uppercase or lowercase. The system converts the command to uppercase, if required. However, information within a command that is contained in single quotes (for example, a reply to a WTOR message) is not converted to uppercase by the system. If the information within the single quotes is required by the system in uppercase, be sure to type it in uppercase when you enter the command. Since all information is displayed on the screen in uppercase, you will not be able to determine whether information was entered in uppercase or lowercase by looking at the screen.

Entering the Command: When you enter a command, the cursor must be located in the entry area, but it need not be located at the end of the command. Pressing the ALT and END keys or selecting the *ENTER* indicator with the light pen causes the command to be read into storage and processed by the system. For commands other than the CONTROL command, the command disappears from the entry area and reappears in the message area. If the message area is full, the command may not appear immediately; to display it you may have to delete some messages (see "How to Delete Messages" in this chapter). The CONTROL command is not moved to the message area; it remains in the entry area until the requested action takes place.

Pressing the ALT and END key when the entry area contains nothing but the cursor moves the cursor to the first data entry position in the entry area.

Commands Entered with Errors: If you enter a CONTROL command with errors, the audible alarm sounds (if the console is equipped with an audible alarm), and the command is displayed in the entry area. The location of the cursor indicates the source of the error:

- If the error is an invalid operand, the cursor is placed under the invalid operand:

```
-----  
K  X,N  
-----
```

- If the error is an invalid erase request, the cursor is placed under the first character after the E:

```
-----  
K  E,31,19  
-----
```

- If the CONTROL command exceeds 126 characters, the cursor is positioned at location 127 in the entry area.

To correct any of these errors, use the procedures described in this chapter under "How To Change Information in the Entry Area."

If an error is detected in a command other than the CONTROL command, the command is written in the message area along with an appropriate error message. Follow the procedures indicated for the message in Messages and Codes, GC28-6631.

ENTERING COMMANDS WITH THE PFK

The program function keyboard is an optional feature on the 2250 and on the model 91 and model 195 display consoles. One or more of the PFK keys on the keyboard may be available to you for entering commands. The keys are designated for command entry by the system programmer during system generation. You may define or redefine the commands to be associated with each key available to you.

Each PFK key is defined as conversational or nonconversational. In nonconversational mode, the commands associated with the key are entered immediately when you press the key. In conversational mode, the commands associated with the key are presented in the entry area, one at a time, where they may be entered, altered and entered, or canceled.

How to Enter Commands with the PFK in Nonconversational Mode

1. Select the key associated with the command that you want to enter.
2. Press the selected key.

In nonconversational mode, all of the commands associated with the selected key are entered in the order in which they were associated with the key. The commands will not appear in the entry area, but they will appear in the message area (unless they are CONTROL commands) when screen space becomes available.

How to Enter Commands with the PFK in Conversational Mode

1. Select the key associated with the command that you want to enter.
2. Press the selected key, causing the first command associated with the key to appear in the entry area.
3. According to your requirements, you can:
 - a. Enter the command by pressing the ALT and END keys or by selecting the *ENTER* indicator with the light pen; the next command associated with the key (if any) appears in the entry area.
 - b. Change the command from the keyboard before entering it (see "How to Change Information in the Entry Area" in this chapter).
 - c. Cancel the command that appears in the entry area by pressing the ALT and CANCEL key or by selecting the *CANCEL* indicator with the light pen; the next command associated with the key (if any) appears in the entry area.
 - d. Cancel the request initiated by the first press of the key by pressing the same key or any other PFK key while the command is still in the entry area.

In conversational mode, each command associated with a key is presented in the entry area, one command at a time, where it may be entered as is, altered and entered, or canceled. Altering a command in the entry area is effective only for the command entry in progress; the original definition is retained for the key. To permanently redefine a key, use the procedures described in this section under the heading "How to Define Commands for PFK Keys."

PFK Entry Errors

If you press a PFK key that was not designated for command entry, the following message appears in the instruction line:

```
IEE722I PFK nn NOT SUPPORTED
```

If you press a PFK key for which support has been requested but not defined, the following message appears in the instruction line:

```
IEE722I PFK nn NOT DEFINED
```

To determine which PFK keys are available for command entry, and which commands are defined for each key, enter a DISPLAY PFK command.

How to Determine What Commands are Associated With Each PFK Key

1. Move the cursor to the first position in the entry area.
2. Type in the DISPLAY PFK command.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator in the instruction line.

For example, to request a display of the PFK definitions in effect for a console, enter:

```
D PFK
```

In response to this request, the following message appears in the message area of the console that you are using:

```
IEE724I PFK DEFINITION
```

The PFK definitions appear in tabular form under the headings KEY#, CON (conversational mode -- YES or NO), and DEFINITION. The definitions that are displayed always refer to the console on which they are displayed (the D PFK display cannot be routed to a display area or to a separate console).

How to Define Commands for PFK Keys

1. Select the PFK key that you want to associate with operator commands (the key selected must have been designated for command entry during system generation).
2. Select the operator commands that you want to associate with the selected key.
3. Type the CONTROL N,PFK command in the entry area.
4. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator in the instruction line.

The CONTROL N,PFK command has two forms. If you want to associate the text of one or more operator commands with the key, use the following form:

```
K N,PFK=(nn,CMD='text[;text...]'),CON=Y or N
```

where nn is the number of the key that you are defining, 'text' is the text of each command that you are associating with the key, and CON specifies conversational mode (Yes or No; see "Conversational Mode and Non-conversational Mode" below).

For example, to associate a START RDR command with PFK key number 5, enter the following:

```
K N,PFK=(5,CMD='S RDR.001'),CON=N
```

The text of the command is enclosed in single quotes. Up to 101 characters can be enclosed in the quotes; if more than one command is to be associated with a key, separate the commands with a semi-colon. For example, to associate a START RDR and a START WTR command with PFK key number 5, enter:

```
K N,PFK=(5,CMD='S RDR.001;S WTR.292'),CON=N
```

If you want to associate one key with the commands defined for one or more other keys, use this form:

```
K N,PFK=(nn1,KEY=nn2[,nn2...]),CON=Y or N
```

where nn₁ is the number of the key that you are defining, each nn₂ is the number of a key whose commands you want associated with key nn₁, and CON specifies conversational mode (Yes or No).

For example, if key number 3 was associated with the commands S RDR.001 and S WTR.292, and key 4 was associated with the command S INIT,,,ABC, you could associate all three of these commands with key 5 by entering the following:

```
K N,PFK=(5,KEY=3,4),CON=Y
```

The commands associated with key 5 would now be S RDR.001, S WTR.292, and S INIT,,,ABC, in that order (because that is the order in which they were defined for the keys in the list, and that is the order in which the keys in the list were specified). Up to 52 key numbers can be included in the list, provided that the limits of the entry area are not exceeded.

Note: All PFK commands are converted to uppercase during the definition process. If a command must be entered in lowercase (for example, part of a reply to a WTOR), the command cannot be entered by PFK command entry.

Redefining Keys: Use the same procedures for redefining keys that you used for defining keys. The new definition replaces the current definition.

Deleting a Definition: To return a key to the undefined state, enter the K N,PFK command, with the CMD keyword, but include no data between the quotes; for example:

```
K N,PFK=(5,CMD='')
```

Conversational and Nonconversational Mode: The CON parameter of the CONTROL N,PFK command specifies the conversational or nonconversational mode. In nonconversational mode, the commands associated with a key are entered immediately when that key is pressed. For example, if you enter the following command:

```
K N,PFK=(5,CMD='D U,L=09A'),CON=N
```

pressing PFK key 5 has the same effect as typing D U,L=09A in the entry area and pressing the ALT and END keys. On the other hand, if you had specified conversational mode by entering:

```
K N,PFK=(5,CMD='D U,L=09A'),CON=Y
```

pressing PFK key 5 causes the command D U,L=09A to appear in the entry area but does not cause it to be entered. The command can then be altered, entered, or canceled according to your requirements.

Note: If CON is omitted, CON=N is assumed.

Cursor Location: In conversational mode, the cursor is normally located in the third non-blank character position of the command when the command appears in the entry area. If you want the cursor to appear in a different location within the command, when you define the key, type an underscore () before the character under which the cursor is to appear. For example, if you enter:

```
K N,PFK=(5,CMD='D U,L= XXX'),CON=Y
```

pressing PFK key 5 causes the following to appear in the entry area:

```
D U,L= XXX
```

Note that the space occupied by the underscore is deleted.

PFK Definition Errors: If you enter an invalid CONTROL N,PFK command, the audible alarm sounds (if the console is equipped with an audible alarm), and the command is written to the entry area. The location of the cursor indicates the source of the error:

- If the cursor is positioned under the first letter of a keyword (CMD, KEY, PFK, or CON), that keyword or its trailing equal sign is incorrect.
- If the cursor points to the number of the key being defined, that key number is either not a numeric character, not a number of a key that was designated for command entry during system generation, or is being associated with a list of key numbers when it is already contained within a list of key numbers.
- If the cursor points to a number following the KEY operand, the key number indicated is either a non-numeric character, the number of the key that is being defined, the number of a key that has already

been defined as a list of key numbers, or the number of a key that was not designated for command entry during system generation.

To correct these errors follow the procedures described under "How to Change Information in the Entry Area" in this chapter.

ENTERING COMMANDS WITH THE LIGHT PEN

The light pen is used in conjunction with the PFK display line to enter commands. The numbers appearing in the display line represent PFK numbers, and selecting a number with the light pen has the same effect as pressing a PFK key. The key numbers available for light pen command entry must be designated for PFK command entry during system generation. If your console has both a program function keyboard and a light pen, both forms of command entry can be used.

How to Display the PFK Numbers

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D, PFK command.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator in the entry area.

A display, similar to the following, appears in the PFK display line:

```
1 2 3 4 5 6 7 8 9 10 11 12
```

Only those numbers that have been designated for PFK command entry appear in the display. Once you have requested this display, you can leave it on the screen; the PFK display line is not used for any other purpose, even when the key numbers are not displayed. To erase the display, enter:

```
K E, PFK
```

How to Enter Commands with the Light Pen in Nonconversational Mode

1. Display the PFK key numbers in the PFK display line by entering the CONTROL D, PFK command.
2. Select the PFK key number associated with the command that you want to enter.
3. Position the light pen over the selected number, causing immediate entry of the command.

In nonconversational mode, all of the commands associated with a key number are entered in the order in which they were associated with the key number. The commands do not appear in the entry area; they will appear in the message area (unless they are CONTROL commands) when screen space is available.

How to Enter Commands with the Light Pen in Conversational Mode

1. Display the PFK numbers in the PFK display line by entering the CONTROL D, PFK command.

2. Select the PFK key number associated with the command you want to enter.
3. Position the light pen over the selected number, causing the first command associated with the key to appear in the entry area.
4. According to your requirements, you may:
 - a. Enter the command by holding down the ALT key and pressing the END key or by selecting the *ENTER* indicator with the light pen; the next command associated with the key (if any) appears in the entry area.
 - b. Change the command from the keyboard before entering it (see "How to Change Information in the Entry Area" in this chapter).
 - c. Cancel the command in the entry area by pressing the CANCEL key or by positioning the light pen over the *CANCEL* indicator in the instruction line; the next command (if any) appears in the entry area.
 - d. Cancel the request initiated by the first selection of the key number by positioning the light pen over any PFK key number while a command associated with the first key number is still in the entry area.

In conversational mode, each command associated with a key number is presented in the entry area, one command at a time, where it may be entered as is, altered and entered, or canceled. Altering a command in the entry area is effective only for the command entry in progress; the original definition is retained for the key number. To permanently redefine a key number, use the procedures described in this chapter under the heading "How to Define Commands for PFK Keys."

How to Define Commands for Light Pen Command Entry

To define commands for light pen command entry, use the procedures described under the heading "How to Define Commands for PFK Keys." On console equipped only with a light pen, these procedures define commands for the numbers in the PFK display line; on consoles equipped with both a PFK and a light pen, the procedures define commands for both the PFK keys and the numbers in the PFK display line.

HOW TO CHANGE INFORMATION IN THE ENTRY AREA

You may want to change information in the entry area to correct a typing error or to change a command form that the system has displayed there during conversational message deletion or PFK command entry. You may also wish to blank the message area without entering a command to the system.

Character Substitution: To substitute one or more characters for characters that are already in the entry area:

1. Move the cursor to the location of the first character that you want to change.
2. Type in the correct characters.

For example, if you typed in the following reply to a WTOR message:

```
R 22, 'DISLPAY REQUESTED'
```

and then noted (before you pressed the END key) that the P and the L in DISPLAY were transposed, you could correct the error by positioning the cursor under the L and typing PL. The response would then read:

```
R 22, 'DISPLAY REQUESTED'
```

Clearing the Entry Area: If you want to clear the entire entry area without passing the information in the entry area to the system, hold down the ALT key and press the CANCEL key. Pressing the CANCEL key causes the following to occur:

- The entry area is blanked and the cursor is positioned to the first data entry position.
- All message lines are rewritten to the screen.
- If a deletion request is pending, all deletion indicators (|) are removed.
- If message line numbers are displayed, the line numbers are removed.

HOW TO START THE SYSTEM

To start the system using the 2250, model 91, and model 195 display consoles, follow the same procedures that you follow when using the 1052 typewriter console:

- Set the LOAD UNIT dials to the unit address of the SYSRES volume, and press the LOAD key on the control panel.
- Respond to the system parameter messages that appear on the screen.
- Set the system time and date.
- Start the system input readers and system output writers.
- Vary devices offline as appropriate.

During nucleus initialization (NIP), the first messages appear on the top line of the screen, and subsequent messages are displayed on succeeding lines. When the number of lines displayed reaches 8, as each new line is displayed, the oldest (top-most) message is removed from the screen to provide room for the new message. You do not have to delete any messages during NIP.

Initial Console Specifications: When the console is initialized, the following message deletion specifications are in effect:

```
DEL=Y  
CON=Y  
SEG=35  
CON=Y  
RTME=94  
RNUM=47
```

For an explanation of these values, see "How to Delete Messages" in this chapter.

HOW TO DELETE MESSAGES

As the programs execute during system operation, the message area of the screen gradually fills with messages. To make room for more messages, you should delete nonaction messages and messages for which action has been taken.

You may delete messages from the message area manually by using the CONTROL command or the light pen, or you can delete messages automatically by requesting automatic mode, roll mode, or roll-deletable mode. (Note: Procedures for deleting status displays are described in the section of this chapter called "System Status Displays.")

Deletion by light pen is useful for providing screen space quickly; the CONTROL command is more flexible for deleting messages selectively. Automatic message deletion is most useful when messages appear frequently, and when it is important that messages not back up on system queues while waiting for screen space.

MANUAL MESSAGE DELETION IN NONCONVERSATIONAL MODE

In nonconversational message deletion, your request causes the selected messages to be deleted immediately.

How to Delete Nonaction Messages with the Light Pen in Nonconversational Mode

To delete nonaction messages with the light pen, position the pen anywhere on the nonaction message to be deleted. This deletes the designated message and any nonaction messages above it. All messages are moved toward the top of the screen to fill the lines that were occupied by the deleted messages. As message lines become available at the bottom of the message area, any messages waiting for screen space are moved in to fill them.

How to Delete Action Messages with the Light Pen in Nonconversational Mode

To delete action messages position the pen at the asterisk (position four) in front of the action message that you want to delete. This deletes the designated action message. All messages below the deleted message are moved toward the top of the screen; as message lines become available at the bottom of the message area, any messages waiting for screen space are moved in to fill them.

How to Delete Messages with the CONTROL Command in Nonconversational Mode

The CONTROL command can be used to delete one message, a segment of messages, or flagged messages.

Deleting One Message: To delete a single message (action or nonaction):

1. Position the cursor at the first position in the entry area.
2. Type in the CONTROL E,nn command, where nn is the message line number of the message to be deleted.
3. Hold down the ALT key and press the END key, or position the light pen over the *ENTER* indicator in the instruction line.

For example, to delete the message in line 10, which appears on the screen as follows:

```
10 *IEE101A  READY
```

enter:

```
K E,10
```

Deleting a Segment of Messages: To delete the nonaction messages from a segment of messages:

1. Position the cursor at the first data entry position in the entry area.
2. Type in CONTROL E,SEG or CONTROL E,nn,nn command, where SEG indicates that the message lines previously specified in the CONTROL S,SEG=nn command are to be erased; nn,nn specifies the range of messages to be erased.
3. Hold down the ALT key and press the END key, or position the light pen over the *ENTER* indicator in the instruction line.

For example, if SEG=5 has been established using the CONTROL S,SEG= command (see "How to Establish Message Deletion Specifications") you could delete the nonaction messages in message lines 1 through 5 by entering:

```
K E,SEG
```

You could delete the nonaction messages in message lines 4-10 by entering:

```
K E,4,10
```

Any action messages within the block of messages would remain on the screen.

Note: Message numbering can help you determine the line numbers of the messages that you want to delete; see "Numbering Messages" in this chapter.

Deleting All Flagged Messages: To delete all flagged messages (messages marked with a vertical or horizontal line in position three):

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL E,F command.
3. Hold down the ALT key and press the END key, or position the light pen over the *ENTER* indicator.

MANUAL MESSAGE DELETION IN CONVERSATIONAL MODE

Conversational message deletion allows you to verify all messages that have been selected for deletion by light pen or CONTROL command. Conversational mode is requested by means of the CONTROL S,CON=Y command (see "How to Establish Message Deletion Specifications").

To delete messages in conversational mode:

1. Follow the procedures described for nonconversational message deletion by light pen or CONTROL command, as appropriate.
2. After you enter the deletion request, a vertical line appears in position three of each deletable message (all other vertical lines are temporarily removed from the screen), and the following message appears in the instruction line:

```
IEE157E DELETION REQUESTED
```

Message line numbers are also written for all messages on the screen.

3. The deletion request appears in the entry area in command form.

What Appears in the Entry Area: If your deletion request is made by light pen, or is a CONTROL E,nn,nn or CONTROL E,SEG command, the CONTROL E,nn,nn command form appears in the entry area. For example, if SEG has been defined as 10 (see "How to Establish Message Deletion Specifications"), and you enter CONTROL E,SEG, the following appears:

```
K E,1,10
```

If you make your deletion request by positioning the light pen on the fifth message line, that message and all nonaction messages above it are marked with vertical bars, and the following appears in the entry area:

```
K E,1,5
```

If your deletion request is a CONTROL E,F command, the following appears in the entry area:

```
K E,F
```

Verifying the Deletion: The system now requires verification of whatever deletion request appears in the entry area. To provide this verification:

1. Make certain that the indicated messages are the ones that you want to delete. If you want to make any changes, use the procedures described in "How to Change Information in the Entry Area". If you want to cancel the deletion request, hold down the ALT key and press the CANCEL key.
2. When the command is in the proper form, hold down the ALT key and, press the ENTER key, or position the selector pen over the *ENTER* indicator in the instruction line. (If you originally used the light pen to designate the messages to be deleted, you may enter the command by positioning the light pen over the same line a second time.)

The messages selected for deletion are removed from the message area, and any remaining messages are moved up toward the top of the screen. Whether you enter the command in the entry area or cancel it, message line numbers are removed and any flags that existed prior to the request

are restored. Also, the entry area is blanked, and the cursor is repositioned to the first data entry position.

AUTOMATIC MESSAGE DELETION

Automatic message deletion is a means of deleting messages from the screen without operator intervention. There are three modes of automatic message deletion:

- Automatic Mode: In this mode, all flagged messages are removed from the screen whenever the screen becomes full.
- Roll Mode: In this mode, a specified number of messages are deleted if the screen is full when a specified time interval elapses.
- Roll-deletable Mode: In this mode, the flagged messages in a specified group of messages are deleted if the screen is full when a specified time interval elapses.

Automatic Mode

Automatic mode of message deletion is in effect when the console is initialized. In automatic mode, messages are deleted whenever the message area is full and a message is waiting to be displayed, or when a status display is overlaying messages in the bottom portion of the message area.

Messages flagged with a vertical line (|) in position three are the only messages removed under automatic mode. Flagged messages include:

- Action messages for which the action has been taken.
- System or problem program messages that are marked deletable by the issuer.
- Messages that are indicated as deletable at job step end.
- WTOR messages that have been answered.
- WTOR messages that have not been answered, but are associated with a job step that has ended.

If there are no messages marked with a vertical line when a message is waiting to be displayed, the following message appears in the warning line:

```
-----  
IEE159E MESSAGE WAITING  
-----
```

You must then delete messages by using the CONTROL command or the light pen.

Note 1: In rare instances the screen could become full of action messages that require a reply. Messages are not marked for deletion until the accepted reply is displayed on the screen. For this reason, it is possible that you may have replied to some messages, but your reply has not appeared on the screen and, therefore, not caused the messages to be marked for deletion. In this situation, automatic message deletion does not operate, and you must delete action messages one at a time to get rid of the backlog.

Note 2: Intervention required messages (IEA000A INT REQ) are not marked for deletion when the required action is taken; they are marked when the screen becomes full. If automatic message deletion is in effect, intervention required messages marked as deletable are removed from the screen.

Roll Mode

Roll mode is a form of automatic message deletion in which the system deletes a specified number of messages from the screen each time that a time interval elapses. Deletion occurs only if the screen is full and messages are waiting to be displayed when the time interval elapses.

Roll mode is specified by the DEL=R operand of the CONTROL S command, and the number of messages removed and the time interval are set by the RNUM and RTIME operands of the same command. These specifications are described in this chapter under "How to Establish Message Deletion Specifications."

Roll-deletable Mode

Roll-deletable mode is a form of automatic message deletion in which the system deletes a specified number of flagged messages from the screen when a time interval elapses. Deletion occurs only if the screen is full and messages are waiting to be displayed. (Flagged messages are described above under "Automatic Mode.")

Roll-deletable mode is specified by the DEL=RD operand of the CONTROL S command; the number of messages removed and the time interval are set by the RNUM and RTIME operands of the same command. These specifications are described in this chapter under "How to Establish Message Deletion Specifications."

For roll mode or roll-deletable mode to be operational, the system interval timer must be set during IPL. If it is not set, entering a CONTROL S,DEL=R or CONTROL S,DEL=RD command causes the following message to appear in the instruction line:

```
IEE165I DEL UNCHANGED, NO TIMER
```

If the timer is shut off after IPL, roll mode does not function, and no message is issued. The only indication you have is that messages are not being removed. If this occurs and you still want roll mode or roll-deletable mode, reset the timer; otherwise, you can change DEL to either Y (automatic mode) or N (no automatic message deletion).

A hardcopy device must be in service when roll mode or roll-deletable mode is in effect. If the hardcopy device goes out of service, the system switches to conversational mode (CON=Y), and no messages are deleted automatically. The following message is issued at this time and also when you enter a request for roll mode or roll-deletable mode when there is no hardcopy device in the system:

```
IEE155I NO HARDCOPY - CON=Y,DEL=N
```

Procedures for specifying hardcopy devices are contained in Operator's Reference, GC28-6691.

When a console is operating in roll mode or roll-deletable mode, messages are not numbered. Instead, a two-digit number is displayed in the first new message line on the screen after each roll. This number indi-

cates the number of messages waiting to be displayed (including any messages that are hidden by a status display).

Recommendation: Roll mode is not recommended for normal operator console use because:

- Messages may be lost before you see them.
- System overhead may be increased.

One use for roll mode is for consoles used to monitor messages in a tape or disk library.

HOW TO ESTABLISH MESSAGE DELETION SPECIFICATIONS

The CONTROL S command is used to establish message deletion specifications. The specifications that may be established are:

- Deletion Mode: automatic mode, roll mode, or roll-deletable mode (DEL)
- Conversational Mode: in effect or not in effect (CON)
- Segment: the number of lines in the segment (SEG)
- Roll number: the number of lines to be rolled (RNUM)
- Roll time interval: the number of seconds between removal of messages by roll or roll-deletable mode (RTIME)

Deletion Mode: The deletion mode may be established as automatic mode, roll mode, or roll-deletable mode. Also, since automatic mode is in effect when the console is initially brought into service, automatic message deletion may be canceled. To request automatic message deletion, enter the following command:

```
K S,DEL=Y
```

To request roll mode, enter:

```
K S,DEL=R
```

To request roll-deletable mode, enter:

```
K S,DEL=RD
```

To cancel automatic message deletion (including automatic mode, roll mode, or roll-deletable mode), enter:

```
K S,DEL=N
```

Conversational Mode: To request conversational mode, enter:

```
K S,CON=Y
```

To request nonconversational mode, enter:

```
K S,CON=N
```

Segment: To define the size of the message segment (number of message lines to be deleted when CONTROL E,SEG is entered), enter:

```
K S,SEG=nn
```

nn is any number from one to 46. For example, to specify SEG equal to ten screen lines, enter:

```
K S,SEG=10
```

Roll Number: To define the number of lines to be removed from the screen by roll mode or roll-deletable mode, enter:

```
K S,RNUM=nn
```

nn is any number from three to 19. For example, to have three lines removed each time that the roll mode time interval elapses, enter:

```
K S,RNUM=3
```

Roll Time: To establish the time interval for roll mode or roll-deletable mode, enter:

```
K S,RTME=nnn
```

nnn is any number from one to 999. It specifies the number of seconds between roll actions. For example, to set the time interval at 30 seconds, enter:

```
K S,RTME=30
```

Establishing Several Specifications at Once: You need not enter a separate CONTROL command for each specification. You can define all or any portion of the specifications whenever you enter a CONTROL S command. For example, if roll mode is in effect with five messages being deleted every 20 seconds, and you want to change to roll-deletable mode with the same number of messages being deleted every 30 seconds, you can enter:

```
K S,DEL=RD,RTME=30
```

In this case, roll-deletable mode becomes effective, and the time interval changes to 30 seconds; RNUM remains 5 and SEG and CON remain unchanged because no new specifications were entered.

Checking the Specification Values: To determine which specifications are in effect, enter:

```
K S,REF
```

In response to the CONTROL S,REF command, the following display appears in the entry area:

```
K S,DEL=x,SEG=xx,CON=x,RNUM=xx,RTME=xxx
```

In the actual display, each x is replaced by the specifications currently in effect. You can change any specification at this time by following the procedures described for changing information in the entry area (see "How to Change Information in the Entry Area"). For example, if the following appears as a result of a CONTROL S,REF command:

```
K S,DEL=RD,SEG=05,CON=N,RNUM=05,RTME=040
```

you can change the roll mode time interval to 30 seconds by positioning the cursor at the first 0 after RTME and typing in 030. If the display now reflects the specifications that you want, enter the changes by holding down the ALT key and pressing the END key, or by positioning the selector pen over the *ENTER* indicator in the instruction line.

Note: When you enter CONTROL S,REF and you want to retain the values as they are shown, hold down the ALT key and press the ENTER key, or position the indicator pen over the *ENTER* indicator in the instruction line.

NUMBERING MESSAGES

You can request that message numbers appear in positions one and two of the message area lines. Consecutive numbers will appear for each message line, including continuation lines, for all message area messages except status displays.

Numbering is useful in determining the range of messages to delete with the CONTROL E,n command or the CONTROL E,SEG command.

HOW TO REQUEST TEMPORARY MESSAGE NUMBERING

To request a temporary display of message numbers to assist you in determining what segment of messages to delete:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,N command.

3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator in the instruction line.

The message numbers that appear are intended to assist you in one message deletion; the numbers are removed when you perform any form of message deletion, or when you cancel the request by holding down the ALT key and pressing the CANCEL key. If automatic message deletion occurs, the messages are renumbered.

HOW TO REQUEST CONTINUAL MESSAGE NUMBERING

To have message numbers displayed at all times:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,N,HOLD command.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator in the instruction line.

The CONTROL D,N,HOLD command causes numbers to be displayed permanently. Messages are automatically renumbered after each message deletion to assist you in performing the next message deletion.

HOW TO STOP CONTINUAL MESSAGE NUMBERING

To stop the continual display of message numbers:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL E,N command.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator in the instruction line.

The CONTROL E,N command terminates the display of message numbers.

Note: A message roll (in roll mode or roll-deletable mode) also stops message numbering requested by the CONTROL D,N,HOLD command.

SYSTEM STATUS DISPLAYS

A status display is a formatted, multiple-line display of information about some part of the system. It is written to the operator's console in response to a DISPLAY or MONITOR command.

Status displays can be used to obtain information such as the status of system devices, the identification of active jobs, and the use of system queue space. This information can help you decide how to best use the system resources. The operands of the DISPLAY and MONITOR commands are described in the Operator's Reference, GC28-6691.

A status display is either static or dynamic. A status display is static if it remains the same until it is removed from the screen. A dynamic status display is updated by the system each time a preset time interval elapses. The different procedures required for dynamic displays are described under "Dynamic Status Displays."

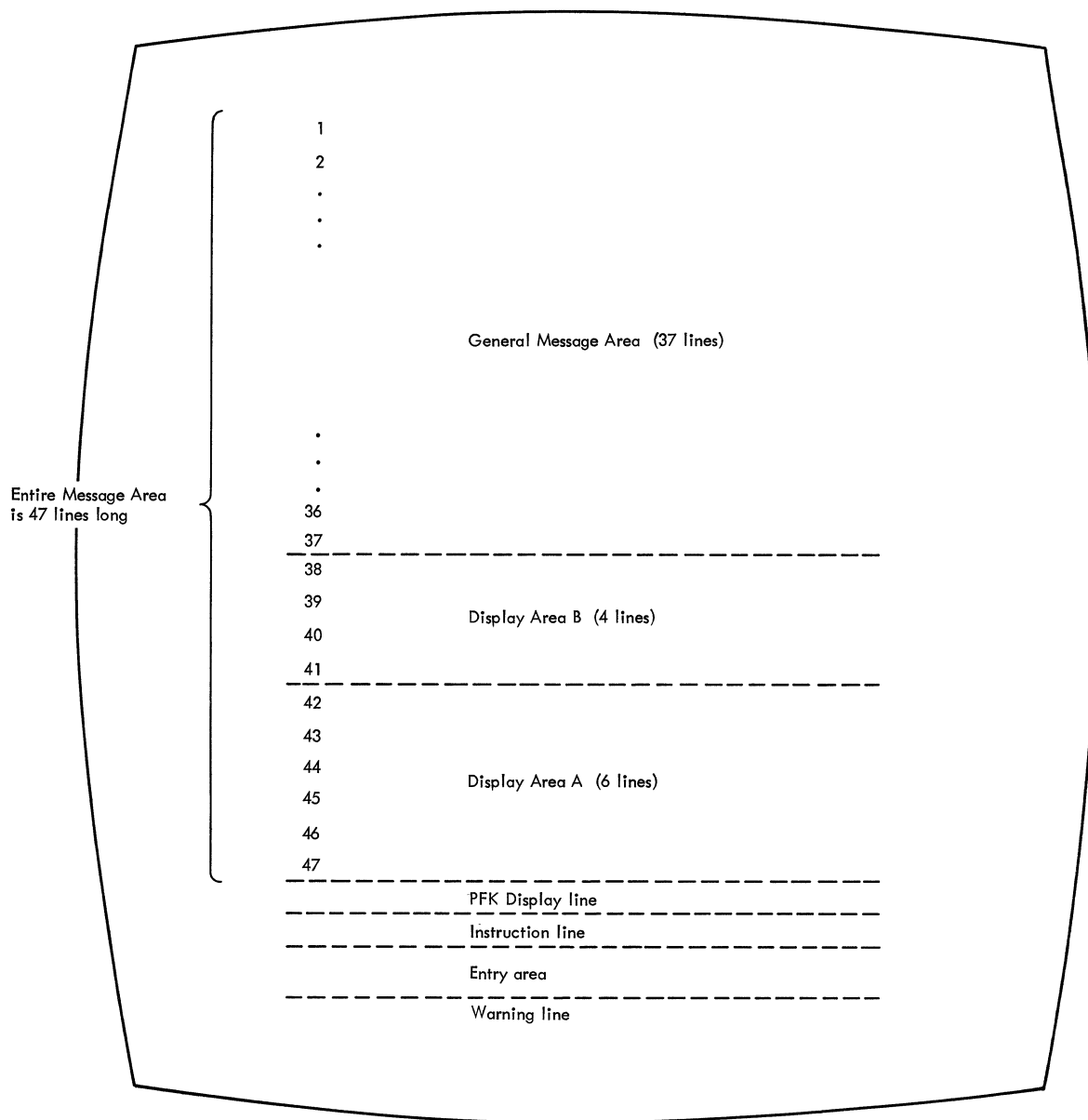


Figure 2250-2. Screen format showing two display areas

DISPLAY AREAS

Display areas are blocks of screen lines designated to receive status displays. They enable you to define the location and the number of screen lines that will be used for status displays. Display areas are defined beginning with the bottom lines of the message area and working toward the top. In Figure 2250-2, for example, two display areas are defined. The first (bottom-most) area is six lines long, and the second is four lines long. Status displays can be routed (using the L=cca operand of the DISPLAY or MONITOR command) to area A or B, or to the general message area.

The alphabetic display area identifiers are assigned by the system. The bottom-most area is assigned identifier A and additional areas are assigned identifiers in alphabetic order, working toward the top of the screen. The identifier Z always refers to the general message area.

Establishing Display Areas

Display areas can be established during system generation; you can alter the original specification, or establish a new specification, using the CONTROL A command. To establish display areas:

1. Position the cursor to the first command entry position in the entry area.
2. Type in the CONTROL A,nn[,nn] command, where nn specifies the number of lines in each display area.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

The first nn defines the bottom-most area on the screen; additional nn's define additional areas, working toward the top of the screen. The minimum nn value is four and the maximum is the number of lines in the message area (47). Also, the total of all nn specifications for a screen cannot exceed 47.

To establish two display areas, the first of eight lines and the second of four lines, enter the following command:

```
K A,8,4
```

You can check the display area specifications in effect at any time by entering:

```
K A,REF
```

This command displays specifications in the entry area in the CONTROL command form. For example, if three display areas of eight, four and four lines are defined for a screen, entering K A,REF causes the following to appear in the entry area:

```
K A,8,4,4
```

You can then change the specifications by following the procedures described in this chapter under the heading "How to Change Information in the Entry Area." To change the specification in the above example to two display areas of four and six lines, position the cursor at the 8, type in 4,6; blank the remainder of the area, and enter the command.

Establishing Display Areas for Output-only Consoles: To establish display areas for consoles other than the one you are using, use the CONTROL A command with the L=cc operand. For example, to establish two display areas of four and eight lines for a console with the system assigned identifier of 10, enter the following:

```
K A,4,8,L=10
```

The L operand can also be used with the REF operand to determine the display area specifications for any output-only console in the system.

Using Display Areas

Display areas can be thought as addressable blocks of message area lines that overlay parts of the message area.

The blocks of lines assigned to a display area function as message area lines until a status display is written to them. When this happens, any messages occupying the lines of the display area are replaced by the status display. If these messages are general operator messages, they are not lost; they reappear, higher up on the screen if screen lines above the status display become available for their use. When messages are overlaid by a status display, the following message appears in the warning line:

```
-----  
IEE160I UNVIEWABLE MESSAGE  
-----
```

Erasing a display from a display area restores the display area lines to general message use. Unless there are other status displays above the restored display area, any messages that were overlaid by the erased display reappear. If there are status displays in display areas above the restored area, the lines of the restored area remain blank. General messages are not displayed in any line in the message area below a display area containing a status display.

Note: It is good practice to erase status displays from display areas when the displays are no longer required. The undisplayed frames of lengthy status displays tie up WTO buffers which may be required for other messages.

HOW TO REQUEST STATUS DISPLAYS

1. Select the status display you wish to see.
2. Type in the appropriate DISPLAY or MONITOR command, including the location operand (L=cca) if you wish to specify the display area in which the display is to be presented.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to request a display of active jobs in display area B of console 12, enter:

```
-----  
D A,L=12B  
-----
```

Status displays can be routed to specific display areas on the screen of the console that you are using to enter the command. They can also be routed to output-only consoles. However, status displays cannot be routed to a full-capability console other than the one you are using.

You can avoid entering the L=cca operand each time that you request a display by establishing defaults for the message routing operands. Use the MSGRT command for this purpose; it is described in Operator's Reference, GC28-6691.

HOW TO FRAME STATUS DISPLAYS

Depending on the size of the display and the number of lines available in the message area or display area, status displays may be divided into two or more frames. The title line of each frame contains a frame number, and the last frame contains FRAME LAST.

Framing by CONTROL Command: To move a status display forward to the next frame:

1. Position the cursor to the first data entry position.
2. Type in the CONTROL D,F command, with the appropriate location operands (L=cca).
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to display the next frame of a status display in display area B of console 12, enter the following:

```
K D,F,L=12B
```

Framing by Light Pen: Position the light pen over the *F in the title line of the display.

Note: You can frame only forward through a display; to re-examine previous pages of the display you must enter a request for a new display.

HOW TO ERASE STATUS DISPLAYS

Status displays require different deletion methods depending on whether they are displayed in the message area of the screen (in-line) or in a defined display area (out-of-line).

Erasing In-Line Status Displays: A status display in the general message area of the screen (rather than in a display area) is erased by the message deletion methods used for other in-line messages (that is, CONTROL E,SEG; CONTROL E,nn,nn; or selector pen). These methods are described under "How to Delete Messages" in this chapter.

An in-line status display that has not been completely displayed (that is, a display that is in progress) can be deleted by positioning the light pen over the *C indicator in the control line or by entering the CONTROL C,D command. For example, to erase the status display with identification number 121, which is in progress in the general message area of console number 10, enter:

```
K C,D,121,L=10Z
```

Because of the speed of display consoles, this command has limited usefulness in erasing in-line displays from the screen. It is used primarily to halt displays in progress on printer consoles.

Erasing an Out-of-Line Display: To erase an out-of-line status display (one that is presented in a display area):

1. Move the cursor to the first position in the entry area.

2. Type in the CONTROL E,D,L=cca command, specifying the console (cc) and display area (a) containing the display you want erased.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to erase the display in display area A of console number 12, enter the following:

```
K E,D,L=12A
```

You can also erase out-of-line status displays by positioning the light pen over the *C indicator in the control line.

Note: It is not necessary to erase a status display from a display area in order to present another status display in that area. If a new status display is routed to an area that already contains a status display, the new display replaces the old. To avoid tying up system buffers, erase status displays from display areas when you no longer need the display.

DYNAMIC STATUS DISPLAYS

A dynamic status display is one that is requested once by the operator and then updated and redisplayed by the system each time a preset time interval elapses. The MONITOR command is used to request a dynamically updated display; this command is explained in Operator's Reference, GC28-6691.

Display Areas: Dynamic status displays can be presented only in display areas. Also, once the dynamic display appears in an area, it has exclusive use of the area until it is terminated; it cannot be overlaid by another status display.

Requesting a Dynamic Status Display: To request a dynamic status display:

1. Move the cursor to the first position in the entry area.
2. Type in the MONITOR command with the location operands (L=cca).
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to request a dynamic display of active jobs in display area A on console 12, enter the following command:

```
MN A,L=12A
```

Dynamic displays require use of the system interval timer. If you enter a MONITOR A command when the timer is inoperative, the system issues the following message:

```
IEE921I MN A REJECTED-NO TIMER
```

How to Request Hold Mode: You can suspend updating of a dynamic display by placing the display in hold mode:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,H command with the appropriate location operands (L=cca).
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to suspend updating of a dynamic display in area A of console 12, enter the following:

```
K D,H,L=12A
```

You can also place a dynamic display in hold mode by positioning the light pen over the *H indicator in the control line.

How to Resume Updating: To resume updating of the display:

1. Move the cursor to the first position in the entry area.
2. Type in the CONTROL D,U command with the appropriate location operands (L=cca).
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to resume updating of the display in display area A of console 12 (assuming that you have previously requested hold mode for the display), enter the following command:

```
K D,U,L=12A
```

You can also request that updating be resumed by positioning the light pen over the *U indicator in the control line of the display. (The *U indicator appears in the control line only when the display is in hold mode.)

How to Frame a Dynamic Display: To frame a dynamic display:

1. Place the display in hold mode by following the procedures described under "How to Request Hold Mode."
2. Move the cursor to the first position in the entry area.
3. Type in the CONTROL D,F command with the location operands (L=cca).
4. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.
5. Resume updating of the display by following the procedures described under "How to Resume Updating."

For example, to frame a dynamic display in display area A of console 12, first place the display in hold mode by entering:

```
K D,H,L=12A
```

Then display each frame by entering:

```
K D,F,L=12A
```

When you want to resume updating of the display, enter:

```
K D,U,L=12A
```

Updating will resume when the next time interval elapses, and the first frame of the updated display will appear on the screen at that time.

You can also perform the same hold-frame-update function with the light pen:

1. Request hold mode by positioning the pen over the *H indicator.
2. Display the frames by positioning the pen over the *F indicator once per frame.
3. Resume updating by positioning the pen over the *U indicator.

How to Erase a Dynamic Display: A dynamic display initiated by a MONITOR command is terminated by means of the STOPMN (PM) command.

1. Move the cursor to the first position in the entry area.
2. Type in the STOPMN A command with the appropriate location operands (L=cca).
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

For example, to terminate and erase a dynamic display in display area A of console 12, enter the following:

```
PM A,L=12A
```

You can also terminate and erase a display by positioning the light pen over the *PM indicator in the control line of the display (the *PM indicator does not appear when the display is in hold mode).

Note: You can predefine message routing operands (L=cca) for the STOPMN command by means of the MSGRT command. MSGRT and STOPMN are described in Operator's Reference, GC28-6691.

How to Change the Time-Interval for Updating: To change the time interval for updating dynamic displays:

1. On the master console, position the cursor to the first position in the entry area.
2. Type in the CONTROL M,UTME=nnn command, where nnn is a decimal number from 30 to 999 indicating the number of seconds in the time interval.
3. Enter the command by holding down the ALT key and pressing the END key or by positioning the light pen over the *ENTER* indicator.

There is only one time interval for all of the dynamic displays on all of the consoles in the system. To set the time interval so the dynamic display will be updated by the system every two minutes (120 seconds), enter the following command:

```
K M,UTME=120
```

You can check the current time interval by entering:

```
K M,REF
```

This will cause the current time interval to be displayed in the entry area in control command form; for example:

```
K M,UTME=120
```

You can then change the time interval by using the procedures described under "How to Change Information in the Entry Area." To change the time interval in the above example to 60 seconds:

1. Position the cursor at the 1.
2. Type in 60.
3. Blank the remainder of the entry area.
4. Enter the command.

Note 1: If the master console is a non-display console, the system will respond to the CONTROL M,REF command by displaying:

```
IEE922I K M,UTME=nnn
```

nnn is the current time interval. You can change the time interval by entering another CONTROL M,UTME command.

Note 2: If there are dynamic displays in progress when you change the time interval, the new interval will not take effect until the interval in progress elapses.

ERROR CONDITIONS

Several types of errors may occur that directly affect the operation of display consoles. In some cases, the error will be made apparent by a sudden screen failure, the appearance of an error message, or the locking of the keyboard. In other cases, the error may not be immediately apparent. Errors may be caused either by a programming problem (system error) or a console malfunction (hardware error).

SYSTEM ERRORS

When certain types of system errors occur, the screen is blanked, and an error message appears in the center of the screen. Other types of system error conditions are characterized by an abnormal lack of console activity.

Blank Screen and Error Message

If the error message indicates that a recoverable system error has occurred, perform the action specified by the error message, and then press the CANCEL key. This should restore the screen. It is good practice to review the messages at this time to make certain that no messages were lost during error recovery.

If the error message indicates that an unrecoverable system error has occurred, the system must be loaded again. Follow normal procedures for initial program load, and notify the programmer responsible for the system.

Console Inactivity

Console inactivity is characterized by a lack of messages or system response to commands. It may be due to the level of system activity, or it may be the result of a problem in the message handling portion of the control program.

One function of the message handling portion of the control program is to check for the end line of a status display or other multiple-line message. If for some reason the system fails to detect the end line of either a status display or a multiple-line message to the operator, your console may be put into a condition of inactivity, awaiting completion of the display or message. This situation occurs because the system is designed to present all of the lines of a status display or multiple-line message, once it is begun, before presenting any other message on the console.

If your console seems to be abnormally inactive, check the system response by requesting a display of the time:

```
-----  
D T
```

The system should respond immediately (within a few seconds) with the time and date. If it does not respond, cancel any status displays being presented on the inactive console using the procedure for erasing a status display. If this does not return the console to normal activity, cancel any jobs that have written multiple-line messages to the console.

If neither of these procedures returns the console to normal activity, assume that there is some other problem related to the console. Check for a console hardware error. If possible, switch control to another console. If the system must be loaded again, follow normal procedures for initial program load (IPL). Report the occurrence of this problem to the programmer responsible for the system.

CONSOLE HARDWARE ERRORS

If a console hardware error occurs, one or more of the following conditions may occur:

- An error message is centered on the screen (the remainder of the screen is blank).
- The screen is completely blank.
- The keyboard is locked, and command entry is not possible.

Error Message Response

If a console hardware error occurs, the following message may appear on the screen:

```
IEE170E RETRYABLE ERROR. RECENT ACTION MAY NEED TO BE  
REPEATED.  
IEE170E PRESS THE CANCEL KEY TO RESTORE THE SCREEN.
```

Perform the indicated action (press the CANCEL key). This should restore the screen, including messages displayed in the message area, the PFK display line, the instruction line and the warning line. The entry area is blanked, and the cursor is positioned to the first data entry position. Message numbering is terminated (if it was previously in effect).

Note: If you do not press the CANCEL key, the system will automatically rewrite the screen (same effect as CANCEL) after about 30 seconds have elapsed. If a console hardware error results from keyboard input, the system always regards it as a temporary error. If it becomes apparent to you that the error is permanent, switch control to an alternate console. Procedures for switching consoles are described in the Operator's Reference, GC28-6691. If you switch consoles, all messages except status displays are moved to the new console.

Blank Screen Response

If the console screen goes blank, a console switch is probably taking place. The following message should appear on the new console:

```
IEE143I OLD=xxx, NEW=xxx, VALDCMD=xx  
IEE143I ROUTCDE=xx[,xx] T=x H=x
```

In the actual message, the appropriate values appear in place of the x's. Use the alternate console to continue operating the system and have the old console checked for the source of the error.

Locked Keyboard Response

Sometimes the system is unable to blank the screen. If you find that you cannot enter commands through a console that appears normal, try to restore the keyboard by pressing the CANCEL key.

If a console switch has taken place, operate the system from the alternate console and have the old console examined for the source of the error.

Note: Inhibited input, with or without keyboard locking, may also occur when the system goes into an ABEND wait state or when a problem occurs in the message handling portion of the control program. Check the procedures described for console inactivity under "System Errors."

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This chapter explains how to use the 2260 display station as an operator's console. All important procedures are described, including the procedures that pertain to the full-capability (input/output) mode of operation and the procedures that pertain to the output-only mode of operation.

CONSOLE CHARACTERISTICS

The 2260 display console is composed of a display screen and a typewriter keyboard. The display screen is a cathode-ray tube with 960 character positions. The typewriter keyboard is a 50-key keyboard including special keys to control cursor movement. Figure 2260-1 shows a 2260 display console.

SCREEN FORMAT

The screen is divided into four functional areas (see Figure 2260-1):

- Message Area: This area has eight lines of 80 character positions each. The first two character positions contain the message number (if message numbering is in effect). Positions three and four contain the action-required indicator (*), the no-action-required indicator (-), and the action-taken indicator (|). Positions five through 80 contain the text of system messages, operator commands, message replies, and system status displays. The following is a sample message area line:

```
04 *IEE101A READY
```

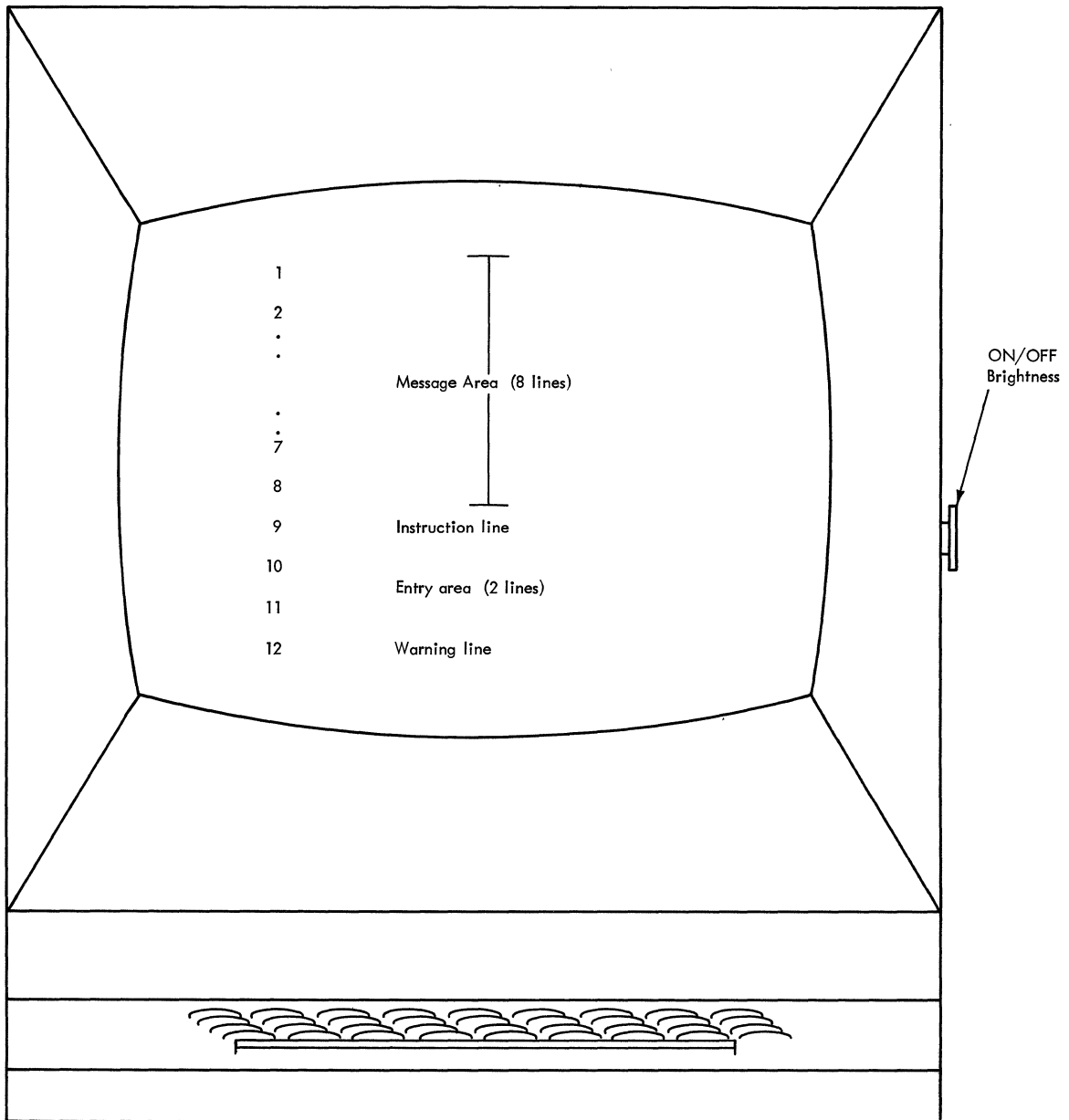
- Instruction Line: This line is used to display system messages relating to control of the console.
- Entry Area: These two lines are used to enter commands and to reply to messages.
- Warning Line: This line is used to display messages that warn you of conditions that may require action.

SPECIAL SCREEN CHARACTERS

The 2260 display console uses five special screen characters to assist you in entering displays and to inform you of the status of messages in the entry area.

Command Entry: Two special screen characters pertain to command entry:

- The start manual input (START MI) indicator (▷) appears in the first data entry position (in the entry area) when the system is ready for you to type in a command or a message reply.
- The end of message (EOM) indicator (=) appears after the last character in the entry area when you signal that the information in the entry area is to be read into the system.



Note: The labels shown do not appear on the screen.

Figure 2260-1. 2260 display console

Message Status: Three special indicators may appear in positions 3 and 4 of messages in the message area:

- A vertical line (|) in position three indicates that required action has been taken for the message or that the message can be deleted.
- A horizontal bar (-) in position three indicates that the message is for information only and requires no action by the operator.
- An asterisk (*) in position four indicates that the message requires action by the operator.

THE CURSOR

The 2260 display console can be equipped with two types of cursors:

- The destructive cursor appears as a heavy horizontal bar (=). It marks the position that the next character entered will occupy. When the destructive cursor is advanced or backspaced through a character, the character is replaced by a blank.
- The nondestructive cursor appears as a vertical bar. It is located below the character line and to the left of the position that it is designating. The nondestructive cursor can be moved freely about the console screen without erasing other characters.

The position of the cursor indicates to the system:

- Where to position the next character that you type.
- What pre-defined action you want the system to take.
- What messages you want deleted from the screen.

On the 2260 display console, the cursor can be positioned anywhere on the screen, but its position is meaningful only in the following locations:

- Any position on a nonaction message line for deleting all messages above that line.
- The asterisk in an action message for deleting action messages.
- The *F, *E, *U, *H, or *PM in a status display control line for controlling the display.
- Any position within the entry area for entering a command.

The cursor is controlled by the advance (space bar), backspace, up, and down keys. Pressing these keys moves the cursor one space to the right (advance), one space to the left (backspace), one line up, and one line down.

Note: The ERASE DISPLAY key erases the screen and moves the cursor to the upper left hand corner of the screen. This key is not intended for use in operator console mode. To restore the screen (if ERASE DISPLAY is pressed accidentally):

1. Position the cursor to the first position in line ten (the first line of the entry area).
2. Hold down the SHIFT key and press the START key (this displays the START MI symbol (➔) in the entry area).
3. Hold down the SHIFT key and press the ENTER key twice.

HOW TO ENTER COMMANDS

To enter a command or to reply to a message you must arrange the information in the proper format, and then signal the system that information is to be passed.

ENTERING COMMANDS WITH THE KEYBOARD

1. Position the cursor in the entry area to the right of the START MI symbol (►).
2. Put the console in hold mode by holding down the SHIFT key and pressing the ENTER key; wait for the following message to appear in the second line of the entry area

```
IEE167E OUTPUT IN HOLD MODE
```

3. Type in the command.
4. Move the cursor to the next character position after the last character in the command.
5. Enter the command by holding down the SHIFT key and pressing the ENTER key.

You can position the cursor to the first data entry position by pressing the START key. As you type each character of the command, the corresponding character is displayed in the entry area, and the cursor is advanced to the next character position. When the end of the first entry area line is reached, the cursor advances automatically to the first character position of the second entry area line, permitting continuation of the command. The maximum number of characters that can be entered is 126; but only one command can be entered at a time.

Uppercase and Lowercase: You can enter most commands in either uppercase or lowercase; the system converts the commands to uppercase, if required. However, information contained in single quotes (for example, part of a reply to a WTOR message) is not converted to uppercase by the system. If the information within the single quotes is required in uppercase by the system, be sure to type it in uppercase when you enter the command. Since all information on the screen is displayed in uppercase, you cannot determine how it was entered by looking at the screen.

Entering the Command: Position the cursor after the last character in the command before you press the SHIFT and ENTER keys. When you press the SHIFT and ENTER keys, the EOM indicator (=) momentarily replaces the cursor; its appearance indicates that the system is receiving the command. After the command is accepted by the system, the command disappears from the entry area, (unless it is a CONTROL command), and the cursor is repositioned to the character position immediately following the START MI symbol. Commands other than the CONTROL command reappear in the message area when screen space is available. The CONTROL command remains in the entry area until the requested action takes place.

Commands Entered with Errors: If you enter a CONTROL command with errors, the command is displayed in the entry area. The location of the cursor indicates the source of the error:

- If the error is an invalid operand, the cursor is placed under the invalid operand:

```
K X,N
```

- If the error is an invalid erase request, the cursor is placed under the first character after the E:

```
K E,31,19
```

- If the CONTROL command exceeds 126 characters, the cursor is positioned at location 127 in the entry area.

To correct any of these errors, use the procedures described in this chapter under "How to Change Information in the Entry Area."

If an error is detected in a command other than the CONTROL command, the command is written in the message area along with an appropriate error message. Follow the procedures indicated for the message in Messages and Codes, GC28-6631.

HOW TO CHANGE INFORMATION IN THE ENTRY AREA

You may want to change information in the entry area to correct a typing error or to change a command form that the system has displayed during conversational message deletion. You may also wish to blank the message area without entering a command to the system.

Character Substitution: To substitute one or more characters for characters that are already in the entry area:

1. Position the cursor under the character that you wish to change.
2. Type the correct character.

The correct character replaces the incorrect character. For example, if you typed the following reply to a WTOR message:

```
R 22,'DISLPAY REQUESTED'
```

and then noted (before you entered the command) that the P and L in DISPLAY were transposed, you could correct the error by positioning the cursor under the L and typing PL. The response would then read:

```
R 22,'DISPLAY REQUESTED'
```

To enter this response, reposition the cursor to the end of the display and press the SHIFT and ENTER keys.

Note: If your console is equipped with a destructive cursor, you must retype each character that the cursor passes through.

Clearing the Entry Area: To clear the entire entry area without passing the information in the entry area to the system:

1. Position the cursor next to the START MI symbol (➤).
2. Hold down the SHIFT key and press the ENTER key twice (if the console is in hold mode, press the ENTER key only once).

this results in the following:

- The entry area is blanked and the cursor is repositioned to the first data entry position next to the START MI symbol.

- If a conversational delete request was pending, any deletion indicators are removed.
- If message line numbering was in effect, the line numbers are removed.

HOW TO START THE SYSTEM

To start the system using the 2260 display console, follow the same procedures that you follow for the 1052 typewriter console:

1. Set the LOAD UNIT dials to the unit address of the SYSRES volume, and press the LOAD key on the control panel.
2. Respond to the system parameter messages that appear on the screen.
3. Set the system time and date.
4. Start the system input readers and system output writers.
5. Vary devices offline as appropriate.

During nucleus initialization (NIP), the first messages appear on the top line of the screen, and subsequent messages are displayed on succeeding lines. When the number of lines displayed reaches 8, as each new line is displayed, the oldest (top-most) message is removed from the screen to provide room for the new message. You do not have to delete any messages during NIP.

The start manual input (START MI) symbol (-) appears in the first character position of the entry area during NIP. The cursor appears in the second position. The START MI symbol remains in position 1 of the entry area at all times. Do not attempt to erase or overlay the symbol because the symbol must be present to allow you to communicate with the system.

Initial Console Specifications: When the console is initialized, the following message deletion specifications are in effect:

```
DEL=Y
CON=Y
SEG=8
RTME=16
RNUM=8
```

For an explanation of these specifications, see "How to Establish Message Deletion Specifications" in this chapter.

HOW TO DELETE MESSAGES

As programs execute during system operation, the message area of the screen gradually fills with messages. To make room for more messages, you should delete from the screen nonaction messages and messages for which action has been taken.

You may delete messages manually by using the cursor or the CONTROL command; you can also delete messages automatically by requesting automatic mode, roll mode, or roll-deletable mode. (Note: Procedures for deleting system status displays are described in the section of this chapter called "System Status Displays.")

Deletion by cursor is useful for providing screen space quickly; the CONTROL command is more flexible for deleting messages selectively.

Automatic message deletion is most useful when messages appear frequently and when it is important that messages not back up on system queues while waiting for screen space.

MANUAL MESSAGE DELETION IN NONCONVERSATIONAL MODE

In nonconversational mode, message deletion is accomplished when you enter the deletion request with the cursor or with the CONTROL command.

How to Delete Nonaction Messages with the Cursor in Nonconversational Mode

1. Select the message or messages that you wish to delete.
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Position the cursor at any location within the selected message.
4. Hold down the SHIFT key and press the ENTER key, deleting the indicated message and all nonaction messages above it.

In addition to deleting the messages, this action blanks the entry area, terminates hold mode, and positions the cursor to the first data entry position in the entry area. All messages in the message area are moved toward the top of the screen to fill the lines that were occupied by the deleted messages. The message lines that become available at the bottom of the message area are filled by any messages that were waiting for screen space.

Note: Message deletion by cursor is valid only with the nondestructive cursor feature.

How to Delete Action Messages by Cursor in Nonconversational Mode

1. Select the action message that you wish to delete.
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Position the cursor at the asterisk (position 4) in the message you want to delete.
4. Hold down the SHIFT key and press the ENTER key, deleting only the designated action message.

How to Delete Messages with the CONTROL Command in Nonconversational Mode

The CONTROL command can be used to delete one message, a segment of messages, or flagged messages.

Deleting One Message: To delete a single message (action or nonaction):

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL E,nn command, where nn is the message line number of the message to be deleted.

4. Position the cursor after the last character in the command.
5. Enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to delete message number 06, which appears on the screen as follows:

```
06 *IEE101A READY
```

enter:

```
K E,06
```

Deleting a Segment of Messages: To delete the nonaction messages from a segment of messages:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL E,SEG or CONTROL E,nn,nn command (SEG indicates that the message lines previously specified in the CONTROL S,SEG command are to be erased; nn,nn specifies the range of messages to be erased).
4. Position the cursor after the last character in the command.
5. Enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, if SEG=5 has been established (see "Establishing Message Deletion Specifications"), you can delete the nonaction messages in lines 1 through 5 by entering:

```
K E,SEG
```

You can delete the nonaction messages in lines 4 through 8 by entering:

```
K E,4,8
```

Any action messages within the block of messages remain on the screen.

Note: Message numbers can help you determine which messages you want to delete. See "Numbering Messages" in this chapter.

Deleting all Flagged Messages: To delete all flagged messages (messages marked with a vertical or horizontal line in position 3):

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.

3. Type in the CONTROL E,F command.
4. Position the cursor after the last character in the command.
5. Enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to remove all nonaction messages and messages for which action has been taken, enter:

```
K E,F
```

MANUAL MESSAGE DELETION IN CONVERSATIONAL MODE

Conversational mode of message deletion allows you to verify all messages that have been selected for deletion by cursor or CONTROL command. Conversational mode is requested by means of the CONTROL S,CON=Y command.

How to Delete Messages in Conversational Mode

1. Follow the procedures described for nonconversational message deletion by cursor or CONTROL command.
2. After you press the SHIFT and ENTER keys for the second time, a vertical line appears in position 3 of each message eligible for deletion (all other vertical lines are temporarily removed from the screen), and the following message appears in the instruction line:

```
IEE157E DELETION REQUESTED
```

Message line numbers are also written.

3. The deletion request appears in the entry area in CONTROL command form.
4. Enter the request by holding down the SHIFT key and pressing the ENTER key.

What Appears in the Entry Area: If your request is made by cursor, or is a CONTROL E,nn[,nn] or a CONTROL E,SEG command, the CONTROL E,nn,nn command form appears in the entry area. For example, if SEG has been defined as 06 (see "How to Establish Message Deletion Specifications"), and you enter:

```
K E,SEG
```

a vertical bar appears in position 3 of the first (top-most) six messages on the screen, and the following appears in the entry area:

```
K E,1,6
```

If you make your deletion request by positioning the cursor on the fifth message line and pressing the SHIFT and ENTER keys, the message on the fifth line, and all nonaction messages above it are marked with vertical bars, and the following appears in the entry area:

```
K E,1,5
```

If your deletion request is a CONTROL E,F command, the following appears in the entry area:

```
K E,F
```

Verifying the Deletion: The system now requires verification of whatever deletion request appears in the entry area. To provide this verification:

1. Make certain that the command in the entry area indicates the messages that you want to delete. If you want to make changes, use the procedures described under "How to Change Information in the Entry Area". If you want to cancel the deletion request, position the cursor to the first character position to the right of the START MI symbol (-), and press the SHIFT and ENTER keys twice.
2. When the command is in the proper form, enter it by positioning the cursor after the last character in the command and pressing the SHIFT and ENTER keys.

Whether you enter the request or cancel it, line numbers are removed, and any screen symbols that existed prior to the request are restored. Also, the entry area is blanked, and the cursor is repositioned to the first data entry position.

AUTOMATIC MESSAGE DELETION

Automatic message deletion is a means of deleting messages from the screen without operator intervention. There are three modes of automatic message deletion:

- **Automatic Mode:** In this mode, all flagged messages are removed from the screen whenever the screen becomes full.
- **Roll Mode:** In this mode, a specified number of messages are deleted if the screen is full when a specified time interval elapses.
- **Roll-Deletable Mode:** In this mode, the flagged messages in a specified group of messages are deleted if the screen is full when a specified time interval elapses.

Automatic Mode

Automatic mode of message deletion is in effect when the console is initialized. In automatic mode, messages are deleted whenever the message area is full and a message is waiting to be displayed, or when a status display is overlaying messages in the bottom portion of the message area.

Messages flagged with a vertical line (|) in position 3 are the only messages removed under automatic mode. Flagged messages include:

- Action messages for which the action has been taken.
- System or problem program messages that are marked deletable by the issuer.

- Messages that are indicated as deletable at job step end.
- WTOR messages that have been answered.
- WTOR messages that have not been answered, but are associated with a job step that has ended.

If there are no messages marked with a vertical line when a message is waiting to be displayed, the following message appears in the warning line:

```

-----
IEE159E MESSAGE WAITING
-----

```

You must then delete messages with the CONTROL command or the cursor.

Note 1: In rare instances the screen could become full of action messages that require a reply. Messages are not marked for deletion until the accepted reply is displayed on the screen. For this reason, it is possible that you may have replied to some messages, but your reply has not appeared on the screen and, therefore, not caused the messages to be marked for deletion. In this situation, automatic message deletion does not operate, and you must delete action messages one at a time to get rid of the backlog.

Note 2: Intervention required messages (IEA000A INT REQ) are not marked for deletion when the required action is taken; they are marked when the screen becomes full. If automatic deletion is in effect, intervention required messages marked as deletable are removed from the screen.

Roll Mode

Roll mode is a form of automatic message deletion in which the system deletes a specified number of messages from the screen when a time interval elapses. Deletion occurs only if the screen is full and messages are waiting to be displayed when the time interval elapses.

Roll mode is specified by the DEL=R operand of the CONTROL S command and the number of messages removed and the time interval are set by the RNUM and RTME operands of the same command. These specifications are described in this chapter under "How to Establish Message Deletion Specifications."

Roll-Deletable Mode

Roll-deletable mode is a form of automatic message deletion in which the system deletes a specified number of flagged messages from the screen when a time interval elapses. Deletion occurs only if the screen is full and messages are waiting to be displayed. (Flagged messages are described above under "Automatic Mode.")

Roll-deletable mode is specified by the DEL=RD operand of the CONTROL S command, and the number of messages removed and the time interval are set by the RNUM and RTME operands of the same command. (These specifications are described in this chapter under "How to Establish Message Deletion Specifications.")

For roll mode or roll-deletable mode to be operational, the system interval timer must be set during IPL. If it is not set, entering a CONTROL S,DEL=R or CONTROL S,DEL=RD command causes the following message to appear in the instruction line:

```
IEE165I DEL UNCHANGED, NO TIMER
```

If the timer is shut off after IPL, roll mode does not function, and no message is issued. The only indication you have is that messages are not being removed. If this occurs and you still want roll mode or roll-deletable mode, reset the timer; otherwise, you can change DEL to either Y (automatic mode) or N (no automatic message deletion).

A hardcopy device must be in service when roll mode is in effect. If the hardcopy device goes out of service, the system switches to conversational mode (CON=Y), and no messages are deleted automatically. The following message is issued at this time and also when you enter a request for roll mode or roll-deletable mode when there is no hardcopy device in the system:

```
IEE155I NO HARDCOPY - CON=Y, DEL=N
```

Procedures for specifying hardcopy devices are contained in the Operator's Reference, GC28-6691.

When a console is operating in roll mode, messages are not numbered. Instead, a two-digit number is displayed in the first new message line on the screen after each roll. This number indicates the number of messages waiting to be displayed (including any messages that are hidden by a status display).

Recommendation: Roll mode is not recommended for normal operator console use because messages may be lost before you see them, and system overhead may be increased. Roll mode is useful for monitor consoles; this topic is discussed in this chapter under "Console Mode."

HOW TO ESTABLISH MESSAGE DELETION SPECIFICATIONS

The CONTROL S command is used to establish the message deletion specifications. The specifications that may be established are:

- Deletion Mode: automatic mode, roll mode, or roll-deletable mode (DEL)
- Conversational Mode: in effect or not in effect (CON)
- Segment: the number of lines in the segment (SEG)
- Roll number: the number of lines to be rolled (RNUM)
- Roll time interval: the number of seconds between removal of messages by roll mode (RTME)

Deletion Mode: The deletion mode may be established as automatic mode, roll mode, or roll-deletable mode. Also, since automatic mode is in effect when the console is initially brought into service, automatic message deletion may be cancelled. To request automatic mode, enter the following command:

```
K S,DEL=Y
```

To request roll mode, enter:

```
K S,DEL=R
```

To request roll-deletable mode, enter:

```
K S,DEL=RD
```

To cancel automatic message deletion (including automatic mode, roll mode, and roll-deletable mode), enter:

```
K S,DEL=N
```

Conversational Mode: To request conversational mode, enter:

```
K S,CON=Y
```

To request nonconversational mode, enter:

```
K S,CON=N
```

Segment: To define the size of the message segment (number of message lines) to be deleted when CONTROL E,SEG is entered, enter:

```
K S,SEG=nn
```

nn is any number from one to 7. For example, to specify SEG equal to 6 screen lines, enter:

```
K S,SEG=6
```

Roll Number: To define the number of lines to be removed from the screen by roll mode or roll-deletable mode, enter:

```
K S,RNUM=nn
```

nn is any number from three to eight. For example, to have three lines removed each time that the roll mode time interval elapses, enter:

```
K S,RNUM=3
```

Roll Time: To establish the time interval for roll mode or roll-deletable mode, enter:

```
K S,RTME=nnn
```

nnn is any number from one to 999. It specifies the number of seconds between roll actions. For example, to set the interval at 30 seconds, enter:

```
K S,RTME=30
```

Establishing Several Specifications at Once: You need not enter a separate CONTROL command for each specification. You can define all or any portion of the specifications whenever you enter a CONTROL S command. For example, if roll mode is in effect with five messages being deleted every 20 seconds, and you want to change to roll-deletable mode with the same number of messages being deleted every 30 seconds, you can enter:

```
K S,DEL=RD,RTME=30
```

Roll-deletable mode becomes effective, and the time interval changes to 30 seconds; however, the roll number (RNUM), conversational mode (CON), and segment (SEG) remain unchanged because no new specification was entered.

Checking the Specifications: To determine which specifications are in effect, enter:

```
K S,REF
```

The following display appears in the entry area:

```
K S,DEL=x,SEG=xx,CON=x,RNUM=xx,RTME=xxx
```

In the actual display, each x is replaced by the specification currently in effect. You can change any specification at this time by following the procedures described for changing information in the entry area (see "How to Change Information in the Entry Area"). For example, if the following appears as a result of a CONTROL REF command:

```
K S,DEL=RD,SEG=05,CON=N,RNUM=05,RTME=040
```

You can change the roll mode time interval to 30 seconds by positioning the cursor at the first 0 after RTME= and typing in 030. If the display now shows the specifications that you want, enter the changes by holding down the SHIFT key and pressing the ENTER key.

Note: When you enter CONTROL S,REF and you want to retain the values as they are shown, hold down the SHIFT key and press the ENTER key.

NUMBERING MESSAGES

You can request that message numbers appear in positions 1 and 2 of the message area lines. Consecutive numbers appear for each message line, including continuation lines, for all messages except status displays.

Numbering is useful in determining the range of messages to delete with the CONTROL E,nn command or the CONTROL E,SEG command.

HOW TO REQUEST TEMPORARY MESSAGE NUMBERING

To request a temporary display of message numbers to assist you in determining what segment of messages to delete:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL D,N command.
4. Enter the command by holding down the SHIFT key and pressing the ENTER key.

The message numbers that appear are intended to assist you in one message deletion; they are removed when you perform any form of message deletion or when you cancel the request by positioning the cursor next to the START MI symbol and pressing SHIFT and ENTER. If automatic message deletion occurs (in automatic mode, roll mode, or roll-deletable mode), the messages remaining on the screen after the deletion are renumbered.

HOW TO REQUEST CONTINUAL MESSAGE NUMBERING

To have message numbers displayed at all times:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL D,N,HOLD command.
4. Enter the command by holding down the SHIFT key and pressing the ENTER key.

The CONTROL D,N,HOLD command causes numbers to be displayed permanently. Messages are automatically renumbered after each message deletion that you perform to assist you in performing the next message deletion.

HOW TO STOP CONTINUAL MESSAGE NUMBERING

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL E,N command.
4. Enter the command by holding down the SHIFT key and pressing the ENTER key.

Note: A message roll (in roll mode or roll-deletable mode) also stops message numbering requested by the CONTROL D,N,HOLD command.

SYSTEM STATUS DISPLAYS

A status display is a formatted, multiple-line display of information about some part of the system. It is written to an operator's console in response to a DISPLAY or MONITOR command.

Status displays can be used to check on things like the status of system devices, the jobs active in the system, and the use of system queue space. This information can help you decide how best to use the system resources. The operands of the DISPLAY and MONITOR commands are described in Operator's Reference, GC28-6691.

On display consoles, status displays are normally presented in display areas set aside for their use. A status display is either static or dynamic. A status display is static if it remains the same until it is removed from the screen. A dynamic status display is updated by the system each time that a preset time interval elapses. The different procedures for dynamic displays are discussed in this section under "Dynamic Status Displays."

DISPLAY AREAS

Display areas are blocks of screen lines designated to receive status displays. They enable you to define the location and number of screen lines that are to be used for status displays. Display areas are defined beginning with the bottom lines of the message area and working toward the top.

For example: a display area is defined for display console screen shown in Figure 2260-2; the display area is five lines long. Status displays can be routed to display area A using the L operand of the DISPLAY or MONITOR command. The alphabetic identifier is assigned by the system. The bottom-most area on the screen is assigned identifier A, and additional areas are assigned identifiers in alphabetic order, working toward the top of the screen. The identifier Z always refers to the portion of the message area that is not assigned to a display area.

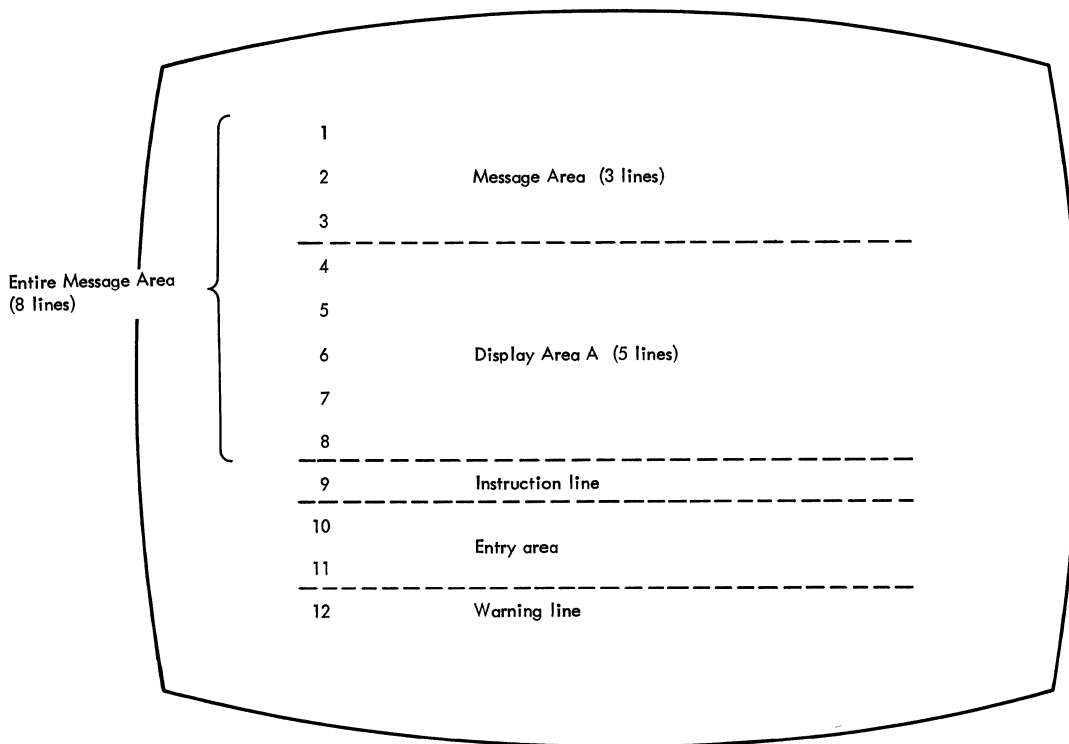
Establishing Display Areas

Display areas are established by the system programmers during system generation; you can alter the original specifications, or establish new specifications, using the CONTROL A command.

To establish display areas:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL A,nn[,nn] command, where each nn specifies the number of lines in each display area.
4. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

The first nn defines the bottom-most area on the screen; subsequent nn's define additional areas working toward the top of the screen. The minimum nn value is four, and the maximum is the number of lines in the message area (8). Also, the total nn specification cannot exceed 8.



Note: The lines and labels do not appear on the screen.

Figure 2260-2. Screen format showing one display area

For example, to establish two display areas of four lines each, enter:

```
K A,4,4
```

When the command is removed from the entry area, the new specifications are in effect. To check the display area specifications in effect, enter:

```
K A,REF
```

This displays the specification in the entry area in CONTROL command form. For example, if two display areas of four lines each are defined for screen, entering K A,REF causes the following to appear in the entry area:

```
K A,4,4
```

You can then change the specifications using the procedures described in this chapter under "How to Change Information in the Entry Area."

Establishing Display Areas for Output-only Consoles: To establish display areas for consoles other than the one you are using, use the CONTROL A command with the L=cc operand. For example, to establish two display areas of four lines each for a console with the system assigned identifier of 10, enter the following:

```
K A,4,4,L=10
```

The L operand can also be used with the REF operand to determine the display area specifications for any output-only console in the system.

Using Display Areas

Display areas can be thought of as addressable blocks of message area lines that overlay parts of the message area. The blocks of lines assigned to a display area function as message area lines until a status display is written to them. When this happens, any messages occupying the lines of the display area are replaced by the status display. If these messages are general operator messages, they are not lost; they will reappear, higher up on the screen if screen lines above the status display become available for their use. When messages are overlaid by a status display the following message appears in the warning line:

```
IEE160I UNVIEWABLE MESSAGE
```

Erasing a display from a display area restores the display area lines to general message use. Unless there are other status displays above the restored display area, any messages that were overlaid by the erased display reappear. If there are status displays in display areas above the restored area, the lines of the restored area remain blank. General message traffic is not displayed in any line in the message area below a display area containing a status display.

Note: It is good practice to erase status displays from display areas when the displays are no longer required. The undisplayed frames of lengthy status displays tie up WTO buffers which may be required for other messages.

HOW TO REQUEST STATUS DISPLAYS

1. Select the status display you wish to see.
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the appropriate DISPLAY or MONITOR commands, including the location operand (L=cca) if you wish to specify the display area in which the display is to be presented.
4. Position the cursor after the last character of the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to request a display of active jobs for display area B of console 12, enter:

```
D A,I=12B
```

Status displays can be routed to specific display areas on the screen of the console that you are using to enter the command. They can also be routed to output-only consoles. However, status displays cannot be routed to a full-capability console other than the one you are using to enter the command.

If your console has only one display area, the system always tries to use that area for any status display that you request. If the area is occupied, the system presents the display in the unassigned area, unless you specify that the display is to be presented in the display area by coding L=A. If you do code L=A, the new display replaces the old display in the area.

You can avoid the necessity of entering the L=cca operand each time that you request a display by establishing default message routing operands. Use the MSGRT command for this purpose; this command is described in Operator's Reference, GC28-6691.

HOW TO FRAME STATUS DISPLAYS

Depending on the size of the display and the number of lines available in the message area or display area, status displays can be divided into two or more frames. The title line of each display contains a frame number, and the last frame contains FRAME LAST.

You can display the frames of a status display by means of the CONTROL command or the nondestructive cursor.

Framing by CONTROL Command: To move a status display forward to the next frame:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL D,F command with location operands (if required).
4. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to display the next frame of a status display in display area B of console 12, enter:

```
K D,F,L=12B
```

Framing by Cursor: The title line of a status display contains a framing indicator, which appears as *F on the screen. To frame by cursor:

1. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
2. Position the cursor under the *F indicator in the control line of the display.
3. Hold down the SHIFT key and press the ENTER key.

Note: You can frame only forward through a display; to reexamine previous frames of the display you must enter a request for a new display.

HOW TO ERASE STATUS DISPLAYS

Status displays require different deletion methods depending on whether they are displayed in the message area of the screen (in-line) or in a defined display area (out-of-line).

Erasing In-Line Status Displays: A status display that is in the general message area of the screen (rather than in a display area) is erased by the message deletion methods used for other in-line messages (that is, CONTROL E,SEG; CONTROL E,nn,nn; or cursor). These methods are described under "Message Deletion" in this chapter.

An in-line status display that has not been completely displayed (that is, a display that is in progress) can be deleted by entering the K C,D command. For example, to erase the status display with identification number 121, which is in progress in the general message area of console number 10, enter:

```
K C,D,121,L=10Z
```

Because of the speed of display consoles, this command has limited usefulness in erasing in-line displays from display console screens. It is used primarily to halt displays in progress on printer consoles.

You can also erase in-line status displays with the nondestructive cursor:

1. Position the cursor at the *C indicator in the control line of the display.
2. Hold down the SHIFT key and press the ENTER key.

Erasing an Out-of-Line Status Display: To erase an out-of-line status display (one that is presented in a display area):

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL E,D command with the location operands (if required).
4. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to erase a display from display area A of console number 12, enter the following:

```
K E,D,L=12A
```

You can also erase an out-of-line status display with the cursor:

1. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
2. Position the cursor under the *C indicator in the control line of the status display.
3. Hold down the SHIFT key and press the ENTER key.

Note: It is not necessary to erase a status display from a display area in order to present another status display in that area. If a new display is routed to an area that already contains a display, the new display replaces the old. To avoid tying up buffer space, erase status displays from display areas when you no longer need the displays.

DYNAMIC STATUS DISPLAYS

A dynamic status display is one that is requested once by the operator and then updated and redisplayed by the system each time a pre-set time interval elapses. The MONITOR command is used to request a dynamically updated display; this command is explained the Operator's Reference, GC28-6691.

Display Areas: Dynamic status displays can be presented only in display areas. Also, once the dynamic display appears in an area, it has exclusive use of the area until it is terminated; it cannot be overlaid by another status display.

Requesting a Dynamic Status Display: To request a dynamic status display:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the MONITOR (MN) command.
4. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to request a dynamic display of active jobs for display area A on console 12, enter the following command:

```
MN A,I=12A
```

Dynamic displays require the use of the system interval timer. If you enter a MONITOR A command when the timer is inoperative, the system issues the following message:

```
IEE921I MN A REJECTED-NO TIMER
```

How to Suspend Display Updating: To suspend dynamic display updating:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL D,H command.
4. Position the cursor after the last character in the command and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to suspend updating of a dynamic display in area A of console 12, enter the following:

```
K D,H,L=12A
```

You can also suspend dynamic display updating by placing the console in hold mode, positioning the cursor at the *H indicator in the control line, and pressing the SHIFT and ENTER keys.

How to Resume Updating: To resume updating of the display:

1. Position the cursor to the first data entry position.
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL D,U command.
4. Position the cursor after the last character in the command and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to resume updating of the display in display area A of console 12 (assuming that you have previously requested hold mode for the display), enter the following command:

```
K D,U,L=12A
```

You can also request that updating be resumed by placing the console in hold mode, positioning the cursor under the *U indicator in the control line of the display, and pressing the SHIFT and ENTER keys. The *U indicator appears in the control line only when updating is suspended.

How to Frame a Dynamic Display: To frame a dynamic display:

1. Suspend updating of the display by following the procedures described under "How to Suspend Display Updating."
2. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
3. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
4. Type in the CONTROL D,F command.
5. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.
6. Resume updating of the display by following the procedures described under "How to Resume Updating."

For example, to frame a dynamic display in display area A of console 12, first place the display in hold mode by entering:

```
K D,H,L=12A
```

Then frame forward one frame by entering:

```
K D,F,I=12A
```

When you want to resume updating of the display, enter:

```
K D,U,L=12A
```

Updating will resume when the next time interval elapses. The first frame of the updated display will appear on the screen at that time.

You can also perform the same function with the nondestructive cursor:

1. Place the console in hold mode; suspend updating of the display by positioning the cursor under the *H indicator and pressing the SHIFT and ENTER keys.
2. Place the console in hold mode; request the next frame of the display by positioning the cursor under the *F indicator (the *F indicator appears only when the display updating is suspended) and pressing the SHIFT and ENTER keys.
3. Place the console in hold mode; resume updating of the display by positioning the cursor under the *U indicator (the *U indicator appears only when the display updating is suspended) and pressing the SHIFT and ENTER keys.

How to Erase a Dynamic Display: A dynamic display initiated by a MONITOR command is terminated by means of the STOPMN (PM) command.

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the STOPMN A command.
4. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to terminate and erase a dynamic display in display area A of console 12, enter the following:

```
PM A,L=12A
```

You can terminate and erase a display by placing the console in hold mode, positioning the cursor at the *PM indicator in the control line of the display, and pressing the SHIFT and ENTER keys (the *PM indicator does not appear when the display updating is suspended).

Note: You can establish default routing location operands for the STOPMN command by means of the MSGRT command. MSGRT and STOPMN are described in the Operator's Reference, GC28-6691.

How to Change the Time-Interval for Display Updating: To change the time interval for updating of dynamic displays:

1. On the master console, move the cursor to the first position in the entry area.
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL M,UTME=nnn command; where nnn is a decimal number from 30 to 999 indicating the number of seconds in the time interval.
4. Position the cursor after the last character in the command and enter the command by holding down the SHIFT key and pressing the ENTER key.

There is only one time-interval for all of the dynamic displays on all of the consoles in the system. To set the time interval so the dynamic display will be updated by the system every two minutes (120 seconds), enter the following command:

```
K M,UTME=120
```

You can check the current value for the time interval by entering:

```
K M,REF
```

This will cause the current time interval to be displayed in the entry area in control command form; as, for example:

```
K M,UTME=120
```

You can then change the time interval, by using the procedures described in this chapter under the heading "How to Change Information in the Entry Area." To change the time interval in the above example to 60 seconds, position the cursor at the 1, type in 60, blank the remainder of the entry area, and perform an enter action.

Note 1: If the master console is a non-display console, the system will respond to the K M,REF command by displaying:

```
IEE922I K M,UTME=nnn
```

where nnn is the current value of the time interval. You can then change the time interval by entering another K M,UTME=nnn command.

Note 2: If there are dynamic displays in progress when you change the time interval, the new interval will not take effect until the current interval elapses.

CONSOLE MODE

The 2260 display console can operate in two modes:

- Full-Capability Mode: A console in full-capability mode has both input and output capability; the console can be used to enter commands to the system and to display operator messages. One full-capability console is the master console; there may be many full-capability consoles in the system.

- **Output-Only Mode:** An output-only display console can be used only to display the operator messages; it cannot be used to enter information to the system. There are two forms of output-only mode: message stream mode, which applies to output-only display consoles designated for the presentation of messages other than status displays; and status display mode, which applies to output-only display consoles that have been designated for the presentation of system status displays.

VARYING CONSOLE MODE

You can vary a console's mode of operation: (1) from full-capability mode to output-only mode for presentation of either general messages (message stream mode) or status displays (status display mode); (2) from one output-only mode to the other (from status display to message stream, or vice versa); or (3) from output-only mode to full-capability mode.

System Requirements: You can vary console mode for 2260 display consoles that were originally designated as secondary consoles by means of the CONSOLE='address' operand of the SECONSLE system generation macro instruction. A console otherwise qualified for mode change cannot be changed to monitor mode while it is the master console in the system; you must first designate another console as the master console (for information about varying the master console, see the description of the VARY command in the Operator's Reference, GC28-6691).

Screen Format: When you vary a console from full-capability mode to output-only mode, the instruction line and the entry area are incorporated into the message area as shown in Figure 2260-3.

Once a 2260 display console has been placed in output-only mode, its input capability is nullified. You must use another console to make any requests concerning an output-only console.

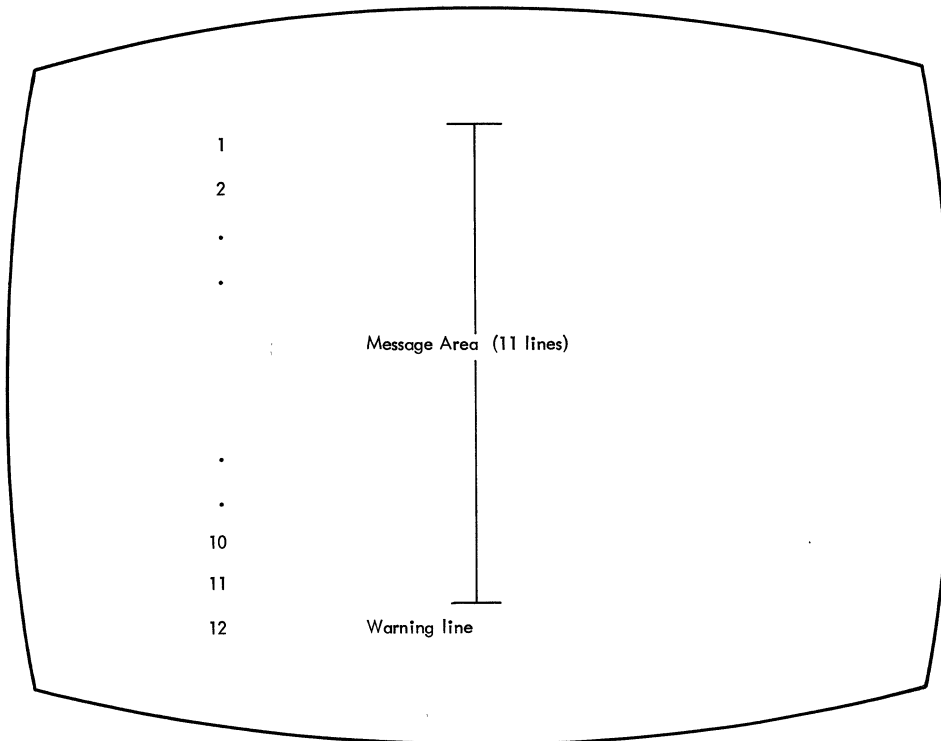


Figure 2260-3. Screen format in output-only mode

STATUS DISPLAY MODE

In status display mode, the console provides a convenient area for displaying system status information and frees screen space on the master console for use by other system messages.

How to Request Status Display Mode

To place a console in output-only mode for presentation of status displays:

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL V,USE=SD,L=cc command, where cc is the system-assigned identifier of the console whose mode you want to change.
4. Position the cursor after the last character in the command, and enter the command by holding down the SHIFT key and pressing the ENTER key.

For example, to change a 2260 console with system identifier 10 from full-capability mode to output-only mode for status displays, enter:

```
K V,USE=SD,L=10
```

In response to this request, the console's message area expands to 11 lines, and any information that had appeared in the instruction line or the entry area disappears. The display area specifications that were made during system generation go into effect, and you can check the specifications for console 10 by entering:

```
K A,REF,L=10
```

(This request, and any other requests concerning this console, must be entered on a different console.) In response to the K A,REF command, the following appears in the entry area of the console used to enter the command:

```
K A,nn,nn...
```

In the actual display the nn's are the number of lines in each area (the left-most number defines the bottom-most area).

Note: When moving from message stream mode to status display mode, the message area remains the same size (11 lines), and the system generation display area specifications go into effect.

Controlling Displays on Status Display Consoles

Procedures for requesting, framing, holding and terminating status displays (static and dynamic) are described in this chapter under the heading: "System Status Displays." Since the output-only console has no input capability, you must enter each request concerning the console on a full-capability console. Use the routing location operand (L=cca) with each command to designate the console and display area at which the

action is to be taken, or establish routing defaults by means of the MSGRT command (which is described in Operator's Reference, GC28-6691).

MESSAGE STREAM MODE

In message stream mode, the console provides an area for presentation of operator's messages away from the master console. The type of message sent to a message stream console depends on the routing codes assigned to that console. Message stream consoles are useful in providing system monitoring in tape or disk libraries, or for assisting in system security.

How to Request Message Stream Mode

To vary a console to output-only mode for display of operator messages other than status displays (message stream mode):

1. Move the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Place the console in hold mode by holding down the SHIFT key and pressing the ENTER key.
3. Type in the CONTROL V,USE=MS,L=cc command, where cc is the system-assigned identifier of the console whose mode you want to change.
4. Position the cursor after the last character in the command, and enter the command by pressing the SHIFT and ENTER keys.

For example, to change console 10 from full-capability mode to output-only mode for general message traffic, enter:

```
K V,USE=MS,L=10
```

In response to this request, the message area expands to 11 lines, and any information that had been in the instruction line or the entry area disappears. All display area specifications are removed.

Note: When changing from status display mode to message stream mode, the message area remains the same size, and the display area specifications are removed.

Routing Messages to Message Stream Consoles

The routing codes that are assigned to a console determine which messages are routed to that console. Routing codes are assigned during system generation, but you can alter the assignments by means of the VARY command. You can determine what routing codes are currently in effect for a console by means of the DISPLAY CONSOLES command. (VARY and DISPLAY CONSOLES are described in Operator's Reference, GC28-6691, and a description of routing codes is contained in Messages and Codes, GC28-6631.)

Deleting Messages from Message Stream Consoles

When a console is placed in message stream mode, roll-deletable message deletion mode goes into effect automatically. The majority of the screen messages are removed by the roll-deletable method without any intervention on your part. Intervention required messages will be removed by the system when the screen becomes full.

Note: If the screen should become full of action messages for which no action can be taken, it may be necessary for you to vary the console out of operator console mode (by means of the VARY command) in order to remove unwanted action messages. This should occur only in unusual circumstances.

RETURNING TO FULL CAPABILITY MODE

To return an output-only console to full-capability mode:

1. Position the cursor to the first position in the entry area (to the right of the START MI symbol).
2. Type in the CONTROL V,USE=FC,L=cc command, where cc identifies the console whose mode you want to change.
3. Position the cursor after the last character in the command, and enter the command by pressing the SHIFT and ENTER keys.

For example, to change console 10 to full-capability mode, enter:

```
K V,USE=FC,L=10
```

In response to this request, the message area of console 10 returns to eight lines, line nine becomes the instruction line, and lines 10 and 11 become the entry area. The display area specifications return to the specifications made during system generation, and you can check these specifications for console 10 by entering:

```
K A,REF,L=10
```

The specifications will appear in the entry area, and you can change the specifications using the procedures described under "How to Change Information in the Entry Area."

MAKING OTHER ALTERATIONS TO CONSOLE FUNCTIONS

The VARY command can be used to:

- Change the routing codes that are assigned to the console.
- Alter the location or characteristics of the hardcopy log.
- Make the display console available for other display device applications.

The VARY command is described in detail in Operator's Reference, GC28-6691.

ERROR CONDITIONS

Several types of errors may occur that directly affect the operation of display consoles. In some cases, the error will be made apparent by a sudden screen failure, the appearance of an error message, or the locking of the keyboard. In other cases, the error may not be immediately apparent. In general, errors may be caused either by a programming problem (system error) or a console malfunction (hardware error).

SYSTEM ERRORS

When certain types of system errors occur, the screen is blanked, and an error message appears in the center of the screen. Other types of system error conditions are characterized by an abnormal lack of console activity.

Blank Screen and Error Message

If the error message indicates that a recoverable system error has occurred, perform the action specified by the error message, and then press the CANCEL key. This should restore the screen. It is good practice to review the message traffic at this time to make certain that no messages were lost during error recovery.

If the error message indicates that an unrecoverable system error has occurred, the system must be loaded again. Follow normal procedures for initial program load (IPL), and notify the programmer responsible for the system.

Console Inactivity

Console inactivity is characterized by a lack of message traffic or system response to commands. It may be due to the level of system activity, or it may be the result of a problem in the message handling portion of the control program.

One function of the message handling portion of the control program is to check for the end line of a status display or other multiple-line message. If for some reason the system fails to detect the end line of either a status display or a multiple-line message to the operator, your console may be put into a condition of inactivity, awaiting completion of the display or message. This situation occurs because the system is designed to present all of the lines of a status display or multiple-line message, once it is begun, before presenting any other message on the console.

If your console seems to become abnormally inactive, check the system response by requesting a display of the time:

```
┌──────────────────────────────────────────────────────────────────────────┐
│ D T │
└──────────────────────────────────────────────────────────────────────────┘
```

The system should respond immediately (within a few seconds) with the time and date. If it does not respond, cancel any status displays being presented on the inactive console using an appropriate procedure for erasing a status display. If this does not return the console to normal activity, cancel any jobs that have written multiple-line messages to the console.

If neither of these procedures returns the console to normal activity, assume that there is some other problem related to the console. Check for a console hardware error. If possible, switch control to another console. If the system must be loaded again, follow normal procedures for initial program load (IPL). Report the occurrence of this problem to the programmer responsible for the system.

CONSOLE HARDWARE ERRORS

If a console hardware error occurs, one or more of the following conditions may occur:

- An error message is centered on the screen (the remainder of the screen is blank).
- The screen is completely blank.
- The keyboard is locked, and command entry is not possible.

Error Message Response

If a console error occurs, the following message may appear on the screen:

```

IEE170E RETRYABLE ERROR. RECENT ACTION MAY NEED TO BE
      REPEATED.
IEE170E PRESS THE CANCEL KEY TO RESTORE THE SCREEN.

```

Perform the indicated action. This should restore the screen, including messages displayed in the message area, the instruction line, and the warning line. The entry area is blanked, and the cursor is positioned to the first position in the entry area. Message numbering is terminated (if it was previously in effect).

Note: If you do not perform a CANCEL action, the system will automatically rewrite the screen (same effect as CANCEL) after about 30 seconds have elapsed. If a console hardware error results from keyboard input, the system will always regard it as a temporary error. If it becomes apparent to you that the error is permanent, switch control to an alternate console (procedures for console switch are described in Operator's Reference, GC28-6691). If you request a console switch, all messages, except status displays, are moved to the new console.

Blank Screen Response

If the console screen goes blank, a console switch is probably taking place. The following message should appear on the new console:

```

IEE143I OLD=xxx, NEW=xxx, VALDCMD=xx
IEE143I ROUTCDE=xx[,xx] T=x H=x

```

In the actual message, the appropriate values will appear in place of the x's. Use the alternate console to continue operating the system, and have the old console checked for the source of the error.

Locked Keyboard Response

Sometimes an error requiring console switch is serious enough that the system is unable to blank the screen. If you find that you cannot enter commands through a console that appears normal otherwise, try to restore the screen by performing a CANCEL action.

If a console switch has taken place, operate the system from the alternate console, and have the old console examined for the source of the error.

Note: Inhibited input, with or without keyboard locking, may also occur when the system goes into an ABEND wait state or if a problem occurs in the message handling portion of the control program. Check the procedures described for console inactivity under "System Errors."

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APPENDIX A: CONTROL COMMAND SUMMARY

The CONTROL command is the primary command for controlling display consoles. The command summary provides detailed information about each operand of the command; the fold-out sheet provides the command form and an example for each function that the command performs.

The CONTROL command has eight major functions which are requested by eight major operands:

- D: The display operand requests that certain information (such as message numbers or PFK numbers) be displayed on the screen, or it also requests framing, updating, and holding of status displays.
- E: The erase operand removes information from the screen.
- S: The specification operand establishes message deletion specifications.
- C,D: The cancel display operand terminates displays that are in the process of being written to a console.
- A: The area operand defines display areas for status displays.
- M: The master console operand (which can be entered only on the master console) changes the time interval for updating dynamic status displays.
- N,PFK: The program function keyboard operand associates operator commands with PFK keys.
- V: The vary operand changes the operating mode of the console.

The routing location operand (L=cca) can be used with several forms of the CONTROL command. It designates the console identification number (cc) and the display area (a) at which the indicated action is to take place.

CONTROL	<pre> D [,N [,HOLD] ,F } ,H } [,L=cca] ,U } ,PFK] E [,SEG ,nn [,nn] ,F ,D [,L=cca] ,N ,PFK] C,D,display id [,L=ccZ] S [,REF { Y ,DEL= { R } ,CON= { N } ,SEG=nn ,RNUM=nn ,RTME=nn { RD }] A [,REF ,NONE } [,L=cc] ,nn [,nn...]] M [,REF ,UTME=nnn] N ,PFK= (nn₁ { ,CMD='text [; text ...] ' }) ,CON= { Y { ,KEY=nn₂ , nn₂... } } { N } V ,USE= { FC { SD } ,L=cc { MS } </pre>
---------	---

DISPLAY OPERANDS

D

specifies that you want the message lines numbered, or that you want to move a status display forward to see different frames of the display.

{ N
{ N,HOLD }

specifies that you want a display of numbers in character positions 1 and 2 of each message line. Consecutive numbers appear on the screen in front of every message line, including continuation lines, that are currently displayed. As messages are added to the display, corresponding numbers are displayed also. HOLD specifies that you want the numbers displayed at all times. Unless HOLD is specified, numbers are removed from the screen when messages are deleted by any method except automatic message deletion. You must reenter CONTROL D,N (or CONTROL D) if you want the messages numbered. If automatic message deletion occurs (specified by CONTROL S,DEL=Y), messages are automatically renumbered. To remove the numbers (in either case), you can enter CONTROL E,N.

Note: If DEL=R or RD, the CONTROL D,N,HOLD option is canceled the first time the messages are rolled. Entering CONTROL D,N,HOLD while DEL=R or RD results in an error message.

- F** specifies that you want the status display moved forward to the next frame. (L=cca is valid after this operand.)
- H** specifies that you want to hold the dynamically updated status display. A dynamic status display is one that is updated according to a preset time interval. The CONTROL D,H command requests that updating be suspended. The routing location operand (L=cca) can be coded with this operand.
- U** specifies that you want to resume updating of a "held" dynamic status display. The routing location operand (L=cca) can be coded with this operand.
- PFK** specifies that the display of light pen detectable PFK key numbers is to be displayed in the PFK display line.

{ L=cc }
 { L=cca }

specifies the console (cc) and display area (a) containing the display to be controlled. L=cc indicates the console identification number of the console where the control action should take place. L=cca specifies the console and display area where the control action should take place. If no console is specified, and no default routing instructions have been established (see Note 1), the issuing console is assumed.

Note 1: Default routing instruction (L=cca) operands may be established by means of the MSGRT command. More information about default routing is available in Operator's Reference, GC28-6691.

Note 2: Console identification numbers and display area definitions for each console can be examined by requesting the DISPLAY CONSOLES display.

ERASE OPERANDS

- E** specifies that you want to erase messages, status displays, or the message line numbers. The operands that follow the E define the scope of the erasure.

SEG specifies that a segment of messages should be removed from the message area starting with the first (top) line. The number of messages deleted by CONTROL E,SEG depends on the segment size.

When CONTROL E,SEG is entered, messages 1 through the current value of SEG are removed. All deletable messages are removed; only those with asterisks in position 4 are not removed. (See "How to Delete Messages" for an explanation of deletable messages.)

Note 1: CONTROL (or K) with no operands is treated as a CONTROL E,SEG command.

Note 2: If you enter CONTROL E,SEG and the number of displayed messages is less than the current value of SEG, SEG temporarily defaults to the number of messages on the screen.

Note 3: If you enter CONTROL E,SEG and a status display is on the screen, the number of messages deleted is never greater than the number of visible messages. For example, if SEG=22 and there are 10 visible messages, the number of deletable messages is 10, or less than 10 if there are action messages on the screen. If the last visible message has a continuation line which is not displayed, that message is not removed.

nn or nn,nn

specifies that a single message (nn) or range of messages (nn,nn) is to be removed from the message area. The value specified as nn must be a number from one to the highest message number on the screen; nn,nn must be a range of numbers specified in ascending order. For example, entering CONTROL E,2,18 specifies that messages on line two through 18, are to be removed. Leading zeros are not necessary. If a range of messages is given (that is, nn,nn), only messages that are not marked with an asterisk in position four are removed. Messages containing an asterisk in position four may be removed one at a time. For example, if message three is an action message (marked with an asterisk), you can enter CONTROL E,3 to remove this message. This form should be used with caution because such messages may contain information required for continued operation of the system. The messages become deletable after the action is taken.

Note 1: If a range of messages is given, either nn can refer to a line that contains an action message; however, the action message is not removed.

Note 2: The E,nn,nn form may be thought of as overriding the segment indicated by CONTROL E,SEG. However, it overrides the segment only for this command; it does not change the value of SEG.

Note 3: If an out-of-line status display is on the screen, nn or nn,nn cannot refer to a line within the status display. If so, the following message is issued:

```
-----  
IEE151E DELETE REQUEST INCONSISTENT-INVALID RANGE  
-----
```

Note 4: If you enter CONTROL E,nn,nn and the second nn exceeds the number of messages displayed, the request is considered an error, and the following message is issued:

```
-----  
IEE151E DELETE REQUEST INCONSISTENT-INVALID RANGE  
-----
```

Note 5: When you are not given the opportunity to verify messages to be deleted (CON=N), you should first specify CONTROL D,N to display the message numbers.

If verification is required (CON=Y), you may wish to first specify CONTROL D,N to display message numbers, or you may wish to specify CONTROL E,nn[,nn] without displaying message numbers, since you can change the deletion request if necessary.

F

specifies that flagged messages are to be removed from the message area. Flagged messages are those messages identified (flagged) by a vertical or horizontal line in position three to the left of the message text. Examples of messages deleted by the F operand are: all NIP messages, all answered WTORS with their associated REPLYS, and information messages which require no operator action.

Note: Messages with an asterisk in position four are not flagged messages.

If DEL=Y, CONTROL E,F does not need to be entered to remove messages flagged with vertical lines. However, the messages flagged with a horizontal line are not removed automatically when DEL=Y.

D
specifies that the status display is to be removed from the display area. Any messages that were displaced by the display are rewritten on the screen. The routing location operand (L=cca) is valid with this operand.

N
specifies that the line numbers in character positions one and two are not to be displayed anymore. This is the only way to remove the line numbers if CONTROL D,N,HOLD has been entered. To display the line numbers again, you may enter CONTROL D,N or CONTROL D,N,HOLD. If DEL=R or RD, the line numbers are removed when the messages start rolling.

PFK
specifies that the display of light pen detectable PFK key numbers is to be erased from the PFK display line. The display of key numbers is requested by means of the CONTROL D,PFK command.

{L=cc }
{L=cca }

specifies the console (cc) and display area (a) containing the display to be controlled. L=cc indicates the console identification number of the console where the control action should take place. L=cca specifies the console and display area where the control action should take place. If no console is specified, the issuing console is assumed.

Note 1: Routing instruction operands (L=cca) may be predefined by means of the MSGRT command. More information about default routing is available in Operator's Reference, GC28-6691.

Note 2: Console identification numbers and display area definitions for each console can be examined by requesting the DISPLAY CONSOLES display.

CANCEL IN-LINE DISPLAY OPERAND

C,D
specifies that an in-line status display (that is, a status display being presented in that portion of the message area that has not been designated as a display area) is to be erased.

display id
is the identification number assigned to the display by the system. This identification number is found in the control line of the display.

L=ccz
specifies the console identification number (cc) and the display area identifier (z) containing the display to be erased. This form of the CONTROL command is used to erase status displays being presented in the unassigned message area.

Note: The CONTROL C,D,id,L=ccz command is also used to stop printing of a display on a non-display console. The K E,D,L=cca command

is used to erase a status display from a display area. The STOPMN command is used to stop and erase a time interval updated status display. (Information about the STOPMN command is available in Operator's Reference, GC28-6691.)

SPECIFICATION OPERANDS

S

specifies that the specification options are to be displayed or changed.

Note: All operands except REF are keyword; REF is positional and must be specified by itself.

DEL

specifies the mode of message deletion. If a hard copy device is not immediately available, DEL must equal N.

Y

specifies that messages having a vertical line in position three are automatically deleted when lines are needed to display more messages. Examples of messages marked with a vertical line are WTORS that have been answered and action messages when the action has been taken. A list of all deletable message types can be found under "Automatic Message Deletion" in the section "Deleting Messages." Automatic message deletion occurs only when the message lines are filled and another message is ready to be displayed or, if there is a status display, when the visible message area is filled. (The visible message area is defined as all lines above the first line of a status display.) The operand should not be specified in conjunction with CON=N. This could result in deletion of messages you do not want to delete. For further information on automatic message deletion, see "Automatic Message Deletion" under "How to Delete Messages."

N

specifies that automatic deletion of messages is not desired. Messages are not automatically removed from the screen; you must specify an erase command or use the cursor with a light pen to remove messages.

R

specifies that roll mode is desired. When space is needed on the screen to display new messages, a fixed number of messages (specified by RNUM) is removed from the screen at the rate specified by RTME. New messages are added as old messages are deleted. For example, if RNUM=1 and RTME=2, one old message is rolled, and one new message is displayed every two seconds. Both action and nonaction messages are removed from the screen. If there is a status display in a display area on the screen, roll mode takes effect as soon as a message is being overlaid by a status display. The status display itself is not rolled; all currently displayed line numbers are removed. The number of message lines remaining on the message queue is displayed in character positions one and two of the first new line on the screen. If more than 99 messages are waiting, AA appears in positions one and two.

Note 1: If you specify roll mode, the timer must be enabled at IPL and a hard copy device must be available at all times.

Note 2: CONTROL D,N[,HOLD] cannot be specified when DEL=R.

RD

specifies that only deletable (nonaction) messages are to be rolled. Action messages are moved toward the top of the screen as the other messages are rolled, but are not removed until after the action is taken. Action messages are not considered part of the RNUM value. In every other respect, roll-deletable mode operates the same as roll-mode.

CON

specifies whether conversational mode is in effect. If a hard-copy device is not available, CON must equal Y.

Y

specifies that conversational mode is in effect. You have the opportunity to verify the messages specified in the erase operands (E,SEG or E,nn[,nn] or E,F) before they are removed from the screen. For further information, see "Conversational Mode" under "How to Delete Messages."

N

specifies that conversational mode is not in effect. You do not have the opportunity to verify the messages to be deleted before they are removed from the screen. Removal of messages occurs immediately upon entry of the erase commands: E,SEG or E,F or K E,nn[,nn].

Note: If DEL=Y (when CON=N), extreme care should be taken when performing message deletion by using the erase command. If a full screen condition exists, it is possible for automatic deletion to occur a fraction of a second before the ENTER action is taken. This could result in the deletion of messages you do not wish to delete. Therefore, when CON=N, you should specify DEL=N.

SEG=nn

specifies the segment (number of messages) to be deleted when CONTROL E,SEG is entered. nn specifies a number from 0 to 47. SEG starts with line 1 and includes all message lines up to and including the line specified as nn.

RNUM=nn

specifies the number of message lines to be removed from the screen at one time when DEL=R or RD. nn must be a number from one to number of lines in the message area. nn cannot equal zero. If it does, the following error message is issued:

```
-----  
IEE156E INVALID OPERAND  
-----
```

If there are less than nn messages waiting on the queue, only the number of messages waiting is removed from the screen as new ones are added.

RTME=nnn

specifies the time interval for messages to be removed from the screen and new ones added when DEL=R or RD. nnn is a value from 1 to 999 seconds; a maximum of four seconds for each message specified by RNUM is recommended. RTME is initialized at two times the maximum number allowed in RNUM. If you change the RTME value to a lower interval than is currently specified, the timer elapses for the current (higher) interval before the new interval takes effect.

Example 1: If RNUM=1 and RTME=3, when space is needed for new messages, one new message is displayed every three seconds, with the top message (line 1) removed from the screen.

Example 2: If RNUM=8 and RTME=30, every 30 seconds, eight old messages are removed and up to eight new ones displayed. nnn cannot equal zero. If it does, the following error message is issued:

```
-----  
IEE156E INVALID OPERAND  
-----
```

REF

specifies that you want to refer to the current values of the specification option. The values appear in the entry area in CONTROL command format so that you can easily change the specification values. The cursor is positioned under the DEL value. To change any other value, move the cursor to the character position you want to change. Then type in the new value and perform the ENTER action. You may change more than one value with each request of REF.

Example: The format of the CONTROL S,REF response is as follows:

```
-----  
K S,DEL={Y},SEG=nn,CON={Y},RNUM=nn,RTME=nn  
-----
```

The cursor is positioned under the value for DEL. For any values you want to change, you can position the cursor under the value and type in the new character. Then enter the command.

Note: When you enter CONTROL S,REF and you still want the current values, cancel the command.

DISPLAY AREA OPERANDS

A

specifies the number and dimensions of the display areas for status displays, or requests a display of the display area specifications in effect for a console.

REF

specifies that you want a display of the display area specifications in effect for a console. The values appear in the entry area in CONTROL command format. To change any value, position the cursor under the character to be changed, type in the correct information and enter the command. The routing location operand (L=cc) is valid with this operand.

NONE

specifies that you want to cancel all of the display area specifications in effect for a console. The routing location operand (L=cc) is valid with this operand.

nn

specifies the number of lines in a display area. nn is a number from 4 through the number of lines in the message area. The first nn defines the bottom-most lines of the message area; additional nn's define contiguous lines above the first area, working toward the top of the screen. The total number of lines defined by nn cannot exceed the number of lines in the message area. The routing operand (L=cc) is valid with this operand.

L=cc

specifies the identification number (cc) of the console for which you want to define, cancel, or redefine display areas.

MASTER CONSOLE OPERANDS

M

specifies that the master console operands are to be displayed or altered.

REF

requests a display of the current master console operands. The values appear in the entry area in the CONTROL command format. You can alter them by positioning the cursor at the value to be changed, typing in the correct information, and entering the command.

UTME=

specifies the time interval to be used for automatically updating the MONITOR A status display.

nnn

is a two- or three-digit decimal number representing the number of seconds in the time interval. The allowable range is 30 to 999.

Note: CONTROL M commands can be issued only from the master console.

PROGRAMMED FUNCTION KEYBOARD OPERANDS

N, PFK

specifies that a PFK key or a PFK display line number is to be defined or redefined.

nn₁

specifies the number of the key or the PFK display line number that is being defined or redefined.

CMD=

specifies that the text in the 'text' parameter is one or more operator commands. These commands are to be associated with the key number specified by nn₁.

'text'

is any valid operator commands. One or more commands may be defined; each command should be separated from the next by a semicolon. A maximum of 101 characters (including semicolons) may be coded between the apostrophes.

KEY=

specifies that the commands previously associated with the key numbers specified by nn₂ are to be associated with the key number specified by nn₁.

nn₂

is the number of a key (or PFK display line number) that has already been associated with one or more commands. The commands associated with key nn₂ are associated with key nn₁ by means of this specification (the specification for key nn₂ remains unchanged). A list of key numbers may be specified after the KEY= operand, and the commands associated with each nn₂ will be associated with key nn₁. Individual nn₂ numbers must be separated by a comma. Up to 52 key numbers may be included in the list.

CON=

specifies the mode -- conversational or nonconversational -- for the key or detectable key number specified by nn₁.

Y

specifies that key nn_1 is used in conversational mode. When entry is made for a key in conversational mode, either by pressing the PFK key or selecting the number from the PFK display line with the light pen, the first command associated with the key is displayed in the display area. The command can then be entered, altered and entered, or canceled. When action is complete on the first command, the next command is displayed.

N

specifies nonconversational mode for key nn_1 . When entry is made for a key in nonconversational mode, all of the commands associated with that key are entered immediately without being displayed in the entry area.

Note: If CON=Y is specified for key nn_1 , all commands associated with it by means of the KEY operand will be displayed in the entry area for verification regardless of their previous designation.

VARY CAPABILITY OPERANDS

V

specifies that the capability of a console is to be varied either to monitor (output-only) mode or to full-capability mode of operation.

USE=

indicates the mode of operation to which the console specified is to be varied. The routing location operand (L=cc) can be coded with this operand.

FC

indicates that the console is to be placed in full-capability (input and output) mode of operation.

SD

indicates that the console is to be placed in monitor mode of operation for the presentation of status displays (status display mode).

MS

indicates that the specified console is to be placed in monitor mode of operation to display the normal operator messages (message stream mode).

L=cc

specifies the identification number (cc) of the console whose mode is to be changed.

Function	Command Form	Example	System Response			
STATUS DISPLAYS						
Define one or more display areas for status displays	K A, nn[, nn...][, L=cc]	K A, 6, 4, L=10	Two display areas are defined for console 10; the bottom area is six lines long and the top area is four lines long.			
Cancel all display area definitions for a console	K A, NONE[, L=cc]	K A, NONE, L=10	All display area definitions for console 10 are canceled.			
Check the display area definitions in effect for a console	K A, REF[, L=cc]	K A, REF, L=10	The current display area definitions are displayed in the entry area in CONTROL command form.			
Request the next frame of a status display	K D, F[, L=cca]	K D, F, L=10A	The next frame of the status display in display area A of console 10 is displayed.			
Suspend updating of a dynamic display	K D, H[, L=cca]	K D, H, L=10A	Updating of the dynamic display in area A of console 10 is suspended.			
Resume updating of a dynamic display	K D, U[, L=cca]	K D, U, L=10A	Updating of the dynamic display in area A of console 10 is resumed.			
Change the time interval for updating of dynamic displays	K M, UTME=nnn	K M, UTME=60	The time interval for updating of dynamic status displays is changed to 60 seconds.			
Check the time interval in effect for updating dynamic displays	K M, REF	K M, REF	The current value for the time interval for updating dynamic status displays is displayed in the entry area in CONTROL command form.			
Erase a status display from a display area	K E, D[, L=cca]	K E, D, L=10A	The status display is removed from display area A of console 10 (Note: dynamic status displays are canceled by means of the STOPMN command).			
Cancel a status display that is in progress in the general message area of a display console or on a hardcopy console	K C, D, id[, L=cca]	K C, D, 121, L=10Z	The status display with identification number 121, which is in progress on console 10, is stopped.			
PFK COMMAND ENTRY						
Associate a PFK key number with operator commands	K N, PFK=(nn ₁ , CMD='text[;text...]', CON=x)	K N, PFK=(5, CMD='S RDR.001;S WTR.292'), CON=N	PFK key #5 and the 5 in the PFK display line are associated with the START RDR and START WTR commands. Nonconversational mode is in effect for key #5.			
Associate a PFK key number with the operator commands associated with other key numbers	K N, PFK=(nn ₁ , KEY=nn ₂ [, nn ₂ ...]), CON=x	K N, PFK=(5, KEY=1, 2, 3), CON=Y	PFK key #5 and the 5 in the PFK display line are associated with all of the commands that are associated with key numbers 1, 2, and 3. Conversational mode is in effect for key #5.			
Display numbers in the PFK display line for light pen command entry	K D, PFK	K D, PFK	The key numbers are displayed in the PFK display line.			
Erase the PFK display line	K E, PFK	K E, PFK	The PFK display line is erased.			
CONSOLE MODE						
Vary console mode	K V, USE= <table style="display: inline-table; vertical-align: middle;"><tr><td>FC</td></tr><tr><td>SD [, L=cc]</td></tr><tr><td>MS</td></tr></table>	FC	SD [, L=cc]	MS	K V, USE=SD, L=10	Console 10 is changed to an output-only console for presentation of status displays.
FC						
SD [, L=cc]						
MS						



Function	Command Form	Example	System Response
MESSAGE DELETION			
Display message numbers for one message deletion	K D,N	K D,N	All message lines (including continuation lines) are numbered until a message deletion or a CANCEL action is performed.
Display message numbers at all times	K D,N,HOLD	K D,N,HOLD	All message lines are numbered; the numbers are restored after each message deletion.
Erase one message line	K E,nn	K E,10	Message line 10 is deleted even if it is an action message.
Erase a range of messages	K E,nn,nn	K E,1,5	All of the nonaction messages in message lines 1 through 5 are deleted.
Erase all flagged messages	K E,F	K E,F	All of the messages with a vertical or horizontal line in position 3 are deleted.
Erase the message line numbers	K E,N	K E,N	Message line numbers are erased.
Erase the messages specified in the SEG operand	K E,SEG	K E,SEG	Assuming SEG has been set to 10, all of the nonaction messages in message lines 1-10 are deleted.
Specify the number of messages to be deleted when K E,SEG is entered	K S,SEG=nn	K S,SEG=10	The value of SEG is set to 10; when K E,SEG is entered, all of the nonaction messages in lines 1-10 are deleted.
Request automatic mode of message deletion	K S,DEL=Y	K S,DEL=Y	Automatic mode goes into effect; when the screen becomes full, all messages marked in position 3 are deleted.
Request roll mode of message deletion	K S,DEL=R	K S,DEL=R	Roll mode goes into effect; the number of messages specified by RNUM are deleted from the screen if the screen is full when the time interval elapses.
Request roll-deletable mode of message deletion	K S,DEL=RD	K S,DEL=RD	Roll-deletable mode goes into effect; the number of deletable messages specified by RNUM are removed from the screen if the screen is full when the time interval elapses.
Change the time interval for rolling messages	K S,RTME=nn	K S,RTME=90	The time interval is changed to 90 seconds; when roll mode or roll-deletable mode is in effect, messages are rolled every 90 seconds.
Change the number of messages to be rolled	K S,RNUM=nn	K S,RNUM=10	The number of messages rolled is changed to 10; when roll mode or roll-deletable mode is in effect, ten messages are rolled every time that the time interval elapses.
Cancel automatic message deletion	K S,DEL=N	K S,DEL=N	Automatic message deletion is ended.
Request conversational mode of message deletion	K S,CON=Y	K S,CON=Y	Conversational mode of message deletion goes into effect; this allows you to verify all deletion requests before they are accomplished.
Cancel conversational mode of message deletion	K S,CON=N	K S,CON=N	Conversational message deletion is ended; your deletion requests are effective as soon as you enter them.
Check the message deletion specifications in effect	K S,REF	K S,REF	The current values for DEL, SEG, RTME, RNUM, and CON are displayed in the entry area.

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Action message: A message that requires you to perform some action. It is marked with an asterisk in character position four.

Automatic message deletion: A CONTROL command option specifying that all messages marked with a vertical bar in character position three are to be deleted when the screen is full. Specified by CONTROL S,DEL=Y.

Continuation line: Any message that is longer than 72 (70 on the 2250) characters is displayed on two lines, the second of which is referred to as a continuation line. It is indented one character position; that is, it starts in position six.

Conversational mode: The mode of console operation that allows you to verify the deletion of selected messages before they are deleted from the screen.

Cursor: An underscore that specifies where on the screen the next character typed by you is displayed. You may also use the cursor to delete messages and status displays.

Display area: A group of message area lines that are designated for the presentation of system status displays.

Deletable message: A message that requires no action (or no further action) by you. It contains a horizontal (-) or vertical (|) line in character position three or is blank in positions three and four. Also referred to as a nonaction message.

Flagged messages: Any messages that are marked with a vertical (|) or horizontal (-) bar in character position three.

Frame: A segment of a status display. Usually the entire status display cannot be displayed on the screen at one time; each segment of the display is referred to as a frame.

Full-capability console: A console that includes a device for displaying messages (such as a cathode-ray tube) and a device for entering commands (such as a typewriter keyboard).

Message stream mode: The mode of output-only console operation in which the console displays only operator messages other than system status displays.

Nonaction message: See "Deletable message."

Nonconversational mode: The mode of console operation that specifies that messages are removed from the screen immediately after you enter a deletion request.

Nondeletable message: A message that requires you to perform some action. It is marked with an asterisk in character position four. Also referred to as an action message.

Output-only console: An operator's console with active output capability but with no active input capability.

Roll-deletable mode: A method of deletion that removes only deletable messages from the screen at the interval specified in the RTME specification operand of the CONTROL command.

Roll mode: A method of deletion that removes a specified number of messages (RNUM) from the screen at the interval specified in the RTME specification operand of the CONTROL command.

Segment: The number of message lines that are removed from the screen when CONTROL E,SEG is entered.

Status display: A formatted, multiple-line display of system information that is displayed on an operator's console in response to a DISPLAY or MONITOR command. On display consoles, status displays are presented in display areas whenever possible.

Status display mode: The mode of monitor console operation in which the console displays only status displays.

Visible message area: When a status display is on the screen, the visible message area is all lines above the first line of a status display. Any messages displayed here are referred to as visible messages.

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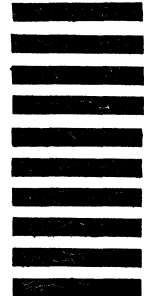
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