the 43 teleprinter

INSTALLATION &
ROUTINE SERVICING
for
BASIC KSR TERMINALS

THE 43 TELEPRINTER

BASIC KSR

INSTALLATION AND ROUTINE SERVICING MANUAL

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PART 1 -- INTRODUCTION

This manual provides information on the installation and routine servicing of the
43 Teleprinter Basic KSR Terminals. Instructions are provided for service
personnel, with a minimum of training, tools and spare parts, to enable variable
features, connect the proper interface, correct minor troubles and periodically
inspect, lubricate and clean the terminal during extended service intervals.

These 43 Teleprinter Basic KSR Terminals provide character at a time keyboard-
printer send-receive operation using 12-inch wide sprocket feed paper or 8-1/2-inch
wide friction feed paper. Transmission speeds are attendant controlled at 100 or
300 characters per second on terminals equipped with either an internal modem or
with one of three types of digital communications interfaces.*

Terminals with an internal modem for data transmission, interface electrically with
the telephone switched network and with a modular jack telephone for originating
calls and talking. Terminals with digital interfaces are furnished to operate on
EIA voltage levels, TTL voltage levels, or on a 20/60 mA current loop and exchange
data and control signals with external modems or other devices for communication
over switched or private lines.

Information on how to check proper operation, change the ribbon cartridge and
install paper is included in the How To Operate Manual 367 furnished with each
terminal.

Note: When ordering replaceable components, prefix each part number with the
letters "TP" (ie, TP129534), unless specified otherwise.

Tools and spare parts that may be required are as follows:

DESCRIPTION	TELETYPE CORP. PART NO.
3/16" and 1/4" Open-End Wrench	129534
1/4", 6" Blade, Screwdriver	100982
1/16" Allen Wrench	124682
1.0 A SLO-BLO Fuse	143306
1.0 A Fuse	120139
Lubricants	See Page 3-5

In the event that troubles occur that cannot be corrected with the information
in this manual, refer to the applicable 43 Teleprinter Manuals: Repair Manual
391, Service Manual 369, and Circuit Diagram Manual 385 (can be purchased from
Teletype Corporation), replace the terminal, or contact the nearest Teletype
Product Service Center.

*Digital Interfaces: (Teletype Corporation Technical Reference for 43
Teleprinter Basic KSR Terminals).

EIA -- Electronics Industries Association (Spec RS-232C) +25 V dc to -25 V dc
                                                          (On-Off Range)

TTL -- Transistor Logic 0 V dc to +5 V dc (On-Off Range)
20/60 mA Current Loop -- Current, No Current (Mark, Space)

The five types of interfaces and the ten basic KSR sets can be identified as
shown below:

CODE PLATE LOCATION

INSIDE HOUSING

FUSE

POWER
SWITCH

(1)

SET CODE
4320AAA (Sprocket Feed)
4320AAE (Friction Feed)
(Internal Interface Connector)

CONNECTOR TO
AUXILIARY
PORT

CONNECTOR TO
EXTERNAL DATA SET
OR COMMUNICATIONS
DEVICE

TDU CONNECTORS
UPPER — TO TELEPHONE
LOWER — TO LINE

PHONE

LINE

(5)

SET CODE
4320AAH (Sprocket Feed
w/410754 TAU2)
4320AAJ (Friction Feed
w/410754 TAU2)

(4)

SET CODE
4320AAK (Sprocket Feed
w/410755 TAU1)
4320AAL (Friction Feed
w/410755 TAU1)

(3)

SET CODE
4320AAC (Sprocket Feed
w/430751 TAU)
4320AAD (Friction Feed
w/430751 TAU)

(2)

SET CODE
4320AAB (Sprocket Feed
w/430750 TDU)
4320AAF (Friction Feed
w/430750 TDU)

KSR (Sprocket Feed)

KSR (Friction Feed)

PART 2 -- INSTALLATION
A. VARIABLE FEATURES

The chart below provides information on how to set the feature shown under feature numbers 431 through 435. Record any nonstandard options enabled in the space provided on the directory card (bottom side).

Feature No. | Feature Suffix and Conditions | Feature Definition | Switch Numbers | Location of Switch on Circuit Card (See Page 3-8)

XXX			SPD4							
			1	2	3	4	5	6	7	8
a.			—	—	—	—	O	●	—	—	†
b.			—	—	—	—	O	●	—	—	

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 ←.	—	—	—	—	—	—	●	O	
c. Slash alpha Ø and wide numeric O. ∧ prints as ↑ and __ prints as ← .	—	—	—	—	—	—	O	O	

432. Line Length		SPD4							
	1	2	3	4	5	6	7	8	
a. 132 Characters (Sprocket Feed Only)	—	—	—	—	●	●	—	—	†
b. 72 Characters — Printed line not centered.	—	—	—	—	O	●	—	—	
c. 80 Characters §	—	—	—	—	●	O	—	—	‡
d. 72 Characters — Printed line centered (Friction Feed Only) §	—	—	—	—	O	●	—	—	

433. EOT Response		SPD4							
	1	2	3	4	5	6	7	8	
a. Disconnect or turn off Term Ready on received EOT.	—	—	—	O	—	—	—	—	†
b. Does not disconnect or turn off Term Ready on received EOT.	—	—	—	●	—	—	—	—	

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

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

● Indicates toggle or slide position to ON.
O Indicates toggle or slide position to OFF.
— Position of switch does not affect feature.
† Factory furnished state of feature.

‡ On friction feed terminals, 432c (80 Characters) is factory furnished. 432a (132 Characters) should not be selected.
§ LEFT-HAND MARGIN adjustment must be performed (See Page 3-10).

PART 2 -- INSTALLATION (Cont)
B. INTERFACES

The 4320AAB and AAF sets equipped with a 430750 Terminal Data Unit (TDU) provide two modular telephone jacks for connection to the telephone equipment using modular cords. These jacks are labeled line (bottom) and phone (top) and the pin assignments are as shown:
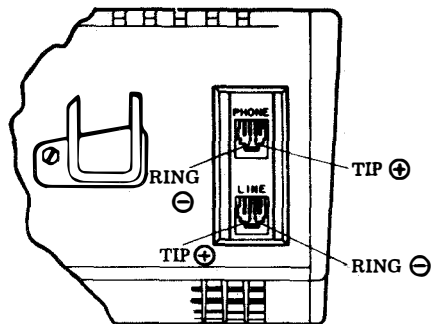
The 4320AAC and AAD sets equipped with a 430751 Terminal Auxiliary Unit (TAU) provide a 25-pin male receptacle with male pins for connection to an external communications device (modem) or distant terminal. The interface meets the requirements of EIA - RS-232C. (See Page 2-10 for cables available from Teletype Corporation.)   The pin assignments are given below:

EIA DATA SET INTERFACE SIGNALS

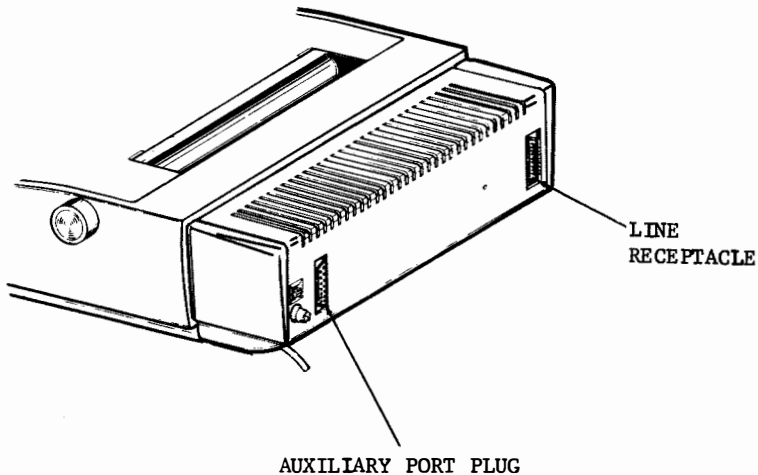| Connector Pin	Signal	EIA Circuit Designation	Status
1	Protective Ground	AA	Not Wired in TAU or Recommended Cable
2	Transmit Data	BA	Active
3	Receive Data	BB	Active
4	Request to Send	RS	Always Off (Issue 1B Logic Card) -- Always On (Issue 2A Logic Card)
5	Clear to Send	CB	Active
6	Data Set Ready	CC	Active
7	Signal Ground	AB	Active
8	Received Line Signal Detector	CF	Active
9			Not Wired in TAU or Recommended Cable
10			Not Wired in TAU or Recommended Cable
11	TWX Control	-	Not Applicable
12	Data Speed Indicator	SCF	Not Applicable
13			Not Wired in TAU or Recommended Cable
14			Not Wired in TAU or Recommended Cable
15			Not Wired in TAU
16			Not Wired in TAU or Recommended Cable
17			Not Wired in TAU
18	TWX Indicator	-	Not Applicable, Not Wired in Recommended Cable
19			Not Wired in TAU or Recommended Cable
20	Data Terminal Ready	CD	Active
21			Not Wired in TAU or Recommended Cable
22			Not Wired in TAU
23	Data Speed Select	CH	Always Off
24			Not Wired in TAU or Recommended Cable
25	Analog Loop Test		Active

UNIT ON TN4000

The (4320AAK) and AAL sets equipped with a 410755 Terminal Auxiliary Unit (TAU1)
provide a 25-pin receptacle with male pins for connection to an external com-
munications device or distant terminal (EIA or 20/60 mA current loop) or modem.
The EIA interface meets the requirements of EIA - RS-232C. (Refer to Page 2-10
for EIA cables available from Teletype Corporation.) The pin assignments are
given below.

INTERFACE SIGNALS

Connector Pin	Signal	EIA Circuit Designation	Status
1	Protective Ground	AA	Active
2	Transmit Data	BA	Active
3	Receive Data	BB	Active
4	Request to Send	RS	Always On
5	Clear to Send	CB	Active
6	Data Set Ready	CC	Active
7	Signal Ground	AB	Active
8	Received Line Signal Detector	CF	Active
9			Not Wired in TAU1 or Recommended Cable
10			Not Wired in TAU1 or Recommended Cable
11	TWX Control	-	Not Wired in TAU1
12	Data Speed Indicator	SCF	Active
13	Transmit Current Loop - (Output)		Active - Not Wired in Recommended Cable
14	Transmit Current Loop + (Output)		Active - Not Wired in Recommended Cable
15	Receive Current Loop - (Input)		Active
16	Receive Current Loop + (Input)		Active - Not Wired in Recommended Cable
17			Not Wired in TAU1
18	TWX Indicator	-	Not Wired in TAU1 or Recommended Cable
19			Not Wired in TAU1 or Recommended Cable
20	Data Terminal Ready	CD	Active
21			Not Wired in TAU1 or Recommended Cable
22	Ring Indicator		Active
23	Data Speed Select	CH	Not Wired in TAU1
24			Not Wired in TAU1 or Recommended Cable
25	Analog Loop Test		Active

PART 2 -- INSTALLATION (Cont)

B. INTERFACES (Cont)

The 4320AAH and AAJ sets equipped with a 410754 Terminal Auxiliary Unit with
Auxiliary Port (TAU2) provide two 25-pin interface connectors. The line inter-
face receptacle with male pins located at the left rear of the terminal inter-
faces to an external communications device or distant terminal (EIA or 20/60 mA
current loop) or modem. The auxiliary port plug with female pins located at
the right rear of the terminal is intended to interface to a separate send-
receive device such as a paper tape reader, tape punch, or a magnetic tape
device (EIA or 20/60 mA current loop).

LINE
RECEPTACLE

AUXILIARY PORT PLUG

The EIA interface meets the requirements of EIA - RS-232C (see Page 2-10 for
cables available from Teletype Corporation). The pin assignments are given on
Pages 2-5 and 2-6.

TAU2 LINE RECEPTACLE INTERFACE SIGNALS

Connector Pin	Signal	EIA Circuit Designation	Status
1	Protective Ground	AA	Not Wired in Recommended Cable
2	Transmit Data (Output)	BA	Active
3	Receive Data (Input)	BB	Active
4	Request to Send	RS	Always On
5	Clear to Send	CB	Active
6	Data Set Ready	CC	Active
7	Signal Ground	AB	Active
8	Received Line Signal Detector	CF	Active
9			Not Wired in TAU2 or Recommended Cable
10			Not Wired in TAU2 or Recommended Cable
11	TWX Control	-	Not Wired in TAU2
12	Data Speed Indicator	SCF	Active
13	Transmit Current Loop - (Output)		Active - Not Wired in Recommended Cable
14	Transmit Current Loop + (Output)		Active - Not Wired in Recommended Cable
15	Receive Current Loop - (Input)		Active
16	Receive Current Loop + (Input)		Active - Not Wired in Recommended Cable
17			Not Wired in TAU2
18	TWX Indicator	-	Not Wired in TAU2 or Recommended Cable
19			Not Wired in TAU2 or Recommended Cable
20	Data Terminal Ready	CD	Active
21			Not Wired in TAU2 or Recommended Cable
22	Ring Indicator		Active
23	Data Speed Select	CH	Not Wired in TAU2
24	Device Control		Not Wired in Recommended Cable
25	Analog Loop Test		Not Wired in TAU2

PART 2 -- INSTALLATION (Cont)

B. INTERFACES (Cont)

TAU2 AUXILIARY PORT PLUG INTERFACE SIGNALS

Connector Pin	Signal	EIA Circuit Designation	Status
1	Protective Ground	AA	Active
2	Transmit Data (Input)	BA	Active
3	Receive Data (Output)	BB	Active
4	Request to Send	RS	Active
5	Clear to Send	CB	Always On
6	Data Set Ready	CC	Active
7	Signal Ground	AB	Active
8	Received Line Signal Detector	CF	Always On
9			Not Wired in TAU2 or Recommended Cable
10			Not Wired in TAU2 or Recommended Cable
11	TWX Control		Not Wired in TAU2
12	Data Speed Indicator	SCF	Not Wired in TAU2
13	Transmit Current Loop - (Output)		Active - Not Wired in Recommended Cable
14	Transmit Current Loop + (Output)		Active - Not Wired in Recommended Cable
15	Receive Current Loop - (Input)		Active
16	Receive Current Loop + (Input)		Active - Not Wired in Recommended Cable
17	Printer ON/$\overline{\text{OFF}}$ (TTL)		Active
18	TWX Indicator		Not Wired in TAU2 or Recommended Cable
19			Not Wired in TAU2 or Recommended Cable
20	Data Terminal Ready (Input)	CD	Active
21			Not Wired in TAU2 or Recommended Cable
22	Ring Indicator		Not Wired in TAU2
23	Data Speed Select	CH	Active
24	Device Control		Not Wired in Recommended Cable
25	Analog Loop Test		Not Wired in TAU2

The 4320AAA and AAE sets are furnished without the interface signaling unit. Connection to the external communications device (provided by the customer) is made through a 20-pin connector, Berg 65346-003 or 3M 3421-300 or equivalent at the end of a short ribbon cable. No provision is made for adding additional cable length.

Electrical Characteristics of Interface Leads are:

Electrical signals compatible with low-power TTL logic are utilized for both control and data interchange as described below:

STATE	DRIVER	TERMINATOR
MARK (OFF) (1)	$+2.4 \leq V_{MARK} \leq +5.25$ Volts	$+2.0 \leq V_{MARK} \leq +5.25$ Volts
SPACE (ON) (0)	$0 \leq V_{SPACE} \leq +0.4$ Volts	$0 \leq V_{SPACE} \leq +0.7$ Volts

TTL PIN ASSIGNMENT CHART

Pin No.	Code	Function	Status
1	DL	Digital Loop Test	Active
2	DSI	Data Speed Indicator to Terminal	Not Wired in TTL Cable
3	AL	Analog Loop Test	Active
4	DSS	Data Speed Select from Terminal	Not Wired in TTL Cable (410740 Logic Card) Active (410742 Logic Card)
5	TR	Terminal Ready	Active
6	RS	Request to Send	Not Connected, Always Off (Issue 1B Logic Card) -- Always On (Issue 2A Logic Card)
7	+5	+5 Volts	Active
8		Reserved for future	Not Applicable, Not Wired in TTL Cable
9	GND	Circuit Ground	Active
*10	RTS	Request to Send future	Not Wired in TTL Cable
11	-12	-12 Volts	Active
*12	RI	Ring Indicator future	Not Wired in TTL Cable
13	+12	+12 Volts	Active
14	DP	Duplex Indicator from Terminal	Active (Open Collector)
15	DR	Data Ready	Active
16	TW2	TWX Indicator	Not Applicable, Not Wired in TTL Cable
17	RD	Receive Data	Active
18	TW1	TWX Control	Not Applicable, Not Wired in TTL Cable
19	SD	Transmit Data	Active
20		Reserved for future	Not Applicable, Not Wired in TTL Cable

*Refer to 50944S if 410710 Answer-Back Circuit Card is present.

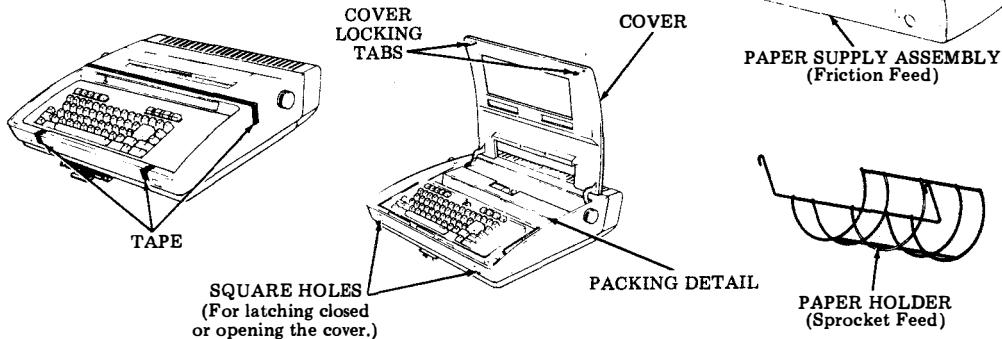PART 2 -- INSTALLATION (Cont)
C. ASSEMBLY

The basic 43 Teleprinter set is furnished fully assembled and tested with one of
the signal interfaces described on Page 2-2, B. INTERFACES.

CAUTION: To avoid condensation on the electrical components, the terminal should
be allowed to assume room temperature before unpacking, for example, when brought
into a warm humid room from outside subzero temperatures.

1. UNPACKING

   a. Unpack the large carton referring to instructions on the container.
   b. Remove tape securing the cover to the housing (see below).
   c. Depress the cover locking tabs on the lower front of the cabinet and lift
       the cover. Remove the packing detail securing the print head (see below).
   d. Verify that the following items are included in the box:

     1 - Set -- 43 Teleprinter (4320AA-)
     1 - Ribbon
     1 - Manual, Installation and Routine Servicing, 368
     1 - Manual, Attendant, 367
     1 - Paper Holder (Sprocket Feed Only)
     1 - Paper Supply Assembly (Friction Feed Only)

COVER
LOCKING   COVER
TABS

PAPER SUPPLY ASSEMBLY
(Friction Feed)

TAPE

SQUARE HOLES   PACKING DETAIL
(For latching closed   PAPER HOLDER
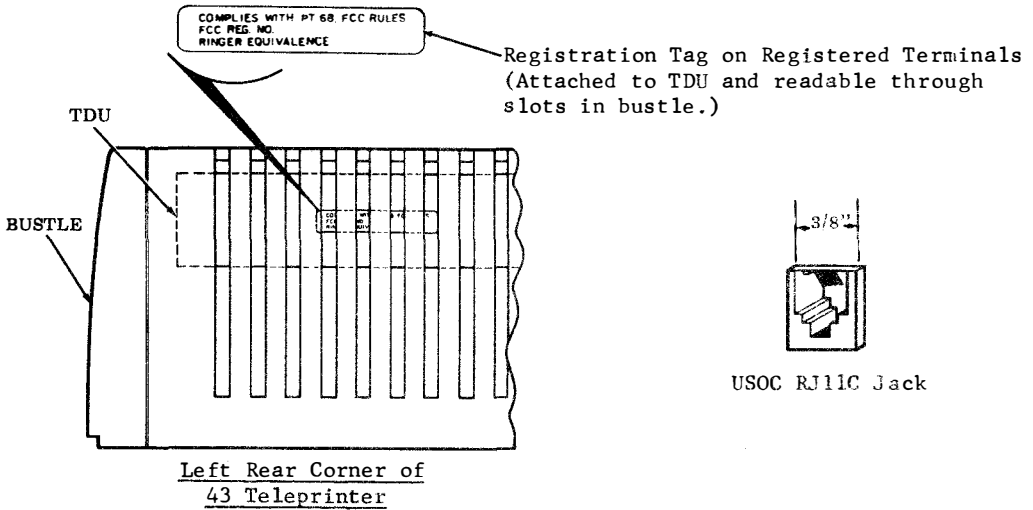or opening the cover.)   (Sprocket Feed)

NOTE: Fan-fold 12 by 8-1/2 inch paper (sprocket feed), 8-1/2 inch wide by 5 inch
diameter rolls (friction feed) and EIA and modular telephone cords must be
obtained locally or ordered separately. Refer to HTO for paper suppliers. EIA
and modular telephone cords can be ordered from Teletype Corporation (see Page
2-10).

2. TELEPHONE AND LINE CONNECTION

NOTICE: In the U.S.A., under the FCC registration program, the 43 Teleprinters
with 430750 terminal data units (TDU) may be connected directly to the telephone
switched network subject to the following conditions:

   a. Connection must be through a standard six-pin miniature jack (USOC RJ11C)
      installed by the Telephone Company.
   b. The telephone, if any is to be connected to the teleprinter, must be
      registered or grandfathered (Bell System 500 or 2500 type or equivalent)
      and be reported as such to the local Telephone Company.

Registration Tag on Registered Terminals
(Attached to TDU and readable through
slots in bustle.)

USOC RJ11C Jack

Left Rear Corner of
43 Teleprinter

c. Before connection or reconnection to the switched network, the local
    Telephone Company must be advised of the following:

	Registered Terminals Only (With Registration Tag)		Grandfathered Terminals Only (No Registration Tag)§
(1)	Registration Number (from tag)	(1)	Teleprinter model number 4310 (RO) or 4320 (KSR) with suffix AAB (sprocket feed) or AAF (friction feed). Includes built-in Western Electric 153A1 modem (TDU).
(2)	Ringer Equivalence (from tag)		
(3)	Telephone number where terminal will be connected.		
		(2)	Telephone number where terminal will be connected.
		(3)	Ringer Equivalence: 0.3
		(4)	Ringer Type: A
		(5)	Voice baud metallic signal power: Nonadjustable -9 dbm max.
		(6)	Baud Rate: 300 max.

§First time connection must take place before July 1, 1979. The teleprinter
may remain connected and be reconnected for its life.

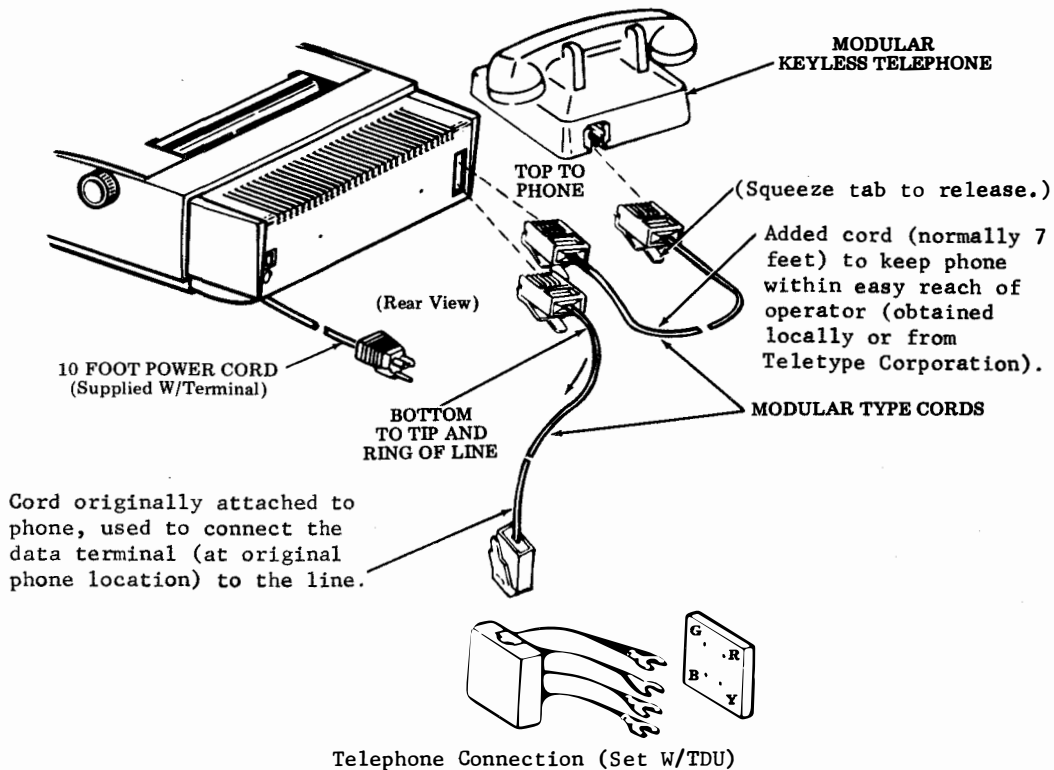.Refer to Manual 407 for additional registration instructions.

4320AAB and AAF Sets With TDU

a. Remove the modular cord plug from the modular jack associated with the key-
    less telephone to be used with the teleprinter (squeeze tab to release).
    Connect the plug to the lower connector marked LINE on the rear of the TDU
    accessible through the opening in the left rear of the bustle cover (Page
    2-10).
b. Connect the additional modular cord between the upper connector on the TDU
    marked PHONE and the telephone jack (Page 2-10).

PART 2 -- INSTALLATION (Cont)
C. ASSEMBLY (Cont)

c. The modular telephone cord connected between the upper connector on the
TDU and the telephone jack must be furnished by the installer. The
following cables are available from Teletype Corporation.

7 foot length	430581
14 foot length	430582
25 foot length	430583

Telephone Connection (Set W/TDU)

MODULAR KEYLESS TELEPHONE

TOP TO PHONE

(Squeeze tab to release.)

Added cord (normally 7 feet) to keep phone within easy reach of operator (obtained locally or from Teletype Corporation).

(Rear View)

10 FOOT POWER CORD
(Supplied W/Terminal)

BOTTOM TO TIP AND RING OF LINE

MODULAR TYPE CORDS

Cord originally attached to phone, used to connect the data terminal (at original phone location) to the line.

43200AAC and AAD Sets With TAU
43200AAK and AAL Sets With TAU1
EIA Interface Connection

a. The connecting cables between the terminal and the data set must be furnished
by the installer and should employ shielded cable. The following cables
are available from Teletype Corporation.

7 foot length	408065
12 foot length	408066
25 foot length	408067
50 foot length	408068

b. The connection to the data set and telephone should be made following the
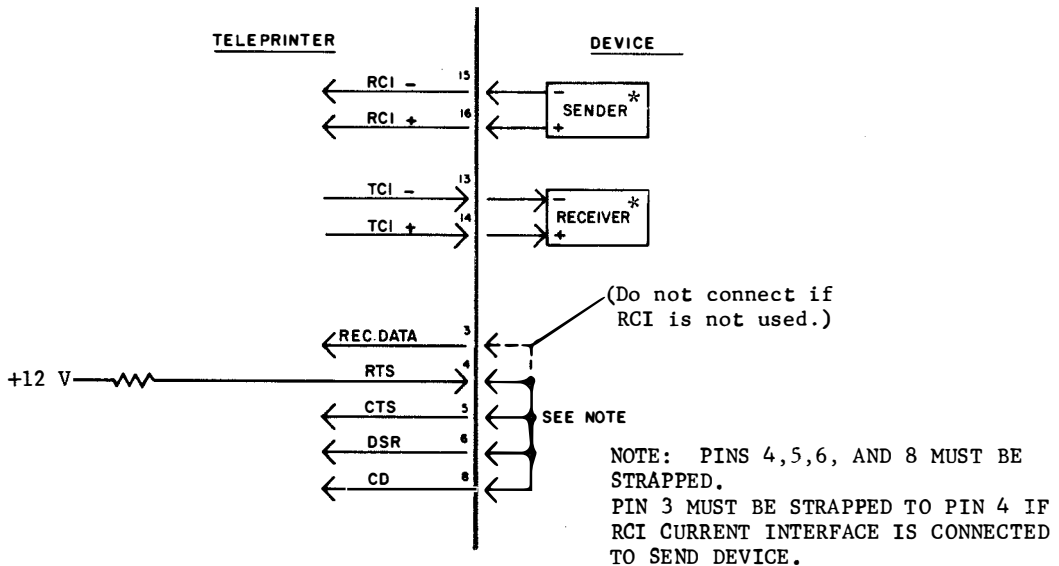instructions for the particular data set involved (Page 2-11).
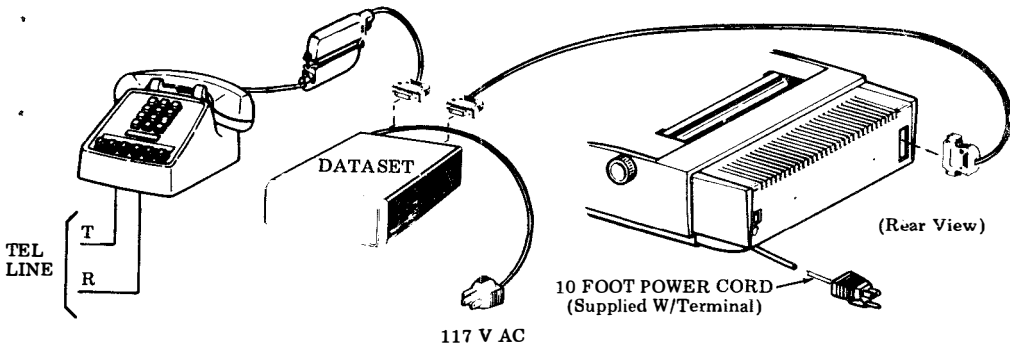
Telephone Connection (Set W/TAU, TAU1 or TAU2)

<u>4320AAK and AAL Sets With TAU1</u>

20/60 Ma. Current Loop Connection:

a. Determine the terminal configuration desired and connect the send and/or receive current device as shown below following any local instructions for the particular device involved. Terminal configurations are shown on Page 2-14.

NOTE: PINS 4,5,6, AND 8 MUST BE STRAPPED.
PIN 3 MUST BE STRAPPED TO PIN 4 IF RCI CURRENT INTERFACE IS CONNECTED TO SEND DEVICE.

*Limit current to 20 mA or 60 mA for MARK. Voltage must be between 12 V dc and 125 V dc.

Refer to dc current arrangements shown on Page 2-13 to provide operation as shown in the desired terminal configuration.

PART 2 -- INSTALLATION (Cont)
C. ASSEMBLY (Cont)

4320AAH and AAJ Sets With TAU2

EIA Interface Connection

a. The connecting cables between the terminal and the data set or auxiliary
   sender-receiver must be furnished by the installer and employ shielded cable.
   Refer to Page 2-10 for cables available from Teletype Corporation.

b. The connection to the auxiliary sender-receiver or data set and telephone
   should be performed following the instructions for the particular data set
   or device involved. Refer to the diagram on Page 2-11 for data set and tele-
   phone connection. The diagram below describes the interface connections.

20/60 mA Current Loop Connection

a. Connect the send and/or receive current device using the diagram below and
   following any local instructions for the particular device involved.
   Terminal configurations are shown on Page 2-14.

INTERFACE CONNECTIONS

Except for Notes 3 and 4 (which apply
regardless of the type of interface
signaling) EIA interfacing is standard
RS-232-C. The remaining connections
are used for current interface only.

The connections shown below may
be made within separately provided
cables with standard 25-pin EIA
connectors and terminals.
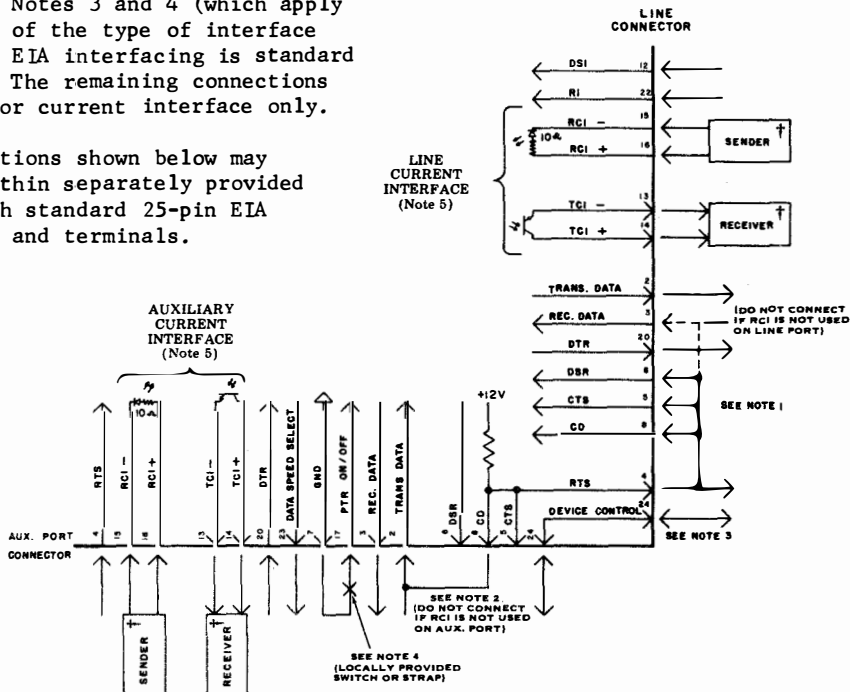
NOTE 1: Pins 4, 5, 6 and 8 must be strapped when using 20/60 mA current loop at
the line connector. Pin 3 must also be strapped to pin 4 when using RCI interface
at the line connector.

NOTE 2: Pins 2 and 8 must be strapped when using RCI Auxiliary current loop.

NOTE 3: Provided for customer use.

NOTE 4: Connect pins 7 and 17 to blind received data to the printer (current or EIA connections).

NOTE 5: Current can be used on either or both ports but current and EIA cannot be used simultaneously on the same port.

†Limit current to 20 mA or 60 mA for mark.
Voltage must be between 12 V dc and 125 V dc.

Refer to dc current arrangements shown below to provide operation as shown in the desired terminal configuration.
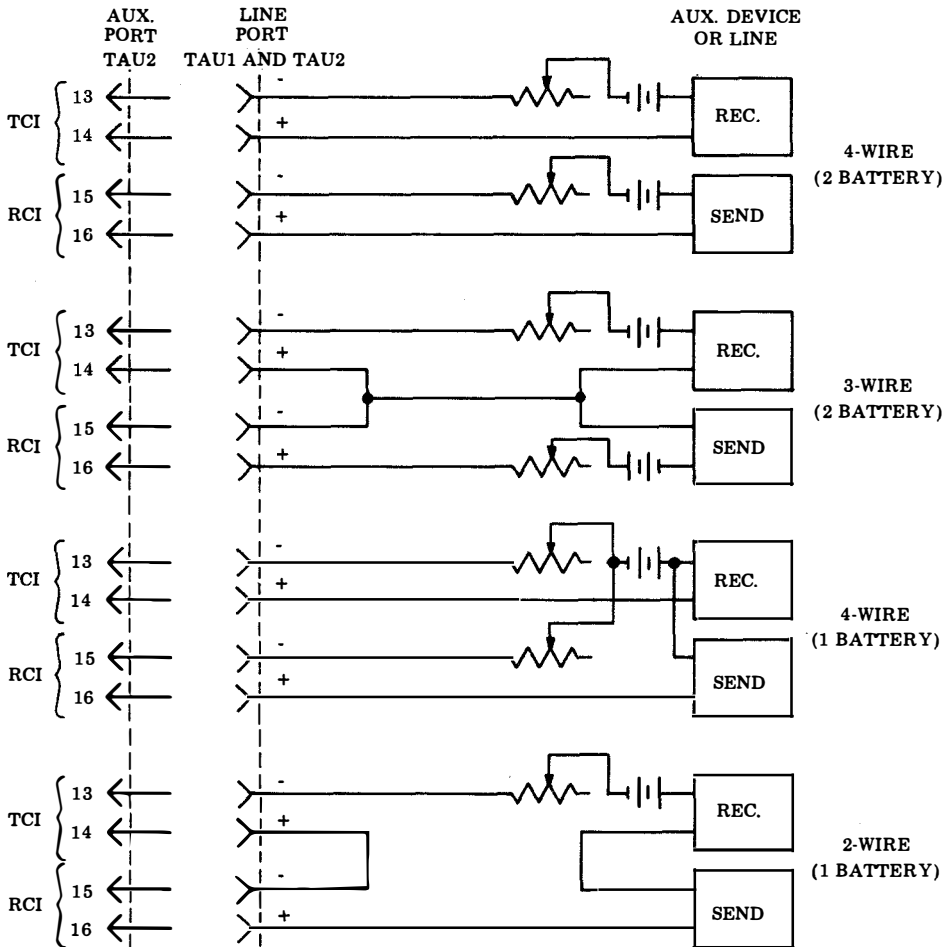
RCI = Receive Current Interface

TCI = Transmit Current Interface

DC CURRENT ARRANGEMENTS

PART 2 -- INSTALLATION (Cont)
C.   ASSEMBLY (Cont)

TYPE OF OPERATION		KEY POSITION AND WIRING	TYPE OF TERMINAL AND COMMUNICATIONS MODE
Half-Duplex		HDX or FDX Wiring Not Applicable	KSR LOCAL
Half-Duplex		HDX Line — 3- or 4-wire or EIA Aux — 3- or 4-wire or EIA	KSR DATA
Half-Duplex (Modified)		HDX Line — 2-wire Aux — 3- or 4-wire or EIA	KSR TAU 2 only DATA
		FDX Line — 2-wire Aux — 3- or 4-wire or EIA	KSR DATA
Full Duplex		FDX Line — 3- or 4-wire or EIA Aux — 3- or 4-wire or EIA	KSR DATA
Full Duplex (Echoplex)		FDX Line — 3- or 4-wire or EIA Aux — 2-wire	KSR DATA

§ PTR ON/OFF External Switch (TAU2)
   Always On (TAU1)

Terminal Configurations

4320AAA and AAE Sets Without Interface Signaling Unit

Connection to the 43 Teleprinter interface cable requires the removal of the paper holder or paper supply assembly, paper deflector (if present) and bustle cover. Refer to Page 3-8, C. COMPONENT ACCESS for removal instructions.
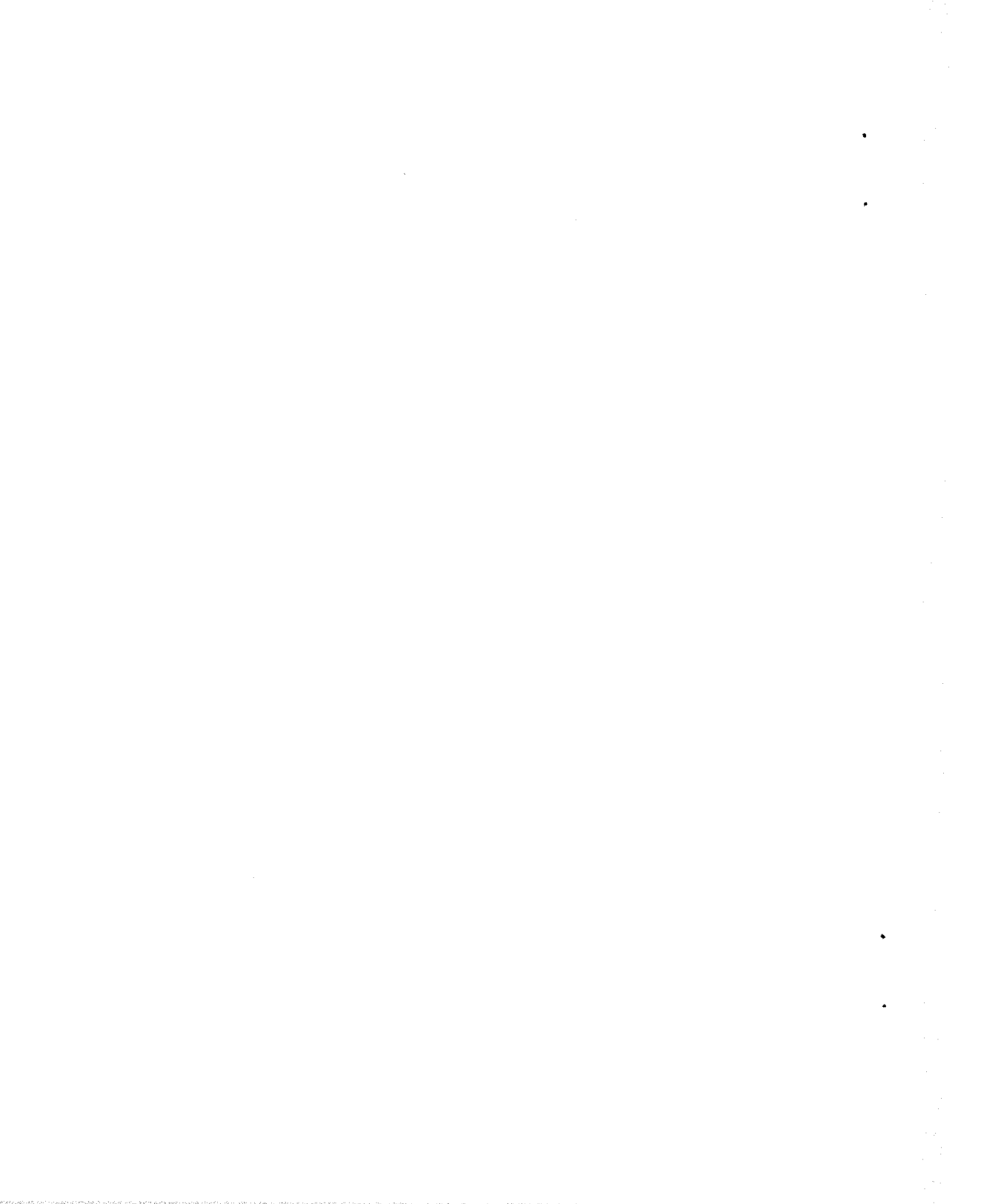
This set is not equipped with a communications unit and telephone and line connections cannot be made until the KSR set is provided with an appropriate communications device. The connections to the telephone, data set or communications device should be performed following the instructions for the particular device involved.

3. ACCESSORIES

   a. Install the ribbon and paper. Refer to Manual 367.
   b. Install the friction feed paper supply assembly or the sprocket feed paper holder, if desired. If the paper holder is not installed, provide to attendant for possible future use. Refer to Page 3-8.
   c. Record any nonstandard options enabled in the space provide on the directory card. (Write in any not listed on card.)
   d. Fill out remaining information on the directory card in accordance with local procedures, (ie, provide attendant with HTO manual).

   e. Install the directory card in the holder provided, "Frequently Called Numbers" side up. Refer to Page 3-8.

4. STATION TESTING

After installation, the station shall perform as stated in the How To Operate Manual 367.

PART 3 -- ROUTINE SERVICING
A. TROUBLE ISOLATION AND CORRECTION

QUESTIONS	YES	NO
1. Are any of the three commu- nications mode keys lit? (Power available and set power on.) (Depress other keys if proper key not lit.)	Go to 2.	Go to 1a.
1a. Is there any indication of power in the set? (Lamps flash when power is turned on and off, red lamp on power supply, etc). (See Page 3-8.)	Go to 1b.	Check and replace set fuse (F1) if blown. Trouble is in terminal if fuse blows again. If not blown go to 1b.
1b. Is red lamp on power supply lit?	Check opcon cable connector. (See Page 3-8.)	Check fuse (F2) on power supply. If blown, check for foreign objects be- tween circuit lands or terminals and replace fuse. Trouble is in terminal if fuse blows again.
2. Does printer print test message while the PRINTER TEST key is depressed? (ie, character set printed repeatedly within margin restraints.)	Go to 2a.	Turn off power for several seconds and retry. Trouble is in terminal.
2a. Are any of the following characters substituted in copy? O Ø ∧ ↑ — ←	Check Page 2-1, A. VARIABLE FEATURES, 431.	Go to 2b.
2b. Are undesired line lengths set as follows when power is turned on? 72 80 132	Check Page 2-1, A. VARIABLE FEATURES, 432.	Go to 2c.

PART 3 -- ROUTINE SERVICING (Cont)
A. TROUBLE ISOLATION AND CORRECTION (Cont)

QUESTIONS	YES	NO
2c. Is printed copy properly centered or aligned with edges of paper? Sprocket Feed - Parallel to edge and not printing on fold or form line. Friction Feed - Properly centered on roll paper.	Go to 2d.	Sprocket Feed - Check Right Paper Sprocket adjustment and Printed Line adjustment. (See Page 3-9.) Friction Feed - Check Left-Hand Margin adjustment. (See Page 3-10.)
2d. Is print density acceptable (including any carbons)?	Go to 3.	Replace ribbon. Check proper density multicopy paper.
3. Are data messages properly sent and received?	Go to 4.	Go to 3a.
3a. Do PARITY, DUPLEX and CPS keys alternately lock down and release up when depressed?	Go to 3b.	Trouble is in terminal.
3b. Does substitute character ■ appear with PARITY key on?	Go to 3c.	Go to 4.
3c. Are both stations operating at same speed, is local copy obtained and is remote station sending even parity?	Go to 4.	Select proper speed and DUPLEX keys. Operate with PARITY switch off or check Page 2-1, A. VARIABLE FEATURES, 434 if remote station is printing the ■ character.
4. Does terminal have a directly connected modular telephone?	Go to 5.	Communications troubles encountered using externally connected data sets and telephones or other arrangements may be isolated by observing signals at the interface connector. See Page 2-2, B. INTERFACES.
5. Does AUTO ANSW key light when power is turned on and do LOCAL-TALK, AUTO ANSW and DATA keys each light when depressed?	Go to 6.	Trouble is in terminal.

QUESTIONS	YES	NO
6. Does telephone operate normally with LOCAL-TALK key lit?	Go to 7.	Check proper connection of modular cords at rear of set. See Page 2-2, B. INTERFACES. Connect phone directly to line. Go to 6a.
6a. Does phone now operate normally?	Check cord that was between phone and terminal. If OK, trouble is in terminal.	Check connections to line and cord between phone and line. Replace phone.
7. When originating a call (answering tone heard) and DATA key depressed, does DATA key light steadily?	Go to 8	Go to 9.
8. Does phone ring only once and the DATA key light following a received call in the AUTO ANSW mode?	Go to 9.	Originating station must send originating frequency tones, ie, go to DATA mode. If OK, trouble is in terminal.
9. Does station echo-back characters (print twice) in ANALOG LOOPBACK -- HALF DUPLEX mode? (ie, depress AUTO ANSW key, ESC key and shifted > key.) (Alarm lamp flashes.)	Remote station may be sending incorrect frequencies or signal levels.	Trouble is in terminal.
10. Does carriage return automatically when line lengths beyond the right margin are received on-line and does station disconnect when EOT is received?	Place in service.	Check Page 2-1, A. VARIABLE FEATURES, 433 or 435. If OK, trouble is in station.

PART 3 -- ROUTINE SERVICING (Cont)
B. PERIODIC CHECKS, LUBRICATION AND CLEANING (Cont)

1. GENERAL

This part provides routine servicing procedures for the 43 Teleprinter Basic KSR
Station.

Routine servicing should be performed, at the convenience of the customer, at
least once a year.

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

Following the routine servicing, a local and on-line installation checkout
should be performed. The routine servicing date should be filled out on the
bottom side of the directory card holder.

2. VISUAL CHECKS

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 (Page 3-8).
   d. Print head cover fully seated.

3. CLEANING AND APPEARANCE

Examine exterior areas for smudges, dust, etc.

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

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

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 mineral spirits.

WARNING: DO NOT ALLOW MINERAL SPIRITS OR SOLVENTS TO CONTACT EXTERIOR PLASTIC
SURFACES.

4. LUBRICATION PROCEDURES

The printer can be lubricated by opening the cabinet cover. Apply lubricant to
points as indicated on Pages 3-6 and 3-7.

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

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

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.

The following symbols indicate the quantity of lubricant to be used in a specified area: Symbols 01, 02, 03, etc, refer to 1, 2, 3, etc, drops of oil.

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

   O   Oil 88970 (1 qt), 88971 (1 gal).
  G-A   Apply thin film of 97116 (4 oz) or 88973 (1 lb) grease.
  G-B   Apply thin film of Syn-Tech grease (use 430836 tube with grease and 430838 brush).
  G-C   Fill with Poly Oil grease (use 430837 injector with grease).
   S   Saturate felt oilers, washers, and wicks with oil.
   D   Keep dry, no lubricant permitted.

Lubrication Check List: (See Pages 3-6 and 3-7.)

Lead Screw -- Film of grease over entire threaded portion of lead screw.
Carriage Wicks -- Saturate with oil (4 places)
Ribbon Guide Rollers -- 2 drops of oil (2 places)
Ribbon Rollers -- 2 drops of oil (2 places)
Ribbon Tension Arm Pivot and Spring -- 2 drops of oil each (4 places)
Spacing Tension Arm Pivot, Roller and Spring -- 2 drops of oil each (4 places)
Platen Bearing -- 5 drops of oil each side (2 places)
Finger Pivots -- 2 drops of oil each side (2 places)
Paper-Out Arm Pivot -- 2 drops of oil on both pivot points (sprocket feed only).
Lead Screw Pulley Clip -- Grease between clip and lead screw shaft.
Pressure Roller Bail Spring -- 2 drops of oil each end (2 places - friction feed only).
Platen Tray Shaft -- 2 drops of oil each end at the side plates (2 places - friction feed only).
Pressure Roller Bail -- 2 drops of oil each end at pivot points on each side of bail (2 places - friction feed only).
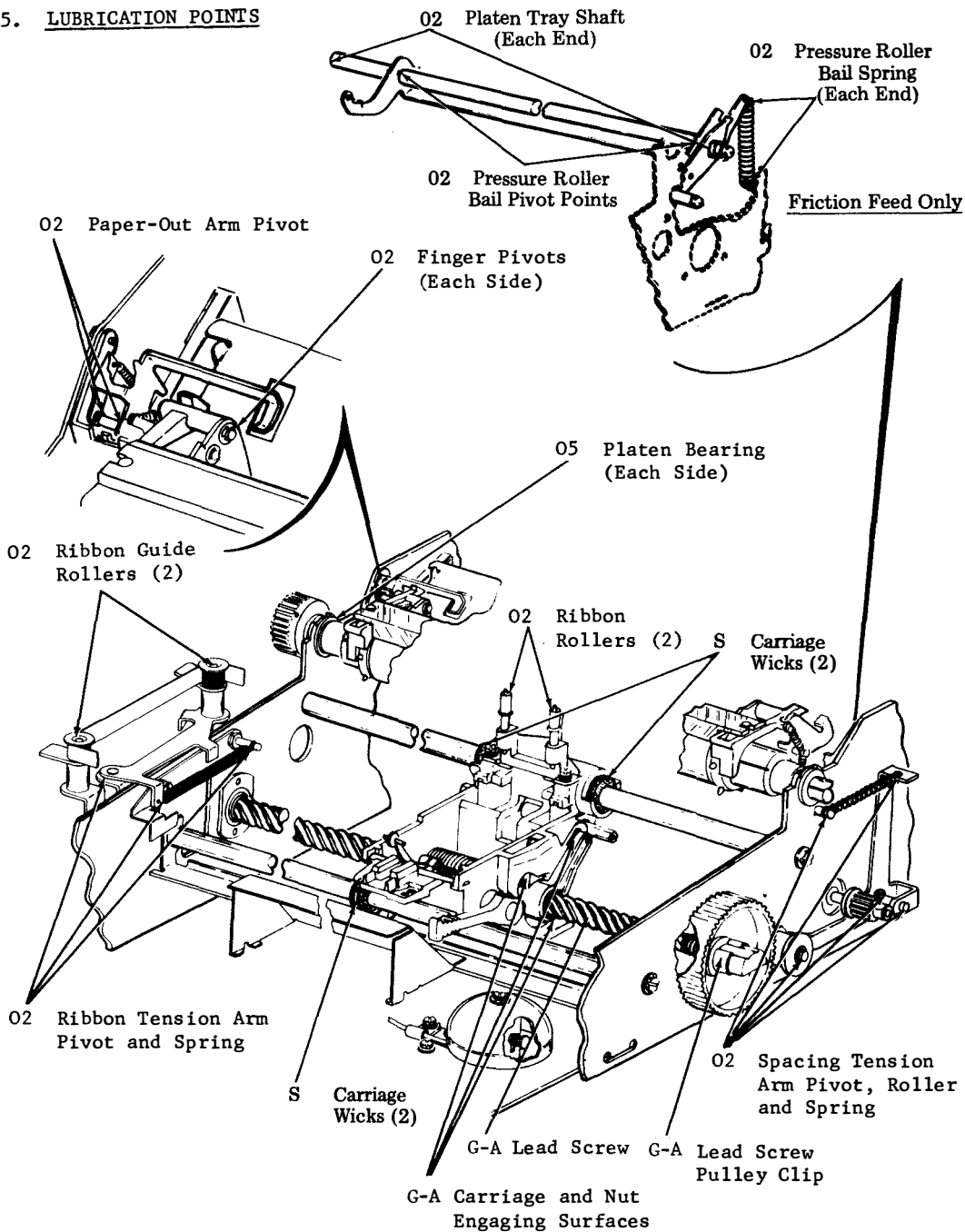
Carriage and Nut Engaging Surfaces:
   a. Two Nut Drive Arms -- Grease four bearing surfaces.
   b. Nut Keying Arm -- Lubricate by packing carriage engaging slot with grease.

Print Head:
   a. Active Armatures and Outer Pole Plate -- Grease at the upper pivot area as well as the lower locator area (9 places).
   b. Print Wire Well Area -- Completely fill with grease.

PART 3 -- ROUTINE SERVICING (Cont)
B. PERIODIC CHECKS, LUBRICATION AND CLEANING (Cont)

5. LUBRICATION POINTS

02 Platen Tray Shaft
    (Each End)

02 Pressure Roller
    Bail Spring
    (Each End)

02 Pressure Roller
    Bail Pivot Points

Friction Feed Only

02 Paper-Out Arm Pivot

02 Finger Pivots
    (Each Side)

05 Platen Bearing
    (Each Side)

02 Ribbon Guide
    Rollers (2)

02 Ribbon
    Rollers (2)

S Carriage
   Wicks (2)

02 Ribbon Tension Arm
    Pivot and Spring

S Carriage
   Wicks (2)

02 Spacing Tension
    Arm Pivot, Roller
    and Spring

G-A Lead Screw   G-A Lead Screw
                     Pulley Clip

G-A Carriage and Nut
Engaging Surfaces

PART 3 -- ROUTINE SERVICING (Cont)
B. PERIODIC CHECKS, LUBRICATION AND CLEANING (Cont)
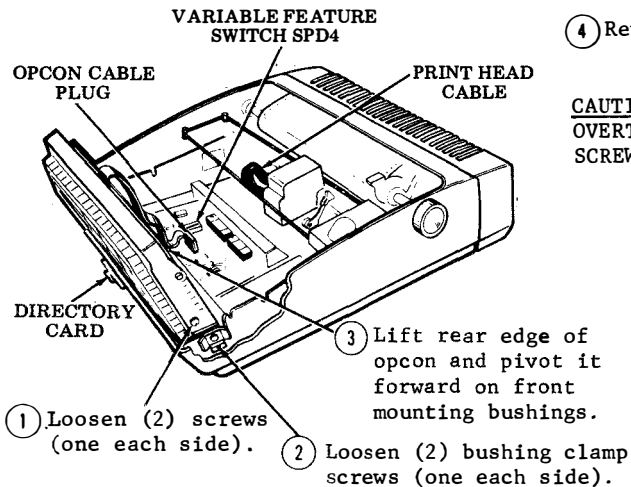
5. LUBRICATION POINTS (Cont)
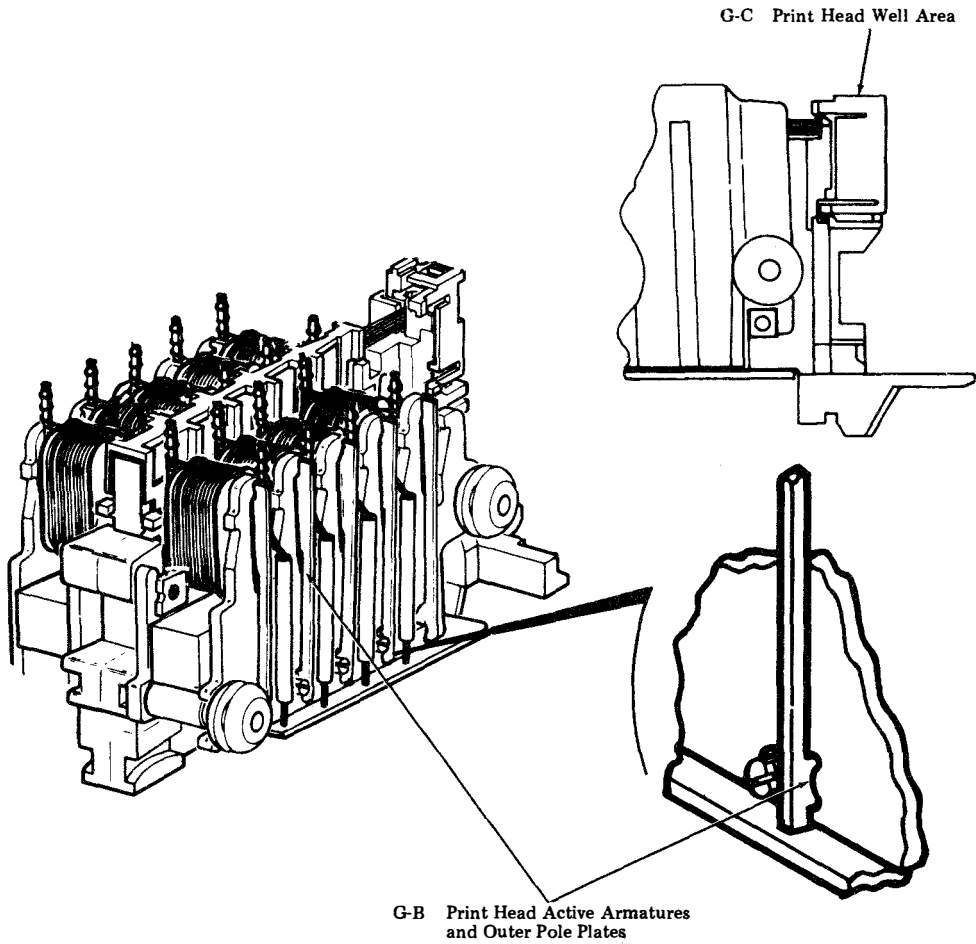
G-C Print Head Well Area

G-B Print Head Active Armatures
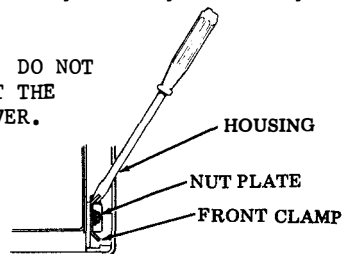and Outer Pole Plates

PART 3 -- ROUTINE SERVICING (Cont)
C. COMPONENT ACCESS

1. Operator Console (Opcon), Cables, Directory Card and Variable Feature Switch

VARIABLE FEATURE
SWITCH SPD4

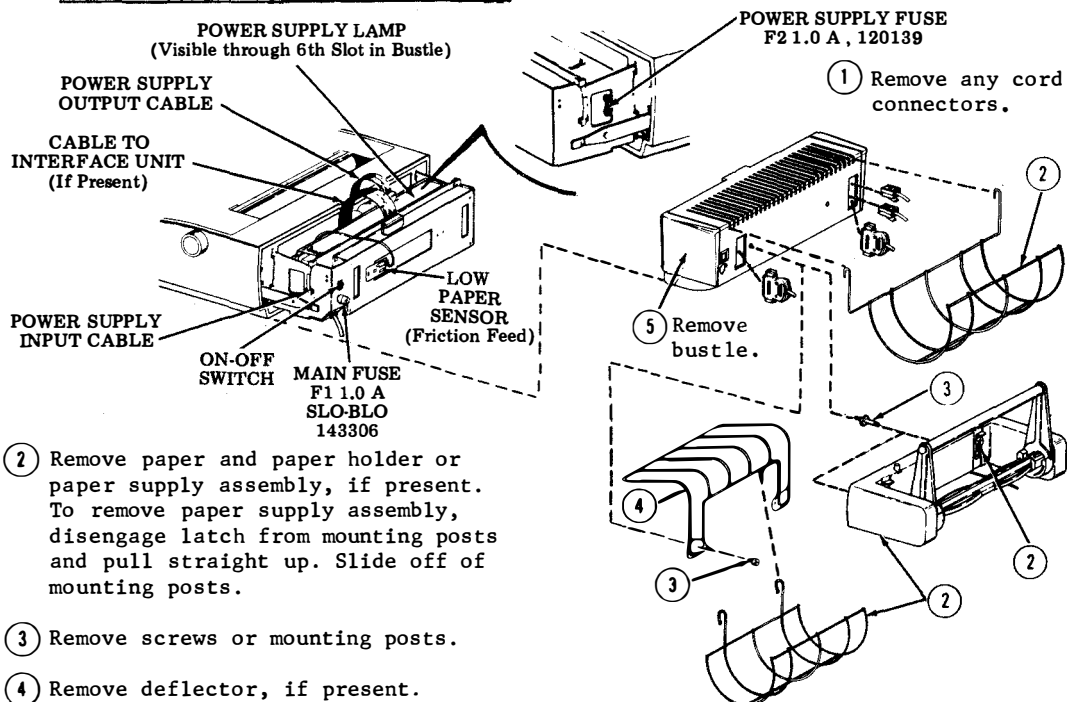OPCON CABLE
PLUG

PRINT HEAD
CABLE

DIRECTORY
CARD

(1) Loosen (2) screws
(one each side).

(2) Loosen (2) bushing clamp
screws (one each side).

(3) Lift rear edge of
opcon and pivot it
forward on front
mounting bushings.

(4) Reverse steps to reposition opcon.

CAUTION: DO NOT
OVERTWIST THE
SCREWDRIVER.

HOUSING

NUT PLATE

FRONT CLAMP

NOTE: When repositioning opcon,
insert a screwdriver into the
square hole in the nut plate and
gently twist (or pry) the screw-
driver with enough force to draw
the assembly forward.

Tighten the clamp screws.

2. Power Supply Lamp, Cables and Fuses

POWER SUPPLY LAMP
(Visible through 6th Slot in Bustle)

POWER SUPPLY
OUTPUT CABLE

CABLE TO
INTERFACE UNIT
(If Present)

POWER SUPPLY
INPUT CABLE

ON-OFF
SWITCH

MAIN FUSE
F1 1.0 A
SLO-BLO
143306

LOW
PAPER
SENSOR
(Friction Feed)

POWER SUPPLY FUSE
F2 1.0 A, 120139

(1) Remove any cord
connectors.

(2)

(3)

(4)

(5) Remove
bustle.

(2)

(3)

(2)

(2) Remove paper and paper holder or
paper supply assembly, if present.
To remove paper supply assembly,
disengage latch from mounting posts
and pull straight up. Slide off of
mounting posts.

(3) Remove screws or mounting posts.

(4) Remove deflector, if present.

PART 3 -- ROUTINE SERVICING (Cont)
D. ADJUSTMENTS

RIGHT PAPER SPROCKET (Sprocket Feed Only)

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

To Adjust
  Loosen setscrews and position right
  sprocket to meet requirement.
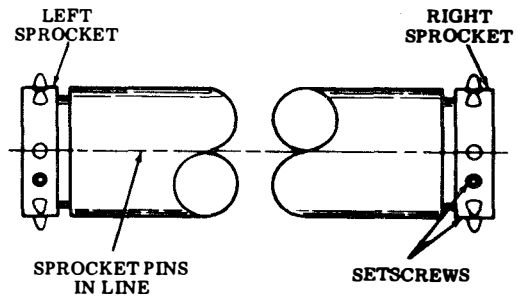
PLATEN ENDPLAY AND PRINTED LINE POSITION

The following two requirements must be met:

(1) Requirement
  Platen Endplay -- With the platen
  biased to the right, there should
 be
    Min Some---Max 0.008 inch
  clearance between the left bearing
  and the platen hub, at the closest
  point, and
    Max 0.030 inch
  between the left bearing and the
  sprocket at the closest point.

(2) Requirement (Sprocket Feed Only)
  Printed Line Position -- The lower
  edges of a typed line of M characters
  should be 1/32 +1/64 inch above a
  horizontal line located by any of
  the following methods:

      (a) A line drawn between the lower
           edges of two opposite sprocket
           holes.
      (b) A preprinted line on the form
           the same as in (a) above or in
           1/6 inch multiples.
      (c) A fold midway between two
           sprocket holes on fanfold paper.
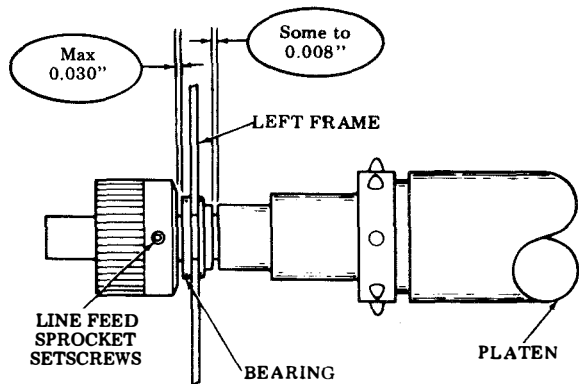
(Power must be on line feed motor for this adjustment.)

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

LEFT-HAND MARGIN (Friction Feed Only)

Requirement
   When the variable feature switch arrangement on the printer logic card has been
   enabled for 80 character lines (Option 432c), the slide should be located all
   the way to the left. When the switch arrangement has been enabled for 72 char-
   acter lines and printed line centering (Option 432d) is required, then the slide
   must be located all the way to the right.

To Adjust
   Loosen the single mounting screw holding the slide to the bracket and move the
   slide to meet the adjustment.

BRACKET

SLIDE

FOR 80 CHARACTER LINES
FOR 72 CHARACTER LINES (Printed Line
Centered)

MOUNTING SCREW