49762900

CONTROL DATA CORPORATION

STREAMING TAPE UNIT 92185 SERIES

GENERAL DESCRIPTION
OPERATION
INSTALLATION AND CHECKOUT

HARDWARE MAINTENANCE MANUAL

REVISION RECORD

REVISION	DESCRIPTION
G (05-24-85) Series Code 12	This revision incorporates technical changes and corrections affecting pages: 3-35, 3-37, A-1, A-2, B-1, B-2. ECO 51664
G.1 (06-12-85) Series Code 12	This revision incorporates technical changes and corrections affecting pages: C-1/2 and D-1 thru D-5/6.
G.2 (07-16-85) Series Code 12	This revision incorporates technical and editorial changes affecting pages: 3-6, 3-7.
H (08-19-85) Series Code 13	This revision incorporates ECO PB 51703 and other technical and editorial changes affecting pages: iii, iiia, viii, ixa/b, 3-35, 3-37, 3-40, 3-42, C1 thru C-6, D-2, D-4, D-5/6. ECO PB 51629 is not applicable to this manual.
H.1 (09-06-85) Series Code 13	This revision includes technical changes affecting pages: C-3 and C-4.
H.2 (09-15-85) Series Code 13	This revision includes technical changes affecting pages: vii, viii, ixa/b, A-1 thru A-4, B-1, C-1, C-2, C-3, C-5, C-6, D-1.
PUB. NO. 49762900	Revision letters I, O, Q, and X are not used.

REVISION RECORD

REVISION	DESCRIPTION
A (03-29-84)	Released.
B (04-13-84) Series Code 04, 05, 06	This revision incorporates technical changes affecting pages: 1-3, 1-4, 2-1, 2-15, 3-1, 3-6, 3-19, 3-19B.
C (09-14-84) Series Code 07	This revision incorporates technical changes and corrections affecting pages: iii, vii/viii, 1-5, 1-8, 1-9, 2-9, 2-14, 3-6, 3-8, 3-15 thru 3-36. Added pages 3-37 thru 3-44.
C.1 (09-21-84)	This interim update incorporates ECO PB 51520 affecting pages: 3-10, 3-11, and 3-12. ECO's PB 51476, 51477, 51489, and 51516 N/A.
D (10-19-84) Series Code 08	This revision incorporates technical changes and corrections affecting pages: 1-2, 1-3, 1-8, 2-5, 2-6, 2-8, 2-9, 2-10, 2-12, 2-13, 2-15, 2-16, 3-1, 3-2, 3-7 thru 3-13, 3-15 thru 3-19, 3-21, 3-22, 3-23, 3-31, 3-34, 3-38, 3-40. Added pages 3-10A thru 3-10D. ECO's PB51380, 51520, 51533, and 51540 N/A.
E (01-18-85) Series Code 09	This revision incorporates Appendices A and B adding pages: A-1 thru A-4, B-1 thru B-4 and viii. ECO's PB 51419B, 51515, and 51533A N/A.
E.1 (01-23-85) (02-22-85) Series Code 09, 10	This interim update incorporates technical changes and corrections affecting pages: iii, 1-9, 3-8, 3-10A, 3-10B, 3-13, 3-34, A-2, B-2. Added page iiib. ECO 51419C N/A.
F (3-22-85) Series Code 11	This revision incorporates technical changes and corrections affecting pages: 1-9, 1-11, 2-6, 2-7, 2-8, 3-15, 3-17, 3-18, 3-19, B-3, and added page iiia. ECO's PB 51615 and 51638 N/A.
PUB. NO. 49762900	Revision letters I, O, Q, and X are not used.

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Norristown, PA 19403

or use the comment sheet in the back of this manual.

WARNING

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A peripheral computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his own expense, will be required to take whatever measures may be required to correct interference.

NOTE

In the back of this publication is a self-addressed folding envelope with a comment sheet. Please use this comment sheet to let us know of any discrepancies you find in this manual.

The instructions for the operator (Publication No. 49762900, Section 2) are written for a person with non-technical background. The remainder of Publication No. 49762900 (Sections 1 and 3) is written for a person with technical background and experience with similar peripheral equipment.

It is assumed that any user of Publication No. 49763000 or Publication No. 49763100 is a qualified customer engineer with experience and/or training on similar peripheral equipment. The documents identified above are available through the nearest Control Data Corporation Sales Office.

PREFACE

This manual (Publication No. 49762900) furnishes the information needed to install, operate, and perform basic operator maintenance on the 92185 Series Streaming Tape Unit (STU). Section 1 (General Description) and Section 3 (Installation and Checkout) are written for use by a person with a technical background and experience with similar peripheral equipment. Section 2 (Operation) is written for a person with a non-technical background.

Related publications of this manual are Publication No. 49763000 (92185 STU - Vertical Mount) and Publication No. 49763100 (92185 STU - Horizontal Mount).

It is assumed that any user of Publication No. 49763000 or Publication No. 49763100 is a qualified customer engineer with experience and/or training on similar peripheral equipment. The documents identified above are available through the nearest Control Data Corporation Sales Office.

The content of each of the manuals described above is as follows:

- Publication No. 49762900

  Section 1 - General Description
  Section 2 - Operation
  Section 3 - Installation and Checkout

- Publication No. 49763000 (Vertical Mount STU)

  Section 4 - Theory of Operation
  Section 5 - Diagrams
  Section 6 - Maintenance
  Section 7 - Parts Identification

- Publication No. 49763100 (Horizontal Mount STU)

  Section 4 - Theory of Operation
  Section 5 - Diagrams
  Section 6 - Maintenance
  Section 7 - Parts Identification

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GENERAL DESCRIPTION 1

GENERAL

The streaming tape unit (STU) is a microprocessor-controlled electro-mechanical assembly that includes all hardware and firmware necessary for the transfer of phase encoded (PE) or group coded recording (GCR) data to and from half-inch wide magnetic tape.

Solid-state electronics replace many traditionally mechanical devices. The STU does not contain a capstan with motor drive, tension arm, vacuum column, or associated components. Tape tension as the tape moves from reel to reel is kept constant by an electronically controlled servo mechanism. Read/Write functions are accomplished in an ECMA and ANSI compatible format at 1600 bpi phase encoded or 6250 bpi group coded recording.

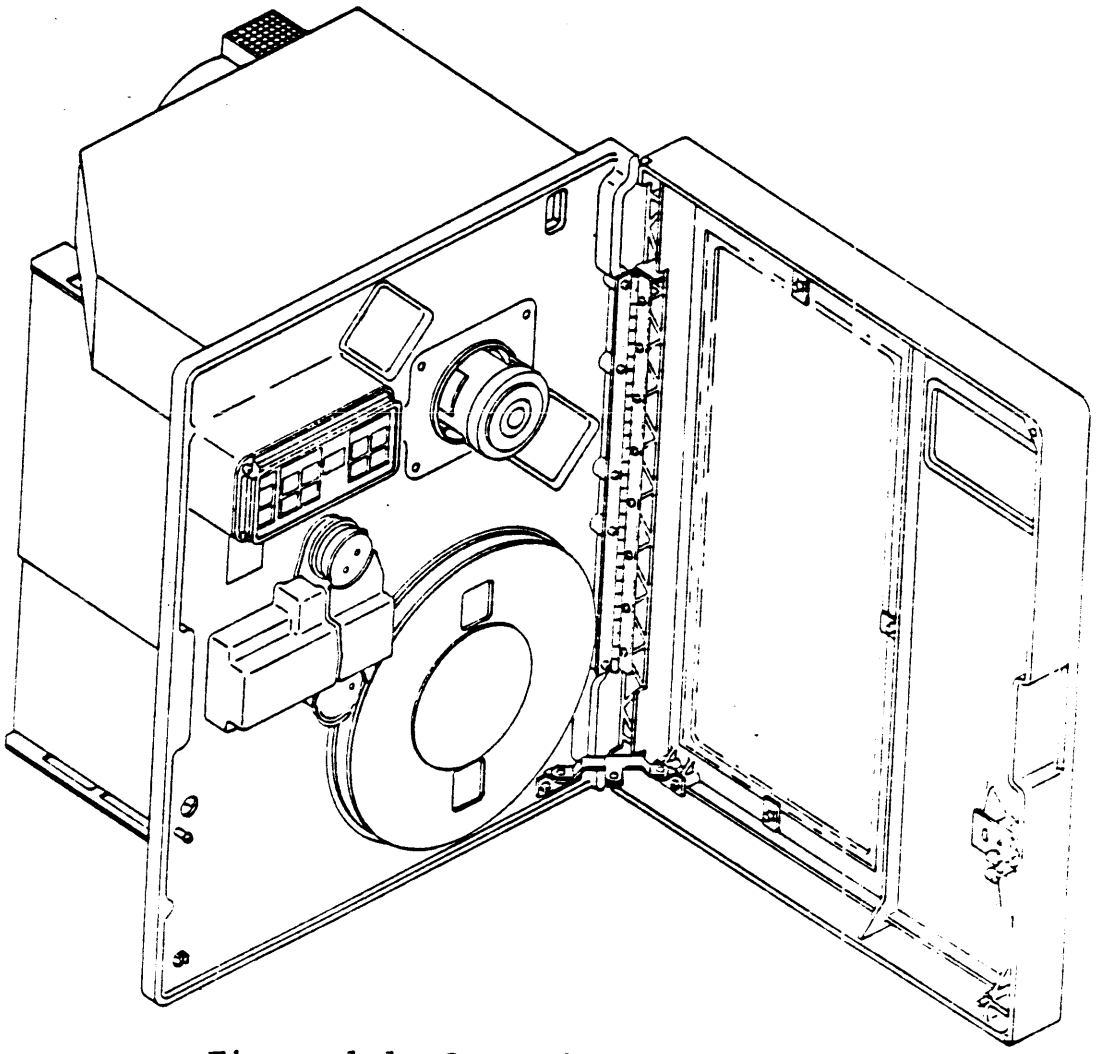


Figure 1-1. Streaming Tape Transport

A standard STU includes a tape deck with a read/write head, reel hubs, servo motors, power supply and air bearings. Printed circuit boards contain the following electronic features: servo power amplifier, read/write, reel servo control, data encoding and decoding, and two microprocessors with their support devices (for transport control in both the operational and diagnostic modes). The device features a quick-release reel latch which, like its simplified tape threading path, is designed for ease of operation.

Multiple data-transfer-rate capability is achieved by allowing selection of the 25 ips modes and 75 ips streaming mode, and density selection through the adapter interface. The 25 ips modes operate at an instantaneous data rate of 40,000 bytes/second when in PE mode and 156,250 bytes/second when in GCR mode. The 75 ips streaming operates at 120,000 bytes/second when in PE mode and 468,750 bytes/second when in GCR mode.

Selection of either a usual inter-block gap (IBG) length of 0.6 inch or a longer IBG length of 1.2 inches when in PE mode, and 0.3 inch or a longer IBG length of 0.6 inch when in GCR mode is also available through the adapter interface. Optionally, long and short gaps can be selected to be variable length.

Off-line diagnostic routines are designed into the transport and are capable of isolating faults throughout its electronics (except in the area of interface to the host I/O controller). These diagnostic routines are initiated via the operator's control panel and are discussed in detail in section 2 - OPERATION. On-line diagnostics are possible with the transport, and the host I/O controller is capable of monitoring transport status through the SENSE TRANSFER command. In addition to the off-line routines initiated by the control panel, power-on health checks are also an integral part of the STU. The STU automatically performs a "power-on health check" sequence of routines each time application of its power is applied.

STU mechanical and electrical characteristics are shown in table 1-1.

TABLE 1-1. MECHANICAL & ELECTRICAL CHARACTERISTICS

FUNCTIONAL CHARACTERISTICS:	
Tape Speed (Nominal)	
Low Speed Start/Stop Mode	25 inch/seconds
Low Speed Streaming Mode	25 inch/seconds
High Speed Streaming Mode	75 inch/seconds
Data Format/Recording	
GCR Mode	6250 bpi, 9-track
PE Mode	1600 bpi, 9-track
Data Transfer Rate	
GCR Mode	
High Speed	469 Kbyte/seconds
Low Speed	156 Kbyte/seconds
PE Mode	
High Speed	120 Kbyte/seconds
Low Speed	40 Kbyte/seconds
Rewind Time (Nominal)	2.5 minutes (2400 foot reel)
Load Time (Maximum)	15 seconds
PHYSICAL CHARACTERISTICS:	
Electronics	Solid-State
Tape Width	12.65 mm (0.5 inch)
Tape Thickness	38.1 micron (1.5 mil)
Tape Tension	2.23 N (8.0 ounces)
Reel Diameter	26.7 cm (10.5 inches) *
Reel Capacity	732 m (2400 feet) *
Transport Dimensions	60.9 cm (H) x 48.26 cm (W) x 38.6 cm (D) (24.0 inch (H) x 19.0 inch (W) x 15.2 inch (D))
Transport weight	49.90 kg (110 pounds)
Mounting	Vertical or Horizontal

* Smaller tape reels are also allowed.

TABLE 1-1. MECHANICAL AND ELECTRICAL CHARACTERISTICS (Contd)

OPERATIONAL CHARACTERISTICS	
Power Requirements:	
Current, Maximum	4.2A
Voltage	93 to 128 VAC, 120 VAC nominal, 60 Hz, single phase 187 to 256 VAC, 220 or 240 VAC nominal, 50 Hz, single phase
Power Consumption	300 VA - standby and loaded 550 VA maximum - start/stop
Power Cord	Supplied with 60 Hz STU only. Minimum power cord requirement for basic unit is #18 AWG, 3-conductor shielded with shield tied on each end to green-yellow ground wire. Power cord must be re-sized for any additional load added by the user.
Operating Temperature **	15°C (60°F) to 33°C (90°F)
Storage Temperature	-10°C (+14°F) to 50°C (+122°F)
Relative Humidity	20% to 80% (no condensation) (10% to 90% in storage)
Altitude	Up to 3048 m (10,000 feet) or 688 millibars (9.98 psi)
Heat Dissipation (Average)	1025 BTU/hour
Acoustical Noise (Operating)	6.8 bels (maximum)
Data Reliability:	
Recoverable Write Error	1 in 10^7 bytes
Recoverable Read Forward Error	1 in 10^9 bytes (PE) 1 in 5×10^9 bytes (GCR)
Recoverable Read Reverse Error	1 in 10^8 bytes (PE Only)
Unrecoverable Read Error	1 in 10^{10} bytes (PE) 1 in 10^{11} bytes (GCR)
Unrecoverable Write Error	Not Allowed

** Restricted by the operating temperature of the media.

PHYSICAL DESCRIPTION

The STU is designed to be hinge-mounted in a standard 19-inch equipment rack in the vertical position or adapted to a horizontal mount. It is also available in a cabinet with horizontal orientation. All components are mounted to provide rear access. When the equipment rack or enclosure is securely anchored, the assemblies mounted on the rear of the tape deck can be accessed by releasing the deck latch and swinging the transport open on its hinges (vertical), or rotating transport deck (horizontal).

A plastic hinged front cover protects the transport from dust and other foreign matter. A window in the front cover allows observation of tape motion. Also, the control panel mounted on the front of the tape deck is accessed via a cut-out in the front cover. The power cord (standard 3-prong grounded plug) is connected at the rear of the transport, as are the customer-supplied interface cables.

TAPE DECK - FRONT

The following components are located on the front of the transport. Refer to figure 1-2 for component locations. A brief description of the components and their function is provided as follows.

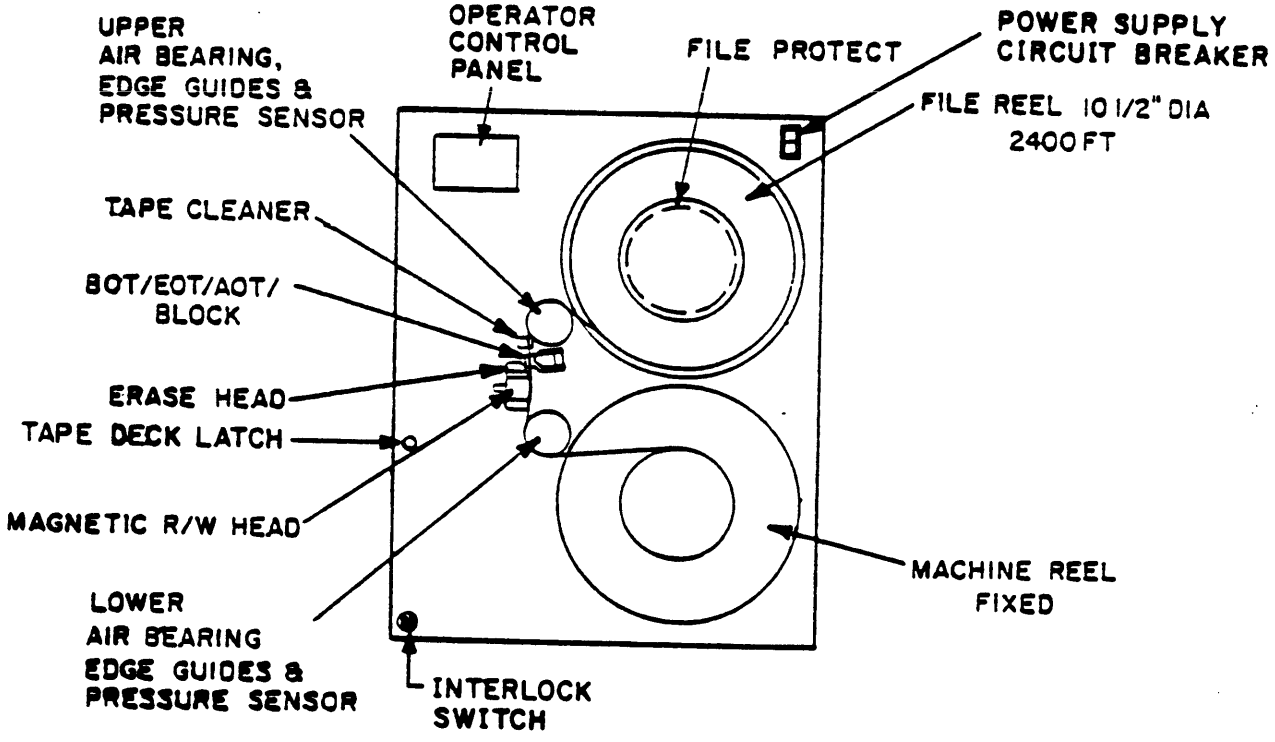


Figure 1-2. Component Locations, Front View

Reels and Reel Motors

The supply hub is a manual mechanical-latching device that secures the tape reel to the unit. The supply reel is latched by pressing the periphery of the hub face while the reel is in position against the rear flange of the hub. The supply reel is released by pressing the center button of the hub face. The supply reel motor has a single-line tachometer whose output is used to monitor tape capacity and tension control. The take-up reel is a permanently mounted reel secured to the take-up motor shaft. The take-up reel motor has a 1,000 segment tachometer attached to supply velocity control information.

Upper and Lower Air Bearings

Solid-state air pressure sensors integrated into the air bearings provide information to both the supply reel and to the take-up reel to maintain the required tension and speed. In addition, both upper and lower air bearing assemblies provide guidance of the tape across the magnetic head.

BOT/EOT/AOT Assembly

Beginning-of-tape and end-of-tape detection is done optically. Photo-transistors detect light from a light source reflected from the BOT and EOT markers on the tape. An absence-of-tape (AOT) condition is detected when both the BOT and EOT photo-transistors detect the presence of light reflected from a unit-mounted reflector, which is normally covered by tape.

Magnetic Head Assembly

The magnetic head is a dual-gap head designed to perform the read/write functions in 9-track phase encoded (PE) and group coded recording (GCR) modes. A full width erase head is provided to erase tape in the forward direction before passing over the write head.

Tape Cleaner

The tape cleaner assembly consists of two sapphire blades and a vacuum port. The sapphire blades are set so that one cleans tape in the forward direction and the other cleans in the reverse direction. The vacuum port draws off the debris removed by the cleaner blade.

File Protect

The file protect assembly consists of a 360° reflecting ring around the supply hub and a photo-transistor mounted adjacent to the reflecting ring. If a write-enable ring is installed in the supply reel, the reflecting ring is in direct line with the photo-transistor. If a write enable ring is not present, then the reflecting ring is out of the path of the photo-transistor.

Power Supply Circuit Breaker

The main circuit breaker is located at the top right corner of the tape deck. In the OFF position (0 side pressed), input power is removed from the power supply. This circuit breaker must be ON (1 side pressed) in order to perform a power-on operation from the control panel.

Control Panel

The control panel, which is located at the top left of the tape deck (vertical mount), comprises operating and maintenance switches and indicators, and a two-digit display. The maintenance controls and the display are used to initiate off-line diagnostic tests and to monitor test results.

Front Cover Interlock

The transport is equipped with an interlock switch/front cover latch located at the lower left corner of the tape deck. This interlock is basically a safety device to prevent reel motion if the front cover is not closed and secured.

Tape Deck Latch

This latch enables access to the components and interface cables located on the rear of the tape deck.

TAPE DECK - REAR

The following components are located on the rear of the transport. Refer to figure 1-3 for component locations. A brief description of the components and their function is provided as follows.

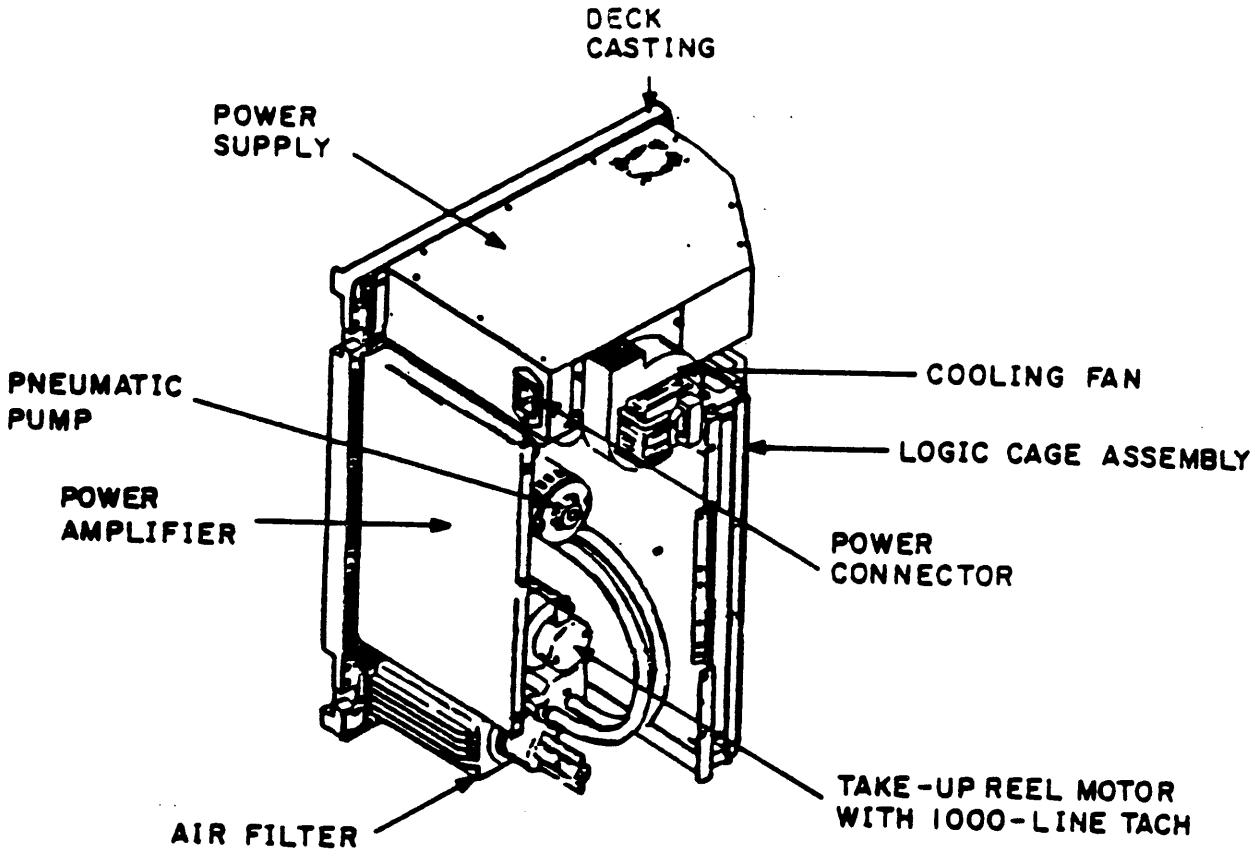


Figure 1-3. Component Locations, Rear View (Cover Removed)

Power Supply

The power supply converts the input ac voltage to the required dc output voltages. The supply contains a line filter, unit circuit protectors, on/off circuit breaker, logic master clear circuit, pneumatic pump motor control, cooling blower control, and voltage and current supply monitor circuits.

Pneumatic Pump and Filter/Regulator System

The pneumatic pump has a 120V (60 Hz) or 220/240V (50 Hz) ac motor. The output air is routed to a filter where any particles are removed before air distribution to tape deck components; principally the upper and lower air bearings. The vacuum portion of the pump draws air through the tape cleaner.

Power Amplifier Assembly

The power amplifier assembly receives the low voltage analog signals from the control logic and outputs a higher voltage, high current to the reel motors. Outputs are dependent on the requirements of the velocity and tension servo systems.

Cooling Fan

The cooling fan is a squirrel-cage type assembly located at the rear of the power supply. Cooling air is drawn across the rear deck assemblies and through the power supply. The fan motor is compatible with either 120 or 240 volt operation.

Logic Cage Assemblies

There are six PC boards mounted into two separate logic cages. The circuitry that resides on the PC boards are the interface, formatter write, and formatter read in one logic cage assembly, and the read amplifier, write driver, and servo/control boards in the other logic cage assembly.

EQUIPMENT CONFIGURATION

The equipment configuration of the transport is determined by the equipment identification plate plus the equipment configurator log that must be present with every transport. A description of the ID plate and the FCO log is given in the following paragraphs.

Equipment ID Plate Location

Vertical rack-mounted STU - ID plate located inside lower right of the front door.

Horizontal STU in cabinet - ID plate located on the support bracket inside the cabinet, behind the front door.

Horizontal STU without cabinet - ID plate located on the lower right hand side of the power amplifier bracket. This ID plate does not have the (UL) symbol.

Refer to Figure 1-4 for the following items contained on the plate.

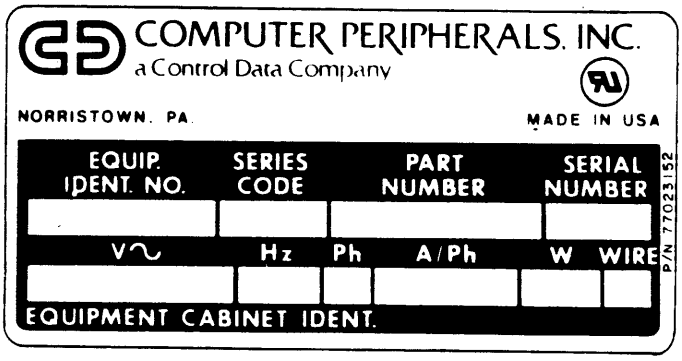


Figure 1-4. Equipment Identification Plate

Equipment Identification Number

The BY3 identifies the basic function and major design characteristics of the transport. For this application, BY3 indicates a transport with formatter designed for the streaming mode. The fourth and fifth digit of the identification number are control numbers used to identify specific features of the basic model. The sixth digit identifies the specific model configuration.

Series Code

This alpha-numeric character indicates at what point the transport was built. The basic function and operation of the transport remain the same throughout all series codes; however, engineering changes, which occur during the course of production, are controlled by the series number.

Part Number

This is the top level assembly number of the transport.

Serial Number

Each transport has a unique serial number that is assigned sequentially by the manufacturer. No two transports within a family of products will have the same serial number.

V

Indicates the input voltage requirement of the transport.

Hz

Indicates the cycles per second requirement associated with the input voltage.

Ph

Indicates the phase requirement of the transport.

A/Ph

Indicates the maximum ampere requirements per phase.

W

Indicates the total power consumption of the transport.

Wire

Indicates configuration of the input line cord.

EQUIPMENT CONFIGURATION LOG

A Field Change Order is a change to the transport after it has been shipped from the manufacturing facility. It is important that the equipment configuration log is kept current by the person installing the FCO, so that the exact configuration of the transport can be referenced.

OPERATION 2

GENERAL

This section of the manual contains a description of the control panel, the cleaning procedures, and service routines associated with the Streaming Tape Unit. A thorough understanding of the control panel functions and the cleaning procedures ensures optimum operating efficiency. In the event of failure, the service routines enable the operator to accurately report the type of failure to the customer engineer.

HANDLING AND STORAGE OF MAGNETIC TAPE

Improper handling and storage of tape can result in a variety of operational problems, some of which can cause read or write errors on tape. Since information may be written only a few thousandths of an inch from the tape's edge, precautions must be taken to avoid data loss through damage.

Besides the specific tape loading procedures described in this section, there are certain tape handling precautions which should be observed.

Irregular Wind

High speed tape winding operations trap air between the tape layers that may cause the tape to stack irregularly on the reel. When this occurs, the tape edges protrude slightly, forming what appears to be an irregular surface when viewed through the reel flange cutouts. This condition does not hamper tape performance, but does require careful reel handling to avoid squeezing the flanges into contact with the tape edges. Handle tape reels at the central hub area whenever possible.

Reel Care and Handling

Extra care should be taken when removing a tape from the transport hub. Avoid the tendency to squeeze the reel flanges together when pulling a reel off the hub.

Improper seating of reels, improper threading of tape on the transport, and improper handling of reels can cause stretched, wrinkled, or creased edges. A wavy-edged condition prevents proper tape-to-head contact, and results in serious loss of signal amplitude and intermittent errors. The wrinkled edges present a stretched appearance, and normally do not lie in close contact with a flat surface. Reel warpage may also cause this form of edge damage. Nicks and creases due to squeezed flanges also cause tape edge damage.

Precautions should be taken when a reel of tape is removed from its canister. The end of the tape tends to unwind from the reel, exposing several feet of tape. Although the first 10 to 15 feet are not used for recording, they are threaded through the tape transport guides. If the end of the tape is allowed to touch the floor, or come in contact with a dirty surface, dust and dirt can adhere to the tape, and can be transferred to the transport guides and onto the heads.

Tape Storage

Tapes should be stored on edge and not exposed to magnetic fields. If a tape is stored at an abnormal temperature or humidity level, it should not be used until it has stabilized at room temperature.

File Protection - Write Ring

File protection prevents writing over a reel of prerecorded data. A small, removable plastic ring called a write enable ring is mounted in the back of the reel to the tape deck assembly as shown in figure 2-2. A sensing device detects the presence of the ring and allows write operations to take place. If the ring is removed, the STU write circuits are disabled and writing cannot take place.

This is an important feature because an accidental erasure of a tape could result in the loss of many man-hours as the destroyed records are recreated. Never insert a write ring into a tape reel unless you know that it is permissible to write on that reel. The presence or absence of the write ring has no effect on the reading of the tape.

CONTROLS AND INDICATORS

Figure 2-1 shows the layout of the STU control panel switches and indicators. All switches on the panel are membrane switches. Switch functions and the conditions required for enabling these functions are summarized in table 2-1.

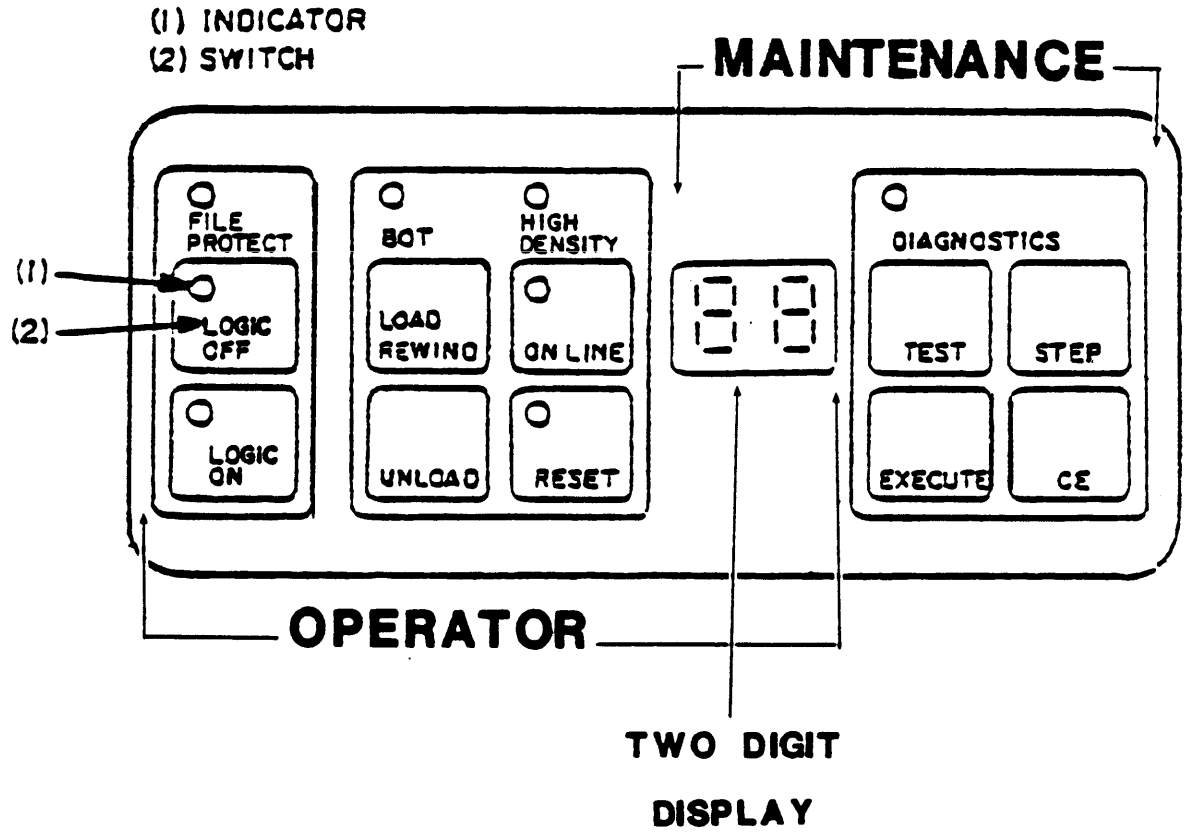


Figure 2-1. Operator Control Panel

TABLE 2-1. CONTROLS AND INDICATORS

SWITCH/ INDICATOR	FUNCTION
LOGIC OFF	Switch: If pressed when transport is powered on, dc power is removed from transport.
	Indicator: Lights when a standby power condition exists.
LOGIC ON	Switch: If pressed when transport circuit breaker is on, transport is powered on.
	Indicator: Lights when transport is powered on.
FILE PROTECT	Indicator: Lights to indicate absence of a write enable ring in supply reel; write operation is inhibited in transport.
BOT	Indicator: Lights when tape is positioned at the beginning-of-tape.
LOAD/ REWIND	Switch: If transport is powered on and tape is threaded, pressing LOAD/REWIND causes a load operation to be performed. If tape is loaded, pressing LOAD/REWIND causes a rewind operation to beginning-of-tape.

NOTE

Following a LOAD or REWIND operation, the unit will automatically set 25 ips start/stop mode and position accordingly.

If transport is configured in local-density-select mode and unit is positioned at BOT, alternate pressing of LOAD/REWIND causes unit to change density from PE to GCR and vice versa. The HIGH DENSITY indicator lights when GCR mode is selected.

UNLOAD	Switch: If tape is loaded, pressing UNLOAD causes tape to unload from take-up reel and tape path onto supply reel. If tape is threaded, but not loaded, pressing UNLOAD causes unit to slowly unload tape onto supply reel.

TABLE 2-1. CONTROLS AND INDICATORS (Contd)

SWITCH/ INDICATOR	FUNCTION
ON LINE	Switch: If tape is loaded, pressing ON LINE causes transport to go on-line and become available for system control. Indicator: Lights when STU is on-line.
RESET	Switch: When pressed, takes unit off-line, stops tape motion, and clears error status. Certain control faults require a power-off/power-on sequence to clear. Indicator: Lights when an STU error condition exists, or at the completion of a diagnostic test.
HIGH DENSITY	Indicator: Lights when unit is in GCR mode.
TWO-DIGIT DISPLAY	Indicator: This two-character digital display lights when STU is in off-line diagnostic/test mode. It displays diagnostic/test numbers and results of STU microdiagnostic or exerciser routines when in off-line diagnostic/test mode. When RESET indicator is lit, the display shows either a diagnostic fault code or on-line operational failure code.
DIAGNOSTICS	Indicator: Lights when unit is in diagnostic/ test mode.
TEST	Switch: If STU is not on-line, pressing TEST places unit in diagnostic/test mode.
STEP	Switch: If unit is in diagnostic/test mode, the diagnostic/test numbers can sequenced by pressing STEP.
EXECUTE	Switch: If unit is in diagnostic/test mode, pressing EXECUTE initiates diagnostic test number shown on two-digit display.
CE	Switch: If unit is in diagnostic/test mode, pressing CE initiates special diagnostics to aid customer engineer.

OPERATING INSTRUCTIONS

Without a write-enabled ring installed into the rear recess of the reel (figure 2-2), only read operations can be performed. With the write-enabled ring installed, both read and write operations can be performed. If write operations are to be performed, before mounting the reel of tape onto the supply hub, install a write-enabled ring (refer to figure 2-2). When reel is prepared, proceed with the load sequence as described below.

TAPE THREADING AND LOADING

1. Open dust cover door, place circuit breaker to ON position (1 pressed). LOGIC OFF indicator should light momentarily and the LOGIC ON, FILE PROTECT, HIGH DENSITY indicators should light. A built-in power-on health check is now executed.

   NOTES

   a. If a fault code appears on display, press RESET and LOGIC OFF switches to clear display. Then press LOGIC ON to repeat power-on health check. If fault code reappears, refer to table 2-2 for corrective action.

   b. Certain requirements must be met in steps 2 thru 7 prior to power-on if power-on auto load option is enabled. See Diagnostic Tests.

   c. If unit is already powered on, proceed to step 2.

2. Press inner button on face of supply reel hub.

3. Mount supply reel onto hub so that reel is against rear flange. Secure reel by pressing periphery of hub face to latch reel.

   NOTE

   Position hands on reel so they are aligned with recesses in deck (11 o'clock and 5 o'clock).

4. Thread magnetic tape over tape path as shown in figure 2-3.

5. Wrap tape leader onto take-up reel for several turns.

CAUTION

Ensure tape is positioned correctly over all tape path components; otherwise, tape damage may occur.

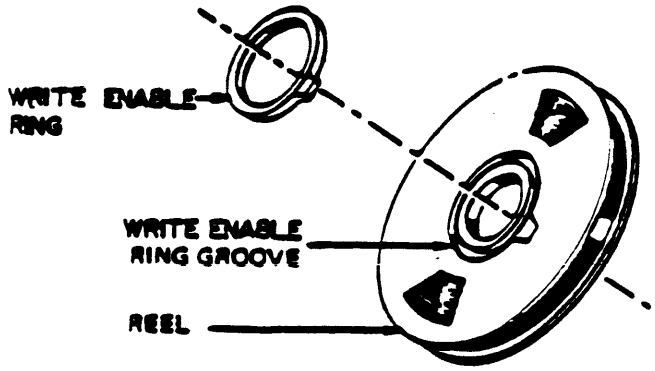


Figure 2-2. Write Enable Ring

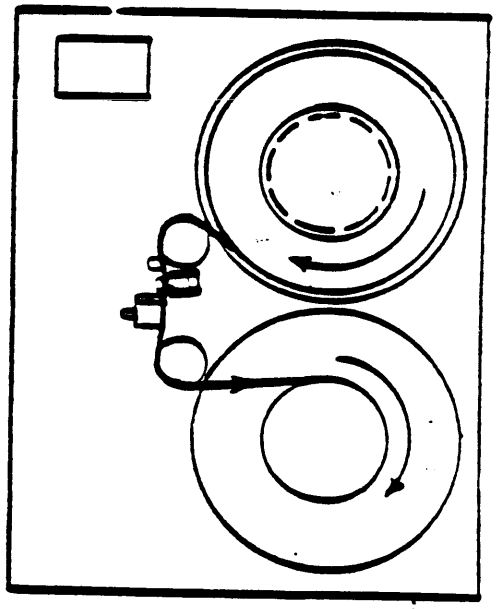


Figure 2-3. Tape Path

6. Close dust cover door and press LOAD/REWIND switch. Pneumatics pump motor starts and, after one second delay, forward motion is established. Motion stops when beginning of tape (BOT) reflective marker is detected. If BOT marker was positioned after sensor, when tape was threaded, then forward motion continues for approximately 40 feet. The transport then initiates reverse motion until reflective marker is detected. Motion stops and the BOT indicator lights.

7. Press ON LINE switch to place unit on-line. The ON LINE switch may be pressed while load operation is in progress. On completion of load operation, the ON LINE indicator will light.

UNLOAD SEQUENCE

1. Press RESET switch to place transport off-line.

2. Press UNLOAD switch. Tape moves in reverse direction until tape leaves take-up reel and tape path component areas.

3. Open dust cover and press center button face of supply reel hub. Hub will unlatch and supply reel can be removed.

NOTE

Position hands on reel so they are aligned with recesses in deck (11 o'clock and 5 o'clock).

4. Close dust cover door to prevent dust accumulation on tape deck components.

CLEANING

The STU is designed to provide a high degree of reliability to the user while minimizing the maintenance requirements.

The high reliability, low maintenance feature however, is entirely dependent on the proper care and handling of the transport and magnetic tape. The cleaning procedures outlined in the following paragraphs are brief and require only minutes of the operator's time, but cleaning must be done as explained, in order to achieve continued reliability and low maintenance.

CLEANING PROCEDURES

Cleaning of the transport should be performed on a regularly scheduled basis. Areas that require operator cleaning are as follows:

1. Clean magnetic head, EOT/BOT sensor, reel hub pads, tape cleaner, and air bearings after every eight hours of operation.

2. Clean housing, front of tape deck and dust cover (front door) as required.

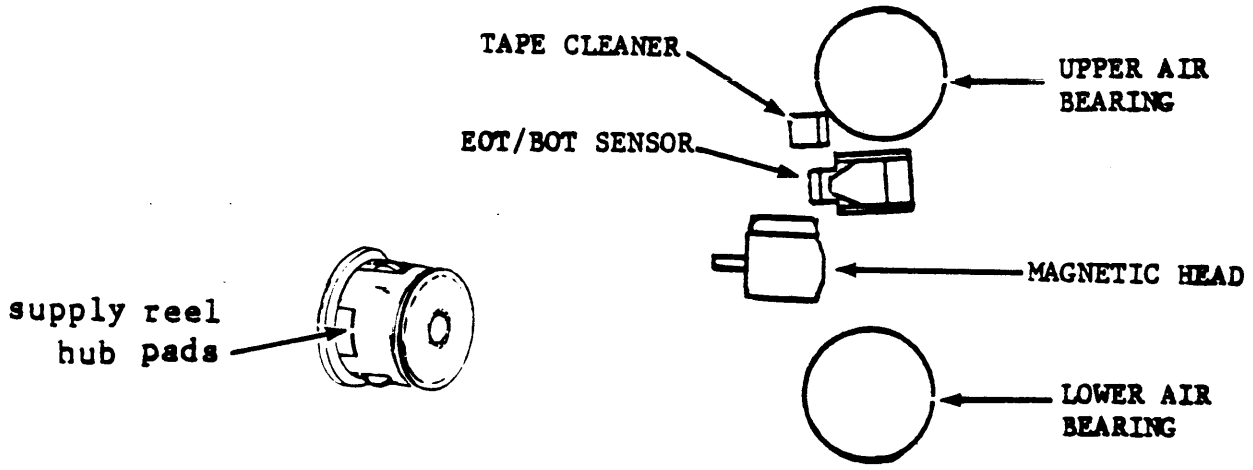


Figure 2-4. Component Cleaning Locations

CAUTION

Do not use solvent in a confined or poorly ventilated area. Avoid prolonged breathing of vapor and contact with skin or clothing. Use disposable gloves (P/N 95962550) to avoid prolonged contact with skin. Adhere to any other precautions on cleaning solvent container.

Cleaning materials recommended to perform maintenance are as follows:

- Solvent P/N 95054700
- Foam Swabs P/N 12218463
- Lint-Free Cloth P/N 94211400

To access components, remove the two-part head assembly dust cover from tape deck.

Magnetic Head

Clean head recording surface with a soft lint-free cloth moistened with solvent. Wipe recording surface in the same direction that tape moves across the head.

Tape Cleaner

Use a foam swab moistened with solvent to remove dirt or oxide from tape cleaner blades.

Air Bearings (Upper and Lower)

Clean both air bearings with a soft lint-free cloth moistened with solvent. Do not soak cloth with cleaner. Ensure foil area, guide springs and both tape guides are cleared of any oxide/dirt build-up. If available, use a small mirror to inspect inner edge of guides.

Head Assembly Dust Covers

To prevent the transfer of dirt to tape components, do not allow an accumulation of dust or dirt to reside on the inside of the dust cover.

Supply Reel Hub Pads

Clean the three hub pads with a clean cloth moistened with solvent. Do not soak cloth with solvent.

REFLECTIVE TAPE MARKERS

Every reel of magnetic tape must have a BOT (beginning of tape) and an EOT (end of tape) reflective marker, so that the transport can recognize starting and stopping areas. Tapes are always supplied with reflective markers installed; however, if the markers become detached for any reason or, if a tape leader is shortened because of tape damage, then the operator must install the markers in the manner shown in figure 2-5.

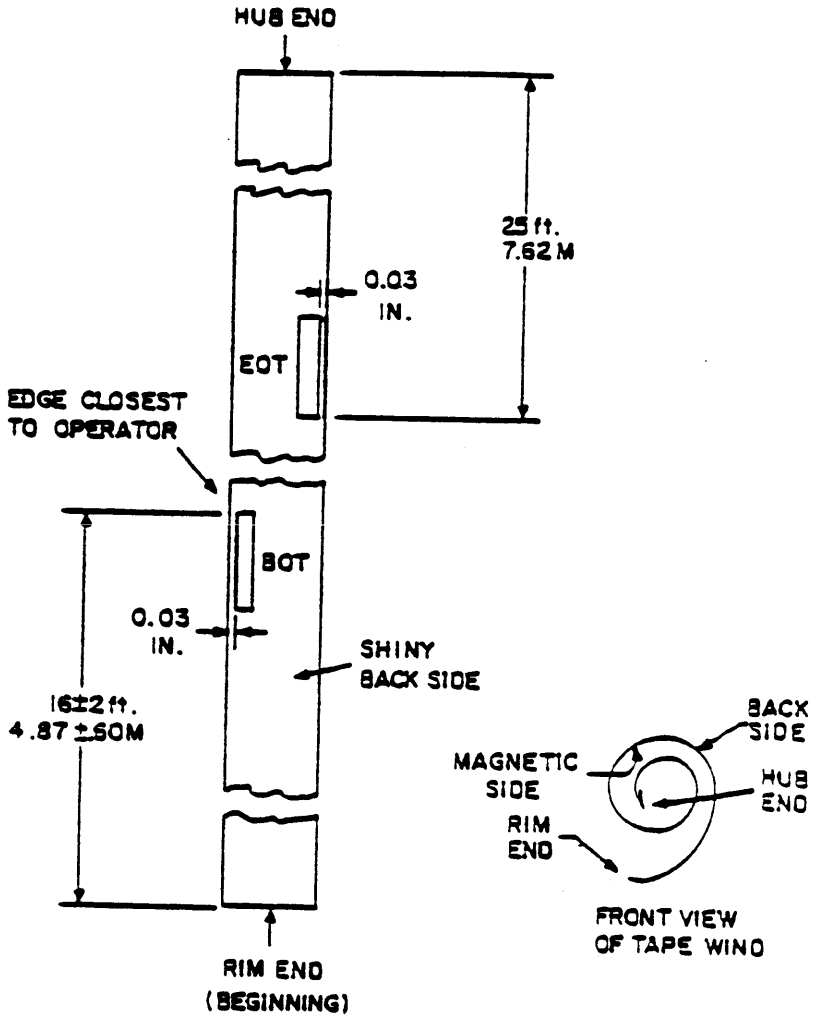


Figure 2-5. Location of Reflective Tape Markers

OPERATOR DIAGNOSTICS

Operator diagnostics are designed to allow the operator to initiate a functional test in order to verify the performance of the transport. The operator diagnostics should normally be initiated in the event of a failure.

REPORTING ERRORS AND CORRECTIVE ACTION

Faults detected in the STU are reported to the operating system via status lines and sense bytes, which describe the operating status of the STU. When the STU is operating on-line to the operating system, the operator may be made aware of any abnormal condition by the operating system (either by a CRT display or output printer). These fault reports should be retained or logged by the operator so that maintenance personnel can determine not only the type of fault, but also the circumstances under which the fault occurred.

If the STU takes itself off-line because of the fault, the operator is informed of the fault by illumination of RESET indicator and the display of the fault code on the 2-digit display. For a breakdown of fault codes and probable causes, refer to table 2-2 in this section of the manual.

There are certain situations in which the operator can take action to correct a reported problem prior to running the operator diagnostics. Read or write (data) errors are a prime example. Data errors are very often caused by dirt accumulation in the tape path area (magnetic head, air bearings, tape cleaner) or by a defective reel of tape. If data errors are reported, clean the tape path area as described in the CLEANING PROCEDURES of this manual. During cleaning, take the time to inspect the tape path components for defects; e.g., tape cleaner blades damaged, reel flanges cracked or misaligned causing contact with tape edges, etc. Both cleaning and inspection of components take only minutes, but go a long way toward maintaining the reliability of the transport and minimizing down-time.

If cleaning does not resolve the problem, then replace the reel of tape with a tape of known good quality. After the above procedures are performed, then the only recourse is to report the fault to maintenance personnel.

OPERATOR DIAGNOSTICS PROCEDURE

The operator diagnostics consist of one selectable test which runs for approximately 13 minutes, if a 10.5 inch tape reel is used. Optional tests are available, and should be run only if maintenance personnel request the operator to initiate these tests. Faults encountered during the test will stop the test and display a numerical code on the display panel. Any fault code should be logged by the operator and given to maintenance personnel when the problem is reported.

In order to eliminate the possibility of false displays due to a malfunctioning display panel, the first portion of the operator diagnostic is an exercise of the display panel indicators. At this time, the numerical display will increment from 00 thru 99. Concurrent with the numerical display exercise, the following indicators will be light: FILE PROTECT, LOGIC ON, ON LINE, RESET, and DIAGNOSTICS. Initiate the operator diagnostics as follows:

STU Status - Test 01

- Test Conditions

  1. Place circuit breaker ON and depress LOGIC ON (LOGIC ON indicator lit). If a fault occurs at this time, do not attempt further testing; report error code to maintenance personnel.

  2. Tape threaded through tape path and onto take-up reel, but NOT loaded.

  3. Front door closed.

- Test Procedure

  1. Press TEST switch on diagnostic portion of operator panel.

     a. DIAGNOSTICS indicator lights.

     b. 01 is indicated on display panel.

2. Press EXECUTE switch.

   a. Test commences with display panel incrementing from 00, 11, 22 thru 99. Verify that all segments of numerical display are functioning.

   b. Concurrent with step a. above, verify that all indicators except LOGIC OFF, BOT, and HIGH DENSITY are lit.

   c. Test continues with various motion and read/write exercises for approximately 10 minutes (2400 feet of tape).

o Test Successful

1. If test runs to completion, the STU performs a REWIND/UNLOAD operation and 00 is indicated on display panel, with RESET indicator lit.

o Test Unsuccessful

1. If test is unsuccessful, the diagnostic halts and numerical code appears on display, with RESET indicator lit. Record this number.

2. Refer to table 2-2 for operator action that may resolve fault without maintenance personnel involvement.

   Reinitiate Test 01 after performing any of the above actions. If test is successful, return STU to normal operation. If fault is not resolved, proceed with step 3.

3. Report number recorded in step 1 and any different numbers to maintenance personnel.

TABLE 2-2. OPERATOR CORRECTIVE ACTION

FAULT CODE	CORRECTIVE ACTION
01 thru 09	Clean magnetic head and tape path per instructions in OPERATOR CLEANING PROCEDURES of this manual.
10	Ensure front door is securely closed.
11	Thread tape.
12	Indicates supply reel hub is not latched, BOT marker located incorrectly, or a tension fault occurred during load operation.
13	Refer to tape threading diagram on tape deck to ensure tape is threaded correctly.
14	Check for BOT marker on tape. Refer to figure 2-5.
15	Indicates RESET switch pressed inadvertently by operator. Reinitiate test.
16	Check for presence of write enable ring in rear of supply reel. Install ring if not present.
17	Check for presence of EOT marker.
18	Indicates tape loaded when test was initiated. Thread tape, but do not press LOAD switch.
20 thru 29	Mount a tape of known good quality.
All Others	Report fault code to maintenance personnel per procedure discussed in previous paragraphs.

In certain instances, maintenance personnel may request the operator to initiate diagnostic test 02 or 03. If such a request is made, proceed as follows:

NOTE

Tests 02 and 03 cannot be used unless Test 01 directs their use. These tests will fail if run alone.

STU Status - Test 02/Test 03

- Test Conditions

  1. STU powered on.
  2. Tape threaded, but NOT loaded for test 02. Tape should NOT be threaded for test 03.
  3. Front door closed.

- Test Procedure

  1. Press RESET switch (resets fault code from test 01, if still indicated).
  2. Press TEST switch.
     a. DIAGNOSTICS indicator lights.
     b. 01 is indicated on display.
  3. Press STEP switch one time.
     a. Numerical display steps from 01 to 02.
     b. If test 03 is requested, press STEP again to increment from 02 to 03.
  4. Press EXECUTE switch.
     a. Test commences; test runs less than one minute.

- Test Terminates

  1. The diagnostic halts and a numerical code appears on display and RESET indicator is lit. Record this number and report fault to maintenance personnel.

NOTE

Test 01 is required to precondition the unit for Test 02. If Test 02 is attempted without first getting Test 01 fault code directing Test 02 be run, unit will display Termination Code 70 - Invalid Operator Sequence.

INSTALLATION AND CHECKOUT 3

GENERAL

The purpose of this section is to provide a list of requirements and procedures so that the streaming tape unit (STU) can be easily installed and made operable. The information listed in succeeding paragraphs should be used in a step-by-step sequence. In this manner, the installation and checkout of the STU will progress quickly, with maximum operational reliability ensured.

SITE REQUIREMENTS

The STU characteristics pertinent to this section are listed in table 3-1.

TABLE 3-1. STU CHARACTERISTICS

Data Transfer Rate (kilobytes/second)	
Low Speed	40 in PE mode, 156 in GCR mode
High Speed	120 in PE mode, 469 in GCR mode
Rewind Time	2.5 minutes (nominal)
Beginning of Tape (BOT) and End of Tape (EOT) Detectors	Photo-electric
Weight	59.87 kg (132 pounds) Packaged 49.90 kg (110 pounds) In Frame
Dimensions	
Height	60.9 cm (24.0 inches)
Width	48.26 cm (19.0 inches)
Depth	38.6 cm (15.2 inches)
Operating Temperature	15°C (60°F) to 33°C (90°F)
Non-Operating Temperature (Storage)	-10°C (14°F) to 50°C (+122°F)

TABLE 3-1. STU CHARACTERISTICS (Contd)

Relative Humidity (Operating)	20% to 80% (no condensation) with maximum Wet Bulb Temperature of 26°C (79°F)
Relative Humidity (Non-Operating)	10% to 90% (Storage) 5% to 95% (Transit)
Altitude (Operating)	Up to 3048 m (10,000 feet) equivalent to a barometric pressure of 688 millibars
Altitude (Non-Operating)	Up to 3048 m (10,000 feet) equivalent to a barometric pressure of 688 millibars
Power	
Voltage	120 VAC (93 minimum to 128 maximum), 60 Hz, single phase, 2-wire plus ground 220 or 240 VAC (187 minimum to 256 maximum), 50 Hz, single phase, 2-wire plus ground
Average Input Current	3.0 amps RMS (75 ips streaming)
Average Continuous Power	300 VA - Standby and Loaded 550 VA maximum - Start/Stop
Mounting	Standard EIA Rack 19-inch vertical mounting or horizontal mounting
Electronics	Solid-State

Space and Clearance

Allowance must be made for maintenance and operator access. There should be sufficient space, to the left and front of the STU, to allow full opening of the STU on its mounted hinges. Maintenance or operator access requirements are shown in figure 3-1. The user must consider the safety and electro-magnetic interference ramifications and cooling requirements in designing the transport enclosure, signal cables, and power cables of the subsystem. Such consideration may require that fewer than four STU's be mounted in a specific cabinet design.

Power

The input power requirements for the STU are 120 VAC (60 Hz) or 220/240 VAC (50 Hz), single phase, 2-wire, plus ground with shielded power cord. The input power cord is supplied as part of the installation kit for 60 Hz units. The input power connector is supplied in the installation kit for 50 Hz units. Refer to table 3-1 for voltage tolerances and current/power characteristics.

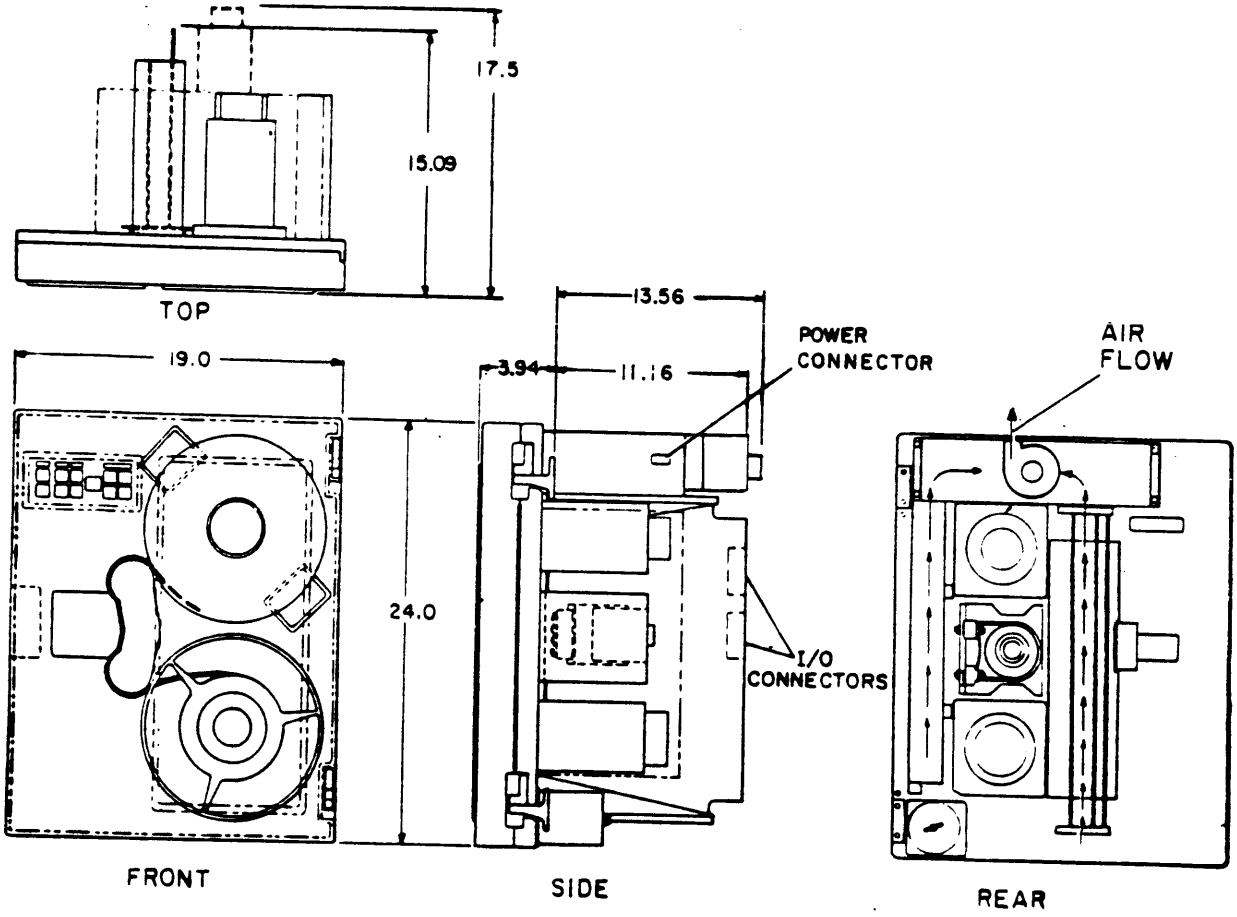


Figure 3-1. STU Dimensions

Grounding

Earth ground is obtained via the power cord. An EMC ground is provided by system- grounding the shielded jackets of the I/O cables. Logic ground referencing is via the interface connector. A single-point grounding scheme is used to connect logic ground to frame/earth ground.

UNPACKING/INSPECTION

Acceptance of Delivery

Carefully inspect the shipping container on all sides, including top and bottom, for severe gouges, cuts, abrasive tears, or badly smashed corners or edges. This constitutes mishandling in shipment and the unit may have been damaged. If there is any evidence of damage to the shipping container, it should be recorded and signed by the carrier's representative, acknowledging the damage before accepting delivery.

Unpacking Instructions

Each STU is packed in a 500-pound tested, double-wall corrugated container, 23 inches by 24-1/2 inches by 31-1/2 inches high, with inner protective packaging as shown in figure 3-2. The STU should be unpacked in the area or room where it will be installed and, because of the weight (approximately 132 pounds packaged), the unpacking requires two people. Perform the unpacking as follows:

CAUTION

When performing step 1, use a utility knife or other short-blade instrument to ensure that STU is not scratched or marred.

1. Place carton with arrows pointing up. Cut reinforcing tape at top of carton (three places) and fold four carton flaps back.

2. Remove STU and all protective packaging as follows: (See figure 3-2)

   a) Remove manual and installation kit taped on top inner tray.

   b) Remove top inner tray by pulling straight up.

   c) Securely grasp steel shipping frame (one person each side) and remove STU from carton and bottom inner tray.

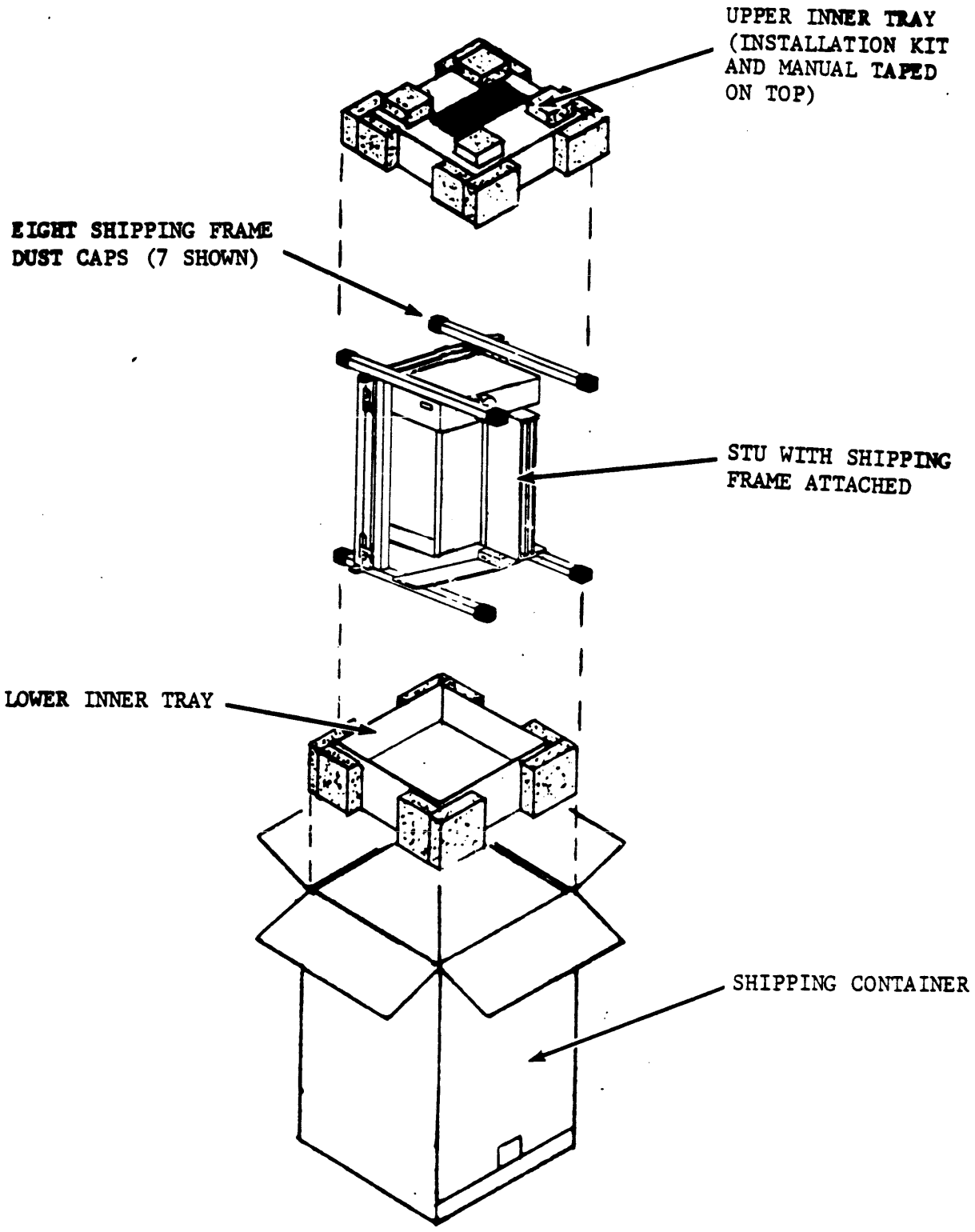


Figure 3-2. STU Packaging

CAUTION

Lift the STU by shipping frame only. Do not support weight of the STU by using any other assemblies as lift points.

d) Place unit on a clean table or bench top

e) Visually inspect the installation kit for the following:

PART NO.	QUANTITY	PART DESCRIPTION
77013032	1	Hinge Assembly, Top
77013031	1	Hinge Assembly, Bottom
93288008	2	Thrust Bearing
77021760	2	Hinge Blocks
77006921	1	Stiffener Bar
10127156	10	Screw, 1/4-20 x 0.88
10125806	12	Washer, Lock, 1/4
10125301	10	Nut, Hex, 1/4-20
77010091	1	Stud
94873500	1	Bumper, Socket Tip
10127158	1	Screw, 1/4-20 x 1.250
77015830	1	Power Cord (60 Hz Only)
95967880	1	Power Connector (50 Hz Only)
77021730	1	Support Spacer
77021720	2	Support Block
10127154	2	Screw, 1/4-20 x 0.62

f) Carefully cut and remove non-metallic band securing STU door.

g) Remove filler blocks located between upper and lower PC board rear-mounted hinges.

h) Remove door support blocks from under door assembly. (Leave 1-inch frame support block in place until unit is ready for rack mounting.)

j) Remove filler block located between shipping frame and underside of PC boards by carefully pressing downward, and sliding foam block backward and out from under PC boards.

k) Remove door stud (P/N 77010091) from installation kit. Screw threaded end into receptacle block inside dust cover door. Unit will not run if stud is not in place to engage interlock switch.

NOTE

In the event reshipment of unit is necessary, all shipping materials and container should be retained.

Acceptance of Unit After Unpacking

It is essential to visually inspect the following areas of the STU prior to the application of power:

- o Front door and control panel for scratches, cracks or abrasions.
- o Control panel for damaged switches or indicators.
- o PWA assemblies for damaged connectors and components.
- o PWA alignment and seating.
- o Cable connectors and hoses properly attached.

NOTE

In the event that a claim for damage is necessary, be sure that all shipping material is available for evidence of damage, and file claim with carrier immediately.

- o Perform CLEANING procedures included in Section II of this manual.

CHECKOUT PROCEDURE

The operational checks defined below must be performed prior to submitting the STU to the operating system. The STU does not have to be mounted to perform these checks; the shipping frame will suffice until the unit has been completely checked out.

The following procedures require the use of the diagnostic controls on the control panel. In the event that any one of the tests does not perform successfully, a fault code will be displayed on the panel. These fault codes are for use by maintenance personnel and should, therefore, be logged by the operator in the event of test failure. This logging of fault codes and subsequent reporting to maintenance personnel is not restricted to this installation period, but should be standard operating procedure at all times.

Primary Power Checkout

1. Check equipment identification plate located at lower left rear of tape deck to ensure input power coincides with requirements on ID plate.

2. Connect power cord (60 Hz units) or power connector (50 Hz units) to receptacle on power supply located at top right side at the rear of the STU.

3. Place circuit breaker (top right of tape deck) to ON position (1 depressed). Observe that the LOGIC OFF indicator lights.

Functional Checkout

The functional checkout testing starts with the off-line resident diagnostic to check the tape transport performance, and continues with the resident diagnostic to test the tape subsystem. The acceptance testing must be performed in the following steps:

- Power-On Health Check

  This self-test diagnostic checks dc power and functionality of the control panel and major logic modules of the transport. To start the health check, press the circuit breaker on (1 down).

  After the power-on health check runs successfully, the LOGIC ON indicator lights. If the LOGIC ON indicator fails to light, report the problem to maintenance personnel. If the test is successful, proceed with the STU status test 01 as described below.

- Test 01

  This resident test checks basic transport functions and tape motions including BOT/EOT tape motion, read data, and write data. A write enabled, known good quality tape should be used for this test. This test runs to completion in approximately 13 minutes (with a 2400-foot long tape).

- Test Conditions

  1. STU powered on (LOGIC ON indicator lit). Built-in diagnostics include a power-on health check when operator presses LOGIC ON switch. If an fault occurs at this time, do not attempt further testing; report error code to maintenance personnel.

  2. Tape threaded through tape path and onto take-up reel, but NOT loaded.

  3. Front door closed.

- Test Procedure

  1. Press TEST switch on diagnostic portion of operator panel.

     a. DIAGNOSTICS indicator lights.

     b. 01 is indicated on display panel.

  2. Press EXECUTE switch.

     a. Test commences with display panel incrementing from 00, 11, 22 thru 99. Verify that all segments of numerical display are functioning.

     b. Concurrent with step a. above, verify that all indicators except LOGIC OFF, BOT, and HIGH DENSITY are lit.

     c. Test continues with various motion and read/write exercises for approximately 13 minutes (2400 feet of tape).

- Test Successful

  1. If test runs to completion, the STU performs a REWIND/UNLOAD operation and 00 is indicated on display panel, with RESET indicator lit.

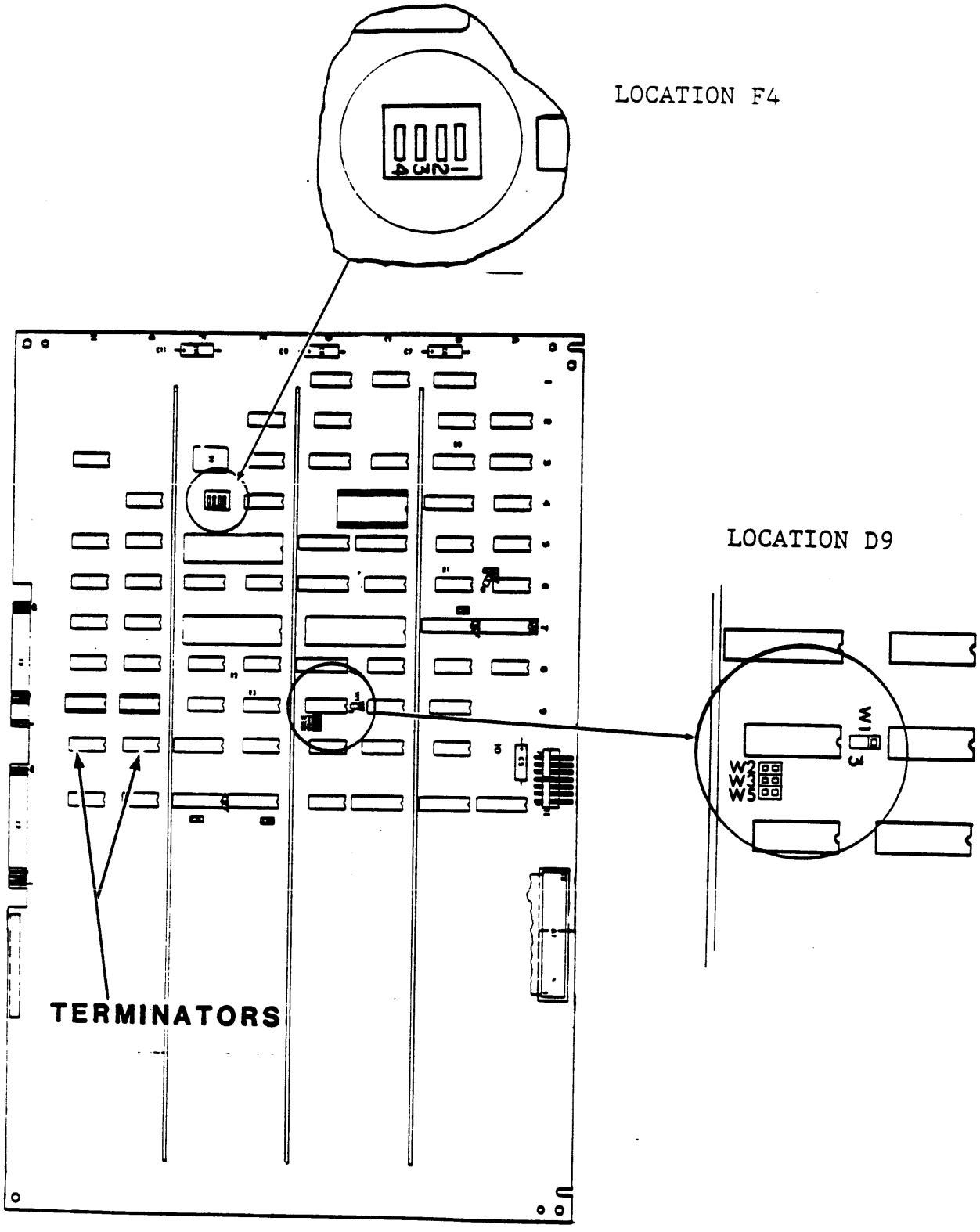
- Test Unsuccessful

  1. If test is unsuccessful, the diagnostic halts and numerical code appears on display, with RESET indicator lit. Record this number.

  2. Refer to table 3-2 for operator action that may resolve fault without maintenance personnel involvement.

     Reinitiate test 01 after performing any of the above actions. If test is successful, return STU to normal operation. If fault is not resolved, proceed with step 3.

  3. Report number recorded in step 1 to maintenance personnel.



INTERFACE PWA, USING PWB 77020320

Figure 3-3. Interface PWA, Using PWB 77020320 Jumper and Switch Locations

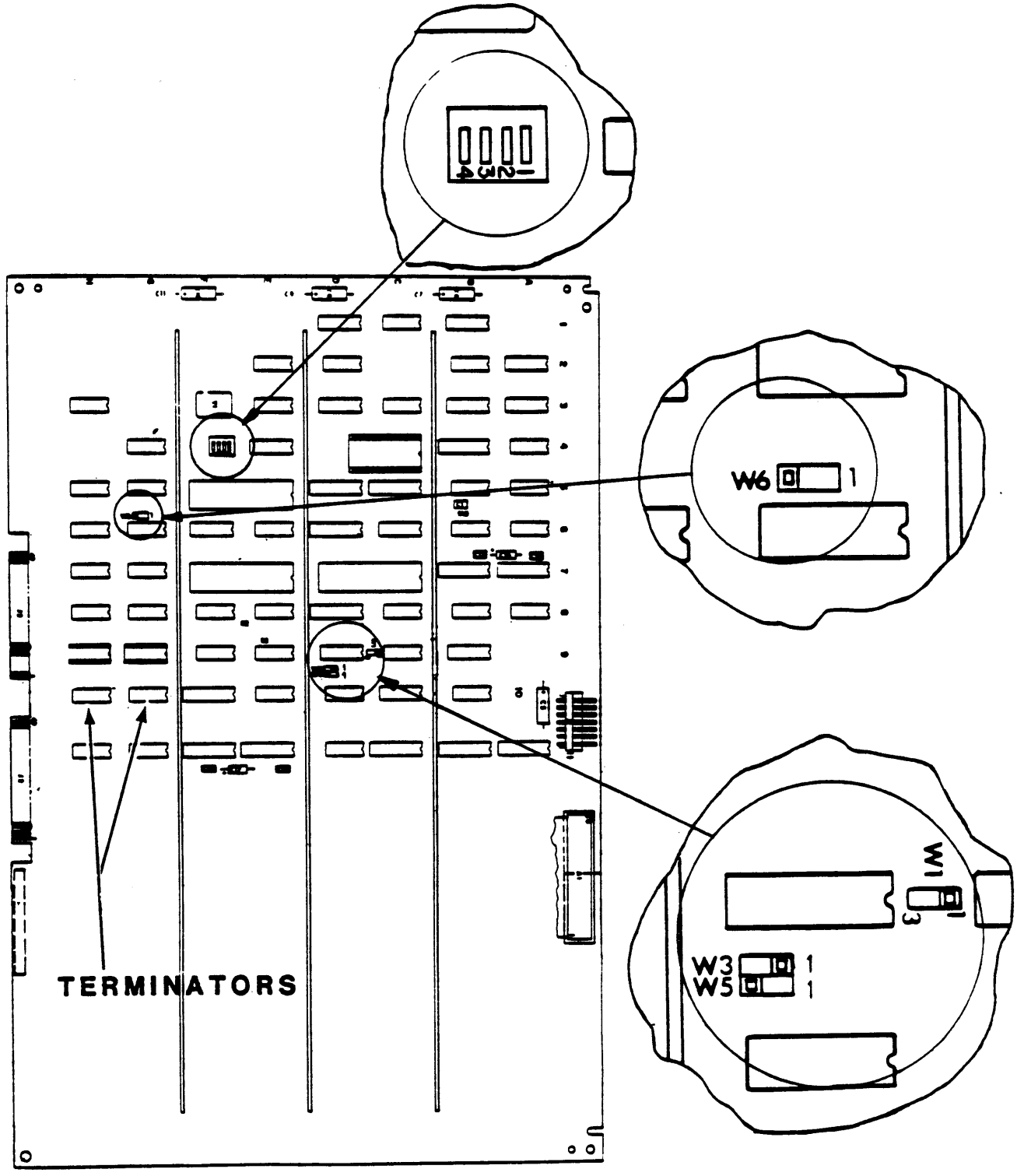


Figure 3-3A. Interface PWA, Using PWB 77023050
Jumper and Switch Locations

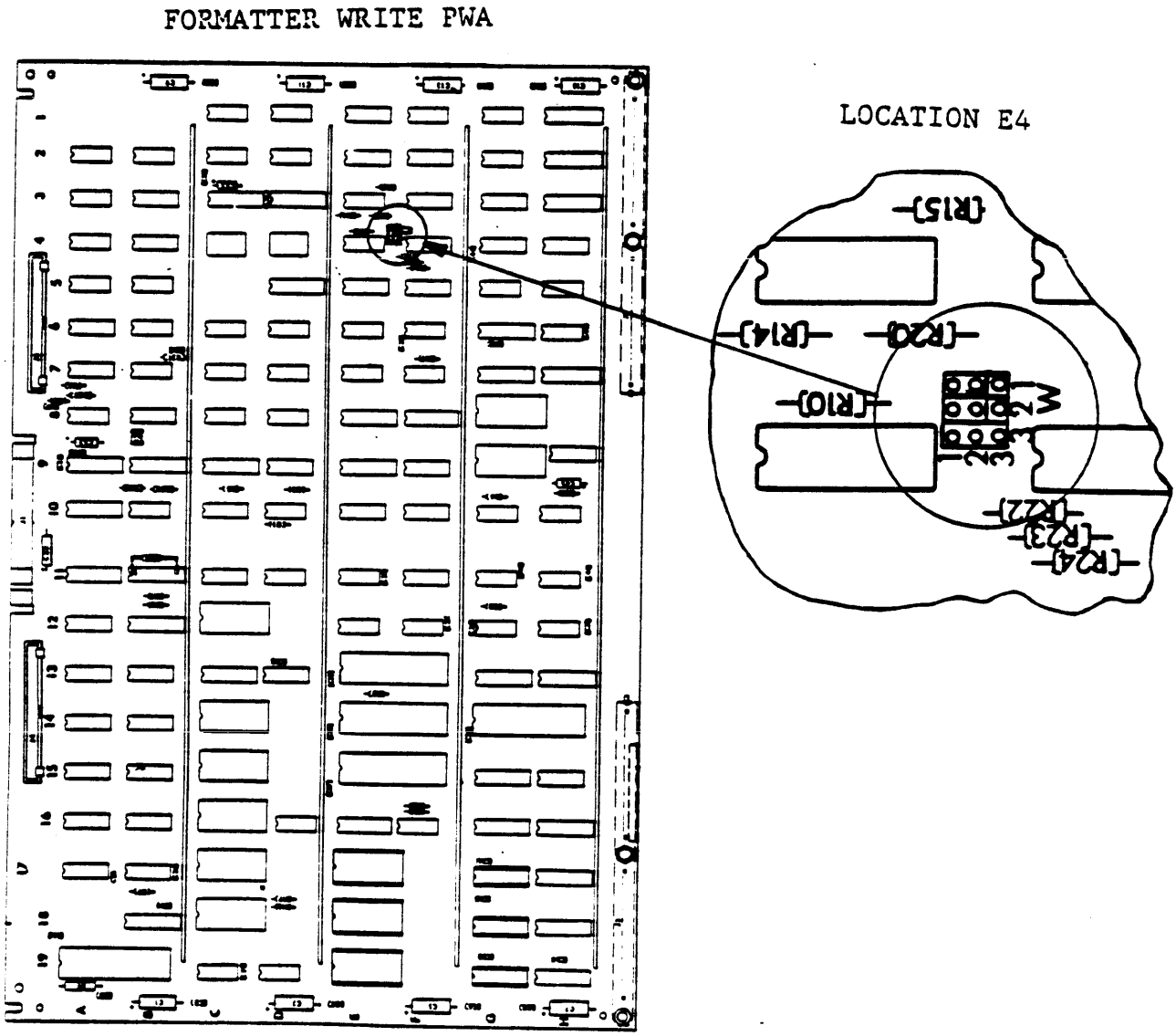


Figure 3-3B. Formatter Write PWA
Jumper Locations

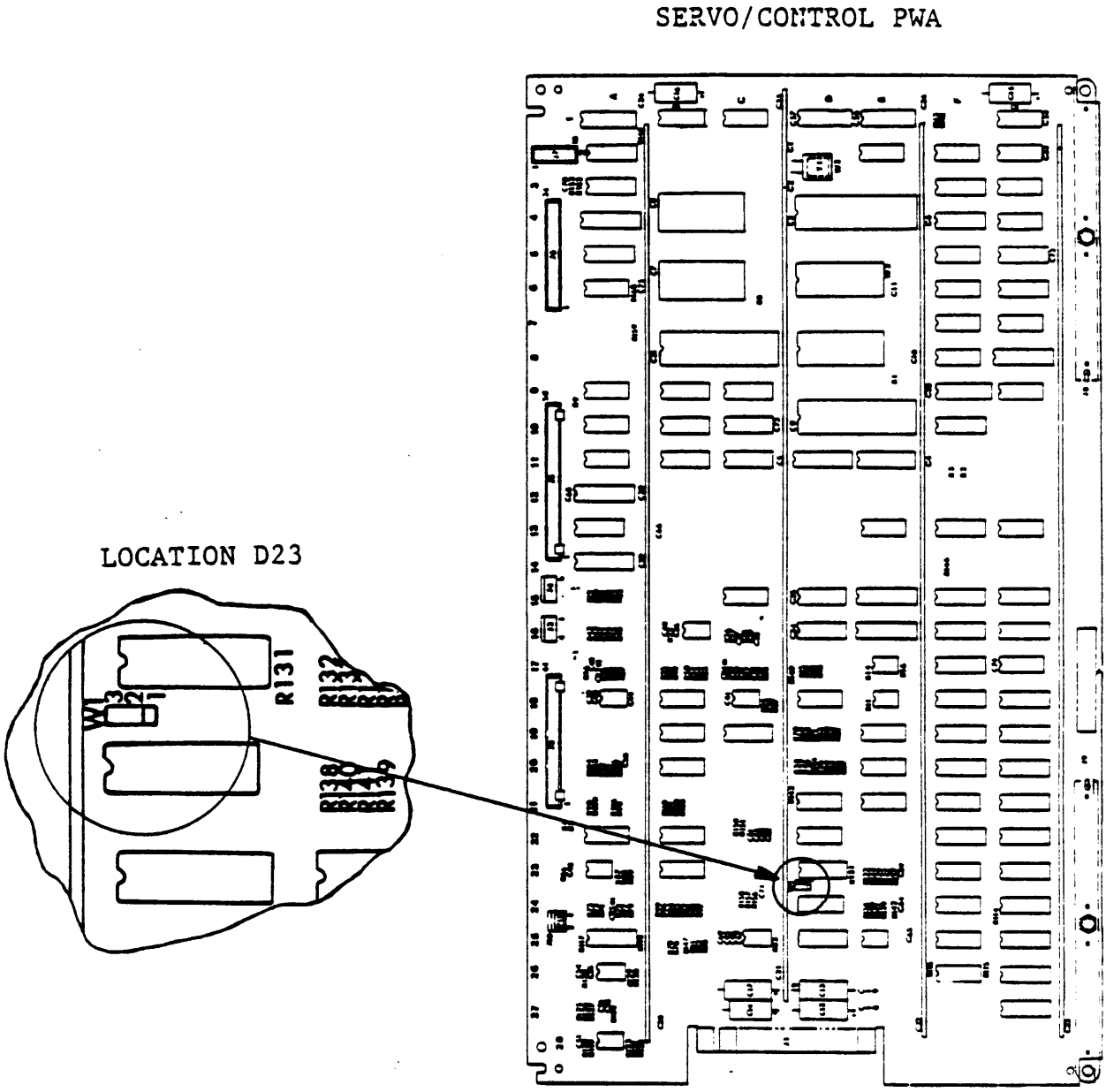


Figure 3-3C. Servo Control PWA
Jumper Locations

TABLE 3-2. OPERATOR CORRECTIVE ACTION

FAULT CODE	CORRECTIVE ACTION
01 thru 09	Clean magnetic head and tape path per instructions in OPERATOR CLEANING PROCEDURES of this manual.
10	Ensure front door is securely closed.
11	Thread tape.
12	Indicates supply reel hub is not latched, BOT marker located incorrectly, or a tension fault occurred during load operation.
13	Refer to tape threading diagram on tape deck to ensure tape is threaded correctly.
14	Check for BOT marker on tape. Refer to figure 3-5.
15	Indicates RESET switch pressed inadvertently by operator. Reinitiate test.
16	Check for presence of write enable ring in rear of supply reel. Install ring if not present.
17	Check for presence of EOT marker.
18	Indicates tape loaded when test was initiated. Thread tape, but do not press LOAD switch.
20 thru 29	Mount a tape of known good quality.
All Others	Report fault code to maintenance personnel.

TRANSPORT CONFIGURATION

The STU has several optional features and selectable addresses that must be considered during the installation procedure. Option and address selection components are contained on the Interface, Formatter Write, and Servo/Control PWAs. Table 3-3 lists these features and their associated jumpers and switches. Refer to figures 3-3, 3-3A, 3-3B, and 3-3C for component locations.

NOTE

The interface printed wiring assembly (PWA) is made from either one of two printed wiring boards (PWB's) 77020320 or 77023050. The jumper and switch locations for both PWB's are listed in Table 3-3. To determine which PWB is used in your STU, check location G-6 on the interface PWA for the presence of W6 (see Figure 3-3A). If W6 is present, the PWB is 77023050; if W6 is not present, the PWB is 77020320. Jumper and switch settings for both PWB's are listed in Table 3-3.

TABLE 3-3. STU CONFIGURATION

OPTION	JUMPER/SWITCH	FUNCTION
	INTERFACE PWA (USING PWB 77020320)	
Channel Parity Check	W1 (1-2)	Parity Disabled
	(2-3) As Shipped	Parity Enabled
	W2 Unused (Can be used to store jumper.)	
Remote/Local Density *	W3 (Jumper In)	Remote Density Select
	(Jumper Out) As Shipped	Local Density Select
Adaptive Velocity Control (AVC)**	W5 (Jumper In) As Shipped	AVC Enabled
	(Jumper Out)	AVC Disabled
Formatter/Device Address Select Switches S1 to S4	S1-OFF As Shipped	Formatter Address 0
	S1-ON	Formatter Address 1
	S2-OFF, S3-OFF As Shipped	Transport Address 0
	S2-OFF, S3-ON	Transport Address 1
	S2-ON, S3-OFF	Transport Address 2
	S2-ON, S3-ON	Transport Address 3
	S4 - Not Used	

TABLE 3-3. STU CONFIGURATION (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
INTERFACE PWA (USING PWB 77023050)		
Channel Parity Check	W1 (1-2)	Parity bit not transferred with data from host.
	W1 (2-3) As Shipped	Parity bit transferred with data from host.
Remote/Local Density *	W3 (1-2)	Remote Density Select
	W3 (2-3) As Shipped	Local Density Select
Adaptive Velocity Control (AVC) **	W5 (1-2) As Shipped	AVC Enabled
	W5 (2-3)	AVC Disabled
Density Status Option	W6 (1-2) As Shipped	Density Status Enabled
	W6 (2-3)	Density Status Disabled
Formatter/Device Address Select Switches S1 to S4	S1-OFF As Shipped	Formatter Address 0
	S1-ON	Formatter Address 1
	S2-OFF, S3-OFF As Shipped	Transport Address 0
	S2-OFF, S3-ON	Transport Address 1
	S2-ON, S3-OFF	Transport Address 2
	S2-ON, S3-ON	Transport Address 3
FORMATTER WRITE PWA (Series Code 01 thru 06)		
Long Gap Select (PE)	W1 (1-2) As Shipped	Variable Gap-0.6" to 1.2"
	W1 (2-3)	Fixed Gap-1.2"
Short Gap Select (PE)	W2 (1-2) As Shipped	Variable Gap-0.6" to 0.9"
	W2 (2-3)	Fixed Gap-0.6"
Long Gap Select (GCR)	W1 (1-2) As Shipped	Variable Gap-0.3" to 0.6"
	W1 (2-3)	Fixed Gap-0.6"
Short Gap Select (GCR)	W2 (1-2) As Shipped	Variable Gap-0.3" to 0.45"
	W2 (2-3)	Fixed Gap-0.3"

TABLE 3-3. STU CONFIGURATION (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
Long Gap or Short Gap selection is made by means of I/O interface line $\overline{\text{FLGAP}}$.		
Spare	W3	
	FORMATTER WRITE PWA (Series Code 07 and Above or earlier Series Code with SPO 77026120)	
Gap Select	W1 (1-2), W2 (1-2) As Shipped	Variable Short Gap With FLGAP = False Variable Long Gap With FLGAP = True
	W1 (2-3), W2 (2-3)	Fixed Nominal Gap With FLGAP = False Fixed Long Gap With FLGAP = True
	W1 (1-2), W2 (2-3)	Variable Long Gap
	W1 (2-3), W2 (1-2)	Extended Gap
	W3	Spare
	SERVO/CONTROL PWA	
Write to EEPROM	W1 (1-2)	Active
	W1 (2-3) As Shipped	Inactive

* If the transport is configured in the local density mode (W3, no jumper) and tape is positioned at BOT, alternately pressing of the LOAD/REWIND switch will cause the unit to alternately change density from PE to GCR and vice versa. The HIGH DENSITY indicator lights when GCR is selected.

** Jumper W5 - Adaptive Velocity Control. When this option is used, rather than selecting 25 ips mode when low speed is commanded, the transport enters a mode whereby the optimum speed is chosen to match system requirements. If 75 ips mode gives the best throughput, then this mode is used; the same applies to 25 ips streaming and 25 ips start/stop modes if the unit is in the PE mode. This choice of operating mode is made automatically by the STU and does not require any involvement by the system. This option allows the STU to be interfaced to a standard adapter and to run under standard 1/2-inch tape software and, yet, offer the advantage of streaming. With this option enabled, the STU responds to a SET 75 IPS command in the normal manner.

Minimum System Configuration

The minimum system configuration, as shown in figure 3-4, provides for a single STU connected to the controller. The terminator for the I/O channel is installed on the Interface PWA (see figure 3-5). Maximum cable length to the controller is 6.09m (20 feet).

Maximum System Configuration

Figure 3-4 shows the maximum system configuration, consisting of four STU's daisy- chained together. Only the last STU will have the terminator installed on the Interface PWA (see figure 3-3). Intermediate units should have the factory installed terminator removed. Maximum total cable length to the controller is 6.09m (20 feet).

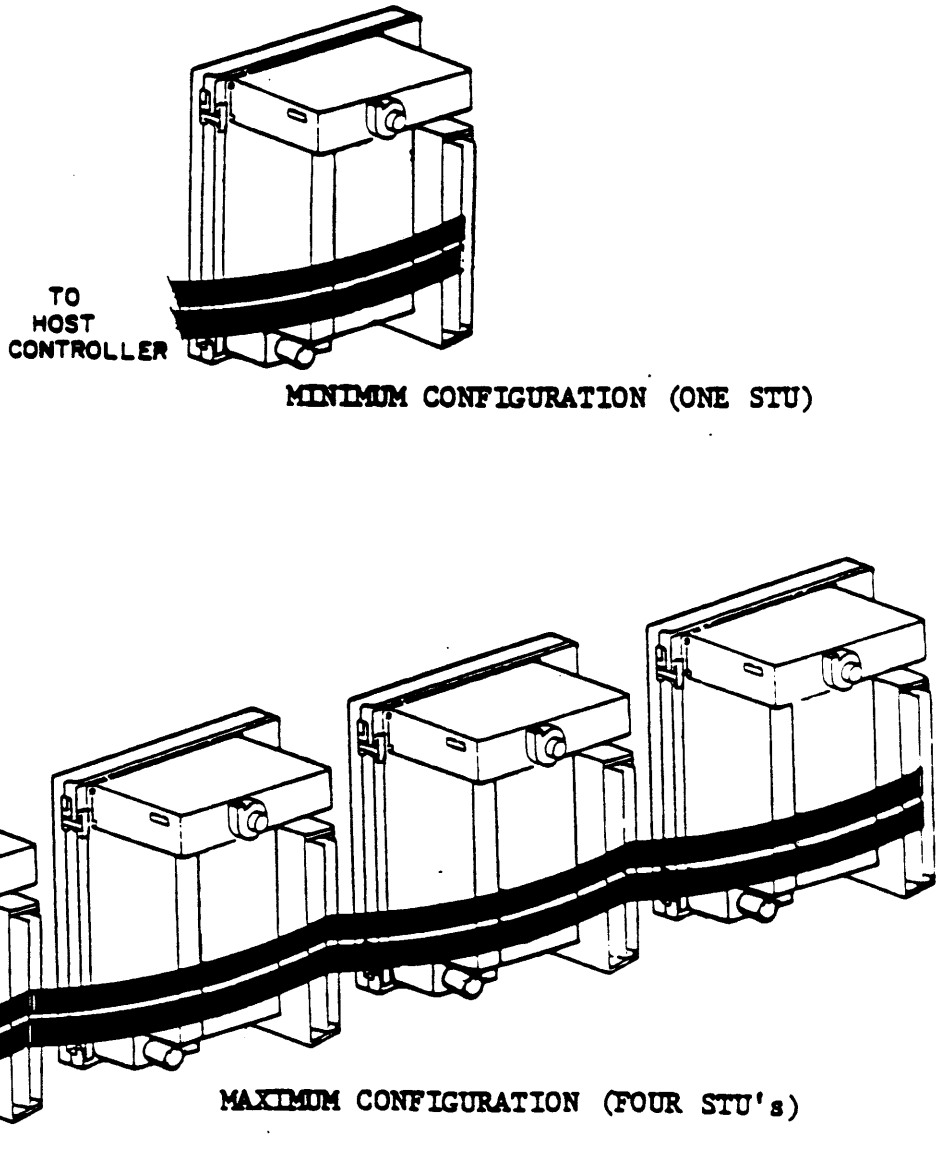


Figure 3-4. Interface Configurations

Electrical/Mechanical Interface

- Electrical Interface

  All lines are low true and driven by 2-state devices, type SN7438. These lines are received by the circuit shown in Figure 7.3. The following voltage levels apply:

	Transmitted	Received
True = 0	0.0V - 0.4V	0.0V - 0.8V
False = 1	2.4V - 5.0V	2.0V - 5.0V

- Mechanical Interface

  1. Connector Requirements - The connectors for this interface are two 50-pin printed circuit edge connectors.

     a. 50-Pin Connector P/N 95966510 (Amp 88373-1 or equivalent)

     b. Keying Plug P/N 95966560 (Amp 88113-1 or equivalent)

  2. I/O Cabling Requirement - Two 50-pin flat shielded signal cables are used to interface the STU with the controller/adapter. The maximum allowable cable length is 20 feet.

     The I/O cables are attached to connectors J2 and J3 on the interface PWA. Refer to Figure 3-6 for physical pin locations and Table 3-4 for signal to pin assignments.

     An I/O cable clamp is provided to mount the I/O cables to the rear of the transport. This clamp, when used as recommended in the following procedure, will ensure proper grounding of the I/O cable shield.

     a. Remove approximately 1-1/2 inches of the cable jacket on the transport end of the I/O cables (Refer to Figure 3-7).

     b. Cut the ground shield such that approximately 1 inch of shielding extends beyond the cable jacket.

     c. Cut the edges of the shielding to allow the shield to be folded back on both sides of the cable jacket.

Table 3-4. Connector Pin Configuration

Connector	Signal Pin	Return Pin	Signal	Connector	Signal Pin	Return Pin	Signal
J2	2	1	FFBY	J3	1	5	FRDP
	4	3	FLWD		2	5	FRD0
	6	5	FWD4		3	5	FRD1
	8	7	FGO		4	5	FLDP
	10	9	FWD0		6	5	FRD4
	12	11	FWD1		8	7	FRD7
	14	13	Spare		10	9	FRD6
	16	15	FLOL		12	11	FHER
	18	17	FREV		14	13	FFMK
	20	19	FREW		16	15	FID
	22	21	FWDP		18	17	FFEN
	24	23	FWD7		20	19	FRD5
	26	25	FWD3		22	21	FEOT
	28	27	FWD6		24	23	FOFL
	30	29	FWD2		26	25	GCR
	32	31	FWD5		28	27	FRDY
	34	33	FWRT		30	29	FRWD
	36	35	FLGAP		32	31	FFPT
	38	37	FEDIT		34	33	FRSTR
	40	39	FERASE		36	35	FDWDS
	42	41	FWFM		38	37	FDBY
	44	43	RTHR		40	39	FHSPD
	46	45	FTAD0		42	41	FCER
	48	47	FRD2		44	43	FONL
J2	50	49	FRD3		46	45	FTADI
					48	47	FFAD
				J3	50	49	FHISP

The prefix "F" denotes Formatter Interface Signals.

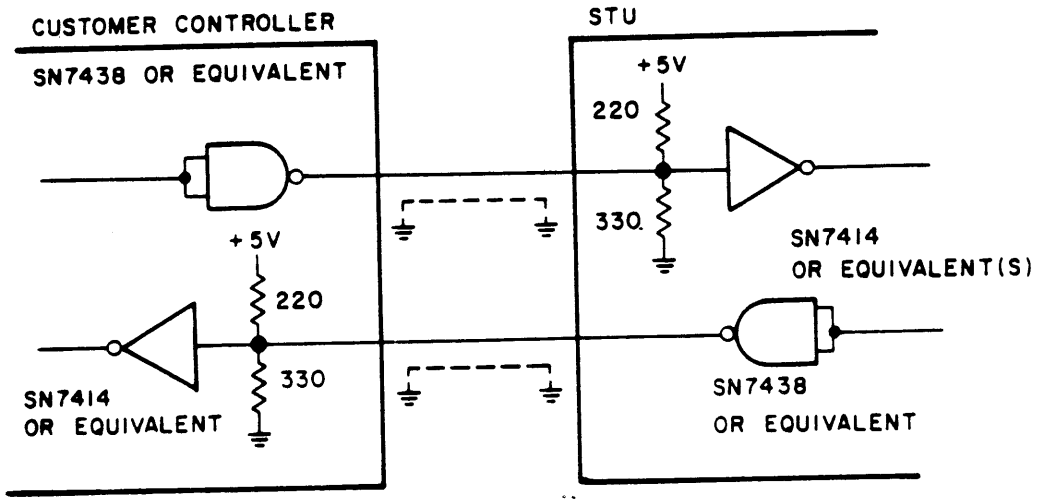


Figure 3-5. Electrical Interface

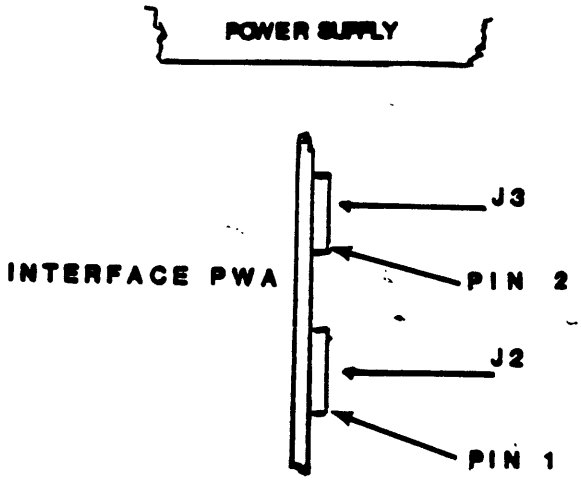


Figure 3-6. I/O Connector Locations

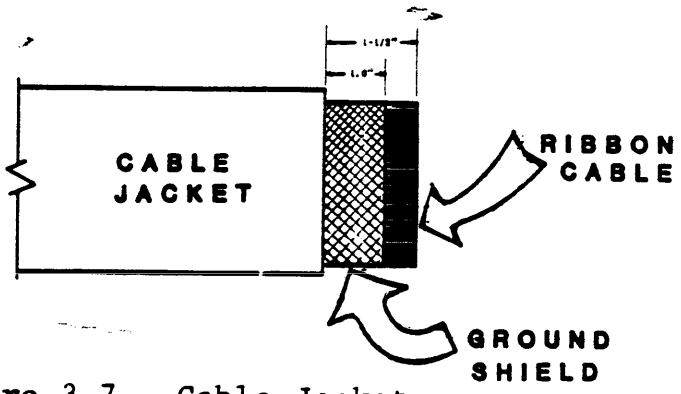


Figure 3-7. Cable Jacket

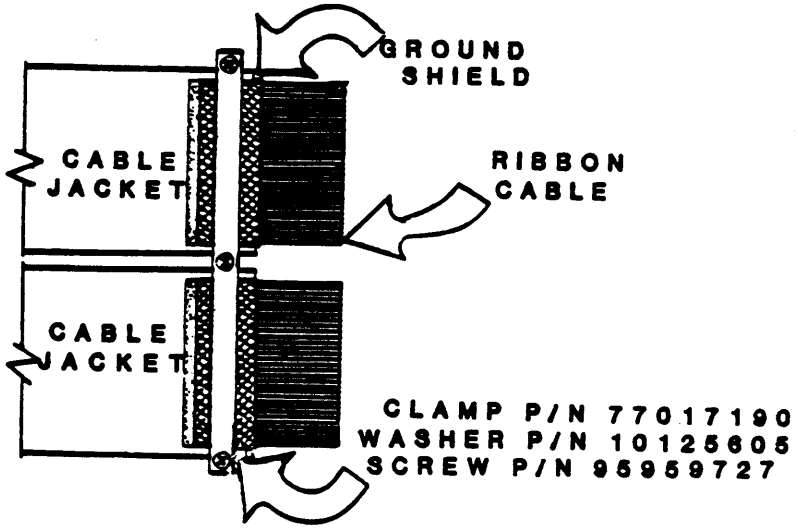


Figure 3-8. Cables With Clamp Strip

NOTE

When installing the I/O connectors on the ribbon cable, ensure that the cable length is sufficient to extend from the cable clamp to the I/O board connectors.

d. Install the two 50-pin connectors on the ribbon cable.

3. Install the two 50-pin connectors of the ribbon cable to J2 and J3 on the interface PWA.

4. Place the ribbon cables against the logic cage bracket. Reference Figure 3-9. Place the clamp strip over the cables and secure the clamp strip to the cable bracket with 3 screws and washers. Reference Figure 3-9. Be sure the clamp strip and the cable bracket make good contact against the ground shield of the ribbon cables. The top and bottom threaded holes in the cable bracket provide additional grounding points, as required. Reference Figure 9.

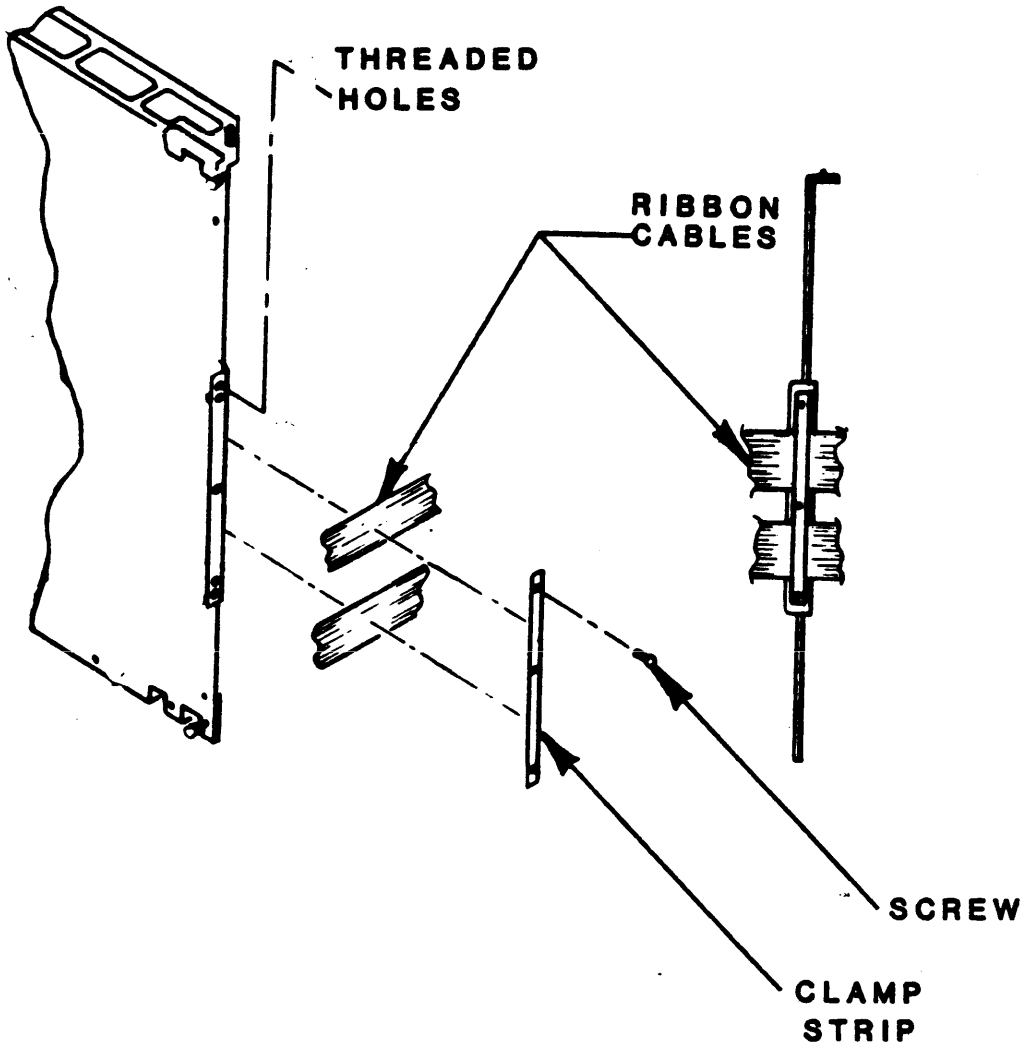


Figure 3-9. I/O Ribbon Cable Installation

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VERTICAL MOUNTING PROCEDURE

The STU is designed for installation in a standard 19-inch EIA rack. The unit is supported by two hinge assemblies attached to the rack and deck of the STU. When mounted, the STU is held in the closed position by a single, adjustable pawl fastener. Mounting details are as follows: (see Figure 3-10):

1. Bolt two hinge assemblies and stiffener bar to frame as shown in the following illustration. (Mounting holes in stiffener bar determine distance between rack hinges.)

2. With STU in a vertical position on shipping frame, support STU so that four screws can be removed and STU detached from shipping frame.

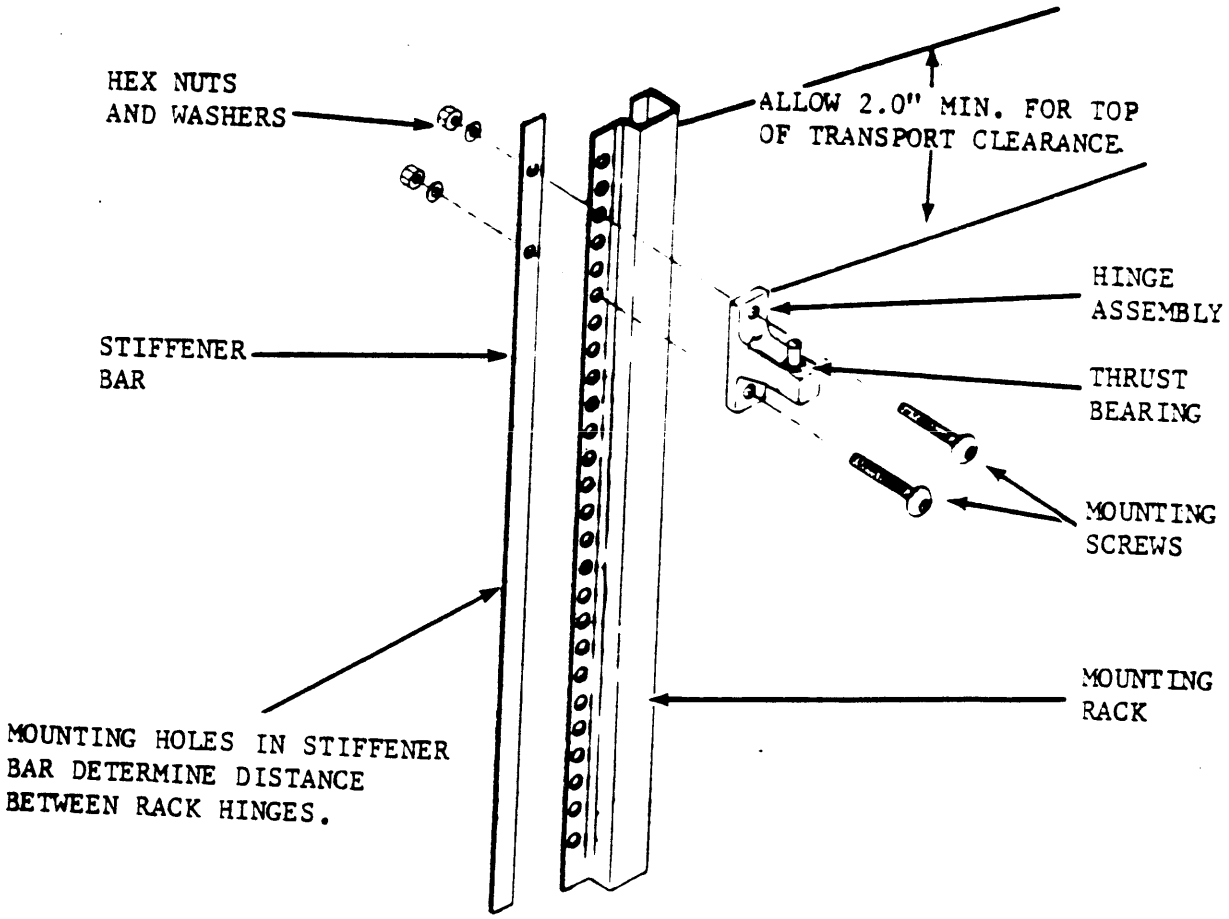

Figure 3-10. Hinge Mounting (Rack)

CAUTION

Two persons are required for lifting or manuvering the unmounted STU. STU weight is approximately 110 pounds.

3. When shipping frame is removed, install two hinges with screws and lockwashers as shown in figure 3-11.

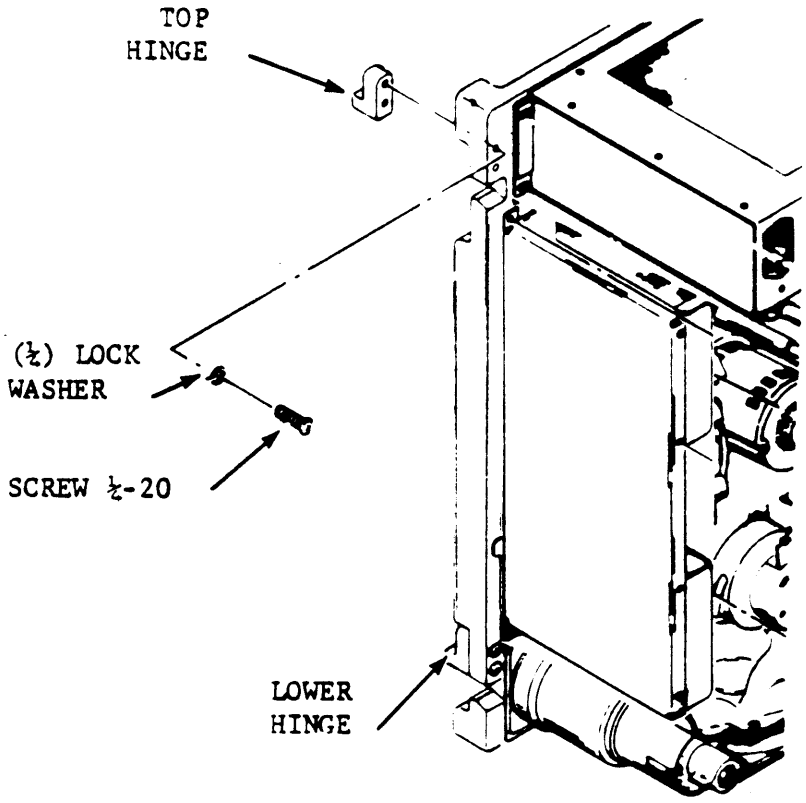

Figure 3-11. Hinge Mounting (Transport)

CAUTION

Make sure that the equipment rack is secure against movement or tipping. To avoid damage, lift transport by the deck casting. Do not support weight of transport by using the rear assemblies as lift points.

4. Position STU onto mounting hinges. STU must be perpendicular to equipment rack so that hinges can be mated.

5. Place STU in a closed position. Mark area at wnich adjustable pawl fastener of STU contacts mounting rail.

6. With STU in open position, install bumper assembly (figure 3-12) into mounting rail approximately one to two inches above point at whicn pawl fastener contacts mounting rail.

7. Adjust bumper assembly so that, when STU is in closed position, tape deck is parallel to mounting rack.

8. Install support block to the rear of the STU tape deck on the left side (Figure 3-12), and secure with 1/4-20 x 0.62 inch long machine screws and lockwashers.

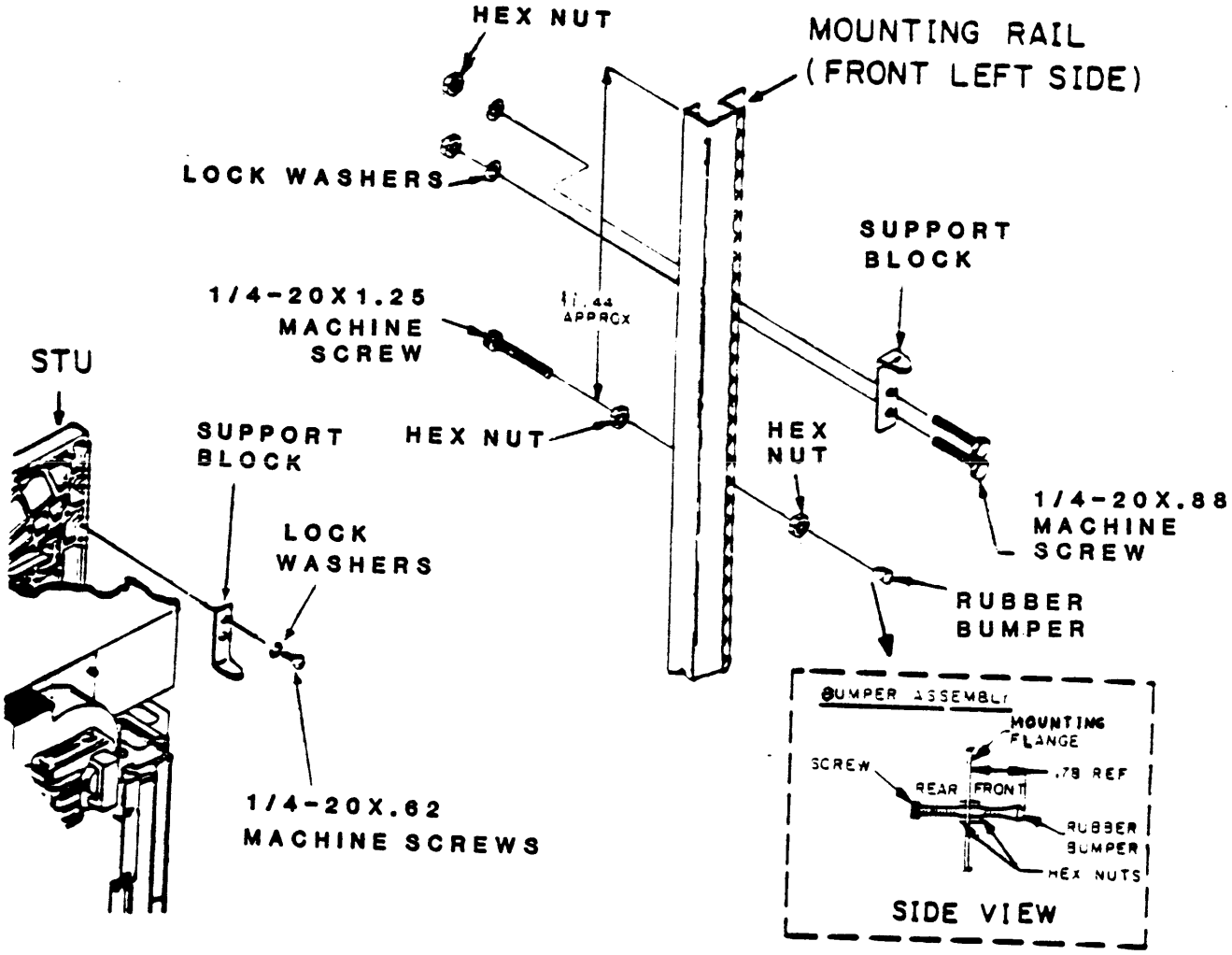

Figure 3-12. Bumper Assembly And Support Block Installation

9. With the STU in an open position, attach one support block to the left mounting flange on the rack (Figure 3-12) and secure with two 1/4-20 x 0.88 inch long machine screws, lockwashers, and hex nuts.

NOTE

Adjust support on the rack so that tape deck is parallel to top surface of rack when STU is in the closed position.

10. Place STU in a closed position and secure with adjustable pawl fastener. continue turning pawl fastener clockwise until STU is secure against bumper assembly.

11. Remove the protective paper from the outside of window.

PACKAGING FOR RESHIPMENT

Use the original container and packaging material when preparing the STU for reshipment. If original material is not available, new packaging can be obtained by contacting the following:

COMPUTER PERIPHERALS, INC.
2621 Van Buren Avenue
Valley Forge Corporate Center
Norristown, PA. 19403
Attn: OEM Marketing

Refer to figure 3-13 for part numbers of all packaging materials.

Dismount the STU from the mounting rack and prepare for shipment as follows:

1. Remove STU from mounting rack.

2. Remove mounting hinges and hardware from STU and retain for shipment with STU.

NOTE

All loose piece parts removed from STU and mounting frame should be retained in a plastic bag for shipment with STU.

CAUTION

Do not attempt to package STU without shipping frame.

3. Mount STU to shipping frame using four screws (1/4-20 x 1-3/4).

4. Remove rack hinges, thrust bearings, stiffener bar and mounting hardware, and retain for shipment.

5. Remove bumper assembly from rack frame and retain.

6. Remove door stud (interlock switch actuator) and retain for shipment.

7. With front door closed, insert two door and deck support blocks (19-1/2" x 1" x 1/4" plywood strips) between top of deck/door and shipping frame. Insert two more support blocks between bottom of deck/door and shipping frame.

8. Carefully insert filler block across bottom rear of shipping frame. Press downward while sliding filler block forward until foam block is completely under logic cage. This will support underside of logic cage during shipping. Tape both ends of wooden brace to metal snipping frame to prevent movement.

9. Insert a small piece of filler block (3/4" x 3/4" x 1-1/4") inside of each (upper and lower) rear logic cage pivot bracket.

10. Strap door in closed position with a length of avis strap. Make one turn around door and tape deck. Place two jiffy sleeves under strap to protect door finisn. Attach buckle and secure avis strap.

12. Lift STU (using shipping frame only) and carefully place into lower inner tray inside of shipping container.

13. Place upper inner tray in position over STU. Place technical manual, plastic bag containing all loose mounting piece parts, and AC cord (60 Hz) or AC connector (50 Hz) on top of inner tray and secure with filament tape.

14. Close and seal shipping carton with 3-inch wide carton sealing tape.

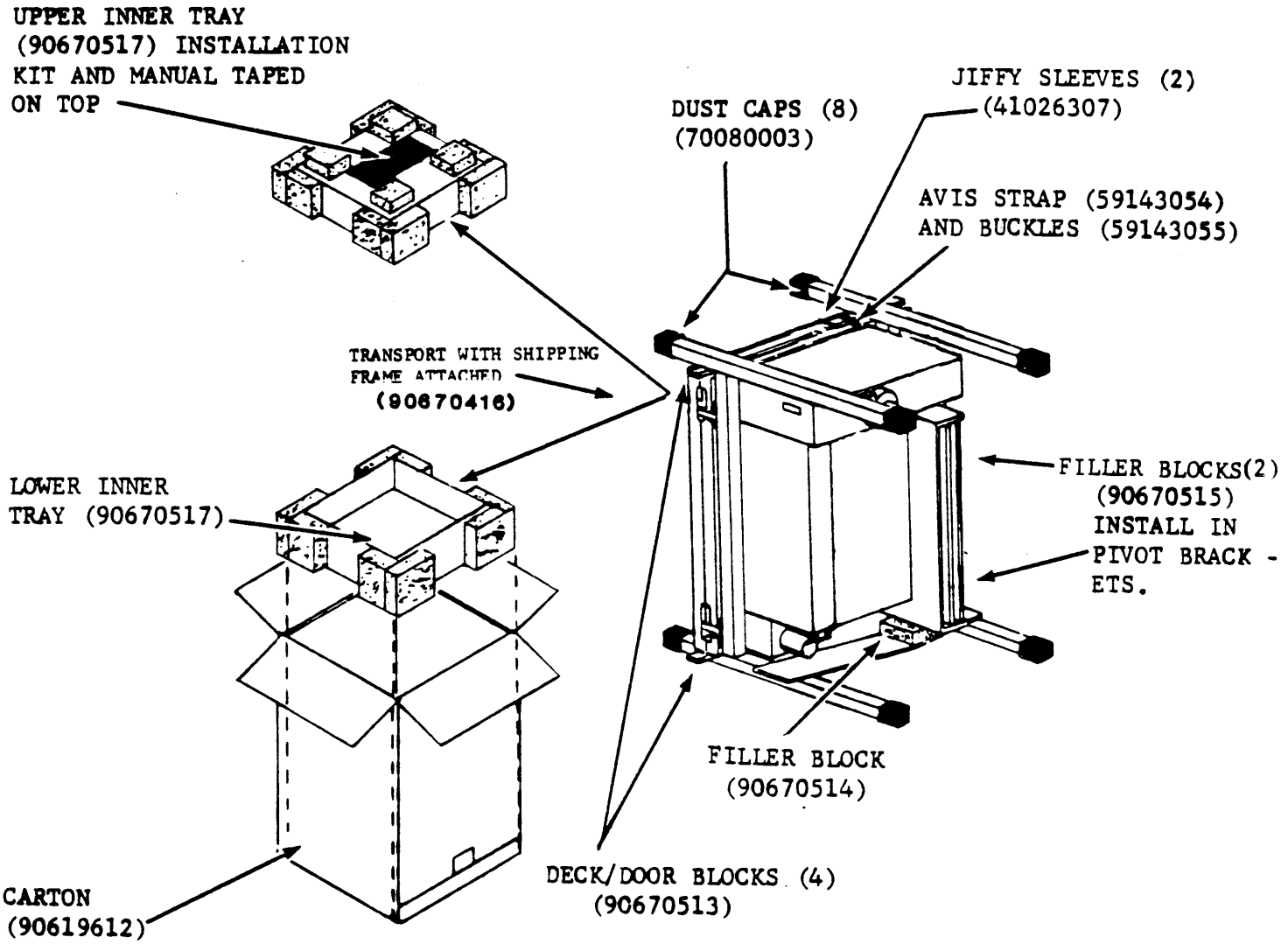

Figure 3-13. Packaging For Reshipment

HORIZONTAL CABINET MOUNTING

GENERAL DESCRIPTION

The Streaming Tape Unit (STU) can also be horizontally mounted in either a CDC/OEM standard or customer designed cabinet. The envelope dimensions of the CDC/OEM standard cabinet are illustrated in Figure 3-14. The bottom of the cabinet can be utilized to mount additional equipment.

The STU is supported by a pivot arrangement that allows the unit to be rotated to any one of the following two service positions:

1. The unit is in a vertical position.
2. The unit is 25° beyond the vertical position.

The STU is held in the closed position by an adjustable pawl fastener.

For horizontal mounting applications, the unit will be delivered without a front door and without the operator panel mounted on the tape deck. The cut-out in the tape deck used for attaching the operator panel on the vertical mounted unit is covered by a flat plate.

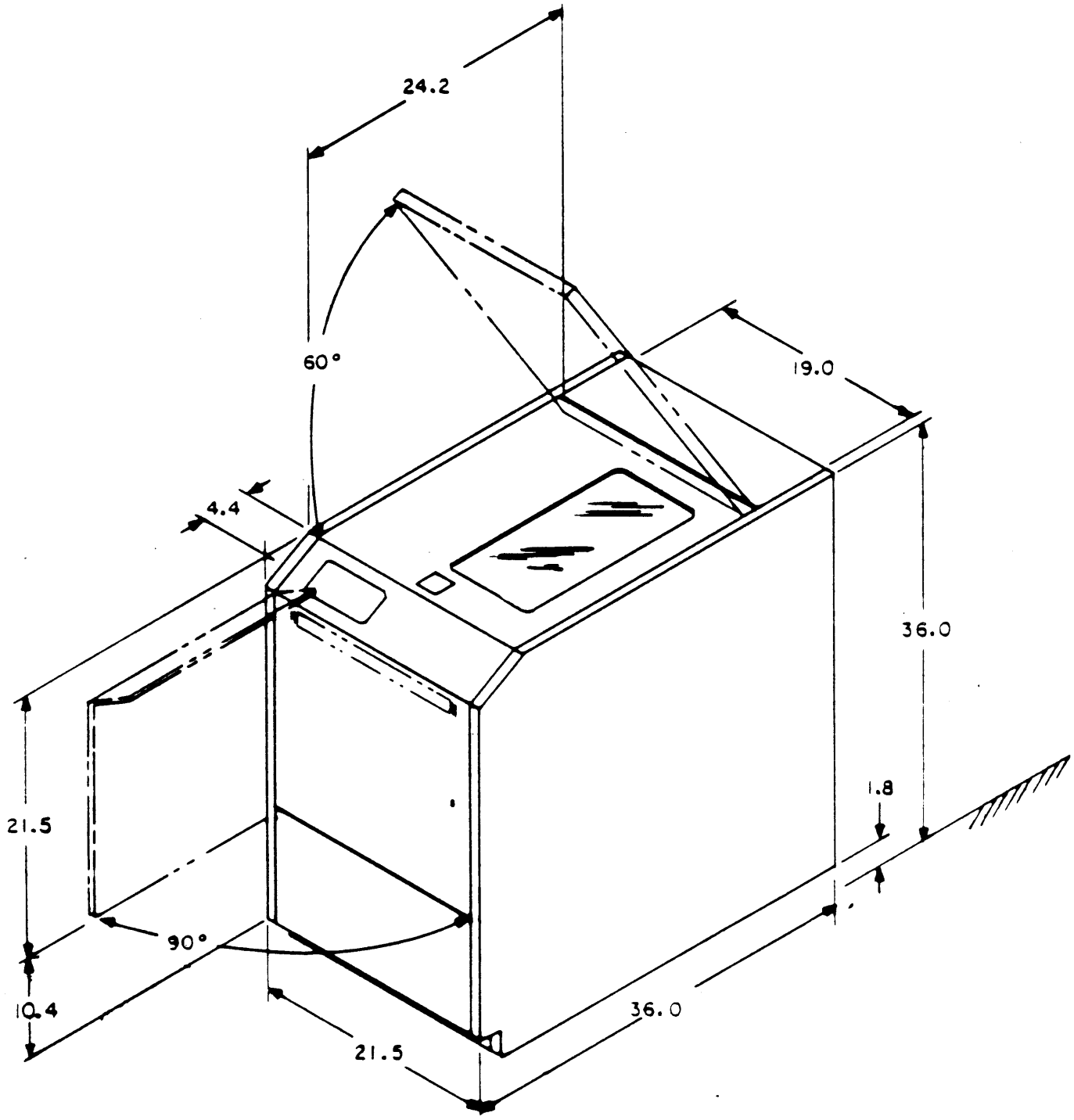

Figure 3-14. CDC/OEM Cabinet Envelope Dimensions

INSTALLATION KIT (Horizontal Mount)

Table 3-5 lists the parts that are provided with the STU for horizontally mounting in a customer designed cabinet.

Table 3-5. HORIZONTAL INSTALLATION KIT

PART DESCRIPTION	QUANTITY	PART NO.
Stud - Pivot	2	77015290
Bearing, Nylon	2	93847011
Cover, Hinge Block	2	77015139
Screw, Self-Tapping, 6-20 x 0.75	4	95647426
Washer, Plain, 6	4	10125605
Bracket - Pivot	2	77015120
Screw, Machine, 1/4-20 x 0.62	8	95843350
Indexing Pin Assembly	1	77018521
Screw, Machine, 8-32 x 0.38	2	95959746
Cap	2	77015320
Screw, Machine, 1/4-20 x 0.50	4	95843349
Ground Cable Assembly	1	76992342
Screw, Machine, 10-32 x 0.31	1	95959766
Terminal, Foil Grounding	1	77009840
Power Cord (60 Hz Unit Only)	1	77015830
Power Connector (50 Hz Unit Only)	1	95967880
Screw, Flat Head, 10-32 x .44	8	10125941
Nut, Self Locking, 10-32	8	00860109
Screw, Machine, 6-32 x .31	4	95959724
Screw, Machine, 8-32 x .25	1	95959744

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HORIZONTAL MOUNTING PROCEDURE

The following procedures, steps 1 thru 15, may be referenced to Figures 3-16 and 3-17. Figure 3-16 illustrates the installation hardware mounting locations on the cabinet while Figure 3-17 illustrates the installation hardware mounting locations on the STU.

1. Mount pivot studs to inside surfaces of cabinet as shown with 10-32 x .44 inch long flat head machine screws and nuts.

2. Install nylon bearings over pivot studs in cabinet as shown.

3. Remove STU from shipping frame by supporting unit vertically such that the four mounting screws can be removed.

CAUTION

Use a two-person operation for lifting or manuvering the unmounted STU-weight is approximately 110 pounds.

4. Turn STU over so that unit is in a vertical position resting on the power supply assembly (Figure 3-16).

CAUTION

Do not rest STU on logic cage end (bottom) or lay face down to avoid damage to unit.

5. Attach hinge block covers to the side of tape deck on STU as shown with #6-20 x 0.75 inch self-tapping screws and flat washers.

6. Install pivot brackets to the back of tape deck on STU as shown with 1/4-20 x 0.62 inch machine screws.

7. Attach indexing pin assembly to inside surface of pivot bracket located on pawl fastener side of STU as shown using #8-32 x 0.38 inch washer head machine screws.

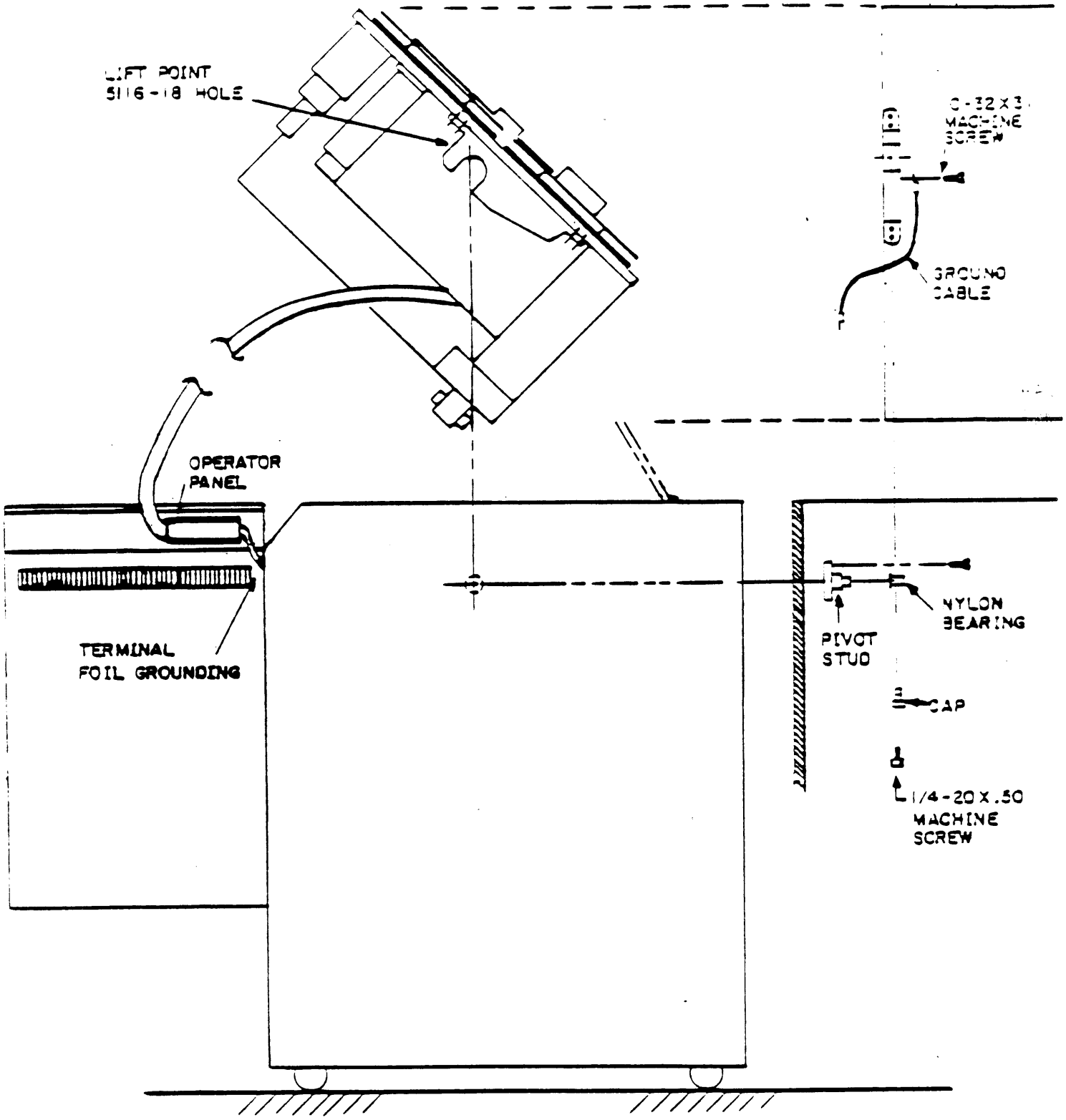

Figure 3-15. Installation Hardware - Cabinet

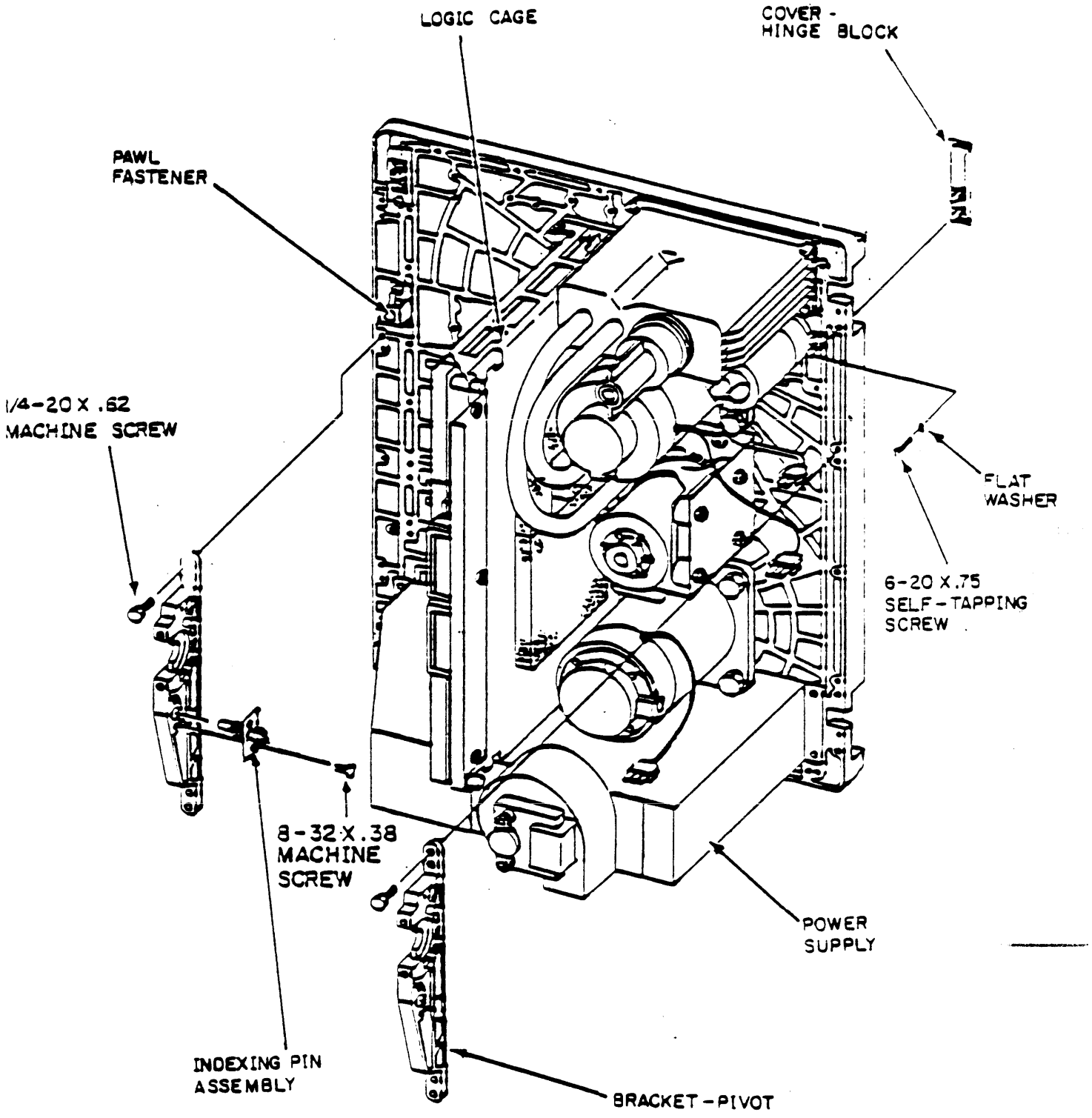

Figure 3-16. Installation Hardware - STU

CAUTION

Ensure that the cabinet is secure against movement before attempting to mount the STU. Lift the STU by tape deck only to avoid damage to unit. Threaded holes (5/16-18) are provided in the end of pivot brackets for use as lift points to assist in mounting the STU.

8. Lower power supply end (top) of STU into cabinet with unit tilted at approximately 45° such that logic cage end (bottom) of unit is pointed toward front of cabinet.

9. Carefully position STU onto pivot studs in cabinet ensuring nylon bearings are not damaged. Rotate unit slightly until indexing pin engages first hole in cabinet at approximately 37° above horizontal.

10. Install caps over pivot studs in cabinet to pivot brackets on STU as shown using 1/4-20 x 0.50 inch long machine screws.

11. Attach ground cable assembly between inside surface of left pivot bracket on STU as shown using #10-32 x 0.31 inch washer head machine screw and inside surface of cabinet.

12. Install operator panel of STU to front door of cabinet with 6-32 x .31 inch long machine screws with lockwashers.

13. Insert end of ground strip on operator panel into foil grounding terminal and attach to front door of cabinet with 8-32 x .25 inch long machine screw and external tooth lockwasher.

14. Connect power cord between STU and terminal block on inside vertical frame member in rear of cabinet, then connect a power cord from the terminal block to the external supply.

15. Place STU in closed position and secure against deck latch bracket on cabinet by turning adjusting screw of pawl fastener located on front of tape deck.

STU IN OEM CABINET

UNPACKING INSTRUCTIONS

1. Carefully inspect the unit on all sides, including the top and bottom, for severe gouges, cuts, abrasive tears, or badly smashed corners or edges. This constitutes mishandling during shipment and the unit may have been damaged. If there is any evidence of damage to the shipping container, it should be recorded and signed by the carrier representative to acknowledge the damage before accepting delivery.

2. All shipping materials should be retained in case of future unit reshipment. Steps 3 thru 12 may be referenced to figure 3-17.

3. Cut and remove the two plastic strapping bands and the angleboards from the shipping container.

4. Lift and remove the top container cover.

5. Lift and remove the shipping carton from around the unit.

6. Remove the two straps from around the polybag and the angleboards.

7. Remove the polybag cover from the unit.

8. Remove the four shipping bolts and washers securing the shipping brackets to the pallet, using a 9/16 inch open-end wrench.

9. Remove the four shipping brackets from around the levelers on the unit.

10. Set up the left and right ramp assemblies (not supplied) by inserting the end plate on the ramps into the groove in the rear of the pallet.

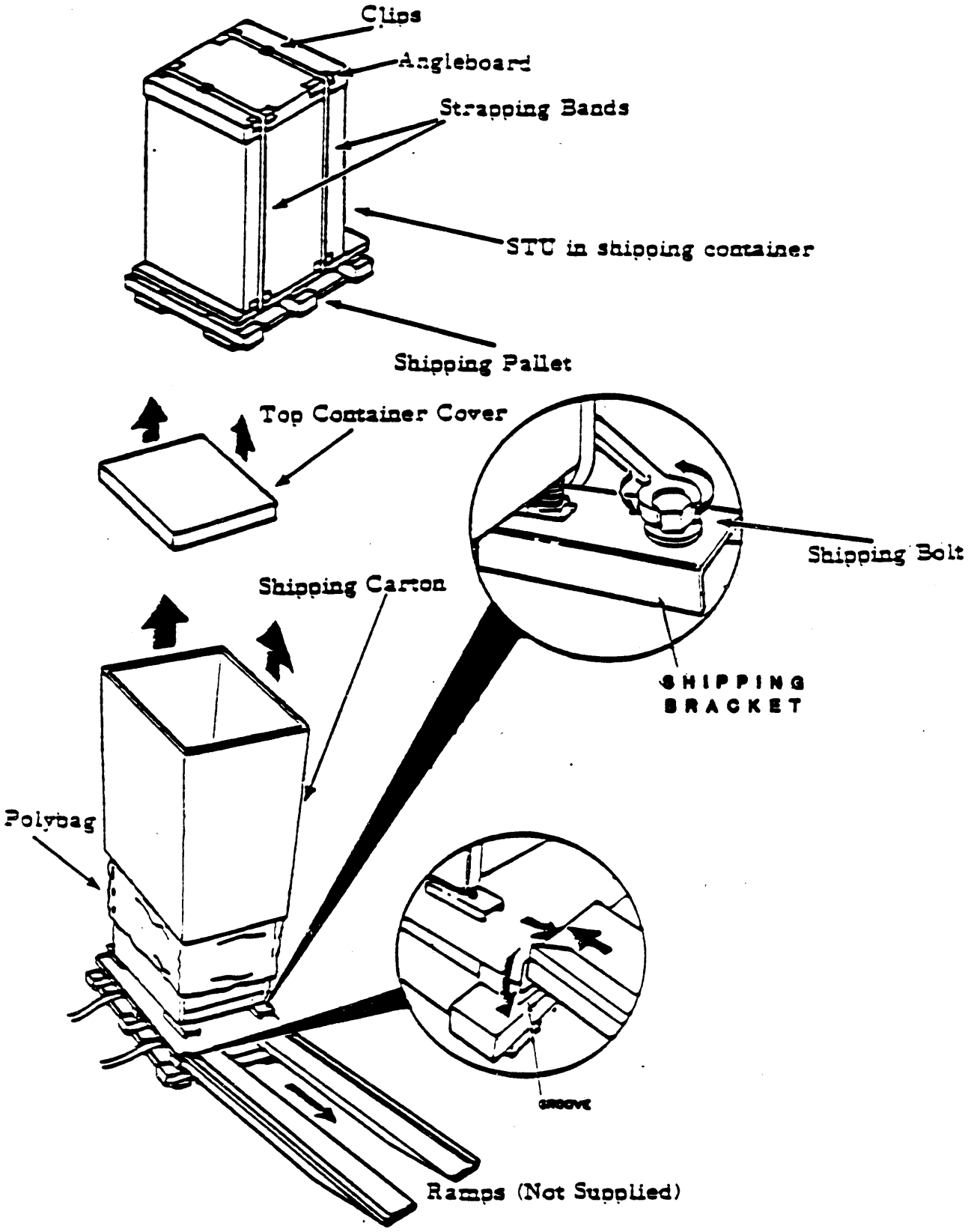

Figure 3-17. In Cabinet STU Unpacking

WARNING

In step 11, take extreme care to prevent the unit from rolling uncontrolled off either side of the pallet after releasing the levelers. Removal of the unit from the pallet is a two-person procedure.

11. Raise the levelers using a 1/2 inch open-end wrench until the cabinet is free to roll. Carefully guide (two-person operation) the unit onto the ramps and down to the floor.

12. Open the front dust cover door latch with a 1/8 inch hex wrench. See figure 3-18.

13. Lift the top cover.

14. From the underside of the tape deck, remove the two slotted hex head screws (one on left side and one on right side) passing through the angle brackets into the tape deck. See figure 3-19.

15. Using a straight slot screwdriver, rotate the pawl fastener on the left side of the tape deck one-half turn counterclockwise to release the tape deck.

16. Reach into the left side of the cabinet, grasp the tape deck latch, and pull the ring out to release the catch.

17. Lift the deck to the maintenance position.

18. Remove the filament tape and the tie-wraps from the PWAs. See figure 3-20.

19. Remove the foam from the rear of the PWAs.

20. Remove the hinge cover kit, P/N 77023062, taped to the manual packet in the bottom of the cabinet and attach the hinge block cover to the top of the tape deck with two #6-20 x .75 inch self-tapping screws and flat washers. See figure 3-19.

21. Return the deck to the operating position and secure by rotating the pawl fastener clockwise.

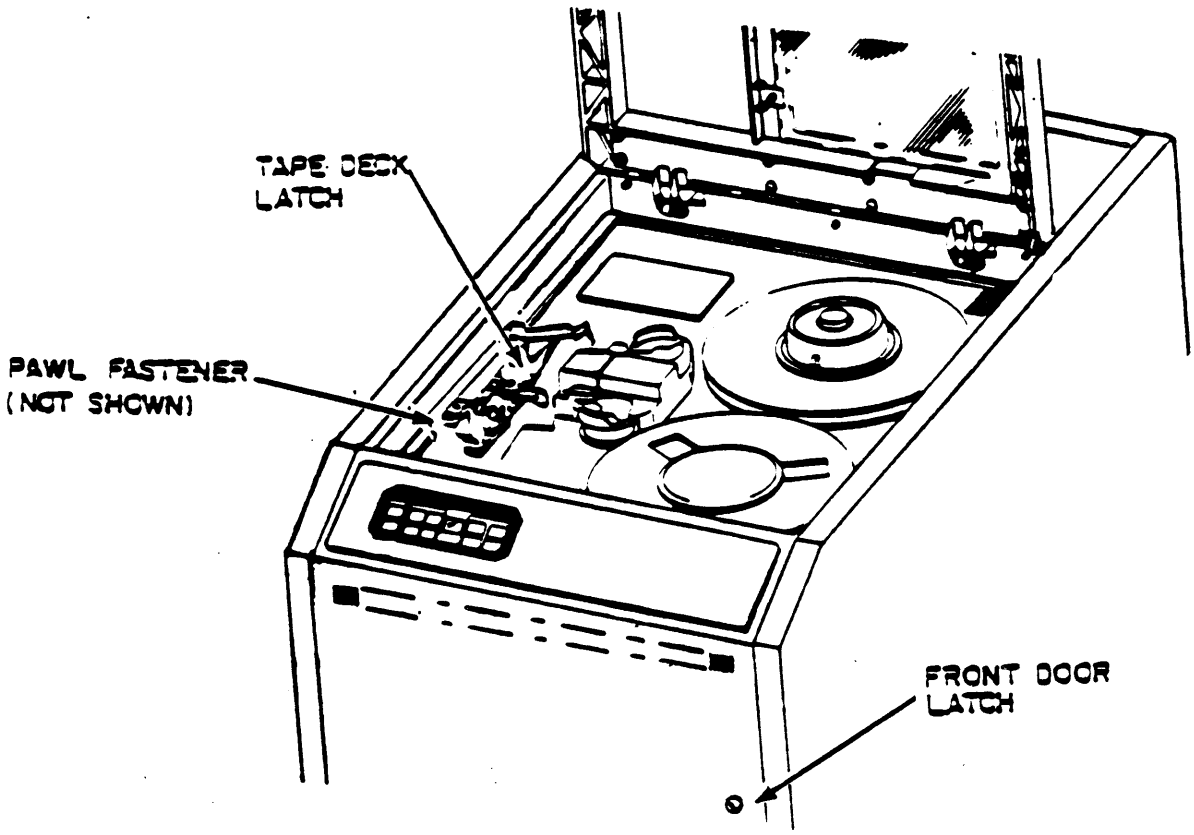

Figure 3-18. Tape Deck Access

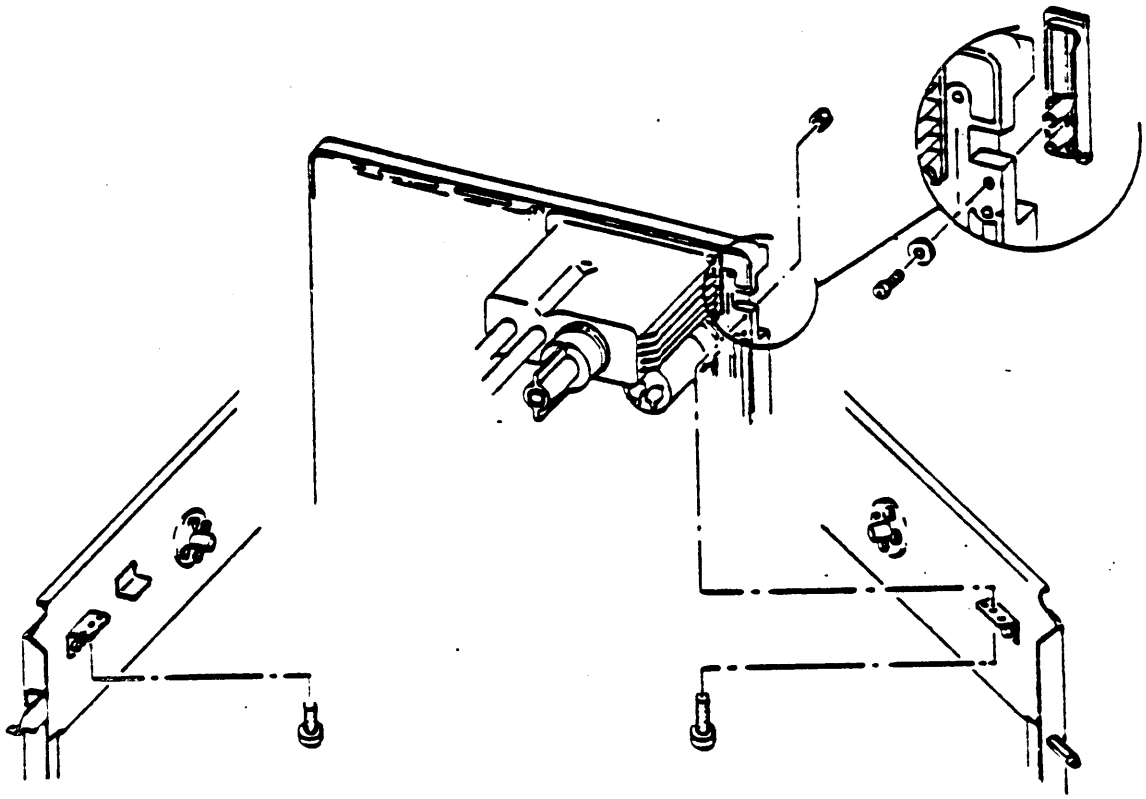

Figure 3-19. Tape Deck Shipping Screws

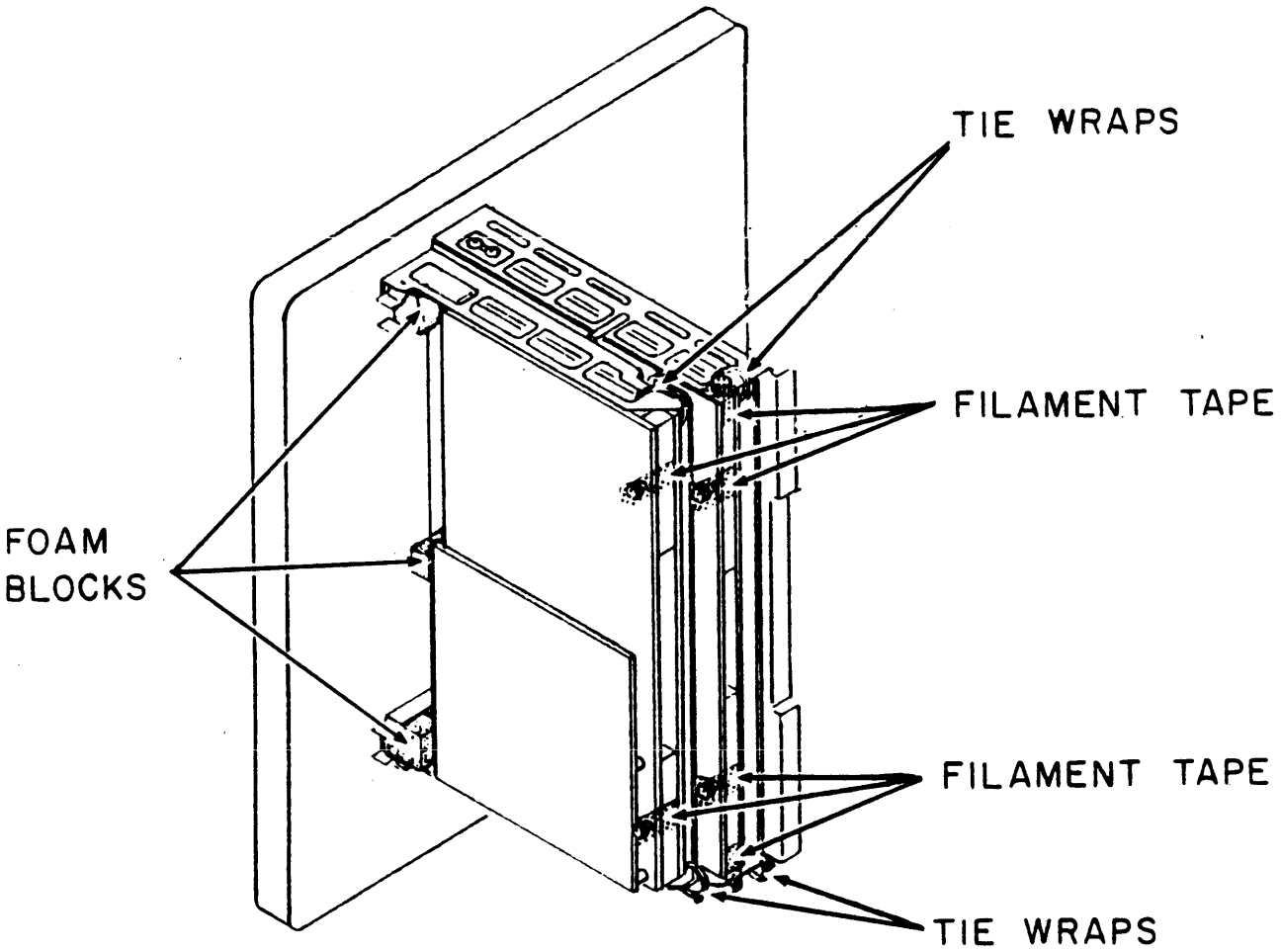

Figure 3-20. Tape Deck Shipping Material

PACKAGING INSTRUCTIONS

The following instructions are provided so that if reshipment of the unit becomes necessary, both the unit and cabinet may be safely and securely transported. If any of the original shipping materials are unavailable, substitutes may be used; however, replacement shipping materials may be obtained by contacting:

Computer Peripherals Inc.
2621 Van Buren Avenue
Valley Forge Corporate Center
Norristown, PA. 19403
Attn: OEM Marketing

In the following packaging procedure, refer to figures 3-17 and 3-21. The part location numbers in figure 3-21 match the numbers (in parentheses) preceding the part number.

1. Insert two pieces of styrofoam (1) part no. 90670515 into the top and bottom pivot brackets located where the PWA cage hinges at the rear of the tape deck. Insert one piece of styrofoam (2) part no. 90541620 between the rear of the tape deck and back edge of the PWAs in the cage. Secure the PWAs to the cage by using tie-wraps (3) part no. 94277400, placing them through holes in the PWA (4 corners). Attach a piece of filament tape (4) part no. 59143067 over the knurled head of the captive screw and tape to the PWA at two locations.

2. To close and lock the tape deck in the horizontal position, with the deck locked and positioned upright, locate the pivot bracket on the left side. Grasp the ring attached to the spring-loaded locking pin and pull outward to disengage the pin. Rotate the deck toward the front and downward until the locking pin engages the hole and locks the deck in the horizontal position. On the top left-hand side of the deck, locate the large screw head recessed into the deck. Using a screwdriver, turn the screw clockwise, thus causing the pawl on the underside of the deck to engage a metal plate. Tighten the screw until there is no movement or play in the deck.

3. On the right side at the front of the cabinet, assemble a hex screw and nut from the underside of the cabinet up into the deck. Repeat this procedure for the left side.

4. Enclose the cabinet with a poly-bag dust cover part no. 90541604.

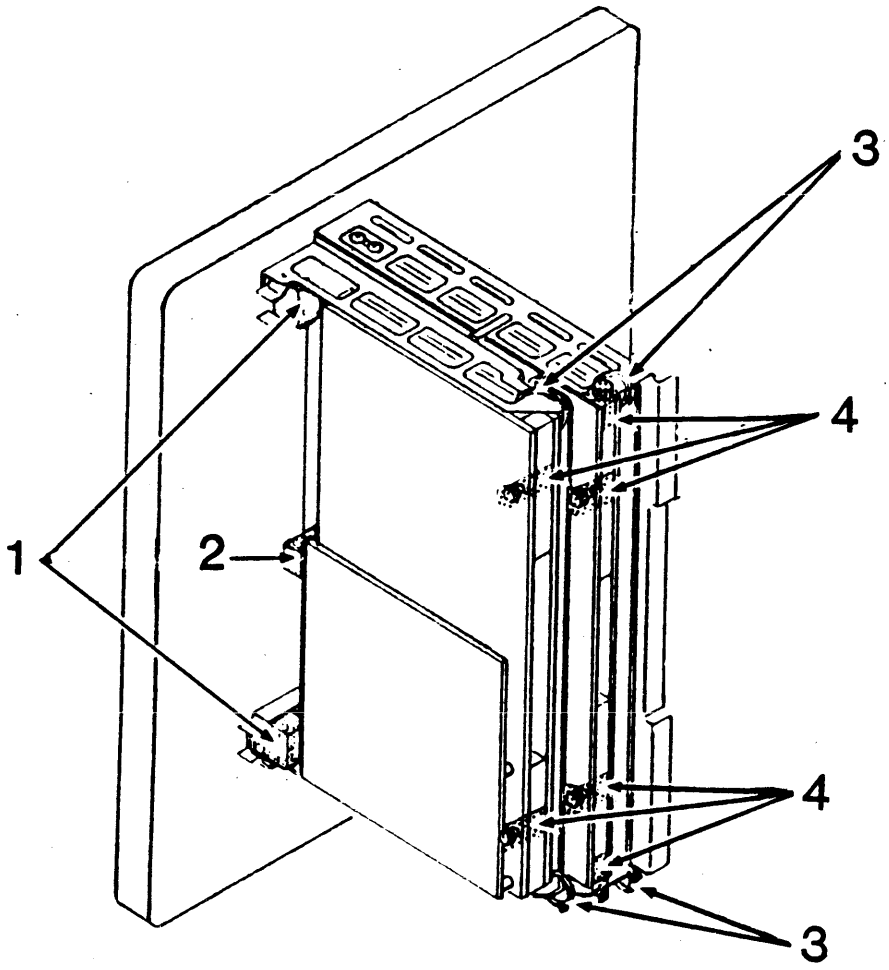

Figure 3-21. STU Shipping Preparation

5. Run a length of avis strap under the bottom of the cabinet from the front to the back and up the rear, across the top and down the front door. Secure the avis strap with a buckle down at the bottom. This will prevent the top and front doors from opening during shipment.

6. With the cabinet bolted to the shipping pallet, position the corrugated shipping carton, part no. 90547202, over the cabinet onto the pallet. Position the top container cover, part no. 90541602, onto the top of the shipping carton.

7. Locate four 8 inch long angle boards, part no. 90541619, on the long dimensions, two each side, to the shipping container.

8. Remove the backing and attach the recloseable poly envelope (pouch) to the shipping carton.

Appendix A - BUFFERED PERTEC INTERFACE

GENERAL DESCRIPTION

The Buffered Pertec Interface is used on Control Data Model 92185-02 Streaming Tape Unit (STU). Except for differences resulting from the change from the non-buffered Pertec interface to the buffered Pertec interface, Model 92185-02 is the same as the Control Data Model 92185-01 STU. Operation in the buffered mode allows the STU to emulate the performance of a high speed start/stop tape drive. For a detailed description of the buffered Pertec interface, refer to Publication No. 49763020, Buffered Pertec Interface Supplementary Hardware Reference/Maintenance Manual.

JUMPERS AND SWITCHES

Jumper and switch locations are shown in figure A-1. The selectable options and addresses with their associated jumpers and switches are listed in table A-1.

Table A-1. BUFFERED PERTEC INTERFACE OPTIONS

OPTION	JUMPER/SWITCH	FUNCTION
Buffer Enable Location F5	W4 1-2 enabled (As Shipped)	Do not change from 1-2 position.
AVC Enable Location F5	W5 1-2 disabled (As Shipped) 2-3 enabled	High speed is forced when AVC is disabled.
Remote Density Select Location F5	W6 1-2 disabled (As Shipped) 2-3 enabled	When enabled, density selection is made by host command. When disabled, density selection is made by operator.
Read Error Recovery Location F5	W7 1-2 enabled (As Shipped) 2-3 disabled	Available only when buffer is enabled. When read error recovery is enabled, buffer attempts read error recovery. When disabled, read error recovery is performed by host. Write error recovery is always performed by the STU.

Table A-1. BUFFERED PERTEC INTERFACE OPTIONS (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
Start Data Delay 1-2 = 0 2-3 = 1 Location H24	W10 W11 W12 0 0 0 = 1ms (As Shipped) 0 0 1 = 5ms 0 1 0 = 10ms 0 1 1 = 15ms	Allows emulation of start/stop delay ramp in write-type commands.
GCR Status Location J10	W13 1-2 enabled (As Shipped) 2-3 disabled	When enabled, either GCR or PE status reported to host.
Write Parity Location H26	W14 1-2 disabled 2-3 enabled (As Shipped)	When enabled, parity of incoming write data is checked by STU. When disabled, parity of incoming data is ignored.
Transfer Rate Switches S1, S2, S3 Location F22 OFF=1, ON=0	TRANSFER RATES S1 S2 S3 Kbytes 0 0 0 = 62.5 1 0 0 = 125 0 1 0 = 250 1 1 0 = 380 0 0 1 = 500 1 0 1 = 625 0 1 1 = 770 1 1 1 Not Used Shipped with 770 Kbytes selected.	In buffered mode, used to select maximum channel transfer rate in kilobytes per second.
Max. Record Size Switches S4, S5, S6 S8 ON (Do Not change setting) Location F22 OFF=1, ON=0	RECORD SIZE S4 S5 S6 Kbytes 0 0 0 = 8 1 0 0 = 16 0 1 0 = 24 1 1 0 = 32 0 0 1 = 40 1 0 1 = 48 0 1 1 = 56 1 1 1 = 64 Shipped with 8 Kbytes enabled.	In buffered mode, used to select maximum record size. (Any record size up to 64K is accepted; value selected is used to allocate minimum buffer space available to prevent overflow.)
RDY Status Delay	S7 OFF (1) disabled (As Shipped) ON (0) enabled	When enabled, RDY status is forced inactive until ONL status goes true.

Table A-1. BUFFERED PERTEC INTERFACE OPTIONS (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
Formatter/Device Address Select Switches S1 to S4 Location H24	S1-OFF As Shipped	Formatter Address 0
	S1-ON	Formatter Address 1
	S2-OFF, S3-OFF As Shipped	Transport Address 0
	S2-OFF, S3-ON	Transport Address 1
	S2-ON, S3-OFF	Transport Address 2
	S2-ON, S3-ON S4-Not Used	Transport Address 3
TERMINATORS - In a daisy-chain configuration of more than one STU (maximum of four), only the last STU has terminators. Remove the terminators from intermediate units.		

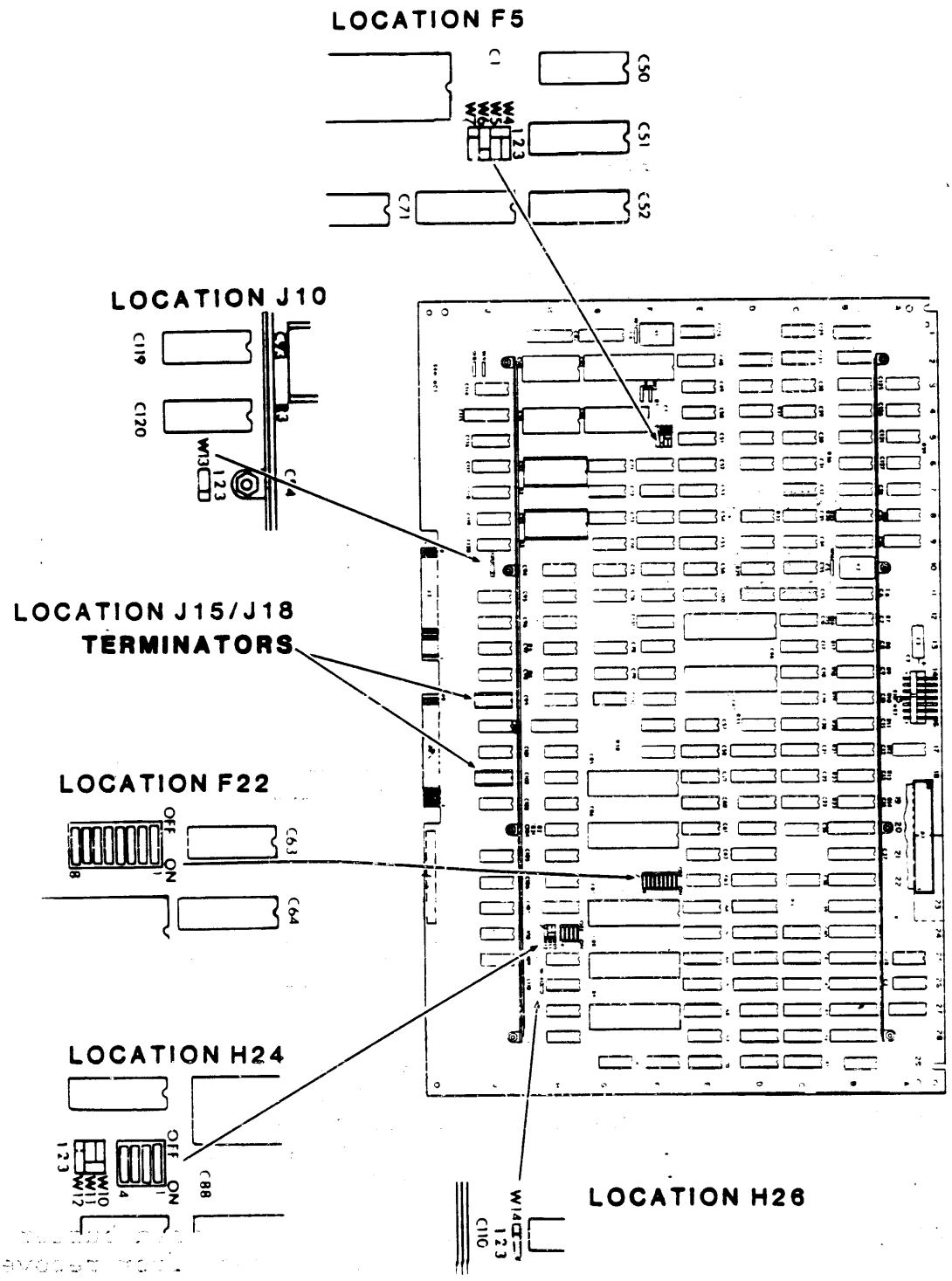

Figure A-1. Buffered Pertec Interface PWA
Jumper and Switch Locations

Appendix B - BUFFERED STC INTERFACE

GENERAL DESCRIPTION

The buffered STC interface is used on Control Data Model 92185-04 Streaming Tape Unit (STU). Except for differences resulting from the change from the non-buffered Pertec interface to the buffered STC interface, Model 92185-04 is the same as the Control Data Model 92185-01 STU. Operation in the buffered mode allows the STU to emulate the performance of a high speed start/stop tape drive. For a detailed description of the buffered STC interface, refer to Publication No. 49763040, Buffered STC Interface Supplementary Hardware Reference/Maintenance Manual.

JUMPERS AND SWITCHES

Jumper and switch locations are shown in figure B-1. The selectable options and addresses with their associated jumpers and switches are listed in table B-1.

Table B-1. BUFFERED STC INTERFACE OPTIONS

OPTION	JUMPER/SWITCH	FUNCTION
Buffer Enable Location F5	W4 1-2 enabled (As Shipped) 2-3 disabled	Allows buffer to be enabled or disabled.
AVC Enable Location F5	W5 1-2 disabled (As Shipped) 2-3 enabled	High speed is forced when AVC is disabled.
Remote Density Select Location F5	W6 1-2 disabled (As Shipped) 2-3 enabled	When enabled, density selection is made by host command. When disabled, density selection is made by operator.
Read Error Recovery Location F5	W7 1-2 enabled (As Shipped) 2-3 disabled	Available only when buffer is enabled. When error recovery is enabled, buffer attempts error recovery. When disabled, error recovery is performed by the host.

Table B-1. BUFFERED STC INTERFACE OPTIONS (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
Start Data Delay 1-2 = 0 2-3 = 1 Location G19	W10 W11 W12 0 0 0 = 1ms (As Shipped) 0 0 1 = 5ms 0 1 0 = 10ms 0 1 1 = 15ms	Allows emulation of start/stop delay ramp.
Transfer Rate Switches S1, S2, S3 Location F22 OFF=1, ON=0	Transfer Rates S1 S2 S3 Kbytes 0 0 0 = 62.5 1 0 0 = 125 0 1 0 = 250 1 1 0 = 380 0 0 1 = 500 1 0 1 = 625 0 1 1 = 770 1 1 1 Not Used Shipped with 770 Kbytes selected.	In buffered mode, used to select maximum channel transfer rate in kilobytes per second.
Max. Record Size Switches S4, S5, S6 S8 OFF (Do Not change setting) Location F22 OFF=1, ON=0	Record Size S4 S5 S6 Kbytes 0 0 0 = 8 1 0 0 = 16 0 1 0 = 24 1 1 0 = 32 0 0 1 = 40 1 0 1 = 48 0 1 1 = 56 1 1 1 = 64 Shipped with 8 Kbytes enabled.	In buffered mode, used to select maximum record size. (Any record size up to 64K is accepted; value selected is used to allocate minimum buffer space available to prevent overflow.)
RDY Status Delay	S7 OFF (1) disabled (As Shipped) ON (0) enabled	When enabled, RDY status is forced inactive until ONL status goes true.

Table B-1. BUFFERED STC INTERFACE OPTIONS (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
Device Address Select Switches S1 to S4 Location G30	S1-OFF, S2-OFF	Transport Address 0
	As Shipped	
	S1-ON, S2-OFF	Transport Address 1
	S1-OFF, S2-ON	Transport Address 2
	S1-ON, S2-ON	Transport Address 3
	S3-Not Used	
	S4-Not Used	

TERMINATORS - In a daisy-chain configuration of more than one STU (maximum of four), only the last STU has terminators. Remove the terminators from intermediate units.

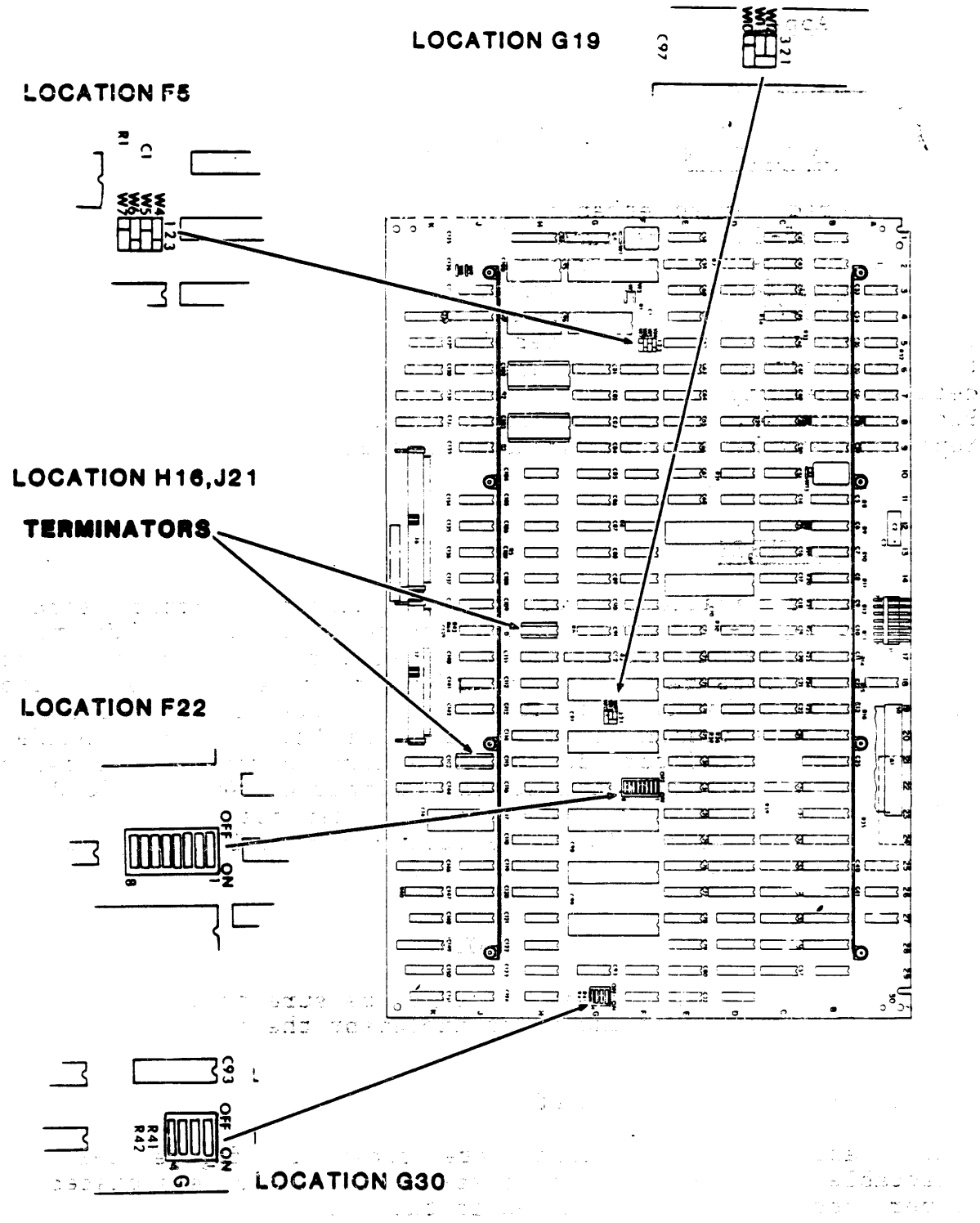

Figure B-1. BUFFERED STC INTERFACE PWA
JUMPER AND SWITCH LOCATIONS

Appendix C - BUFFERED PERTEC ENHANCED INTERFACE

GENERAL DESCRIPTION

The buffered Pertec enhanced interface is used on Control Data Model 92185-02 Streaming Tape Unit (STU). Except for differences resulting from the change from the non-buffered Pertec interface to the buffered Pertec enhanced interface, Model 92185-02 is the same as the Control Data Model 92185-01 STU. Operation in the buffered mode allows the STU to emulate the performance of a high speed start/stop tape drive. For a detailed description of the buffered Pertec interface, refer to Publication No. 49763025, Buffered Pertec Enhanced Interface Supplementary Hardware Maintenance Manual.

OPTIONAL FEATURES

The options available with the buffered Pertec enhanced interface may be selected in two ways: by means of jumpers and switches located on the interface PWA, and by executing CE test 84. Some options may be selected by either means; these options are identified by an asterisk (*). A detailed description of the options is presented in Publication No. 49763025, Buffered Pertec Enhanced Interface Supplementary Hardware Maintenance Manual. Test 84 is described in Publication No. 49763000, STU 92185, Vertical Mount, Hardware Maintenance Manual and in Publication No. 49763100, STU 92185, Horizontal Mount, Hardware Maintenance Manual.

NOTE

After changing any options, be sure to power the STU off and on to implement the changes.

PWA JUMPER AND SWITCH OPTIONS

Jumper and switch locations are shown in figure C-1. The selectable options and addresses with their associated PWA jumpers and switches are listed in table C-1.

Table C-1. BUFFERED PERTEC ENHANCED INTERFACE PWA OPTIONS

OPTION	JUMPER/SWITCH			FUNCTION
*Buffer Enable Location F5	W4	1-2 enabled (As Shipped) 2-3 disabled		Enables or disables buffer.
*AVC Enable Location F5	W5	1-2 disabled 2-3 enabled (As Shipped)		Enables or disables AVC.
*Remote Density Select Location F5	W6	1-2 disabled (As Shipped) 2-3 enabled		When enabled, density selection is made by host command. When disabled, density selection is made by operator.
*Auto Read Error Recovery Location F5	W7	1-2 enabled (As Shipped) 2-3 disabled		Available only when buffer is enabled. When read error recovery is enabled, buffer attempts read error recovery. When disabled, read error recovery is performed by host. Write error recovery is always performed by STU.
*Start Data Delay 1-2 = 0 2-3 = 1 Location H24	W10	W11	W12	Allows emulation of start/stop delay ramp in write-type commands.
	0	0	0 = 1 to 2ms (As Shipped)	
	0	0	1 = 4 to 6ms	
	0	1	0 = 8 to 10ms	
	0	1	1 = 12 to 18ms	
*Density Status Location J10	W13	1-2 enabled (As Shipped) 2-3 disabled		When enabled, either GCR or PE status reported to host.
*Write Parity Location H26	W14	1-2 disabled 2-3 enabled (As Shipped)		When enabled, parity of incoming write data is checked by STU. When disabled, parity of incoming data is ignored.

Table C-1. BUFFERED PERTEC ENHANCED INTERFACE PWA OPTIONS (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
*Transfer Rate Switches S1,S2,S3,S4 Location F22 OFF=1, ON=0 S5 Not Used S6 Not Used	TRANSFER RATES S1 S2 S3 S4 Kbytes/sec 0 0 0 0 62.5 1 0 0 0 125 0 1 0 0 189 1 1 0 0 250 0 0 1 0 313 1 0 1 0 385 0 1 1 0 435 1 1 1 0 500 0 0 0 1 555 1 0 0 1 625 0 1 0 1 714 1 1 0 1 770 0 0 1 1 770 1 0 1 1 770 0 1 1 1 770 1 1 1 1 770	In buffered mode, used to select maximum channel transfer rate in kilobytes per sec. In unbuffered mode, the tranfer rate is determined by STU operating speed and density.
*RDY Status Delay	S7 OFF (1) disabled (As Shipped) S7 ON (0) enabled S8 Not Used	When enabled, RDY status is forced inactive until ONL status goes true.
Formatter/Device Address Select Switches S1 to S4 Location H24	S1-OFF As Shipped S1-ON S2-OFF, S3-OFF As Shipped S2-OFF, S3-ON S2-ON, S3-OFF S2-ON, S3-ON S4-Not Used	Formatter Address 0 Formatter Address 1 Transport Address 0 Transport Address 1 Transport Address 2 Transport Address 3
TERMINATORS - In a daisy-chain configuration of more than one STU (maximum of four), only the last STU has terminators. Remove the terminators from intermediate units.		

TEST 84 OPTIONS

The options listed below can be enabled or disabled by executing test 84. The options marked with an asterisk (*) can also be changed by jumper or switch on the interface PWA. In case of a conflict between the test 84 selection and the jumper selection, the priority is as follows:

a. After test 37, which clears the option bits, and before any test 84 selection is entered, each byte display = 80. Under these conditions, the jumper selection prevails.

b. After one or more selections is made in a byte via the operator panel and test 84, the content of the entire byte prevails over the jumper selection.

The options are described in Publication No. 49763025, Buffered Pertec Enhanced Interface Supplementary Hardware Maintenance Manual.

OPTION	AS SHIPPED
When AVC disabled, force high speed.	Enabled
*AVC Enable	Enabled by jumper
*Density Status on interface	Enabled by jumper
*Remote Density Select	Disabled by jumper
*READY status ANDed with ONLINE status.	Disabled
Operator Panel Buffer Selection	Disabled
Perfect Write	Disabled
*Auto Read Error Recovery	Enabled by jumper
*Buffer Enable	Enabled by jumper
Convert READ REVERSE to BACKSPACE	Disabled
Buffer Mode Display	Disabled
Density Mode Display	Disabled
*Transfer Rate	Set at 770 kilobytes/sec
*Write Start Delay	Set a 1 to 2 millisecs

* Also selectable by jumper or switch on the interface PWA.

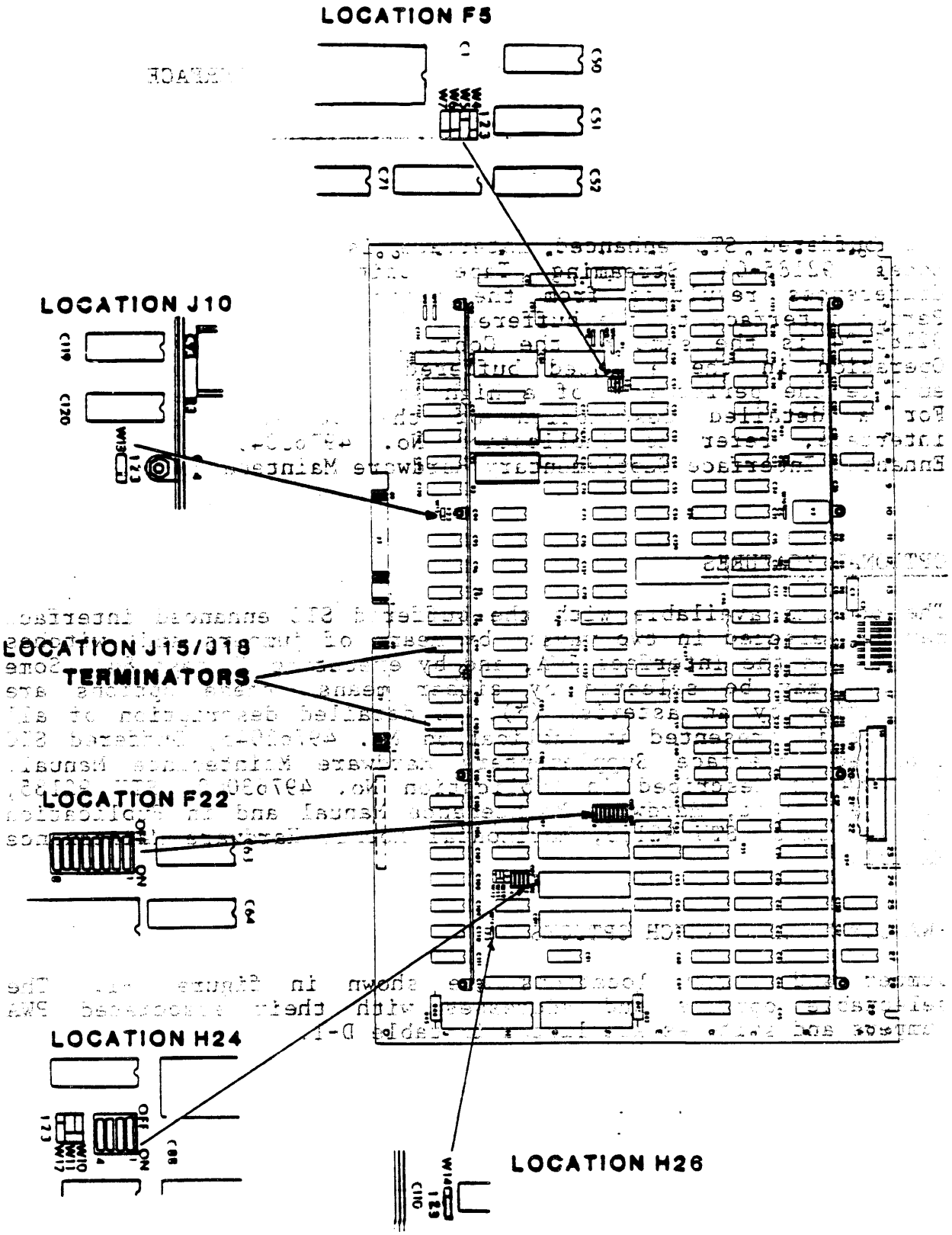

Figure C-1. Buffered Pertec Enhanced Interface PWA Jumper and Switch Locations

Appendix D - BUFFERED STC ENHANCED INTERFACE

GENERAL DESCRIPTION

The buffered STC enhanced interface is used on Control Data Model 92185-04 Streaming Tape Unit (STU). Except for differences resulting from the change from the non-buffered Pertec interface to the buffered STC enhanced interface, Model 92185-04 is the same as the Control Data Model 92185-01 STU. Operation in the enhanced buffered mode allows the STU to emulate the performance of a high speed start/stop tape drive. For a detailed description of the buffered STC enhanced interface, refer to Publication No. 49763045, Buffered STC Enhanced Interface Supplementary Hardware Maintenance Manual.

OPTIONAL FEATURES

The options available with the buffered STC enhanced interface may be selected in two ways: by means of jumpers and switches located on the interface PWA, and by executing CE test 84. Some options may be selected by either means; these options are identified by an asterisk (*). A detailed description of all options is presented in Publication No. 49763045, Buffered STC Enhanced Interface Supplementary Hardware Maintenance Manual. Test 84 is described in Publication No. 49763000, STU 92185, Vertical Mount, Hardware Maintenance Manual and in Publication No. 49763100, STU 92185, Horizontal Mount, Hardware Maintenance Manual.

PWA JUMPER AND SWITCH OPTIONS

Jumper and switch locations are shown in figure D-1. The selectable options and addresses with their associated PWA jumpers and switches are listed in table D-1.

Table D-I. ENHANCED BUFFERED STC PWA INTERFACE OPTIONS

OPTION	JUMPER/SWITCH	FUNCTION
*Buffer Enable Location F5	W4 1-2 enabled (As Shipped) 2-3 disabled	Allows buffer to be enabled or disabled. Forces unbuffered mode.
*AVC Enable Location F5	W5 1-2 disabled 2-3 enabled (As Shipped)	Disables AVC. Allows use of test 84 to select tape speed. Enables AVC.
*Remote Density Select Location F5	W6 1-2 disabled (As Shipped) 2-3 enabled	When enabled, density selection is made by host command. When disabled, density selection is made by operator.
*Auto Read Error Recovery Location F5	W7 1-2 enabled (As Shipped) 2-3 disabled	Available only when buffer is enabled. When error recovery is enabled, buffer attempts error recovery. When disabled, error recovery is performed by the host.
Transfer Rate Jumper Location D4	Jumper In Position / Max. Transfer Rate Kbytes	
	W14 (As Shipped) 1400	Used to select maximum channel transfer rate.
	W15 840	
	W16 670	
	W17 556	

Table D-1. ENHANCED BUFFERED STC PWA INTERFACE OPTIONS (Cont'd)

OPTION	JUMPER/SWITCH	FUNCTION
Device Address Select Switches S1 to S4	S1-OFF, S2-OFF (As Shipped)	Transport Address 0
Location G32 OFF=1, ON=0	S1-ON, S2-OFF	Transport Address 1
	S1-OFF, S2-ON	Transport Address 2
	S1-ON, S2-ON	Transport Address 3
	S3-OFF (As Shipped)	When enabled, latches address lines to allow operation with certain older controllers. *
	S4-ON (As Shipped)	Allows power-down of last unit in multi-drive systems.

TERMINATORS - In a daisy-chain configuration of more than one STU (maximum of four), only the last STU has terminators. Remove the terminators from intermediate units and turn S4, location G32, OFF. When configured as instructed, any intermediate STU may be powered down without affecting the other STUs. When the last STU is powered down, the intermediate STUs are disabled to prevent possible operating errors.

* Also selectable by test 84.

TEST 84 OPTIONS

The options listed below can be enabled or disabled by executing test 84. The options marked with an asterisk (*) can also be enabled or disabled by jumpers on the interface PWA. In case of a conflict between the test 84 selection and the jumper selection, the priority is as follows:

a. After test 37, which clears the option bits, and before any test 84 selection is entered, each byte display = 80. Under these conditions, the jumper selection prevails.

b. After one or more selections is made in a byte via the operator panel and test 84, the content of the entire byte prevails over the jumper selection.

The options are described in Publication No. 49763045, Buffered STC Enhanced Interface Supplementary Hardware Maintenance Manual.

OPTION	AS SHIPPED
When AVC disabled, force high speed.	Enabled
*AVC Enable	Enabled by jumper
Density Status on interface	Enabled
*Remote Density Select	Disabled
READY status ANDed with ONLINE status.	Disabled
Operator Panel Buffer Selection	Disabled
Perfect Write	Disabled
*Auto Read Error Recovery	Enabled by jumper
*Buffer Enable	Enabled by jumper
Convert READ REVERSE to BACKSPACE	Disabled
Buffer Mode Display	Disabled
Density Mode Display	Disabled

* Also selectable by jumper on the interface PWA.

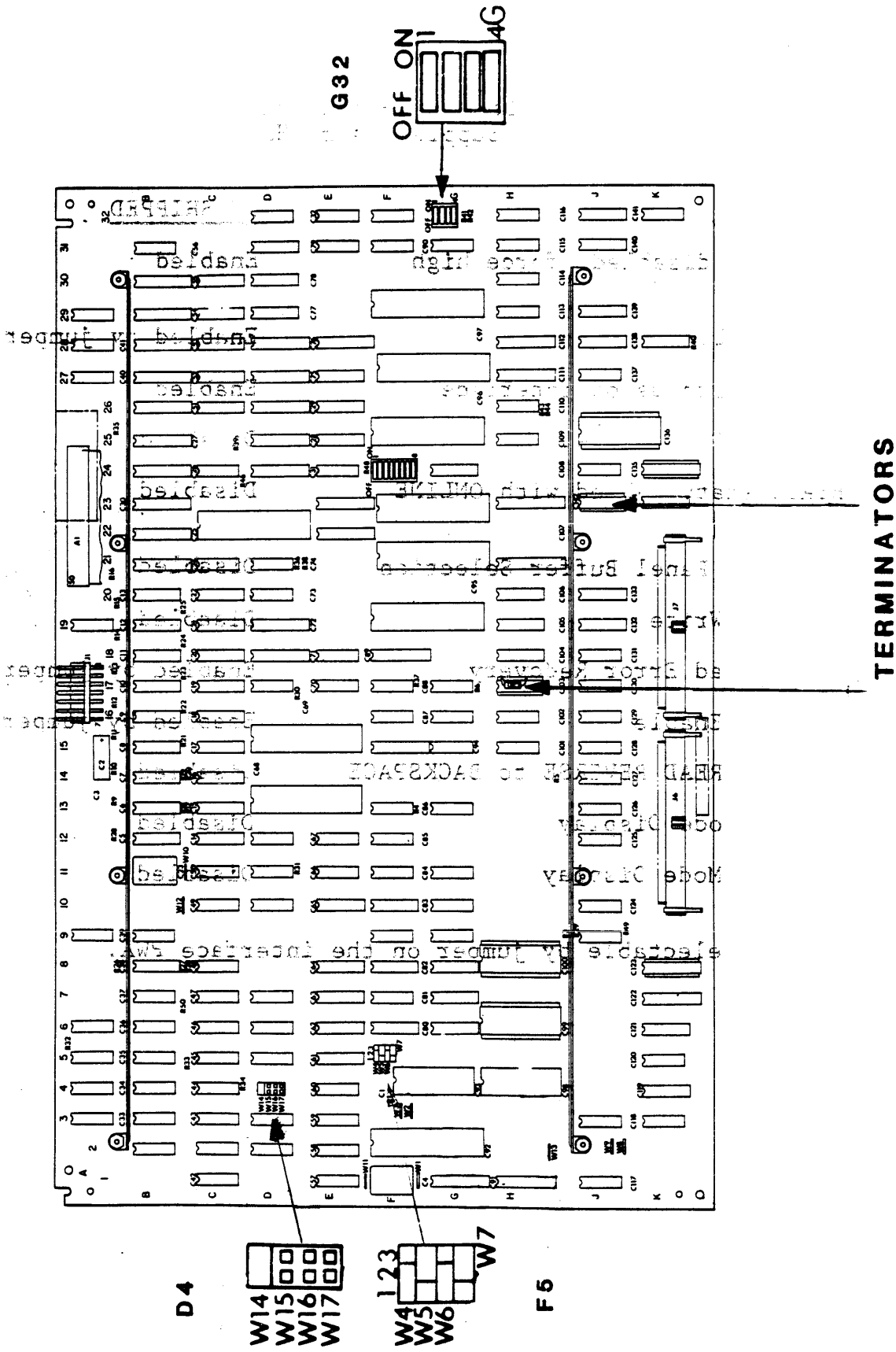

Figure D-1. Buffered STC Enhanced Interface PWA

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