Updated to October 1969

5/68

28 TYPING UNIT

INSTALLATION OF FUNCTION PARTS

ON A 28 STUNTBOX

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1. GENERAL

1.01 This section contains the instructions for the installation of function parts on a 28 stuntbox.

1.02 This section is reissued to (a) change the title, (b) omit reference to the TP152339 modification kit previously furnished on an interim basis and now replaced by the TP152307 modification kit, and (c) omit reference to the TP154745 modification kit, the parts of which have been included in the TP152307 modification kit.

1.03 Although the instructions herein apply particularly to the AN stuntbox, they are not necessarily limited to that stuntbox. Reperforator control contacts, for instance, can be used on any stuntbox. Some of the sets of parts described herein are usable on the AG stuntbox (28A, A1, and A2 typing units) and AR stuntbox (28B, C, and D typing units). The ADA stuntbox (28A sequence selector) and AED stuntbox (28H typing unit), are equipped for use with the 83B1 selective calling system. If local modification for other applications is desired, use may be made of the parts described herein.

2. SETS OF PARTS

2.01 Function Lever Sets of Parts:

For	Sets of Parts	Consists of Quantity	Part No.	Part
(1) The first slot (and intermediate slots if CDCs are of three or more letters) in the sequential operation of a function. Sequential operation takes place from the lower numbered slots to the next higher slot. The function lever in the lower numbered slot is latched operated on one character and unlatched on the next following character. The operation of this function lever ~~ungates~~ the path of the function bar in the next higher numbered slot, thus permitting it to operate if the next character received is the one for which it is coded. The only limit to the number of steps in a sequence is the availability of adjacent slots. Spacing is not suppressed with the operation of these parts. See Note 1.	TP153915 (Note 2)	1 1 1 1 1 1 1 See Note 5.	TP4703 TP152653 TP154690 TP154698 TP90517 TP152121 TP154613	function bar spring function pawl function pawl spring wick function lever spring function lever function lever latch
(2) Momentary operation of a contact on a single CDC or, in conjunction with TP153915 Sets of Parts, as the final operation of a sequence. Spacing is not suppressed with the operation of these parts. See Note 1.	TP153916 (Note 2)	1 1 1 1 1 1 1 See Note 5.	TP4703 TP152653 TP154690 TP154698 TP90517 TP152642 TP152660	function bar spring function pawl function pawl spring wick function lever spring function lever spring plate
(3) Operation of a contact on one character and release on the next following character. The function may be operated separately or, in conjunction with TP153915 Sets of Parts, as the final operation of a sequence. Spacing is not suppressed with the operation of these parts. See Note 1.	TP153917 (Note 2)	1 1 1 1 1 1 1 See Note 5.	TP4703 TP152653 TP154690 TP154698 TP90517 TP152298 TP154613	function bar spring function pawl function pawl spring wick function lever spring function lever function lever latch

2.01 Function Lever Sets of Parts (Cont):

For	Sets of Parts	Consists of Quantity	Part No.	Part
(4) Operation on one character and release by the operation of the latch release bail. (Notes 3 and 4.) The function may be operated separately, or, in conjunction with TP153915 Sets of Parts, as the final operation of a sequence, to position a contact or a shift slide. Spacing is not suppressed with the operation of these parts. See Note 1.	TP153918 (Note 2)	1 1 1 1 1 1 1 See Note 5.	TP4703 TP152653 TP154690 TP154698 TP90517 TP152298 TP152089	function bar spring function pawl function pawl spring wick function lever spring function lever function lever latch
(5) Space suppression for certain functions. (BL, LF, CR, etc.)	Parts must be ordered separately	1 1 1 1 1 1 1 See Note 5.	TP4703 TP152653 TP154690 TP154698 TP90517 TP152641 TP152660	function bar spring function pawl function pawl spring wick function lever spring function lever spring plate

Note 1: For selective-calling applications, space suppression with the operation of these parts is not needed because:

(1) The typing unit is in the nonprint condition where spacing does not occur; or,

(2) The typing unit is in the print condition where spacing is suppressed for control functions such as BL, CR, FIGS, LF, LTRS, upper-case H, upper-case S (Bell).

Note 2: Contact assemblies, contacts, and shift slides must be added if such parts are not already installed on the stuntbox. See 2.04 and 2.05.

Note 3: A latch release bail is operated in most cases by a pair of function levers a number of slots apart. The slots in between are equipped with functions which are to be latched and unlatched. One function lever is at an end of the bail and the other is at an intermediate point. (Since the bail is only fastened at the end, the function lever at the intermediate point may be installed in the most convenient slot.) Order two each of the parts in (2) except a TP154647 instead of a TP152-642 function lever. In addition, the following parts are required:

(1) One shaft* for latch release bail
(2) Two TP119649 retaining rings

*Shafts for latch release bail may be obtained in the following lengths.

Length in Inches	Part No.
1.062	TP153838
1.484	TP155071
1.921	TP154668
2.796	TP154667
3.237	TP154666

2.01 Function Lever Sets of Parts (Cont):

Length in Inches	Part No.
3.890	TP155072
4.984	TP155073
5.640	TP154669
6.077	TP153318

Note 4: If a latch release bail is to consist merely of a short stud to release a function lever latch in an adjacent slot (the unlatching function is limited to the one slot), order separately the parts as in (2), except a TP154647 instead of a TP152642 function lever. In addition, order the following parts:

(1) One TP152357 stud
(2) One TP110743 lockwasher
(3) One TP3599 nut

Note 5: The function bar desired must be specified in addition to the set of parts. See 5. when using ~~universal~~ function bars. See the piece part data for precoded function bars.

2.02 Description of Function Levers, Function Lever Latches and Spring Plate: The following tables describe the function levers and function lever latches used in the various sets of parts.

TABLE A

		Projections (Figure 1)			
Function Lever	Used in Set of Parts	Blocking	Latching	Releasing	Space Suppression
TP152121	TP153915	X	X		
TP152298	TP153917, TP153918		X		
TP152299	Operate a latch release bail		X	X	X
*TP152641	For Space Suppression				X
*TP152642	TP153916				
TP153670 (Not shown on Figure 1)	Operate a latch release bail			X	
TP154647	Operate a latch release bail			X	X
TP157206 (Not shown on Figure 1)			X		
TP157207 (Not shown on Figure 1)		X	X		

*Momentary Operation

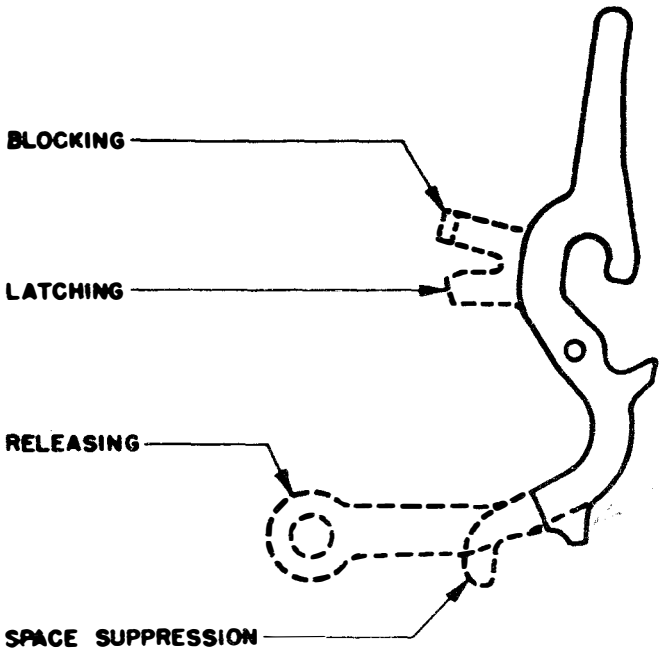
Note 1: The TP157206 function lever has a stud on its upper tip bent to the left (observed from the rear of the stuntbox) which can operate two contacts, one above the slot in which the function lever is installed and one above the adjacent lower numbered slot. In this way a transfer can be accomplished if a make and break contact are used.

Note 2: The TP157207 function lever has part of its upper tip cut away so that it can be used in sequential operation with the TP157206 function lever. The TP152121 function lever cannot be used in sequential operation with the TP157206 function lever because the upper portion of its tip would interfere with the extension of the TP157206 lever function.

TABLE B

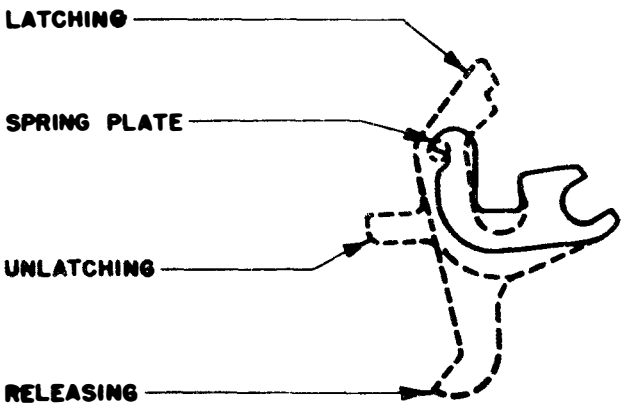
Function Lever Latch	Used in Set of Parts	Projections (Figure 1)		
		Latching	Unlatching	Releasing
TP152089	TP153918	X		
TP154613	TP153915, TP153917	X	X	X

See Figure 1 for the spring plate used in momentary operation of a function.



FUNCTION LEVER

(DOTTED PORTIONS DENOTE OPTIONAL FORMS)



FUNCTION LEVER LATCH AND SPRING PLATE

Figure 1

2.03 Reperforator Control Modification Kit:

For	Modification Kit	TP152307 Modification Kit Consists of: Quantity	Part No.	Part
(1) Control of an associated reperforator on receipt of UC-H or UC-F. When UC-H is received a contact is operated. When UC-F is subsequently received, the function associated with that character operates a latch release bail which releases the function mechanism holding the contact operated. If it is desired to operate the contact on receipt of UC-F with release on UC-H, the UC-F function bar should be installed in the slot with the TP152298 function lever, and the UC-H function bar should be installed in the slot with the TP152299 function lever. The modification kit cannot be used in slots spanned by a latch release bail.	TP152307 TP152307 replaces TP152399 previously furnished for use in early 28A, A1, and A2 typing units	1	TP3599	nut
		2	TP4703	function bar spring
		1	TP152089	function lever latch
		1	TP152298	function lever
		1	TP152299	function lever (Note 1)
		1	TP152660	spring plate
		1	TP152357	stud
		2	TP152653	function pawl
		2	TP153440	function bar (~~universal~~) (see 5.)
		2	TP157200	function pawl spring
		3	TP90517	function lever spring
		1	TP157975	cable assembly
		1	TP110743	lockwasher
		1	TP157074	switch assembly
		2	TP155751	insulating sleeve
		2	TP157240	function pawl spring
		2	TP72522	wick
		2	TP94693	wick
(2) The parts for the TP-154745 modification kit previously listed here have been included in the TP152307 modification kit.				

Note 1: If it is desired to space on the function that operates the latch release bail, order a TP153670 function lever in addition to the modification kit. Use the TP153670 instead of the TP152299 function lever.

2.04 Shift Slide Assemblies:

For	Set of Parts or Shift Slide	Consists of Quantity	Part No.	Part
(1) Operation on either one of two 2-character CDCs.	TP154750 Sets of Parts	*1	TP157164	slidebar
		2	TP153644	stud
		2	TP153645	guide plate
		4	TP153646	bushing
		1	TP153647	spring plate
		1	TP153608	shift fork
		4	TP125011	flat washer
		4	TP110743	lockwasher
		4	TP3599	nut
		1	TP153609	roller
(2) Operation on either one of four 1-character CDCs.	TP154639 Slidebar	If an entire shift slide assembly is to be installed, order the parts as in (1) and a *TP154639 slidebar. Use the TP154639 slidebar instead of the TP157164 slidebar.		
(3) Operation on one 1-character CDC.	TP153795 Slidebar	If an entire shift slide assembly is to be installed, order the parts as in (1) and a TP153795 slidebar. Use the TP153795 slidebar instead of the TP157164 slidebar.		

*If only a slidebar is to be changed, order that item separately.

2.05 Contact Assemblies (Spanning Four Slots):

Furnished With	Contact Assembly	Consists of Quantity	Part No.	Part
(1) One make-contact in slot three of the contact block (Note 1).	TP152737	1	TP152733	contact block
		1	TP152734	make-contact arm
		1	TP152735	contact terminal
		1	TP152736	spring
		2	TP151689	screw } Note 2
		2	TP110743	lockwasher } Note 2
(2) One break-contact in slot one of the contact block (Note 1).	TP153324	The same parts as for the TP152737 Contact Assembly except that it has a TP152738 break-contact arm instead of a TP152734 make-contact arm.		

Note 1: As viewed from the rear of the typing unit with the contact block mounted the slots are numbered one through four from left to right.

Note 2: These parts, formerly ordered separately, are now included as part of the Contact Assembly Set of Parts.

To add a make- or break-contact to either the TP152737 or TP153324 Contact Assembly, order the following parts:

2.05 Contact Assemblies (Spanning Four Slots) (Cont):

To	Sets of Parts	Consists of Quantity	Part No.	Part
(1) Add a make-contact	TP154751	1	TP152734	make-contact arm
		1	TP152735	contact terminal
		1	TP152736	spring
(2) Add a break-contact	TP154752	Same as (1) except a TP152738 break-contact arm instead of a TP152734 make-contact arm.		

In all cases, suitable function lever parts must be provided in the slots over which contacts are installed.

3. INSTALLATION OF PARTS

3.01 Function Parts - AN (28E, F, and G Typing Units), AR (28D, B, and C Typing Units), ADA (28A Sequence Selector), AED (28H Typing Unit) Stuntboxes. Before installing function parts, proceed as follows:

(1) Remove the typing unit from the base. Refer to associated sections covering disassembly and reassembly.

(2) Remove the stuntbox from the typing unit. Refer to associated sections covering disassembly and reassembly.

(3) Remove the rear handle from the stuntbox.

(4) Remove the retaining ring and slide the felt washers along the stripper bail shaft from the stripper bail cams.

(5) Remove the two screws that secure the stripper bail cams to the stripper bail shaft and slide the cams along the shaft and out of the notches in the left and right stripper blade arms.

(6) Remove the screw that secures the left or right stripper blade arms to its mounting bracket and disengage the arm from the stripper blade.

(7) Remove the stripper blade from its mounting brackets.

(8) Remove the stripper bail shaft.

(9) Remove the retaining plate from the ends of the function shafts.

(10) Slide the function lever retaining shaft from in front of the slot(s) in which the function parts are to be installed.

(11) Install the function parts in accordance with 3.03

(12) Reassemble the stuntbox in the reverse order of 1 to 10.

3.02 Function Parts - AG (28A, A1, A2 Typing Units) Stuntbox. Before installing function parts in the AG stuntbox, proceed as follows:

(1) Remove the typing unit from the base. Refer to associated section covering disassembly and reassembly.

(2) Remove the stuntbox. Refer to associated sections covering disassembly and reassembly.

(3) Remove the retaining plate from the ends of the function shafts.

(4) Slide the function lever retaining shaft from in front of the slot(s) in which function parts are to be installed.

(5) Install the function parts in accordance with 3.03.

(6) Reassemble the stuntbox in the reverse order of 1 to 4.

3.03 To install the parts for the function mechanisms, proceed as follows:

(1) Hook the function lever spring in the hole in the function lever and insert the function lever in the proper guide bar slot, back of the spring plate shaft.

(2) Hook the function lever over the function lever shaft.

(3) Slide the function lever retaining shaft in front of the function levers and place it in the left or right mounting plate.

(4) Remount the retaining plate.

(5) Slide the function pawl over the tip of the function lever and position it on the function pawl shaft.

(6) Lubricate the wick in the function pawl spring and hook the spring in the hole in the spring guide plate and over the end of the function pawl.

(7) Insert the function bar through the opening in the spring guide plate opposite the desired slot in the guide bar.

(8) Insert the function bar in the proper guide bar slot and position it on the function bar shaft.

(9) Hook the function bar spring in the bottom hole of the spring guide plate and over the projection on the function bar.

(10) Insert the spring plate or function lever latch in the slot of the guide bar and under the spring plate shaft. Position the spring plate or function lever latch on the spring plate shaft and snap the spring plate or function lever latch upward under the spring-plate stop shaft. If the function lever latch is of the type unlatched by the stripper bail, its unlatching projection should extend under the stripper blade. If the function lever latch is of the type unlatched by the latch-release bail, its unlatching projection should be under the latch-release bail.

Note: When installing parts for sequential operation, first install the parts for the function to be operated on the final operation, then install the parts for the first or intermediate functions in the adjacent lower-numbered slots.

3.04 Shift Slides and Contact Assemblies: Mount the shift slide assemblies and contact assemblies over the slots in which functions are to be installed on top of the function lever guide, using the mounting holes provided.

4. STUNTBOX SLOT OCCUPANCY AND MODIFICATIONS

4.01 The following tables list the occupancy of slots in the stuntboxes, as furnished. The slots are numbered one through 42, from left to right, as viewed from the rear of the typing unit.

TABLE C

AG Stuntbox Slot Occupancy
(28A, A1, A2 Typing Units)

Slot No.	Function
1	Unshift on Space
2	FIGS Shift
3	LTRS Shift
4	Vacant (can be used only for a function with which carriage return is permissible)
5	CAR RET
6-16	Vacant
17	Reserved for Horizontal Tab
18-21	Vacant
22	Upper-case Blank } Motor Stop
23	Upper-case H } Motor Stop
24-27	Vacant
28	Space Suppression on Blank
29	Upper-case S (Bell)
30-34	Vacant
35-36	Keyboard lock on double blank
37	Vacant
38	Space Suppression on LF
39	Vacant (can be used only for a function with which line feed is permissible)
40	LF
41	Reserved for Vertical Tab
42	Reserved for Page Feedout

TABLE D

AN Stuntbox Slot Occupancy
(28E, F, and G Typing Units)

Slot No.	Function
1	Unshift on SPACE
2	FIGS Shift
3	LTRS Shift
4	Vacant (can be used only for a function with which carriage return is permissible)
5	CAR RET
6	Select U (All Stations CDC) } CDC Shift Slide
7	Select U (All Stations CDC) } CDC Shift Slide
8	Select U (All Stations CDC) } CDC Shift Slide
9	Select U (All Stations CDC) } CDC Shift Slide
10	FIGS } Disconnect Code
11	Upper-case H } Disconnect Code
12	Vacant (unusable for contact operation because of the shift slide mounted at slot 14 which spans slots 12 to 15)

TABLE D (Cont)

AN Stuntbox Slot Occupancy
(28E, F, and G Typing Units)

Slot No.	Function
13	CAR RET ┐ End-of-Address
14	LF ┘ Code
15	Space suppression on BLANK
16	Space suppression on LF
17	Reserved for Horizontal Tab
18-24	Spare for 7 contacts or 1 shift slide plus 3 contacts (Note 2)
25	Upper-case S (Bell)
26	Busy Lamp
27	Busy Lamp Flasher - On SPACE
28	Copylight control
29	Spare for one contact (Note 2)
30	FIGS ┐ Disconnect Code
31	Upper-case H ┘
32,33,34	Reserved for motor stop and delay disabler
35-36	Keyboard lock on double BLANK
37	Keyboard lock on LF (unselected units)
38	Spare for one contact (Note 1)
39	Vacant (can be used only with a function with which line feed is permissible)
40	Line Feed
41	Reserved for Vertical Tab
42	Reserved for Page Feedout

Note 1: Function lever mechanisms in these slots can be arranged for:

(1) Momentary operation.

(2) Latch with release by the stripper bail on the next following character.

Note 2: The same as Note 1 and:

(3) Latch with release by the latch-release bail on a subsequent disconnect signal.

TABLE E

AR Stuntbox Slot Occupancy
(28D, B, and C Typing Units)

Slot No.	Function
1	Unshift on Space
2	FIGS Shift
3	LTRS Shift
4	Vacant (can be used only for a function with which carriage return is permissible)
5	CAR RET
6-16	Vacant

TABLE E (Cont)

AR Stuntbox Slot Occupancy
(28D, B, and C Typing Units)

Slot No.	Function
17	Reserved for Horizontal Tab
18-21	Vacant
22	Space Suppression on BLANK
23-27	Vacant
28	Upper-case Blank ┐ Motor Stop
29	Upper-case H ┘
30	Upper-case S (Bell)
31-34	Vacant
35-36	Keyboard lock on double BLANK
37	Vacant
38	Space Suppression on LF
39	Vacant (can be used only for a function with which line feed is permissible)
40	LF
41	Reserved for Vertical Tab
42	Reserved for Page Feedout

4.02 Restrictions on Slot Use:

(a) General: Contact blocks and shift slides may be mounted on the function lever guide, above the function lever parts that will operate them, by means of mounting holes tapped in the function lever guide. The presence of functions already installed or certain functions for which specific slots are reserved (see the applicable table of slot occupancy) must be considered whenever additional shift slides or contact blocks are to be installed. In the examples where specific slot numbers are given, it is assumed that they are not required for any other functions.

(b) Contact Blocks: Possible locations for contact blocks are any two adjacent tapped holes back of the even-numbered slots from 8 to 42 for the AG, AN, AR, ADA, and AED stuntboxes. With the blocks mounted in a continuous row, all of the slots are potentially available for contact operation. However, with 2-letter sequential codes, the operating function lever mechanisms appear only in alternate slots. In some cases, as in the ADA and AED stuntboxes, a single function lever may operate the contacts in two adjacent slots, one a make and one a break. This might be used as a substitute for a transfer contact, not available for single-slot operation.

(c) Shift Slides: Potential locations for shift slides (where the space is not occupied

by other mechanisms) are slots 3 and 6 for the AG stuntbox, and slots 3, 8, 11, 14, 17, 20, 23, 26, 29, 32, and 35 for the AN, AR, ADA, and AED stuntboxes. Plans for the use of these slots require consideration of the adequacy of the latch release bail to release latched-up function levers and of the code bars to be shifted. For instance, the select (0) code bar can be shifted by a shift slide at slot 14 only.

(d) In general it is desirable to avoid mounting shift slides on adjacent sets of tapped holes because the resulting overlap of the adjusting ears makes adjustment somewhat inconvenient. However, to secure the maximum capacity of the stuntbox, it may sometimes be necessary.

(e) Since the shift slide was originally designed for three-slot sequential operation, special treatment is required for full use of all slots with 2-letter CDCs. The example shows a way to use five pairs of slots for five 2-letter CDCs without loss of a slot.

(1) Mount three shift slides at slots 17, 20, and 23.

(2) In the slide at slot 17 use a TP157164 slidebar, which is operated by either one of two 2-character CDCs. Install the function lever parts for one CDC in slots 15 and 16, and for the second in slots 17 and 18.

(3) In the slide at slot 20 install a TP153-795 slidebar and arrange it to operate on one 2-letter CDC, with the function lever parts in slots 19 and 20.

(4) In the slide at slot 23 install a TP157164 slidebar, with the function lever parts in slots 21, 22, and 23, 24.

(f) Contact Blocks and Shift Slides: Contact blocks and shift slides cannot be mounted in immediately adjacent holes because of mechanical interference. For example, with the lockout shift slide at slot 14, it is not possible to mount a contact block at slots 16 and 18. However, a contact block can be mounted at slots 18 and 20, and another shift slide at slot 23 without interference between the two. These particular slot numbers refer to the AN stuntbox, where the arrangement might be a useful one. The tapped holes are not directly back of the slots but are associated with the nearest one for ease of reference.

4.03 Modifications:

(a) The modifications listed in the following tables are intended for selective-calling changes on the AN stuntbox. However, some modifications are given for the AG and AR stuntboxes since it may be useful to equip either of these for the function desired without the selective-calling features of the AN stuntbox.

TABLE F

Function Lever Parts and Shift Slides

Modification Desired or Feature to be Added	Stuntbox	Parts Required			
		Quantity	Part No.	Part	Modification
(1) Space on Figs shift	AG, AN, AR	1	TP152642	Function lever	Replace the TP152-641 function lever in slot 2 with the TP-152642 function lever.
(2) Combined carriage return and line feed on the CAR RET signal with line feed only on LINE-FEED signal.	AG, AN, AR	1 1	TP153916 TP152667	Set of Parts Function bar CAR RET (AG, AR only)	Install the parts in slot 39.

TABLE F (Cont)

Function Lever Parts and Shift Slides					
Modification Desired or Feature to be Added	Stuntbox	Parts Required Quantity	Part No.	Part	Modification
			Note: To prevent line feed in the nonprint condition on teletypewriters equipped with the AN stuntbox, use a TP155127 function bar coded for CAR RET with a print restriction or code a TP153440 universal function bar for print, CAR RET		
(3) One, two, or three single letter CDCs to put a TTY E/W the AN stuntbox in the print condition.	AN	1 1	Function bar with a select restriction for each CDC. TP153918	Set of Parts for each CDC	Install the parts in slot(s) 7, 8, and/or 9.
(4) One 2-Letter CDC to put a TTY E/W the AN stuntbox in the print condition, instead of a single letter CDC.	AN	1 1	TP157164 Function bar with a select restriction, and upper or lower case, if desired, for the first character. (Slot 8)	Slidebar	Replace the TP154-639 slidebar over slot 8 with the TP157164 slidebar. Install the parts in slots 8 and 9. Remove the U function bar and function lever parts from slot 6.
		1 1 1	TP153915 *Function bar with a select restriction for the second character. (Slot 9) TP153918	Set of Parts (Slot 8) Set of Parts (Slot 9)	
(5) A second 2-letter CDC for a TTY equipped as per (4).	AN	1 1 1 1	Function bar with a select restriction and upper or lower case, if desired, for the first character. (Slot 6) TP153915 *Function bar with a select restriction for the second character. (Slot 7) TP153918	 Set of Parts (Slot 6) Set of Parts (Slot 7)	Install the parts in slots 6 and 7.

*Although a select restriction is unnecessary for the second character of 2-letter CDCs, to facilitate the stocking of function bars, they should be ordered with such restrictions where indicated. See 5 and the piece part section covering precoded function bars.

TABLE F (Cont)

Function Lever Parts and Shift Slides

Modification Desired or Feature to be Added	Stuntbox	Parts Required: Quantity	Part No.	Part	Modification
(6) A third or fourth 2-letter CDC to put a TTY equipped as per (4) and (5), in the print condition.	AN	1	TP154750	Set of Parts (Shift Slide)	Install the TP154-750 Set of Parts on top of the stuntbox in the mounting holes at slot 23. For the third CDC, install the parts for the first character in slot 21, and for the second in slot 22. For the fourth CDC, install the parts for the first and second characters in slots 23 and 24 respectively.
		All the parts listed in Item (5) for each 2-letter CDC.			
(7) A fourth and/or fifth single-letter CDC to a TTY equipped as per (3)	AN	1	TP154750	Set of Parts (Shift Slide)	Install the TP154-750 Set of Parts (shift slide) on top of the stuntbox in the mounting holes at slot 23.
		1 or 2	Function bar(s) with select restriction		
		1 or 2	TP153918	Set of Parts	Install the function bar and TP153918 set of parts for the 4th CDC in slot 22 and for the 5th CDC in slot 24. If only a fourth CDC is desired and the broadcast CDC (all stations, U in slot 6) is not required, replace the U function bar with the desired one.
(8) Four additional single letter CDCs to a TTY equipped as per (3)	AN	1	TP154639	Slidebar and parts	Install the slidebar and parts on top of the stuntbox at slot 23. Add the TP153-918 Set of Parts for each CDC in slots 21 to 24 inclusive.
		1	TP153918	Set of Parts	
		for each CDC added.			
		1	*Function bar with a select restriction		

*Although a select restriction is unnecessary for the second character of 2-letter CDCs, to facilitate the stocking of function bars, they should be ordered with such restrictions where indicated. See 5 and the piece part section covering precoded function bars.

TABLE G

Contact Assemblies					
		Parts Required			
Contact to be Added	Stuntbox	Quantity	Part No.	Part	Modification
(1) One make-contact for momentary operation.	AN	1	TP152737	Contact Assembly	Mount the contact block over slots 17 to 20. Install the function bar and function lever parts in slot 19. Provide wiring from the contact to the typing-unit connection block, as required.
		2	TP151689	screw	
		2	TP110743	lockwasher	
		1	TP153916	Set of Parts (function lever)	
		1	Function bar with any desired restrictions.		
(2) One make-contact for closing on one character and opening on the next following character.	AN	Same as (1) except: TP153917 instead of TP153916 Set of Parts.			Same as (1).
(3) One make-contact for closing on one character and opening on FIGS H. (End-of-Message Code)	AN	Same as (1) except: TP153918 instead of TP153916 Set of Parts.			Same as (1).
(4) One break-contact for momentary operation.	AN	1	TP153324	Contact Assembly	Mount the contact block over slots 17 to 20. Install the function bar and function lever parts in slot 17. Provide wiring to the typing-unit connection block, as required.
		2	TP151689	screw	
		2	TP110743	lockwasher	
		1	TP153916	Set of Parts (function lever)	
		1	Function bar with any desired restrictions.		
(5) One break-contact for opening on one character and closing on the next following character.	AN	Same as (4) except: TP153917 instead of TP153916 Set of Parts.			Same as (4).
(6) One break-contact for opening on one character and closing on FIGS H.	AN	Same as (4) except: TP153918 instead of TP153916 Set of Parts.			Same as (4).
(7) Additional make-contacts to a stunt-box modified as per (1) to (6).	AN	1	TP154751	Set of Contact Parts	Add the parts in any one of the available 17 to 24 slots of the stuntbox and contact block. Provide the required wiring to the typing-unit connection block.
		1	Set of desired function lever parts.		
		1	Function bar with any desired restrictions.		

TABLE G (Cont)

Contact Assemblies					
		Parts Required			
Contact to be Added	Stuntbox	Quantity	Part No.	Part	Modification
(8) Additional break-contacts to a stuntbox modified as per (1) to (6).	AN	1	TP154752	Set of Contact Parts	Add the parts in any one of the available 17 to 24 slots of the stuntbox and contact block. Provide the required wiring to the typing-unit connection block.
		1	Set of desired function lever parts.		
		1	Function bar with any desired restrictions.		

5. UNIVERSAL FUNCTION BAR

5.01 A universal function bar, TP153440, is available with tines at all the code levels (Print, 4, 1, 5, 2, 3, Select, and FIGS-LTRS Shift) which may be broken off as desired, thus permitting the function bar to be coded for any character with or without the restrictions necessary for use in selective calling. When the code bars are moved so that those opposite marking tines on a function bar are in the left-hand or marking position, and those opposite spacing tines are in the right-hand or spacing position, the function bar can move into selection. As a basis for determining which tines should be removed, the following table shows the relation between the positions of the print, select, and FIGS-LTRS shift code bars and the typing unit condition as affecting which function bars will go into selection.

	Typing Unit Condition	
Codebar Position	Left (Marking)	Right (Spacing)
Codebar Name		
Print	Nonprint	Print
Select	Select	Nonselect
FIGS-LTRS	FIGS	LTRS
Shift	(upper case)	(lower case)

To code the TP153440 function bar, proceed as follows:

(a) Hold the function bar so that the tines appear as in Figure 2(b).

(b) Consider that the tines have the arbitrary numbers assigned as shown in Figure 2(b).

Note: These numbers have no direct relation to the code element numbers associated with the code bar stack and the function bar tines; the correlation is as follows:

Code Element	Corresponding Tine Numbers of Figure 2
4	3 and 4
1	5 and 6
5	7 and 8
2	9 and 10
3	11 and 12

(c) Mark the tines that are to be removed in accordance with the following table:

(1) Character	Tines To Be Marked For Removal
A	3-6-7-10-11
B	4-6-8-9-11
C	4-5-7-10-12
D	4-6-7-9-11
E	3-6-7-9-11
F	4-6-7-9-12
G	4-5-8-10-11
H	3-5-8-9-12
I	3-5-7-10-12
J	4-6-7-10-11
K	4-6-7-10-12
L	3-5-8-10-11
M	4-5-8-9-12
N	4-5-7-9-12
O	4-5-8-9-11
P	3-5-8-10-12
Q	3-6-8-10-12

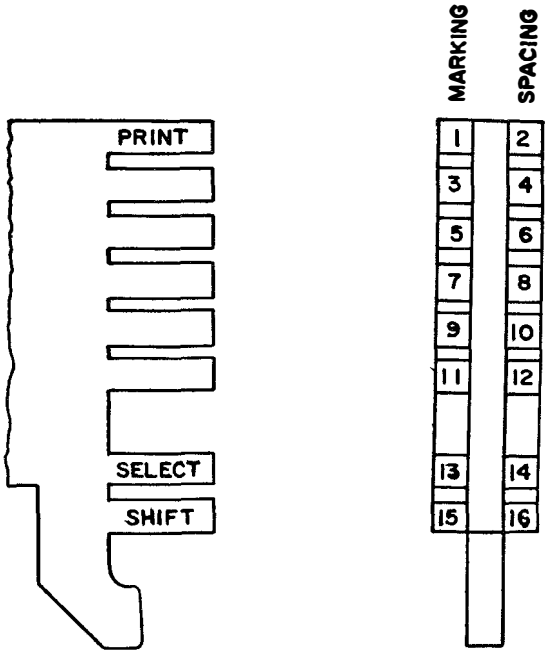


Figure 2

(1) Character	Tines to Be Marked For Removal
R	4-5-7-10-11
S	3-6-7-9-12
T	3-5-8-9-11
U	3-6-7-10-12
V	4-5-8-10-12
W	3-6-8-10-11
X	4-6-8-9-12
Y	3-6-8-9-12
Z	3-6-8-9-11
BLANK	3-5-7-9-11
CR	4-5-7-9-11
LF	3-5-7-10-11
SP	3-5-7-9-12
LTRS	4-6-8-10-12
FIGS	4-6-8-10-11

(2) In addition to those tines marked for the character, the Print, Select, and FIGS-LTRS Shift tines should be marked for removal according to the following:

	Tines to Be Marked For Removal		
To Respond In	Shift	Print	Select
FIGS Condition	16		
LTRS Condition	15		
Both FIGS and LTRS Conditions	15 and 16		
Print*		1	
Nonprint		2	
Both Print and Nonprint Conditions		1 and 2	
Select*			14
Nonselect			13
Both Select and Nonselect Conditions			13 and 14

*With selective calling, the Print and Select levels both must be considered. Without selective calling, tines 1, 2, 13, and 14, may be marked for removal.

(d) Recheck the tines marked and remove the tines.

Note: Refer to Figure 3, Page 18.

5.02 The following examples describe the coding of the TP153440 universal function bar for use in selective calling:

(a) Call Directing Code - Select Condition

(1) Remove tines 1, 2, 14, 15, 16 (unless otherwise indicated).

(2) Remove the tines for the desired character.

(b) Upper-Case Control Character - (Print, Upper Case, For example: Upper-Case S (Bell) in slot 25)

(1) Remove tines 1, 13, 14, 16.

(2) Remove the tines for S character.

5.03 Coding the Universal Function Bar for Multiple Response to Two or More Characters:

(a) For some special applications it may be desirable to arrange a function bar so that it will respond to either one of two characters or to any one of more than two characters. The method described below offers a systematic way of doing this for particular combinations of letters by taking advantage of certain characteristics of the 5-unit teletypewriter code. As shown, it is possible to code a bar to respond to any one of two, four, eight, 16, or 32 characters.

(b) For response to either one of two, the 5-unit codes of the two characters chosen must differ by only one signal element. As an illustration, consider the letter A (marking elements 1 and 2) and the letter W (marking elements 1, 2, and 5). These differ only in the fifth element. If now both marking and spacing tines are removed at position 5, with marking tines at positions 1 and 2, and spacing tines at positions 3 and 4, the resulting function bar will respond to either A or W when received by the machine.

(c) For response to any one of four letters, choose four, such as A, J, K, and U, which have three code elements in common, 1 and 2 marking, and 5 spacing. In this case, remove both marking and spacing tines in code positions 3 and 4. The bar will then respond to any one of the four letters.

(d) For response to any one of 8 letters, choose letters with two code elements in common and remove the tines in three positions. By analogy the plan might be extended to 16 and 32 letters. (Note that the term "universal" has sometimes been used for a function bar responding to all of the 32 characters of the code.)

(e) The code element numbers referred to in this discussion have no relation to the tine numbers assigned for convenience as indicated in Figure 2. However, a simple use may be made of the table in 5.01 (c) to accomplish the same result. Note that the tines to be removed for the letter A (3, 6, 7, 10, 11) and for the letter W (3, 6, 8, 10, 11) differ in only one position, 7 and 8. Remove both marking and spacing tines in this position and the function bar will respond to either of the two letters. The principle can be extended to the other cases.

6. SELECTION PREVENTION CLIPS

6.01 (a) A TP152127 selection prevention clip is available to provide optional changes, such as disabling a function in the unoperated or operated position. The clip can be positioned in three ways:

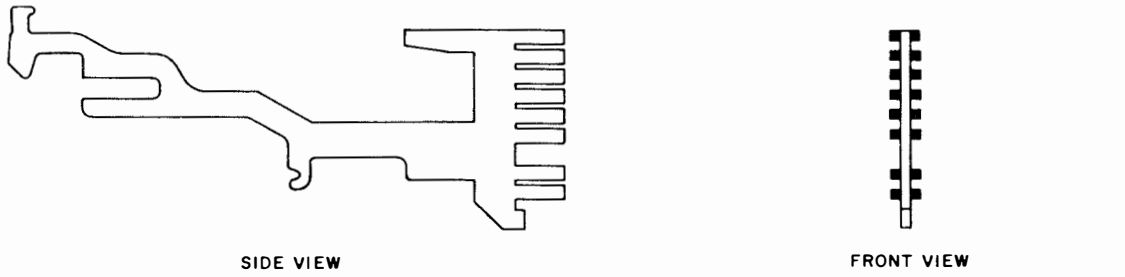
(1) To have no effect.

(2) To hold the function lever operated at all times.

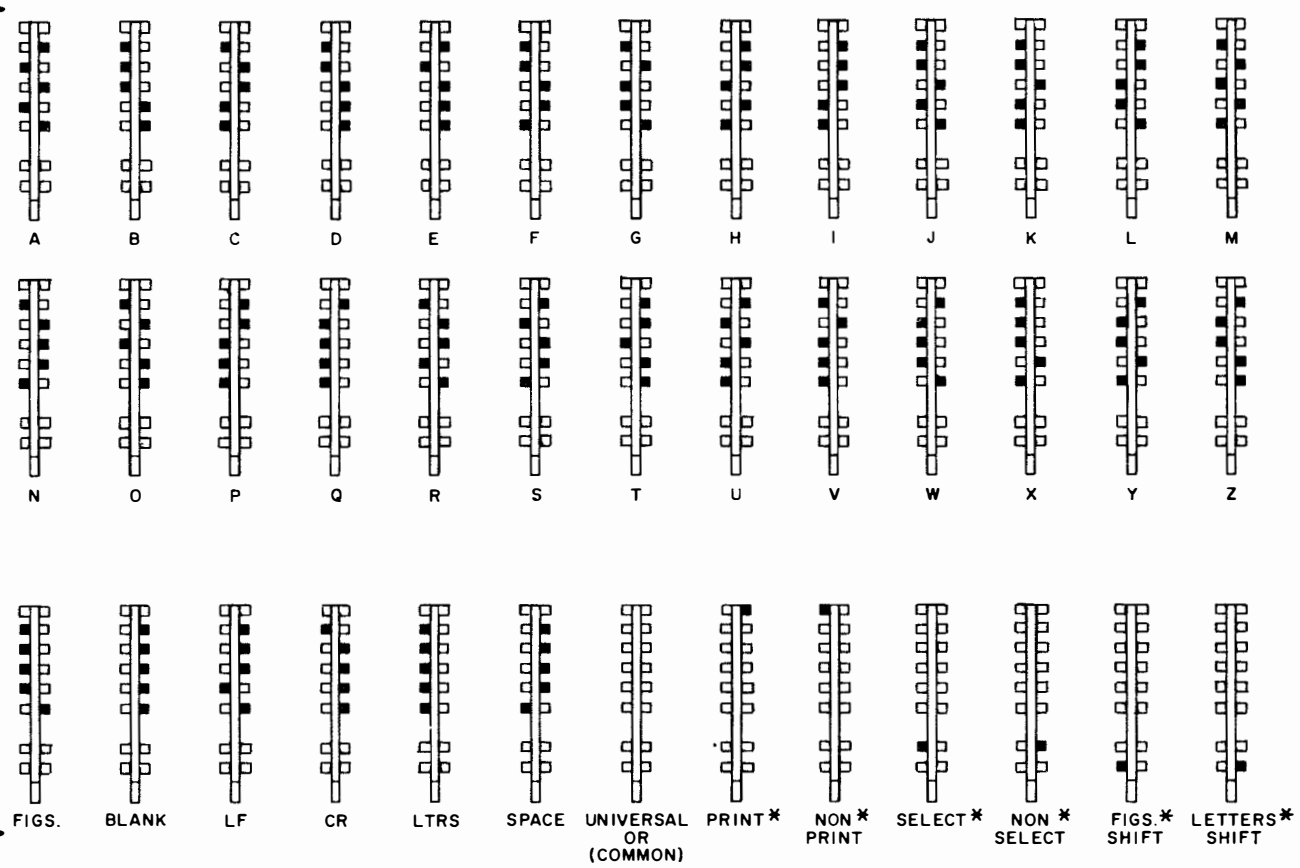
(3) To prevent the function pawl from being moved by the function bar, thus keeping the function lever unoperated at all times.

(b) The clips provide for optional control in two slot sequential operation, for example: The AR stuntbox is equipped for upper-case BLANK response in slot 28 and upper-case H response in slot 29 provided that the next character received after upper-case BLANK is upper-case H. The upper-case H function lever operates the motor stop contact. A clip, furnished for slot 28, can be positioned to have the following effects:

(1) Right-hand Position - Clip positioned to have no effect. The motor stops on FIGS BLANK H.



UNIVERSAL FUNCTION BAR



SNAP OUT TINE □
LEAVE IN TINE ■

* NOTE: A FUNCTION BAR CODED FOR A PARTICULAR CHARACTER CAN BE CODED IN ADDITION FOR PRINT OR NON-PRINT, SELECT OR NON-SELECT, FIGS. OR LTRS, OR ANY COMBINATION THEREOF.

Figure 3 - Universal Function Bar Coding

(2) Center Position - Clip positioned to raise the function pawl in the BLANK slot, thus keeping its function lever unoperated. This in turn prevents the operation of the upper-case H function which disables the motor stop feature.

(3) Left-hand Position - Clip positioned to hold the function lever in the BLANK slot operated at all times, thus enabling the adjacent upper-case H to operate whenever its character is received.

(c) The clips can be used only for slots other than 2, 9, 16, 22, 28, 35, and 42 since they can be mounted only for those slots.

(d) When a clip is used at one of these slots, the next lower numbered slot is unusable since the clip partially covers it.

6.02 A TP157274 selection prevention clip is available which, when placed under the function pawl and over the cable channel, disables the function by raising the function pawl thus preventing it from being engaged by its function bar. The clip may be used to disable functions in slots where it is not convenient to use a TP152127 selection prevention clip.

6.03 A TP154650 clip is available to hold the print codebar in its print (spacing) position. The clip mounts on the code bar detent bracket. It is standard equipment on the 28D, B, and C typing units. (AR stuntbox) The clip is provided so that function bars with a print restriction (such as the TP153437 print, uppercase S function bar in slot 30 and the TP153435 print LF function bar in slot 40 of the AR stuntbox) can be used. This is to facilitate the possible conversion of those units to selective calling. The clip can also be used on 28E, F, and G typing units if it is desired to convert those units to nonselective calling.

ADDENDUM 573-115-200
Issue 1, May, 1968
AT&TCo Standard

REPLACING PAGE ADDENDUM
Filing Instructions:

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.

28 TYPING UNIT

INSTALLATION OF FUNCTION PARTS

ON A 28 STUNTBOX

1. GENERAL

1.001 This addendum supplements Section 573-115-200, Issue 2. It is issued to correct the coding of the universal function bar as shown in the table in the lower right corner of page 16, and in Figure 3 on page 18.

1.002 Insert the attached pages in accordance with the filing instructions above. Arrows in the margin indicate changes.

Attached:
Page 15 dated May 1968, reissued
Page 16 dated May 1968, revised
Page 17 dated May 1968, reissued
Page 18 dated May 1968, revised

Prepared for American Telephone and Telegraph Company
by Teletype Corporation
Printed in U.S.A.