37 AUTOMATIC SEND-RECEIVE (ASR)

TELETYPEWRITER SET

INSTALLATION

CONTENTS

1. GENERAL

1.01 This section provides the installation procedures for the 37 Automatic Send-Receive (ASR) Set. The 37 ASR Set conforms to EIA standard (RS-233-B) for the interface connections. This issue replaces interim special printing of Issue 2.

1.02 The 37 ASR Set consists of a reperforator-transmitter (RT) module and a 37 keyboard send-receive unit (Figure 1). The set can be installed in a floor space 44-1/2 inches wide and 27 inches deep. Maximum height, with the printed cover and RT cabinet lids open, is 46 inches. Space for the operator must be added to the depth dimension.

1.03 Reference directions are based on the normal position of the operator facing the keyboard. Left or right, up or down, and front or rear are referenced with the keyboard in front.

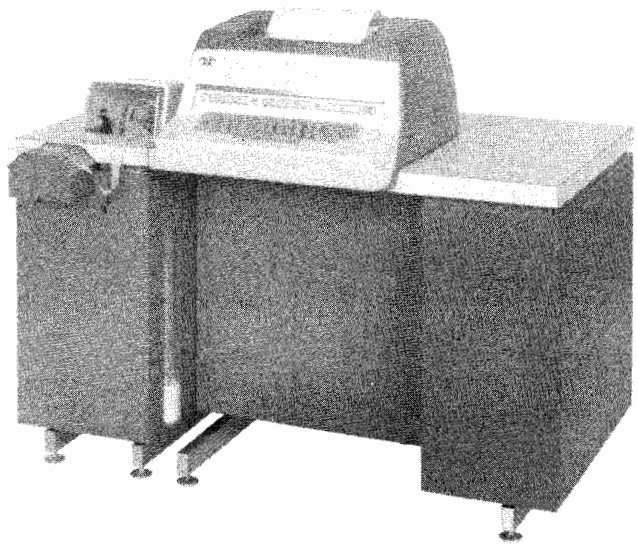


Figure 1 - 37 ASR Teletypewriter Set

1.04 The 37 ASR Set operates under a 3-wire, single-phase 117-volt +10%, 60 Hz ac power source. The ac receptacle must be located within 8 feet of the installation area and be capable of carrying 15 amperes of current.

Note: The ac receptacle should not be under control of a switch.

1.05 Refer to the wiring diagram package packed with the set for information concerning wiring and circuit cards.

2. UNPACKING

2.01 The 37 ASR Set is disassembled and shipped in four separate cartons containing the following major components:

(1) Table with electrical service unit and utility strip.

(2) Reperforator-transmitter module.

(3) Keyboard and cover assembly.

(4) Typing unit.

2.02 Unpack each carton carefully to avoid marring paint finishes or losing small parts. Observe all special unpacking instructions associated with each carton. The table and RT module should be unpacked and prepared first, followed by the components that mount on the table.

2.03 Unpack the table and remove all external packing material. Place the table upright in the assembly area.

Table Access (Figure 2)

2.04 Front panel is removed as follows.

(1) While holding the front panel, push down on the panel latch in the panel slot to unlatch the panel to allow it to move forward.

(2) Release the spring stop safety catch on the underside of the table.

(3) Open the panel and align its top edge with the front edge of the table.

(4) Carefully lift upward and remove panel from its hinges. Place the panel aside until the set is completely assembled.

2.05 To prevent damage to the terminals on the cable connections, do not remove the packing material that protects the connector terminals until the routing is complete as outlined in 4.08.

CAUTION: DO NOT CONNECT AC POWER TO THE SET UNTIL THE INSTALLATION IS COMPLETE AND READY FOR TESTING.

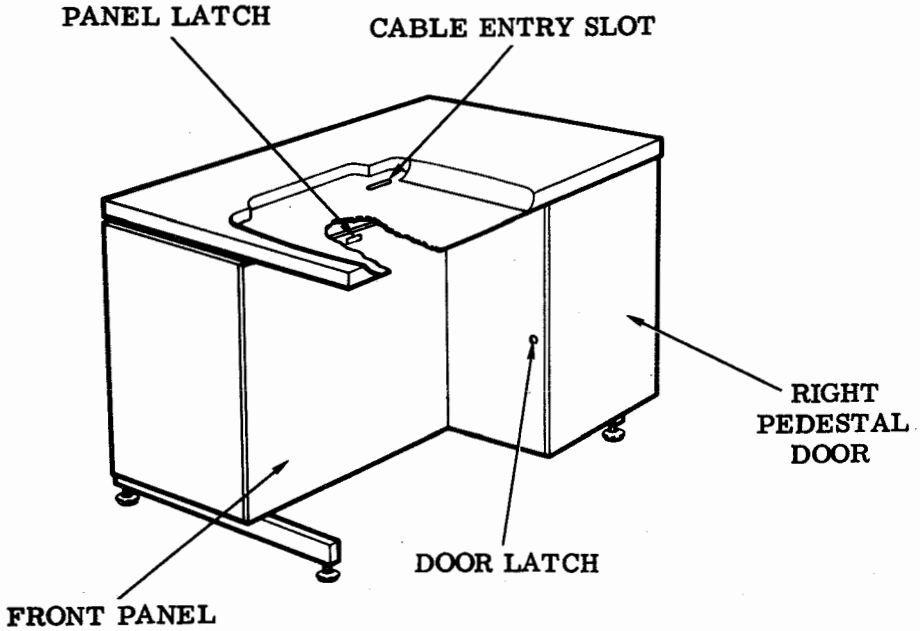


Figure 2 - 37 Teletypewriter Table

Reperforator-Transmitter Module (Figure 3)

2.06 Unpack the RT module by removing the cabinet and all packing material from the carton. Place the RT cabinet in the assembly area. Move the RT cabinet to the left side of the table and route the RT interface plug (P310) and the power cord (Figure 4) through the base of the cabinet and into the opening at the base of the table.

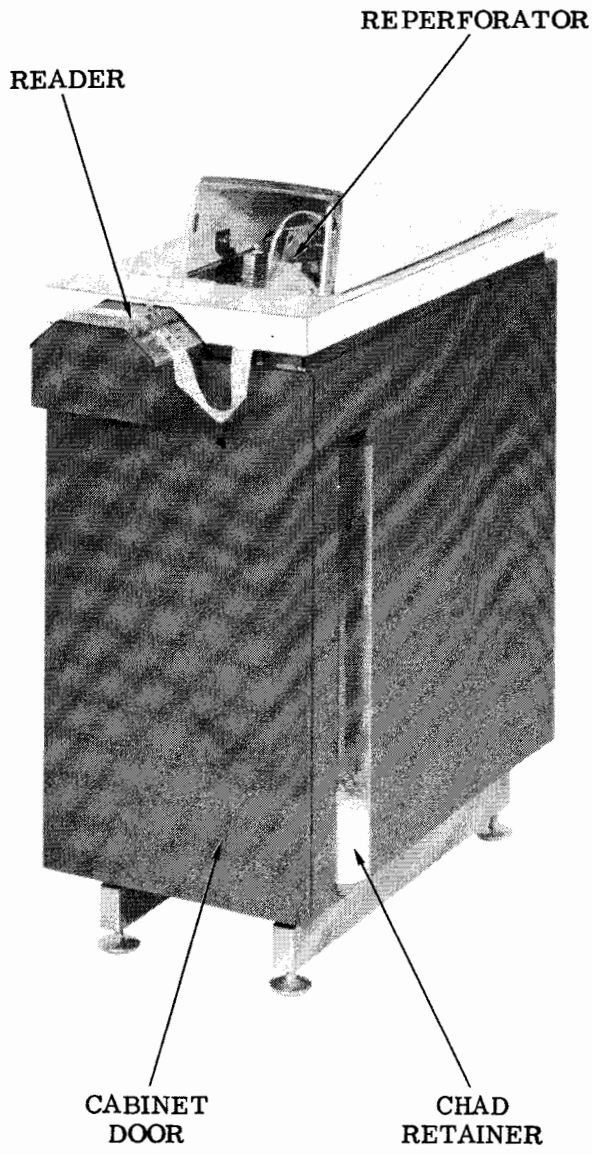


Figure 3 - 37 Reperforator-Transmitter Module

Keyboard and Cover

2.07 Unpack the keyboard and cover assembly which contains the reset mechanism, base, and motor, by opening the top and one side of the carton (Figure 5). Remove all packing materials and slide the assembly out.

CAUTION: DO NOT LIFT ASSEMBLY BY THE KEYBOARD HOUSING.

2.08 Place the assembly in the cutout area on the table top. Open the cover by depressing the two cover latches (one on each side) and lift the front cover upward. Remove the cover from the pan by the following procedure.

(1) Disconnect the cover balancing arm, located on the right side, by sliding the cam to its lowest position and moving the arm to the left.

(2) Pull back on the spring clip located inside lower left corner of the cover and slide the cover to the right until the clip clears the retaining plate.

(3) Slide the cover to the right, disengaging the hinges.

(4) Place the cover aside until the final assembly.

Typing Unit

2.09 Unpack the typing unit (Figure 6) from its carton and remove all packing materials. Remove the shipping pallet from the base. Remove the wire retainer that secures the print hammer assembly. Check the feed pawls and ratchet wheel for packing detail. If detail is present, remove it when moving the print hammer assembly toward the left.

3. LUBRICATION

3.01 Lubricate the typing unit per Section 574-320-701TC and the keyboard unit per Section 574-321-704TC before placing in service. Make visual inspection of the units for general lubrication requirements. Check oil locations on felt washers, oil cups, and in most locations where parts rub or move with respect to each other. Grease should be used on gears, rollers, points of heavy pressure, and some ball bearings.

3.02 General requirements for lubrication areas for the units are as follows.

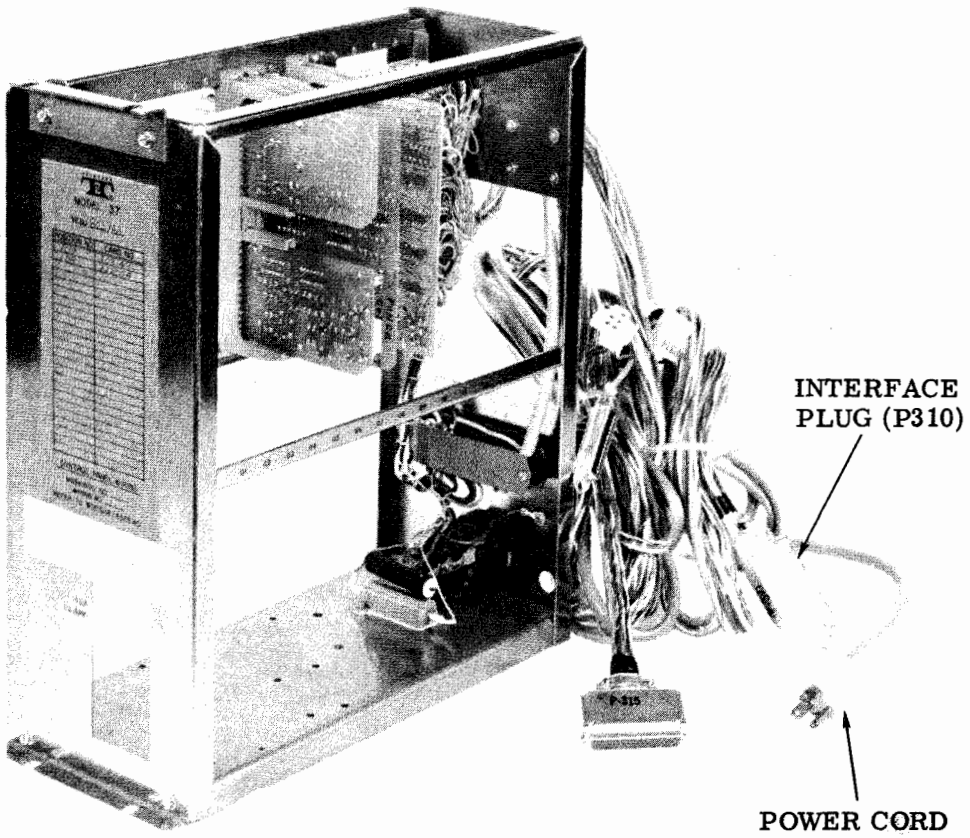


Figure 4 - 37 RT Electrical Service Unit

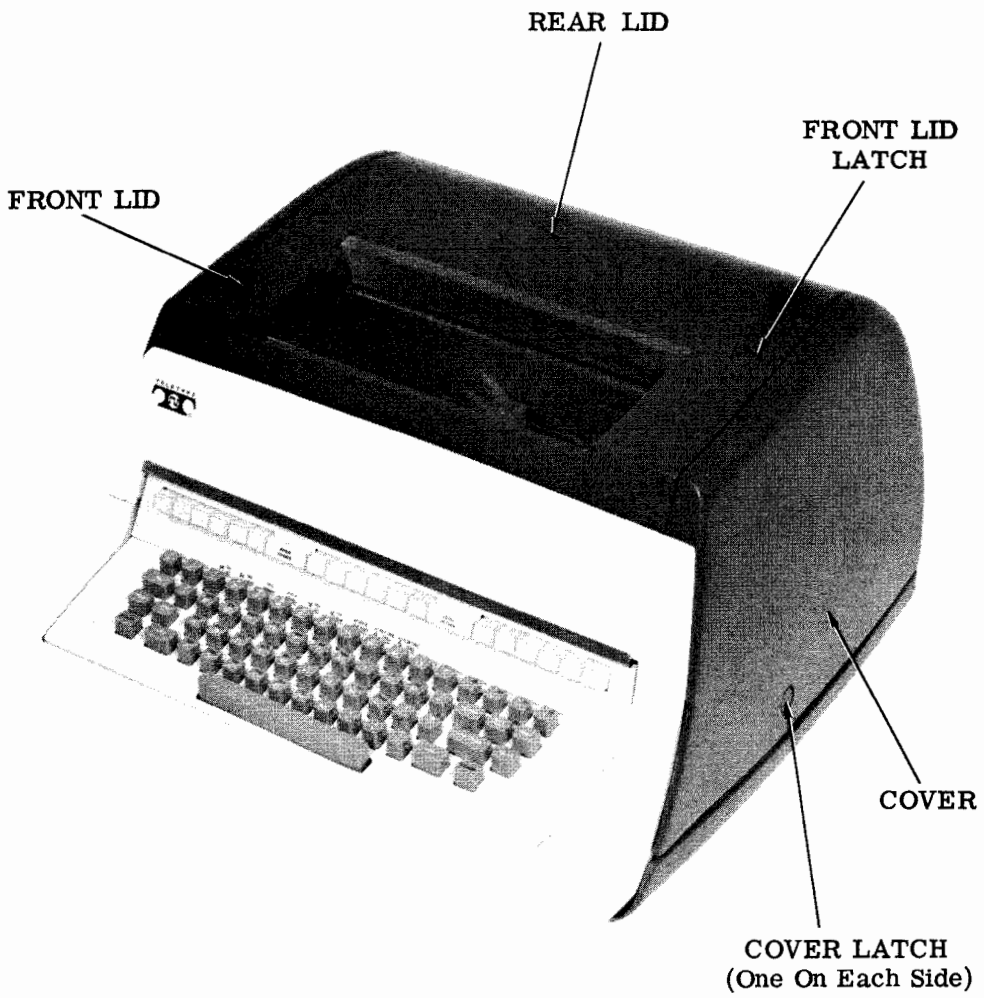


Figure 5 - Keyboard and Cover Assembly

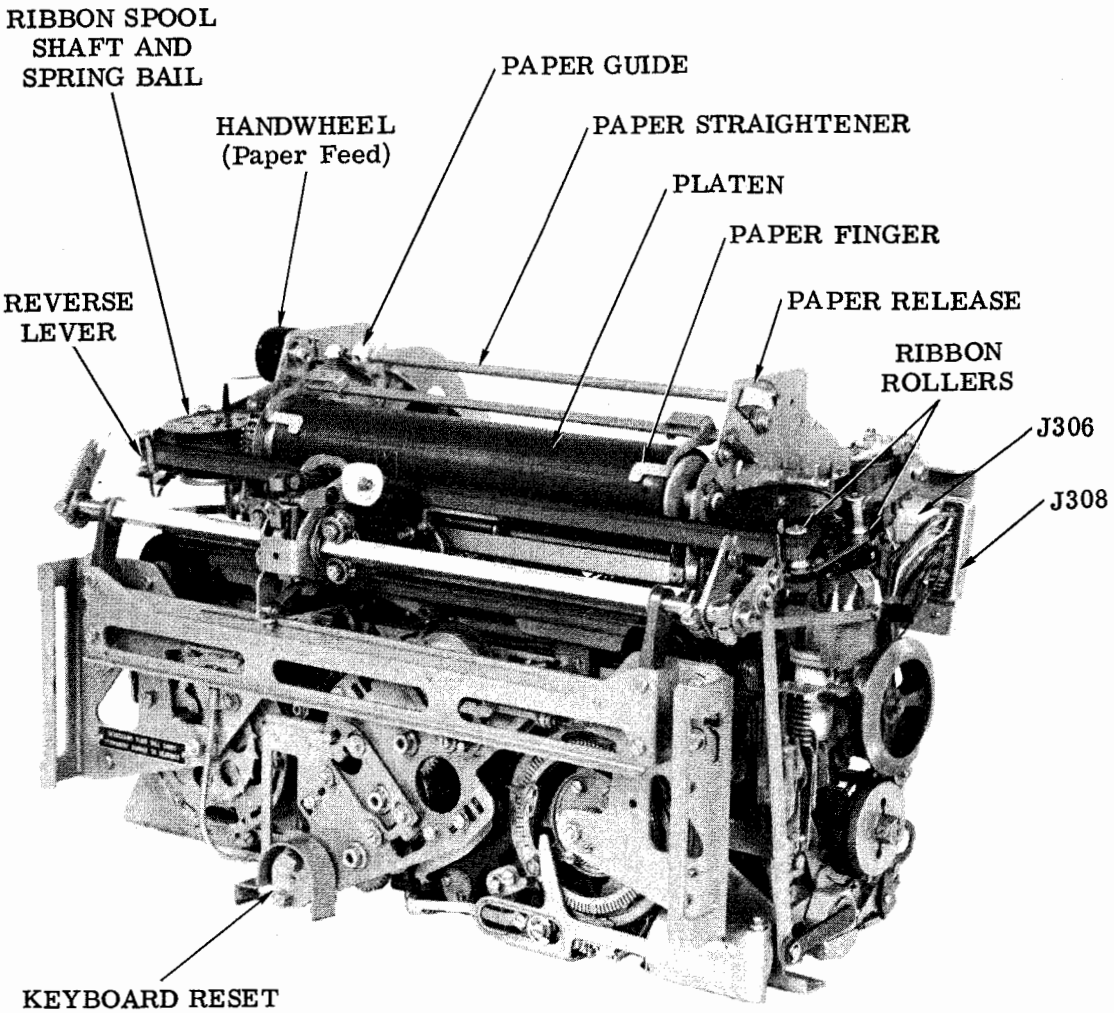


Figure 6 - 37 Typing Unit

(1) Pivot points require two or three drops of oil.

(2) Felt washers are saturated with oil.

(3) Cams and sliding surfaces require a film of oil.

(4) All open roller bearings should be packed with grease TP88973 (KS7471).

Note: Closed roller bearings do not require lubrication.

3.03 Overlubrication which would allow oil to drip or grease to be thrown on other parts should be avoided. Excessive lubricants should be removed with a dry lint-free cloth. Keep all electrical contacts free of oil or grease.

Note: Use maintenance pad TP124828 to protect furniture and floor coverings from oil and grease while lubricating the units.

4. ASSEMBLY PROCEDURE

REPERFORATOR-TRANSMITTER MODULE

4.01 The reperforator-transmitter (RT) module is packaged as a complete unit and consists of cabinet, tape reader, motor unit, reperforator, and an electrical service unit. The components are mounted in place and the installation procedure requires removing the shipping bracket mountings on the reperforator base, and connecting two cables.

4.02 Connect the ac power cord from RT module to an outlet on the utility strip and mate P310 to J310 inside the table (Figures 4 and 7).

4.03 Remove the four shipping brackets from the reperforator base by the following procedure (Figure 8).

(1) Remove and discard the four shipping screws securing the reperforator base to the shipping brackets.

(2) Loosen the four shipping bracket retaining screws.

(3) Drop the shipping brackets out of engagement with the reperforator base.

(4) Slide the shipping brackets down until the top of its stowing slot is resting on the retaining screws.

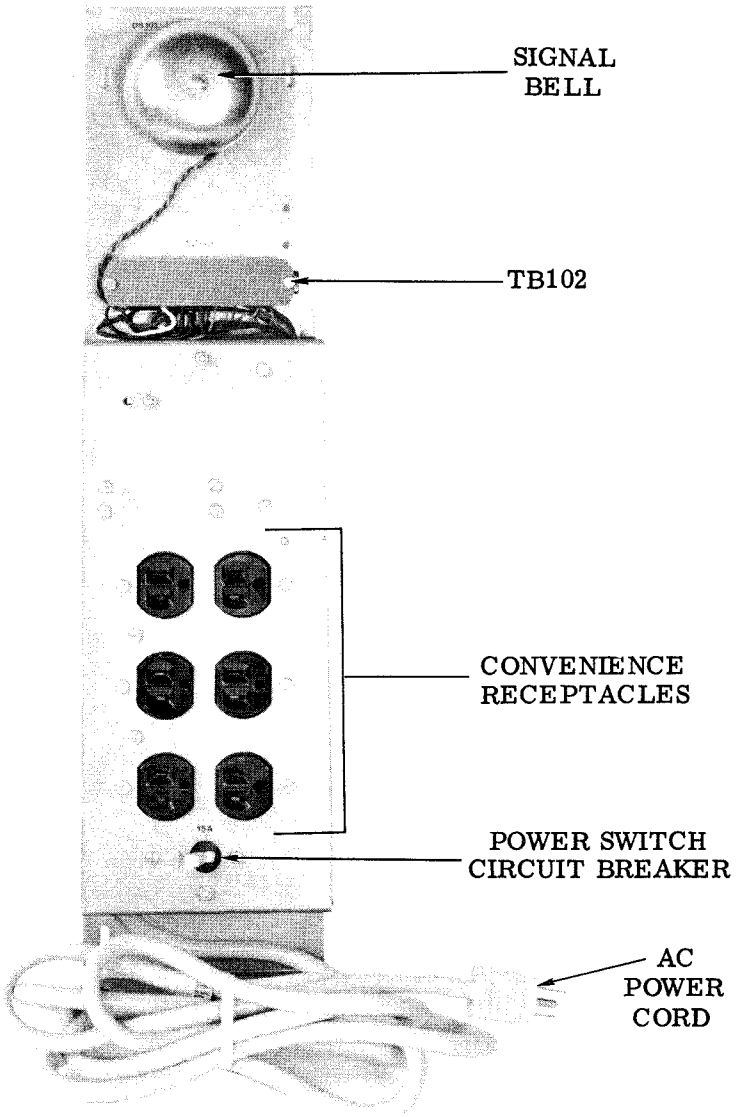


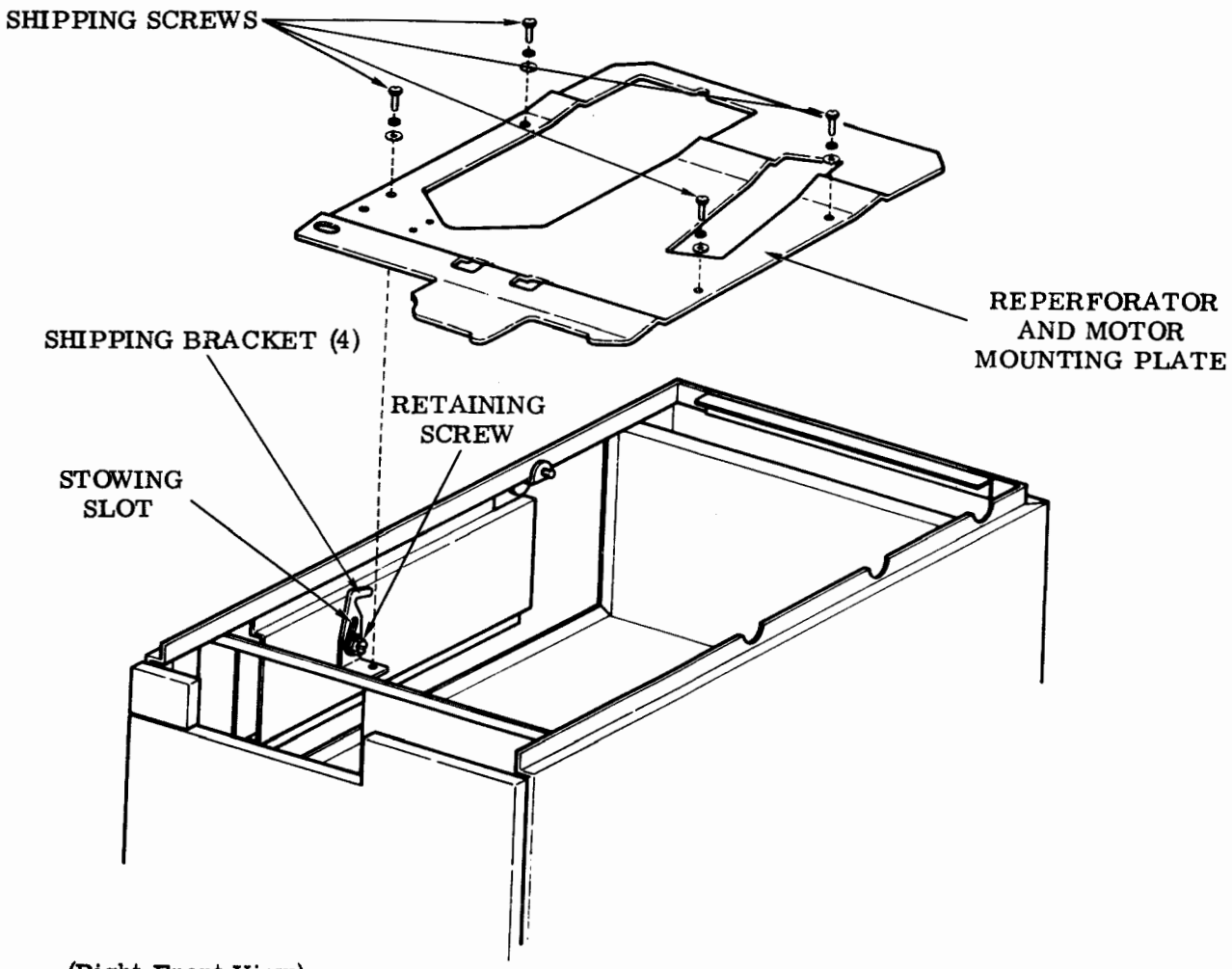
Figure 7 - 37 Utility Strip

(5) Tighten the four shipping bracket retaining screws.

Note: All four (4) shipping brackets must be disengaged from the reperforator and motor mounting plate before operating the unit.

4.04 Refer to Figure 9 and install the reperforator gear and gear guard. The adjustment between the motor pinion and reperforator gear is made during final assembly of the RT cabinet and should not require readjustment. The motor pinion and gear should rotate freely without binding. If adjustment is necessary, refer to the reperforator gear mesh adjustment outlined in Section 574-327-700TC.

4.05 The two muslin bags attached to the base of the keyboard and cover assembly contain the necessary parts to assemble the units.



(Right Front View)

Figure 8 - Disabling Shipping Brackets RT Module

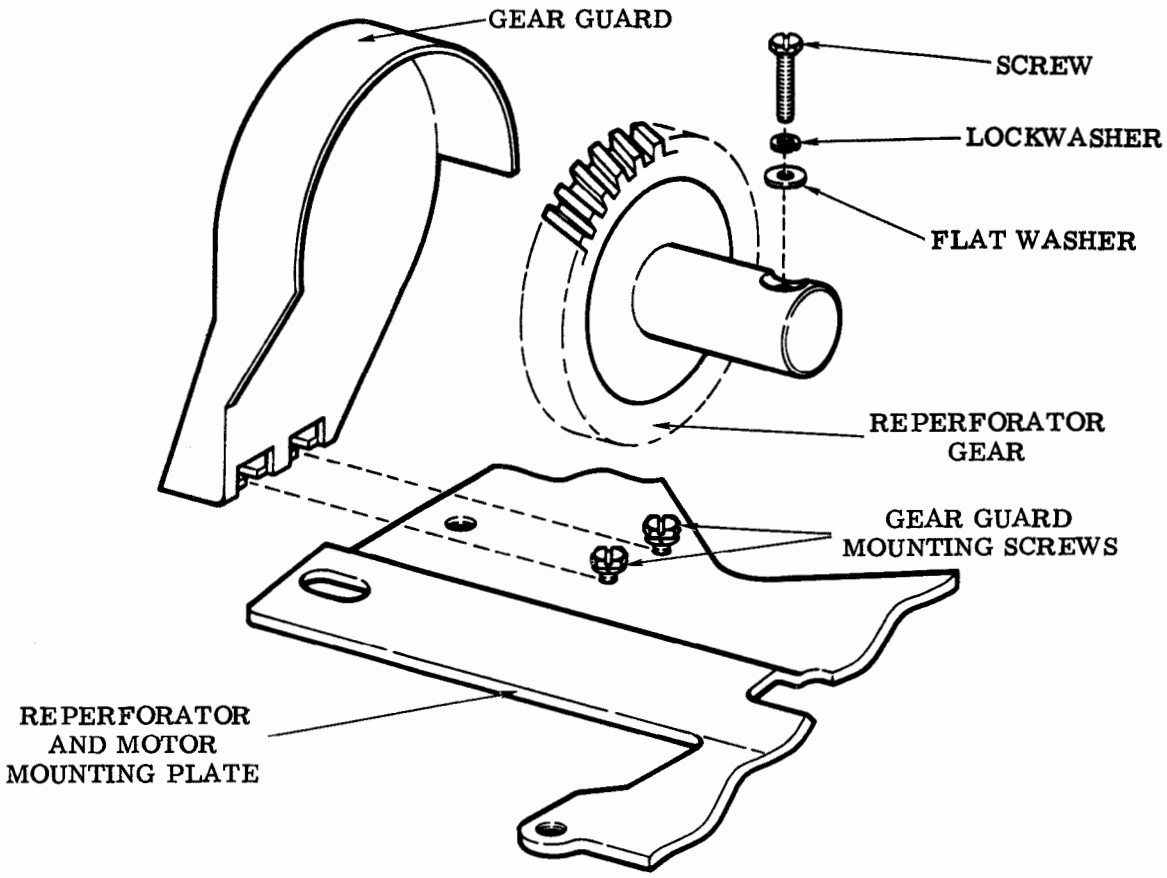


Figure 9 - Gear and Gear Guard Installation

KEYBOARD AND COVER ASSEMBLY

4.06 The keyboard and cover assembly is secured to the table top by four shoulder screws mounted from the under side of the table top. Align the four weld nuts on the bottom of the pan assembly with the four cutouts and rubber grommets in the table top. With the four shoulder screws (TP333169, Figure 10) and associated washers from the muslin bag tied to the pan assembly, secure the pan assembly to the table top.

A. Base Mobilization

4.07 Remove the 6-40 screws (TP151631) from the two base retainers (Figure 11). DO NOT REMOVE THE BASE RETAINERS. Remove the packing detail between the base and the pan. When the packing detail is removed, the vibration mounts will push the base against the base retainers. When installed, the weight of the typing unit will restore the clearance between the base and base retainers.

B. Cable Routing

4.08 Route the cable connectors shown in Figure 12 from the electrical service unit through the cable entry slot in the table and pan (Figures 2 and 11). Use care to prevent bending of the control panel connector pins when routing through the entry slots. If possible, leave the protective covering on the control panel connectors until the routing is complete.

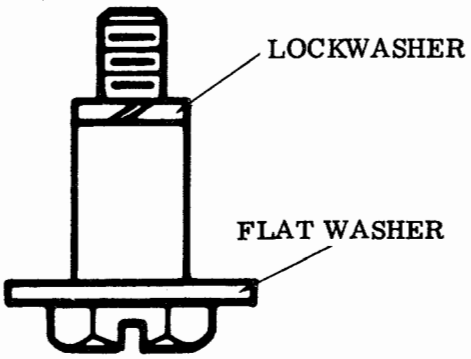


Figure 10 - Shoulder Screw

4.09 Remove the control panel trim strip and loosen the retaining screws, one on each side (Figure 13) Swing the control panel up and connect the control panel connectors making sure connector "A" is to left, "B" is to center and "C" is to the right as viewed from the front of the control panel (Figure 14). Use care when making the control panel connections and check to insure that the pins line up with the mating connector.

4.10 Route and clamp the cables shown in Figures 12 and 14. The center cable should always be routed along the left side of the pan assembly. The plastic cable clamps and associated screws and washers are located in the muslin bags tied to the pan assembly. Use the speed clips located on the inside edge of the pan to secure the cables (Figure 15). Install the cables by prying the spring tang on the speed clip away from lip of pan with a small screwdriver or pull tang away with a spring hook to receive the cables.

Note: The base assembly may be removed to ease the installation of the keyboard and control panel cables. After the base assembly is replaced, mount the base retainers.

TYPING UNIT

A. Mounting on Base

4.11 Locate the selector clutch on the right end of the typing unit main shaft and the keyboard reset coupler (Figure 6) at the lower center front. Facing the right end of the typing unit, rotate the selector clutch drum in a counterclockwise direction until the lugs on the keyboard reset coupler are vertical.

4.12 Viewing the keyboard reset mechanism from the right side of the keyboard, rotate the mechanical reset shaft in a clockwise direction until the open slots, in the plastic universal joint member, are vertical to receive the lugs on the typing unit (Figures 6 and 11) keyboard reset coupler.

4.13 The typing unit may be gripped for lifting by grasping the right vertical handle on the front plate and the rear curve under the left side plate. From a level position, tilt the typing unit slightly forward (toward the keyboard). Mate the reset coupler of the keyboard reset mechanism, and carefully lower the typing unit over the locating studs and intermediate gear assembly. Be sure the main shaft driven gear and intermediate gear mesh properly.

4.14 Install the four typing unit mounting screws, starting with the left rear.

B. Interrelated Adjustments

4.15 Keyboard Trip Arm: Adjust the keyboard trip arm as shown in Figure 16.

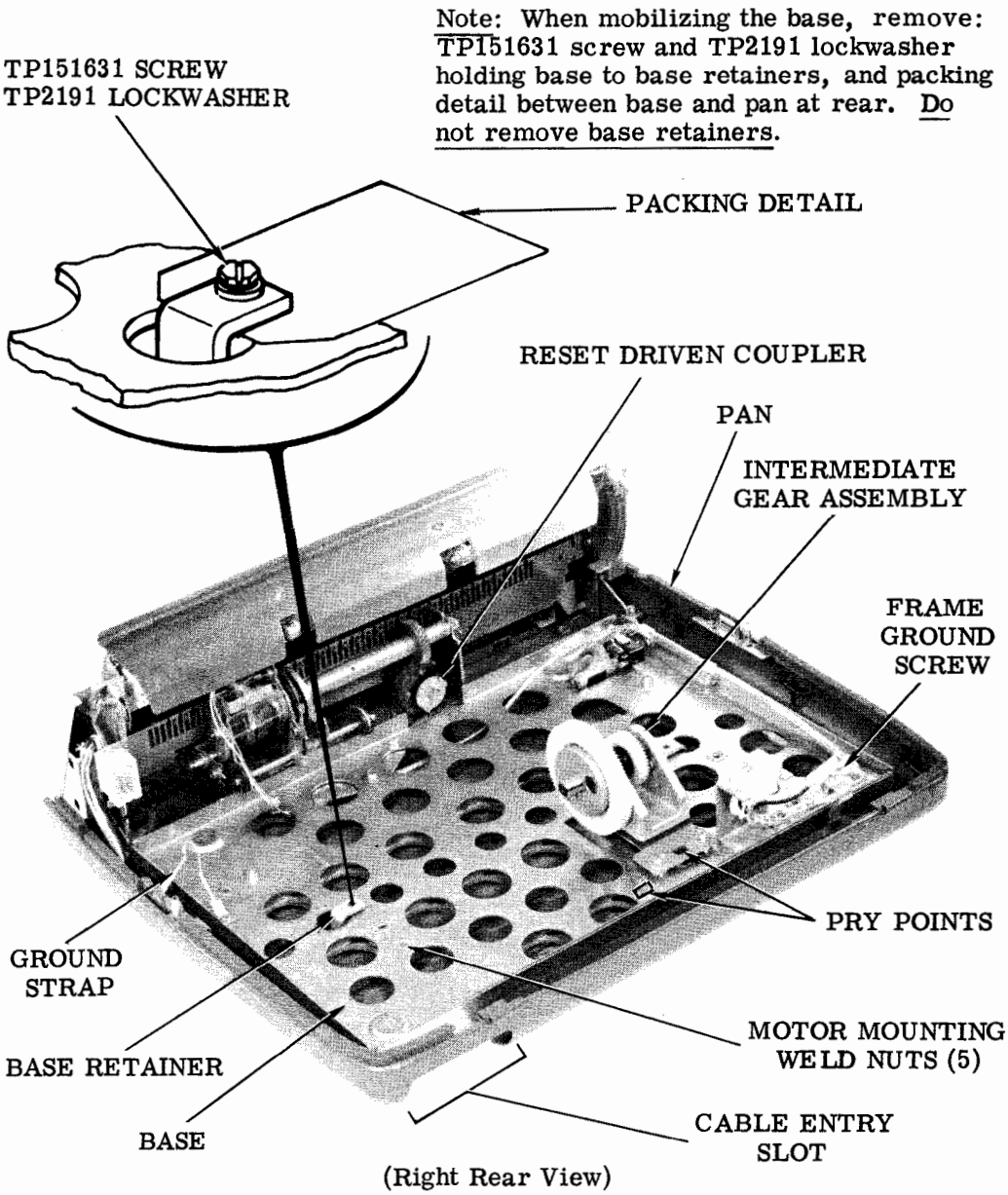


Figure 11 - Keyboard Unit

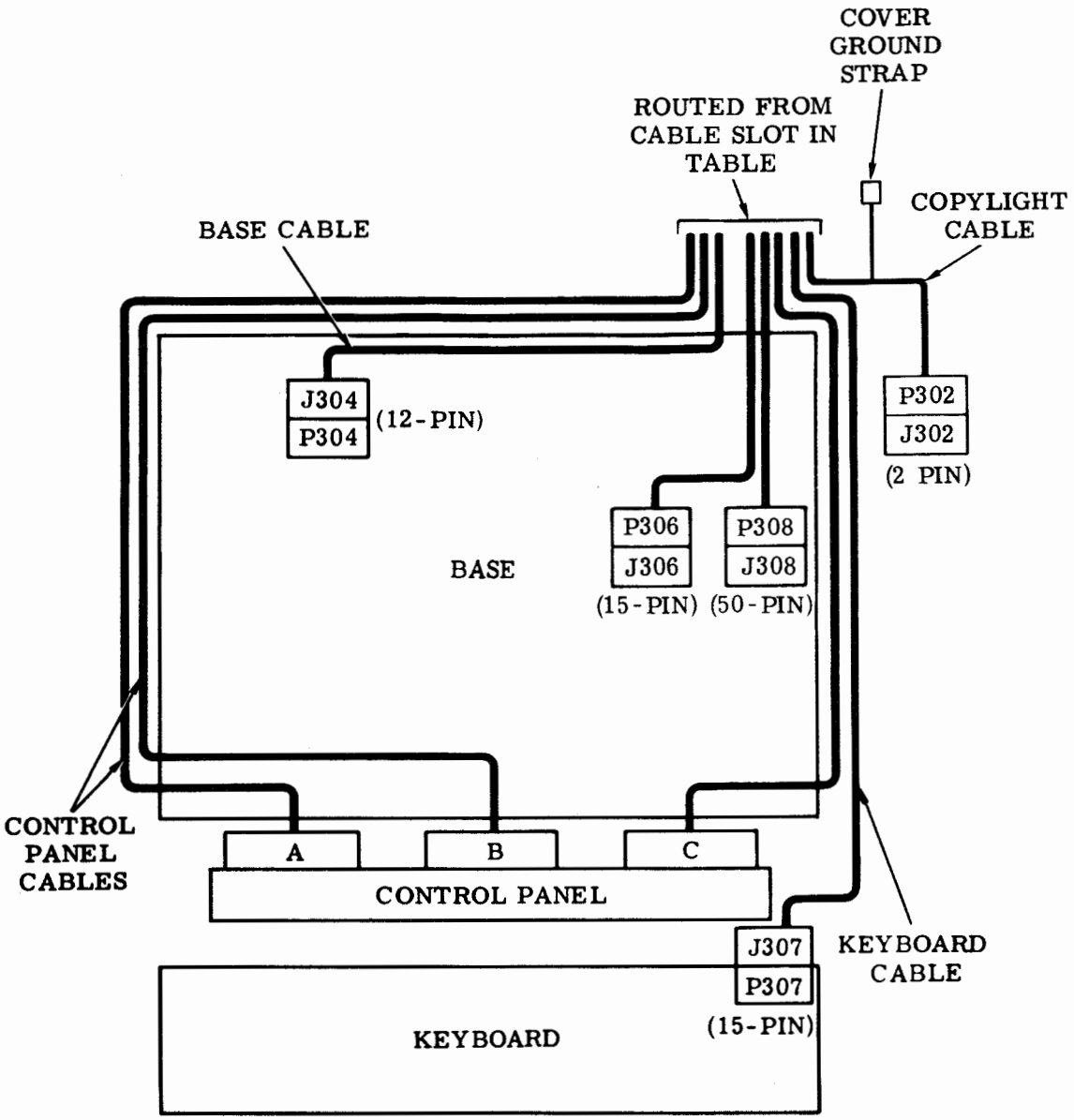
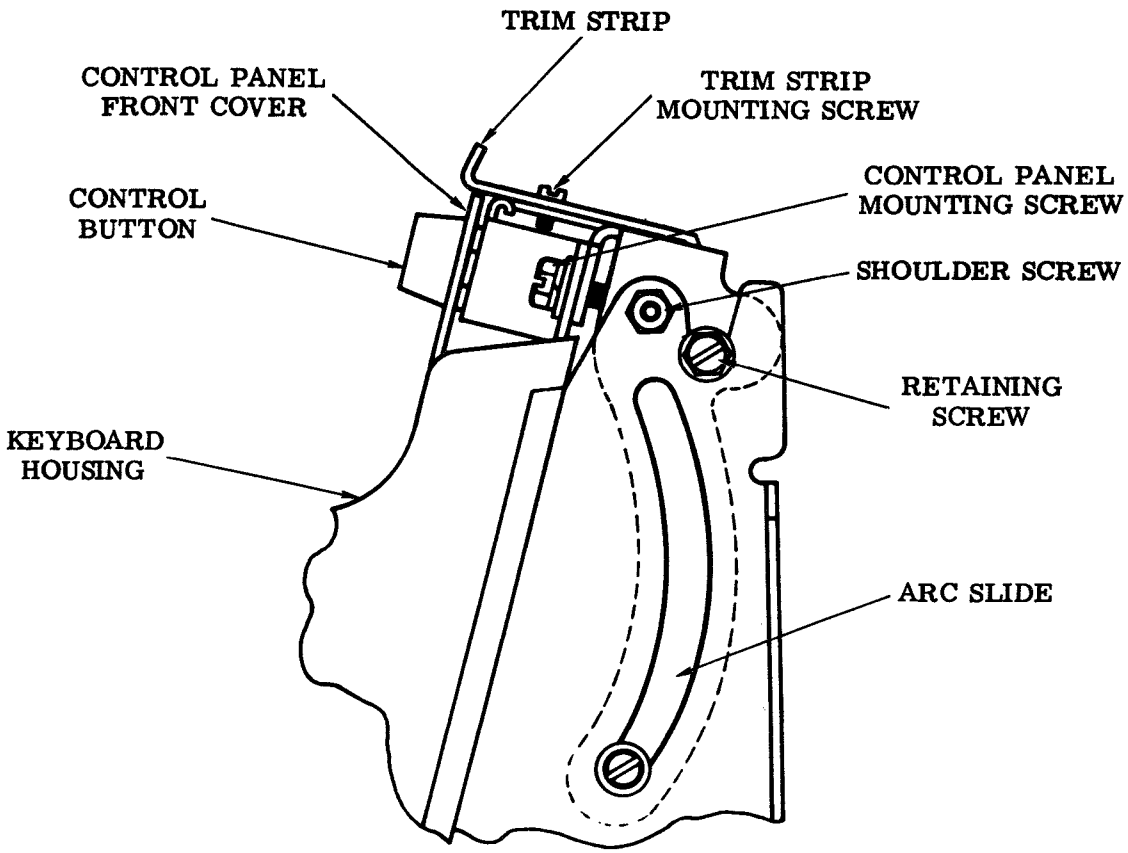


Figure 12 - 37 Typing Unit Cable Routing



(Side View)

Figure 13 - Control Panel

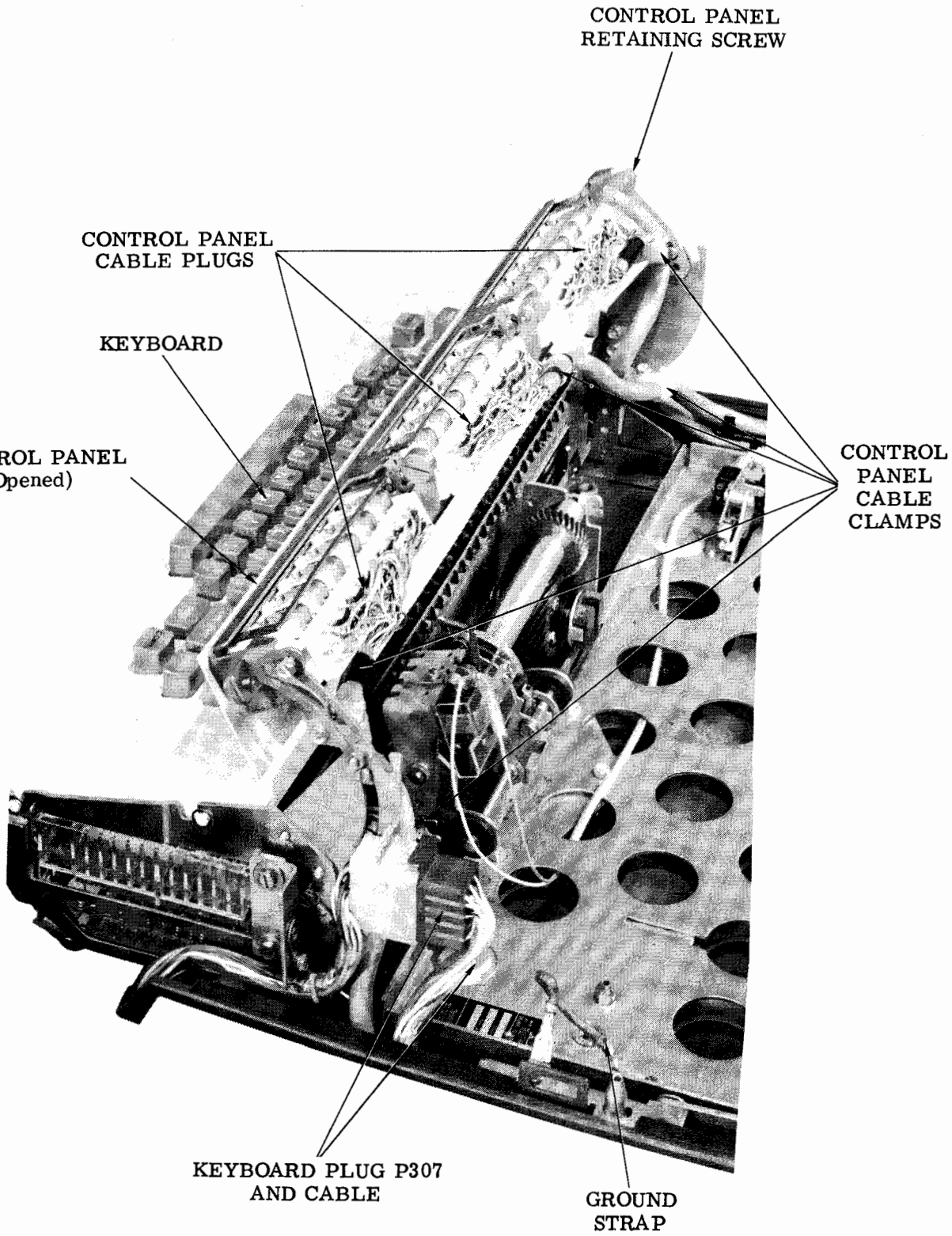
4.16 The motor, intermediate gear assembly (Figures 11 and 17), and the main shaft driven gear should rotate freely without friction between the gears. The backlash should be barely perceptible as outlined in the requirements in the following paragraphs.

4.17 Intermediate Gear Assembly: Remove the gear guard and check for a backlash of 0.004 inch between the main shaft driven gear and the intermediate drive gear. This backlash has a tolerance from 0.004 inch minimum to 0.015 inch maximum. The backlash should move freely and the gears should mesh properly. If adjustment is necessary, loosen the three intermediate gear assembly mounting screws and the five motor mounting screws friction tight. Move the motor to the rear. Use the pry points at the rear of the intermediate gear assembly (Figure 11), adjust the assembly from front to rear until the requirement is met. Tighten the three intermediate gear assembly mounting screws. Proceed with 4.18 to provide backlash between the motor pinion and the intermediate gear assembly.

4.18 Motor Unit: Check for a backlash of 0.004 inch between the motor pinion and intermediate driven gear as outlined in the above paragraph. If adjustment is necessary, loosen the five motor mounting screws friction tight. Use the back edge of the base and the motor cradle as a pry point to move the motor assembly forward. To move the motor back, use the pry point located in front of the left rear mounting screw (Figure 11). Adjust to meet the requirement, tighten the five motor mounting screws, and replace the gear guard.

C. Cable Connection

4.19 Attach the typing unit cable connectors, P306 and P308 to the rear of the typing unit. Position the cables toward the cable exit.



(Right Side View)

Figure 14 - Control and Keyboard

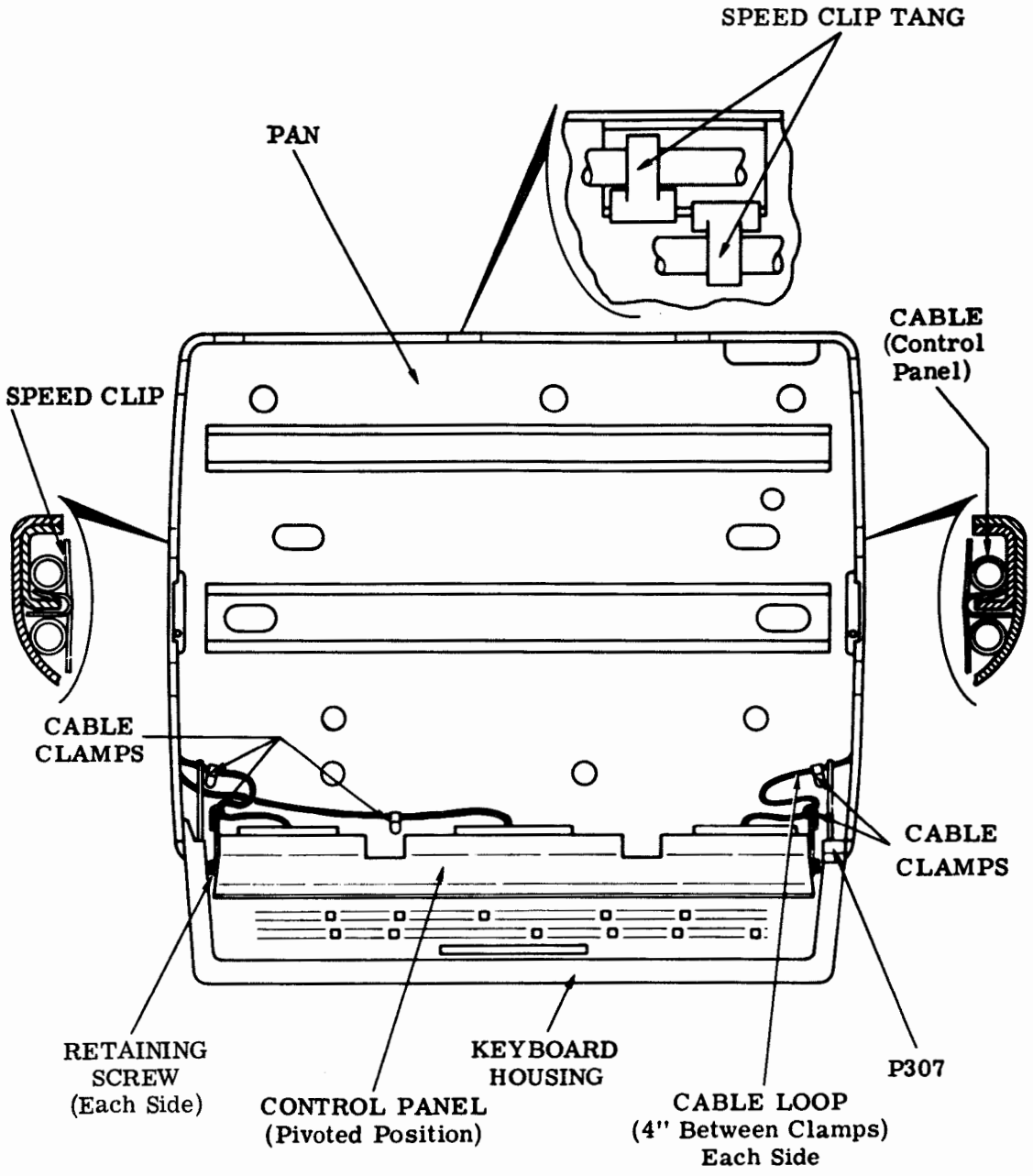


Figure 15 - 37 Control Panel Cable Routing

TRIP ARM

Note: The typing unit must be assembled on the base to make the trip arm adjustment.

To Check

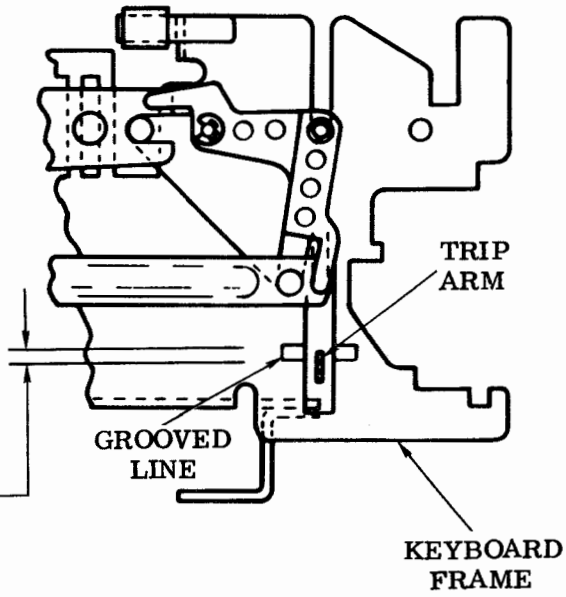
Engage clutch. Rotate shaft until reset bail roller is opposite one of the high parts of reset cam. Note the position of the top edge of trip arm with respect to the grooved line on the front of the keyboard frame. Then rotate the shaft until reset bail roller is on the other high part of the cam, note position of trip arm on keyboard frame.

Requirement

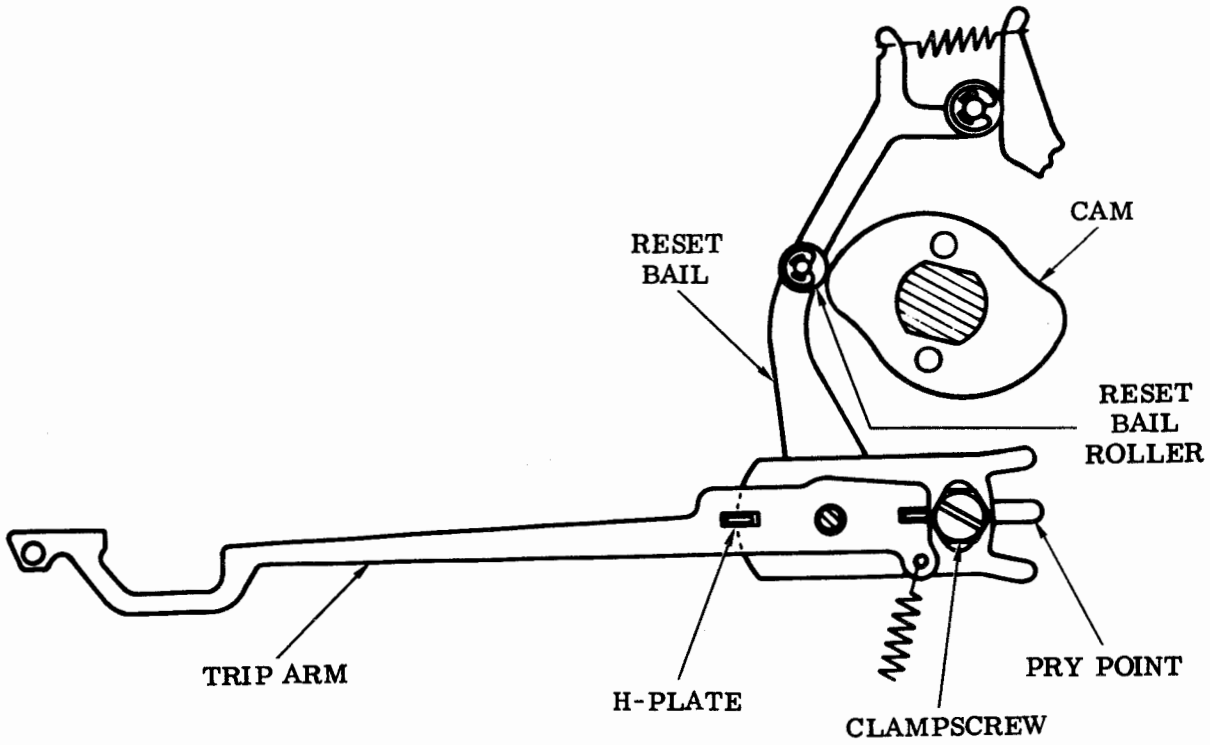
The lowest of the two positions obtained should be within the width of grooved line on front of keyboard frame.

To Adjust

Loosen clampscrew friction tight. Insert screwdriver between pry points and position trip arm to meet requirement. Tighten clamp.



(Front View)



(Right Side View)

Figure 16 - Keyboard Trip Arm

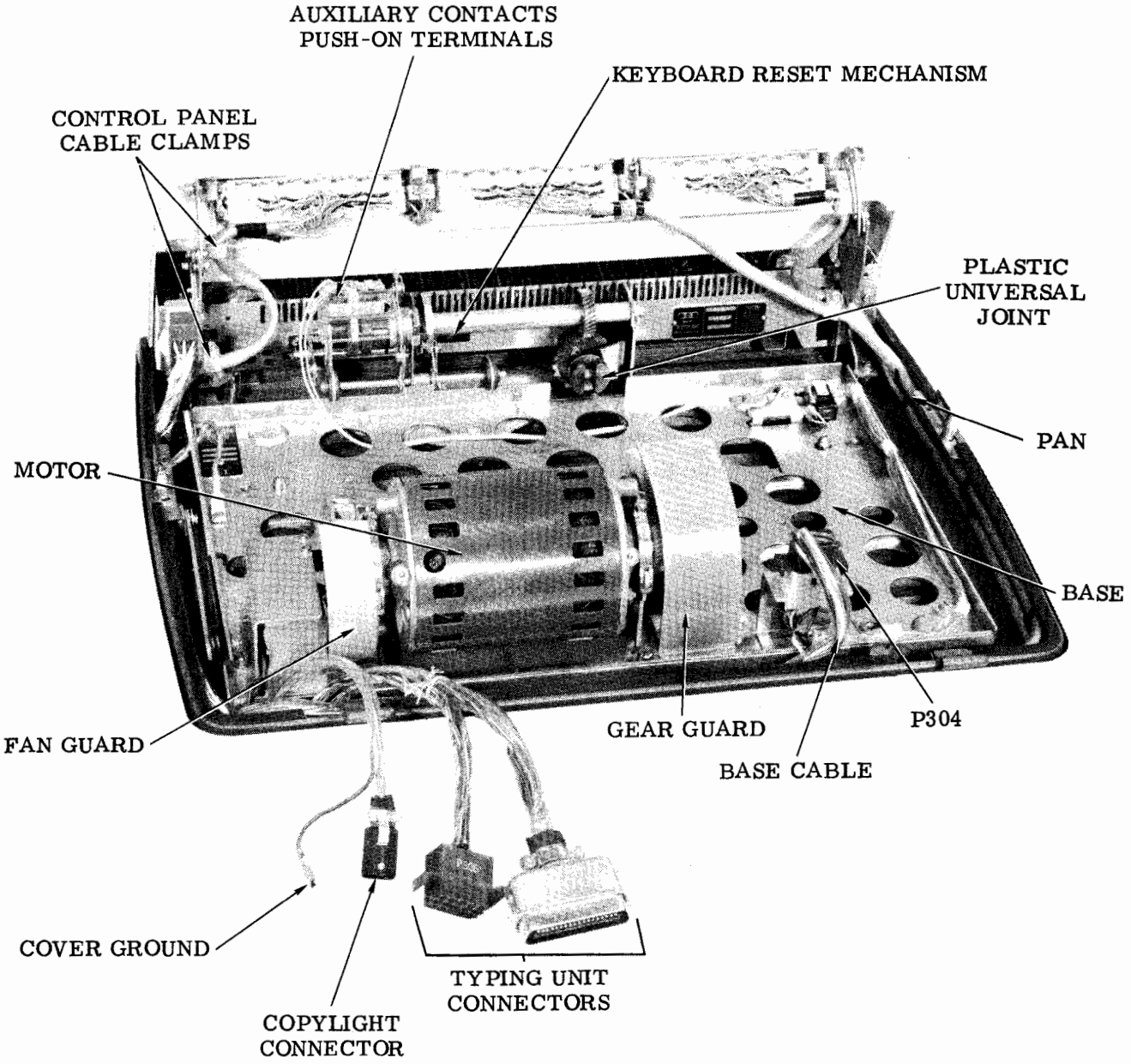


Figure 17 - Keyboard and Motor Units

4.20 Check the cable connections to insure that they are closed and fitted properly. Swing the control panel back and seat the retaining screws, one on each side, and tighten the retaining screws.

4.21 Replace the trim strip with the two mounting screws. Tighten the screws.

D. Ribbon Routing

4.22 To route the new teletypewriter ribbon, straighten the spring bail and lift the spool off the shaft. Remove the packaging, and reel out enough ribbon to reach the empty spool and for three turns on the spool. Refer to Figures 6 and 18 and perform the following routing procedure.

(1) Place the spool on the right shaft, engaging the spool shaft by turning the spool.

(2) Thread the ribbon over the guide rollers and through both ribbon reversing levers. Keep the ribbon free of twists and in-line between the two reversing levers and between the typebox and print indicator.

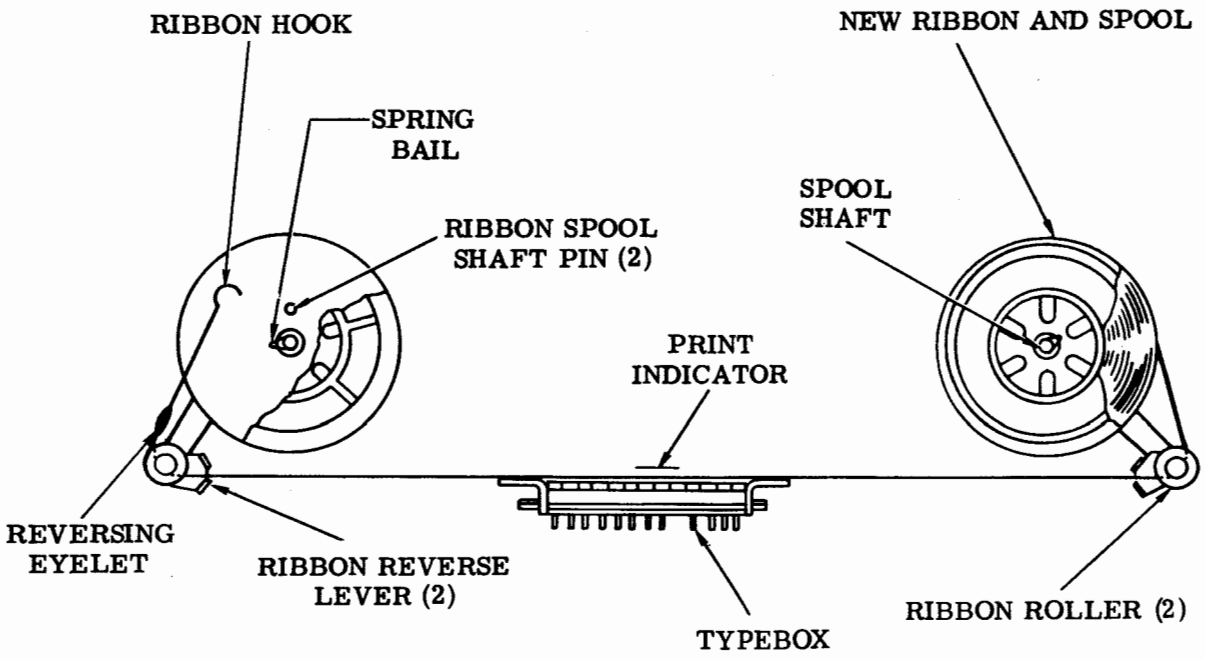


Figure 18 - Ribbon Routing

(3) Position the reversing eyelet, near the ribbon end, between the spool shaft and the ribbon reverse lever.

(4) Attach the ribbon to the empty spool and install the spool on the shaft.

(5) Adjust the ribbon tension by turning the ribbon on the spool until the ribbon is tight and under a spring load.

(6) Engage the spool shaft pin and lower the two spring bails.

E. Cover Replacement

4.23 Install the cover by tilting the cover back towards the right of the hinges and perform the following.

(1) Align the hinge pins on the cover with the hinges on the pan.

(2) Engage the hinges and slide the cover to the left until the spring clip slides off the retaining plate, locking the cover in place.

(3) Attach the 2-pin copylight connectors to the receptacle mounted on the back (right rear corner) of the cover and attach the associated ground tab terminal.

(4) Position the cable toward the cable exit and connect the cover balancing arm.

(5) Close the cover, the latches on the left and right side will snap into place.

F. Paper Assembly and Routing

4.24 Open the front lid on the cover by depressing the two latch releases on top of the cover (Figure 5); pivot the front lid upward and toward the front and pivot the rear lid upward and toward the rear.

4.25 Insert the paper spindle into the paper roll and install the paper roll into the spindle blocks. Route the paper over the paper straightener between the two paper guides, refer to Figure 19. Lift the paper finger on the platen and insert the paper between the platen and pressure rollers. Turning the handwheel, move the paper through the platen assembly leaving 1 foot of loose paper. Lower the paper fingers on the platen assembly and hold the paper toward the front of the typing unit, and close the rear lid. Close the front lid, and position the paper between the window and the paper guide (be sure that the cover and lids are latched).

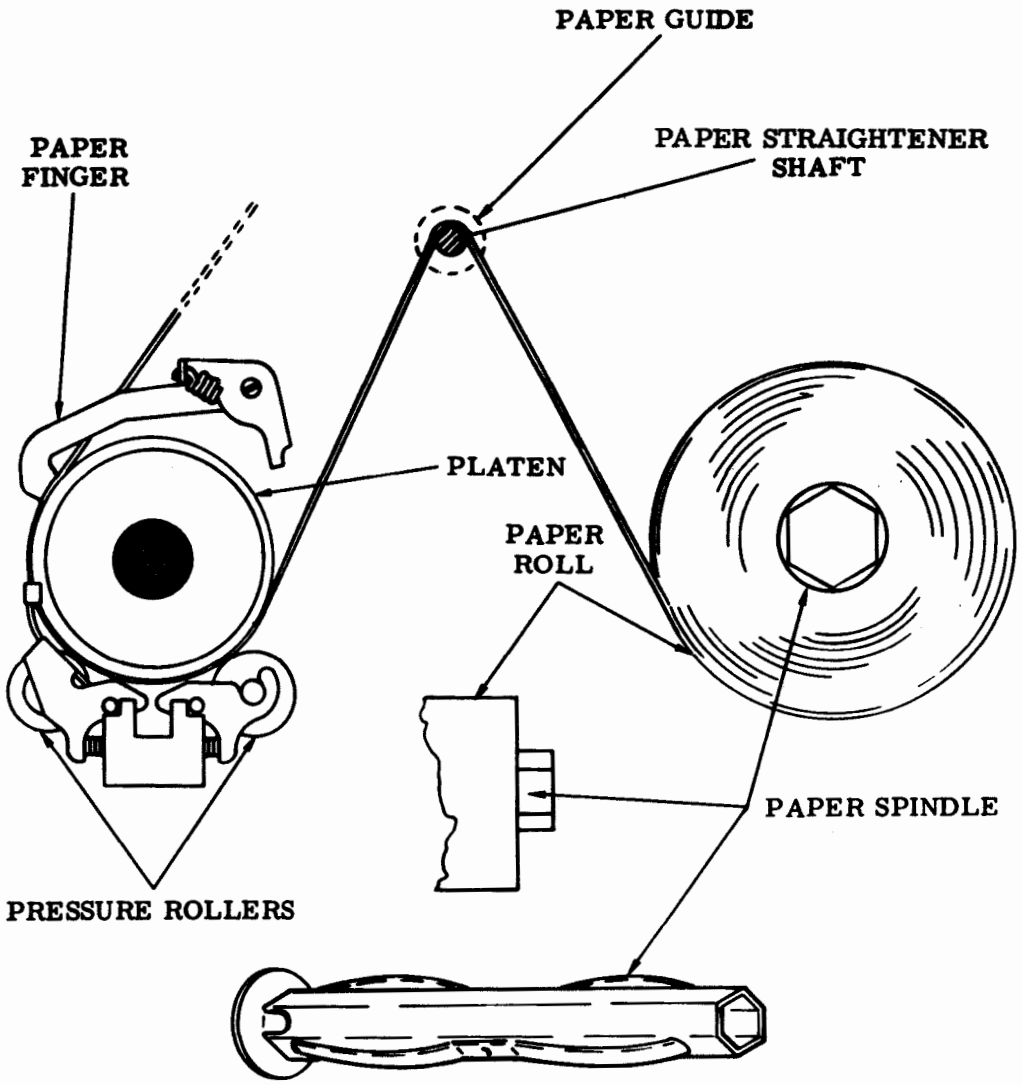


Figure 19 - Paper Routing Assembly

ELECTRICAL SERVICE UNIT AND UTILITY STRIP

4.26 The electrical service unit (ESU) and utility strip (Figures 7 and 20) are exposed when the front panel on the table is removed, refer to 2.04. To gain access to the circuit cards (Table A) and the answer-back unit, the electrical service unit must be removed from the table. To remove the ESU, refer to Figure 21, and proceed as follows.

(1) Remove the three mounting screws on the front panel, one on the top and two on the bottom.

(2) Remove the packing bracket from the bottom panel inside the table.

(3) Unhook the ESU cables from the cable bracket located on the upper back portion of the table.

(4) Slide the ESU to the right, clearing the left edge of the table and pull the unit from the table.

4.27 The electrical service unit for the punch and reader (Figure 4) is located in the RT cabinet. If it is necessary to remove the RT electrical service unit for access to the circuit

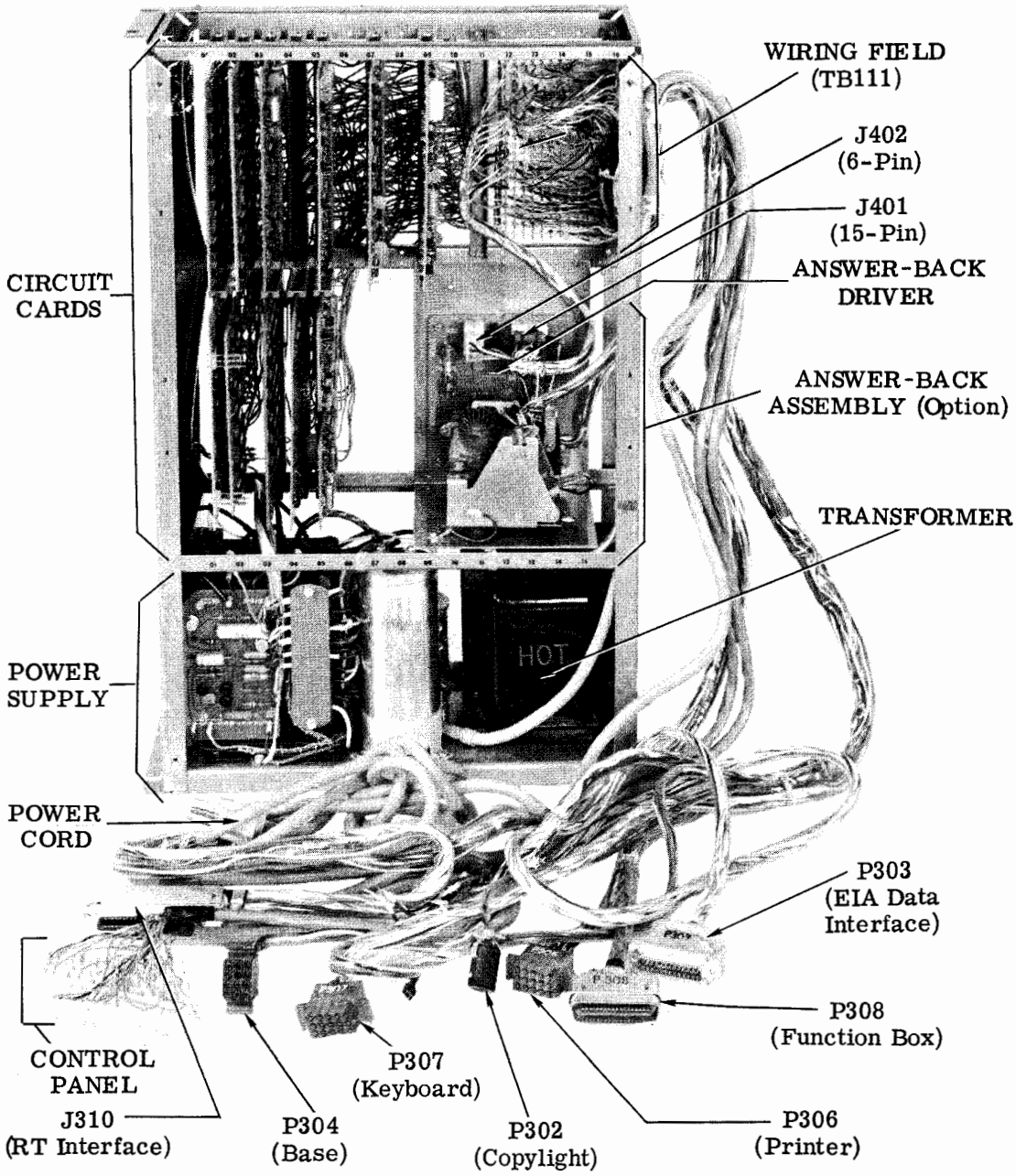


Figure 20 - 37 Electrical Service Unit

cards (Table B) open the cabinet door and remove the three mounting screws on the front panel and pull the unit out.

4.28 Refer to the ordering information to check for the desired circuit cards (options and variable features) that are installed in the electrical service units. Refer to the circuit description (CD) and the wiring diagrams (WD) packed with the set for information concerning the strapping options on the circuit cards.

A. Answer-Back Assembly

4.29 Remove the packing material from the answer-back assembly (Figures 20 and 22) by performing the following procedures.

(1) Cut the plastic strapping with a pair of side cutters.

(2) Pull out the strapping, being careful not to jar the unit.

(3) Remove the packing material.

4.30 Code the answer-back drum as outlined in 4.32 through 4.39. Replace the electrical service unit, install the three mounting screws on the front plate, and route the cables over the bracket on the back panel (Figure 21). Route the power supply cable from the utility strip (Figure 7) through the oblong opening in the base of the table. DO NOT CONNECT THE POWER CABLE AT THIS TIME. Check to insure that the power cable from the electrical service unit is connected to an outlet on the utility strip.

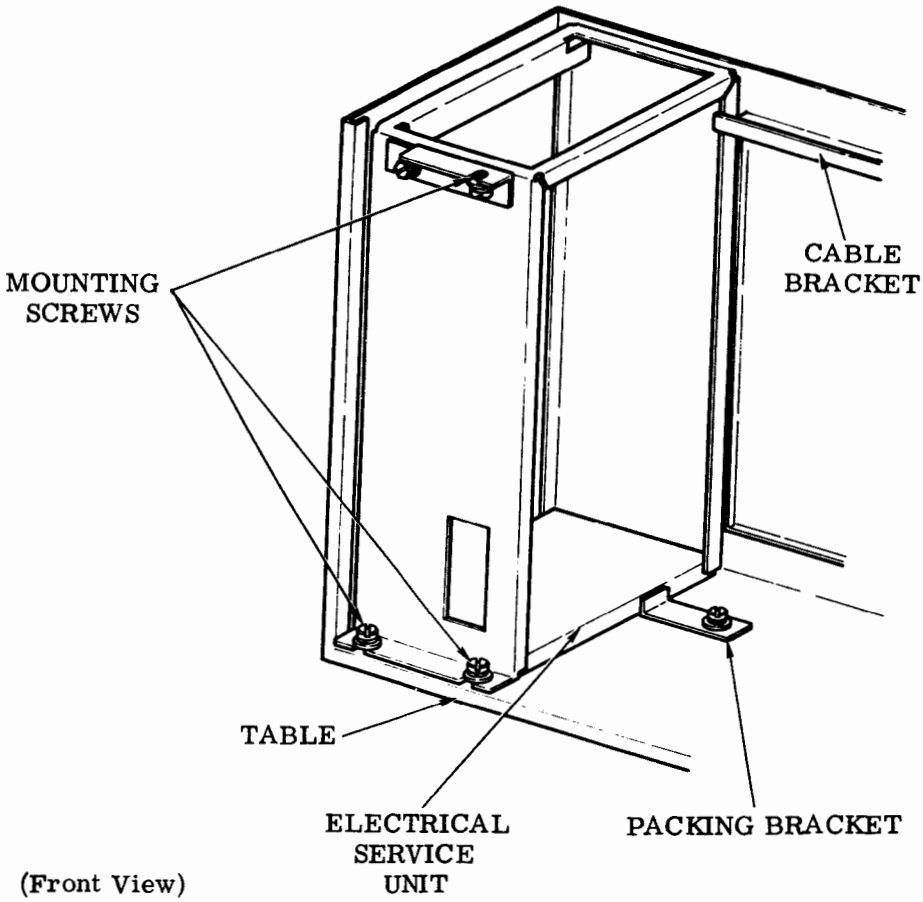


Figure 21- Electrical Service Unit Mounted in the Table

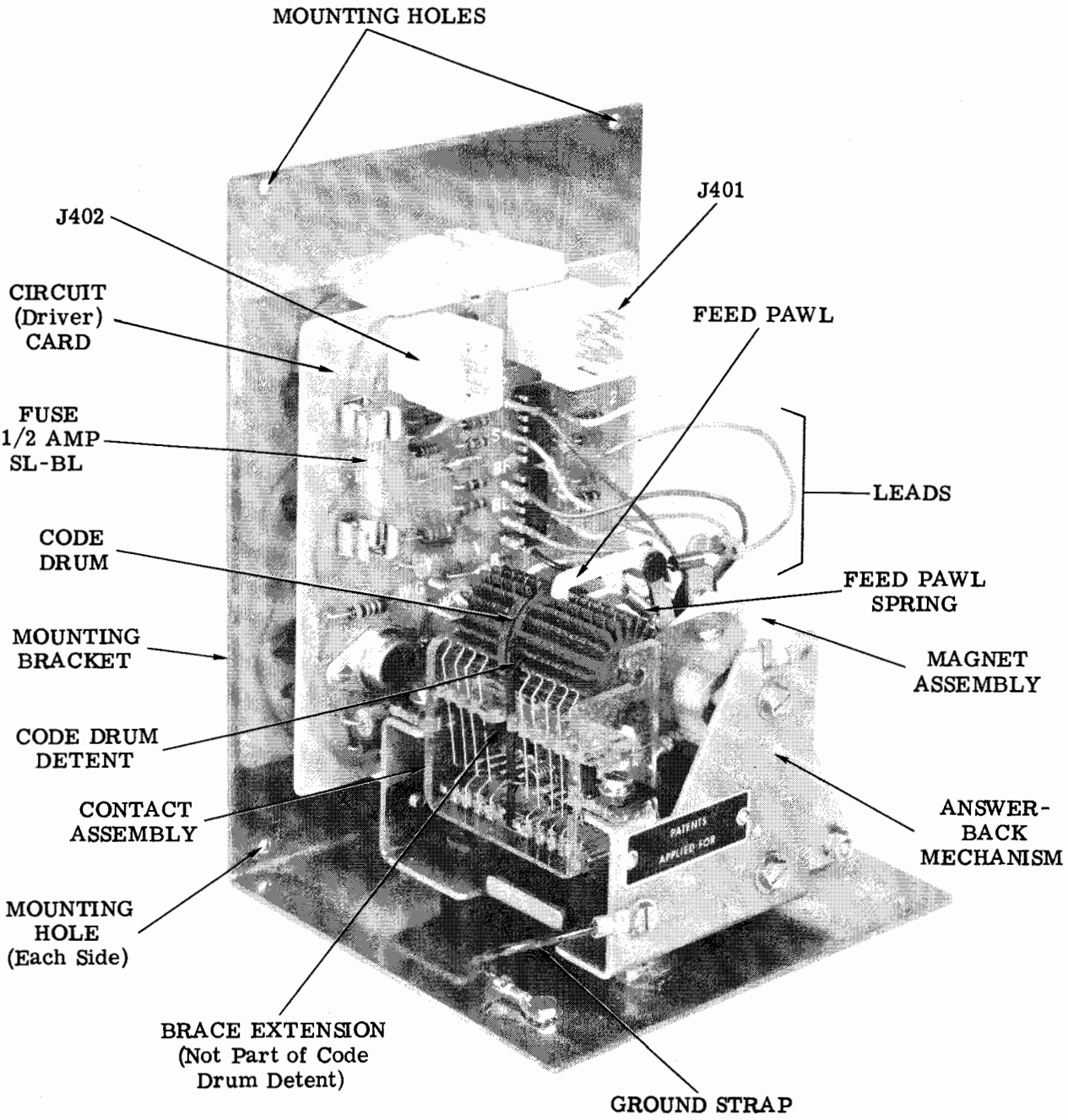
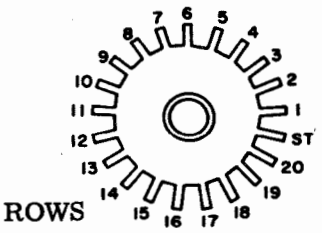


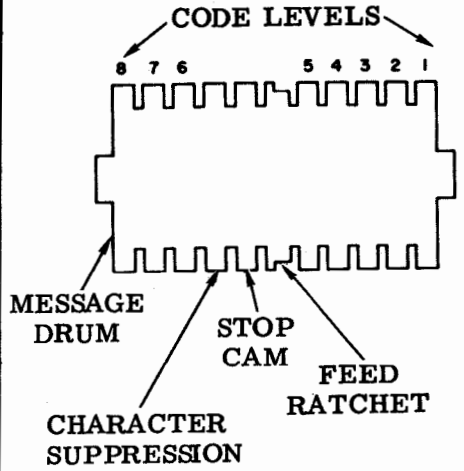
Figure 22 - 37 Answer-Back Assembly

	CODE LEVELS REMOVE TINES
NUL	NONE
SOH	1-8
STX	2-8
ETX	1-2
EOT	3-8
ENQ	1-3
ACK	2-3
BEL	1-2-3-8
BS	4-8
HT	1-4
LF	2-4
VT	1-2-4-8
FF	3-4
CR	1-3-4-8
SO	2-3-4-8
SI	1-2-3-4
DLE	5-8
DC1	1-5
DC2	2-5
DC3	1-2-5-8
DC4	3-5
NAK	1-3-5-8
SYN	2-3-5-8
ETB	1-2-3-5
CAN	4-5
EM	1-4-5-8
SUB	2-4-5-8
ESC	1-2-4-5
FS	3-4-5-8
GS	1-3-4-5
RS	2-3-4-5
US	1-2-3-4-5-8
SPACE	6-8
!	1-6
"	2-6
#	1-2-6-8
$	3-6
%	1-3-6-8
&	2-3-6-8
' (APOS)	1-2-3-6
(	4-6
)	1-4-6-8
*	2-4-6-8
+	1-2-4-6
,	3-4-6-8
-	1-3-4-6
.	2-3-4-6
/	1-2-3-4-6-8
0	5-6
1	1-5-6-8
2	2-5-6-8
3	1-2-5-6
4	3-5-6-8
5	1-3-5-6
6	2-3-5-6
7	1-2-3-5-6-8
8	4-5-6-8
9	1-4-5-6
:	2-4-5-6
;	1-2-4-5-6-8
<	3-4-5-6
=	1-3-4-5-6-8
>	2-3-4-5-6-8
?	1-2-3-4-5-6

	CODE LEVELS REMOVE TINES
@	7-8
A	1-7
B	2-7
C	1-2-7-8
D	3-7
E	1-3-7-8
F	2-3-7-8
G	1-2-3-7
H	4-7
I	1-4-7-8
J	2-4-7-8
K	1-2-4-7
L	3-4-7-8
M	1-3-4-7
N	2-3-4-7
O	1-2-3-4-7-8
P	5-7
Q	1-5-7-8
R	2-5-7-8
S	1-2-5-7
T	3-5-7-8
U	1-3-5-7
V	2-3-5-7
W	1-2-3-5-7-8
X	4-5-7-8
Y	1-4-5-7
Z	2-4-5-7
[	1-2-4-5-7-8
\	3-4-5-7
]	1-3-4-5-7-8
^	2-3-4-5-7-8
_	1-2-3-4-5-7
`	6-7
a	1-6-7-8
b	2-6-7-8
c	1-2-6-7
d	3-6-7-8
e	1-3-6-7
f	2-3-6-7
g	1-2-3-6-7-8
h	4-6-7-8
i	1-4-6-7
j	2-4-6-7
k	1-2-4-6-7-8
l	4-5-6-7
m	1-3-4-6-7-8
n	2-3-4-6-7-8
o	1-2-3-4-6-7
p	5-6-7-8
q	1-5-6-7
r	2-5-6-7
s	1-2-5-6-7-8
t	3-5-6-7
u	1-3-5-6-7-8
v	2-3-5-6-7-8
w	1-2-3-5-6-7
x	4-5-6-7
y	1-4-5-6-7-8
z	2-4-5-6-7-8
{	1-2-4-5-6-7
|	3-4-5-6-7-8
}	1-3-4-5-6-7
~	2-3-4-5-6-7
DEL	1-2-3-4-5-6-7-8

MESSAGE DRUM





Note 1: Remove tine — marking. Leave tine — spacing.

Note 2: The eighth code level must be coded as shown for even parity operation.

Figure 23 - Answer-Back Drum ASCII 67 Code Chart

B. Encoding Answer-Back Drum

4.31 The answer-back code drum is contained within the answer-back unit (Figure 22). If detailed coding instructions are unavailable, the instructions outlined in this part describe the method used to encode the drum.

4.32 Remove the code drum by deflecting the brace extension downward, lifting the feed pawl, and withdrawing code drum.

CAUTION: DO NOT OVEREXTEND FEED PAWL SPRING.

4.33 Encoding the answer-back drum is performed by removing tines on the drum. The rows of tines are numbered and embossed on the right end of the code drum. The elements in each row are identified in Figure 23, which also describes the answer-back drum code chart used for encoding the drum.

4.34 Determine the number of characters in the answer-back message (not to exceed 20). Consider any control functions such as CARRIAGE RETURN and LINE FEED (these codes must be followed by a delete code). The control functions should precede and follow the text of the answer-back message. Refer to Figure 24 and determine number of message cycles per revolution of the code drum. One, two, or three stop cam positions are broken out depending on what operation cycle is desired.

4.35 Encode the code drum, referring to Figures 23, 24, and 25. Character sequence starts on row following home (ST) position. En-

Message Characters	Cycles	Remove Stop Cam Element From
Up to 6	3	Rows 6, 13, & 20
7 thru 9	2	Rows 6 & 17
10 thru 20	1	Row 6

Figure 24 - Message Cycles per Revolution of Code Drum

Cycles	Home Position (Leave all tines in)	Start Message On	Usable Rows	Remove Character Suppression Tine From
3	Row ST	Row 1	1 thru 6	Unused rows
	Row 7	Row 8	8 thru 13	Unused rows
	Row 14	Row 15	15 thru 20	Unused rows
2	Row ST	Row 1	1 thru 9	Row 10 and unused rows
	Row 11	Row 12	12 thru 20	Unused rows
1	Row ST	Row 1	1 thru 20	Unused rows

Figure 25 - General Coding Instructions

code sequence starts with row 1 for the first character or control function and proceeds to higher numbered rows (counterclockwise). Remove tine for a MARK element and leave tine for a SPACE element. Repeat message sequence if more than one cycle is used. To remove tines and stop cam element(s), use a long-nose pliers or a small screwdriver and proceed as follows.

(1) Grasp tine firmly with long-nose pliers, crack, remove tine.

(2) Place the tip of a small screwdriver at the base of tine in adjacent row; lean top of blade against tine to be removed; and break tine off by leaning against it (be sure the base of screwdriver touches the base of the adjacent tine).

4.36 Remove suppression tine from unused rows in any given cycle, see Figure 24. Do not remove any tines in the ST position or other home position.

4.37 With the answer-back drum properly coded, return the drum to the unit as follows.

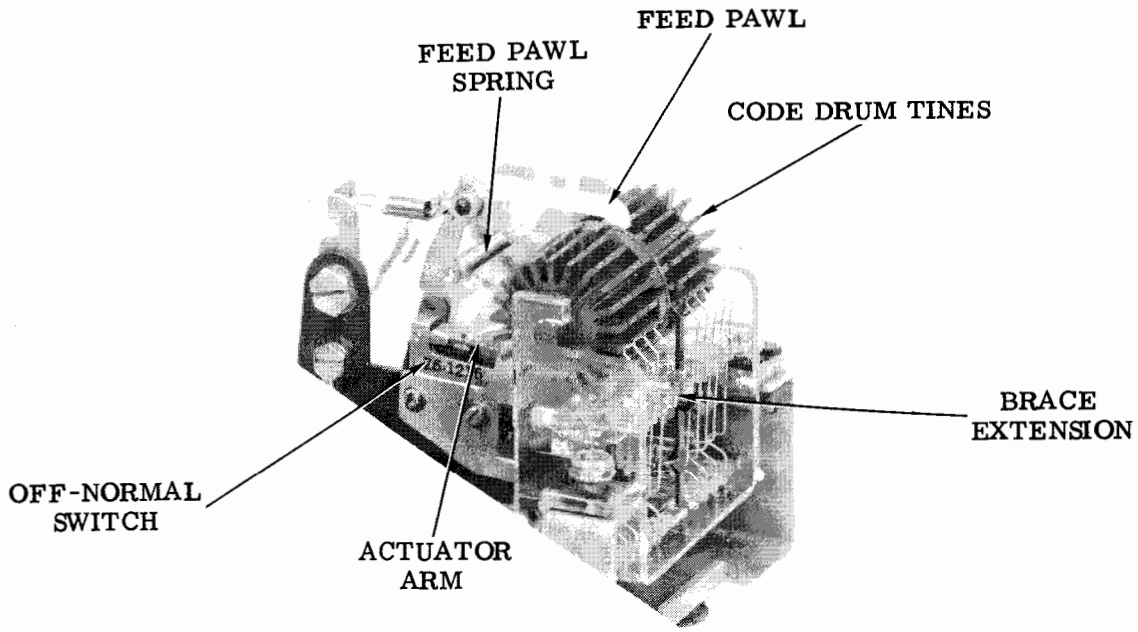
(1) Lift feed pawl while depressing the switch actuator arm (Figure 26) and insert the code drum.

Note: The code drum will not seat properly in the plastic block if installed backwards.

(2) Place the ST position (row with all tines left in) opposite contact wires.

(3) Restore brace extension to normal position.

4.38 The installation of a different code drum in the answer-back unit may cause abnormal operation and require readjusting the answer-back unit. If adjustments are necessary, refer to Section 574-325-700TC for information concerning the following adjustments:



(Left Front View)

Figure 26 - Answer-Back Mechanism

(a) Contact Block

(b) Feed Pawl Advanced

(c) Feed Pawl Relaxed

(d) Off-Normal Switch

(e) Feed Bail Spring

5. CHECKOUT

LOCAL AND ON-LINE TESTS

5.01 The ASR Set can be tested in local and on-line modes by performing designated tests. Local tests can be performed without a data set (6.01). Simulated on-line testing requires wiring connections on the electrical service unit. Refer to the testing information outlined in troubleshooting section, 574-302-300TC.

TABLE A

37 - ASR CIRCUIT CARD ARRANGEMENT

CARD	POSITION
Local Distributor	101
Line Distributor	102
Send Control	103
Bid (option)	104
Mode Control	105
Receive Control	107
Channel Control	109
Receiving Device	305
Keyboard Control Character Counter (option)	401
Counter Control (option)	403
Alarms and Automatic Control	404
Two-Color Control (option)	405

5.02 Connect the power cable from the utility strip to the ac receptacle. Check all the cable connections and proceed with the local and on-line tests.

Note: Check the ordering information to determine the features and options before conducting the checkout. The tests contained in the troubleshooting section cover all available features and options.

TABLE B

CIRCUIT CARD LOCATION — RT MODULE

CARD	POSITION
Receiving Device	107
Punch Feed-out	207
Reader Driver	208
Punch Code Detection	210

6. INTERFACE UNITS

6.01 The output of the electrical service unit terminates with an EIA standard interface connector. The connector extends all related power, control, and signal line circuits to an appropriate data set or line interface units. The data set or line interface units can be installed in the right pedestal of the table.

6.02 As a final check make sure that:

(a) All connections made to facilitate the local and on-line circuit tests have been removed.

(b) The power switch on the utility strip is in the NORMAL ON position.

When the interface units are properly installed and the power cord is connected to a 115-volt source, the automatic send-receive station is ready for operation.