

37 RECEIVE-ONLY (RO)

TELETYPEWRITER SET

INSTALLATION

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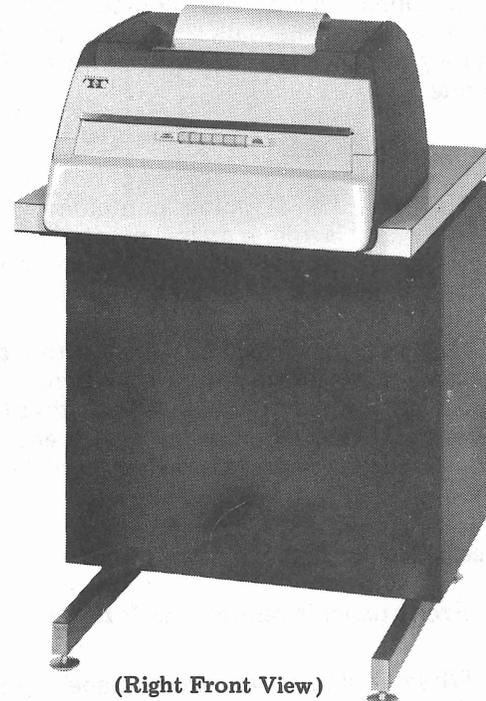
1. GENERAL

1.01 This section provides a general assembly procedure for the 37 Receive-Only (RO) Teletypewriter Set (Figure 1). Since this is a general revision and the previous issue did not receive general distribution, marginal arrows normally used to indicate changes or additions have been omitted. A station is a self-contained arrangement which is completely assembled and

tested by the service center prior to shipment. It is intended to be shipped completely assembled, with the exception of the typing unit, which is shipped in a separate carton.

1.02 The installation of this set requires supplementary information found in the appropriate station installation section.

1.03 The customer must furnish a standard 3-wire grounding type, 106 to 129 volt, 59.55 to 60.45 Hz ac power receptacle (to accept a plug equipped with two parallel blades and a round-shaped grounding pin). All components of a station should be connected to the same fused circuit.



(Right Front View)

Figure 1 - 37 RO Teletypewriter Set

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

1.04 The 37 RO Set can be installed in a floor space 22-1/2 inches wide and 24 inches deep. Maximum height, with the printer cover lids open, is 43 inches. Space for the operator must be added to the depth dimension.

Note: If the two-compartment table is used, floor space required is 32-1/2 inches wide. Space for sprocket feed paper supply and form accumulator must be added to the depth space requirement.

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

1.06 Refer to the appropriate station practice and wiring diagrams for information concerning the station, circuit cards, and auxiliary equipment.

2. UNPACKING

2.01 The 37 RO Set is shipped on a pallet strapped down and covered with a container fastened to the pallet. The sets that are shipped a long distance are packaged in a standard wooden crate.

TABLE AND CONSOLE

2.02 Unpack the shipping container carefully and avoid marring paint finishes. Observe all special unpacking instructions associated with the shipping container.

2.03 Remove the fasteners that secure the table/console to the pallet. Place the table/console in the assembly area. Check that the set is level and rests squarely on all feet. If adjustment is necessary, turn the hex-head bolts attached to the feet, to level the cabinet.

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 (push up) the spring stop on the underside of the table.

- (3) Open the panel and align its top edge with the front edge of the table. Disconnect ground strap between front panel and table, if present.

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

Cover Removal

2.05 Open the cover (Figure 3) by depressing the two cover latches (one on each side) and lift the front cover upward. If desired, remove the cover from the pan by the following procedure.

- (1) Disconnect the cover ground strap and the optional copylight connector.
- (2) 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.
- (3) 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.
- (4) Slide the cover to the right, disengaging the hinges.
- (5) Place the cover aside until the final assembly.

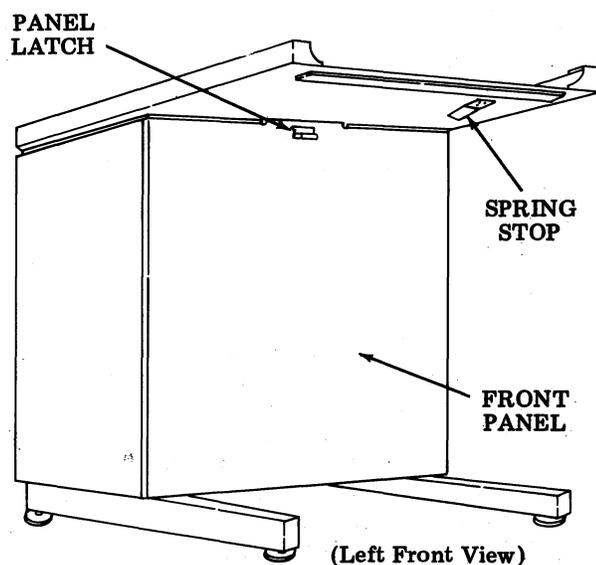


Figure 2 - 37 Teletypewriter Table

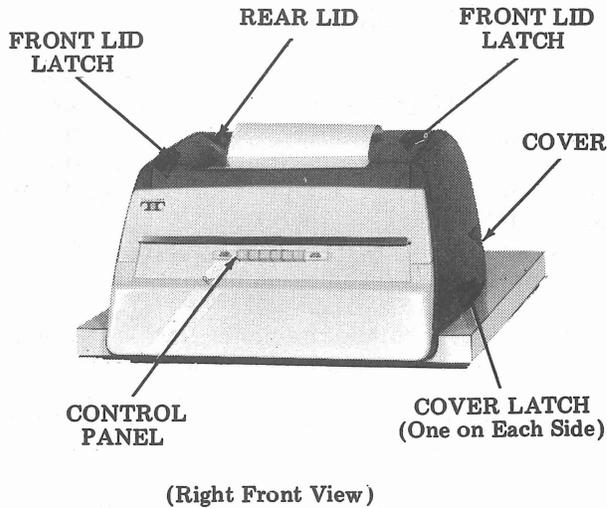


Figure 3 - Cover Assembly

TYPING UNIT

2.06 Unpack the typing unit (Figure 4) from its carton and remove all packing material. The typing unit may be lifted by grasping the right side of the front plate and the rear curve under the left side plate. Do not lift any other way. Place the typing unit on its front plate on a flat surface allowing the shipping pallet to hang over the edge. Remove the shipping pallet from the typing unit. Remove the four shipping fasteners clipped to the feet of the typing unit. Remove the wire retainers that secure the print hammer assembly and the retraction reset slide, if

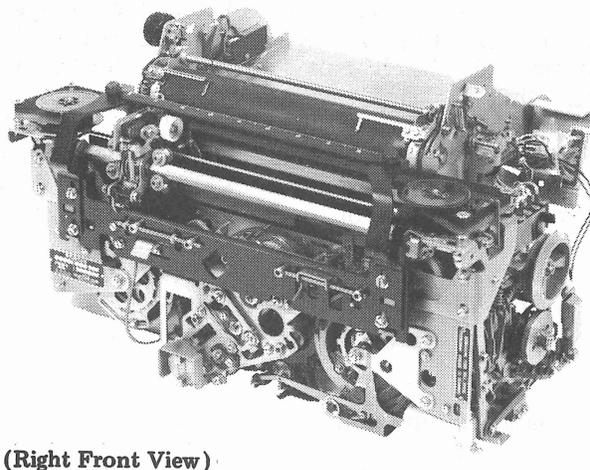


Figure 4 - 37 Typing Unit.

present. 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.

CAUTION: INSTALL THE TYPEBOX IN THE TYPING UNIT BEFORE APPLYING POWER TO AVOID THE POSSIBILITY OF DAMAGING PARTS.

2.07 Perform the following three operations before applying power to the Model 37 typing unit.

(1) View the typing unit from the back over the trip shaft mechanism, and check to insure that the suppression slide is not hung-up over the suppression bail. The correct position is indicated in Figure 5. If corrective action is required, push down on suppression bail and move the suppression slide towards the front of the unit. Hold slide in and release the bail.

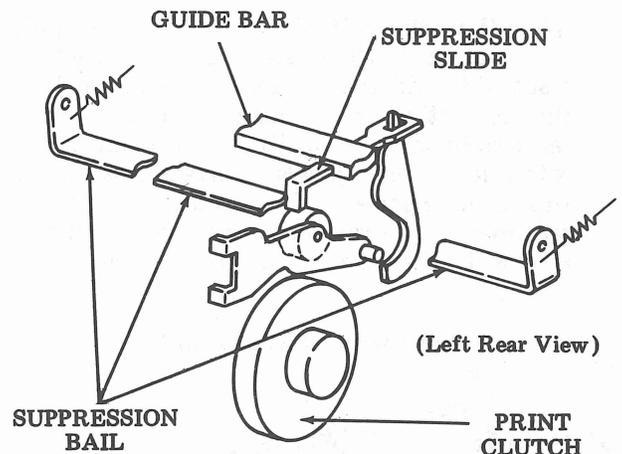


Figure 5 - Suppression Slide and Bail

(2) View the typing unit from the top and check the alignment of the four horizontal positioning clutch trip levers with the codebar forks. The correct alignment is shown in Figure 6. If corrective action is required, lift up the codebar fork and position the Number 4 horizontal trip lever into the fork. Perform the same corrective action for all four forks and trip levers. It may be necessary to loosen front plate mounting screws in order to reposition trip levers. Tighten mounting screws.

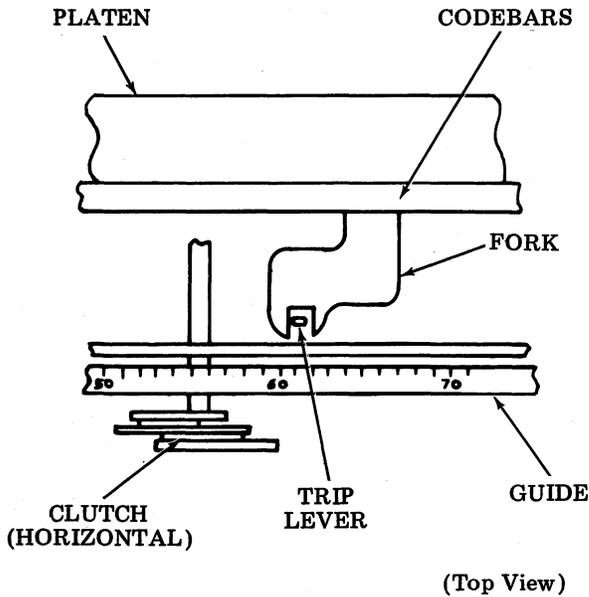


Figure 6 - Codebar Fork and Clutch Trip Lever Alignment

(3) View the left side of the typing unit and check the position of the retraction reset slide and the retraction check pawls in the retraction mechanism. The retraction reset slide shall be positioned in front of the retraction check pawls. Correct position is shown in Figure 7. If corrective action is required, move retraction reset slide out and around to the front of the check pawl.

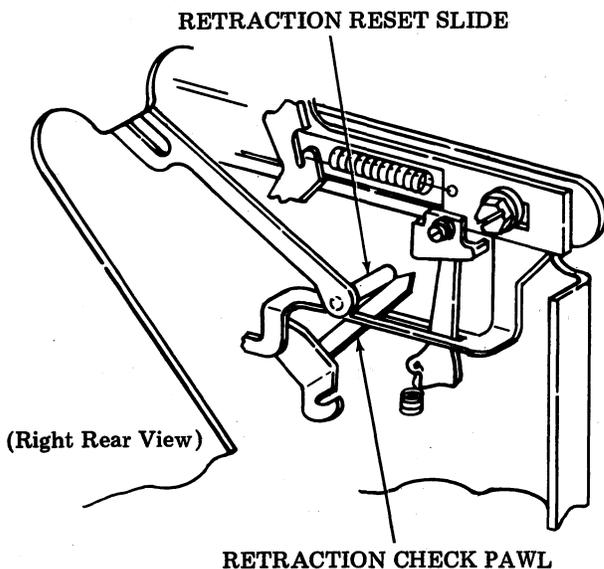


Figure 7 - Retraction Slide and Check Pawl

3. LUBRICATION

3.01 Lubricate the typing unit per Section 574-320-704 before placing in service. Make visual inspection of the unit 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 for the unit are as follows:

- (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 (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 unit.

3.04 After 300 to 500 hours of operation, the unit should be relubricated to make sure all operating points receive lubrication. At this time all clutch gaps should be rechecked to insure that the gaps have not opened up after all parts have seated themselves. Refer to typing unit adjustment Section 574-320-703 for requirements. Thereafter, the unit should be relubricated every 1500 hours of operation or 6 months, whichever occurs first.

4. ASSEMBLY PROCEDURE

TYPING UNIT

A. Base Mobilization

4.01 Remove the 6-40 screws from the two base retainers (Figure 8). **DO NOT REMOVE THE BASE RETAINERS.** Remove packing detail between base and pan. When

packing detail is removed, vibration mounts will push the base against the base retainers. When installed, the weight of the typing unit will restore clearance between base and base retainers.

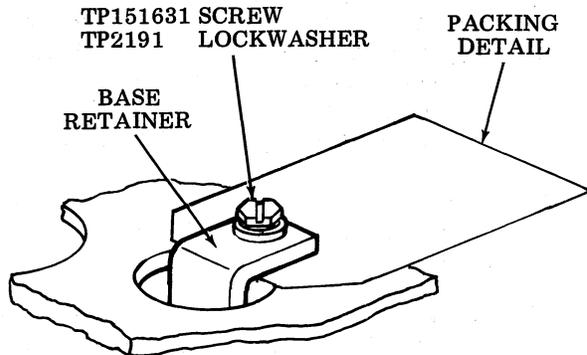


Figure 8 - Base Retainers

B. Typing Unit Mounting

4.02 The typing unit may be lifted by grasping the right side of the front plate and the rear curve under the left side plate. Do

not lift any other way. Loosen the control panel mounting screws (one at each end) and rotate the panel forward away from the typing unit mounting area. Carefully lower the typing unit over the locating studs and intermediate gear assembly on the base. Rotate the motor fan to be sure the main shaft driven gear and the intermediate gear mesh properly.

4.03 Install the four typing unit mounting screws, starting with the left rear. Rotate the control panel back to its original position. Tighten control panel mounting screws.

C. Interrelated Adjustments

4.04 The motor intermediate gear assembly (Figure 9), and the typing unit 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.

4.05 Intermediate Gear Assembly: Remove the gear guard and check for a backlash of 0.004 inch between the typing unit driven gear

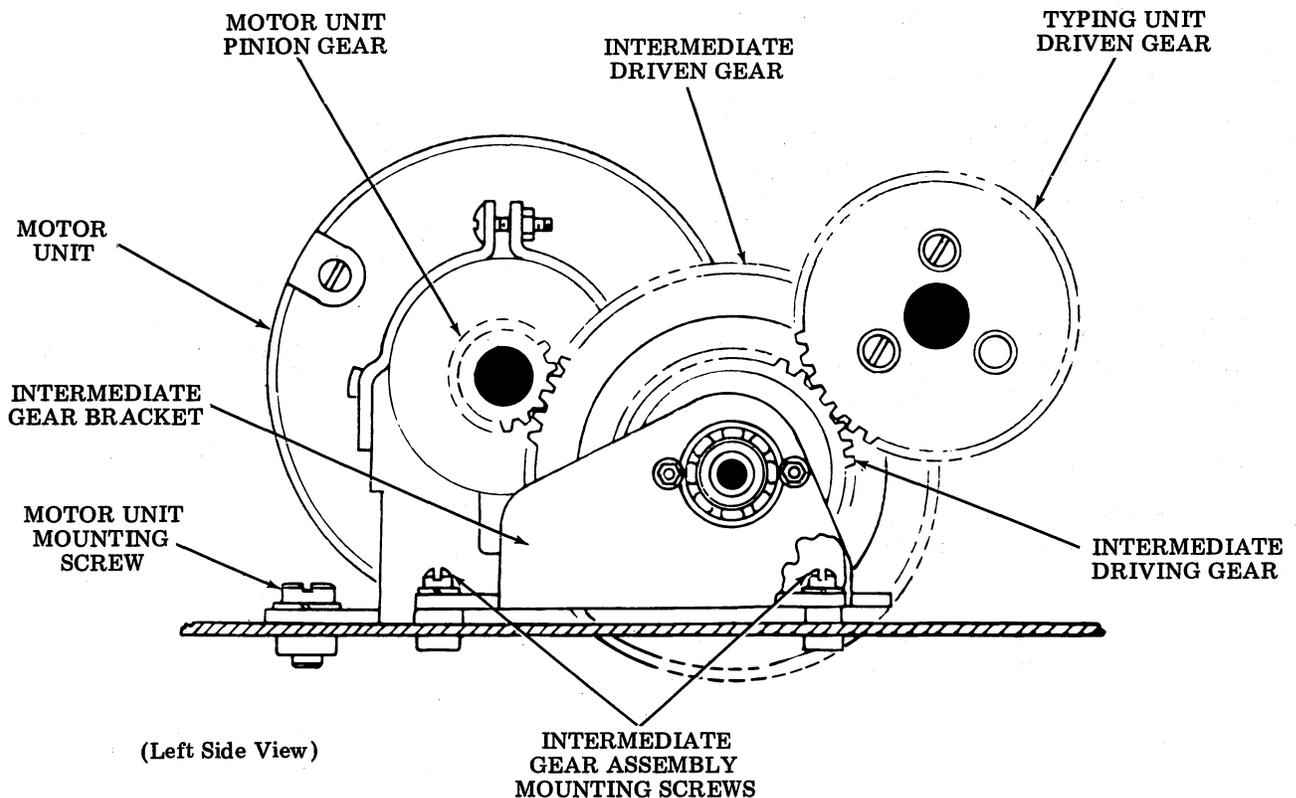


Figure 9 - Intermediate Gear Assembly

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and intermediate driving gear. This backlash has a tolerance from 0.004 inch minimum to 0.008 inch maximum, at a point in the gear rotation where the backlash is at a minimum. 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. Using the pry points at the rear of the intermediate gear assembly, adjust the assembly from front to rear until the requirement is met. Tighten the three intermediate gear assembly mounting screws. Proceed with the next step to provide backlash between motor pinion and intermediate gear assembly.

4.06 Motor Unit: Check for a backlash of 0.004 inch between the motor pinion and intermediate driven gear as outlined in the preceding 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 and adjust to meet the requirement. Tighten the five motor mounting screws.

4.07 Paper Advance and Local Return: With the control panel in its normal position and the typing unit secure to the base, loosen the two eccentric screw locknuts friction tight. Rotate the eccentric until the gap between the paper advance bail and/or the local return bail is 0.060 inch minimum (Figure 10). Tighten both nuts. Move the print hammer carriage to the right and check the local carriage return operation. The paper advance operation must be checked under power.

CAUTION: IF WIDE PLATEN TYPING UNIT IS USED, GAP BETWEEN THE ECCENTRIC AND LOCAL RETURN BAIL MUST BE 0.040 TO 0.060 INCH.

D. Cable Connection

4.08 Attach the typing unit cable connectors, P306 and P308, to the rear of the typing unit.

4.09 Check the cable connections to insure that they are closed and fitted properly.

E. Ribbon Routing

4.10 To route the new teletypewriter ribbon, straighten the spring bail on the ribbon spool shaft, and lift the spool off the

shaft. Remove the packaging, and reel out enough ribbon to reach the empty spool, (plus an additional three turns on the spool). Refer to Figure 11 and perform the following routing procedure:

Note: Use only nylon ribbon on the typing unit. A new ribbon is supplied with the unit. Additional ribbons can be obtained under the following Bell System numbers:

61215 Nylon Ribbon — Black
62215 Nylon Ribbon — Red/Black

- (1) Place the new ribbon spool on the left shaft, turning the spool until the spool shaft pin is engaged.
- (2) Thread the ribbon over the rollers and through both ribbon guide levers. Keep the ribbon free of twists and in line between the two ribbon guide levers and between the fingers of the ribbon guide.
- (3) Position the reversing eyelet, near the ribbon end, between the shaft of the empty spool and the ribbon guide lever.
- (4) Attach the ribbon to the empty spool and install the spool on the shaft.

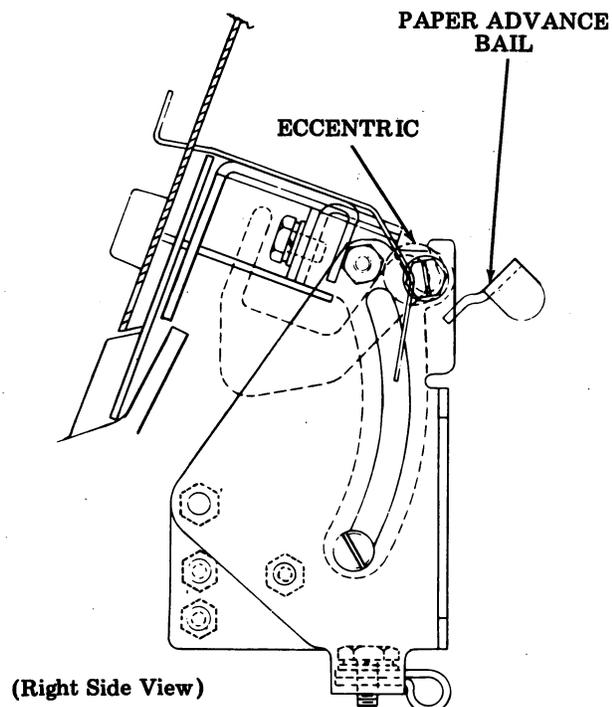


Figure 10 - Control Panel Button Adjustment

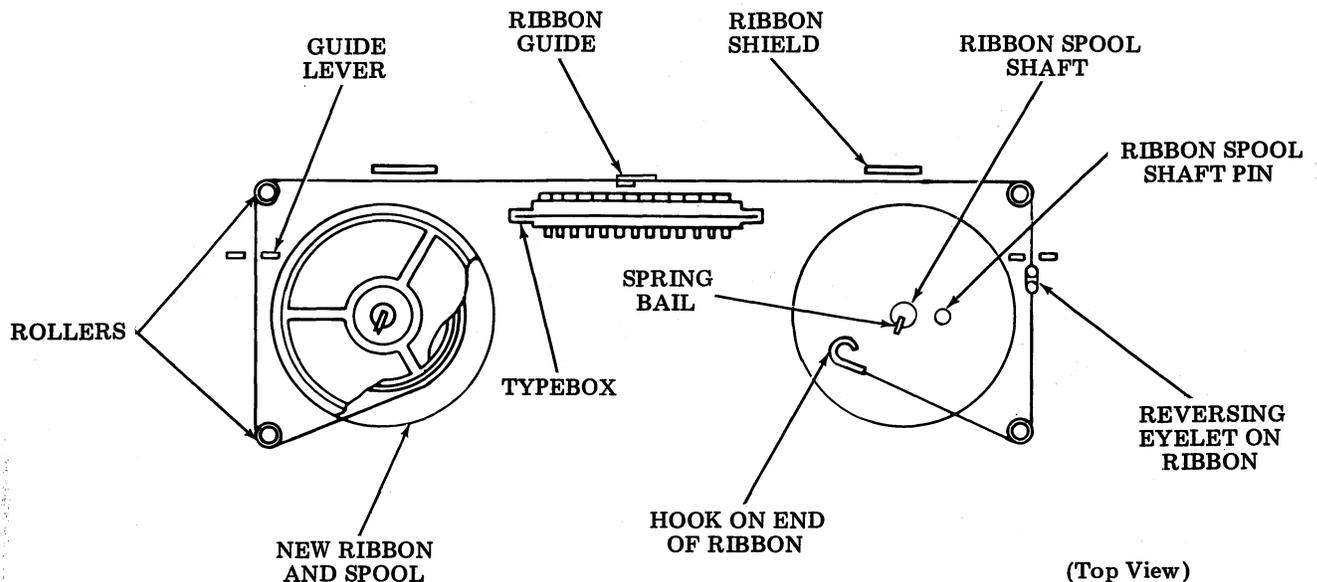


Figure 11 - Ribbon Routing

(5) Turn the ribbon spool on the shaft until the spool shaft pin is engaged. Lower the two spring bails.

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

F. Cover Replacement

4.11 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. Connect the cover balancing arm.
- (3) If equipped with copylights, attach the copylight connector to the receptacle mounted on the right rear corner of the cover and attach the ground tab terminal.
- (4) Close the cover; the latches on the left and right side will snap into place.

G. Paper Guide and Wear Strip

4.12 On sprocket feed typing units, remove the wear strip tied to the print position indicator. Install the wear strip to the rear of the cover assembly using the mounting hardware supplied with the wear strip (Figure 12).

4.13 On typing units equipped with reverse line feed, it is necessary to install a paper guide to the lid assembly. It is to be secured with the same mounting hardware as the existing guide (Figure 12).

4.14 Remove the mounting hardware from the existing guide. Position the bottom surface of the reverse line feed paper guide against the flange of the rear lid. Place the open slots over the weld screws and replace the mounting hardware.

H. Paper Assembly and Routing

4.15 Open the front lid of the cover by depressing the two latch releases located on top of the lid. Pivot the front lid upward and toward the front and pivot the rear lid upward and toward the rear.

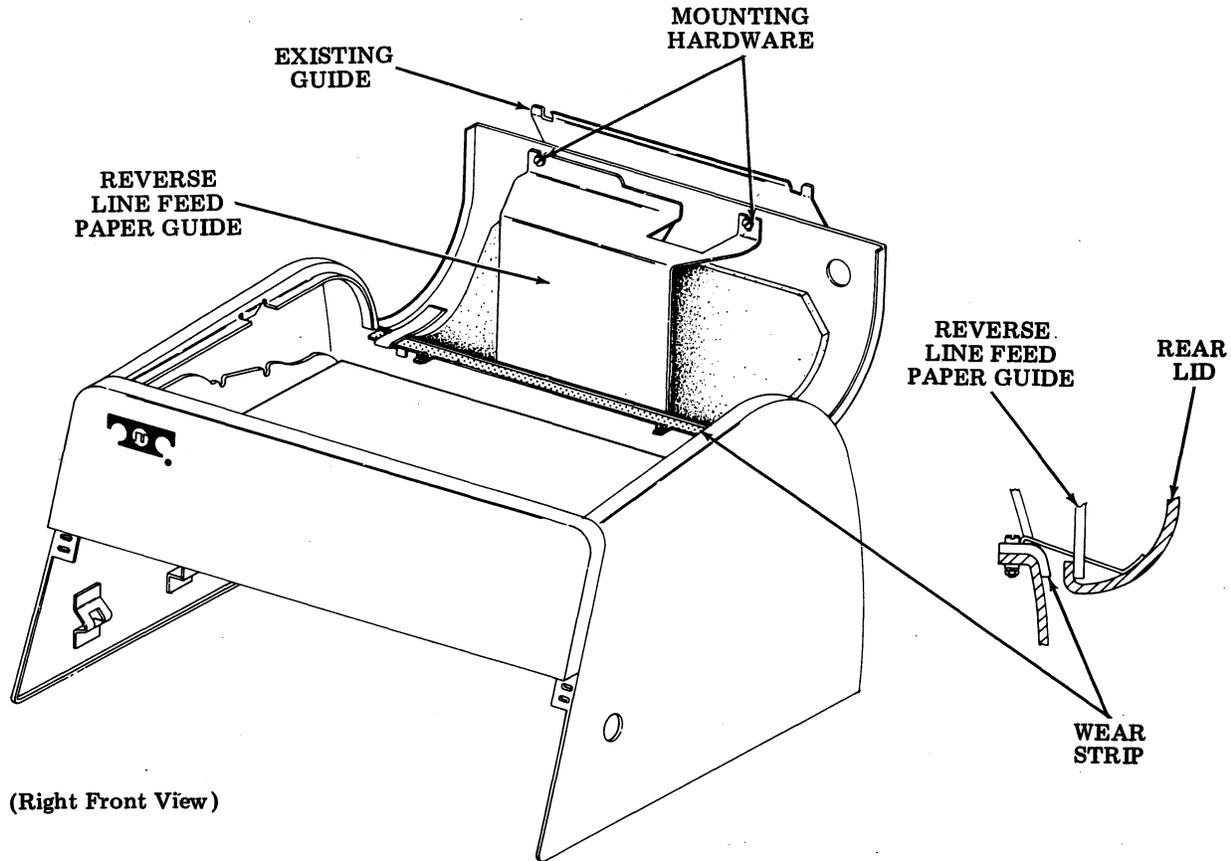


Figure 12 - Paper Guide and Wear Strip

4.16 Insert the paper spindle into the paper roll and install the paper roll into the spindle blocks. Flip the paper release lever on the top of the right side plate towards the rear of the typing unit to release the pressure rollers. Route the paper over the paper straightener between the two paper guides (Figure 13). Lift the paper finger on the platen and insert the paper between the platen and the pressure rollers. Flip the paper release lever towards the front of the typing unit to hold the paper between the platen and pressure rollers. Turn the handwheel to move the paper through the platen assembly, leaving one foot of loose paper. Lower the paper fingers on the platen assembly and hold the paper towards the front of the typing unit. 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.

4.17 When installing paper in sprocket feed typing units, feed the paper through the slot in the cover between the wear strip and the rear lid (Figure 12). Route the paper over the

paper tray under the paper-out lever, and under the platen (Figure 14). Depress the paper finger release lever on the right side plate of the typing unit. Position the print carriage at a point in the middle of the platen to prevent the paper from jamming on the ribbon guide as it is fed under the platen. Turn the handwheel while engaging the holes in the paper with the feed pins at both ends of the platen. Feed several inches of paper out of the typing unit. Depress the paper fingers until they are latched.

4.18 Turn the typing unit handwheel to advance the paper to the first line of the next form. Set the form-out disc to the stop position. Close the rear lid, then the front lid, positioning the paper between the window and the paper guide.

I. Form-Out Positioning

4.19 Before operating a set equipped with vertical tabulation and/or form-out, check to see if the required stops for the form

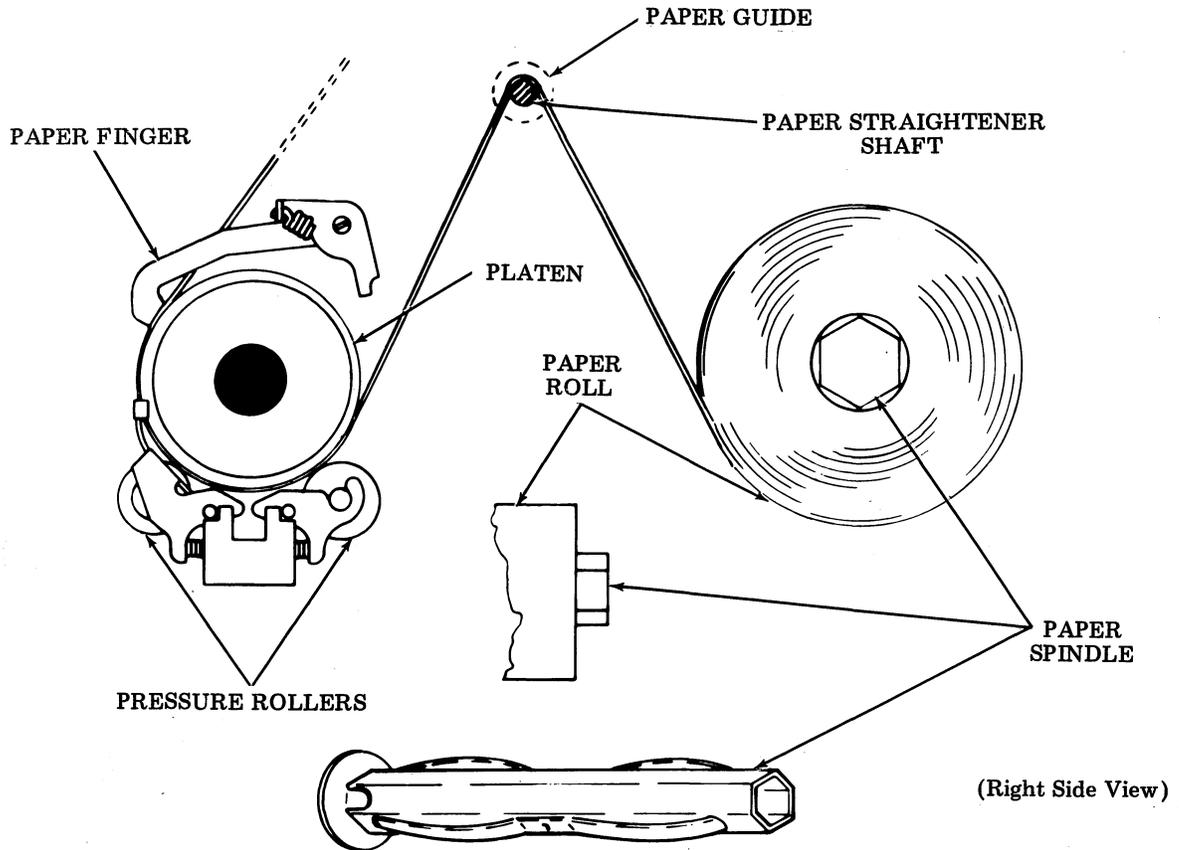


Figure 13 - Paper Routing Assembly - Friction Feed

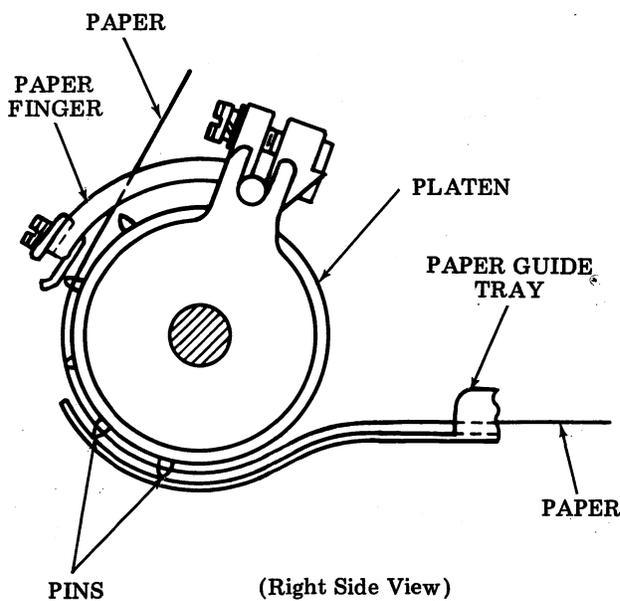


Figure 14 - Paper Routing Assembly - Sprocket Feed

length have been added. All units are shipped from the factory with only the stop for the longest form length. Extra form-out stops are provided in a bag tied to the typing unit. They are to be installed if a form length shorter than the wheel length was ordered. For example: on an 8-, 4-, 2-inch wheel (Figure 15), if an 8-inch form is used, no action is necessary. If a 4-inch form is used, a form-out stop must be inserted in the slot marked 4. For 2-inch forms, insert form-out stops in slot marked 4 and slot marked 2.

4.20 To install form-out stop, remove vertical tab stop from appropriate slot by lifting it up and rotating it out of the slot. Replace the vertical tab stop with the form-out stop by raising the spring slightly and sliding the stop into the slot.

CAUTION: DO NOT OVEREXTEND SPRING; IT MAY SNAP AND DROP STOPS INTO TYPING UNIT. DO NOT DROP STOPS INTO TYPING UNIT WHEN INSERTING THEM INTO SLOT.

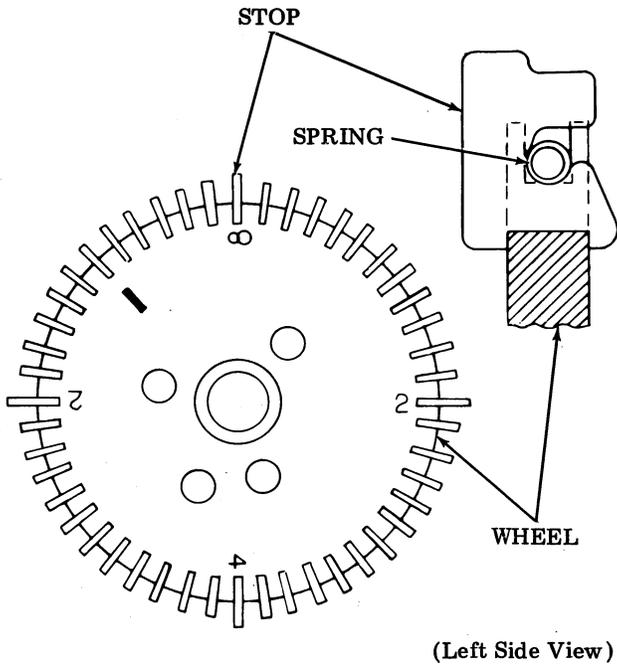


Figure 15 - Form-Out Positioning

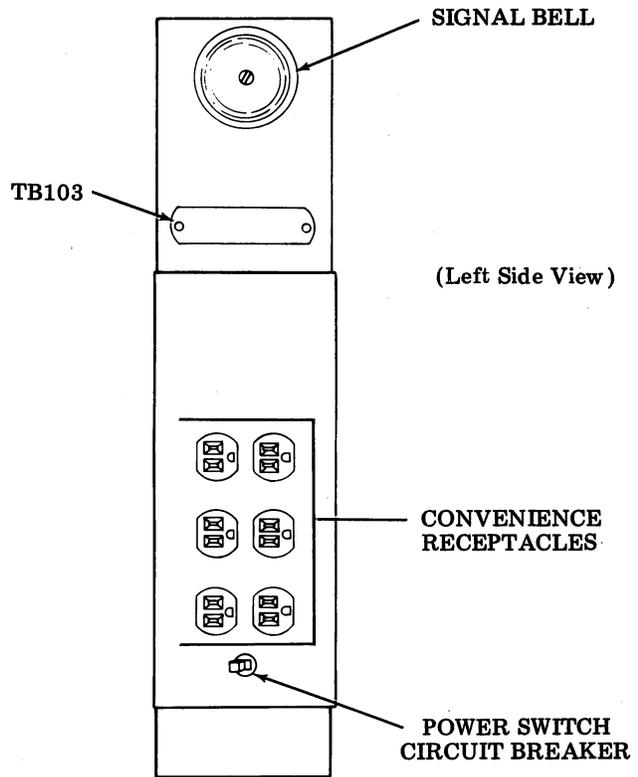


Figure 16 - 37 Utility Strip

ELECTRICAL SERVICE UNIT

4.21 The utility strip (Figure 16), if used, and the electrical service unit (ESU) are exposed when the front panel on the table is removed (2.04). To gain easier access to the circuit cards and answer-back unit (optional), the electrical service unit may be removed from the table. To remove the ESU, refer to Figure 17 and proceed as follows.

- (1) Remove the three mounting screws on the front panel, one on the top and two on the bottom.
- (2) Unhook the ESU cables from the cable bracket located on the upper back portion of the table.
- (3) Slide the ESU to the right, clearing the left edge of the table and pull the unit from the table.

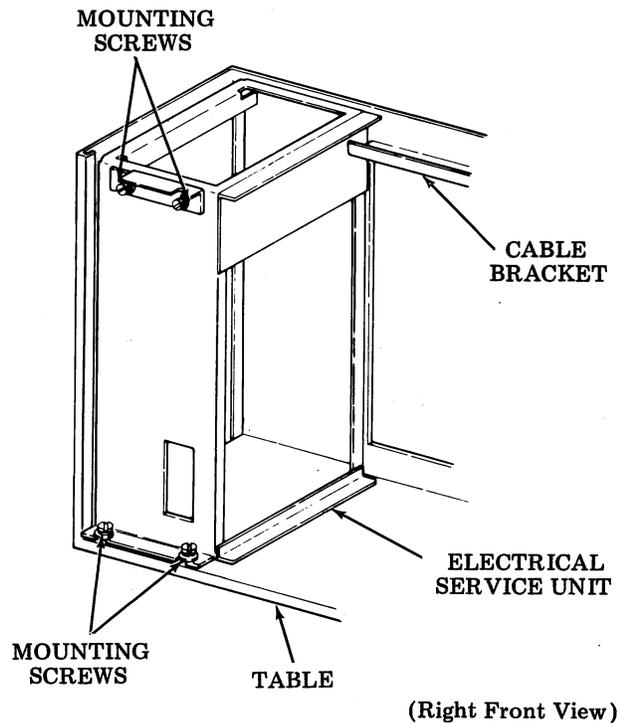


Figure 17 - ESU Mounted in Table

4.22 Refer to the ordering information to check for the desired circuit cards (options and variable features) that are installed in the electrical service units.

A. Answer-Back Unit (Option)

4.23 Remove the packing material from the answer-back unit (Figure 18) 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.

4.24 Code the answer-back drum as outlined in the following paragraphs. Use the ASCII (American National Standard Code for Information Interchange) shown in Figure 19. 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 17). Route the power supply cable from the utility strip (Figure 16) through the oblong opening in the base of the table. **DO NOT CONNECT THE POWER CABLE AT THIS TIME.** If equipped with a utility strip, check to insure that the power cable from the electrical service unit is connected to an outlet on the utility strip.

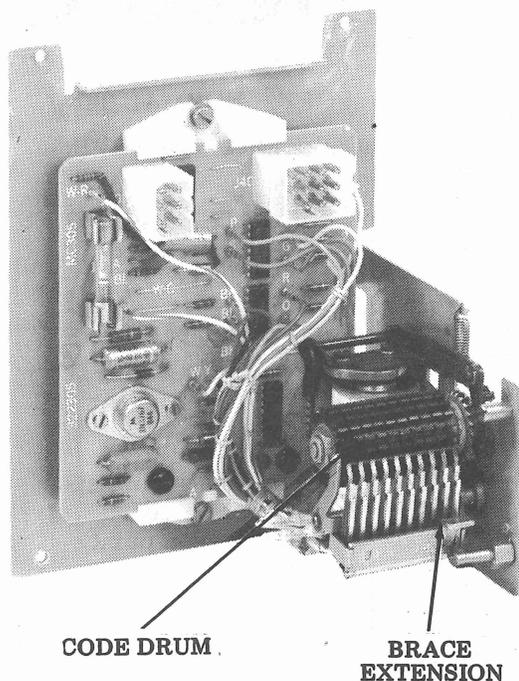


Figure 18 - Answer-Back

B. Encoding Answer-Back Drum

4.25 The answer-back drum is contained within the answer-back unit (Figure 18). If detailed coding instructions are unavailable, the instructions outlined here describe the method used to encode the drum.

4.26 Remove the code drum by deflecting the brace extension downward and withdrawing the code drum.

4.27 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 shown in Figure 19, which is the answer-back code drum chart used for encoding the drum.

4.28 Any message may be selected that does not contain more than 20 characters including spaces. The coding of the drum normally begins with carriage return, new line and delete. This arrangement insures that the message will appear at the beginning of a line on the distant printer, and that overprinting of the message will not occur on carriage return.

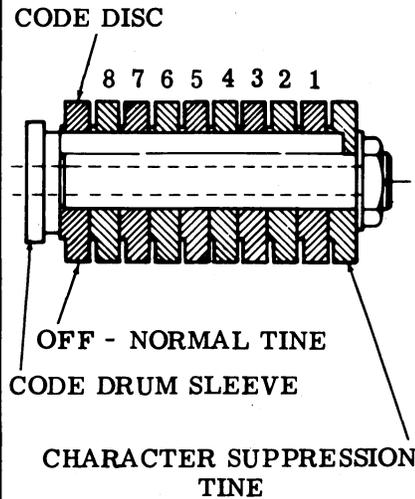
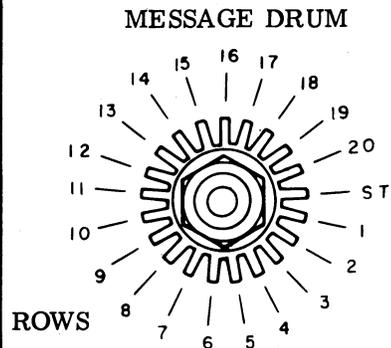
4.29 Two methods are provided for coding character sequences shorter than 20 characters. One row of tines on the code drum controls a character suppression contact, which may be programmed to blind the answer-back transmission at the end of a predetermined number of characters. In this mode of operation, the unit must continue to operate through its full cycle of 21 steps (although blinded after the predetermined number of characters). Another row of tines on the code drum assembly controls the off-normal contact, and may be programmed for partial cycle. The length of the cycle is determined by the number of off-normal tines broken out. The code drum will stop in the row that has the off-normal tine remaining on the drum. It will continue stepping through any row that has the off-normal tine broken out. The row in which the code drum stops will not be read, and consequently should not be coded. For example, the coded message may contain the following numbers of characters:

- 1-Cycle Operation — 20 Characters
- 3-Cycle Operation — 6 Characters

4.30 Code the drum in a clockwise direction (viewing from the numbered end) beginning with the row numbered 1. Each row is

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	CODE LEVELS REMOVE TINES		CODE LEVELS REMOVE TINES
NUL	1-2-3-4-5-6-7-8	@	1-2-3-4-5-6
SOH	2-3-4-5-6-7	A	2-3-4-5-6-8
STX	1-3-4-5-6-7	B	1-3-4-5-6-8
ETX	3-4-5-6-7-8	C	3-4-5-6
EOT	1-2-4-5-6-7	D	1-2-4-5-6-8
ENQ	2-4-5-6-7-8	E	2-4-5-6
ACK	1-4-5-6-7-8	F	1-4-5-6
BEL	4-5-6-7	G	4-5-6-8
BS	1-2-3-5-6-7	H	1-2-3-5-6-8
HT	2-3-5-6-7-8	I	2-3-5-6
LF	1-3-5-6-7-8	J	1-3-5-6
VT	3-5-6-7	K	3-5-6-8
FF	1-2-5-6-7-8	L	1-2-5-6
CR	2-5-6-7	M	2-5-6-8
SO	1-5-6-7	N	1-5-6-8
SI	5-6-7-8	O	5-6
DLE	1-2-3-4-6-7	P	1-2-3-4-6-8
DC1	2-3-4-6-7-8	Q	2-3-4-6
DC2	1-3-4-6-7-8	R	1-3-4-6
DC3	3-4-6-7	S	3-4-6-8
DC4	1-2-4-6-7-8	T	1-2-4-6
NAK	2-4-6-7	U	2-4-6-8
SYN	1-4-6-7	V	1-4-6-8
ETB	4-6-7-8	W	4-6
CAN	1-2-3-6-7-8	X	1-2-3-6
EM	2-3-6-7	Y	2-3-6-8
SUB	1-3-6-7	Z	1-3-6-8
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FS	1-2-6-7	\	1-2-6-8
GS	2-6-7-8]	2-6
RS	1-6-7-8	^	1-6
US	6-7	-	6-8
SPACE	1-2-3-4-5-7	\	1-2-3-4-5-8
!	2-3-4-5-7-8	a	2-3-4-5
"	1-3-4-5-7-8	b	1-3-4-5
#	3-4-5-7	c	3-4-5-8
\$	1-2-4-5-7-8	d	1-2-4-5
%	2-4-5-7	e	2-4-5-8
&	1-4-5-7	f	1-4-5-8
(APOS)	4-5-7-8	g	4-5
(1-2-3-5-7-8	h	1-2-3-5
)	2-3-5-7	i	2-3-5-8
*	1-3-5-7	j	1-3-5-8
+	3-5-7-8	k	3-5
,	1-2-5-7	l	1-2-5-8
-	2-5-7-8	m	2-5
.	1-5-7-8	n	1-5
/	5-7	o	5-8
0	1-2-3-4-7-8	p	1-2-3-4
1	2-3-4-7	q	2-3-4-8
2	1-3-4-7	r	1-3-4-8
3	3-4-7-8	s	3-4
4	1-2-4-7	t	1-2-4-8
5	2-4-7-8	u	2-4
6	1-4-7-8	v	1-4
7	4-7	w	4-8
8	1-2-3-7	x	1-2-3-8
9	2-3-7-8	y	2-3
:	1-3-7-8	z	1-3
;	3-7	<	3-8
<	1-2-7-8	:	1-2
=	2-7	}	2-8
>	1-7	~	1-8
?	7-8	DEL	NONE



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

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

Figure 19 - Answer-Back Code Drum Chart

provided with an off-normal tine, a character suppression tine, and 8 tines for 8-level operation. A row is coded by breaking off the designated tines. The chart in Figure 19 indicates which tines are to be removed for a particular character or cycle. Leave tine for a MARK element and remove tine for a SPACE element. To remove a tine, grasp it firmly and twist it until it breaks off. Tine tool TP161868 may also be used in a similar manner.

4.31 Unused character rows may be coded either for delete, null, or some other character, or the character suppression tine may be left in these rows. This prevents any character from being transmitted as the drum steps through these rows to the stop position. Should an encoding error be made, the character suppression

tine must be left in the row with the erroneous characters. The next row shall be encoded with the correct character. Nothing will be transmitted from the "erased" row. With the individual code discs used on this drum assembly, an encoding error can also be corrected by replacing a code disc or discs.

5. CHECKOUT

5.01 Connect the power cable to an ac receptacle. Using the appropriate RO station installation section as a guide, connect the P303 connector to the appropriate controlling device and check the set for proper local operation.

5.02 Check that the set is level and rests squarely on its feet.