37 ANSWER-BACK UNIT

ADJUSTMENTS

CONTENTS

1. GENERAL

1.01 This section provides the mechanical requirements and adjustments for the late design Model 37 answer-back unit (Figure 1), which are required for field maintenance. The drum feed mechanism on the late design unit is located at the end of the code drum. The drum feed mechanism on the early design answer-back unit is located in the middle of the code drum.

1.02 The tools and test equipment required to check the clearances, spring tensions, and make the adjustments are not supplied with the equipment, but are listed separately in Section 570-005-800.

1.03 The adjustments are arranged in a sequence that should be followed if a complete readjustment of the unit is undertaken.

1.04 A complete adjusting procedure should be read before attempting to make the adjustments. The adjusting illustrations indicate the locations of clearances, positions of moving parts, and angles at which spring scales should be applied. After an adjustment is completed, tighten any nuts or screws that may have been loosened. Springs which do not meet requirements and for which no adjustment procedure is given should be discarded and replaced with new springs.

1.05 Reference made to front or rear, left or right, or top or bottom applies to the answer-back unit as viewed with the code drum and contacts to the front. In this position the magnet rests in the right rear corner.

1.06 For information concerning the removal of the answer-back unit from the electrical service unit, refer to removal and replacement of components Section 574-301-702 for

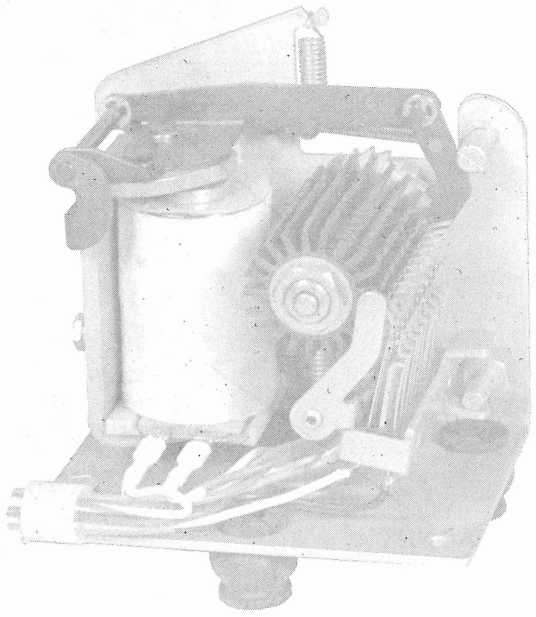


Figure 1 - 37 Answer-Back Unit

Prepared for American Telephone and Telegraph Company by Teletype Corporation

the KSR Sets and Section 574-302-702 for the ASR Sets.

CAUTION: DISCONNECT ALL AC POWER CORDS BEFORE PERFORMING ANY PROCEDURE.

1.07 A tab is provided on the contact assembly to facilitate the removal and replacement of the code drum assembly. To remove the code drum assembly:

(a) Deflect the tab downward to rotate the contacts away from the code drum assembly.

(b) Slide the code drum assembly off its shaft.

To replace the code drum assembly:

(a) Deflect the tab downward to rotate the contacts away from the code drum shaft.

(b) Slide the code drum assembly onto the shaft and rotate the code drum assembly to properly seat the key on the ratchet in the slot in the code drum assembly.

1.08 Use twill jean cloth to clean gold contacts. The code reading contacts should be cleaned after approximately 1500 hours of set operation or 6 months of service, whichever occurs first. Use the following procedure: (1) Deflect the tab on the contact assembly downward to open the contacts, (2) drop a strip of twill jean between the contacts, (3) close the contacts, (4) draw the twill jean between the contacts, and (5) reopen the contacts and withdraw the twill jean. This procedure will prevent small fibers from the edges of the twill jean strip from becoming lodged between the contacts.

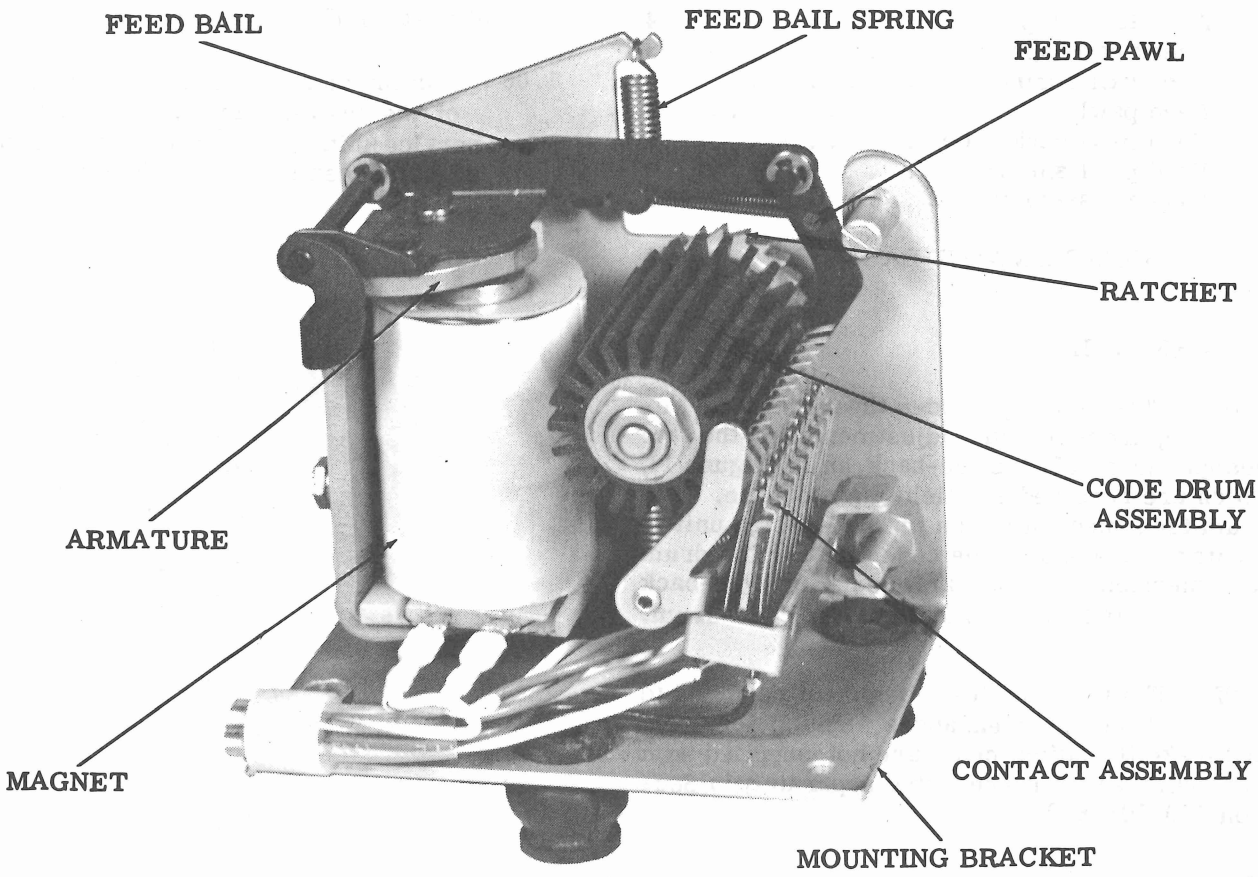
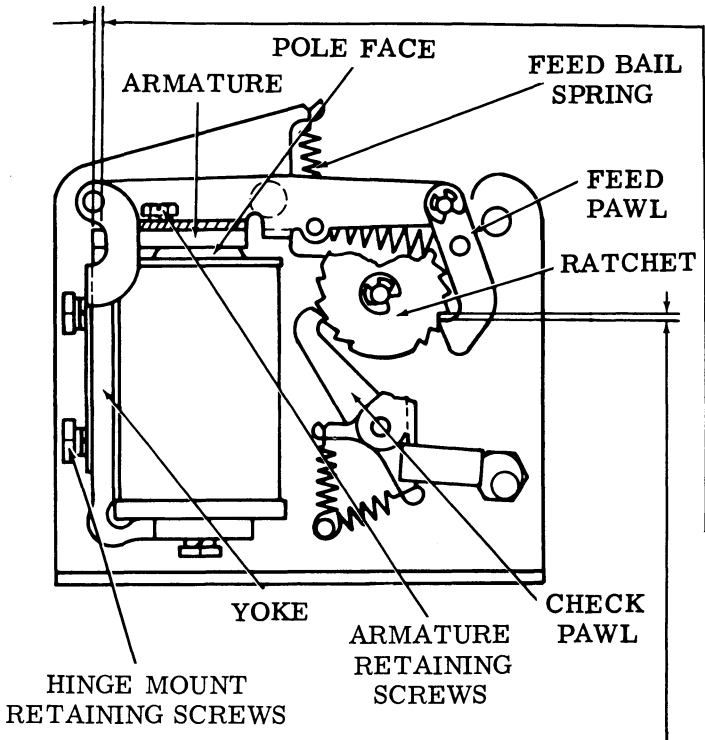
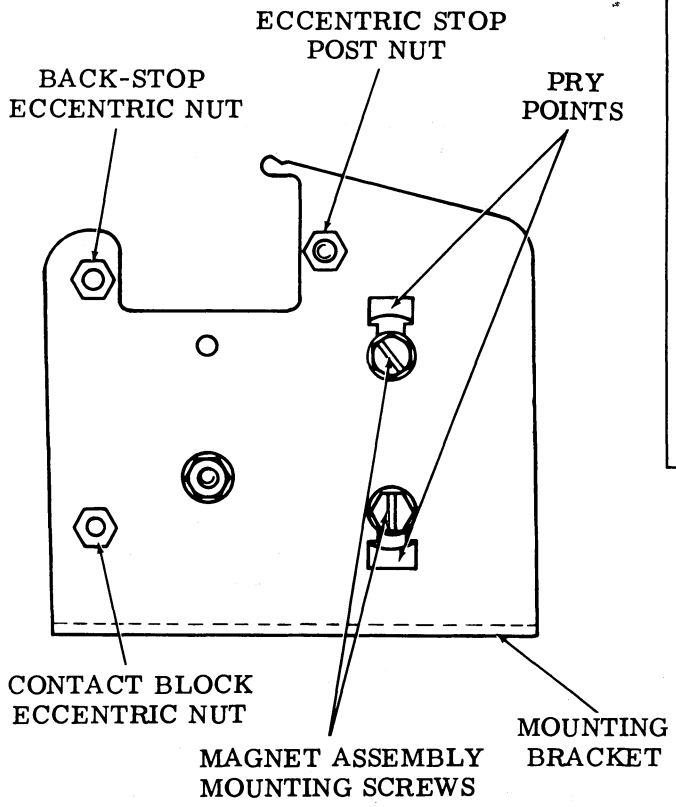


Figure 2 - 37 Answer-Back Unit

2. BASIC UNIT

2.01 Feed Mechanism





MAGNET ASSEMBLY

Note: This adjustment is made with the magnet assembly removed from the unit and need only be made if the assembly has been dismantled.

(1) Requirement

Armature should be flat against the pole face when depressed as gauged by eye.

To Adjust

Loosen the two hinge mount retaining screws. Push the armature flat against the pole face and tighten the screws.

(2) Requirement

With the armature depressed, it should be centrally positioned from left to right and flush to under flush to the rear edge of the yoke.

To Adjust

Loosen the two armature retaining screws. Position the armature so that it is centrally located and flush to under flush with rear edge of yoke. Tighten the screws. Check adjustment.

FEED PAWL

To Check

Remove feed bail spring. Hold armature flat against the pole face and take up clearance between the ratchet and check pawl.

Requirement

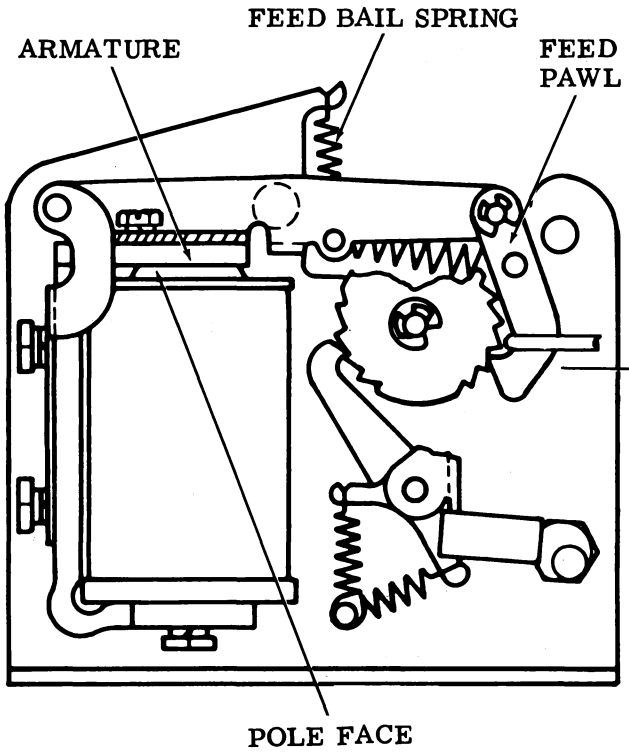
Clearance between feed pawl and ratchet should be

Min 0.020 inch---Max 0.030 inch.

To Adjust

With magnet assembly mounting screws friction tight and armature held flat against the pole face, position magnet assembly by use of pry points to meet requirement. Tighten mounting screws. Recheck adjustment at several points around the ratchet and refine if necessary. Replace feed bail spring.

2.02 Feed Mechanism (continued)



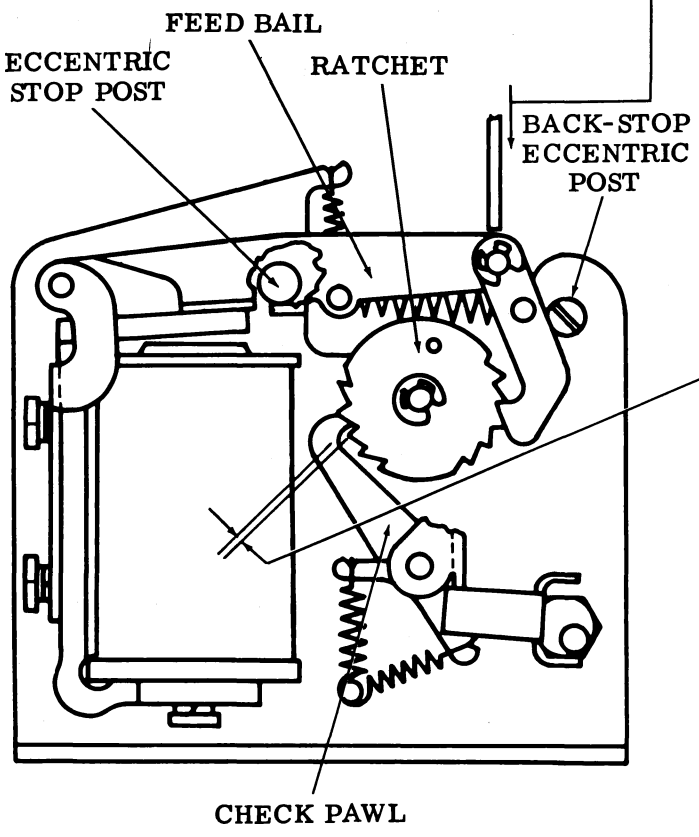
FEED PAWL SPRING

To Check
Hold armature flat against pole face.

Requirement
Min 3-1/4 oz---Max 4-1/4 oz
to start the feed pawl moving.

FEED BAIL SPRING

Requirement
Min 18 oz---Max 24 oz
to start the feed bail moving.



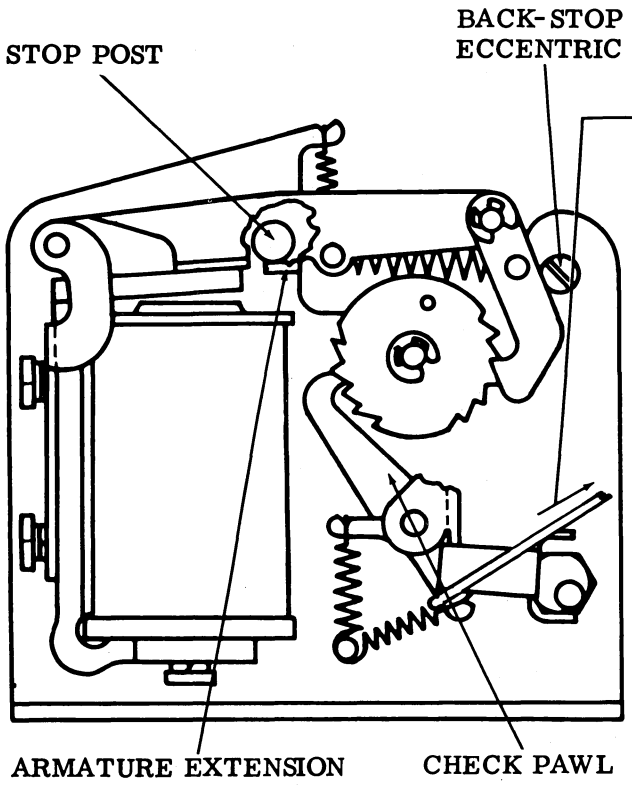
ARMATURE STOP

To Check
De-energize magnet and take up clearance between feed pawl and ratchet.

Requirement
Clearance between check pawl and ratchet should be
Min some---Max 0.008 inch

To Adjust
Loosen nut on back-stop eccentric post friction tight and rotate post so that it does not interfere with this adjustment. Then loosen the nut on the eccentric stop post friction tight. Take up clearance between the feed pawl and the ratchet and rotate the eccentric stop post to meet the requirement, keeping the high part of the eccentric toward the front of the unit. Tighten the nut. Recheck adjustment at several points around the ratchet and refine if necessary. Make the FEED PAWL BACK-STOP adjustment.

2.03 Feed Mechanism (continued)



CHECK PAWL SPRING

Requirement
Min 2 oz---Max 3 oz to start the check pawl moving.

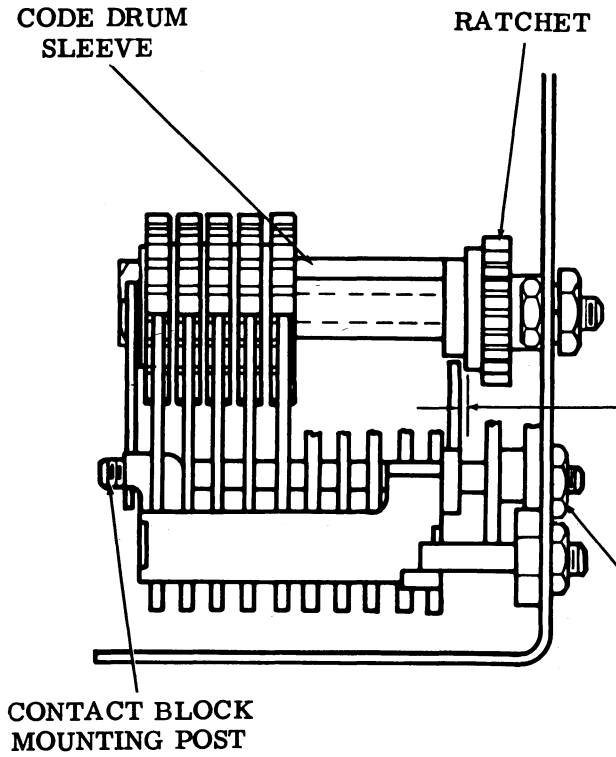
FEED PAWL BACK-STOP

To Check
De-energize magnet and hold armature extension against its stop post.

Requirement
There should be none to a barely perceptible amount of counter-clockwise rotation of the ratchet.

To Adjust
Loosen the nut on the back-stop eccentric post friction tight and rotate post to meet requirement, keeping the high part of the eccentric toward the bottom of the unit. Tighten the nut. Recheck adjustment at several points around the ratchet and refine if necessary.

2.04 Contact Assembly



CODE DRUM

To Check
Take up clearance between code drum sleeve and ratchet.

Requirement
Clearance between the contact block extension and the end flange on the code drum sleeve should be
Min 0.006 inch---Max 0.012 inch

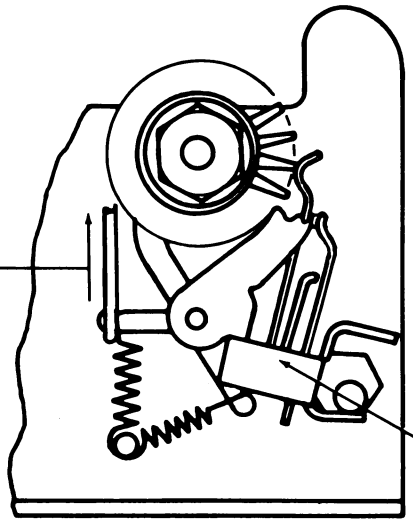
To Adjust
Loosen the nut on the contact block mounting post friction tight and rotate post with a hex wrench to meet requirement. Tighten the nut and recheck adjustment.

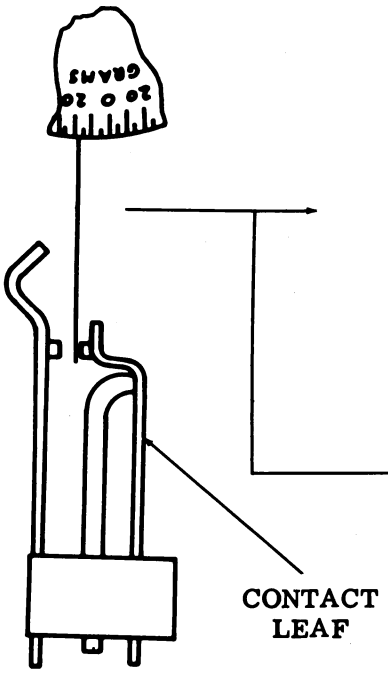
2.05 Contact Assembly (continued)

CONTACT BLOCK ASSEMBLY SPRING

To Check
Remove the code drum.

Requirement
To start the contact block assembly moving, it should require
Min 3 lb---Max 6 lb



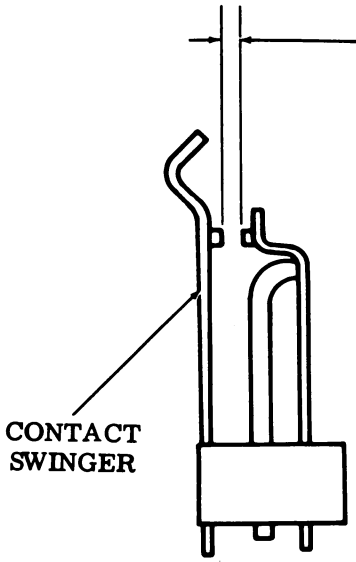


CONTACT LEAF TENSION

To Check
Remove the code drum.

Requirement
To just move the contact leaf it should require
Min 20 grams---Max 35 grams

To Adjust
Bend contact leaf with contact bending tool.



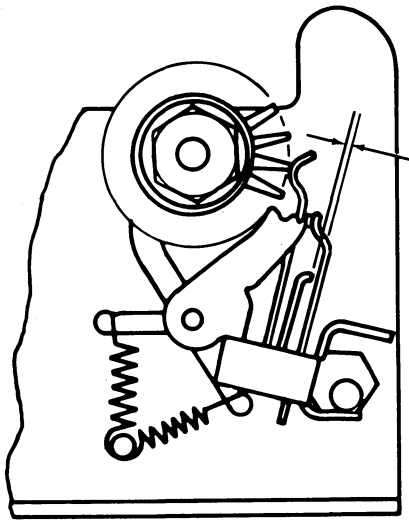
CONTACT GAP-OPEN

To Check
Remove code drum.

Requirement
Clearance between the contact swinger and the contact leaf should be
Min 0.035 inch---Max 0.060 inch

To Adjust
Bend the contact swinger at its base with tool TP172060 with an X stamped on the handle.

2.06 Contact Assembly (continued)



CONTACT GAP-CLOSED

To Check
Contact swingers in mark condition or sensing a row of tines on the code drum.

Requirement
There should be a clearance of Min some---Max 0.020 inch between the contact leaf and the contact stiffener.

To Adjust
Loosen the contact block eccentric nut friction tight. Rotate the eccentric to meet requirement.

3. ENCODING ANSWER-BACK DRUM

3.01 The answer-back code drum assembly is contained within the answer-back unit (Figure 2).

3.02 Removal and replacement of the code drum assembly is outlined in 1.07.

3.03 Any message desired may be selected that does not contain more than 20 characters including spaces. The coding of the drum normally begins with carriage return and new line. 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. 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

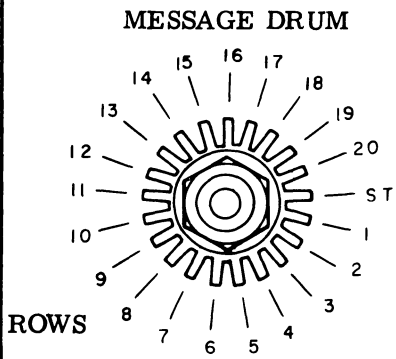
3.04 Code the drum in a clockwise direction (viewing from the numbered end) beginning with the row numbered 1. Each row is provided with an off-normal tine, a character suppression tine, and 8 tines for 8-level operation. A row is coded by breaking off the designated tines. The chart in Figure 3 indicates 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 tines, use a long-nose pliers and proceed as follows:

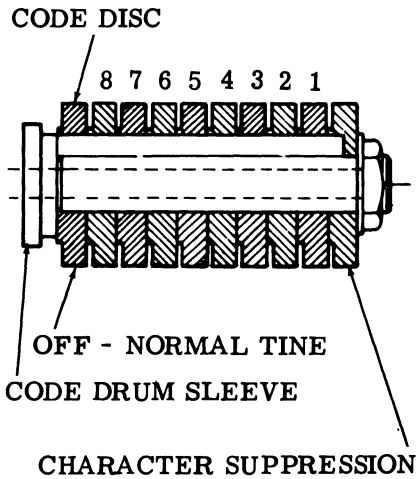
(1) Grasp tine firmly with long-nose pliers, twist approximately 180° to crack, and remove tine. Tine tool TP161686 may also be used in a similar manner.

Unused character rows may be coded either for Delete, Null, or some other tolerable 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 character. 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.

	CODE LEVELS REMOVE TINES
NUL	1-2-3-4-5-6-7-8
SOH	2-3-4-5-6-7
STX	1-3-4-5-6-7
ETX	3-4-5-6-7-8
EOT	1-2-4-5-6-7
ENQ	2-4-5-6-7-8
ACK	1-4-5-6-7-8
BEL	4-5-6-7
BS	1-2-3-5-6-7
HT	2-3-5-6-7-8
LF	1-3-5-6-7-8
VT	3-5-6-7
FF	1-2-5-6-7-8
CR	2-5-6-7
SO	1-5-6-7
SI	5-6-7-8
DLE	1-2-3-4-6-7
DC1	2-3-4-6-7-8
DC2	1-3-4-6-7-8
DC3	3-4-6-7
DC4	1-2-4-6-7-8
NAK	2-4-6-7
SYN	1-4-6-7
ETB	4-6-7-8
CAN	1-2-3-6-7-8
EM	2-3-6-7
SUB	1-3-6-7
ESC	3-6-7-8
FS	1-2-6-7
GS	2-6-7-8
RS	1-6-7-8
US	6-7
SPACE	1-2-3-4-5-7
!	2-3-4-5-7-8
"	1-3-4-5-7-8
#	3-4-5-7
$	1-2-4-5-7-8
%	2-4-5-7
&	1-4-5-7
(APOS)	4-5-7-8
(	1-2-3-5-7-8
)	2-3-5-7
*	1-3-5-7
+	3-5-7-8
'	1-2-5-7
–	2-5-7-8
.	1-5-7-8
/	5-7
0	1-2-3-4-7-8
1	2-3-4-7
2	1-3-4-7
3	3-4-7-8
4	1-2-4-7
5	2-4-7-8
6	1-4-7-8
7	4-7
8	1-2-3-7
9	2-3-7-8
:	1-3-7-8
;	3-7
<	1-2-7-8
=	2-7
>	1-7
?	7-8

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