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M-965

INSTALLATION MANUAL
DDP-516 General Purpose Computer

September 1966

Honeywell

 **COMPUTER CONTROL DIVISION**

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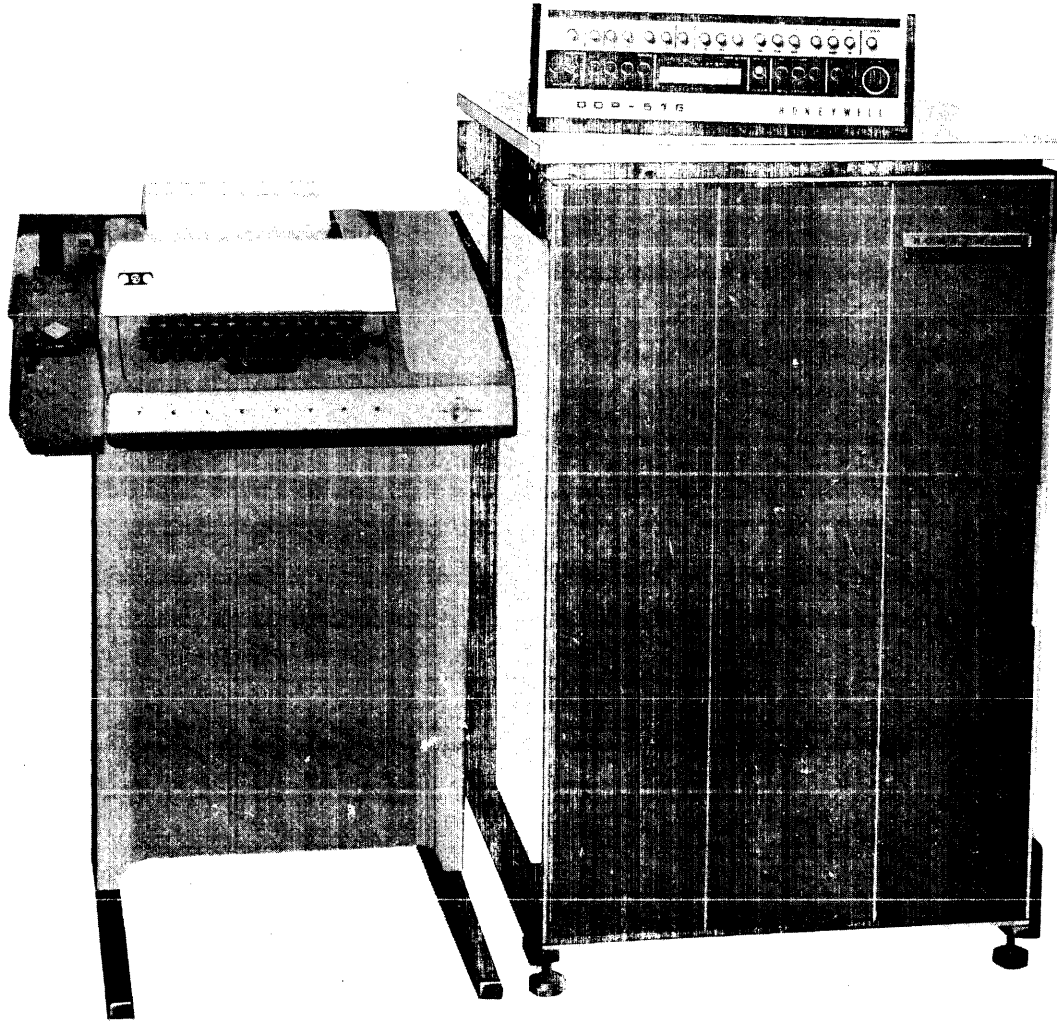
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DDP-516 GENERAL PURPOSE COMPUTER

INTRODUCTION

SCOPE OF MANUAL

This manual contains sufficient data to permit a customer to plan and prepare a site for the installation of a DDP-516 system; to receive, unpack, and install the system equipment; and to perform all checks and operational tests to insure the operability of the system.

APPLICABLE DOCUMENTS

A complete listing of the documents supplied with each system as a standard documentation package is presented in Instruction Manual for DDP-516 General Purpose Computer, Vol. I, 3C Doc. No. 130071620. Where possible, other applicable documents supplied with the system are referenced.

A special document which describes in detail all of the unique aspects of a particular system is supplied with that system. This special document includes such information as the equipment configuration, equipment interconnection data, and assigned cable designators.

SECTION I INSTALLATION PLANNING

This section contains descriptions of the physical and operational requirements of the DDP-516 equipment that are necessary for the planning and preparation of a customer's site.

PHYSICAL DESCRIPTION, BASIC SYSTEM

The minimum system consists of the following items:

- a. One basic equipment enclosure
- b. One control console unit
- c. Standard I/O equipment

Basic Equipment Enclosure

The basic computer equipment enclosure (Figure 1-1) consists of a small desk-height unit which is provided with: 1) front and rear access doors, 2) a Formica covered work surface, and 3) leveling pads at each corner of the unit. The basic enclosure is capable of housing one fixed power supply assembly and two tilt-out equipment assemblies. A dimensionalized illustration of a basic unit is presented in Figure 1-1.

In a minimum (single-bay) system only one enclosure is used; however, two or three enclosures may be used for larger system configurations. For the larger systems, the basic enclosures are bolted together side-by-side to form a single rigid enclosure.

Weight/Unit. -- A single enclosure containing the maximum amount of equipment weighs approximately 250 lb.

Floor Space Requirements. -- Figure 1-2 illustrates the minimum amount of floor area required for a single enclosure including the space required to open the front access door and for the extension of the largest tilt-out assembly possible. Tabular data is also supplied for two- and three-bay configurations. The areas given in Figure 1-2 are required for the equipment only. Any additional space required to permit personnel full access to the equipment is not indicated.

CAUTION

The rear of the unit must be a minimum of 3 in. away from any obstruction to permit air to flow from the rear exhaust ducts.

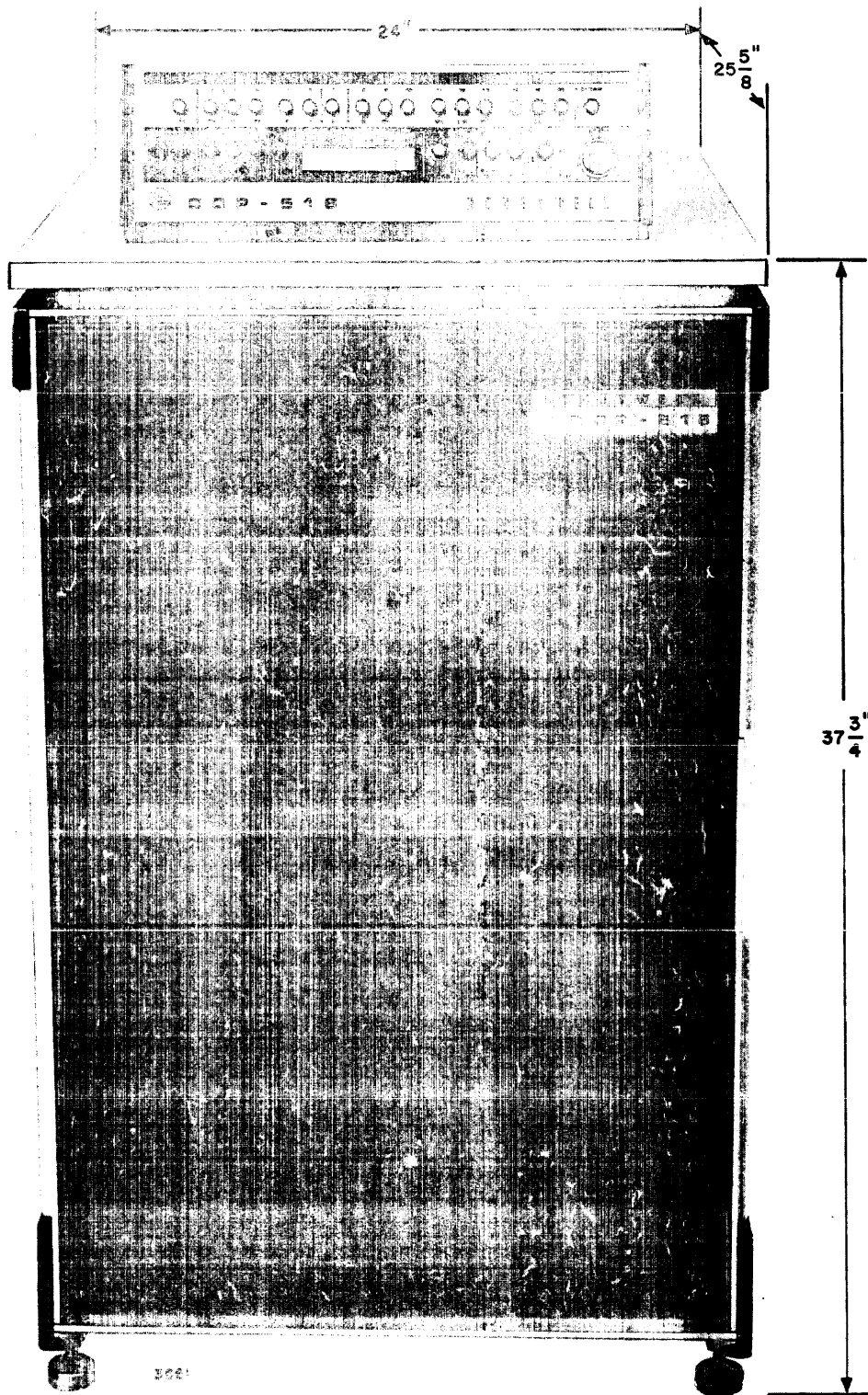
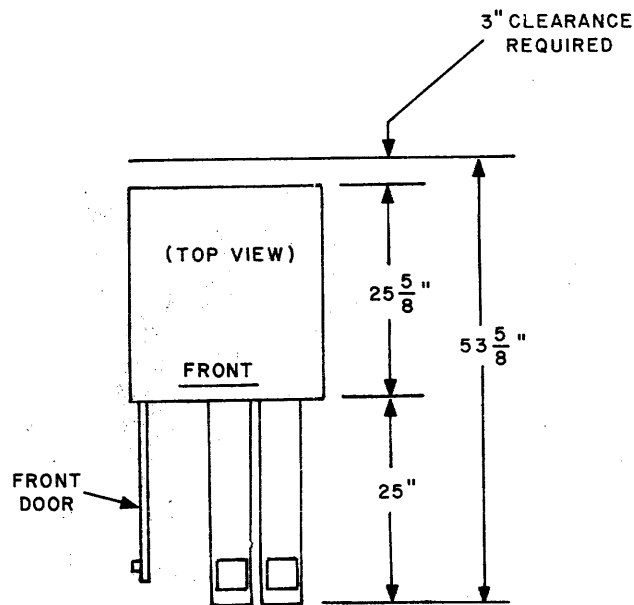


Figure 1-1. Basic Equipment Enclosure, Overall Dimensions



SYSTEM	AREA DIMENSIONS	
	WIDTH	DEPTH
SINGLE - BAY	(AS ILLUSTRATED)	
TWO - BAY	48 INCHES	53 5/8 INCHES
THREE - BAY	72 INCHES	53 5/8 INCHES

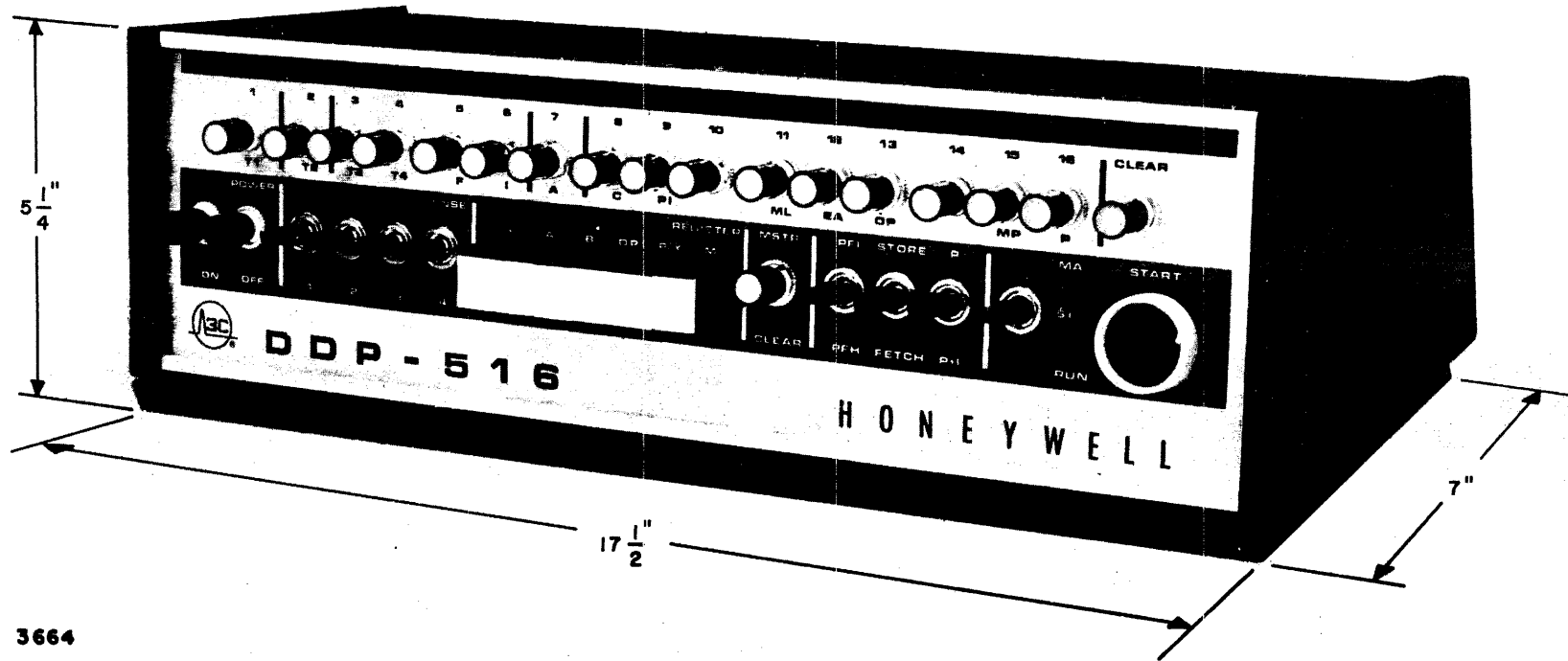
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Figure 1-2. Minimum Floor Area Required for a DDP-516

Control Console

The control console (Figure 1-3) is a single unit which contains the system operating controls and indicators. The console is connected to the system enclosure containing the processor's mainframe logic (always at the left-hand end of multiple-bay systems) via three cables. The placement of the control console is limited only by the length of the interconnecting cables (9 ft). It may be located on top of the system enclosure or on an adjoining table or desk.

Dimensions. -- The overall dimensions of the control console unit are illustrated in Figure 1-3.



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Figure 1-3. Control Console Unit, Overall Dimensions

Weight. -- The control console unit weighs 12 lb.

Basic I/O Equipment

Either a Model 33 (DDP-516-53) or Model 35 (DDP-516-55) Automatic Send-Receive (ASR) Teletype unit is supplied with the computer system as a standard I/O device. The model used is selected by the customer. Both units are supplied with standard teletype mounting stands.

Dimensions. -- The overall dimensions of the Model 33 and Model 35 ASR Teletype units are illustrated in Figures 1-4 and 1-5, respectively.

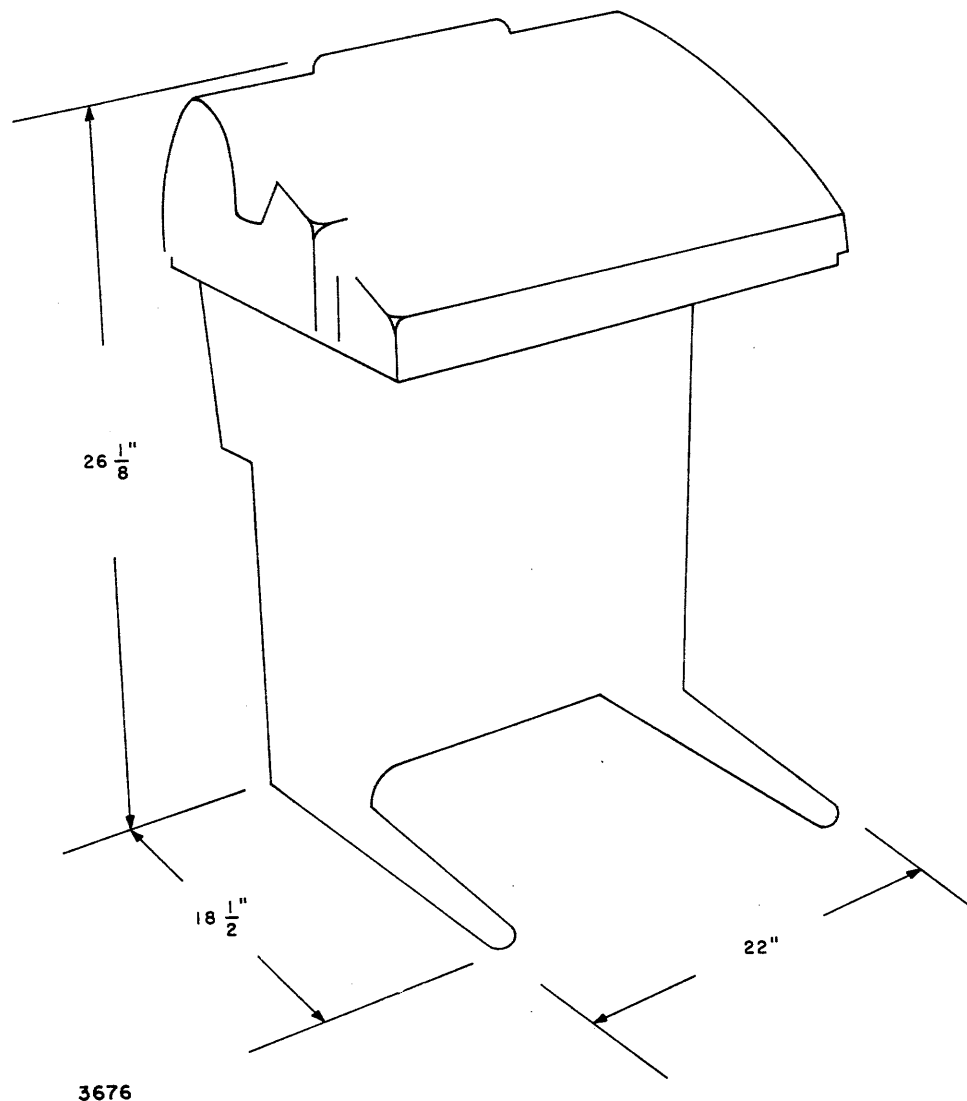


Figure 1-4. DDP-516-53 I/O Unit, Overall Dimensions

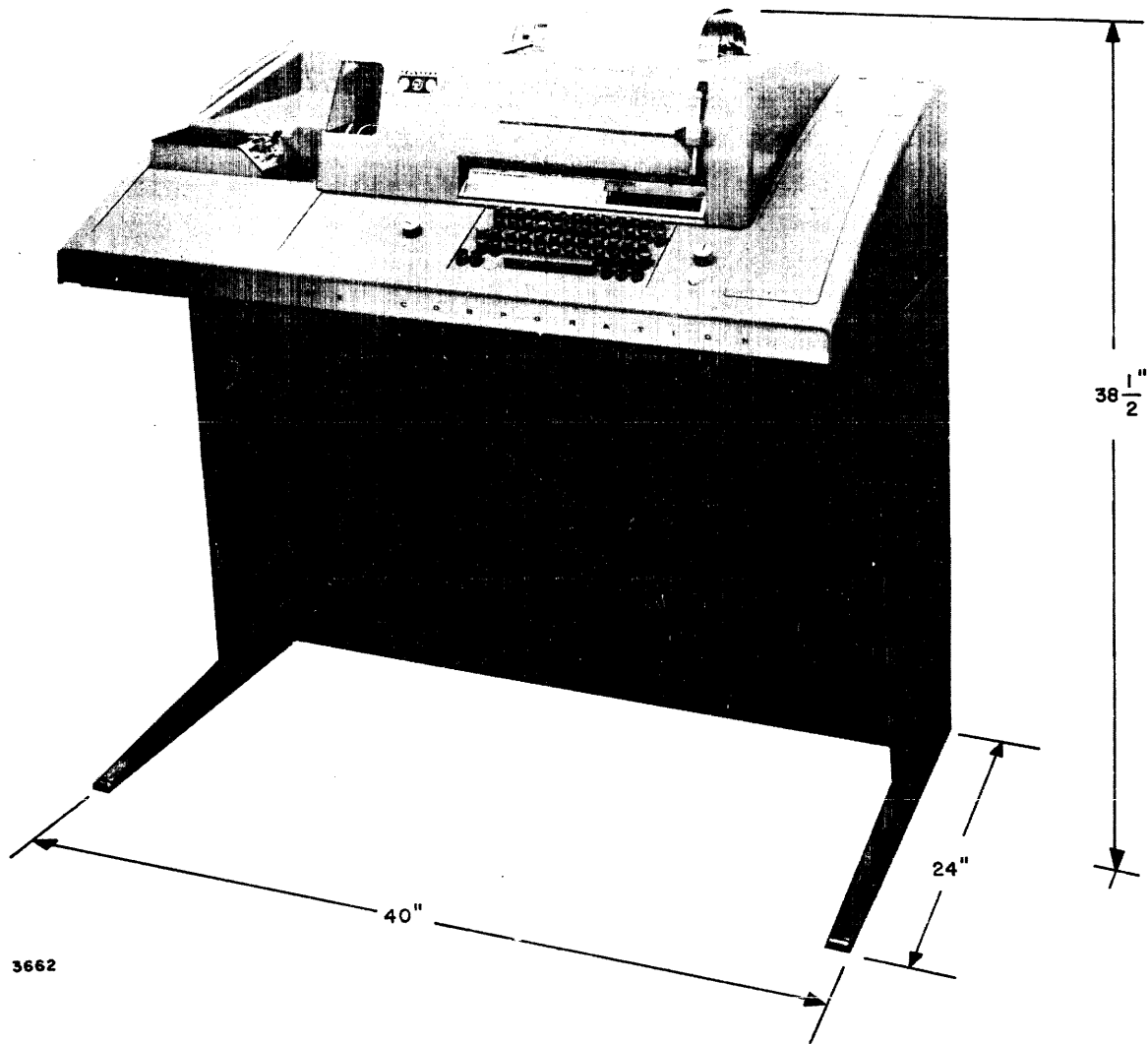


Figure 1-5. DDP-516-55 I/O Unit, Overall Dimensions

Weight. -- The weight of each type of I/O device is as follows.

ASR-33: 56 lb

ASR-35: 225 lb

Floor Space Requirements. -- The Model 33 and Model 35 ASR units require 2.06 sq ft and 6.66 sq ft of floor space, respectively. The areas stated, however, are for the equipment only; additional area is required for the operator and for maintenance personnel.

EQUIPMENT ENVIRONMENTAL AND POWER REQUIREMENTS, STANDARD SYSTEM

Site power and environmental requirements for the installation of standard DDP-516 equipment items are summarized in Table 1-1.

Table 1-1.
Environmental and Power Requirements, Standard System Equipment

Item	Required Source	Maximum Power Required	Temperature Range
Single-Bay System	115 vac, $\pm 10\%$, 60 cps ± 2 cps single phase	1400w	0° to 45°C
Two-Bay System	115 vac, $\pm 10\%$, 60 cps ± 2 cps single phase	2100w	0° to 45°C
Three-Bay System	115 vac, $\pm 10\%$, 60 cps ± 2 cps single phase	2800w	0° to 45°C
ASR-33 I/O Unit	115 vac, $\pm 10\%$, 60 cps ± 0.45 cps single phase	230w	5° to 43°C
ASR-35 I/O Unit	115 vac, $\pm 10\%$, 60 cps ± 0.5 cps single phase	230w	

Standard Equipment Power Cords

The power cords supplied with each item of standard equipment, including the type of plug with which it is terminated at the source end of the cable, are listed in Table 1-2.

Table 1-2.
Equipment Power Cords

Equipment	Power Cord	
	Length	Type
Computer (Main frame enclosure only)	15 ft	Twist-lock plug with 3 circular male contacts. Hubbell 3321G or equivalent.
ASR-33 I/O Unit	8 ft	Male plug with two parallel blades and a ground pin contact. Teletype, similar to Belden 17419.
ASR-35 I/O Unit	6 ft	(Same as the ASR-33 I/O Unit)

OPTIONAL EQUIPMENT DESCRIPTIONS

Model 516-50 Paper Tape Reader and Model 516-52 Punch Units

A special enclosure is provided to house either or both the paper tape reader and/or the paper tape punch optional units when either or both of these options are included in a system. The reader/punch enclosure is designed to be mounted on top of a standard computer equipment enclosure. A dimensionalized drawing of the enclosure is illustrated in Figure 1-6; the weight of the enclosure housing both optional units is 150 lb.

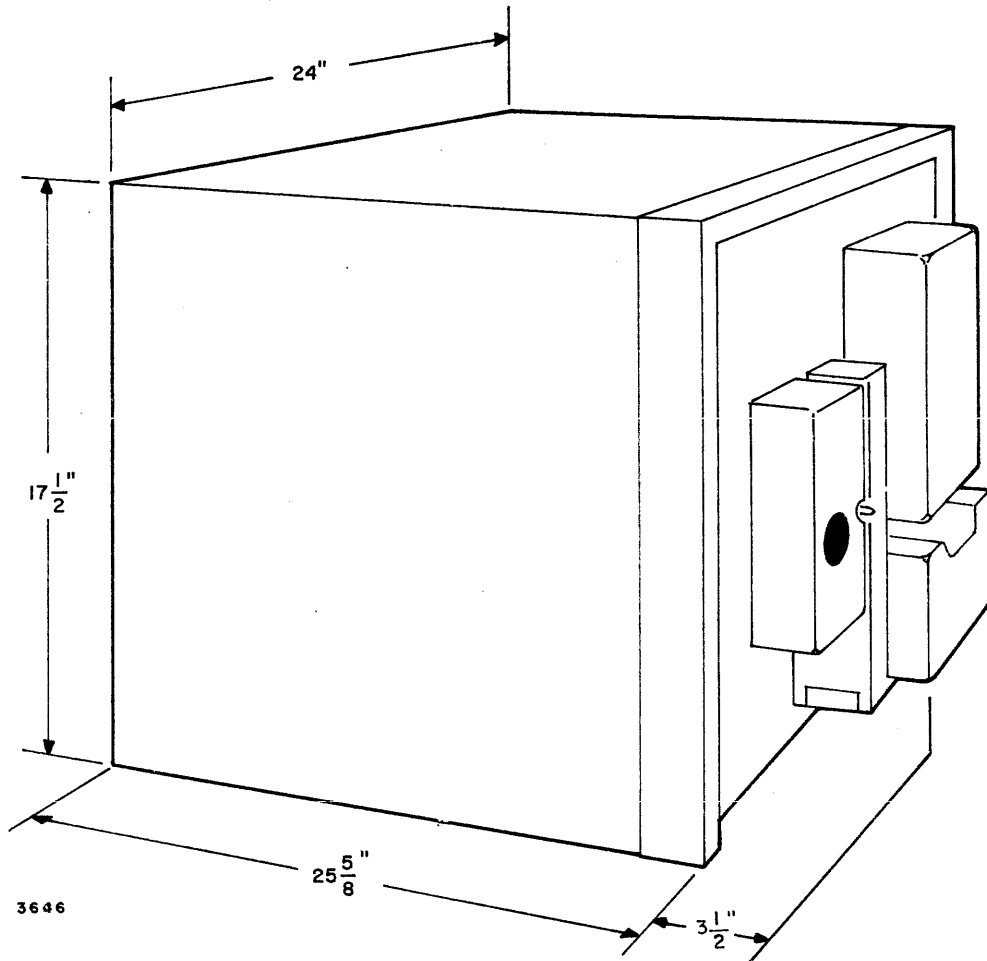


Figure 1-6. DDP-516-50 Paper Tape Reader and DDP-516-52 Punch Unit, Overall Dimensions

The site power requirements for the installation of paper tape reader and punch options are listed below.

Item	Required Source	Average Power Required	Temperature Range
Paper Tape Reader	105-125 vac, 60 cps, single phase (10 amp peak-to-peak surge at 125 vac)	125w	0° to 50°C
Paper Tape Punch	115 vac ±10%, 60 cps ±2 cps, (starting current 9 amp)	230w	5° to 43°C

Model 516-61 Card Reader Unit

The overall dimensions, weight, and minimum required floor area for the DDP-516 Card Reader Unit are listed in Table 1-3. The minimum floor area given in Table 1-3 is that required for the unit only; the additional area required for access to the unit by operating and maintenance personnel is not included.

Table 1-3.
Card Reader Unit, Physical Description

Overall Dimensions (in inches)	Weight	Minimum Required Floor Area
Height: 41 Width: 29-5/8 Depth: 17-3/4	250 lb	3.54 sq ft

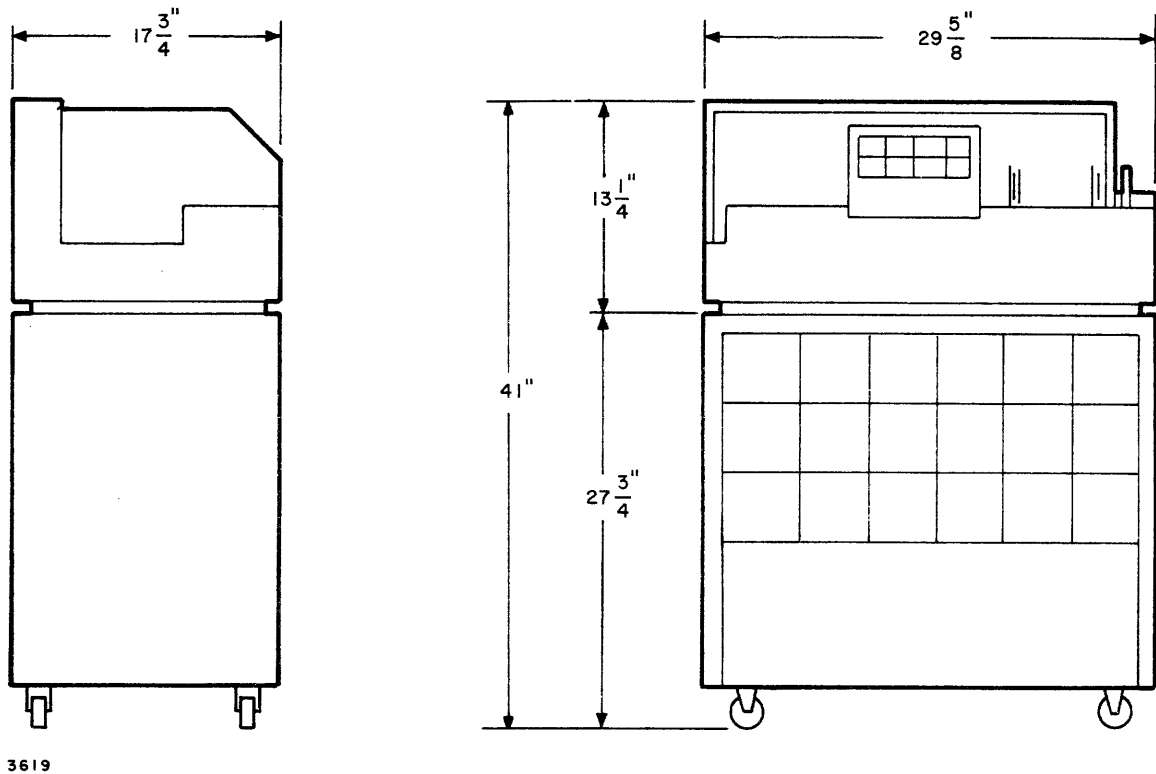


Figure 1-7. Model 516-61 Card Reader Unit, Overall Dimensions

The site power requirements for installation of the card reader are given below.

Required Source	Average Power Required	Temperature Range
115 vac, 60 cps single phase	400w	0° to 45°C

SECTION II EQUIPMENT UNPACKING INSTRUCTIONS

This section contains information regarding the manner in which the items of a computer system are packaged, shipped to the user, and unpacked.

COMPUTER MAIN FRAME

Packaging Procedure

One-, two-, and three-bay computer systems are packaged in the following manner.

a. All loose parts in the computer enclosure are secured by tape; the unit power cord and the system computer-to-peripheral device cables (where possible) are coiled and taped inside of the system central processor enclosure.

b. Wood shipping braces are installed to which movable items, such as the tilt-out units, are secured. (See Figures 2-1 and 2-2.)

c. The computer is covered with a plastic shroud and is mounted on a shock-absorbing float which is fastened to a wood skid. (See Figure 2-3.)

d. The mounted computer enclosure is covered by a triwall, half-slotted fiberboard container. The covered enclosure is held in place on the skid by metal straps. (See Figure 2-3.)

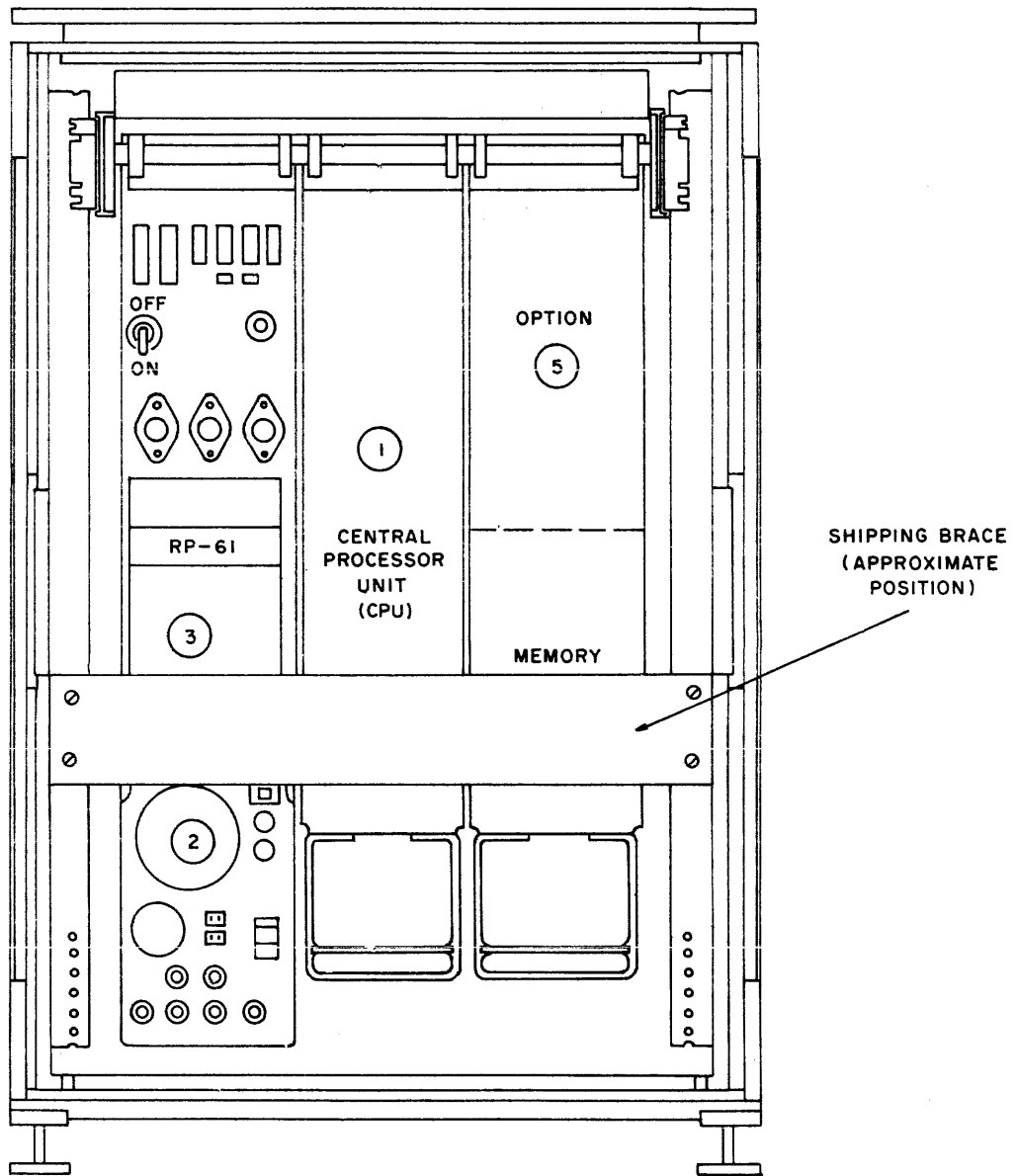
Handling Procedures

The computer (one-, two-, or three-bay systems) may be moved with fork-lift type moving equipment either when skid-mounted or unmounted. It is recommended that the packaged unit be moved as near to its final site as possible before being unpackaged and set into place.

WARNING

When using a fork lift or similar equipment to move a computer enclosure, the lift must be made from either the front or rear of the unit (preferably the front).

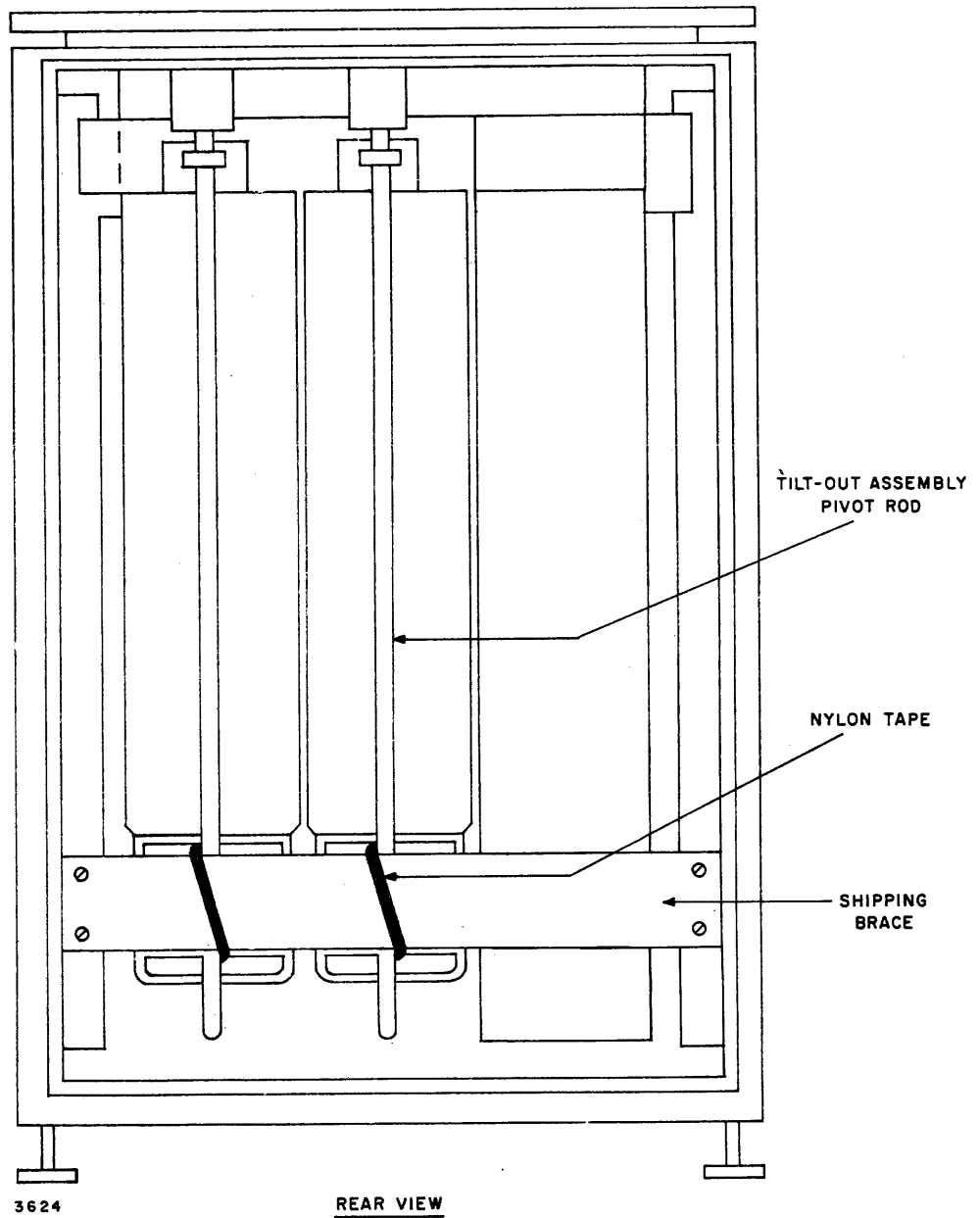
When it is lifted, the primary supports of a computer enclosure (particularly multi-bay enclosures) are one-piece metal channels which are fastened, lengthwise, to the bottom of the enclosure. Any lifting of an enclosure should be done against the bottom support channels.



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FRONT VIEW

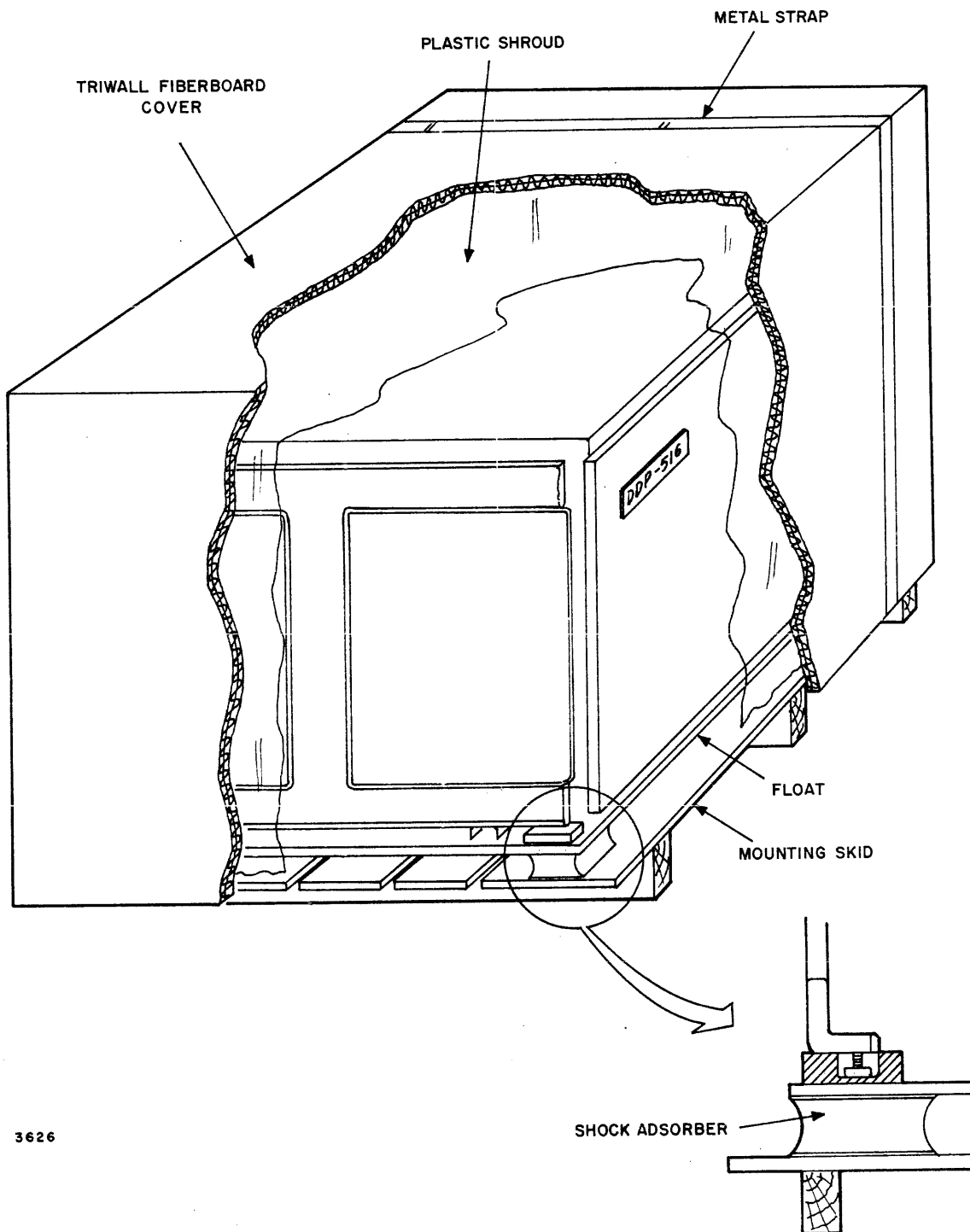
Figure 2-1. Placement of Front Shipping Brace



NOTE:

POWER SUPPLY DOES NOT TILT OUT.

Figure 2-2. Placement of Rear Shipping Brace



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Figure 2-3. Packaging of a Computer Enclosure

Unpacking Instructions

The following instructions are applicable to the unpacking of one-, two-, and three-bay enclosures.

- a. Move packaged unit as close as possible to its final site (refer to Handling Instructions)
- b. Cut and remove metal retaining straps
- c. Lift fiberboard cover from unit
- d. Remove plastic shroud from unit
- e. Remove unit from mounting skid and move to final site (refer to Handling Instructions)
- f. Level unit using the adjustable leveling pads on each leg
- g. Open front door of system bay (or bays) and remove wood shipping brace mounted across the lower front of the bay tilt-out logic assemblies (Figure 2-1). The brace is held in place by four bolts.
- h. Open rear door of each system bay, untape tilt-out assembly pivot rods, and remove wood shipping brace (Figure 2-2). The shipping brace is held in place by four bolts.
- i. Untape any cables secured inside the system bay (or bays) and pull free end of cable to the rear of the unit through the open bottom of the bay.
- j. Inspect system bay (or bays) and untape any item secured inside the bay.

CONTROL CONSOLE

Each control console unit is packaged in a fiberboard carton. Each unit is supported in its carton by fitted inner blocking. Every carton is sealed with tape and is labeled as to its contents.

MODEL 516-53 ASR-33

The ASR-33 consists of two separable units, a stand and a teletypewriter unit which are shipped in the same carton. The stand is a sheet metal unit designed to mount the ASR-33 Teletypewriter Unit. Prior to packing, a bag containing mounting hardware and a carton containing a copy-holder are taped inside the stand. The stand is then packed in a standard fiberboard carton with fitted inner blocking to prevent movement.

The ASR-33 Teletypewriter Unit consists of a sub-base with a keyboard, a typing unit and a drive motor mounted on it. An auxiliary sub-base is bolted to the left-hand side (from front) of the teletypewriter sub-base. It contains the paper tape punch and reader units.

The ASR-33 Teletypewriter, paper tape punch, and reader units are prepared for shipment in the following manner.

- a. A tie-twist is installed at the left-hand end of the typing unit carriage to prevent movement of the carriage during shipment.
- b. Tissue paper is placed around the spacing pawl to retain it.
- c. Packing clips are installed under the hooks of the unit function levers, under the paper tape punch unit sensing lever, and behind the 0 codebar extension located between the tape punch unit base casting and the left-hand codebar extension guides.

d. The teletypewriter (including paper tape units) is mounted on a wood pallet by seven screws. Four self-tapping screws are used to secure the teletypewriter sub-base to the pallet; three machine screws are passed through aluminum bushings and are screwed into tapped holes in the frame of the typing unit. The typing unit must be fastened in this manner because it is mounted on the sub-base only with rubber isolating pads.

The pallet-mounted teletypewriter unit is covered with a plastic shroud and placed inside the fiberboard carton on top of the stand. A protective fiberboard cover is placed over the units inside the carton. Fitted blocking and padding are installed within and the carton is sealed and labeled as to its contents.

ASR-33 Handling Procedure

No special handling procedures are required for the ASR-33. The typing mechanism is fragile, however, and normal precautions must be observed. The carton should be kept upright in a horizontal plane and not be subjected to abnormal shocks or vibrations.

Unpacking Instructions

To unpack the ASR-33 perform the following steps.

- a. Open carton from top and remove padding and fitted inner fiberboard blocking.
- b. Remove inner fiberboard cover and lift pallet-mounted teletypewriter unit from carton.
- c. Remove remaining carton fillers and take out stand.
- d. Place pallet-mounted unit on a work bench.
- e. Tilt teletypewriter unit and remove mounting screw from countersunk hole.
- f. Loosen remaining six mounting screws and return unit to a normal upright position.
- g. Remove remaining mounting screws by sliding unit to edge of bench until screw to be removed is accessible.
- h. When all mounting screws are removed, lift teletypewriter unit from pallet.

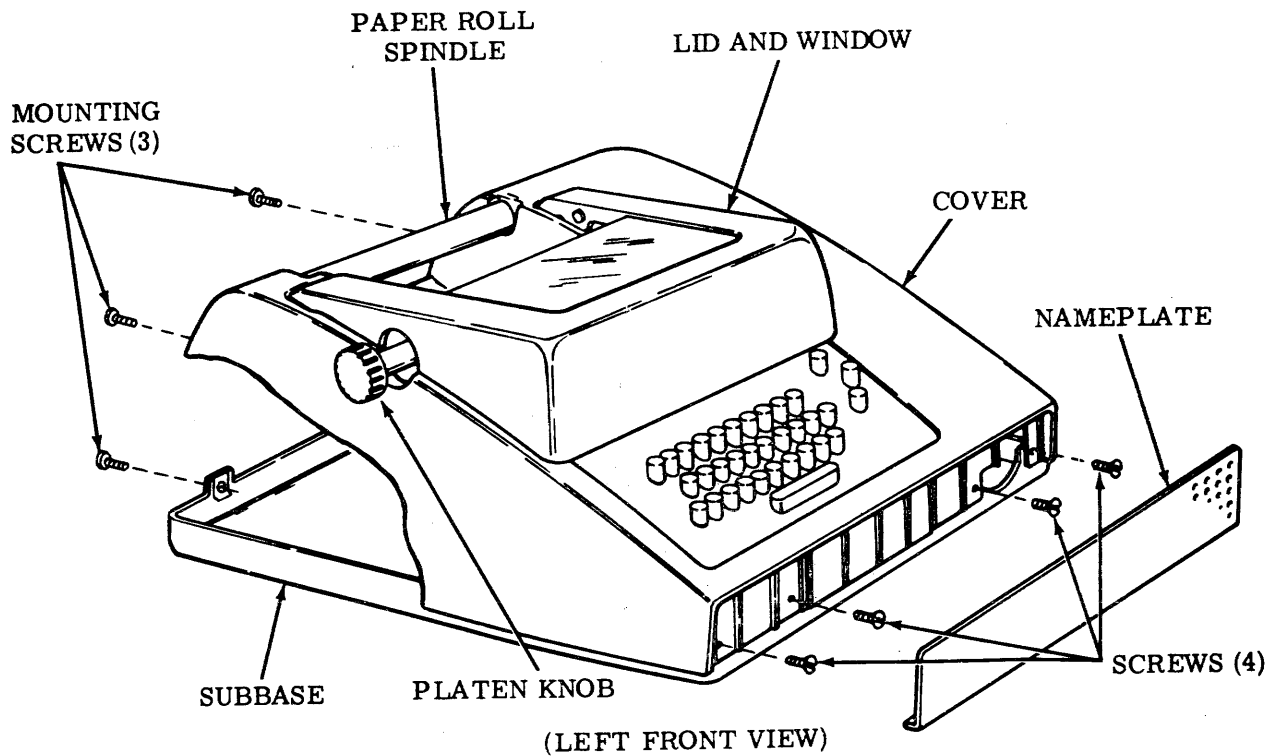
CAUTION

Do not tilt the teletypewriter unit after it has been freed from the mounting pallet. The inner typing mechanism floats on rubber mounts and may tear loose if the unit is tilted.

Teletypewriter Unit, Assembly Preparation

The following steps must be carried out before the unit is assembled to the stand.

- a. Remove tape from cover and take out cables, platen knob, and paper spindle from paper recess at rear of cover.
- b. Remove power rotating switch knob located at front right-hand side of unit. Pull knob forward for removal.
- c. Remove front nameplate by pulling downward and out (Figure 2-4). Removal of plate exposes four cover retaining screws.
- d. Remove four front cover retaining screws, one cover retaining screw located at right-hand front end of unit (paper tape reader sub-base) and three retaining screws from rear.



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Figure 2-4. Cover Mounting Typical Model 33 Teletypewriter Unit

NOTE

Figure 2-4 shows only basic teletypewriter unit. The paper tape reader and punch subassemblies are not shown.

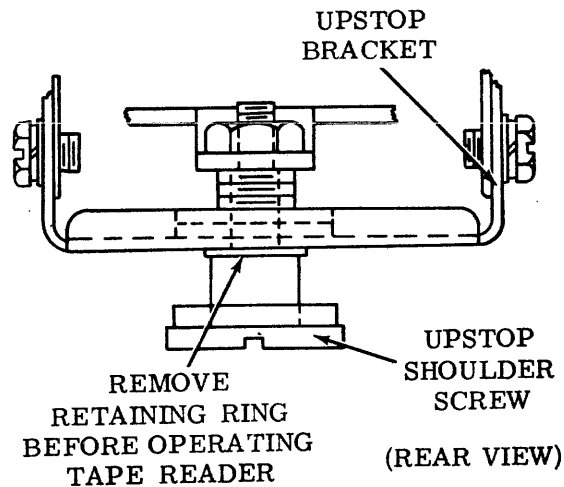
- e. Lift cover from unit (teletypewriter cover and paper tape reader and punch cover are an integral unit).
- f. Remove twist-tie at left end of carriage.
- g. Remove tissue paper below carriage which retains spacing pawls.
- h. Remove two yellow packing clips from under hooks of function levers.
- i. Remove yellow packing clip located under the paper tape punch sensing levers and behind the 0-code bar extension between the left-hand codebar extension guide and tape punch base casting.
- j. Remove retaining ring from tape reader unit upstop screw by performing the following steps.
 - (1) Locate rectangular pattern of four screws with a fifth screw located in center of pattern on sub-base directly under reader unit.
 - (2) Remove center screw.
 - (3) Gently lift reader from its housing.

(4) Remove upstop screw retaining ring (identified by yellow stripe) from screw (Figure 2-5).

(5) Install reader unit into housing by reversing the instructions given in steps 1 through 3.

k. Replace cover, nameplate, and control knob by performing steps b through e in reverse order.

l. Install platen knob by aligning knob mounting hole with keying flat cut on left-hand end of platen and pushing knob onto platen.



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Figure 2-5. Tape Reader Upstop Bracket Retaining Ring

Assembling Teletypewriter Unit and Stand

To install the teletypewriter unit on its stand, perform the following steps.

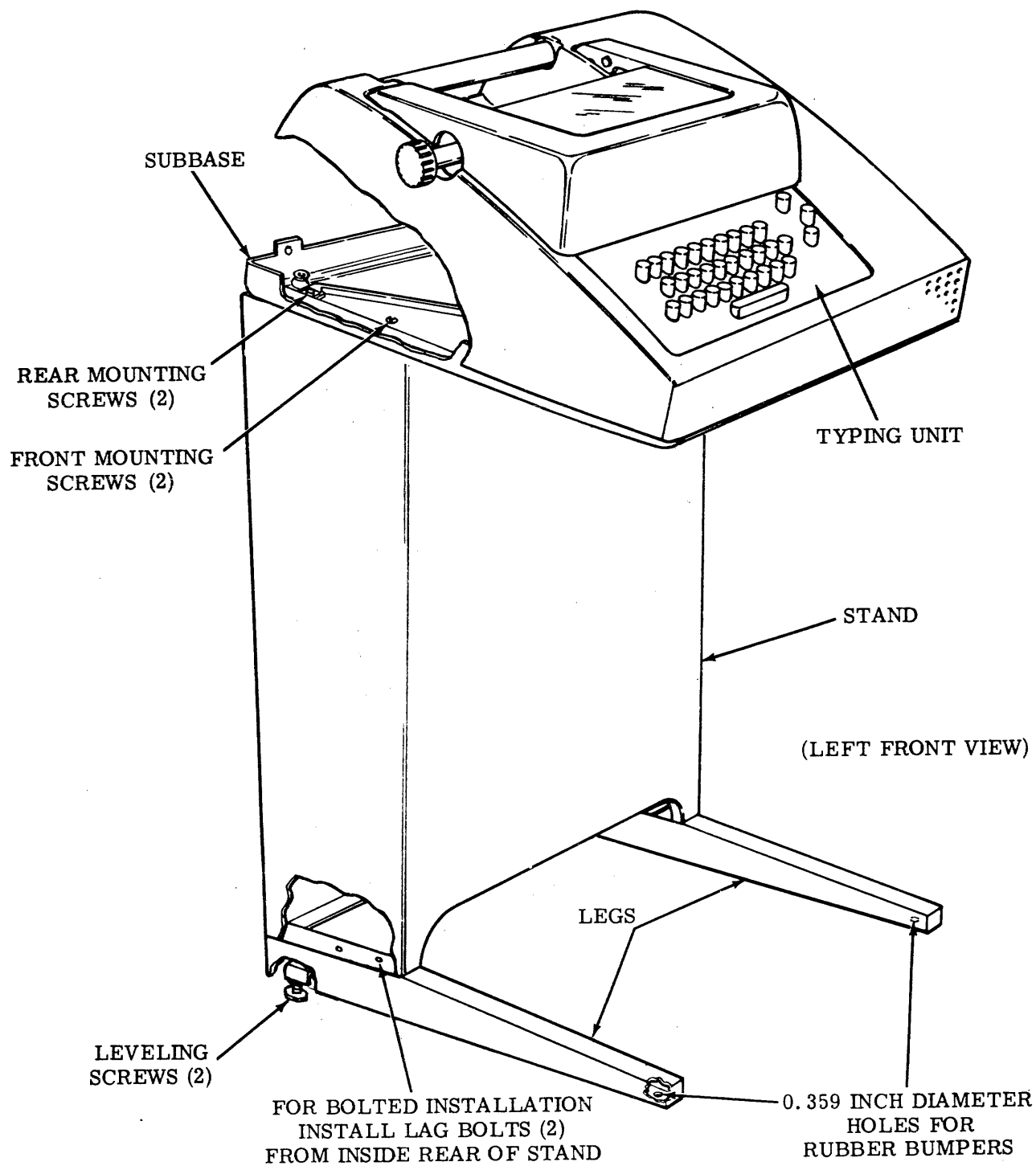
a. Remove back panel of stand by removing top panel with retaining screws (two). Pull top of panel slightly away from unit and lift to disengage bottom of panel from lower retaining flange.

b. Remove carton containing copy-holder and bag containing mounting hardware from inside stand.

NOTE

The sub-base of the teletypewriter unit is fastened to the stand with four No. 14Z screws and flat washers (some units use two No. 14Z screws and two 10-32 hex head screws). No. 14Z screws are always used to fasten the rear of the sub-base. (See Figure 2-6 for position of screws.)

c. Set teletypewriter unit on stand so that the unit sub-base is aligned with stand top at the rear and right-hand edges.



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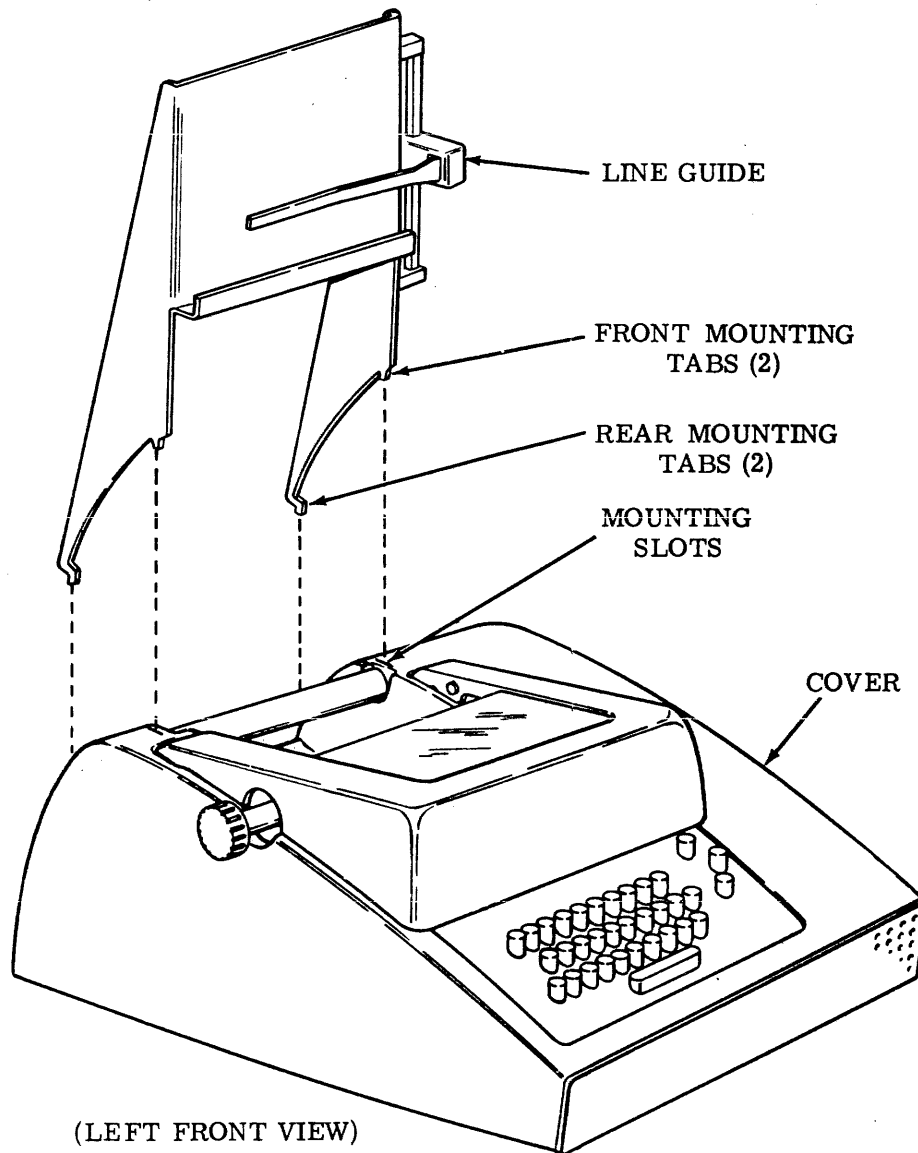
Figure 2-6. Stand Leveling and Anchoring and Assembly of Subbase with Typing Unit to Stand

d. Insert and tighten mounting screws taking care not to dislodge speed nuts located in sub-base units.

CAUTION

The teletypewriter unit must be supported until the two mounting screws at the rear are installed and tightened.

e. Move complete ASR-33 Teletypewriter Unit to area in which it is to be used. If necessary, adjust leveling screws located at the rear of each stand leg to compensate for floor irregularities. (See Figure 2-6).



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Figure 2-7. Installation of Copy Holder

Installation of Copy Holder

The copy holder is installed in the following manner.

- a. Four mounting slots are provided at the rear of the unit cover to mount the holder.
- b. Standing at the rear of the unit, tilt holder backwards and partially insert bottom tabs (see Figure 2-7) into lower slots provided in cover.
- c. Move holder forward until top mounting tabs are positioned over holes provided in cover.
- d. Engage top mounting tabs in mounting holes and push downward until holder is seated fully in place.

MODEL 516-55, ASR-35

Packaging Procedures

The ASR-35 I/O device consists of two main assemblies, i. e., a stand and a teletypewriter unit, which are combined into a single unit (Figure 1-5). A typing unit mounted in the teletypewriter assembly is removed and shipped in an individual carton, and the remaining equipment is shipped as a single unit. A general description of the steps involved in packaging an ASR-35 is as follows.

- a. The typing unit is removed from the teletypewriter assembly, it is mounted on a wooden pallet and packed with its required mounting hardware (four bolts) in a fiberboard carton. The typing unit is protected in the carton by appropriate padding and fitted inner blocking. The carton is sealed and labeled as to its contents.
- b. The ASR-35 device, less the typing unit, is prepared for shipment by taping down all loose components, wrapping and taping loose cable connectors, and the installation of mounting bolts (seven) in the teletypewriter assembly to secure the typing unit mounting base (four bolts) and the paper tape reader mounting base (three bolts). When the internal equipment has been secured, the device cover is also secured by the installation of sheet-metal screws at the front right- and left-hand corners of the teletypewriter assembly.
- c. A plastic shroud is fitted over the device and taped in place.
- d. The covered device is placed on a wooden mounting skid located in the bottom of a special fiberboard carton. Fitted fiberboard blocking is installed and taped in place around the device.
- e. A heavy-duty fiberboard cover which forms the top of the shipping carton is placed over the prepared device. Interlocking folds at the mating edges of the carton top and bottom sections are engaged to hold the two sections together. Metal strapping is installed to tie the device/carton arrangement into a single integral package.

Handling Procedures

The packaged ASR-35 device may be moved by using a forklift truck or similar type of lifting mechanism; however, care must be taken to prevent damage to the bottom of the

carton. The packaged unit must be maintained upright at all times and must not be subjected to severe shock or vibration.

The unpackaged device may be moved by hand using the handholds at the rear of the unit and the front of the teletypewriter assembly. The device may also be lifted and moved by a fork-type lifting mechanism by placing a suitable support across the fork tines on which the device legs may be supported.

The carton containing the typing unit must be handled with caution, the unit it contains must not be subjected to unusual shock or vibration.

Unpacking and Assembly Procedure

To unpack an ASR-35 device, perform the following steps.

- a. Cut metal strapping, disengage interlocking carton folds and remove fiberboard cover (top) from packaged device.
- b. Remove padding and blocking from around device.
- c. Lift device from carton bottom and move to assembly area.
- d. Remove cover retaining screws (two) from the underside of the front right-hand and left-hand corners of the teletypewriter assembly (see Figure 2-13 for location of mounting tabs).
- e. Open upper cover by pressing catch release pushbuttons located at the left- and right-hand sides of the cover and lift. (Figure 2-8 presents a top view of the device with the upper cover open, the locations of the left upper cover release pushbutton and the lower cover release catch are shown.)
- f. Secure upper cover in detent position (Figure 2-13) and open lower cover by releasing the lower cover release catch (see Figure 2-8 for location) and lifting front edge of cover.

NOTE

The upper cover must be either secured in its detent position or closed before the lower cover can be raised to an open (upright) position.

- g. Remove shipping bolts (seven) from teletypewriter assembly typing unit mounting base and paper tape reader mounting base. (See Figure 2-9 for location of shipping bolts.)
- h. Remove tape and protective wrappings from components and cables.
- i. Remove typing unit from shipping carton and unbolt unit from wood shipping pallet. (See Figures 2-10 and 2-11 for an illustration of the unmounted typing unit.)
- j. Remove retaining tie-back from printing carriage typing hammer (see Figure 2-10 for location of typing hammer).
- k. Remove retaining tie-back from paper finger shaft (see Figure 2-10).

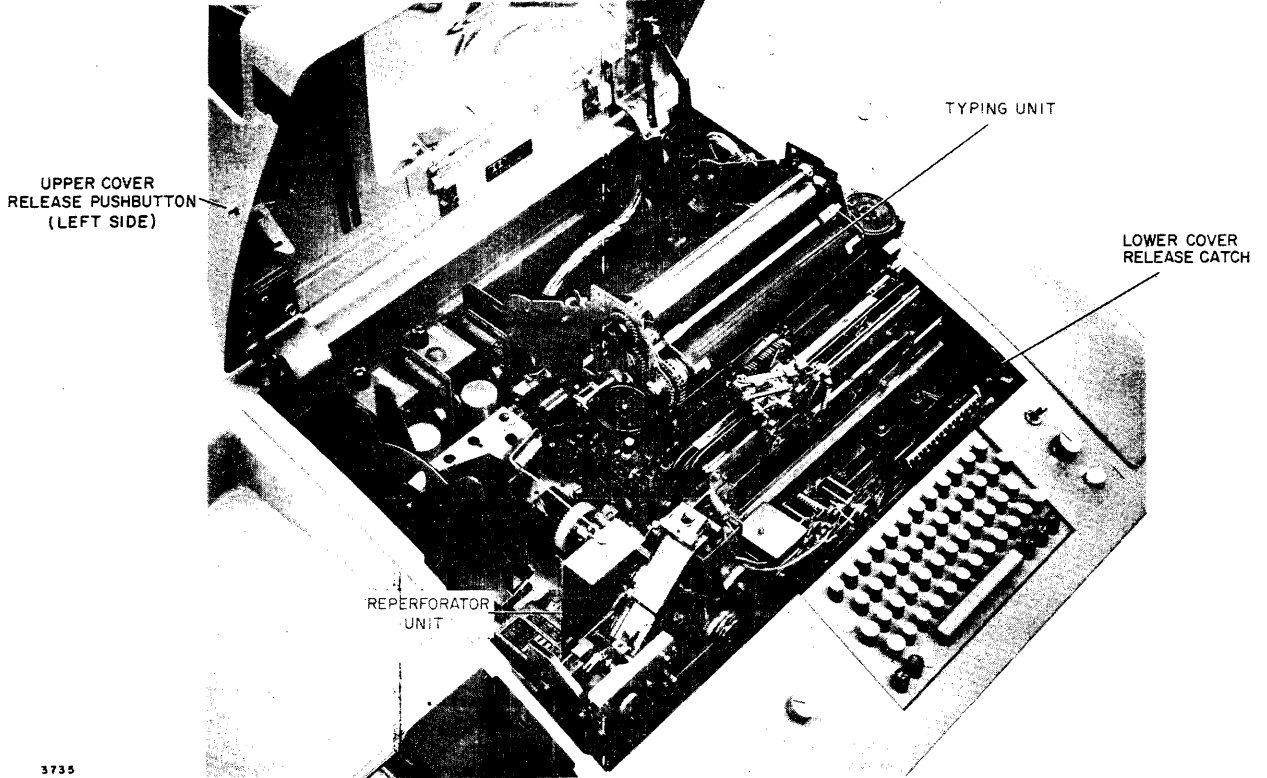


Figure 2-8. ASR-35 Teletypewriter Unit, Top View With Upper Cover Open

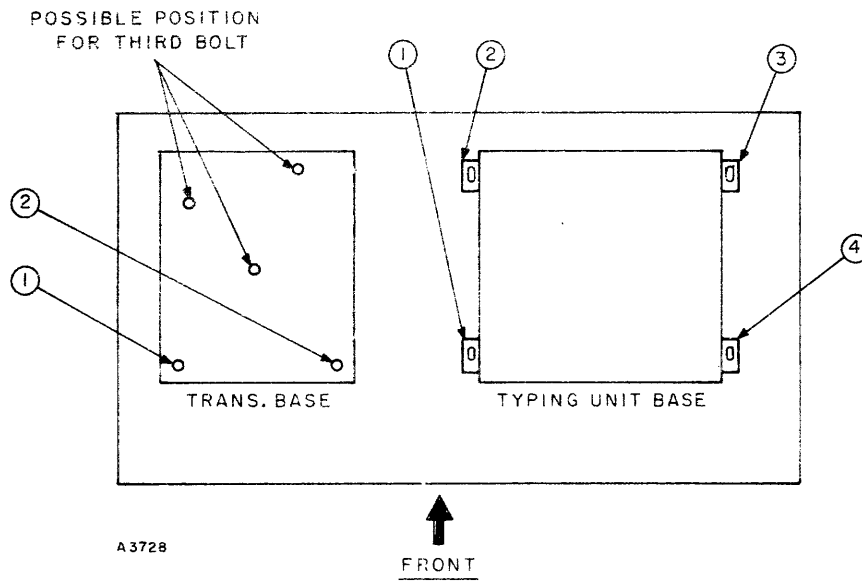


Figure 2-9. Location of Shipping Bolts

1. Remove typing unit mounting hardware (four bolts) from bag attached to unit and prepare to install unit in teletypewriter assembly.

NOTE

The mounting flanges and mounting holes located on the typing unit are shown in Figures 2-10 and 2-11. The location of the mounting holes and guide pins on the typing unit base in the teletypewriter are illustrated in Figure 2-12.

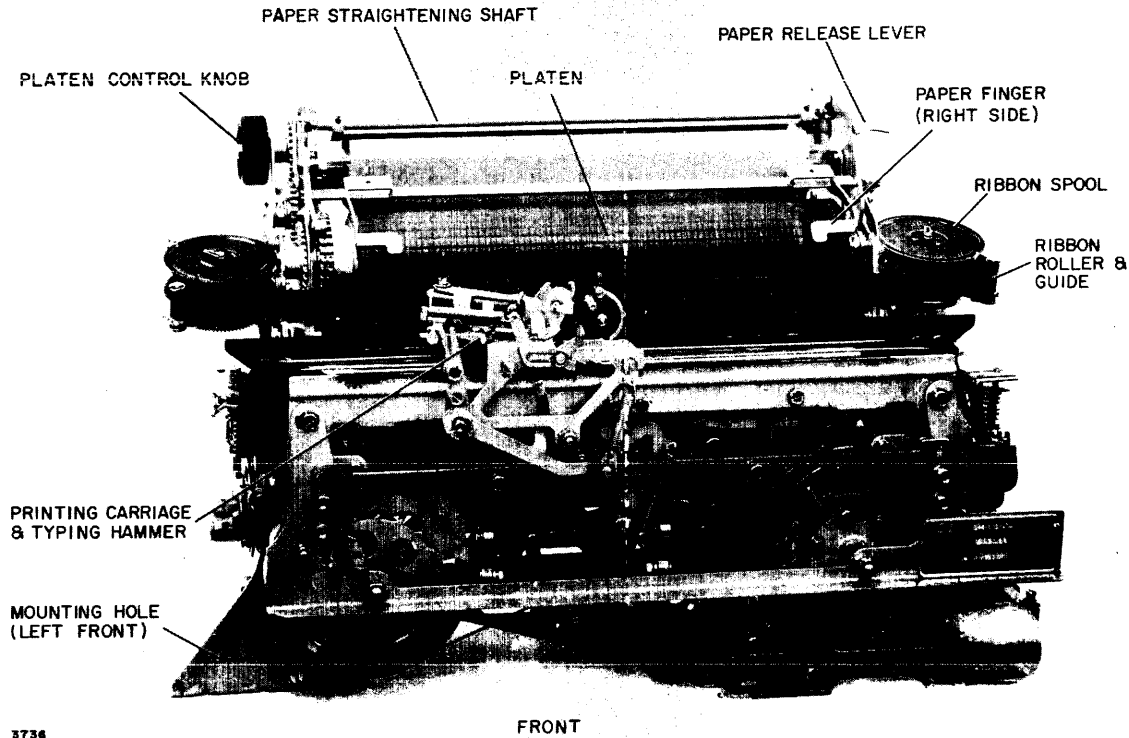


Figure 2-10. Typing Unit, Front View

- m. Position typing unit over mounting holes and guide pins provided in teletypewriter assembly typing unit base; lower unit into place making sure that the guide pins are engaged.
- n. Install and tighten mounting bolts.
- o. Connect control cable to typing unit. (See Figure 2-11 for location of typing unit cable connector.)

NOTE

Two cables terminated in similar connector plus are provided on the teletypewriter assembly. One is connected to a receptacle located at the left-hand rear corner of the typing unit mounting base, the other is connected to the typing unit. Only the cable connected to the typing unit is disconnected for shipment purposes.

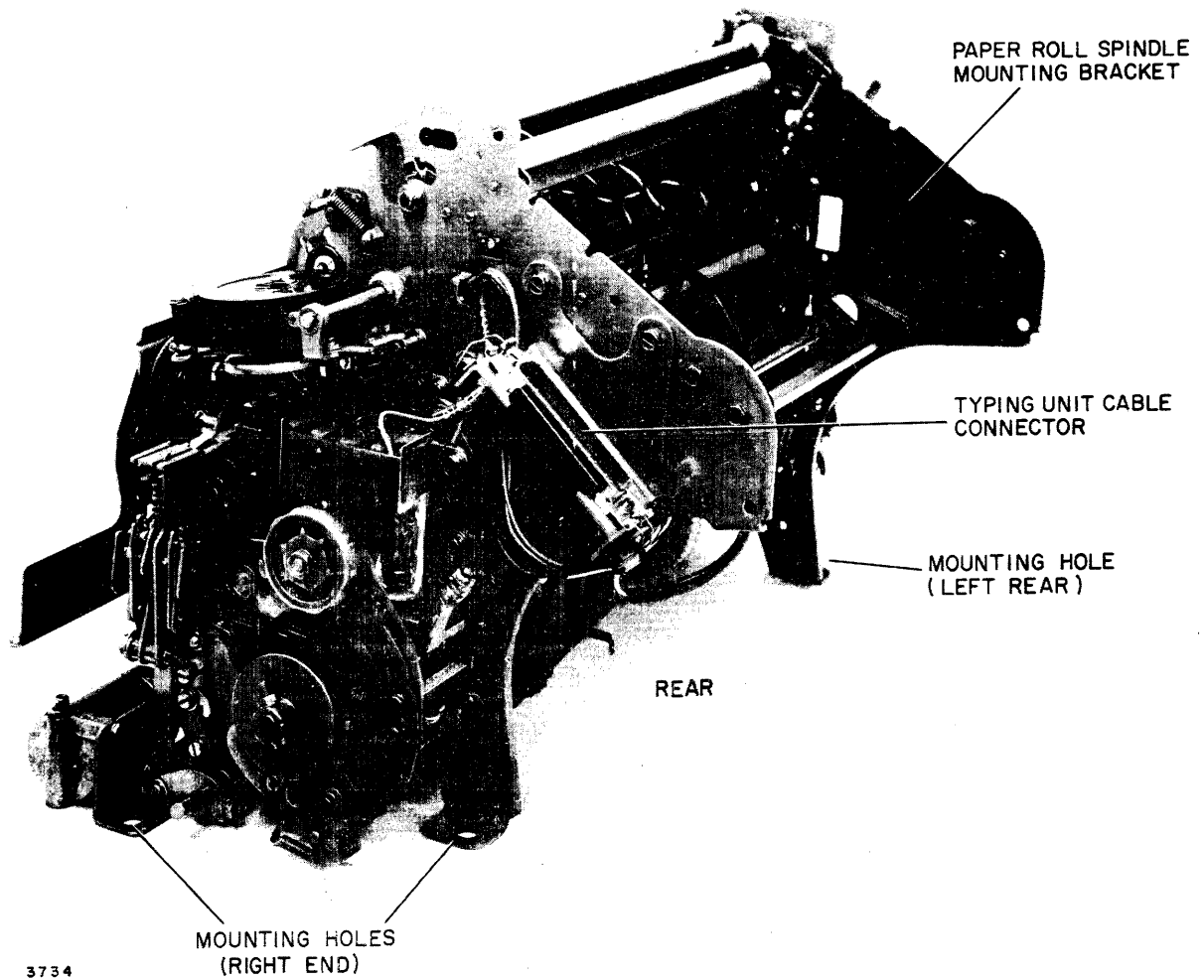
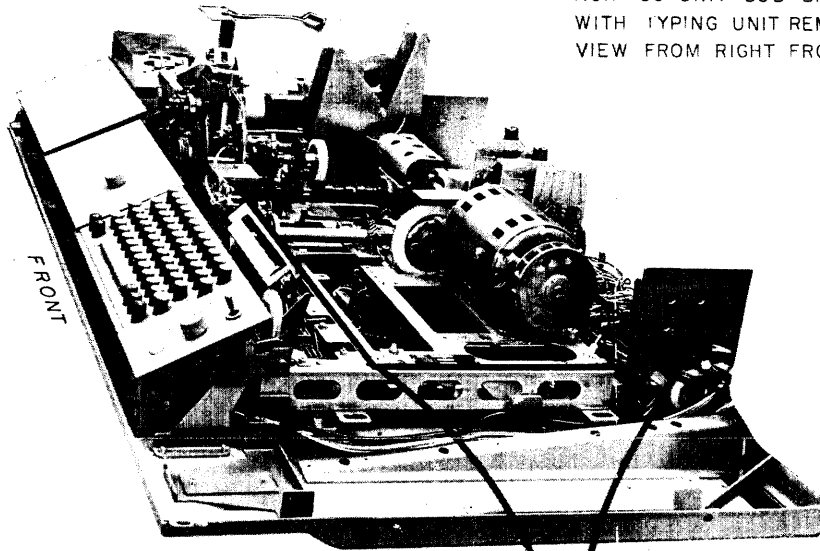


Figure 2-11. Typing Unit, Right Rear View

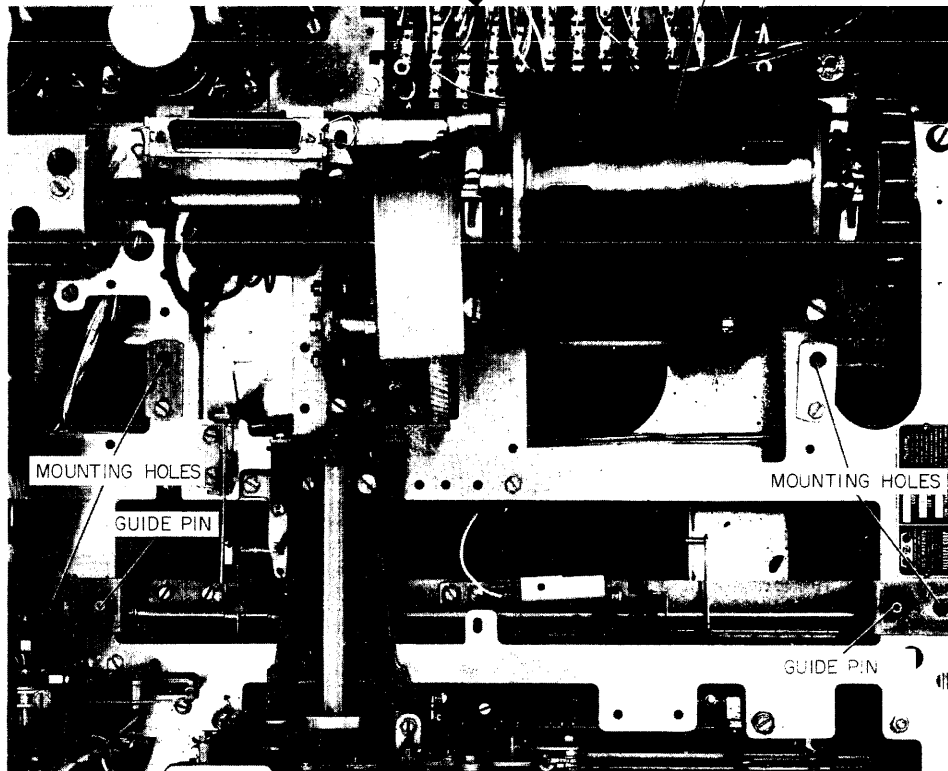
p. Close upper and lower covers and move device to area in which it is to be used for final interconnection to system and set-up procedures. Figure 2-13 presents a view of the assembled unit with the lower cover in open position.

ASR-35 UNIT SUB-BASE
WITH TYPING UNIT REMOVED,
VIEW FROM RIGHT FRONT



ASR-35 TYPING UNIT
MOUNTING BASE
TOP VIEW

DRIVE MOTOR



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FRONT

Figure 2-12. Typing Unit Mounting Box Location of Mounting Holes and Guide Pin

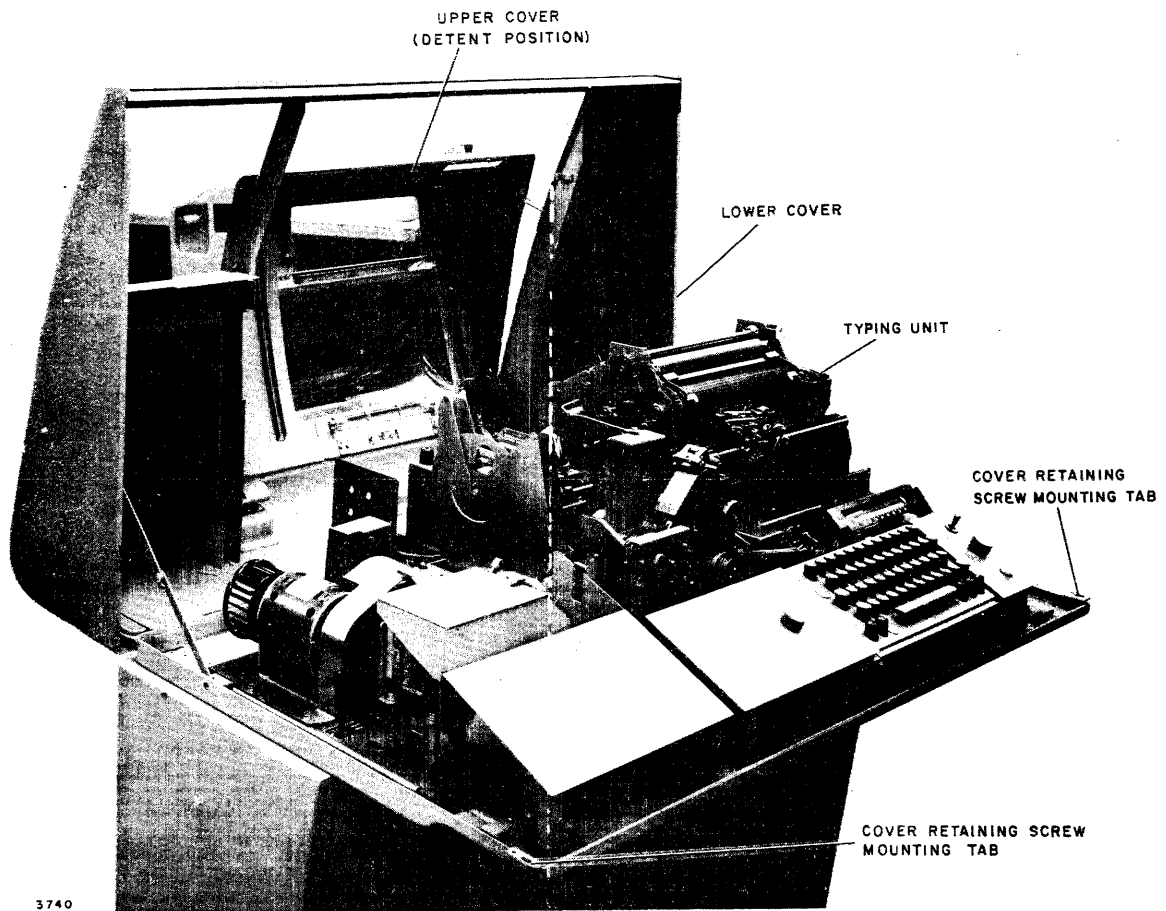


Figure 2-13. Assembled Unit, Left Front View With Lower Cover Open

MODEL DDP-516-61 CARD READER

Packaging Procedure

The card reader is prepared for shipment by securing all loose components and cables with tape and covering the unit with a plastic shroud. The card reader is then mounted on a wood skid, secured with metal strapping, and enclosed with a heavy fiberboard cover. Inner fiberboard fittings and pads protect the unit.

Handling Procedure

The packaged card reader should be lifted with the wood skid on which it is mounted by using a fork-lift truck or dolly. The unit must not be subjected to severe shock or vibration.

Unpacking Procedure

To unpack the card reader, perform the following steps.

- a. Move the packaged unit as close as possible to the area in which it is to be installed.
- b. Cut the metal straps that secure the unit to mounting skid.
- c. Remove fiberboard cover and all padding and inner blocking material.
- d. Lift unit from mounting skid.

CAUTION

Lift unit by bottom section only and do not tilt the unit while lifting. The reader is in two separable sections: a reader unit (top section) and stand (bottom section) which are not fastened together. A padded fork-lift or similar mechanism may be used, but the top section must be supported at all times to prevent accidental separation.

- e. Remove masking tape from unit and power cord. The unit may then be moved to its point of installation.

MODEL DDP-516-50 AND 516-52 PAPER TAPE READER/PUNCH UNIT

Each optional paper tape reader/punch unit is packaged in a separate fiberboard carton and is supported in its carton by fitted inner blocking. Each carton is completely sealed by tape and is labeled as to its contents. No special handling or unpacking procedures are required.

SHIPPING METHODS

The computer system may be shipped to the user by any of the following methods.

<u>Classification</u>	<u>Method</u>
Class I	Standard Domestic Van
Class II	Standard Air Freight
Class III	Standard Railroad Express

The method used for each DDP-516 system is selected by the customer.

SECTION III SYSTEM INTERCONNECTION AND SET-UP PROCEDURES

Control and data signals are transmitted between the optional and standard system peripheral devices and the computer via interconnecting device cables. The device cables are connected directly to the device control logic in the computer and are terminated in the respective device. No interfacing connector panel is provided.

This section contains descriptive and procedural data concerning the manner in which interconnecting device cables within a system are installed in a device and in the computer. Whenever possible, system equipment is sent to the user with all computer-to-external device cables (including control console interconnecting cables) installed in the computer. Therefore the user is only required to install the cables in the peripheral devices. In some instances, however, a customer may wish to install equipment of his own into the computer. In such a case, the user will be required to perform the complete installation of any required cables. In order to cover both possibilities, the information in this section is divided into categories as follows.

- a. The procedures and descriptive data required to install device cables in their respective devices
- b. The procedures and descriptive data required to install device cables in the computer.

DEVICE CABLE ASSEMBLIES

Each device cable included in a system is tagged according to its unique destination within the system. Assembly drawings for the different device cables are located in the Appendix. The unique aspects of each system (including device cable source and termination designations) are described in special documentation supplied to the user.

DEVICE CABLE INSTALLATION EXTERNAL TO COMPUTER

The installation of device cables into each possible standard and optional item of equipment external to the computer is described in the following paragraphs.

Control Console Unit

Three cables (two terminated in μ -PACs and one terminated in a 9-pin male connector) and five wires (terminated in colored quick-disconnect connectors) are used to connect the control console to the computer. The cables and wires enter the console unit through an access at the rear of the unit (Figure 3-1); the procedure required to connect the cables and wires is as follows.

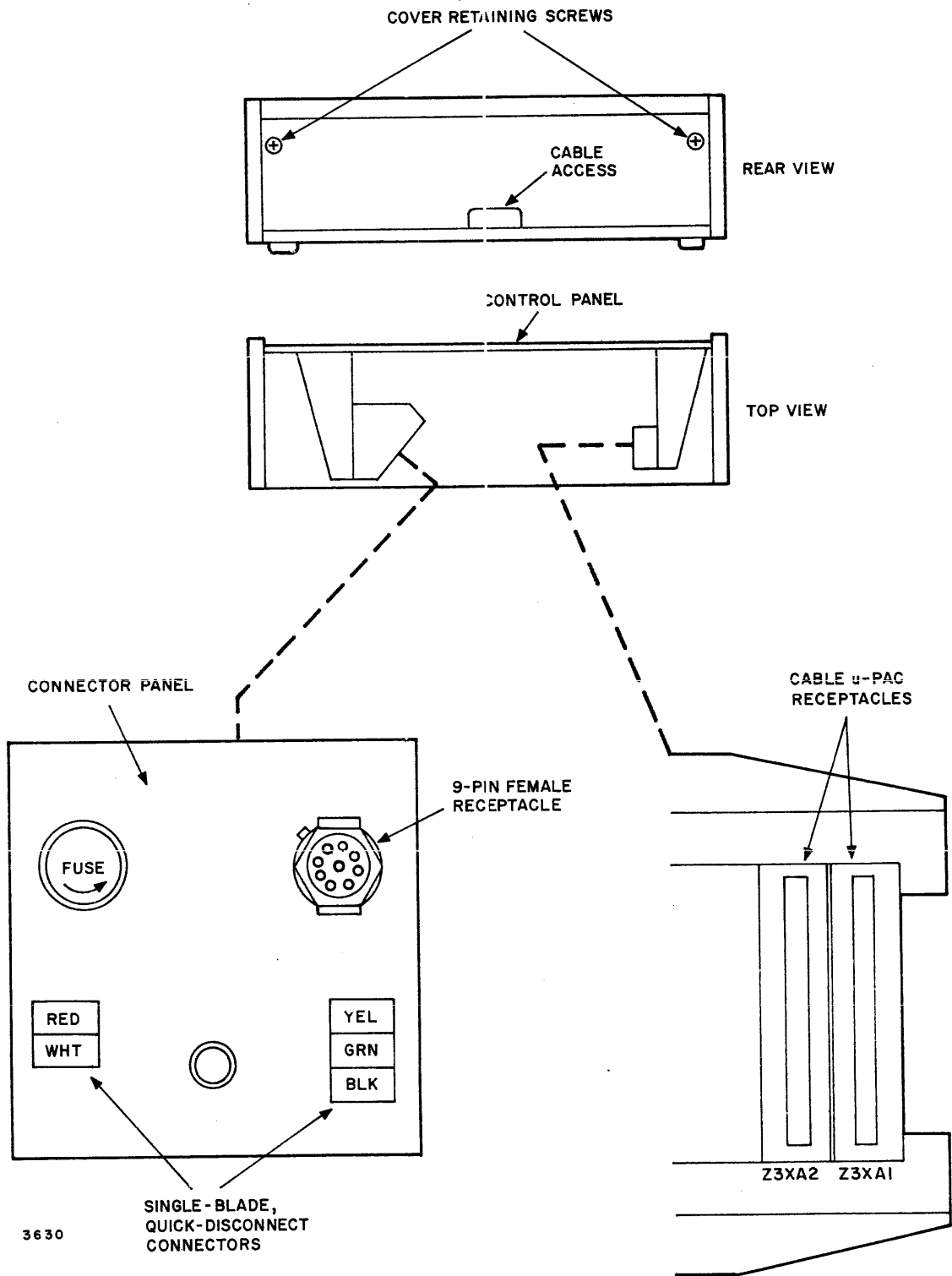


Figure 3-1. Control Console, Location of Connector Panel and μ -PAC Receptacles

a. Remove the cover from the unit by removing the retaining screws at the rear, lifting rear of cover from the retaining slot, and pulling the cover to the rear to disengage the front retaining lip of the cover.

b. Connect cable and wire connectors to corresponding receptacles provided in unit. (See Figure 3-1 for locations.)

NOTE

Check to insure that the cable μ -PAC connectors are placed in the proper receptacle. The console connector panel receptacles for the single-wire inputs are color-coded to match the terminating wire connector.

c. Secure cables and wires with cable clamps provided at access and reinstall cover.

DDP-516-50 and 516-52 Paper Tape Reader/Punch Unit

The cables required and the manner in which they are routed through and installed in the paper tape reader and punch unit are illustrated in Figures 3-2 and 3-3. Access to the interior of this unit is gained by removing the two screws holding the top plate and removing the plate. The rear panel of the unit also may be withdrawn by removing the four retaining screws. If necessary, the side panels may also be removed in a similar manner.

As illustrated in Figures 3-2 and 3-3, cable clamps and brackets are provided in the unit to secure the cables and to provide a means of coiling the excess cable inside the unit.

DDP-516-61 Card Reader Unit

The routing of the device cable for the card reader to the connector provided on the reader is illustrated in Figure 3-4. As indicated in Figure 3-4, the card reader unit consists of the reader and a separate stand. It is best to install the device cable when the reader unit is being placed on its stand because the cable must be routed through the stand and connected to a receptacle located at the bottom right-hand side of the rear (rear view) of the reader unit. The reader and its stand are not fastened together, however, so it is not difficult to lift the reader to permit installation of the device cable.

CAUTION

Care must be exercised in lifting tape reader unit to avoid damaging internal reader/base cabling.

DDP-516-53 ASR-33

Signal interfacing between the ASR-33 and the computer is accomplished by a 25-ft two-conductor twisted pair No. 22 wire cable which is provided with one end installed in the computer. The cable ends to be installed in the ASR-33 are provided with terminal lugs which are connected to a terminal block located at the upper right-hand corner at the rear of the unit.

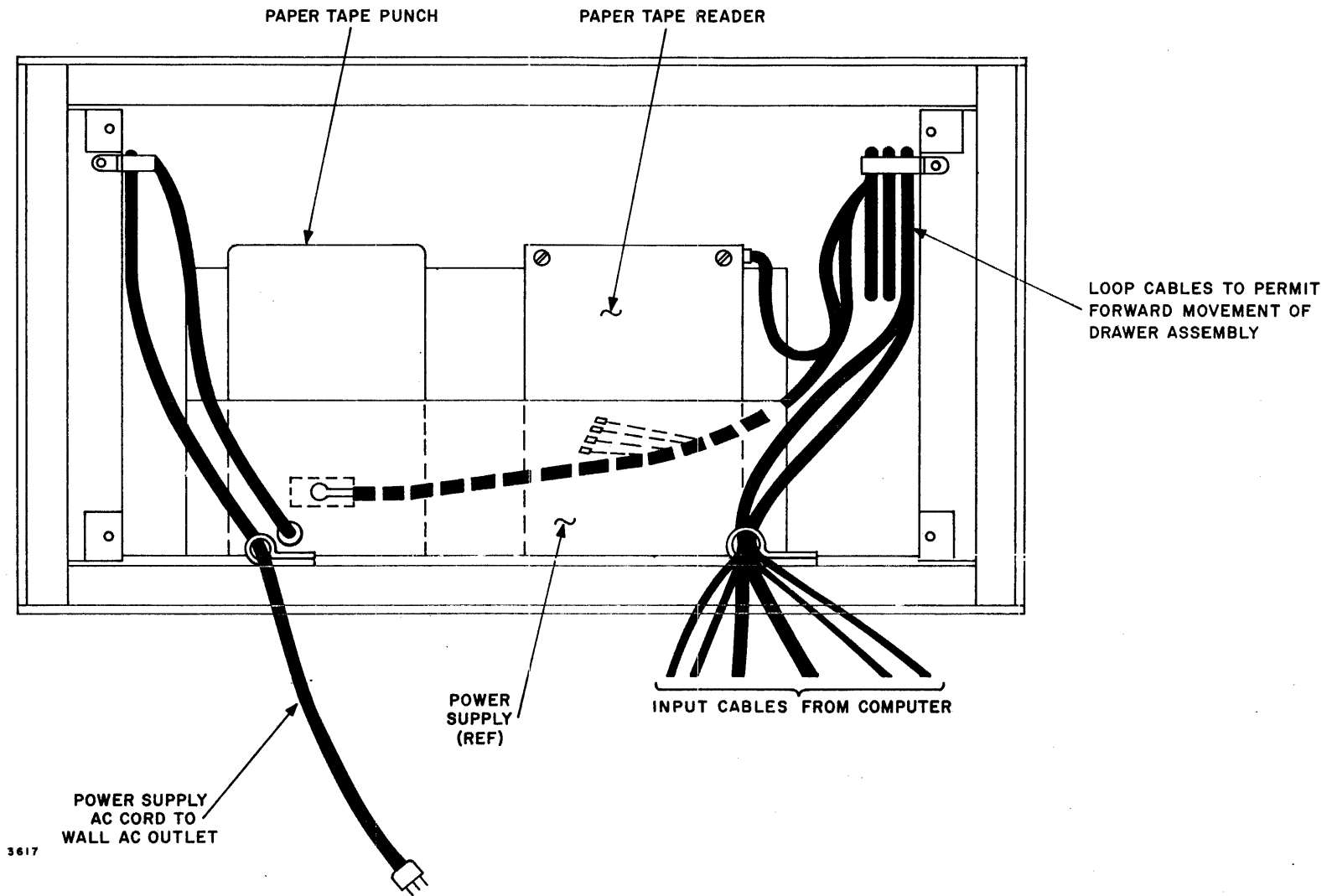


Figure 3-2. Device Cable Routing In Optional Paper Tape Reader/Punch Unit (Rear View of Unit)

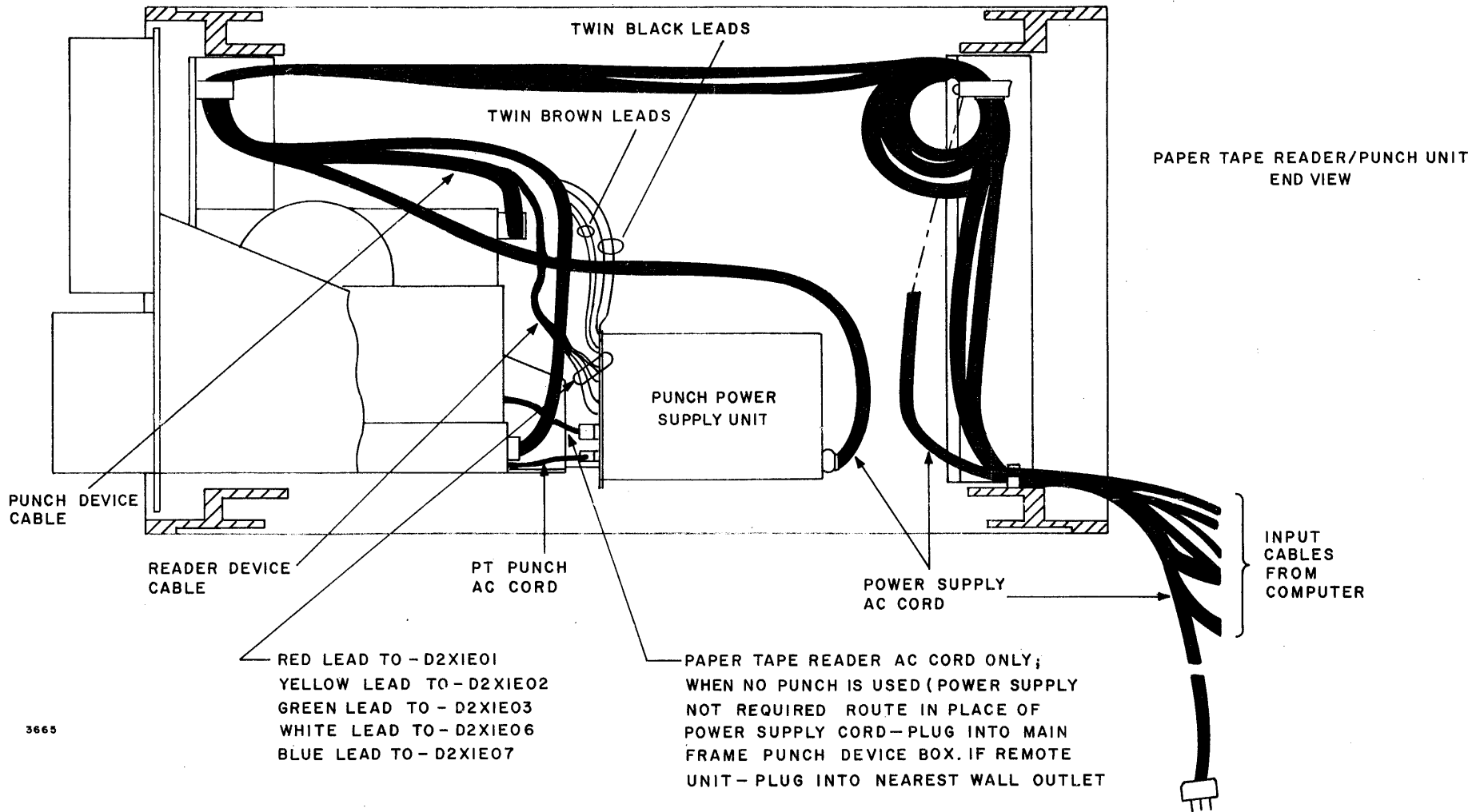


Figure 3-3. Device Cable Routing In Optional Paper Tape Reader/Punch Unit
(End View of Unit)

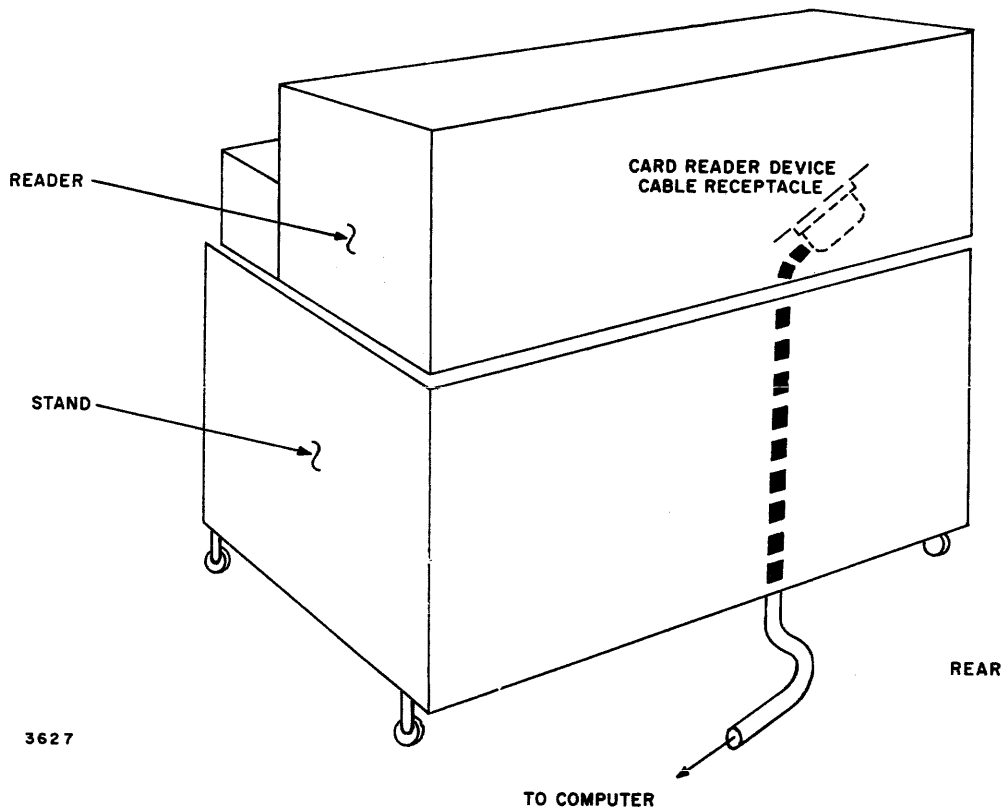


Figure 3-4. Card Reader Unit, Routing of Device Cable

The connections to be made are as follows.

<u>Wire Color and Gauge</u>	<u>From Computer Tiltout</u>	<u>To ASR-33</u>	<u>Signal Mnemonic</u>
Black No. 22	XXK1K01	XTERM06	TYS1G-0
Red No. 22	XXK1P01	XTERM07	24VDC+

To install the signal cable perform the following procedure.

- a. Remove cover from ASR-33 unit (refer to steps b through e of Teletypewriter Unit Assembly Preparation in Section II for cover removal procedure.)

WARNING

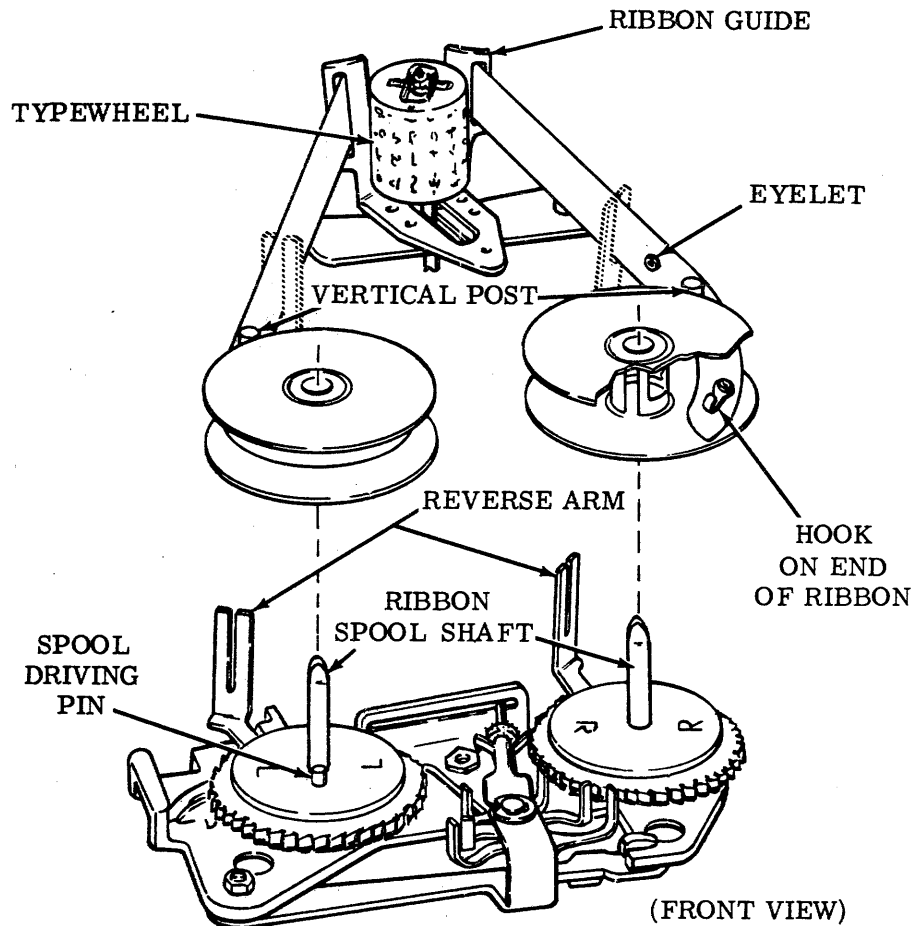
Before proceeding, insure that no power is applied to the unit. Remove AC power cord from source receptacle if connected.

- b. Install signal cable leads as indicated in above description.
- c. Replace cover and proceed with unit set-up procedures.

ASR-33 Set-Up Procedures

The ASR-33 is prepared for use in the following manner.

a. Install typewriting ribbons as illustrated in Figure 3-5. The ribbon spools must be placed to insure that the ribbon feeds to the rear from the right-hand side of the right-hand spool and from the left-hand side of the left-hand spool.



This illustration from Technical Manual Models 32 and 33 Teletypewriter Sets Keyboard Send-Receive (KSR) Receive-Only (RO) Automatic Send-Receive (ASR), Copyrighted by Teletype Corporation; used with permission.

Figure 3-5. Installation of Ribbon

b. Install paper roll in unit by inserting spindle supplied with unit into paper roll and placing roll into recess provided at the rear of the cover. The ends of the spindle extending from both ends of roll should rest in the slots provided.

c. The manner in which the paper is threaded into the typing unit is illustrated in Figure 3-6. To install the paper as shown, perform steps d through h.

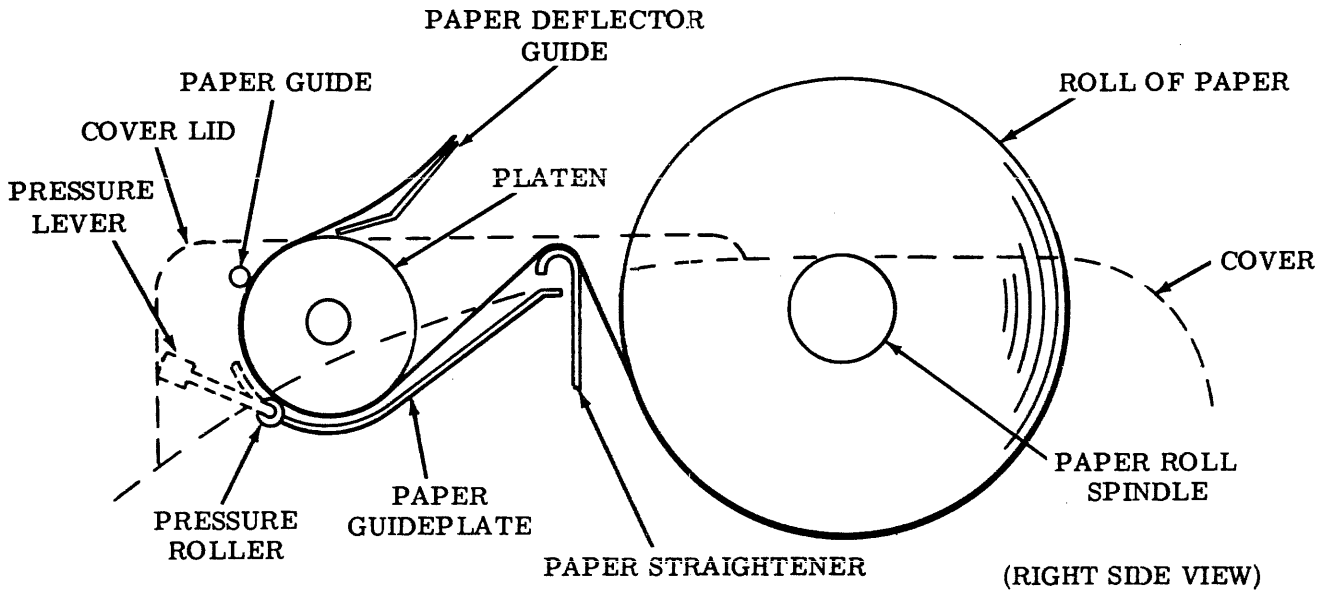
d. Raise clear plastic lid over typing unit.

e. Fold and crease leading edge of paper to present a smooth end for threading.

f. Release tension of typing unit platen by moving pressure lever forward.

g. Push paper under platen roller as far as possible and move pressure lever backward to reapply roller tension.

h. Turn platen knob to feed paper forward until it can be passed under the unit paper guide. If necessary, again release tensions on the pressure roller and straighten paper. Reapply roller tension and close cover.



This illustration from Technical Manual Models 32 and 33 Teletypewriter Sets Keyboard Send-Receive (KSR) Receive-Only (RO) Automatic Send-Receive (ASR), Copyrighted by Teletype Corporation; used with permission.

Figure 3-6. Installation of Paper Roll

DDP-516-55 ASR-35

Signal interfacing between the ASR-35 I/O device and the computer is accomplished by a 25-ft two-conductor cable which is provided with one end installed in the computer. The cable ends to be installed in the ASR-35 are provided with terminal lugs which are connected to a terminal block located at the right-hand corner at the rear of the unit.

The interconnecting cable must be routed through access holes located in the bottom of the device stand and at the right-hand rear corner of the device teletypewriter assembly. An access panel is provided at the front of the device stand which may be removed in the following manner.

- a. Operate release control buttons located at the top right- and left-hand corners of the panel.
- b. Pull the panel top away from the unit and lift to disengage the bottom retaining flange of the panel.

The connections to be made are as follows.

<u>Wire Color and Gauge</u>	<u>From Computer Tiltout</u>	<u>To ASR-35</u>	<u>Signal Mnemonic</u>
Black No. 22	XXK1K01	XTERM08	TYS1G-0
Red No. 22	XXK109	XTERM05	24VDC+0

ASR-35 Set-Up Procedure

The ASR-35 is prepared for use in the following manner.

a. Typewriting ribbon is installed on the typing unit in a manner similar to that used for a standard typewriter. (See Figure 2-10 for an illustration of an installed ribbon.)

b. A roll of paper is installed in the typing unit as follows.

- (1) Install paper roll on spindle provided with unit.
- (2) Open upper cover to gain access to typing unit.
- (3) Install spindle-mounted roll into brackets provided at rear of typing unit.

(See Figure 2-11 for location.) Paper must feed from bottom of roll.

(4) Route end of paper over paper straightening shaft and insert between platen and pressure rollers (see Figure 2-10).

(5) Turn platen control knob counterclockwise to advance paper around platen. Lift paper finger shaft and advance paper until it is under paper fingers, then release shaft.

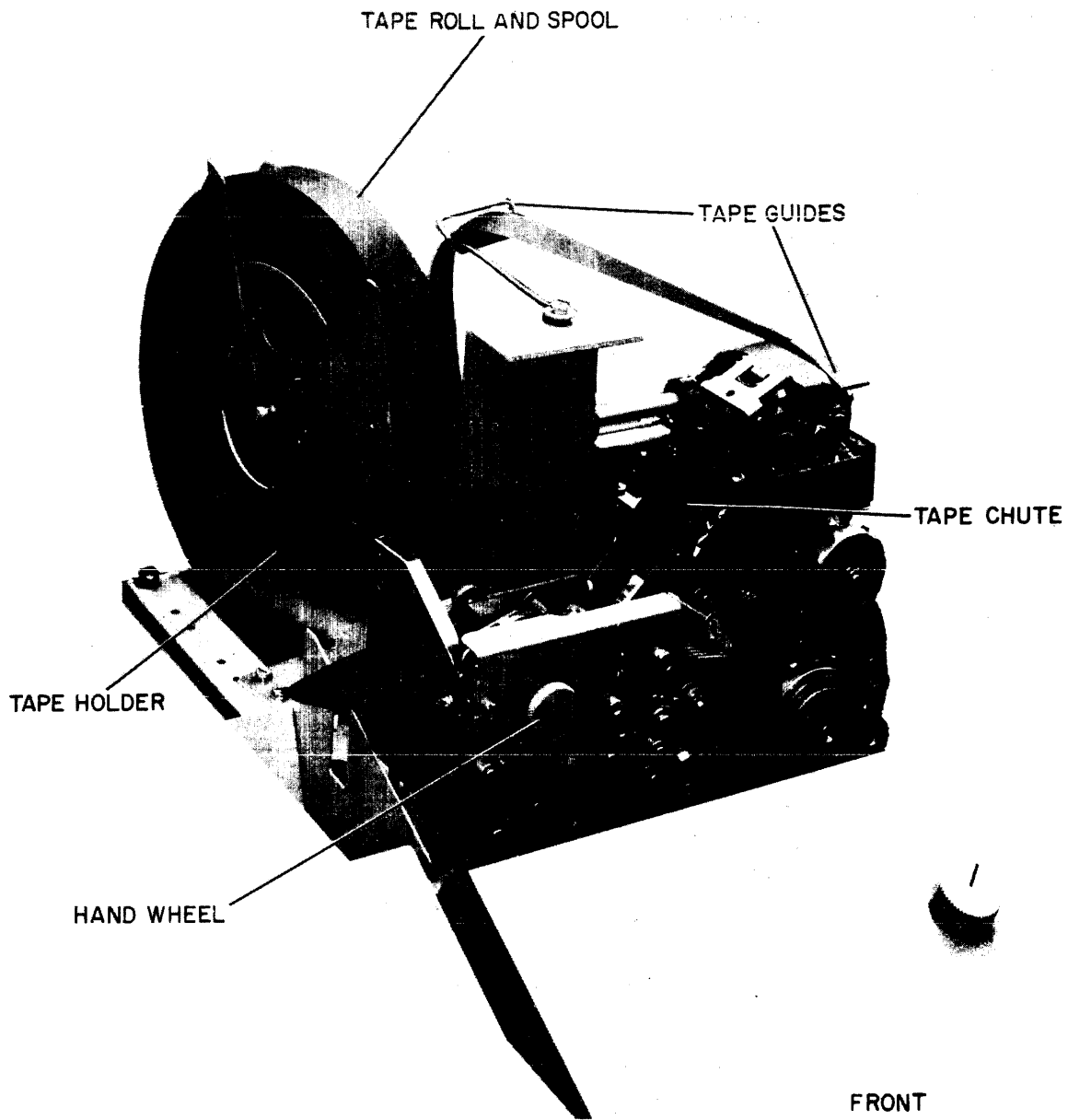
c. Install tape roll in reperforator (punch) unit as follows.

- (1) Install tape roll on spool provided with unit.
- (2) Open upper cover to gain access to reperforator.
- (3) Insert mounted tape roll into reperforator unit tape holder (Figure 3-7). Paper tape must feed toward reperforator from bottom of roll.

(4) Thread paper tape through tape guides and into tape chute as illustrated in Figure 3-7.

(5) Turn hand wheel (Figure 3-7) clockwise until tape emerges from reperforator punch head.

(6) Close upper cover making sure that tape end passes through opening provided in cover.



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Figure 3-7. Reperforator (Punch) Unit

INSTALLATION OF DEVICE CABLE IN COMPUTER

As previously stated, device cable ends are terminated at the device and at the computer logic controlling the device with no interfacing connector panel. Therefore, in order to install a cable in the computer it is necessary to understand the following:

- a. The manner in which the device control logic is housed in the computer
- b. The coding scheme used to locate specific items, such as a designated cable PAC receptacle, in the computer
- c. The manner in which cables may be routed throughout the computer enclosure.

Housing of Equipment in Computer Enclosure

Figure 3-8 illustrates the equipment which may be housed in a three-bay computer enclosure. As shown, each bay contains three assemblies (i. e., a power supply assembly and two logic and/or memory assemblies) which comprise the computer electronic equipment.

The logic (central processor and option) and memory elements are housed in tilt-out assemblies which swing out of the equipment enclosure to permit access to the equipment and back into the enclosure for storage. In its stored position, each tilt-out assembly is suspended in its bay (Figure 3-9) by a hinge at the top front of the bay and by a friction-type sliding clutch which moves over a pivot rod located at the rear of the bay. A lifting handle and catch control assembly is located at the front bottom of the assembly.

To move a tilt-out assembly to its raised position, it is necessary that:

- a. The center catch control bar of the lifting handle assembly be pulled against the lift handle
- b. The assembly be raised by pulling out and upward using the lifting handle
- c. When the tilt-out assembly is in its raised position or at any desired angle, the catch control bar be released to engage the pivot rod clutch.

The power supply assemblies are fixed in the bay, but the power supply units which they contain can be disengaged and removed from the assembly.

Equipment Coding Scheme

No attempt is made in this manual to give a complete breakdown of the coding scheme for the entire system. Sufficient information, however, is presented to familiarize the reader with the general aspects of the coding scheme, and facilitate accurate location of the equipment receptacles referenced by device cable destination designations.

Assigned Bay and Assembly Codes. -- The bay (unit) and assembly coding of a typical three-bay system is illustrated in Figure 3-8. The bay containing the computer's central processor is referenced as Unit A. An A unit represents the basic DDP-516 computer. To expand the computer, up to two units may be added to the right-hand side of the A unit. The units added are designated in sequence, Units B and C.

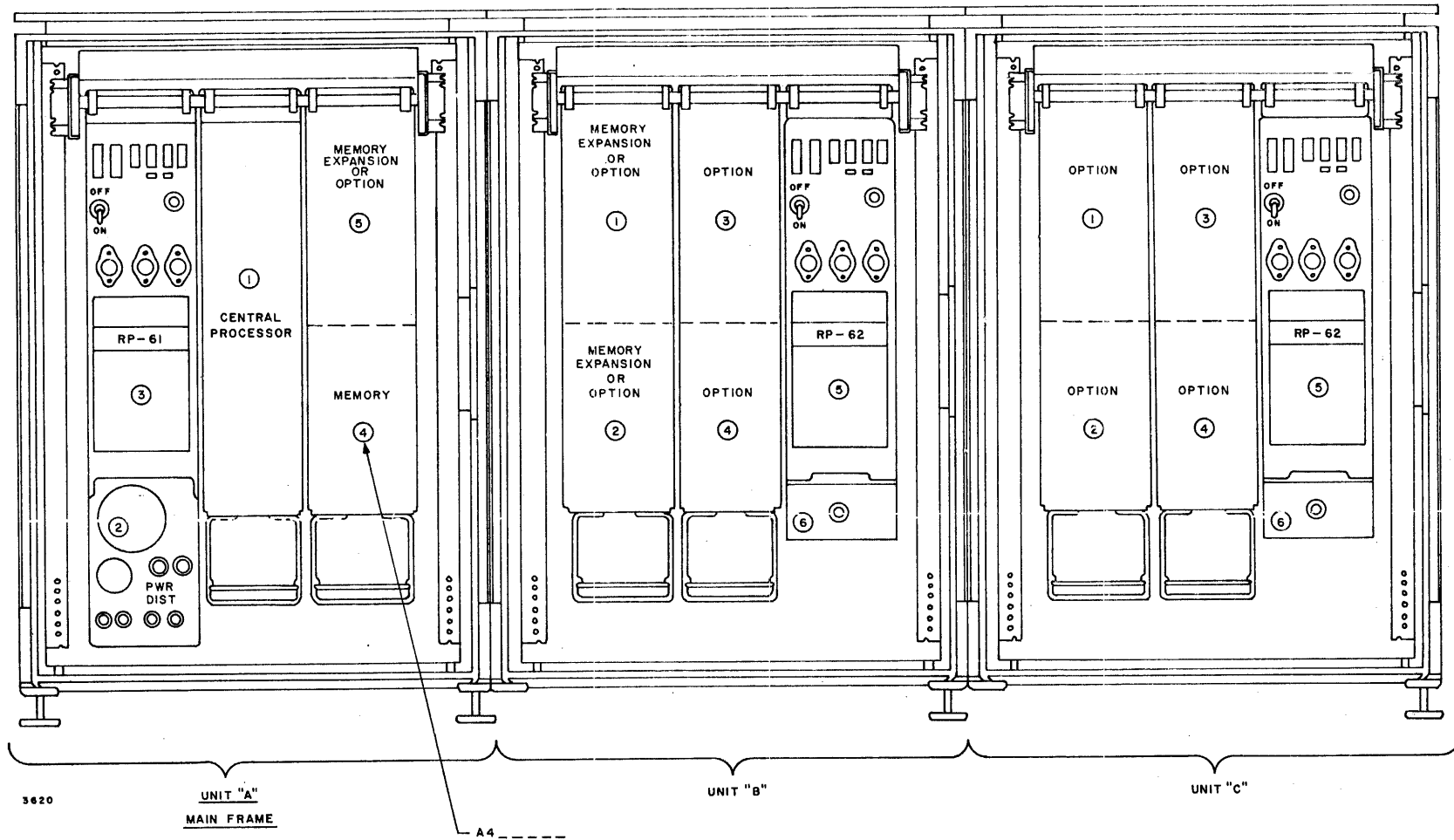


Figure 3-8. Typical 3-Bay System Equipment Configuration

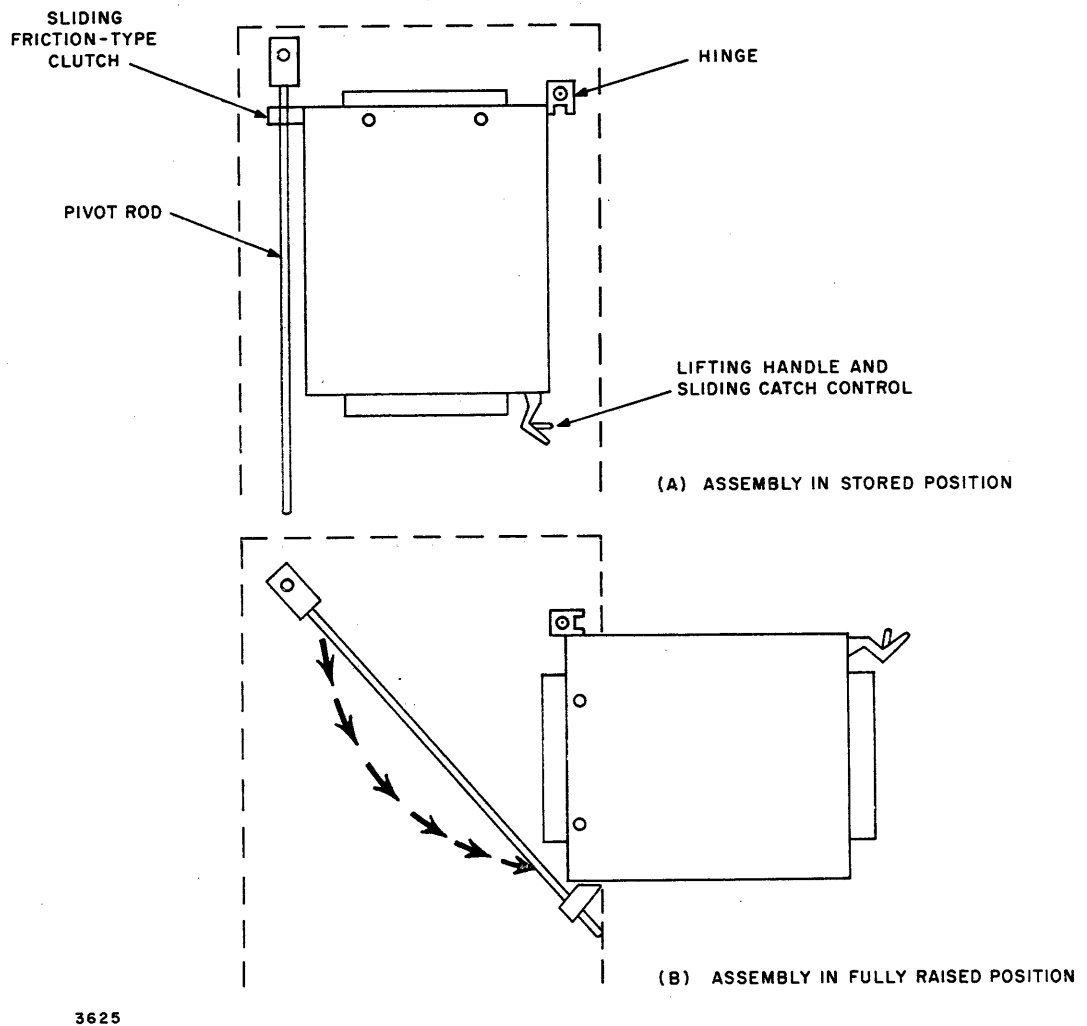


Figure 3-9. Computer Enclosure Tilt-Out Assembly

The second-level coding of the equipment housed in Bay A is accomplished by using numerics. The assignment of the numerics is as follows.

<u>Numeric</u>	<u>Item</u>
1	Central Processor Logic
2	Power Supply Assembly Power Distribution Unit
3	Power Supply Assembly RP-61 Power Supply Unit
4	Memory Unit
5	Option Logic and/or Memory

Each of the above numerics must be prefixed with the letter A to reference the items of equipment as presented (e. g., A1 designates the central processor logic).

NOTE

The use of the alphabetic unit designator is necessary since the same second-level numeric designator identifies different items of equipment in the expansion units (B and C).

The second-level numeric code designators used for the equipment which may be housed in system expansion units B and C are assigned as follows.

<u>Numeric</u>	<u>Item</u>
1	Memory Expansion Unit or Option Logic
2	Memory Expansion Unit or Option Logic
3	Option Logic
4	Option Logic
5	Power Supply Assembly RP-62 Power Supply Unit

Each of the above numerics must be prefixed with either B or C to reference the items of equipment as presented (e. g. , B3 identifies option logic in the second-middle-tilt-out assembly in the first expansion bay).

Tilt-Out Assembly Coding. -- As can be seen in Figure 3-8, the tilt-out assemblies may be used to contain one specific group of logic (e. g. , A1 Central Processor unit) or may be divided into two areas which may contain option and memory logic (e. g. , tilt-out A4, A5) or two groups of option logic (e. g. , tilt-out B3, B4). The tilt-out assemblies used in the system may be classified as divided or undivided units. The equipment which may be contained by the two types of tilt-out assemblies is as follows.

a. Divided unit may contain:

1. Two complete memory units.
2. One memory unit and six 1x3 μ -PAC connector BLOCs each containing 24 μ -PAC slots.
3. Twelve 1x3 μ -PAC connector BLOCs each containing 24 μ -PAC slots.

b. Undivided units contain a 6 x 6 arrangement of 36 eight-slot μ -PAC connector BLOCs which are designated to house logic for one specific functional and/or control group.

The two types of tilt-out units and the manner in which each type is used require the use of two separate coding systems.

Coding System for an Undivided Tilt-Out Assembly. -- The coding system for an undivided tilt-out assembly (such as that used for A1, the Central Processor logic) is illustrated in Figure 3-10. As shown in Figure 3-10, the μ -PAC connector BLOCs contained by the assembly are arranged in a 6-row, 6-column configuration with each BLOC locatable by alphabetic column and numeric row coordinates. For example, the detailed BLOC shown from column F row 2 is designated F2.

The connector slots in each μ -PAC connector BLOC are numbered from 1 through 8 (bottom to top as shown in the detail of Figure 3-10) to permit each slot to be uniquely identified also. For example, the slot receiving the μ -PAC circuit module as illustrated in the detail of Figure 3-10 is identified within the tilt-out assembly by the code F21 (row, column, slot). To expand the above example further, assume that a device cable is terminated in a

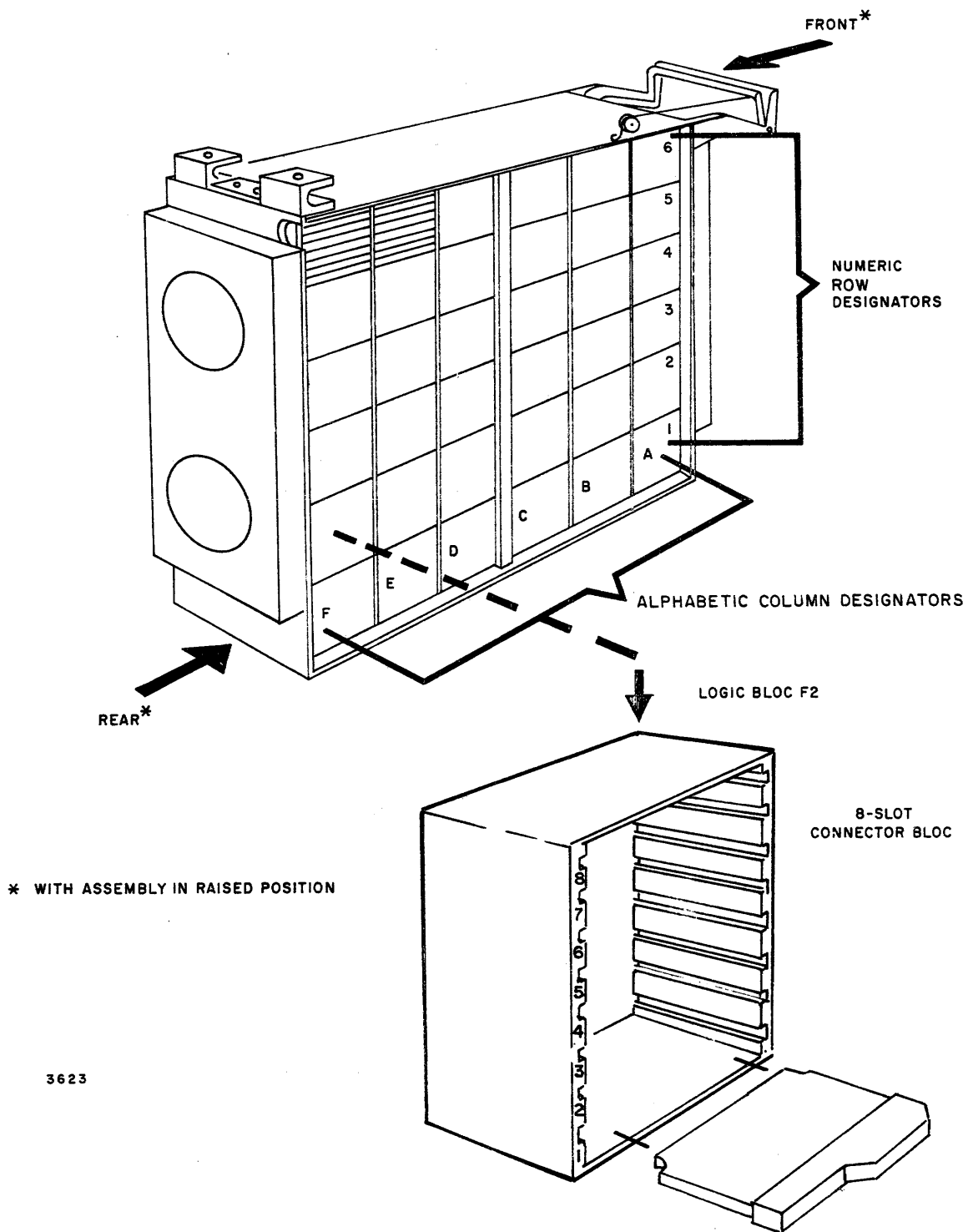


Figure 3-10. Tilt-Out Assembly, Logic BLOC Row and Column Designators for Central Processor Unit Logic BLOC Only

μ -PAC connector which bears the designation code A1F28. From the information presented this far, it can be seen that the code breaks down in the following manner.

<u>Code</u>	<u>Item Indicated</u>
A	Computer enclosure Bay A (Central Processor)
1	Central Processor Tilt-Out Assembly
F	Connector BLOC column coordinate F
2	Connector BLOC row coordinate 2
8	Slot 8 of connector BLOC located by coordinates F2

Coding System for a Divided Tilt-Out Assembly

The μ -PAC connector BLOC layout of a divided (two-section) tilt-out assembly is illustrated in Figure 3-11. Also shown in Figure 3-11 are the possible section designations and the assigned BLOC row and column coordinates.

As shown in Figure 3-11, the first divided assembly in an expansion bay contains Sections 1 and 2; the second assembly, Sections 3 and 4. The divided tilt-out in the basic (first) system bay (A) differs from those in the expansion bays in that the section designators assigned to it are 4 (always basic memory unit) and 5 (option).

The following examples of possible cable PAC designators are referenced to Figure 3-8 for unit and assembly locations and to Figure 3-11 for logic BLOC and slot locations.

a. Designator A5B21 indicates bay A, area 5 of memory/option tilt-out assembly, μ -PAC connector BLOC B2, and slot 1.

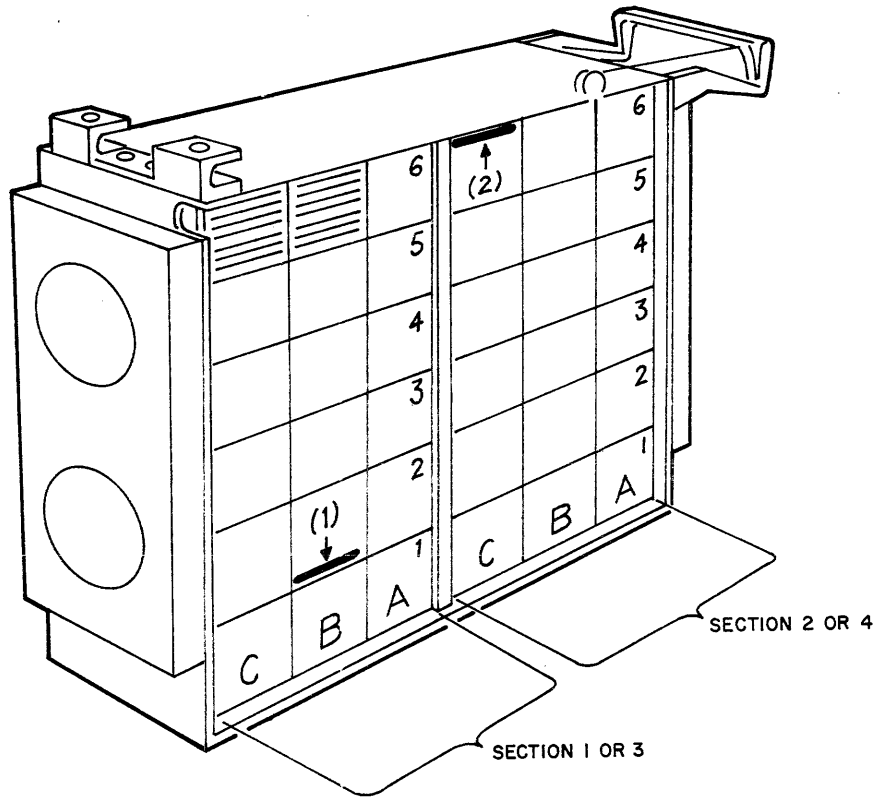
b. Designator B2C68 indicates bay B, area 2 of first tilt-out assembly, μ -PAC connector BLOC C6 and slot 8.

CABLE ROUTING

The routing of device and other types of cables into and through a typical computer bay enclosure is illustrated in Figure 3-12. The cables that are shown are routed from floor level through the open bottom of the bay enclosure and up the side of the bay to a cable trough at the top of the unit. Sufficient room for cables is provided at the side of the unit in the center horizontal H-shaped frame member.

Input cables should be clamped or otherwise secured in the cable trough and routed to the cable access of the desired assembly as shown in the top view of Figure 3-12. Care must be taken to position the cable in such a manner that it will not prevent the tilt-out assembly from being raised nor will it prevent the assembly from being lowered into its storage position.

Access to the cable trough is gained by removing the top of the computer enclosure (the top is always in one piece regardless of the number of bays in the enclosure). To remove the top, open the front door of the system bay (or bays) and remove the two screws (two per bay) securing the top to the top front frame member and tilt the front edge of the top up while pulling forward to free rear flange-type catches.



(1) SLOT REFERENCED BY EXAMPLE 1 GIVEN IN TEXT

(2) SLOT REFERENCED BY EXAMPLE 2 GIVEN IN TEXT

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Figure 3-11. Tilt-Out Assembly for Option Logic, Logic BLOC Row, Column and Section Designators

Cable Routing In Tilt-Out Assemblies

A cable access is provided in the top left-hand corner at the rear of each tilt-out assembly (as viewed with assembly in raised position). (See Figure 3-13 for location of cable access.) Access to the interior of the assembly for the installation of a device cable PAC is obtained by removing the left-hand cover plate from the unit. The removal of the cover plate (Figure 3-13) is accomplished by unlocking the two quick release screw type fasteners located at the rear of the assembly, then pulling the rear edge of the cover outward and to the rear to release two flange-type catches at the front of the cover. Figure 3-14 illustrates the installation of a cable in a tilt-out assembly. As shown, the cable must be secured at intervals along the inner edge of the unit. The designation of the μ -PAC connector BLOC that is marked on the cable PAC shown is XXA11.

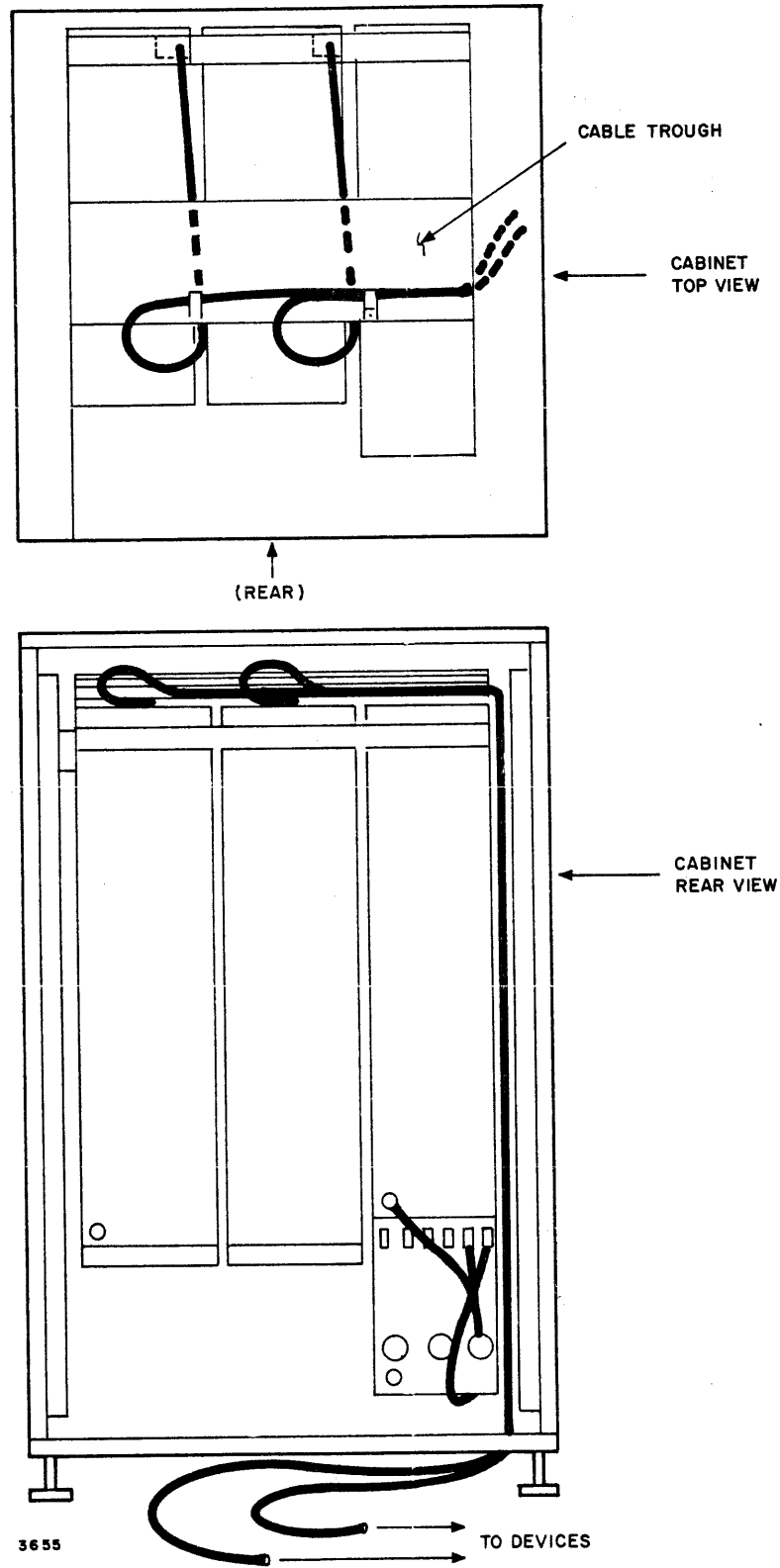
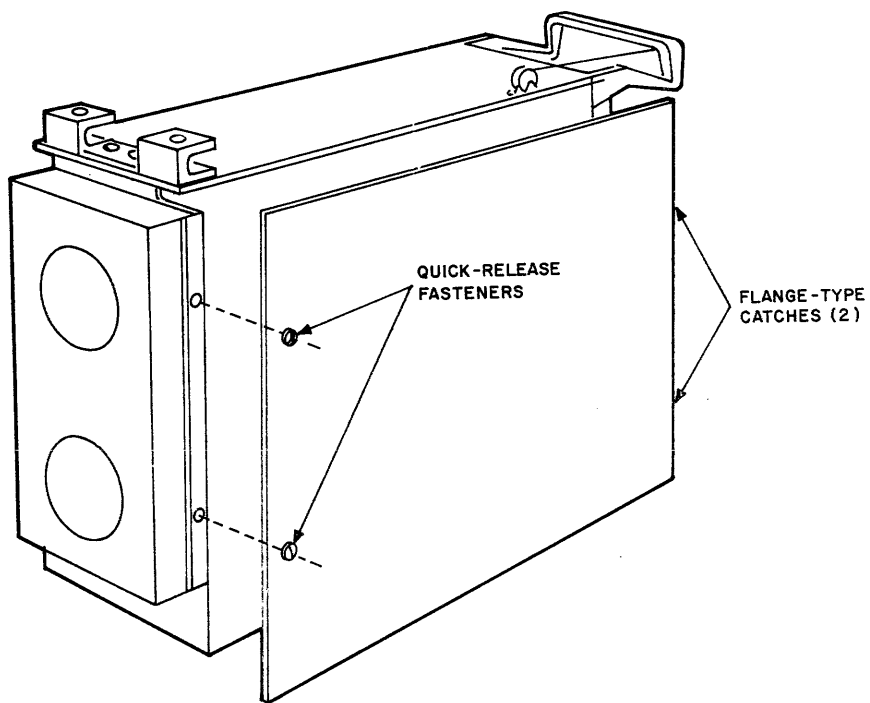
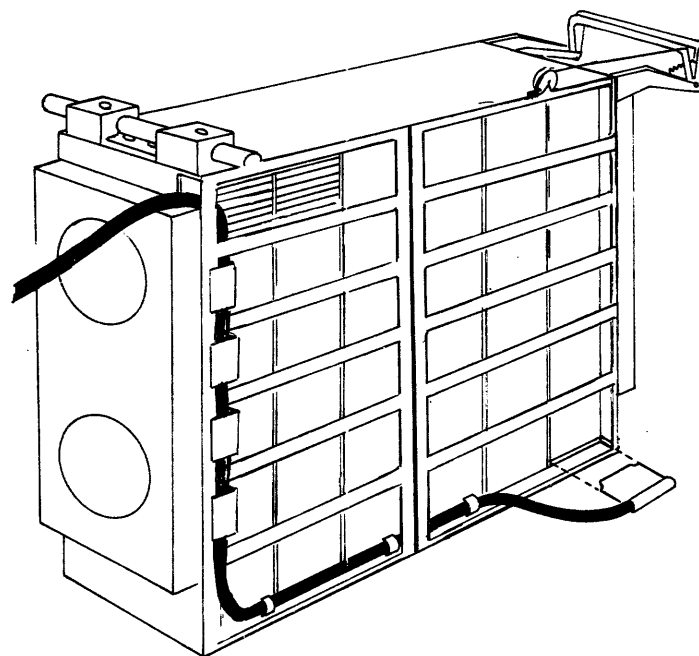


Figure 3-12. Example of Cable Routing in a Single-Bay Enclosure



3647

Figure 3-13. Removal of Cover From Tilt-Out Assembly



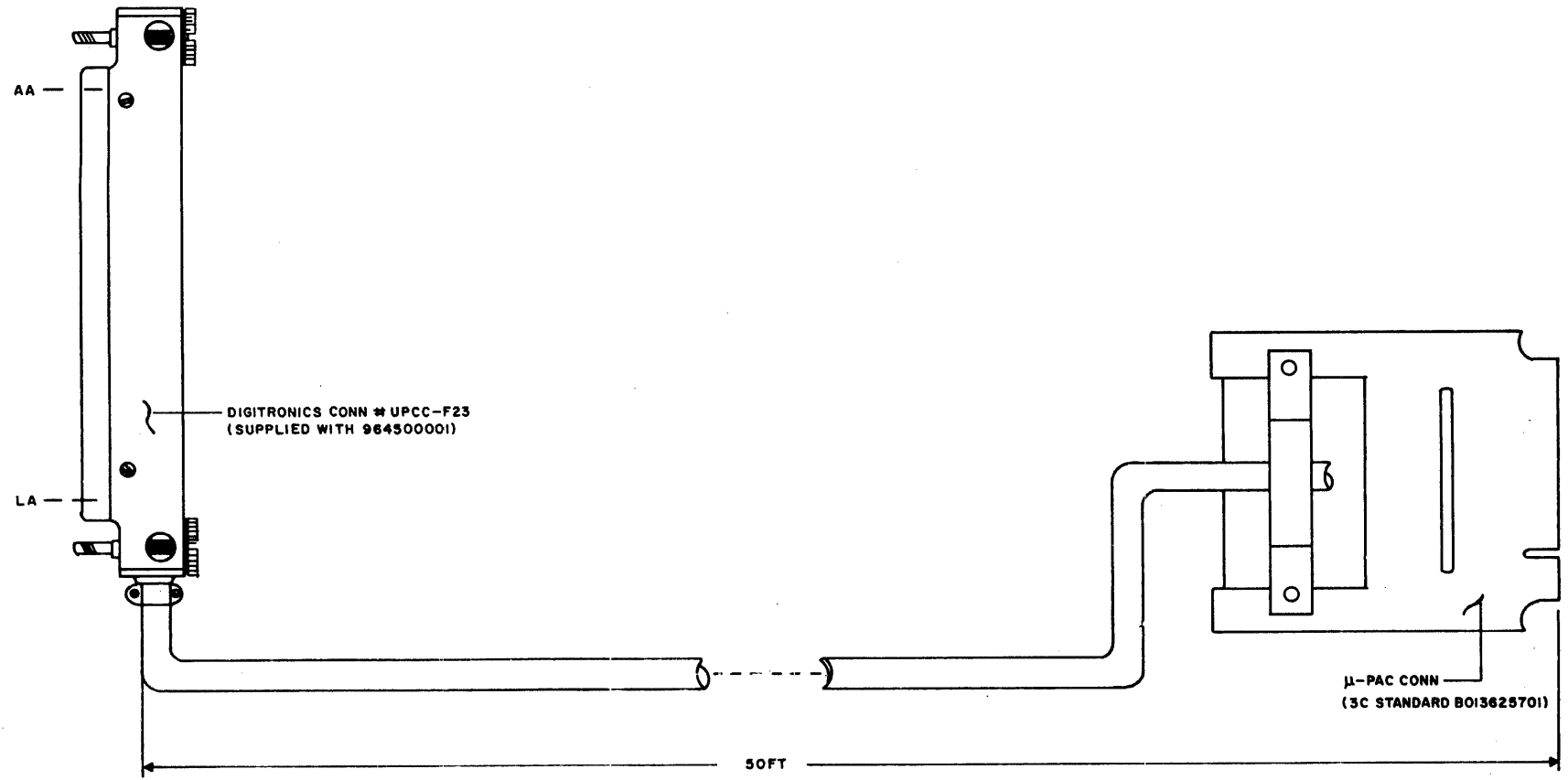
3659

Figure 3-14. Example of Cable Routing and Installation in a Tilt-Out Assembly

APPENDIX
DEVICE CABLES

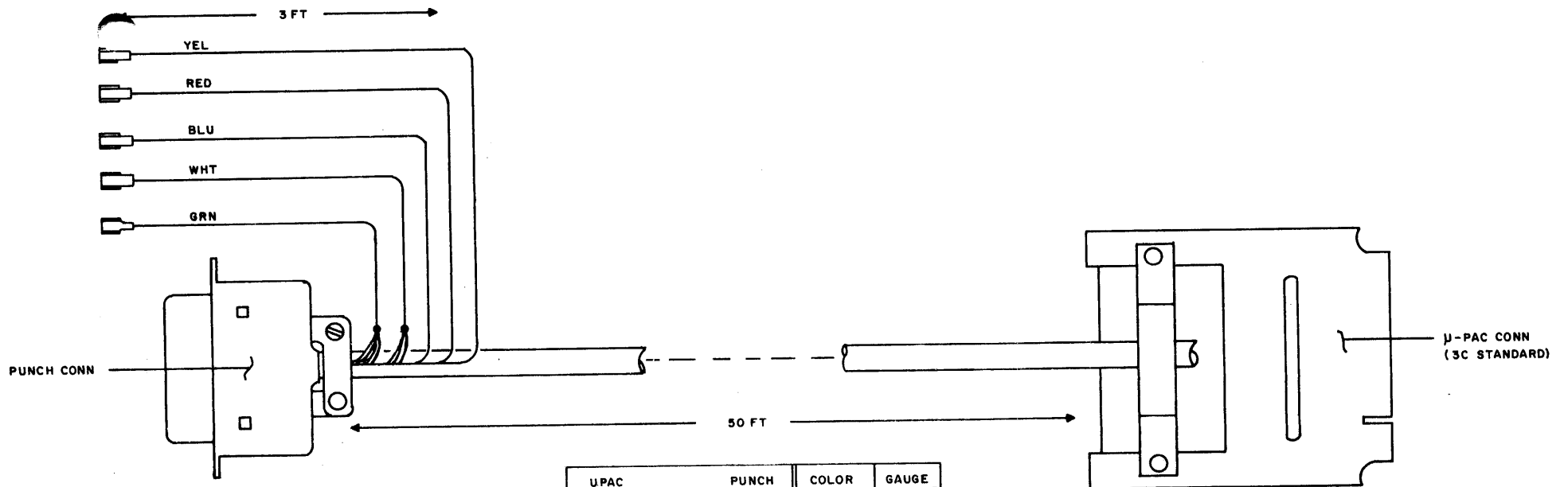
The following diagrams are included in this appendix.

- DDP-516-50 Paper Tape Reader Device Cable
- DDP-516-52 Paper Tape Punch Device Cable
- DDP-516-61 Card Reader Device Cable



PAPER TAPE READER CABLE		
DEVICE		μ-PAC
LA	RCH01+	1
LB	RCH02+	2
LC	RCH03+	3
LD	RCH04+	4
LE	RCH05+	5
LF	RCH06+	6
LH	RCH07+	7
LJ	RCH08+	8
LV	RSXXX+	9
LY	RNSTP+	10
LK	GND	33
LZ	-15S	
AA	-15L	

Figure A-1. DDP-516-50 Paper Tape Reader Device Cable



U PAC	PUNCH	COLOR	GAUGE	
1	PCH01+0	8	RED	22
3	PCH01+1		BLK	
4	PCH02+0	1	RED	
6	PCH02+1		BLK	
7	PCH03+0	2	RED	
9	PCH03+1		BLK	
10	PCH04+0	3	RED	
12	PCH04+1		BLK	
13	PCH05+0	4	RED	
15	PCH05+1		BLK	
16	PCH06+0	5	RED	
18	PCH06+1		BLK	
19	PCH07+0	6	RED	
21	PCH07+1		BLK	
22	PCH08+0	7	RED	
24	PCH08+1		BLK	
25	PFHXX+0	9	RED	
27	PFHXX+1		BLK	
28	PMPXX+0	24	SHLD	
29	PMPXX+1	12	SHLD	
30	PWDVR+0		RED	
31	PWDVR+1		BLK	
32	TDRLY-0		RED	
33	TDRLY-1		BLK	22
	- 26 RTN	18	BLU	18

Figure A-2. DDP-516-52 Paper Tape Punch Device Cable

U-PAC	MNEMONIC	CONN	
		SIG	RET
1	SCCLX -	27	30
2	CBILX -	33	36
3	CBHLX -	39	42
4	RACLX -	13	16
5	CSPXX -	40	37
6	CRELX -	46	43
7	CC1LX +	1	2
8	CC2LX +	6	4
9	CC4LX +	15	12
10	CC8LX +	22	18
11	CCALX +	28	25
12	CCBLX +	34	31
13	CCLXX -	32	35
14	EOFLX +	20	23
15	CRLXX -	26	29
16			
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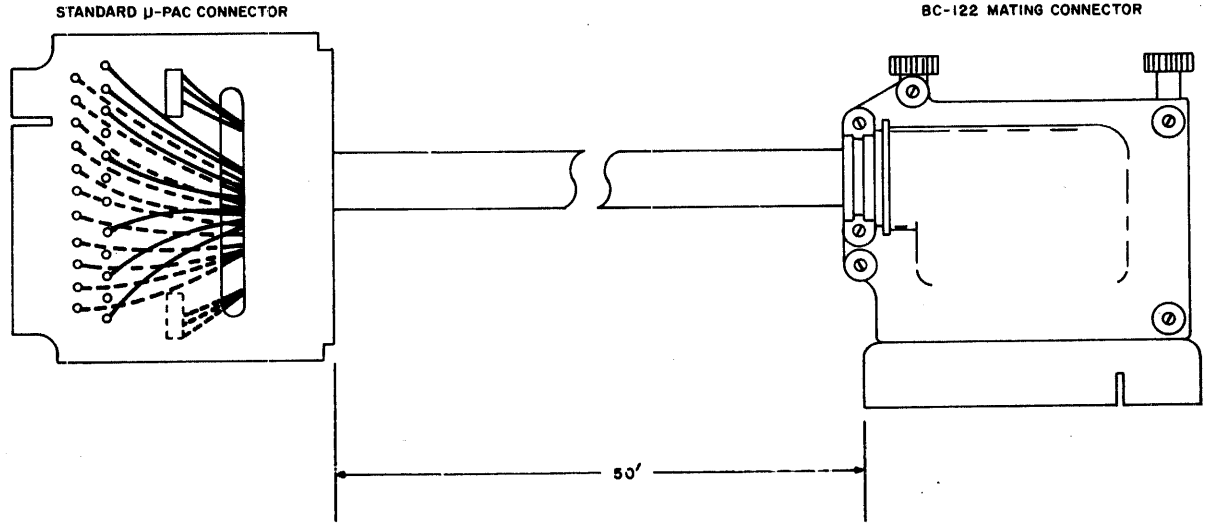


Figure A-3. DDP-516-61 Card Reader Device Cable