

**BELL SYSTEM PRACTICES**  
**Teletypewriter and Data Stations**

**ADDENDUM P34.101**  
**Issue 2, March, 1958**  
**AT&TCo Standard**

## **28 TELETYPEWRITER**

### **LIST OF UNITS**

### **AND**

### **AUXILIARY FEATURES**

#### **1. GENERAL**

- 1.001 This addendum replaces Issue 1 of the addendum and supplements Section P34.101, Issue 2.
- 1.002 This addendum is reissued to include additional typing units, typeboxes and miscellaneous features. Marginal arrows indicate the changes.

#### **2. TYPING UNITS**

The following change applies to Part 2 of the section:  
(a) 2.02—revised

- 2.02 Table 1 shows the codes assigned to 28 typing units and indicates the essential features provided under each of these codes.

#### **3. TYPEBOXES**

The following changes apply to Part 3 of the section:  
(a) 3.01 and 3.02 added  
(b) Table—revised and numbered 3.03

- 3.01 The original "thick" typebox containing dummy pallets has been rated Manufacture Discontinued and superseded by a "thin" typebox having no dummy pallets. The new-style typebox can be used in a typing unit adjusted for the old-style typebox without causing any difficulty. However, if an old-style typebox is used in a typing unit adjusted for the new-style typebox **the print hammer stop bracket must be readjusted** to prevent excessive print hammer blows which might result in breakage of the typebox. Typing units may be equipped with new- or old-style typeboxes but the **printing ham-**

**mer stop bracket** and **printing arm** adjustment should be checked whenever a typebox is installed. Old-style type pallets and springs can not be used in new-style typeboxes. New-style type pallets and springs can be used in both old- and new-style typeboxes. Parts ordering information for the new-style pallets is shown in Bulletin 1164B.

3.02 The TP150077 pallet springs are replaced by TP157238 springs. The TP152559 pallet box plate (front) is superseded by a TP154616 plate. The TP152559 plate may be obtained for maintenance purposes when required.

3.03 The codes for the typeboxes have not changed and are as follows:

<u>Code</u>	<u>Bell System Type Arrangement</u>
28A	A
28B	B
28C	C
28D	D
28E (Note 1)	A (Long Gothic style)
28E-1 (Notes 1 & 2)	Basically A (Long Gothic style)
28F (Note 3)	A
28F-1 (Note 3)	A (includes # sign)

Note 1: Long Gothic style is not recommended for single line-feed use as the printed character is 0.120-inch high.

Note 2: Deviations from type arrangement "A" are as follows:

- Upper Case B has \* (asterisk)
- Upper Case D has ◇ (diamond)
- Upper Case F has # (number sign)
- Upper Case H has → (arrow to right)
- Upper Case M has ∞ (infinity sign)
- Upper Case N has ⊕ (weather symbol)
- Upper Case V has ⊗ (weather symbol)
- Upper Case Z is blank (no pallet)

Note 3: The 28F and 28F-1 typeboxes are to be used only with the 28J and 28J-1 typing units. They have the maximum size type and the characters are approximately 0.180-inch high. No character is provided for upper case H and the upper case P is φ.

#### 4. TELETYPEWRITER BASES

The following changes apply to Part 4 of the section:

(a) Unnumbered paragraph has been numbered 4.01.

4.01 Table 2 shows a summary of bases and associated electrical service units and cabinets.

#### 7. ELECTRICAL SERVICE UNITS

The following change applies to Part 7 of the section:

(a) Unnumbered paragraph revised and numbered 7.03.

7.03 **28E Electrical Service Unit.** This unit is shown in Table 2 and is like the 28B unit except it includes the rectifier and line relay mounting assembly which is wired at the factory. ↙

**TABLE 1**  
**CODES FOR 28 TYPING UNITS**

Units	Friction Paper Feed	Sprocket Paper Feed	Horizontal Tabulate Feature	Additional Cabinet Terminals	Common Selective Calling Parts	Normal Paper Width Adjustment	Units Marked # or ## Have Same Wiring	Uses 28A, B, or C Base	Stuntbody Used	Stuntbody Assembly Part Number
<b>Typing Units</b>						8½"				
28A Notes 1 & 2	X					8½"	#	X	AG	TP152804
28A-1 Notes 1 & 2		X				8½"	#	X	AG	TP152804
28B		X				8½"	#	X	AR	TP164944
28B-1 (AMA Machine)*	X					7"	#		AX	TP154961
28C		X	X			8½"	#	X	AR	TP154944
28D	X					8½"	#	X	AR	TP154944
28E Note 3	X			X	X	8½"	##	X	AN	TP152810
28F Note 3		X		X	X	8½"	##	X	AN	TP152810
28G Note 3		X	X	X	X	8½"	##	X	AEK	TP157519
28H (For 83B1 Selective Calling System only)	X					8½"			AED	TP157400
28H-1 (For 83C1 Selective $\phi$ Calling System only)	X					8½"			AFA	TP157401
28H-2 (For 83C1 Selective $\phi$ Calling System only)	X					8½"			AFB	TP157402
28J (For Air Defense)	X					8½"		X	AEG	TP157405
28J-1 (For Air Defense)	X					4½"		X	AEG	TP157405
28K (For 83C1 Selective $\phi$ Calling System only)	X					8½"			AFC	TP157404

Note 1—Function pawl stripper bail operated from typebox clutch. All others operated from function clutch.

Note 2—Manufacture Discontinued.

Note 3—Includes TP153920 Selective Calling Parts.

\* Equipped with special typebox (TP157000)

$\phi$  The 83C1 Selective Calling System is under development as of 1-1-58.

**TABLE 2**  
**CODES FOR 28 BASES, ELECTRICAL SERVICE UNITS AND CABINETS**

Units	Sending Receiving	Receiving Only	Uses 28A Electrical Service Unit	Uses 28B Electrical Service Unit	Requires 28A Cabinet	Requires 28B Cabinet	For AC	For DC	Floor Mounted	Shelf Mounted	Requires DC Conversion Parts on DC	80-Volt Coplamps	6-Volt Coplamps
<b>Bases</b>													
28A Note 2	X		X										
28B		X	X	X									
28C	X			X									
<b>Electrical Service Units</b>													
28A					X								
28B						X							
28E Note 4						X							
<b>Cabinets</b>													
28A Note 2							X	X	X		X	X	
28B Note 2							Note 1	X	X		X	X	Note 3
28C Note 2							Note 1	X		X	X	X	Note 3
28D							X		X				X
28E							X			X			X

Note 1—May be used on ac but 28D or 28E more satisfactory.

Note 2—Manufacture discontinued.

Note 3—May be converted to low-voltage copylamp arrangement by using TP159357 modification kit.

Note 4—Includes rectifier and line relay mounting.

## 8. 28 TELETYPEWRITER CABINETS

The following changes apply to Part 8 of the section:  
8.04 and 8.05—added

8.04 **28D Teletypewriter Cabinet:** This cabinet is floor mounted and like the 28B teletypewriter cabinet except that it is equipped with a transformer and two 6-volt copylamps in parallel for use on ac only.

8.05 **28E Teletypewriter Cabinet:** This cabinet is shelf mounted like the 28C teletypewriter cabinet except that it is equipped with a transformer and two 6-volt copylamps in parallel for use on ac only. A directory holder mounted on the left side is included.

## 9. AUXILIARY FEATURES AND CONVERSION PARTS

The following changes apply to Part 9 of the section:

- (a) 9.02—table revised
- (b) 9.03—added features
- (c) 9.10(a) reference \*\* —revised
- (d) 9.11.1 through 9.11.7—added features
- (e) 9.15—revised
- (f) 9.19.1 through 9.19.7—added
- (g) 9.20—revised
- (h) 9.24—added

### A. Auxiliaries Associated with the Electrical Service Units

9.02 (Change the TP152327 conversion set of parts [rectifier and cable assembly] listed in the table to TP153477.)

### B. Auxiliaries Associated with Cabinets

9.03 (Add the following to the listing)

Modification Kit (TP153901)	Facilities for mounting 15A, 15B, 15C, and 15D paper winders on 28A, 28B, and 28C cabinets.
--------------------------------	---

Modification Kit (TP153926)	A paper guide attached to the back of the cabinet to be used with superfold paper or forms in a friction- or sprocket-feed teletypewriter, respectively. The superfold paper in the friction-feed machine shall be fed under a partial roll of paper to provide a slight drag so that the paper straightener will function properly.
--------------------------------	--

- Modification Kit (TP154744)** Provides incandescent 6-volt copy-light system when installed on 28B or 28C cabinet with a 28B electrical service unit. This set of parts uses a 6.3-volt transformer and a 100-ohm resistor for use on ac only.
- Modification Kit (TP154754)** Subbase to be added to 28A or 28B cabinets to raise cabinet level 10 inches to permit stand-up operation.
- Modification Kit (TP154777)** For use on 28B and 28C cabinets (dc operation) to rewire the two 60-volt copylamps in parallel with a 700-ohm resistor in series with each lamp.
- Modification Kit (TP159357)** Replaces TP154744 set of parts for providing a low-voltage copylight system when used on 28B and 28C cabinets. This new set of parts uses a 5.5-volt transformer and does not use a resistor for use on ac only.
- Modification Kit (TP159356)** Provides a paper guide that will not obscure the typed copy above the printing point by replacing the TP153771 through TP153787 guide brackets on sprocket-feed typing units having TP153701 through TP153717 paper handling sets of parts.
- Modification Kit (TP154756)** A form-out alarm to be installed on 28 floor-mounted cabinets, equipped with rear paper guide set of parts (TP153926), to give an alarm when the last form is being used.

#### D. Associated with Selective Calling Typing Units

##### 9.10(a) (Change reference indicated by \*\* to read)

\*\*In this case the AN and AEK stuntboxes are equipped with a shift slide assembly for one to four one-letter CDCs. Where two 2-letter codes are required, the TP154639 slide must be replaced with a TP157164 slide. The TP157164 slide is furnished as part of the TP154750 stuntbox shift slide set of parts.

##### 9.11.1 (Add the following)

**Modification Kit (TP153909):** This kit provides parts to be used with 28E, 28F, 28G, and 28H typing units for typing all

28 TELETYPEWRITER  
LIST OF UNITS

ADDENDUM AND  
**P34.101** AUXILIARY  
Page 7 FEATURES

"call directing codes." Units containing these parts are used with 83A and 83B selective calling systems where it is desired to have all call directing codes typed on some or all machines on the circuit.

**9.11.2 Modification Kit (TP153913):** This kit may be installed on 28E, 28F, 28G, and 28H typing units to suppress the typing of all call directing codes used in selective calling systems.

**9.11.3 Modification Kit (TP153920):** This kit is used to modify 28B, 28C, and 28D cabinets for selective calling and consists of a TP157152 terminal block assembly, TP157157 busy light feature, and TP157156 cable assembly. These parts are furnished with the 28E, 28F, and 28G typing units.

**9.11.4 Modification Kit (TP154758):** This kit includes the stuntbox, cable and terminal blocks used on the 28E typing unit.

**9.11.5 Modification Kit (TP154759):** This kit includes the stuntbox, cable and terminal blocks used on the 28H typing unit.

**9.11.6 Modification Kit (TP154740):** This kit is used to convert the stuntbox of a 28E typing unit to a stuntbox for 28H typing unit.

**9.11.7 Modification Kit (TP153921):** This kit includes plug, cable and connector block to mount the 28A distributor on a teletypewriter base.

#### **F. Miscellaneous Features Associated with Typing Units**

**9.15 Horizontal Tabulator Mechanism (TP154781):** This modification kit is used to convert a 28B or 28F typing unit into a 28C or 28G typing unit, respectively, and to provide tabulating features on friction-feed typing units for 60-, 75-, and 100-wpm operation. This mechanism includes a contact to control an associated transmitter-distributor start magnet. (If parts without this transmitter control are desired, the TP152903 set of tabulator parts should be ordered.) The original parts, TP153908 and TP152304, used to provide tabulating features with and without transmitter control, respectively, may be used for 60- and 75-wpm operation only.

**9.19.1 Universal Contacts (TP154785):** A modification kit for installing make-before-break universal contacts.

**9.19.2 Vertical Spacing—Four Lines to the Inch (TP154742):** This set of parts, when installed on a 28 sprocket-feed typing unit, provides vertical spacing of four lines to the inch in the double line-feed position and eight lines per inch in the single line-feed position. Eight lines per inch is not recommended for use with standard type because of overprinting.

The vertical spacing feature is obtained by changing line-feed spur gears, the two line-feed bars, and the two line-feed bar eccentrics.

9.19.3 **Function Lever (TP153670):** This function lever is for use where space suppression on the function that operates a latch-release bail is not desired.

9.19.4 **Reperforator Control Parts (TP152339):** This set of parts is used with the 28A typing unit stuntbox; it locks contact on upper-case H and releases on upper-case F.

9.19.5 **Reperforator Control Parts (TP152307):** This set of parts is used on 28D, 28E, 28F, 28G, and 28H typing unit stuntboxes; it locks contact on upper-case H and releases on upper-case F.

9.19.6 **Selective Calling Parts (TP153920):** This set of parts is used to modify 28A and 28B cabinets for selective calling and consists of a TP157152 terminal block assembly, TP157157 busy light feature, and TP157156 cable assembly. These parts are furnished with the 28E, 28F, and 28G typing units.

9.19.7 **Multiple Copy Roll Paper Parts (TP152340):** A set of parts to provide means for feeding two or three copy paper from a roll on 28A typing units. These parts prevent the carbon paper from getting out of line when rolled multicopy stationery is used.

#### G. Miscellaneous Features Associated with Bases

9.20 **Break-Key Mechanism (TP154726):** This modification kit provides for converting the TP153902 signal line break mechanism to the new signal line break mechanism which is furnished on 28C bases and has break contacts separated from the sending contacts.

9.24 **Noise Suppressor (TP151369):** This is a set of parts to suppress radio frequency induction.

### 10. MAINTENANCE PARTS KITS

The following additions apply to Part 10 of this section:

10.01 (Add the following maintenance parts kits to the table.)

<u>Equipment to be Serviced</u>	<u>For Maintenance of Single Unit</u>	<u>For Maintenance of 2 to 5 Units</u>
28 Teletypewriter Set (less typing unit)	—	TP152863
28 Typing Unit	—	TP152864

28 TELETYPEWRITER

ADDENDUM LIST OF UNITS

P34.101 AUXILIARY

Page 9 AND

9 Pages FEATURES

This page intentionally left blank

**BELL SYSTEM PRACTICES**  
**Teletypewriter Stations**

**SECTION P34.101**  
**Issue 2, August, 1955**  
**AT&T Co Standard**

## **28 TELETYPEWRITER**

### **LIST OF UNITS**

### **AND**

### **AUXILIARY FEATURES**

<b>Table of Contents</b>	<b>Paragraph</b>
1. GENERAL .....	1.01, 1.07
2. TYPING UNITS .....	2.01-2.06
3. TYPEBOXES .....	3.00
4. TELETYPEWRITER BASES .....	4.01-4.03
5. GEARS .....	5.01
6. MOTOR UNITS .....	6.01, 6.02
7. ELECTRICAL SERVICE UNITS .....	7.01, 7.02
8. TELETYPEWRITER CABINETS .....	8.01-8.03
9. AUXILIARY FEATURES AND CONVERSION PARTS .....	9.01-9.23
A. Associated with Electrical Service Units...	9.01, 9.02
B. Associated with Cabinets.....	9.03
C. Conversion Parts and Auxiliary Features for Sprocket-Feed Operation.....	9.04-9.08
D. Associated with Selective-Calling Typing Units.....	9.09-9.11
E. Parts to Provide Remote Motor Control....	9.12-9.14
F. Miscellaneous Features Associated with Typing Units.....	9.15-9.19
G. Miscellaneous Features Associated with Bases .....	9.20-9.23
10. MAINTENANCE PARTS KITS .....	10.01

#### **1. GENERAL**

1.01 This section lists by code designations, together with brief descriptive information, the 28 teletypewriter apparatus units and the auxiliary features associated with these units.

**28 TELETYPEWRITER**  
**LIST OF UNITS**

**P34.101** AND  
Page 1 **AUXILIARY**  
**FEATURES**

1.02 This section is reissued to:

- (a) Add to the listings and describe new or improved units and associated auxiliaries, in particular such as are arranged to provide for sprocket-feed, horizontal-tabulating, and selective-calling features.
- (b) Add to the listings a number of new conversion and maintenance kits.
- (c) Improve the text by tabular presentation, where possible.

Because of the extensive changes made, marginal arrows are not feasible.

1.03 A 28-type teletypewriter station consists in general of the coded components below which must be provided:

- (a) typing unit
- (b) typebox
- (c) teletypewriter base
- (d) set of gears
- (e) motor unit
- (f) electrical service unit
- (g) cabinet

1.04 Each of the coded components may be obtained in various designs to suit the functions it is required to perform.

1.05 In addition to the coded units there are numerous auxiliary features. An auxiliary feature is provided by an apparatus assembly which is not regularly part of coded units, but is ordered separately to be installed by the factory before delivery or by others after delivery. In some instances, coded machines include parts listed as auxiliary features, but this is the exception. The tariff usually provides for an additional charge for auxiliary features.

1.06 Various sets of parts are provided to convert a coded unit from one model to another, or to convert auxiliary features to a later design. For example, a friction-feed typing unit can be converted to sprocket feed.

1.07 Finally, the various maintenance parts kits for servicing units are tabulated.

## 2. TYPING UNITS

2.01 Typing units are arranged to provide for friction-feed, sprocket-feed, horizontal-tabulating, and selective-calling features. Older 28A units and interim 28A1 and 28A2 units are of the type in which the function-pawl stripper bail is operated from the typebox clutch. The 28B, C, D, E, F, and G units are of the improved type in which the function-pawl stripper bail is operated by the function clutch and thereby the

typing operation is separated from the operation of the function mechanism, as is necessary for selective-calling uses.

2.02 The following table gives the codes assigned to 28 typing units and indicates the essential features provided under each of these codes:

	<b>Nonselective Calling</b>	<b>Non- selective Calling</b>	<b>Selective Calling</b>
		(Function-pawl stripper bail operated from function clutch.)	
Friction Feed	28A (to be superseded by 28D)	28D	28E
Sprocket Feed	28A1 (to be superseded by 28B)	28B	28F
Sprocket Feed with Horizontal Tabulator	28A2 (to be superseded by 28C)	28C	28G

2.03 Features common to all the typing units are as follows:

- (a) Signal-bell contacts on upper-case S.
- (b) Motor-stop contacts (except on selective-calling units).
- (c) Unshift on space (activated but can be disabled).
- (d) Keyboard Lock (Break Signal Mechanism) normally on double blank (can be disabled).

2.04 Features provided on the stuntbox of selective-calling typing units are as follows:

- (a) One shift slide to shift the unit from nonprint to the print condition, equipped with one function-lever mechanism which responds to U as a group call. For other CDCs, function bars and associated parts must be ordered and installed separately.
- (b) Function-lever mechanisms operating on the disconnect code (FIGS H LTRS) shift the unit to the select-nonprint condition.
- (c) Shift slide responding to CAR RET LINE FEED LTRS (end-of-address code) to shift the unit to the nonselect condition.
- (d) Function-lever mechanism to lock the keyboard of unselected machines on the end-of-address signal.
- (e) A contact block with four contacts for copylight control, busy lamp, busy lamp flashing, and bell.

28 TELETYPEWRITER  
LIST OF UNITS

P34.101

AND  
AUXILIARY  
FEATURES

2.05 All sprocket-feed typing units include the TP153926 cabinet parts to modify a 28-type teletypewriter cabinet for use with sprocket-feed paper. See Paragraph 9.03.

2.06 Sprocket-feed typing units are equipped with parts for handling superfold sprocket-feed stationery 8-1/2" wide. Paper widths other than 8-1/2" can be accommodated by installing on the typing unit the paper-handling parts and associated paper tray required for the width of paper desired. See Paragraph 9.06.

### 3. TYPEBOXES

<u>Code</u>	<u>Bell System Type Arrangement</u>
28A	A
28B	B
28C	C
28D	D

### 4. TELETYPEWRITER BASES

4.01 **28A Teletypewriter Base**—A send-receive base usable only with the 28A electrical service unit, and equipped with keytop arrangement C. Behind the character keyboard are six red keys which furnish the following operating features: local line feed, keyboard lock, keyboard unlock, break (opening contacts of signal generator), repeat character operation, and local carriage return. The base is provided with radio-frequency filter for signal generator (sending contacts).

4.02 **28B Teletypewriter Base**—A receiving-only base usable with the 28B electrical service unit. Two keys provide for local line feed and local carriage return. Space is provided for a break key, available as the TP152344 set of parts. See Paragraph 9.21.

4.03 **28C Teletypewriter Base**—A send-receive base, the same as the 28A teletypewriter base, except that it has a separate break contact and uses a W.E.Co. 185A network instead of a radio-frequency filter. The base is arranged for operation with a 28B electrical service unit.

### 5. SETS OF GEARS

5.01 The following sets of gears consist of a motor pinion and a countershaft gear, usable with either synchronous or governed motors:

<u>Code</u>	<u>Speed (words per minute)</u>
28A	60
28B	75
28C	100

## 6. MOTOR UNITS

6.01 **28A Motor Unit**—A synchronous motor unit equipped with a starting relay.

6.02 **28B Motor Unit**—A series motor unit equipped with a centrifugal-type governor and the necessary components for governing and spark protection circuits. It is designed for operation on 115-volt ac or on 115-volt dc with a capacitor-resistor assembly mounted in the electrical service unit as discussed in Paragraph 9.01. Requires tuning fork TP104986 for setting speed.

## 7. ELECTRICAL SERVICE UNITS

7.01 **28A Electrical Service Unit**—A service assembly to be mounted in the 28A teletypewriter cabinet. It is equipped with a line-shunt relay, fuses, switches, wiring and cables with plug receptacles. It is not equipped with, but has provision for, other auxiliary features listed hereafter.

7.02 **28B Electrical Service Unit**—A service assembly to be mounted in the 28B and 28C teletypewriter cabinet. It differs from the 28A electrical service unit in that it is equipped with four connecting blocks instead of three. It is likewise not equipped with, but has provision for, auxiliary features listed hereafter.

## 8. 28 TELETYPEWRITER CABINETS

8.01 **28A Teletypewriter Cabinet**—A console-type cabinet for 28-type, either send-receive or receiving-only teletypewriters, and designed for use with the 28A electrical service unit. It is equipped with a copylight, an end-of-line indicator lamp, signal bell, and the necessary cabling and three 10-terminal terminal blocks for external connections. The upper section has a hinged cradle for the teletypewriter; a copyholder is mounted on the front of the cover. The lower section has a shelf for a rectifier and a door that can be used as a maintenance tray.

8.02 **28B Teletypewriter Cabinet**—Similar to the 28A teletypewriter cabinet except that it is equipped with two 20-terminal terminal blocks and with incandescent lighting instead of fluorescent lighting. It is designed for use with the 28B electrical service unit.

8.03 **28C Teletypewriter Cabinet**—A cabinet for table mounting. It is similar to the upper portion of the 28B teletypewriter cabinet and is designed for use with the 28B electrical service unit.

## 9. AUXILIARY FEATURES AND CONVERSION PARTS

### A. Auxiliaries Associated with the Electrical Service Units

9.01 The following table lists and describes the auxiliary features associated with the electrical service units:

#### Set of Parts For

	<u>28A Electrical Service Unit</u>	<u>28B Electrical Service Unit</u>	<u>Description</u>
Line Test Key Assembly	TP152744	TP152625	Provides for switching from signal line operation to local operation for test or maintenance purposes.
Line Relay Mounting Assembly	TP151822	TP152623	Provides a mounting for the 255A line relay.
Line Pad Resistor Assembly		TP152330	Provides the necessary current limiting resistance in series with the signal line circuit when the signal line current is to be supplied at the station.
Rectifier and Cable Assembly	TP151999	TP152950	Provides direct current for the selector magnet and the line-relay biasing winding. It is not designed to supply the signal line current.
Capacitor-Resistor	TP152021	TP152624	Adapts a 28 teletypewriter set equipped with a series motor to operate from a 115-volt dc supply.
Electrical Motor Control Assembly	TP151400	TP153251	This assembly of start and stop magnets and contacts works together with the motor-stop contacts on the typing unit or the time-delay motor-stop mechanism on the base to start and stop the teletypewriter motor.

9.02 The following are sets of parts for converting the 28A electrical service unit to a 28B unit, and for converting the auxiliary parts of the 28A electrical service unit to the corresponding parts on the 28B electrical service unit.

<u>Conversion Set of Parts</u>	<u>Conversion</u>
TP152324	28A to 28B Electrical Service Unit
TP152325	TP152744 to TP152625 Line Test Key Assembly
TP152326	TP151822 to TP152623 Line Relay Mounting Assembly
TP152327	TP151999 to TP152950 Rectifier and Cable Assembly
TP152328	TP152021 to TP152624 Capacitor-Resistor Assembly
TP152329	TP151400 to TP153251 Motor Control Assembly

## B. Auxiliaries Associated with Cabinets

9.03 The following is a list of the auxiliary features associated with the cabinets:

Conversion Unit (TP152321)

To convert the 28A cabinet to the electrical equivalent of the 28B cabinet.

Copyright (TP153309)  
End-of-Line Indicator Lamp  
(TP152310) }

Provided as part of TP152321 conversion unit.

28A Copyholder

Offset copyholder, to be mounted on right side of the 28A and 28B cabinet.

28B Copyholder

Offset copyholder, similar to 28A copyholder, to be mounted on right side of the 28C cabinet.

Auxiliary Apparatus  
Mounting Rack (TP152909)

Set of mounting racks to permit mounting 19-inch relay rack mounting plates in the lower compartment of the 28A and 28B cabinet.

Directory Holder (TP152910)

To be mounted on left side of the 28A and 28B cabinet.

Directory Holder (TP152300)

To be mounted on left side of the 28C cabinet.

28A Paper Box

Floor-mounted stand to be attached at the rear of the 28A and 28B cabinet for containing a supply of form stationery in alignment with the typing unit. A form-accumulating shelf for typed forms is provided as part of the paper box. A TP153842 paper-holder clip is also provided to facilitate the insertion of paper into the typing unit.

Modification Kit (TP153926)  
(Cabinet Paper Guide Set of  
Parts)

To be installed on the 28A and 28B cabinet to permit handling sprocket-feed paper. (This kit is an accessory to the sprocket-feed typing unit and is supplied with the typing unit.)

### C. Conversion Parts and Auxiliary Features for Sprocket-Feed Operation

9.04 Conversion Parts required on the typing unit and cabinet to convert a friction-feed teletypewriter set to a sprocket-feed set are tabulated below:

<u>Set of Parts</u>	<u>Installation On</u>	<u>Reference Paragraph</u>
Conversion Set (TP152316)	Typing Unit	9.05
Modification Kits (TP153701 through TP153717)	Typing Unit	9.06
Paper Trays (TP153726 through TP153729)		
Spacing Drum Parts (TP153905 or TP153914)	Typing Unit	9.07
Modification Kit (TP153926)	Cabinet	9.03
28A Paper Box	Cabinet	9.03

**9.05 Conversion Set of Parts (TP152316)**—To convert a 28-type friction-feed typing unit into a sprocket-feed typing unit. This conversion set includes all conversion parts required for the typing unit except the variable parts covered by Paragraphs 9.06, 9.07 and 9.08.

Note: The TP153673 shaft tool and TP153797 retaining tool are required for the assembly of the sprockets in the TP152316 set of parts.

**9.06 Modification Kits (TP153701 through TP153717)**—To adapt a sprocket-feed typing unit to a desired width of continuous superfold form stationery. Each kit is used in association with a particular paper tray which is ordered separately. Tabulated below are the various widths of stationery together with the corresponding modification kits and paper trays:

<u>Paper Width in Inches</u>	<u>Modification Kit</u>	<u>Paper Tray</u>
9	TP153701	TP153727
8-1/2	TP153702	TP153726
8	TP153703	TP153727
7-1/2	TP153704	TP153726
7	TP153705	TP153727
6-1/2	TP153706	TP153726
6-3/8	TP153707	TP153728
6-1/4	TP153708	TP153729
6	TP153709	TP153727
5-3/4	TP153710	TP153728
5-1/2	TP153711	TP153726
5	TP153712	TP153727
4-1/2	TP153713	TP153726
4-5/16	TP153714	TP153729
4-1/4	TP153715	TP153728
4	TP153716	TP153727
3-5/8	TP153717	TP153726

**9.07 TP153905** (for units not equipped with the automatic carriage-return and line-feed feature) or **TP153914** (for units equipped with the automatic carriage-return and line-feed feature) **set of parts:** To provide a universal spacing drum on the typing unit for handling narrow-page friction-feed paper centrally located or narrow-page sprocket-feed paper located at the left-hand side. Whenever friction feed is converted to sprocket feed, these parts should be installed.

9.08 **Page Feed-Out Mechanism (TP152302 or TP153907)**—

To be installed on the typing unit to provide automatic advancing of a sprocket-feed form from any point on the form to the first printing line on the succeeding form. Only the TP153907 set of parts includes contacts for controlling an associated transmitter distributor.

(a) The following table indicates the gear and disc assembly set to be used in addition to the TP152302 or TP153907 set of parts for a given length of form:

<u>Gear and Disc Set</u>	<u>Form Length in Inches</u>
TP153927	15, 7-1/2
TP153928	14, 7, 3-1/2
TP153929	13, 6-1/2
TP153930	12, 6, 3
TP153931	11, 5-1/2
TP153932	10, 5
TP153933	9-1/2
TP153934	9, 4-1/2
TP153935	8-1/2, 4-1/4
TP153936	8, 4, 2

**D. Associated with Selective-Calling Typing Units**

9.09 **Conversion Set of Parts (TP153941)**—To convert a 28D,

28B or 28C typing unit into a 28E, 28F, or 28G typing unit respectively. These are the basic selective-calling parts furnished in the 28E, 28F, and 28G units. Additional function-bar and function-lever parts are required as described in Paragraphs 9.10 and 9.11.

9.10 Cut-on parts, as tabulated below, are required for selective-calling typing units. In addition, function bars listed in Paragraph 9.11 are also required.

(a) **On 1-Letter Codes**

<u>Features to be Provided</u>	<u>Stuntbox Parts Required</u>	
	<u>Function-Lever Parts</u>	<u>Contact Assembly*</u>
1. To call in machine	TP153918	—**
2. To momentarily close contact	TP153916	TP152737
3. To momentarily open contact	TP153916	TP153324
4. To latch contact closed on CDC and release on FIGS H LTRS	TP153918	TP152737
5. To latch contact open on CDC and release on FIGS H LTRS	TP153918	TP153324

\* Contact assembly TP152737 consists of a contact block mounting a single make-contact mechanism. Contact assembly TP153324 is the same except that it has only a single break-contact mechanism. However, the contact blocks are each capable of holding three additional contact mechanisms which may be selected from the following:

Make-contact mechanism—TP154751 set of parts

Break-contact mechanism—TP154752 set of parts

\*\* In this case a shift slide is provided in the stuntbox.

(b) **On 2-Letter Codes**

For each feature listed under (a), TP153915 function-lever parts are required (to operate on the first letter of the CDC) in addition to the respective function-lever parts and contact assemblies which then operate on the second letter.

In addition, the TP157164 shift slidebar is needed for 2-letter code operation instead of the shift slidebar used in 1-letter code operation.

(c) If an additional shift slide is desired, shift slide TP154750 should be added for 2-letter code operation. The part number for 1-letter code operation is not presently available; latest information should be secured at the time needed.

9.11 Additional cut-on character function bars are required with each of the above sets of function-lever parts for selective-calling typing units. Function-bar mechanisms should be ordered for 1-letter codes, or for the first and second letter on 2-letter code sequences, from the list below, according to characters desired.

**List for Cut-on Character Function Bars**  
(Both Upper and Lower Case)

<u>Character</u>	<u>Bar</u>	<u>Character</u>	<u>Bar</u>
A	TP155100	N	TP155113
B	TP155101	O	TP155114
C	TP155102	P	TP155115
D	TP155103	Q	TP155116
E	TP155104	R	TP155117
F	TP155105	S	TP155118
G	TP155106	T	TP155119
H	TP155107	U	TP155120
I	TP155108	V	TP155121
J	TP155109	W	TP155122
K	TP155110	X	TP155123
L	TP155111	Y	TP155124
M	TP155112	Z	TP155125

**Note:** All of the above function bars are coded to operate in the select condition only.

**E. Parts to Provide Remote Motor Control**

9.12 If it is desired to turn the teletypewriter motor on and off from a remote point, two sets of parts are required, with a third set needed if the automatic shut-down of the motor is desired after a fixed time delay.

- (a) Upper-case BLANK H contacts on the stuntbox of the typing unit (furnished on all typing units except selective-calling units 28E, F, and G).
- (b) Electrical motor-control assembly on the electrical service unit. See Paragraph 9.01.
- (c) Optionally, the time-delay motor stop mechanism on the base.

9.13 **Motor-Stop Contact Parts (TP153924)**—To provide for motor stop on upper-case BLANK H on selective-calling typing units when the units are in the select nonprint condition. These mount on the stuntbox.

9.14 **Time-Delay Motor-Stop Mechanism (TP152338)**—To be installed on send-receive or receiving-only bases, to measure a predetermined time interval during which the teletypewriter receives no telegraph signals, and thereafter to energize the associated electrical motor control assembly to stop the teletypewriter motor.

#### F. Miscellaneous Features Associated with Typing Units

9.15 **Horizontal Tabulator Mechanism (TP153908)**—To convert a 28A1, 28B, or 28F typing unit into a 28A2, 28C, or 28G typing unit, respectively, and to provide tabulating features on friction-feed typing units where this may be desired. This mechanism includes a contact to control an associated transmitter distributor start magnet. (If parts without this transmitter control are desired, the TP152304 set of tabulator parts should be ordered.)

9.16 **Multicopy Roll Paper Handling Mechanism (TP152340)**—To control multiple carbon friction-feed paper (original and two carbons).

9.17 **Latching Control Parts Mechanism (TP152307)**—A reperforator-control mechanism to close and latch a contact on upper-case H and unlatch the contact on upper-case F.

9.18 **Automatic Carriage Return—Line Feed Parts TP152322**—Typing-unit parts (except for stuntbox) to provide automatic carriage return and line feed.

**TP152335**—Stuntbox parts to provide automatic carriage return and line feed.

**Note:** These parts cannot be used with selective-calling typing units.

9.19 **Space on Upper-Case BLANK Mechanism (TP152900)**—To provide spacing on upper-case BLANK (along with the printing of a dash) on 28 typing units for weather service.

#### G. Miscellaneous Features Associated with Bases

9.20 **Break Key Mechanism (TP152333)**—To be installed on 28A bases to provide a separate BREAK key.

9.21 **Break Key Mechanism (TP152344)**—To be installed on receiving-only bases to provide a BREAK key.

9.22 **Paper Feed-Out Motor Start Mechanism (TP152334)**—To be installed on send-receive or receiving-only bases in sets equipped with a 28B electrical service unit, to permit starting the teletypewriter motor, simultaneously feeding out copy paper by depressing the local line-feed keylever without operating the line shunt relay.

9.23 **Keylever Conversion Sets**—The following sets of key-levers convert keytop arrangement C to the other arrangements indicated:

<u>Set of Parts No.</u>	<u>Convert Arrangement C to Arrangement</u>
TP152904	D
TP152905	B
TP152906	A

**Note:** The entire keylever is changed. Do not remove the keytops proper from the levers.

## 10. MAINTENANCE PARTS KITS

10.01 Maintenance Kits for servicing 28-teletypewriter units are tabulated below.

<u>Equipment to be Serviced</u>	<u>For Maintenance of Single Unit</u>	<u>For Maintenance of 2 to 5 Units</u>
28 Teletypewriter Set	TP152861	TP152862
28B Cabinet and 28B Electric Service Unit } 28D Typing Unit	TP154712	TP154714
Selective-Calling Typing Unit	TP154715	TP154713
Sprocket-Feed Typing Unit	TP154716	TP154719
Horizontal-Tabulate Typing Unit	TP154717	TP154720
	TP154718	TP154721