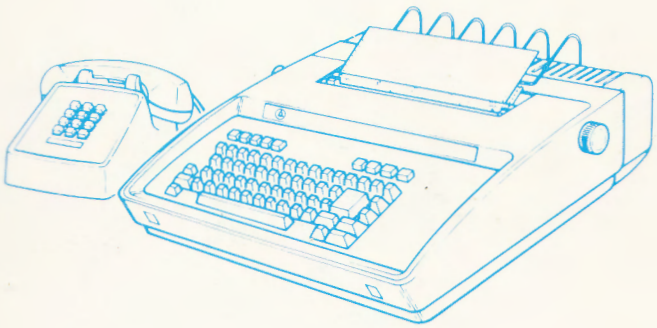
Hart

SERVICE MANUAL . . .

Manual 325-065
Issue 1, April 1977



the 43 teleprinter

Basic KSR

for dataphone® Service


Bell System

The 43 TELEPRINTER SERVICE MANUAL

TABLE OF CONTENTS

9-Digit Sections

The 43 TELEPRINTER

SERVICE MANUAL

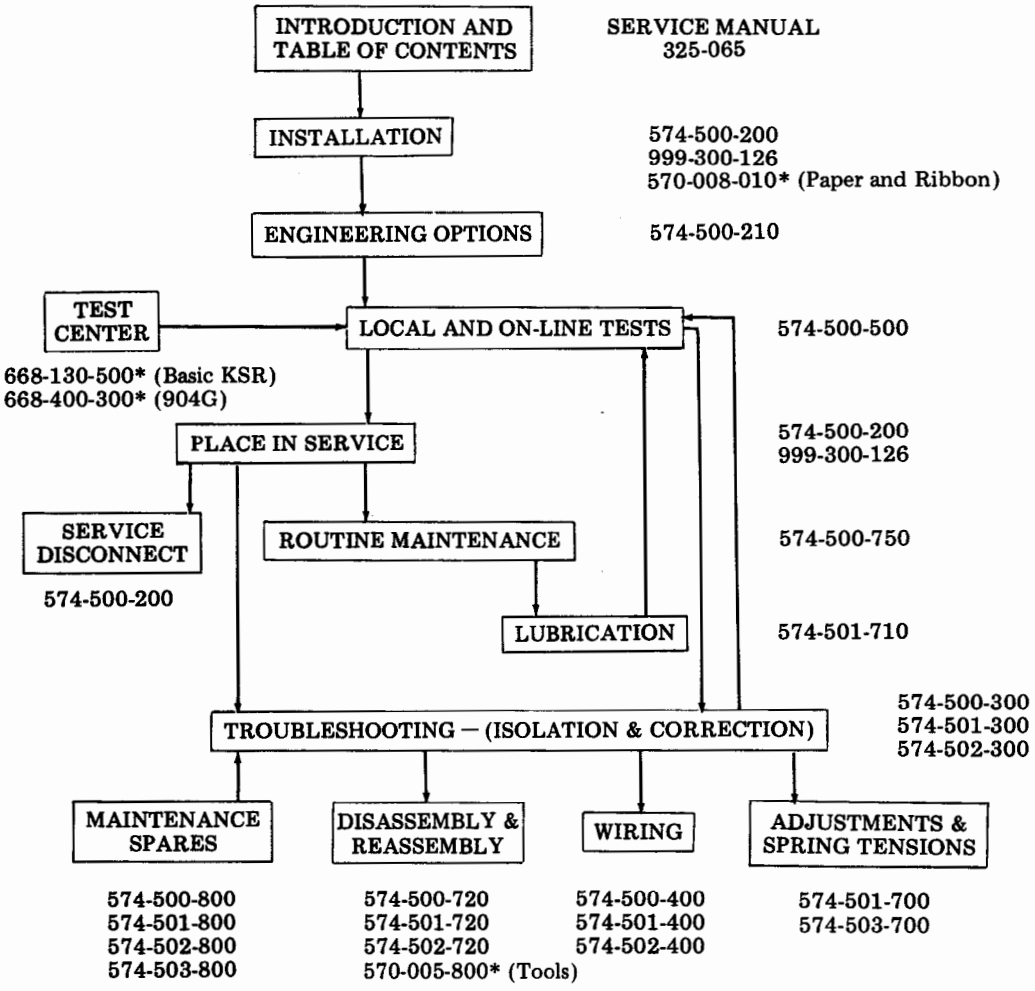
INTRODUCTION

This manual provides servicing information for the 43 Teleprinter Basic KSR used in DATAPHONE Switched Network Service. The 9-digit sections included in the service manual provide instructions for use by crafts personnel when performing the servicing tasks required for the installation, testing, troubleshooting and routine maintenance of the 43 KSR.

The task flow chart on the next page illustrates the intended servicing activities and associated 9-digit sections.

A brief plant training course and the maintenance spares are available. Crafts personnel should be properly trained and have access to maintenance spares before attempting to service the 43 Teleprinter.

TASK FLOW AND 9-DIGIT SECTIONS



*Not included in Service Manual.

43 KSR STATION

INSTALLATION AND REMOVAL

CONTENTS PAGE

1. GENERAL

1.01 This section provides station installation and removal information for the 43 KSR Station (Fig. 1).

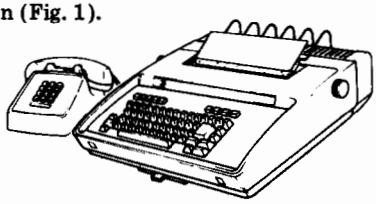


Fig. 1—43 KSR Station

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Installation should be performed under the direction of a service order indicating USOC code, options, date, materials required and location.

1.04 For additional information, refer to: Section 574-500-500, Station Testing and Section 574-500-210, Engineering Options.

1.05 The 43 Teleprinter is furnished fully assembled and tested with an integrated TDU (Terminal Data Unit) ready to connect between a modular 500DM or 2500DM type keyless telephone and the line telephone jack. Where telephones and jacks are not of the modular type, they must be converted to the modular type before station installation. (Refer to local procedures and Section 503-100-100 for conversion information.)

1.06 Before starting the installation procedure, verify that two boxes which make up the USOC 43AXS Basic 43 Teleprinter Arrangement are present at the installation location. The two boxes will contain:

(a) 43 Teleprinter and Documentation

(b) Paper

Note: Obtain locally at least one D4BU modular cord of the appropriate length to connect between the telephone and the 43 Teleprinter. Discuss with customer where the teleprinter and phone are to be installed before obtaining cord(s).

1.07 Reference in the procedures to left or right, up or down, and top or bottom, etc, refer to the teleprinter in its normal operating position.

1.08 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP430202).

2. TOOLS REQUIRED

2.01 No tools are required to install or remove the 43 KSR Station. For tools required to enable engineering options, refer to the Engineering Options, Section 574-500-210.

3. INSTALLATION PROCEDURE

UNPACKING

3.01 Select an area to unpack the carton so that damage to the terminal will not occur.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

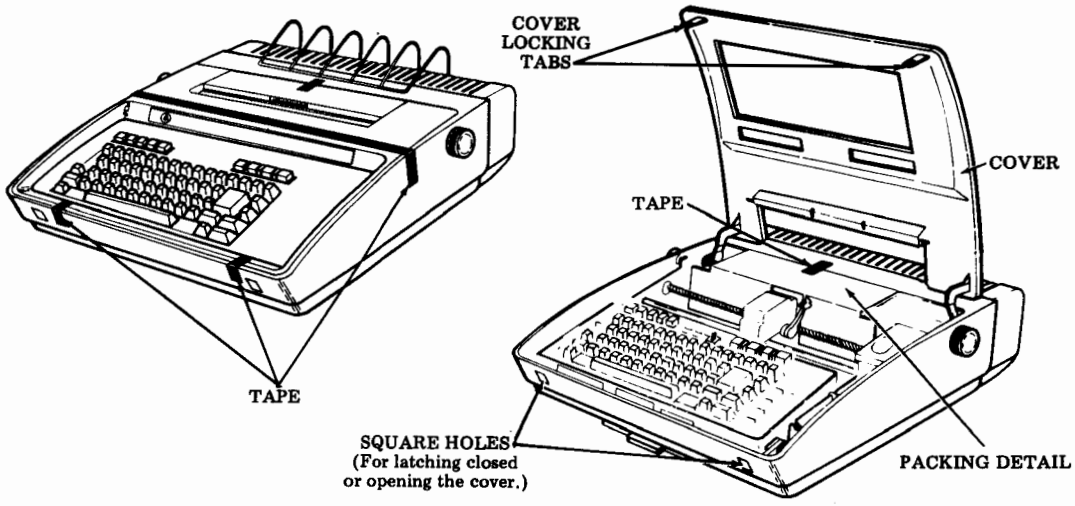


Fig. 2—Packing Detail

3.02 When unpacking, be sure to wear approved safety glasses.

3.03 Unpack the large carton. Refer to instructions on the container. Remove tape securing the cover to the housing (Fig. 2).

Note: Observe all "caution" notes printed on the carton.

3.04 Depress the cover locking tabs on the lower front of the cabinet and lift the cover. Remove the packing detail securing the print head in place (Fig. 2).

3.05 The containers and other packing details are to be retained and reused by field locations to facilitate movement of stations.

3.06 Verify that the following items are included with the service order and are at the installation location after the boxes are unpacked.

1 — Set w/TDU, 43 Teleprinter, 4320 AAB
1 — Paper Holder
1 — Ribbon
1 — Paper, Box of, White Fan-Fold 12 x 8 1/2, E-6879
1 — Manual, Attendant, 999-300-126
1 — Practice, Installation, 574-500-200
1 — Plan, Wiring, W-43AXS

TELEPHONE CONNECTION

3.07 Place the 43 Teleprinter on the desk, table, etc, indicated by the customer. Placement should be near the modular phone that will be used with the teleprinter.

3.08 Unplug the modular plug of the D4BU cord from the modular jack associated with the telephone specified on the service order and connect it to the lower connector marked LINE on the rear of the TDU accessible through the opening in the left rear of the bustle cover (Fig. 3). If telephone is not to be placed at original phone location, a different length cord may be needed.

3.09 Connect the locally furnished D4BU modular cord between the upper connector on the TDU marked PHONE and the telephone jack.

3.10 Since the two cords are interchangeable, the selection of which cord to apply to which function is a matter of installer judgement based on length of cords available and terminal location with respect to the wall jack.

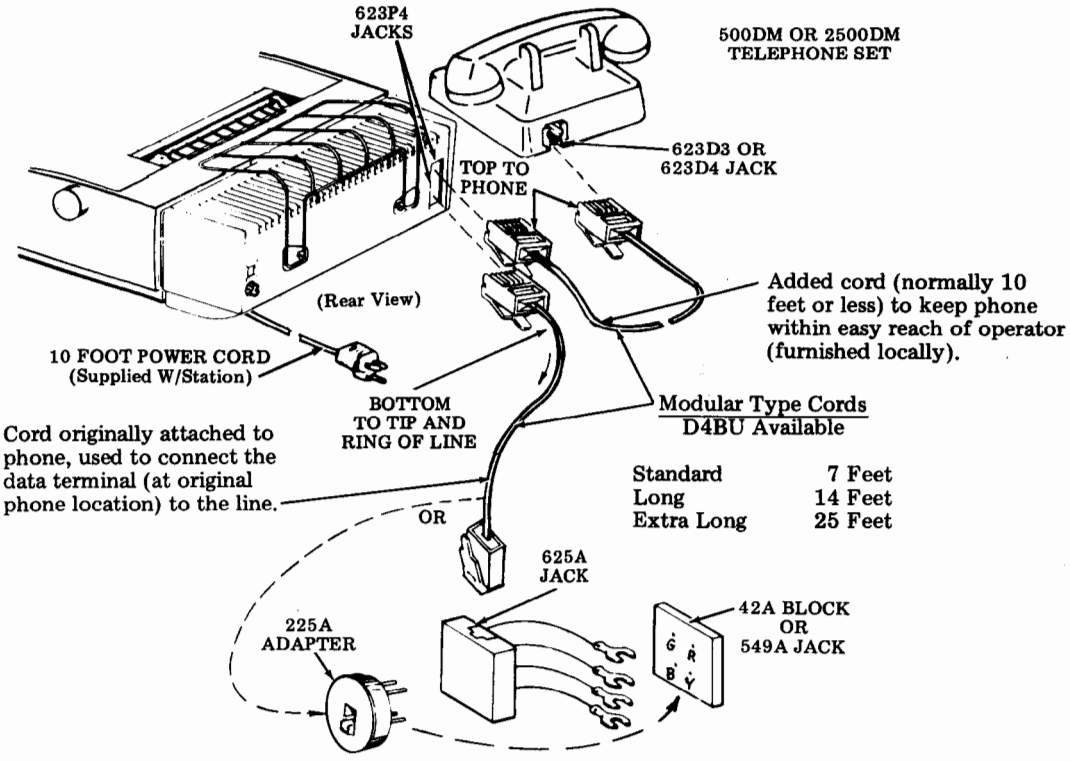


Fig. 3—Telephone Connection

430202 PAPER HOLDER

3.11 Attach the paper holder to the deflector as shown in Fig. 4.

RIBBON AND PAPER

3.12 Install the ribbon and paper supplied. Refer to the How to Operate Manual, 999-300-126 for ribbon and paper installation information. Retain the order form provided with the ribbon. Refer to Section 570-008-010 for information on other types of paper.

CHECKOUT PROCEDURE

3.13 Plug the 43 Teleprinter into a properly grounded and polarized 3-wire 115 V ac 50-60 Hz electrical power source.

3.14 Perform the Station Installation Checkout Procedures (Local and On-Line) found in 43 KSR Station Testing, Section 574-500-500.

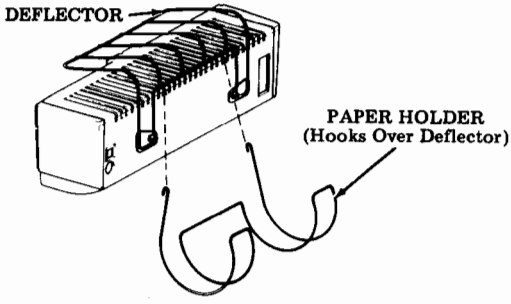


Fig. 4—Paper Holder

DIRECTORY CARD

3.15 Record the installed location of the station (floor, area, and phone number), location of extension phone(s) if any, and the number to be called in case of trouble in the space provided on the slide-out directory card (Fig. 6).

3.16 Remove the directory card by pulling it out as far as it will go and moving it side to side. Fill in the information requested on the underside of the card. Replace the directory card.

Note: If the checkout procedure was performed successfully, the teleprinter has the standard engineering options incorporated as shown on the card.

3.17 Clean up the unpacking area, wipe off any finger prints on the set, and turn the 43 KSR Station over to the subscriber.

3.18 Provide the customer with the attendant manual and the ribbon ordering card. Advise the customer to order spare ribbons and paper as soon as possible (quantities depending on expected usage).

3.19 Advise the customer of the "trouble number" location on the directory card.

3.20 Place Section 574-500-200, Installation and the Wiring Plan in the shipping containers and retain.

4. STATION REMOVAL

4.01 Reverse the procedures in 3. INSTALLATION PROCEDURE to remove the station from service (service disconnect).

4.02 If a paper holder was provided with the terminal at the time of installation (check underside of directory card) verify its presence before packing teleprinter.

4.03 Before repacking the teleprinter, move the print head to the center of the printer and insert the packing detail removed in 3.04.

4.04 Using the containers and packing details retained in 3.05, pack the 43 Teleprinter (Fig. 5).

4.05 Reconnect the telephone to the phone line and retain the D4BU modular cord obtained locally for future use.

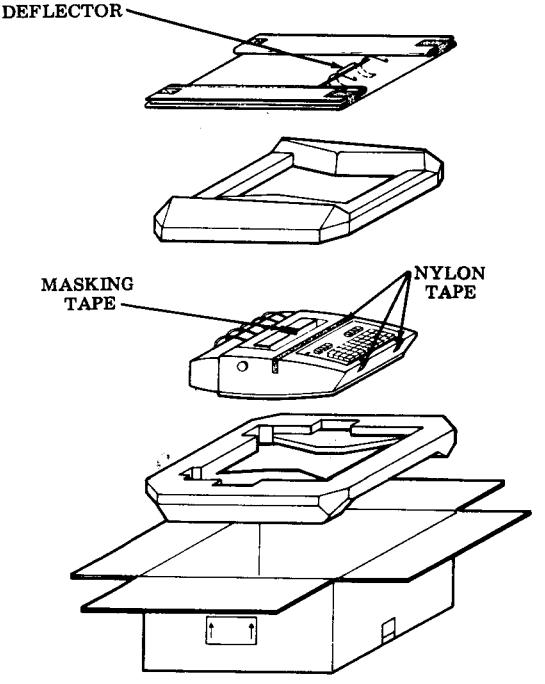
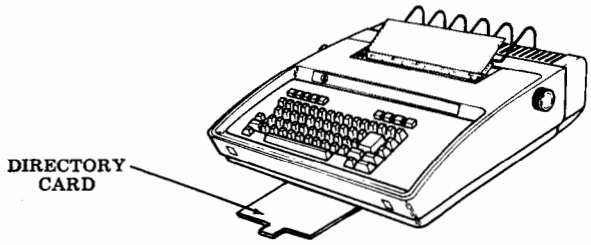


Fig. 5—Packing Details



TOP SIDE

FREQUENTLY CALLED NUMBERS

NAME	AREA CODE	TEL. NO.

EXAMPLE

INSTALLED LOCATION IN BUILDING

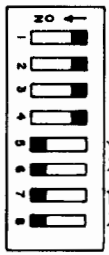
FLOOR 3 AREA Post A16 PHONE 341-7296

LOCATION OF EXTENSION PHONE IF ANY Post B16

IF THE TERMINAL DOES NOT APPEAR TO BE WORKING PROPERLY, CONSULT THE "HOW TO OPERATE" MANUAL. THEN IN CASE OF TROUBLE CALL: 362-1212

BOTTOM SIDE

STANDARD SWITCH POSITION



INSTALLATION DATE 11-4-76

INITIALS LM

☑ CHECK NON STANDARD OPTIONS ENABLED

OPTION NO.		
435	☐	
434	☑	b. Send Bit 8 Mark
433	☐	
432	☑	c. Line Length — 80
431	☐	

☑ INSTALLATION TEST PERFORMED

LOCATION: Floor 3, Post A16

STATION

TEST CENTER 362-3261

MAINTENANCE SPARES— 431 W. 5th St.

LUBRICATION DATE ——

FURNISHED AT INSTALLATION:

☑ ATTENDANT MANUAL

☑ PAPER HOLDER

☑ RIBBON & ORDERING CARD

☑ PAPER

DATE	TROUBLE INDICATION	CORRECTIVE ACTION	INITIALS

EXAMPLE

Fig. 6—Directory Card

43 KSR STATIONS

ENGINEERING OPTIONS

CONTENTS PAGE

1. GENERAL

1.01 This section provides information on engineering options for the 43 KSR Station.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The engineering options can be made to satisfy engineering requirements using switches located on the logic circuit card mounted on the bottom of the printer frame.

1.04 The options are numbered for field identification and record keeping purposes.

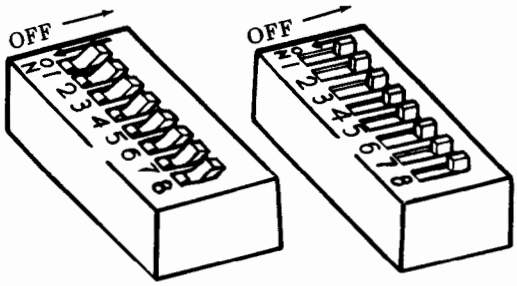
1.05 The operator console circuitry can be damaged by static discharge. The 346392 static discharge ground strap is available for use by service personnel.

1.06 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP41055).

1.07 For additional servicing information, refer to Section 574-500-300, Station Trouble-shooting and Section 574-503-700, Cabinet Adjustment.

OPTION SWITCHES

1.08 Different styles of option selecting switches may be present on the logic card. On toggle or slide type switches, options are activated by positioning the toggle or slide toward the positions indicated in Fig. 1.



Toggle Style Slide Style

(Toggles and slides shown in OFF position.)

Fig. 1—Option Switches

1.09 The option switches on the logic circuit card are factory optioned and should not be changed unless the local engineering requirements specify incorporating a nonstandard option (Fig. 2).

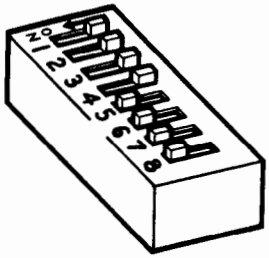


Fig. 2—Standard Switch Positions

Prepared for American Telephone and Telegraph Company by Teletype Corporation

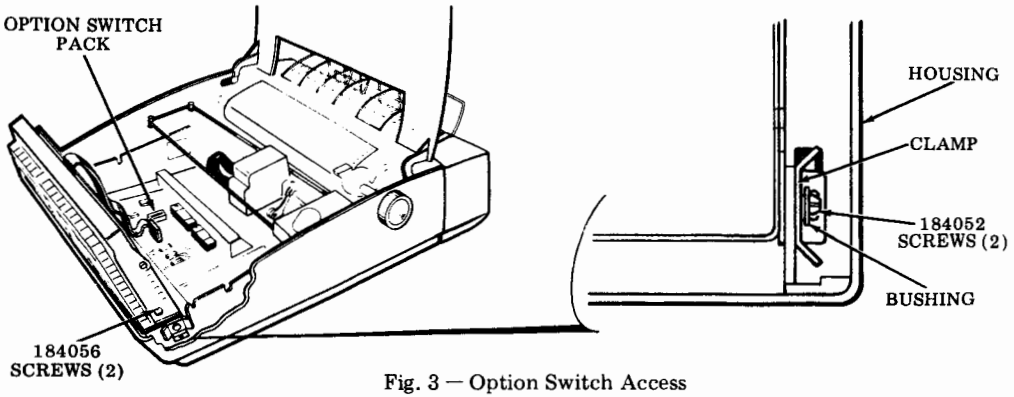


Fig. 3 — Option Switch Access

2. TOOLS REQUIRED

2.01 The following tools will be required to enable the engineering options. These items should normally be present in standard maintenance tool kits.

Wrench, open end	3/16" and 1/4"	129534
Screwdriver	1/4", 6" blade	100982
Static Discharge Strap		346392

3. ACTIVATING OPTIONS

3.01 Turn off ac power to the station.

3.02 Depress the two locking tabs on the lower front of the cabinet and open the cover.

3.03 Loosen the two 184056 screws (one each side) on the side frames securing the operator console in place (Fig. 3).

3.04 Loosen the two 184052 bushing clamp screws (one each side) and gently lift the rear edge of the operator console assembly, pivoting it forward on the front mounting pins (Fig. 3).

3.05 Locate the option switch pack SPD4 (Fig. 3) on the logic circuit card and activate the option switches in 4. ENGINEERING OPTIONS, as required by local engineering.

3.06 Reinstall the operator console, tighten the screws loosened in 3.03. Perform the KEYBOARD TO COVER ALIGNMENT adjustment in Section 574-503-700, Cabinet Adjustments and close the cabinet cover.

3.07 Remove the pull out directory card and record the nonstandard options incorporated in the terminal on the underside of the card. Check the appropriate square and briefly describe the enabled option(s) (Fig. 4).

3.08 Reinstall the directory card and turn on the ac power to the station.

3.09 Perform the options checkout procedure to verify proper operation of the nonstandard option(s) installed. Refer to 5. for checkout procedures.

3.10 The checkout procedure in 5. provides information for checking nonstandard options only. Refer to Section 574-500-500 for Station Testing Procedures.

EXAMPLE:

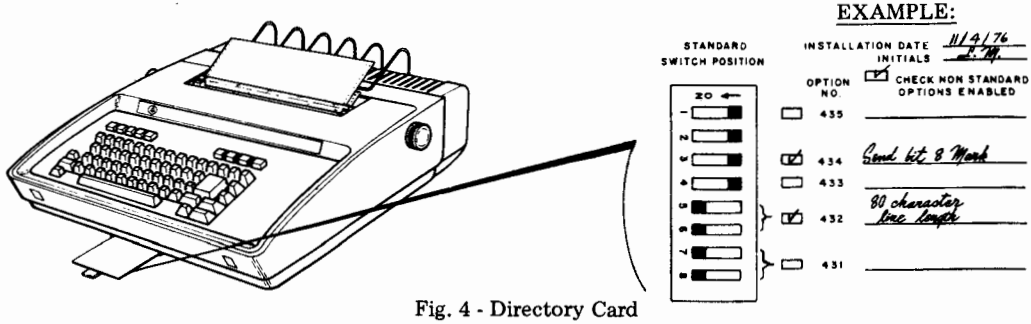
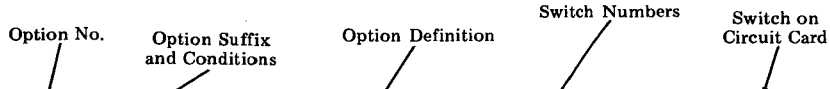


Fig. 4 - Directory Card

4. ENGINEERING OPTIONS

4.01 The example below provides information on how to set the options shown under option numbers 431. through 435.



430.	SPD4 1	2	3	4	5	6	7	8	
a.	—		—	—	○	●	—	—	*
b. EXAMPLE	—	—	—	—	○	●	—	—	
c.	—	—	—	—	●	○	—	—	

431. Type Font Arrangement	SPD4 1	2	3	4	5	6	7	8	
a. Narrow numeric 0 and wide alpha O. Standard ∧ and underline _ .	—	—	—	—	—	—	●	●	*
b. Slash numeric Ø and wide alpha O. ∧ prints as ↑ and _ prints as ←.	—	—	—	—	—	—	●	○	
c. Slash alpha Ø and wide numeric O. ∧ prints as ↑ and _ prints as ←.	—	—	—	—	—	—	○	○	

432. Line Length	SPD4 1	2	3	4	5	6	7	8	
a. 132 Characters	—	—	—	—	●	●	—	—	*
b. 72 Characters	—	—	—	—	○	●	—	—	
c. 80 Characters	—	—	—	—	●	○	—	—	

433. EOT Disconnect	SPD4 1	2	3	4	5	6	7	8	
a. Disconnect on EOT	—	—	—	○	—	—	—	—	*
b. Does not disconnect on EOT	—	—	—	●	—	—	—	—	

434. Character Parity Bit Sent	SPD4 1	2	3	4	5	6	7	8	
a. Even Parity	—	—	○	—	—	—	—	—	*
b. 8th Bit Mark	—	—	●	—	—	—	—	—	

435. End-of-Line on Receive	SPD4 1	2	3	4	5	6	7	8	
a. Auto CR-LF performed	○	—	—	—	—	—	—	—	*
b. Bell & Print Inhibit at last char. position	●	—	—	—	—	—	—	—	

● Indicates toggle or slide position to ON.
○ Indicates toggle or slide position to OFF.
— Position of switch does not affect option.
* Factory furnished state of option.

5. OPTION CHECKOUT

CHECK	PROCEDURE	RESPONSE
OPTION 431.b. & c.	Depress and hold PRINTER TEST key.	Characters printed as in Fig. 5. Bell sounds at end of each line.
OPTION 432.b. & c.	Depress and hold PRINTER TEST key.	Line length will be: 432 b — 72 characters 432 c — 80 characters Characters printed as in Fig. 6. Bell sounds at end of each line.
OPTION 433. b.	Depress DUPLEX key to down position (FULL DUPLEX). Depress AUTO ANS key. Depress ESC key. Hold SHIFT key depressed and depress [>] key. Depress the following keys: ABC Hold CTRL key depressed and depress [EOT D] key.	AUTO ANS turns on (if not already on). AUTO ANS goes off. DATA turns on. ALARM flashes. Printer will print ABC. DATA remains on (does not flash). AUTO ANS remains off (does not flash) as EOT key is depressed.
OPTION 434. b.	Depress DUPLEX key to down position (FULL DUPLEX). Depress AUTO ANS key. Depress ESC key. Hold SHIFT key depressed and depress [>] key. Depress and release PARITY key to up position (PARITY ON). Place CAPS LOCK key in down position. Depress the following keys: PARITY TEST	AUTO ANS turns on (if not already on) AUTO ANS goes off. DATA turns on. ALARM flashes. Printer will print: ▪▪RIT▪ IE▪T
OPTION 435. b.	Place DUPLEX key in down position (FULL DUPLEX). Depress AUTO ANS key. Depress ESC key. Hold SHIFT key depressed and depress [>] key. Depress REPT and K keys. Hold down until end of line is reached.	AUTO ANS turns on (if not already on). AUTO ANS goes off. DATA turns on. ALARM flashes. Characters will be printed until end of line is reached. Automatic return and line feed will not be performed. Bell will sound continuously until keys are released.

Note: Options 433, 434, and 435 - Depress LOCAL - TALK key to terminate checkout procedure.

(OPTION 431. b.)

(OPTION 431. c.)

Fig. 5 — Printer Test Message

(OPTION 432. b.)

```
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
hijklmnopqrstuvwxyz{¦}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
hijklmnopqrstuvwxyz{¦}~
```

(OPTION 432. c)

```
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
pqrstuvwxyz{¦}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
pqrstuvwxyz{¦}~
```

Fig. 6 — Printer Test Message

43 KSR STATION
TROUBLESHOOTING

CONTENTS PAGE

1. GENERAL

1.01 This section provides troubleshooting information for the 43 Teleprinter Basic KSR Station with an integrated Terminal Data Unit (TDU).

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Troubleshooting is based on isolation of troubles to major components and the correction of troubles by replacement of these components or by reference to the component troubleshooting sections.

Note: Except for the 153A1 Terminal Data Unit which is a Western Electric component, all numbers shown in this section are Teletype Corporation part numbers.

1.04 Components troubleshooting sections are:

574-501-300	43 Printer
574-502-300	43 Operator Console (Opcon)

1.05 Trouble isolation provided in this section is intended for use by the craftsperson at the same location as the station. Troubles may occur either during an installation, a routine maintenance visit or as the result of a customer trouble report.

1.06 Trouble isolation for the attendant is provided in the 999-300-126 How to Operate Manual and for the Test Center in Section 668-130-500.

1.07 To facilitate trouble correction, the recommended maintenance spares as listed in the Parts Section 574-500-800 should be available. In addition, parts for the repair of components as listed in Section 574-501-800, 574-502-800 and 574-503-800 for the printer, operator console and cabinets should be available.

1.08 Refer to the Disassembly/Reassembly Section 574-500-700 for component access and Engineering Options Section 574-500-210 for option switches and operation.

1.09 For location and identification of station components, refer to the Parts Section 574-500-800.

1.10 When replacement of the print head, logic card or opcon corrects the trouble, additional checks should be made to isolate and possibly correct the trouble without returning for repair.

On the print head — check cable continuity.
On the logic card — check TDU and power supply cables or fuse.
On the opcon — check the cable and keyswitches per opcon troubleshooting.

1.11 When replacement of a component does not correct the trouble, the original component should be reinstalled before going to the next step of the trouble analysis. If there are no more steps provided, go to the last question.

1.12 Circuitry used in the operator console can be damaged by high static voltage discharge. The 346392 wrist strap is available to ground service personnel.

1.13 When returned to the WECo Service Center for repair, the set or components should be packed in the container in which the replacement is received. This includes the conductive (black) plastic bag used with the opcon for static protection.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

1.14 Components returnable for repair and referred to in this section for replacement are:

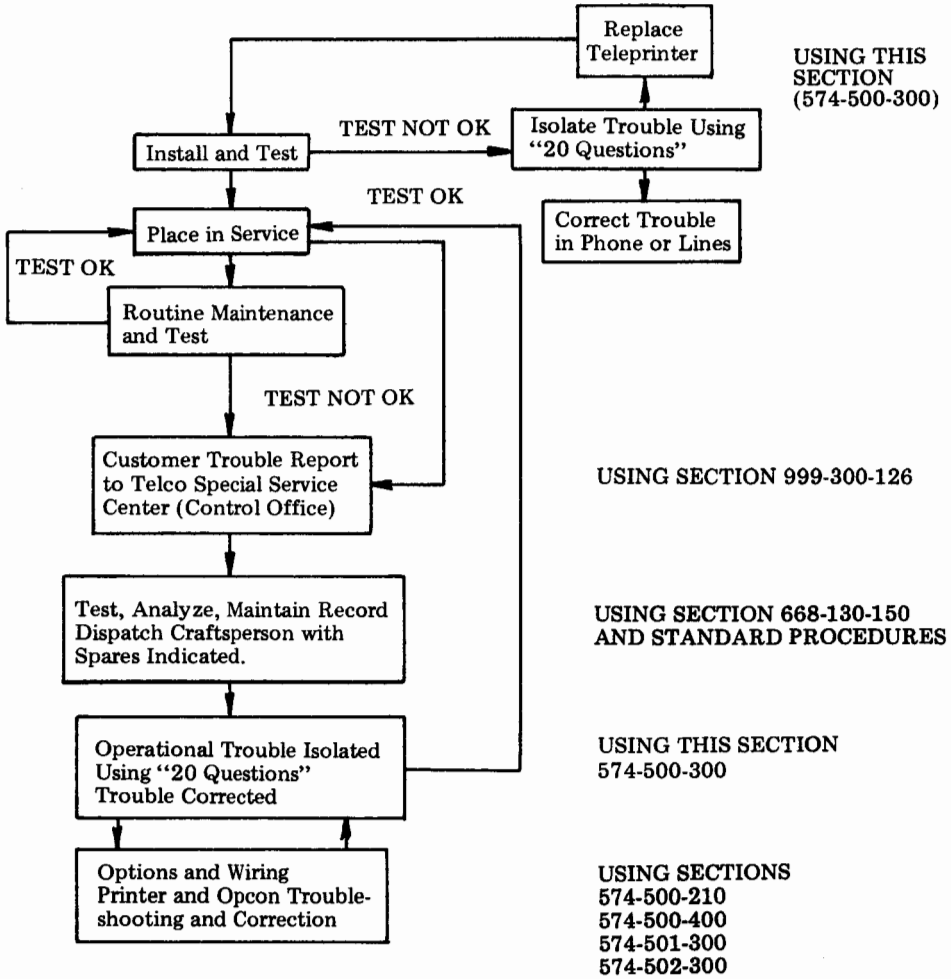
153A1 Terminal Data Unit
43K101/CAA Operator Console
410740 Logic Card
430700 Power Supply Card
430850 Print Head

1.15 Before disconnecting the internal cables or replacing circuit cards, turn off ac power. Make certain the power cord is connected to a properly polarized and grounded ac outlet.

1.16 Refer to 2. TROUBLESHOOTING DIAGRAM for the intended flow of troubleshooting procedures.

1.17 Trouble analysis is presented in the form of a "20 Questions" routine in 3. TROUBLESHOOTING GUIDE. The guide, with questions and yes or no columns, should be used always starting with the first question and proceeding according to the "yes" or "no" directive.

2. TROUBLESHOOTING FLOW DIAGRAM



3. TROUBLESHOOTING GUIDE

QUESTIONS	YES	NO
1. Are any of the three communications mode indicators lit? (Power available and set power on.) (Depress other keys if proper indicator not lit.)	Go to 2.	Go to 1a.
1a. Is there any indication of power in the set? (Indicators flash when power is turned on and off, red lamp on power supply, etc.)	Go to 1b.	Check and replace set F1 fuse if blown. Replace power supply if fuse blows again. If not blown go to 1b.
1b. Is red lamp on power supply lit?	Check P107 opcon cable connector. Replace logic card. Replace opcon.	Disconnect power supply cable. Go to 1c.
1c. Does red lamp on power supply now light?	Unplug TDU, opcon and printer cables (6). Reconnect power supply cable. Go to 1d.	Check F2 fuse on power supply. Replace if blown. Replace power supply. Replace rear frame assembly.
1d. Does red lamp on power supply still light?	Go to 1e.	Replace logic card.
1e. Does red lamp on power supply go out after the TDU, opcon and printer cables are reconnected one at a time?	Replace the TDU, opcon or the printer component (refer to printer trouble-shooting) that caused lamp to extinguish.	Intermittent short. Check for foreign objects between circuit lands or terminals.
2. Does AUTO ANSW indicator light when power is turned on?	Go to 3.	Go to 2a.
2a. Does ALARM indicator: 1. Flash? 2. Light (cover closed and paper installed?)	1. Replace logic card. 2. Replace opcon or refer to printer trouble-shooting.	Go to 2b.
2b. Does AUTO ANSW indicator light when depressed?	Replace logic card.	Replace opcon.

QUESTIONS	YES	NO
3. Does LOCAL TALK indicator light when depressed?	Go to 4.	Go to 3a.
3a. Does AUTO ANSW indicator go out?	Replace logic card.	Replace opcon.
4. Does AUTO ANSW indicator light when depressed?	Go to 5.	Replace opcon.
5. Does test message print and perform properly while the PRINTER TEST key is depressed?	Go to 6.	Check option 431 and 432. Go to 5a.
5a. Is red lamp on power supply lit?	Go to 5c.	Disconnect power supply cable. Go to 5b.
5b. Does red lamp on power supply now light?	Reconnect power supply cable. Unplug print head and motor cables then reconnect one at a time to isolate cause of lamp not lit. Replace defective component (refer to printer troubleshooting).	Replace power supply.
5c. Does anything print or perform?	Go to 5d.	Place the No. 2 printer test bypass switch in ON position. If ok, replace opcon. Replace logic card.
5d. Does anything print?	Go to 5e.	Replace logic card. Refer to printer troubleshooting.
5e. Are characters properly formed?	Go to 5f.	Refer to printer troubleshooting. Replace logic card.
5f. Are the proper characters printed?	Go to 5g.	Replace logic card.
5g. Is print density acceptable? (Good ribbon)	May be undefined printing problem. Refer to printer troubleshooting. Replace logic card. Go to 5h.	Refer to printer troubleshooting.

QUESTION	YES	NO
5h. Does paper feed properly? (Paper supply free)	Go to 5i.	Check F3 fuse on logic card. Replace line feed motor if fuse blows again. Refer to printer trouble-shooting. Replace logic card.
5i. Does print head space and return properly?	Undefined problem in printer test functions. Refer to printer trouble-shooting.	Refer to printer trouble-shooting. Replace logic card.
6. Did ALARM indicator light during printer test?	Go to 7.	Go to 6a.
6a. Does ALARM indicator light when cover is opened?	Replace logic card.	Replace opcon.
7. Does ALARM indicator light when 1. paper is out and when 2. cover is opened?	Go to 8.	1. Check printer trouble-shooting. 2. Replace opcon. 3. Replace logic card.
8. Do all characters print and functions (except bell and margin set) perform when the keys on the keyboard are operated? (local talk mode)	Go to 9.	Replace opcon. Replace logic card.
9. Does signal bell ring on CTRL G?	Go to 10.	Go to 9a.
9a. Did signal bell ring during printer test.	Replace logic card. Replace opcon.	Check P106 bell connector. Refer to printer (bell) trouble-shooting. Replace logic card.
10. Does signal bell ring eight characters before right margin and at left and right margins?	Go to 11.	Replace logic card.
11. Are margins set and cleared properly?	Go to 12.	Check column indicator positioning adjustment. Replace logic card.

QUESTION	YES	NO
12. Does printer respond properly to keyboard operation in analog loop-back mode? (Entered from keyboard by ESC > sequence (data mode). Ended by ESC = sequence.)	Go to 13.	Check P301 connector to TDU. Replace 153A1 Terminal Data Unit. Replace logic card.
13. Did 1. ALARM indicator flash and 2. DATA indicator light during analog loop-back?	Go to 14.	1. Replace logic card. 2. Replace opcon.
14. Does telephone operate normally in both local talk mode and with set power off?	Go to 15.	Check that modular cords are properly connected at rear of teleprinter and phone. Go to 14a.
14a. Does telephone operate normally (dial tone, dial, talk, ring) when connected directly to line using modular cord that was connected to the teleprinter?	Check modular cord originally between set and phone. If ok Replace 153A1 Terminal Data Unit. Replace logic card.	Check tip and ring of phone line for 48 V dc. (use 150 V or higher scale). Check proper polarity (if no touch tone dial). Check phone resistance on hook (capacitors only) off-hook (600 ohms). Correct wiring of phone lines or replace phone as indicated.
15. Does DATA indicator flash when depressed in local talk mode? (Handset on hook.)	Go to 16.	Replace opcon. Replace logic card.
16. Does phone ring repeatedly in automatic answer mode?	Replace 153A1 Terminal Data Unit. Replace logic card.	Go to 17.
17. Does DATA indicator light following a received call in automatic answer mode?	Go to 18.	Remote station must also go to data mode. Check that modular cords are not reversed. Go to 28.
18. Are data messages properly sent and received in the data mode?	Go to 19.	Go to 18a.
18a. Do PARITY, DUPLEX and CPS keys alternately lock down then release up when depressed?	Go to 19.	Replace defective key switch.
19. Can any data be received	Go to 20.	Go to 28.

QUESTION	YES	NO
20. Does substitute character print on some characters. (PARITY key on)	Remote station may be sending incorrect parity or be at different speed. Go to 25.	Go to 21.
21. Does printer copy and data transmit properly in half-duplex? (DATA indicator lit.)	Go to 22.	Check option 434. Replace opcon. Replace logic card. Go to 28.
22. Is printer blinded to keyboard transmission in full duplex? (DATA indicator lit.)	Go to 23.	Replace opcon. Replace logic card.
23. Does the carriage return automatically when characters to the right of the right hand margin are received? (DATA indicator lit.)	Go to 24.	Check option 435. Replace logic card.
24. Does call disconnect on received EOT and when carrier is not received (in data mode)?	Go to 25.	Check option 433. Replace logic card. Replace TDU.
25. Is INTRPT indicator lit?	(Interrupt received) Go to 25a.	Go to 26.
25a. Does INTRPT indicator go off when depressed?	Go to 26.	Replace opcon. Replace logic card. Go to 28.
26. Does INTRPT indicator light briefly and bell ring when INTRPT key is depressed?	Go to 27.	Replace opcon. Replace logic card.

QUESTION	YES	NO
27. Does remote station receive interrupt?	Go to 29.	Go to 28.
28. Does station pass on-line end-to-end tests with Test Center?	Trouble (if any) is in remote station.	Perform distortion, dBm level, or other parameter tests including digital loop-back under control of Test Center to isolate trouble to line, TDU or logic card (904G Section 668-400-300).
29. Is trouble present but not defined by Questions 1 to 28?	Refer to printer or opcon troubleshooting for other symtoms. Replace opcon, power supply, TDU, logic card and/or print head to correct trouble.	

43 KSR STATION

WIRING

CONTENTS PAGE

1. GENERAL

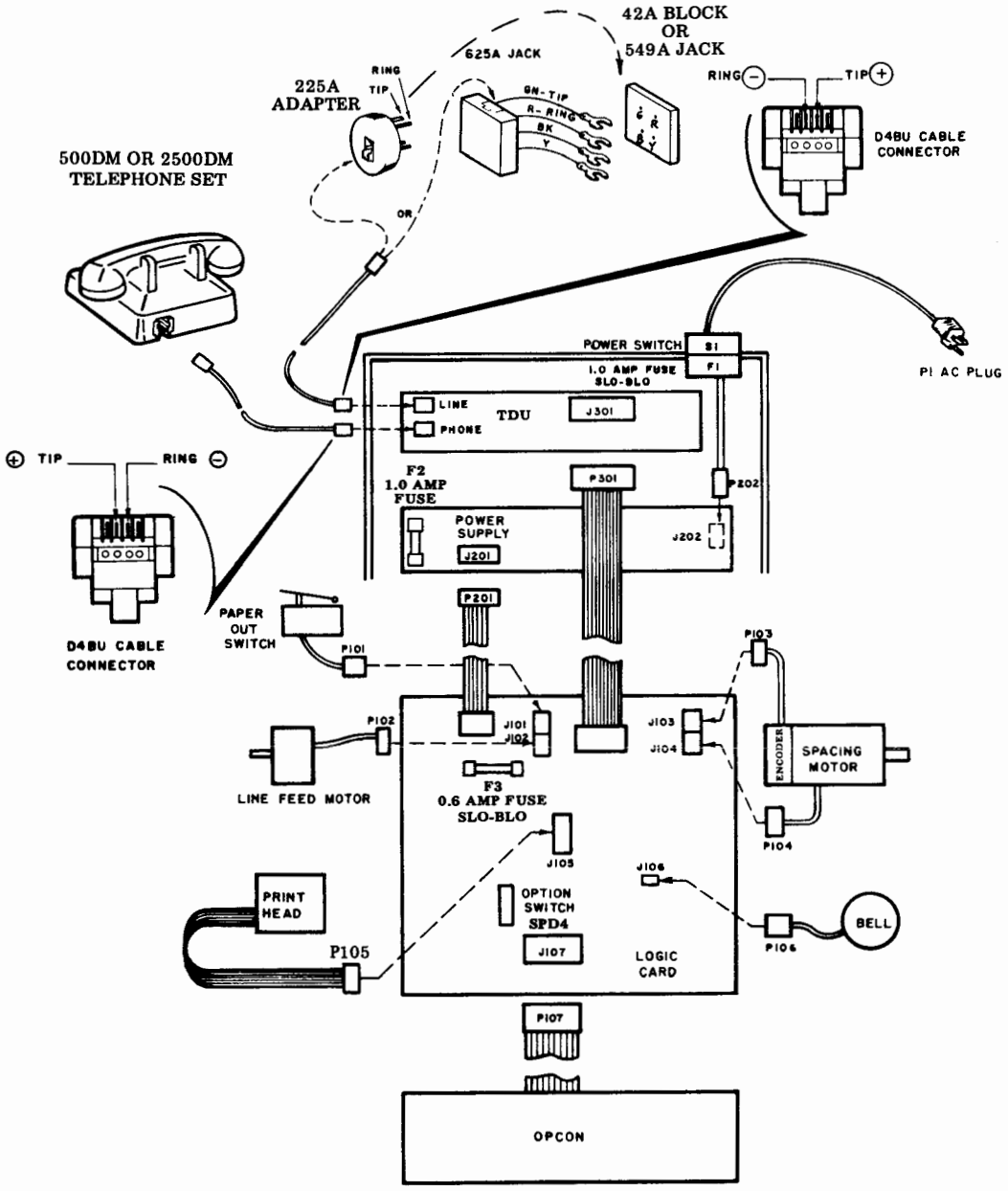
1.01 This section provides wiring information for the 43 KSR Station. The wiring information provides proper component interconnection information.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 For additional wiring information refer to Sections 574-501-400, Printer Wiring and 574-502-400, Operator Console Wiring.

1.04 All numbers shown on the station wiring do not appear on plugs and jacks.

Prepared for American Telephone and Telegraph Company by Teletype Corporation


42A BLOCK
OR
549A JACK
625A JACK
225A
ADAPTER
RING
TIP
GN-TIP
R-RING
BK
Y
OR
500DM OR 2500DM
TELEPHONE SET
RING
TIP
D4BU CABLE
CONNECTOR
POWER SWITCH
S1
F1
1.0 AMP FUSE
SLO-BLO
P1 AC PLUG
LINE
PHONE
TDU
J301
TIP
RING
F2
1.0 AMP
FUSE
P301
J202
POWER
SUPPLY
J201
D4BU CABLE
CONNECTOR
PAPER
OUT
SWITCH
P101
P201
P103
P102
J101
J102
J103
J104
ENCODER
SPACING
MOTOR
LINE FEED MOTOR
F3
0.6 AMP FUSE
SLO-BLO
P104
J105
J106
PRINT
HEAD
OPTION
SWITCH
SPD4
BELL
P105
J107
LOGIC
CARD
P106
P107
OPCON

43 KSR STATION

TESTING

CONTENTS PAGE

1. GENERAL

1.01 This section provides station testing information for the 43 KSR Station.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 An installation checkout should be performed after installation to make sure the station is operable.

1.04 On trouble calls an installation checkout should be performed after trouble correction to make sure the station is operable and a trouble verification test should be performed under the direction of the test center to isolate specific troubles not covered in the installation test. After correction of a trouble the test may be confined to the specific area that was failing.

1.05 Following routine maintenance calls at a location, an installation checkout should be performed.

1.06 The checkout routines are presented in chart form with test conditions arranged in a specific sequence. A response is given to verify the test condition has passed.

1.07 Refer to Section 574-500-300 for Station Troubleshooting information.

1.08 If the indicated response is not obtained in any step of a test procedure, repeat the step to make sure that the procedure has been performed properly. If the results are still unsatisfactory refer to the Station Troubleshooting Section 574-500-300.

1.09 Always perform the tests in the order given. The Test Steps are based on satisfactory results of all previous steps.

PRELIMINARY CHECK

1.10 Before proceeding with the checkout procedure check the following:

(a) Is station connected to a properly grounded and polarized ac service?

(b) Are all cable connectors fully seated?

(c) Are printer paper and ribbon properly installed?

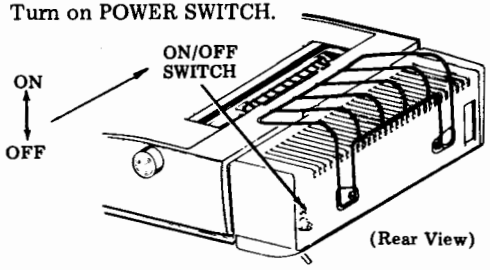
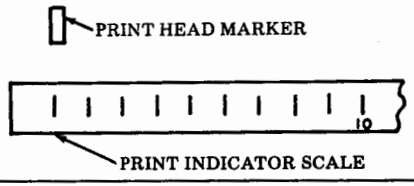
Note: All references to columns are after a one second delay, to allow the print head to index two character spaces to the right. The print head indicates next character to be printed.

1.11 On-line tests can be performed with test centers equipped with a 43 Teleprinter or equivalent using Section 668-130-500.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. TESTING PROCEDURES

OFF-LINE TESTS (Installation and Trouble Call Checkout)

TEST	STEP	PROCEDURE	RESPONSE
Power On/Off	1.	Turn on POWER SWITCH.  	Print head is indexed to the left-hand margin. Printer performs (1) line feed. AUTO ANSW turns on.
	2.	 	Print head marker points to first mark on indicator scale.
Printer	3.	Hold PRINTER TEST key depressed until approximately eight lines are printed.	ALARM and LOCAL TALK turn on. Characters printed as in Fig. 3 Page 7. Bell rings at end of each line.
	4.	Release PRINTER TEST key.	ALARM turns off. Character printing stops.
Operator Console	5.	Depress RETURN and then LINE FEED key.	Print head is indexed to left-hand margin and indicates beginning of next line.
	6.	Place CAPS LOCK key in DOWN position. Starting with top row and moving from left to right, depress each unshaded key in Fig. 1.	Characters printed as in Fig. 4.
	7.	Depress RETURN and then LINE FEED key.	Print head is indexed to left-hand margin and indicates beginning of next line.
	8.	Depress and release CAPS LOCK key so it returns to UP position. Starting with top row and moving left to right, depress each unshaded key in Fig. 1.	Characters printed as in Fig. 5.
	9.	Depress RETURN and then LINE FEED key.	Print head is indexed to left-hand margin and indicates beginning of next line.

OFF-LINE TESTS (Cont)

TEST	STEP	PROCEDURE	RESPONSE
Operator Console (Cont)	10.	Hold left SHIFT key depressed and starting with top row and moving from left to right, depress each unshaded key in Fig. 2. Hold right shift key depressed and depress  key.	Characters printed as in Fig. 6.
	11.	Depress RETURN and then LINE FEED key.	Print head is indexed to left-hand margin and indicates beginning of next line.
	12.	Hold CTRL key depressed and depress  key.	SUB prints ■ .
	13.	Hold CTRL key depressed and depress  key.	Signal bell rings.
	14.	Hold CTRL key depressed and depress  key.	Print head moves one character position to the left.
	15.	Depress SPACE BAR.	Print head moves one character position to the right.
	16.	Depress BACK SPACE key.	Print head moves one character position to the left.
	17.	Depress LINE FEED key. Depress and hold REPT and  keys.	Print head indicates beginning of next line. Continuous Ks are printed until end of line is reached. Signal bell rings at end of line.
Cover Interlock	18.	Depress AUTO ANSW key. Raise cover.	AUTO ANSW goes off. LOCAL and ALARM turns on.
	19.	Close cover.	ALARM goes off.
Right Margin & Signal Bell	20.	Depress RETURN and the LINE FEED key.	Print head is indexed to left-hand margin and indicates beginning of next line.
	21.	Space print head to Column 125. Depress  key.	Signal bell operates as character b is being printed.
	22.	Depress SPACE BAR six times.	Signal bell does not operate. Print head moves six character position to the right.
	23.	Depress SPACE BAR two times.	Signal bell operates two times.

2.01 OFF-LINE TESTS (Cont)

TEST	STEP	PROCEDURE	RESPONSE
Margin Set and Clear	24.	Depress ESC and then [CAN X] key. (ESC x)	Print head is indexed to left-hand margin and indicates beginning of line.
	25.	Depress SPACE BAR nine times. Depress ESC and then [FF L] key. (ESC L lower case.)	Print head moves to Column 10.
	26.	Space print head to Column 71. Depress ESC and then [DC2 R] key. (ESC r) Depress RETURN key.	Print head moves to left margin (Column 10).
	27.	Depress BACK SPACE key.	Signal bell rings.
	28.	Space print head to Column 70. Depress SPACE bar.	Signal bell operates. Print head indicates Column 71.
	29.	Depress SPACE BAR.	Signal bell rings. Print head remains at Column 71.
	30.	Depress ESC and then [CAN X] key. (ESC X) Depress AUTO ANSW key.	Print head moves to Column 1. AUTO ANSW turns on.
Analog Test	31.	Place CPS key in UP position (30 CPS). Depress ESC key. Hold SHIFT key depressed and depress [> .] key.	ALARM flashes. DATA turns on.
	32.	Depress and release PARITY key to UP position (PARITY ON). Place DUPLEX key in UP position (HALF-DUPLEX). Place CAPS LOCK key in DOWN position. Type the following: ANALOG Depress SPACE BAR.	AANNAALLOOGG is printed.
	33.	Place DUPLEX key in DOWN position (FULL DUPLEX). Type the following: TEST	TEST is printed.
	34.	Watch AUTO ANSW key, then hold CTRL key depressed and depress [EOT D] key.	DATA and AUTO ANSW flash as EOT key is depressed.
	35.	Depress INTRPT key.	INTRPT turns on momentarily. Signal bell rings.

2.01 OFF-LINE TESTS (Cont)

TEST	STEP	PROCEDURE	RESPONSE
Analog Test (Cont)	36.	Depress RETURN and then LINE FEED key. Depress REPT and K keys. Hold down until two lines of Ks are printed.	Continuous Ks will be printed across entire line. Bell rings at end of line and automatic return and line feed will be performed. One printed line plus return will occur in approximately four seconds.
	37.	Place CPS key in DOWN position (10 CPS). Depress REPT and K keys. Hold down until two lines of Ks are printed.	Continuous Ks will be printed across entire line. Bell rings at end of line and automatic return and line feed will be performed. One printed line plus return will occur in approximately 14 seconds. First part of line (approx. 18 characters) will be printed at a faster rate of speed.
	38.	Remove the paper.	Signal Bell rings. ALARM remains on, stops flashing.
	39.	Depress LINE FEED key eight times.	DATA turns off. LOCAL-TALK turns on as 8th LINE FEED is sent.
	40.	Replace the paper.	ALARM flashes.
	41.	Depress DATA key.	DATA turns on. LOCAL-TALK turns off.
	42.	Depress ESC and then [key.	ALARM and DATA turn off. AUTO ANSW turns on.
	43.	Place CPS key in UP position (30 CPS). Place DUPLEX key in UP position (HALF-DUPLEX).	

This completes the OFF-LINE test of the 43 KSR Station. Proceed to the ON-LINE Testing Procedures found in 2.02.

ON-LINE TESTS (Installation Checkout)

TEST	STEP	PROCEDURE	RESPONSE
Full Duplex Send & Receive Data (Originating Station)	1.	With power on and AUTO ANSW lit, depress LOCAL-TALK key and place DUPLEX key in DOWN position (FULL DUPLEX). Place CAPS LOCK key in DOWN position. Depress RETURN and LINE FEED keys.	LOCAL-TALK lights.
	2.	Call Data Test Center and request a 43 Teleprinter test. Provide test center with phone number of station and operating speed. Agree that test center will call back after disconnect.	
	3.	When instructed by Data Test Center operator, go to DATA mode by depressing DATA key.	DATA turns on. LOCAL-TALK goes off.
	4.	Type the following message request on the operator console: SEND THE QUICK BROWN FOX TEST MESSAGE	Test message request will be received by the Data Test Center.
	5.	Data Test Center will send 'The Quick Brown Fox' test message ending with EOT.	'The Quick Brown Fox' test message will be printed. Station will disconnect. DATA goes off. AUTO ANSW goes on.
Automatic Answer	6.	Depress and release DUPLEX key so it returns to upper position. (HALF-DUPLEX)	Data Test Center will call station. Phone rings once. DATA turns on. AUTO ANSW goes off.
Half-Duplex Send & Receive Data (Answering Station)	7.	Test Center will send the following test message: NOW IS THE TIME FOR ALL GOOD MEN	Test message will be printed.
	8.	Depress the SPACE BAR. Send the following test message from the operator console: TO COME TO THE AID OF THEIR COUNTRY.	Printed copy at the station will be: NOW IS THE TIME FOR ALL GOOD MEN TO COME TO THE AID OF THEIR COUNTRY. Data Test Center will receive the test message sent from the operator console.
	9.	Test center will send TEST OK message if test was satisfactory and disconnect call. Test center will send GO TO TALK message if test was unsatisfactory. Pick up handset, depress LOCAL-TALK key and evaluate results.	Station will disconnect. AUTO ANSW goes on. DATA goes off.

This completes the ON-LINE test of the 43 KSR Station.

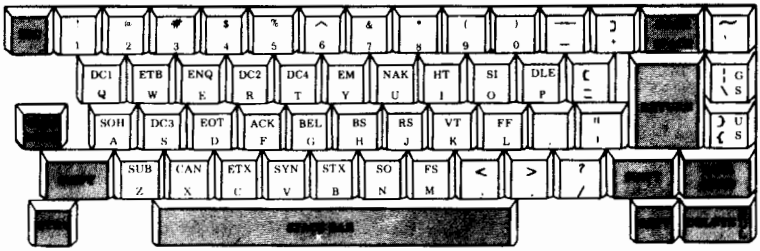


Fig. 1

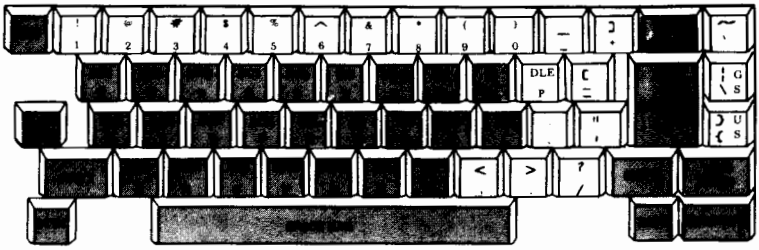


Fig. 2

Note: First line may start with any character.

```
lmnopqrstuvwxyz{|}
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

Fig. 3

```
1234567890-+`QWERTYUIOP=\ASDFGHJKL;'{ZXCVBNM,./
```

Fig. 4

```
1234567890-+`qwertyuiop=\asdfghjkl;'{zxcvbnm,./
```

Fig. 5

```
!@#$%^&*()_]~P[|:"}<>??
```

Fig. 6

43 KSR STATION

DISASSEMBLY/REASSEMBLY

CONTENTS

1. GENERAL

1.01 This section provides disassembly and reassembly information for the 43 KSR Station (Fig. 1).

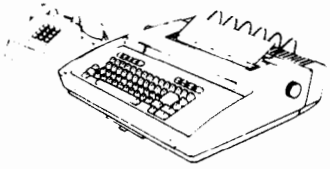


Fig. 1—43 KSR Station

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Disassembly and reassembly information for additional housing and cover parts is provided in the following paragraphs:

Part	Paragraph
Bustle Cover	3.01
Deflector	3.01
Paper Holder	3.01
Cover, Set	3.04
Rear Frame	3.06

1.04 The procedures provided in this section break the terminal down into subcomponents. The appropriate parts sections illustrate the arrangement of subcomponents and parts — Section 574-500-800, Station Parts and Section 574-503-800, Cabinet Parts.

Caution: Remove all power from the set before performing any component replacement.

1.05 When removing a major component or part from the terminal, do not pry or force parts to provide the necessary clearance for removal. Follow the removal procedure and note how each part is removed and the sequence of its removal so that proper reassembly can be accomplished. For reassembly, reverse the removal procedure except where different instructions are given.

1.06 Reference in the procedures to left and right and up or down and top or bottom, etc, refer to the KSR terminal in its normal operating position.

1.07 Refer to Maintenance Tools, Section 570-005-800 for a complete listing of the various types of hand tools available for maintenance of Teletype Corporation equipment. For a listing of the tools required to perform the disassembly and reassembly procedures, refer to 2. TOOLS REQUIRED.

1.08 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP41055).

Prepared for American Telephone and Telegraph Company by Teletype Corporation

1.09 Some parts that are not listed in the parts sections are shown as necessary to the disassembly procedures such as screws, ring retainers, etc. Most of these parts are common to other Teletype Corporation product lines and, if needed, may already be available in field repair kits or can be ordered.

1.10 The operator console circuitry can be damaged by static discharge. The 346392 static discharge ground strap is available for use by service personnel. Maintenance spares are provided in antistatic bags which should be saved for reuse when returning components for repair.

1.11 Containers and packing materials retained from maintenance spares should be saved and reused when returning defective components for repair.

1.12 Adjustment information is provided in Printer Adjustments, Section 574-501-700 and Cabinet Adjustments, Section 574-503-700.

2. TOOLS REQUIRED

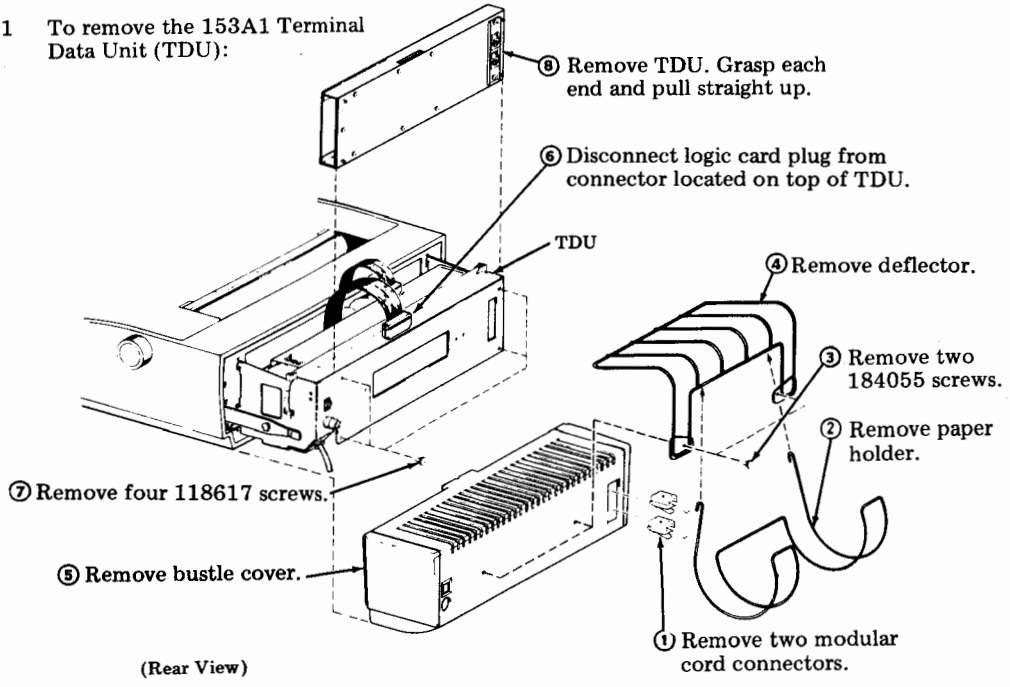
2.01 The following tools may be required when performing the station disassembly and reassembly procedures. Most of these items should normally be present in standard maintenance tool kits.

Part No.	Tools
129534	Wrench, Open End, 3/16 Inch and 1/4 Inch
135676	Nut Driver, Handle
135677	Nut Driver, 1/4 Inch
135678	Nut Driver, 5/16 Inch
95368	Screwdriver, 1/8 Inch, 2 Inch Blade
100982	Screwdriver, 1/4 Inch, 6 Inch Blade
346392	Static Discharge Strap

3. DISASSEMBLY/REASSEMBLY

153A1 TERMINAL DATA UNIT (TDU)

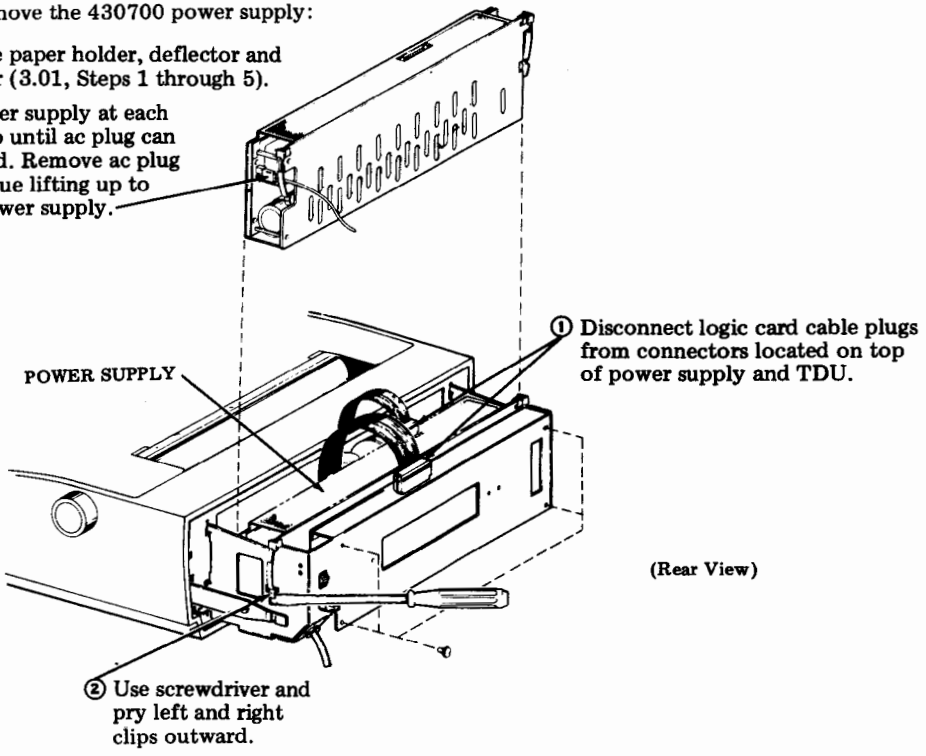
3.01 To remove the 153A1 Terminal Data Unit (TDU):



430700 POWER SUPPLY

3.02 To remove the 430700 power supply:

- Remove the paper holder, deflector and bustle cover (3.01, Steps 1 through 5).

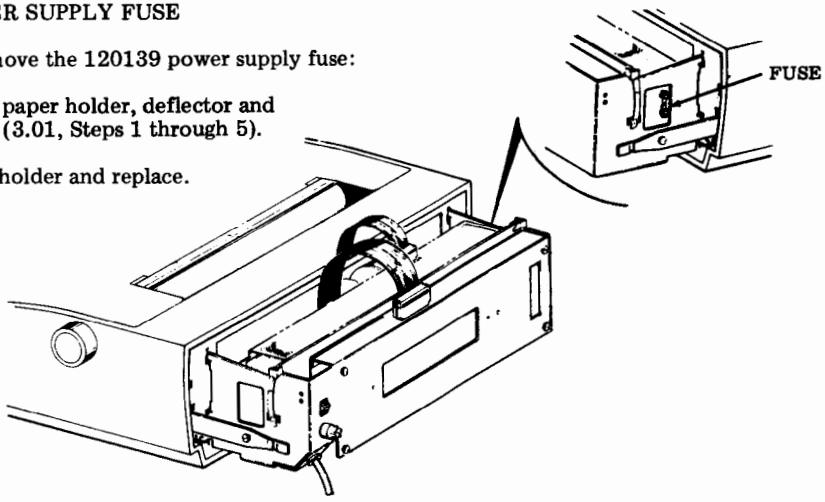


120139 POWER SUPPLY FUSE

3.03 To remove the 120139 power supply fuse:

- Remove the paper holder, deflector and bustle cover (3.01, Steps 1 through 5).

Pry fuse from holder and replace.

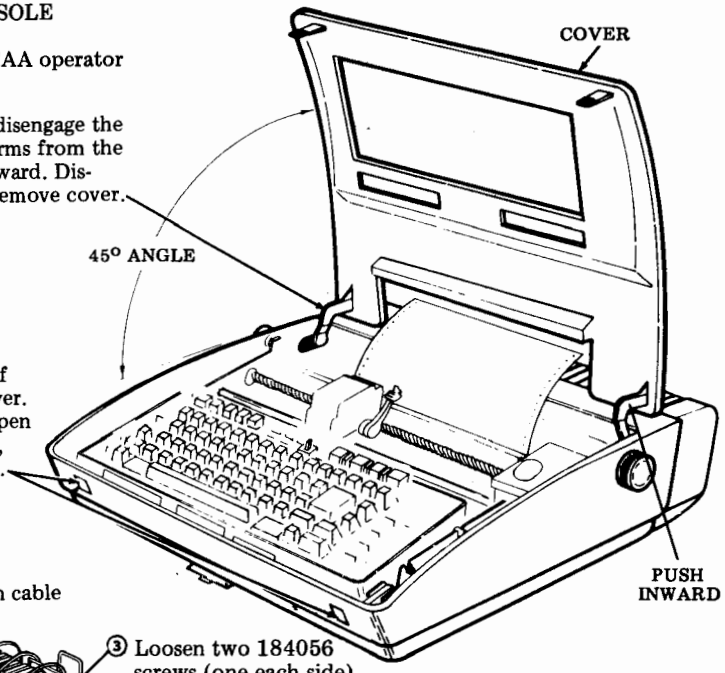


43K101/CAA OPERATOR CONSOLE

3.04 To remove the 43K101/CAA operator console:

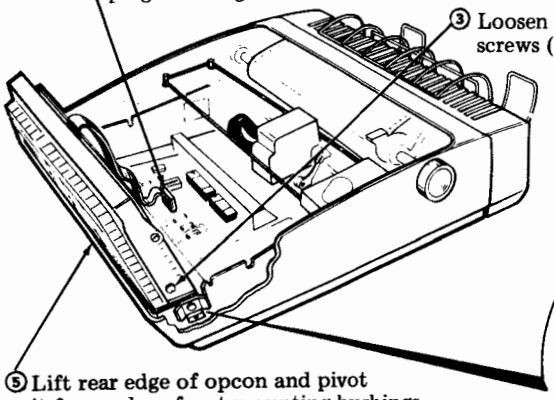
② If cover is being removed, disengage the button end of one of the arms from the dovetail slot by pushing inward. Disengage the other side and remove cover.

① Depress locking tabs (part of cover) to release and lift cover. If cover is being removed, open to 45 degree angle and hold, otherwise open fully to rear.

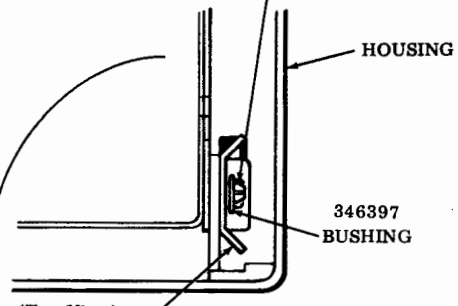


⑥ Disconnect P107 opcon cable plug from logic card.

③ Loosen two 184056 screws (one each side).



④ Loosen two 184052 screws (one each side).



(Top View)

⑤ Lift rear edge of opcon and pivot it forward on front mounting bushings.

⑧ Move lower edge of opcon rearward until bushings are free. Remove opcon.

⑦ Tilt top of clamps outward, releasing front bushings connected to the opcon.

Note 1: In reassembly, perform the KEYBOARD TO COVER ALIGNMENT adjustment.

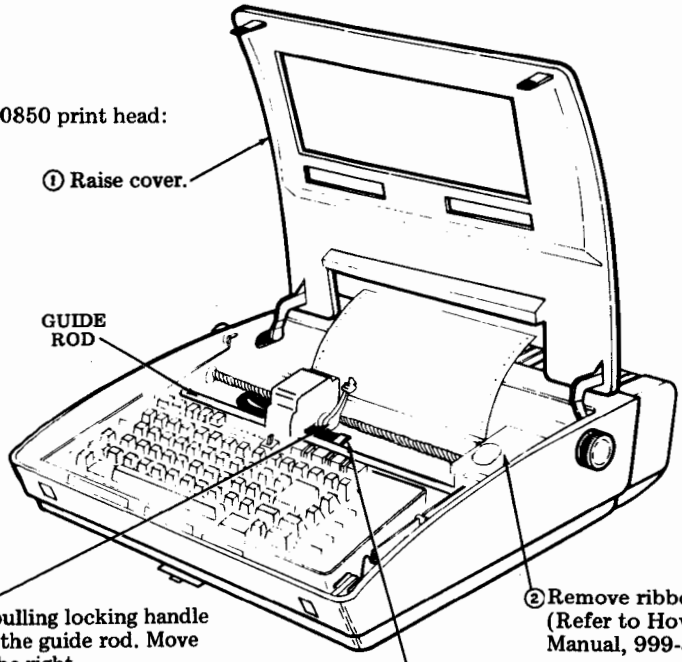
Note 2: When replacing the cover or indicator scale, perform the COLUMN INDICATOR POSITIONING adjustment.

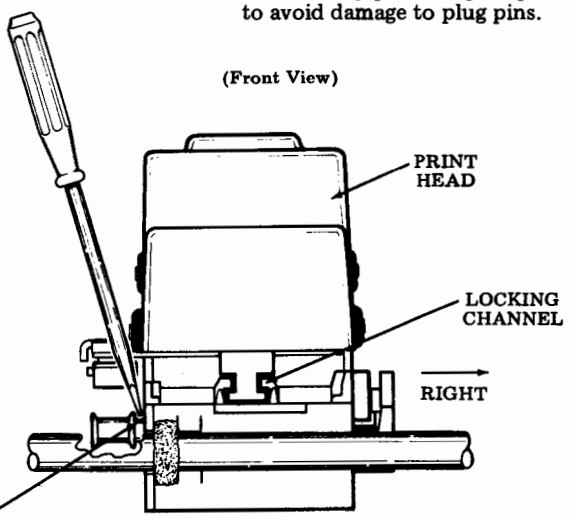
Note 3: Loose operator consoles are shipped with 184056 screws and 346397 bushings furnished in a loose envelope. These parts must be assembled to the operator console before installing into the printer side frames.

430850 PRINT HEAD

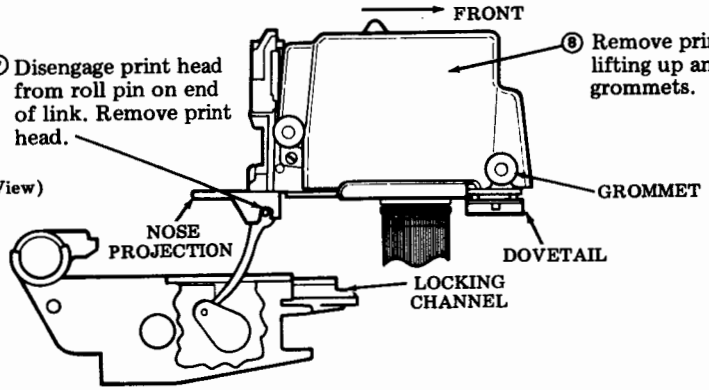
A. Removal

3.05 To remove the 430850 print head:



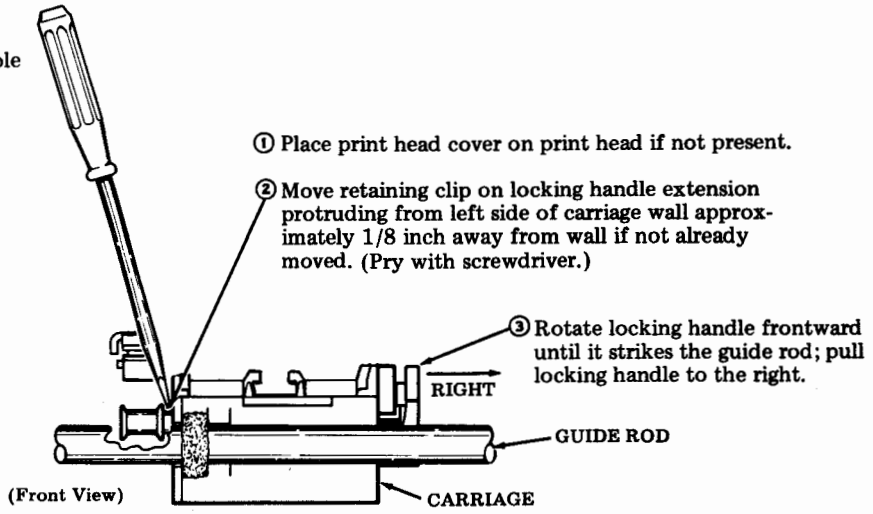


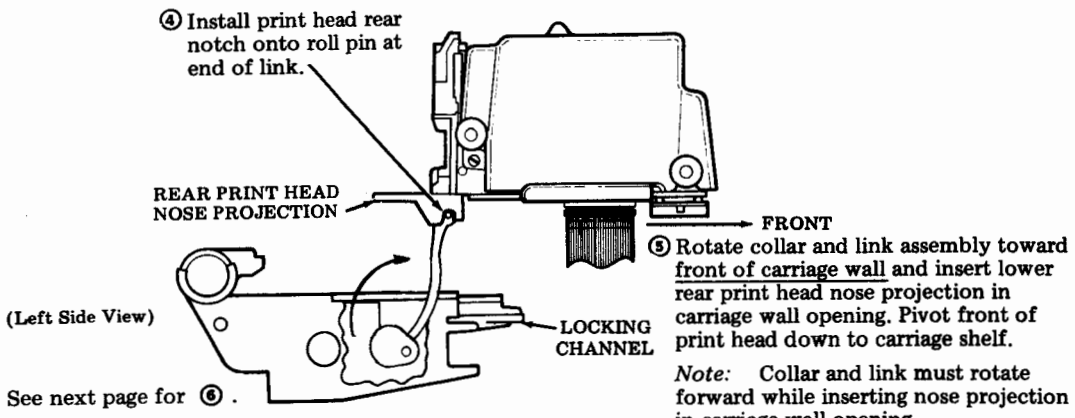
See next page for ⑦.



B. Reassembly

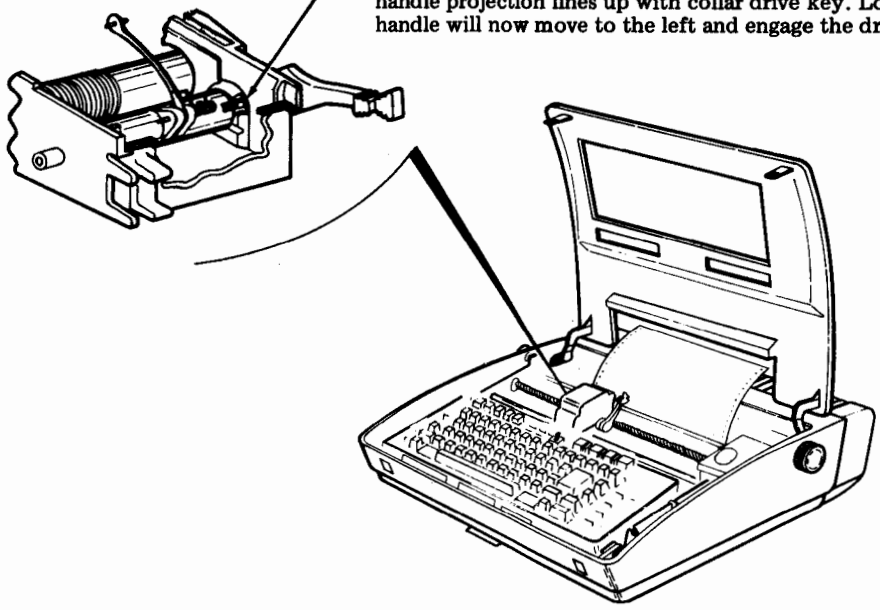
3.06 To reassemble the 430850 print head:





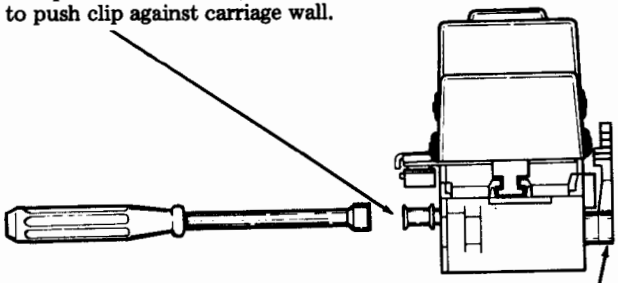
Note: Collar and link must rotate forward while inserting nose projection in carriage wall opening.

See next page for ⑥ .



⑥ Apply continuous leftward pressure to locking handle at its pivot shaft, while slowly pushing print head rearward and further into the carriage locking channel until locking handle projection lines up with collar drive key. Locking handle will now move to the left and engage the drive key.

⑧ Position print head and carriage assembly to right side of printer and use a 5/16 inch socket wrench to push clip against carriage wall.



(Front View)

⑨ Reconnect the print head cable plug to the logic card.

⑩ Install ribbon. (Refer to How to Operate Manual, 999-300-126.)

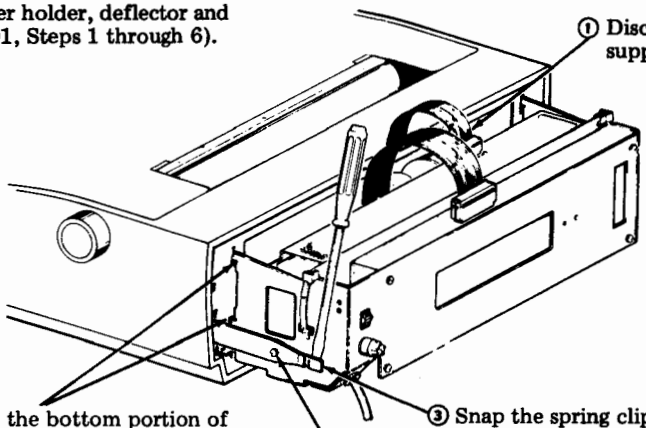
⑦ Move the handle all the way to the rear, locking the print head in close proximity to the platen by the additional force necessary to detent the handle.

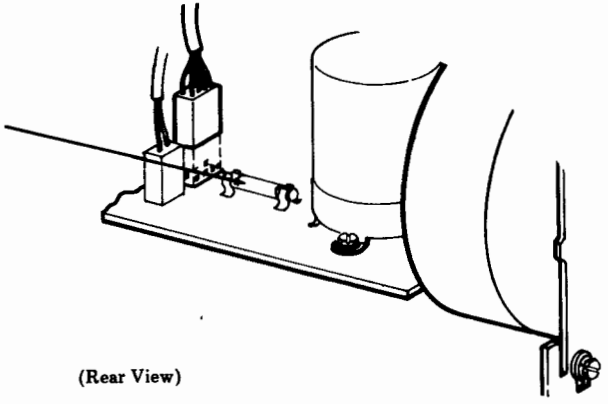
Note: Check to make sure there is some clearance between print head and platen before detenting handle. Perform PRINT HEAD TO PLATEN adjustment.

143307 LOGIC CARD FUSE

3.07 To remove the 143307 logic card fuse:

- Remove the paper holder, deflector and bustle cover (3.01, Steps 1 through 6).



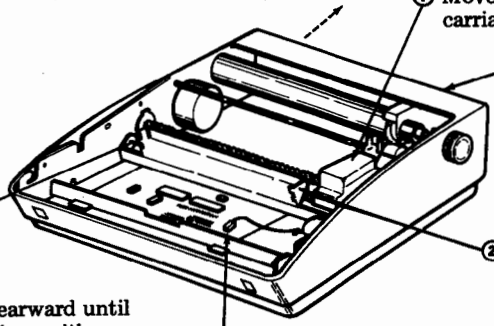


(Rear View)

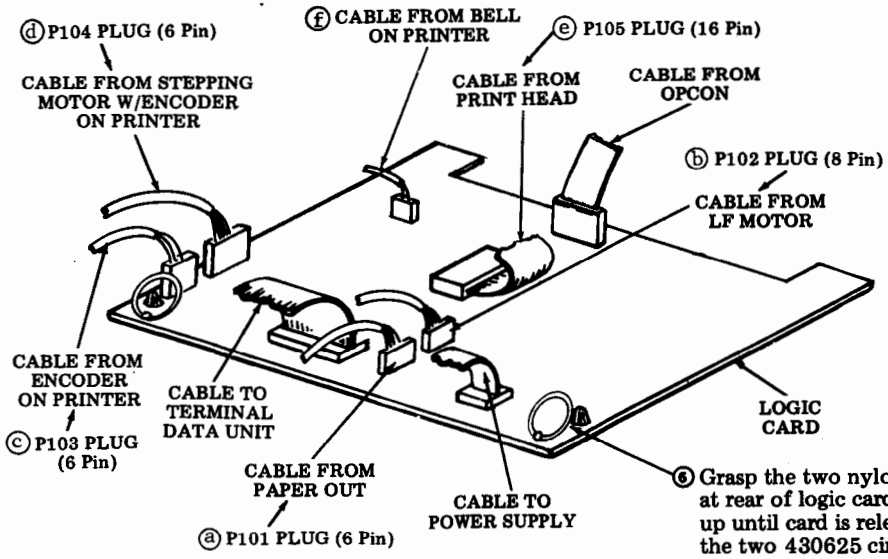
410740 LOGIC CARD

3.08 To remove the 410740 logic card:

- Remove the paper holder, deflector and bustle cover (3.01, Steps 1 through 6).
- Remove the rear frame assembly (3.07, Steps 1 through 4).
- Remove the 43K101/CAA operator console (3.04).



⑤ Disconnect the following plugs located on the logic card:



(Rear View)

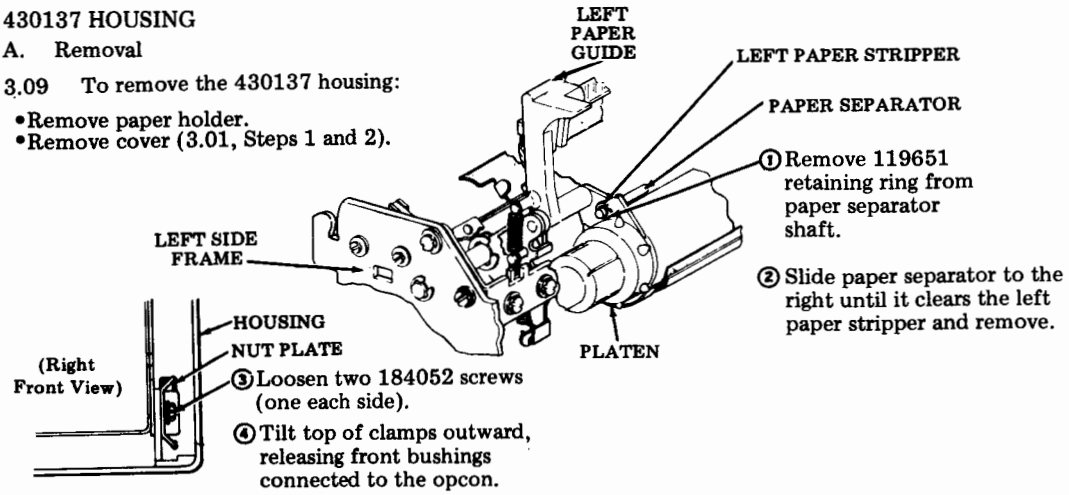
⑥ Grasp the two nylon rings at rear of logic card and pull up until card is released from the two 430625 circuit board supports. Slowly pull logic card rearward until it clears the printer assembly.

430137 HOUSING

A. Removal

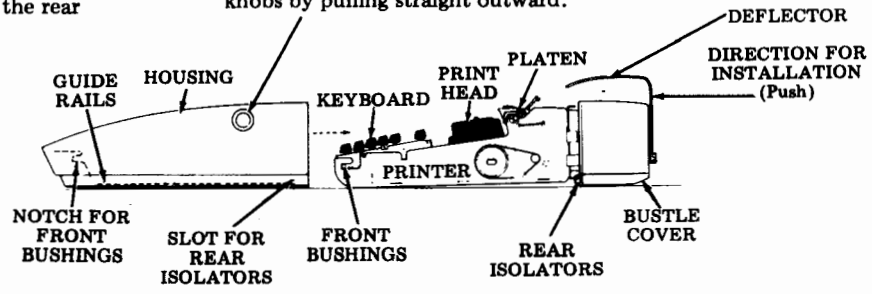
3.09 To remove the 430137 housing:

- Remove paper holder.
- Remove cover (3.01, Steps 1 and 2).



⑤ Remove the left and right platen knobs by pulling straight outward.

⑥ Grasp the bustle cover and slide the printer and rear frame assembly from the housing through the rear opening.



B. Replacement

3.10 To replace the 430137 housing:

① Push the printer and rear frame assembly into the housing through the opening in the rear of the housing. There are two molded guide rails in the bottom of the housing to steer the assembly into position.

② Replace the paper separator and platen knobs.

③ Replace the cover and paper holder.

④ Perform the KEYBOARD TO COVER ALIGNMENT adjustment.

Note: The two front clamps should be loosely fastened to the nut plate before the assembly is pushed into the housing. Position each clamp so that the front bushings (operator console) protrude through the large holes in their respective clamps.

43 KSR STATION

ROUTINE MAINTENANCE

CONTENTS PAGE

1. GENERAL

1.01 This section provides routine maintenance procedures for the 43 Teleprinter Basic KSR Station.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 A routine maintenance should be performed, at the convenience of the customer, at least once a year.

1.04 Routine maintenance consists of visual checks, lubrication, and cleaning. When performed at routine intervals, the possibility of later troubles will be reduced.

1.05 Following the routine maintenance, a local and on-line installation checkout should be performed. (See Section 574-500-500.) The routine maintenance date should be filled out on the bottom side of the directory card holder.

2. VISUAL CHECKS

2.01 The following areas should be checked for mechanical condition:

(a) Frayed belts on spacing and line feed motors.

(b) Worn or frayed ribbon.

(c) All cable connectors fully seated.

3. LUBRICATION

3.01 Lubrication of the printer is required during routine maintenance. Refer to Section 574-501-710 for type, location, and amounts of lubrication.

4. CLEANING AND APPEARANCE

4.01 Examine exterior areas for smudges, dust, etc.

4.02 Check proper fit of cover. Replace extremely damaged or discolored cover, housing, bustle, etc.

4.03 Exterior cleaning should normally be limited to wiping with a soft cloth (such as KS-2423) moistened with a mild detergent. However, in case of ink stained plastic surfaces, a waterless (nonabrasive) hand cleaner or a lather from abrasive bar soap applied with a cloth should be used.

4.04 Interior areas should be examined with the cover opened and accumulations of paper dust or ribbon fragments cleaned by carefully brushing loose material onto a cloth. Ink stains or deposits on interior surfaces, ribbon rollers, platen, etc, can be wiped with a cloth dampened in KS-19578 Trichloroethane.

Warning: Do not allow trichloroethane to contact exterior plastic surfaces.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

43 KSR STATION

PARTS

CONTENTS PAGE

1. GENERAL

1.01 Information on maintenance spare parts is provided in this section for the 43 Teleprinter Basic KSR Station.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 This section is provided to identify the Teletype Corporation or Western Electric Company part number and location of recommended spares that should be available and may be required to correct a trouble.

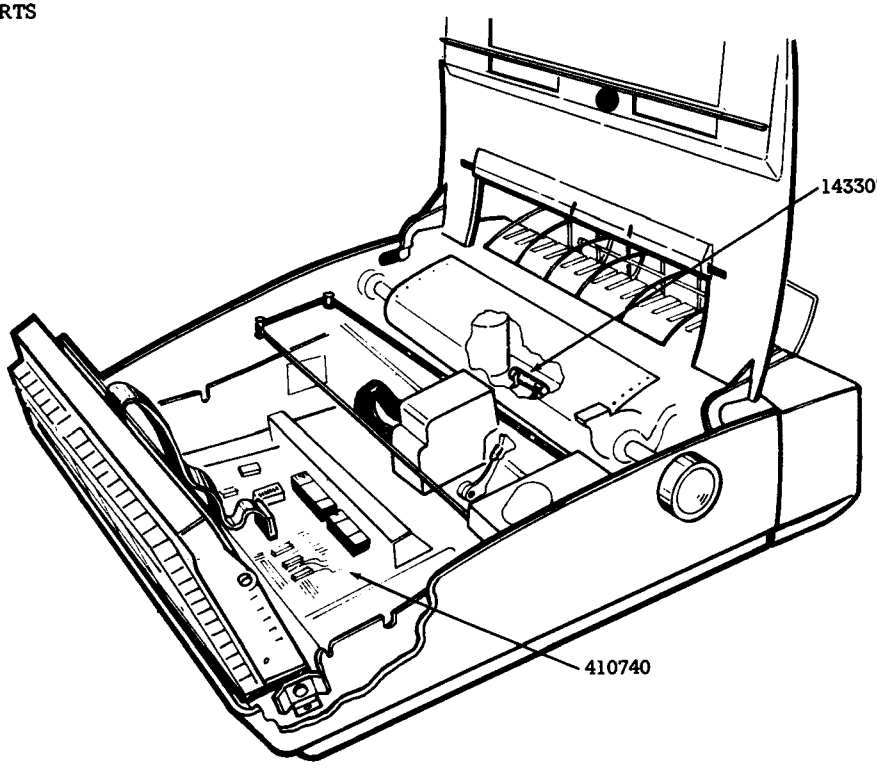
1.04 Part numbers are listed in the index in numerical order and indicate the page on which the parts appear. Asterisked numbers, stocked as "List 1", indicate a maintenance spare stocking ratio of one spare for the first ten stations and an additional spare for each additional 30 stations in a maintenance area. Part numbers without asterisks, stocked as "List 2", indicate that one spare should be available in each maintenance area.

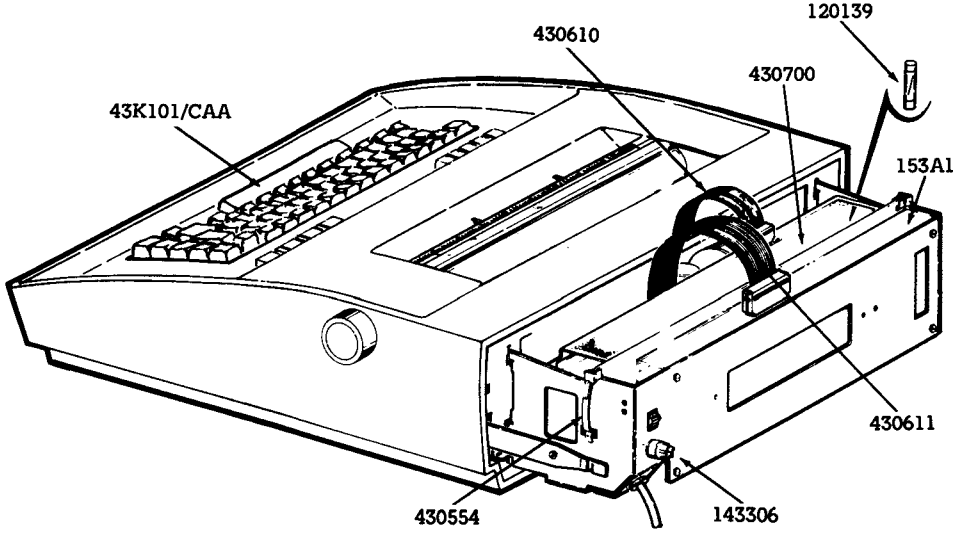
1.05 When ordering replacement components, unless indicated as a Western Electric Company part, prefix each part number with "TP" (ie, TP410055).

1.06 Troubleshooting, disassembly and reassembly information for these parts are covered in Sections 574-500-300 and 574-500-720 respectively.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. PARTS


143307
410740


120139
430610
430700
43K101/CAA
153A1
430611
430554
143306

NUMERICAL INDEX

Note: One spare should be available in each maintenance area, unless otherwise specified in parenthesis.

*A maintenance spare stocking ratio of one spare for each ten stations and one additional spare for each additional 30 stations in a maintenance area.

43 PRINTER

TROUBLESHOOTING

CONTENTS PAGE

1. GENERAL

1.01 This section provides troubleshooting information for the 43 Printer.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Printer troubleshooting is initiated either by the 43 KSR Station Troubleshooting Section 574-500-300 or when trouble in the printer is suspected from symptoms observed.

1.04 Analysis in this section is limited to isolation of the trouble within the printer up to its electrical interface to the logic card. The 43 printer must be tested as part of a 43 Basic KSR Teleprinter Station. Refer to Section 574-500-500. Where analysis indicates the trouble is not in the printer, return to the station section for further analysis.

1.05 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP41055).

1.06 The 430850 print head is returnable to Western Electric Company Service Center for repair.

1.07 Isolation and correction of troubles is based on electrical checks, parts replacement or adjustments.

Reference Sections are:

574-501-400	Wiring
574-501-700	Adjustments and Tensions
574-501-720	Disassembly/Reassembly
574-501-800	Parts

1.08 Trouble analysis is presented in the form of a "20 Questions" routine in 2. TROUBLESHOOTING GUIDE. The guide, with questions and yes or no columns, should be used always starting with the first question and proceeding according to the "yes" or "no" directive.

2. TROUBLESHOOTING GUIDE

QUESTION	YES	NO
1. Does test message print and paper advance properly while PRINTER TEST key is depressed? (or No. 2 switch on logic card is operated on)	Go to 2.	Go to 1a.
1a. Is red lamp on power supply lit?	Go to 1b.	Go to Station Troubleshooting. Check circuit that failed for shorts.
1b. Does anything print or perform?	Go to 1c.	Go to Station Troubleshooting.

Prepared for American Telephone and Telegraph by Teletype Corporation

QUESTION	YES	NO
1c. Does printing carriage space and return properly?	Go to 1d.	Check for mechanical bind by moving carriage manually with power off. Check for proper spacing belt spring tension. Check PLATEN END PLAY adjustment. Check continuity of spacing motor and encoder. Check switch No. 1 on print head. Replace motor and/or encoder or cable.
1d. Does paper advance properly? (Successive lines uniformly spaced.)	Go to 1e.	Check line feed belt tension. Check for mechanical bind by rotating platen manually with power off. Check PLATEN END PLAY adjustment. With power on (reset) check platen detenting through full rotation by turning platen knob. Check continuity of line feed motor. Replace motor or cable.
1e. Do sprocket pins on platen line up with paper and with paper guides?	Go to 1f.	Check LEFT AND RIGHT SPROCKET adjustment. Check LEFT AND RIGHT PAPER GUIDE adjustment.
1f. Are any characters printed?	Go to 1g.	Check continuity of print head and cable. Go to Station Troubleshooting.

QUESTION	YES	NO
1g. Are any dots missing from printed characters?	Check continuity of associated print magnet. Visually examine print head for any print wires that do not retract. Replace print head or cable.	Go to 1h.
1h. Are any dots noticeably out of line on characters with vertical segments.	Replace print head.	Go to 1i.
1i. Is proper print density obtained? (Good ribbon, proper multicopy paper — see Section 570-008-010)	Go to 1j.	Check PRINT HEAD TO PLATEN adjustment. With power off and carriage moved manually, check that ribbon moves with carriage without slipping during return and does not move when carriage is moved to the right. Check carriage and left bracket ribbon rollers for "one way" rotation.
1j. Does printed copy align properly with edge of paper? (Prints equally on each side of page perforation.)	Undefined problem during PRINTER TEST. Go to Station Troubleshooting.	Check PRINTED LINE POSITION adjustment.
2. Did bell ring during PRINTER TEST.	Go to 3.	Go to 2a.
2a. Does bell ring under any conditions? (CTRL G R.H. margin, etc)	Go to Station Troubleshooting.	Check bell coil and cable continuity. Check for freedom of bell plunger.
3. Does ALARM indicator light when a paper-out condition is sensed?	Undefined trouble. Go to Station Troubleshooting.	Check continuity of paper-out cable and contacts. Check PAPER ALARM CONTACT adjustment.

43 PRINTER

WIRING

CONTENTS PAGE

1. GENERAL

1.01 This section provides wiring information for the 43 printer.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Related wiring information and cable connections to the logic card are shown in Section 574-500-400, Station Wiring.

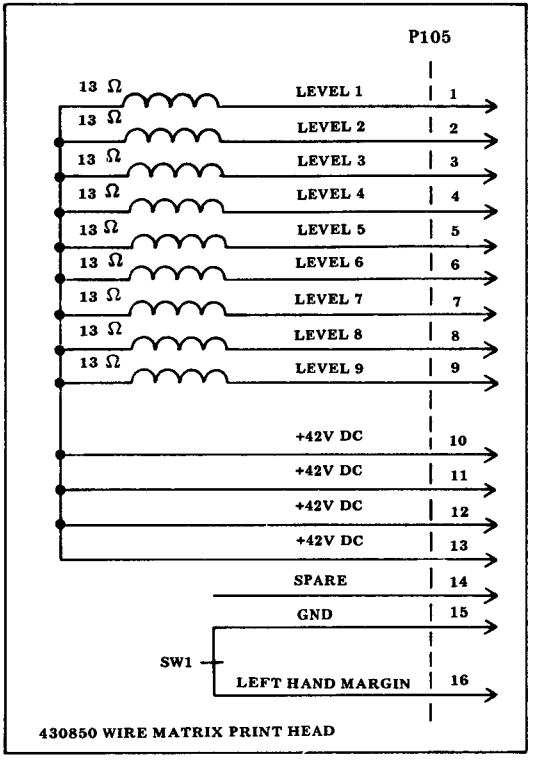
1.04 Designations on printer wiring diagram do not appear on the components.

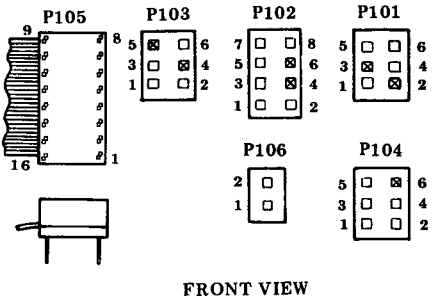
1.05 The wiring information in this section is provided to support the 43 Printer Troubleshooting in Section 574-501-300.

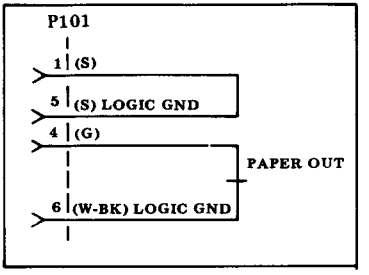
1.06 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP410055).

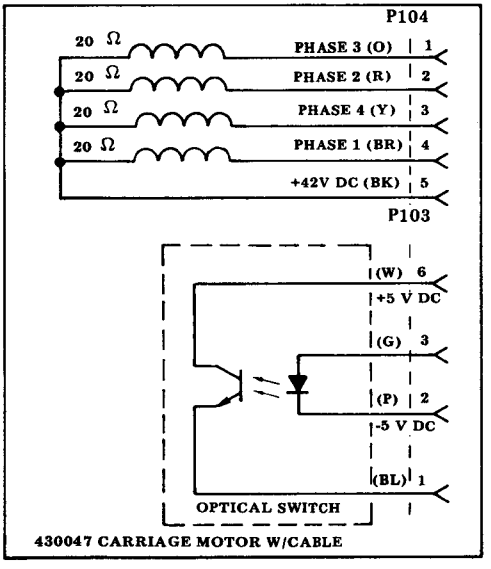
Prepared for American Telephone and Telegraph Company by Teletype Corporation

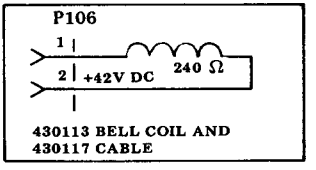
2. PRINTER WIRING

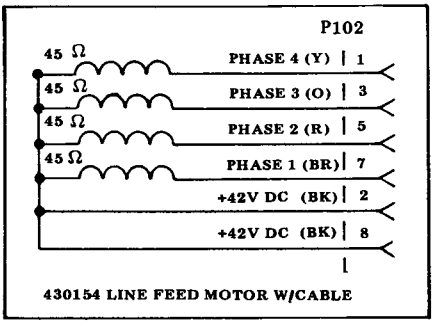












43 PRINTER

ADJUSTMENTS AND SPRING TENSIONS

CONTENTS PAGE

1. GENERAL

1.01 This section provides printer adjustments and spring tensions.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Belt tensions are checked with a spring scale held at the angle shown in the adjustment illustration.

1.04 When ordering replaceable components, unless otherwise specified, prefix each part number with "TP" (ie, TP430028).

1.05 After an adjustment is complete, tighten any screws or nuts loosened to make the adjustment.

1.06 Reference in the procedure to left or right, up or down, and top or bottom, etc, refer to the printer in its normal operating position.

1.07 Adjustments should be checked and performed when a trouble indicates a specific adjustment may be out of tolerance or when an adjustment is disturbed to enable a part to be removed or replaced.

1.08 Spring tension checks should be performed when a trouble indicates a possible defective spring or to verify proper part numbers.

1.09 Springs that do not meet the tension requirements should be replaced.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. TOOLS REQUIRED

2.01 Refer to Maintenance Tools Section 570-005-800 for a complete listing of various types of hand tools available for maintenance of TELETYPE® Equipment.

2.02 The following tools may be required when performing adjustments or spring tension checks. Most of these items should normally be present in standard maintenance tool kits.

Tools

Wrench	3/16" socket	125752
Wrench, open end	3/16" and 1/4"	129534
Wrench, open end	5/16" and 3/8"	152835
Nut driver	Handle	135676
Nut driver	1/4"	135677
Nut driver	5/16"	135678
Screwdriver	1/8", 2" blade	95368
Screwdriver	1/4", 6" blade	100982
Screwdriver	(blade less than 5/32")	94647
Allen wrench	0.062	124682
Tweezers		151392
Spring hook (pull)		142554
Spring hook (pull)		75765
Spring hook (push)		142555
Gauge set, feeler		117781
Scale, spring (8 oz)		110443
Scale, spring (32 oz)		110444
Scale, spring (64 oz)		82711
Scale, spring (15 lb)		135059
Ruler, 6"		95960

3. PRINTER ADJUSTMENTS

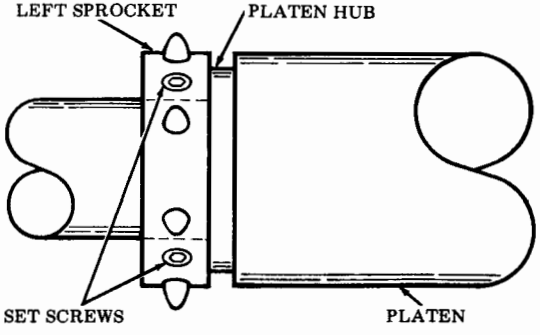
LEFT PAPER SPROCKET

Requirement

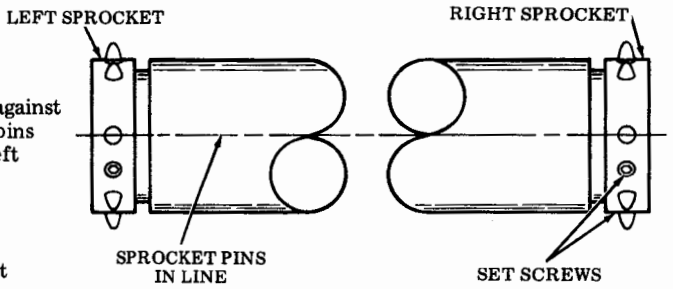
The left sprocket should be biased against the collar of the platen hub.

To Adjust

Loosen set screws and position left sprocket to meet requirement.



RIGHT PAPER SPROCKET



Requirement

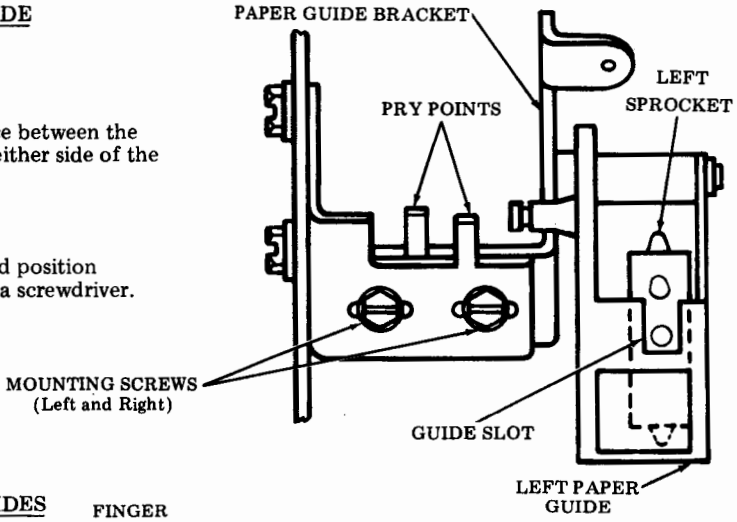
The right sprocket should be biased against the collar of the platen hub and the pins shall be in line with the pins of the left sprocket.

To Adjust

Loosen set screws and position right sprocket to meet requirement.

Note: This adjustment to be refined when making the PRINTED LINE POSITION adjustment.

LEFT AND RIGHT PAPER GUIDE
(Horizontal Positioning)



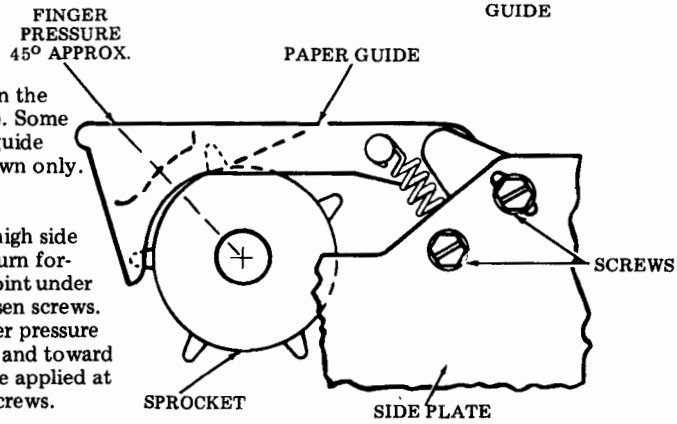
Requirement

There should be some clearance between the base of the sprocket pins and either side of the paper guide slot.

To Adjust

Loosen screws finger tight and position paper guide bracket by using a screwdriver.

LEFT AND RIGHT PAPER GUIDES
(Angular Positioning)



Requirement

The paper guides should seat fully on the paper sprockets (left and right sides). Some gap at the lower front of the paper guide is permissable. Check by pushing down only.

To Adjust

Turn platen until paper guide is on high side of the sprocket. Rotate platen 1/2 turn forward (one sprocket pin) to put high point under lower front of the paper guide. Loosen screws. To seat the paper guides, apply finger pressure to top of paper guides at 45 degrees and toward center of platen. With finger pressure applied at approximately 45 degrees, tighten screws.

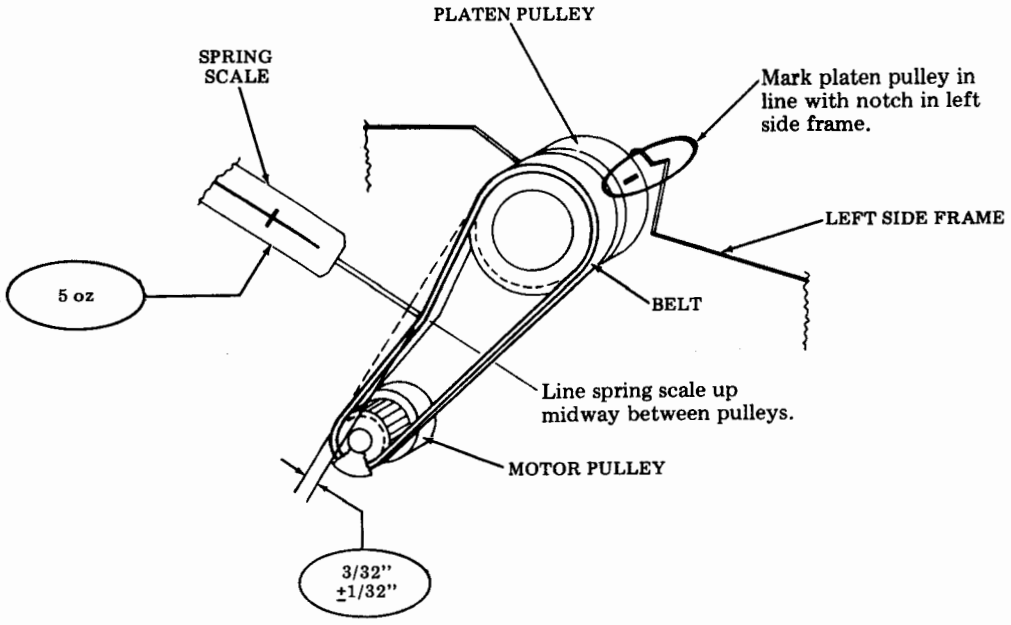
LINE FEED BELT TENSION

Requirement

When the belt and sprocket system is at the point of least slack; a force of 5 ounces applied with a spring scale midway between the sprockets the belt should deflect 3/32 inch ±1/32 inch.

To Adjust

By feel and by eye, locate the point of least slack as the platen is rotated through one revolution. Mark this point relative to the side frame, as shown below, for future reference. Loosen motor screws, position motor to meet requirement at the point of least slack. Tighten screws.



(Left Side View)

PRINT HEAD TO PLATEN

Requirement

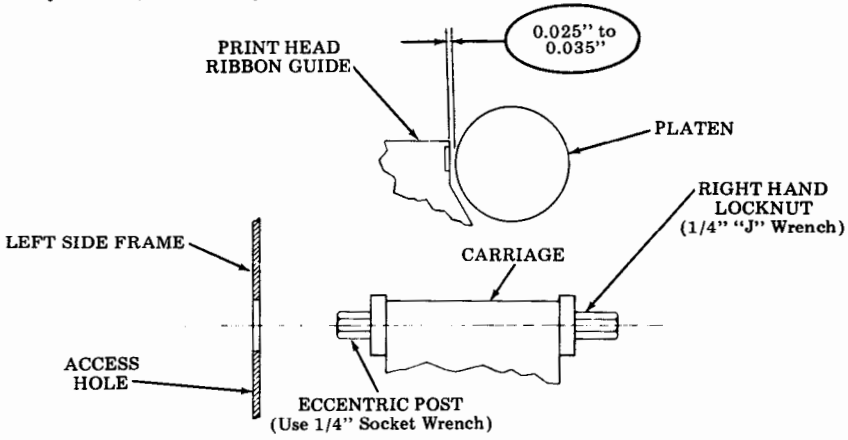
There should be

Min 0.025 inch---Max 0.035 inch

gap between the ribbon guide of the print head and the platen (without paper or ribbon) and at all positions of the carriage and platen, when platen play at the right end is biased down and to the rear and the print head is locked.

To Adjust

Position carriage to the extreme left position. Unlock locking handle, use 1/4 inch "J" wrench to loosen right-hand locknut and with carriage biased rearward, insert 1/4 inch socket wrench through access hole in left side frame and rotate eccentric post to adjust. Tighten locknut. Check adjustment with carriage locked. Check adjustment on extreme right end of platen, while biasing platen down and to the rear. Refine adjustment, if necessary.



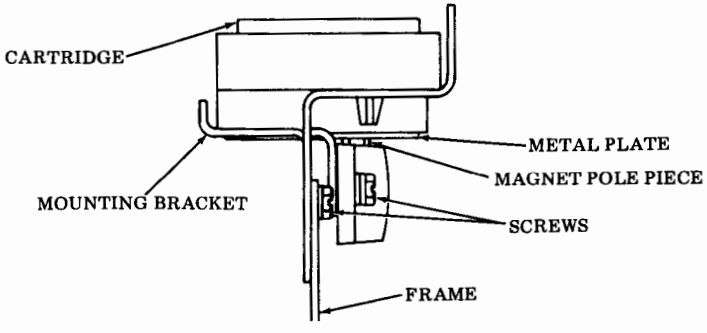
RIBBON CARTRIDGE MAGNETIC LATCH

Requirement

The magnetic pole pieces of the magnetic latch should be firmly engaged with the cartridge lower metal plate when the cartridge is installed in the right-hand cartridge mounting bracket.

To Adjust

Loosen the two magnetic latch mounting screws. Install cartridge onto the mounting bracket. While holding the cartridge down firmly, allow the magnetic latch to fully engage the lower metal plate of the cartridge. Tighten the latch mounting screws.



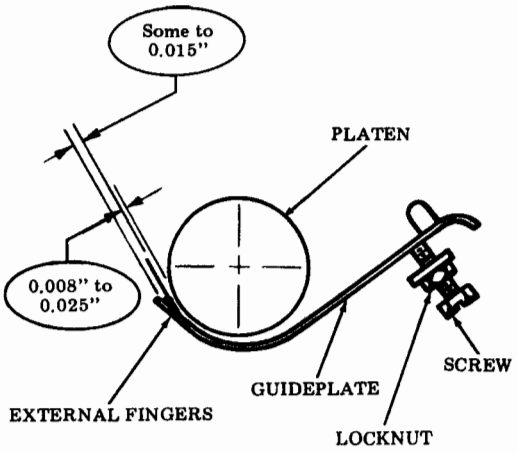
PAPER GUIDE PLATE CLEARANCE

(1) Requirement
With no sprocket forms in the platen mechanism and the platen oriented with the slot in the right platen hub in the top uppermost position there should be
Min 0.008 inch---Max 0.025 inch
between the platen and the left and right ends of the paper guideplate. Record the two clearances.

To Adjust
Loosen locknut and adjust screw. Tighten locknut.

(2) Requirement
The fingers at both the left and right ends of the platen should be
Min Some---Max 0.015 inch
beyond the recorded gap between the platen and the left and right ends of the paper guideplate.

To Adjust
Bend fingers to meet requirement.

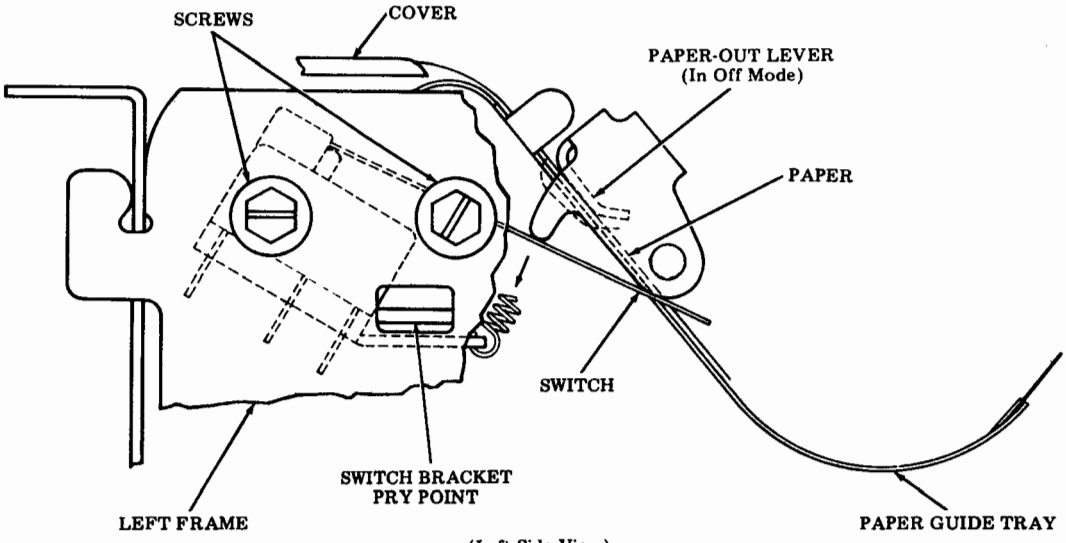


(Right Side View)

PAPER ALARM CONTACT LEVER

Requirement
With the paper alarm contact lever resting on the paper and the paper held taught over the cutout in the paper guide tray, the switch will be in the off mode (nonalarm). With the paper out, the lever should activate the switch (alarm mode).

To Adjust
Loosen screws and position switch bracket to meet requirement.

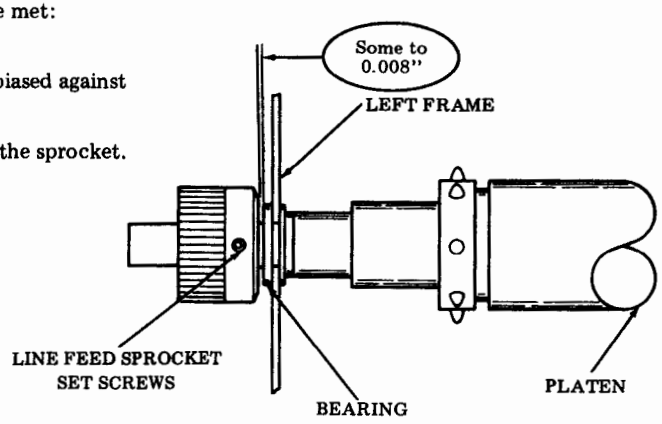


(Left Side View)

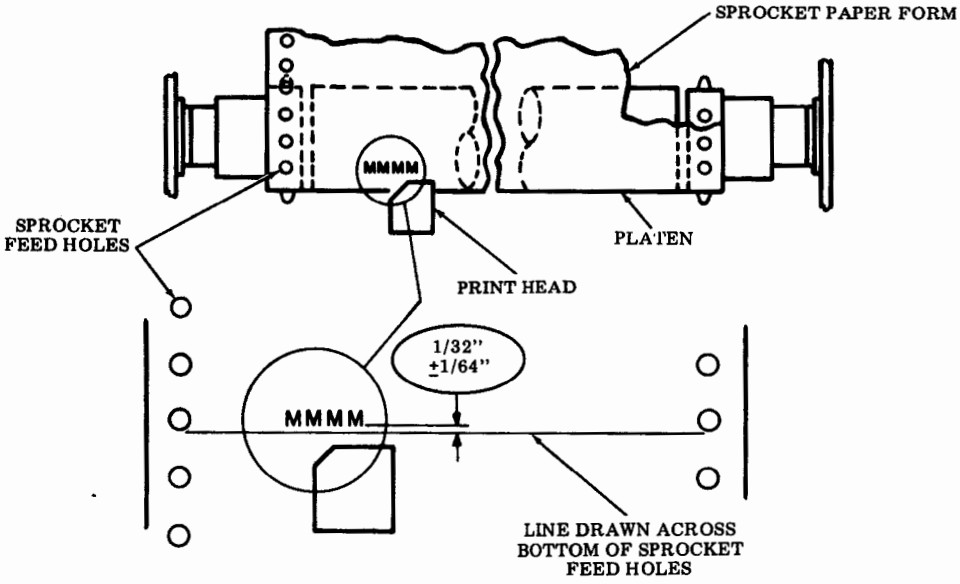
PLATEN ENDPLAY AND PRINTED LINE POSITION

The following 2 requirements must be met:

(1) Requirement
Platen Endplay — With the platen biased against the left bearing there should be
Some to 0.008 inch
clearance between the bearing and the sprocket.



(2) Requirement
Printed Line Position — The lower edges of a typed line should be 1/32 inch ±1/64 inch above a horizontal line drawn even with the bottom edge of any sprocket hole. If horizontal ruled lines are provided on which typing is to be done, the lower edges of a typed line should be even with, or a multiple of 1/6 inch from the bottom of any sprocket hole within a tolerance of ±1/64 inch. (Power must be on line feed motor for this adjustment.)



(Top View)

To Adjust
Loosen the line feed sprocket (at platen) set screws and position. Print the character "M" across the line and check (2) Requirement. If necessary, loosen set screw on right sprocket to meet alignment requirement.

4. SPRING TENSIONS

① 430028 Lead Screw Spring

On left side of lead screw, push to start to compress spring — 9 to 11 pounds.

② 430030 Carriage Nut Spring

Place carriage on left side of unit. Hold lead screw pulley. Insert spring scale through top hole of left bearing housing. Push carriage with 46 ±8 ounces to compress carriage nut spring.

③ 430242 Ribbon Tension Spring

4-1/2 to 6-1/2 ounces to pull spring to installed length with ribbon installed.

④ 101386 Paper Finger Springs (Left and Right) (2)

2 to 4 ounces to start to lift paper fingers at front edge of fingers (with center paper guide installed).

⑤ 430021 SP Belt Tension Arm Spring

18 to 22 ounces to pull spring to installed length.

⑥ 110437 Paper-Out Spring

1/2 to 1 ounce to start paper-out lever moving.

⑦ 430118 Bell Plunger Spring

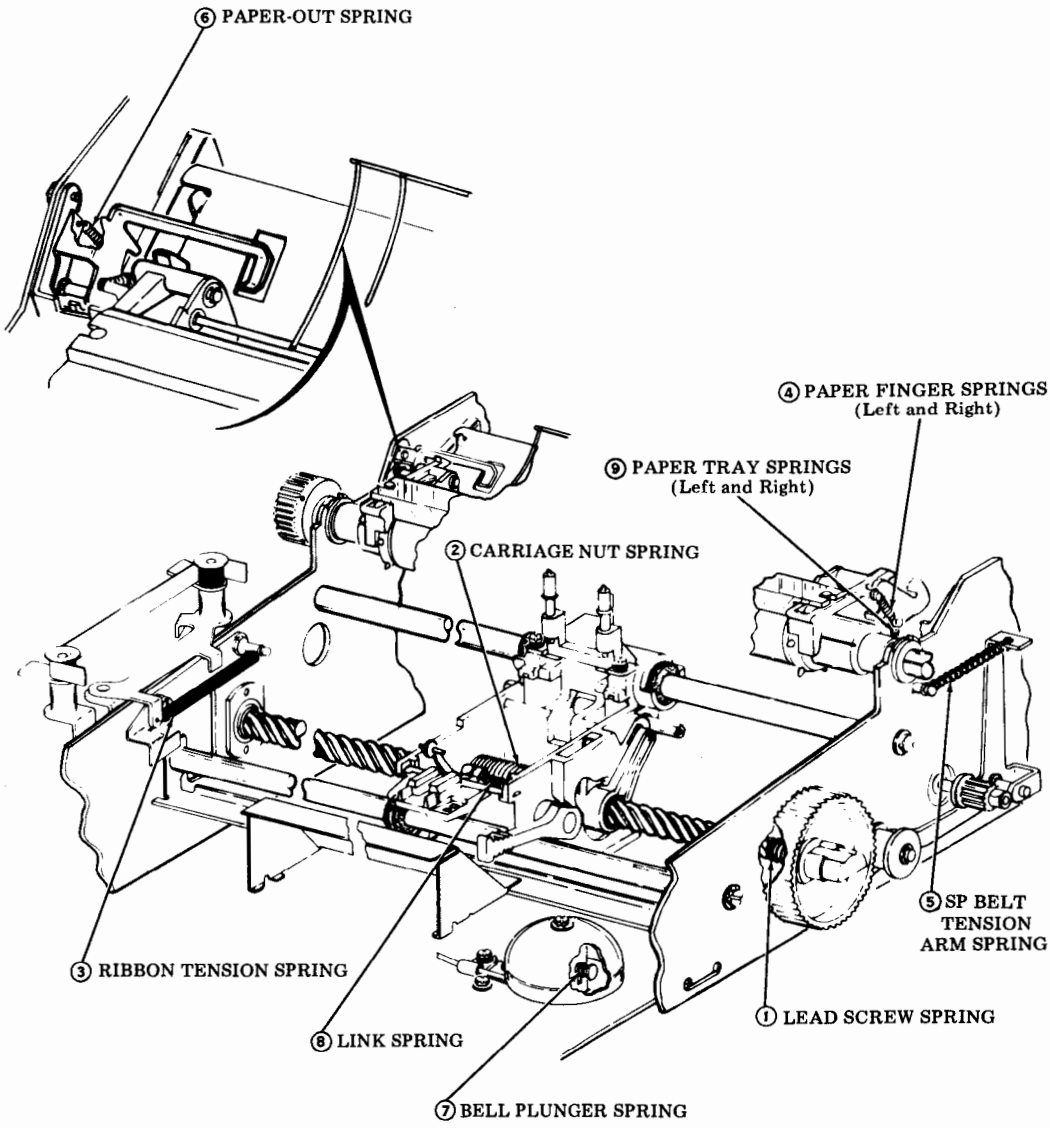
1/2 to 1 ounce to seat plunger.

⑧ Link Spring (Part of 430216)

3/4 to 1-1/4 ounces at roll pin to hold spring in lowest position with locking handle in the most forward position.

⑨ 4708 Paper Tray Springs (Left and Right) (2)

Hook paper-out lever on left paper guide. With spring scale, pull at right angle at center rear of paper tray. It should take 6 to 10 ounces to start the paper tray moving upward.


⑥ PAPER-OUT SPRING
④ PAPER FINGER SPRINGS
(Left and Right)
⑨ PAPER TRAY SPRINGS
(Left and Right)
② CARRIAGE NUT SPRING
⑤ SP BELT
TENSION
ARM SPRING
③ RIBBON TENSION SPRING
① LEAD SCREW SPRING
⑧ LINK SPRING
⑦ BELL PLUNGER SPRING

43 PRINTER

LUBRICATION

CONTENTS PAGE

1. GENERAL

1.01 This section provides lubrication procedures for the 43 printer.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Lubricate the printer at intervals indicated under Routine Maintenance, Section 574-500-750.

1.04 The printer can be lubricated by opening the cabinet cover.

2. LUBRICATION PROCEDURES

2.01 Apply lubricant to points as indicated.

(a) On small parts, a minimum amount of lubricant should be applied so that the lubricant remains on the parts and does not run off.

(b) Excessive lubricant should be removed with a dry, lint-free cloth.

(c) The following areas must be kept dry, free of all lubricant: All electrical components, including terminals. All parts normally touched by the operator, including exposed surfaces in ribbon, paper handling areas, and all large flat areas.

2.02 The following symbols indicate the quantity of lubricant to be used in a specified area: Symbols O1, O2, O3, etc, refer to 1, 2, 3, etc, drops of oil.

2.03 The following list of symbols applies to the lubrication instructions and the type of lubricant to be used:

O Apply KS-7470 oil.

G Apply thin film of KS-7471 grease.

S Saturate felt oilers, washers, and wicks with oil.

D Keep dry, no lubricant permitted.

2.04 Lubrication checklist:

Lead Screw — Film of grease over the entire threaded portion of lead screw.

Carriage Wicks — Saturate with oil (4 places).

Ribbon Rollers — Two drops of oil (4 places).

Ribbon Tension Arm Pivot and Spring — Two drops of oil each (4 places).

Spacing Tension Arm Pivot, Roller and Spring — Two drops of oil each (4 places).

Platen Bearing — Five drops of oil each side (2 places).

Finger Pivots — Two drops of oil each side (2 places).

Paper Out Arm Pivot — Two drops of oil on both pivot points.

Lead Screw Pulley Clip — Grease between clip and lead screw shaft.

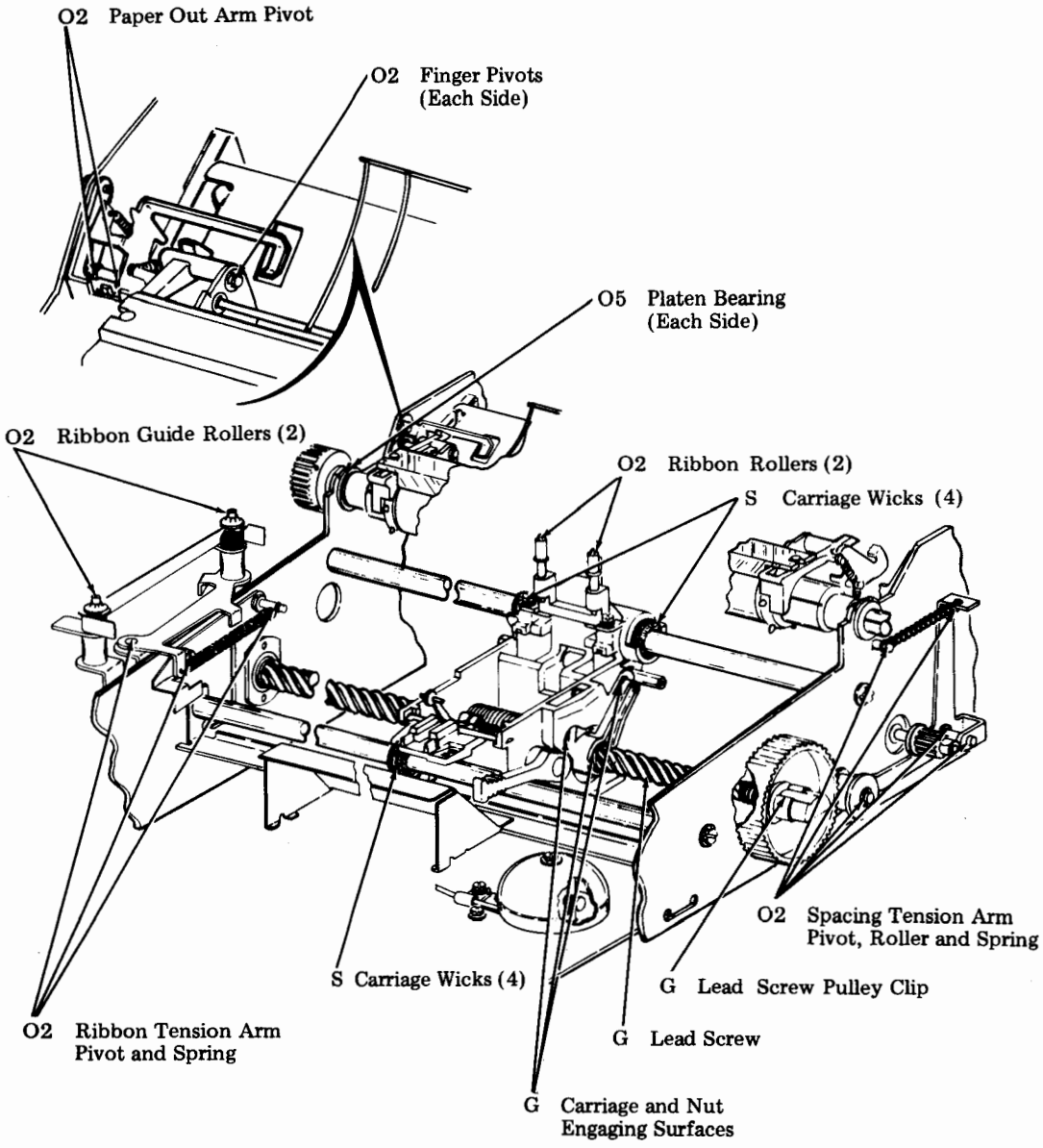
Carriage and Nut Engaging Surfaces:

(a) Two Nut Drive Arms — Grease four bearing surfaces.

(b) Nut Keying Arm — Lubricate by packing carriage engaging slot with grease.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

3. LUBRICATION POINTS



43 PRINTER

DISASSEMBLY/REASSEMBLY

CONTENTS PAGE

1. GENERAL

1.01 This section covers disassembly and reassembly procedures for the 43 printer.

1.02 Whenever this section is reissued the reason for reissue will be listed in this paragraph.

1.03 The printer is not considered a field replaceable item. Any trouble can be corrected by adjustments or by replacement with maintenance spares.

1.04 Procedures are provided to remove individual assemblies and parts and are intended to directly access any assembly or part, insofar as possible, without total disassembly of the unit.

1.05 When removing a subassembly or part from the printer, follow the removal procedure and note the sequence of removal to enable proper reassembly. For reassembly, reverse the procedure except where different instructions are given.

1.06 Disassembly of printer parts except the print head will require the removal of the set housing and rear frame. Refer to Station Disassembly/Reassembly, Section 574-500-720 for set housing and rear frame removal and replacement procedures.

1.07 Some parts that are not listed in the parts sections are shown as necessary to the disassembly procedures such as screws and ring retainers, etc. These parts are common to other Teletype Corporation product lines and if needed may already be available in field repair kits or can be ordered.

1.08 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP430047).

1.09 Reference in the procedures to left and right, up or down, and top or bottom, etc, refer to the printer in its normal operating position.

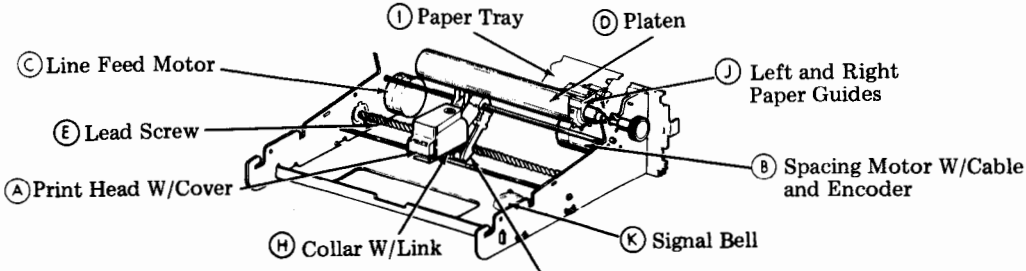
Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. TOOLS REQUIRED

2.01 The following tools may be required when performing the printer disassembly and reassembly procedures. Most of these items should normally be present in standard maintenance tool kits.

Part No.	Tools
125752	Wrench, 3/16 Inch Socket
129534	Wrench, Open End, 3/16 Inch and 1/4 Inch
152835	Wrench, Open End, 5/16 Inch and 3/8 Inch
135676	Nut Driver, Handle
135677	Nut Driver, 1/4 Inch
135678	Nut Driver, 5/16 Inch
95368	Screwdriver, 1/8 Inch, 2 Inch Blade
100982	Screwdriver, 1/4 Inch, 6 Inch Blade
100704	Screwdriver, 10 Inch Blade
124682	Allen Wrench, 0.062 Inch
151392	Tweezers
142554	Spring Hook, (Pull)
75765	Spring Hook, (Pull)
142555	Spring Hook, (Push)

3. SUBASSEMBLY AND PARTS IDENTIFICATION

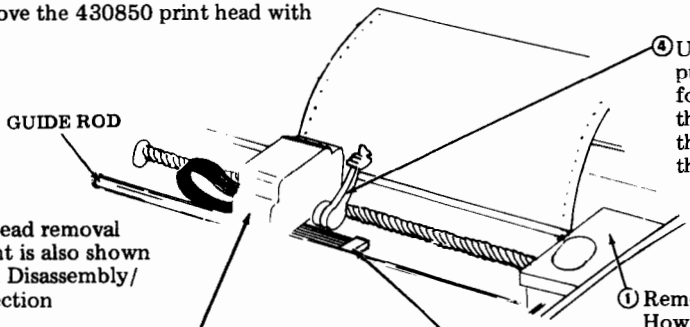


Note: Circled letters indicate the paragraph which gives disassembly procedures.

4. DISASSEMBLY/REASSEMBLY

430850 PRINT HEAD WITH COVER

4.01 To remove the 430850 print head with cover:



④ Unlock print head by pulling locking handle forward until it strikes the guide rod. Move the locking handle to the right.

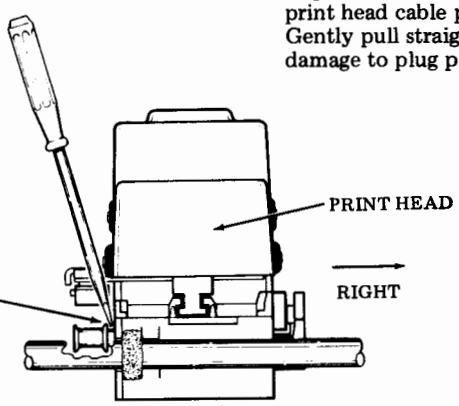
Note: Print head removal and replacement is also shown in KSR Station Disassembly/ Reassembly, Section 574-500-720.

① Remove ribbon. (Refer to How to Operate Manual, 999-300-126.)

⑤ Grasp print head and pull forward. Lift front of print head to disengage locking channels.

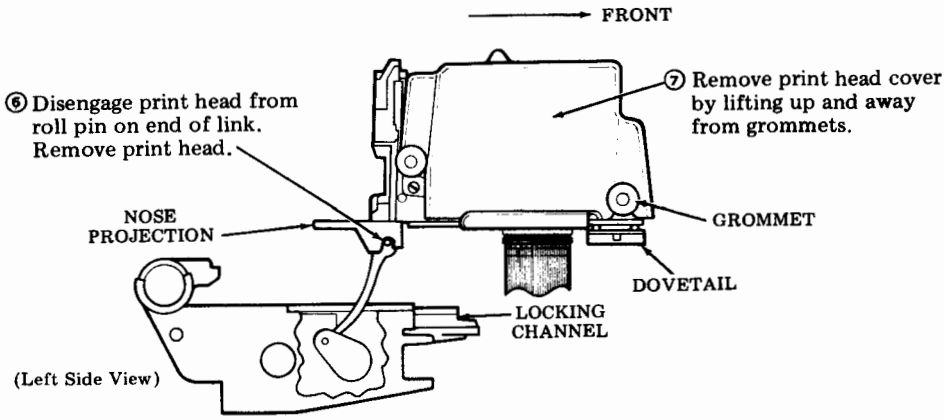
② Move print head and carriage to right of print head cable plug. Disconnect print head cable plug from logic card. Gently pull straight up to avoid damage to plug pins.

(Front View)

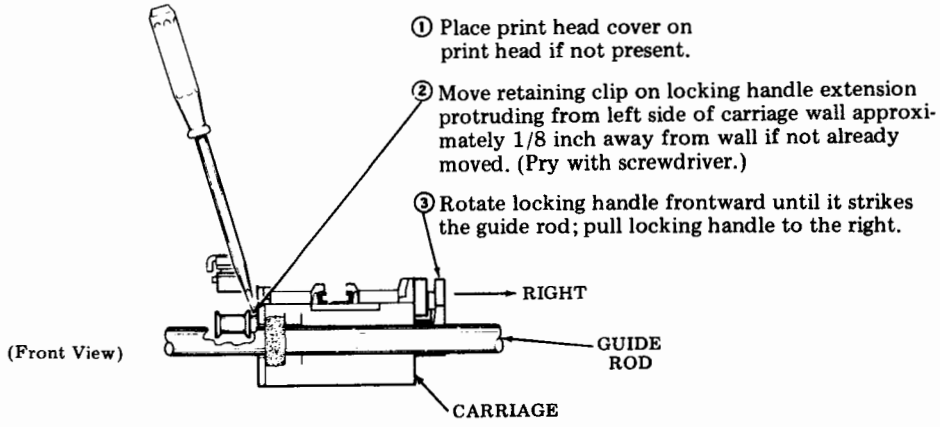


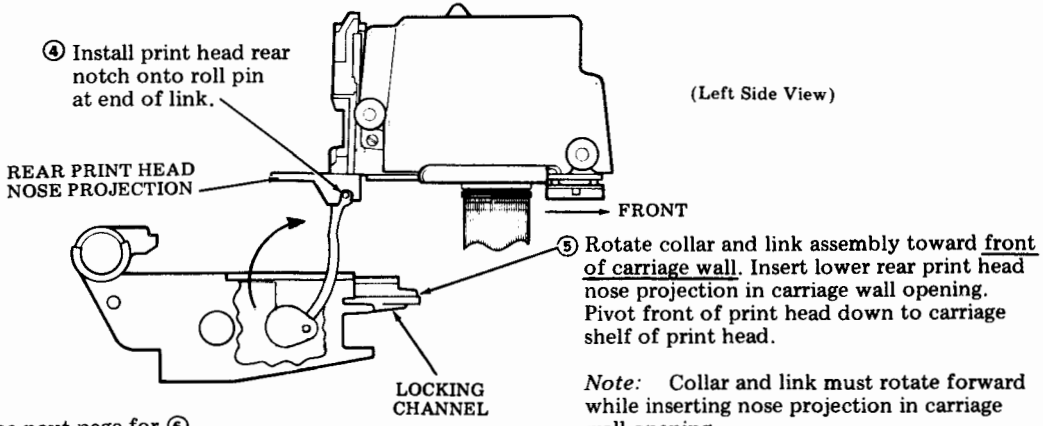
③ Move retaining clip on locking handle extension protruding from left side of carriage wall approximately 1/8 inch away from wall. (Pry with screwdriver.)

See next page for ⑥.



4.02 To replace the 430850 print head with cover:

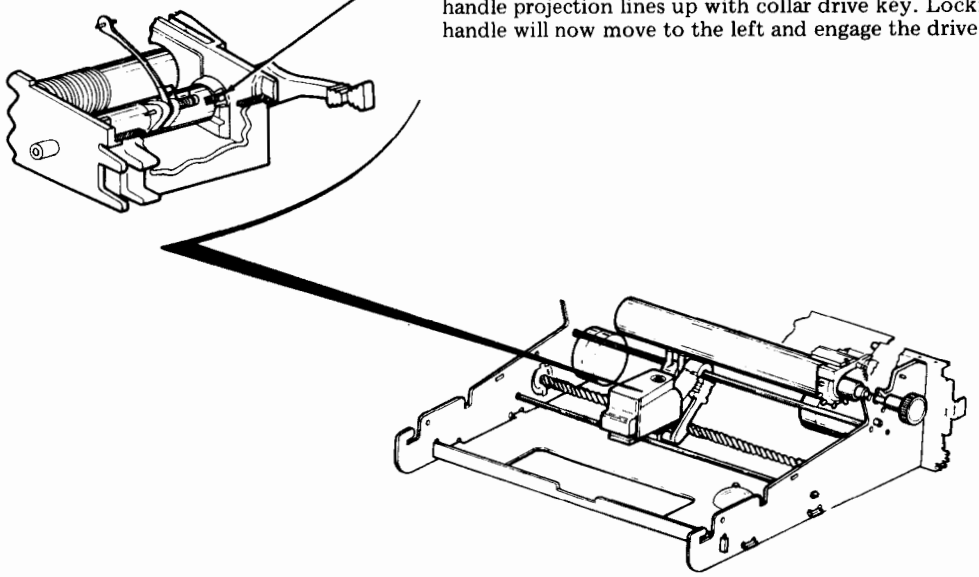




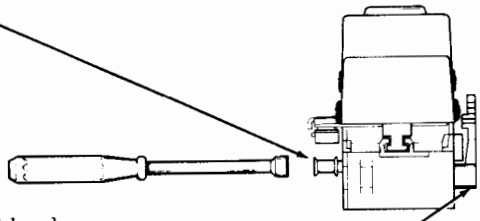
Note: Collar and link must rotate forward while inserting nose projection in carriage wall opening.

See next page for ⑥.

⑥ Apply continuous leftward pressure to locking handle at its pivot shaft, while slowly pushing print head rearward and further into the carriage locking channel until locking handle projection lines up with collar drive key. Locking handle will now move to the left and engage the drive key.



⑧ Position print head and carriage assembly to right side of printer and use a 5/16 inch socket wrench to push clip against carriage wall.



(Front View)

⑨ Reconnect the print head cable plug to the logic card.

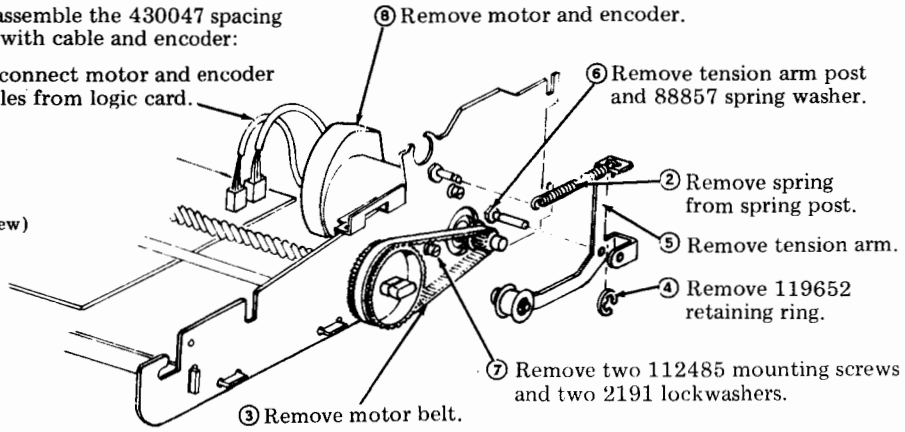
⑩ Install ribbon. (Refer to How to Operate Manual, 999-300-126.)

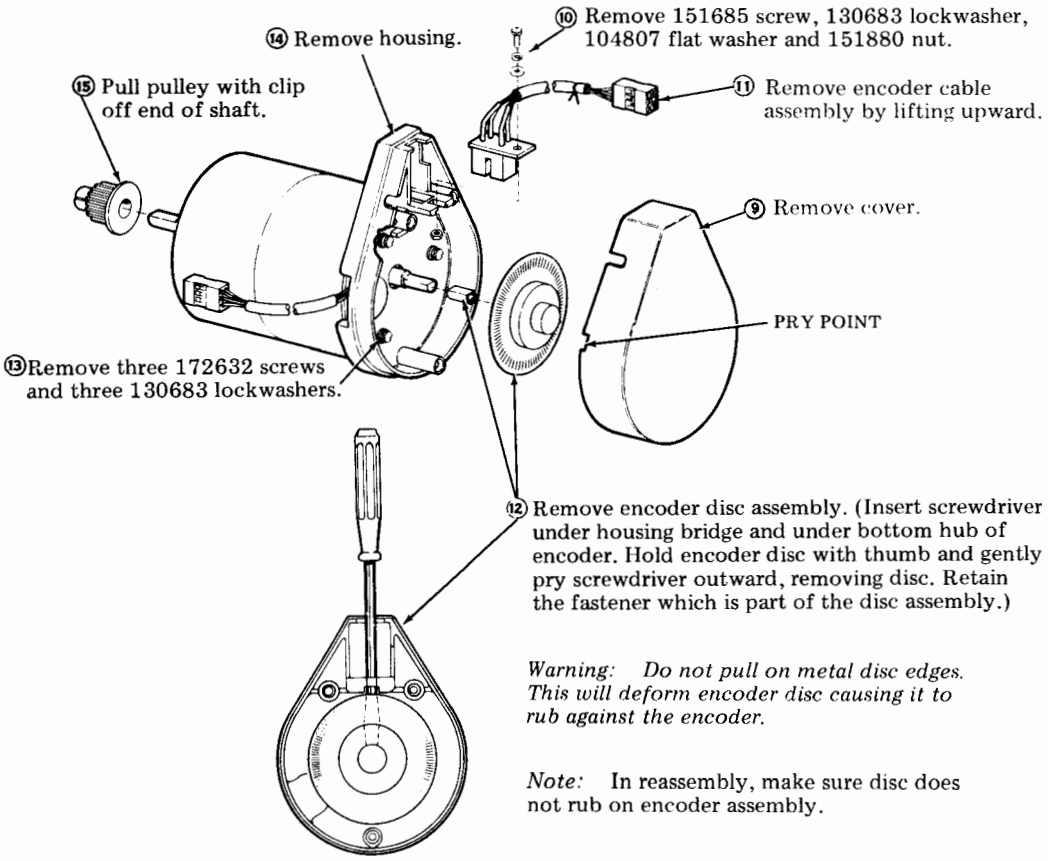
⑦ Move the handle all the way to the rear, locking the print head in close proximity to the platen by the additional force necessary to detent the handle.

Note: Check to make sure there is some clearance between print head and platen before detenting handle. Perform PRINT HEAD TO PLATEN adjustment in Section 574-501-700.

430047 SPACING MOTOR WITH CABLE AND ENCODER

4.03 To disassemble the 430047 spacing motor with cable and encoder:





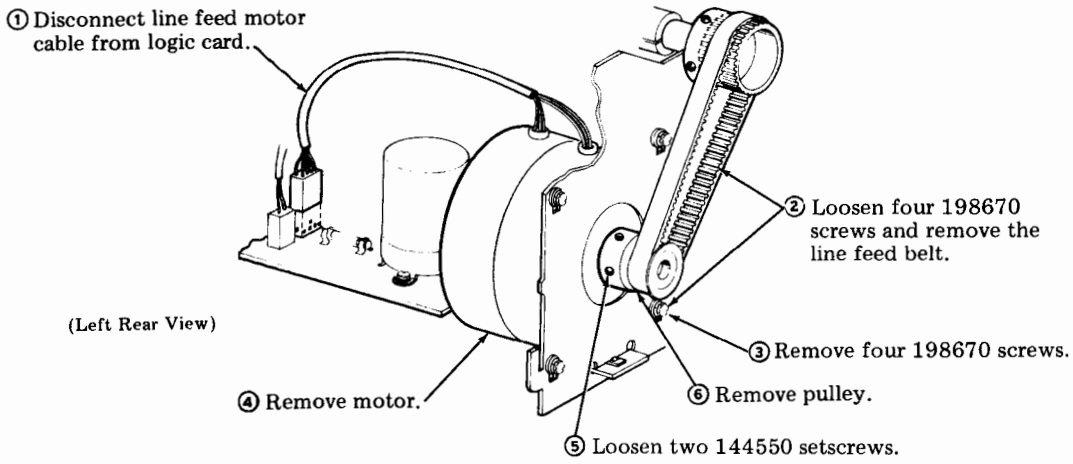
Warning: Do not pull on metal disc edges. This will deform encoder disc causing it to rub against the encoder.

Note: In reassembly, make sure disc does not rub on encoder assembly.

430154 LINE FEED MOTOR

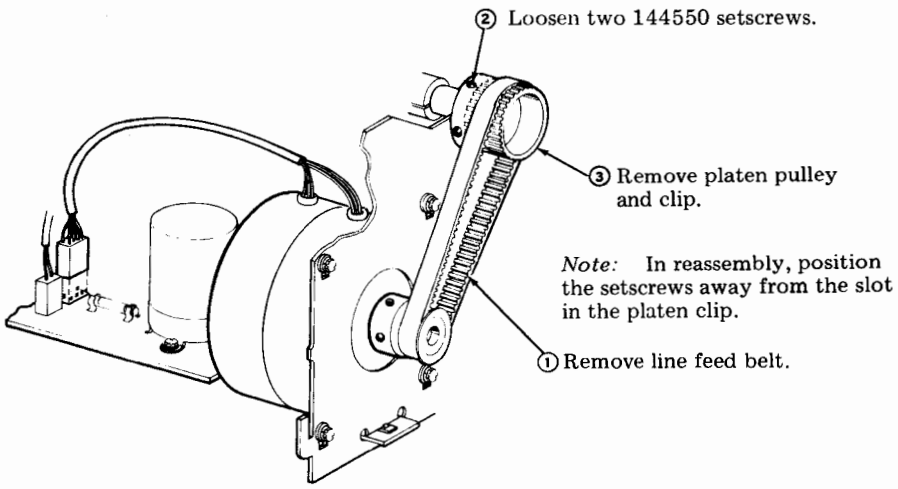
4.04 To disassemble the 430154 line feed motor:

Note: In reassembly, make LINE FEED BELT TENSION adjustment.

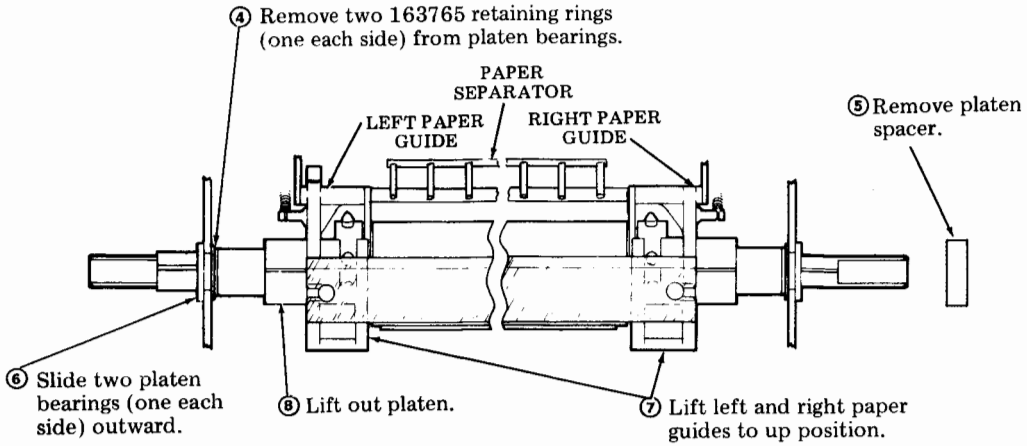


430088 PLATEN

4.05 To disassemble the 430088 platen:

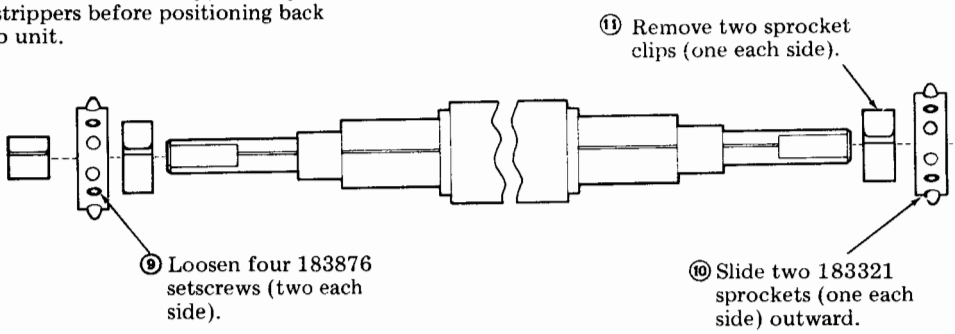


See next page for ④.



Note: Left and right strippers are in upward position after platen is removed. In reassembly, locate platen in strippers before positioning back into unit.

(Top View)

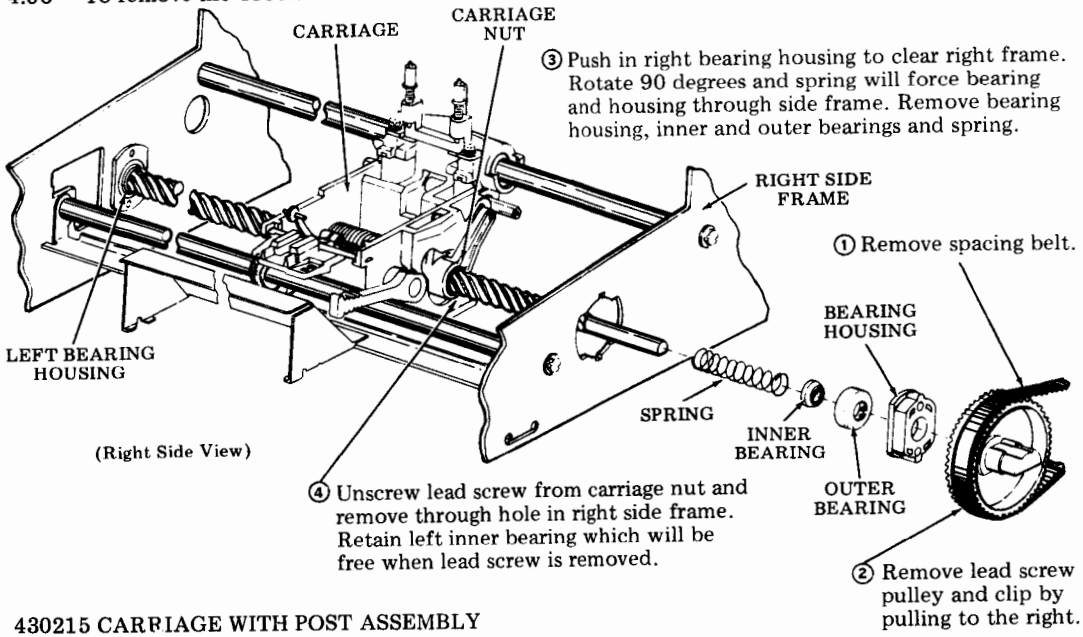


Note: In reassembly, position the setscrews away from the slot in the sprocket clip.

Perform the LEFT AND RIGHT SPROCKET adjustments and PRINTED LINE POSITION AND PLATEN ENDPLAY adjustments.

430029 LEAD SCREW

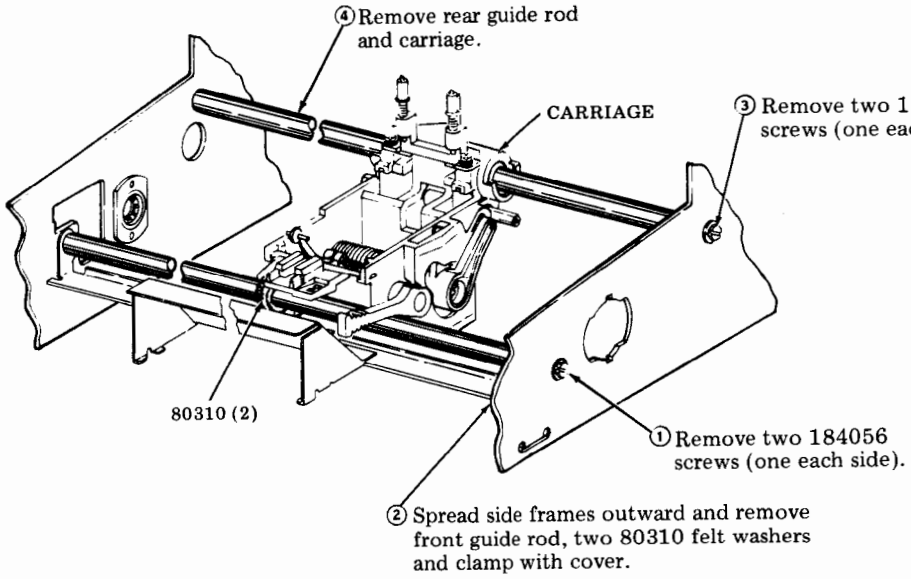
4.06 To remove the 430029 lead screw:



430215 CARRIAGE WITH POST ASSEMBLY

4.07 To remove the carriage with post assembly:

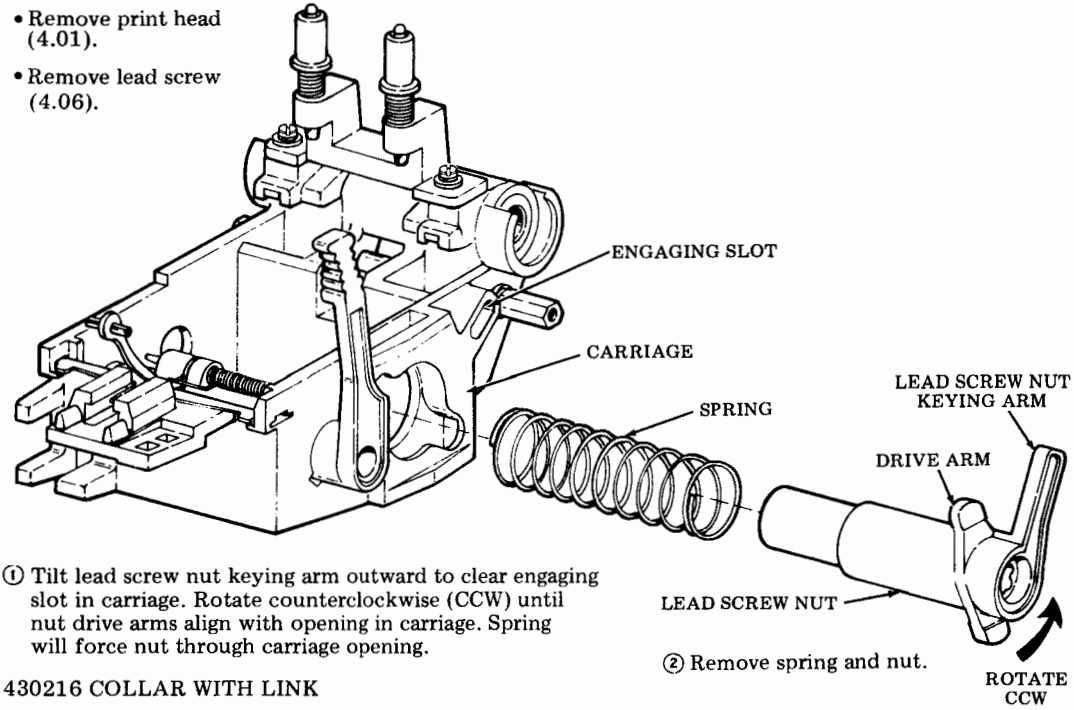
- Remove print head and lead screw (4.01 and 4.06).



430031 LEAD SCREW NUT

4.08 To remove the 430031 lead screw nut:

- Remove print head (4.01).
- Remove lead screw (4.06).



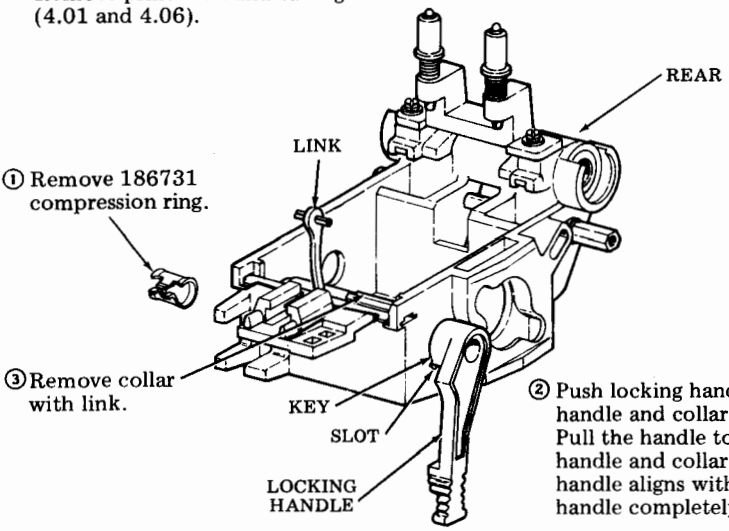
① Tilt lead screw nut keying arm outward to clear engaging slot in carriage. Rotate counterclockwise (CCW) until nut drive arms align with opening in carriage. Spring will force nut through carriage opening.

② Remove spring and nut.

430216 COLLAR WITH LINK

4.09 To remove the 430216 collar with link:

- Remove print head and carriage (4.01 and 4.06).

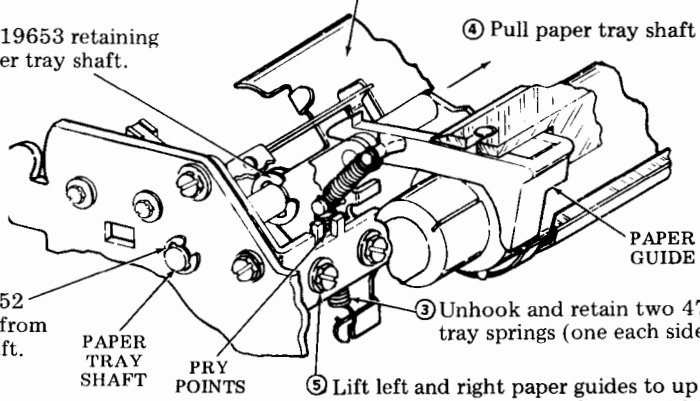


② Push locking handle to the left and rotate locking handle and collar fully counterclockwise (forward). Pull the handle to the right while slowly rotating handle and collar clockwise (rearward) until key on handle aligns with slot in carriage. Pull locking handle completely out of carriage.

430011 PAPER TRAY

4.10 To remove the 430011 paper tray:

Note 1: Parts on left and right sides are similar.

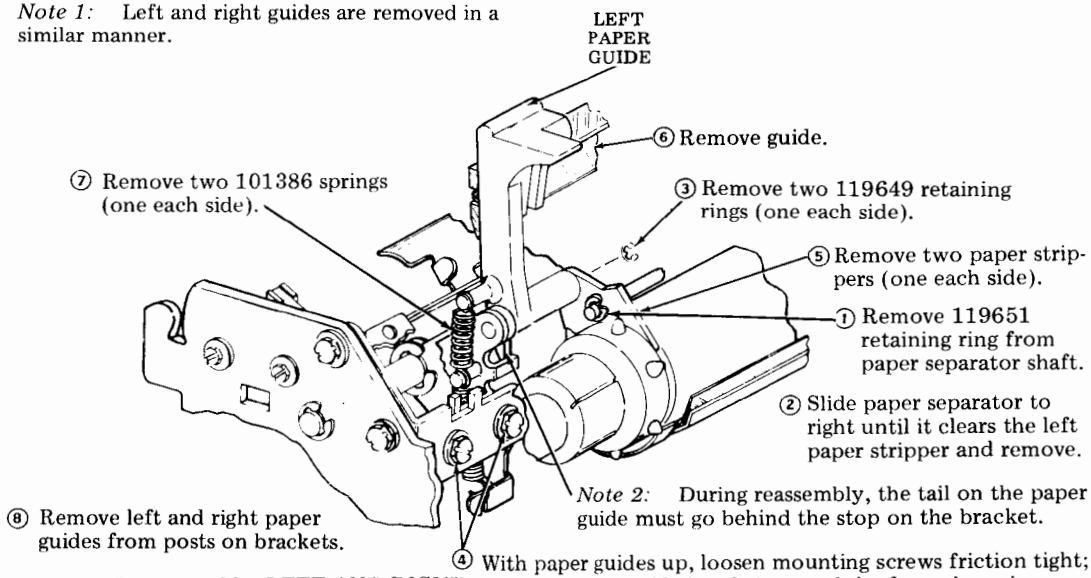


Note 2: In reassembly, LEFT AND RIGHT PAPER GUIDE adjustments must be made.

430100 LEFT PAPER GUIDE, 430101 RIGHT PAPER GUIDE, AND 430179 GUIDE

4.11 To remove the 430100 left paper guide, 430101 right paper guide, and 430179 guide:

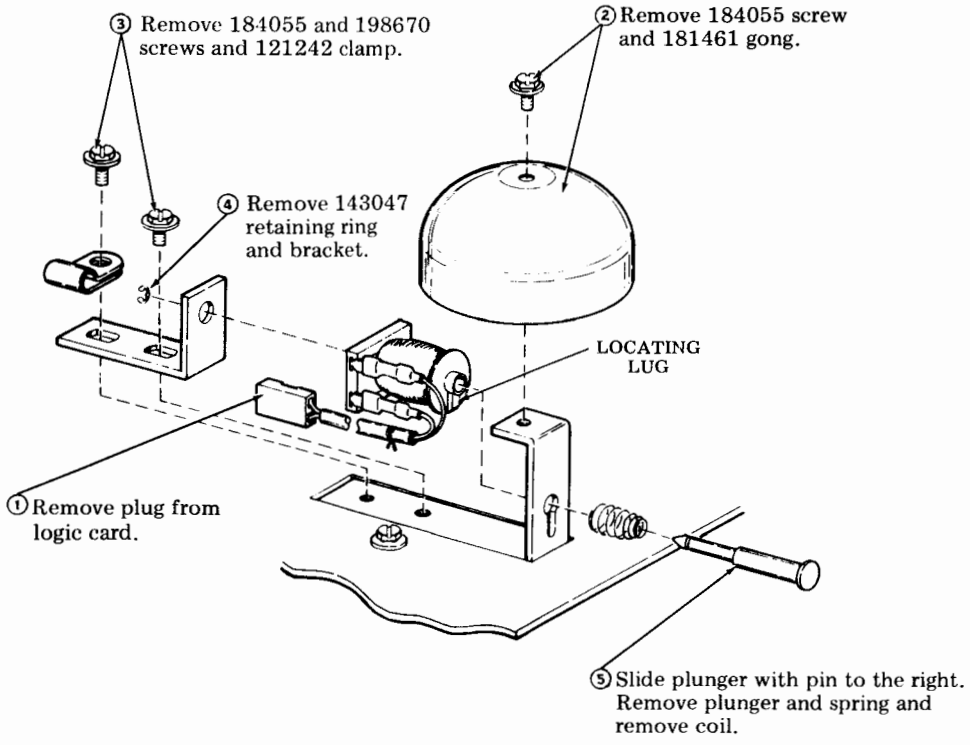
Note 1: Left and right guides are removed in a similar manner.



Note 3: In reassembly, LEFT AND RIGHT PAPER GUIDE adjustments must be made.

SIGNAL BELL

4.12 To remove the signal bell:



43 PRINTER

PARTS

CONTENTS PAGE

1. GENERAL

1.01 Information on maintenance spare parts is provided in this section for the 43 printer.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

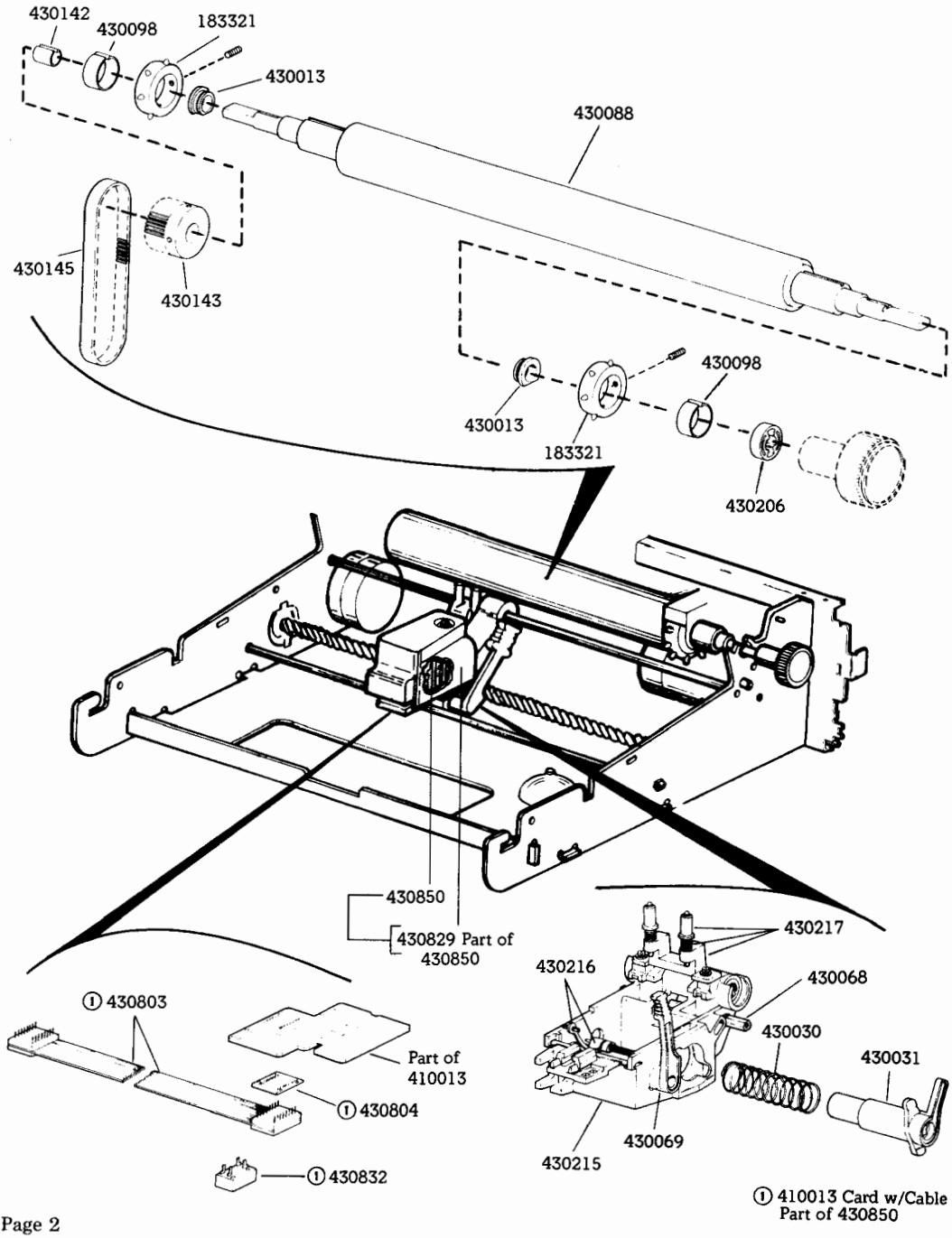
1.03 Part numbers are listed in the index in numerical order and indicate the page on which the parts appear. Asterisked numbers, stocked as "List 1", indicate a maintenance spare stocking ratio of one spare for the first ten stations and an additional spare for each additional 30 stations in a maintenance area. Part numbers without asterisks, stocked as "List 2", indicate that one spare should be available in each maintenance area.

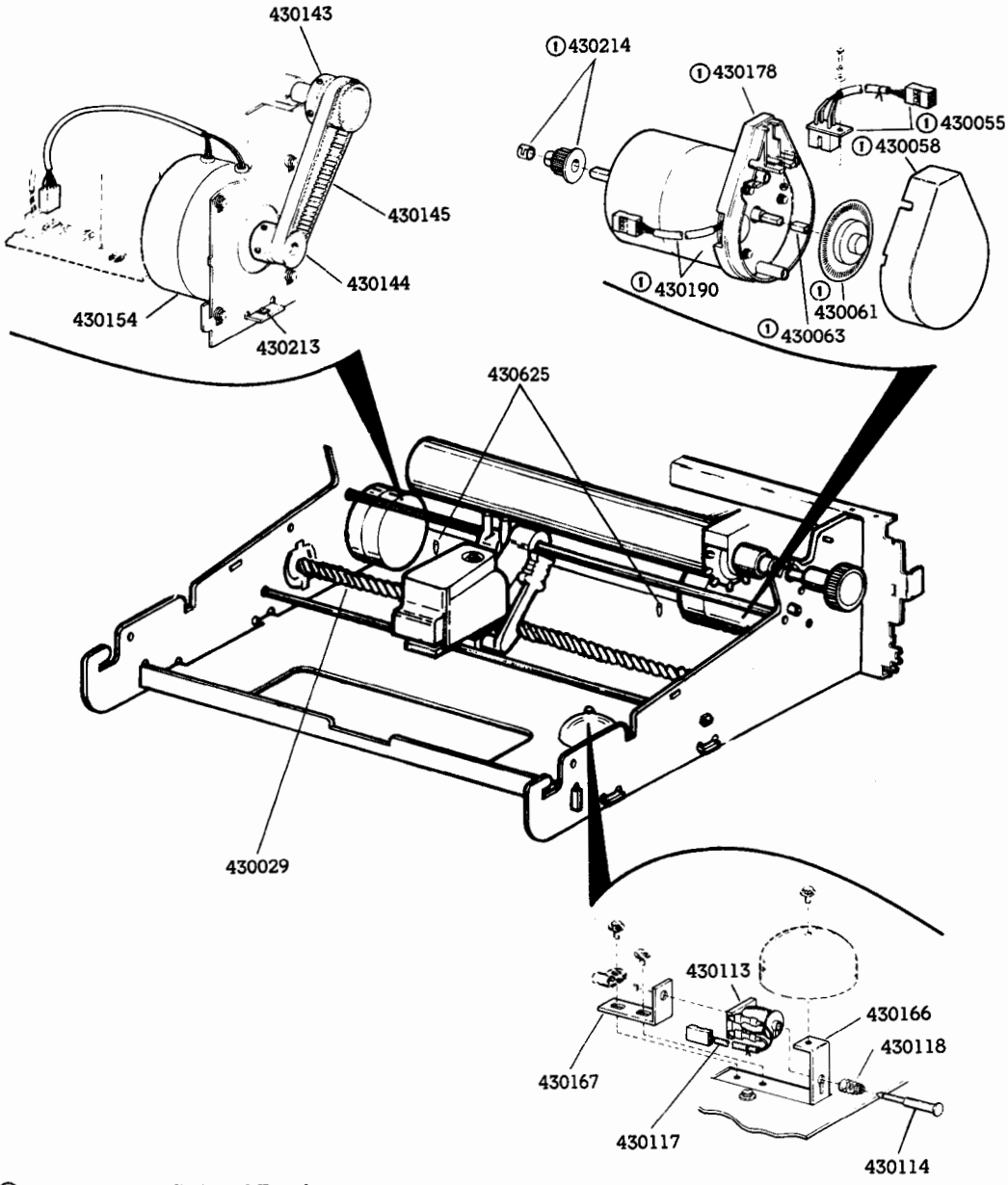
1.04 When ordering replaceable components, unless otherwise specified, prefix each part number with "TP" (ie, TP430019).

1.05 Troubleshooting and disassembly/reassembly information for these parts is provided in Section 574-501-300 and Section 574-501-702, respectively.

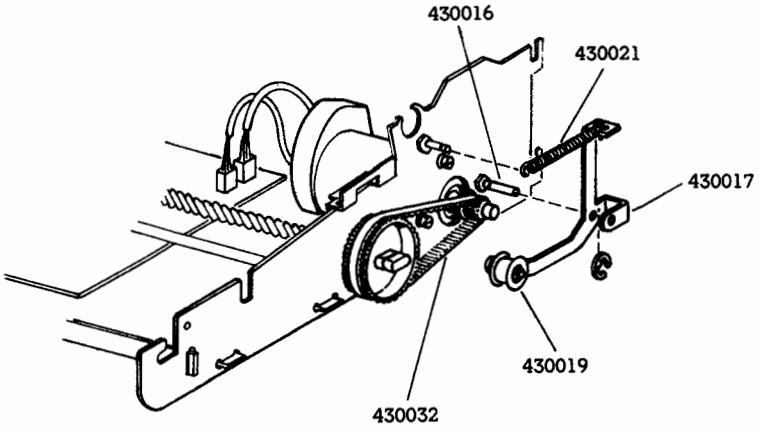
Prepared for American Telephone and Telegraph Company by Teletype Corporation

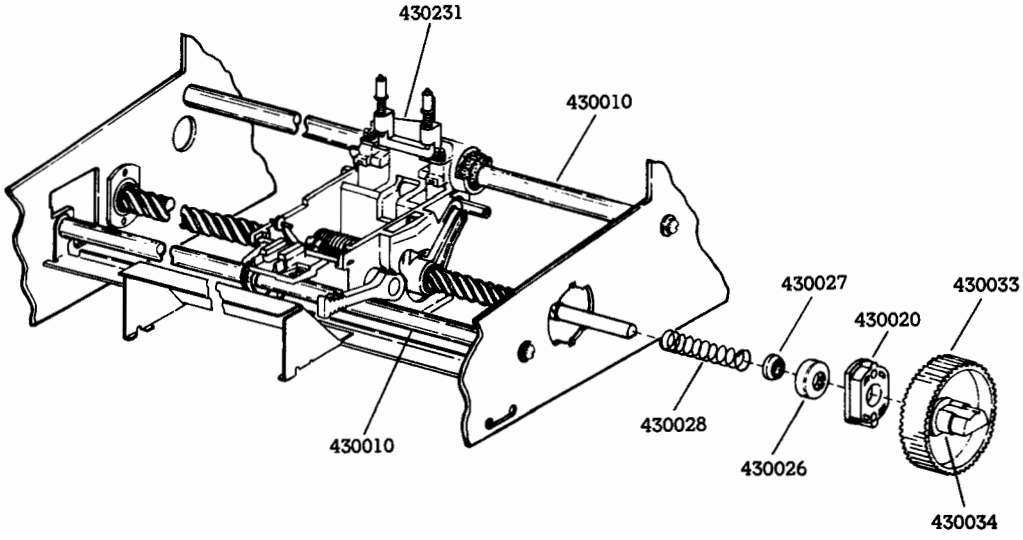
2. PARTS

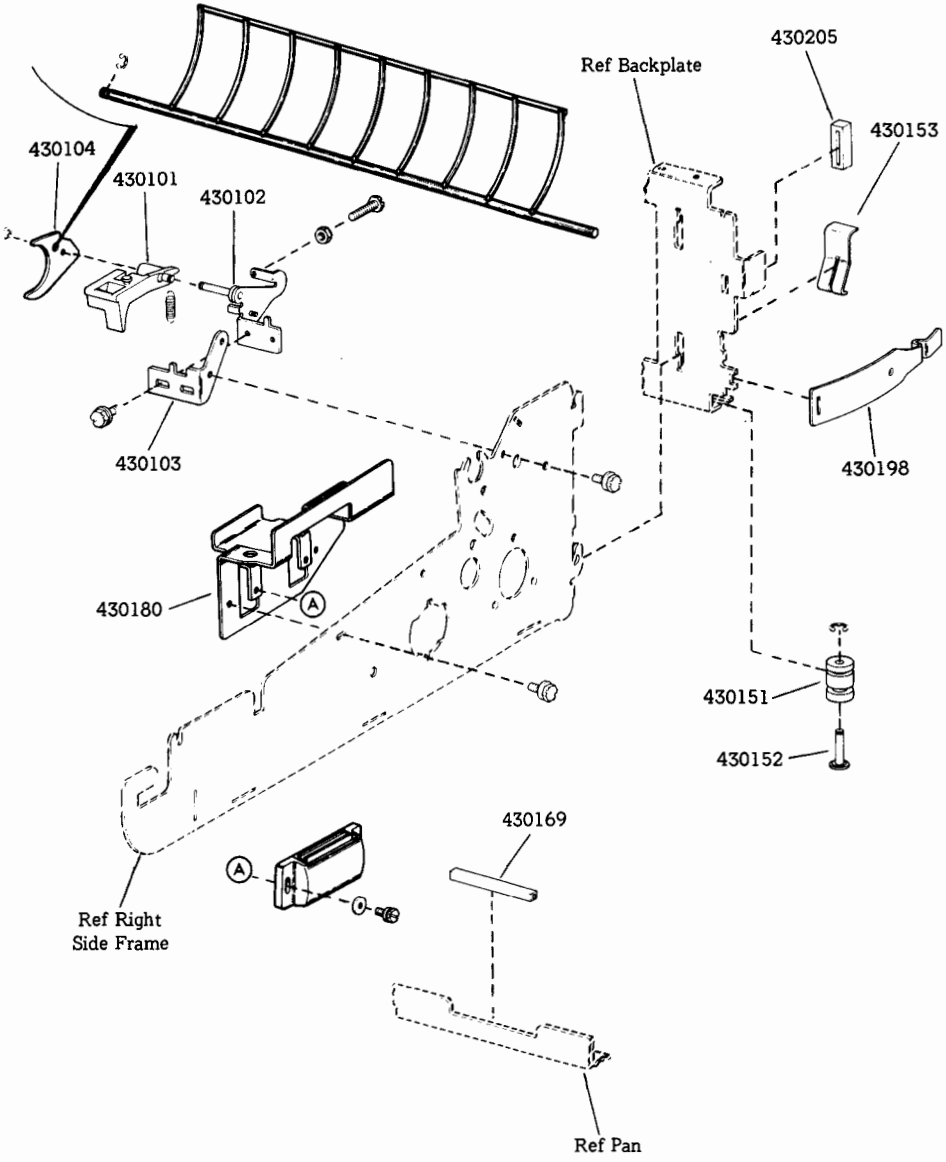

430142
430098
183321
430013
430088
430145
430143
430013
183321
430098
430206
430850
430829 Part of 430850
430217
430216
430068
430030
430031
430069
430215
① 430803
Part of 410013
① 430804
① 430832
① 410013 Card w/Cable Part of 430850

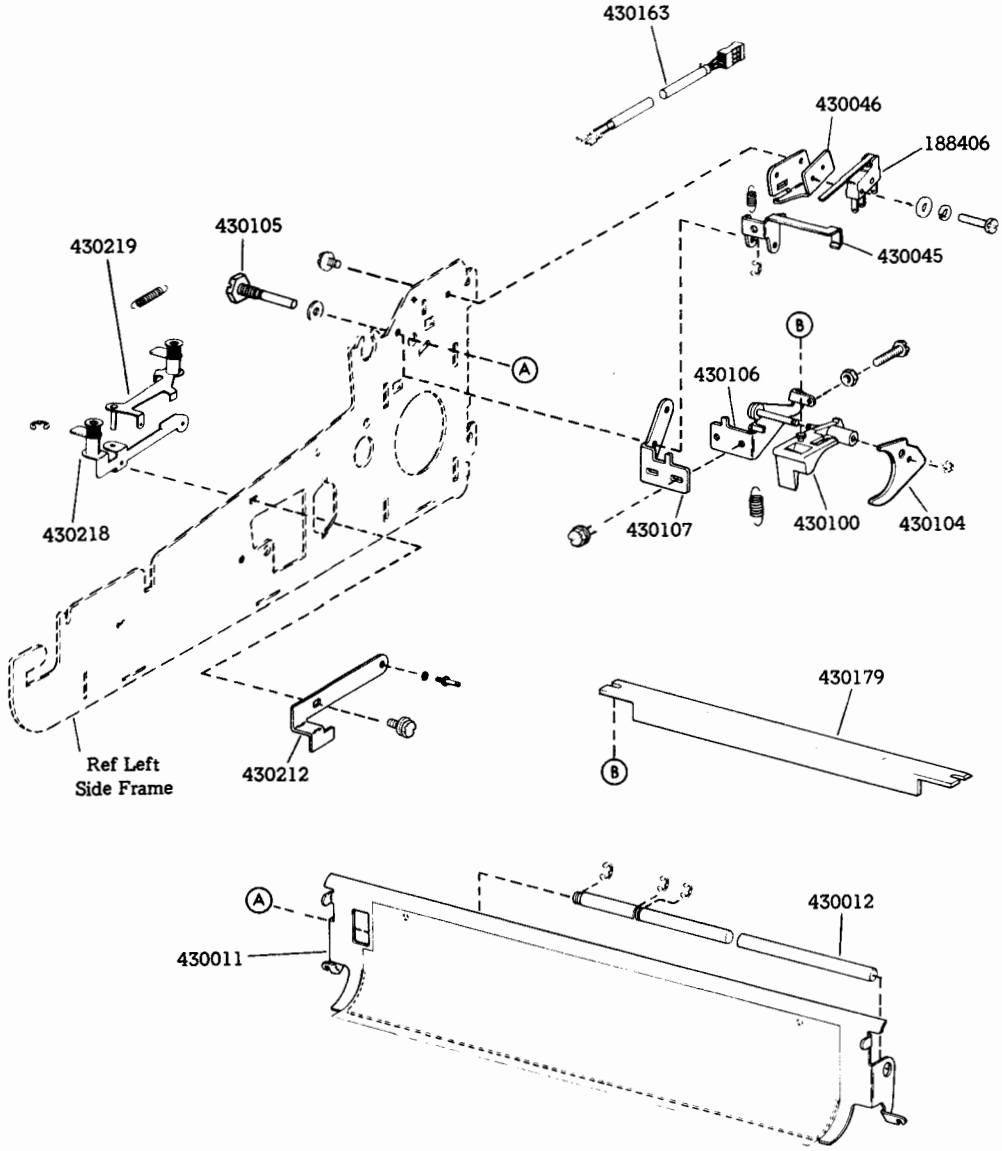


① 430047 Motor w/Cable and Encoder


430016
430021
430017
430019
430032


430231
430010
430027
430033
430020
430028
430026
430010
430034


430205
Ref Backplate
430153
430104
430101
430102
430103
430198
430180
A
430151
430152
430169
A
Ref Right
Side Frame
Ref Pan


430163
430046
188406
430105
430219
430045
430106
430218
430107
430100
430104
430179
Ref Left
Side Frame
430212
430012
430011

NUMERICAL INDEX

Note: One spare should be available in each maintenance area, unless otherwise specified in parentheses.

*A maintenance spare stocking ration of one spare for each ten stations and one additional spare for each additional 30 stations in a maintenance area.

43 OPERATOR CONSOLE

TROUBLESHOOTING

CONTENTS PAGE

1. GENERAL

1.01 This section provides troubleshooting information for the 43 operator console (opcon).

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Opcon troubleshooting is initiated by the 43 KSR troubleshooting Section 574-500-300 or when trouble in the opcon is suspected from symptoms observed.

1.04 Analysis in this section is limited to isolating the trouble within the opcon up to its electrical interface at the logic card. The 43 opcon must be tested as part of a 43 Basic KSR Teleprinter Station. Refer to Section 574-500-500. Where analysis indicates the trouble is not in the opcon, return to the Station Troubleshooting Section 574-400-300 for further analysis.

1.05 When a trouble is verified to be in the opcon (by replacement of the opcon) this section should be used to help isolate the trouble to any replaceable components to correct the trouble. The opcon is returnable to the Western Electric Company Service Center for repair as a unit 43K101/CAA. Pack in carton (using conductive plastic bag) that was used to pack replacement opcon. High voltage static discharge can damage opcon circuitry. The 346392 wrist strap is available to ground service personnel.

1.06 Isolation and correction of troubles is based on electrical and mechanical checks and parts replacement.

Reference sections are:

574-502-400	Wiring
574-502-720	Disassembly/Reassembly
574-502-800	Parts

1.07 Trouble analysis is presented in the form of a "20 Questions" routine in 2. TROUBLESHOOTING GUIDE. The guide, with questions and yes and no columns, should be used always starting with the first question and proceeding according to the "yes" or "no" directive.

2. TROUBLESHOOTING GUIDE

QUESTION	YES	NO
1. Are any of the communication mode indicators (LOCAL TALK, DATA, AUTO ANSW) lit? (Power on, red light in power supply lit.)	Go to 2.	Check continuity through key-lamp indicator common to -12 V.
2. Do any indicators fail to light properly?	Go to 2a.	Go to 3.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

QUESTION	YES	NO
2a. Do any keys on the opcon generate characters?	*Note:* If indicators light when depressed but not under all its conditions, go to Station Trouble-shooting. Verify proper voltage at circuit card test points. Replace keyswitch or cable.	Check dc supply to opcon at circuit card test points. Check cable.
3. Do any latching keys fail to latch down when depressed or release up when depressed again? (CAPS LOCK, PARITY, DUPLEX or CPS) Do any other keys (except ALARM) fail to snap down when depressed or release up when released?	Replace defective keyswitch.	Go to 4.
4. Does any keyboard key fail to generate the proper character or function?	Go to 4a.	Go to 5.
4a. Does the key fail in all modes? (Shift, Unshift, Ctrl, Caps Lock)	Replace keyswitch.	Replace opcon.
5. Do any of the latching type keys (PARITY, DUPLEX, CPS) or PRINTER TEST keys fail to operate.	Check continuity through switch. Replace keyswitch or cable.	Go to 6.
6. Does ALARM indicator light when cover is opened?	Undefined trouble. Go to Station Trouble-shooting.	Check continuity through interlock keyswitch. Check fit of cover actuating button.

43 OPERATOR CONSOLE

WIRING

CONTENTS PAGE

1. GENERAL

1.01 This section provides wiring information for the 43 operator console.

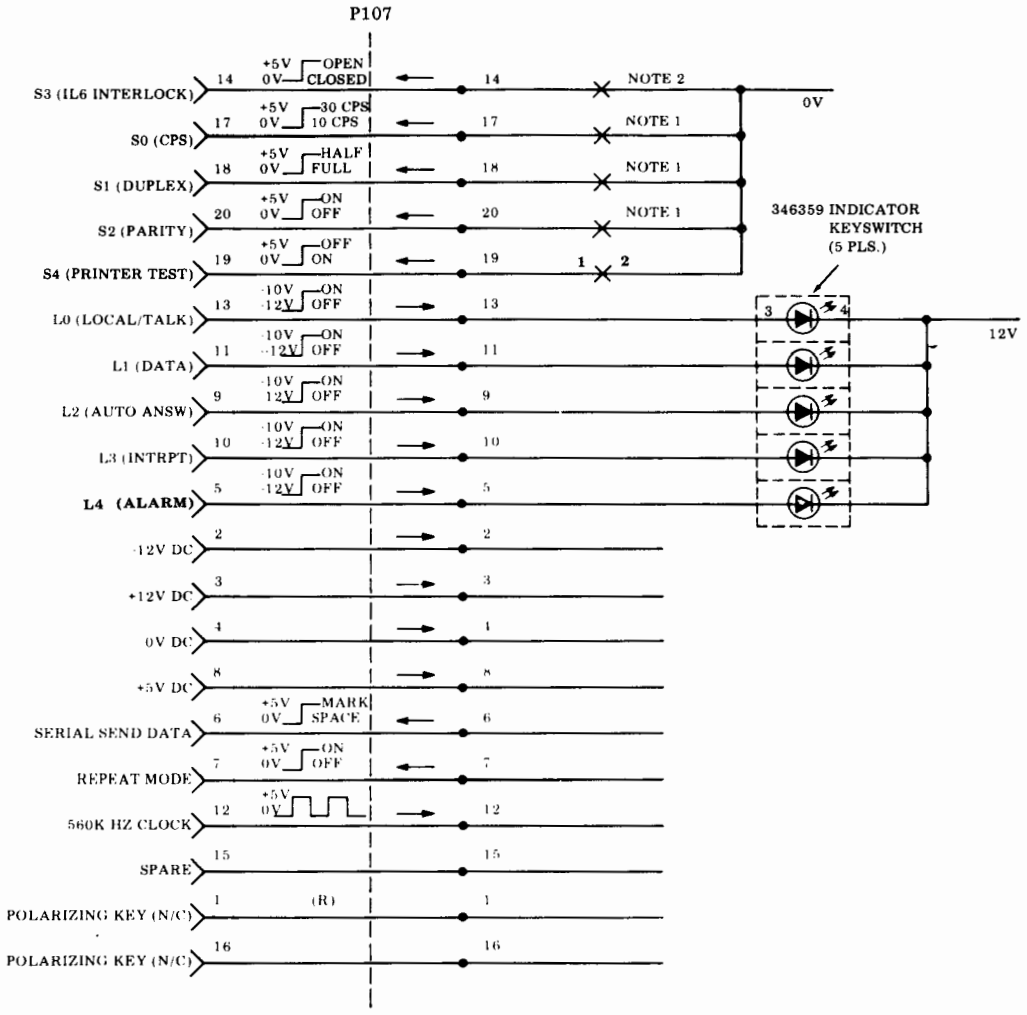
1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

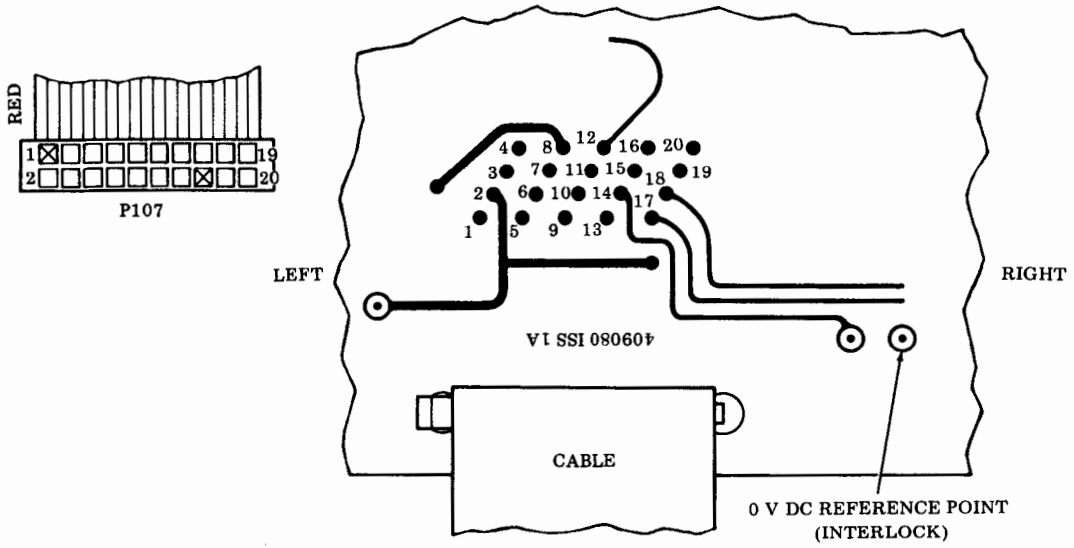
1.03 For additional wiring information, plug or cable locations, refer to Station Wiring, Section 574-500-400.

1.04 Where possible, small notes indicating voltage levels have been added to aid in troubleshooting.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. OPERATOR CONSOLE WIRING

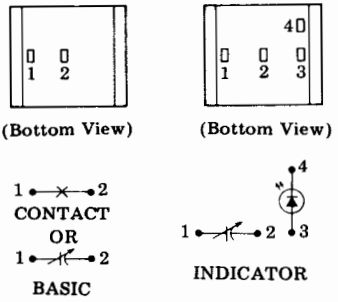




Note 1:

SWITCH KEYTOP	OPEN (UP)	CLOSED (DOWN)
CPS (S0)	30	10
DUPLEX (S1)	HALF	FULL
PARITY (S2)	ON	OFF

KEYSWITCH TYPES



Note 2: When the cover is open, S3 switch is up (open). This signal will inhibit the printer from receiving data. Closing the cover will depress (close) the switch enabling the printer.

Note 3: All voltages are measured in respect to 0 V dc.

Note 4: The input voltage from pin 12 swings between 0 V dc and +5 V dc. The input voltages for pins 13, 11, 10, 9 and 5 swing between -12 V dc and -10 V dc. The output voltages for pins 6, 7, 14, 17, 18, 19, and 20 swing between 0 V dc and +5 V dc.

43 OPERATOR CONSOLE

DISASSEMBLY/REASSEMBLY

CONTENTS PAGE

1. GENERAL

1.01 This section provides disassembly and reassembly procedures for the 43 operator console (opcon) (Fig. 1).

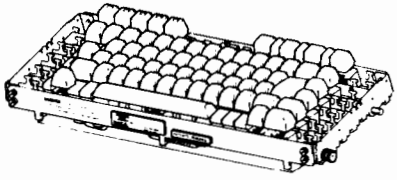


Fig. 1—43K101/CAA Operator Console

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

Note: When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP410055).

1.03 The operator console circuitry can be damaged by static discharge. The 346392 static discharge ground strap is available for use by service personnel. Maintenance spares are provided in antistatic bags which should be saved for reuse when returning operator consoles for repair.

1.04 The extent of the disassembly procedure is limited to that which is required for correction of troubles or replacement of parts in field locations. When removing a subassembly or part from the operator console, follow the removal procedure and note the sequence of removal to enable proper reassembly.

1.05 Refer to Maintenance Tools, Section 570-005-800 for a complete listing of the various types of hand tools available for maintenance of TELETYPE® equipment. For a listing of the tools required to perform the disassembly and reassembly of the 43 operator console, refer to 2. TOOLS REQUIRED.

1.06 Precautions should be taken to assure that the opcon is disassembled and reassembled under clean conditions. No oil, grease, or other liquids shall be allowed on loose parts, subassemblies, keyswitches, or the complete opcon.

1.07 Reference in the procedures to left or right and up or down and top or bottom, etc, refer to the opcon in its normal operating position.

1.08 When removing a subassembly or part from the opcon, do not force or pry parts to provide the necessary clearance for removal. No forcing is required to accomplish a removal procedure. Follow the removal procedure and note how each part is removed and the sequence of its removal so that proper reassembly can be accomplished. For reassembly, reverse the removal procedure except where different instructions are given.

1.09 Refer to Station Disassembly/Reassemby, Section 544-500-700 for opcon removal and replacement procedures.

1.10 Some parts that are not listed in the parts sections are shown as necessary to the disassembly procedures such as screws, ring retainers, etc. Most of these parts are common to other TELETYPE® product lines and if needed may already be available in field repair kits or can be ordered.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. TOOLS REQUIRED

2.01 The following tools are recommended for use during the disassembly and reassembly procedures:

75765	Spring Hook — Pull
89954	1/4 Inch Nut Driver
100982	Screwdriver (6 Inch Medium)
108285	Long-Nose Pliers
346257	Keyswitch Extractor
346260	Keytop Extractor
346392	Static Discharge Strap
Telco Provided	Soldering Iron (Low Wattage)
Telco Provided	Desolderer

3. DISASSEMBLY/REASSEMBLY

SPACEBAR MECHANISM

3.01 To remove the spacebar mechanism:

(a) Disengage the leaf spring (bronze colored) from the wire bail using a spring hook and pull toward the front (Fig. 2).

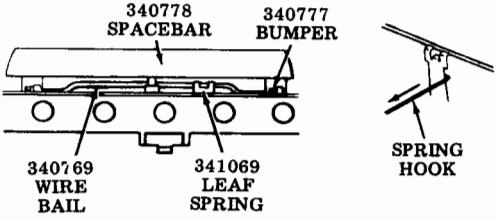


Fig. 2—Leaf Spring Disengagement

(b) Disengage the two rear tines (one at each end of spacebar) with a small screwdriver while pulling the spacebar up and toward the front (Fig. 3).

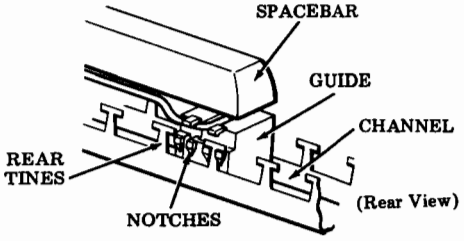


Fig. 3—Spacebar Removal

(c) Continue applying upward pressure to the spacebar and disengage the two front tines.

(d) Remove the wire bail from the left and right spacebar guides (snaps in and out) (Fig. 4).

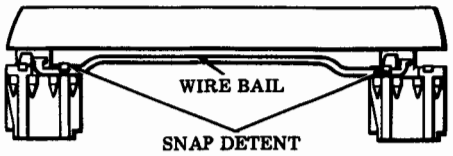


Fig. 4—Wire Bail Removal

3.02 To reassemble the spacebar mechanism:

(a) Make sure the four tines engage the notches in the space bar housing and the leaf spring is engaged to the wire bail.

(b) Check mechanical operation of the spacebar so that it returns to its unoperated position freely when depressed and released slowly.

KEYTOP

3.03 To remove the keytop (Fig. 5):

(a) There are two types of keytops used on the operator console.

(1) Control Keytop

Indicator
Non-Indicator

(2) Data Keytop

Fig. 5—Keytops

(b) To remove data keytops, place 346260 tool over the keytop and pull up to remove (Fig. 6).

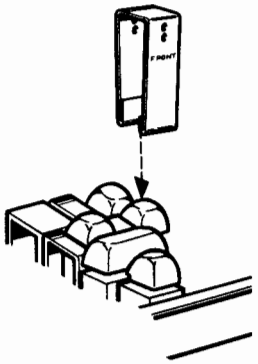


Fig. 6—Data Keytop Removal

Warning: The CAPS LOCK, PARITY, DUPLEX, and CPS keytops must be in the fully extended, unlatched position before attempting to remove the keytop. Failure to observe this precaution will result in a damaged keyswitch.

(c) To remove control keytops (Fig. 7):

(1) Grasp keytop using thumb and index finger.

(2) Exert upward force until keytop releases.

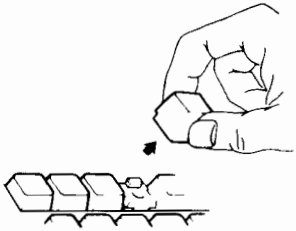


Fig. 7—Control Keytop Removal

(d) To remove the RETURN keytop with housing:

(1) Remove keytops BACKSPACE, OVERLINE, GS, US, LINE FEED, SHIFT, and QUOTES that surround the RETURN keytop using 346260 tool.

(2) Disengage the rear tines from housing with a small screwdriver while pulling the RETURN keytop up and toward the front (Fig. 8).

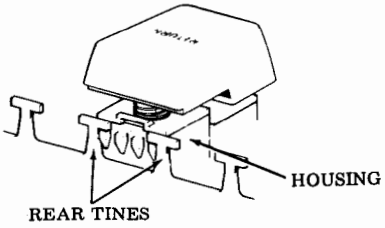


Fig. 8—Rear Tine Disengagement

(3) Continue applying upward pressure to the RETURN keytop and disengage the front tine from housing using a spring hook. Remove keytop with housing from channel (Fig. 9).

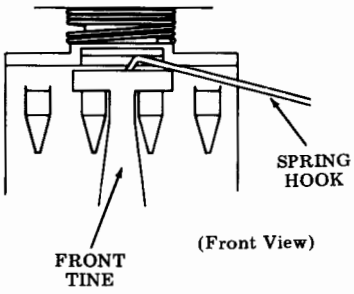


Fig. 9—Front Tine Disengagement

3.04 To reasssemble the keytop:

Insert housing with keytop; observe position of locating lug on housing and press into channel. Housing must snap fully into front and rear channel tines.

KEYSWITCH

3.05 To remove the keyswitch:

(a) Remove keytop.

(b) Remove solder from around terminal pins of keyswitch to be removed (Fig. 10).

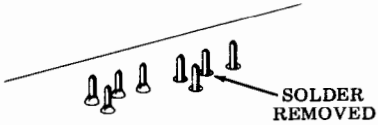


Fig. 10—Solder Removal

Warning: Use a grounded low wattage soldering iron (avoid prolonged contact with pins) along with a desoldering tool to prevent damage to keyswitch card circuits and components.

(c) Place 346257 tool over the keyswitch and press downward. When the tool bottoms and embossed projections snap into notches on keyswitch, squeeze and pull back on the tool to lift keyswitch out (Fig. 11).

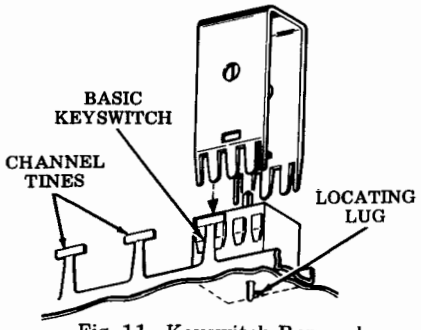


Fig. 11—Keyswitch Removal

Note: The tines of the tool must pass between the keyswitch housing and the inside of the tines on the channel.

3.06 To reassemble the keyswitch:

Insert new keyswitch, observe position of the locating lug, and press keyswitch into channel. Switch must snap fully into front and rear channel tines. Hold keyswitch in place and resolder.

346395 CABLE

3.07 To remove the 346395 cable:

(a) Remove the PRINTER TEST, PARITY, DUPLEX and CPS keytops.

(b) Remove the INTERLOCK, PRINTER TEST, PARITY, DUPLEX and CPS keyswitches (Fig. 12).

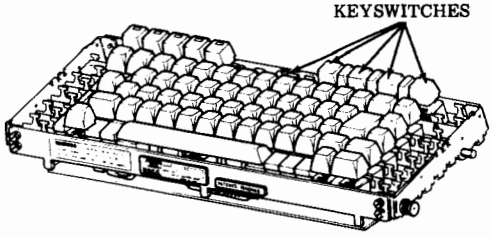


Fig. 12—Keyswitch Identification

(c) Remove solder from around connector pins of cable to be removed (Fig. 13).

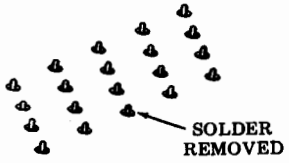


Fig. 13—Connector Pins

Warning: Use a grounded, low wattage soldering iron (avoid prolonged contact with pins) along with a desoldering tool to prevent damage to card circuits and components.

(d) Remove the circuit card cover located in front of the control keys from the channel. Use a spring hook to remove the cover from the mounting posts (Fig. 14).

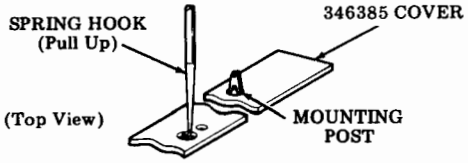


Fig. 14—Cover Removal

(e) Grasp the cable connector using thumb and index finger.

(f) Exert upward force until cable connector releases (Fig. 15).

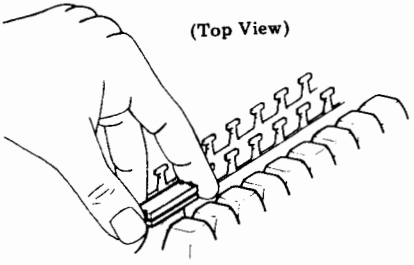


Fig. 15—Cable Connector Removal

(g) Remove rear plate (Fig. 16).

(h) Slide cable to the right until it clears the circuit card. Remove through opening between channels (Fig. 16).

3.08 To reassemble the 346395 cable:

(a) Insert new cable connector into circuit card holes and press into place. Hold cable connector in place and resolder.

(b) Fasten cable to card using locally furnished cable tie.

(c) Reassemble keyswitches and keytop removed in 3.07 (a) and (b).

(d) Replace circuit card cover removed in 3.07 (d).

(e) Replace rear plate.

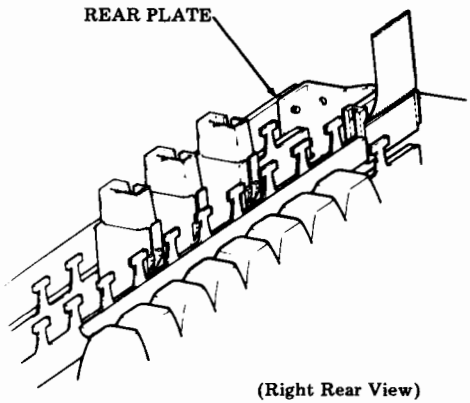


Fig. 16—Cable Removal

4. KEYTOP AND KEYSWITCH IDENTIFICATION (Fig. 17, 18 and 19)

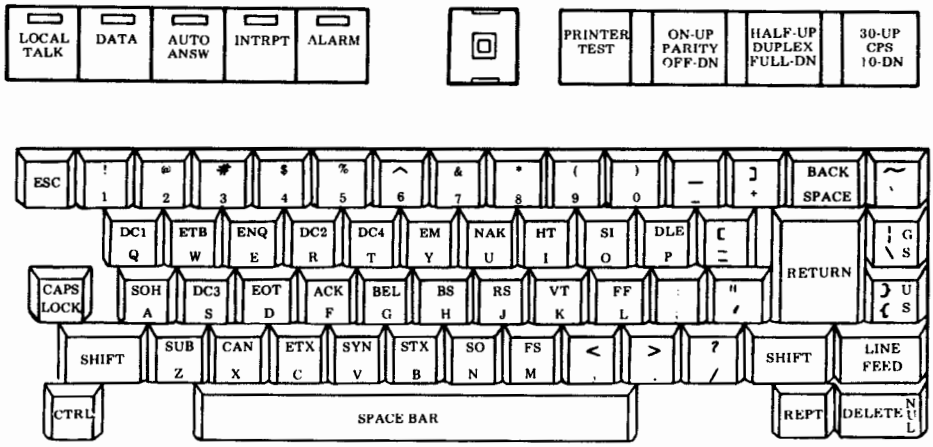


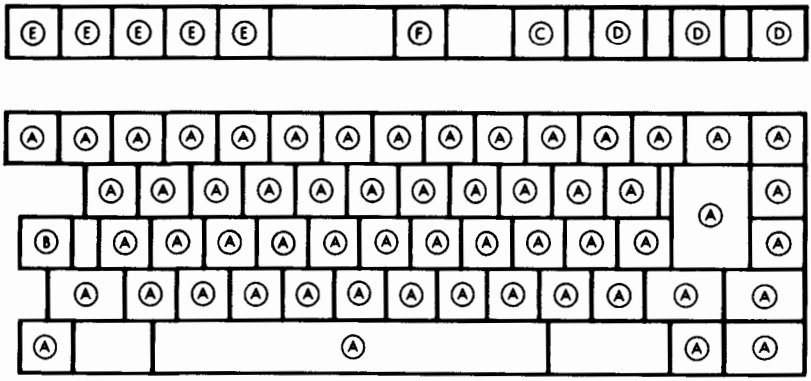
Fig. 17—Keyboard Layout

TP PART NO.	KEYTOP DESCRIPTION	TP PART NO.	KEYTOP DESCRIPTION
340778	SPACEBAR	340872	STX B
340821	! 1	340873	SO N
340822	@ 2	340874	FS M
340823	# 3	340875	< ,
340824	$ 4	340876	> .
340825	% 5	340877	? /
340826	^ 6	340889	] +
340827	& 7	340890	[=
340828	* 8	340894	CAPS LOCK
340829	(9	340975	ESC
340830	) 0	340976	BACKSPACE
340831	_ -	340977	~ `
340838	DC1 Q	340978	HT |
340839	ETB W	340979	DLE P
340840	ENQ E	340981	¦ GS \
340841	DC2 R	340982	BS H
340842	DC4 T	340983	} US {
340843	EM Y	340984	SUB Z
340844	NAK U	340985	SYN V
340846	SI O	340986	LINE FEED
340852	SOH A	340987	CTRL
340853	DC3 S	340988	REPT
340854	EOT D	340989	DELETE NUL
340855	ACK F	346106	INTRPT
340856	BEL G	346116	AUTO ANSW
340858	RS J	346161	LOCAL — TALK
340859	VT K	346162	DATA
340860	FF L	346163	ALARM
340861	: ;	346164	ON-UP PARITY OFF-DN
340862	" /	346165	HALF-UP DUPLEX FULL-DN
340867	SHIFT	346166	30-UP CPS 10-DN
340869	CAN X	346169	PRINTER TEST
340870	ETX C	346403	RETURN

*346409 spacer must be installed under the 346163 keytop to block the action of the ALARM keyswitch.

**The 340764 compression spring between the 346403 keytop and the housing must be ordered separately.

Fig. 18—Keytop Identification



SWITCH NO.	TYPES	PUSH ROD COLOR
Ⓐ 340720	BASIC	WHITE
Ⓑ 340722	LATCHING	BLACK
Ⓒ 340779	DC CONTACT	PINK
Ⓓ 341098	LATCHING	GREY
Ⓔ 346359	INDICATOR	ORANGE
Ⓕ 346432	DC CONTACT	BLACK (Cut-Off)

Fig. 19—Keyswitch Identification

5. SPACER, HOUSING AND REFERENCE IDENTIFICATION (Fig. 20)

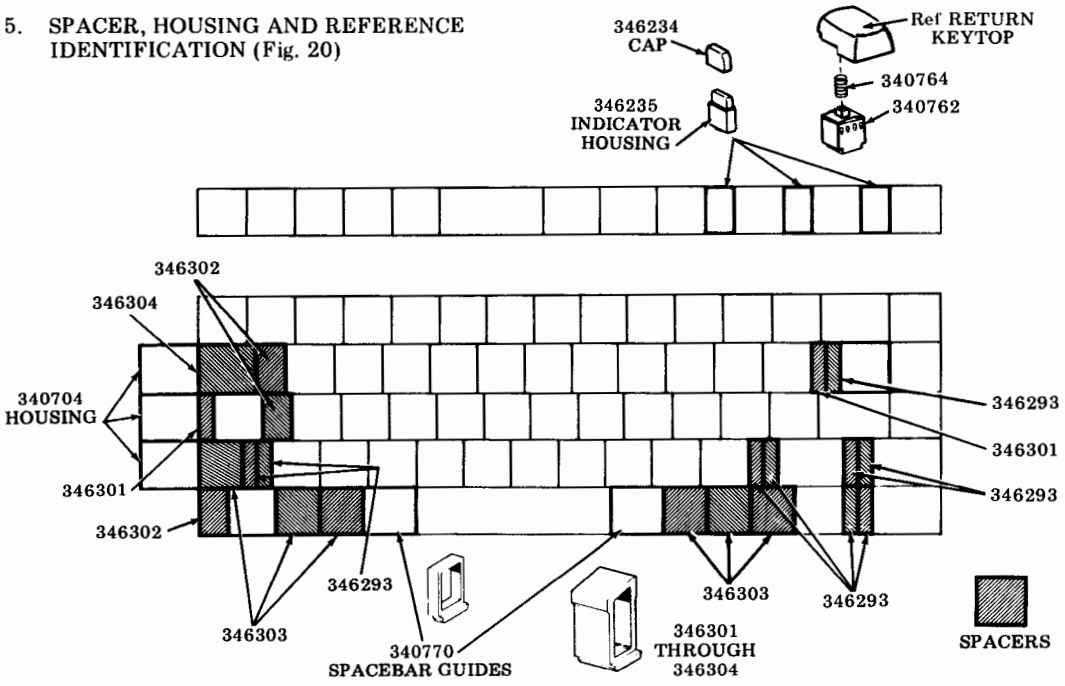


Fig. 20

43 OPERATOR CONSOLE

PARTS

CONTENTS PAGE

1. GENERAL

1.01 The parts in this section are maintenance spares for the 43 operator console. They should be available, in the quantities shown in parentheses in the numerical index, to correct troubles in the operator console.

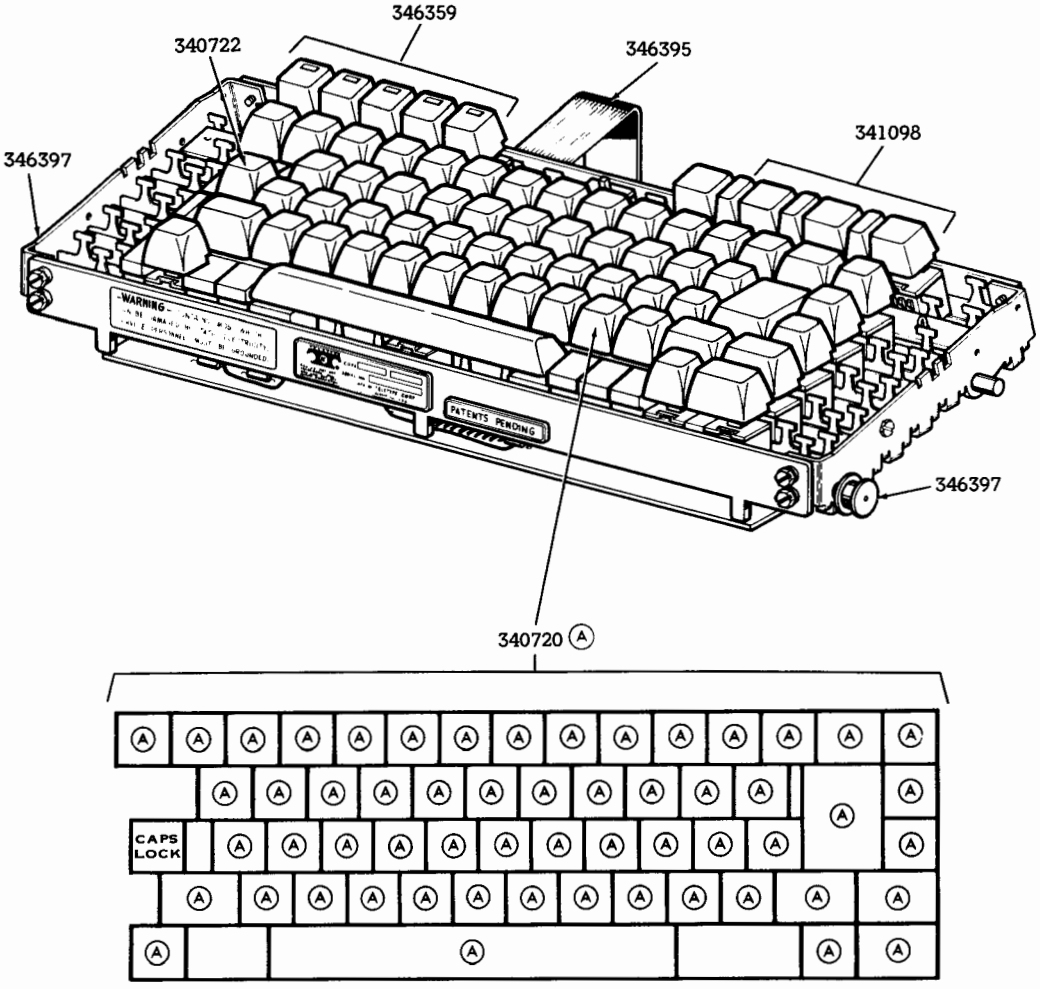
1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP41055).

1.04 Troubleshooting and disassembly/reassembly information for these parts is provided in Section 574-502-300 and Section 574-502-720, respectively.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2. PARTS


346359
340722
346395
341098
346397
WARNING
PATENTS PENDING
346397
340720 (A)
CAPS LOCK

NUMERICAL INDEX

Note: One spare should be available in each maintenance area, unless otherwise specified in parenthesis.

43 CABINET

ADJUSTMENTS

CONTENTS PAGE

1. GENERAL

1.01 This section provides adjustment information for the 43 cabinet.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 After an adjustment is completed, tighten any screws or nuts loosened to make the adjustment.

1.04 Reference in the procedure to left or right, up or down, and top or bottom, etc, refer to the teleprinter in its normal operating position.

1.05 Adjustments should be checked and performed when a trouble indicates a specific adjustment may be out of tolerance, or when an adjustment is disturbed to enable a part to be removed or replaced.

2. TOOLS REQUIRED

2.01 The only tool required to perform the cabinet adjustments is a 100982 screwdriver (1/4 inch, 6 inch blade).

Prepared for American Telephone and Telegraph Company by Teletype Corporation

3. CABINET ADJUSTMENTS

KEYBOARD TO COVER ALIGNMENT

The following two requirements must be met:

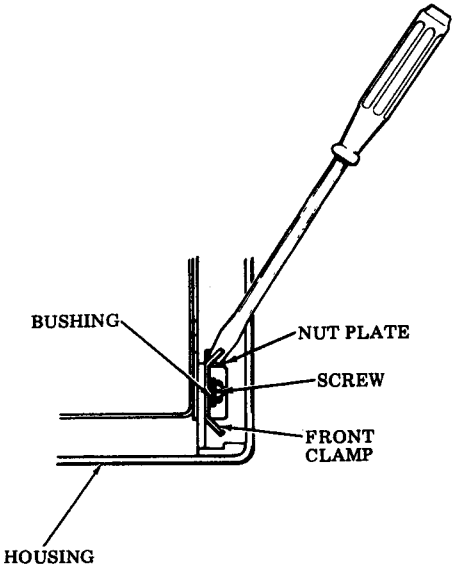
(1) Requirement
Left to Right Positioning — When the free play movement of the cover (left to right) is taken up lightly in each direction, the cover shall not touch any opcon keytops.

To Adjust
Loosen two screws and position the printer and rear frame assembly to meet the requirement.

(2) Requirement
Forward Positioning — The two front bushing clamps shall firmly engage the opcon bushings and hold the printer and rear frame assembly fully forward into the housing. There should be no front to rear play between the bushing and clamp (left and right sides).

To Adjust
Insert a screwdriver into the square hole in the nut plate and gently twist (or pry) the screwdriver with enough force to meet the requirement.

Warning: Do not overtwist the screwdriver.



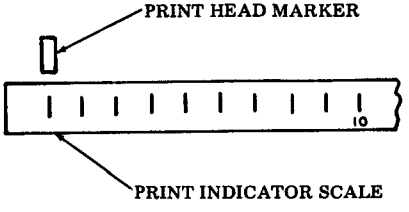
(Top View — Right Corner)

COLUMN INDICATOR POSITIONING

Requirement
With power applied, the cover closed, and the print head positioned to column one (1), the print head marker should point to the first mark on the indicator scale.

To Adjust
Gently remove the glue holding the indicator scale in place. Reposition scale to meet the requirement and reglue using household cement or equivalent.

Note: This adjustment to be refined when making the KEYBOARD TO COVER ALIGNMENT adjustment.



43 CABINETS

PARTS

CONTENTS PAGE

1. GENERAL

1.01 The parts in this section are maintenance spares for the 43 cabinets. They should be available in the quantities shown, in parentheses in the numerical index, to correct possible troubles or to meet appearance requirements of the 43 cabinets.

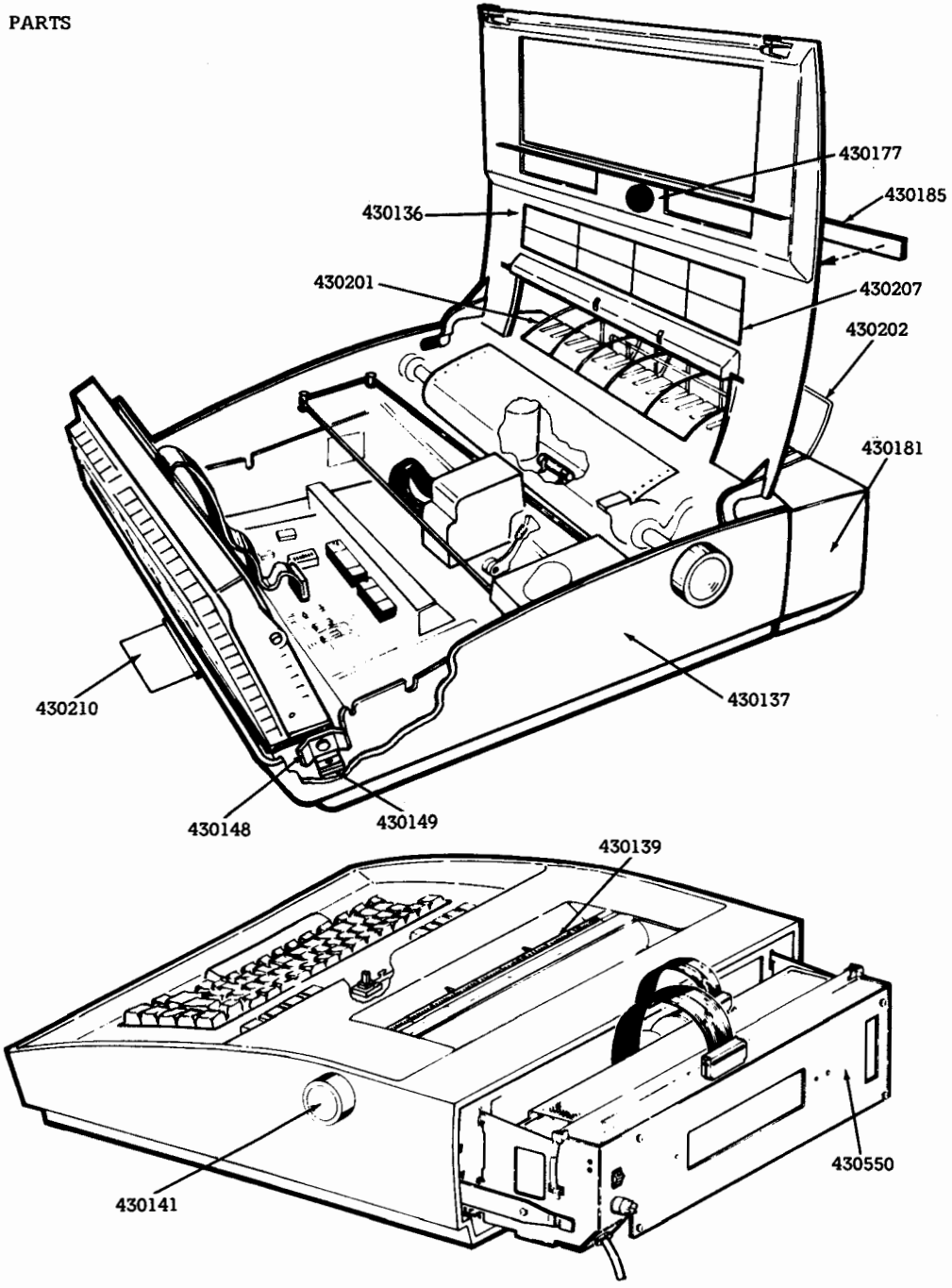
1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP41055).

1.04 Replacement of cabinet parts is provided in Section 574-500-750, Routine Maintenance for 43 KSR Station. Disassembly and reassembly is provided in the 43 KSR Station Section 574-500-720.

Prepared for American Telephone and Telegraph Company by Teletype Corporation

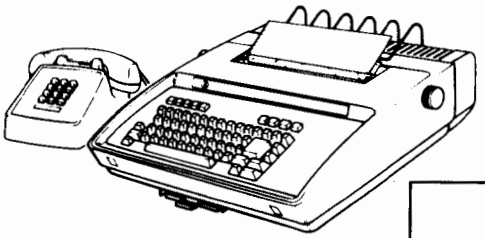
2. PARTS


430177
430185
430136
430201
430207
430202
430181
430210
430137
430148
430149
430139
430141
430550

NUMERICAL INDEX

Note: One spare should be available in each maintenance area, unless otherwise specified in parenthesis.

How to operate...

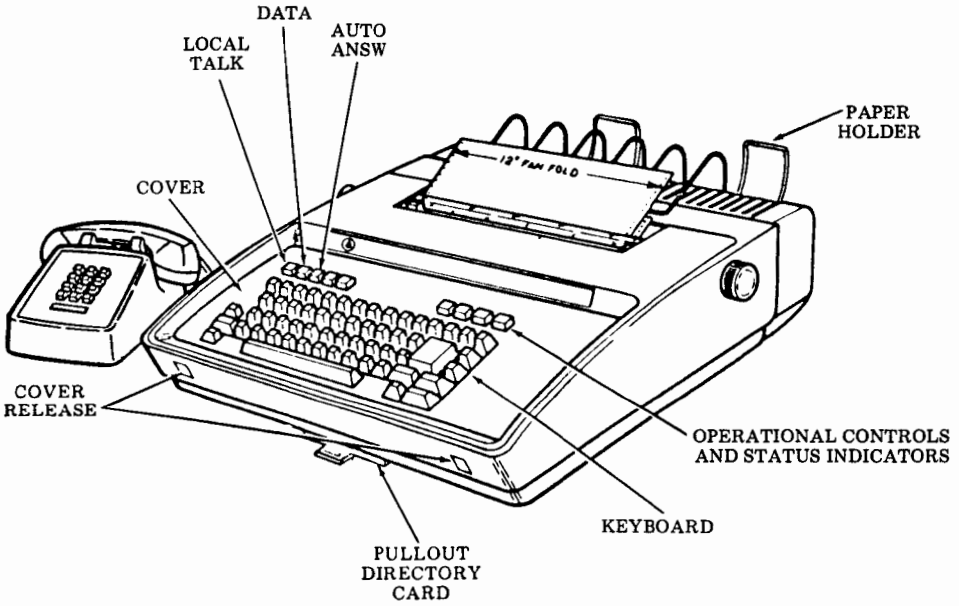


The 43 Teleprinter

Basic KSR
for dataphone® Service

Prepared for American Telephone and Telegraph Company by Teletype Corporation

TABLE OF CONTENTS



43 KSR Teleprinter

HOW TO OPERATE INSTRUCTIONS
(Pages 1 Through 10)

1. INTRODUCTION

The 43 Basic KSR Teleprinter is associated with a modular telephone and provides character-at-a-time keyboard-printer send-receive operation.

When connected to a remote station in DATAPHONE switched network service, transmission speeds are 10 characters per second (cps) (100 wpm) or 30 cps (300 wpm) and can be selected by the attendant to match the remote station.

Calls are originated in a manner similar to regular telephone calls and can be answered either automatically or manually. The telephone can be used for normal voice communication or data messages can be exchanged over the telephone line using controls on the 43 Teleprinter.

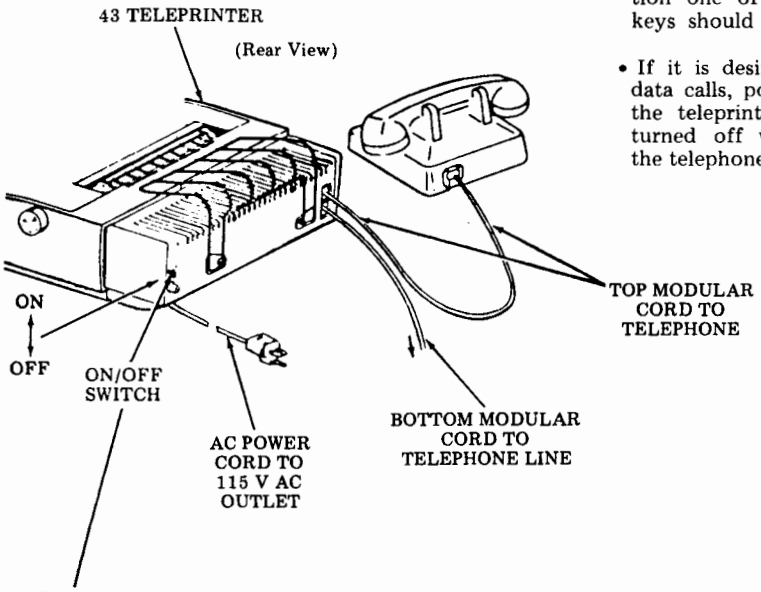
Messages are printed with up to 132 characters per line. The paper may be fed from a supply box or limited amounts can be placed in a paper holder that clips on the rear of the teleprinter.

The 43 Teleprinter may be temporarily (moved to another location) within the same building. See Page 2 for connections and see Page 20 in case of trouble.

Note: The paper used with this teleprinter is a new 12 inch wide sprocket feed. See Page 8 for ordering information.

CONNECTIONS AND POWER TURN ON

- Make sure ac power cord and telephone cords are connected as shown before turning on power.

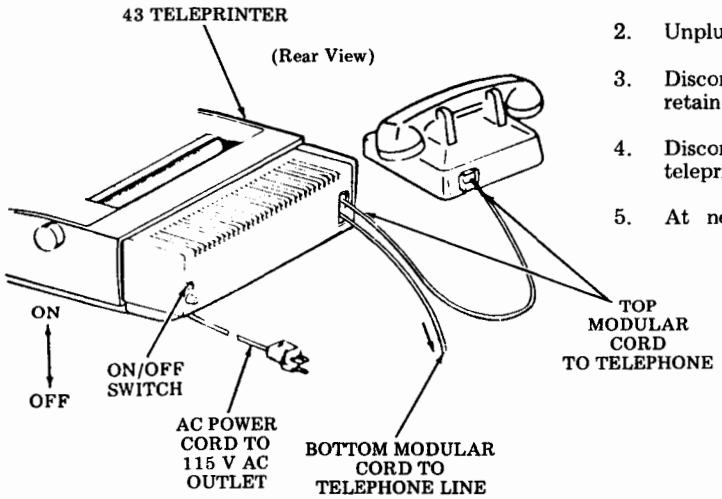


- Turn on power to teleprinter by depressing upper half of ON/OFF switch.

- When power is turned on, the print head will move fully left and the AUTO ANSW key on the keyboard console will light. During normal operation one of the three operational mode control keys should always be lit indicating power is on.

- If it is desired to automatically answer incoming data calls, power should be left on, however, when the teleprinter is not in use, the power may be turned off without affecting the normal use of the telephone.

RELOCATING TELEPRINTER

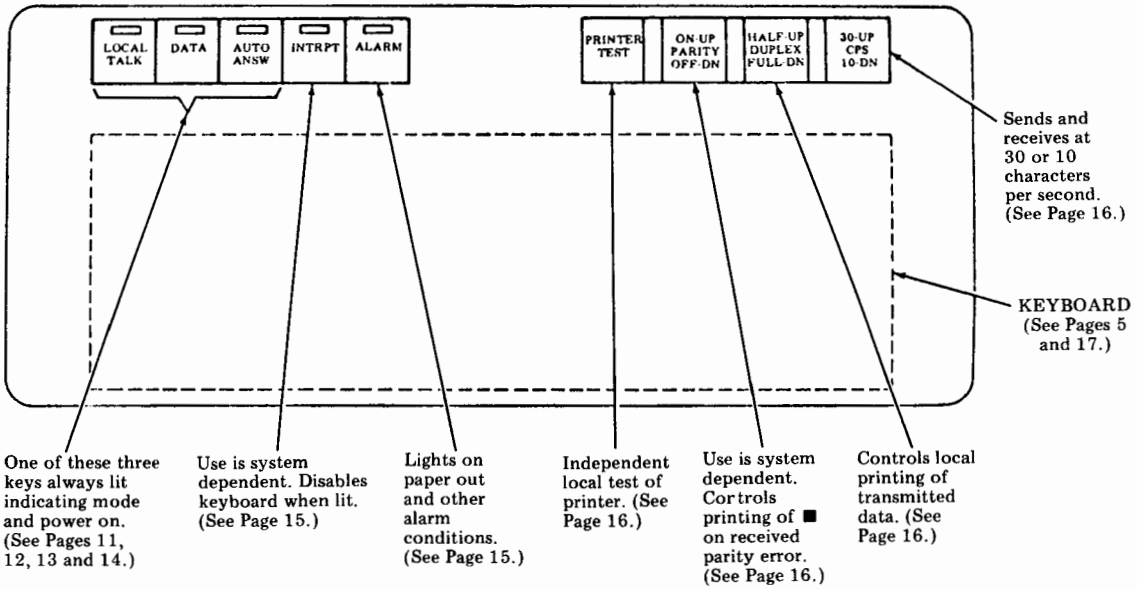


If the teleprinter is to be moved to another location within the building, the following steps should be observed:

1. Turn off power to teleprinter by depressing lower half of ON/OFF switch.
2. Unplug ac power cord from outlet.
3. Disconnect top modular cord from phone and retain with teleprinter.
4. Disconnect bottom modular cord from the teleprinter and reconnect to phone.
5. At new location connect as shown in figure.

OPERATIONAL CONTROLS AND STATUS INDICATORS

- Use and function of the operational control and status indicators should be reviewed before the 43 Teleprinter is operated locally or on-line.



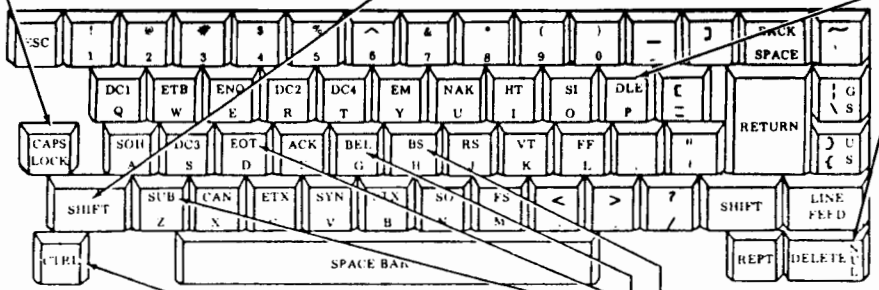
KEYBOARD LAYOUT

- The keyboard is operational locally in the Local Talk mode and on-line in the Data mode.

Locks down for capital alpha. Releases up for lower case (affects alpha characters only).

Shifts lower case alpha to upper case alpha and symbols on lower half of keytop to symbols on upper half. (Does not release CAPS LOCK.)

See Page 17 for the remaining CTRL key generated characters.



- When the CTRL RETURN keys are operated together, the carriage is returned and the paper advances one line. No character is sent on-line.

- Several keys perform special functions when depressed together with the CTRL key (codes are sent on-line).

EOT — may initiate a disconnect.
SUB — prints ■.
BEL — sounds bell.
BS — performs backspace (in addition to BACKSPACE key).

- Several escape sequence functions also can be performed by depressing the ESC followed by the indicated key. (See Page 17.)

ESC l — (ESC lower case L) set left margin.
ESC r — Set right margin.
ESC x — Clear left and right margin.

ORIGINATING, ANSWERING AND DISCONNECTING CALLS

• Telephone calls must be originated and answered as follows in order to send and receive data or to talk. Calls can also be disconnected as described below. Power must be on to complete a data call (see Page 2).

☐ To Originate a Data Call:

1. LOCAL TALK key lit. Depress if not lit, (if DATA key was lit wait 6 seconds) lift handset and dial in normal manner.
2. Listen for tone or talk:
   - •If tone is heard, transfer to Data.
   - •If no tone is heard, talk, then transfer to Data when agreed.
3. Transfer to Data mode by depressing DATA key and hang up. Key lights (may flash before lighting).
4. Data transmission may begin.

☐ To Answer a Data Call:

With AUTO ANSW Key Lit:
(May be depressed to light.)

1. No action required. Phone rings once. DATA key lights and AUTO ANSW key extinguishes.
2. Data transmission may begin.

With LOCAL TALK Key Lit:
(Depress if not lit.)

1. When phone rings lift handset and talk.
2. When agreed, transfer to Data by depressing DATA key and hang up.
3. Key lights (may flash before lighting).
4. Data transmission may begin.

☐ To Disconnect a Data Call Manually:

- •Depress the LOCAL TALK key or:
- •Transfer to Automatic Answer mode. Wait 6 seconds before originating another call.

☐ To Disconnect a Data Call Automatically:

- •Send EOT or:
- •Other system log-off procedures.

Note: Automatic disconnect can only be implemented if the distant end recognizes it.

☐ To Disconnect in Local Talk Mode:

- •Hang up handset or:
- •Call may also disconnect from remote signals.

KEYBOARD-PRINTER OPERATION

- The keyboard-printer can be operated locally with the LOCAL TALK key lit or on-line with the DATA key lit.

- **Bell**

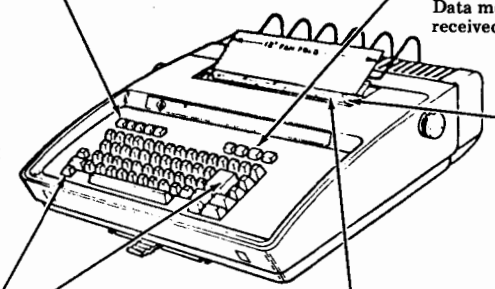
  The bell sounds when characters are entered seven characters before and at the right margin, ie, margin at 80, bell at 73 and 80. Also sounds at left margin when attempting to backspace and when an interrupt is sent.

- **Local Return Line Feed**

  The carriage is returned and the paper advances one line when the CTRL RETURN keys are operated together. No character is sent on-line.

- **Printer**

  The printer copies all printable data messages except that in full duplex (DUPLEX key down — Data mode) the printer copies received data only.

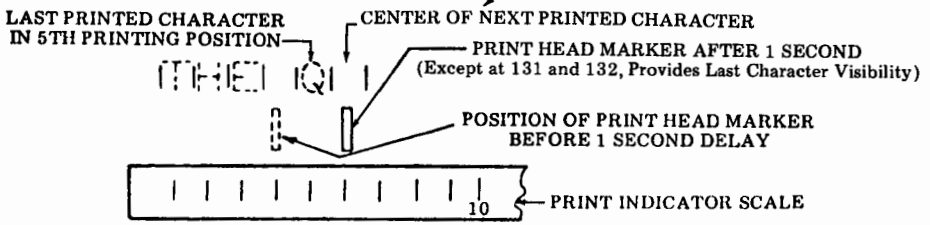


- **Margin Setting**

  When power is turned on, the left- and right-hand printing margins are reset to 1 and 132. They may be set or cleared locally or on-line by using the escape sequences. See Page 5 To change either margin outward, both must be reset.

- **Indicator Scale**

  The next printing location of the print head and the position for setting left- and right-hand margins is indicated by the print head marker at the print indicator scale after 1 second delay. The print head moves back when printing resumes.



TELEPRINTER SUPPLIES MAINTENANCE

The Telephone Company maintains the 43 Teleprinter and provides service. The equipment is inspected and serviced periodically.

It is your responsibility to keep the teleprinter equipped with sufficient paper and ribbon. In addition, an adequate supply of these items should be ordered and kept in storage.

Ribbon

Only cartridges with ribbon designated for use with 43 Teleprinter should be used. Teletype part number is 430035.

The cartridge with ribbon can be ordered from Teletype Corporation, 5555 Touhy Avenue, Skokie, IL 60076. An order form included with each new cartridge may be used for this purpose or established ordering procedures may be followed for large orders.

The ribbon should be replaced whenever it becomes frayed or print density becomes light.

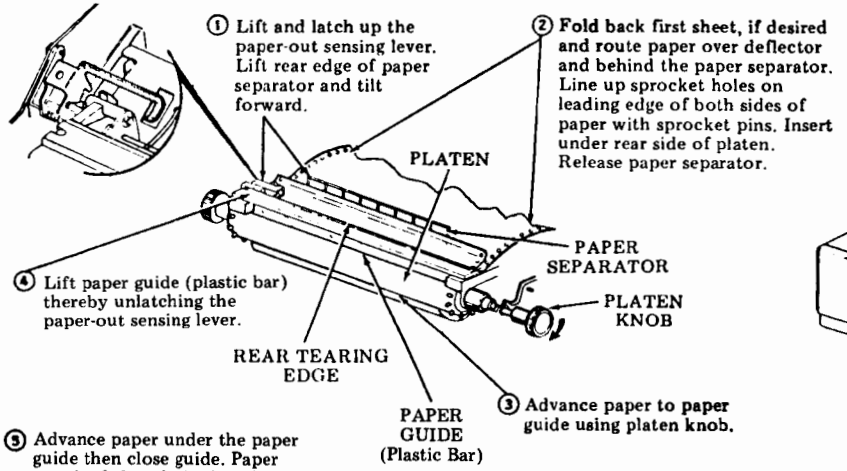
Paper

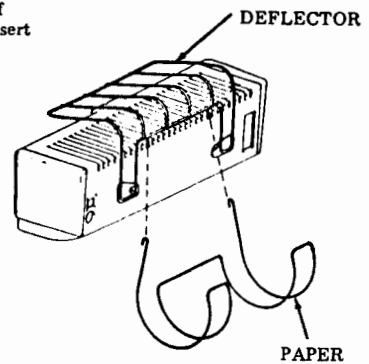
Paper for the 43 Teleprinter must be 12 inch wide sprocket feed. The original and up to two-copy multi-ply forms may be used. Only the first box of paper is supplied with each teleprinter and is single-ply with 8-1/2 inch folds to provide 11 inch x 8-1/2 inch copy when the serrations are removed. Replacement paper may be obtained from the supplier listed on the original paper box or other suppliers. Contact your sales representative for ordering information.

INSTALLING PAPER

- Install paper as shown after centering the print head and removing the unused paper. It is not necessary to disconnect the call in the Data mode or turn off power. However, to avoid loss of data, paper should not be replaced without interrupting the remote sender.

Note: Paper may be fed directly from the supply box or if the paper holder is used, a limited stack of forms may be placed in the holder and fed over the deflector.

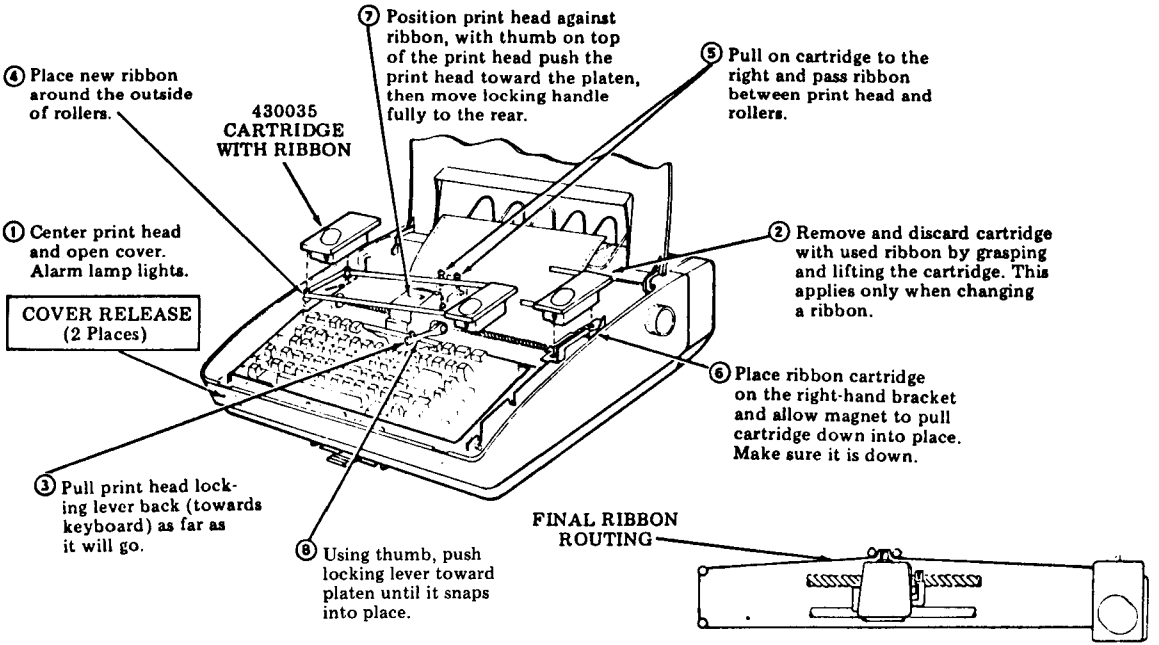




(Rear View of Paper Holder Attached to Deflector)

INSTALLING RIBBON

- Any data received with the cover open will not be printed and the keyboard and operational controls will be disabled. Power may remain on.



Remember Steps.

Note: Make sure ribbon is fully on all four rollers before closing cover.

LOCAL TALK MODE KEY

Key lights in Local Talk mode.

- The telephone is enabled for normal telephone use and the keyboard printer can be operated locally off-line in the Local Talk mode. See Page 6 for telephone and Page 7 for keyboard-printer operation.

- The Local Talk mode can be entered:

  - ☐ At any time, momentarily depressing the LOCAL TALK key will disconnect call in Data mode.
  - ☐ By depressing the PRINTER TEST key. (See Page 16.)
  - ☐ Opening the cover or removing paper in the Automatic Answer mode.
  - ☐ Receiving eight line feeds in the Data mode after paper-out alarm.

- **The Local Talk mode can be terminated by:**

  - ☐ Depressing AUTO ANSW key.
  - ☐ Transferring call to Data mode.
  - ☐ Turning off power.

- Can be used to clear Loop-Back mode or immediately stop flashing of DATA key when a call attempt is abandoned.

DATA MODE KEY

Key lights in Data and when in Analog Loop-Back.

- Data can be sent or received on-line in the Data mode only.

- The Data mode can be entered:

  - ☐ Automatically — following a telephone call in the Automatic Answer mode.
  - ☐ Manually — after a telephone connection has been established in the Local Talk mode by momentarily depressing the DATA key before hanging up.

- The Data mode will be terminated disconnecting the call when:

  - ☐ Eight line feeds are received after paper-out alarm. (See Page 15.)
  - ☐ The mode is manually transferred to Automatic Answer (Page 13) or Local Talk (Page 11).
  - ☐ The character EOT is received.
  - ☐ Carrier from the remote station is lost.
  - ☐ The local printer test is operated (Page 16).
  - ☐ The call is disconnected for any reason (Page 17).
  - ☐ Power is turned off.

- The telephone is disabled during the Data mode (cannot ring, dial or talk).

- The DATA key may blink indicating a short interruption in carrier (short flash).

- Transfer to Data cannot be completed if the answering station turned on power after the call was received.

Note: The DATA key flashes during transfer from the Local Talk mode. If the transfer is not properly completed within 20 seconds, (ie, local or distant station does not go to Data mode, etc.) the DATA key will stop flashing, the call will disconnect and the AUTO ANSW key will light.

AUTOMATIC ANSWER MODE KEY

Key lights in Automatic Answer mode.

- When power is turned on, the teleprinter will be in the Automatic Answer mode. In this mode the telephone cannot be used in the normal manner. (No dial tone and no dialing or talking but the ringer can sound) and no printing or data transmission can occur.

- Telephone calls received in the Automatic Answer mode will be answered automatically after one ring on the telephone and the AUTO ANSW light will turn off.

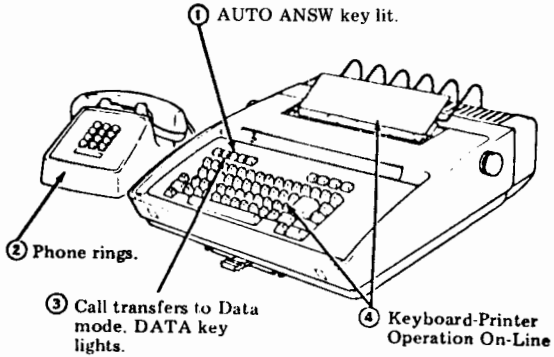
  Note: The handset must be on-hook to answer the call.

- Following the ring, the teleprinter will automatically transfer to the Data mode only after the remote originating station transfers to the Data mode.

- The Automatic Answer mode can also be entered:

  ☐ Automatically — following calls in the Data mode. (See Page 12 for Data mode.)

  ☐ Automatically — following a flashing DATA key when a call origination is not completed.



  ☐ Depressing AUTO ANSW key momentarily after local operation or talking on the phone. (See Page 11 for Local Talk mode.) If depressed during Data mode the call will disconnect.

- The Automatic Answer mode can also be terminated by:

  ☐ Opening the cover.
  ☐ Operating local printer test.
  ☐ Removing paper.
  ☐ Manual transfer to Local Talk mode.
  ☐ Turning off power.

TRANSFER TO TALK MODE

Calls can be transferred from the Data mode to the Talk mode. (See Page 6 for transfer back to the Data mode.)

To transfer to the talk mode, lift the handset and depress the LOCAL TALK key.

The other party must also go to Talk within 4 seconds.

DISCONNECTING CALLS

- Telephone calls in the Local Talk mode will be disconnected when the handset is placed on-hook.
- Transfer to Automatic Answer from the Local Talk mode or incomplete transfer to Data (after 20 seconds) will also disconnect the call.
- Telephone calls in the Data mode will be disconnected when:
  - ☐ An EOT is received.
  - ☐ The printer test is initiated.
  - ☐ Manual transfer to Automatic Answer.
  - ☐ Transfer to Local Talk mode (disconnects after 4 seconds if handset is on-hook).
  - ☐ Eight line feeds received on-line after the ALARM key lights due to a paper-out condition.

INTERRUPT AND ALARM KEYS

Key lights when transmission has been interrupted by the remote station.

Note: The use of this key is system dependent. It may not be operable with some remote stations. When operable, its use should be under direction of the system.

- The INTRPT key operates as follows:
  - ☐ It lights under control of the remote station. When lit, keyboard sending is disabled.
  - ☐ If depressed momentarily when lit, the interrupt is canceled.
  - ☐ If depressed when not lit, the remote station sending may be interrupted ie, stop sending. Locally the bell rings and the key lights momentarily.
- Interrupt is also canceled by a disconnect or when power is turned off.

Key lights or flashes when alarm condition exists.

- Lights when:
  - ☐ Paper-out condition is sensed. This is an advance warning that eight received or automatic line feeds later, in the Data mode, the call will disconnect or after thirteen line feeds, paper will be out at the print head.
  - ☐ When the cover is opened.
  - ☐ When printer test is operated.
- Can be cleared by:
  - ☐ Replacing paper or closing cover.
- Flashes when:
  - ☐ Teleprinter is in a Loop-Back Test mode.
- Can be cleared (when flashing) by:

  ESC = sequence.
  Depressing LOCAL TALK key.
  Turning off power.

PRINTER TEST, PARITY, DUPLEX AND CHARACTER SPEED KEYS

An independent test of the printer is provided for use by the attendant or field service personnel. The test consists of continuous printing of the 95 character set (plus a space) as shown below. During the test, the bell rings at the end of each line and automatic return of the carriage and line feed is performed within margin restraints.* The test should not be performed in the Data mode since the call will be disconnected. Depression of the PRINTER TEST key initiates the test. The test is terminated when this key is released. (See Pages 11, 12, 13 and 15 for keys that light or extinguish during test.)

Half-Duplex (key up) — printer copies data sent and received. The printer can be blinded to on-line transmission from the local keyboard while receiving messages simultaneously from the remove sender. This mode is known as Full Duplex (key down — DN).

□Functions not performed in Full Duplex are:
Bell on CTRL G — character sent.
LOCAL CR-LF on CTRL RETURN — character not sent.

Sample of Test Message

```
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
■ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

The proper position of this key depends on the system application. The remote sender may or may not be equipped to send correct (even) parity. The 43 Teleprinter always sends even parity. When the PARITY key is on, characters received with incorrect (odd) parity will print as the substitute character symbol ■, when parity is off, the character that is received will be printed or performed if it is a printable character or a valid function. The PARITY key alternately locks down (DN) for parity off or releases up for parity ON to set the parity checking mode.

In Half-Duplex, the printer copies all data sent and received but only one sender can operate at a time without interference, ie, characters from the keyboard will be inhibited if the unit is receiving on-line. The key locks down or releases up.

In order to communicate in the Data mode, the transmission rates of the sending and receiving stations must be the same. This key alternately locks down or releases up and sets the on-line operating speed of the station to either 30 (key up) or 10 (key down — DN) characters per second (300 or 100 words per minute).

*If margins are set for less than 96 characters, a character will be skipped (not printed) each time a new line starts, except for the new line that starts a new cycle of the printing.

SPECIAL KEYBOARD CHARACTERS

- Code for the following characters are generated from the 43 Teleprinter keyboard by use of the CTRL key and the key with the symbol shown, operated together.

These characters are not functional in the Model 43 Teleprinter but may be used in some systems.

DC1	EM	GS	VT	SYN
ETB	NAK	SOH	FF	STX
ENQ	HT	DC3	US	SO
DC2	SI	ACK	CAN	FS
• DC4	DLE	RS	ETX	NUL

- The special escape sequences listed below (in addition to those on Page 5) are functional in the 43 Teleprinter by sending (or receiving) the character immediately following the escape character (ESC key).

Use of other escape sequences are system dependent. (Character following ESC will not print.)

ESC >	Analog Loop-Back
ESC <	Digital Loop-Back*
ESC =	Clears either Loop-Back

*Used under direction of Test Center only.

- Repeat speed varies depending on 10, 30 cps on line and approximately 50 cps locally.

- The telephone directly associated with the 43 Teleprinter is used in accordance with the originating answering and disconnecting procedures on Pages 6 and 14. Other phones cannot be used to originate data calls. The phone may be or have an extension and therefore would be subject to the limitations of extension telephones, for example:

  - ☐ Lifting handset, dialing or talking on an extension can interfere with data transmission.

  - ☐ Calls may not be disconnected if the extension is off-hook.

- In some cases, the phone may be a "designated" extension of a key telephone set. These extensions may be arranged (by use of an exclusion feature) to prevent interference from other phones. The telephone company installer indicates the presence of any extension phones on the pullout directory card located under the front of the keyboard. The card may also be used to write in frequently used telephone numbers.

WHEN TROUBLE OCCURS

Before reporting a trouble, follow the Analysis Questions in the table always starting with Question no. 1 and then proceed according to the "Yes" or "No" directive on the following pages.

Trouble that is encountered with Telephone Company provided equipment should be reported as locally specified by calling the number entered on the directory card pullout by the installer.

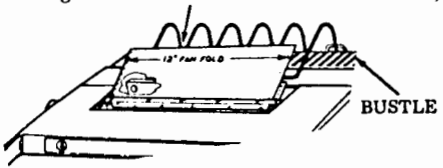
If it can be determined that the trouble is in the remote equipment, the attendant at the location in trouble should follow local procedures for that area.

The following table of analysis questions is arranged to aid in the isolation of a trouble for:

- Local correction.
- Correction at the remote location.
- Advising service personnel in advance of trouble visit of Analysis Question results.

Note: If a trouble is reported on a transported 43 Teleprinter, it should be returned to its original INSTALLED LOCATION IN THE BUILDING as shown on the directory card.

Troubleshooting Sequence

ANALYSIS QUESTION	YES	NO
1. Are one of the three mode keys lit? (LOCAL TALK, DATA or AUTO ANSW)	Go to 2.	1. Check that power switch is on. 2. Check that power cord is connected. 3. Check source of power. (Wall switch, other equipment OK, circuit breaker, etc). 4. Report as local trouble in equipment.
2. Does test message print properly while the PRINTER TEST key is depressed? Sample of message appears on Page 16.	Go to 4.	Turn off power momentarily. Go to 3.
3. Is red lamp on power supply lit? (Visible through slot in bustle 6th slot from the left). 	Report as local trouble in printer.	Report as local trouble in power supply.
4. Does printer respond properly to keyboard operation? (Local-Talk mode)	Go to 5.	Report as local trouble in keyboard.
5. Does printer respond properly to keyboard operation in Analog Loop-Back mode? (ie, print double in half-duplex.) (Entered from keyboard in Local Talk mode by ESC sequence, ended by ESC -.) (Depress DATA key to light. ALARM key flashes.)	Go to 6.	Report as local trouble in "modem".

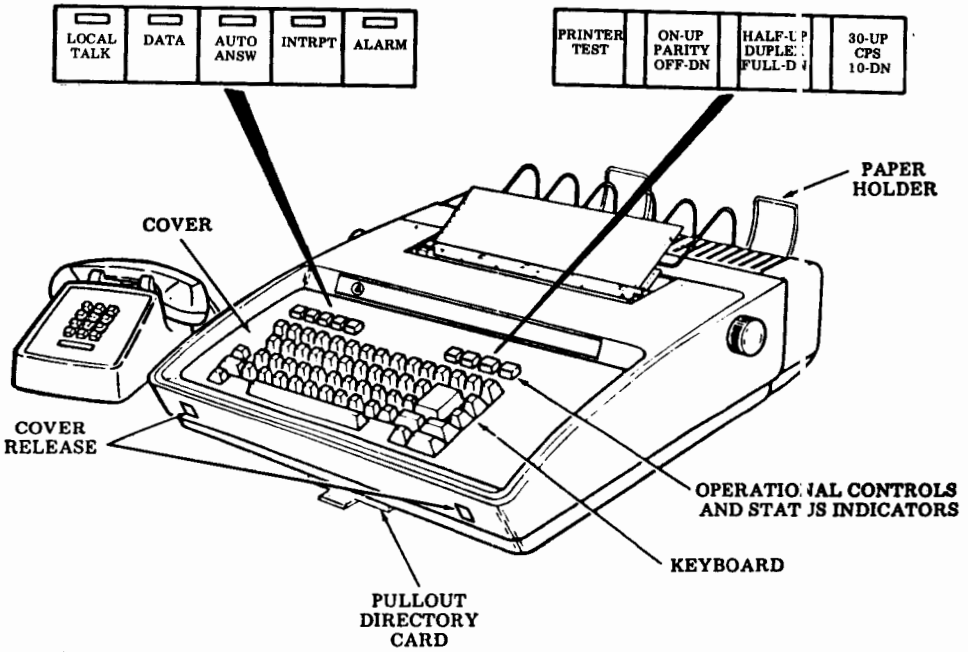
ANALYSIS QUESTION	YES	NO
6. Does telephone operate normally in the Local Talk mode? (Dial tone, dialing, ringing, talk)	Go to 8.	1. Check that modular cords are connected at rear of teleprinter. 2. Go to 7.
7. Does telephone operate normally when connected directly to line? (ie, modular cord from line connected to phone)	Report as local trouble in teleprinter.	Report as local trouble in telephone.
8. Does phone ring repeatedly in Automatic Answer mode? (ALARM key not lit.)	Report as on-line trouble in teleprinter.	Go to 9.
9. Does DATA key light following call in Automatic Answer or when DATA key is depressed after originating call? (Connection established.)	Go to 11.	1. Remote station must also go to Data mode. 2. Check that modular cords are not reversed, ie, top cord should go to phone. 3. If key does not flash or light, report as trouble in teleprinter. 4. Go to 10.
10. Is proper tone heard in handset*? (High tone if remote party answered the call automatically or transferred to Data.)	Report as on-line trouble in teleprinter. (Call does not transfer to Data mode.)	Trouble may be in remote station. (Call does not transfer to Data.)

*If originating a call.

ANALYSIS QUESTION	YES	NO
11. Are data messages properly sent and received in the Data mode?	Go to 12.	1. Check proper speed, DUPLEX and PARITY key positions. 2. Check that INTRPT key is not lit. 3. Report as on-line trouble in teleprinter unless trouble occurs with only one other station.
12. Is trouble present but not isolated by Questions 1 through 11?	Report trouble to the Telephone Company.	

NOTES:

NOTES:



43 KSR Teleprinter

Attendant Manual
999-300-126
Issue 1, March 1977