

28A SEQUENCE SELECTOR
DESCRIPTION AND OPERATING PRINCIPLES
83B1 SELECTIVE CALLING SYSTEMS

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1. GENERAL

1.01 This section gives a description and the operating principles of the 28A sequence selector.

1.02 The 28A sequence selector is basically a 28 typing unit from which all the mechanisms required for printing and functions associated with printing have been omitted. It is equipped with a stuntbox so as to be responsive to teletypewriter selective-calling codes and provides a means whereby 15 KSR and 19 ASR teletypewriter equipment can be used with teletypewriter selective-calling systems.

1.03 This section describes the use of the 28A sequence selector in the 83B1 selective-calling system, for which the contact arrangement and wiring were designed. However, this unit could be used in other applications provided suitable rearrangements of contacts and wiring are made.

1.04 In this section the words "right" and "left" refer to the sides of the unit, or of its component mechanisms, as seen from the front of the unit.

2. DESCRIPTION OF APPARATUS UNITS

(A) General

2.01 Figs. 1 and 2 show the 28A sequence selector mounted on the 28A sequence selector base and equipped with a motor and gears.

2.02 On the same base, and driven by the same motor, is the 28A distributor. This is a separate unit, which is supplied only when needed. It is used, for instance, for transmitting transmitter-start codes and pushbutton-generated CDCs in the 83B1 system.

2.03 The side frames and front plate of the 28 typing unit are components of the sequence selector. All mechanisms associated with printing, including paper handling, are omitted. This results in numerous drillings on the side frames and front plate being vacant, and the side frames are higher than required. However, the use of these standard parts gave a cheaper unit and one the initial units of which could be produced faster.

(B) Selecting Mechanism

2.04 The selecting mechanism is the one which is standard for the 28 line, including the range-finder assembly.

(C) Codebar Assembly

2.05 The codebar assembly is equipped with the usual eight codebars. No use is made in this unit of the print and the FIGS-LTRS shift codebars and they are not controlled by shift slides, since for use as a selector in the 83B1 system it is immaterial whether these codebars are positioned to the right or to the left, because the function bars have no tines opposite these codebars. As a result, for instance, the machine does not discriminate between upper- and lower-case characters.

(D) Stuntbox

2.06 Figs. 3 and 4 are front and rear views, respectively, of the stuntbox, designated the ADA stuntbox. Fig. 5 shows the slot and contact arrangement. As shown in Fig. 3 the stuntbox is equipped with a lockout shift slide. The stuntbox, associated cable, and connector can be removed from the unit.

(E) Main Shaft and Clutches

2.07 Since printing and the associated functions are not required, the main shaft is not equipped with the spacing-clutch assembly, spacing driving gear, keyboard driving gear, line-feed clutch assembly and typebox-clutch assembly.

(F) Motor and Gear Assembly

2.08 The motor unit and intermediate shaft assembly is the same as that used with the 28 typing unit. The 28A synchronous or the 28B ac governed motor can be provided.

2.09 Operation at 60, 75 or 100 words per minute can be provided by means of the standard motor pinions and gears.

(G) Base

2.10 The 28A sequence selector and motor unit are mounted on the 28A sequence selector base. The base measures 15-1/2" wide and 9-1/4" deep.

(H) Connector and Terminal Block

2.11 A 35-terminal connector is mounted on the right-hand side frame, Fig. 1, to terminate the wiring from the stuntbox and the selector magnets.

2.12 The motor wiring terminates at a 4-terminal terminal block mounted on top of the 28A distributor as seen in Fig. 1, or on the 28 sequence selector base when the 28A distributor is not used.

3. THEORY OF OPERATION(A) General

3.01 The theory of operation of the main shaft clutches, selector mechanism and the codebar assembly is covered in Section P70.034.

3.02 The stuntbox operation is covered in Section P70.035. The stripper blade in this unit is operated by the function clutch.

(B) RY Test Mechanism

3.03 Since the 28 sequence selector does not print, an RY mechanism is provided to determine orientation limits and for other error-detection purposes. This mechanism is located at slots 40, 41 and 42 (Fig. 3).

3.04 In order to clarify the operation of this mechanism, Table 1 lists the characteristics of the function bars and associated mechanisms.

TABLE 1

<u>Slot No.</u>	<u>Function Bar</u>	<u>Function Lever</u>	<u>Function Lever Latch</u>	<u>Remarks</u>
40	Universal Select	Latching	Latching Releasing	Released by manual operation of release button.
41	Y Select	Latching	Latching Unlatching	
42	R Select	Latching	Latching Unlatching	

3.05 The function levers in slots 41 and 42 operate a common slide, called the RY slide, which is shown nonoperated in Fig. 3. The front end of this slide is equipped with a projection which extends over and down in front of the UNIVERSAL function bar in slot 40. Either the letter R or Y will cause the slide to be moved and latched to the rear. The projection will prevent the forward motion (going into selection) of the UNIVERSAL function bar on the next character, or characters, as long as the slide is kept to the rear by the receipt of either R or Y.

3.06 The function lever in slot 40 operates an indicating slide, the position of which enables an observer to detect errors in operation. Once an error is indicated, this slide remains latched until released manually. Consequently, continuous watching of the mechanism is not necessary.

3.07 The mechanism may be operated by alternate Rs and Ys or by a series of Rs or a series of Ys. In the following discussion a continuous series of Rs is assumed. The action would be similar for Ys or for Rs and Ys.

3.08 Assume that the indicating slide has been released. When the first R is received, both the R and UNIVERSAL function bars move into selection with the result that both the RY slide and the indicating slide move to the rear and are latched. The indicating slide must then be released by pushing the release button. Now with the RY slide latched, the UNIVERSAL function bar is prevented from moving into selection on the next character. When the next R is received, the stripper blade in its downward motion unlatches the R function lever tending to permit the RY slide to move to the front. However, the function lever is immediately moved to the rear and latched. Thus, the RY slide is again latched to the rear, preventing the UNIVERSAL function bar from moving into selection on the next character.

3.09 If on the receipt of any character, neither of the function bars in slots 41 and 42 go into selection (this may happen either because the received character is not an R or a Y or because of a machine condition, such as a changed orientation setting, which prevents the correct response to the R or Y) the function levers in slots 41 and 42 remain unlatched, the RY slide is in its front position and no longer prevents the function bar in slot 40 from going into selection. Consequently, on the next character received, no matter what character it is, the function lever in slot 40 is latched and the indicating slide controlled by it will be pulled to the rear with its visible front end pulled out of sight as an indication of an error.

(C) Transmitter Stop-Start Mechanism

- 3.10 The transmitter stop-start control mechanism is shown in Fig. 4. The V answerback function lever in slot 33 is provided with a releasing projection to which is attached a short latch-release bail extending to adjacent slots on both sides.
- 3.11 The operation of this mechanism is as follows: On receipt of the first letter of the CDC (as explained in Section P70.036, the CDCs for a particular line must have one of two chosen letters as their first letters) either the contact in slot 32 or the contact in slot 34 is opened by the action of the function lever and latched open. Through the control circuits this stops the transmitter which is sending but only after the second letter of the CDC has been sent. The two-letter CDC is transmitted to the called station, which returns a V answerback to indicate that it is ready to receive the message. The returned V operates the mechanism in slot 33, the latch-release bail of which then releases the latched function lever in slot 32 or 34. This recloses the stuntbox contact and, again through the control circuits, starts the transmitter. For multiple-address messages, this process is repeated for each CDC transmitted.
- 3.12 The slot and contact arrangement of the 28A sequence selector is shown in Fig. 5.

(D) Disconnect Operation

- 3.13 For reasons associated with the operation of the 83B1 system, the latch-release bail (see Fig. 4), which releases certain latched function levers, is here operated by twin sets of 3 function-lever mechanisms operated by the 3 sequential characters of the disconnect code, FIGS H LTRS. The disconnect operation itself takes place on the receipt of the LTRS character.
- 3.14 This is in contrast to the operation of the AED stuntbox in the 28H typing unit, also used with the 83B1 selective-calling system. On that stuntbox, there is a shortage of available slots, and, in addition, discrimination between upper and lower case is provided. Consequently, the latch-release bail is operated by two pairs of function lever mechanisms, each responding to the sequence FIGS H. The disconnect operation takes place on the H character of the code. LTRS is added, as usual, but now only for timing and other reasons as described in Section P70.035.
- 3.15 It is not essential that either of these codes, or, in fact, any particular code be used for the disconnect signal. For special applications, any upper-case character might be used. However, since the sequence selector does not discriminate between upper- and lower-case characters, it is essential that the mechanism operate on at least a two-slot sequence with FIGS for the first slot, followed by the desired character.
- 3.16 It will be noted from examination of Fig. 4 that in this particular case the latch-release bail has only a single function, i.e., to unlatch the function lever controlling the select code bar. No other use was made of the latch-release bail in this particular application because the other unlatching functions required on the receipt of the disconnect character are performed in the associated relay circuits, initiated by the FIGS H contact on the stuntbox. The latch-release bail mechanism, which might be simplified for this particular application, has been retained in its original form on the assumption that other optional mechanisms might be arranged to be unlatched by the latch-release bail. This might be true either for the addition of contacts to cut on or off auxiliary apparatus or for other special requirements which might later develop.

SECTION P70.037

4. MOUNTING ARRANGEMENTS

4.01 The sequence selector and base will usually be mounted on a shelf (to be provided) in a cabinet or on a relay rack.

5. MOTOR CONTROL

5.01 Motor control arrangements are not available.

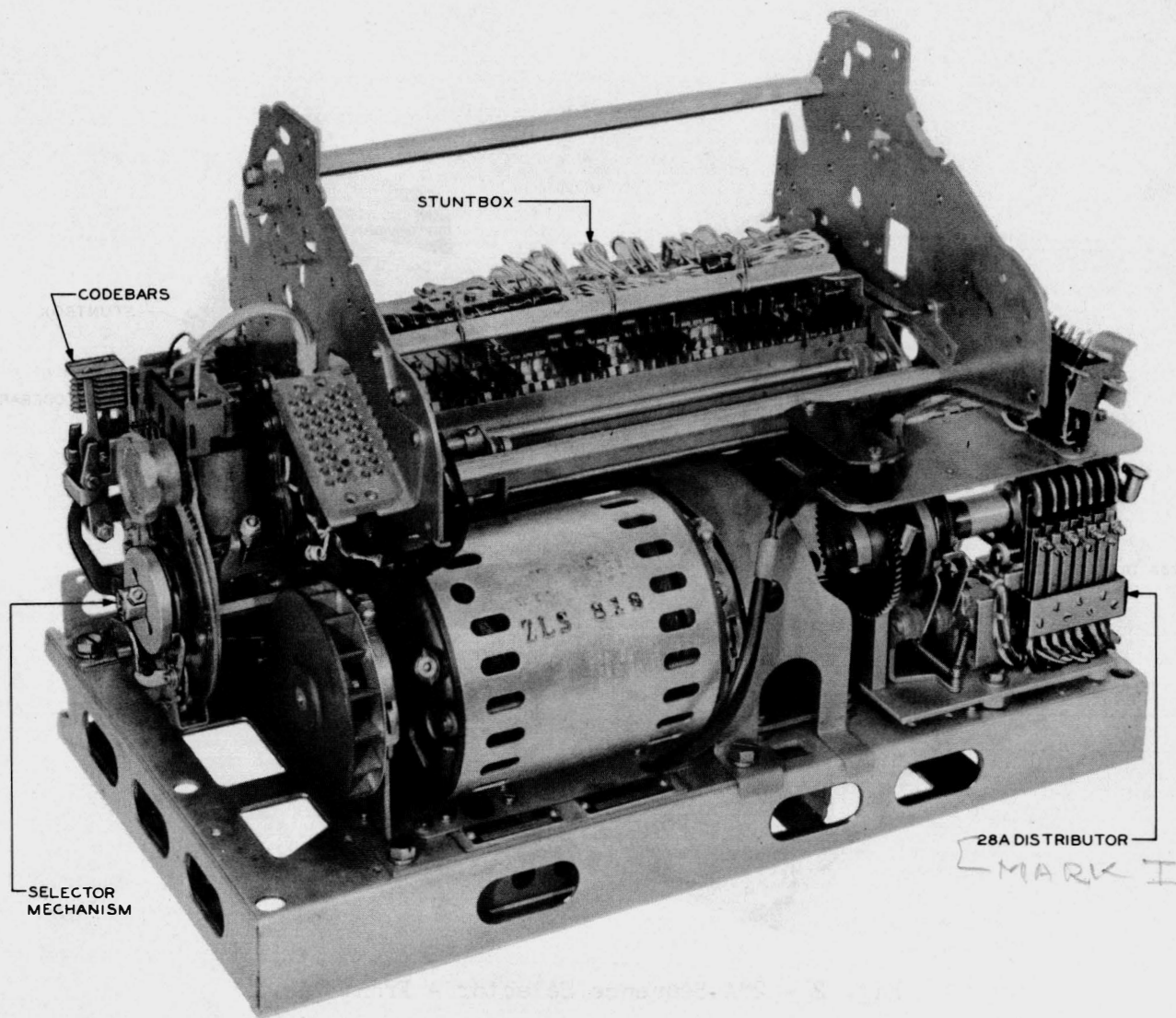


Fig. 1 - 28A Sequence Selector - Rear View

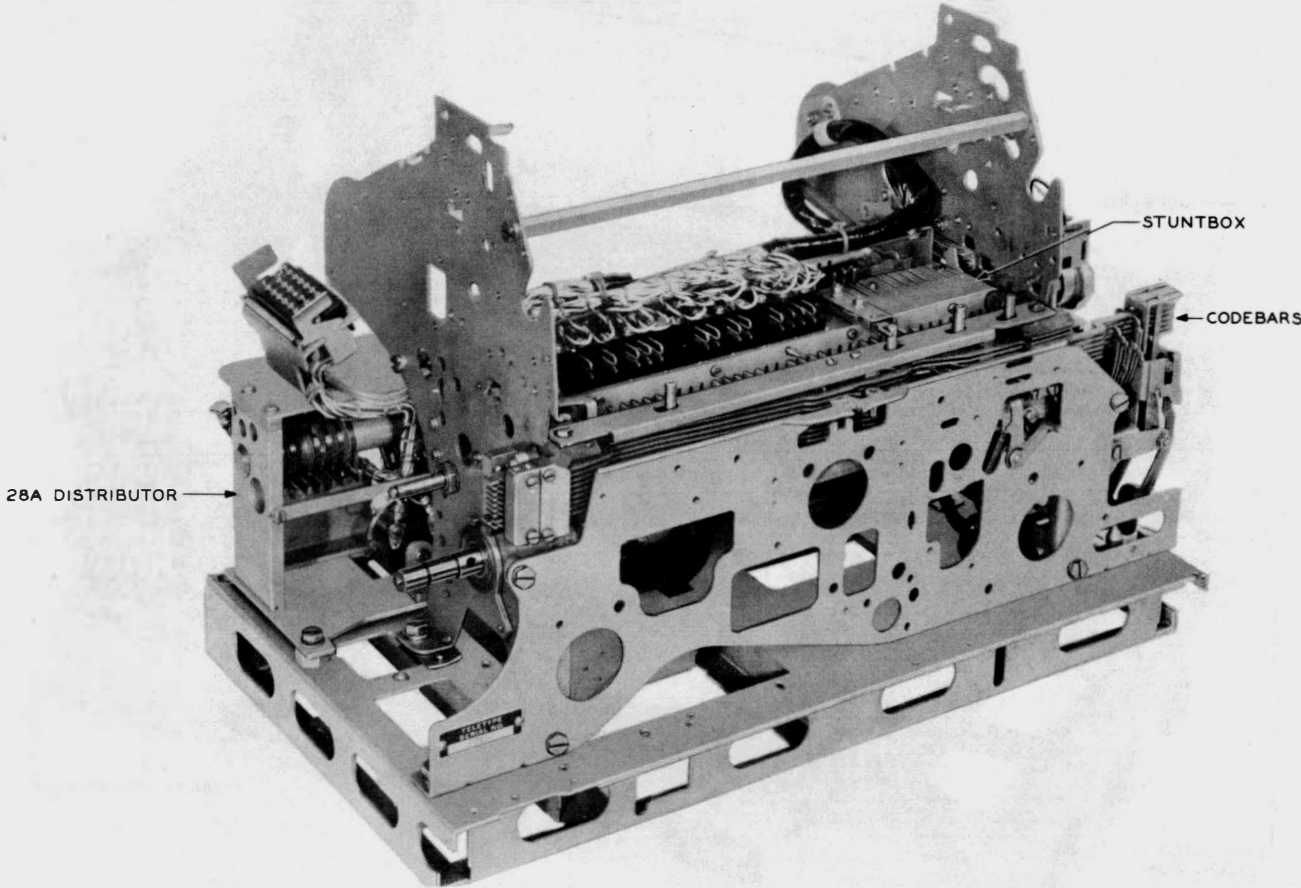


Fig. 2 - 28A Sequence Selector - Front View

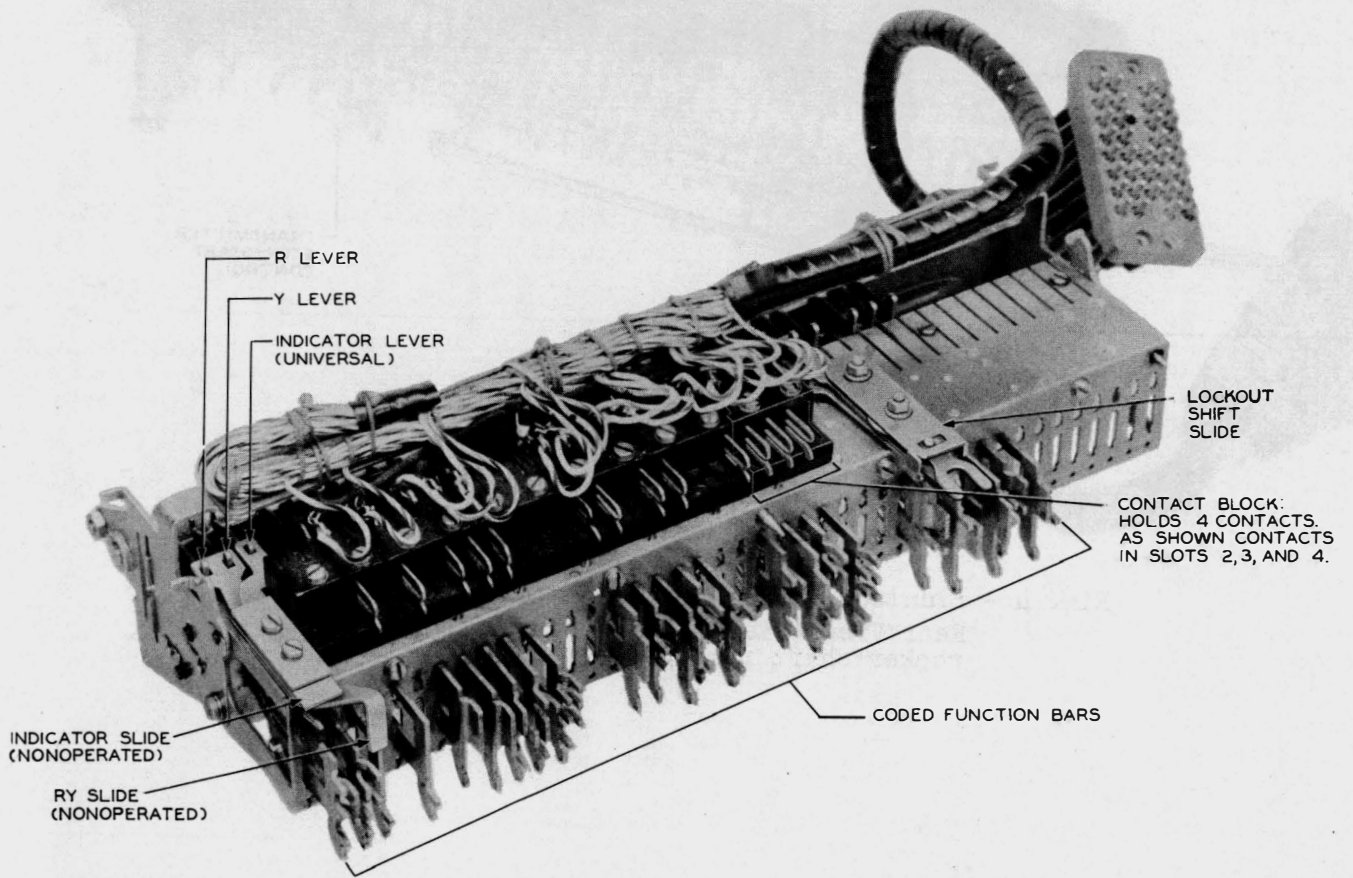


Fig. 3 - Stuntbox for 28A Sequence Selector -
Front View

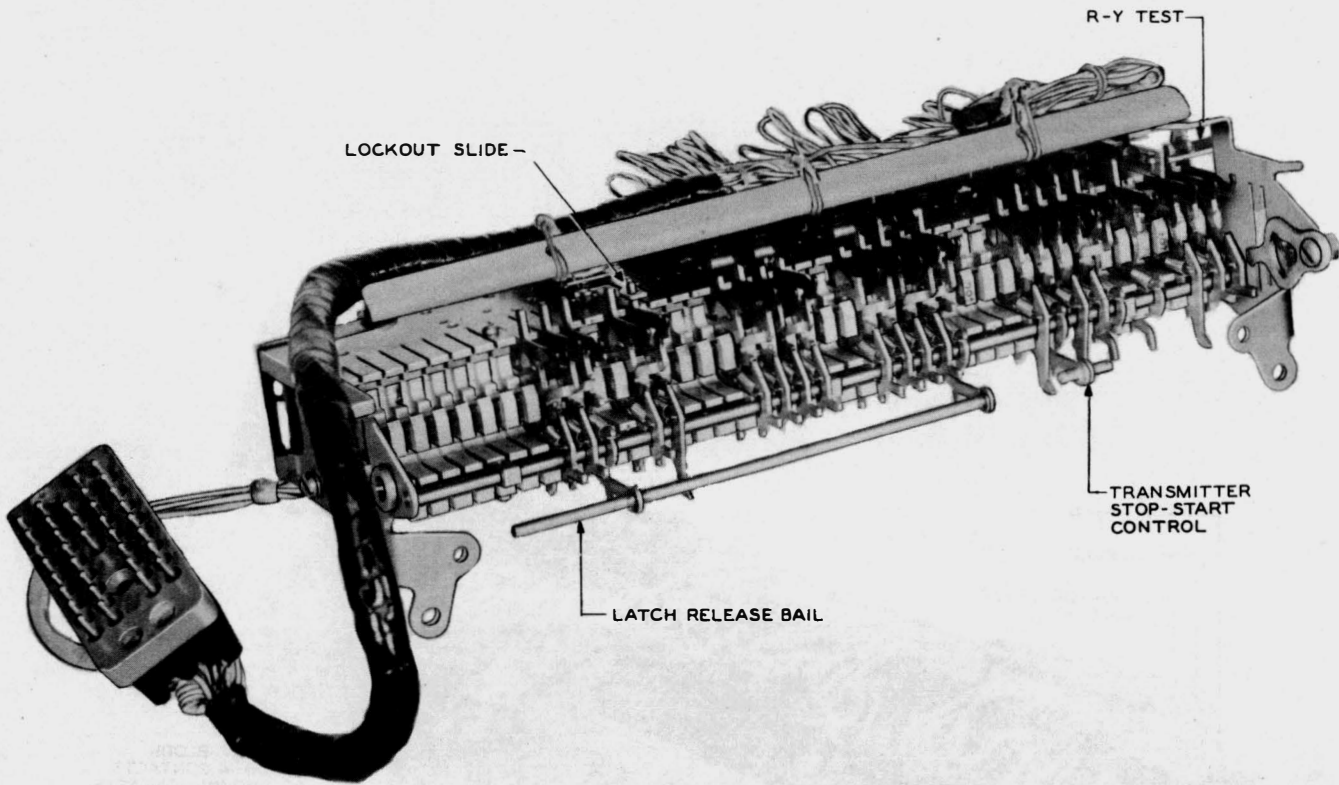


Fig. 4 - Stuntbox for 28A Sequence Selector -
Rear View (Tiebar, stripper blade and
rocker shaft removed)

SLOT AND CONTACT ARRANGEMENT FOR
STUNTBX IN 2BA SEQUENCE SELECTOR FOR SELECTIVE CALLING
(WITH HDX AUTOMATIC TRANSMITTER START OPERATION)

NOTES:

1. BOTH CONTACTS OF A PAIR OPERATE FROM A FUNCTION LEVER IN THE HIGHER NUMBERED SLOT.
2. CDC, TRANS-START, AUTO TRANS STOP-START AND UNIVERSAL FUNCTIONS OPERATE IN THE SELECT CONDITION ONLY.

LEGEND

- ⊗ MAKE CONTACT - MOMENTARY CLOSURE
- ⊕ BREAK CONTACT - MOMENTARY OPEN
- ⊗ L LATCHED CLOSED, RELEASED BY STRIPPER BAIL
- ⊕ LV LATCHED OPEN, RELEASED BY ANSWERBACK
- ⊕ L LATCHED OPEN, RELEASED BY STRIPPER BAIL

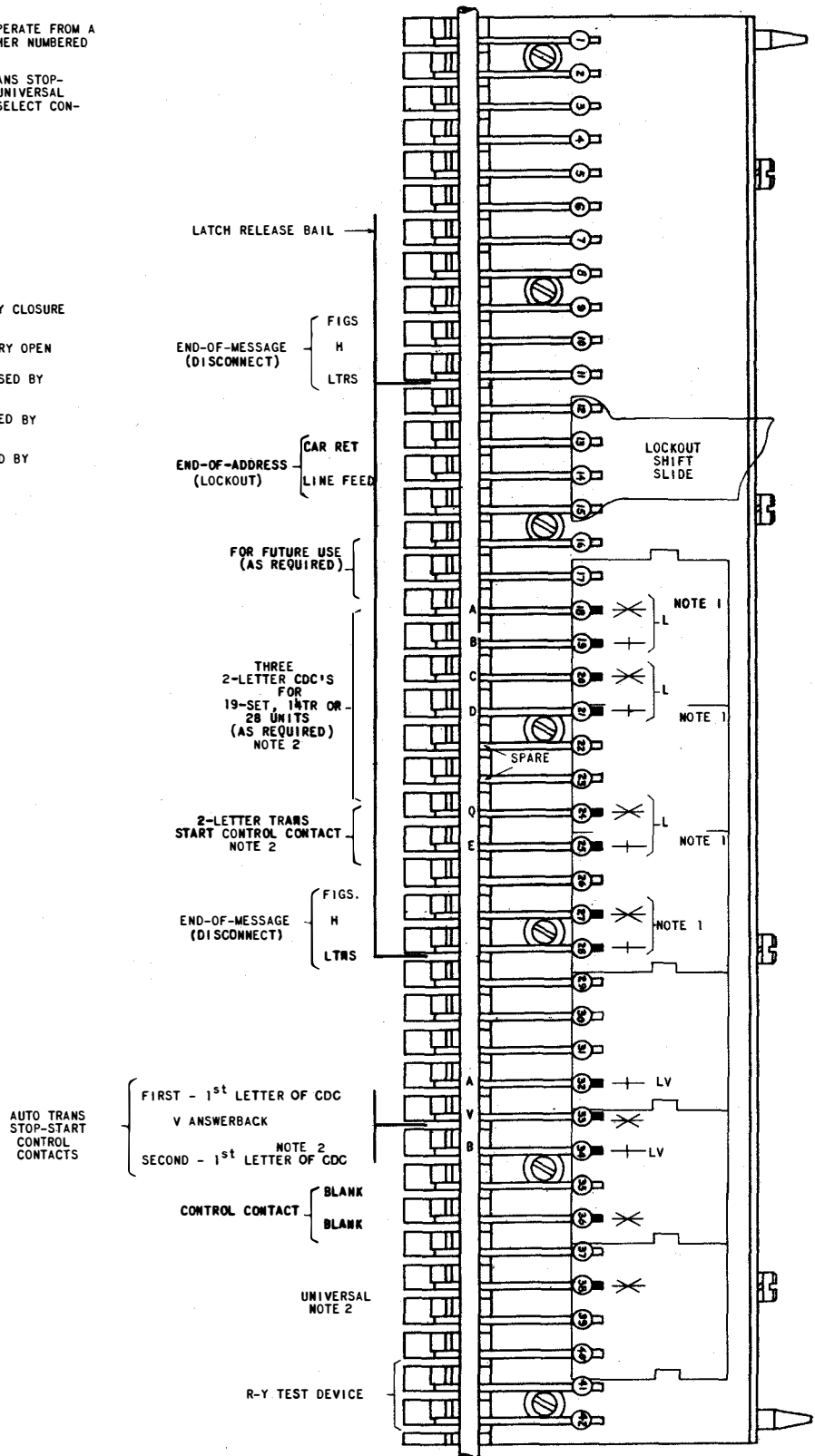


Fig. 5 - Slot and Contact Arrangement

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