1A HIGH SPEED DATA SELECTIVE CALLING SYSTEM

INSTALLATION

CONTENTS PAGE

1. INTRODUCTION

1.01 This reissue incorporates the latest engineering changes and makes the section a standard publication. Since it is a general revision, marginal arrows are omitted.

1.02 This section will provide information necessary to install high speed terminal, converter, and controller cabinet assemblies to implement a 1A High Speed Data Selective Calling System.

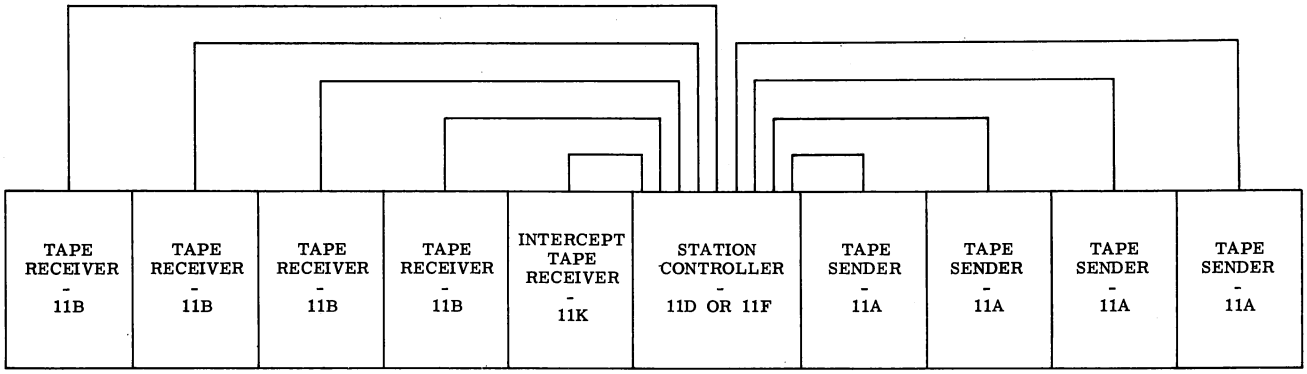
1.03 A High Speed System consists of one master and one or more outlying stations which are interconnected by a Schedule 4, Type 4A data circuit. Each station consists of either a master or outlying Controller, a High to Low and/or Low to High Converters, and a High Speed Tape Sender and/or Receiver. The master station has, in addition, a High Speed Intercept Tape Receiver.

1.04 Each station in a 1A High Speed Data Selective Calling System may be equipped with any number of equipment variations. However, only three types of basic cabinets are used to house the equipment. They are: (1) Controller Cabinets, (2) High Speed Tape Sender and Intercept Tape Receiver Cabinets, (3) Converter Cabinets.

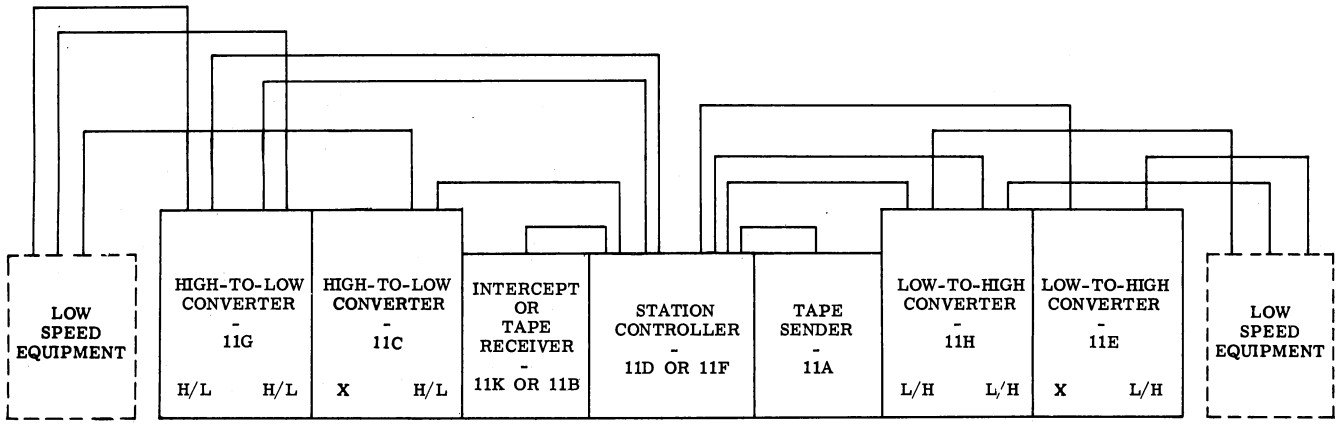
2. STATION LAYOUT

2.01 The nucleus of a 1A High Speed Data Selective Calling station consists of the 3 basic cabinet assemblies. Before proceeding with a layout, consider the total number of cabinet assemblies, tables, storage cabinets, etc., which may be located at the station. The cabinet assemblies may be grouped or separated as required to achieve the most appealing and efficient layout. Cables of variable lengths are available to interconnect the operational cabinet assemblies to the Station Controller.

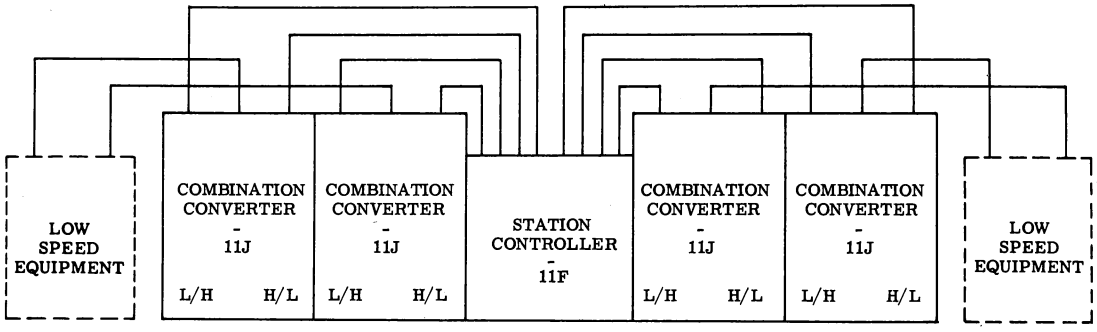
Prepared for American Telephone and Telegraph Company by Teletype Corporation



TORN-TAPE INTERCHANGE CENTER (MASTER OR OUTLYING STATION)



AUTOMATIC INTERCHANGE CENTER (MASTER OR OUTLYING STATION)



AUTOMATIC INTERCHANGE CENTER (OUTLYING STATION)

Figure 1 - Automatic Interchange Center (Outlying Station)

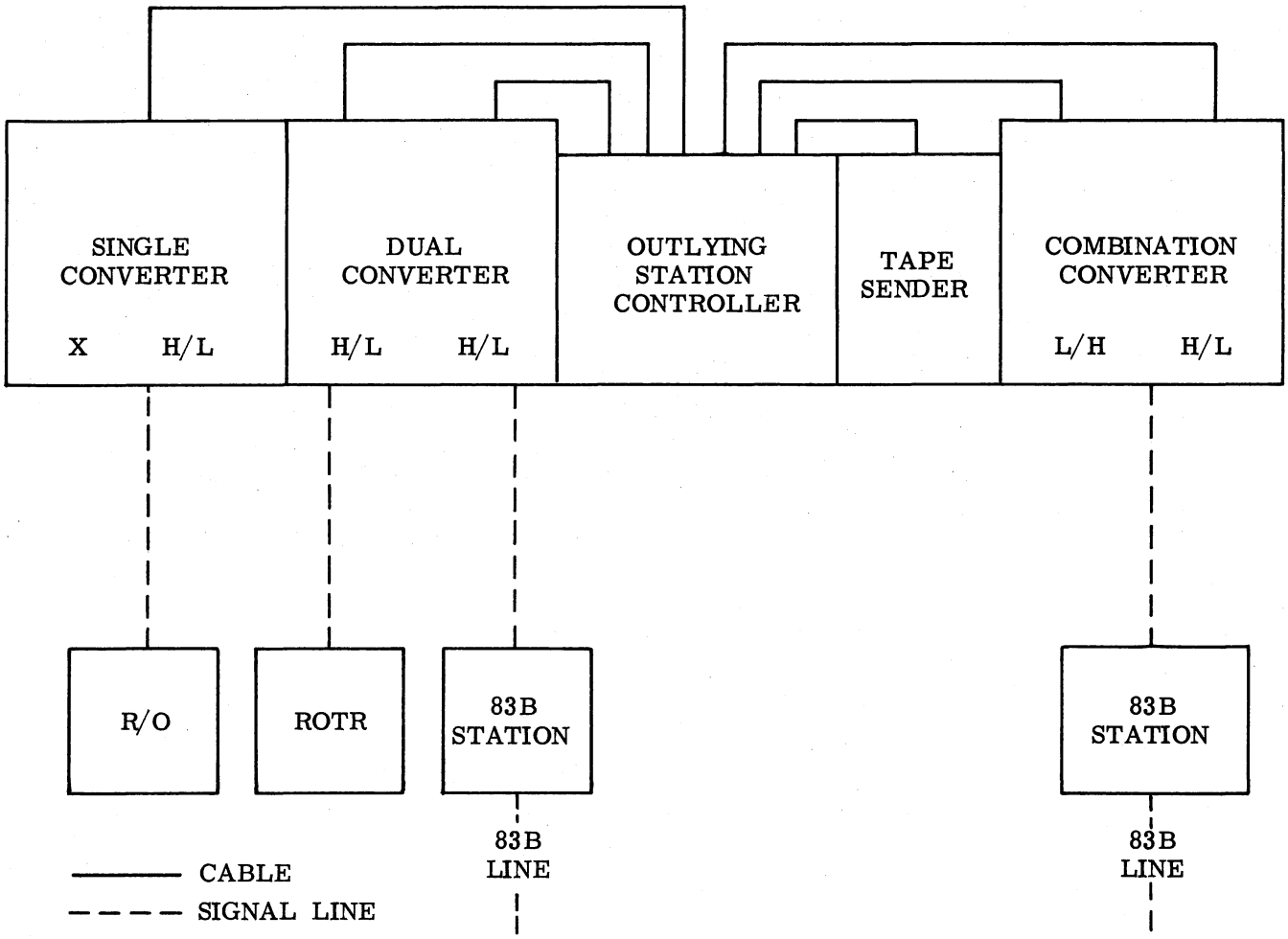


Figure 2 - Typical Outlying Station Installation

Figure 3 - Typical Station Installation

2.02 Some typical station arrangements are shown in Figures 1 and 2. To maintain symmetry, it is suggested that the Station Controller be placed in the center. Low Level Cabinets such as the Tape Sender, Receiver, and Intercept Cabinets, should be placed at the ends of the row or by themselves for maintenance and operating accessibility. The high standing Converter Cabinets may be grouped in banks. A typical arrangement is illustrated in Figure 3. Adequate space should be available for operating and maintaining the cabinet assemblies. Either front edge or rear edge alignment is possible.

2.03 When selecting a site for the System Station, consider the following:

(1) There should be adequate space behind and in front of each cabinet for ease of maintenance and operation.

(2) A separate 117 volt (±10%) ac polarized (3 wire) source should lie within reach of each cabinet. Table 1 gives the current supply requirements.

(3) Variation of the ambient temperature should lie within a $+40^{O}F$ to $+110^{O}F$ range.

2.04 The equipment is packed for maximum protection. Exercise care when unpacking and handling the units to prevent damage. In unpacking, observe all caution labels and instructions.

3. CABINET SPECIFICATIONS

3.01 The Station Controller Cabinet is approximately 55 inches high, 25 inches wide, and 24 inches deep. All station interconnections (except low speed signal lines that terminate in Converter Cabinets) are made in this

TABLE 1

Cabinet	Alternating Current (amps)		Dimensions (ins)			Weight (lbs)	Heat Dis (BTU)
	Start	Run	Width	Depth	Height		
Tape Sender 11A	10	3.5	16	24	55	260	580
Tape Receiver 11B and Intercept Tape Receiver 11K	10	4.0	16	24	55	260	1080
Master Controller 11D	6	6.0	25	25	55	250	630
Outlying Controller 11F	5	5.0	25	25	55	230	630
Single H/L 11C	7	4.0	28	28	87	875	1410
Single L/H 11E	5	4.0	28	28	87	875	760
Dual H/L 11G	14	8.0	28	28	87	1050	2820
Dual L/H 11H	10	8.0	28	28	87	1050	1520
Combination 11J	12	8.0	28	28	87	1050	2060

cabinet. The rear panel is removable to gain access to the cabinet for servicing and routing system connections. Front doors and slide out modules permit accessibility through the front.

3.02 The Tape Sender, Tape Receiver and Intercept Tape Receiver are housed in cabinets which are 55 inches high, 16 inches wide, and 24 inches deep. The Tape Intercept is similar to the Tape Receiver. Inputs and outputs are terminated on a connector which is located in the bottom rear of the cabinet. The rear of the cabinet is accessible by removing a rear panel; the front is accessible by opening a front door.

3.03 The Converter Cabinet is approximately 84 inches high, 28 inches wide, and 28 inches deep. All input and output signals are terminated in connectors at the bottom and top of the cabinet. A terminal block is provided for ac power. Full length rear doors are provided as a part of the basic cabinet assembly. Modular front panels, equipment patch panels, full length or half length front doors are furnished as required by the apparatus installed in the cabinet.

Note: There must be a minimum of 30 inches behind the rear of the Converter Cabinet to provide clearance for the rear access doors, and access to the rear mounted fuses.

4. CABINET ALIGNMENT

4.01 Cable ducts are provided at the bottom rear of the Converter, Station Controller, Tape Sender, and Tape Receiver Cabinets. These ducts are approximately 4 inches high, 5 inches deep, and span the width of the cabinets. In addition, the Converter Cabinet contains an overhead raceway which is approximately 6 inches high, 13 inches wide, and spans the width of the cabinet. The rear edge of all cabinets must be lined up for proper alignment of these ducts. Additional duct hardware is available for front edge alignment.

4.02 After a station layout is prepared, install appropriate anchors in the floor for bolting the cabinets in place. For convenience, the locations of the mounting holes are given in Figure 4.

5. STATION CONTROLLER CABINETS

5.01 The Station Controller should be leveled and bolted in its station layout position before the electronic modules are installed. Refer to Figure 4, and use suitable anchor bolts to secure in position. To gain access to the rear of the cabinet, loosen the single screw at the top and lift the panel out.

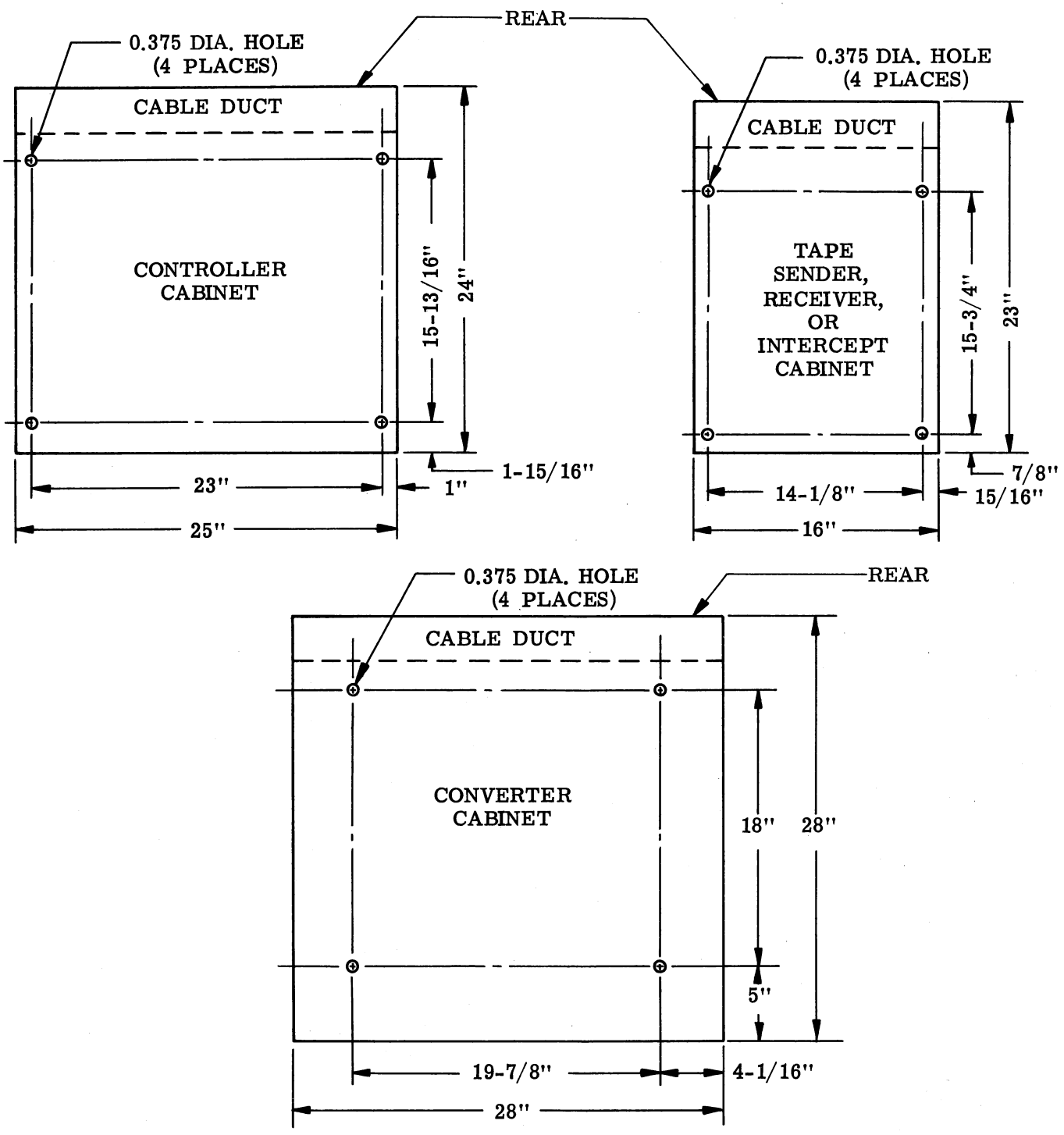


Figure 4 - Cabinet Mounting Hole Locations

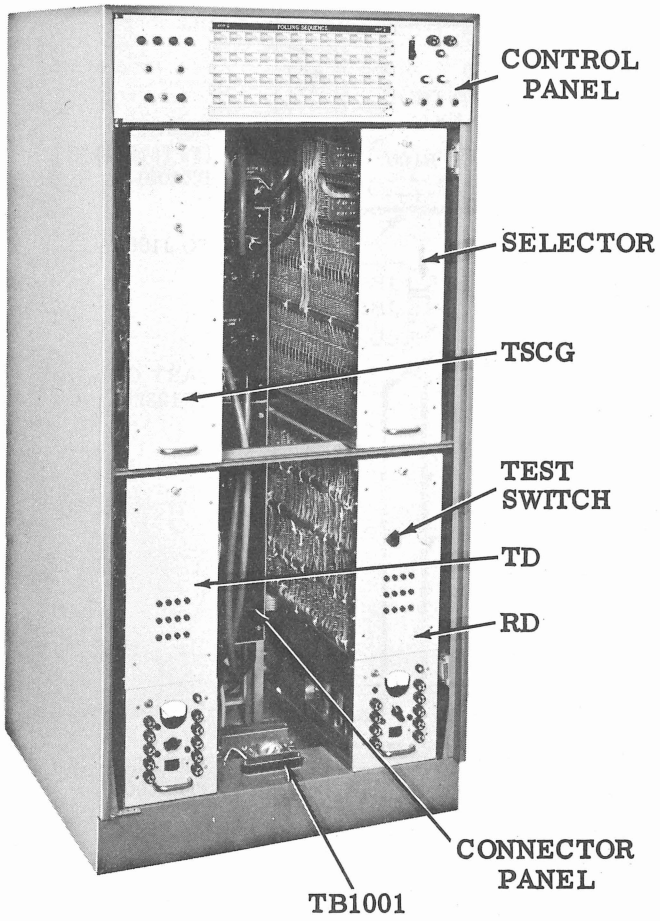


Figure 5 - Master Station Controller

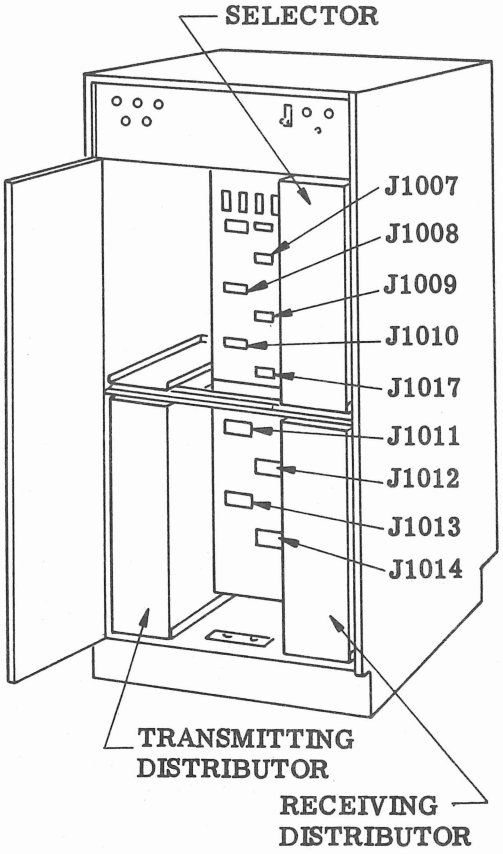


Figure 6 - Outlying Station Controller Components

5.02 The electronic modules for the Station Controller Cabinets are packed separately for shipping. Exercise care while unpacking and handling to prevent damage.

5.03 Refer to Figures 5 and 6 for proper module placement in the respective cabinets. Insert each module in its channel by positioning the top of the module frame behind the module retainer and placing the module on the channel.

5.04 With the module in its forward position, attach the proper cabinet cable and tighten the connector retaining screws. Figures 7 and 8 show cabinet cabling and routing. Typical module cable connections are shown in Figure 9.

5.05 Install all the modules using the method above, and push each module rearward to its locking position after the cable connection has been made. The cable connection can only be made when the module is fully forward.

5.06 The ac power connections can now be made; however, do not apply power to the cabinet until the cabinet ground bus and system connections have been completed. Refer to Figure 10. Ac power wiring is terminated at a terminal block inside the front door. Using the power cord supplied or other suitable wiring, connect ground (green) to terminal block TB1001, terminal 3, ac common (white) to terminal 1, and 117 volt ac lead (black) to terminal 2.

6. INSTALLATION OF DATA SET

6.01 Insert the data set between the two retainers on the upper shelf (see Figure 11). Connect the ac twist receptacle from the cabinet to the plug at the rear of the data set. Connect the multipin plug from the module circuitry into the receptacle at the rear of the data set, and lock the plug in place. The output from the data set should be routed to the duct at the bottom of the Control Cabinet and out to the high speed data line. Connection of the data set to the high speed line can be found in the appropriate section.

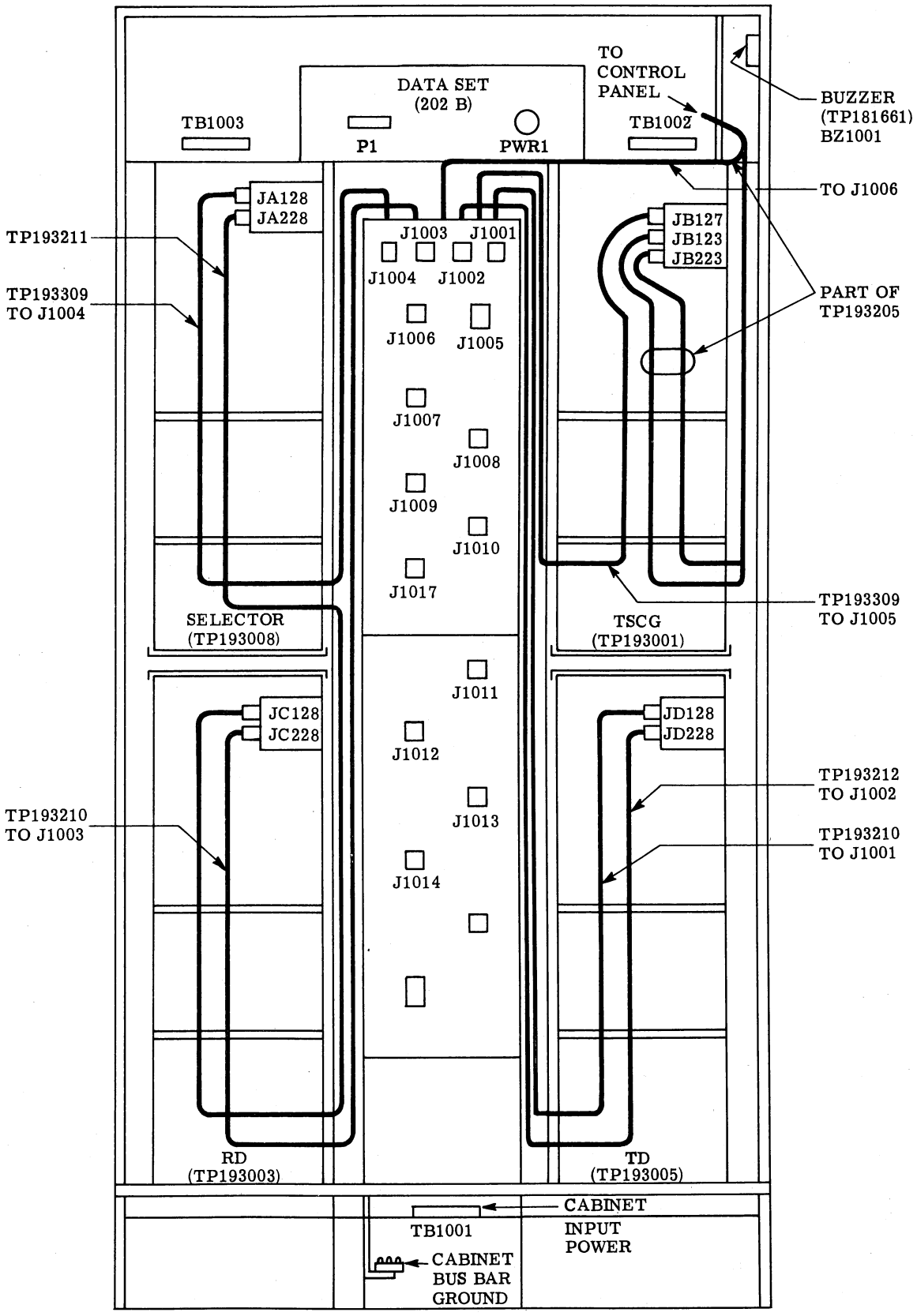


Figure 7 - Rear View Master Station Controller Cabinet

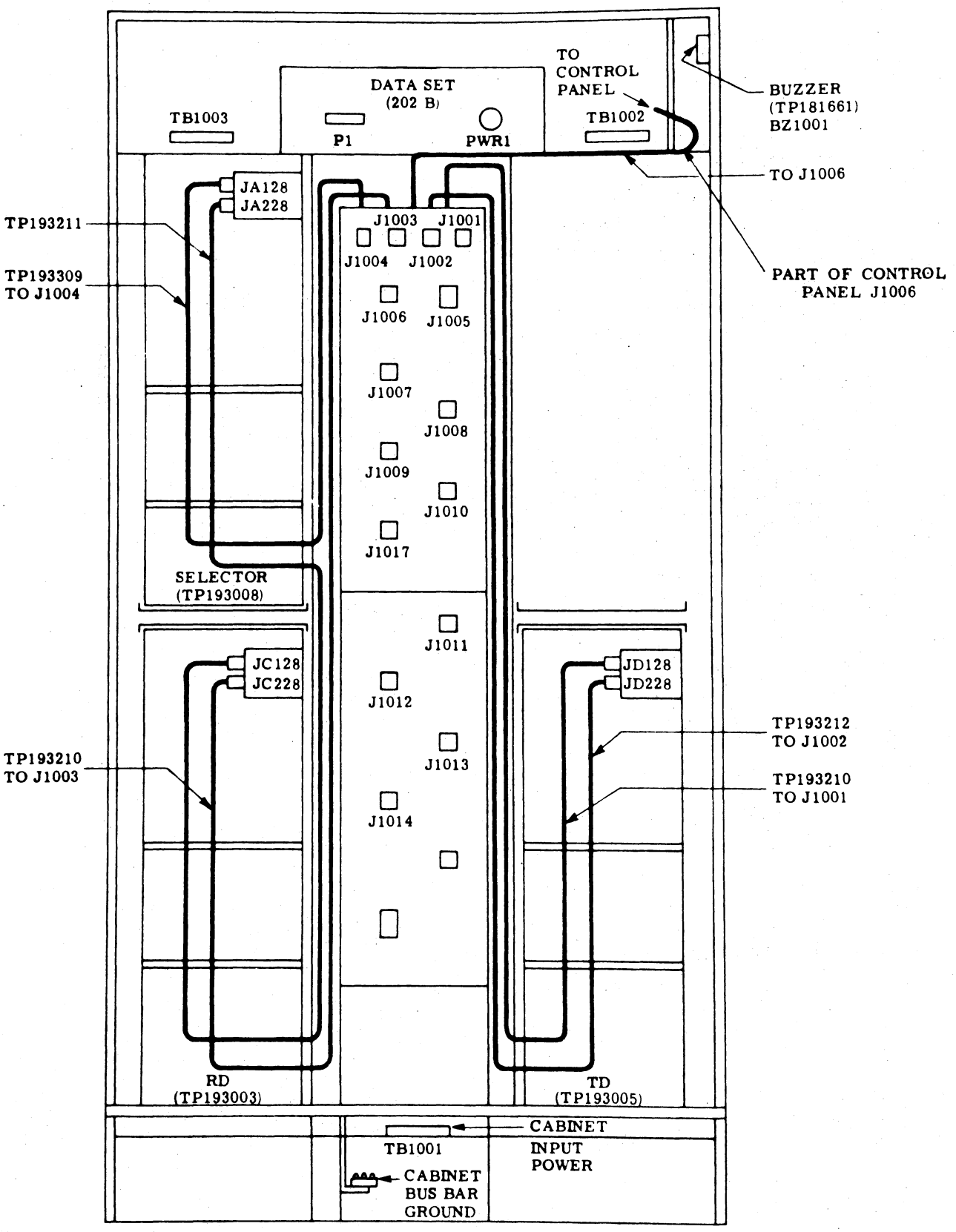


Figure 8 - Rear View Outlying Station Controller Cabinet

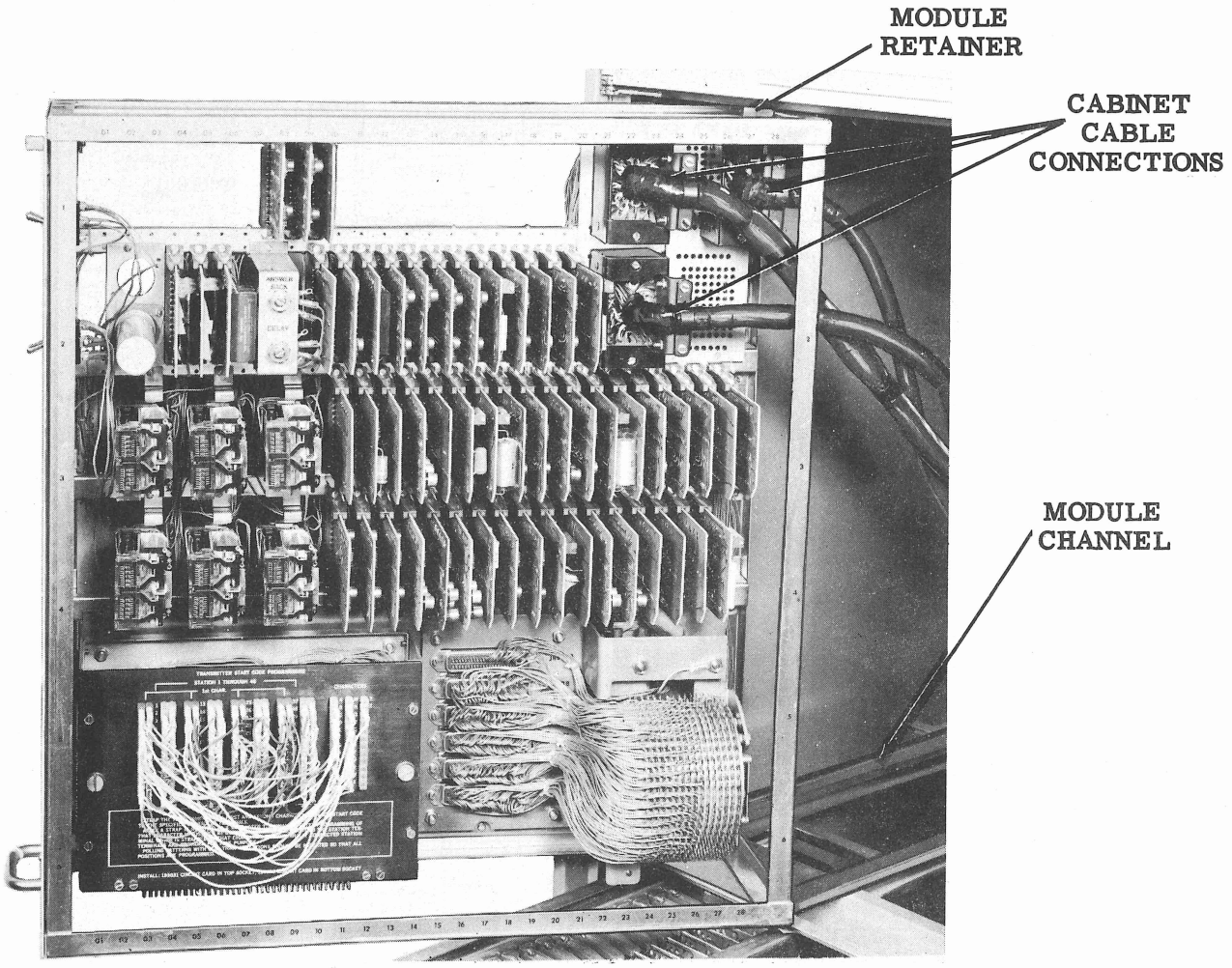


Figure 9 - Transmitter Start Code Generator, Showing Module Position for Cabinet Connections

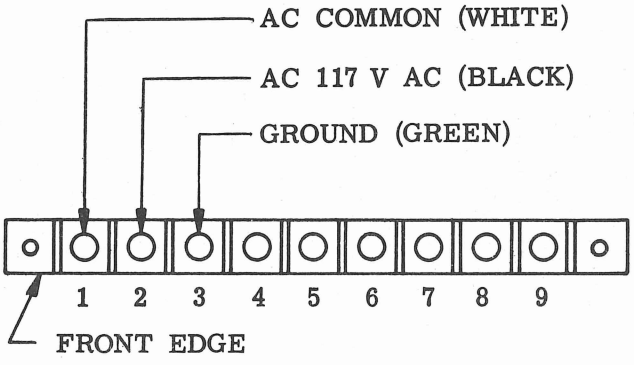


Figure 10 - AC Input Power Terminal Block, TB1001

7. HIGH SPEED SENDER, RECEIVER AND INTERCEPT RECEIVER

7.01 After unpacking the cabinet, remove the four spacer blocks between the channels and motor frame, the block under the motor mounting vibration mounts, the block from the under side of the power supply transformer, and the three blocks from the rear sides and shelf of the cabinet. The High Speed Sender, Receiver and Intercept Receiver Cabinet should be compared with Figures 12 and 13 respectively for proper module placement.

7.02 Remove the cardboard box from inside the cabinet and open along the sealed edges. Remove the plastic tape reels and install on cabinet.

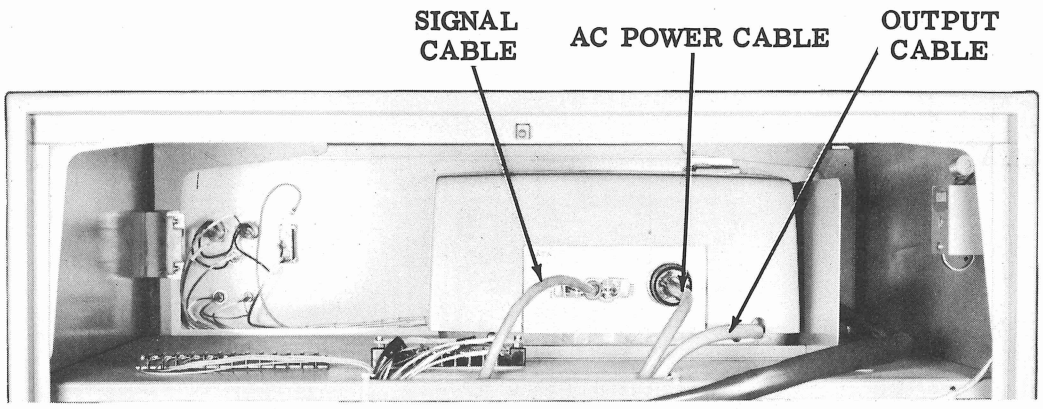


Figure 11 - Rear View Station Controller Cabinet Data Set Installed

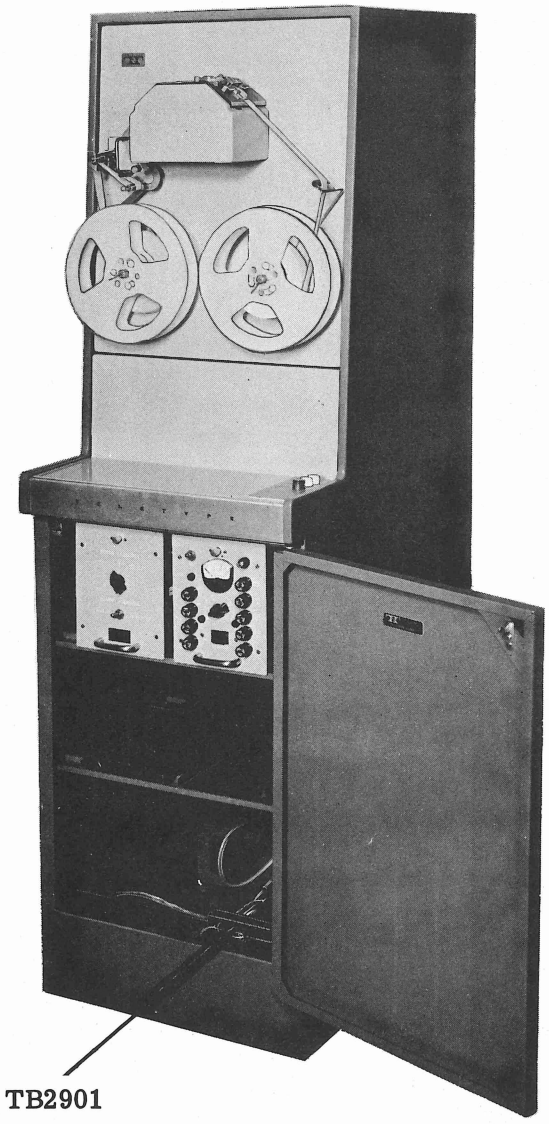


Figure 12 - High Speed Tape Sender

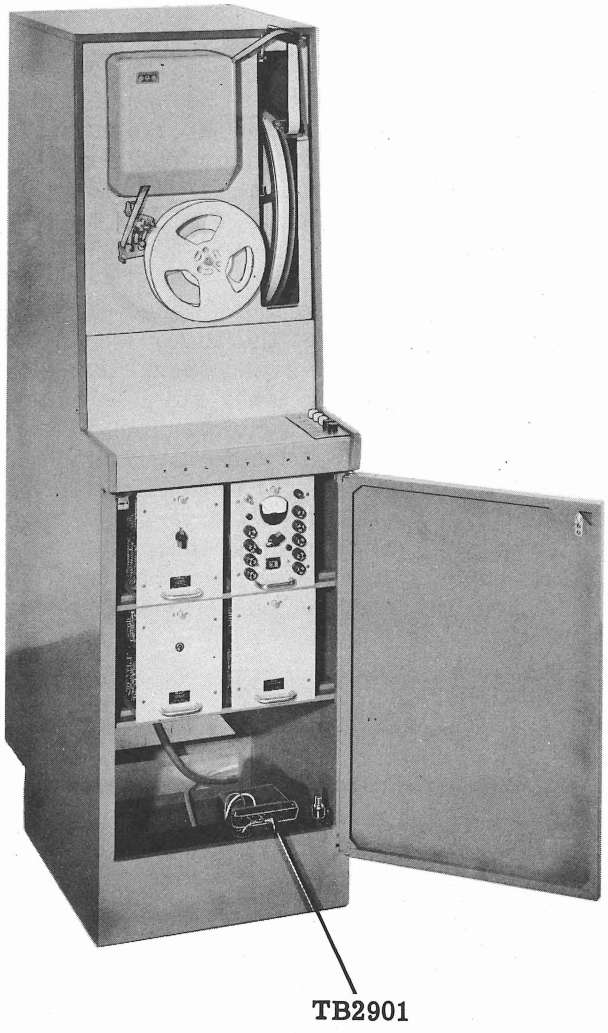


Figure 13 - High Speed Intercept Receiver and General Appearance - High Speed Tape Receiver

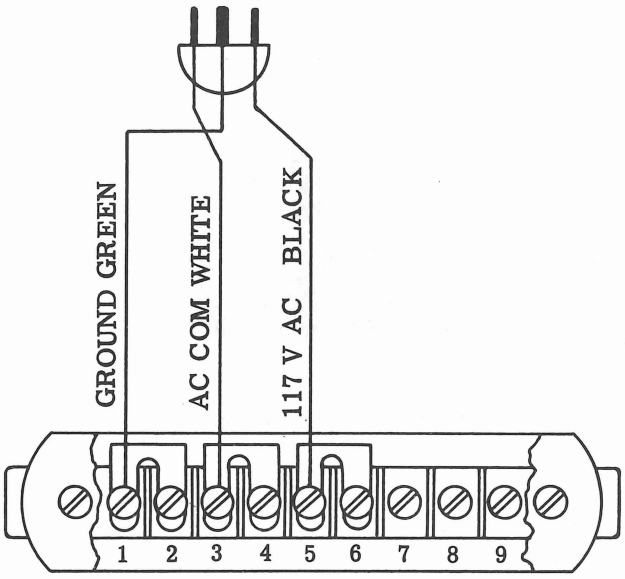


Figure 14 - AC Input Power Terminal Block, TB2901

7.03 The cabinet should be permanently mounted to the floor to avoid lateral movement before system connections are made. Using the diagram in Figure 4, install appropriate anchors in the floor. Position the cabinet, and bolt securely.

7.04 The ac power cord is connected to the terminal block at the lower edge of the cabinet, just inside the front door. Using the power cord supplied or other suitable wiring, connect ground (green) to terminal block TB2901, terminal 1, ac common (white) to terminal 3, and 117 volt ac lead (black) to terminal 5. Refer to Figure 14. Replace the terminal board insulating cover after making the connections. Do not apply power to the cabinet until the ground bus and system connections have been completed.

8. CONVERTER CABINETS

8.01 After unpacking the cabinet, compare the location of the modules with Figure 15 for Single L/H and Dual L/H, with Figure 16 for Single H/L and Dual H/L, and Figure 17 for the Combination Converter Cabinets. Use the diagram in Figure 4 and install appropriate anchors in the floor.

8.02 Move the cabinet into its final position, check the vertical alignment of the cabinet with other cabinets in the bank. If the cabinet is neither aligned nor level, use shim stock

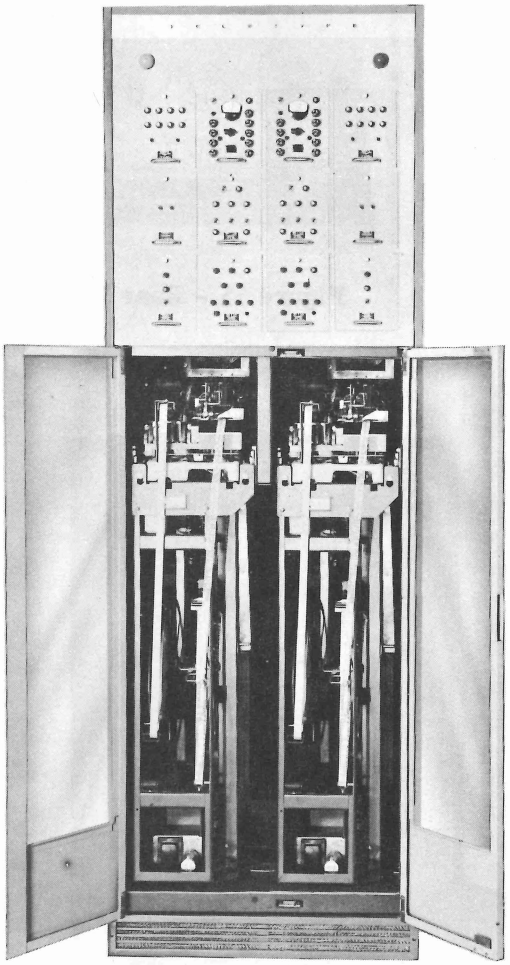


Figure 15 - Dual Low-to-High Speed Converter

to raise one or more corners until the desired alignment is achieved. The shim stock should be placed under the small metal plates, welded to the base at the corners of the cabinet. Upon completion of alignment, bolt the Converter Cabinet securely to the floor.

CAUTION: DO NOT EXTEND EXCESSIVE NUMBER OF MODULES AND/OR THE PUNCH-READER SETS IN CABINET UNTIL ANCHOR BOLTS HAVE BEEN INSTALLED AS THERE IS A POSSIBILITY THAT CABINET WILL TIP FORWARD.

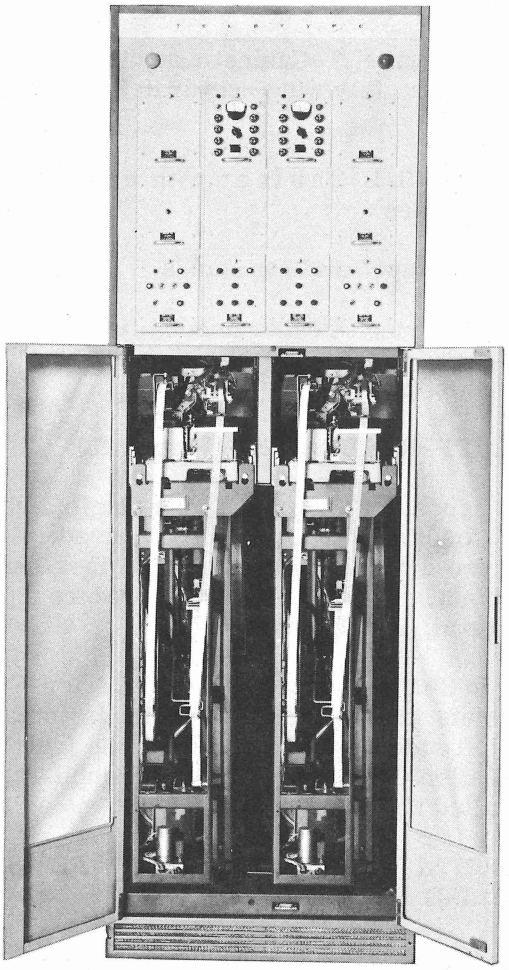


Figure 16 - Dual High-to-Low Speed Converter

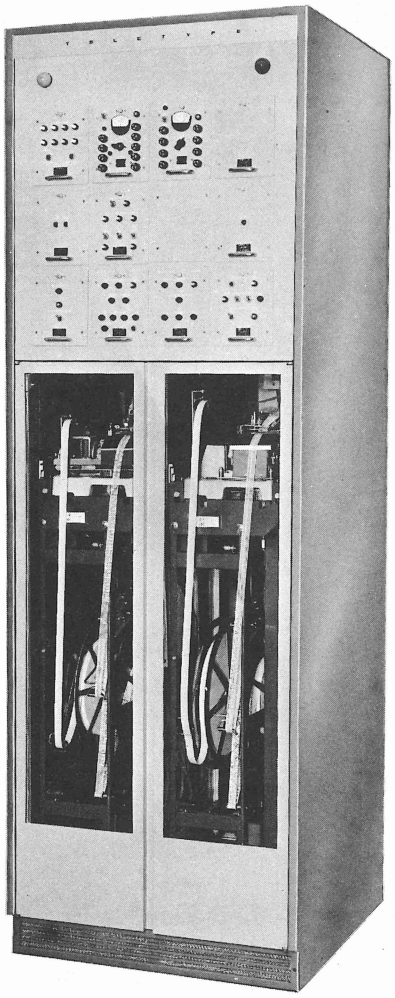


Figure 17 - Combination Converter Cabinet

8.03 The Combination Converter Cabinet assembly consists of the following separately packaged items:

(1) Converter Cabinet with electronic modules.

(2) One L/H punch-reader assembly.

(3) One H/L punch-reader assembly.

(4) Two tape handling stands.

(5) Two tape bins.

8.04 The Single L/H Cabinet assembly consists of the following separately packaged items:

(1) Single L/H Cabinet with electronic modules.

(2) One tape handling stand.

(3) One punch-reader assembly.

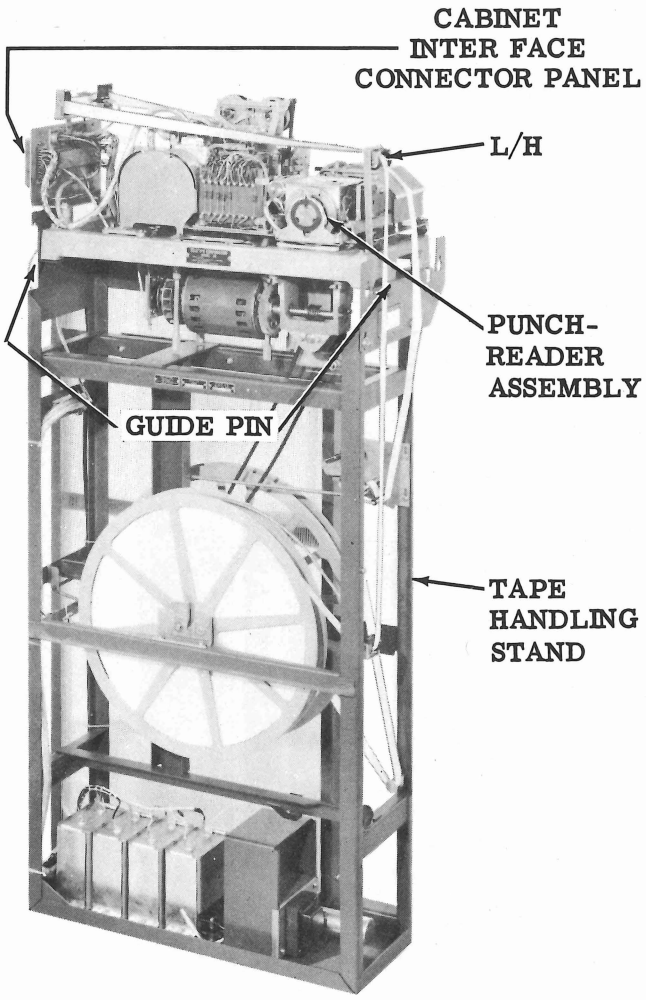


Figure 18 - Left Side, L/H Punch-Reader Set

(4) One tape bin.

8.05 The Dual L/H Cabinet assembly consists of the following separately packaged items:

(1) Dual L/H Cabinet with electronic modules.

(2) Two tape handling stands.

(3) Two punch-reader assemblies.

(4) Two tape bins.

8.06 The Single H/L Cabinet assembly consists of the following separately packaged items:

(1) Single H/L Cabinet with electronic modules.

(2) One tape handling stand.

(3) One punch-reader assembly.

(4) One tape bin.

8.07 The Dual H/L Cabinet assembly consists of the following separately packaged items:

(1) Dual H/L Cabinet with electronic modules.

(2) Two tape handling stands.

(3) Two punch-reader assemblies.

(4) Two tape bins.

9. PUNCH-READER SET (Figure 18)

9.01 Depending upon whether a Single, Dual or Combination Converter is used, either one or two Punch-Reader Sets are installed in the cabinet. The installation procedure is the same for all Punch-Reader Sets.

9.02 In Single L/H and H/L Converter Cabinets, the Punch-Reader Set is installed in the left side (when viewed from the front). In Combination Converters, the L/H punch-reader is installed on the left side.

10. INSTALLATION OF THE TAPE HANDLING STAND

10.01 Unpack the tape handling stand by cutting the carton along its sealed edges, being careful not to damage the finish of the unit. Install the tape handling stand using the following procedure:

(1) Push cabinet slides to their rear stop.

(2) Hook the notched rear tabs of the stand over each of the slide rails.

(3) Push the stand to the rear of the cabinet, holding the front of the stand in line with the rails.

(4) Hook the key holes in the front plate of the stand over the shoulder screws on the front of the slides. Lower the stand onto the shoulder screws.

(5) With the tape handling stand extended, insert the static eliminator plug into the high voltage box at the bottom of the cabinet.

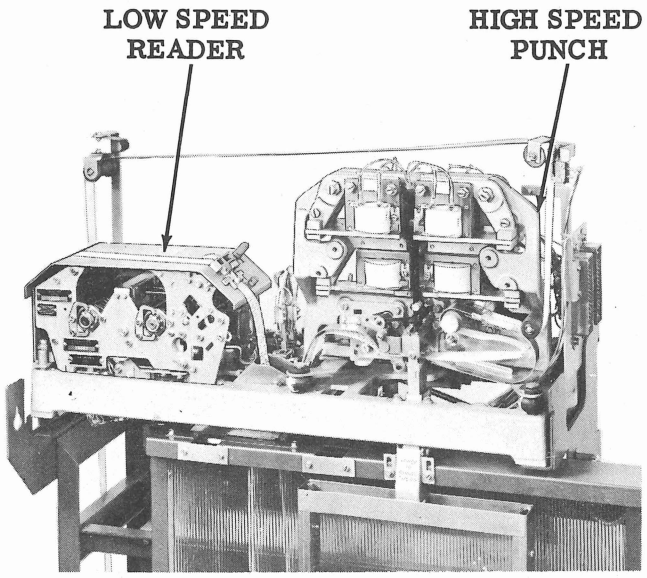


Figure 19 - High-to-Low Punch-Reader Assembly

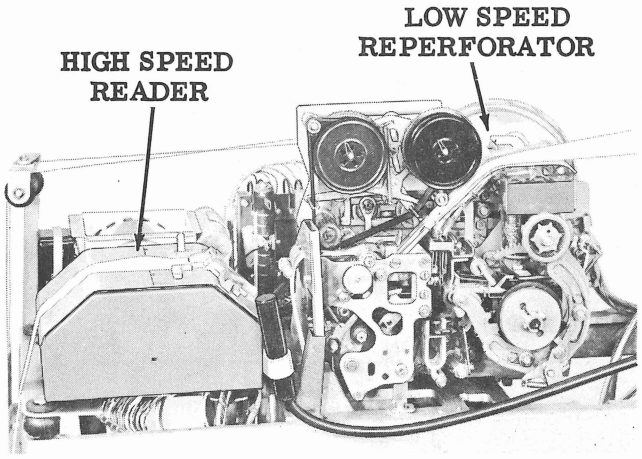


Figure 20 - Low-to-High Punch-Reader Assembly

10.02 If disassembly of the stand from the cabinet is required, simply pull the stand out to the limit of the slides. Disconnect the static eliminator plug. Unhook the key holes in the front plate of the stand from the slide shoulder screws by raising the stand and pulling outward.

CAUTION: THE STATIC ELIMINATOR CABLE MUST BE DISCONNECTED FROM ITS HIGH VOLTAGE POWER SUPPLY WHEN THE TAPE HANDLING STAND IS REMOVED FOR SERVICING.

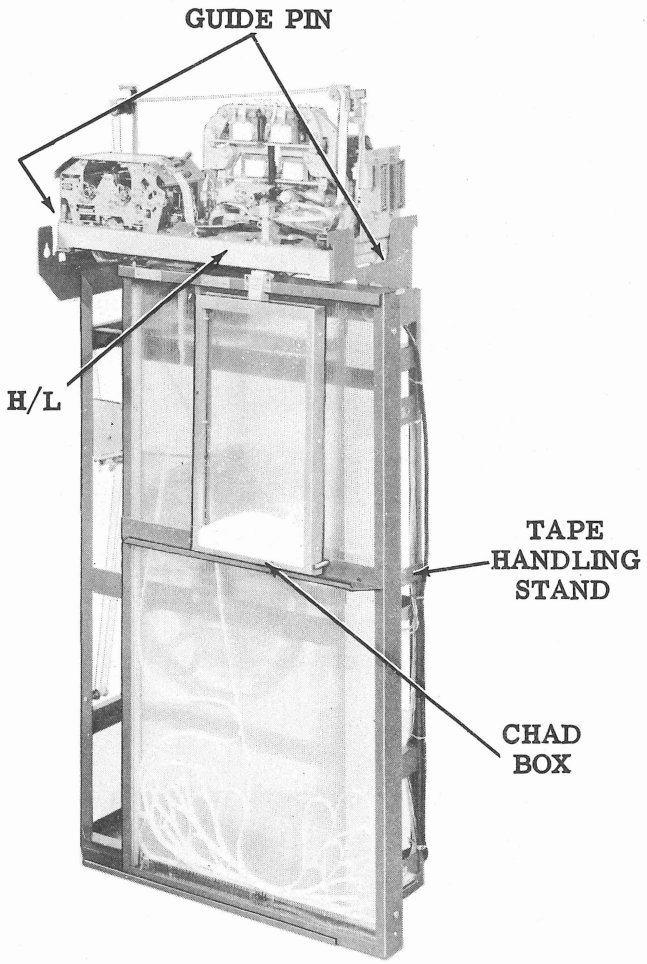


Figure 21 - Right Side, High-Low Punch-Reader Set

11. INSTALLATION OF H/L AND L/H PUNCH-READER ASSEMBLIES (Figures 19 and 20)

11.01 Unpack the punch-reader assembly by cutting the carton along the sealed edges, being careful not to damage the finish.

(1) Lift the base onto the cabinet cradle making sure the locating pins on the cradle enter the holes in the bottom of the base. (Figures 18 and 21.)

(2) On L/H Punch-Reader Sets attach the static eliminator probe to the output side of the punch block. Use the cable clamp provided for securing the probe to the high speed reader cover. See Figure 20. On H/L Punch-Reader Sets the static eliminator probe is attached as shown in Figure 22.

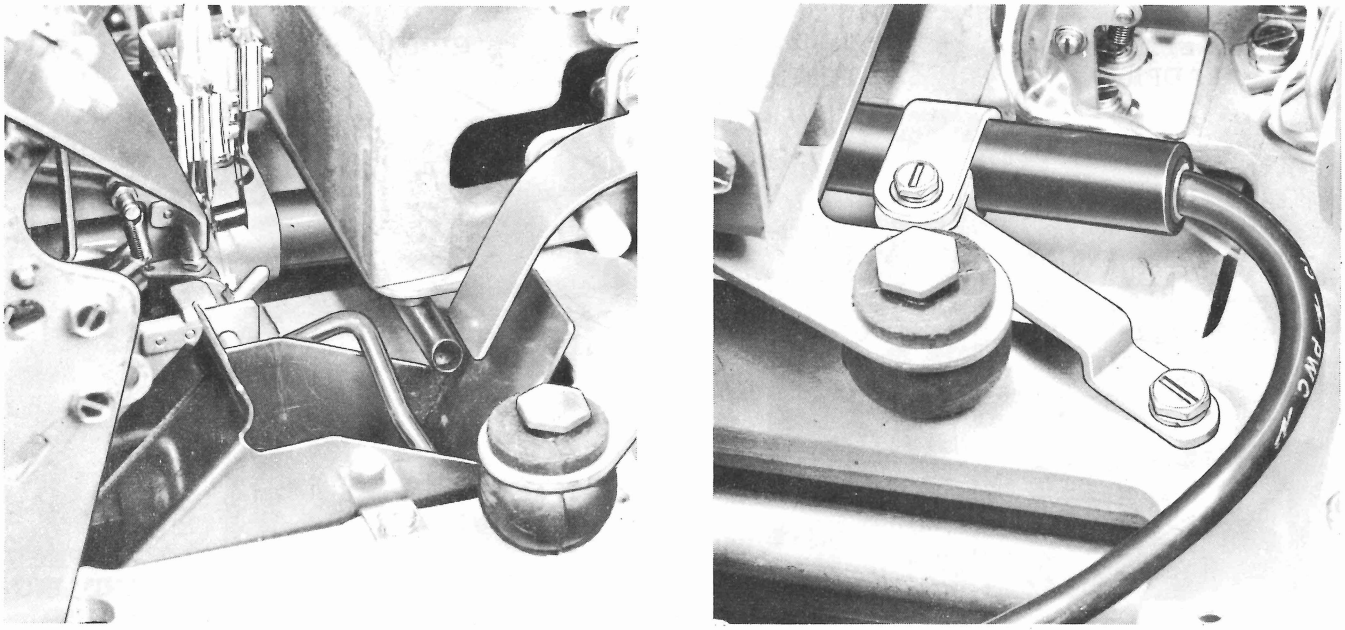


Figure 22 - Static Eliminator Probe Positioning and Mounting

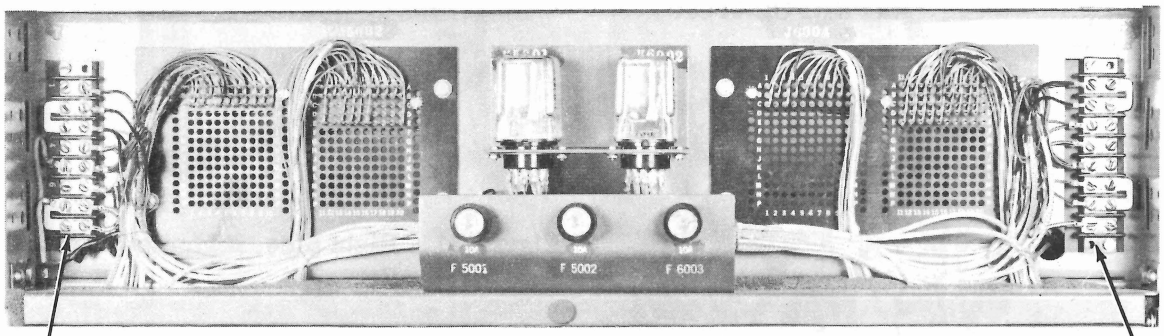


Figure 23 - Rear View, Converter Cabinet Top

(3) Slip the drive belt for the tape winder over the drive pulley on the punch-reader assembly. The belt should pass under the idlers near the drive pulley.

12. TAPE BINS

12.01 Unpack the tape bins and install them on the right side of each tape handling stand.

CAUTION: BEFORE MOUNTING TAPE BIN, LOOSEN CHAD CHUTE MOUNTING SCREWS AND MOVE CHUTE TO ITS EXTREME DOWNWARD POSITION.

12.02 The bottom of each bin rests on a channeled projection on the tape handling stand. The top meets the underside of the punch-reader base and is secured with spring clip catches. As the tape bin is installed on the tape handling stand, mate the connector at the rear of the tape bin with its receptacle on the tape handling stand. Raise the chad chute to its extreme upward position, and tighten the mounting screws.

12.03 Install the chad boxes by slipping the open ends upward over the chad chutes. Then allow each bottom to rest on its support rail. The chad box for the L/H Punch-Reader

Set should be located at the first position on the support rail. The chad box for the H/L Punch-Reader Set should be located at the third position.

13. ELECTRICAL CONNECTIONS

13.01 The Punch-Reader Sets are electrically interfaced with the cabinet by making several cable connections. There are five connections for the L/H Punch-Reader Set, and four connections for the H/L Punch-Reader Set.

13.02 For the L/H Punch-Reader Set, connect the two cabinet cables to the rear of the punch-reader base and lock the rectangular connectors with their thumb screws. Mate the two circular connectors with their receptacles on the punch frame and secure with their threaded rings. Mate the connector with its receptacle on the tape handling stand, and lock with its snap fasteners.

13.03 For the H/L Punch-Reader Set, connect the two cabinet cables to the rear of the punch-reader base, and lock the rectangular connectors with their thumb screws. Mate the connector with its receptacle on the punch frame and lock with its snap fastener; secure the cable to the punch-reader base with the cable clamp. Mate the connector with its receptacle on the tape handling stand and lock its snap fastener.

13.04 AC power wiring is terminated on a terminal block at the top of the cabinet. When viewing the cabinet from the rear, the terminal block, TB6041, for Single H/L and L/H Converters is located at the upper right rear corner; for Dual H/L, L/H, and Combination Converters, the terminal block, TB6042, is located at the upper left rear corner. Refer to Figure 23. Using the power cord supplied or other suitable wiring, connect ground (green) to terminal 5, ac common (white) to terminal 8, and 117 volt ac lead (black) to terminal 1. Do not apply power until the ground bus and system connection have been completed.

14. SYSTEM CONNECTIONS

14.01 After the cabinets have been bolted in position, prepare a suitable ground bus.

14.02 A bus bar is provided within each cabinet for frame grounding. All bus bars should be interconnected and attached to a good earth ground, using a substantial copper wire. Provide 4 feet for each Tape Sender or Intercept Receiver, and 12 feet for the first Converter Cabinet adjacent to the Station Controller or Tape Sender or Intercept Receiver and 4 feet for each additional Converter Cabinet. An additional provision must be made to connect the Station Controller bus bar to ground.

14.03 All cables have connectors at both ends to mate only with the cabinet connectors. Various cable lengths are available up to 250 feet, the maximum distance between cabinets. Part numbers and cable lengths for the 30 conductor receiver cables are given in Table 2; for 50 conductor transmitter cables refer to Table 3.

TABLE 2

30 Conductor Interconnecting Cables

Part No.	Length in Feet
TP175414	15
TP175415	17.5
TP175416	20
TP175417	22.5
TP175418	25
TP175419	27.5
TP175420	30
TP175421	32.5
TP175422	35
TP175423	37.5
TP175424	40
TP175425	42.5
TP175426	45
TP175427	47.5
TP175428	50
TP175429	52.5
TP175430	55
TP175431	57.5
TP175432	60
TP175433	62.5
TP175434	65
TP175435	67.5
TP175436	70
TP175437	72.5
TP175438	75
TP175439	100
TP175440	125
TP175441	150
TP175442	175
TP175443	200
TP175444	225
TP175445	250
TP175446	3
TP175447	6
TP175448	9
TP175449	12.5

TABLE 3

50 Conductor Interconnecting Cables

Part No.	Length in Feet
TP175455	3
TP175456	6
TP175457	9
TP175458	12.5
TP175459	15
TP175460	17.5
TP175461	20
TP175462	22.5
TP175463	25
TP175464	27.5
TP175465	30
TP175466	32.5
TP175467	35
TP175468	37.5
TP175469	40
TP175470	42.5
TP175471	45
TP175472	47.5
TP175473	50
TP175474	52.5
TP175475	55
TP175476	57.5
TP175477	60
TP175478	62.5
TP175479	65
TP175480	67.5
TP175481	70
TP175482	72.5
TP175483	75
TP175484	100
TP175485	125
TP175486	150
TP175487	175
TP175488	200
TP175489	225
TP175490	250

14.04 Low speed interface cables are given in Table 4.

15. CONVERTER CABINETS

INPUT CABLE (HIGH SPEED)

15.01 Referring to Figures 24 and 25, the 50 conductor input cables from the Station Controller Cabinet to the Converters should be brought into the rear of the cabinet through the duct provided. Connectors have been conveniently installed at the bottom of the cabinet similar to the connectors at the top raceway. Each

TABLE 4

Low Speed Interface Cable

Part No.	Description	Length in Feet
TP193099	L/H Conv. to Single Station	90
TP193100	H/L Conv. to Single Station	90
TP193223	L/H Conv. to Single Station	60
TP193224	H/L Conv. to Single Station	60
TP193281	L/H Conv. to Single Station	30
TP193282	H/L Conv. to Sing Station	30
TP193325	Comb. Conv. to 83B	80
TP193326	Comb. Conv. to 83B	100
TP193328	Comb. Conv. to 83B	40
TP193329	Comb. Conv. to 83B	60
TP193396	Comb. Conv. to 83B	30
TP193397	L/H Conv. to 83B	30
TP193398	H/L Conv. to 83B	30

set of jacks applies to its respective Punch-Reader Set, and the input cables may be connected at either the top or bottom of the cabinet. If the bottom cable connection is desired, cabinet jumpers must be connected to connectors in the top raceway.

OUTPUT CABLE (LOW SPEED)

15.02 The 30 conductor output cables, extending from the Converter Cabinets to the low speed lines, may be connected and routed in the same manner as the high speed cables above.

16. STATION CONTROLLER

16.01 All high speed transmitter and receiver cables are terminated on the connector panel facing the front of the cabinet. Refer to Figure 26.

17. TRANSMITTER AND RECEIVER CABLES

17.01 The system cables should enter the Control Cabinet through the opening above the rear cable duct. They should pass under the connector panel and extend to their

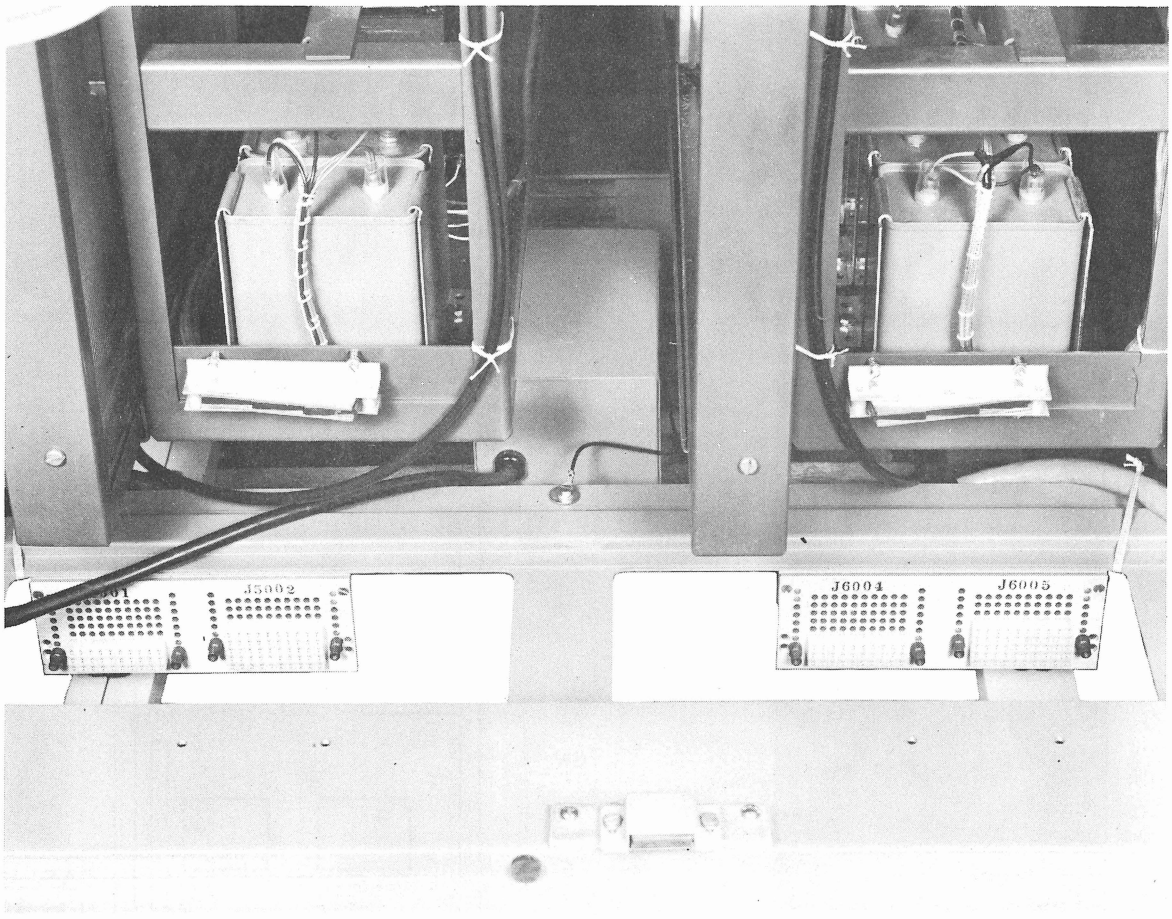


Figure 24 - Rear View Converter Cabinet Showing Input and Output Connectors

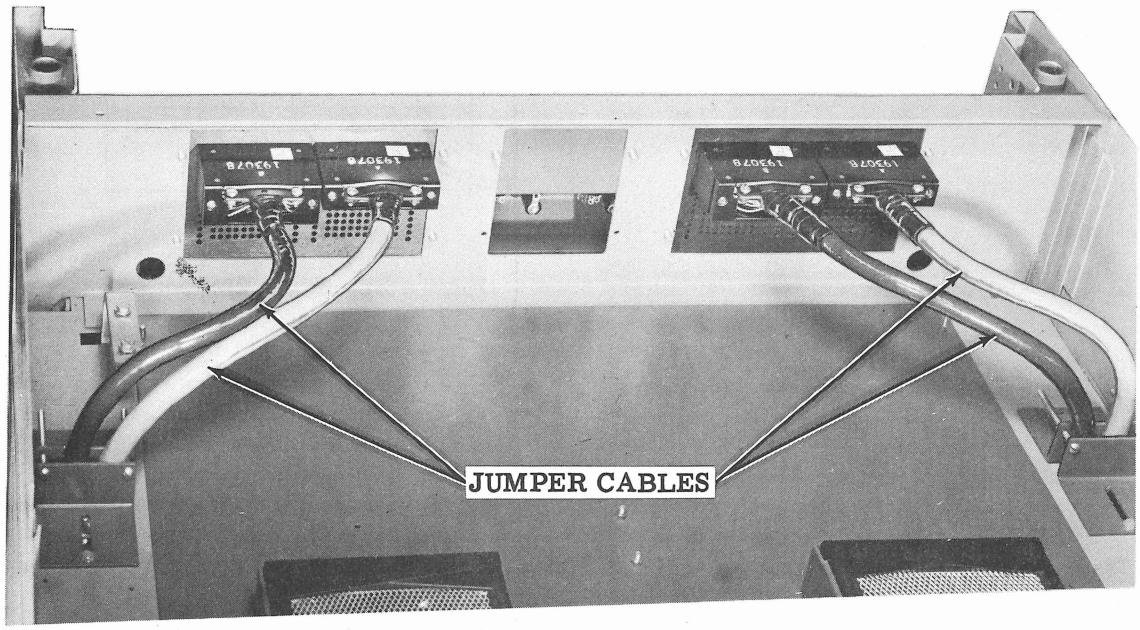


Figure 25 - Converter Cabinet Jumper Connections Top Raceway

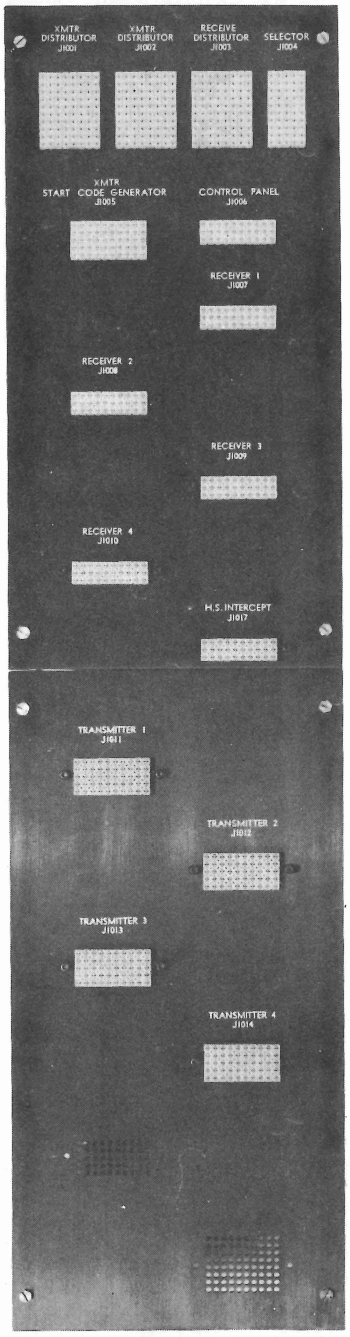


Figure 26 - Station Controller Connector Panel

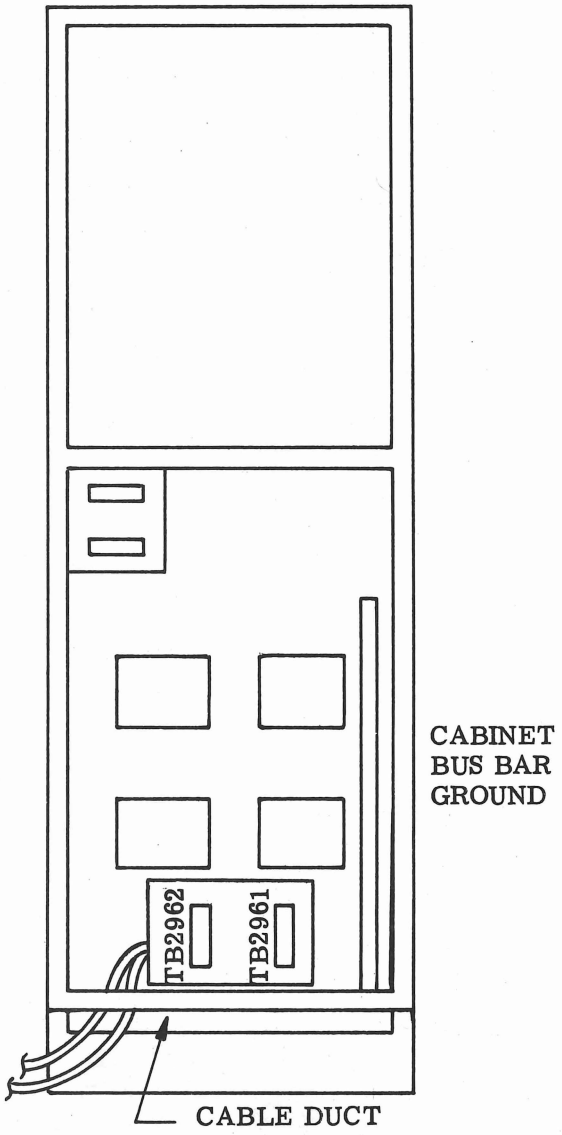


Figure 27 - Rear View of Intercept Tape Receiver

respective transmitter and/or receiver receptacles in the front of the connector panel. All receptacles are clearly marked. Refer to Figure 26. Transmitter cables, ie, system cables from high speed readers, have 50 conductors; receiver cables, ie, system cables to high speed punches, have 30 conductors.

18. SENDER AND INTERCEPT RECEIVER

18.01 Connect the system interconnecting cable from the cable duct to TB2961 (see Figure 27). The connector should be held firmly in place by means of the two lock down screws. The common system ground used to connect all the cabinets should be fastened to the ground bus. Use the hardware provided.

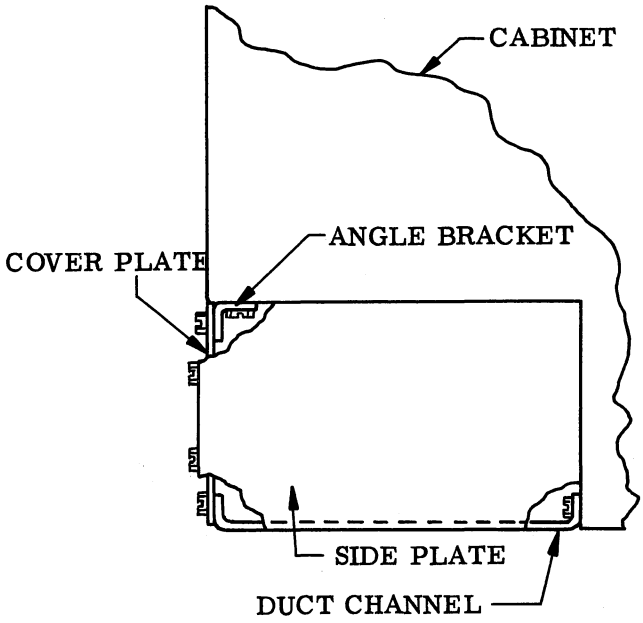


Figure 28 - Cable Ducting

19. CABLE DUCTS

19.01 Upon completion of all system wiring, the cable duct can be closed. Using the screws provided, attach the cover plate to the duct channel and angle bracket. See Figure 28.

If the cabinet stands alone or is at the end of a series of cabinets, cover the end(s) of the cable duct with the side plates provided.

20. PRELIMINARY INSPECTION

20.01 With the ac power cord plug removed, check the following points visually:

(1) Cabinet is properly grounded.

(2) Fuses are of correct value and firmly in place.

(3) Cables are connected in their proper positions, and securely locked.

(4) Circuit cards are in their correct positions and firmly in place.

(5) Doors and panels working freely.

(6) Modules are properly located.

(7) Moving parts are free of interference or obstructions.

(8) Noise and vibration material is not damaged or out of place.

(9) All mechanical requirements and adjustments are met.