

"DATASPEED"* TAPE RECEIVER
WITH ERROR DETECTION AND CORRECTION
TYPE 4B
INSTALLATION AND CHECKOUT PROCEDURE

1. GENERAL

- 1.001 This addendum, which supplements Section 592-812-200, Issue 2, is issued to incorporate engineering changes and to add coverage on the shipping bracket locations and removal. Arrows in the margin indicate changes and additions.
- 1.002 Insert the attached pages in accordance with the filing instructions above.

Attached:

Page 1 dated April 1973, revised
Page 2 dated April 1973, reissued
Page 5 dated April 1973, revised
Page 6 dated April 1973, reissued

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1. GENERAL

1.01 This section provides installation and checkout information for the "DATA-SPEED" Tape Receiver 4B (Figure 1). It is re-issued to include engineering changes, to add interface information wiring field and test tape drawings. Arrows in the margins indicate changes or additions.

1.02 For other information pertaining to Tape Receiver 4B, refer to the appropriate description and servicing sections. Standard tools and maintenance items may be found in Section 570-005-800.

2. INSTALLATION PROCEDURE

UNPACKING

2.01 Remove the outer side nails at the bottom of the shipping crate holding the shipping crate to the pallet. Lift up the shipping crate from the pallet. Discard the shipping crate.

2.02 Remove the tape holding four corner posts to the cabinet. Discard corner posts.

2.03 Remove the cabinet from the pallet. Exercise extreme caution during this procedure so as not to jar the cabinet or drop it on the floor.

2.04 Remove all external tape from cabinet walls. Remove masking tape from edges of front door.

2.05 Remove the back panel by loosening screw at top of panel and unplugging power line to the cooling fans (Figures 2 and 4).

2.06 Remove the cardboard boxes from the inside of the cabinet and put aside. Remove and discard the cardboard liner that keeps the circuit cards in place.

2.07 Remove and discard the brackets, screws, nuts, flat washers and lockwashers from upper rear of modules (Figure 4).

2.08 Remove and discard the screw, flat washer, lockwasher and angle iron from lower rear of the receiving distributor module. Remove and discard the screws, flat washers, lockwashers and angle iron from lower rear of the station control module (Figure 4).

TAPE TRANSPORT ASSEMBLY INSTALLATION

2.09 Open the outer carton of the box containing the tape transport assembly. Remove and discard the four corner details.

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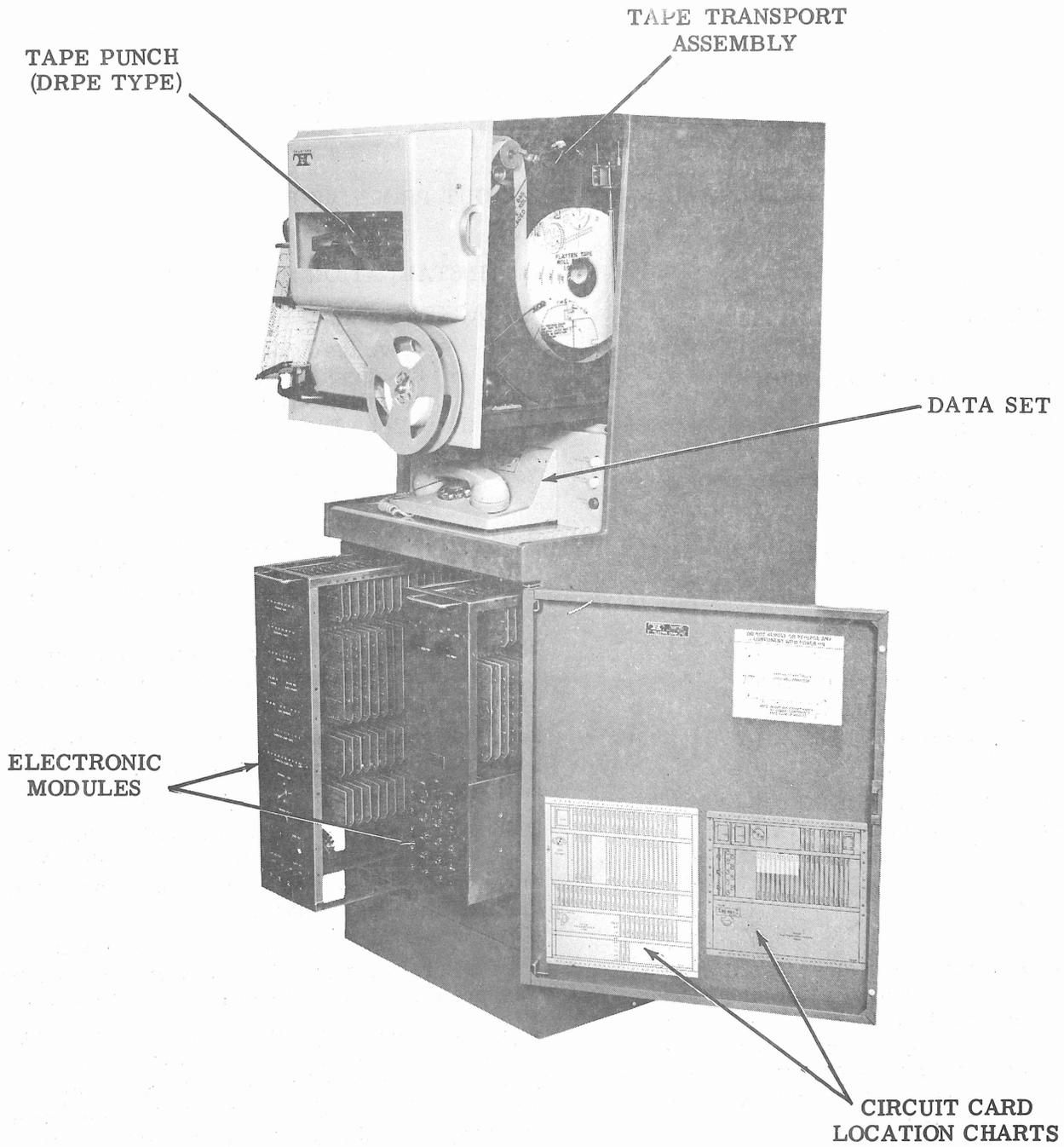


Figure 1 - Tape Receiver 4B

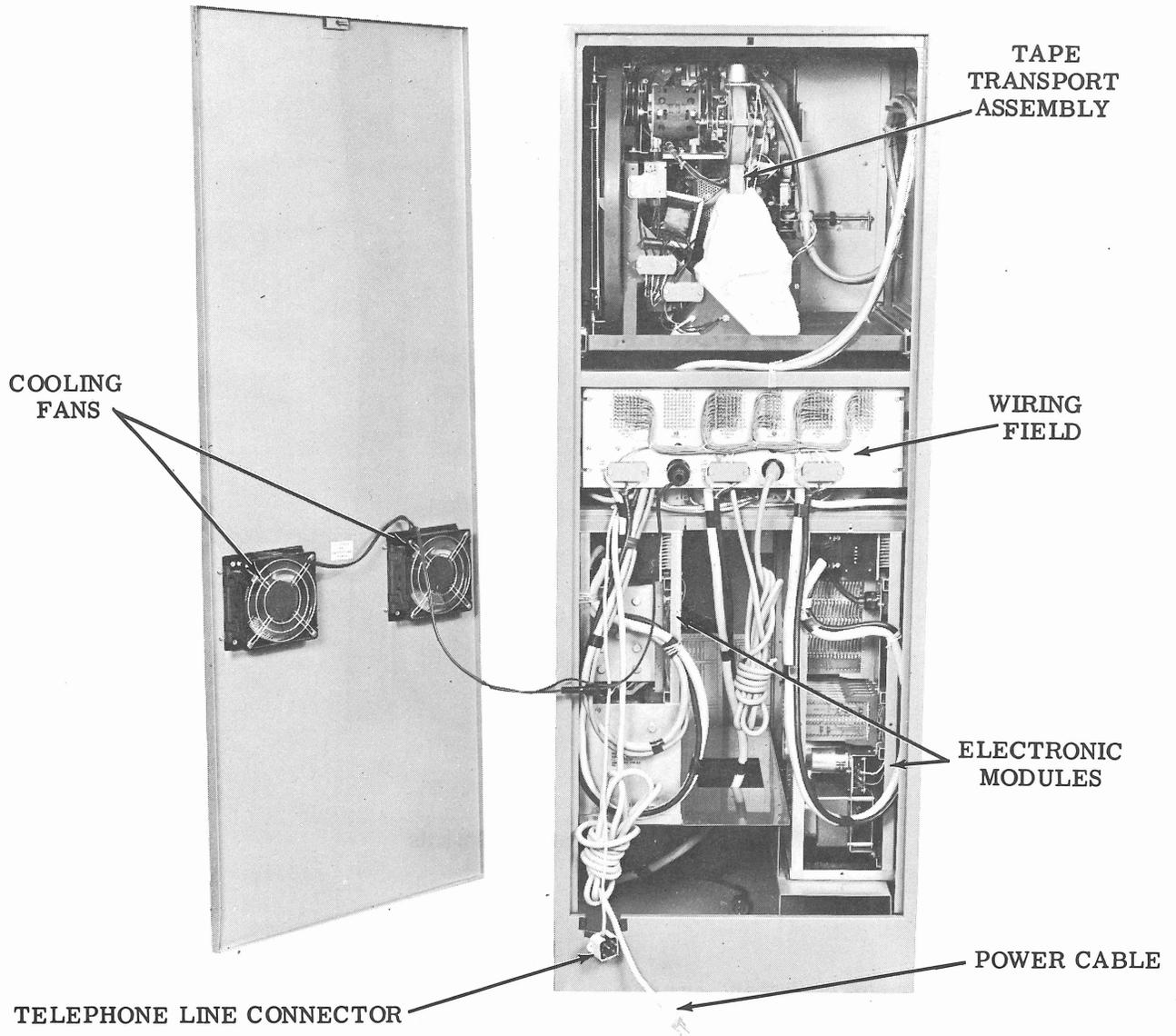


Figure 2 - Tape Receiver 4B, Rear Interior View

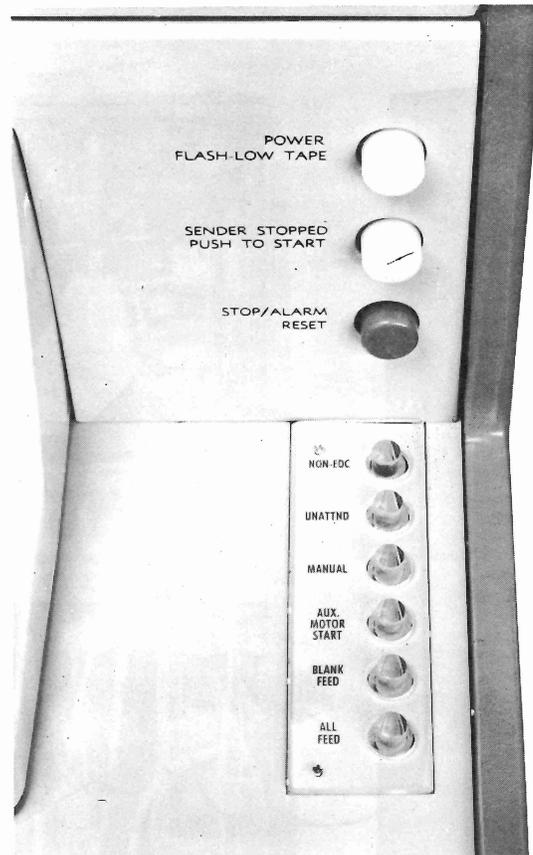


Figure 3 - Operating Controls

2.10 Remove the inner box, open it and remove and discard the one liner from pallet.

2.11 Remove and discard the hold-down detail positioned on the base. Then carefully lift the tape transport unit out of the box.

2.12 Remove and discard the four clamping bolts.

Note: Because the tape transport assembly weighs 76 pounds it must be handled by at least two persons.

2.13 Lift the tape transport assembly from the pallet and install it on cabinet as illustrated in Figures 5 and 6.

2.14 With the tape transport assembly installed and pulled forward, remove all external tape from the transport assembly. Exercise caution on removal of tape so that the punch unit cover or the yield arm does not fall.

2.15 Remove the stepped bracket and its hardware from right side of the punch unit (Figure 8).

2.16 Remove channel iron, bracket, and retaining hardware from the left side of the punch unit (Figure 7).

2.17 Remove and discard the tape puller mechanism rear immobilizing bracket and hardware (Figure 9).

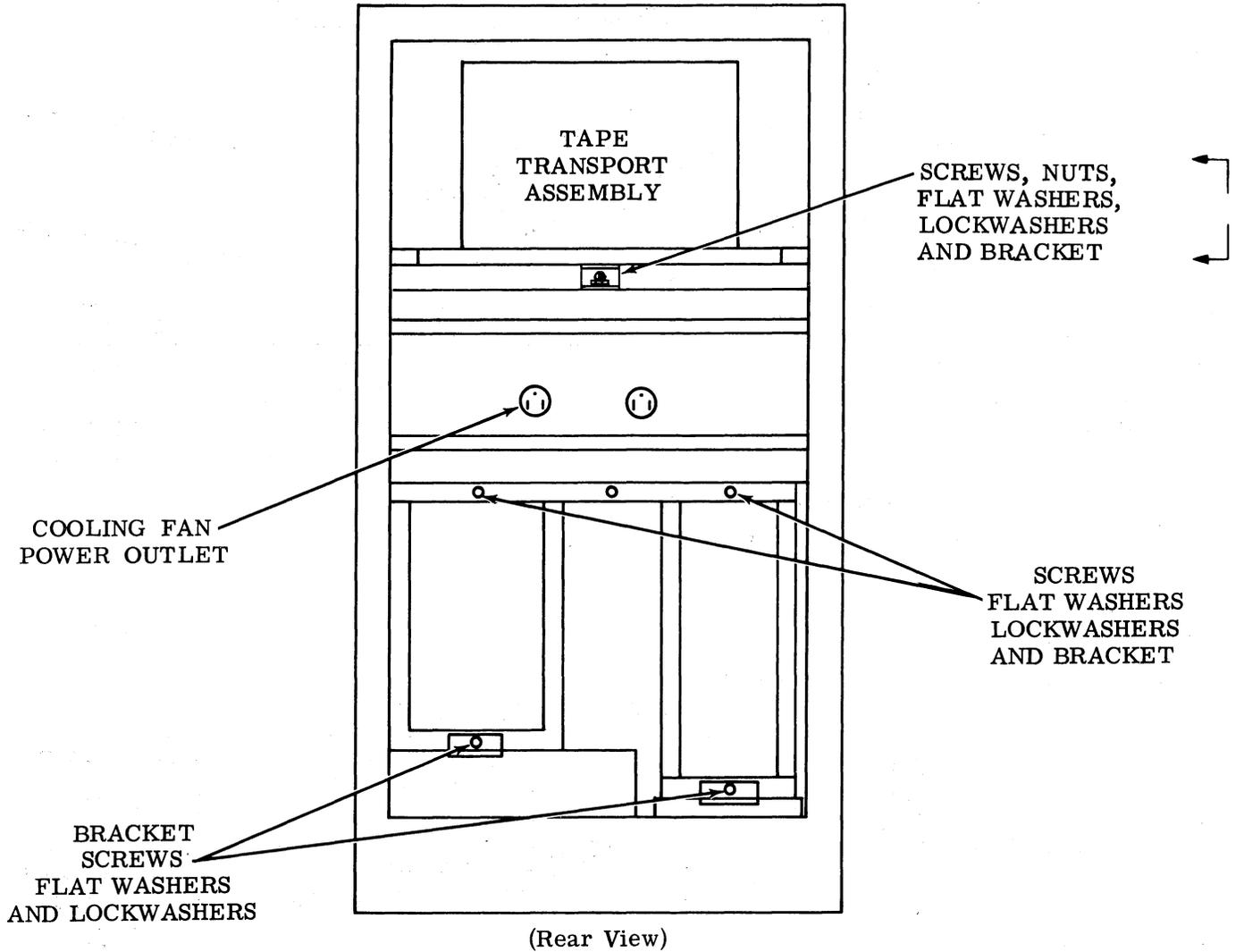


Figure 4 - Location of Shipping Hardware

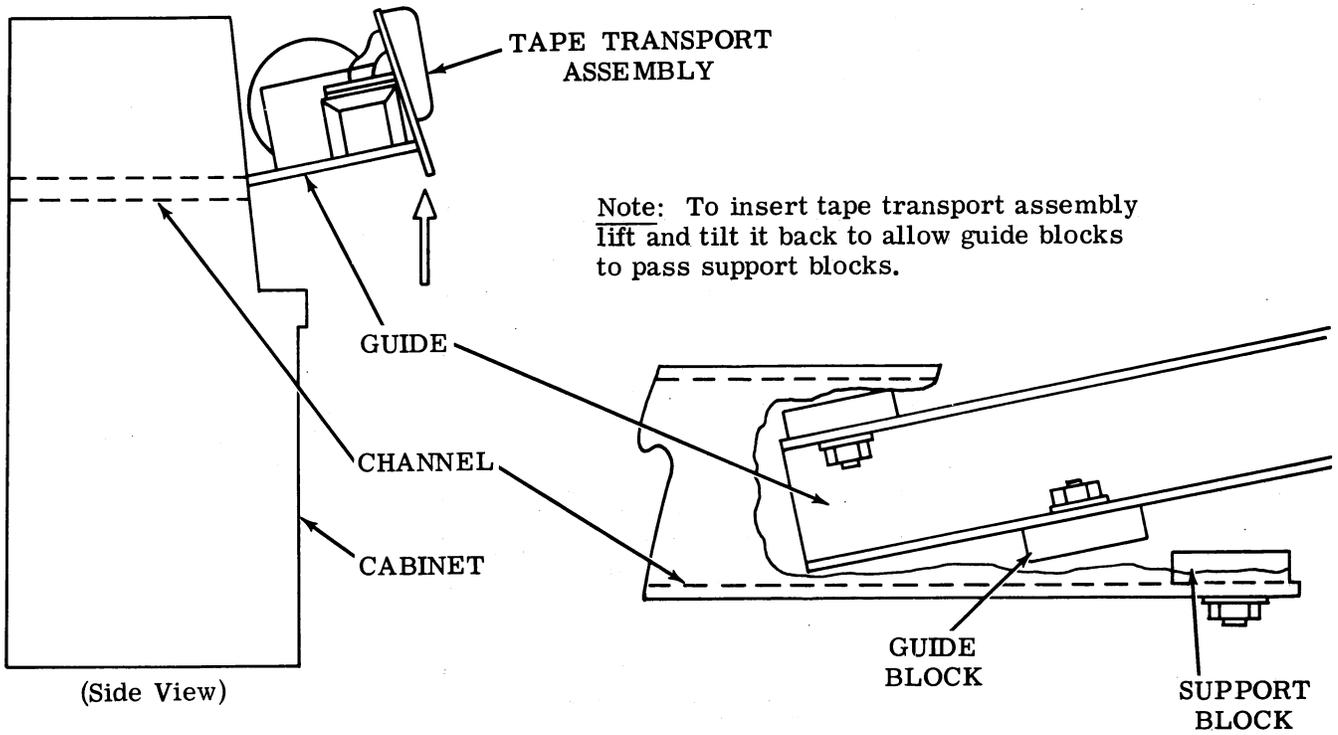


Figure 5 - Tape Transport Assembly Installation

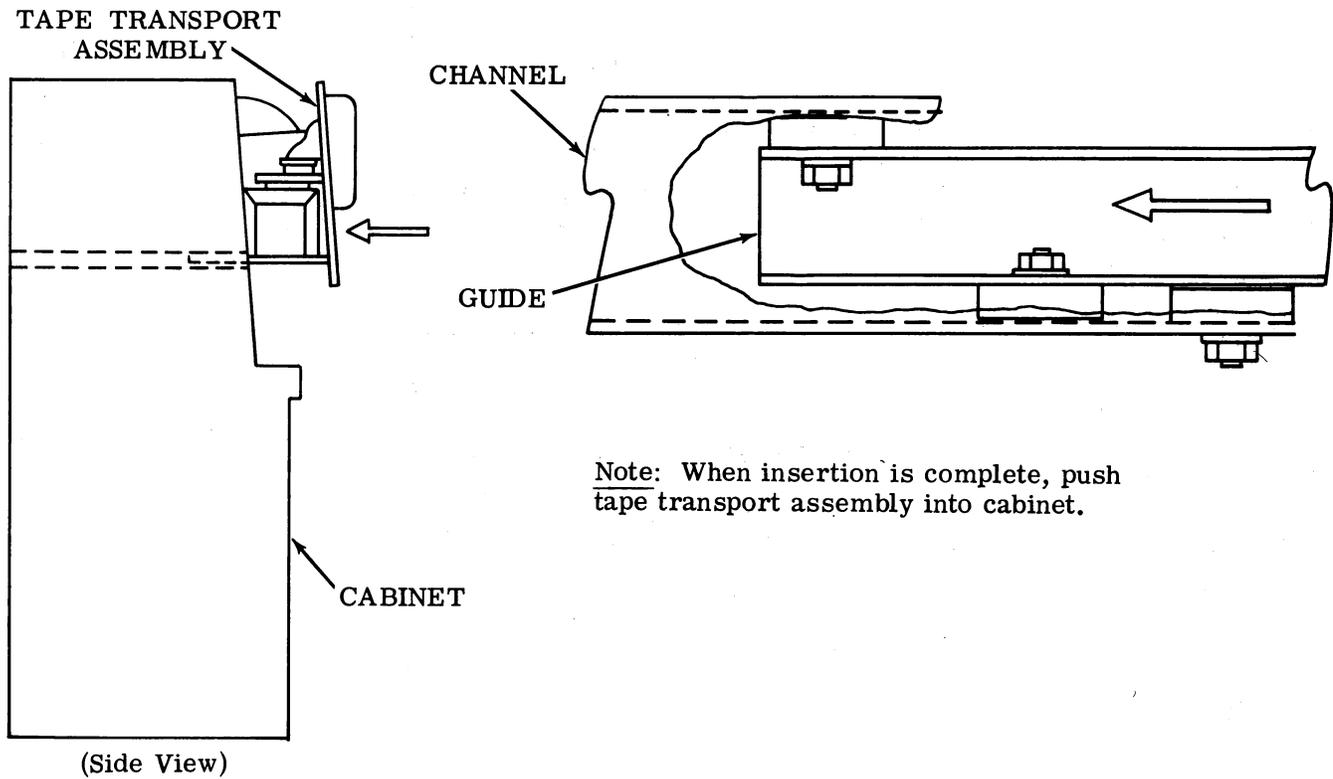


Figure 6 - Tape Transport Assembly Installation

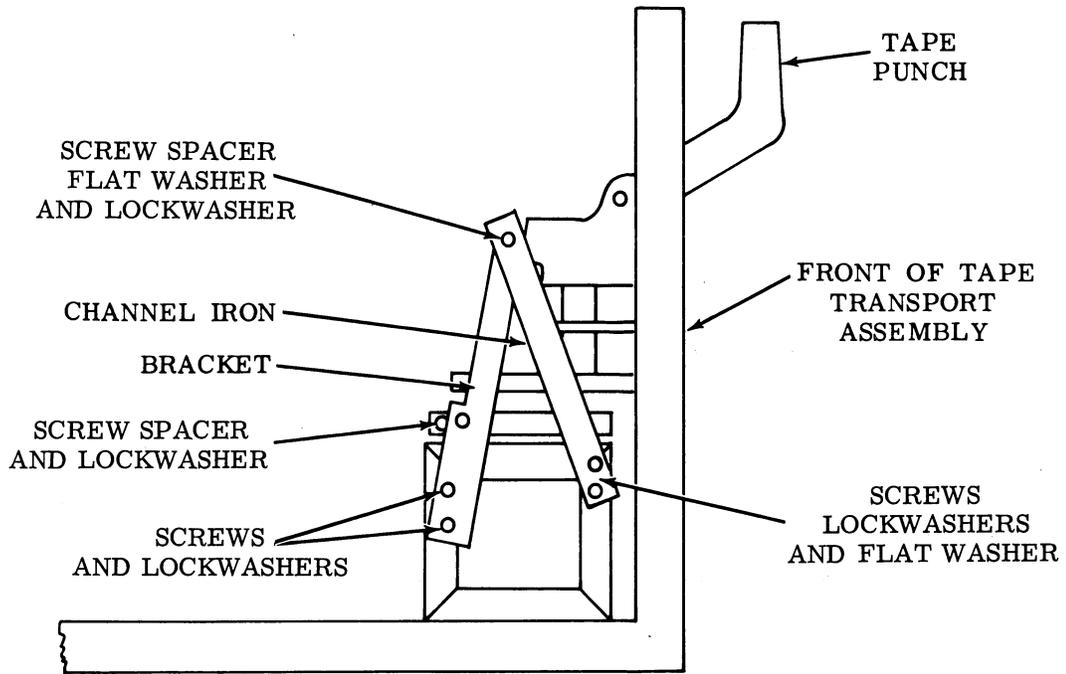


Figure 7 - Tape Transport Assembly Shipping Hardware

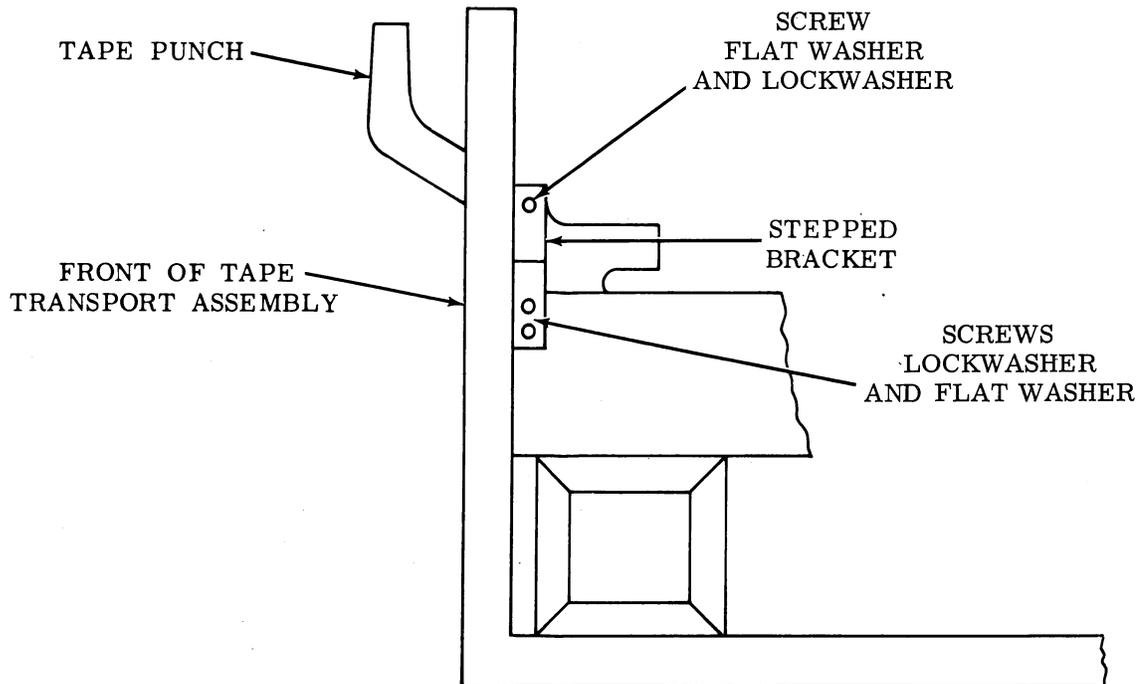


Figure 8 - Tape Transport Assembly Shipping Hardware

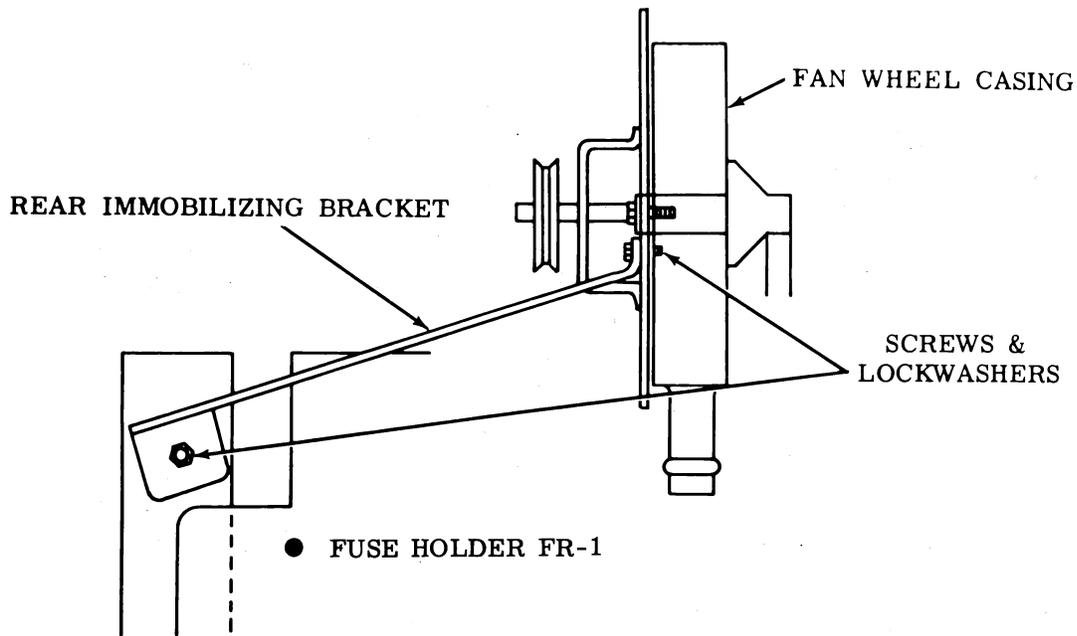


Figure 9 - Tape Punch Immobilizing Hardware

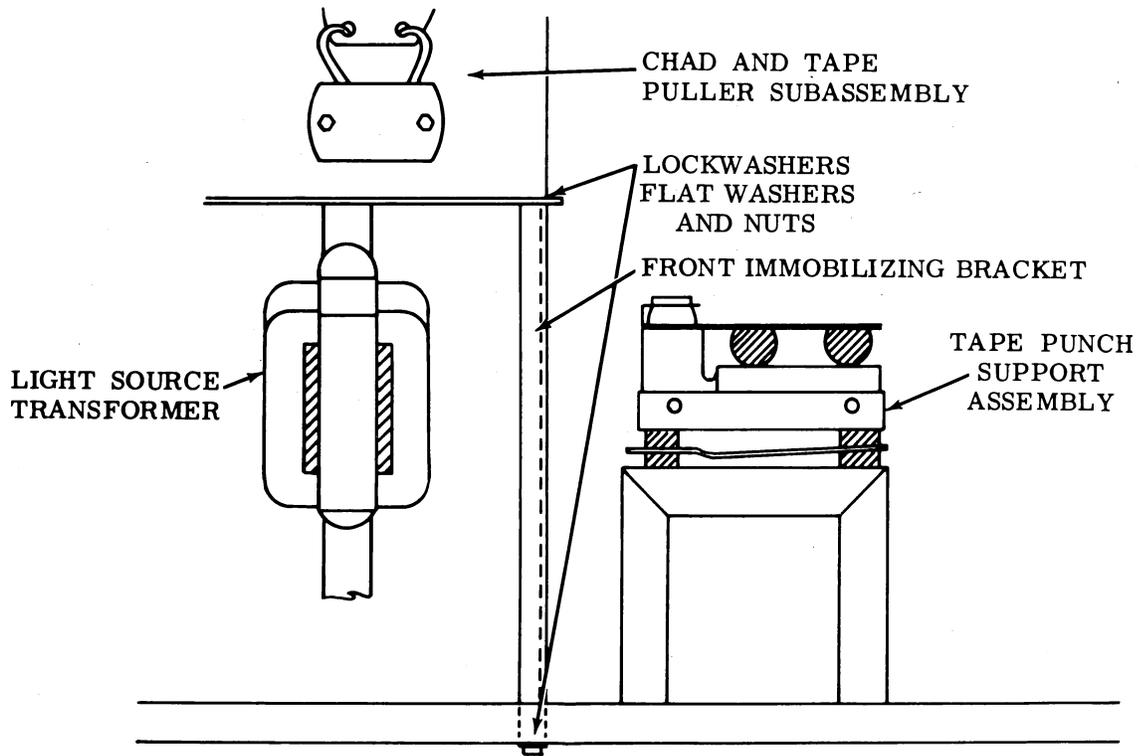


Figure 10 - Tape Punch Immobilizing Hardware

2.18 Remove and discard the tape puller mechanism front immobilizing bracket and hardware (Figure 10).

Note: On certain units the two immobilizing brackets may not have been used. Instead, the tape puller mechanism may be immobilized by means of two strips of nylon filament tape. Remove and discard this tape from these units.

2.19 Remove the drive belt from the muslin bag and install it on the rear of the back-up mechanism (Figure 13) as follows:

- (a) Slide top of belt over pulley at the rear top of mechanism.
- (b) With a spring hook or similar device, pull the belt over the pulley on the shaded-pole motor. It may be necessary to rotate the cooling fan at the rear of the motor to help the belt slide over the pulley.
- (c) Insert the belt-tensioning arm toward the inside of the drive belt.

2.20 Plug the cable connector labeled PM1 into the punch unit receptacle and screw it on tightly. Clamp this cable to the punch unit support assembly as illustrated in Figure 11. Make sure the tape transport assembly is fully forward and that the cable does not bend sharply between the clamp point and the receptacle. Sliding the transport assembly back and forth should give no indication of cable interference with transport motion.

2.21 Screw the appropriate leads (identified in Figure 12) into terminal board TBR1 and to the frame ground.

2.22 Slide the tape transport assembly back into the cabinet.

2.23 Guide the power cord from the station control assembly into the bottom slot at the rear and then out of the cabinet.

2.24 Plug the cooling fans power line into the wire field assembly, replace the back panel and screw it into place if the data set has been installed (2.28 through 2.33).

2.25 Position the receiver within 6 feet of a 15 ampere power line circuit.

INSTALLING ELECTRONIC MODULES

2.26 The receiver control module (TP302762) mounts in the left track of the lower portion of the cabinet as viewed from the front. To install it, it is necessary to first tilt the module backwards and insert the top of the frame behind the bent-over tab on the upper guide. Then the module should be straightened and pushed back in its guide to the rear of the cabinet. The receiver distributor and punch driver module (TP308502) mounts in the right track in the same manner.

2.27 Module cable connections are shown in Figure 14. Make certain the connectors are rigidly held by their mounting screws. Also refer to the actual wiring diagram 7040WD, given in the appropriate section.

DATA SET INSTALLATION

2.28 Space is provided in the receiver cabinet for mounting the various data sets associated with the terminal. The data sets can be installed from the front of the cabinet although access to the rear of the cabinet is required for routing the data set cables.

2.29 When installing a data set of the 202 type, the following procedure can be used.

- (a) Remove the plastic identification card holder and the associated identification card from the horizontal control panel. Open the door at the bottom of the cabinet, remove the two screws that hold the horizontal control panel and pull the horizontal control panel forward to remove it from the cabinet. Pull open the tape transport several inches and remove the three screws that hold the vertical control panel and remove the vertical control panel from the cabinet. The switches that protrude through the panels will remain mounted in the cabinet.

- (b) Install the data set in the tray provided and feed the cable(s) from the data set to the rear of the cabinet. Replace the panels.

- (c) Plug the power cable from the data set into the DATA SET receptacle provided on the TP302748 wire field assembly. Connect the TP308467 cable assembly from the TP302748 wire field assembly to the receptacle provided on the data set. The above connections must be made from the rear of the cabinet. Plug in the telephone line connector.

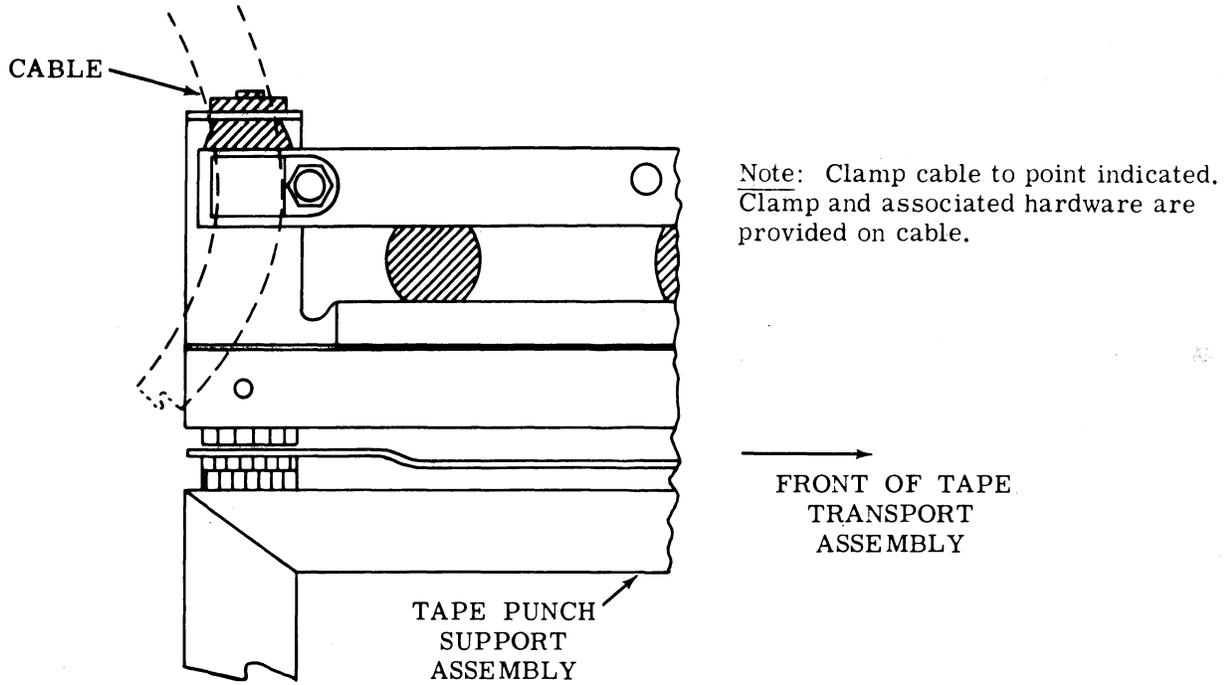


Figure 11 - Cable Installation

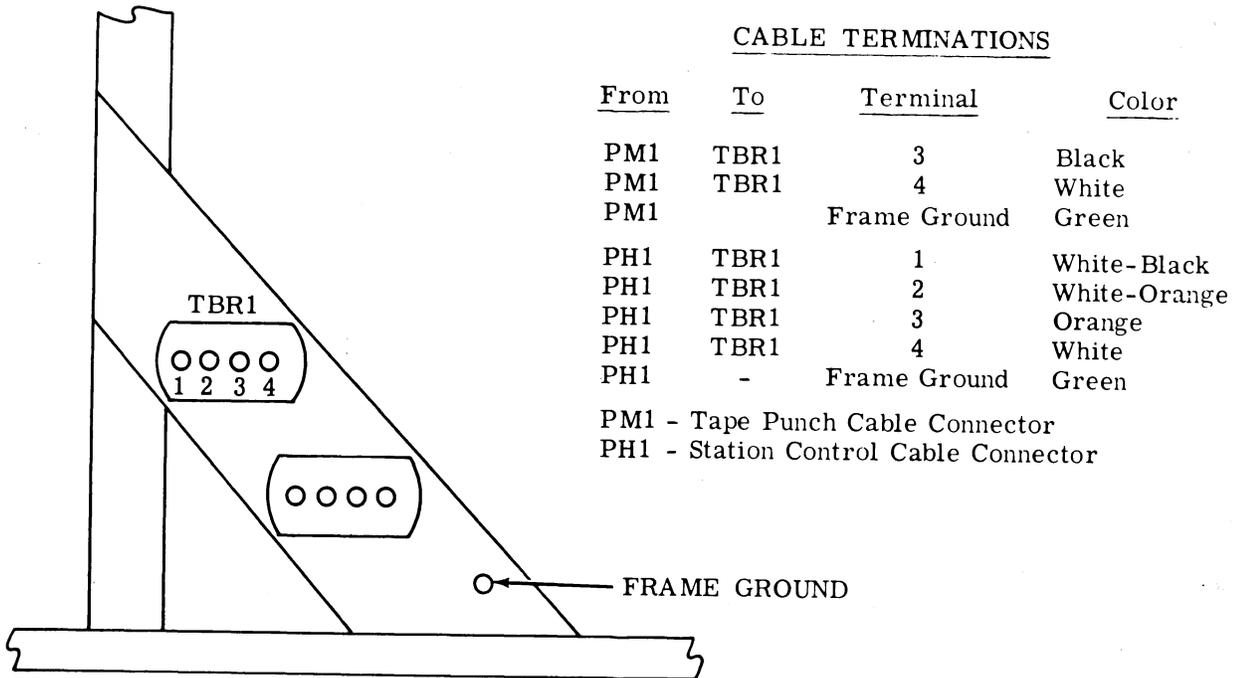


Figure 12 - Cable Terminations

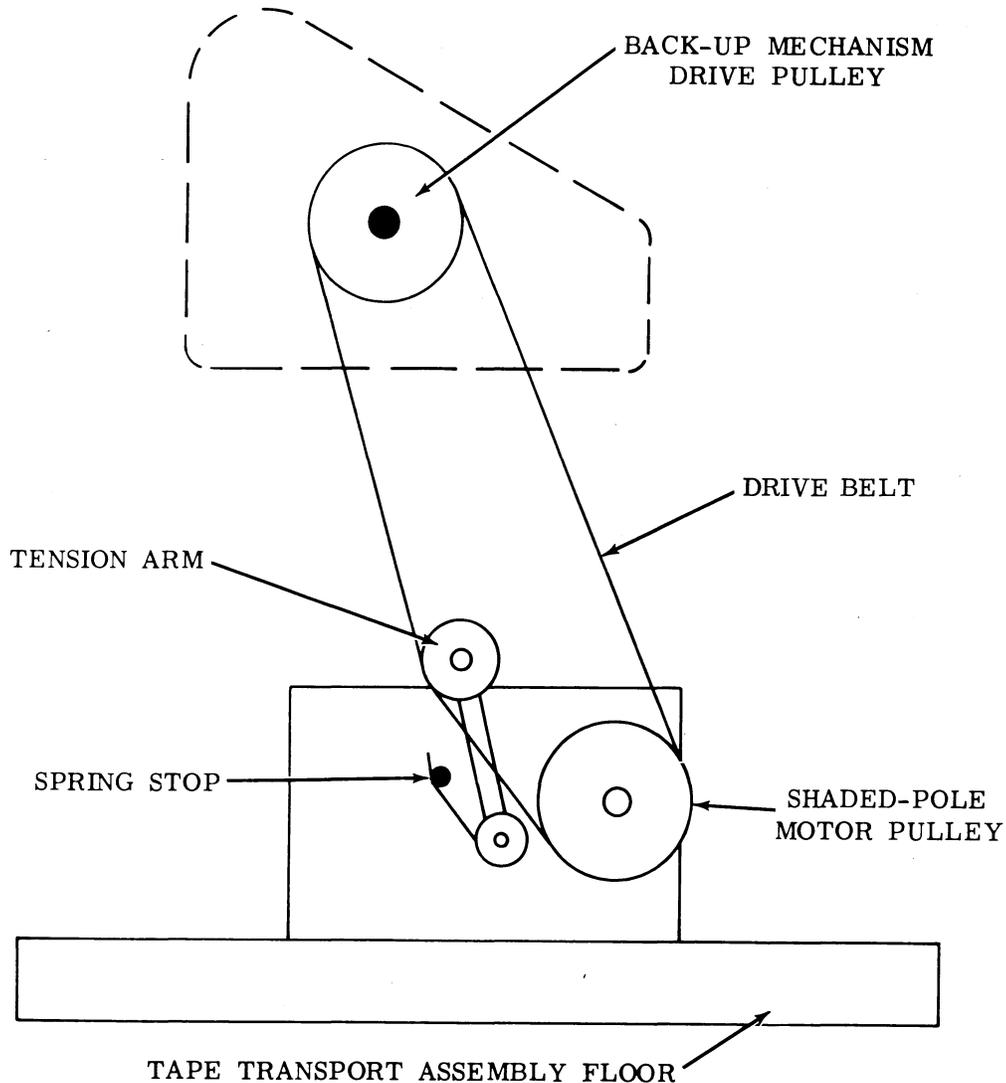


Figure 13 - Back-Up Mechanism Drive Belt Installation

2.30 When installing a data set similar to the 201 type, use the following procedure.

2.31 Space is provided in the bottom of the receiver cabinet to mount a 201 type data set. To install it, the modules must be removed from the cabinet by reversing the procedure given in 2.26. Remove the six screws holding the TP302819 removable tray assembly. The tray is the base that the module on the right hand side of the cabinet rests on. Remove the tray.

2.32 Install the data set in the bottom of the cabinet so that the receptacles on the data set face the left wall of the cabinet. Connect the TP308467 cable assembly from the TP302748 wire field assembly to the receptacle on the data

set provided for customer equipment. Connect the cable from the handset associated with the data set in the receptacle provided on the data set. Plug the power cable for the data set into data set receptacle on the TP302748 wire field assembly. Route the cables so they will not interfere with the module installation. Replace the removable tray assembly making certain that the bend on the bottom front of the assembly fits in the slot on the cabinet. Replace the six screws and reinstall the modules following the procedure given in 2.26.

2.33 If a handset is associated with the 201 type data set, it can be mounted in the area where the 202 type data set is normally installed. Remove the horizontal and vertical control panels in the manner described in 2.29.

TP302748 WIRING
FIELD ASSEMBLY
(ASSEMBLY K)
ACTUAL 7072WD

✕ ——— TERMINAL BOARD
(W/SCREW TERMINALS)

PLUG
RECEPTACLE
CONNECTORS

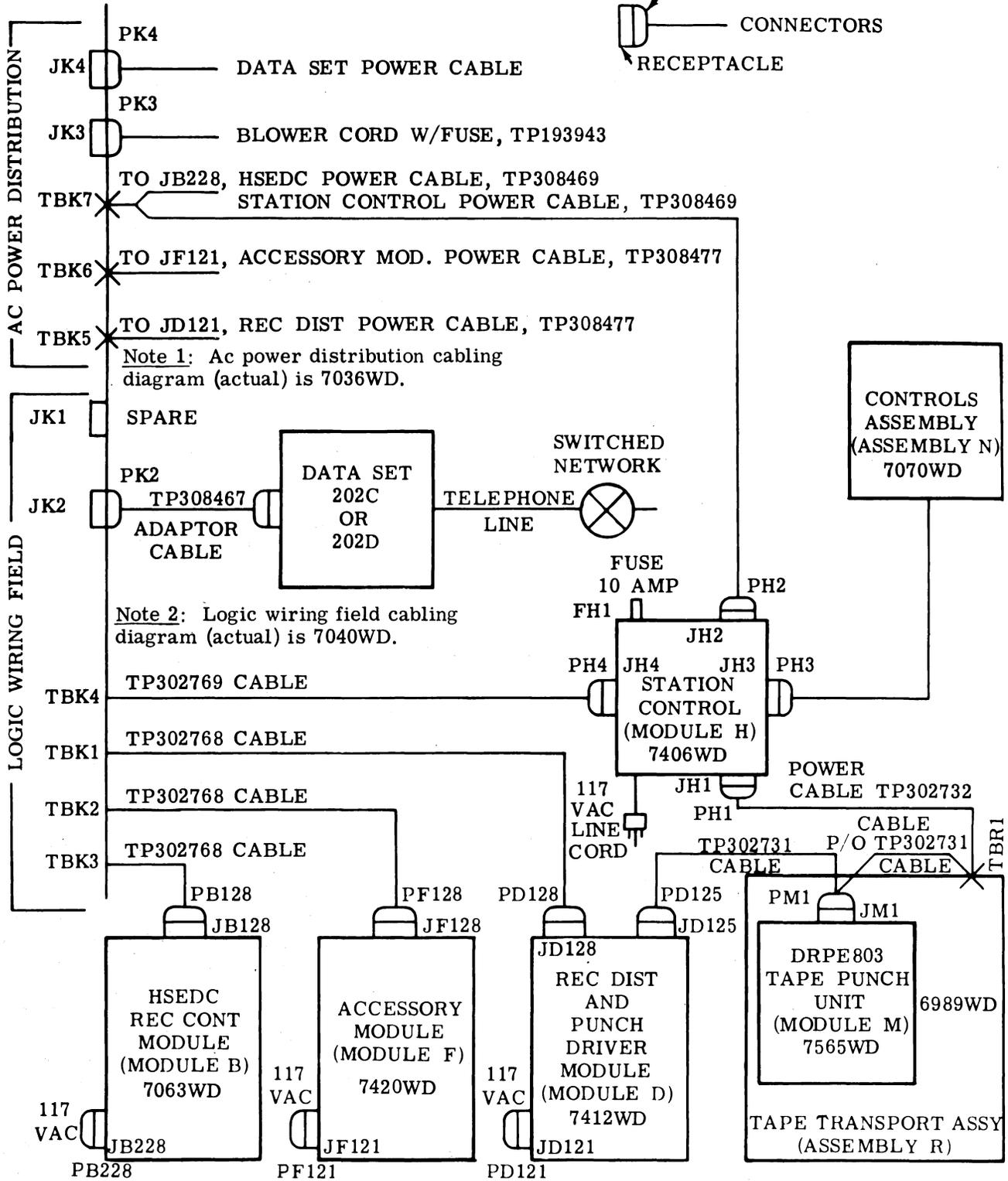


Figure 14 - Receiver Cabling and Schematic Wiring Diagram Reference Numbers

Insert the TP302817 data set retainer in the data set tray. The data set retainer is packaged in a carton taped to the bottom of the cabinet. Packaged with the data set retainer is the TP302818 filler panel which is used to reduce the size of the cutout for the handset. Install the handset in the cabinet so that the rear of the handset rests on the retainer (allow approximately two inches of overlap). Replace the horizontal and vertical control panels. Insert the TP302518 filler panel in the cutout by hooking the bottom of the filler panel to the horizontal control panel and snapping the top of the filler panel into the vertical control panel. Then pull the handset forward until it drops into place on the data set tray.

INPUT POWER CONNECTION

2.34 The input power cable is part of the TP302748 wire field assembly. Route the cable from terminal board TB7 through the opening located in the lower rear of the cabinet to the outside 117 v ac power source.

3. CHECKOUT PROCEDURE

3.01 The information in Table A contains the procedure for checking Receiver 4B for proper operation after installation. The procedure is given in chart form with test conditions arranged in a specific sequence. A visual verification corresponds to each test. The tests should be conducted without a data set connected.

Note 1: The photoelectric verifier and light source must be checked for proper adjustment and operation after removal of the shipping hardware. This is necessary because the punch unit is supported on rubber shock mounts. During shipment the punch unit is immobilized and the rubber mounts may acquire a temporary set which may position the punch unit slightly upward.

Note 2: Refer to the adjustment sections covering Receiver 4B (for pad-out card adjustment) and the DRPE-type punch unit (for light source adjustment).

Note 3: For Tape Splicer (LTS) information, refer to Section 570-300-101, -401, -704, -705 and Parts Section 570-300-801.

**TABLE A
CHECKOUT PROCEDURE**

Check	Action	Verification
Power On/Off	Operate POWER switch.	POWER indicator lights. Power is available at the "Blower" output. Fan operates.
	Operate AUX. MOTOR START button.	AUX. MOTOR START indicator lights. Punch and tape handling motors run and photoelectric verifier light goes on.
Terminal Control Switches	Operate MANUAL button.	MANUAL indicator lights. Punch and tape handling motors stop and photoelectric verifier lamp extinguishes.
	Operate NON-EDC button.	NON-EDC indicator and MANUAL indicator light. RC indicator lights.
	Operate MANUAL button.	NON-EDC indicator goes out. MANUAL indicator remains on. RC indicator extinguishes.

TABLE A

CHECKOUT PROCEDURE (continued)

Check	Action	Verification
Terminal Control Switches (Cont.)	<p>Operate AUX. MOTOR START and NON-EDC buttons simultaneously.</p> <p>Thread tape through punch. Operate BLANK FEED button and start tape feeding by lightly pulling on the tape.</p> <p>Operate ALL FEED button.</p> <p>Operate MANUAL button.</p>	<p>MANUAL indicator goes out. AUX. MOTOR START and NON-EDC lamps light. Motors run and verifier lamp goes on. RC indicator lights.</p> <p>Punch punches, feed holes and proper tape feed is easily established.</p> <p>Punch punches all 8 levels and tape feeds properly.</p> <p>NON-EDC indicator and AUX. MOTOR START indicator go out. MANUAL indicator lights. Motors turn off and verifier lamp goes out. RC indicator extinguishes.</p>
Stop/Alarm-Reset Switch	<p>Depress STOP/ALARM-RESET button.</p> <p>→ Operate AUX. MOTOR START button.</p> <p>Remove tape from punch by breaking the tape and pressing the BLANK FEED button.</p> <p>Thread tape through the punch and re-establish tape feed.</p> <p>Depress the STOP/ALARM-RESET button.</p> <p>→ Depress the MANUAL button.</p>	<p>If STOP/ALARM-RESET light was off it will remain off and there will be no effect. If the light was on, it will turn off.</p> <p>→ Motors and verifier operate. AUX. MOTOR START lamp lights.</p> <p>When the tape clears the punch block, the STOP/ALARM-RESET will go on.</p> <p>No effect. Light remains on.</p> <p>Indicating light goes off.</p> <p>→ MANUAL lamp lights, AUX. MOTOR START lamp extinguishes, motors stop and verifier lamp goes out.</p>
Program Test (Correct any punch failure and alarm condition during this test.)	<p>→ Open the rear door and place the TEST/OPERATE station control switch in the TEST position.</p>	<p>→ Motors and verifier turn on.</p>

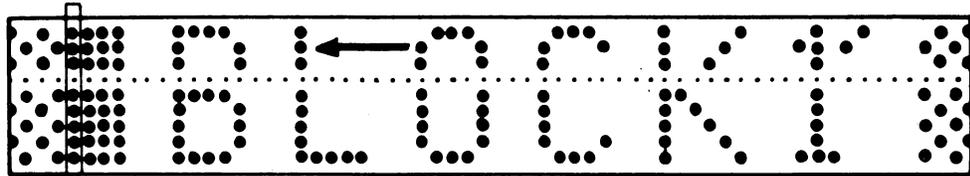
TABLE A
CHECKOUT PROCEDURE (continued)

Check	Action	Verification
<p>Program Test (Cont.) (Correct any punch failure and alarm condition during this test.)</p>	<p>Open the front door and place the PROGRAM TEST SWITCH in the ON position.</p>	<p>The programmer should be in the SR mode as indicated by the SR indicating light.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer should go to the BN mode, RC and IBK indicators turn on.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer should go to the BK mode. The punch will punch continuously. The character counter will count up to 80 and then the units counter will continue to cycle. All the vertical parity and horizontal parity lights will be on and flashing very rapidly and the FE indicator is on.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer will go to the EOB mode. Punching stops, counter stops, and parity lights stop flashing and the FE indicator goes off.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer will go to the CK1 mode. No action occurs.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer will go to the CK2 mode. No action occurs.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer will go to the BU mode. The backup mechanism will back the tape up 80 characters, the counter will count up to 80 and stop.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer will go to the DEL mode. The punch will start punching, producing an all marking tape. The counter will count up to 80 and the units will continue to cycle.</p>
	<p>Depress the PROGRAM ADVANCE button once.</p>	<p>Programmer will return to the SR mode. Punching will stop and the counter will stop.</p>

TABLE A

CHECKOUT PROCEDURE (continued)

Check	Action	Verification
<p>Program Test (Cont.) (Correct any punch failure and alarm condition during this test.)</p> <p>Punch and Photoelectric Reader (This test will verify proper adjustment of the photoelectric reader.)</p> <p>END-TO-END (On-Line) test with a Type 4A Sender or Test Center.</p> <p>Note: END-TO-END tests should always be performed after installation or troubleshooting to assure proper operation of the service.</p>	<p>Repeat the above steps if it is desired to cycle through the program again. If not, place the PROGRAM TEST switch in the OPERATE position.</p> <p>Call the local Test Center or a type 4A or type 2 sender station to obtain a 1050 wpm signal. (This signal may also be obtained from test equipment such as a TSG905 Test Signal Generator.) Operate the NON-EDC button.</p> <p>With the receiver arranged for 8 level operation and PUNCH TEST switch in TEST position have the Test Center or sender transmit a TP303069 test tape (Figure 15) or similar test message. If a type 4A sender is used have it transmit in EDC mode.</p> <p>Return PUNCH TEST switch to NORM position. Depress the MANUAL button.</p> <p>Call a similarly equipped type 4A sender and operate the system to the full extent of it's capabilities as indicated in the Description and Operation Section 592-812-100. After testing with normal complete messages, have the sender introduce errors into the transmitted message.</p> <p>For "DATASPEED" service tests, call the Special Test Center of Illinois Bell Telephone Co. in Chicago. This Test Center can be reached from within Illinois on INWATS 800-972-3500 and from outside Illinois on INWATS 800-621-7447.</p>	<p>The Tape Receiver 4B is now ready to be hooked up to a communications channel.</p> <p>NON-EDC lamp lights and RC indicator lights.</p> <p>The receiver will punch the test message, also all EDC characters if a type 4A sender is transmitting in the EDC mode.</p> <p>NON-EDC lamp extinguishes. RC indicator turns off.</p> <p>Complete and normal messages should be received without error. Errors, when added to the test message, should be detected and corrected automatically.</p> <p>The Special Test Center is equipped to analyze the quality of the service to aid in clearing troubles in the complex control circuitry of the system, and to furnish detailed test instructions where required.</p>



Note: The starting block is one prime (two marks above the numeric one). Three consecutive prime blocks are received and then followed by three blocks without prime.

Figure 15 - TP303069 Test Tape

TABLE B

DATA SET 202C TYPE
INTERFACE LEAD DESCRIPTION AND DESIGNATION

Pin No.	Lead and Function	Designation
1	Protective Ground - common to signal and ac power service ground.	AA
2	Transmitted Data - customer data presented to data set.	BA
3	Received Data - data output presented to business machine.	BB
4	Request to Send - when business machine places this lead in ON condition, data set is placed in transmit condition. When placed in OFF condition, data set is placed in receive condition.	CA
5	Clear to Send - signals business machine that data may be transmitted.	CB
6	Data Set Ready - signals business machine when data set is in the data mode.	CC
7	Signal Ground - common to frame ground and ac power service ground.	AB
8	Data Carrier Detector - signals business machine data carrier is being received.	CF
9	+ Voltage — (+18 volts) power supply (telephone company use only)	+P
10	- Voltage — (-18 volts) power supply (telephone company use only)	-P
11*	Supervisory Transmitted Data - provides means of transmitting low-speed coordinating signals to data transmitting end of connection.	SA
12*	Supervisory Received Data - provides means of receiving low-speed coordinating signals and circuit assurance signal.	SB
19**	Remote Release - when opened by business machine terminates call. Must be connected to CD lead for data set to go to data mode.	RR
20	Data Terminal Ready - business machine applies an ON condition for auto answer and allows data set to go to data mode. An OFF condition disconnects data set from line.	CD
21**	Ready - is closed to CD lead by business machine when automatic answering of incoming calls is desired.	RY
22	Ring Indicator 1 - signals business machine that an incoming call is being received.	CE
23**	Ring Indicator 2 - signals business machine that an incoming call is being received.	RI2

* Sets equipped with and wired for reverse channel (option T).

** For data set 202A/B type interface option only (option M).

4. INTERFACE ELECTRICAL CHARACTERISTICS

4.01 Data Sets 202C and 202D (Table B) conform to the electrical characteristics contained in RS-232-A and will work with business machines that also conform to that specification. These characteristics are briefly outlined in the following paragraphs.

4.02 The maximum open-circuit voltage to either Protective Ground on any interchange circuit does not exceed 25 volts, and the maximum short-circuit current flow between any two conductors (including grounds) does not exceed one-half ampere.

4.03 All circuitry used to generate signal voltages on interchange circuits are designed so that no damage will be caused by either an open circuit condition or a short-circuit to either Protective Ground or Signal Ground. All circuitry used to receive signals from interchange circuits is designed for continuous operation with any input signal within the maximum voltage limits.

4.04 For Transmitted Data and Received Data, the signal is considered in the marking condition when the voltage on the circuit is more negative than minus three volts with respect to Signal Ground, the signal is considered in the spacing condition when the voltage is more positive than plus three volts with respect to Signal Ground. During transmission of data, the marking condition is used to denote the binary state ONE (eg, hole punched in paper tape), and the spacing condition is used to denote the binary state ZERO. Note that marking is the normal condition on a data circuit when no signals are present.

4.05 Summary of Data Circuit Interface Terms:

Binary State	ONE	ZERO
Signal Condition	Marking	Spacing
Voltage	Negative	Positive
Paper Tape	Hole	No Hole

For all control circuits the control function is considered ON when the voltage on the circuit

is more positive than plus three volts with respect to Signal Ground, and is considered OFF when the voltage on the circuit is more negative than minus three volts with respect to Signal Ground.

4.06 Summary of Control Circuit Interface Terms:

Control Function	OFF	ON
Voltage	Negative	Positive

4.07 The operation of the circuitry that receives signals from an interchange circuit is dependent only on the signal voltage, and is, therefore, insensitive to the rise time, fall time, presence of signal overshoot, etc. The design of this circuitry minimizes the effects of any circuit time constants which would delay the circuit response, thus introducing time distortion in the signals.

4.08 The terminating impedance of the receiving end of interchange circuits has a dc resistance of not less than 3000 ohms, and the voltage in open-circuited condition does not exceed two volts.

4.09 The source impedance of the sending end of interchange circuits is not specified.

4.10 For data circuits (Transmitted Data and Received Data), neither the rise time nor the fall time, through the six volt range in which the signal condition is not defined, exceeds three per cent of the nominal duration of a signal element. The circuitry used to generate a signal voltage on an interchange circuit meets this specification with any receiving termination which complies with 4.08.

4.11 In some applications, it may be necessary for fail-safe operation to detect either the power-off condition in the data set or the disconnection of the interconnecting cable. Request to Send, and Data Set Ready may be used for this purpose. The power-off source impedance of the sending end of these circuits is not less than 300 ohms, measured at an applied voltage not greater than plus or minus two volts referenced to Signal Ground.