



**AT&T**

**5310 and 5320 Printer  
Service Manual**



5310 and 5320 Printer

**Service Manual**

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Catalogue Number 582-405-030IS  
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### FCC WARNING STATEMENT

**Note:** There are three versions of the domestic 5310 and 5320 Printers. These versions can be identified by the suffix "AAA", "AAB", "BAC", "BAE" or "BKE" at the end of the manufacturer's code. See "Printer Identification" in Section 2 to determine code plate location.

#### "AAA" and "AAB" Coded Printers:

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measure may be required to correct the interference.

#### "BAC", "BAE" and "BKE" Coded Printers:

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been tested and found to comply with the limits of a Class B computing device in accordance with the specifications in Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna.

Relocate the equipment and or any computer with respect to the receiver.

Move the equipment and or any computer away from the receiver.

Plug the equipment and or any computer into a different outlet so that equipment and or any computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the U. S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

**Note:** Check specific countries, rules and regulations for EMI standards.

**Preface**

This service manual is intended for use by trained technicians performing service on the 5310 and 5320 Printers.

This manual has eight sections which provide an Introduction, General Description, Installation and Removal, Testing, Troubleshooting, Disassembly/Reassembly, Wiring, and Maintenance Spares.

Appendix A (Adjustments) and Appendix B (Printers, Parts and Accessories) are also included for your convenience.

Safety is stressed throughout this manual. Safety notes are included where needed by the words: Caution and Warning. These notes should be read carefully and followed explicitly to minimize the risk of personal injury or property damage.

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Table of Contents

	Page
1. Introduction .....	1-1
2. General Description .....	2-1
3. Installation and Removal .....	3-1
4. Testing .....	4-1
5. Troubleshooting .....	5-1
6. Disassembly/Reassembly .....	6-1
7. Wiring .....	7-1
8. Maintenance Spares .....	8-1
Appendix A - Adjustments .....	A-1
Appendix B - Printers, Parts and Accessories .....	B-1



## List of Figures

Figure	Title	Page
1-1	Task Flow and Page References	1-2
2-1	5310/5320 Printers	2-2
2-2	Printer Code Plate Location	2-3
2-3	Ribbon Cartridge	2-14
2-4	Printhead	2-14
2-5	Control Panel Key Layout	2-21
2-6	Status Indicator Layout	2-21
2-7	5310 Keyboard Layout	2-22
2-8	5320 United States/United Kingdom Keyboard	2-23
2-9	French Keyboard	2-24
2-10	German Keyboard	2-24
3-1	Keyboard Connection	3-8
3-2	Paper Separator Installation	3-8
3-3	FCC Labeling	3-9
3-4	Modular Telephone Connections	3-10
3-5	Integrated Modem Interface Pin Assignments	3-11
3-6	Acoustic Coupler Interface Unit Connections	3-12
3-7	Acoustic Coupler Interface Unit Pin Assignments	3-12
3-8	External Modem Connections	3-13
3-9	EIA Interface Access	3-13
3-10	Interface Pin Assignments - RS-232-C (EIA)	3-15
3-11	Option Lockout Switch	3-16

List of Figures

Figure	Title	Page
3-12	Options Lockout Strap	3-17
3-13	Power Supply Conversion	3-19
3-14	Printer Packing	3-24
3-15	Printer Connection to a Display Terminal	3-25
3-16	5310/5320 to 6300 PC NUL Modem Cable Wiring	3-29
4-1	Options Dump	4-4
4-2	Test Message	4-5
4-3	Keys Used With CAPS LOCK Key	4-7
4-4	Printout Using CAPS LOCK Key	4-7
4-5	Printout Without Using CAPS LOCK Key	4-7
4-6	Keys Used With SHIFT Key	4-8
4-7	Printout Using SHIFT Key	4-8
4-8	EIA Interface Loopback Connector	4-11
5-1	Power Supply Voltages and Check Points	5-5
5-2	Horizontal Character Alignment	5-6
5-3	Terminal Control Card LED	5-7
6-1	Keyboard Removal	6-3
6-2	Printhead Removal	6-4
6-3	Platen Assembly Removal	6-7
6-4	Platen Assembly Installation	6-8
6-5	Top Cover Removal	6-9
6-6	Switch and Display Card Removal	6-12
6-7	Switch (Front Panel) Removal	6-13

## List of Figures

Figure	Title	Page
6-8	Power Supply Removal	6-14
6-9	Terminal Control Card Removal	6-15
6-10	Interface Card (Modem, Current Loop or SSI Card) Removal	6-16
6-11	Print Engine Removal	6-17
6-12	Print Engine Driver Card Removal	6-19
7-1	Printer Block Wiring Diagram	7-2
7-2	Interface - Modem Block Wiring Diagram	7-3
7-3	Interface - SSI Block Wiring Diagram	7-4
7-4	Interface - Current Loop Block Wiring Diagram	7-5
8-1	Maintenance Spares Identification	8-3
A-1	Carriage Assembly Pinion and Transfer Gear	A-3
A-2	Carriage Roller Assembly	A-4
A-3	Carriage Motor Belt Tension	A-5
A-4	Line Feed Motor and Intermediate Gear	A-6
A-5	Line Feed Idler, Platen, and Intermediate Gears	A-7
A-6	Bidirectional and Pull Tractor Idler Gear	A-8
A-7	Idler and Platen Gear Location	A-9
A-8	Intermediate Gear and Tractor Gear	A-10
A-9	Idler Gear and Intermediate Gear	A-11
A-10	Tractor Idler Gear and Platen Gear	A-12
A-11	Horizontal Line Check	A-13
A-12	Friction Feed Paper Holder	A-14



## List of Tables

Table	Title	Page
2-A	Printer Identification	2-6
4-A	Testing Procedures (Common to All Printers)	4-3
4-B	Printers With Keyboard	4-7
4-C	Numeric Pad (56K228AAM Keyboard)	4-9
4-D	Numeric Pad (56K235AAZ Keyboard)	4-9
4-E	Numeric Pad (56K310ACV Keyboard)	4-10
4-F	Numeric Pad (56K Series Keyboard)	4-10
4-G	Printers With EIA Interface	4-12
4-H	Printers With Internal Modem and Keyboard	4-12
4-I	Printers With Internal Modem and Keyboard	4-13
5-A	Error Messages	5-7
5-B	Trouble Analysis	5-8
8-A	Circuit Card Compatibility	8-4
B-A	Circuit Card Compatibility	B-5





Table 2-A. Printer Identification (Continuation)

AC Input Voltage	Paper Type	Configuration	Interface	Catalog Code	Top Cover Color*	Buffer Size	Printer Code †	Price Element Code	Comcode	
115 Vac Domestic	Friction Feed	RO	EIA	5320-1A0A	Grey	4K	53P150BAC	3353-020	501002588	
					Grey	8K	53P150BAE	3353-020	501006167	
					Black	8K	53P150BKE		501006175	
		KP	Modem	5320-1A0B	Grey	4K	53P151BAC	3353-021	501002596	501002596
					Grey	4K	53P151BAE	3353-021	501006183	
					Grey	4K	53P150BAC	3353-020 & 33520	501002588 & 500066758	
		KP	Modem	5320-1ABB	Grey	4K	53P151BAC	3353-021 & 33520	501002596 & 500066758	501002596 & 500066758
					Grey	8K	53P151BAE	3353-021 & 33520	501006183 & 500066758	
					Grey	8K	53P151BAE	3353-021 & 33520	501006183 & 500066758	
230 Vac International	Friction Feed	RO US UK	EIA	5320-1A0R	Grey	4K	53P152BAC	3353-020I	501002604	
					Grey	8K	53P152BAE	3353-020I	501006191	
		KP US UK	EIA	5320-1ABR	Grey	4K	53P152BAC	3353-020I & 33520		
					Grey	8K	53P152BAE	3353-020I & 33520		

\*Cobblestone (dark) grey or black (custom color) top covers are available.

†Printers with BAC codes are early design. Printers with BAE or BKE codes are late design and will be furnished on orders for early design printers.

**Note:** The "BKE" coded printers do not have catalog codes or price element codes assigned. They are identical to the "BAE" coded printers except they have custom black top covers and lids instead of charcoal grey.

Catalog Codes (Models)

- 5310-1AAB: Designed for the greatest flexibility, this 9-1/2 inch friction feed compact model provides a keyboard and integrated 300/1200 baud dialing modem which allows the printer to directly connect to a modular telephone jack for origination and answering calls. An optional acoustic coupler interface unit can be added to the integrated modem for applications where a modular jack is not available. This model can also interface directly to a device or system by using an EIA/CCITT-RS-232-C compatible connection which is standard on all models. This model can be used in 115 Vac applications.
- 5310-1BAB: This 9-1/2 inch pin feed compact model includes all the features of the Model 5310-1AAB.
- 5310-1AOB: This model is a receive only 9-1/2 inch friction feed compact printer and includes all the features of the Model 5310-1AAB, except the keyboard, while still maintaining user control of the printer.
- 5310-1BOB: This model is a receive only 9-1/2 inch pin feed compact printer and includes all the features of the Model 5310-1BAB, except the keyboard, while still maintaining user control of the printer.
- 5310-1AAA: This model is a 9-1/2 inch friction feed compact, direct connection (RS-232-C) printer with all features of the Model 5310-1AAB except the integrated 300/1200 baud modem.
- 5310-1BAA: This model is a 9-1/2 inch pin feed compact, direct connection (RS-232-C) printer with all the features of the Model 5310-1BAB except the integrated 300/1200 baud modem.
- 5310-1AOA: This model is a receive only 9-1/2 inch friction feed compact, direct connection (RS-232-C) printer with all the features of the Model 5310-1AAB except the keyboard and the integrated 300/1200 baud modem.

Table 2-A. Printer Identification

AC Input Voltage	Paper Type	Configuration	Interface	Catalog Code	Top Cover Color*	Buffer Size	Printer Code †	Price Element Code	Comcode
115 Vac Domestic	Friction Feed	RO	EIA	5310-1A0A	Grey	4K	53P101BAC	3353-010	501002521
					Grey	8K	53P101BAE	3353-010	501006084
					Black	8K	53P101BKE		501006092
		Modem	5310-1A0B	Grey	4K	53P102BAC	3353-011	501002539	
				Grey	8K	53P102BAE	3353-011	501006100	
		KP	EIA	5310-1AAA	Grey	4K	53P101BAC	3353-010 & 33510	501002521 & 500064688
					Grey	8K	53P101BAE	3353-010 & 33510	501006084 & 500064688
					Black	8K	53P101BKE		501006092 & 500064688
			Modem	5310-1AAB	Grey	4K	53P102BAC	3353-011 & 33510	501002539 & 500064688
					Grey	8K	53P102BAE		501006100 & 500064688
	Pin Feed	RO	EIA	5310-1B0A	Grey	4K	53P103BAC		501002547
					Grey	8K	53P103BAE		501006118
					Black	8K	53P103BKE		501006126
			Modem	5310-1B0B	Grey	4K	53P104BAC		501002554
					Grey	8K	53P104BAE		501006134
		KP	EIA	5310-1BAA	Grey	4K	53P103BAC		501002547 & 500064688
					Grey	8K	53P103BAE		501006118 & 500064688
					Black	8K	53P103BKE		501006126 & 500064688
			Modem	5310-1BAB	Grey	4K	53P104BAC		501002554 & 500064688
					Grey	8K	53P104BAE		501006134 & 500064688

\*Cobblestone (dark) grey or black (custom color) top covers are available.

†Printers with BAC codes are early design. Printers with BAE or BKE codes are late design and will be furnished on orders for early design printers.

**Note:** The "BKE" coded printers do not have catalog codes or price element codes assigned. They are identical to the "BAE" coded printers except they have custom black top covers and lids instead of charcoal grey.

Table 2-A. Printer Identification (Continuation)

AC Input Voltage	Paper Type	Configuration	Interface	Catalog Code	Top Cover Color*	Buffer Size	Printer Code †	Price Element Code	Comcode
230 Vac International	Friction Feed	RO US UK	EIA	5310-1AOR	Grey	4K	53P105BAC	3353-0101	501002562
					Grey	8K	53P105BAE	3353-0101	501006142
		KP US UK	EIA	5310-1AAR	Grey	4K	53P105BAC	3353-0101 & 33510	501002562 & 500064688
					Grey	8K	53P105BAE	3353-0101 & 33510	501006142 & 500064688
	Pin Feed	RO US UK	EIA	5310-1BOR	Grey	4K	53P106BAC		501002570
					Grey	8K	53P106BAE		501006159
		KP US UK	EIA	5310-1BAR	Grey	4K	53P106BAC		

\*Cobblestone (dark) grey or black (custom color) top covers are available.

†Printers with BAC codes are early design. Printers with BAE or BKE codes are late design and will be furnished on orders for early design printers.

**Note:** The "BKE" coded printers do not have catalog codes or price element codes assigned. They are identical to the "BAE" coded printers except they have custom black top covers and lids instead of charcoal grey.

The following is a summary of the added features the "BAC" version printers provided.

- A. Answerback changed to optionally disable local printing of the answerback message.
- B. Changed error handling method and added LINK and JAM to LCD display messages.
- C. Changed Print with Controls to print DC1 and DC3 flow control characters if optioned for FLOW value set to YES and Local Echo value set to YES.
- D. Added option to ignore received parity.
- E. Improved Model 43 emulation by ignoring the HT, VT and FF characters. Also handling of invalid escape sequences the same as the Model 43.
- F. Added ignore (IGNR) option value to the emulation option.
- G. Added EBCDIC font.
- H. Improved the left and right alignment adjustment by using the active CPI and print speed when performing the ALGN self-test.
- I. Improved line feed software providing faster line feed.
- J. Added reverse line feed.
- K. Added incremental forward and reverse line feed.
- L. Added slashed zero option (all fonts except APL and MOSAIC).
- M. Added buffer overflow indication by printing the SUB character and ringing the bell.
- N. These printers are FCC Class B Certified.
- O. Increased buffer size to 4K. Option value choices are 1/4K, 2K and 4K.
- P. Changed paper out mechanism parts to accommodate the bidirectional tractor assembly.

The following is a summary of the added features the "BAE" and "BKE" version printers provided. The "BKE" version printer is identical to the "BAE" version except the top cover and lid are black instead of charcoal grey.

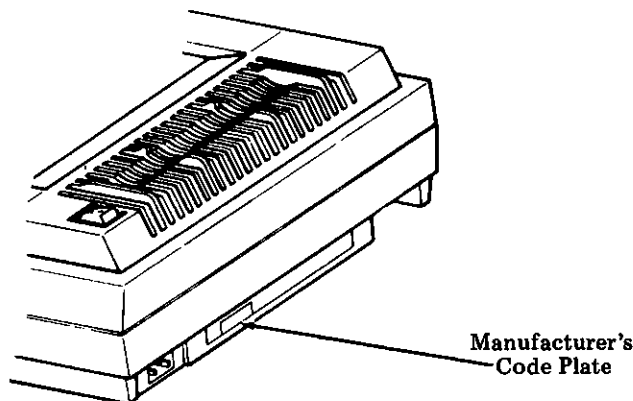
- A. Increased buffer size to 8K. Option value choices are 1/4K, 2K and 8K.
- B. The top cover and lid are available in two colors; black or charcoal grey.

### Printer Identification

There are five versions of the 5310 and 5320 Printers. The printer version can be identified by the three alpha characters located at the end of the printer code which is located on the code plate. See "Figure 2-2. Printer Code Plate Location" for location of the code plate. The "AAA" coded printers were the first printer release. The "AAB" coded printers were the second release and provided enhancements over the "AAA" coded printers. The "BAC" coded printers were the third release printers and provided enhancements over the "AAB" coded printers. The "BAE" and "BKE" coded printers are the current release and provide further enhancements over the previous version printers.

All printers have a misty cream housing with cobblestone grey cover except the BKE coded printers which have a custom black cover instead of a cobblestone grey cover.

The BKE coded printers do not have catalog codes or price element codes assigned.



**Figure 2-2. Printer Code Plate Location**

The following is a summary of the added features the "AAB" version printer provided. Complete descriptions of the printers are provided in Sections 2 and 3 of this document.

- A. Options Lockout mode preventing the operator from changing options.
- B. Entry into the Options mode is treated as an alarm. The printer will cause a disconnect if Disconnect on Alarm option value is YES or will activate flow control if the FLOW option value is CHAR or EIA.
- C. Null and Delete characters are not stored in the receive buffer unless the Print with Controls option value is YES.
- D. Horizontal tabs and underscore are now performed bidirectionally without detracting from the printer throughput.
- E. The printer will enter high speed print mode if no characters are received from the keyboard within 2.5 seconds.
- F. Software improvement to better handle ragged right hand margins improving printer throughput.
- G. In addition to the standard 72 dots per inch vertical resolution in bit mapped graphics, 144 dot per inch has been added to provide a higher vertical resolution.
- H. Additional escape sequences have been added to take advantage of the increased vertical resolution for bit mapped graphics and to be compatible with commercial software printer drivers for this feature.
- I. Software has been added to support new versions of wide keyboards.



2. General Description

Contents	Page
Overview .....	2-1
Product Overview .....	2-2
Printer Identification .....	2-3
Key Features .....	2-13
Printing Features .....	2-14
Keyboard Features .....	2-16
Additional Features .....	2-17
Self-Test Modes .....	2-18
Summary of Options .....	2-18
Interface Features .....	2-20
Internal Modem (Optional) .....	2-20
EIA .....	2-20
Acoustic Coupler Interface Unit (Optional) .....	2-20
Control Panel Keys and Status Indicators .....	2-21
Keyboard Layout .....	2-22
References .....	2-25
Document Ordering .....	2-27

**Overview**

This section provides a general description of the 5310 and 5320 Printers. See "Printer Identification", in this section.

### Product Overview

The Model 5310 and 5320 Printers meet the requirements of compact and tabletop data applications. These printers are preprogrammed single user full duplex (FDX) only (with local sent copy under option control), impact dot matrix character printers with a maximum instantaneous speed of 200 characters per second. These printers can be used for dial up or point to point applications.

The Keyboard Printer set (KP) allows sending data from the keyboard and receiving data on the printer as well as local keyboard printer operation. By removing the keyboard, the KP set becomes a fully functional Receive Only (RO) or auxiliary printer with a self-contained control panel for mode and option control. The RO is intended for traditional receive only applications and for use as an auxiliary printer for Keyboard/Display Terminals. The printers are intended for tabletop attended applications and as the main console for computers. The 5310 Printer can also be used in applications where portability is required.

Salesmen can obtain updated sales forecasts, price lists or technical data and prepare contracts or agreements on-line or while at the customer's place of business. Programmers, engineers and students can access business or time share computers at the office, at home or at school. High resolution bit mapped graphics enable charts and graphs to be received on-line wherever the location. A data connection is as close as the nearest telephone line.

There are forty two models of the 5310 and 5320 Printer designed to fill the requirements of a wide variety of customers.

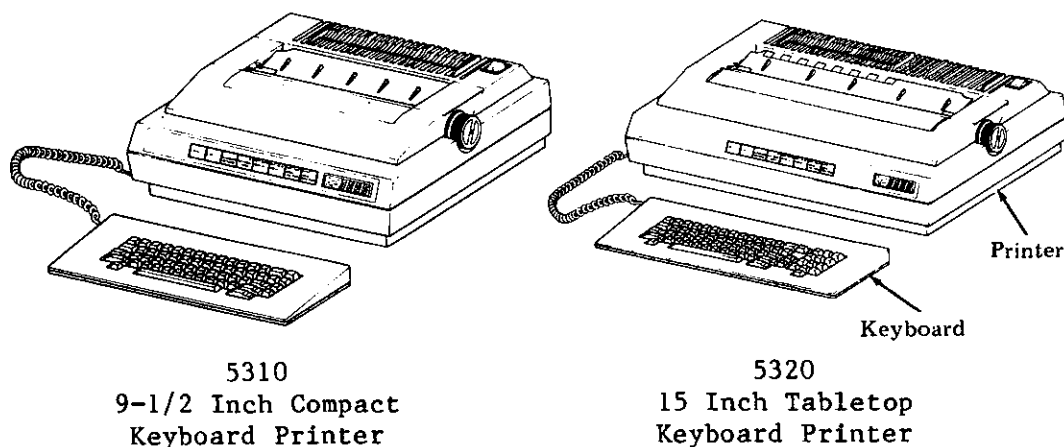


Figure 2-1. 5310/5320 Printers

## 1. Introduction

This manual provides information for the 5310 and 5320 Printers. The manual is divided into sections that cover the assembled printer and its major components. Each section contains task related information that provides instructions for use by servicing personnel when performing the servicing required for installation, testing, and troubleshooting the printer.

Servicing in this manual consists of correction of troubles by means of limited repair (i.e., replacement of major components designated as field replaceable and adjustments) that can be readily performed by service personnel without special skills or special facilities.

The field replaceable components included in this manual, as listed in Section "8. Maintenance Spares," consist of major components that can be easily identified as the cause of a trouble.

The troubleshooting, disassembly and wiring information provided in the various sections of this manual are directly related to the level of these major components.

The selection, stocking (quantity), and location of the major replaceable components/or spare printers should be planned by the service organization and should depend on the quantity of printers in service, their geographical distribution, customer sensitivity to down time, and inventory costs.

The Task Flow chart on the following page illustrates the intended servicing activities and their associated manual sections.

A brief training course and the maintenance spares (as recommended in Section "8. Maintenance Spares") are available from AT&T. Service personnel should be properly trained and have access to maintenance spares before attempting to service 5310 and 5320 Printers.

This issue of the Service Manual covers printers with the manufacturer's code suffix of "AAA", "AAB", "BAC", "BAE" and "BKE".

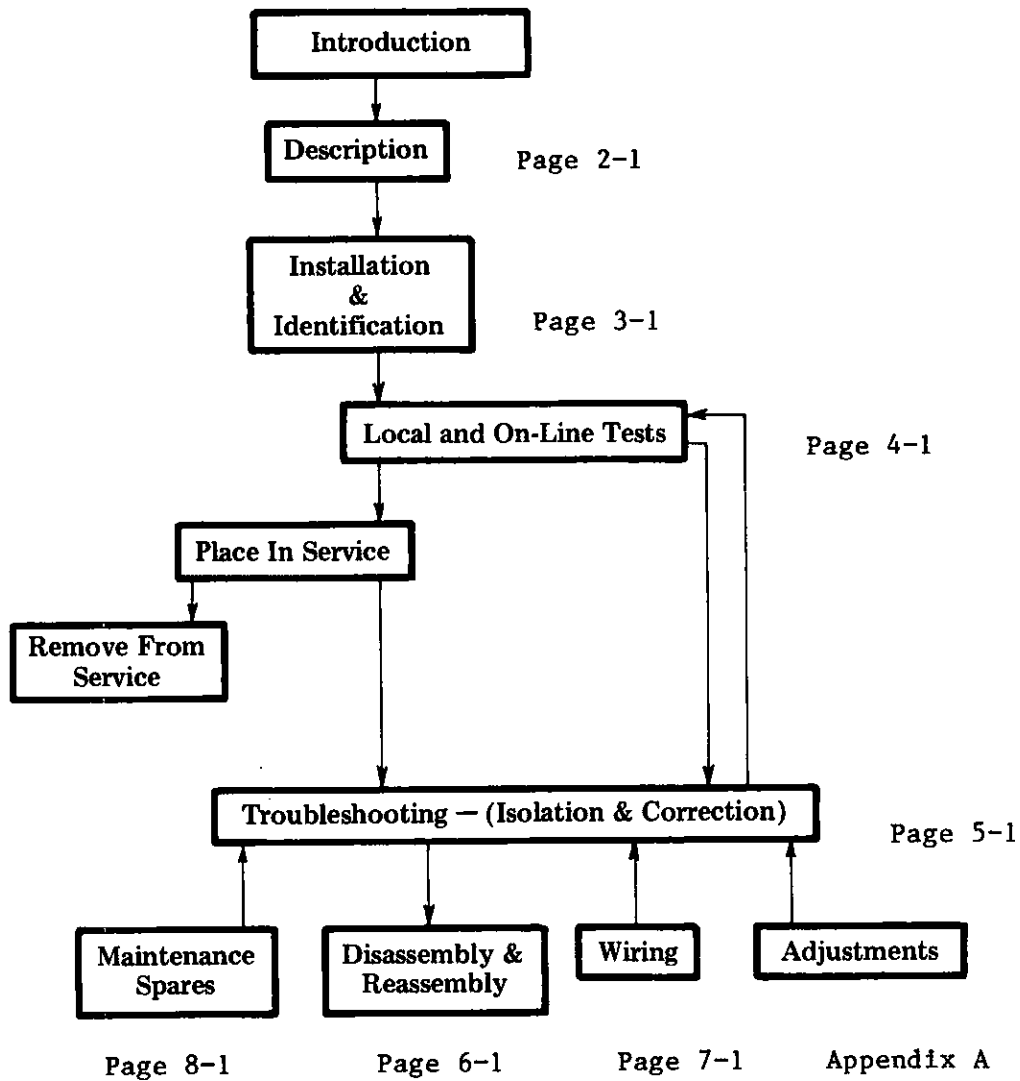


Figure 1-1. Task Flow and Page References

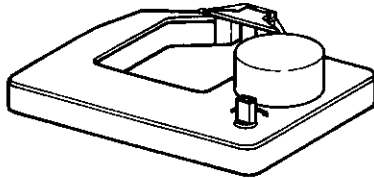
- 5310-1BOA: This model is a receive only 9-1/2 inch pin feed compact, direct connection (RS-232-C) printer with all the features of the Model 5310-1BAB except the keyboard and the integrated 300/1200 baud modem.
- 5310-1AAR: This 9-1/2 inch friction feed compact, 230 Vac model is designed to comply with International Safety and EMI Requirements, including IEC380, VDE0806 and VD0871 Level A. This model provides a keyboard and can interface directly to a device or system using an EIA/CCITT-RS-232-C compatible connection. This can be used in 230 Vac applications.
- 5310-1BAR: This 9-1/2 inch pin feed compact 230 Vac model includes all the features of a Model 5310-1AAR.
- 5310-1AOR: This 230 Vac model is a receive only 9-1/2 inch friction feed compact printer and includes all the features of the Model 5310-1AAR, except the keyboard, while still maintaining user control of the printer.
- 5310-1BOR: This 230 Vac model is a receive only 9-1/2 inch pin feed compact printer and includes all the features of the Model 5310-1BAR, except the keyboard, while still maintaining user control of the printer.
- 5320-1ABB: Designed for the greatest flexibility, this 15 inch friction feed tabletop model provides a keyboard and integrated 300/1200 baud dialing model which allows the printer to directly connect to a modular telephone jack for origination and answering calls. An optional acoustic coupler interface unit can be added to the integrated modem for applications where a modular jack is not available. This model can also interface directly to a device or system by using an EIA/CCITT-RS-232-C compatible connection which is standard on all models. This model can be used in 115 Vac applications.
- 5320-1A0B: This model is a receive only 15 inch friction feed tabletop printer and includes all the features of the Model 5320-1ABB, except the keyboard, while still maintaining user control of the printer.

- 5320-1ABA: This model is a 15 inch friction feed table-top, direct connection (RS-232-C) printer with all features of the Model 5320-1ABB except the integrated 300/1200 baud modem.
- 5320-1AOA: This model is a receive only 15 inch friction feed tabletop, direct connection (RS-232-C) printer with all the features of the Model 5320-1ABB except the keyboard and integrated 300/1200 baud modem.
- 5320-1ABR: This 15 inch friction feed tabletop, 230 Vac model is designed to comply with International Safety and EMI Requirements, including IEC380, VDE0806 and VDE0871 Level A. This model provides a keyboard and can interface directly to a device or system using an EIA/CCITT-RS-232-C compatible connection. This model can be used in 230 Vac applications.
- 5320-1AOR: This 230 Vac model is a receive only 15 inch friction feed tabletop printer and includes all the features of the Model 5320-1ABR, except the keyboard, while still maintaining user control of the printer.

**Key Features**

- Plain paper printing
- Instantaneous print speed up to 200 CPI.
- 110 to 9600 baud communications speeds
- 10 National ASCII variations: Canadian/French, English, French, Spanish, Swedish, Norwegian/Danish, Italian, Germanic, Finnish and Japanese
- EBCDIC font ("BAC, BAE and BKE" coded printers only)
- APL (A Programming Language) font
- Mosaic font
- Securities font
- Line drawing graphics
- Bit mapped graphics - low and high resolution
- Model 43 Teleprinter emulation
- ANSI emulation (X3.64 1979 Format escape sequences)
- Multiple internal diagnostics
- Primary or alternate option set (operator selectable from control panel)
- 115 Vac power supply ("AAA" coded printers)
- 115/230 Vac power supply (all printers except "AAA" coded printers)
- 9 wire printhead with a life expectancy of 300 million characters
- Self-inking ribbon cartridge with a life expectancy of 7 million characters
- Printer flow control with DC1/DC3 or EIA pins 11 and 19, also inverted EIA pins 11 and 19
- DC2/DC4 on/off control
- Programmable receive buffer

- Buffer overflow indication ("BAC, BAE and BKE" coded printers)
- Friction feed with a maximum width of 8.5 inches
- Six auto string (PF keys)

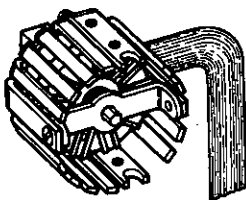


The self-inking ribbon cartridge easily snaps in and out for convenience and efficient use.

**Figure 2-3. Ribbon Cartridge**

### Printing Features

The 5310 and 5320 Printers will print on any form up to 21 inches in length and up to a thickness of 0.021 inches. The types of paper that can be used are roll or single sheet paper on friction feed printers and fanfold paper on pin feed printers or friction feed printers with optional push or pull tractor mechanism installed. The variable spacing, forms handling and print sizes allow the user to remotely generate documents using preprinted forms.



The printhead produces text or graphics on roll, fanfold or single sheet paper on a variety of forms.

**Figure 2-4. Printhead**

### Printing Functions Include:

- Original and up to five copies (maximum form thickness of 0.021 inches) fanfold paper
- Bidirectional printing
- Last character visibility (using VIEW function)



- 7 by 9 dot matrix font (normal)
- 10 by 9 dot matrix for Line Drawing and Mosaic Fonts
- Vertical/horizontal spacing and print size control via host or keyboard
- Bit mapped graphics with a resolution of: 150 or 75 dots per inch horizontally, 72 ("AAA" coded printers) or 72 and 144 (all except "AAA" coded printers) dots per inch vertically, aspect ratio = 2.08 or 1.04
- Emphasized printing
- Compressed/expanded width characters
- Reverse line feed ("BAC, BAE and BKE" coded printers)
- Incremental forward and reverse line feed ("BAC, BAE and BKE" coded printers)
- Print slashed zero option ("BAC, BAE and BKE" coded printers)
- Character column indicator
- Forms thickness adjustment
- Autowrap at right margin
- Auto carriage return on line feed
- Auto line feed on carriage return
- Left and right margin set and clear
- Top and bottom margins for perforation skip
- Form lengths up to 21 inches
- Paper-out sensor
- Tear off bar
- Plain paper, single sheet insertion
- Electronic top of form
- Vertical alignment adjustment (soft roll platen)



- Three tilt positions (4, 8 or 12 degrees)
- Caps and numeric lock with visual indication on display
- Modular telephone-type cable connection
- Detached, true low profile style (meets 30 mm DIN height standard)
- Coiled cable for remote operation (up to 3 feet)
- Low profile design
- Nonglare keys
- Alternate key pad mode (keyboard with separate pad only)

**Additional Features**

- Answer-back message (up to 30 characters)
- Auto answer-back on auto answer
- Inhibit local printing of answer-back ("BAC, BAE and BKE" coded printers)
- Auto, manual or coded disconnects
- Printer on/off control
- Parity detect and transmit (even, odd, mark, space and none)
- Multiple baud rates of 110, 300, 600, 1200, 1800, 2400, 4800 and 9600
- Local echo select
- Integrated modem with auto speed select
- Bell tone for signal and margins
- Alarm and status indicators

### Self-Test Modes

Numerous internal self-tests exist to diagnose the terminal controller, printer controller and mechanism, display/control panel, keyboard and interface.

### Summary of Options

- RETURN key transmits - up to 3 characters
- Horizontal tab settings - any column
- Vertical tab settings - any line
- View last character printed
- Print control codes
- Character/inch setting
- Lines/inch setting
- Form definitions
- Autowrap
- New-line definition
- Character set selection
- Alternate font
- Speed selection (110 - 9600 baud)
- Flow control (character DC1/DC3 or EIA, normal or inverted)
- DC2/DC4 control
- Disconnect on paper out alarm
- Disconnect on EOT
- Local ECHO
- Parity check with character substitution
- Ignore received parity while sending any parity ("BAC", "BAE" and "BKE" coded printers)

- Control sequence emulation
- Select slashed or not slashed zero ("BAC", "BAE" and "BKE" coded printers)
- Software adjustable vertical alignment
- Receive buffer size selection (1/4K, 1K, 2k "AAA" and "AAB" coded printers), (1/4K, 2K, 4K "BAC" coded printers) or (1/4K, 2K, 8K "BAE" and "BKE" coded printers)
- Answer-back
- Inhibit local printing of answer-back ("BAC", "BAE" and "BKE" coded printers)
- Communications mode
- Low paper
- Save options

## Interface Features

### Internal Modem (Optional)

- 212 Compatible (Asynchronous)
- RJ11 jack
- Auto answer
- Auto dial
- Auto redial
- Keyboard dial
- Touch-Tone or pulse dial
- Line status indication
- Full duplex operation

### EIA

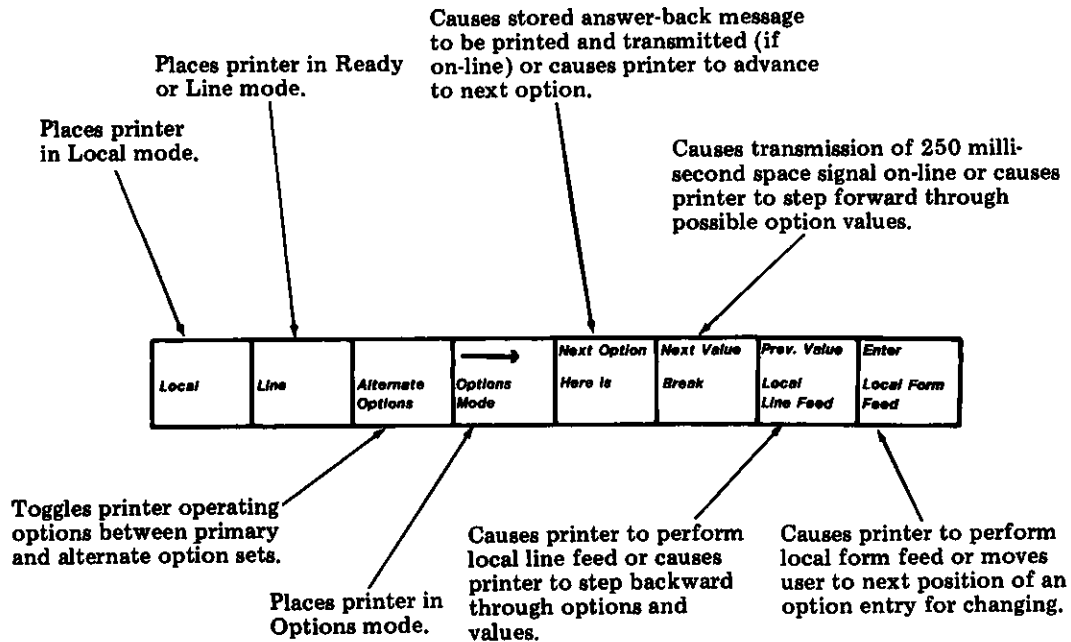
- RS-232-C compatible

### Acoustic Coupler Interface Unit (Optional)

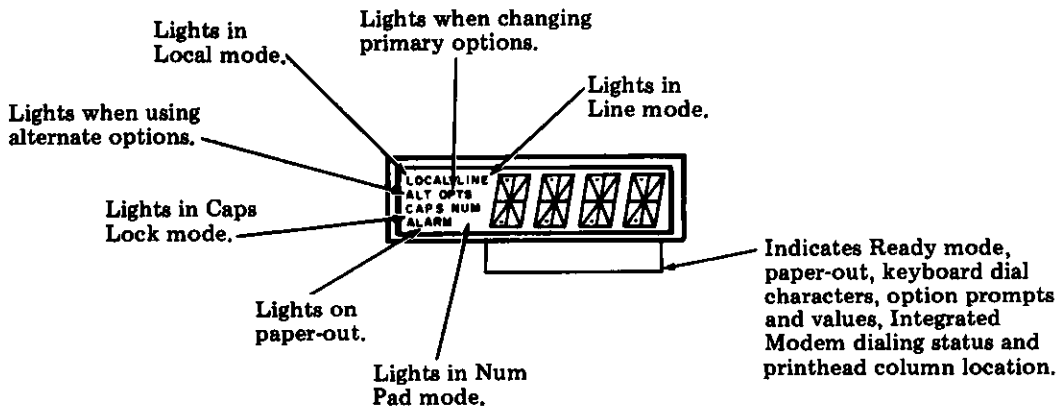
- Originate only
- Full duplex operation only
- 110 or 300 baud rate
- Also operates at 1200 baud although characteristics of some handsets will result in increased error rate.

**Control Panel Keys and Status Indicators**

All functions associated with options are designated in BLUE on the control panel.



**Figure 2-5. Control Panel Key Layout**



**Figure 2-6. Status Indicator Layout**

Keyboard Layout

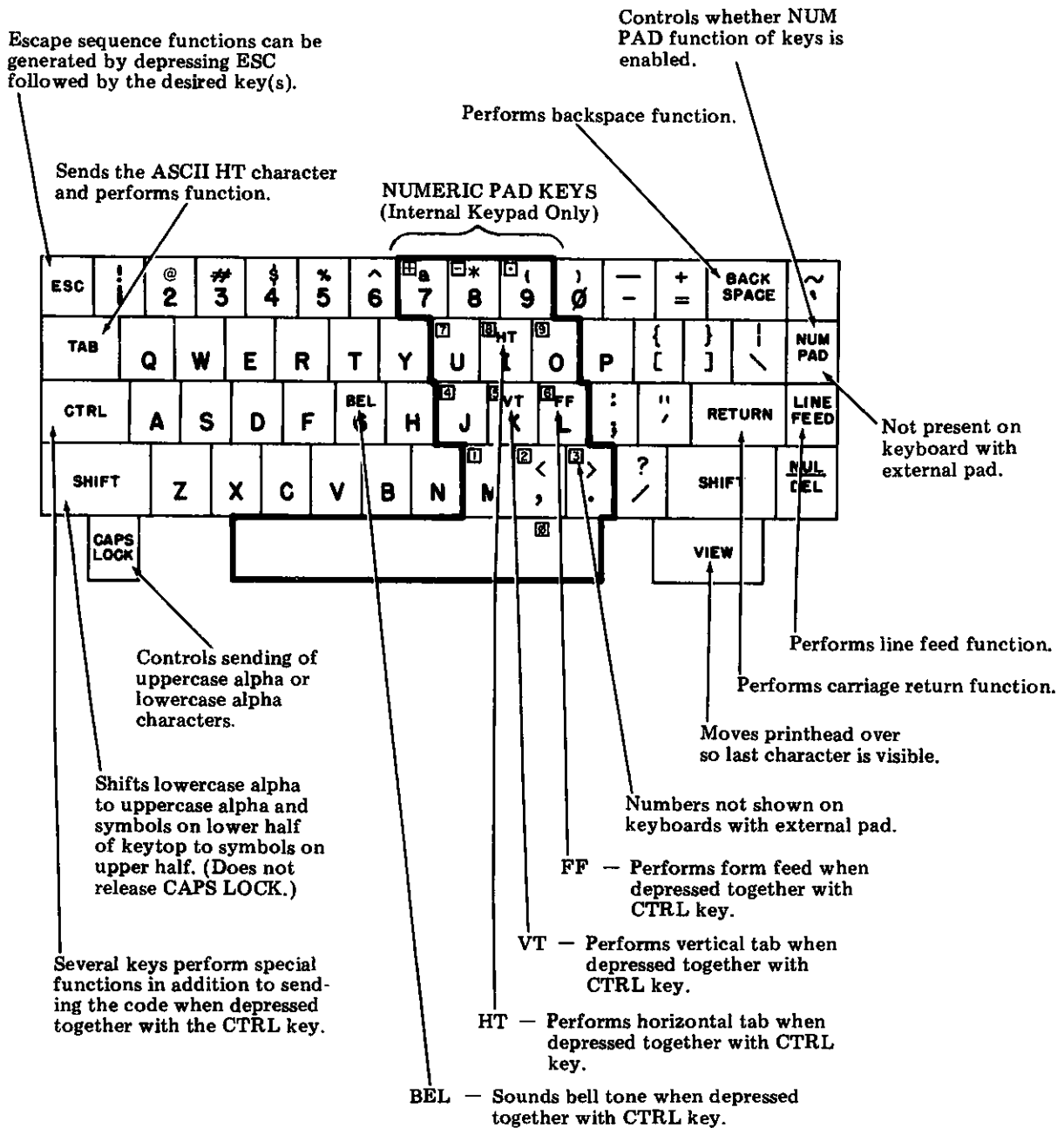
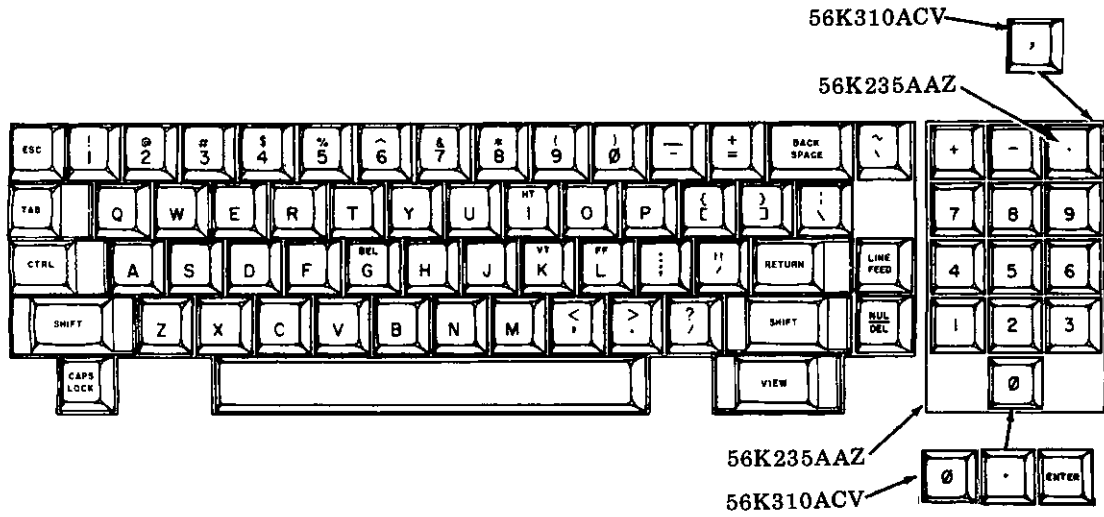


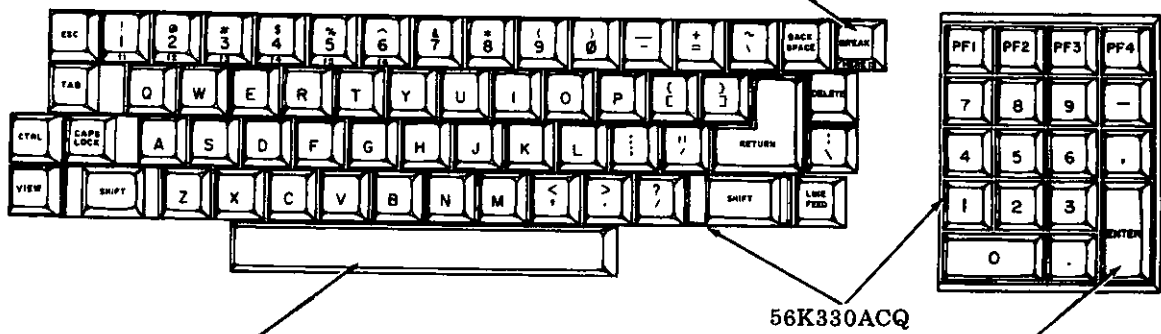
Figure 2-7. 5310 Keyboard Layout





Break — Active on-line only. Depressing key causes transmission of 250 millisecond space signal. Depressing SHIFT and BREAK keys causes transmission of 3-1/2 second space signal. Depressing CTRL and BREAK keys causes transmission of answer-back message.

Dedicated Keypad  
Program Function Keys



ENTER — Performs carriage return function. (See RTRN Option)

Spacebar — Depressing CTRL and SPACEBAR generates a null when on-line.

Figure 2-8. 5320 United States/United Kingdom Keyboard

### References

The documentation for the 5310 and 5320 Printer includes all information necessary to install, operate and to maintain service based on replacement of major components utilizing the maintenance spares listed in Section "8. Maintenance Spares".

**Note:** An illustrated mechanical repair parts list is also provided in this Service Manual, and Wiring Diagrams (along with parts lists for circuit cards) are in the WDP.

Manual	Number	Availability	Comcode	PE Code
5310/5320 Printer User's Guide (AAA, AAB, ABB, and ACB version)	999-300-183IS	Shipped with printer.	501000608	None
5310/5320 Printer User's Guide (BAC, BAE, and BKE version)	999-300-274IS	Shipped with printer.	501001754	None
The 5310 and 5320 Printer Pocket Reference Guide (AAA, AAB, ABB, and ACB version)	999-302-183IS	Shipped with printer.	501000699	None
The 5310 and 5320 Printer Pocket Reference Guide (BAC, BAE, and BKE version)	999-300-275IS	Shipped with printer.	501001762	None
5310 and 5320 Printer KP and RO Service Manual	582-405-030IS	Available for ordering.	501000095	1633-815
5310/5320 Reference Manual	999-301-183IS	Available for ordering.	501001036	None
Job Aid for the 5310 and 5320 Printer	582-405-000IS	Available for FSO (Field Service Organization) only.	None	None
The 5310 and 5320 Printer Testing Using Portable Equipment	582-405-050IS	Available for FSO (Field Service Organization) only.	None	None
5310 and 5320 Printer Remote On-Line Testing	582-405-060IS	Available for FSO (Field Service Organization) only.	None	None

Manual	Number	Availability	Comcode	PE Code
Wiring Diagram Package for Printer	WDP 0627	Available for ordering.	None	None
Wiring Diagram Package for 56K228/AAM	WDP 0628	Available for ordering.	None	None
Wiring Diagram Package for 56K235/AAZ	WDP 0650	Available for ordering.	None	None
Wiring Diagram Package for 56K310/ACV	WDP 0683	Available for ordering.	None	None
Wiring Diagram Package for 56K330 Keyboards	WDP 0681	Available for ordering.	None	None
Specification for tractor mechanism (Pull or Push) or pin feed platen	52004S	Shipped with Mod kit.	None	None
Specification for Modem Mod kit	52008S	Shipped with Mod kit.	None	None
Specification for Paper Roll Support	52025S	Shipped with Mod kit.	None	None
Specification for Current Loop	52034S	Shipped with Mod kit.	None	None
Specification for AAB EPROM	52035S	Shipped with Mod kit.	None	None
Specification for Paper Winder	52050S	Shipped with Mod kit.	None	None

<b>Manual</b>	<b>Number</b>	<b>Availability</b>	<b>Comcode</b>	<b>PE Code</b>
Specification for SSI to EIA	52058S	Shipped with Mod kit.	None	None
Specification for Bidirectional Tractors	52060S	Shipped with Mod kit.	None	None
Specification for Protective Cover	52064S	Shipped with Mod kit.	None	None
Specification for Tear Window	52065S	Shipped with Mod kit.	None	None

**Document Ordering**

The above documents can be ordered:

By calling:

800-432-6600 (for price quote - all orders shipped on  
a prepaid basis).

By writing:

AT&T Customer Information Center  
Commercial Sales Representative  
P.O. Box 19901  
Indianapolis, IN 46219

Orders are acknowledged with a written price quote. All  
orders are shipped on a prepaid basis.

3. Installation and Removal

Contents	Page
Overview .....	3-2
Tools Required .....	3-3
Installation Procedure .....	3-3
Unpacking .....	3-4
5310 Printer Identification .....	3-5
5320 Printer Identification .....	3-7
Keyboard Connection (KP Sets Only) .....	3-8
Paper Separator Installation (Pin Feed Printers Only) .....	3-8
5310/5320 Printers With Integrated Modem .....	3-9
5310/5320 Printers With RS-232-C (EIA) Interface ....	3-13
Option Lockout .....	3-16
Power Supply Replacement/Conversion .....	3-18
Installation Checkout .....	3-19
Initiate Service .....	3-20
Accessories .....	3-20
Power Requirements .....	3-22
Incidence of Harm .....	3-22
Changes in Telephone Company Facilities, Equipment, Operations, or Procedures .....	3-22
Repair .....	3-23
Printer Removal .....	3-24
5310/5320 Connection, Setup and Operation With a 4410 Terminal .....	3-25
5310/5320 Connection, Setup and Operation With a 4415 Terminal .....	3-27
5310/5320 Connection, Setup and Operation With a 4425 Terminal .....	3-28
5310/5320 Connection and Setup With an AT&T 6300 PC .....	3-29

## Overview

This section provides information on the installation and removal of the 5310 and 5320 KP and R0 printers. Instructions are provided for the user to connect the proper interface and correct minor troubles.

The KP printers described in this manual provide character-at-a-time keyboard printer, send-receive operation. The R0 printers are intended for receive-only applications and for use as auxiliary printers for keyboard display terminals and connection to processors. Paper is 8-1/2 inch wide friction feed, optional 9-1/2 inch wide pin feed using the pin feed platen or optional tractor (5310) or 15 inch (5320) wide pin feed paper using optional tractor. Single sheet insertion capabilities are also provided.

The printers can operate at 110, 300, 600, 1200, 1800, 2400, 4800, and 9600 baud using an 8-bit character structure in an asynchronous format with ASCII (American Standard Code for Information Interchange) protocol, and are equipped with either of two types of communications interfaces: Integrated 212A compatible dialing modem or RS-232-C (EIA).

Printers with the integrated 212A compatible dialing modem interface electrically with the telephone switched network and with a modular telephone jack for originating calls and talking. Printers are also furnished to operate on EIA voltage levels and exchange data and control signals with external modems, such as 103-, 108-, 113-, and 212 type modem or equivalent, or other devices for communication over the switched or private lines.

Printers with the integrated 212A compatible dialing modem are also furnished with an 8-position modular jack to enable connection of an auxiliary acoustic coupler interface unit in applications where modular telephones and plugs are not available. By disconnecting a cable plug at the rear of the printer, the EIA interface connector can also be made accessible.

Information on changing user programmable options, check proper operation, change the ribbon cartridge and install paper is included in the user's guide furnished with each printer.

Early version power supplies operate on 115 Vac only. Late version power supplies may be changed to operate at 115 Vac or 230 Vac. Conversion information is located in this section under heading "F. Power Supply Replacement/Conversion".

When converting to another voltage, the power cord with a plug to match the application must be ordered or furnished separately.

The options Lock-Out feature, either a strap or switch on the terminal control card, will prohibit changing the option values from the keyboard or control strip on the front of the printer. A printout of the option values and a printer test can still be performed. See "E. Option Protection" in this section.

In the event that troubles occur that cannot be corrected with the information in this manual, contact the nearest AT&T Information Systems Inc. repair location.

#### **Tools Required**

The only tool that may be required is a 6 inch shank, 1/4-inch blade screwdriver.

#### **Installation Procedure**

The printer is furnished in a single carton. The printer is fully assembled, but the EIA cable (if required) must be ordered separately. The keyboard (if required) connects to the printer via a coiled cord that uses easy insertion telephone type connectors.

A paper separator shelf is furnished with pin feed printers and can easily be installed following the instructions furnished in this manual or the user's guide included with the printer.

Paper, EIA cables and additional modular telephone cords must be obtained locally or ordered separately. Refer to the user's guide for paper suppliers. Packing details and cartons can be retained and reused in the event it is necessary to further transport or return the printer. EIA cables and modular telephone cords can be ordered from AT&T Information Systems Inc.

**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.

### Unpacking

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

- a. Remove printer from its carton referring to instructions on the carton.
- b. Remove any tape present.
- c. Lift cover and remove packing details securing printhead.
- d. Verify the following items are included:
  - 1-5310 or 5320 Printer
  - 1-Keyboard (KP sets only)
  - 1-Keyboard cord (included with keyboard)
  - 1-Ribbon cartridge
  - 1-Paper separator shelf (pin feed printers only)
  - 1-User's Guide, Manual 999-300-183IS (early version printer) or 999-300-274IS (late version printer)
  - 1-Pocket Reference Guide, Manual 999-302-183IS (early version printer) or 999-300-275IS (late version printer)
  - 1-AC power cord
  - 1-Modular cord (printers with integrated modem only)
- e. Optional accessories such as tractor assemblies, paper holder, pin feed platen assembly, etc., can be installed by referring to the user's guide or 50000S specification included with the accessory. Other accessories that require partial disassembly of the printer such as paper roll support, current loop modification kit, etc., refer to the 50000S specification included with the accessory.



Table 3-A. 5310 Printer Identification

AC Input Voltage	Paper Type	Configuration	Interface	Catalog Code	Top Cover Color*	Buffer Size	Printer Code †	Price Element Code	Comcode
115 Vac Domestic	Friction Feed	RO	EIA	5310-1A0A	Grey	4K	53P101BAC	3353-010	501002521
					Grey	8K	53P101BAE	3353-010	501006084
					Black	8K	53P101BKE		501006092
			Modem	5310-1A0B	Grey	4K	53P102BAC	3353-011	501002539
					Grey	8K	53P102BAE	3353-011	501006100
		KP	EIA	5310-1AAA	Grey	4K	53P101BAC	3353-010 & 33510	501002521 & 500064688
					Grey	8K	53P101BAE	3353-010 & 33510	501006084 & 500064688
				Black	8K	53P101BKE		501006092 & 500064688	
			Modem	5310-1AAB	Grey	4K	53P102BAC	3353-011 & 33510	501002539 & 500064688
					Grey	8K	53P102BAE		501006100 & 500064688
	Pin Feed	RO	EIA	5310-1B0A	Grey	4K	53P103BAC		501002547
					Grey	8K	53P103BAE		501006118
				Black	8K	53P103BKE		501006126	
			Modem	5310-1B0B	Grey	4K	53P104BAC		501002554
					Grey	8K	53P104BAE		501006134
		KP	EIA	5310-1BAA	Grey	4K	53P103BAC		501002547 & 500064688
					Grey	8K	53P103BAE		501006118 & 500064688
				Black	8K	53P103BKE		501006126 & 500064688	
			Modem	5310-1BAB	Grey	4K	53P104BAC		501002554 & 500064688
					Grey	8K	53P104BAE		501006134 & 500064688

\*Cobblestone (dark) grey or black (custom color) top covers are available.

†Printers with BAC codes are early design. Printers with BAE or BKE codes are late design and will be furnished on orders for early design printers.

Table 3-A. 5310 Printer Identification (Continuation)

AC Input Voltage	Paper Type	Configuration	Interface	Catalog Code	Top Cover Color*	Buffer Size	Printer Code †	Price Element Code	Comcode
230 Vac International	Friction Feed	RO US UK	EIA	5310-1AOR	Grey	4K	53P105BAC	3353-010I	501002562
					Grey	8K	53P105BAE	3353-010I	501006142
		KP US UK	EIA	5310-1AAR	Grey	4K	53P105BAC	3353-010I & 33510	501002562 & 500064688
					Grey	8K	53P105BAE	3353-010I & 33510	501006142 & 500064688
	Pin Feed	RO US UK	EIA	5310-1BOR	Grey	4K	53P106BAC		501002570
					Grey	8K	53P106BAE		501006159
	KP US UK	EIA	5310-1BAR	Grey	4K	53P106BAC			

\*Cobblestone (dark) grey or black (custom color) top covers are available.

†Printers with BAC codes are early design. Printers with BAE or BKE codes are late design and will be furnished on orders for early design printers.

Table 3-B. 5320 Printer Identification

AC Input Voltage	Paper Type	Configuration	Interface	Catalog Code	Top Cover Color*	Buffer Size	Printer Code †	Price Element Code	Comcode		
115 Vac Domestic	Friction Feed	RO	EIA	5320-1A0A	Grey	4K	53P150BAC	3353-020	501002588		
					Grey	8K	53P150BAE	3353-020	501006167		
					Black	8K	53P150BKE		501006175		
		KP	Modem	5320-1A0B	Grey	4K	53P151BAC	3353-021	501002596	501002596 & 500066758	
					Grey	4K	53P151BAE	3353-021	501006183		
					Grey	8K	53P151BAE	3353-021 & 33520	501006183 & 500066758		
		230 Vac International	Friction Feed	RO US UK	EIA	5320-1A0R	Grey	4K	53P152BAC	3353-020I	501002604
							Grey	8K	53P152BAE	3353-020I	501006191
				KP US UK	EIA	5320-1ABR	Grey	4K	53P152BAC	3353-020I & 33520	
	Grey					8K	53P152BAE	3353-020I & 33520			

\*Cobblestone (dark) grey or black (custom color) top covers are available.

† Printers with BAC codes are early design. Printers with BAE or BKE codes are late design and will be furnished on orders for early design printers.

### Keyboard Connection (KP Sets Only)

Connect one end of the keyboard cord to the modular jack on the keyboard.

Connect the other end of the keyboard cord to the modular jack on the printer.

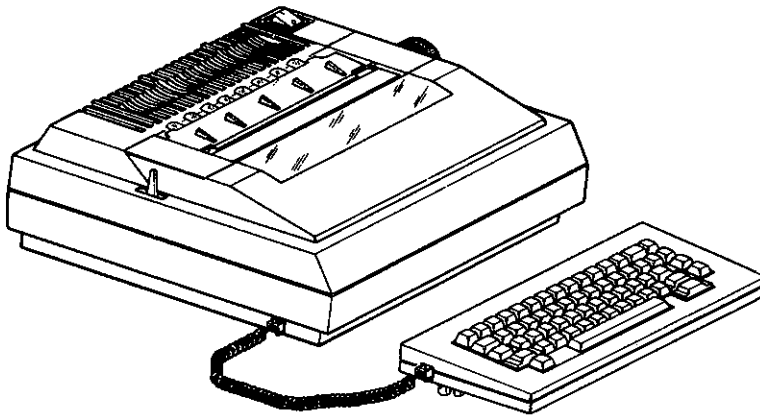


Figure 3-1. Keyboard Connection

### Paper Separator Installation (Pin Feed Printers Only)

Position the separator shelf so that the rear locating posts fit into the molded pockets in the printer cabinet (second slot from edge, each side).

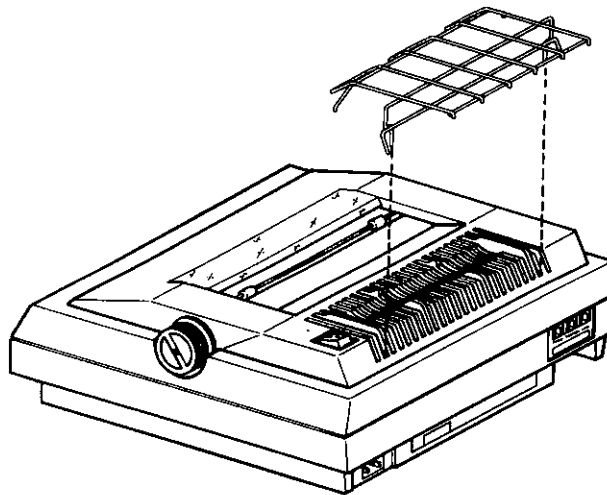
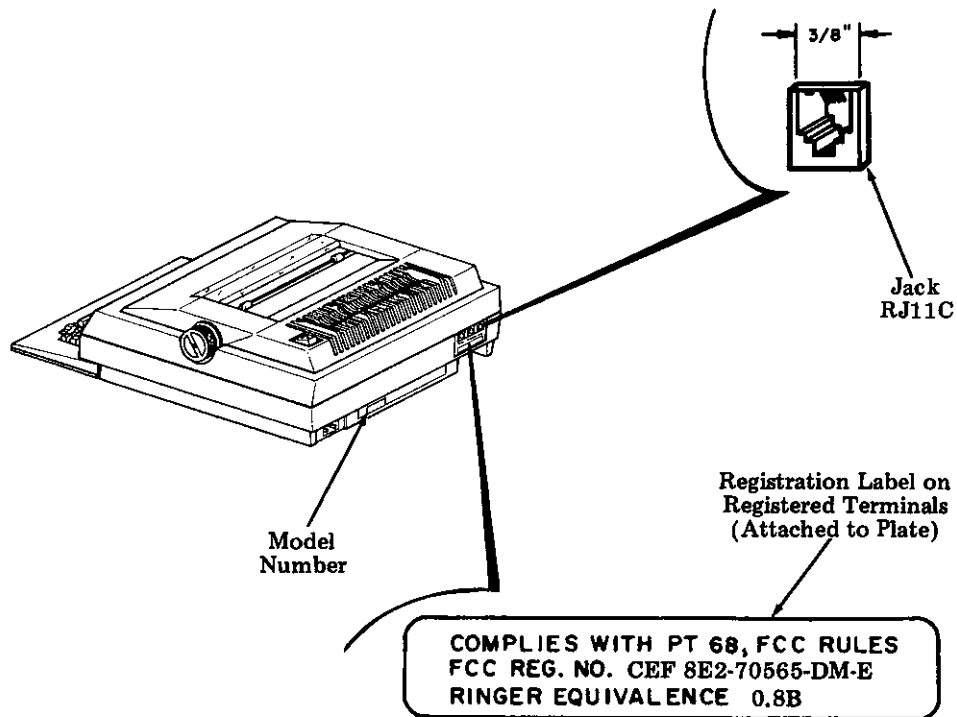


Figure 3-2. Paper Separator Installation

**5310/5320 Printers With Integrated Modem**

**Notice:** In the U.S.A. under the FCC registration program, the printers with the integrated dialing modem may be connected directly to the telephone switched network subject to the following conditions:

- a. Connection must be through a standard 6-position miniature jack.
- b. The telephone, if any is to be connected to the printer, must be registered and be reported as such to the local telephone company.



**Figure 3-3. FCC Labeling**

- c. Before connection or reconnection to the switched network, the local telephone company must be advised of the following:
  1. Printer Model Number.
  2. Registration Number (from label).
  3. Ringer Equivalence (from label).
  4. Telephone number where printer will be connected.

### Line and Telephone Connection

To connect the printer with integrated modem to the line and to connect a telephone to the printer, if required, perform the following:

1. If a telephone is not required, connect the modular cord between the LINE connector on the printer and the wall connector of the telephone line.
- 2a. If a telephone is required, remove the modular cord from the modular jack associated with the keyless telephone to be used. Connect the removed plug to the connector marked LINE at the rear of the printer.
- 2b. Connect the additional modular cord supplied with the printer between the connector marked PHONE, at the rear of the printer, and the jack on the telephone.
- 2c. A seven foot modular cord comes with printer with an integrated modem from the factory. Additional or longer cords can be ordered separately. See "Accessories" in this section.

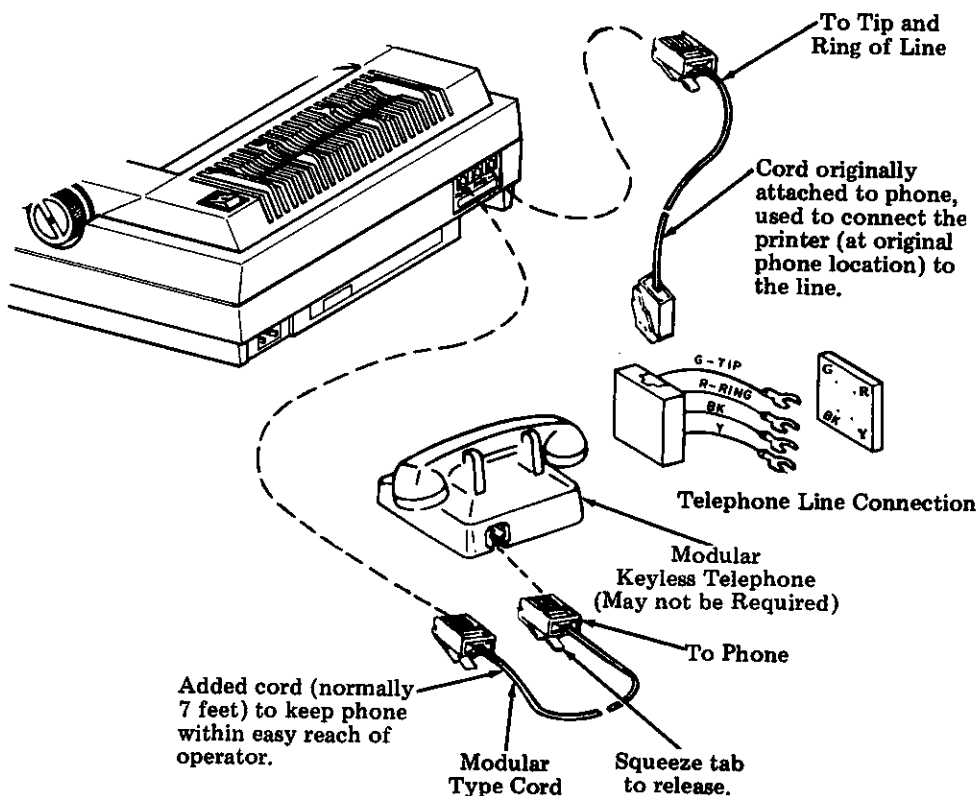
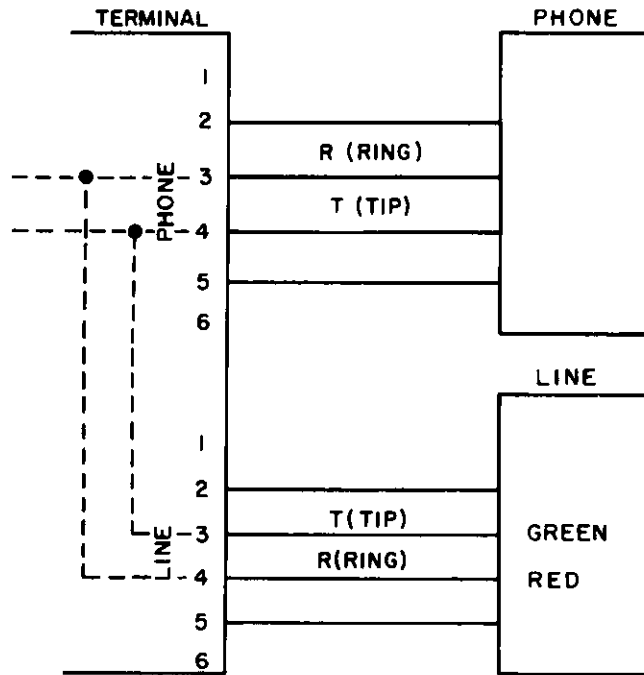


Figure 3-4. Modular Telephone Connections

**Note:** The communication mode (CMOD) option value must be IMDM and flow control (FLOW) option value must be CHAR or NONE for this application. Refer to the user's guide for optioning information.



FSK (Analog) Interface	Sent When Originating	Sent When Answering
	f1	f2
State 0 (space)	1070 Hz	2025 Hz
State 1 (mark)	1270 Hz	2225 Hz

Figure 3-5. Integrated Modem Interface Pin Assignments

### Acoustic Coupler Interface Unit

In applications where modular telephones are not available, an acoustic coupler may be ordered separately and connected to the printer.

Connect the modular cord from the acoustic coupler interface unit to the 8-position connector, located at the rear of the printer, marked COUPLER.

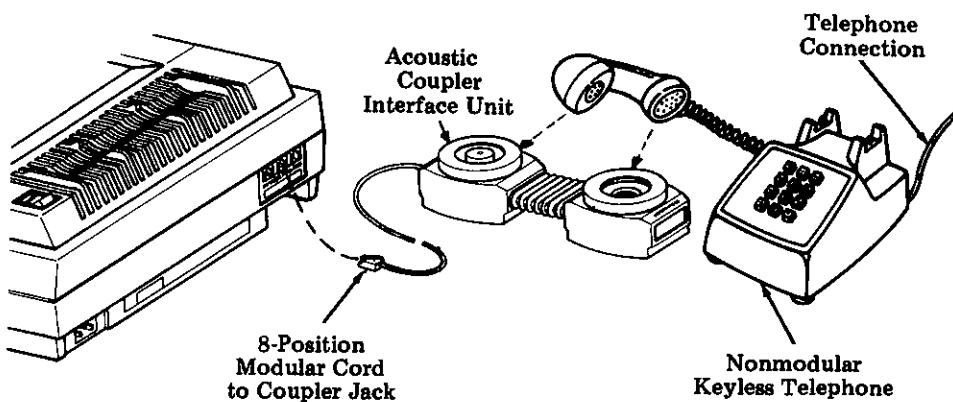


Figure 3-6. Acoustic Coupler Interface Unit Connections

**Note:** For optimum performance, the acoustic coupler interface unit should be placed on its side after a call is transferred to the Line mode.

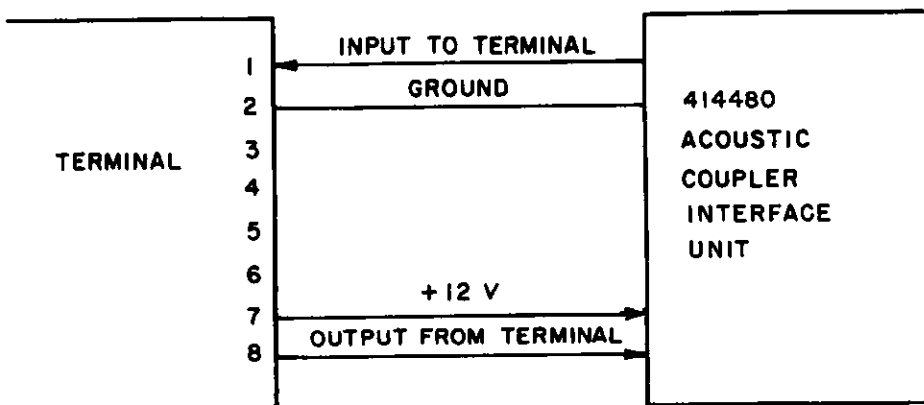


Figure 3-7. Acoustic Coupler Interface Unit Pin Assignments

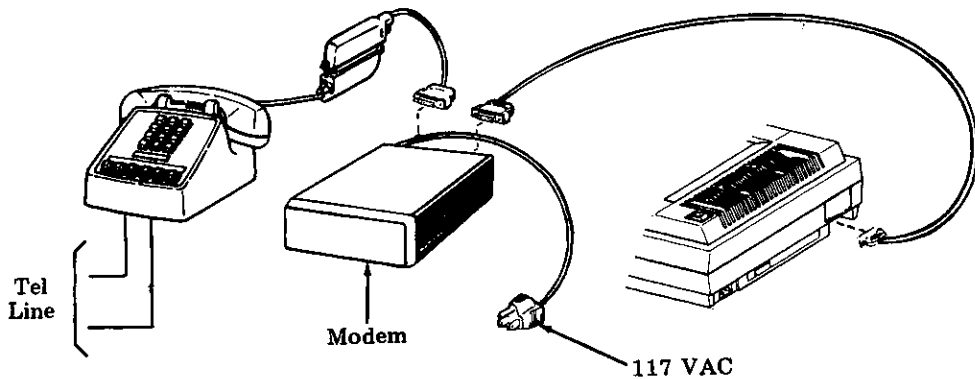
**Note:** The communications mode (CMOD) option value must be ACCP and the flow control (FLOW) option value must be CHAR or NONE for this application. Refer to the user's guide for optioning information.



**5310/5320 Printers With RS-232-C (EIA) Interface**

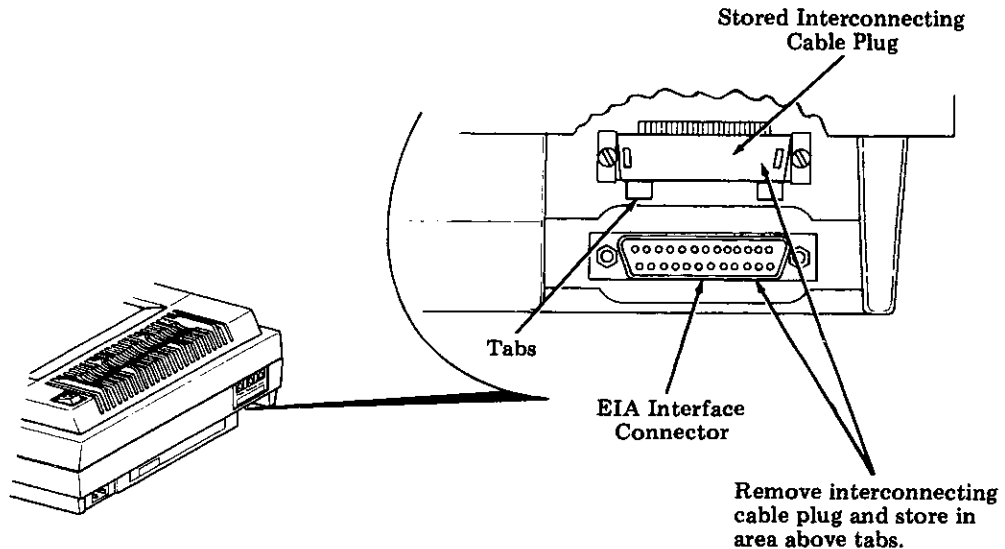
The connecting cables between the printer and the modem or processor must be furnished separately and should employ shielded cable. See "Accessories" in this section for cables available.

The connection to the modem and telephone (if present) should be made following the instructions provided with the modem.



**Figure 3-8. External Modem Connections**

The 25-pin connector for EIA interface can be made accessible on set with integrated modem by removing the interconnecting cable plug and storing it above the tabs provided. See Figure 3-9.



**Figure 3-9. EIA Interface Access**

This interface connection is through a 25-pin connector with male pins located at the left rear of the printer. The pin definitions are as follows:

- Pin 1 Frame Ground
- Pin 2 Send Data - Off when printer is in Line mode until varied per transmitted data.
- Pin 3 Receive Data - OFF when printer is in Line mode until varied per received data.
- Pin 4 Request to Send - Tied active in terminal.
- Pin 5 Clear to Send - Ignored by printer.
- Pin 6 Data Set Ready - ON puts printer in Line mode if pins 20 and 8 are on. OFF switches printer from Line mode to Ready mode. Held ON internally if CMOD option is NOMD.
- Pin 7 Signal Ground.
- Pin 8 Data Carrier Detect - ON puts printer in Line mode if pins 20 and 6 are on. OFF > 20 seconds switches printer from Line mode to Ready mode. Held ON internally if CMOD option is NOMD.
- Pin 11 & 19 Secondary Request To Send - If flow control option value is EIA, these pins are active. If Secondary Request to Send (SRTS) option value is EIA, these pins will be on when the receive buffer is available and off when the receive buffer is not available. If SRTS option value is INV, these pins will be off when the receive buffer is available and on when the receive buffer is not available.
- Pin 12 Speed Mode Indication - Controlled by dual speed modem. OFF puts printer in low speed, ON puts printer in 1200 baud speed if CMOD option value is STAN or IMDM for auto answered calls. This pin is not active if CMOD option is NOMD (no modem) or ACCP (Acoustic Coupler).

Pin 20 Data Terminal Ready - OFF if printer is in Local or Alarm mode. Turns off for 100 ms if EOT (option) is received or paper-out (option).

Pin 22 Ring Indicator - ON causes printer to send answer-back (option).

Pin 23 Speed Select - Reserved for future use.

Pin No.	Interchange Circuit	CCITT Eqv.	Description	Comments
1	AA	101	Frame Ground	
2	BA	103	Transmitted Data	To DCE
3	BB	104	Received Data	To DTE
4	CA	105	Request to Send	Tied Active
5	CB	106	Clear to Send	Ignored
6	CC	107	Data Set Ready	To DTE
7	AB	102	Signal Ground	
8	CF	109	Data Carrier Detect	To DTE
11 & 19	SCA	120	Secondary RTS	Flow Control
12	CI	112	Speed Mode Indication	To DTE
20	CD	108.2	Data Terminal Ready	To DCE
22	CE	125	Ring Indicator	To DTE
23	CH	112	Speed Select	To DCE

EIA (RS-232-C)	
State 0 (space) /On	+3 to +25 Vdc
State 1 (mark) /Off	-3 to -25 Vdc

DTE - Printer  
DCE - Modem or  
Communications Device

Figure 3-10. Interface Pin Assignments - RS-232-C (EIA)

### Option Lockout

If the terminal control card has a switch pack as shown below, placing the switch closest to the connector in the ON position will protect all options from changes except DUMP and TEST.

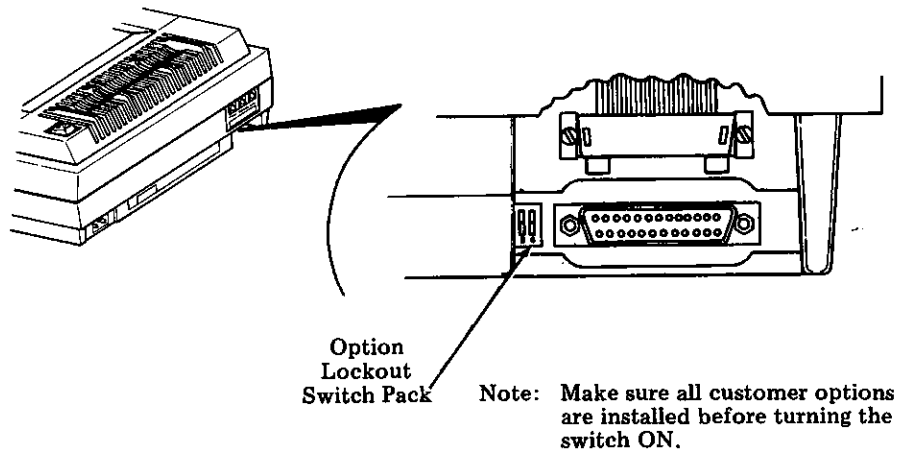
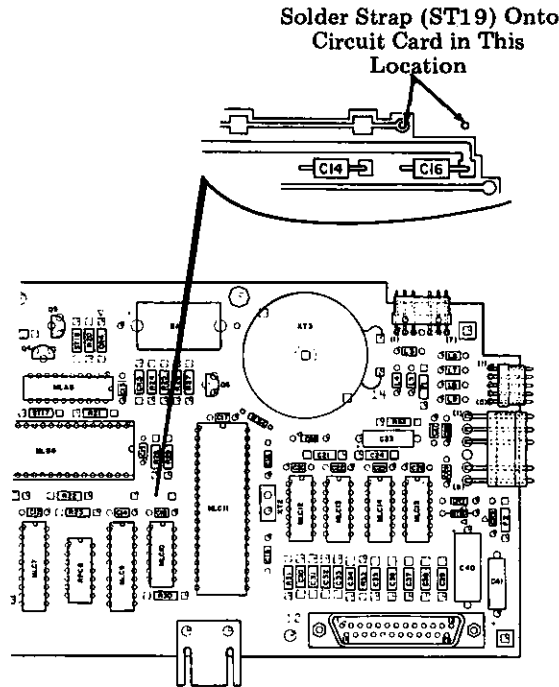


Figure 3-11. Option Lockout Switch

If the printer has a 410934 or 410935 terminal control card but no switch pack and the options lockout feature is required, perform the following:

Enter and "SAVE" all the desired options; then turn power off and remove the terminal control card following the instructions in Section "6. Disassembly/Reassembly". Solder strap ST19 onto the circuit card as shown below.



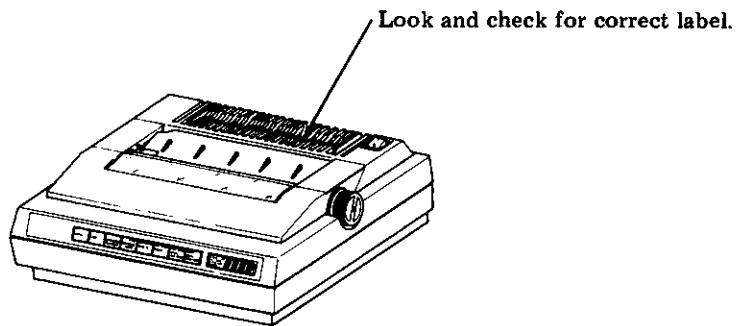
Reinstall the terminal control card.

Figure 3-12. Options Lockout Strap

### Power Supply Replacement/Conversion

If a 410976 Power Supply Card (115 Vac only) is defective, it can be replaced with another 410976 card or a 410968 Power Supply Card (115/230 Vac) strapped for 115 Vac. However, the 410968 Power Supply has EIA pins 1 and 7 directly connected to the printer frame but isolated from ac protective (earth) ground. This arrangement can be used in systems which have only one common protective and signal grounding point. The 410976 Power Supply can be used to replace the 410968 Power Supply in 115 Vac applications. However, the 410976 Power Supply has EIA pins 1 and 7 connected together and to ac protective (earth) ground inside the power supply. The 410968 power supply can be strapped to connect frame ground to earth ground if grounding does not cause a problem; as when connecting to an isolated interface such as a modem.

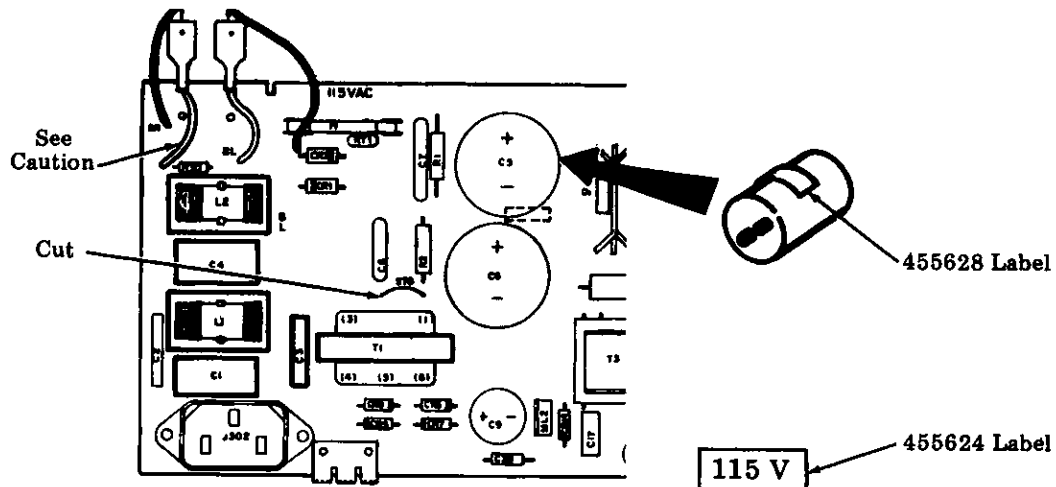
All printers except "AAA" coded printers contain the 410968 Power Supply which can be converted for either 115 Vac or 230 Vac operation. Check by looking through the right rear vent slots for the label indicating the operating voltage.



If the operating voltage needs to be converted, turn off power and remove the power supply card referring to the instructions in Section "6. Disassembly/Reassembly".

a. For 230 Vac operation:

- Cut the strap marked ST6. See Figure 3-13.
- Attach a 455628 label on capacitor C5.
- Reinstall power supply card into printer.



**Figure 3-13. Power Supply Conversion**

b. For 115 Vac operation:

Add a strap by the ST6 marking. See Figure 3-13.  
Attach a 455628 label on capacitor C5.  
Reinstall power supply into printer.

**Caution:** Dress the four leads (from the power switch to the board) to the extreme right before inserting the card into the base.

### Installation Checkout

Install the ribbon cartridge and paper. Refer to the user's guide.

After installation, at least the following procedures as described in the user's guide should be performed. Type out and print several lines of copy from the keyboard (if present). Also activate the AUTO Test in the Options mode for several lines and verify that copy has acceptable density and legibility and is error free. Operate briefly in the system or on-line, or on printers with the integral modem, operate in the Analog loopback mode.

### Initiate Service

Clean up the unpacking area, wipe off any fingerprints on the printer, and turn the printer over to the customer.

Provide the customer with the user's guide and pocket reference guide. Place any other documents in the shipping carton and retain for future use.

Advise the customer to order spare ribbons and paper as soon as possible (quantities dependent on usage).

### Accessories

The following accessories are available to the customer:

Price Element	Comcode	Mfg. Part No.	Description
2724-28G	524124658	412465	EIA Cable, 7 Ft. Length
2724-28L	524124666	412466	EIA Cable, 12 Ft. Length
2724-28S	524124674	412467	EIA Cable, 25 Ft. Length
2724-28V	524124682	412468	EIA Cable, 50 Ft. Length
		412592	Designator Strip
	524146214	414621	Dialing Modem Modification Kit
33511	524169901	416990	Acoustic Coupler Interface Unit
		418040	International, Securities and Line Drawing Labels
		418041	APL Labels
		418042	Nomenclature Label
33523	524202504	420250	Paper Roll Support Modification Kit
	524270113	427011	Friction Feed Platen
33512	524271368	427136	Carrying Case
33514			
TRF-01(d)	524272408*	427240	Tractor Assembly, Pull Type (9-1/2 Inch)
33514			
TRF-02	524272507*	427250	Tractor Assembly, Push Type (9-1/2 Inch)
33513	524272606	427260	Pin Feed Platen Assembly (9-1/2 Inch)
	524272762	427276	Paper Separator
33521	524272937*	427293	Tractor Assembly, Pull Type (15 Inch)
33524	524273422	427342	Paper Holder

\*Cobblestone grey cover.



Price Element	Comcode	Mfg. Part No.	Description
33530			
TRF-01	524273588	427358	Static Eliminator
33531			
TRF-01	524273596	427359	Static Eliminator
33514	524274156*	427415	Tractor Assembly,
TRF-03			Bidirectional (9-1/2 Inch)
33521	524274206*	427420	Tractor Assembly,
TRF-03			Bidirectional (15 Inch)
93086	524274214	427421	Pedestal With Levelers and Castors
93085	524274222	427422	Paper Rack (Accumulator)
93087	524274230	427423	Paper Dolly With Handle
33530			
TRF-03	524275088	427508	Static Eliminator
33531			
TRF-03	524275096	427509	Static Eliminator
	524275229	427552	Paper Separator, Upper
33527	524275583	427558	Protective Cover (5310 Only)
	524275906	427590	Tear Window Mod Kit (5310 Only)
	524276318#	427631	Tractor Assembly, Pull-Type (9 1/2 Inch)
	524276326#	427632	Tractor Assembly, Pull-Type (15 Inch)
	524276334#	427633	Tractor Assembly, Push-Type (9 1/2 Inch)
	524305810	430581	Modular Telephone Cord, 7 Ft. Length
2725-03N	524305828	430582	Modular Telephone Cord, 14 Ft. Length
2725-03S	524305836	430583	Modular Telephone Cord, 25 Ft. Length
93113	524306586	430658	SSI to EIA Modification Kit
93079	524307204	430720	Current Loop Modification Kit
		430972	AAB Version Software Modification Kit
93081	501000764	53PWU101	Paper Winder
33510	500064688	56K228/AAM	Keyboard With Cable
33520	500066758	56K330/ACQ	Keyboard With Cable

\*Cobblestone grey cover.

#Black cover.

### Power Requirements

AC Input Voltage - 90 to 132 Vac 115 Vac Power Supply  
180 to 264 Vac 230 Vac Power Supply  
47 to 63 Hertz

Power Consumption - 66 Watts Maximum - 225 BTU Maximum while  
printing random text at the maximum print  
speed.

Protective Ground Drain Current - 0.75 Milliamps Maximum with an  
input voltage up to 255 Vac  
maximum. However, 255 Vac  
would not normally be applied  
to a 115 Vac printer.

AC Inrush Current (115 Vac) - Turn-on (cold start) = 10A peak  
(1/2 cycle).  
"On-off-on" Turn-on (hot start)  
= 30A peak (1/2 cycle).

### Incidence of Harm

If your printer with internal modem causes harm to the  
telephone network, your telephone company may discontinue your  
service temporarily. If possible, they will notify you in  
advance. But if advance notice is not practical, you will be  
notified as soon as possible, and you will be informed of your  
right to file a complaint with the FCC.

### Changes in Telephone Company Facilities, Equipment, Operations, or Procedures

Your telephone company may make changes in its  
equipment or procedures that could affect the proper  
functioning of your printer. If they do, you should be  
notified in advance to give you an opportunity to maintain  
uninterrupted printer service.

- a. FCC regulations do not permit a printer with an  
integrated modem to be directly connected to party  
lines or coin telephone lines.
- b. FCC regulations require that, if you have trouble  
using your printer, you must disconnect it and  
determine if the printer is malfunctioning. You  
may not use the printer until the problem has been  
corrected or until you are sure that the printer  
itself is not malfunctioning.

**Repair**

Under FCC regulations, repairs other than those described in this service manual for printers with internal modem, may be made only by the manufacturer, its authorized agent, or as otherwise authorized by the FCC. In addition, the following replacement items used in making repairs described in this manual must be obtained from AT&T, its authorized agent, or sources otherwise authorized by the FCC.

<b>Concode</b>	<b>Part Number</b>	<b>Description</b>
524104403	410440	Print Engine Drive Card
524104445		Terminal Control Card
524109345	410934	Terminal Control Card
524109352	410935	Terminal Control Card
524109386	410938	Terminal Control Card
524109402	410940	Print Engine Drive Card
524109410	410941	Switch and Display Card
524109436	410943	Print Engine Drive Card
524109683	410968	Power Supply Card (115/230 Vac)
524109766	410976	Power Supply Card (115 Vac)
524144555	414455	Dialing Modem Circuit Card
524270006	427000	Print Engine (9-1/2 inch) FF
524270014	427001	Print Engine (15 inch) FF
524274008	427400	Print Engine (9-1/2 inch) PF
500064688	56K228/AAM	Keyboard With Cable
500064696	56K235/AAZ	Keyboard With Cable
500066493	56K310/ACV	Keyboard With Cable
500066758	56K330/ACQ	Keyboard With Cable

### Printer Removal

Reverse the installation procedures in this section to remove the printer from service.

Before repacking the printer, move the printhead to the center of the platen and insert the two packing details, removed earlier, to secure the printhead in place.

Verify the two screws holding the print engine into the housing are present.

Using the containers and packing details shown in Figure 3-14, pack the printer as shown.

Mark the outside of the carton with the printer catalog code, catalog code comcode, and price element code wherever possible.

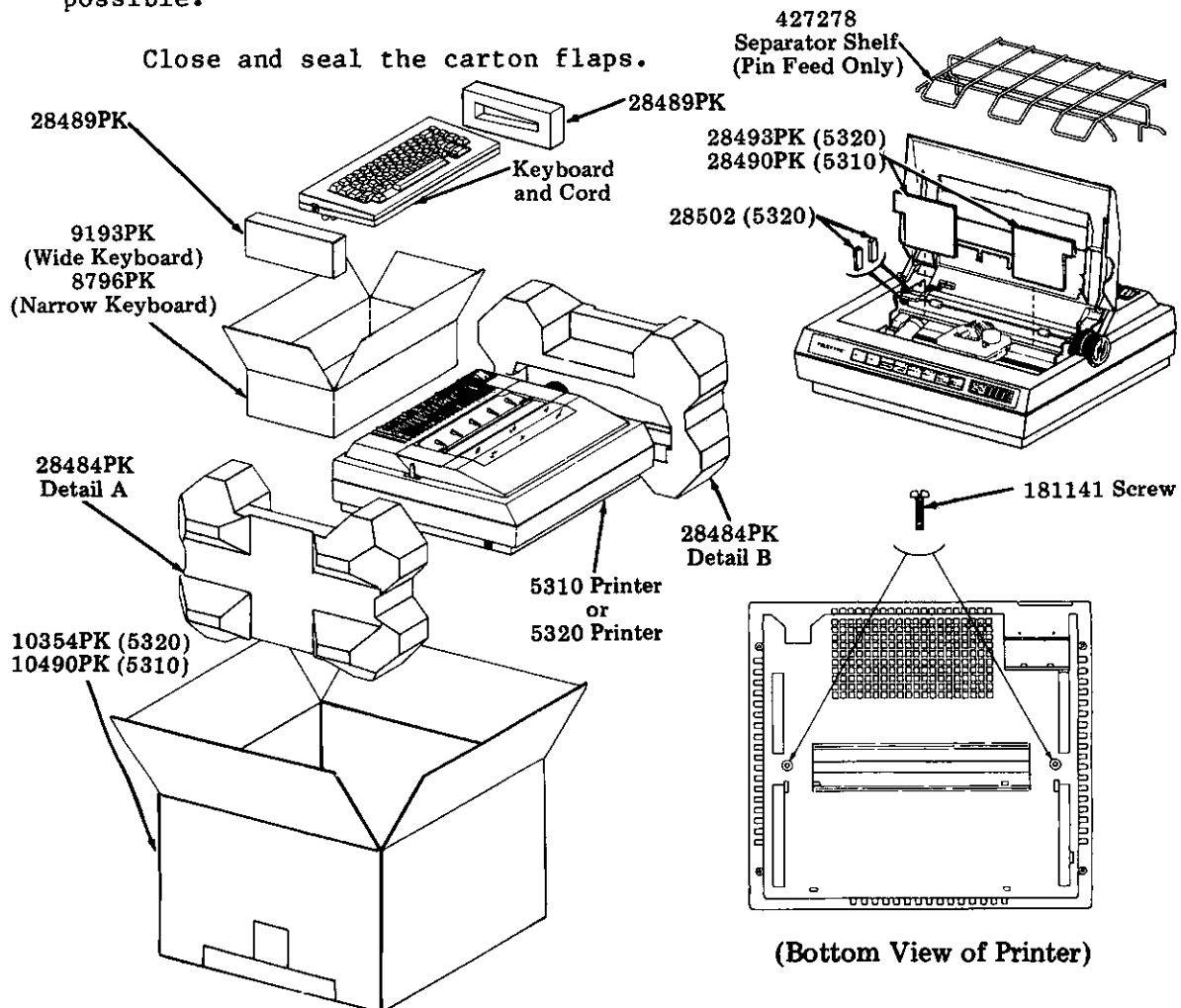
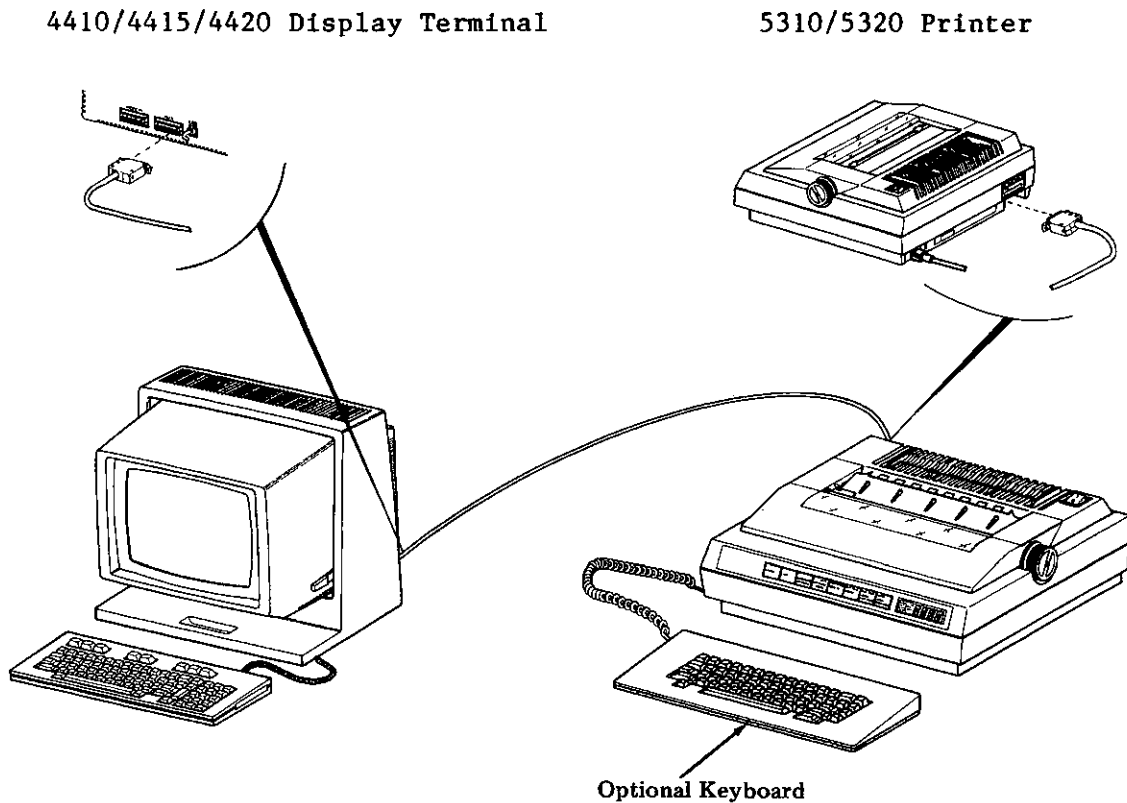


Figure 3-14. Printer Packing

**5310/5320 Connection, Setup and Operation With a 4410 Terminal**

Connect the printer to the AUX port of the terminal as shown in Figure 3-15. See "Accessories" in this section for EIA cables that can be ordered.



**Figure 3-15. Printer Connection to a Display Terminal**

The following option values must be entered into the printer:

Option	Value
DC24	YES if received DC2/DC4 is to turn printer on or off.
FLOW	CHAR (printer will send DC1/DC3 to start and stop transmission).
CMOD	STAN
BAUD	Must match system baud rate.
PRTY	Must match system parity.
ABAA	Not functional in this application.
ANBK	Code up to 30 characters if an answer-back is required when Here Is key is pressed or terminal receives ENQ character.

All other printer option values must meet system requirements.

The printers can send or receive on-line only. There is no Print Local function with the 4410. The printer will receive all control and escape characters.

Refer to User's Guide, Manual 999-300-180IS for detailed 4410 Terminal operation.

**5310/5320 Connection, Setup and Operation With a 4415 Terminal**

Connect the printer to the AUX port of the terminal as shown in Figure 3-15. See "Accessories" in this section for EIA cables that can be ordered.

The following option values must be entered into the printer:

<b>Option</b>	<b>Value</b>
CMOD	STAN
PRTY	NONE or SPACE
BAUD	Must match 4415 auxiliary printer speed option value.
FLOW	Must match 4415 auxiliary printer flow control option value.
ABAA	Not functional in this application.

The following auxiliary printer option values must be entered into the 4415 terminal.

<b>Option</b>	<b>Value</b>
Printer Model	Normal or Graph.
Speed	Must match printer BAUD option value.
Flow Control	Must match printer FLOW option value.

All other 4415 option values must meet system requirements.

The 4415 must be in the Monitor and Log Text mode or Media mode to enable Escape and Control sequences to be sent to the printer. If the 4415 is in the Media mode, the printer is connected directly to the line port and the 4415 keyboard is disabled. So far flow control from the printer to the 4415 is enabled. When the printer buffer fills and the printer tells the 4415 to stop sending data to the printer, address how the 4415 is to stop the sender from sending. If in the Media mode, the printer (if FLOW optioned for CHAR) will send a DC3 directly to the line.

The Monitor mode and Log Text modes must be off before the 4415 can enter the Media mode.

DC2 and DC4 can be used to turn the Log Text mode on and off. Refer to the User's Guide, Manual 999-300-181AB for detailed 4415 Terminal operation.

For normal printer operation, the 4415 must be in the Log Text mode.

### 5310/5320 Connection, Setup and Operation With a 4425 Terminal

Connect the printer to the AUX port of the terminal as shown in Figure 3-15. See "Accessories" in this section for EIA cables that can be ordered.

The following option values must be entered into the printer:

Option	Value
CMOD	STAN
PRTY	NONE or SPACE
BAUD	Must match 4425 auxiliary printer speed option value.
FLOW	Must match 4425 auxiliary printer flow control option value.
ABAA	Not functional in this application.

The following auxiliary printer option values must be entered into the 4425 terminal.

Option	Value
Printer Model	Normal or Graph.
Speed	Must match printer BAUD option value.
Flow Control	Must match printer FLOW option value.

All other 4425 option values must meet system requirements.

The 4425 must be in the Monitor and Print On-Line mode or Media mode to enable Escape and Control sequences to be sent to the printer. If the 4425 is in the Media mode, the printer is connected directly to the line port and the 4425 keyboard is disabled. So far flow control from the printer to the 4425 is enabled. When the printer buffer fills and the printer tells the 4425 to stop sending data to the printer, address how the 4425 is to stop the sender from sending. If in the Media mode, the printer (if FLOW optioned for CHAR) will send a DC3 directly to the line.

The Monitor mode and Print On-Line modes must be off before the 4425 can enter the Media mode.

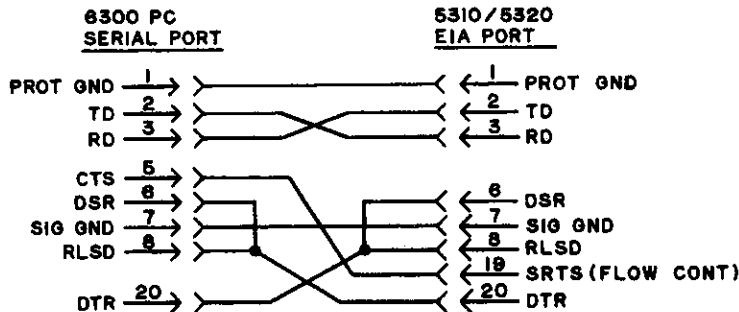
DC2 and DC4 can be used to turn the Print On-Line mode on and off. Refer to the User's Guide, Manual 999-300-109IS for detailed 4425 Terminal operation.

For normal printer operation, the 4425 must be in the Print On-Line mode.



**5310/5320 Connection and Setup With an AT&T 6300 PC**

Connect the printer to the serial port of the computer using a locally supplied cable wired as shown in Figure 3-16.



**Figure 3-16. 5310/5320 to 6300 PC NUL Modem Cable Wiring**

The following option values must be entered into the printer:

Option	Value
CMOD	STAN
PRTY	Must agree with 6300 PC command
BAUD	Must agree with 6300 PC command
FLOW	EIA
SRTS	EIA

The following are recommended 6300 PC commands:

```
MODE LPT1:=COM1
MODE COM1:12,E,7,1,P
```

The above COM1 command is shown driving the printer at 1200 baud, even parity, seven data bits, and one stop bit. The seven data bits must always be used. The baud rate, parity, and stop bits are customer choices but must agree with the printer. Two stop bits are required at 110 baud and one stop bit at all other baud rates.



4. Testing

Contents	Page
Overview .....	4-1
Preliminary Check .....	4-2
Test Equipment .....	4-2
Testing Procedures (Off-Line Checkout) .....	4-2
Testing Procedures (Simulated On-Line Checkout) .....	4-11
Testing Procedures (On-Line Checkout) .....	4-13

**Overview**

This section provides testing information for the 5310 and 5320 printers. After installation, an off-line check and simulated on-line test should be performed to make sure the printer is operable.

On trouble calls, a checkout should be performed after trouble correction to make sure the printer is operable.

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

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

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 Section "5. Troubleshooting" of this manual.

Before an on-line test can be performed, the remote testing station or Test Center must be provided with advance details about the teleprinter under test, such as telephone number, option exceptions present, speed, etc.

FSO Personnel Only - For additional testing procedures, refer to Section 582-405-050IS ("Testing With Portable Equipment") and Section 582-405-060IS ("Remote Testing").

### **Preliminary Check**

Before proceeding with the checkout procedure, check the following:

- (a) Is printer connected to a properly grounded and polarized ac service?
- (b) Are printer paper and ribbon properly installed?

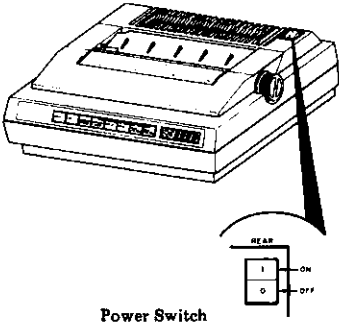
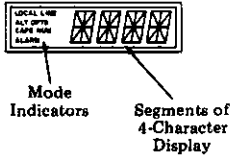




### **Test Equipment**

Off-line test procedures are provided to simulate on-line tests. To perform these simulated on-line tests, a comcode 524033784 (or equivalent) interface loopback connector is required. The connector strapping arrangements are shown in this section.

### **Testing Procedures (Off-Line Checkout)**

Before proceeding with test, disconnect cable from remote device if connected to EIA interface connector.

Table 4-A. Testing Procedures (Common to All Printers)

Test	Step	Procedure	Response
Power	1	Turn power switch off. Wait one second after display is blank and turn power on. <div style="text-align: center;">  <p>Power Switch</p> </div>	Printhead moves left then right and is indexed to the left margin.  ON is momentarily displayed. All mode indicators and segments of the four-character display are momentarily displayed, then RDY is displayed or LINE is displayed if CMOD option value is NOMD. <div style="text-align: center;">  </div>
Display and Control Panel	2	Press  key on control panel.	RDY or LINE turns off. Local is displayed, then 1 is displayed.
	3	Press  key on control panel.	ALT OPTS is displayed.
	4	Press  key on control panel.	LOCAL turns off. ALT OPTS flashes. DUMP is displayed on four-character display.
	5	Press  key on control panel.	Options are printed similar to Figure 4-1.  TEST is displayed on four-character display.

**Note:** Default values are shown for a 5310 Printer with the suffix code of "BAC". Your printer may print different values.

```
CPI : 10
LPI : 6
FLGT: 66
LMGN: 1
RMGN: 80
TMGN: 1
BMGN: 66
CHAR: ASCI
ALTF: ASCI
WRAP: YES
PCTL: NO
EMUL: ANSI
VIEW: MAN
LFON: NO
CRON: NO
CMOD: IMDM
RCVP: YES          (BAC, BBC and BCC codes only)
PRTY: EVEN
BAUD: 1200
FLOW: CHAR
SRTS: EIA
DC24: NO
DALM: NO
DEOT: NO
LP : NO
ZERO: NO          (BAC, BBC and BCC codes only)
ECHO: NO
ABAA: NO
BUFR: 2K
ALGN: 0
HTAB: 1,9,17,25,33,41,49,57,65,73
VTAB:

RTRN: <

AUT1:
AUT2:
AUT3:
AUT4:
AUT5:
AUT6:

ANBK:<≡ Model 5310≡≡
Software Version of 
Copyright AT&T Teletype Corporation (1984,1986)
All Rights Reserved.
```

The date shown in this area indicates the version of software present in your printer.

Figure 4-1. Options Dump

Table 4-A. Testing Procedures (Common to All Printers)  
(Continuation)



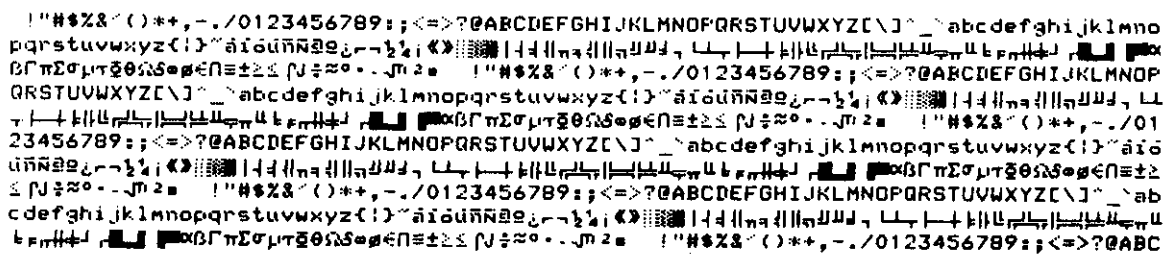















Test	Step	Procedure	Response
Auto Self-Test	6	Press  key on control panel until AUTO is displayed.	STAN is displayed, then AUTO is displayed.
	7	Press  key on control panel.	ALT OPS stops flashing. Printer prints test message shown in Figure 4-2.
			
<p>Figure 4-2. Test Message</p>			
	8	After approximately ten lines are printed, press the Local key on control panel.	LOCAL is displayed. Printer stops printing test message. (Several lines may continue printing until printer stops.)
	9	Press  key on control panel.	LOCAL turns off. RDY or LINE is displayed on the four-character display.
	10	Press  and  keys on control panel.	ALT OPTS turns off, and LOCAL is displayed. RDY or LINE turns off, then 1 is displayed.
STAN Self-Test	11	Press  key on control panel.	OPTS flashes. DUMP is displayed on four-character display.
	12	Press  key on control panel.	Options are printed as in Figure 4-1. TEST is displayed on four-character display.






Table 4-A. Testing Procedures (Common to All Printers)  
(Continuation)

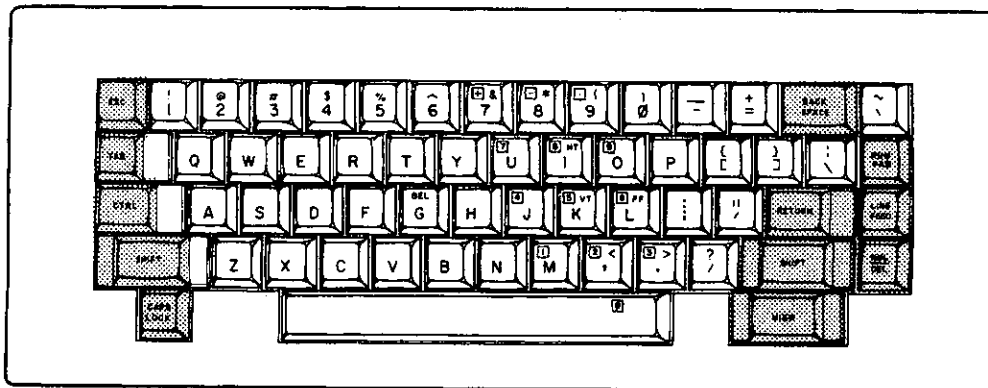
Test	Step	Procedure	Response
	13	Press  key on control panel until AUTO is displayed.	STAN is displayed, then AUTO is displayed on four-character display.
	14	Press  key on control panel.	STAN is displayed.
	15	Watch display and then press  key on control panel.	Bell tone sounds; all indicators turn on momentarily. Then RDY or LINE is displayed on four-character display.
Local Line Feed	16	Press  key on control panel.	LOCAL is displayed, RDY or LINE turns off.
	17	Press  key on control panel.	Printer performs one line feed.
Local Form Feed	18	Press  key on control panel.	Printer performs local form feed.
If option lock-out feature is enabled, do the following:			
Option Lock-Out Test	19	Press  key on control panel.	LOCAL turns off. OPTS flashes. DUMP is displayed on four-character display.
	20	Press  key on control panel.	TEST is displayed on four-character display.
	21	Press  key on control panel.	Bell tone sounds. TEST is displayed on four-character display.
	22	Press  key on control panel.	RDY or LINE is displayed, TEST turns off.

This completes testing procedures common to all printers.



**Table 4-B. Printers With Keyboard**

Test	Step	Procedure	Response
Key-board Keys	1	Press  key on control panel.	LOCAL is displayed.
	2	Press  key on keyboard if CAPS is not displayed.	CAPS is displayed.
	3	Starting with top row and moving from left to right, depress unshaded keys in Figure 4-3. Note that the keyboard shown is a 56K228AAM. Other keyboards are similar in that alphabetical characters print upper case while other printable characters print the character shown on the lower half of the keytop.	Characters are printed as in Figure 4-4.
	4	Press  and  keys.	Printhead is returned to left margin and paper feeds to next line.
	5	Press  key. Starting with top row and moving left to right, depress each unshaded key in Figure 4-3. Note that the keyboard shown is a 56K228AAM. Other keyboards are similar in that alphabetical characters print lower case while other printable characters print the character shown on the lower half of the keytop.	CAPS turns off. Characters printed as in Figure 4-5.



**Figure 4-3. Keys Used With CAPS LOCK Key**









1234567890--`QWERTYUIOP[ ]\ASDFGHJKL;`ZXCVBNM,./

**Figure 4-4. Printout Using CAPS LOCK Key**

1234567890--`qwertyuiop[ ]\asdfghjkl;`zxcvbnm,./

**Figure 4-5. Printout Without Using CAPS LOCK Key**

Table 4-B. Printers With Keyboard (Continuation)

Test	Step	Procedure	Response
	6	Press  and  keys.	Printhead is returned to left margin and paper feeds to next line.
	7	Hold left  key depressed and starting with top row and moving from left to right, depress each unshaded key in Figure 4-6.  Hold right  key depressed and depress  key. Note that the keyboard shown is a 56K228AAM. Other keyboards are similar in that the characters shown on the upper half of the keytop will be printed.	Characters are printed as in Figure 4-7.
	8	Press  and  keys.	Printhead is returned to left margin and paper feeds to next line.
	9	Press  key.	Printhead moves to column 11. 1 is displayed on four-character display.

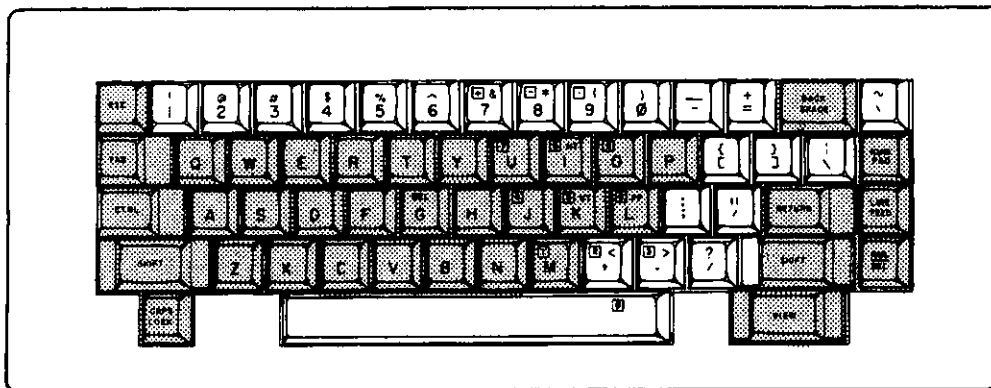




Figure 4-6. Keys Used With SHIFT Key



!@#\$\$%^&\*() +~{|:!"<>??

Figure 4-7. Printout Using SHIFT Key

**Table 4-B. Printers With Keyboard (Continuation)**

Test	Step	Procedure	Response
	10	Press  key two times.	Printhead moves to column 9 and then to column 17. 17 is displayed on four-character display.
	11	Press  key four times.	Printhead moves to column 13. 13 is displayed on four-character display.

**Table 4-C. Numeric Pad (56K228AAM Keyboard)**

Test	Step	Procedure	Response
Num Pad Key	1	Press  key on keyboard.	NUM is displayed.
	2	Press the spacebar.	0 is printed.
	3	Press  key on keyboard.	NUM turns off.

**Table 4-D. Numeric Pad (56K235AAZ Keyboard)**

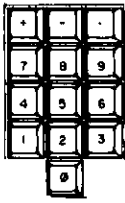
Test	Step	Procedure	Response
Nu- meric Pad	1	Starting with top row and moving from left to right, press keys shown below:  	+-.7894561230 is printed on printer.

Table 4E. Numeric Pad (56K310ACV Keyboard)

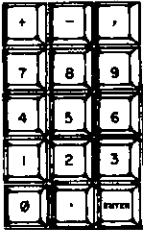
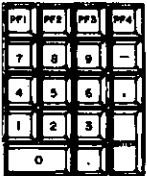
Test	Step	Procedure	Response
Nu- meric Pad	1	<p>Starting with top row and moving from left to right, press keys shown below:</p> 	<p>+-,7894561230. is printed. Pressing the ENTER key returns printhead to left margin of current line.</p> <p><b>Note:</b> If this keyboard is being tested on a 5310 or 5320 with the suffix "AAA", the "ENTER" and "." keys have no function.</p>

Table 4-F. Numeric Pad (56K Series Keyboard)

Test	Step	Procedure	Response
Nu- meric Pad	1	<p>Starting with the second row from the top and moving left to right, press keys shown below:</p> <p><b>Note:</b> Press ENTER key last.</p> 	<p>789-456,1230. is printed. Pressing the ENTER key performs the same function as pressing the RETURN key.</p> <p><b>Note:</b> If this keyboard is being tested on a 5310 or 5320 printer with the suffix "AAA", the "ENTER" and "." keys have no function.</p>

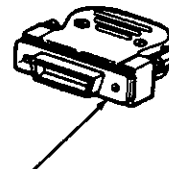
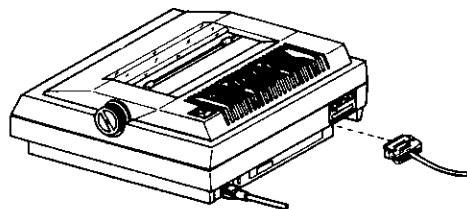
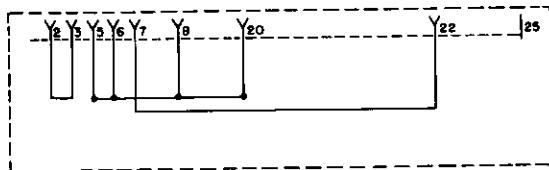
This completes the off-line checkout.

**Testing Procedures (Simulated On-Line Checkout)**

Printers with Current Loop or SSI interfaces can be tested up to, but not including the interface, by performing "Printers With EIA Interface" checkout. Printers with internal modem, but no keyboard can also be tested up to the EIA interface in the same way. Printers with internal modem and a keyboard can be tested by performing "Printers With Internal Modem and Keyboard" checkout. The interface circuit card must be disconnected from the EIA connector at the lower rear of the printer. To test the interface card, the printer must be tested in the system it is intended to operate.

**Printers With EIA Interface**



Printers with EIA interface, perform the following: Turn off power and connect the interface loopback connector shown in Figure 4-8.



Comcode 524033784 Interface Loopback Connector







**Figure 4-8. EIA Interface Loopback Connector**

Table 4-G. Printers With EIA Interface

Test	Step	Procedure	Response
Simulated On-Line	1	Turn power switch ON.	LINE is displayed, then l is displayed.
	2	Press  key on control panel.	Answer-back message is printed if not disabled by a "-" character as the first character. Factory default is: Model 5310 or Model 5320.
	3	Press  key.	LINE turns off. LOCAL is displayed.

Printers With Internal Modem and Keyboard

Table 4-H. Printers With Internal Modem and Keyboard

Test	Step	Procedure	Response
Analog Loop	1	Press  key and change the following option values to the values shown:  EMUL: M43 CMOD: IMDM FLOW: CHAR or NONE ECHO: YES  Press  key.	<b>Note:</b> Option lockout feature must be off: Switch on terminal control card must be off or ST19 strap removed.
	2	Press ESC key. Hold SHIFT key depressed and press  key.	LOOP is displayed on 4-character display.
	3	Type the following message: T E S T.	TTEESST is printed.
	4	Press ESC key and then  key.	LOOP turns off.
	5	If option values were changed in Step 1:  Press  key and change option values back to original values.  Press  key.	

This completes the simulated on-line checkout.

**Testing Procedures (On-Line Checkout)**

Printers with internal modem and keyboard can be tested on-line using the procedures in "Printers With Internal Modem and Keyboard". Printers with other interfaces can be tested in its system environment.

**Table 4-I. Printers With Internal Modem and Keyboard**

Test	Step	Procedure	Response
	1	Verify CMOD option value is IMDM.  Verify FLOW option value is CHAR or NONE.  Verify PRTY and BAUD option values are compatible with remote terminal.	
	2	With RDY displayed on the 4-character display, type telephone number of remote terminal preceded by a + on the keyboard.	Telephone number is displayed on 4 character display.
	3	Press RETURN key.	DIAL is displayed followed by a + and then telephone number.  On-line connection is made and LINE is displayed.
	4	Verify data can be sent and received properly.	
	5	Press <span style="border: 1px solid black; padding: 2px;">LOCAL</span> key on control panel.	DISC is displayed on 4-character display.  LINE turns off and LOCAL is displayed.
	6	With RDY displayed, arrange for remote terminal to call printer under test.	LINE is displayed on call connection.
	7	Verify data can be sent and received properly.	
	8	Remote terminal disconnects call.	DISC is displayed for twenty seconds, then RDY is displayed.

This completes the on-line checkout.





## 5. Troubleshooting

Contents	Page
Overview .....	5-1
Major Components .....	5-2
Troubleshooting Guide .....	5-7

### Overview

This section provides troubleshooting information for the 5310 and 5320 Printers.

Troubleshooting is based on isolation of troubles to major components and the correction of the troubles by replacement of these major components.

Trouble isolation provided in this section is intended for use by a craftsperson or a user with some minimal mechanical and technical ability.

**Major Components**

To facilitate trouble correction, the major components listed below should be available. Refer to Section "8. Maintenance Spares" for maintenance spare parts ordering.

Comcode	Mfg. Part No.	Description
524104403	410440	Print Engine Drive Card
514104445	410444	Terminal Control Card
524109345	410934	Terminal Control Card
524109352	410935	Terminal Control Card
524109386	410938	Terminal Control Card
524109402	410940	Print Engine Drive Card
524109410	410941	Switch and Display Card
524109436	410943	Print Engine Drive Card
524109683	410968	Power Supply Card 115/230 Vac
524123940	412394	AC Power Cable, 115 Vac
524124559	412455	Nameplate, AT&T
524124658	412465	EIA Cable, 7 Ft. Length
524124666	412466	EIA Cable, 12 Ft. Length
524124674	412467	EIA Cable, 25 Ft. Length
524124682	412468	EIA Cable, 50 Ft. Length
524146214	414621	Dialing Modem Modification Kit
524169901	416990	Acoustic Coupler Interface Unit
524202504	420250	Paper Roll Support Modification Kit
524270006	427000	Print Engine (Friction Feed 9-1/2 Inch) Without Printhead
524270014	427001	Print Engine (Friction Feed 15 Inch) Without Printhead
524272408*	427240	Tractor Assembly, Pull Type (9-1/2 Inch)
524272507*	427250	Tractor Assembly, Push Type (9-1/2 Inch)
524272606	427260	Pin Feed Platen Assembly (9-1/2 Inch)
524272762	427276	Paper Separator
524272937*	427293	Tractor Assembly, Pull Type (15 Inch)
524273588	427358	Static Eliminator
524273596	427359	Static Eliminator
524273604	427360	Ribbon (Package of 6)
524274008	427400	Print Engine (Pin Feed 9-1/2 Inch) Without Printhead
524274156*	427415	Tractor Assembly, Bidirectional (9-1/2 Inch)
524274206*	427420	Tractor Assembly, Bidirectional (15 Inch)
524275088	427508	Static Eliminator
524275096	427509	Static Eliminator
524275229	427522	Paper Separator, Upper

\*Charcoal grey cover.

Concode	Mfg. Part No.	Description
524276318#	427631	Tractor Assembly, Pull-Type (9-1/2 Inch)
524276326#	427632	Tractor Assembly, Pull-Type (15 Inch)
524276334#	427633	Tractor Assembly, Push-Type (9-1/2 Inch)
524305810	430581	Modular Telephone Cord, 7 Ft. Length
524305828	430582	Modular Telephone Cord, 14 Ft. Length
524305836	430583	Modular Telephone Cord, 25 Ft. Length
524306586	430658	SSI to EIA Modification Kit
524306990	430699	Keyboard Cable
524307204	430720	Current Loop Modification Kit
524550803	455080	Switch (9-1/2 Inch)
524550811	455081	Switch (15 Inch)
524552007	455200	Printhead Assembly
524556800	455680	AC Power Cable, 230 Vac
500064688	56K228/AAM	Keyboard With Cable
500066758	56K330/ACQ	Keyboard With Cable
	56K330/ADC	Keyboard With Cable
	56K330/ADD	Keyboard With Cable

\*Charcoal grey cover.

#Black cover.

The following major components, if found defective, can be returned to AT&T for repair. Contact your dealer or AT&T sales/service representative.

Concode	Mfg. Part No.	Description
524103074	410307	Dialing Modem Circuit Card
524104403	410440	Print Engine Drive Card
524104445	410444	Terminal Control Card
524109345	410934	Terminal Control Card
524109352	410935	Terminal Control Card
524109386	410938	Terminal Control Card
524109402	410940	Print Engine Drive Card
524109410	410941	Switch and Display Card
524109436	410943	Print Engine Drive Card
524109519	410951	SSI to EIA Converter Card
524109683	410968	Power Supply Card 115/230 Vac
524109766	410976	Power Supply Card 115 Vac
524144555	414455	Dialing Modem Circuit Card
524144805	414480	Acoustic Coupler Interface Unit
524169901	416990	Acoustic Coupler Interface Unit

Comcode	Mfg. Part No.	Description
524270006	427000	Print Engine (Friction Feed 9-1/2 Inch) Without Printhead
524270014	427001	Print Engine (Friction Feed 15 Inch) Without Printhead
524272408*	427240	Tractor Assembly, Pull Type (9-1/2 Inch)
524272507*	427250	Tractor Assembly, Push Type (9-1/2 Inch)
524272937*	427293	Tractor Assembly, Pull Type (15 Inch)
524274008	427400	Print Engine (Pin Feed 9-1/2 Inch) Without Printhead
524274156*	427415	Tractor Assembly, Bidirectional (9-1/2 Inch)
524274206*	427420	Tractor Assembly, Bidirectional (15 Inch)
524276318#	427631	Tractor Assembly, Pull-Type (9-1/2 Inch)
524276326#	427632	Tractor Assembly, Pull-Type (15 Inch)
524276334#	427633	Tractor Assembly, Push-Type (9-1/2 Inch)
524307204	430720	Current Loop Modification Kit
500064688	56K228/AAM	Keyboard With Cable
500064696	56K235/AAZ	Keyboard With Cable
500066493	56K310/ACV	Keyboard With Cable
500066758	56K330/ACQ	Keyboard With Cable
	@5310-	9-1/2 Inch RO Printer
	@5320-	15 Inch RO Printer

@Represents any of the 5310 or 5320 Printers.

\*Charcoal grey cover.

#Black cover.

When returned for repair, the printer or major component should be packed in its replacements container.

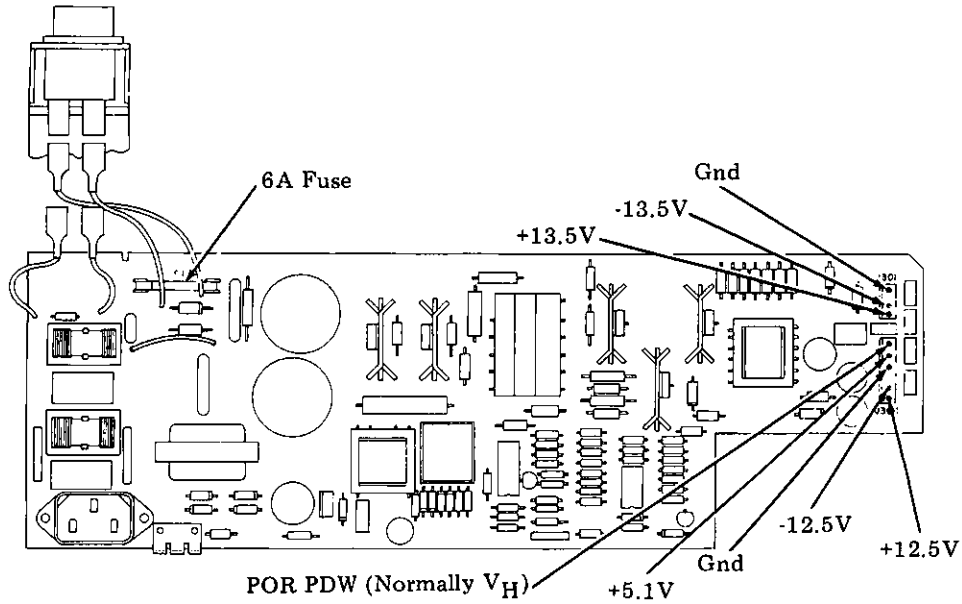
**Caution:** Circuit cards returned for repair must be packed in a conductive plastic bag for static protection. Use the plastic bag from the replacement circuit card. Terminal Control cards must be packed in the pink bags and not the black bags.

For component access, refer to Section "6. Disassembly/Re-assembly".

For interchangeability, identification, location and ordering information, refer to Section "8. Maintenance Spares".

Before disconnecting cables or replacing major components, power cords, etc., turn off ac power. Make sure power cords are connected to a properly grounded and polarized ac outlet.

When the troubleshooting chart indicates the trouble may be in the power supply, voltage checks at the J301 and J304 connectors may be performed to verify the presence of output voltages as indicated in Figure 5-1. The POR PDW lead, J304 pin 1 cannot be checked with a meter. The power supply may be defective even though all output voltages are present.



**Figure 5-1. Power Supply Voltages and Check Points**

When the troubleshooting chart indicates the vertical dot alignment test should be performed, the following procedures should be used:

- A vertical dot alignment test of adjacent horizontal lines can be performed by entering TEST in the Options mode and pressing the Enter key for the value ALGN.
- The following test characters will be printed. If vertical dots of adjacent lines are not aligned, change the value of the alignment (ALGN) option until they are aligned.

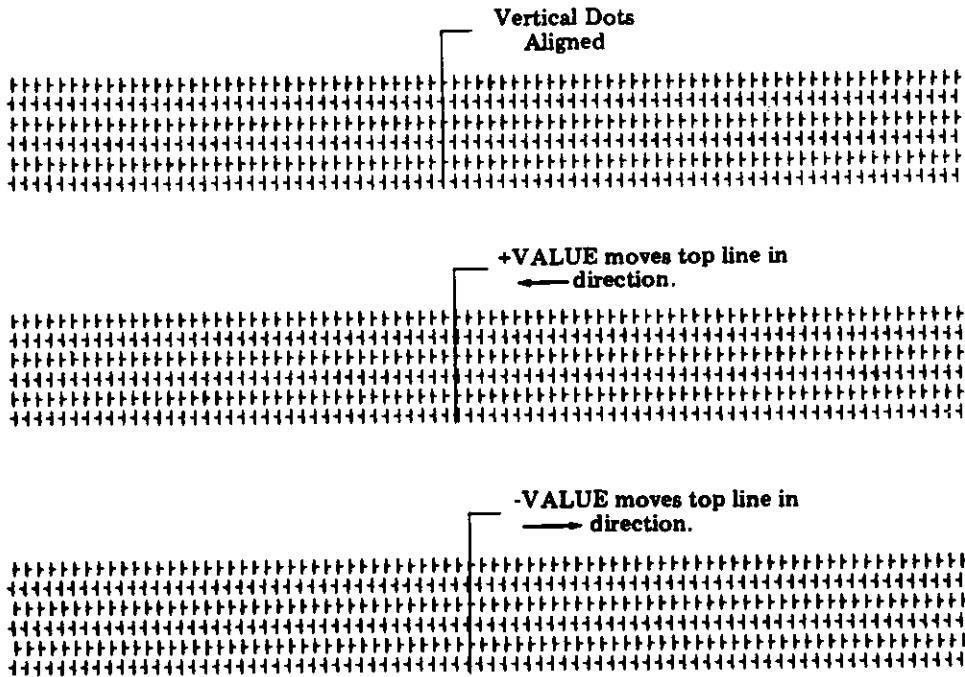


Figure 5-2. Horizontal Character Alignment

**Troubleshooting Guide**

If any errors are detected when a self-test of the printer is performed, a unique HEX code will be displayed on the four-character display. If no errors are detected, the Ready mode will be entered and RDY will be displayed.

The table below shows the displayed HEX code for a failure and the associated defective component. If a keyboard is not connected to the printer, a keyboard failure will result which is ignored since no keyboard is attached.

If the Terminal Control Card is dead, the LED on the Terminal Control Card will be off.

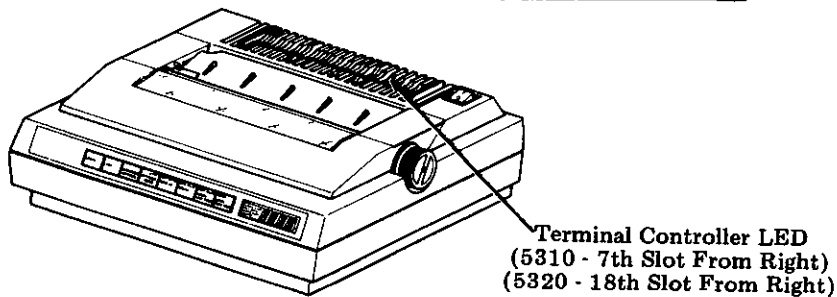
If Switch and Display Card is dead, the LED on the Terminal Control Card will be flashing. Otherwise the LED is lit.

**Table 5-A. Error Messages**

Hex Code	Defective Component
0400	Display Card
1000	Print Engine Drive Card
0800	Keyboard
0001	Terminal Control Card
0002	Terminal Control Card
0004	Terminal Control Card
0020	Terminal Control Card
0040	Terminal Control Card
0080	Terminal Control Card
0100	Terminal Control Card

Multiple failures are indicated by the logical OR (in HEX) of above displays.

Example: 0002 Failure  
          0040 Failure  
          0042 Displayed



**Figure 5-3. Terminal Control Card LED**

If the self-test of the printer is performed successfully and a trouble still exists within the printer, the Trouble Analysis table below should be followed.

Trouble analysis is presented in the form of a "20 Questions" routine. 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.

**Table 5-B. Trouble Analysis**

Question	Yes	No
1. Is anything displayed? (Power available and set power on.)	Go to 2.	Go to 1a.
1a. Is there any indication of power in the printer? (Display flashes or printhead initializes to left margin when power is turned on.)	Replace switch and display card.	Check all cable seating.  Replace power supply.  Replace terminal control card.  Replace switch and display card.
2. Do all indicators (LCD segments) on display operate properly (i.e., light and extinguish under normal operation or during display test)?	Go to 3.	Replace switch and display card.
3. Can any characters or functions be locally generated from the control panel?	Go to 5.	Go to 4.



Table 5-B. Trouble Analysis (Continuation)

Question	Yes	No
4. Can any characters be printed during options dump or printer test?	Replace keyboard.  Replace terminal control card.  Replace print engine drive card.	Replace print engine drive card.  Replace terminal control card.  Replace print engine.
5. Are characters properly formed?	Go to 6.	Replace print engine drive card.  Replace terminal control card.  Replace print engine.  Related adjustments:  Carriage roller to guide rail  Carriage motor belt tension
6. Is print density acceptable?	Go to 7.	Check printhead positioning lever setting.  Go to 6a.
6a. Does ribbon advance properly?	Replace ribbon.  Replace printhead.	Replace ribbon.  Replace print engine.  Related adjustment:  Carriage assembly pinion gear to transfer gear

Table 5-B. Trouble Analysis (Continuation)

Question	Yes	No
7. Does paper feed properly?	Go to 8.	Replace print engine.  Replace print engine drive card.  Related adjustments:  Line feed motor gear and intermediate gear  Line feed idler gear, platen gear, and intermediate gear
8. Does carriage space and return properly?	Go to 8a.	Replace print engine.  Related adjustment:  Carriage motor belt tension adjustment
8a. Do vertical dots align properly on adjacent horizontal lines?	Go to 9.	Perform vertical dot alignment test.
9. Do all characters print, including numeric pad, and do the functions perform when the keys on the keyboard are operated locally to the printer?	Go to 10.	Check options.  Replace keyboard.  Replace terminal control card.  Replace print engine drive card.
10. Does bell tone sound under any conditions?	Go to 11.	Replace terminal control card.

Table 5-B. Trouble Analysis (Continuation)

Question	Yes	No
11. Do all functions perform when keys on control panel are pressed?	Go to 12.	Replace switch.  Replace switch and display card.  Replace terminal control card.
12. Is ALARM: -flashing? -displayed with paper installed?	Check that paper is under paper out arm.  Replace print engine.  Replace terminal control card.  Replace switch and display card.	Go to 13.
13. Does printer respond properly to keyboard operated locally in Analog Loop mode? Sets w/internal modem only - Entered from keyboard by ESC> sequence. Ended by ESC= sequence.	Go to 14.	Check EMUL option value. Must be M43.  Replace modem.  Replace terminal control card.
14. Is LINE displayed following a received call in the Ready mode.	Go to 15.	Replace modem, if present.  Replace terminal control card.

Table 5-B. Trouble Analysis (Continuation)

Question	Yes	No
<p>15. Does telephone operate normally (dial tone, dial, talk, ring)?</p>	<p>Go to 16.</p>	<p>Check tip and ring of phone line for 48 Vdc.</p> <p>Replace phone.</p> <p>Replace modem.</p>
<p>16. Can calls be placed using keyboard to dial numbers?</p>	<p>Go to 17.</p>	<p>Check tip and ring of phone line for 48Vdc.</p> <p>Check CMOD option value. Must be IMDM.</p>
<p>17. Are data messages properly sent and received?</p>	<p>Go to 20.</p>	<p>Go to 18.</p>
<p>18. Is internal modem present?</p>	<p>Place modem in Analog Loopback and go to 19.</p>	<p>Remove cable attached to EIA interface connector and install Interface Loopback connector into EIA interface connector and go to 20.</p>
<p>19. With LINE displayed, are characters printed when entered from keyboard or is answer-back message printed when Here Is key is pressed?</p> <p>If ECHO option value is YES, each character will print twice.</p> <p>If ECHO option value in NO, each character will print once.</p>	<p>Replace modem</p>	<p>Replace modem.</p> <p>Replace terminal control card.</p>

Table 5-B. Trouble Analysis (Continuation)

Question	Yes	No
20. With LINE displayed, are characters printed when entered from keyboard or is answer-back message printed when Here Is key is pressed? (Tilde does not precede Answerback)	Go to 21.	Replace terminal control card.
21. Is trouble present, but not defined by questions 1 through 20?	Check options.  Replace printer.	Place in service.



**6. Disassembly/Reassembly**

Contents	Page
Overview .....	6-1
Tools Required .....	6-2
Disassembly/Reassembly .....	6-2
Keyboard .....	6-3
Printhead .....	6-4
Platen Assembly .....	6-7
Top Cover Assembly .....	6-9
Switch and Display Card .....	6-12
Switch (Front Panel) .....	6-13
Power Supply .....	6-14
Terminal Control Card .....	6-15
Interface Card (Modem, Current Loop or SSI Card) ....	6-16
Print Engine .....	6-17
Print Engine Driver Card .....	6-19

**Overview**

This section provides disassembly and reassembly procedures for the 5310 and 5320 Printers and major components.

Disassembly and reassembly information for the upper and lower cover assembly is also provided in this section.

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

When removing a major component from the printer, do not pry or force parts to provide the necessary clearance for removal. Follow the removal procedure and note how each component 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.

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 as viewed by the operator.

For a listing of the tools required to perform the disassembly and reassembly procedures, refer to "Tools Required".

This section shows the manufacturer's number when referring to parts for disassembly and reassembly. When ordering parts for replacement, refer to Section "8. Maintenance Spares" and Appendix B "Printers, Parts and Accessories" for ordering information.

### **Tools Required**

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

- Screwdriver, 1/4 inch wide, 6 inch long blade.
- Stick, orangewood (nonconductive probe with approximately 1/16 by 1/16 inch tip).

### **Disassembly/Reassembly**

The following procedures are provided with steps listed in numerical sequence. It is recommended that you follow these steps in the order given. Reassemble by following the steps in reverse order.

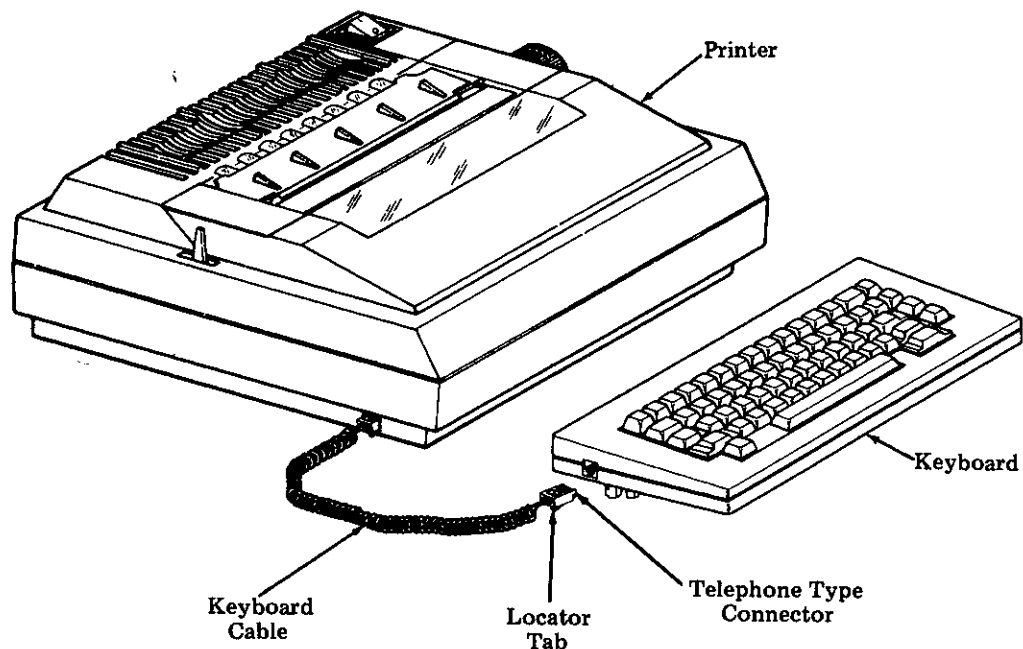
Accessory disassembly/reassembly instructions are provided in the 999-300-274IS User's Guide and in the specification which accompanies the accessory.



**Keyboard**

To remove the keyboard:

Squeeze the locator tab on the telephone type connector and pull the cable connector from the keyboard housing connector.



**Figure 6-1. Keyboard Removal**

### Printhead

To remove the printhead:

1. Lift cover lid.
2. Grasp ribbon cartridge and lift straight up to remove.
3. Move carriage assembly to the right until printhead cable connector on drive card is accessible through hole in guide rail.
4. Unplug cable from card connector.
5. Grasp cable edges and squeeze until cable is bowed enough to be removed from carriage retaining tabs.

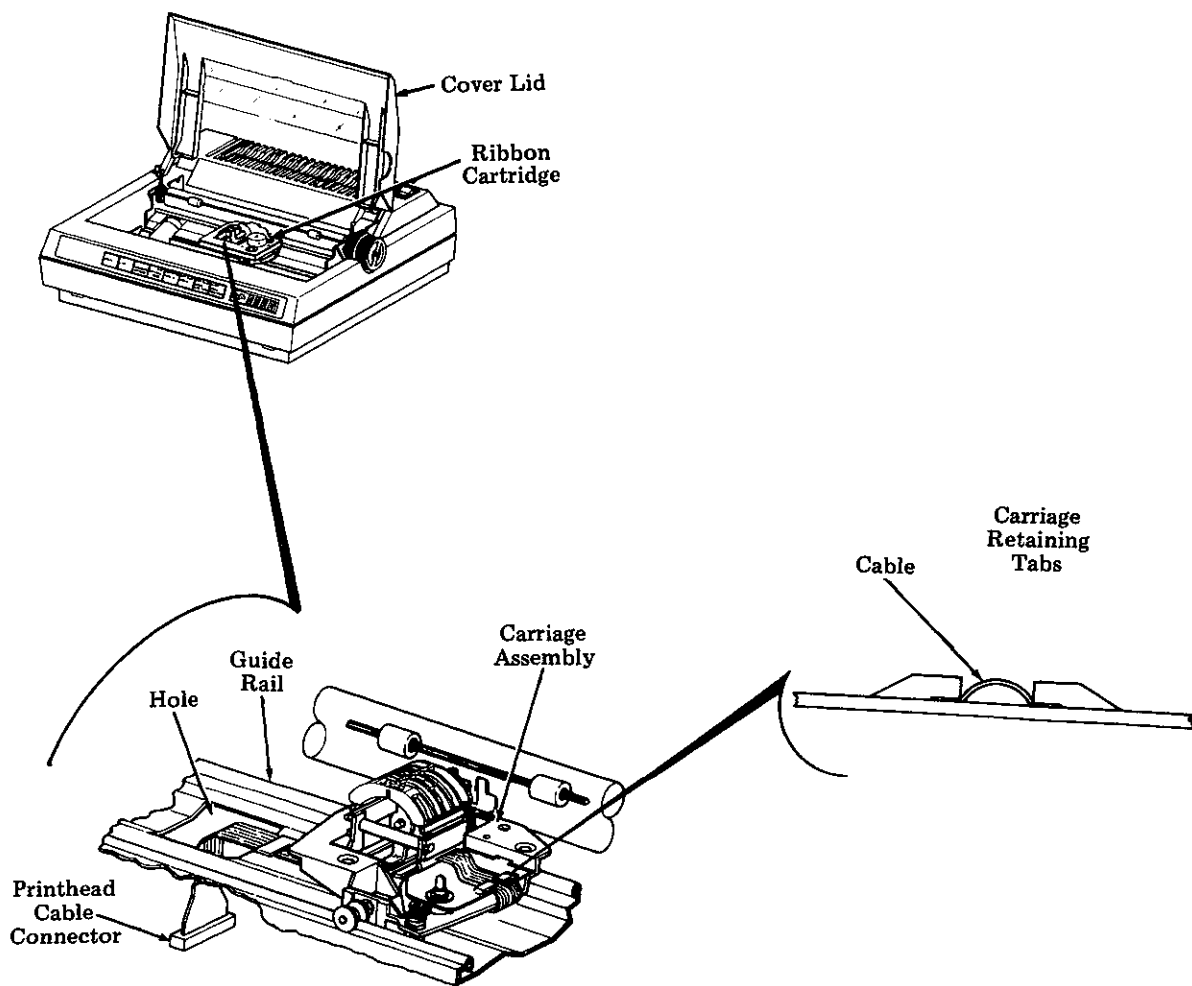


Figure 6-2. Printhead Removal

6. Early design, pull front of guide rail clamp upward and slide cable from underneath clamp. Late design, pull up on fastener.
7. Grasp printhead shield. Pull printhead away from platen against spring loaded pressure arms of bail assembly until locating hole below nose piece of printhead clears locating pin on carriage.
8. Raise nose piece while lifting printhead until slots in heat sink clear locating rod connected to pressure arms of bail.
9. Guide printhead cable through hole in guide rail and from under carriage and remove printhead.

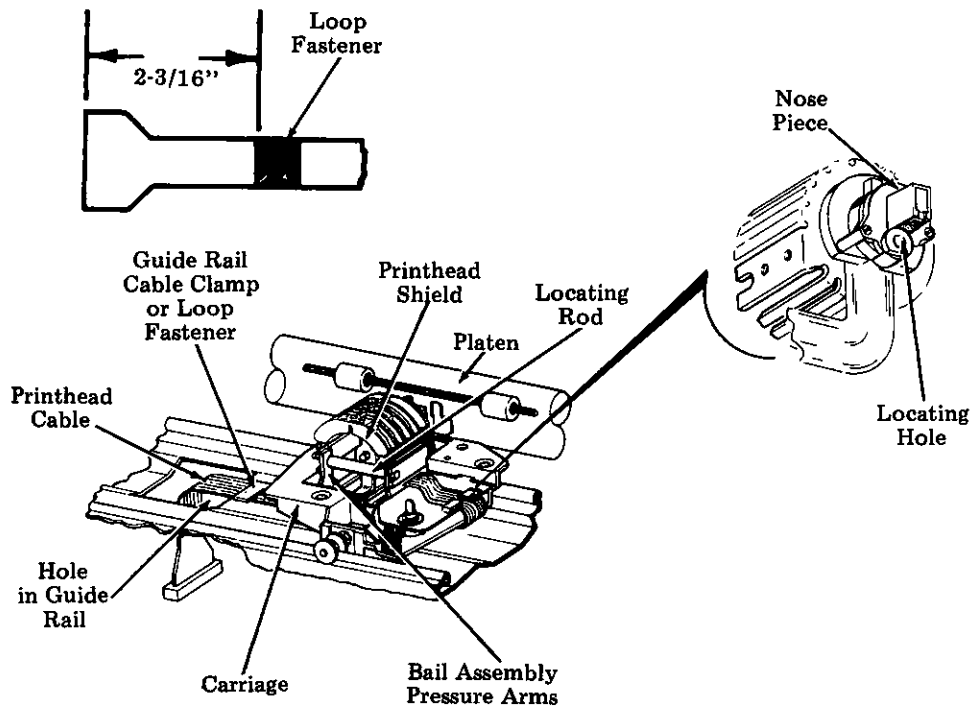


Figure 6-2. Printhead Removal (Continuation)

- Note 1:** The latest printheads have a loop fastener on the cable. If printhead is being replaced and printer has guide rail cable clamp, pry off fastener from cable. If replacement printhead does not contain fastener but printer has a hook fastener, order a 455233 loop fastener. Attach fastener as shown on previous page.
- Note 2:** In reassembly, if printer has a loop fastener, align fastener on cable with fastener on guide rail and press down firmly. Move carriage back and forth on guide rail and observe flat cable to see that it rides along lower surface of guide rail. If it rides up on the guide rail, reposition fastener until it rides on lower surface. If the printer has a guide rail cable clamp, slide cable under guide rail cable clamp and connect to print engine driver card connector. Pull cable to right so cable does not stick up in this area and touch the underneath of the carriage assembly.

### Platen Assembly

To remove the platen assembly:

1. Open cover lid.
2. Move paper hold down bar forward away from the platen.
3. Place index finger on left and right bearing release levers. Push down and toward the front of the printer until tabs clear notch in side plate. Rotate bearing release levers forward until lever is in up position (each side). Lift out the platen.

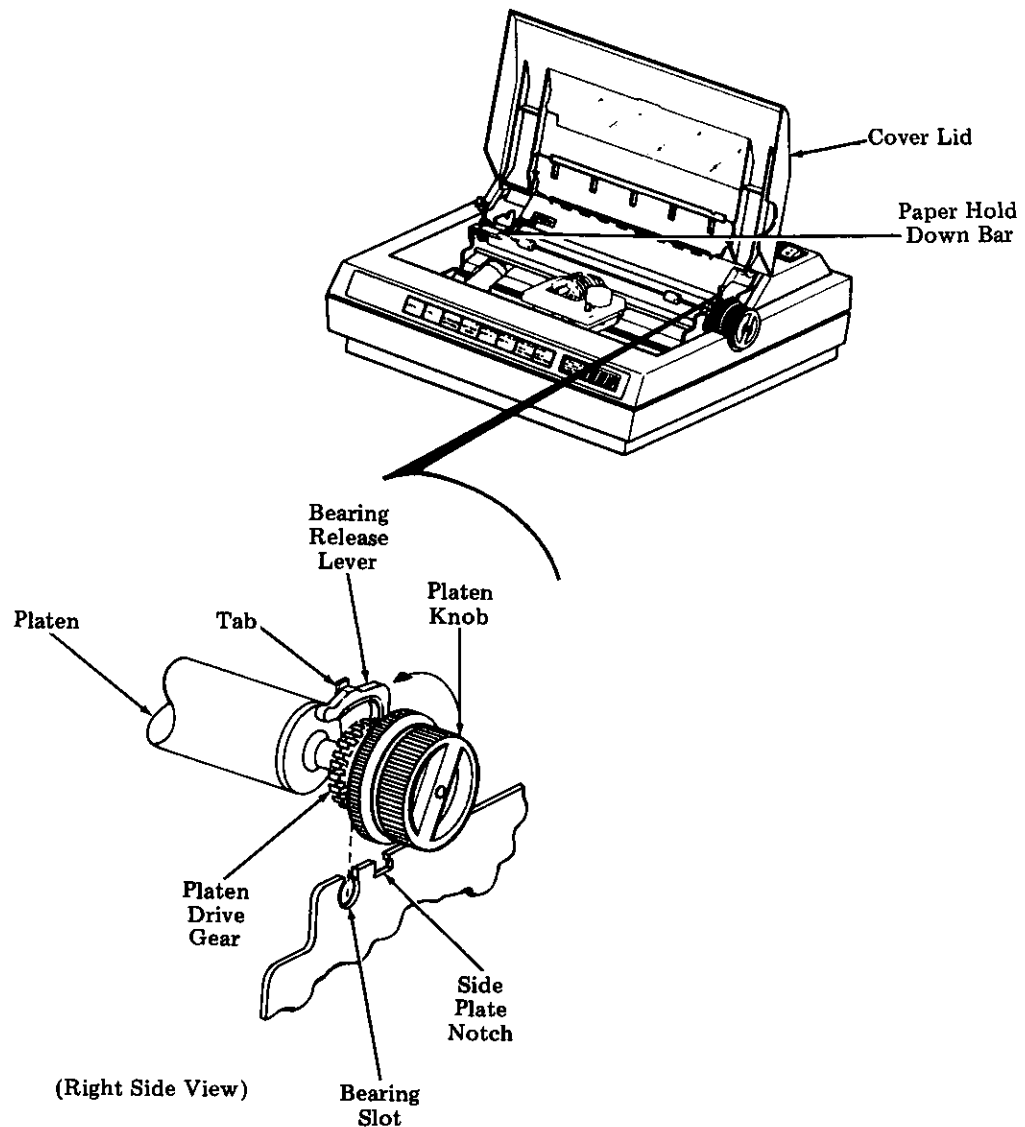


Figure 6-3. Platen Assembly Removal

To install the platen assembly:

1. Rotate the platen bearing release lever tabs to the up position. Place the platen into the printer, locating platen bearings on each side, into the side frame bearing slots. Position platen so that bearing flanges are positioned against the inside surface of side frame (each side).
2. On pin feed platens, align locating slots on each side of platen with locating pins on each side of paper guide assembly before seating platen fully into side frame slots.
3. Rotate platen knob until gears of platen drive gear and line feed motor drive gear mesh.
4. Rotate bearing release levers rearward and down until lever tabs lock inside plate notch.

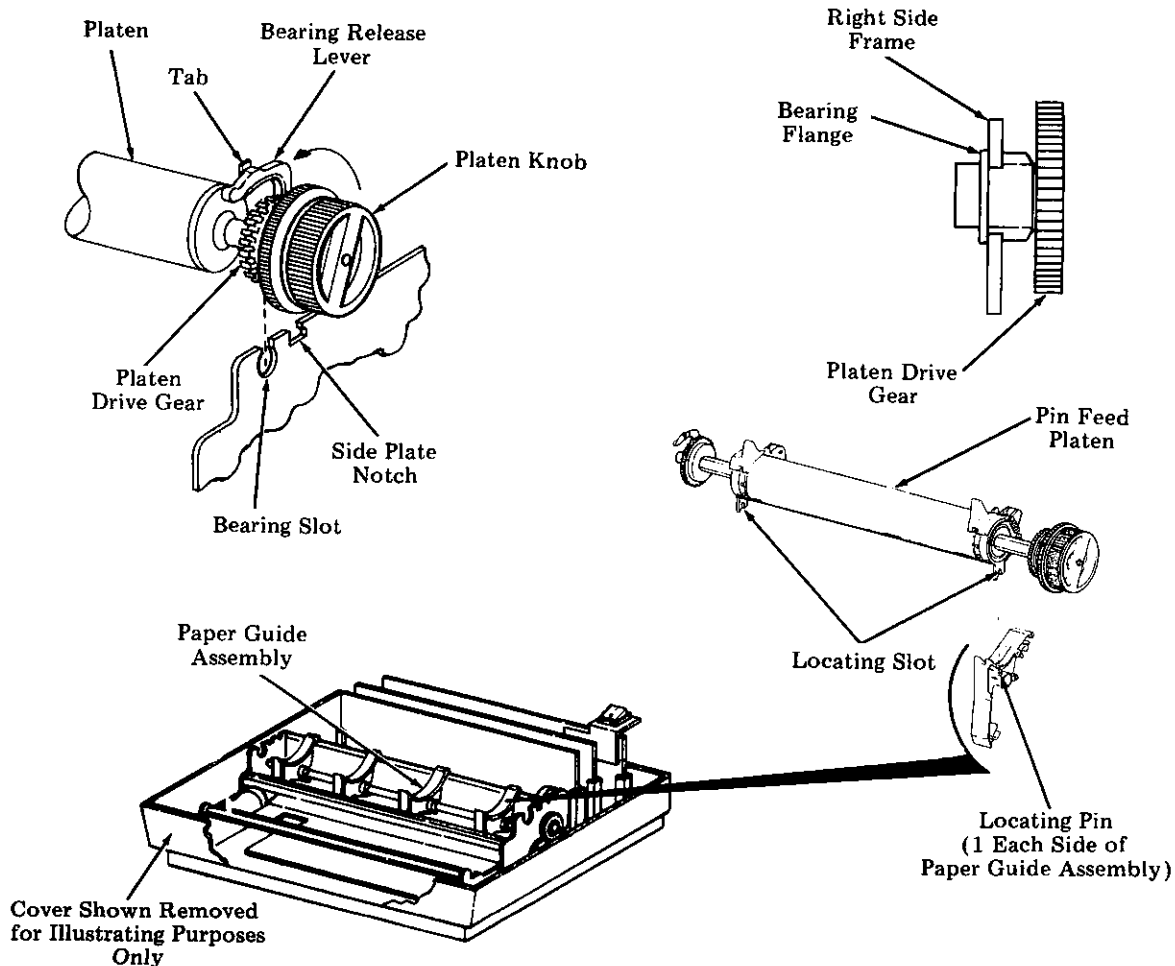


Figure 6-4. Platen Assembly Installation

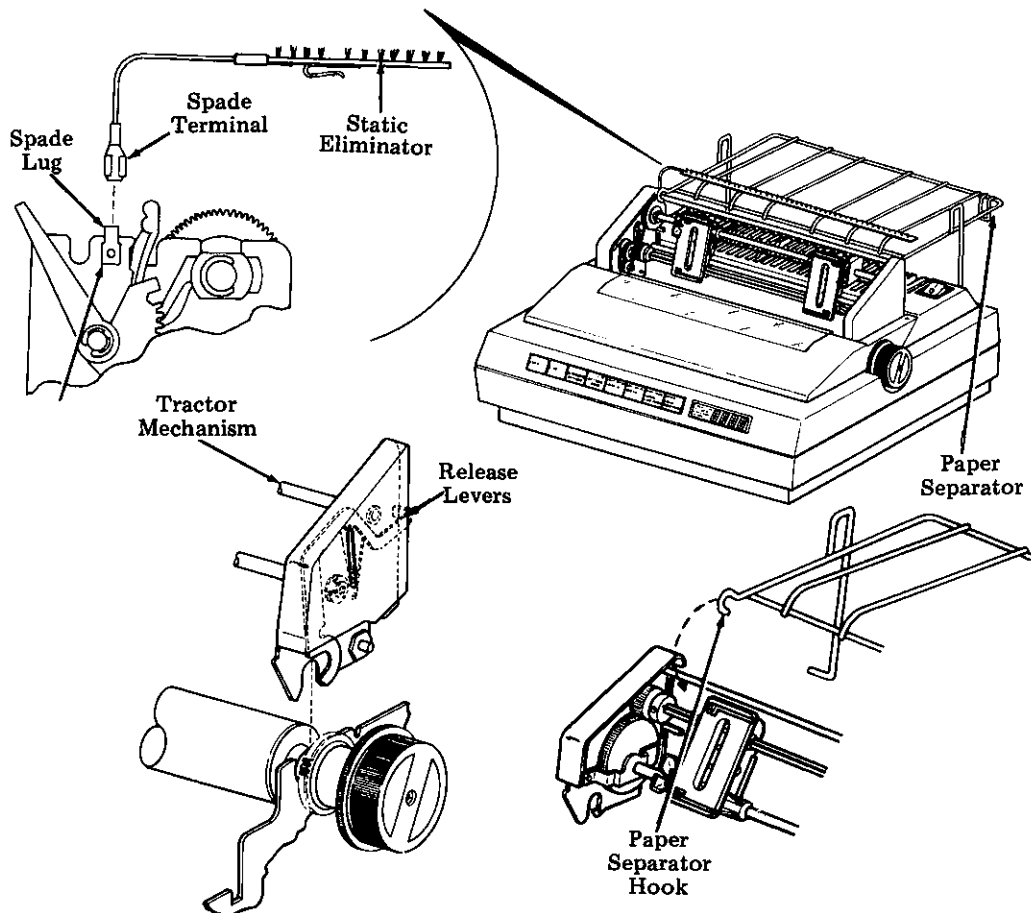
**Top Cover Assembly**

To remove the top cover assembly:

1. Perform A, B, or C, which ever is applicable.

A. Tractor Feed Printers:

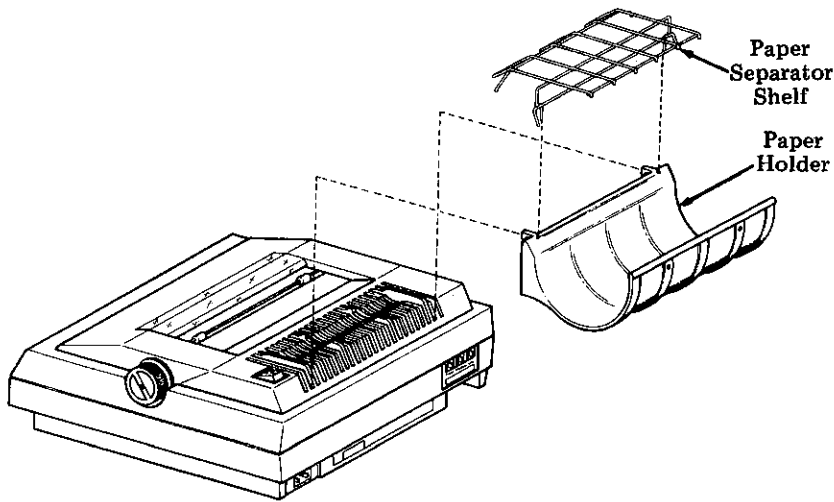
- (1) Remove the static eliminator wire spade terminal from the spade lug on the left side of the printer side frame (if present).
- (2) Unhook paper separator from top rail of tractor mechanism and remove paper separator. Several versions of paper separators exist. All unhook in the same manner. Only one version is shown in the figure for the sake of simplicity.
- (3) Pull up on left and right tractor release levers and lift tractor from printer.



**Figure 6-5. Top Cover Removal**

B. Pin Feed Printers:

- (1) Remove the static eliminator wire spade terminal from the spade lug on the left side of the printer side frame (if present).
- (2) Remove the paper separator shelf and paper holder (if present) by lifting straight up.



C. Friction Feed Printers With Roll Paper Holder:

- (1) Remove paper and roll paper holder (if present) by lifting straight up.

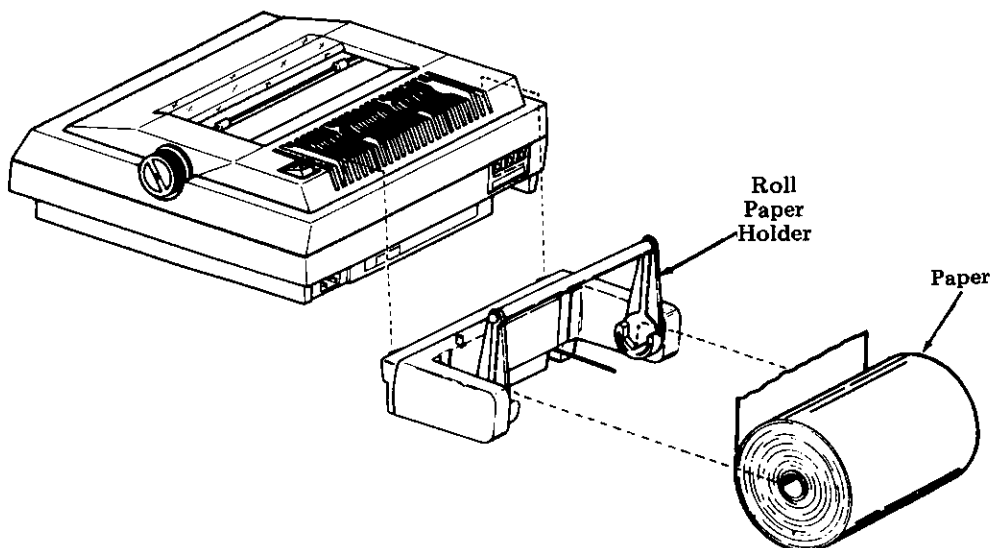


Figure 6-5. Top Cover Removal (Continuation)



2. Remove the platen assembly. See "Platen Assembly".
3. Remove four (5310) or six (5320) cabinet screws.
4. Slowly lift up cabinet cover until cable from display/control panel is visible. While holding cover, disconnect cable plug from driver card. If the roll paper holder assembly was present, also remove the low paper sensor cable from the terminal control card.
5. Remove cover.

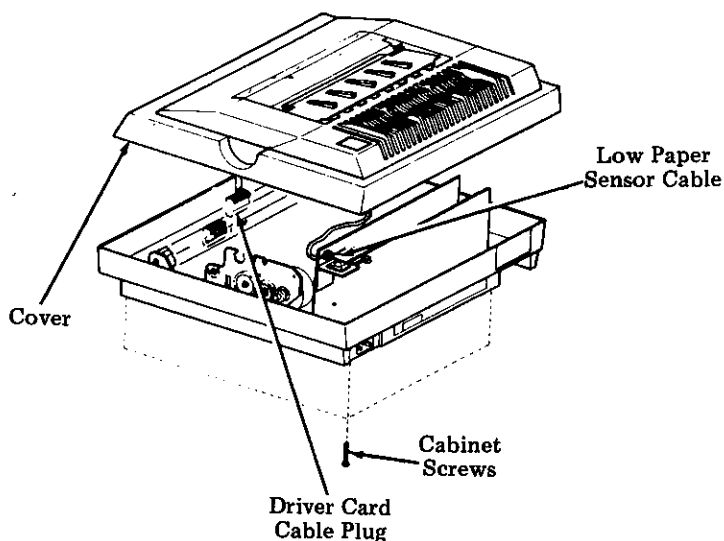


Figure 6-5. Top Cover Removal (Continuation)

### Switch and Display Card

To remove the switch and display card:

1. Remove the top cover assembly. See "Top Cover Assembly" in this section.
2. Remove the switch cable from the connector on the switch and display card.
3. Remove the three screws holding card to top cover assembly. Remove card.

**Note:** On reassembly (early version only), when inserting switch cable into the connector on the switch and display card, place orange stick into holes of flat cable and push toward connector until cable is fully seated.

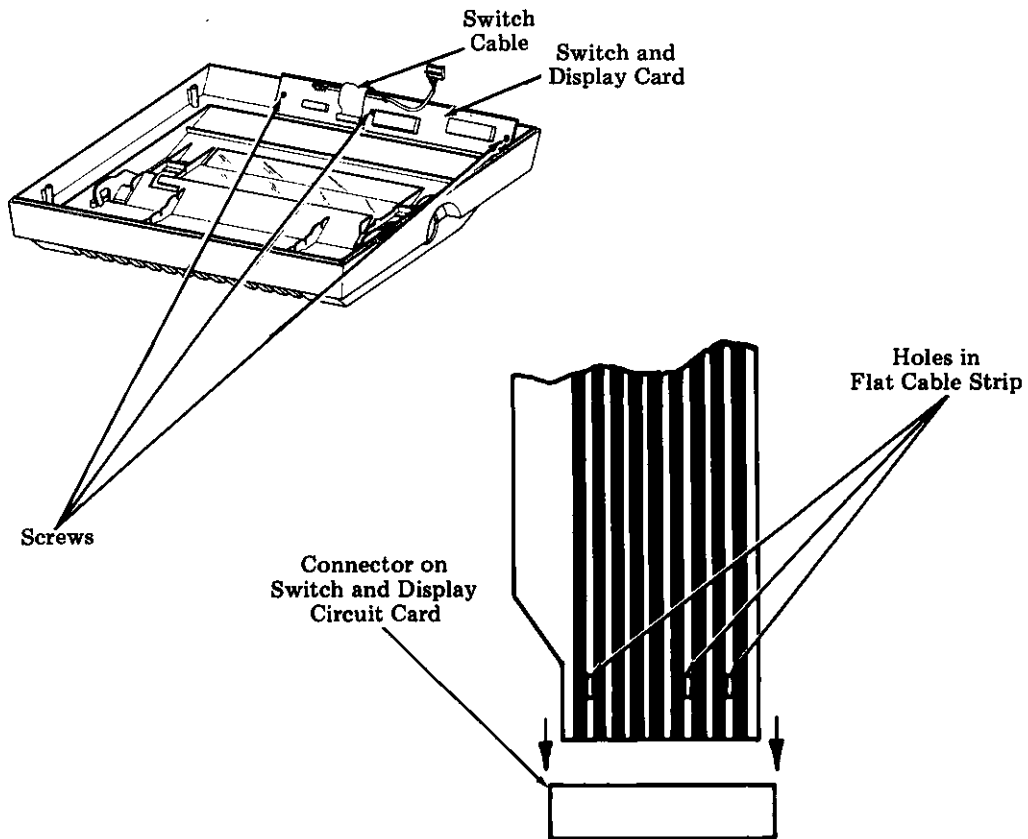


Figure 6-6. Switch and Display Card Removal

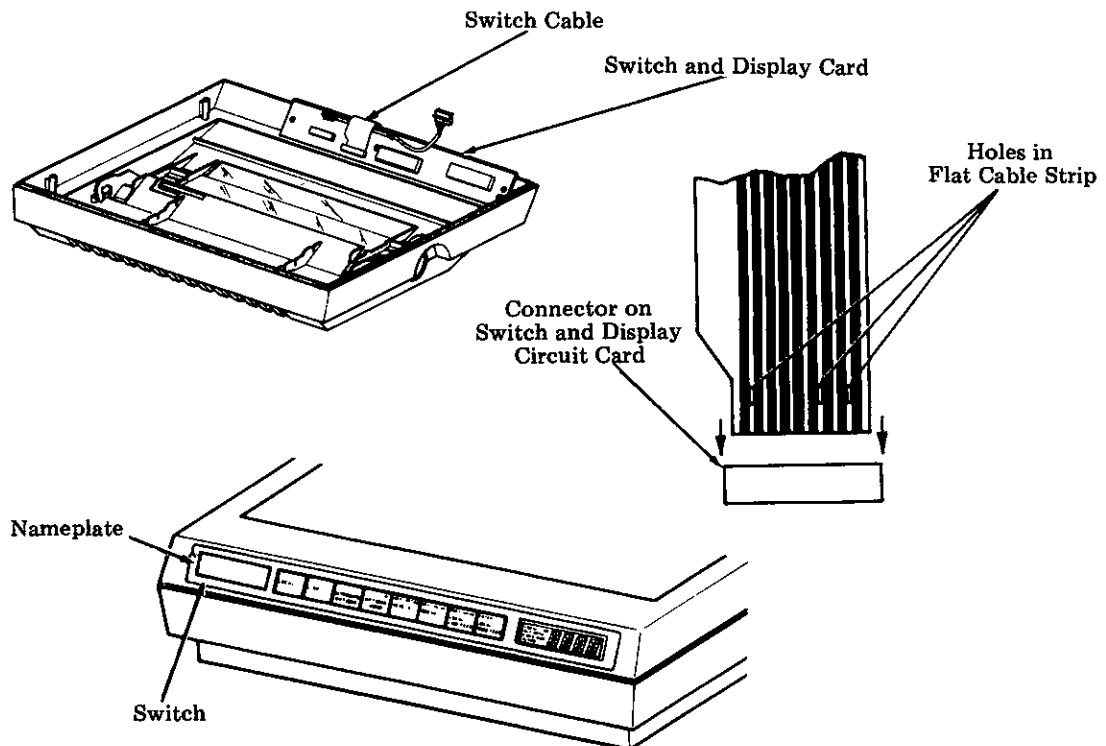
**Switch (Front Panel)**

To remove the front panel switch:

1. Remove the top cover assembly. See "Top Cover Assembly" in this section.
2. Remove the switch cable from the connector on the switch and display card.
3. Pry the nameplate (if present) away from the switch.
4. Peel the switch from the top cover assembly.

**Note 1:** When installing the new switch, peel the protective backing from the switch and attach to top cover. Also peel backing from nameplate and attach through two guide holes.

**Note 2:** On reassembly (early version only), when inserting switch cable into the connector on the switch and display card, place orange stick into holes of flat cable and push toward connector until cable is fully seated.



**Figure 6-7. Switch (Front Panel) Removal**

### Power Supply

To remove the power supply:

1. Remove the top cover assembly. See "Top Cover Assembly" in this section.
2. Remove the two power cables from the power supply.
3. If the modem card, current loop card or SSI card is located in the front circuit card slot, disconnect the internal interface cable from that card.
4. Remove the ac power cord from the ac connector.
5. Pull power supply card upward until it clears the molded guide slots.

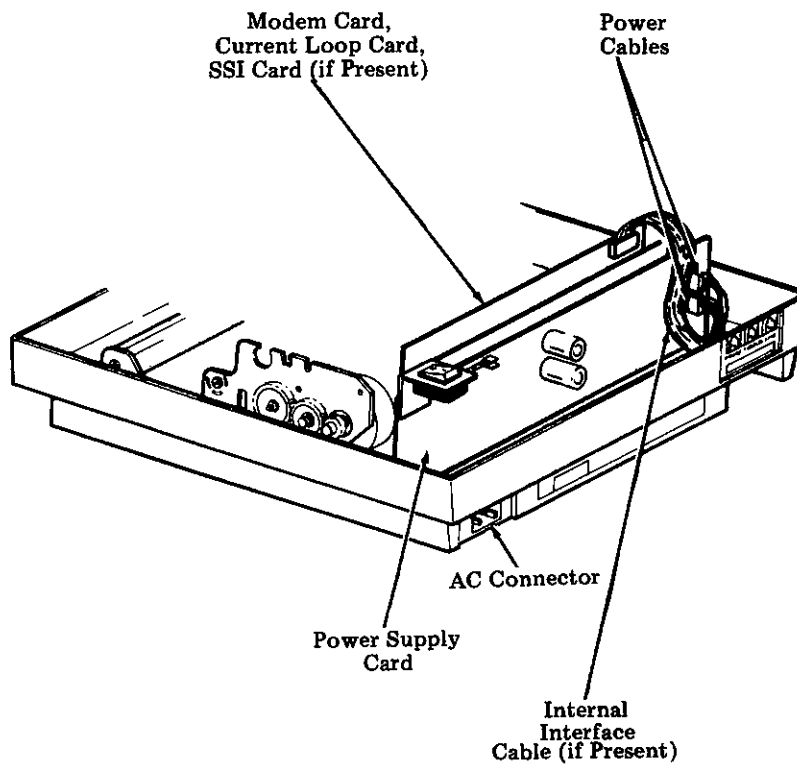
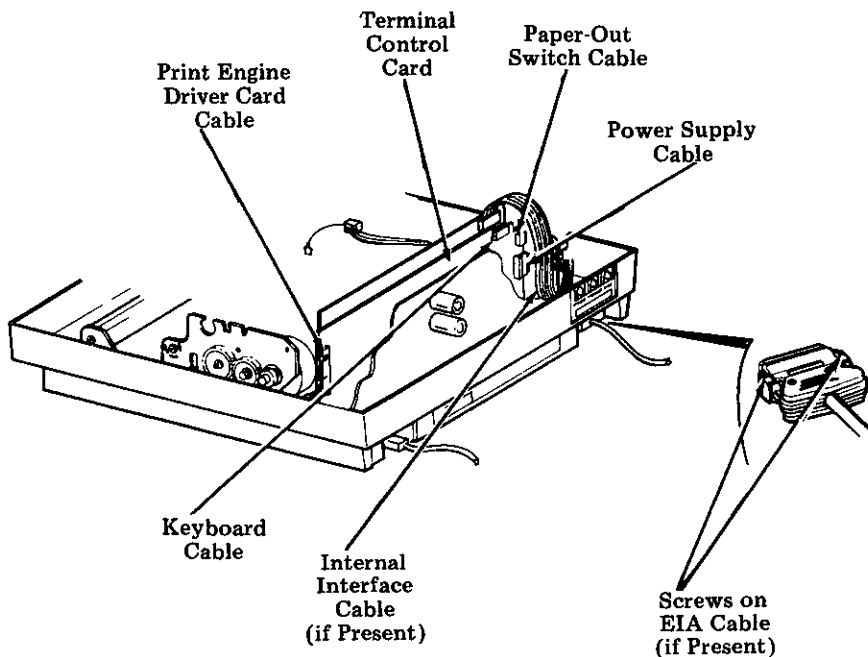


Figure 6-8. Power Supply Removal

**Terminal Control Card**

To remove the terminal control card:

1. Remove the top cover assembly. See "Top Cover Assembly" in this section.
2. Disconnect print engine driver card cable.
3. Disconnect paper-out switch cable.
4. Disconnect the power supply cable.
5. Disconnect the keyboard cable.
6. Disconnect internal interface cable (if present) from EIA connector and from interface card.
7. Disconnect external EIA cable (if present) by removing two screws.
8. Remove terminal control card by lifting straight up.

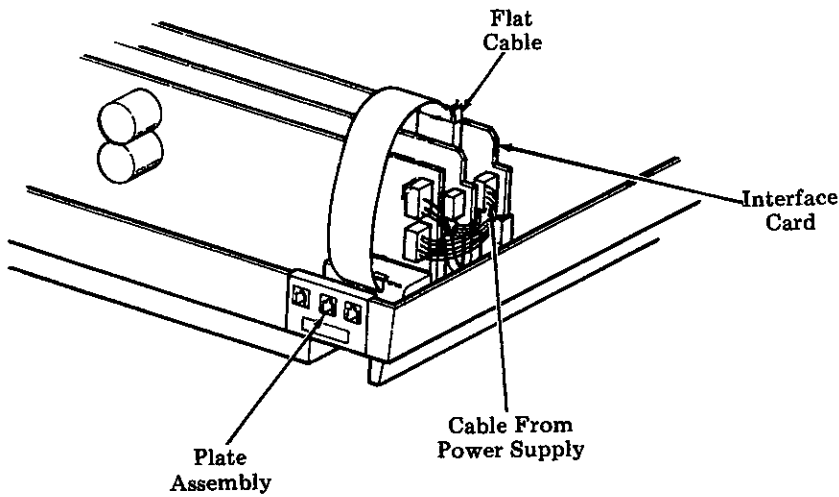


**Figure 6-9. Terminal Control Card Removal**

**Interface Card (Modem, Current Loop or SSI Card)**

To remove the interface card:

1. Remove the top cover assembly. See "Top Cover Assembly" in this section.
2. Disconnect flat cable from top of interface card.
3. Disconnect cable connector coming from power supply.
4. Slide the plate assembly upward and out of the bottom cover assembly. Various versions of this plate assembly exist for the various interface cards. Only one version is shown in the illustration.
5. Remove interface card by sliding straight upward.

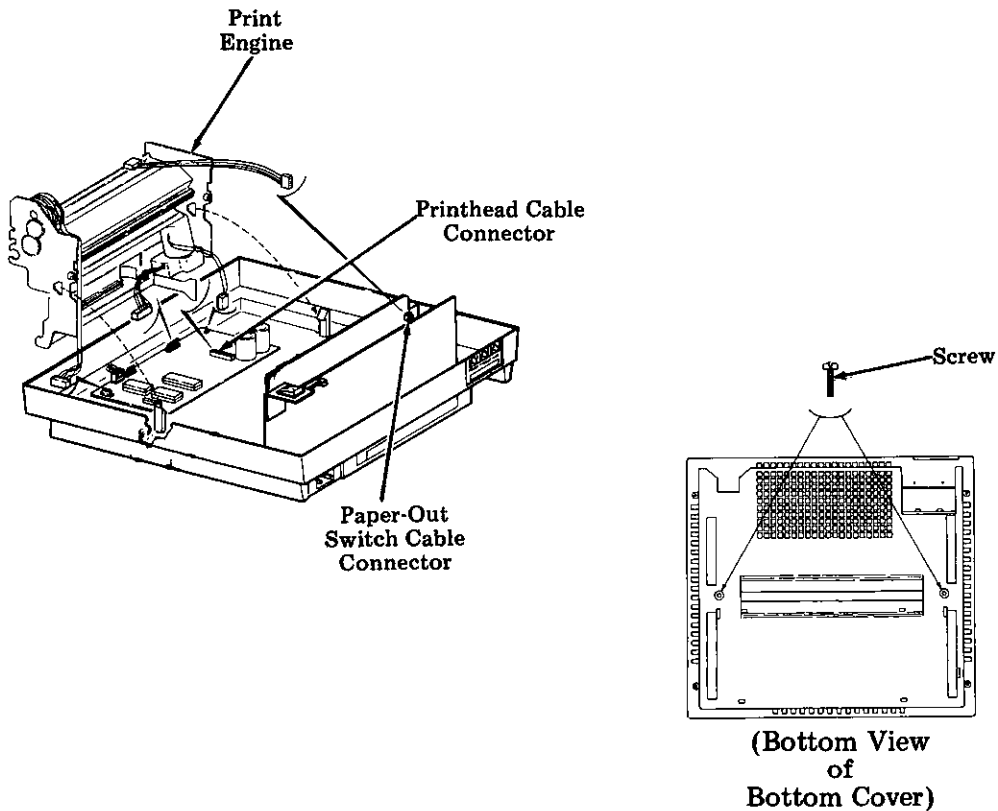


**Figure 6-10. Interface Card (Modem, Current Loop or SSI Card) Removal**

**Print Engine**

To remove the print engine:

1. Remove the top cover assembly. See "Top Cover Assembly" in this section.
2. Disconnect printhead cable from connector on print engine driver card.
3. Disconnect paper-out switch cable from connector on terminal control card.
4. Remove two screws and two washers (present on early version printer) securing print engine to bottom cover.



**Figure 6-11. Print Engine Removal**

5. Disconnect carriage motor cable, encoder cable and line feed motor cable.
6. Pry tabs outward (one each side) and lift print engine upward until it clears guide slots. Remove print engine.

**Note:** In reassembly, make sure print engine side frame springs do not sit on top of driver card.

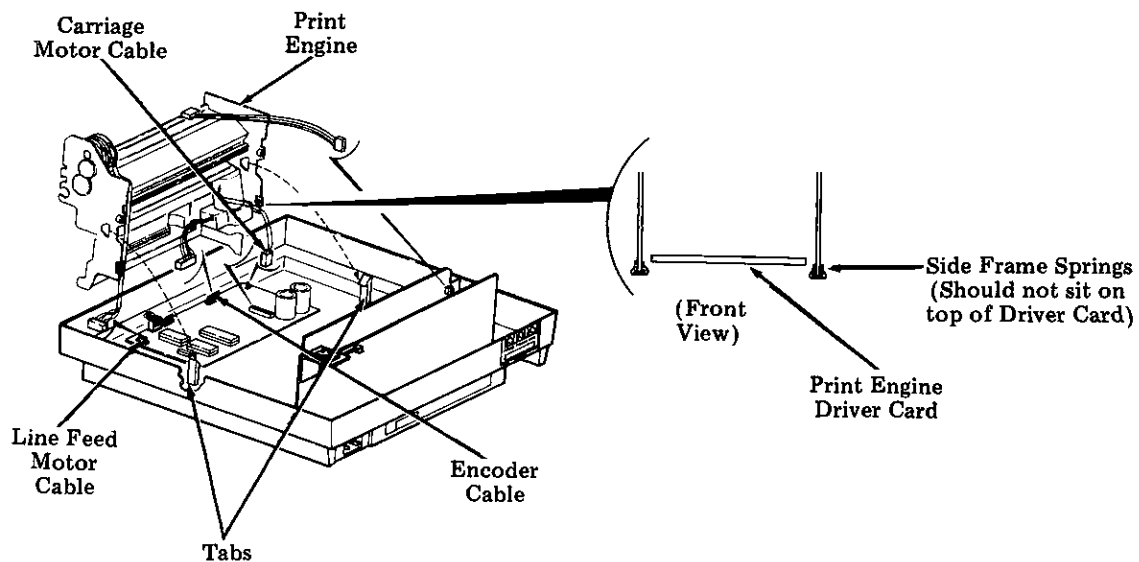


Figure 6-11. Print Engine Removal (Continuation)

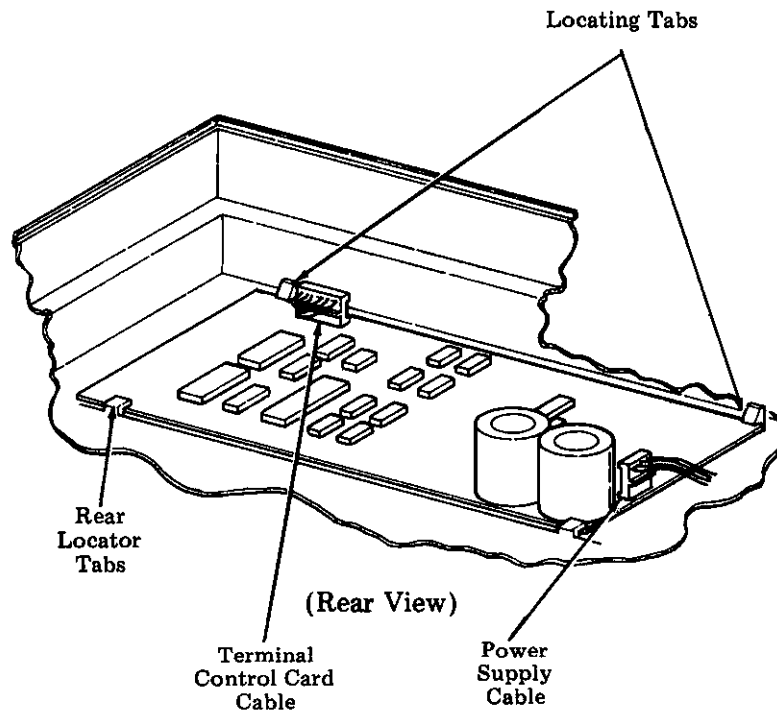


**Print Engine Driver Card**

To remove the print engine driver card:

1. Remove the print engine. See "Print Engine" in this section.
2. Disconnect the power supply cable.
3. Disconnect the terminal control card cable.
4. Push locating tabs toward front of cabinet. Lift front of print engine driver card and remove card.

**Note:** In reassembly, verify insulator under driver card is present and properly positioned. Insert rear of driver card under rear locator tabs before positioning front of card under front tabs. Holes in card should align with molded pins of cabinet before pushing front of card into place.



**Figure 6-12. Print Engine Driver Card Removal**



## **7. Wiring**

### **Overview**

This section provides wiring information for the 5310 and 5320 Printers. The printer wiring information provides proper component interconnection.

Not all numbers shown on the printer wiring diagram appear on the plugs, jacks or circuit cards.

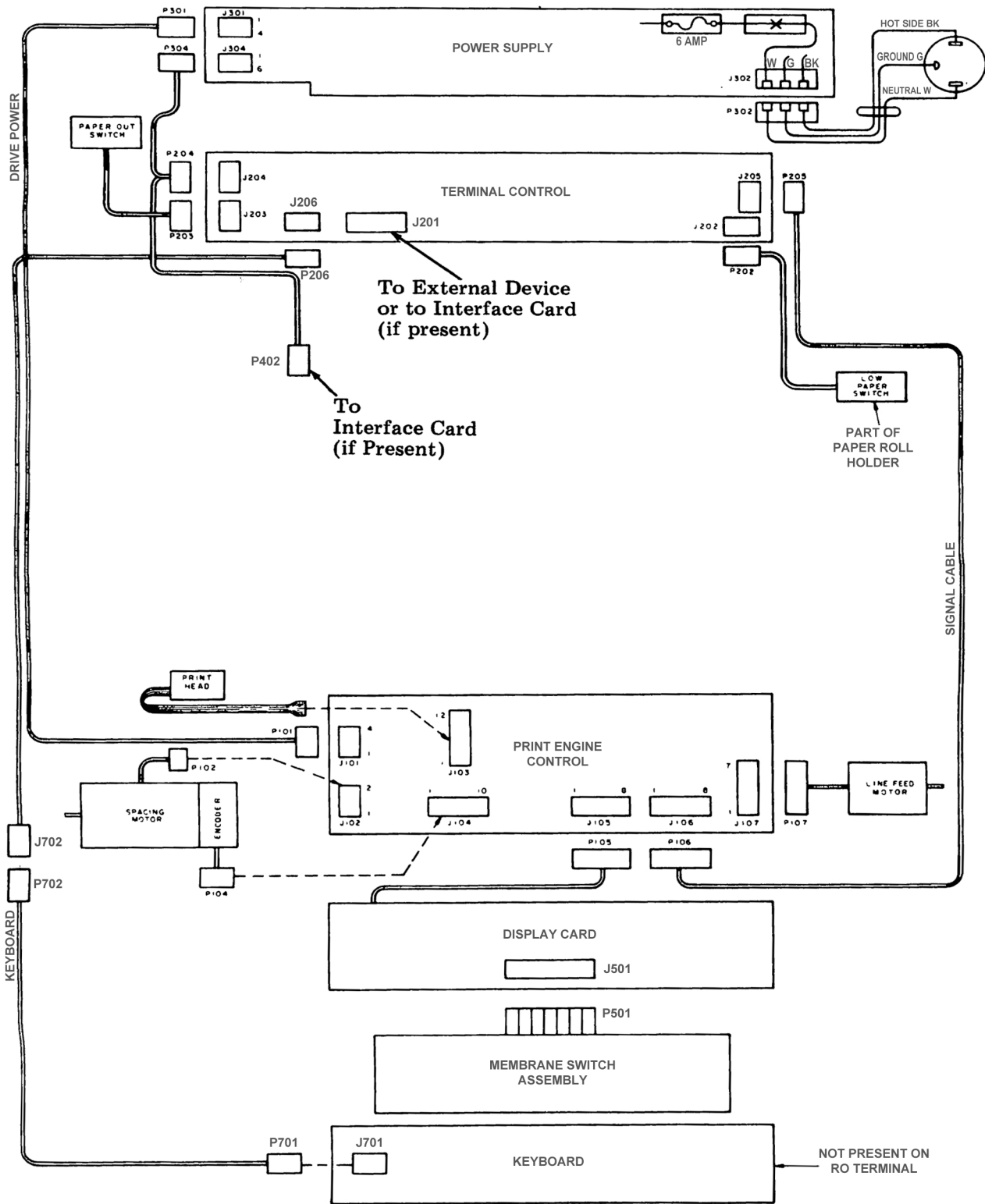


Figure 7-1. Printer Block Wiring Diagram

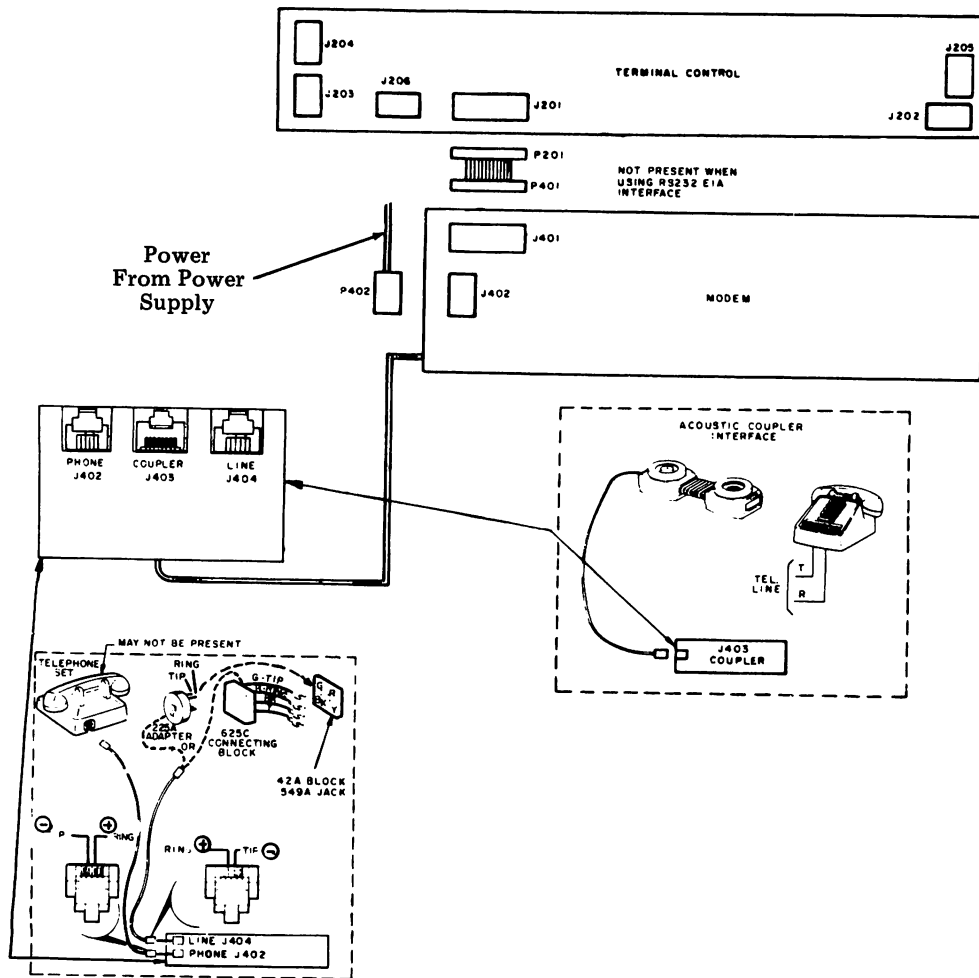


Figure 7-2. Interface - Modem Block Wiring Diagram

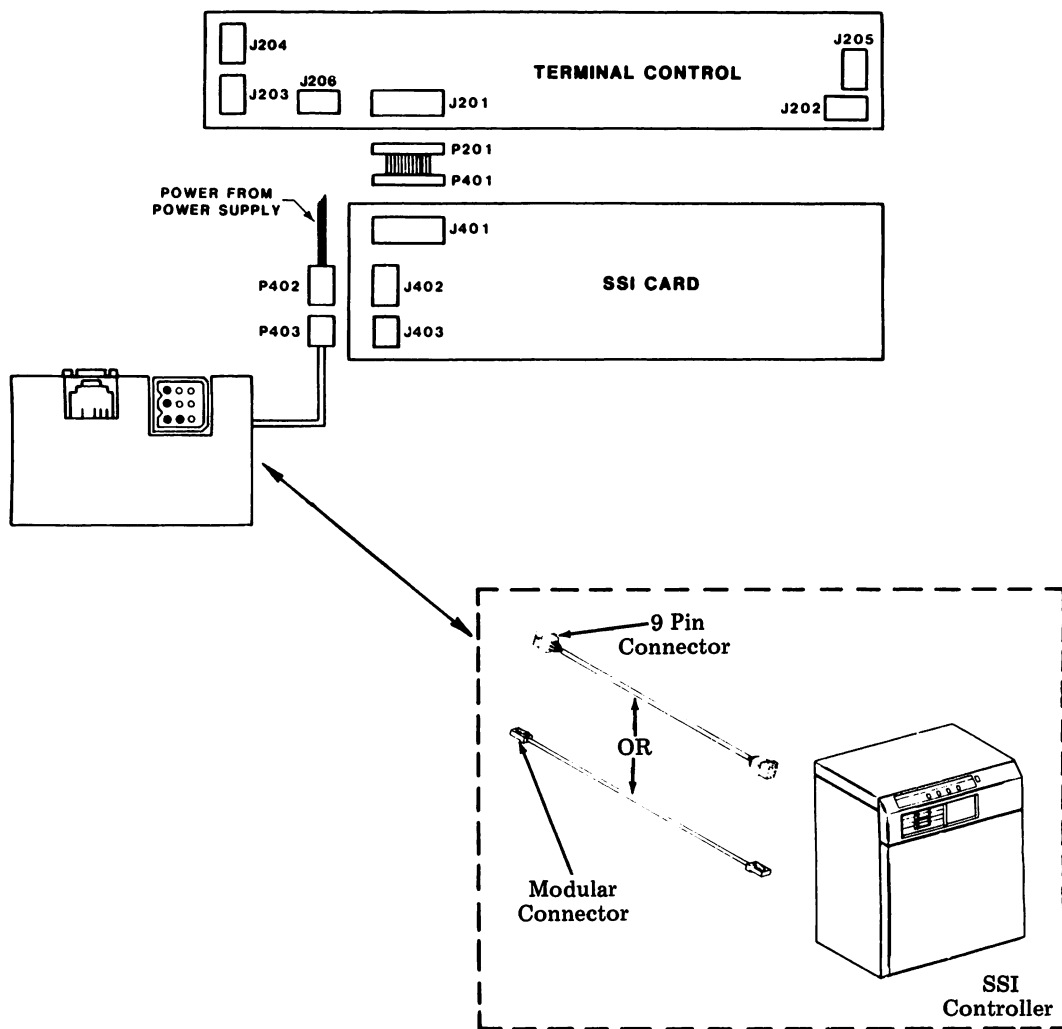


Figure 7-3. Interface - SSI Block Wiring Diagram

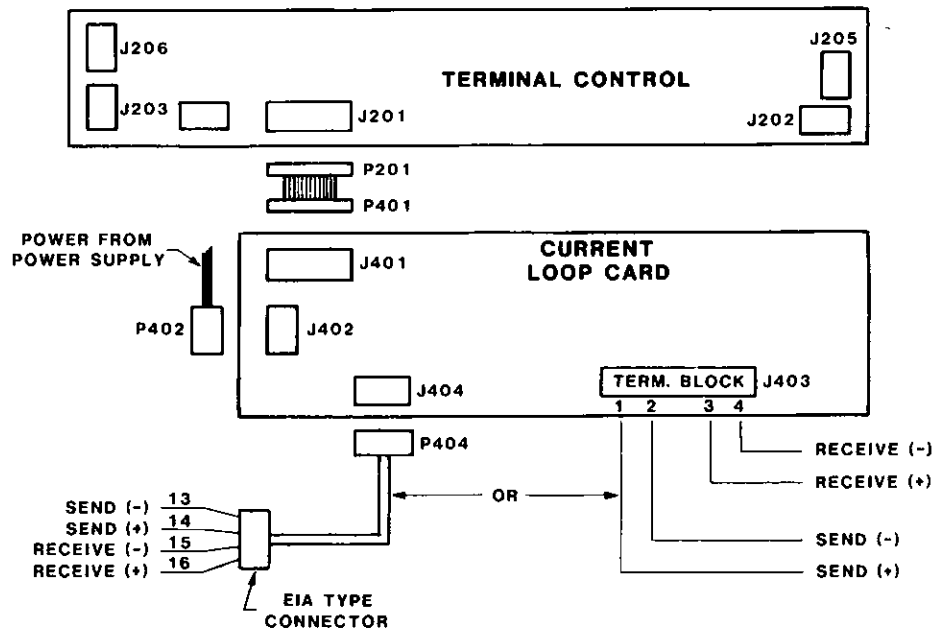


Figure 7-4. Interface - Current Loop Block Wiring Diagram





**8. Maintenance Spares**

Contents	Page
Overview .....	8-1
Ordering .....	8-2
Maintenance Spares .....	8-3
Numerical Index .....	8-6
Application Notes .....	8-8

**Overview**

Information on maintenance spares is provided in this section for the 5310 and 5320 Printers.

This section provides illustrations to identify the part number and location of recommended spares that should be available and may be required to correct the trouble. The illustrations are followed by a five column table with the following headings:

**Comcode:** This is AT&T Information Systems Inc. part number to use when ordering the desired item.

**Mfr's Part Number:** This is the manufacturer's code for identifying the item in the illustrations and is usually found on the shipping package. Nine digit Comcode numbers are used for late version printer maintenance spares instead of catalogue codes or six digit manufacturer numbers.

**Description:** Briefly describes the part.

**Notes:** Describes where used.

**Page Number:** Indicates the page number in this section where the part is identified and can be located.

Troubleshooting and disassembly/reassembly information for these parts is covered in Sections "5. Troubleshooting" and "6. Disassembly/Reassembly" of this manual.

The service parts are listed by AT&T Comcode and AT&T manufacturer's number. Parts are usually packaged and stamped with the manufacturer's number. Order using the comcode number.

### **Ordering**

The following information is needed to place an order for maintenance spares with AT&T Information Systems Inc.:

**Product name:** This information is in the "Overview" of this part and at the top of the "Numerical Index" in this section.

**Part number:** This is the individual part number (Comcode) to be ordered from the "Numerical Index."

**Part description:** The part description is provided under "Description" in the "Numerical Index."

Where to place an order:

Call the National Parts Sales Center, toll free,  
1-800-222-7278 (hours are 8:00 A.M. to 5:00 P.M. in  
all U.S. time zones).

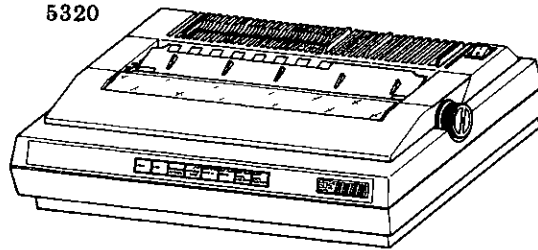
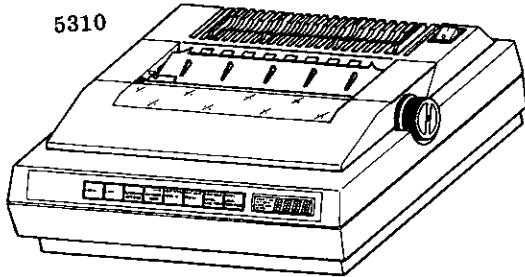
or

Write to "AT&T National Parts Sales Center, 111 Havana,  
Aurora, Colorado 80010.

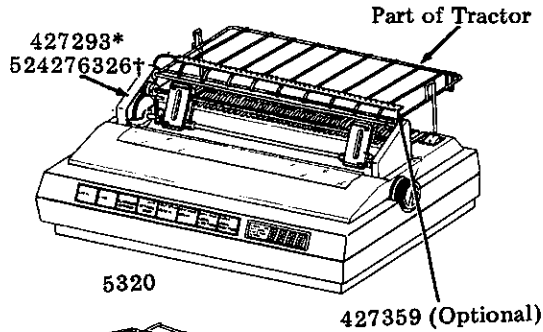
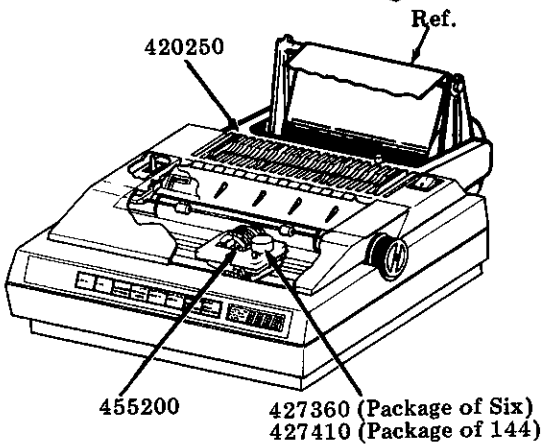
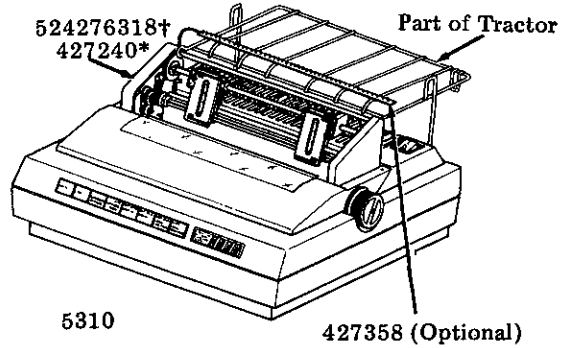
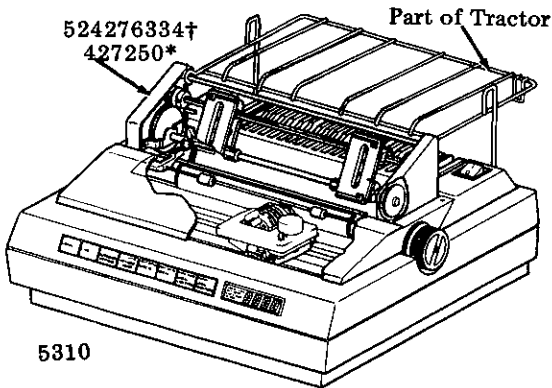
or

Follow your local procedures.

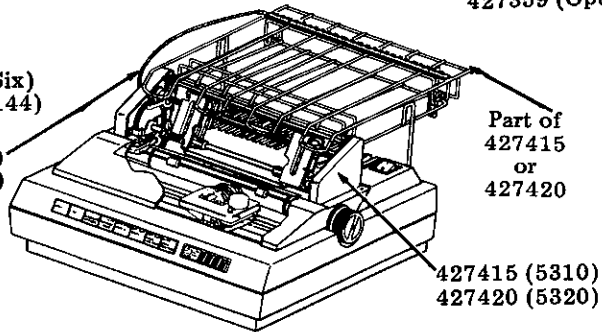
**Maintenance Spares**



- |                                 |                              |
|---------------------------------|------------------------------|
| 501006084 (9-1/2 Inch 115 Vac)* | 501006167 (15 Inch 115 Vac)* |
| 501006092 (9-1/2 Inch 115 Vac)† | 501006175 (15 Inch 115 Vac)† |
| 5310-1AOR (9-1/2 Inch 230 Vac)* | 5320-1AOR (15 Inch 230 Vac)* |

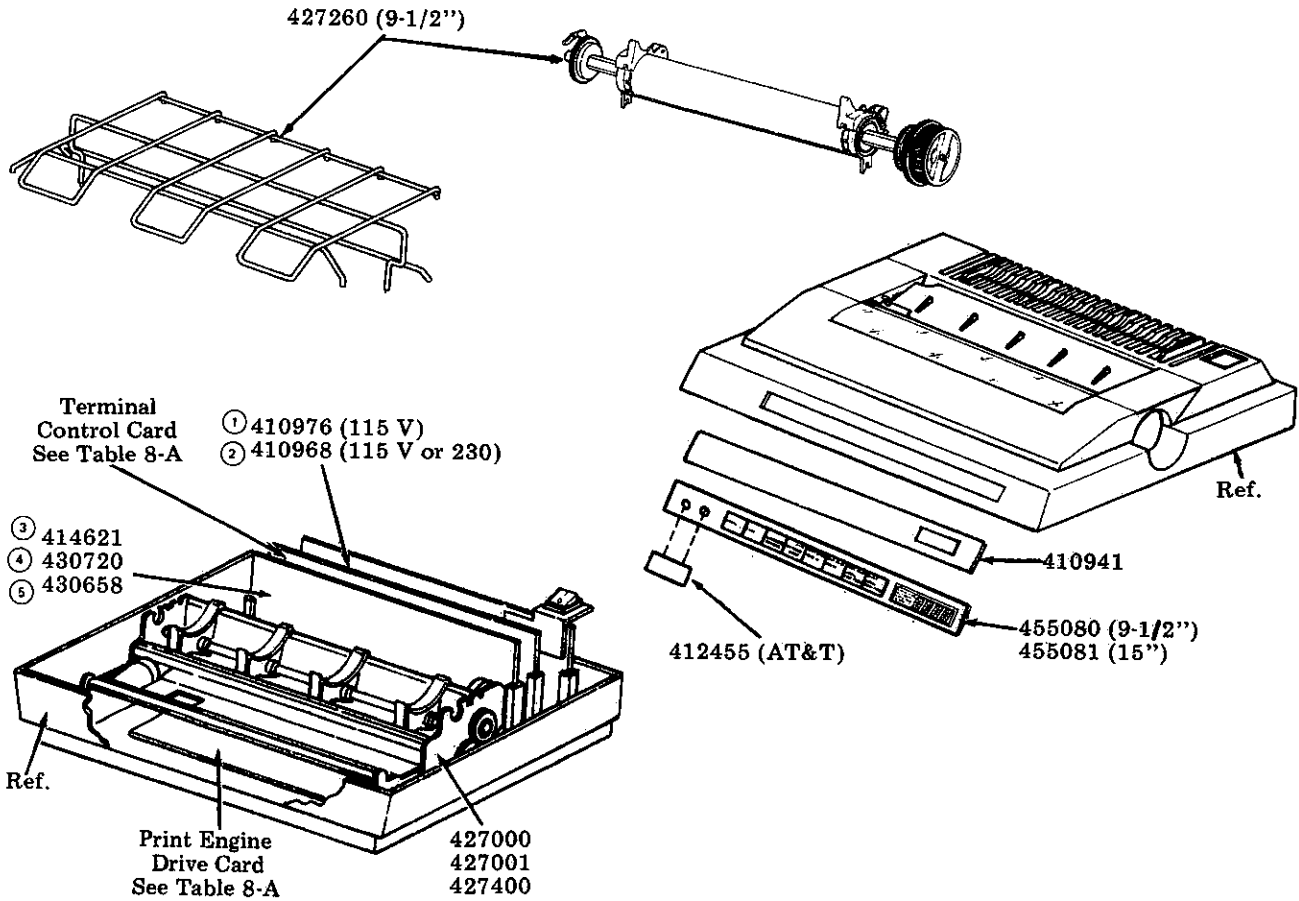


- 427410 (Package of 144)
- 427508 (5310)
- 427509 (5320)



\*Charcoal Grey Cover  
†Black Cover

**Figure 8-1. Maintenance Spares Identification**

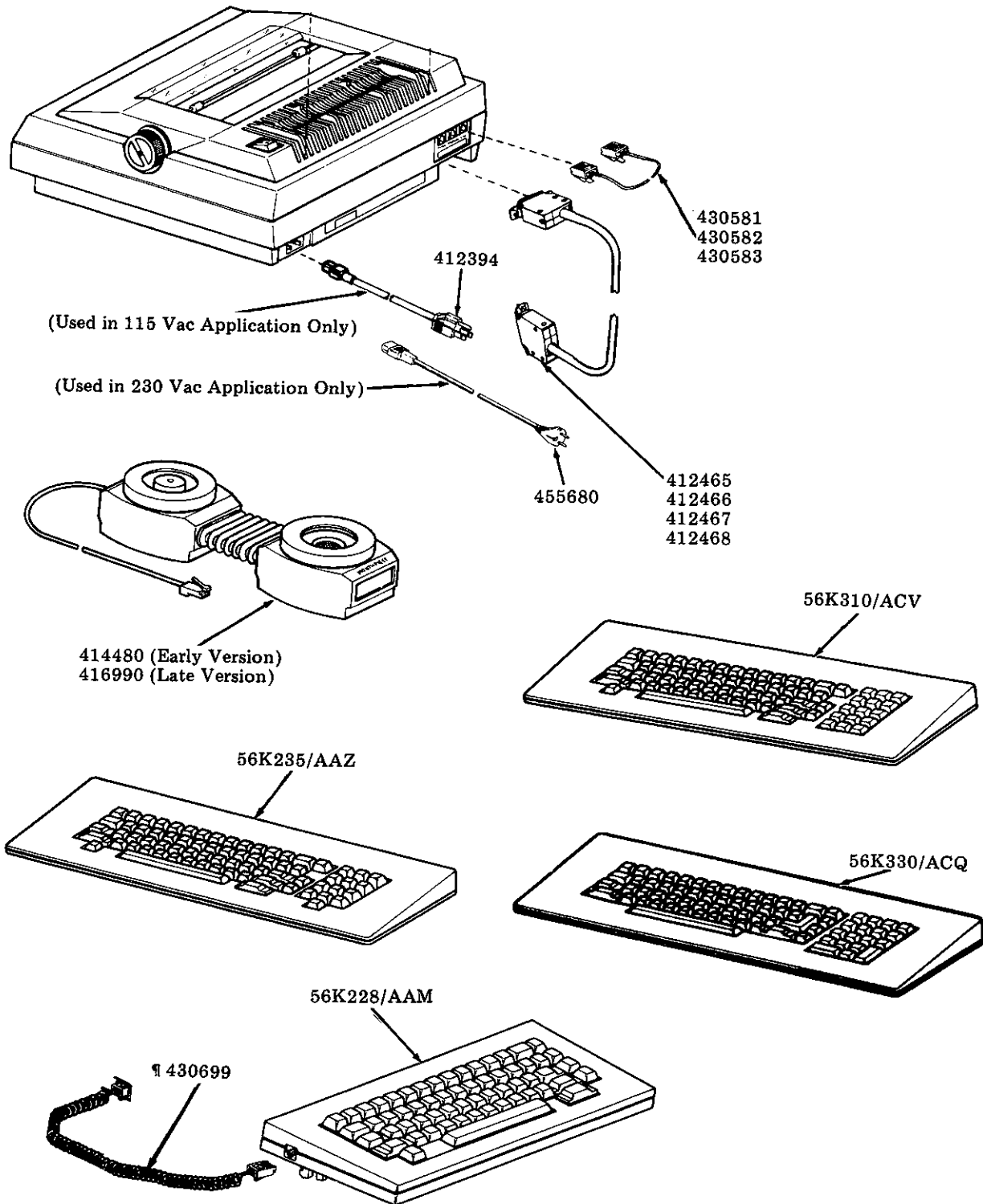


- ① Used on AAA coded printer.
- ② Used on all printers except AAA.
- ③ Modem mod. kit, includes card, flat cable and mounting plate.
- ④ Current Loop mod. kit, includes card, cables and mounting plate.
- ⑤ SSI to EIA mod. kit, includes card, cables and mounting plate.

Table 8-A. Circuit Card Compatibility

Printer Code Alpha Suffix	Terminal Control Card	Print Engine Drive Card
AAA	410934	410940
AAB	410935	410943
BAC	410938	410440
BAE	524104445	410440
BKE	524104445	410440

Figure 8-1. Maintenance Spares Identification (Continuation)



† Included with all keyboard codes.

Figure 8-1. Maintenance Spares Identification (Continuation)

Numerical Index

Comcode	Mfg. Part No.	Notes	Description	Page Number
524104403	410440	1	Print Engine Drive Card	8-4
524104445	410444	26	Terminal Control Card	8-4
524109345	410934	1	Terminal Control Card	8-4
524109352	410935	1	Terminal Control Card	8-4
524109386	410938	1	Terminal Control Card	8-4
524109402	410940	1	Print Engine Drive Card	8-4
524109410	410941	2	Switch and Display Card	8-4
524109436	410943	1	Print Engine Drive Card	8-4
524109683	410968	3	Power Supply Card 115/230 Vac	8-4
524109766	410976	3	Power Supply Card 115 Vac	8-4
524123940	412394	4	AC Power Cable, 115 Vac	8-5
524124559	412455	5	Nameplate, AT&T	8-4
524124658	412465	6	EIA Cable, 7 Ft. Length	8-5
524124666	412466	6	EIA Cable, 12 Ft. Length	8-5
524124674	412467	6	EIA Cable, 25 Ft. Length	8-5
524124682	412468	6	EIA Cable, 50 Ft. Length	8-5
524144805	414480	7	Acoustic Coupler Interface Unit	8-5
524146214	414621	8	Dialing Modem Modification Kit	8-4
524169901	416990	7	Acoustic Coupler Interface Unit	8-5
524202504	420250	9	Paper Roll Support Modifica- tion Kit	8-3
524270006	427000	10	Print Engine (Friction Feed 9-1/2 Inch) Without Printhead	8-4
524270014	427001	11	Print Engine (Friction Feed 15 Inch) Without Printhead	8-4
524272408	427240	12,27	Tractor Assembly, Pull Type (9-1/2 Inch)	8-3
524272507	427250	13,27	Tractor Assembly, Push Type (9-1/2 Inch)	8-3
524272606	427260	14	Pin Feed Platen Assembly (9-1/2 Inch)	8-4
524272762	427276	33	Paper Separator	8-3
524272937	427293	15,27	Tractor Assembly, Pull Type (15 Inch)	8-3
524273588	427358	12,14	Static Eliminator	8-3
524273596	427359	15	Static Eliminator	8-3
524273604	427360	25	Ribbon (Package of 6)	8-3
524274008	427400	14	Print Engine (Pin Feed 9-1/2 Inch) Without Printhead	8-4
524274107	427410		Ribbon (Package of 144)	8-3

Comcode	Mfg. Part No.	Notes	Description	Page Number
524274156	427415	27,31	Tractor Assembly, Bidirectional (9-1/2 Inch)	8-3
524274206	427420	27,32	Tractor Assembly, Bidirectional (15 Inch)	8-3
524275088	427508	31	Static Eliminator	8-3
524275096	427509	32	Static Eliminator	8-3
524276318	427631	12,28,29	Tractor Assembly, Pull-Type (9-1/2 Inch)	8-3
524276326	427632	15,28,29	Tractor Assembly, Pull-Type (15 Inch)	8-3
524276334	427633	13,28,29	Tractor Assembly, Push-Type (9-1/2 Inch)	8-3
524305810	430581	16	Modular Telephone Cord, 7 Ft. Length	8-5
524305828	430582	16	Modular Telephone Cord, 14 Ft. Length	8-5
524305836	430583	16	Modular Telephone Cord, 25 Ft. Length	8-5
524306586	430658	30	SSI to EIA Modification Kit	8-4
524306990	430699	17	Keyboard Cable	8-5
524307204	430720	18	Current Loop Modification Kit	8-4
524550803	455080	19	Switch (9-1/2 Inch)	8-4
524550811	455081	11	Switch (15 Inch)	8-4
524552007	455200	2	Printhead Assembly	8-3
524556800	455680	24	AC Power Cable, 230 Vac	8-5
500064688	56K228/AAM	20	Keyboard With Cable	8-5
500064696	56K235/AAZ	21	Keyboard With Cable	8-5
500066493	56K310/ACV	21	Keyboard With Cable	8-5
500066758	56K330/ACQ	21	Keyboard With Cable	8-5
501006084		8,22,27	9-1/2 Inch RO Printer, EIA, 115 Vac	8-3
501006092		8,22,28	9-1/2 Inch RO Printer, EIA, 115 Vac	8-3
500063318	5310-1AOR	22,27	9-1/2 Inch RO Printer, EIA, 230 Vac	8-3
501006167		8,23,27	15 Inch RO Printer, EIA, 115 Vac	8-3
501006175		8,23,28	15 Inch RO Printer, EIA, 115 Vac	8-3
500063359	5320-1AOR	23,27	15 Inch RO Printer, EIA, 230 Vac	8-3

### Application Notes

- Note 1:** The 410934 and 410940 cards were part of AAA coded printers. The 410935 and 410943 cards were part of AAB coded printers. The 410938 and 410440 cards are part of BAC coded printers. These cards must be used as the pairs specified. The cards for the AAB printers can be used in AAA coded printers; requires Issue 2 of the User's Guide 999-300-183IS. The cards for the BAC coded printers can be used in AAB or AAA coded printers; requires User's Guide 999-300-274IS and Pocket Reference Guide 999-300-275IS. Using the cards from the BAC coded printers in earlier printers does not make those printers FFC Class B certified. The cards are not forward interchangeable (i.e., AAA coded printer cards cannot be used in BAC coded printers) with one exception; cards from AAA coded printers updated using the 430972 AAB EPROM modification kit can be used in AAB coded printers.
- Note 2:** Applies to all printers.
- Note 3:** The late version 410968 power supply (strapped for 115 Vac) can be used in place of the early version 410976 power supply for 5310/5320 AAA coded printers. However, the 410968 power supply has EIA pins 1 and 7 directly connected to the printer frame but isolated from ac protective (earth) ground. This allows the printer to be used in a system which has only one common protective and signal grounding point. The 410968 power supply can be strapped to connect frame ground to earth ground. The 410976 power supply has EIA pins 1 and 7 connected together and to ac protective (earth) ground inside the power supply. The 410976 power supply need no longer be stocked, but can be used to replace the 410968 power supply in 5310/5320 AAB or BAC coded printers used in 115 Vac applications if grounding arrangement does not cause a problem; as when using an isolated interface such as a modem.
- Note 4:** Applies to all 115 Vac printers.
- Note 5:** Required if replacing old style 455080 or 455081 switch.



- Note 6:** Applies to all EIA printers.
- Note 7:** Applies to printers with an acoustic coupler interface unit. The 416990 acoustic coupler interface unit replaces the 414480 acoustic coupler interface unit in all applications. The 416990 unit is required when used with "BAC" coded printers to maintain FCC Class B integrity. The 414480 unit can still be used with "AAA" or "AAB" coded printers.
- Note 8:** The modem modification kit is required with the 5310 or 5320 1A0A to configure a replacement for a 5310 or 5320 with integrated modem. The modem modification kit is required to replace a defective modem.
- Note 9:** Applies to printers equipped with the paper roll support modification kit.
- Note 10:** Applies to 5310 Printers (friction feed or tractor feed).
- Note 11:** Applies to all 5320 Printers.
- Note 12:** Applies to 5310 Printers with the pull tractor accessory.
- Note 13:** Applies to 5310 Printers with the push tractor accessory.
- Note 14:** Applies to 5310 pin feed printers.
- Note 15:** Applies to 5320 Printers with pull tractor accessory.
- Note 16:** Applies to printers with internal modem.
- Note 17:** Applies to all printers equipped with a keyboard.
- Note 18:** Applies to all printers equipped with the current loop modification kit.
- Note 19:** Applies to all 5310 Printers.
- Note 20:** Applies primarily to 5310 Printers equipped with a keyboard. May be used with 5320 Printers.

- Note 21:** The 56K330ACQ keyboard replaces the earlier version 56K235AAZ and 56K310ACV keyboards. Only the 56K330ACQ keyboard should be stocked as a maintenance spare. Earlier version keyboards already in stock can continue to be used. The 56K235AAZ keyboard can be used on all 5320 Printers. The 56K310ACV keyboard, in addition to working on AAB and BAC coded printers, can be used on the 5320 AAA coded Printers except the "ENTER" key and the numeric pad "," key will have no function. The 56K330ACQ keyboard, in addition to working on AAB and BAC coded printers, can be used on the 5320 AAA coded Printers except the "ENTER, PF1 through PF4" keys and the "BREAK/ HERE IS" key will have no function.
- Note 22:** Applies to all United States and United Kingdom version 5310 Printers; may require transferring the internal modem, cable and mounting bracket or using the internal modem modification kit. Other accessories (i.e., tractor, paper roll support, etc.) may require transferring from defective printer also.
- Note 23:** Applies to all United States and United Kingdom version 5320 Printers; may require transferring the internal modem, cable and mounting bracket or using the internal modem modification kit. Other accessories (i.e., tractors, paper roll support, etc.) may require transferring from defective printer also.
- Note 24:** Applies to most European countries for 230 Vac cords. Cords for other countries may have to be ordered locally.
- Note 25:** Applies to all printers; also specified in the User's Guide to stock ribbons on site.
- Note 26:** Applies to BAE and BKE coded printers only.
- Note 27:** Covers are charcoal grey.
- Note 28:** Covers are black.

- Note 29:** The 427240, 427250 and 427293 tractor assemblies may be converted to 524276326, 524276318 and 524276334 tractor assemblies respectively by replacing 427149 left tractor cover with 524276169 left tractor cover and 427148 right tractor cover with 524276177 right tractor cover.
- Note 30:** Applies to printers equipped with the SSI to EIA modification kit.
- Note 31:** Applies to 5310 Printers equipped with the bidirectional tractor assembly.
- Note 32:** Applies to 5320 Printers equipped with the bidirectional tractor assembly.
- Note 33:** Applies to 5310 Printers equipped with push tractors and the 427276 paper separator.



**Appendix A**  
**Adjustments**

<b>Contents</b>	<b>Page</b>
Overview .....	A-1
Tools Required .....	A-2
Adjustments .....	A-3
Carriage Assembly Pinion Gear to Transfer Gear Adjustment .....	A-3
Carriage Roller to Guide Rail Adjustment (Left, Right, Front and Rear) .....	A-4
Carriage Motor Belt Tension Adjustment .....	A-5
Line Feed Motor Gear and Intermediate Gear Adjustment .....	A-6
Line Feed Idler Gear, Platen Gear, and Intermediate Gear Adjustment .....	A-7
Tractor Idler Gear Backlash Adjustment (Pull-Type and Bidirectional Tractor Mechanism) .....	A-8
Tractor Idler Gear to Platen Gear Adjustment (Pull-Type and Bidirectional Tractor Mechanism) .....	A-9
Intermediate Gear and Tractor Gear Adjustment (Push-Type Tractor Mechanism) .....	A-10
Idler Gear and Intermediate Gear Adjustment (Push-Type Tractor Mechanism) .....	A-11
Tractor Idler Gear to Platen Gear Adjustment (Push-Type Tractor Mechanism) .....	A-12
Horizontal Line Adjustment (Bidirectional, Push- and Pull-Type Tractor Mechanism) .....	A-13
Paper Roll Support Low Paper Sensing Arm .....	A-14

**Overview**

This section provides printer and accessory adjustments.

Adjustments related to print quality are shown in this section. Adjustments may be checked and performed when a trouble on the troubleshooting chart indicates a specific adjustment may be out of tolerance.

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

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

Reference in the procedure to left or right, front or back, and top or bottom, etc., refer to the printer in its normal operating position, as viewed by the operator.

**Tools Required**

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.

- Nut Driver, 1/4-Inch Socket
- Nut Driver, 5/16-Inch Socket
- Wrench, 5/16-Inch and 3/8-Inch Open End
- Wrench, 3/16-Inch and 1/4-Inch Open End
- Wrench, Hex Key 0.050 Inch
- Wrench, Hex Key 5/64-Inch
- Gauge Set, Feeler
- Scale, Spring (8 Ounce)
- Screwdriver, 3-1/2 Inch Blade
- Screwdriver, 6 Inch blade



**Carriage Roller to Guide Rail Adjustment (Left, Right,  
Front and Rear)**

(1) Requirement

There should be

Min Some--Max 0.002 inch

gap between the rear roller mounting nut washer surface and  
the roller surface.

To Adjust

Position rear roller mounting nut and retighten lock nut.

(2) Requirement

There should be

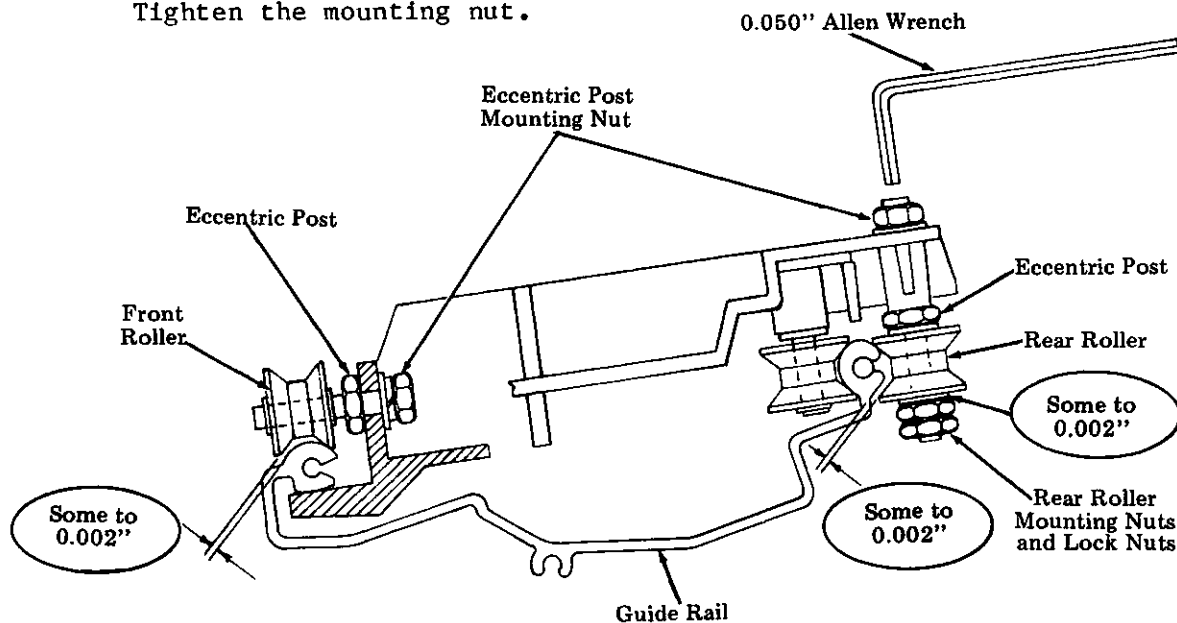
Min Some--Max 0.002 inch

gap between the carriage rollers and the guide rail at the  
closest point.

To Adjust

Loosen eccentric post mounting nut and rotate eccentric post  
to meet the requirement.

Tighten the mounting nut.



**Figure A-2. Carriage Roller Assembly**



**Carriage Motor Belt Tension Adjustment**

**Requirement for 9-1/2 Inch (5310) Print Engine**

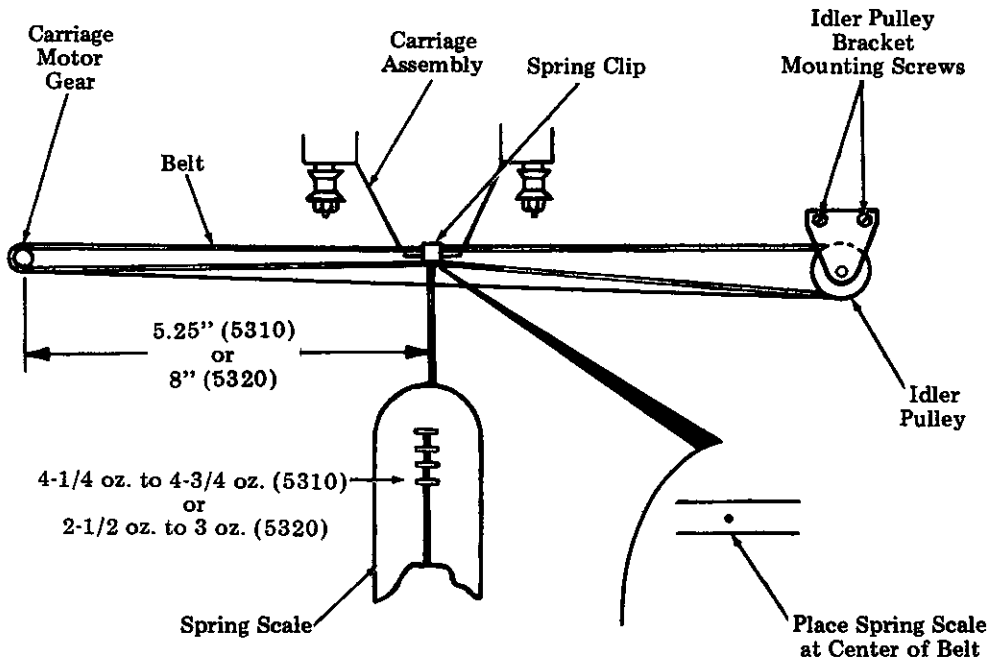
When the carriage assembly is positioned 5.25 inches from the carriage motor gear, a force of 4-1/4 to 4-3/4 ounces should deflect the carriage motor belt to a point where it just touches the carriage assembly spring clip.

**Requirement for 15 Inch (5320) Print Engine**

When the carriage assembly is positioned 8 inches from the carriage motor gear, a force of 2-1/2 to 3 ounces should deflect the carriage motor belt to a point where it just touches the carriage assembly spring clip.

**To Adjust**

Loosen the two screws on the idler pulley bracket to friction tight and move the bracket to meet the requirement. Retighten the screws and recheck the requirement.



(Front View)

**Figure A-3. Carriage Motor Belt Tension**

### Line Feed Motor Gear and Intermediate Gear Adjustment

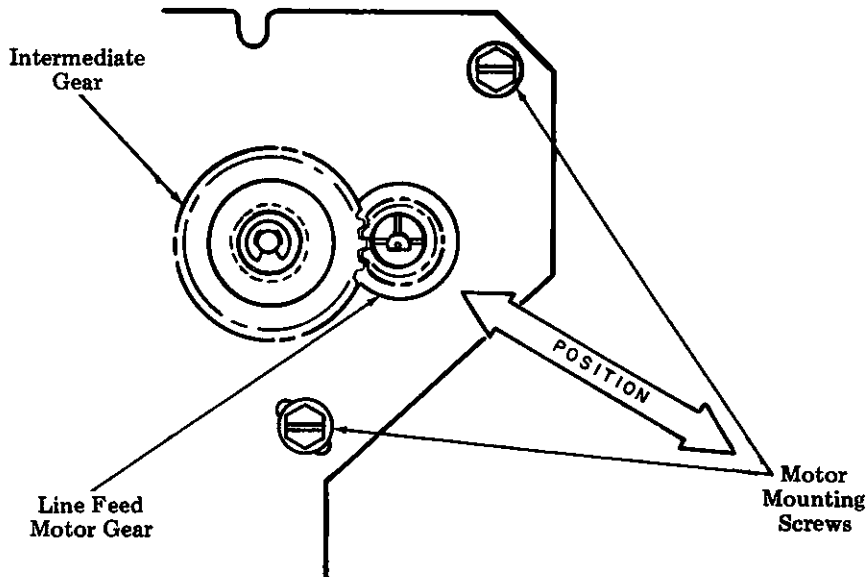
**Note:** Check Idler Gear, Platen Gear, and Intermediate Gear Adjustment before doing this adjustment.

#### Requirement

There should be a minimum backlash between intermediate gear and line feed motor gear.

#### To Adjust

Loosen the line feed motor mounting screws friction tight. Position the line feed motor gear to minimize the backlash. Retighten the mounting screws. Turn the platen a minimum of 8 revolutions and check for binding. Remake the adjustment if necessary.



(Right Side View)

**Figure A-4. Line Feed Motor and Intermediate Gear**

**Line Feed Idler Gear, Platen Gear, and Intermediate Gear Adjustment**

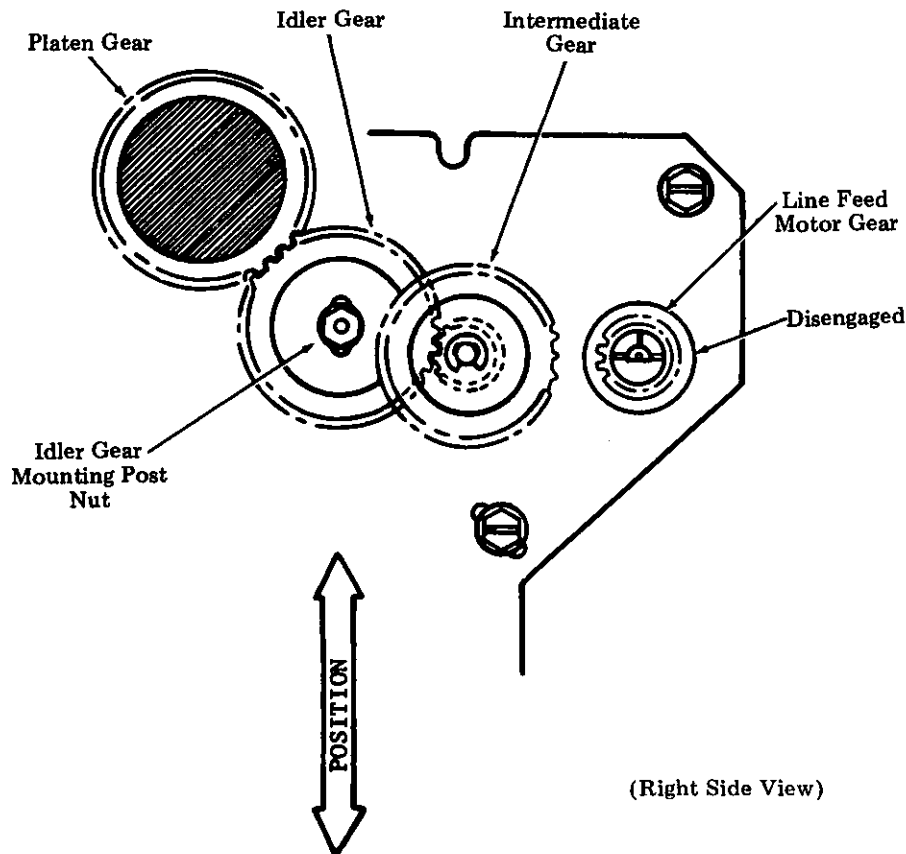
**Requirement**

There should be a minimum backlash between the intermediate gear, idler gear, and platen gear.

**To Adjust**

Remove upper screw from line feed motor, loosen lower screw and pivot line feed motor so gear disengages. This allows checking backlash adjustment without feeling hysteresis drag of the motor.

Loosen the idler gear mounting post nut friction tight. Position the idler gear to minimize the backlash. Retighten the nut. Turn the platen a minimum of 8 revolutions and check for binding. Remake the adjustment if necessary.



(Right Side View)

After adjusting, make the Line Feed Motor Gear and Intermediate Gear Adjustment.

**Figure A-5. Line Feed Idler, Platen, and Intermediate Gears**

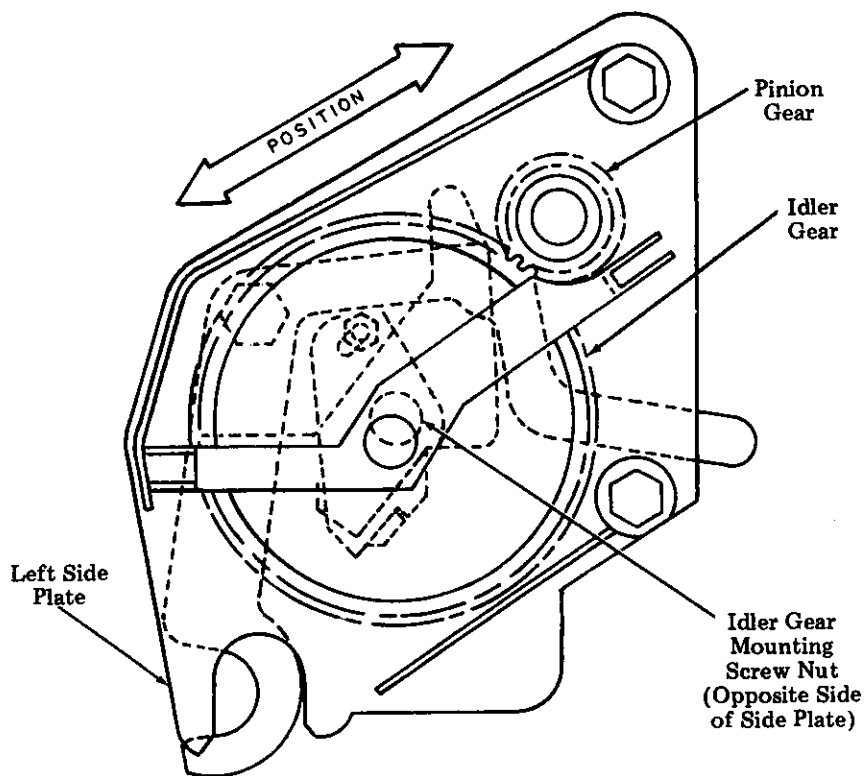
**Tractor Idler Gear Backlash Adjustment (Pull-Type and Bidirectional Tractor Mechanism)**

**Requirement**

There should be minimum backlash between the idler gear and the shaft pinion gear.

**To Adjust**

Remove the end cover from the left tractor side plate. Loosen the idler gear mounting screw friction tight. Position the idler gear to minimize the backlash. Retighten the mounting screw. Turn the idler gear a minimum of 1 revolution and check for binding. Remake the adjustment if necessary.



(Right Side View - Left Tractor Side Plate)

**Figure A-6. Bidirectional and Pull Tractor Idler Gear**

**Tractor Idler Gear to Platen Gear Adjustment (Pull-Type and Bidirectional Tractor Mechanism)**

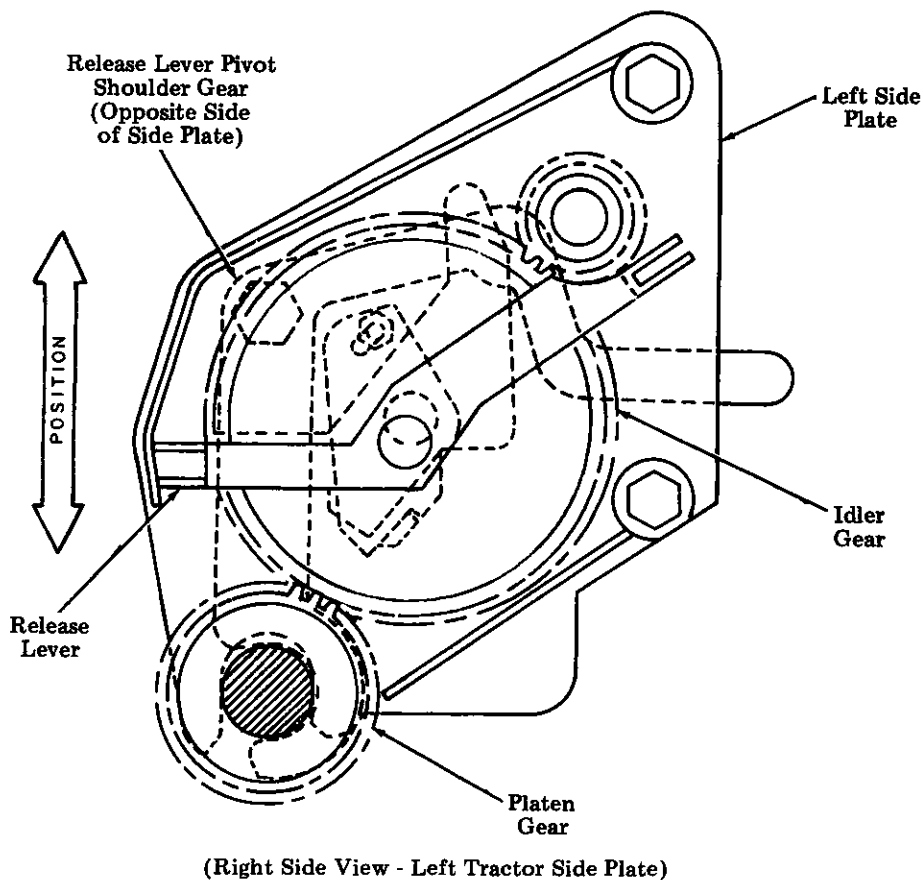
**Requirement**

With the tractor mechanism installed on the print engine (latched on the platen bearings), there should be a minimum backlash between idler gear and the platen gear.

**To Adjust**

Remove the end cover from the left tractor side plate. Loosen the release lever pivot shoulder nut and position the release lever to minimize the backlash. Retighten the shoulder nut and rotate the platen to insure the mechanism rotates freely and there is no binding. Remake the adjustment if necessary.

**Note:** This adjustment should be made after the idler gear adjustment is completed.



**Figure A-7. Idler and Platen Gear Location**

**Intermediate Gear and Tractor Gear Adjustment (Push-Type Tractor Mechanism)**

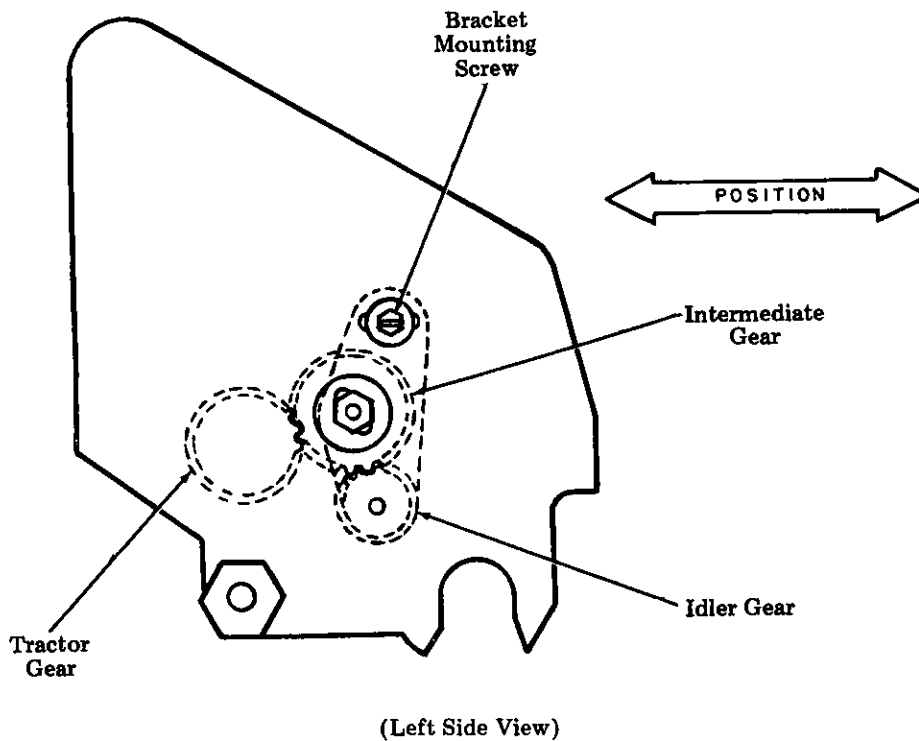
**Requirement**

There should be a minimum backlash between the intermediate gear and the tractor gear.

**To Adjust**

Loosen the intermediate gear bracket mounting screw friction tight. Position the intermediate gear to minimize the backlash. Retighten the mounting screw. Turn the tractor gear and check for binding.

**Note:** This adjustment should be made after making the Idler Gear and Intermediate Gear Adjustment (Push-Type Tractor Mechanism).



**Figure A-8. Intermediate Gear and Tractor Gear**

**Idler Gear and Intermediate Gear Adjustment (Push-Type Tractor Mechanism)**

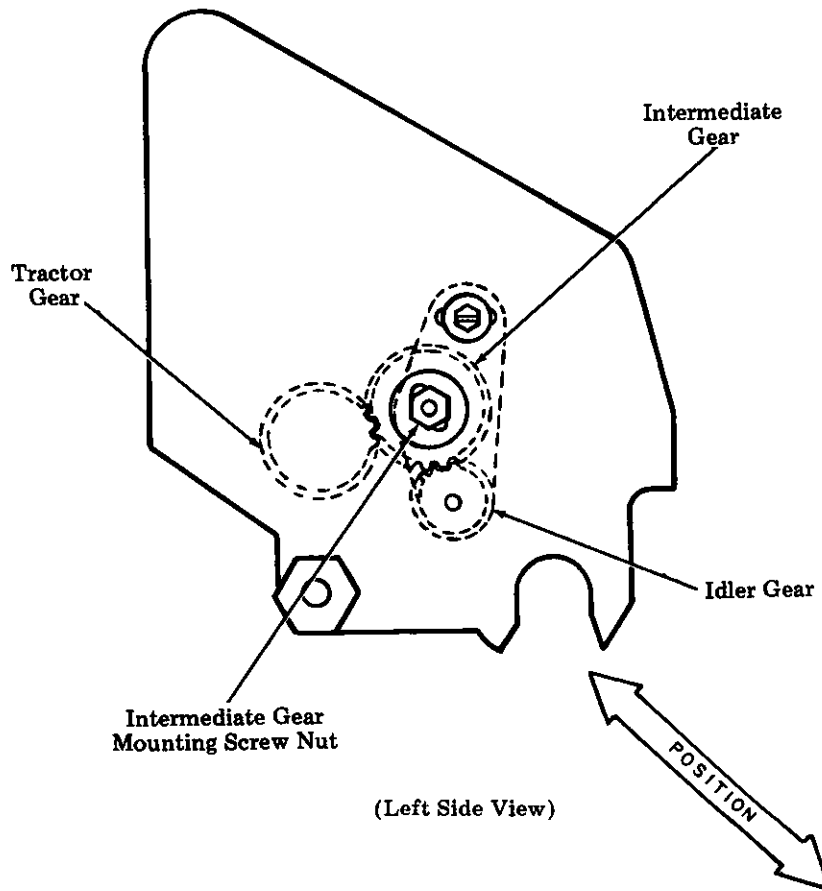
**Requirement**

There should be a minimum backlash between the idler gear and the intermediate gear.

**To Adjust**

Loosen the intermediate gear mounting screw nut friction tight. Position the intermediate gear to minimize the backlash. Retighten the mounting screw nut. Turn the intermediate gear and check for binding.

**Note:** After making this adjustment, recheck Intermediate Gear and Tractor Gear Adjustment (Push-Type Tractor Mechanism).



**Figure A-9. Idler Gear and Intermediate Gear**

### Tractor Idler Gear to Platen Gear Adjustment (Push-Type Tractor Mechanism)

#### Requirement

With the tractor mechanism installed onto the print engine (latched on the platen bearings), there should be a minimum backlash between the idler gear and platen gear.

#### To Adjust

Remove the end cover from the left tractor side plate. Loosen the release lever pivot shoulder nut friction tight and position the release lever to minimize the backlash. Retighten the shoulder nut and rotate the platen to insure the mechanism rotates freely and there is no binding. Remake the adjustment if necessary.

**Note:** This adjustment should be made after all other gear mesh adjustments are completed.

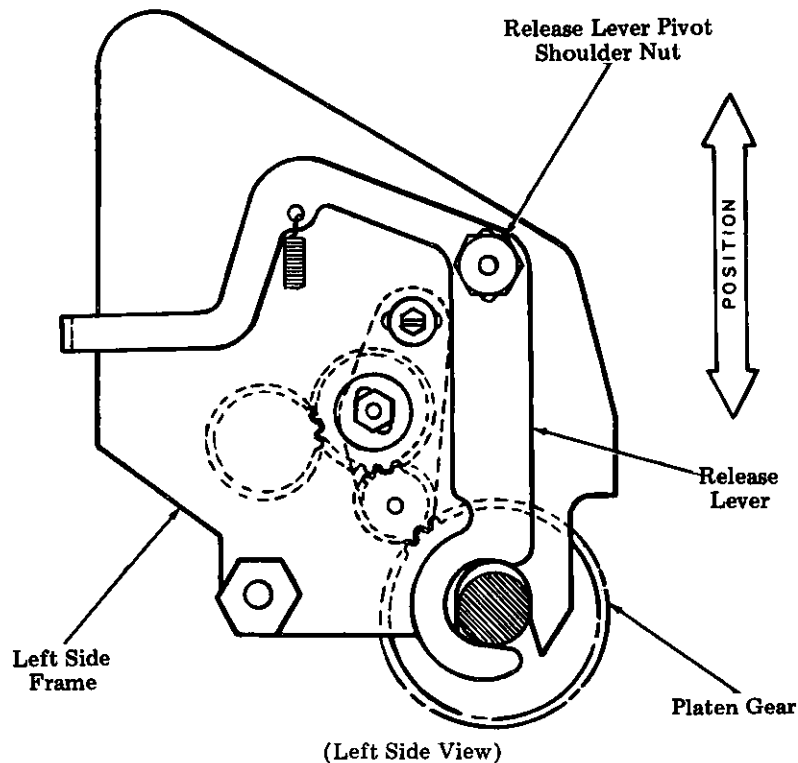


Figure A-10. Tractor Idler Gear and Platen Gear



**Horizontal Line Adjustment (Bidirectional, Push- and Pull-Type Tractor Mechanism)**

**Requirement**

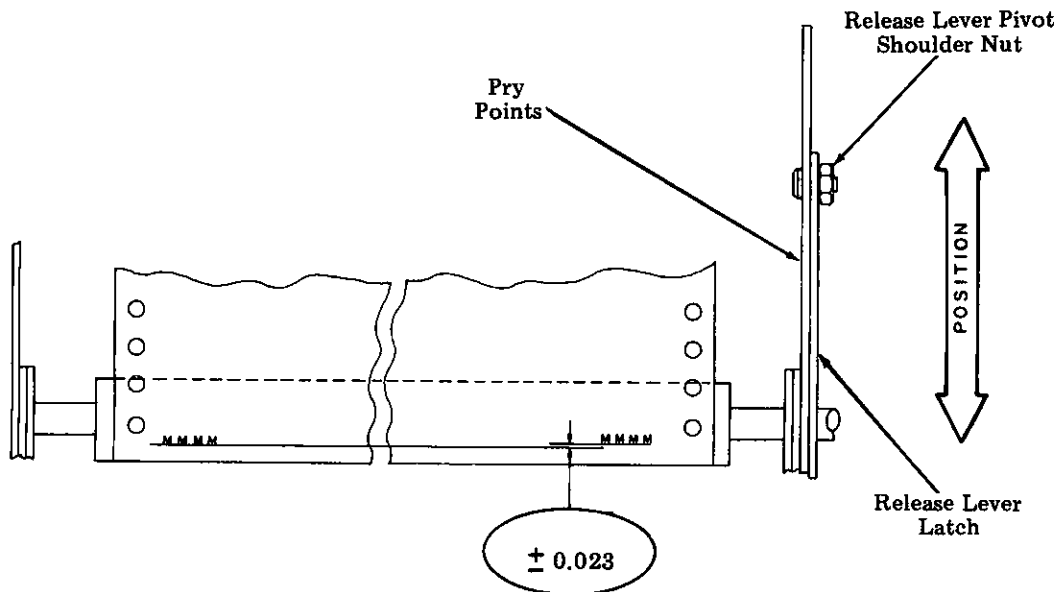
The horizontal line should not vary more than 0.023 from an arbitrary horizontal reference line (lined paper) when a line is drawn even with the bottom of the character. This requirement is for a 75 character, 10 CPI, line.

**To Adjust**

Remove the tractor right end cover. Loosen the release lever pivot shoulder nut and position the release lever latch to meet the requirement. Retighten the shoulder nut and recheck the requirement.

**Note:** It is recommended that a single character, such as M, be repeated across the entire page for the above adjustment.

This adjustment to be refined when making the Tractor Idler Gear to Platen Gear Adjustment.



**Figure A-11. Horizontal Line Check**

### Paper Roll Support Low Paper Sensing Arm

(1) Requirement

Preliminary--Under normal operation, the ALARM indicator should flash when there is approximately a 2 inch diameter (40 feet) of paper left on the spindle.

(2) Requirement

Final--May be set at more or less than a 2 inch diameter as long as ALARM indicator flashes before paper runs out and sensing arm does not touch full roll of paper when depressed downward to end of its travel.

To Check

When the Low Paper Sensing Arm is depressed downward to the end of its travel and then allowed to slowly return upward, the ALARM indicator should flash when there is approximately a 2 inch diameter (40 feet) of paper left on the spindle.

To Adjust

Grasp the sensing arm support (when the wire sensing arm is attached) and bend the sensing arm.

**Caution:** This adjustment is set at the factory and normally does not require readjustment. If the adjustment is performed, care should be taken not to bend the sensing arm support. Check to verify that the sensing arm moves through its entire range without bending.

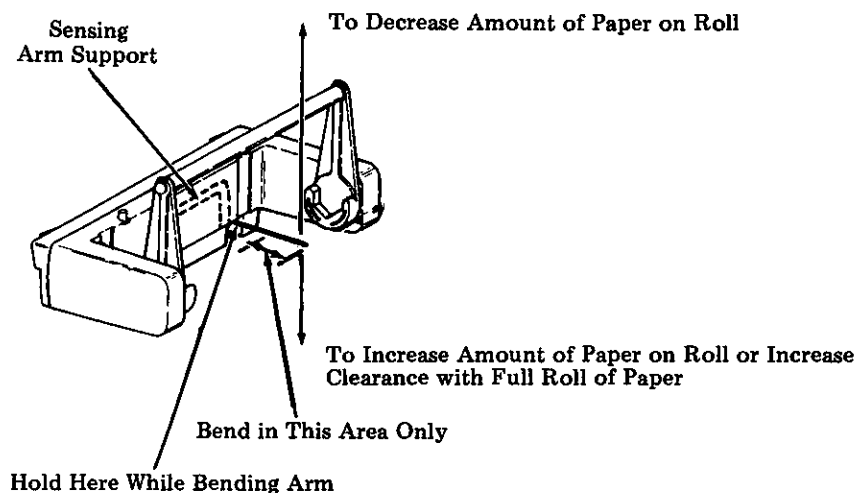


Figure A-12. Friction Feed Paper Holder

**Appendix B**  
**Printers, Parts and Accessories**

<b>Contents</b>	<b>Page</b>
Overview .....	B-2
5310 and 5320 Parts Illustration .....	B-4
Cover and Base Assembly .....	B-4
Base Assembly and Circuit Card .....	B-5
410968 Power Supply Card .....	B-6
414621 Modem Modification Kit .....	B-7
430658 SSI to EIA Modification Kit .....	B-8
430720 Current Loop Modification Kit .....	B-9
Side Frames and Paper Guide Handle .....	B-10
Paper Out and Guide Assembly .....	B-11
Line Feed Motor and Right Side Frame .....	B-12
Carriage Cable and Motor Assembly .....	B-13
Carriage Assembly, Printhead and Ribbon .....	B-14
Friction Feed Platen Assembly .....	B-15
427260 Pin Feed Platen Modification Kit .....	B-16
420250 Roll Paper Holder Modification Kit .....	B-17
427240 (5310) and 427293 (5320)	
Pull-Type Tractor (Charcoal Grey) .....	B-18
427631 (5310) and 427632 (5320) Pull-Type	
Tractor (Black) .....	B-19
427250 and 427633 Push-Type Tractor .....	B-20
427270, 427271, 427287 and 427288 Tractor Assembly ...	B-22
427415 (5310) or 427420 (5320) Bidirectional	
Tractor .....	B-23
427563 and 427564 Tractor Assembly .....	B-24
427136 Carrying Case .....	B-25
Pedestal, Paper Accumulator Rack, Paper Caddy and	
Paper Winder .....	B-26
Numerical Index .....	B-27

### Overview

Appendix B provides parts illustrations and numerical listings of the maintenance and repair parts for the printers listed below and for their accessories.

The 115 Vac printers covered are:

5310	5320
53P101AAA FF EIA 9-1/2 Inch	53P150AAA FF EIA 15 Inch
53P101AAB FF EIA 9-1/2 Inch	53P150AAB FF EIA 15 Inch
53P101BAC FF EIA 9-1/2 Inch	53P150BAC FF EIA 15 Inch
53P101BAE FF EIA 9-1/2 Inch	53P150BAE FF EIA 15 Inch
53P101BKE FF EIA 9-1/2 Inch	53P150BKE FF EIA 15 Inch
53P102AAA FF Modem 9-1/2 Inch	53P151AAA FF Modem 15 Inch
53P102AAB FF Modem 9-1/2 Inch	53P151AAB FF Modem 15 Inch
53P102BAC FF Modem 9-1/2 Inch	53P151BAC FF Modem 15 Inch
53P102BAE FF Modem 9-1/2 Inch	53P151BAE FF Modem 15 Inch
53P103AAA PF EIA 9-1/2 Inch	
53P103AAB PF EIA 9-1/2 Inch	
53P103BAC PF EIA 9-1/2 Inch	
53P103BAE PF EIA 9-1/2 Inch	
53P103BKE PF EIA 9-1/2 Inch	
53P104AAA PF Modem 9-1/2 Inch	
53P104AAB PF Modem 9-1/2 Inch	
53P104BAC PF Modem 9-1/2 Inch	
53P104BAE PF Modem 9-1/2 Inch	

The 230 Vac printers covered are:

5310	5320
53P105AAB FF EIA 9-1/2 Inch	53P152AAB FF EIA 15 Inch
53P105BAC FF EIA 9-1/2 Inch	53P152BAC FF EIA 15 Inch
53P105BAE FF EIA 9-1/2 Inch	53P152BAE FF EIA 15 Inch
53P106AAB PF EIA 9-1/2 Inch	
53P106BAC PF EIA 9-1/2 Inch	
53P106BAE PF EIA 9-1/2 Inch	

Parts listed in this appendix may be needed for repair of some of the major components listed in Section "8. Maintenance Spares".

Disassembly/reassembly and possible adjustments related to replacement of these parts are not included in this manual.

Mechanical parts not shown are parts pressed together, welded or riveted assemblies or other parts that would not fit or could otherwise not be assembled or adjusted without special skills or manufacturing facilities.

Asterisked items on the numerical listing are those more likely to be needed. They consist of the major replaceable components, which are also listed in Section "8. Maintenance Spares", and other mechanical items such as motors, belts, gears, etc., that if stocked, could be used to restore service by repairing instead of replacing the major mechanical component or accessory.

Nine digit Comcode numbers will be used in the future as manufacturer's part numbers for late version printer parts, accessories and accessory part numbers instead of six digit manufacturer part numbers, accessory or accessory part numbers.

When ordering parts using the six digit number, be sure to identify them as "Manufacturer Part" numbers.

Orders for parts may be placed by:

Calling National Parts Sales Center, toll free,  
1-800-222-7278 (hours are 8:00 A.M. to 5:00 P.M.  
in all time zones).

or

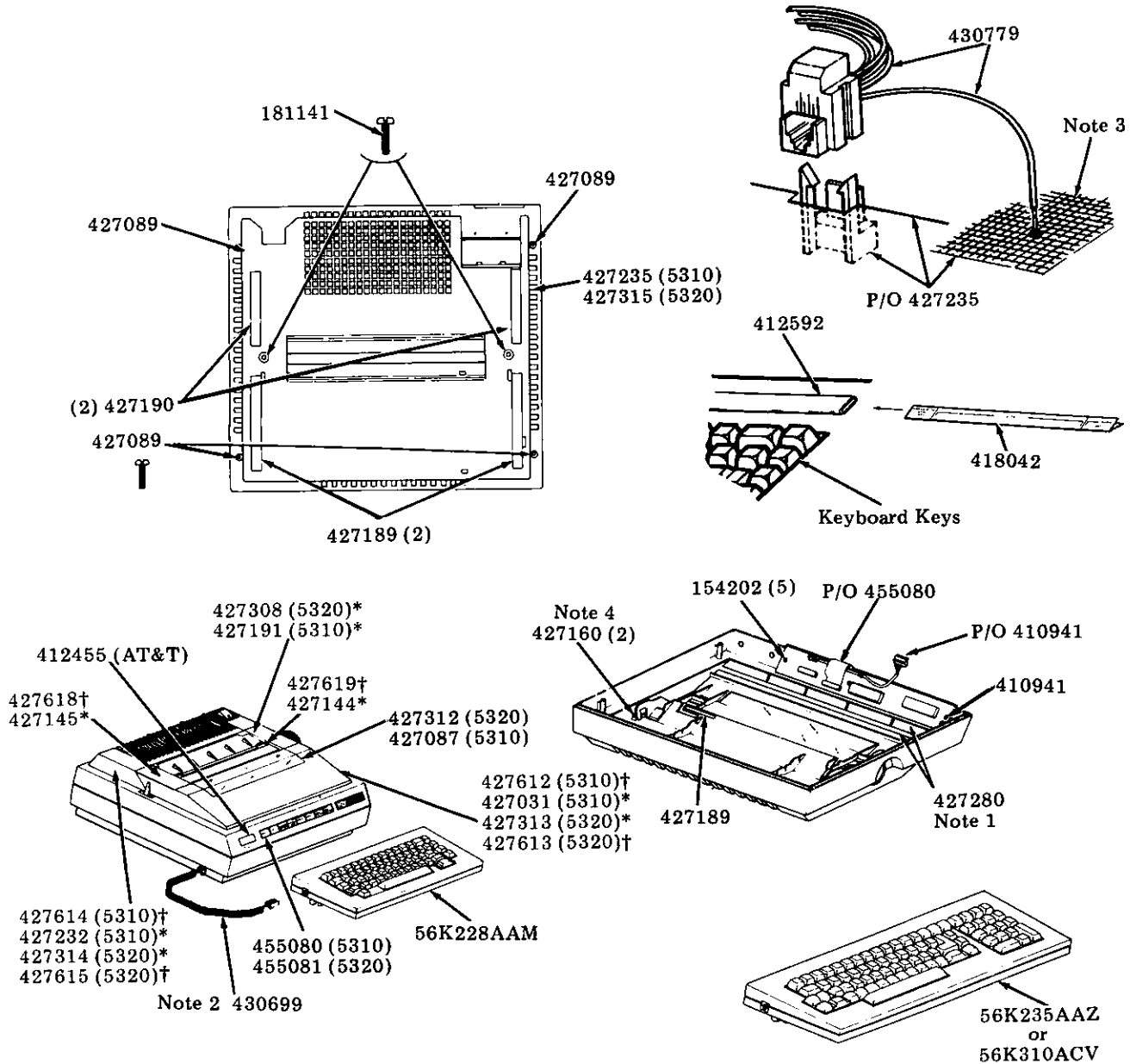
Writing to "AT&T National Parts Sales Center, 111 Havana,  
Aurora, Colorado 80010".

or

Follow your local procedures.

5310 and 5320 Parts Illustration

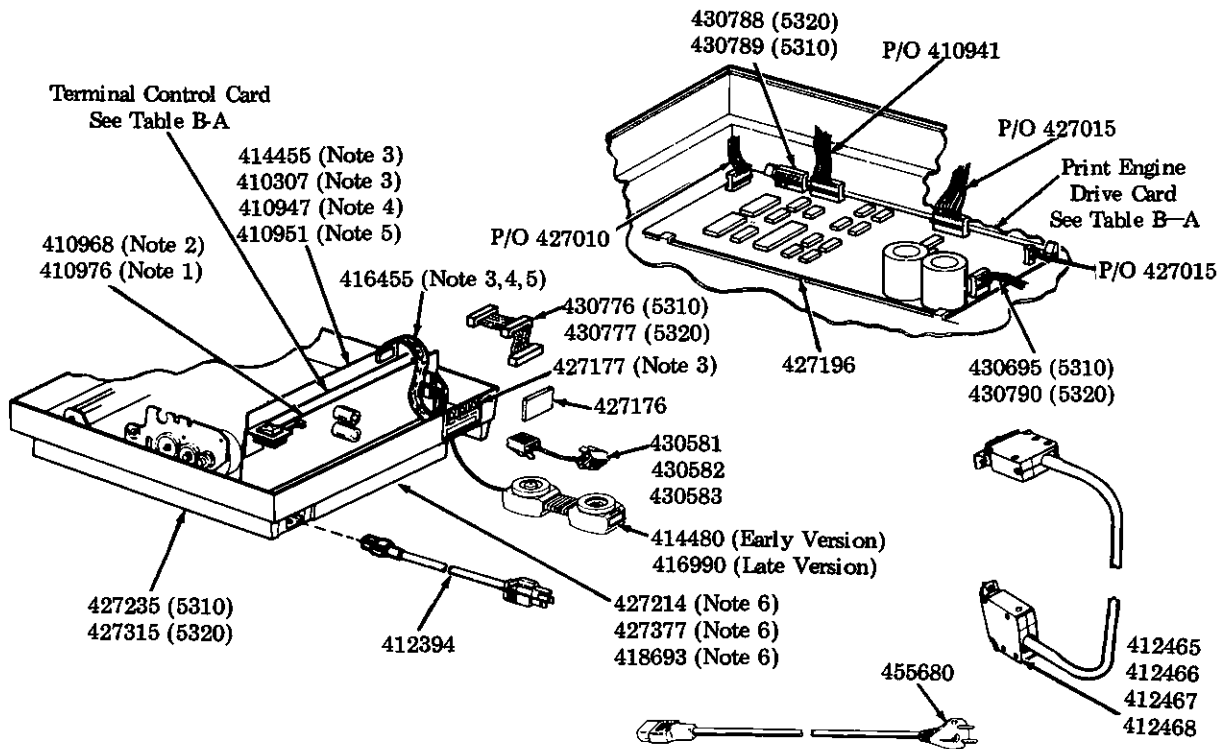
Cover and Base Assembly



\*Cobblestone Grey  
 †Black

- Note 1:** Part number 427280 consists of both labels.
- Note 2:** Part of keyboard.
- Note 3:** The 430779 cable ground lead is soldered to the screen.
- Note 4:** The 427160 retaining clip and 154202 screw are used on early design 427232 and 427314 upper cover assemblies.

Base Assembly and Circuit Card

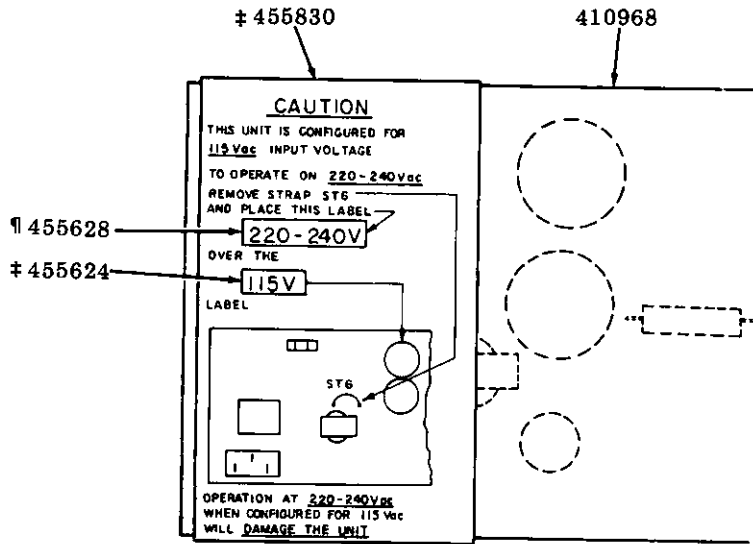


- Note 1:** Used on AAA coded printer.
- Note 2:** Used on all printers except AAA.
- Note 3:** Part of printer with modem or modem mod kit. See 414621 modem modification kit.
- Note 4:** Part of current loop mod kit. See 430720 Current Loop modification kit.
- Note 5:** Part of SSI to EIA mod kit. See 430658 SSI to EIA modification kit.
- Note 6:** 230 Vac printers use 418693 label. 115 Vac Class A printers use 427214 label and Class B printers use 427377 label.

Table B-A. Circuit Card Compatibility

Printer Code Alpha Suffix	Terminal Control Card	Print Engine Drive Card
AAA	410934	410940
AAB	410935	410943
BAC	410938	410440
BAE	524104445	410440
BKE	524104445	410440

410968 Power Supply Card



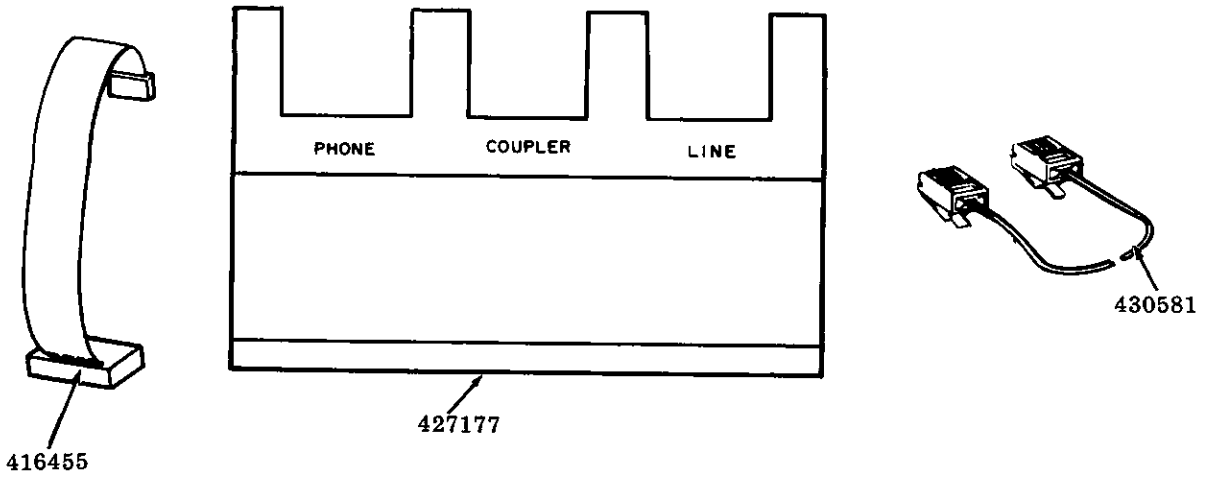
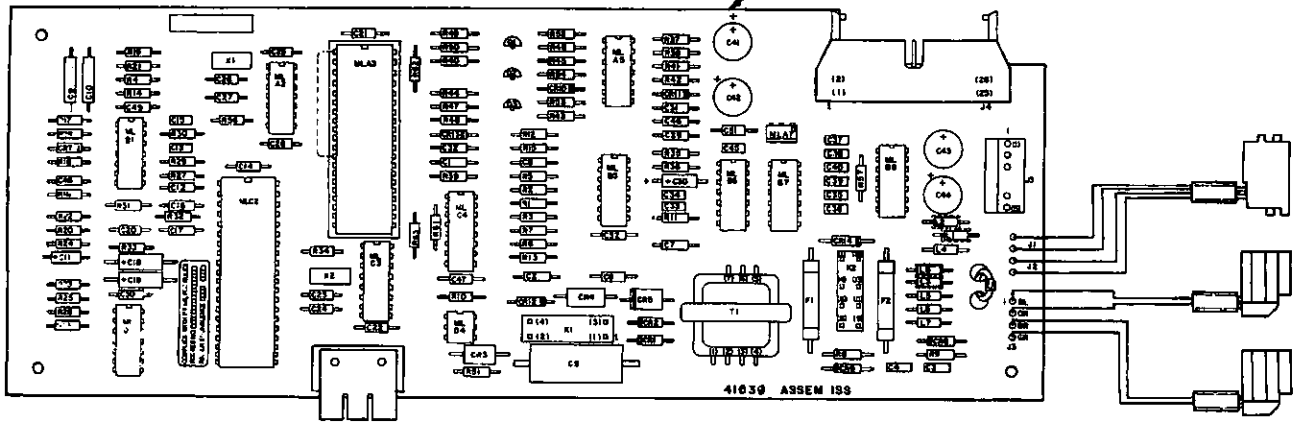
†Part of 455830 label.

‡Part of 410968 power supply.

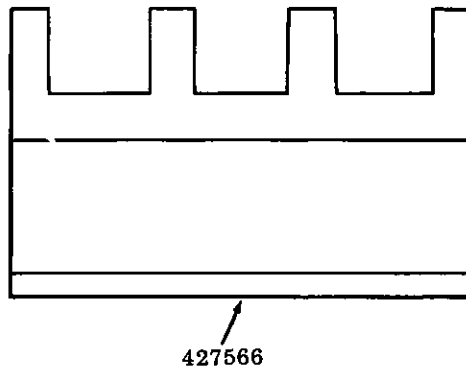
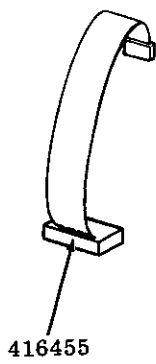
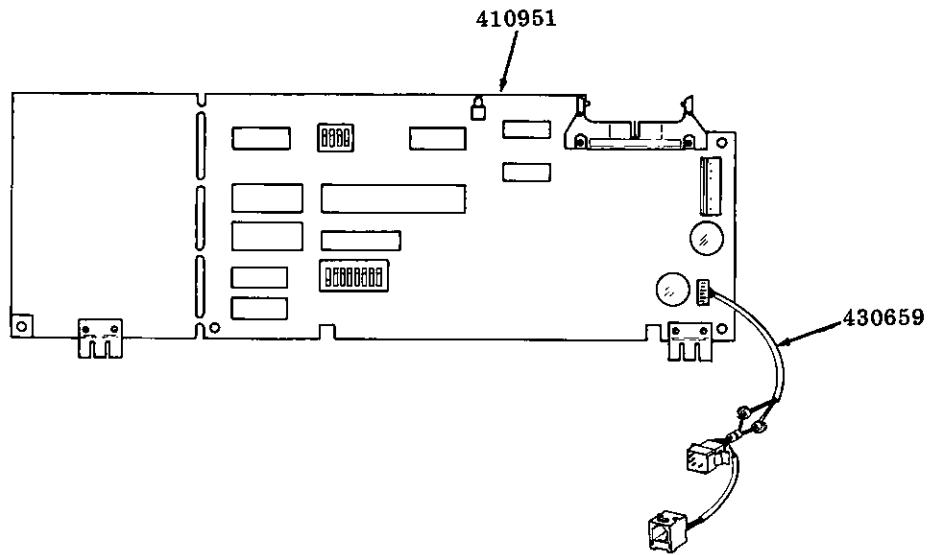


414621 Modem Modification Kit

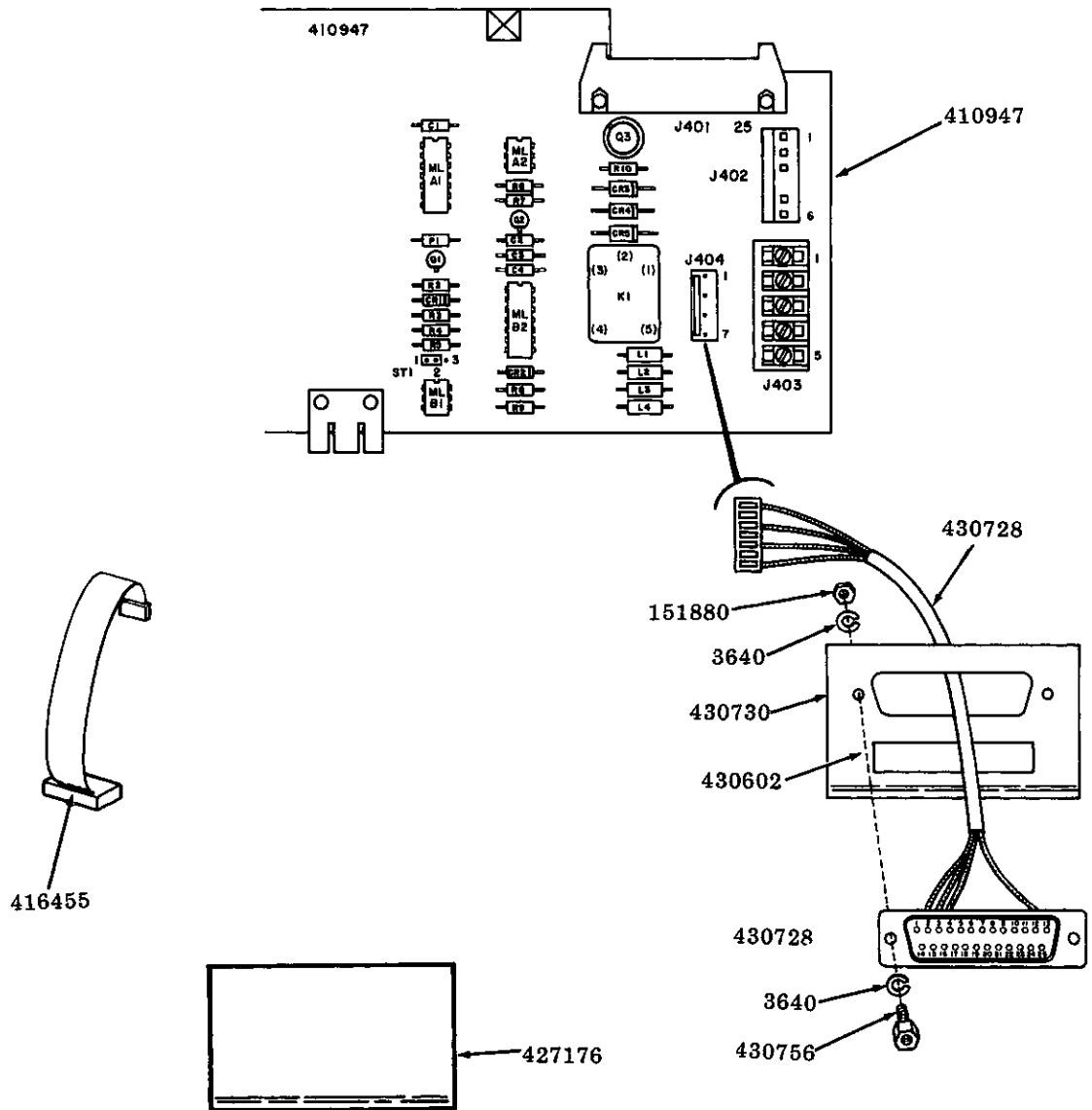
414455 (Early Version)  
410307 (Late Version)



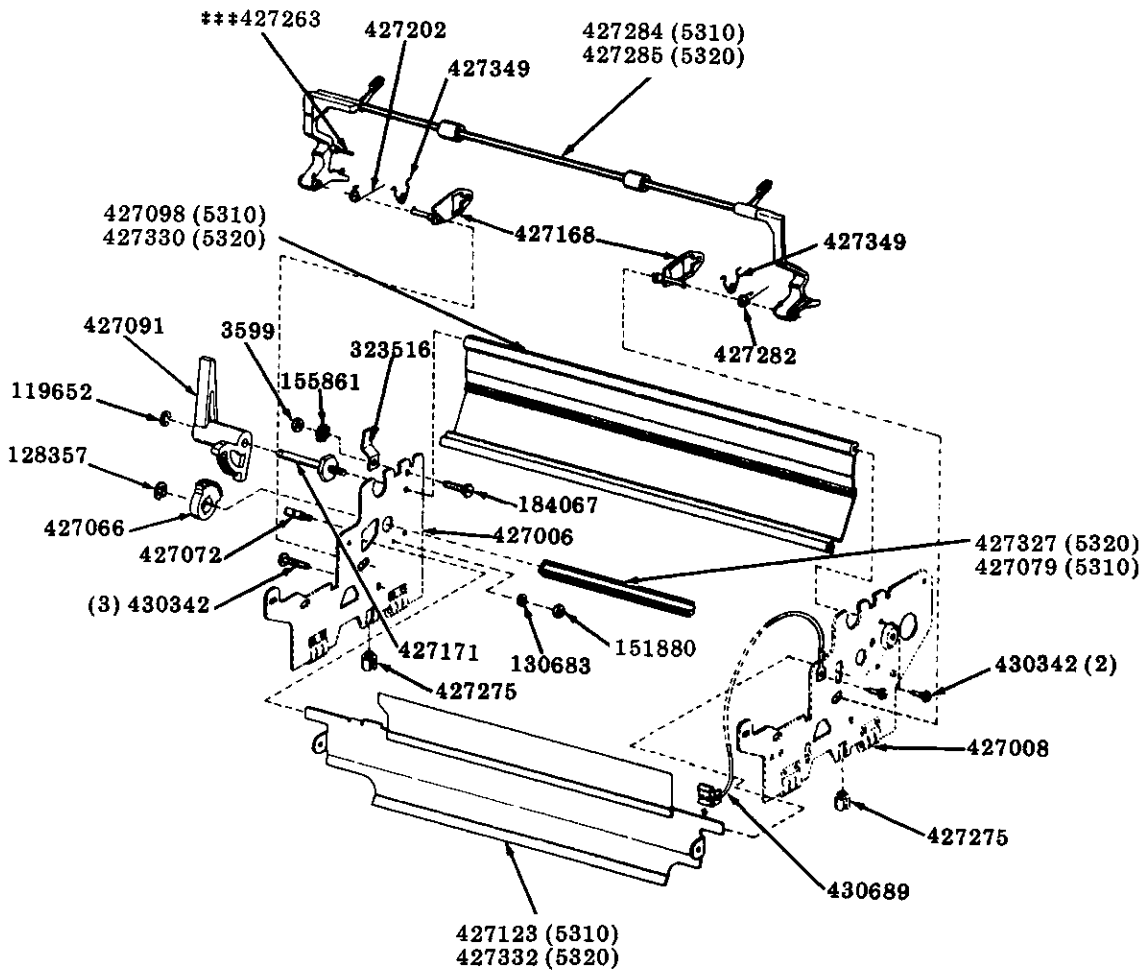
430658 SSI to EIA Modification Kit



430720 Current Loop Modification Kit



Side Frames and Paper Guide Handle

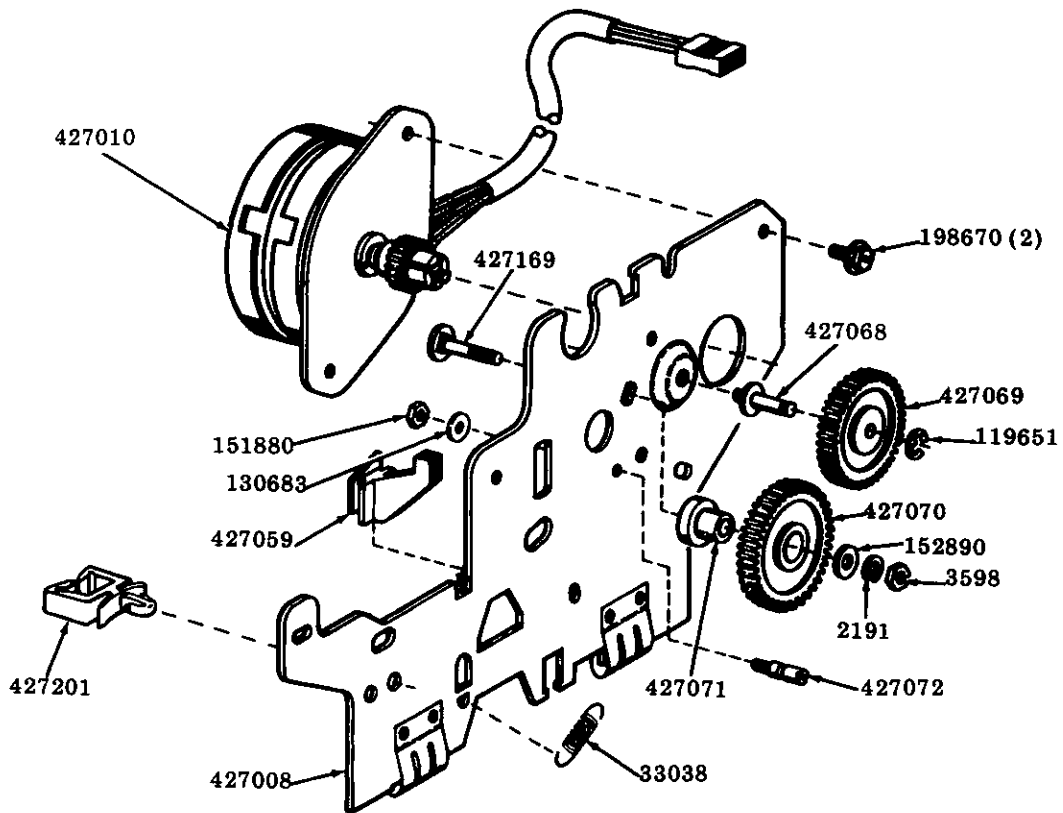


\*\*\*Part of 427284 (5310) or 427285 (5320) paper hold down bar assembly.

**Note:** Everything shown on this page is part of the 427000 or 427400 (5310) or 427001 (5320) print engine assembly.

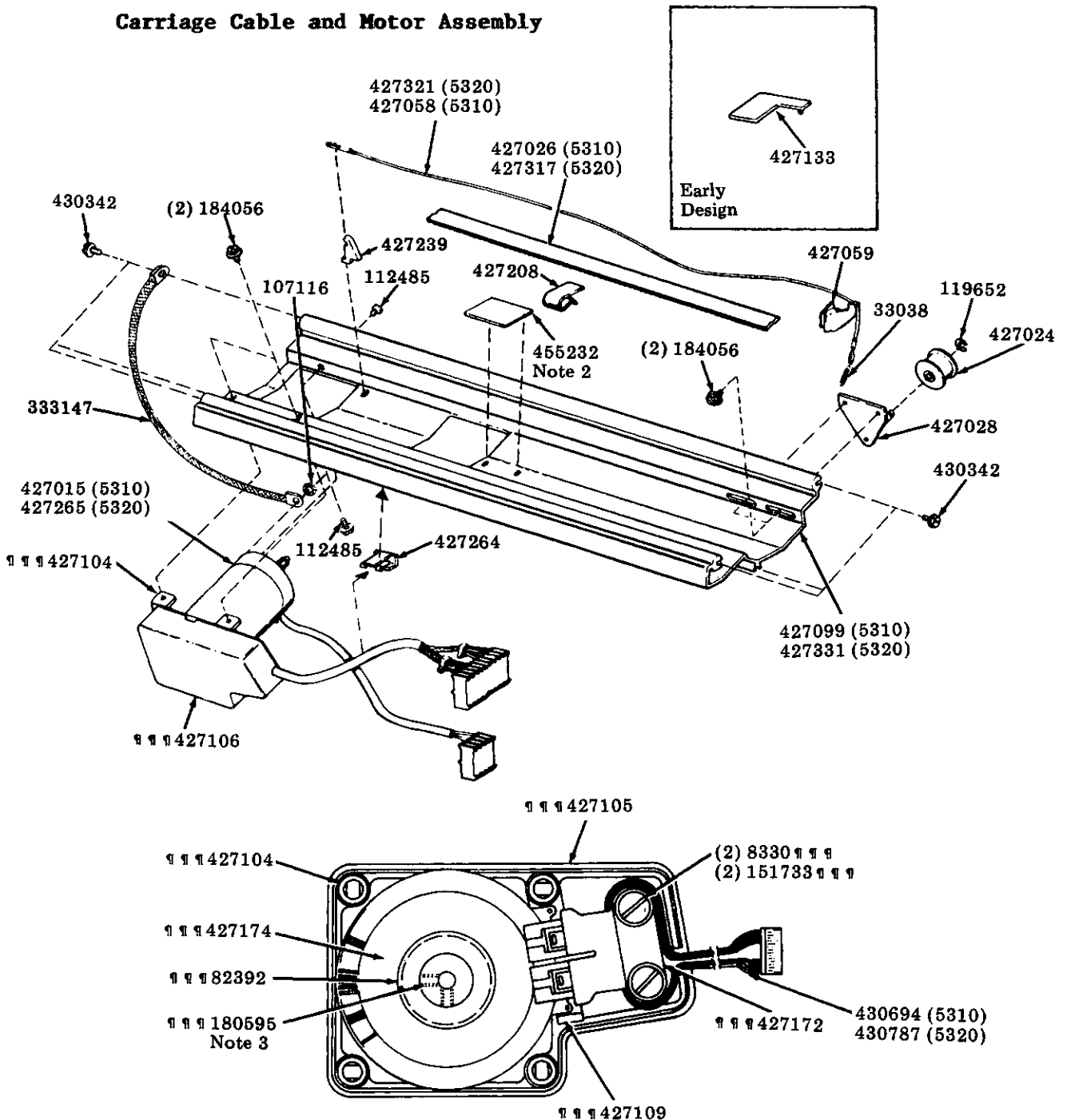


Line Feed Motor and Right Side Frame



**Note:** Everything shown on this page is part of the 427000 or 427400 (5310) or 427001 (5320) print engine assembly.

Carriage Cable and Motor Assembly



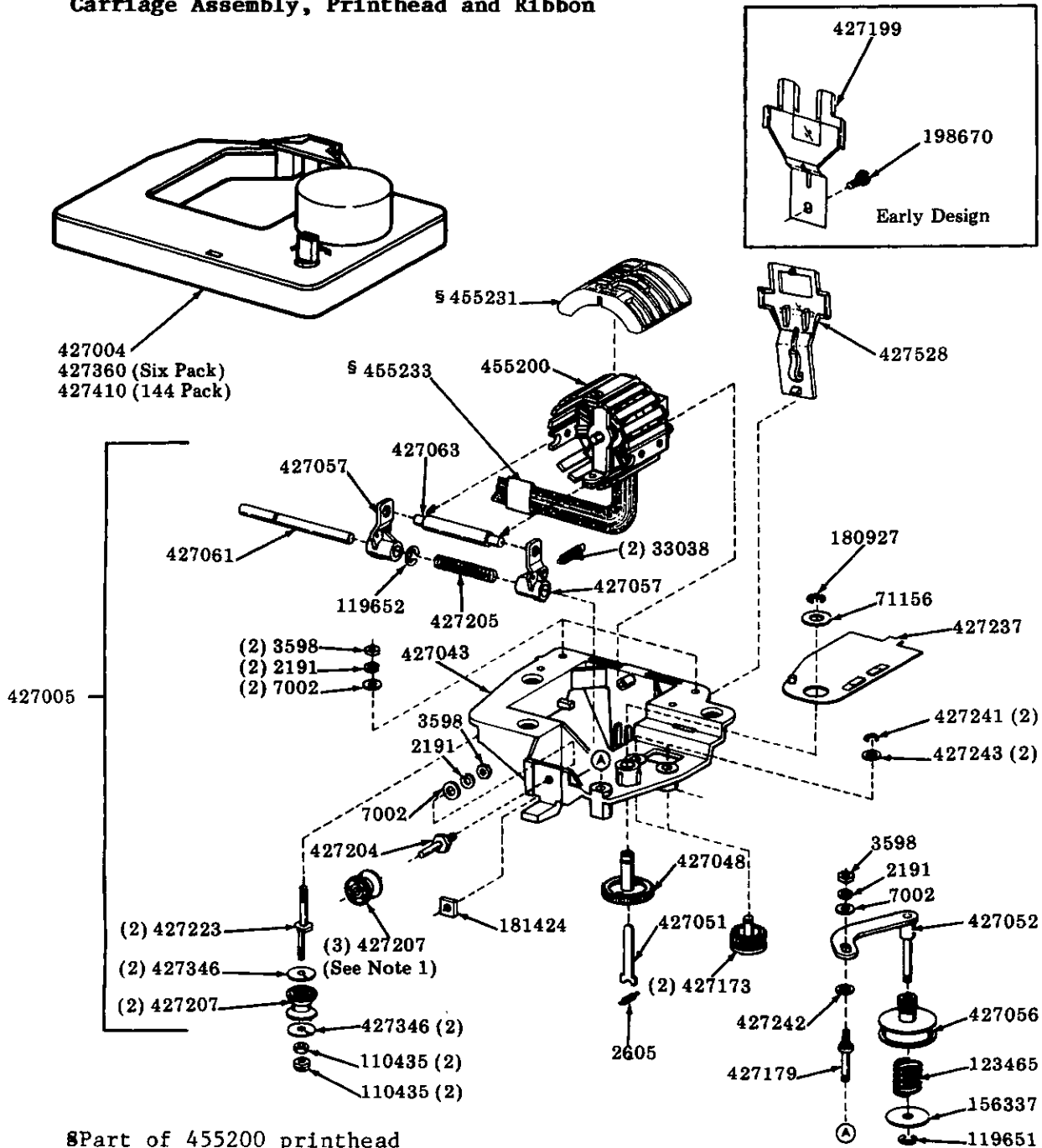
Part of 427015 (5310) or 427265 (5320) motor assembly.

**Note 1:** Everything shown on this page is part of the 427000 or 427400 (5310) or 427001 (5320) print engine assembly.

**Note 2:** Early design used a 427133 clip.

**Note 3:** Early design used two 180595 set screws.

Carriage Assembly, Printhead and Ribbon

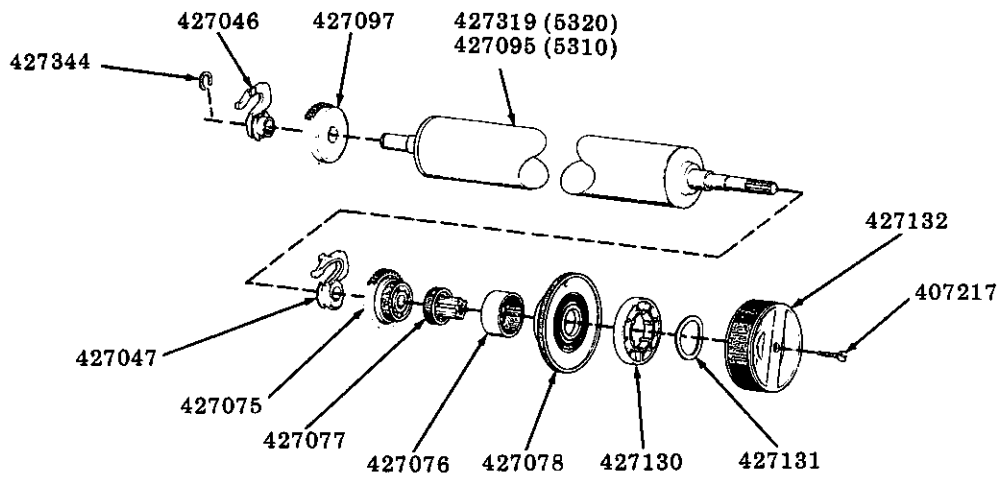


- Note 1:** Two 427207 rollers under carriage assembly not shown.
- Note 2:** Only the late design 455200 printhead cable contains the 455233 loop fastener.
- Note 3:** The 427005 carriage assembly includes everything shown on this page except ribbon and 455200 printhead.
- Note 4:** Everything on this page is part of 427000 or 427400 (5310) or 427001 (5320) print engine except ribbon.



**Friction Feed Platen Assembly**

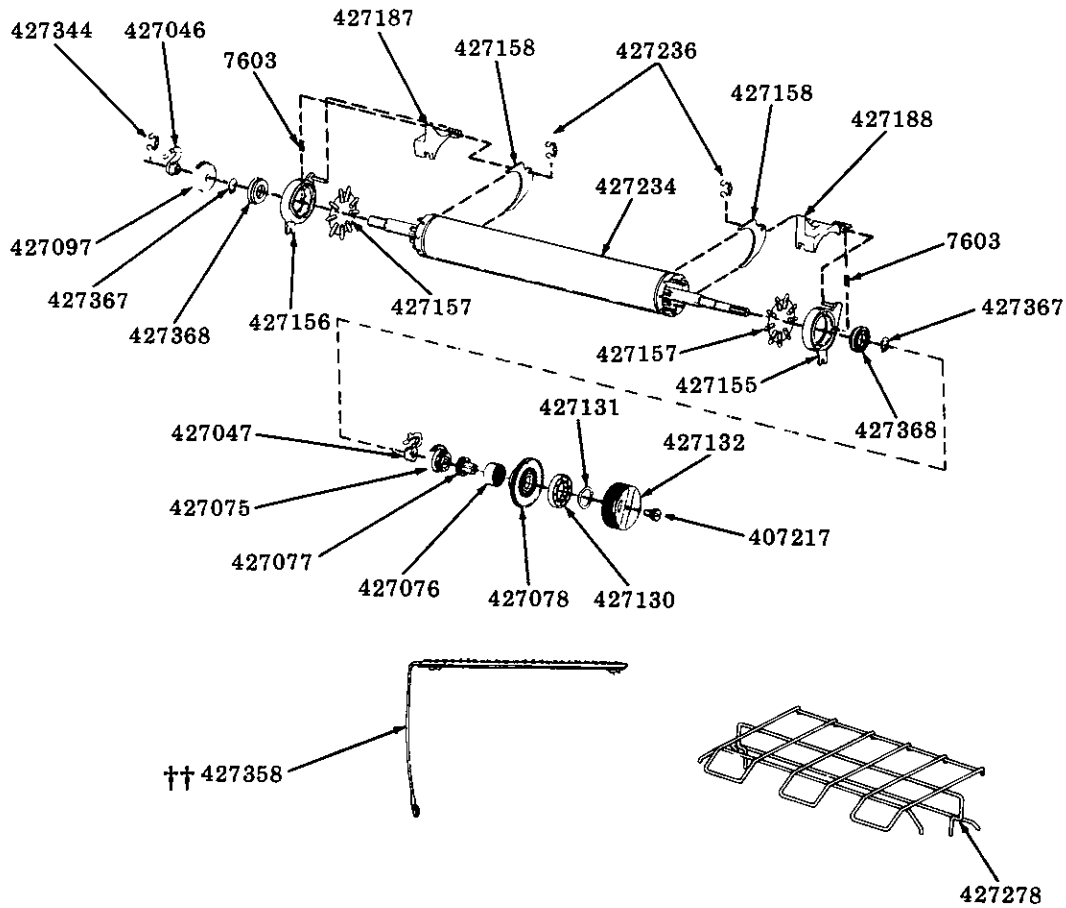
427011 (5310) or 427012 (5320)



**Note:** Everything on this page is part of the 427000 (5310) or 427001 (5320) print engine.

427260 Pin Feed Platen Modification Kit

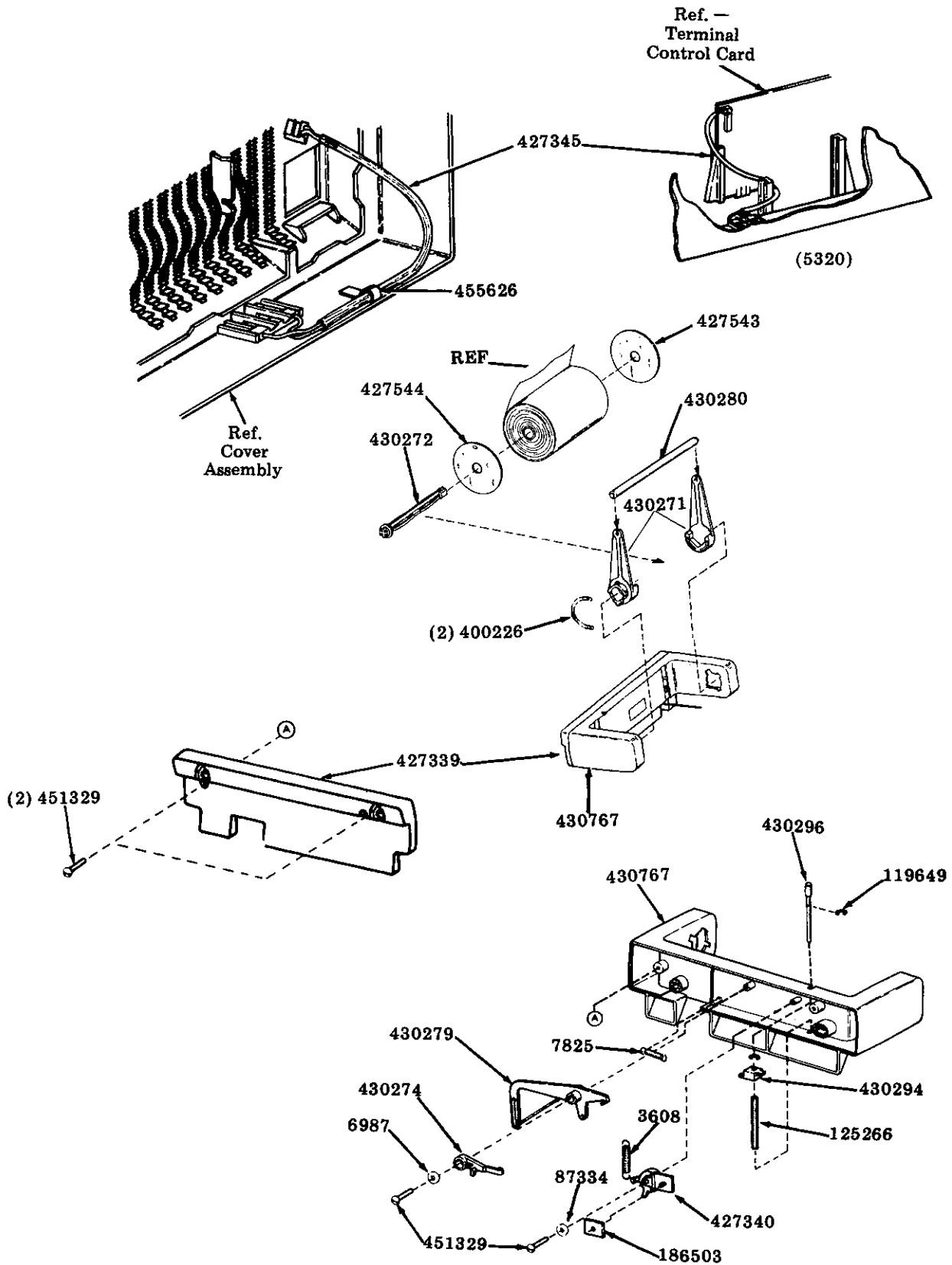
427390 Pin Feed Platen Assembly



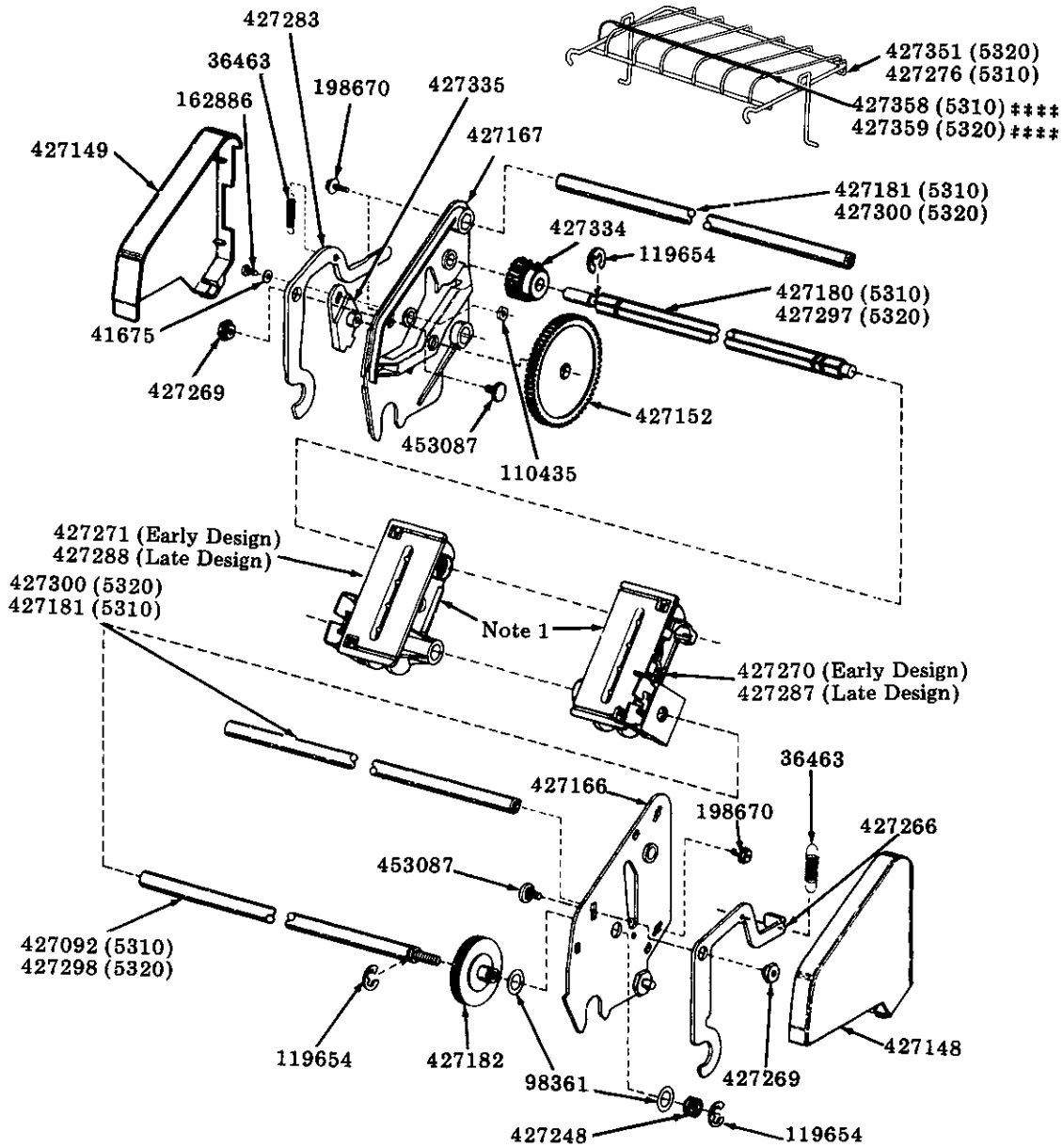
†† Not part of the 427260 pin feed platen modification kit.

**Note:** Everything on this page except the 427358 static eliminator and the 427278 Separator Shelf is part of the 427400 print engine.

420250 Roll Paper Holder Modification Kit



427240 (5310) and 427293 (5320) Pull-Type Tractor  
 (Charcoal Grey)



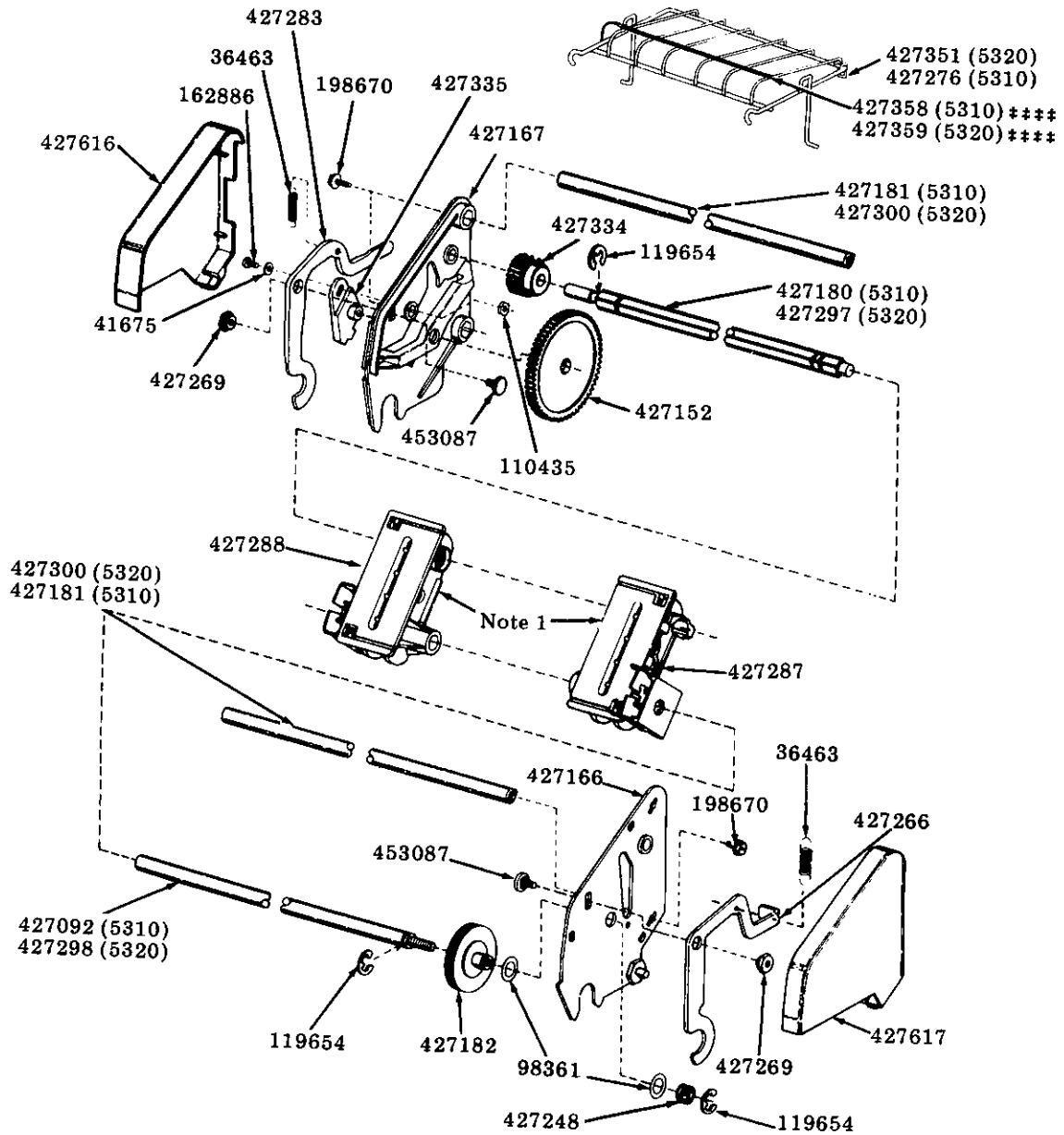
\*\*\*\*Not Part of modification kit.

**Note 1:** For parts breakdown, see "427270, 427271, 427287 and 427288 Tractor Assembly".

**Note 2:** 427240 mod. kit consists of 427370 tractor assembly, 427276 separator and 52004S Specification.

**Note 3:** 427293 mod. kit consists of 427352 tractor assembly, 427351 separator and 52004S Specification.

427631 (5310) and 427632 (5320) Pull-Type Tractor (Black)



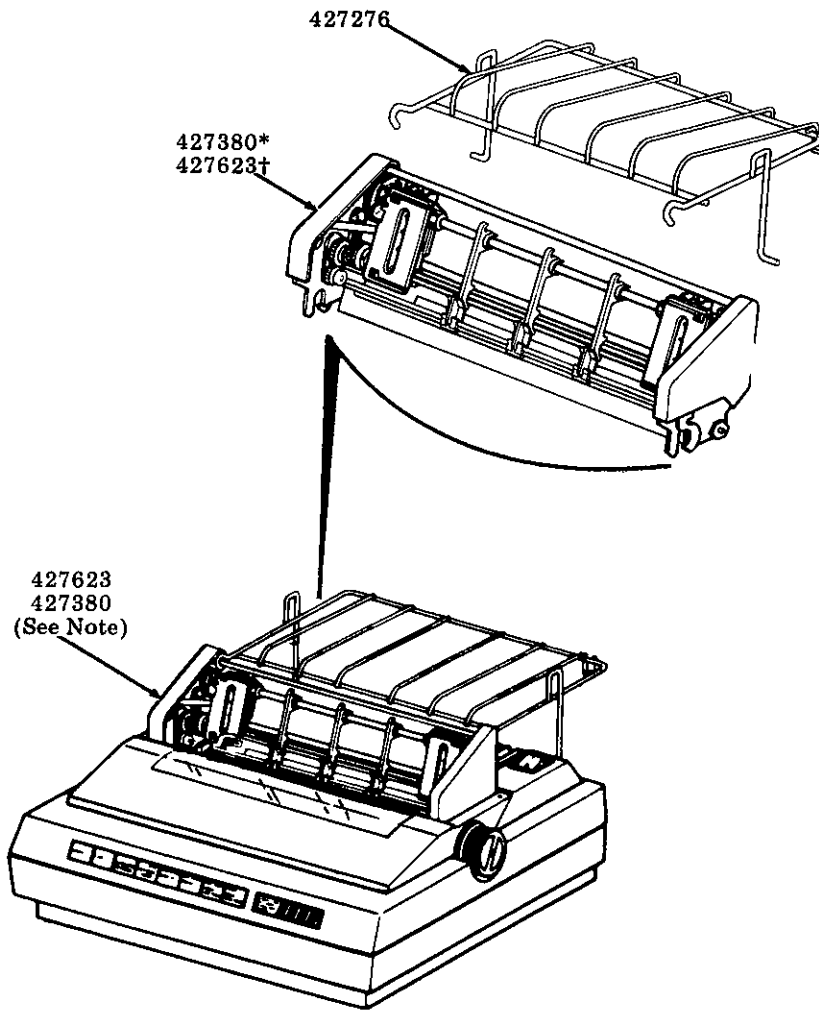
\*\*\*\*Not Part of modification kit.

**Note 1:** For parts breakdown, see "427270, 427271, 427287 and 427288 Tractor Assembly".

**Note 2:** 427631 mod. kit consists of 427621 tractor assembly, 427276 separator and 52004S Specification.

**Note 3:** 427632 mod. kit consists of 427622 tractor assembly, 427351 separator and 52004S Specification.

427250 and 427633 Push-Type Tractor



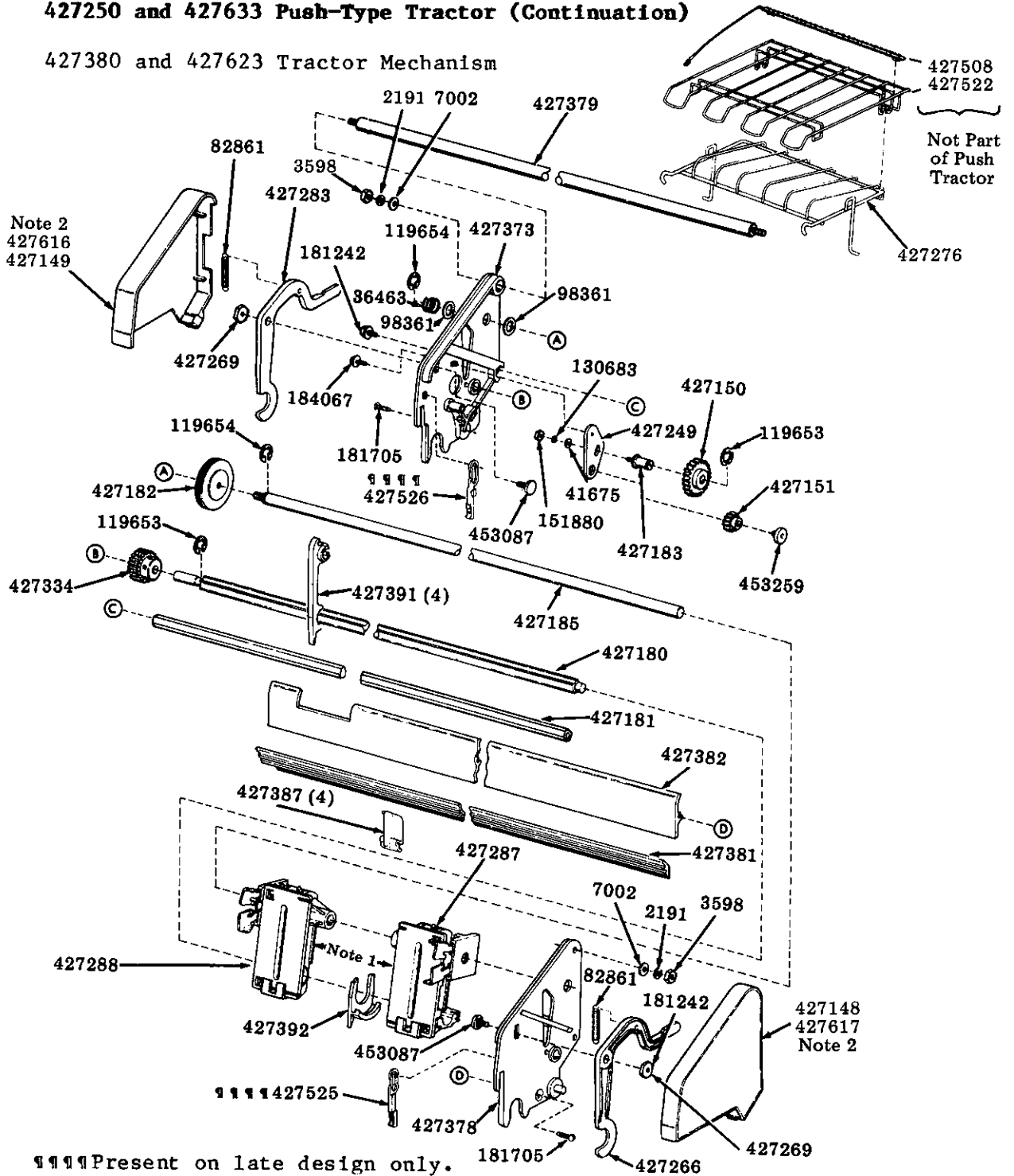
**Note:** The 427250 push-type tractor mod. kit consists of 427380\* tractor mechanism, 427276 paper separator and 52004S Specification.

The 427633 push-type tractor mod. kit consists of 427623† tractor mechanism, 427276 paper separator and 52004S Specification.

\*Charcoal Grey  
†Black

427250 and 427633 Push-Type Tractor (Continuation)

427380 and 427623 Tractor Mechanism



Present on late design only.

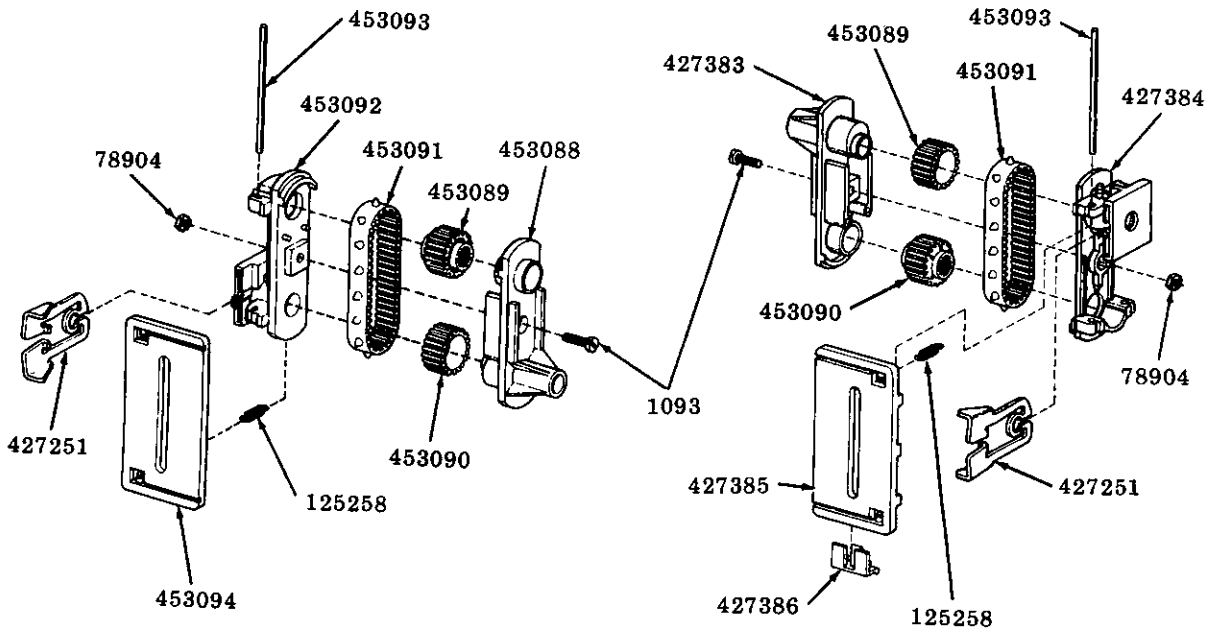
**Note 1:** For parts breakdown, see "427270, 427271, 427287 and 427288 Tractor Assembly".

**Note 2:** The 427250 has 427148 and 427149 charcoal grey covers and the 427633 has 427616 and 427617 black covers.

**427270, 427271, 427287 and 427288 Tractor Assembly**

427270, 427271 Tractor  
Assembly (Early Design)  
See Note 1.

427287, 427288 Tractor  
Assembly (Late Design)  
See Note 2.



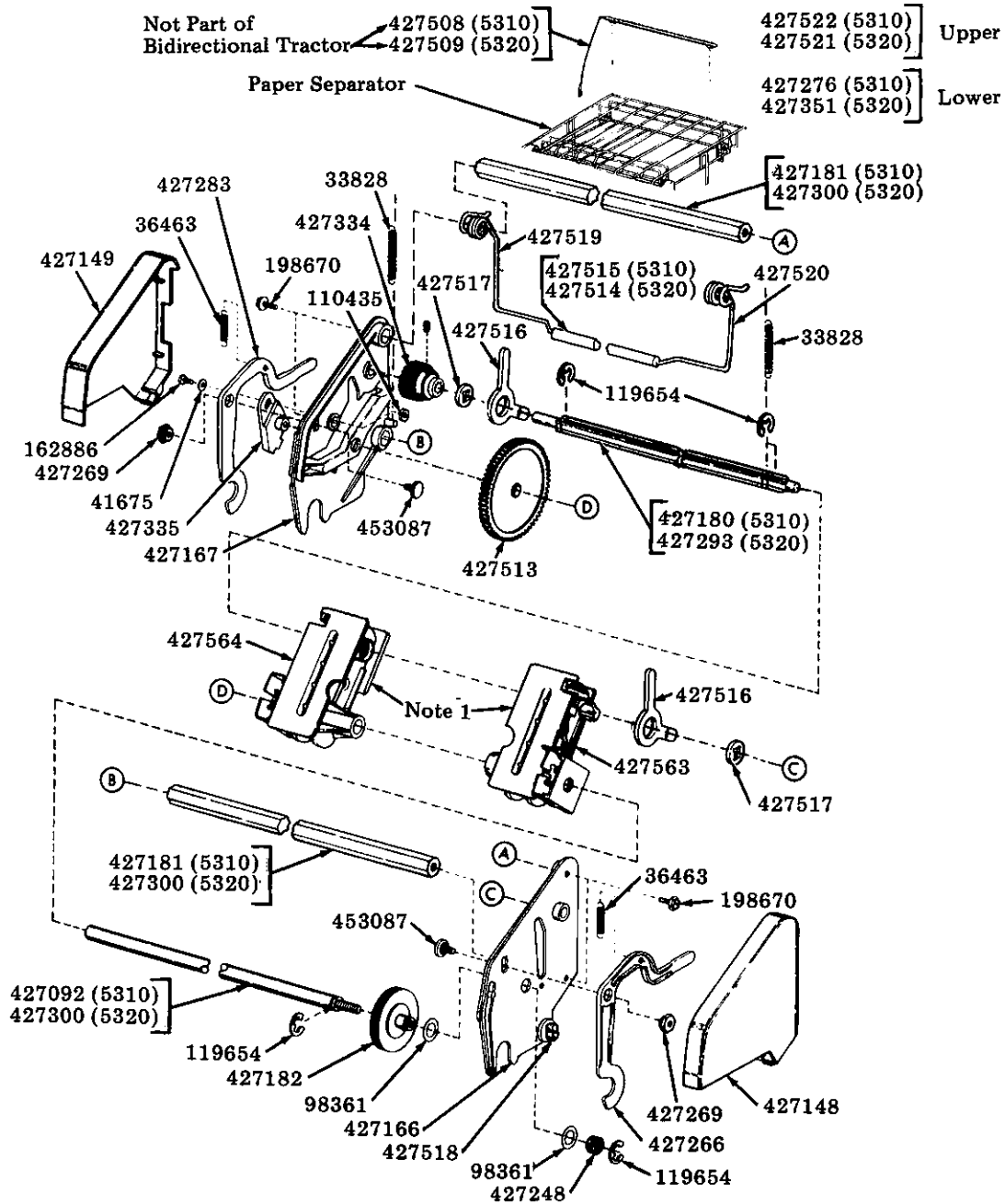
**Note 1:** The 427271 tractor assembly is shown above. The 427270 tractor assembly uses the same parts assembled in reverse.

**Note 2:** The 427287 tractor assembly is shown above. The 427288 tractor assembly uses the same parts assembled in reverse.

**Note 3:** The 427383 guide plate and 427384 hinge plate must be used as a set of parts. These parts can be used to replace the 453088 guide plate and 453093 hinge plate used in the early version tractor assembly. The 453088 guide plate and 453093 hinge plate cannot be used in the late design tractor assembly.

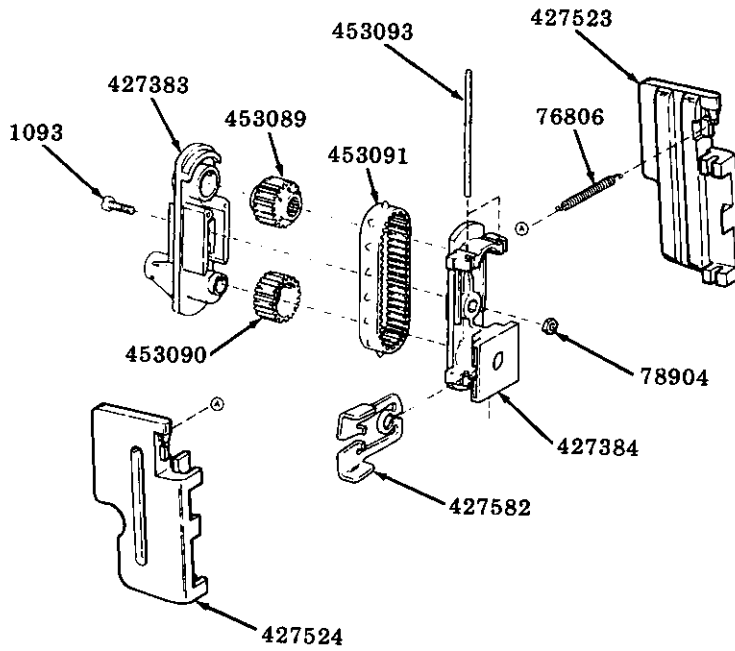


427415 (5310) or 427420 (5320) Bidirectional Tractor

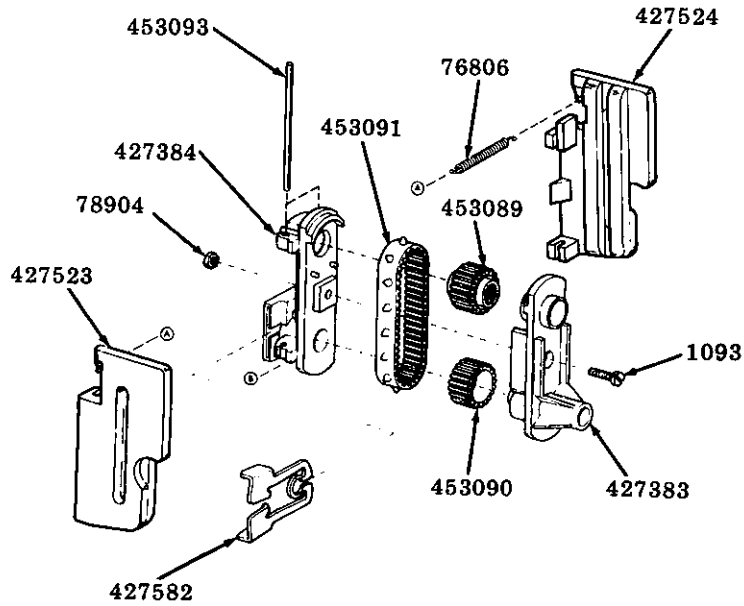


- Note 1:** For parts breakdown, see "427563 and 427564 Tractor Assembly".
- Note 2:** 427415 mod. kit consists of 427567 tractor assembly, 427276 and 427522 paper separator and 52060S Specification.
- Note 3:** 427420 mod. kit consists of 427568 tractor assembly, 427351 and 427521 paper separator and 52060S Specification.

427563 and 427564 Tractor Assembly

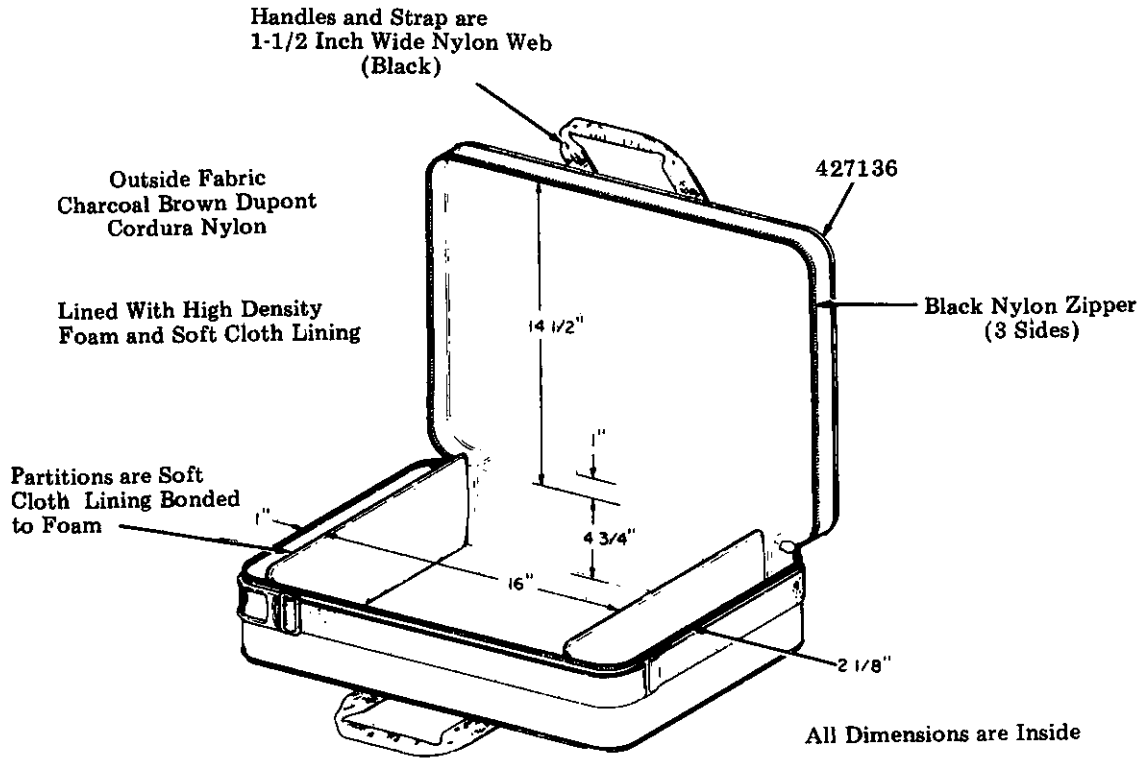


427564 Tractor Assembly, Left

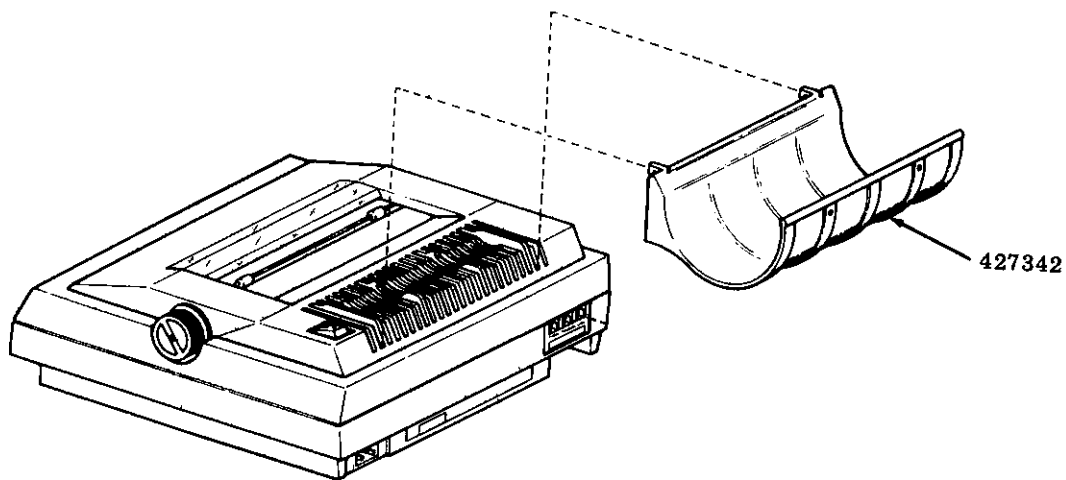


427563 Tractor Assembly, Right

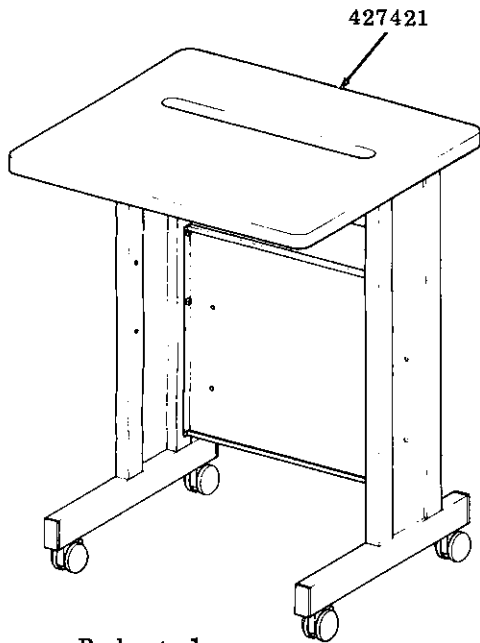
**427136 Carrying Case**



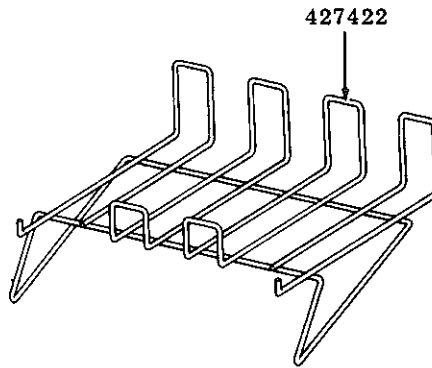
**427342 Fanfold Paper Holder**



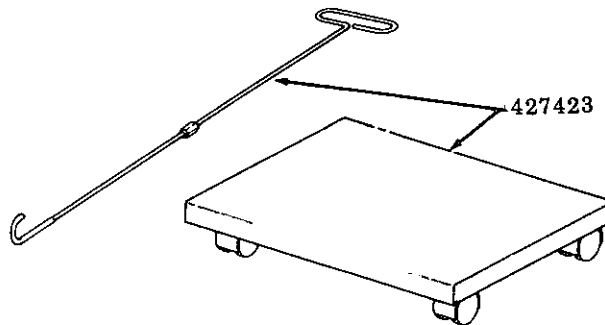
Pedestal, Paper Accumulator Rack, Paper Caddy and Paper Winder



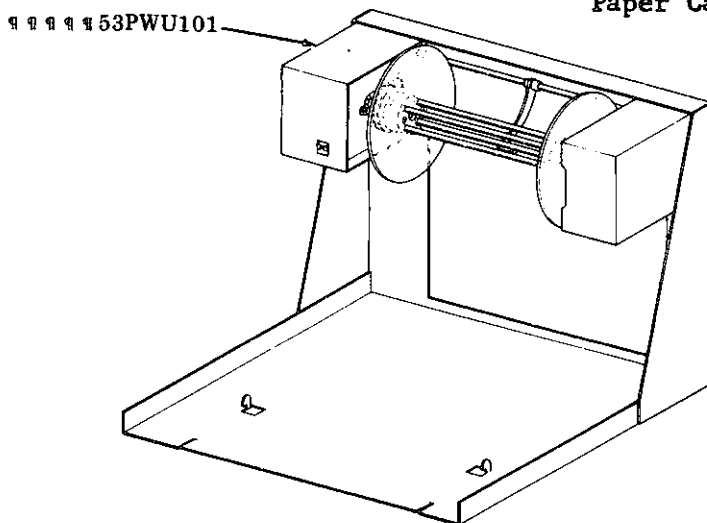
Pedestal



Paper Accumulator Rack



Paper Caddy W/Handle



Refer to Specification 52050S or Model 40 Shop Manual 355 for disassembly/reassembly, adjustments and parts.

**Numerical Index**

**Note:** The asterisk preceding part numbers indicates parts most likely to be needed. Numbers following parts descriptions are the appendix pages on which the parts appear.

<b>Part Number</b>	<b>Description</b>
1093	Screw, Std. Fil. Head 8-32 22,24
2191	Lockwasher 12,14,21
2605	Spring 14
3598	Nut, 6-40 Hex 12,14,21
3599	Nut, 4-40, Hex 10
3608	Spring 17
3640	Lockwasher 9
6987	Washer, Flat 17
7002	Washer, Flat 14,21
7603	Spring 16
7825	Spring 17
8330	Washer, Flat 13
33038	Spring 12,13,14
33828	Spring 23
36463	Spring 18,19,23
41675	Washer, Flat 18,19,21,23
55063	Spring 11
71156	Shim, .010 Inch Thick 14
76800	Spring 11
76806	Spring 24
78904	Nut, 8-32 Hex 22,24
82392	Shim, .004 Inch Thick 13
82861	Spring 21
87334	Washer, Insulating 17
98361	Shim, .005 Inch Thick 18,19,21,23
107116	Lockwasher 13
110435	Nut, 4-40 Hex 14,18,19,23
112485	Screw, 6-32 X 1/4 Fil. 13
119649	Ring, Retaining 11,17
119651	Ring, Retaining 11,12,14
119652	Ring, Retaining 10,13,14
119653	Ring, Retaining 21
119654	Ring, Retaining 18,19,21,23
123465	Spring 14
125258	Spring 22
125266	Spring, Compression 17
128357	Ring, Retaining 10,11

Part Number	Description
130683	Lockwasher 10,12,21
151733	Screw, 4-40 X 9/16 Flt. 13
151880	Nut, 4-40 Hex 9,10,12,21
152890	Washer, Flat 12
154202	Screw, #4 Spl. 4
155861	Lockwasher 10
156337	Washer, Flat 14
162886	Screw, Hex 18,19,23
180595	Setscrew, 4-40 13
180927	Ring, Retaining 14
181141	Screw, 8-32 Spl. 4
181242	Screw w/Lockwasher 21
181424	Nut, 6-40 Square 14
181705	Screw Tapping 21
184056	Screw w/Lockwasher, 6-40 X 1/4 Hex 13
184067	Screw w/Lockwasher, 4-40 X 5/16 Hex 10,21
186503	Magnet 17
198670	Screw w/Lockwasher, 6-40 X 5/16 Hex 12,14,18,19,23
323516	Terminal Male 10
333147	Jumper, 1-3/4 Inch Braided 13
400226	Spring 17
407217	Screw, Hi-Low 15,16
*410307	Card, Circuit, Modem (Late Version) 5,7
*410440	Card, Circuit, Print Engine Drive 5
*410934	Card, Circuit, Terminal Control 5
*410935	Card, Circuit, Terminal Control 5
*410938	Card, Circuit, Terminal Control 5
*410940	Card, Circuit, Print Engine Drive 5
*410941	Card, Circuit, Switch and Display 4,5
*410943	Card, Circuit, Print Engine Drive 5
*410947	Card, Circuit, Current Loop 5,9
*410951	Card, Circuit, SSI to EIA Converter 5,8
*410968	Card, Circuit, Power Supply (115/230 Vac) 5,6
*410976	Card, Circuit, Power Supply (115 Vac) 5
*412394	Cord, Power (115 Vac) 5
412455	Nameplate, AT&T 4
412465	EIA Cable, 7 Ft. Length 5
412466	EIA Cable, 12 Ft. Length 5
412467	EIA Cable, 25 Ft. Length 5
412468	EIA Cable, 50 Ft. Length 5
412592	Designator Strip 4
414455	Card, Circuit, Modem (Early Version) 5,7
414480	Acoustic Coupler Interface Unit (Early Version) 5
414621	Modification Kit, Modem 5,7
416455	Cable, Interface 5,7,8,9

Part Number	Description
416990	Acoustic Coupler Interface Unit (Late Version) 5
418042	Nomenclature Label 4
418693	Label, 230 Vac, International 5
420250	Modification Kit, Roll Paper Holder 17
*427000	Print Engine (5310) FF 10,11,12,13,14,15
*427001	Print Engine (5320) FF 10,11,12,13,14,15
427004	Ribbon 14
427005	Assembly, Carriage 14
427006	Plate, Side 10
427008	Plate, Side 10,12
*427010	Motor Assembly, Line Feed 5,12
*427011	Platen Assembly, Friction 15
*427012	Platen Assembly, Friction 15
*427015	Motor Assembly 5,13
427024	Pulley 13
*427026	Belt, 280T Timing 13
427028	Support, Pulley 13
427031	Lid, Front 4
427039	Roller, Pressure 11
427040	Roller, Center 11
427043	Carriage w/Posts 14
427046	Bearing, Left 15,16
427047	Bearing, Right 15,16
427048	Gear, 42T 14
427051	Key, Drive 14
427052	Arm, Pivot 14
427054	Shaft, Center 11
427055	Bushing, Left 11
427056	Pulley w/Gear 14
427057	Arm 14
427058	Cable 13
427059	Guide 12,13
427061	Rod, Pivot 14
427063	Rod, Latch 14
427066	Gear, 9T 10
427068	Post, Gear 12
427069	Gear, 36/15T 12
427070	Gear, 40T Idler 12
427071	Bushing 12
427072	Post, Spring 10,12
427075	Gear, 50T Drive 15,16
427076	Gear, Ring 15,16
427077	Gear, Platen, 52T 15,16
427078	Wheel, Adjusting 15,16
427079	Shift, Short Spline 10,11
427080	Guide, Paper 11
427081	Spacer, Right 11
427082	Cam 11

Part Number	Description
427083	Arm, Roller 11
427084	Arm, Center Roller 11
427087	Window 4
427089	Screw, Self-Tapping 4
427091	Handle, w/Gear, 8T 10
427092	Shaft, Short Guide 18,19,23
427095	Platen w/Hubs 15
427097	Gear, Tractor Drive 15,16
427098	Support, Rail 10
427099	Rail, Front Guide 13
427104	Plate, Encoder 13
427105	Base, Encoder 13
427106	Cover, Encoder 13
427109	Mask, Encoder 13
427123	Plate, Paper 10
427130	Collar, Detent 15,16
427131	Spring, Detent 15,16
427132	Knob, Platen 15,16
427133	Clip (Early Design) 13
427136	Bag, Carrying 25
427140	Lever, Paper Out 7T 11
427144	Cover, Right Plate 4
427145	Cover, Left Plate 4
427148	Cover, Right Tractor 18,21,23
427149	Cover, Left Tractor 18,21,23
427150	Gear, 24T 21
427151	Gear, 25T 21
427152	Gear, 70T 19
427155	Cam, Sprocket Feed, Right 16
427156	Cam, Sprocket Feed, Left 16
427157	Pin, Sprocket Feed 16
427158	Stripper 16
427160	Retaining Clip 4
427166	Plate, Right Tractor 18,19,23
427167	Plate, Left Tractor 18,19,23
427168	Plate, Pivot 10
427169	Screw, 6-40 X 5/8 Spl. 12
427171	Pivot, Handle 10
427172	Plate, Retainer 13
427173	Gear, 75T 14
427174	Disk, Encoder 13
427176	Plate, Blank 5,9
427177	Plate, Connector 5,7
427179	Stud 14
427180	Shaft, Short Drive 18,19,21,23
427181	Shaft 18,19,21,23
427182	Wheel, Thumb 18,19,21,23



Part Number	Description
427183	Post, Adjusting Gear, 24T 21
427185	Shaft, Guide 21
427187	Cover 16
427188	Cover 16
427189	Pad, 4-3/4 Inch Long 4
427190	Pad, 3-3/4 Inch Long 4
427191	Guide 4
427194	Housing 11
427195	Lever 11
427196	Shield 5
427199	Shield 14
427201	Clamp, Cable 12
427202	Spring, Left Torsion 10
427204	Shaft, Bearing, Eccentric 14
427205	Spring Compression 14
427207	Roller 14
427208	Clip 13
427214	Label, Basic w/FCC UL & CSA, Class A 5
427223	Post 14
427229	Guide, Paper 11
427232	Cover 4
427234	Platen, Pin Feed 16
427235	Base 4,5
427236	Ring, Retaining 16
427237	Shield, Cable 14
427239	Clip, Cable 13
*427240	Modification Kit, Tractor, Pull 18
427241	Ring, Retaining 14
427242	Shim 14
427243	Shim 14
427248	Spring, Compression 18,19,23
427249	Plate, Gear 21
*427250	Modification Kit, Tractor, Push 20,21
427251	Clamp 22
427254	Spring 11
*427260	Modification Kit, Platen, Pin 16
427263	Post, Flexible 10
427264	Clamp 13
*427265	Motor Assembly 13
427266	Lever, Right 18,19,21,23
427269	Nut, 6-40 Shoulder 18,19,21,23
427270	Tractor Assembly, Right 18,19,21,22
427271	Tractor Assembly, Left 18,19,21,22
427275	Nut, Insert 10
427276	Separator, Paper 18,19,20,21,23
427278	Separator, Shelf 16
427280	Label, Instruction 4

Part Number	Description
427282	Spring, Torsion 10
427283	Lever, Left 18,19,21,23
427284	Hold Down Arm, Paper 10
427285	Hold Down Arm, Paper 10
427287	Tractor Assembly 18,19,21,22
427288	Tractor Assembly 18,19,21,22
*427290	Spring 11
427293	Modification Kit, Tractor, Pull 18,23
427297	Shaft, Drive 18,19
427298	Shaft, Guide 18,19
427300	Shaft, Tie 18,19,23
427308	Guide 4
427312	Window 4
427313	Lid, Front 4
427314	Cover, Upper 4
427315	Base 4,5
427317	Belt, Timing 13
427319	Platen, w/Hubs 15
427321	Cable 13
427327	Shaft, Cam 10,11
427328	Spacer 11
427330	Support, Roll 10
427331	Rail, Front Guide 13
427332	Plate, Paper 10
427334	Gear, 25T 18,19,21,23
427335	Plate, Adjusting 18,19,23
427339	Cover 17
427340	Cam, Low Paper 17
427342	Holder, Paper 25
427344	Ring, Retaining 15,16
427345	Cable 17
427346	Washer, Keyed 14
427349	Spring, Torsion 10
427351	Separator 18,19,23
427352	Assembly, Tractor 18
427358	Eliminator Assembly, Static 16,18,19
427359	Eliminator Assembly, Static 18,19
*427360	Ribbon, Six Pack 14
427367	Ring, Retaining 16
427368	Retainer, Hub 16
427370	Assembly, Tractor 18
427371	Housing 11
427372	Lever 11
427373	Plate, Left Tractor 21
427377	Label, 115 Vac Class B 5
427378	Plate, Right Tractor 21
427379	Shaft, Tie 21

Part Number	Description
427380	Tractor Assembly, Push 20,21
427381	Guide, Paper 21
427382	Tie, Bar 21
427383	Plate, Guide (Late Design) 22,24
427384	Plate, Hinge, (Late Design) 22,24
427385	Cover, (Late Design) 22
427386	Cover, Extension 22
427387	Guide, Front 21
427390	Platen Assembly 16
427391	Guide, Rear 21
427392	Plate, Extension 21
*427400	Print Engine (5310) PF 10,11,12,13,14,16
427410	Ribbon, 144 Pack 14
427415	Bidirectional Tractor Assembly (9-1/2 Inch) 23
427420	Bidirectional Tractor Assembly (15 Inch) 23
427421	Pedestal, w/Levelers and Casters 26
427422	Paper Accumulator Rack 26
427423	Paper Caddy w/Handle 26
427508	Eliminator Assembly, Static (5310) 21,23
427509	Eliminator Assembly, Static (5320) 23
427513	Gear, 74 Teeth 23
427514	Bail, Paper 23
427515	Bail, Paper 23
427516	Lever, Latch 23
427517	Bushing, Latch Lever 23
427518	Post 23
427519	Bail, Left 23
427520	Bail, Right 23
427521	Paper Separator, Upper, 15 Inch 23
427522	Paper Separator, Upper, 9-1/2 Inch 21,23
427523	Cover, Tractor 24
427524	Cover, Tractor 24
427525	Paper Arm Cam, Right 21
427526	Paper Arm Cam, Left 21
427528	Ribbon Guide 14
427543	Flange 17
427544	Flange, w/c Sink 17
427546	Lever 11
427547	Lever, Paper Out 11
427563	Tractor Assembly, Right 23,24
427564	Tractor Assembly, Left 23,24
427566	Plate, Connector 8
427567	Assembly, Tractor 23
427568	Assembly, Tractor 23
427582	Clamp, Tractor 24

Part Number	Description
427612	Lid, Front (5310, Black) 4
427613	Lid, Front (5320, Black) 4
427614	Cover Assembly, Upper (5310, Black) 4
427615	Cover Assembly, Upper (5320, Black) 4
427616	Cover, Left, Tractor (Black) 19,21
427617	Cover, Right, Tractor (Black) 19,21
427618	Cover Plate, Left (Black) 4
427619	Cover Plate, Right (Black) 4
427621	Tractor Assembly, Pull-Type (9-1/2 Inch Black) 19
427622	Tractor Assembly, Pull-Type (15 Inch Black) 19
427623	Tractor Assembly Push-Type (9-1/2 Inch Black) 20
*427631	Modification Kit, Tractor, Pull (9-1/2 Inch, Black) 19
*427632	Modification Kit, Tractor, Pull (15 Inch, Black) 19
*427633	Modification Kit, Tractor, Push (9-1/2 Inch, Black) 20,21
430271	Lever 17
430272	Spindle, Paper 17
430274	Follower, Cam 17
430279	Lever, Paper Sensor 17
430280	Roller, Paper 17
430294	Lever, Reset 17
430296	Shaft 17
430342	Screw, #6 Self-Tapping 10,13
430366	Spring, Compression 11
430581	Modular Telephone Cord 7 Ft. Length 5,7
430582	Modular Telephone Cord 14 Ft. Length 5
430583	Modular Telephone Cord 25 Ft. Length 5
430602	Label 9
430658	Modification Kit, SSI to EIA 5,8
430659	Cable Assembly, SSI 8
430689	Strap, Ground 10
430694	Switch, Optical 13
430695	Cable, Power 5
430697	Switch, Optical 11
430699	Cord, Coiled 4
430720	Modification Kit, Current Loop 5,9
430728	Cable, Current Loop 9
430730	Plate, Connector 9
430756	Post 9
430767	Housing 17

Part Number	Description
430776	Cable, 4-3/4 Inch Long 5
430777	Cable, 8-3/4 Inch Long 5
430779	Keyboard Cable 4
430787	Switch, Optical 13
430788	Cable, 23 Inch Long 5
430789	Cable, 17 Inch Long 5
430790	Cable, Power 5
451329	Screw, 5-20 Spl. 17
453087	Screw, Shoulder 18,19,21,23
453088	Plate, Guide (Early Design) 22
453089	Sprocket, Drive 22,24
453090	Sprocket, Idler 22,24
453091	Belt, 12T 22,24
453092	Plate, Hinge (Early Design) 22
453093	Shaft 22,24
453094	Cover (Early Design) 22
453259	Button, Snap 21
455080	Switch, Membrane (5310) 4
455081	Switch, Membrane (5320) 4
*455200	Printhead Assembly 14
455231	Shield 14
455232	Fastener, Hook 13
455233	Fastener, Loop 14
455624	Label, Power Line (115 V) 6
455626	Clamp, Cable 17
455628	Label, Power Line (220-240 V) 6
455680	Cord, Power (230) 5
455830	Label, Caution 6
53PWU101	Paper Winder 26
524104445	Terminal Control Card 5
56K228AAM	Keyboard w/Cable 4
56K235AAZ	Keyboard w/Cable 4
56K310ACV	Keyboard w/Cable 4

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