1025™ PRINTER FIELD SERVICE MANUAL

ATARI®

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A Warner Communications Company

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ATARI

1025™ PRINTER

FIELD SERVICE MANUAL

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TABLE OF CONTENTS

Section	Title	Page
	INTRODUCTION	vii
1	THEORY OF OPERATION	1-1
	Introduction	1-1
	Mechanical Theory	1-1
	Print Head Mechanism and Operation	1-1
	Space Mechanism and Operation	1-3
	Ribbon Feed Mechanism and Operation	1-4
	Paper Feed Mechanism and Operation	1-5
	Paper Lock Release Mechanism	1-6
	Paper End Detecting Mechanism	1-6
	Electrical Theory	1-7
	Introduction	1-7
	8051 Microprocessor	1-8
	8155 RAM I/O	1-8
	2732 EPROM	1-8
	Power Supply	1-8
	Print Head	1-8
2	SILKSCREEN AND SCHEMATIC	2-1
3	MAINTENANCE/TESTING AND TROUBLESHOOTING	3-1
	Equipment Required	3-1
	General Maintenance Precautions	3-1
	Cleaning	3-2
	Diagnostic Program for Testing the 1025	3-2
	ROM Self-Test Procedure	3-7
	Specfic Command Code Failures	3-7
4	DISASSEMBLY/ADJUSTMENT/ASSEMBLY PROCEDURES	4-1
	Upper Cover Disassembly	4-1
	PCB Disassembly	4-1
	Printer Unit Disassembly	4-2
	Transformer Replacement	4-2
	Print Head Disassembly	4-2
	Carriage Frame Disassembly	4-3
	Space Motor Replacement	4-3
	Space Belt Tension Adjustment	4-4
	Space Belt Replacement	4-4
	Platen Disassembly	4-5

TABLE OF CONTENTS

Section	Title	Page
	Platen Assembly	4-6
	Platen/Print Head Adjustment	4-6
	Platen/Paper Separator Adjustment	4-7
	Carriage Frame Assembly	4-8
	First Character Printing Position Adjustment	4-8
	Inserting the Print Head	4-9
	Printer Unit Assembly	4-9
	PCB Assembly	4-10
	Upper Cover Assembly	4-10
5	1025 DIAGNOSTIC FLOWCHART	5-1
6	SYMPTOM CHECKLIST	6-1
7	PARTS LIST	7-1
	Mechanical Parts	7-1
	Electronic Parts	7-3
8	SERVICE BULLETINS	8-1

LIST OF ILLUSTRATIONS

Figure Number	Title	Page
1-1	Printing Mechanism	1-2
1-2	Spacing Mechanism	1-3
1-3	Ribbon Feed to Left	1-4
1-4	Ribbon Feed to Right	1-5
1-5	Paper Feed Mechanism	1-5
1-6	Paper Lock Release Mechanism	1-6
1-7	Paper End Detecting Mechanism	1-6
1-8	PCB Functional Block Diagram	1-7
1-9	Print Head Pattern of the Letter I	1-9
3-1	Sample Diagnostic Printout	3-5
4-1	Printer Unit	4-11
4-2	Cover Unit	4-13
4-3	Carriage Assembly	4-15
4-4	Base Unit Assembly	4-17
4-5	Space Belt Tension Adjustment	4-4
4-6	Ribbon Assembly	4-19
4-8	Platen/Print Head Adjustment	4-7
4-9	Platen/Paper Separator Adjustment	4-7
4-10	First Character Printing Position	4-9

LIST OF TABLES

Table Number	Title	Page
3-1	Character Command Codes	3-4

INTRODUCTION

The ATARI 1025™ Printer Field Service Manual is organized in eight sections.

- **THEORY OF OPERATION** - Overview of the mechanical and electrical theory of the 1025.
- **SILKSCREEN AND SCHEMATIC** - The silkscreen of the PCB component layout and the schematic of the PCB and print mechanism.
- **MAINTENANCE, TESTING AND TROUBLESHOOTING** - Procedures for maintaining, testing and repairing the 1025.
- **DISASSEMBLY/ASSEMBLY** - Step by step instructions on how to disassemble and assemble the unit for component level repair.
- **DIAGNOSTIC FLOWCHART** - Flowchart enabling the technician to test and troubleshoot a defective 1025.
- **SYMPTOM CHECKLIST** - For the experienced technician, a list of symptoms with their probable causes and remedies.
- **PARTS LIST** - All parts available for the mechanical and electrical repair and maintenance of the 1025.
- **SERVICE BULLETINS** - Section to be used to hold service bulletins released by the Director of Technical Support. These bulletins include changes in recommended repair procedures and required modifications for units in the field.

SECTION ONE

THEORY OF OPERATION

INTRODUCTION

The ATARI 1025™ Printer is a desk top, receive only, serial impact dot matrix printer. The 1025 Printer connects directly to the ATARI computer or disk drive with an I/O cable and receives its instructions thereby. It is a uni-directional printer.

MECHANICAL THEORY

PRINT HEAD MECHANISM AND OPERATION

PRINT HEAD MECHANISM

The print head consists of the following:

- Wire Guide
- Yoke
- Armature Assembly
- Spacer
- Magnet Assembly

The print head is spring-loaded and contains a permanent magnet. It can be easily removed and installed. It's mounted on the carriage that runs parallel to the platen and is attached to the PCB at connector CN3.

PRINT HEAD OPERATION

When not operating, the armature is attracted by the permanent magnet (see Figure 1-1). The print wire, which is fixed to the armature, is held retracted within the wire guide. When a character to be printed is detected by the control circuit, a current flows to the coil corresponding to that print wire. When the coil is energized, the magnetic flux generated by the permanent magnet is nullified. The print wire is then driven toward the platen by force of the armature spring. Thus a dot is printed on the paper.

After printing the character, the magnetic flux of the permanent magnet attracts the armature again so the print wire is retracted into the wire guide.

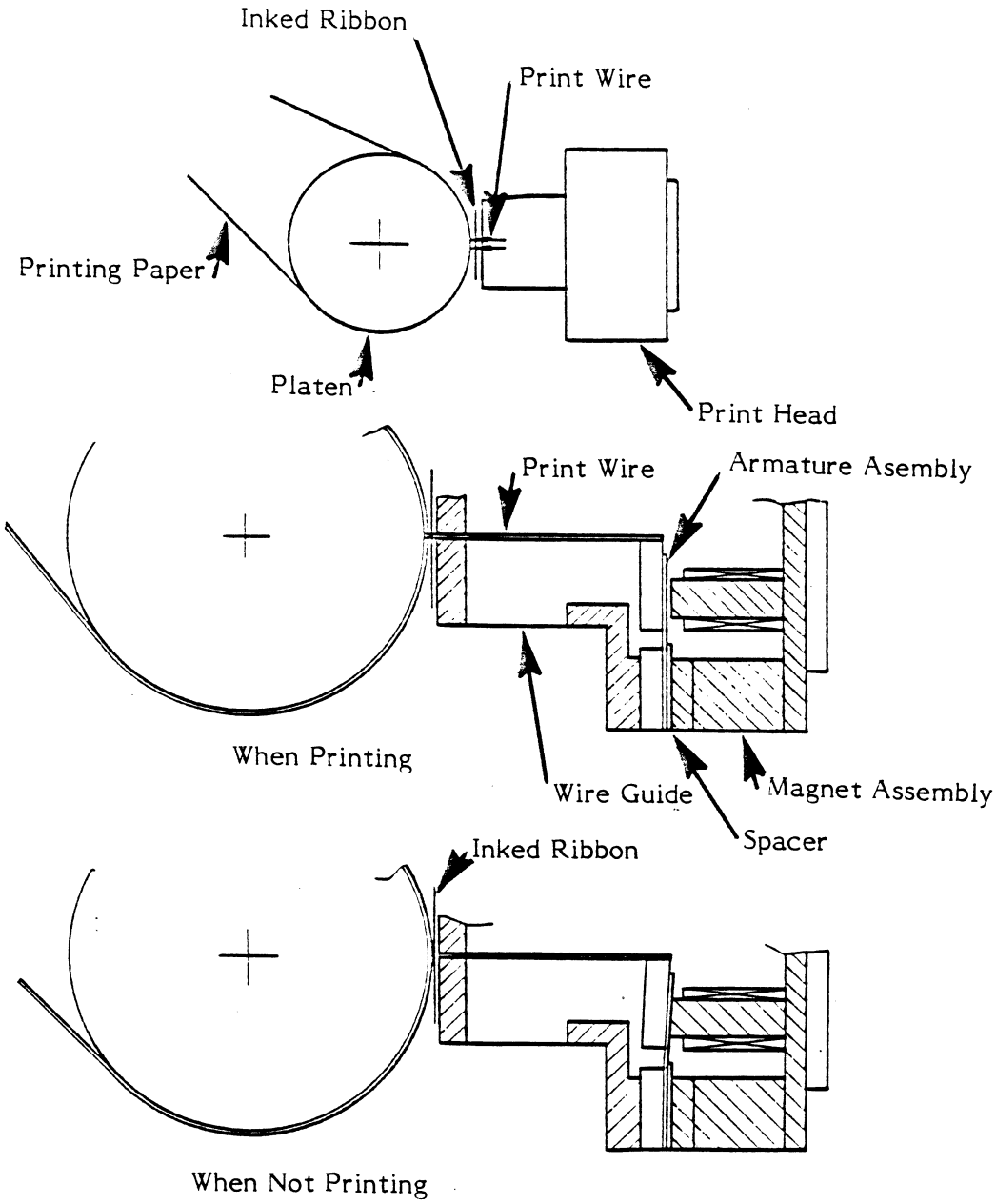

Figure 1-1. Printing Mechanism

SPACE MECHANISM AND OPERATION

SPACING MECHANISM

The space mechanism consists of the following:

- Pulse motor with synchro belt pulley
- Synchro belt
- Two guide shafts
- Carriage
- Home sensor
- Home sensor plate

Spacing and carriage return are performed by driving the carriage with a pulse motor. The carriage is guided by two shafts mounted parallel to the platen.

SPACING OPERATION

The carriage with the print head mounted on it moves parallel to the platen along the upper and lower guide shafts (see Figure 1-2). One end of the carriage frame is fixed to the synchro belt.

As the pulse motor turns clockwise, the carriage assembly is driven from left to right.

The spacing mechanism is designed so that when the pulse motor turns 4 steps (30°), the carriage moves 2.54 mm (1/10 inch).

CARRIAGE RETURN OPERATION

When the carriage return code (EOL) is received, the pulse motor is driven counterclockwise by the signal from the control circuit. The carriage moves from right to left until the home sensor plate enters the opening in the home sensor.

The home sensor consists of an LED photodiode pair. When the home sensor plate enters the sensor, the light is interrupted and a signal is generated to stop the motor. When the pulse motor stops, the carriage stays at the start position until the next line is ready to be printed.

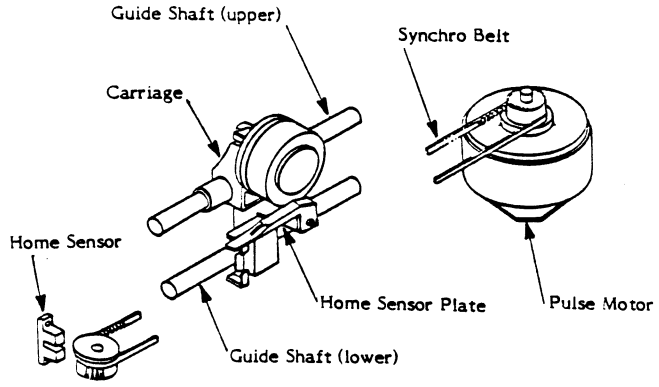

Figure 1-2. Spacing Mechanism

RIBBON FEED MECHANISM AND OPERATION

RIBBON FEED MECHANISM

The ribbon feed mechanism consists of the following:

- Ribbon drive gear
- Ribbon gear
- Ribbon spool gear
- Ribbon change lever
- Eyelet detector lever
- Ribbon bracket

The space pulse motor used to drive the carriage also provides the power to feed the ribbon.

RIBBON FEED OPERATION

When the space pulse motor's drive belt runs counter-clockwise, it engages the central ribbon gear with the ribbon spool gear and winds the ribbon, while the opposite ribbon spool turns freely. When the space pulse motor turns clockwise and the print head moves from left to right, the central ribbon gear disengages and remains disengaged until the motor direction reverses.

The eyelet detector lever indicates the direction in which the ribbon feeds. When this lever is pushed to the left, the ribbon feeds left, and vice versa. When the ribbon is nearly run out, the ribbon eyelet pushes the eyelet detector lever in the opposite direction. The ribbon then feeds to the right in the same fashion as described above. (See Figures 1-3 and 1-4 below).

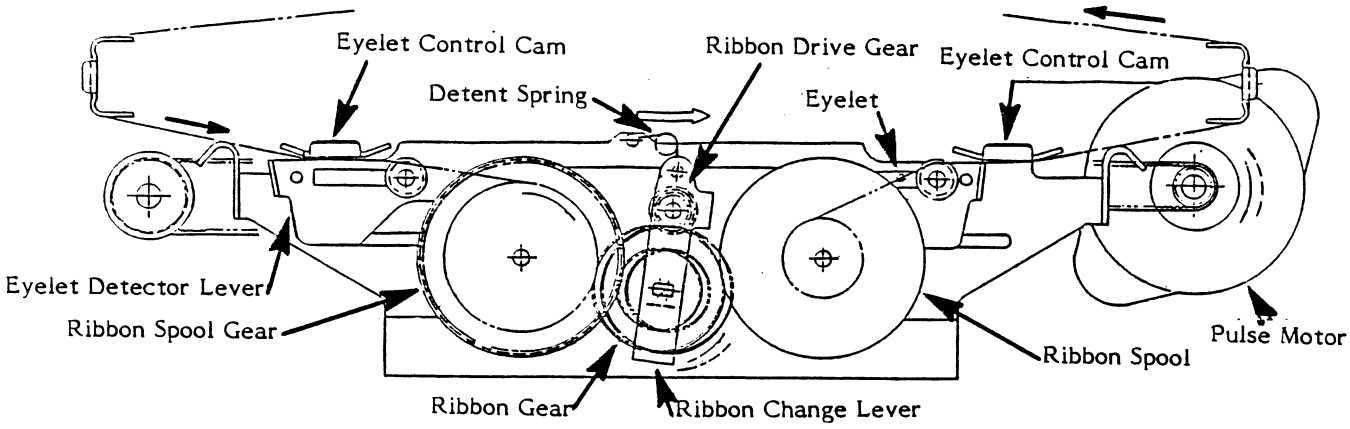

Figure 1-3. Ribbon Feed to Left

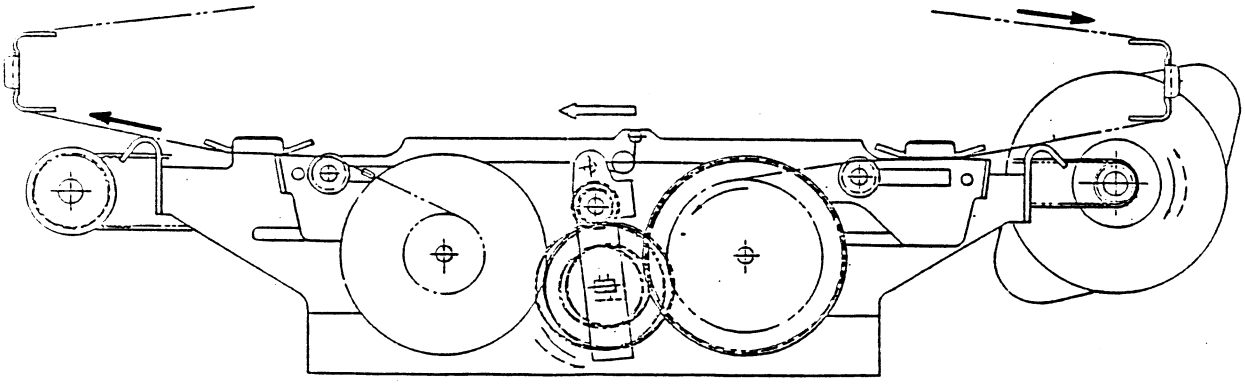

Figure 1-4. Ribbon Feed to Right

PAPER FEED MECHANISM AND OPERATION

PAPER FEED MECHANISM

The paper feed mechanism consists of the following:

- Pulse motor with gear
- Reduction gear
- Platen with fixed sprocket and friction roller

The printing paper is moved up to the next line as the pulse motor runs, meshes the gears, and rotates the fixed pin platen.

PAPER FEED OPERATION

The paper feed pulse motor is mounted on the left side panel, and its rotation is transmitted to the platen via the reduction gear (see Figure 1-5). The paper is fed 4.23 mm (1/6 inch) when the pulse motor advances 24 steps (180°).

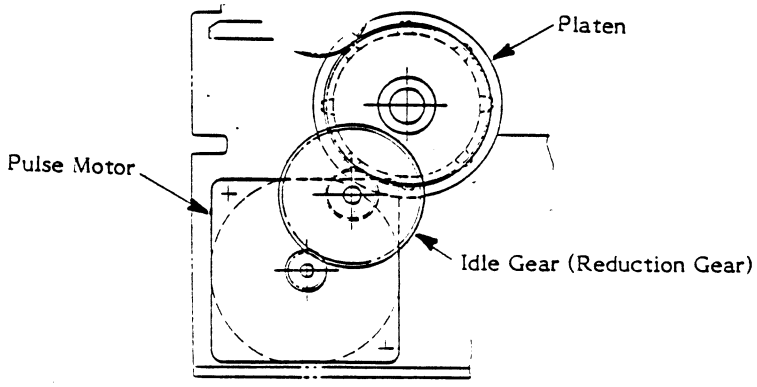

Figure 1-5. Paper Feed Mechanism

PAPER LOCK RELEASE MECHANISM

When the paper lock release lever is moved forward, the paper chute opens to allow clearance between the pressure rollers and the platen, thereby allowing insertion of paper. When the paper lock release lever is moved back, the pressure rollers push against the platen and feed the paper (see Figure 1-6).

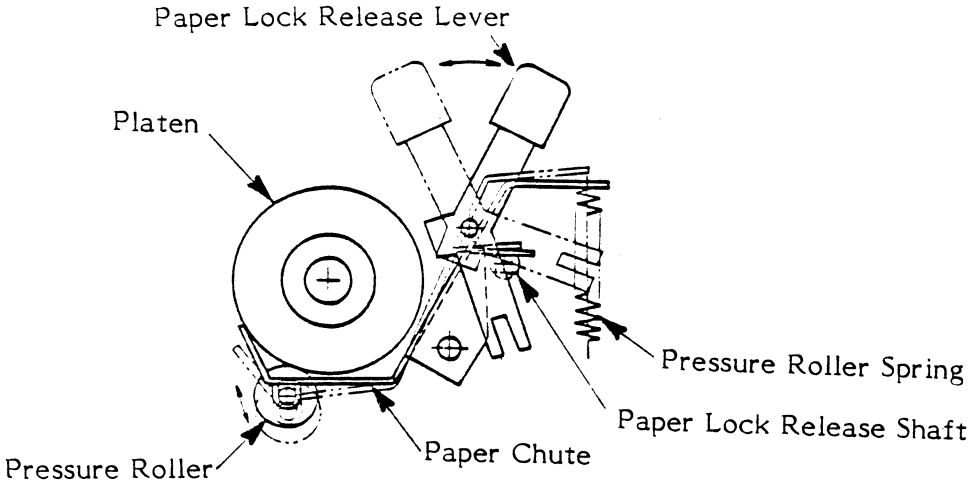

Figure 1-6. Paper Lock Release Mechanism

PAPER END DETECTING MECHANISM

When paper is loaded, the paper prevents the microswitch actuator from dropping into the paper-separator groove, as illustrated in Figure 1-7. This keeps the microswitch turned off. When the paper runs out, the actuator drops into the groove to close the microswitch and detect the absence of paper.

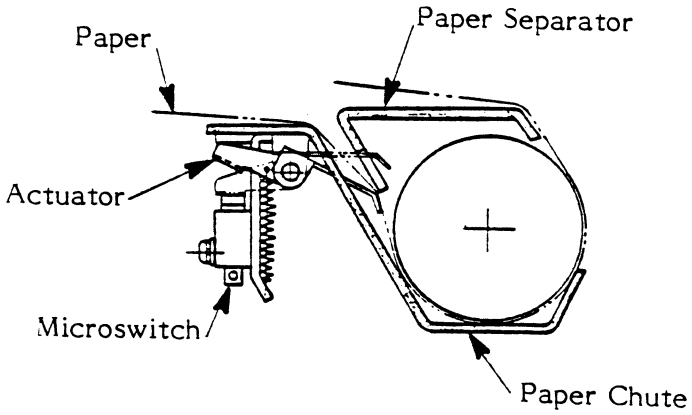

Figure 1-7. Paper End Detecting Mechanism

INTRODUCTION

The electronic portion of the 1025 is on one Printed Circuit Board (PCB). This PCB receives the information serially from the computer console via one of the two identical I/O plugs and then transfers this data into a series of High and Low signals which make one or more of the seven printer pins strike the paper, thereby forming the proper character. A functional block diagram of the PCB is illustrated in Figure 1-8.

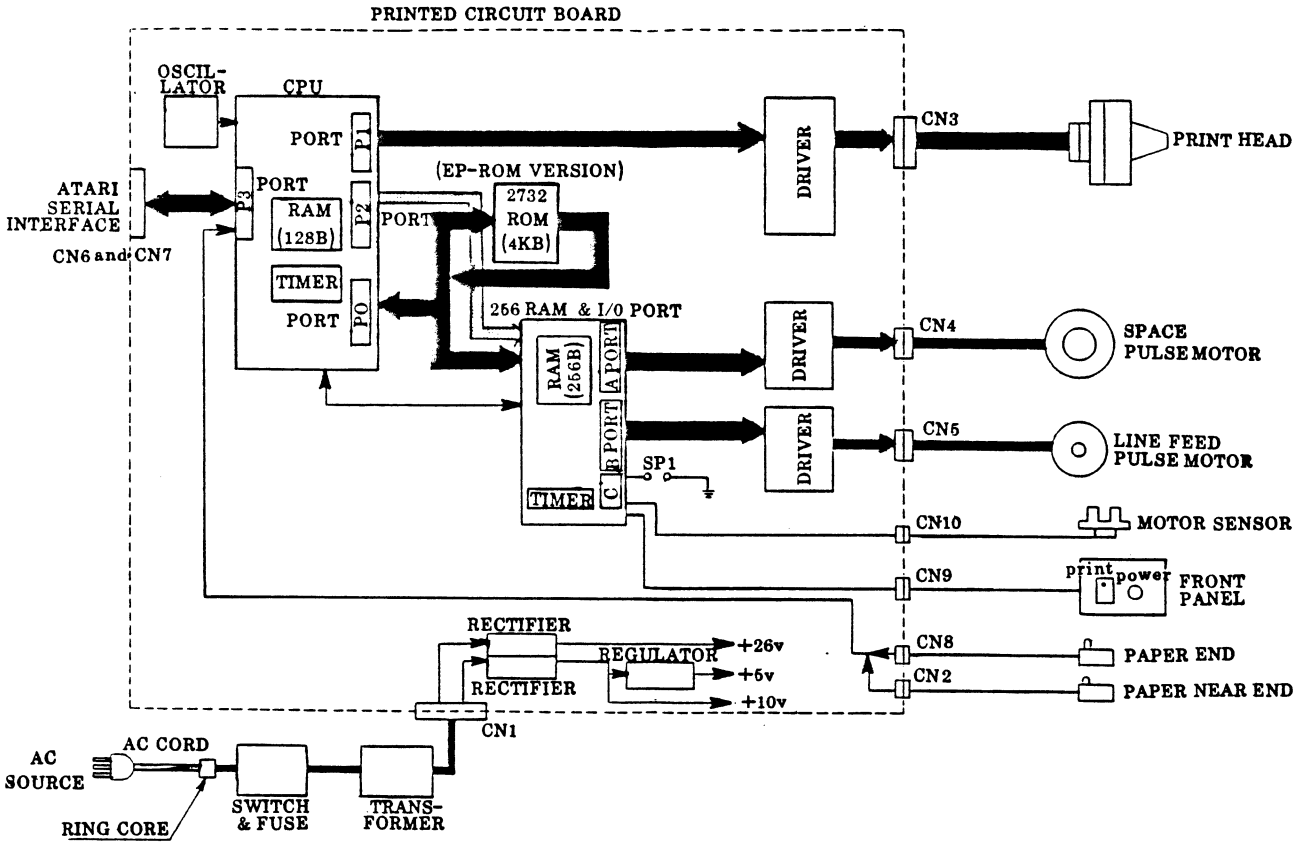

Figure 1-8. PCB Functional Block Diagram

8051 MICROPROCESSOR

The microprocessor controls the overall functioning of the printer. It reads the information the computer wants printed through the I/O cable, looks up the proper character in the ROM chip and by controlling a series of High and Low signals prints the character on the paper.

The microprocessor operates off a 7.37 MHz clock, which acts as the known frequency whereby all functions of the MPU are timed to interact.

8155 RAM I/O

This chip has two functions:

1) It provides the Random Access Memory storage for the printer, that is, it stores information that is subject to change (for example, which character set is currently being used).

2) The 8155 also controls the driver lines that operate the line feed and space motors.

2732 EPROM

This chip contains the information that determines how the characters are formed in all of the different type faces.

POWER SUPPLY

The 110V A/C is fed into a transformer by the power cord. 26VAC and 10VAC are output. The 26VAC runs through a bridge rectifier and supplies voltage to the motors and print head. The 10VAC runs through a rectifier and supplies 10VDC to the printer and a 5V regulator. This regulator delivers the voltage to the logic circuitry of the 1025.

PRINT HEAD

The following discussion describes what occurs electronically in order to print the Letter I. The computer console signals the 1025 to get ready to print a letter by pulling the command line (pin 7 of CN6 or CN7) Low. This in turn pulls down pin 14 of Q8. The computer then sends the information to the microprocessor via the Data In line. If the printer did not for any reason accept the information sent by the computer, it sends a code back to the computer telling it what caused the failure. If the processor accepts the computer's information, it temporarily stores it in the 8155. It then looks up what the print head pattern should be for that character, as determined by the information permanently stored in the ROM, and gets ready to print it.

To print the letter the print head strikes in a series of vertical rows, but only with the pins required to form the letter. After the first column has been printed, which occurs when the proper lines drop Low, the space motor advances one row as a result of a Low signal from the 8155. When the print head has been advanced to the next column, it again strikes the proper dots. The above steps are repeated until the letter I is formed as in Figure 1-8 below.

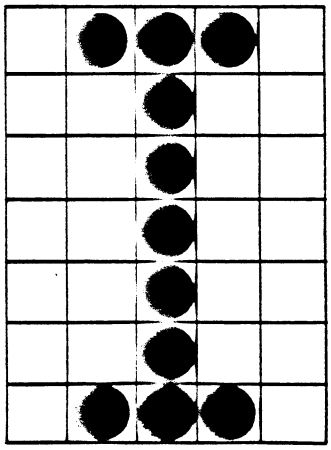

Figure 1-9. Print Head Pattern of the Letter I.

SECTION TWO

SILKSCREEN AND SCHEMATIC

An oversized silkscreen and schematic of the 1025 PCB are folded and stapled to the cover of this manual. Insert them here.

SECTION THREE

MAINTENANCE/TESTING AND TROUBLESHOOTING

EQUIPMENT REQUIRED

- ATARI Computer and accessories
- BASIC Language Cartridge
- No. 1-100 Phillips screwdriver
- No. 2-200 Phillips screwdriver
- No. 5-H clippers
- Thickness gauge
- 50-g pressure gauge
- 300-g stick pressure gauge
- Soldering iron (30 W)
- Oscilloscope
- Digital volt/ohmmeter
- Stop ring pliers
- Small needle-nose pliers

GENERAL MAINTENANCE PRECAUTIONS

- Keep the gears and belts absolutely free of dust and paper waste.
- Disconnect the AC plug before pulling out the connectors or reinserting them.
- Do not unnecessarily disassemble, reassemble, or readjust the printer as long as it is in good operating condition. Particularly, do not carelessly loosen screws.
- Carefully inspect the printer and confirm that nothing is visibly wrong with it prior to switching it on.
- Never print without the paper and ribbon in place.
- Load the printing paper correctly.
- Make sure the ribbon is not loose or twisted.
- During maintenance or printer operation, do not place anything on the cover or lean on the printer.
- Do not leave the parts or screws which have been used during maintenance inside the printer.

- Do not wear gloves, which easily generate static, when handling the printer circuit board. Since the CPU, ROM, and other ICs are liable to damage by static, exercise care not to unnecessarily touch the leads and windows or the ROM.
- Do not place the printed circuit board directly on the printer or the floor. Place it on a grounding pad.

CLEANING

Cleaning interval:	6 months or 300 hours of operation, whichever comes sooner
Tool:	Dry cloth (gauze or other dry cloth)

CLEANING POINTS

Inked ribbon passage:	Clean the inked ribbon passage of dust, and ribbon lint.
Paper passage:	Clean the paper passage and the parts around it of paper lint.

DIAGNOSTIC PROGRAM FOR TESTING THE 1025

To test the 1025 you must type in a short BASIC language program and run it by entering certain command codes. There is also an internal self-test used during troubleshooting to determine certain failures. This second test is referenced in the diagnostic flowcharts and explained later in this section.

Connecting the 1025 for testing:

1. Connect the computer to the TV set as shown in the computer owner's manual.
2. Plug the 1025 into the wall outlet.
3. Plug an I/O cable into the computer and the 1025.
4. Turn on both the POWER switch and the PRINT switch on the 1025.
5. Plug a BASIC cartridge into the computer and turn the computer ON. (If the computer fails to come on, refer to the appropriate ATARI computer repair manual.)

You are now ready to begin testing.

The 1025 has nine different character command codes. These are broken down into four groups:

Character size:	The three sizes of characters are 5, 10, or 16.7 characters per inch.
Line size:	The two line size are 6 or 8 lines per inch of paper.
Margin size:	The two margin sizes are determined by 64 or 80 characters per line.
European characters:	There is a command to enable the European character set and another command to ignore it.

The default set (the one the printer uses when first turned on) consists of 10 characters per line, 6 lines per inch, 80 columns per line, and it ignores the European character set.

To test the 1025:

1. Type the following BASIC program, making sure that you press the RETURN key after each line. If you receive an ERROR message after pressing RETURN, retype the line making sure that it is typed exactly like the model below.

```
10 OPEN #1,8,0,"P"
20 DIM A$(8)
30 ? #1:? #1
40 INPUT A$
50 IF A$="SKIP" THEN GOTO 30
60 ? #1;A$
70 FOR X=0 TO 126
80 IF X=27 THEN 100
90 ? #1;CHR$(X);
100 NEXT X
110 ? #1;CHR$(127)
120 GOTO 40
```

2. Type RUN and press RETURN.

3. A question mark will appear on the screen asking you for the command code.

4. When the computer is ready to accept a command the white cursor appears to the right of the question mark. When the instructions tell you to type in a certain code, refer to the Character Command Code Table on page 3-4.

CHARACTER COMMAND CODES

When entering the character command codes, do not insert spaces or commas between the commands or press RETURN. Type them consecutively on the screen.

Table 3-1. Character Command Codes

You type in:	Function:
ESCAPE, ESCAPE, CONTROL T*	Print at 16.7 char/inch
ESCAPE, ESCAPE, CONTROL O*	Print at 10 char/inch
ESCAPE, ESCAPE, CONTROL N*	Print at 5 char/inch
ESCAPE, ESCAPE, L	Set long line (80 char/line)
ESCAPE, ESCAPE, S	Set short line (64 char/line)
ESCAPE, ESCAPE, 6	Set to 6 LPI (1/6" spacing)
ESCAPE, ESCAPE, 8	Set to 8 LPI (1/8" spacing)
ESCAPE, ESCAPE, CONTROL W*	Enable European characters
ESCAPE, ESCAPE, CONTROL X*	Ignore European characters

*Hold the CONTROL key and the letter key down at the same time.

NOTE: The maximum number of characters that can be entered is eight. Also, although you press the ESCAPE key twice, only one character appears on the screen.

Spacing Dimensions
Not Part of Printout

10 char/inch
6 lines/inch

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

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

16 char/inch
8 lines/inch

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

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

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

5 char/inch
6 lines/inch

```
 !"#$%&' ()*+,-./0123456789:;<=>?@ABCDEFG
HIJKLMNOPQRSTUVWXYZ[\]^_ abcdefghijklmno
pqrstuvwxyz |

 !"#$%&' ()*+,-./0123456789:;<=>?@ABCDEFG
HIJKLMNOPQRSTUVWXYZ[\]^_ abcdefghijklmno
pqrstuvwxyz |
```

10 char/inch
8 lines/inch

```
ÁÐÑÉ¿ßÕÞ£ÝÜäÖöóÜüÝéèñëåàÅ↑↓←→ !"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_iabcdefghijklmnopqrstuvwxyzÄ|¶
                ▶

ÁÐÑÉ¿ßÕÞ£ÝÜäÖöóÜüÝéèñëåàÅ↑↓←→ !"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_iabcdefghijklmnopqrstuvwxyzÄ|¶
                ▶
```

10 char/inch
6 lines/inch

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

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

Figure 3-1. Sample Diagnostic Printout

5. Press RETURN. The printer prints the default character set. Repeat this step again.

6. Type SKIP and press RETURN. The printer line feeds two lines.

7. Type the code for: 16.7 characters per inch
   8 lines per inch
   64 characters per line
   and press RETURN. Repeat this step two more times.

8. Type SKIP and press RETURN. The printer line feeds two lines.

9. Type the code for: 5 characters per inch
   6 lines per inch
   80 characters per line
   and press RETURN. Repeat this step again.

10. Type the code for: 10 characters per inch
    8 lines per inch
    64 characters per line
    Enable European characters
    and press RETURN. Repeat this step again.

11. Type SKIP and press RETURN. The printer line feeds two lines.

12. Type the code for: 6 lines per inch
    80 characters per line
    Ignore European characters
    and press RETURN. Repeat this step again.

13. Using the sample printout as a model and a ruler as a measure, examine the line spaces and characters per inch to determine if they are the correct sizes. If they are not the correct sizes, proceed to the Diagnostic Flowchart, page 5-1.

    If the printout is correct, check for any of the following problems:

    - Is the print lighter on one side of the lines than the other? If so, see the Platen/Print Head Adjustment on page 4-6.
    - Does the print head line up correctly for printing the first character (see Figure 4-9, page 4-9)?
    - Can paper be fed smoothly through the paper chute? If not, see the Platen/Paper Separator Adjustment on page 4-7.

ROM SELF-TEST PROCEDURE

The 1025 printer has a built-in self-test designed to exercise some functions of the ROM, including the functions for 10 print characters per inch, 6 lines per inch, the standard character set, and the 80 column print width. These are the functions that the printer defaults to unless it is given special commands. This test does not determine whether the ROM governing the 16.5 character per inch, the 8 lines per inch, the international character set and the 64 column print function are operating correctly.

EQUIPMENT

- Small needle-nose pliers

PROCEDURE

- Disconnect the I/O cable from the computer.
- Turn the power switch on the back of the printer OFF.
- Follow the Upper Cover Disassembly procedure on page 4-1.
- Do not remove the PCB. Locate the jumper plug (SP1) on the left corner of the PCB and with a pair of small needle-nose pliers, move the shorting plug from the right to the left, from position A to B (as marked on the PCB).
- Load the paper.
- Turn the power switch at the back of the printer ON. Make sure that the PRINT switch on the front panel is ON.
- Return to the Diagnostic Flowchart.

SPECIFIC COMMAND CODE FAILURES

If the customer complains about a specific command code or command code combination that fails to work, for example European characters in 5 characters/inch, you can specifically test that code. Refer to the Diagnostic Program for Testing on page 3-2 and follow it through Step 3 on page 3-3. Then refer to Table 1. Character Command Codes, on page 3-4, and enter the code for the specific functions desired. Press RETURN. If the command does not execute correctly, swapout Q5, Q8, and Q6. Return to the Diagnostic Flowchart.

SECTION FOUR

DISASSEMBLY/ADJUSTMENT/ASSEMBLY PROCEDURES

*** NOTE***

1. **The exploded mechanical drawings, Figures 4-1 through 4-6, referenced in this section are located on pages 4-11 through 4-19, respectively.**

2. **The numerical callouts on the exploded mechanical drawings in this section serve as locators for the DISASSEMBLY/ADJUSTMENT/ASSEMBLY instructions, as well as for the MECHANICAL PARTS LIST in Section Seven. The alphabetical locators, however, only serve as referents for the MECHANICAL PARTS LIST in Section Seven.**

3. **Protect the plastic surfaces of the console by working on a soft surface (a grounding pad works very well) when the console is turned over, bottom up.**

4. **Use ALL static control precautions when handling any printed circuit board.**

UPPER COVER DISASSEMBLY

- Remove the platen knob (Figure 4-1, #1).
- Remove the top cover (Figure 4-2, #2) by pulling it straight up.
- Loosen the two switch assembly screws (Figure 4-2, #3) and slide the switch back out of the way of the cover.
- Remove the two upper cover screws (Figures 4-2, #4) from the inside of the front of the upper cover.
- Tip the upper cover back to disengage it from the hooks on the lower cover and lift it off.

PCB DISASSEMBLY

- Follow the UPPER COVER DISASSEMBLY above.
- Disconnect the I/O cables (CN6,7) and the Paper-Near-End connector (CN2) on the back panel of the lower cover.
- Unplug the print head assembly (Figure 4-1, #5) from the connector by reaching in and carefully working it loose.
- Remove the flat cable connector screw (Figure 4-3, #6) and the connector from the carriage frame. Unwrap the flat cable from around the printer unit.
- Cut the tie-wrap which fastens the flat cable to the right side of the printer unit.

- Remove the two PCB screws (Figure 4-2, #7) securing the printed circuit board and lift the board straight up.

- Set the PCB on a grounding pad.

PRINTER UNIT DISASSEMBLY

- Follow the UPPER COVER DISASSEMBLY, page 4-1.

- Disconnect the print head and remove it (see PRINT HEAD DISASSEMBLY below).

- Remove the flat cable connector screw (Figure 4-3, #6) and the connector from the carriage frame.

- Cut the tie-wrap that fastens the flat cable to the side plate of the printer unit.

- Remove the four bottom cover screws (Figure 4-2, #8) and their Quite-tight rubber caps (Figure 4-2, #9) from the bottom of the printer.

- Follow the PCB DISASSEMBLY on page 4-1. Disconnect all connectors from the board and place it on a static-free surface.

- Grasp the printer unit by its right and left side plates and lift it out of the lower cover.

TRANSFORMER REPLACEMENT

- Follow the UPPER COVER DISASSEMBLY, page 4-1.

- Follow the PRINTER UNIT DISASSEMBLY above.

- Slide the insulation back away from the two transformer terminal connections and desolder the wires from the fuse holder terminal (Figure 4-2, #10) and the flip-flop switch (Figure 4-2, #11). (Do not cut the insulation because you will need to slide it back into place.)

- Remove the PCB, following the PCB DISASSEMBLY on page 4-1, and disconnect the transformer connector (CN1).

- Remove the transformer lead screw (Figure 4-2, #12) and the transformer assembly screws (Figure 4-2, #13). Lift the transformer out and solder the new one in place. Be sure to reconnect the leads correctly (grey to fuse holder, white to flip-flop switch). Replace the insulation over the terminal connections.

- Follow the PRINTER UNIT and PCB ASSEMBLY procedures on pages 4-9 and 4-10.

PRINT HEAD DISASSEMBLY

- Follow the UPPER COVER DISASSEMBLY on page 4-1.

- Disconnect the print head assembly (Figure 4-1, #5) carefully from its flat cable connector on the carriage frame.

- While holding down the print head lock lever to the left of the head, lift the head straight up and out.

CARRIAGE FRAME DISASSEMBLY

- Follow the UPPER COVER DISASSEMBLY, page 4-1.

- Remove the print head (refer to page 4-2). Push the carriage assembly to the left side.

- Remove the space belt clamp screw (Figure 4-3, #14) and the belt clamp (Figure 4-3, #15) from the carriage assembly.

- Remove the four right and left snap lever screws (Figure 4-1, #16) that fasten the upper carriage shaft.

- Remove both snap levers (Figure 4-1, #17 and 17A) and pull the carriage shaft out of the side plates.

- Remove the flat cable connector screw (Figure 4-3, #6) and the connector from the printer unit.

- Remove the four side plate screws (Figure 4-4, #40) and lift the carriage frame up off the metal plate.

SPACE MOTOR REPLACEMENT

Disassembly

- Follow the UPPER COVER DISASSEMBLY, page 4-1.

- Follow the PCB DISASSEMBLY, page 4-1, and disconnect the space motor connector (CN4).

- Cut the tie wraps securing the space motor leads.

- Remove the space belt from the space motor pulley (Figure 4-4, #18).

- Remove the two space motor mounting screws (Figure 4-4, #19) and lift the motor out.

Assembly

- Replace the new space motor and set the space belt back on the pulley. Follow the Space Belt Adjustment procedure on page 4-4. Then follow the First Character Printing Position Adjustment procedure on page 4-8.

- Reconnect CN4 on the PCB and tie down the leads.

- Follow the PCB and UPPER COVER ASSEMBLY procedures, page 4-10.

SPACE BELT TENSION ADJUSTMENT

EQUIPMENT

- #2-200 Phillips screwdriver
- 300g Stick Pressure Gauge

PROCEDURE

If you replace the space motor or the space belt, you need to adjust the tension of the space belt.

- Follow disassembly procedures (pages 4-6 or 4-8) for replacing the space motor or space belt.
- Adjust the tension by moving the idle pulley bracket in either direction so that the tension is between 80 and 140 g when the space belt is depressed 5 mm at the point illustrated below in Figure 4-5.
- Follow the assembly procedure on, pages 4-6 or 4-8.

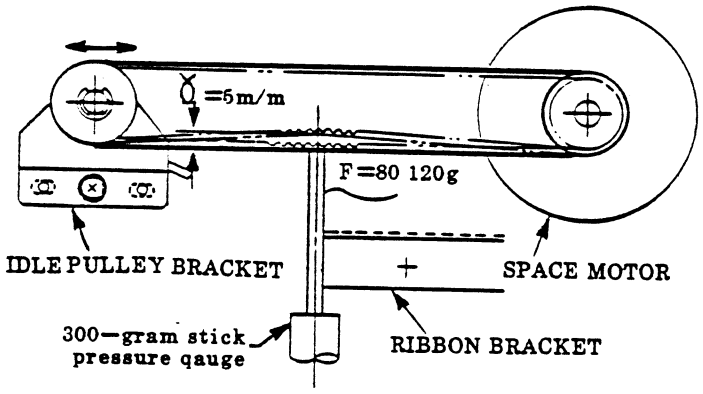

Figure 4-5. Space Belt Tension Adjustment

- You also need now to determine that the first character printing position is accurate (see Figure 4-9). If it is not, follow the procedure for that adjustment on page 4-8.

SPACE BELT REPLACEMENT

Disassembly

- Follow the UPPER COVER DISASSEMBLY procedure, page 4-1.
- Loosen the space motor's mounting screws (Figure 4-4, #19). Move the motor to loosen the space belt.

- Remove the space belt clamp screw and the space belt clamp (Figure 4-3, #14,15) on the carriage assembly

- Remove the ribbon and set it aside. Then remove the E-snap ring (Figure 4-6, #20) from one of the ribbon spool gears and lift off the gear assembly (Figure 4-6, #21-25).

- Remove the detent spring (Figure 4-6, #26).

- Remove the E-snap rings (Figure 4-6, 41 and 42) on the ribbon change lever (Figure 4-6, #27), the lever itself and the ribbon drive gear (Figure 4-6, #28).

- Remove and replace the space belt.

Assembly

- Reassemble the ribbon drive gear (Figure 4-6, #28) into the ribbon change lever (Figure 4-6, #27). Engage its pulley teeth with the space belt teeth accurately before you fasten the ribbon change lever E-snap rings (Figure 4-6, #28).

- Attach the detent spring (Figure 4-6, #26).

- Assemble the ribbon spool gear assembly (Figure 4-6, #20-25).

- Attach and secure the space belt clamp with the belt clamp screw (Figure 4-3, #14 and 15).

- Readjust the position of the space pulse motor correctly. Refer to the Space Belt Tension Adjustment on page 4-4 and the First Character Position Adjustment on pages 4-8.

- Follow the Upper Cover Assembly procedure on page 4-10.

PLATEN DISASSEMBLY

- Follow the UPPER COVER DISASSEMBLY, page 4-1.

- Remove the detent springs (Figure 4-4, #29 and 29A)

- Remove the E-snap rings (Figure 4-4, #30), pull the paper-cut knife lever shaft (Figure 4-4, #31) out of the side plate and remove the paper-cut knife (Figure 4-4, #32).

- Remove the paper separator screws (Figure 4-4, #33) and the paper separator (#34).

- Remove the idle gear E-snap ring (Figure 4-4, #35) and then the idle gear (Figure 4-4, #36).

- Pull the right platen bearing assembly off horizontally (Figure 4-4, #37-39). Turn the platen 90° and remove it by lifting it straight up.

PLATEN ASSEMBLY

- Set the platen in the side plates.
- Replace the platen bearing assembly (Figure 4-4, #37-39).
- Replace the idle gear and its E-snap ring (Figure 4-4, #35,36).
- Attach the paper separator with its two screws (Figure 4-4, #33,34).
- Attach the paper-cut knife and its lever by inserting the lever shaft through the side plates and affixing the E-snap rings (Figure 4-4, #30-32).
- Replace the two detent springs (Figure 4-4, #29 and 29A).
- Follow the PLATEN/PRINT HEAD ADJUSTMENT below.
- Follow the PLATEN/PAPER SEPARATOR ADJUSTMENT on page 4-7.
- Follow the UPPER COVER ASSEMBLY procedure on page 4-10.

PLATEN/PRINT HEAD ADJUSTMENT

EQUIPMENT

- #2-200 Phillips screwdriver
- Thickness gauge

PROCEDURE

If when the printer runs, you see darker print on one side than the other side of the page, adjust the platen/print head spacing. You also need to calibrate this adjustment after disassembly of the printer unit, carriage frame or platen for other repairs.

- Follow the UPPER COVER DISASSEMBLY on page 4-1.
- Loosen the snap lever screws (see Figure 4-1, #16).
- Move the carriage shaft forward or backward until the gap between the platen and print head is between 0.45 and 0.5 mm, as illustrated in Figure 4-8.
- Tighten the snap lever screws.
- Follow the UPPER COVER ASSEMBLY procedure on page 4-10.

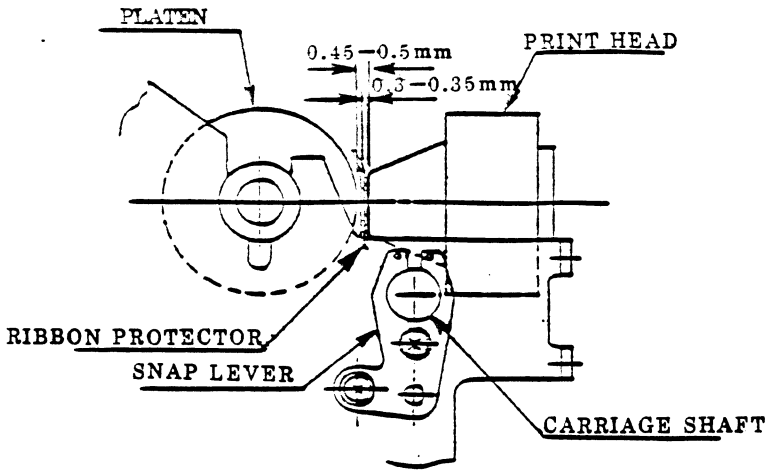

Figure 4-7. Platen/Print Head Adjustment

PLATEN/PAPER SEPARATOR ADJUSTMENT

EQUIPMENT

- #2-200 Phillips Screwdriver
- Thickness Gauge

PROCEDURE

If you have disassembled the platen or if there is an incorrect clearance between the platen and the paper separator, make the following adjustment.

- Follow the UPPER COVER DISASSEMBLY on page 4-1.
- Loosen the paper separator screws (Figure 4-4, #33)
- Measure a clearance of approximately 0.5mm between the platen and the paper separator,as illustrated in Figure 4-8. Then tighten the paper separator screws.
- Follow the UPPER COVER ASSEMBLY procedure on page 4-11.

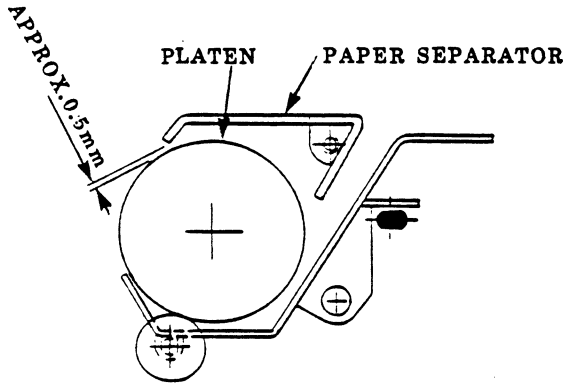

Figure 4-8. Platen/Paper Separator Adjustment

CARRIAGE FRAME ASSEMBLY

- Place the carriage frame on the metal plate in the lower cover of the printer.
- Insert and tighten the four side plate screws (Figure 4-4, #40) to the bottom metal plate.
- Secure the flat cable connector with the flat cable connector screw (Figure 4-3, #6) to the carriage assembly.
- Attach the snap levers (Figure 4-1, #17and 17A) to the carriage shaft and then secure them to the side plates with the snap lever screws (Figure 4-1, #16).
- Attach the space belt clamp (Figure 4-3, #14,15) to the carriage assembly.
- Follow the procedure for INSERTING THE PRINT HEAD on page 4-9.
- Follow the PLATEN/PRINT HEAD ADJUSTMENT page 4-6.
- Follow the FIRST CHARACTER PRINTING POSITION ADJUSTMENT below.
- Follow UPPER COVER ASSEMBLY procedure on page 4-10.

FIRST CHARACTER PRINTING POSITION ADJUSTMENT

EQUIPMENT

- #2-200 Phillips screwdriver

PROCEDURE

If the print head is not lining up correctly for printing the first character make the following adjustment. You also need to make this adjustment when you have disassembled the carriage frame or the base unit, or when you replace the space motor or space belt.

- Follow the UPPER COVER DISASSEMBLY on page 4-1.
- Position the space motor one way or the other so that when the power is on the print head returns and stops at the home sensor position illustrated in Figure 4-9 below.
- If changing the position of the space motor does not remedy the problem, change the engagement of the synchro-belt and pulley by one tooth or two.
- Follow the UPPER COVER ASSEMBLY procedure (page 4-10).

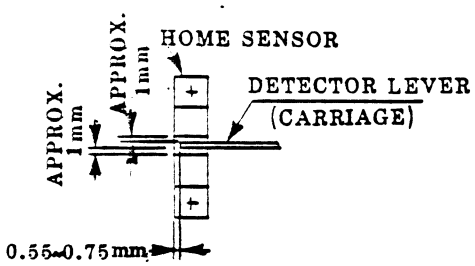

Figure 4-9. First Character Printing Position

INSERTING THE PRINT HEAD

- Push down the lock lever on the left of the carriage assembly and insert the print head assembly. (Feed the seven-wire harness and plug to the left side of the carriage assembly.)

- Connect the print head plug to the flat cable connector mounted on the lower carriage shaft.

- Follow the UPPER COVER ASSEMBLY procedure on page 4-10.

PRINTER UNIT ASSEMBLY

- Set the printer unit in the lower cover, positioning it over the four bottom cover screw holes.

- Insert and tighten the four bottom cover screws (Figure 4-2, #8) in their Quite-tight rubber caps (max. torque of 4-5 kg. cm.).

- Follow the PCB ASSEMBLY procedure below.

PCB ASSEMBLY

- Attach all connectors to the PCB in their original order, if they were removed (refer to the silkscreen and schematic as necessary for locators). Do not insert any wires between the raised metal heat sink of the PCB and the rear panel of the lower cover. Tuck all wires under the heat sink.

- Insert the PCB straight down, lining up the connectors with the rear panel I/O apertures and the PCB with the two PCB screw postholes (Figure 4-2, #7). Insert and tighten the screws.

- Tie or place the flat cable, as well as the space motor leads, at the rear of the right side panel, out of the way of the upper cover.

- Push the carriage assembly to the left. Attach the flat cable connector with the flat cable connector screw (Figure 4-3, #6) to the carriage assembly.

- Follow the procedure on page 4-9 for INSERTING THE PRINT HEAD.

- Follow the UPPER COVER ASSEMBLY procedure below.

- Connect the I/O cables (CN6,7) and the paper-near-end connector (CN2) on the outside of the rear panel, as necessary.

UPPER COVER ASSEMBLY

- Hook the upper cover over the hooks at the rear of the lower cover and set it in place.

- Insert and tighten the two upper cover screws (Figure 4-2, #4) on the inside of the front panel of the upper cover.

- Slide the PRINT POWER switch assembly forward and secure it with the switch assembly screws (Figure 4-2, #3) so that there is no gap between the assembly and the upper cover.

- Replace the top cover.

- Push the platen knob (Figure 4-1, #1) on.

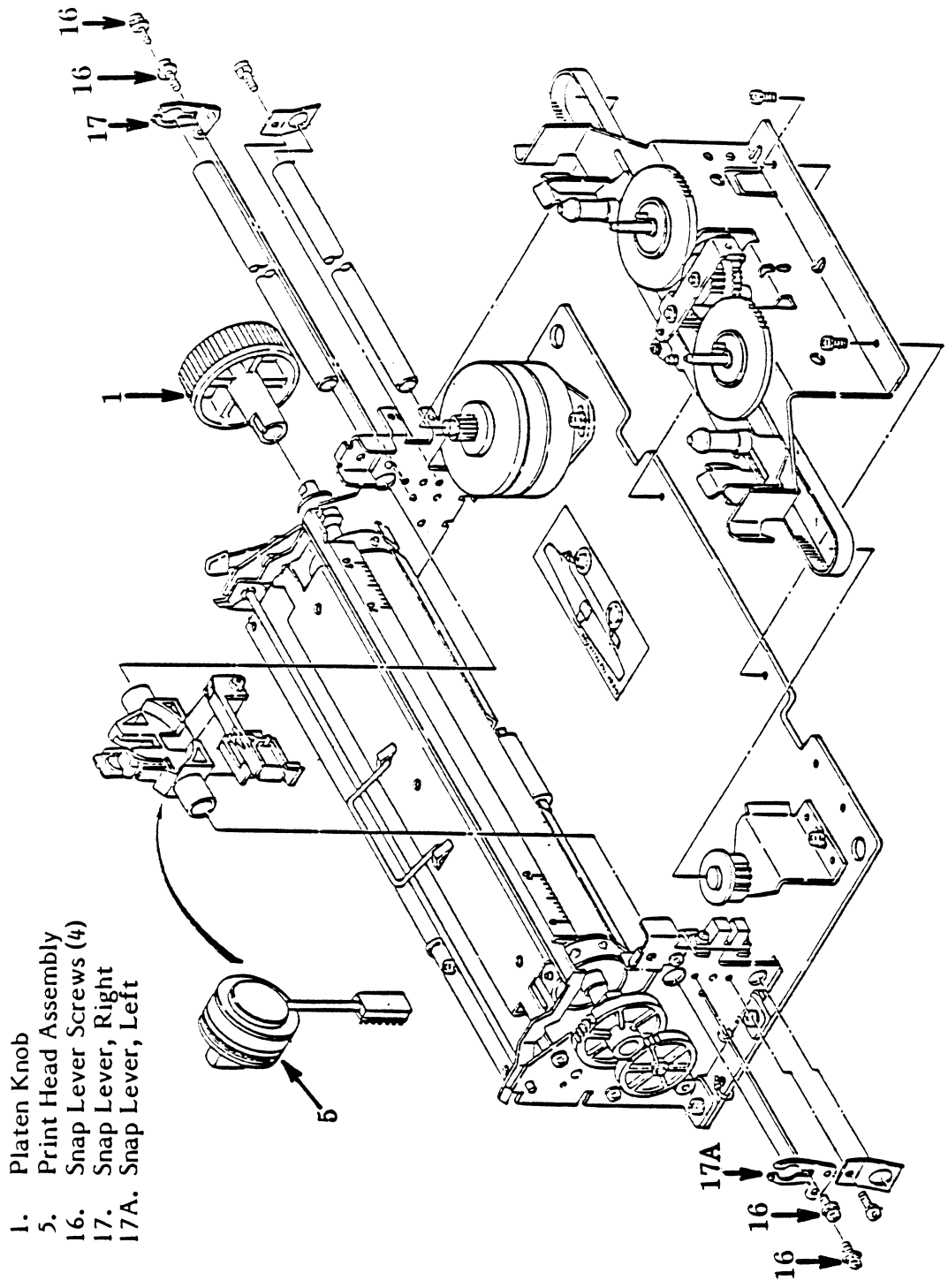

Figure 4-1. Printer Unit (R)

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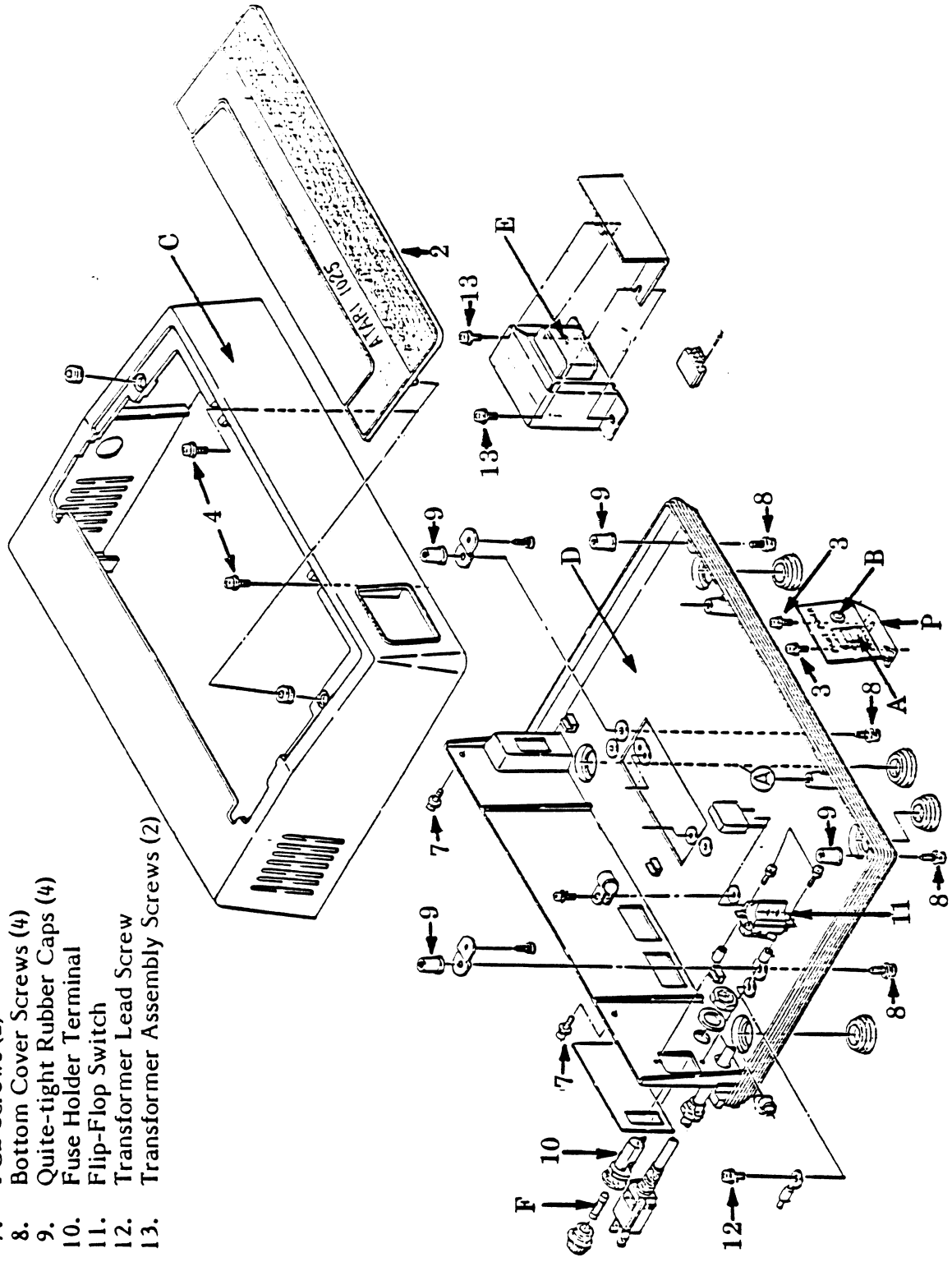

2. Top Cover
3. Switch Assembly Screws (2)
4. Upper Cover Screws (2)
7. PCB Screws (2)
8. Bottom Cover Screws (4)
9. Quite-tight Rubber Caps (4)
10. Fuse Holder Terminal
11. Flip-Flop Switch
12. Transformer Lead Screw
13. Transformer Assembly Screws (2)

Figure 4-2. Cover Unit (Q)

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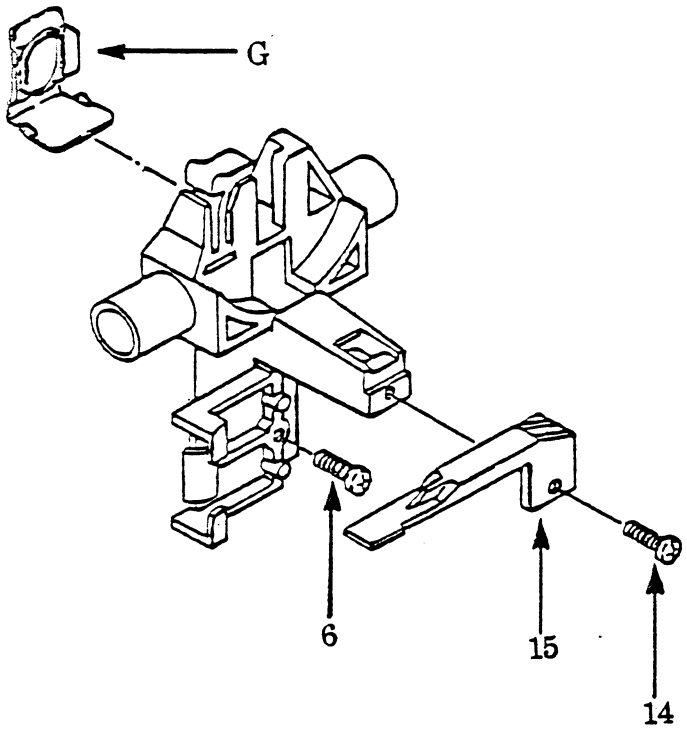

6. Flat Cable Connector Screw
14. Space Belt Clamp Screw
15. Space Belt Clamp

Figure 4-3. Carriage Assembly (S)

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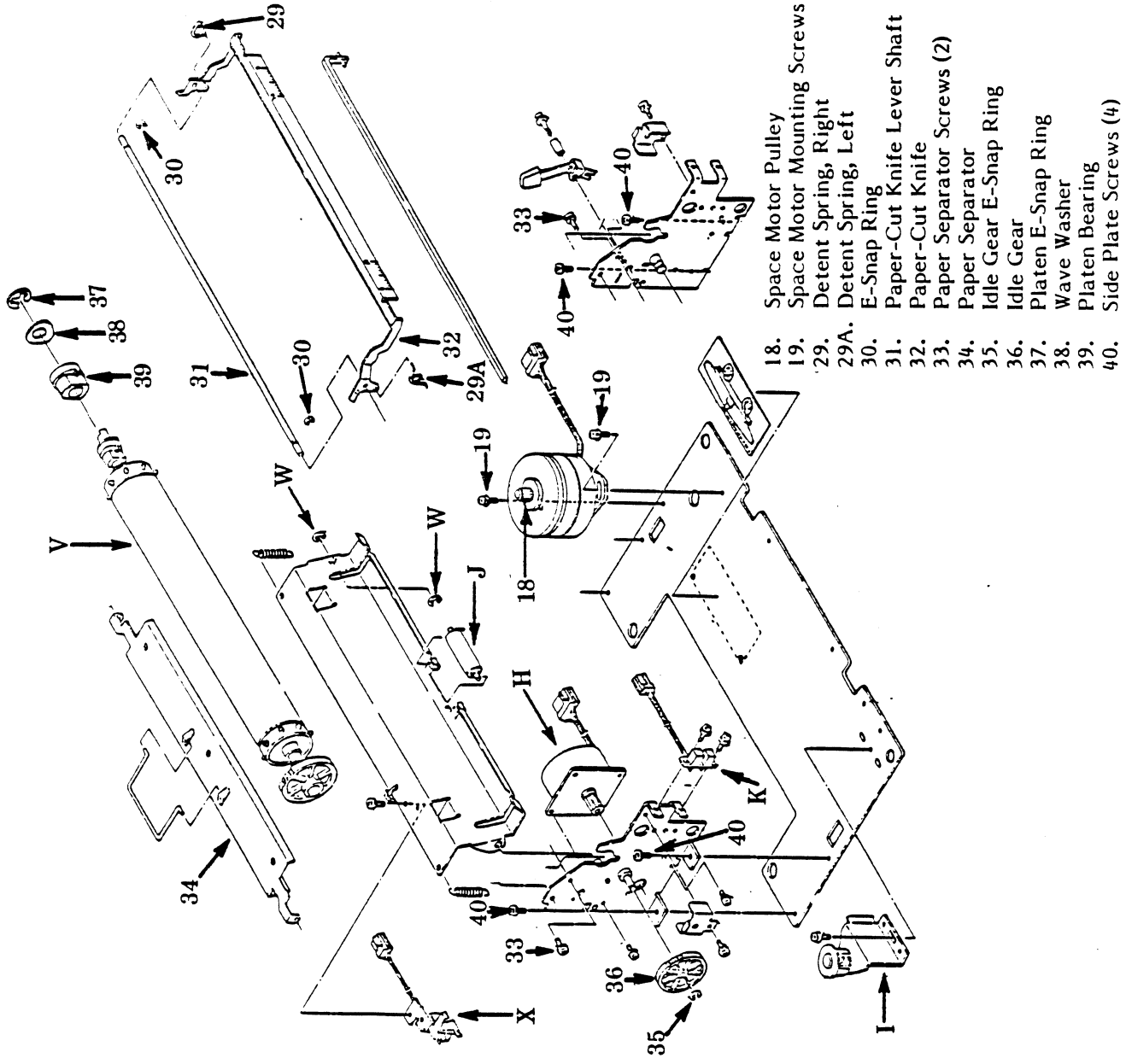

Figure 4-4. Base Unit Assembly (T)

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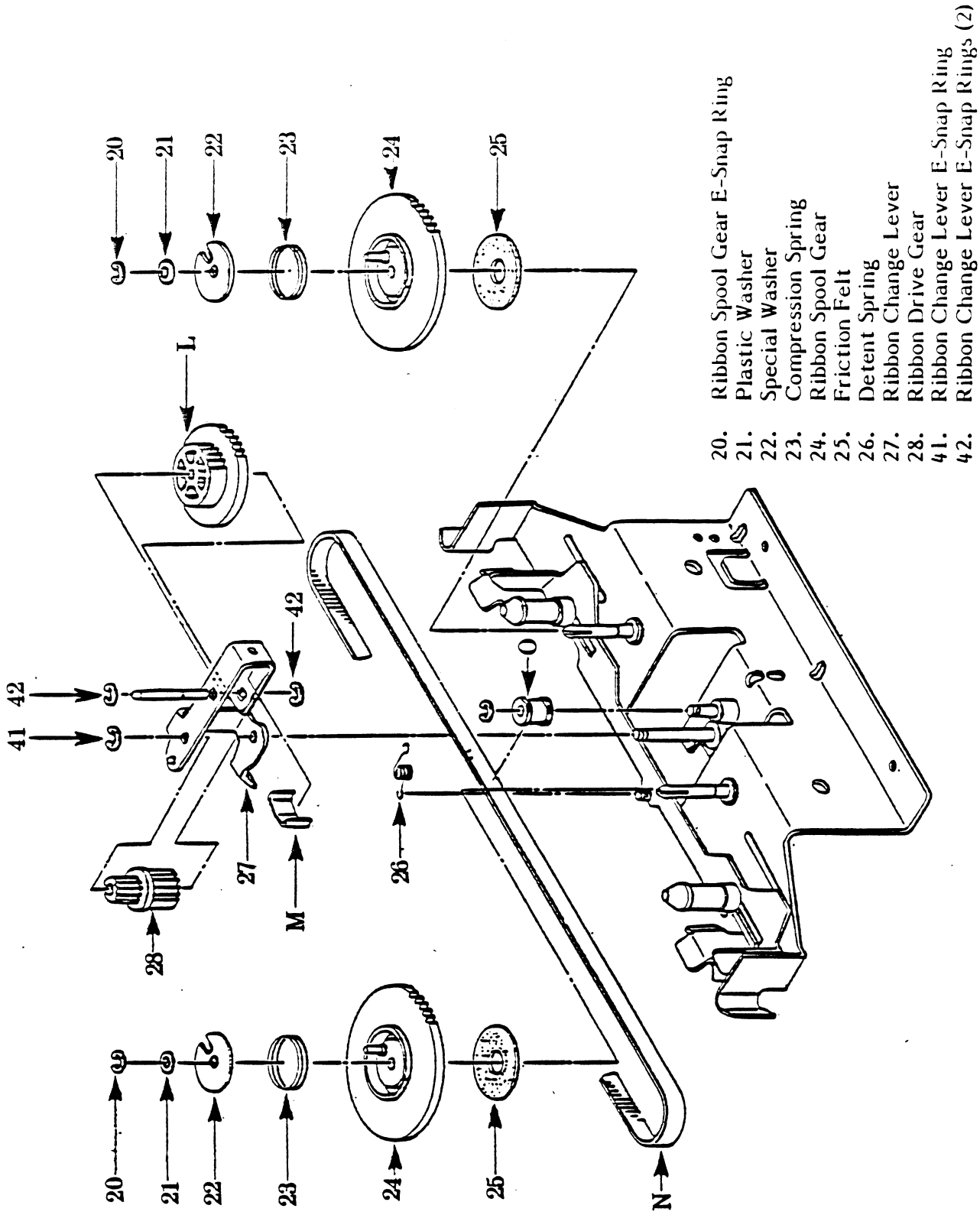

Figure 4-6. Ribbon Assembly (U)

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SECTION FIVE

1025 DIAGNOSTIC FLOWCHART

This Diagnostic Flowchart was designed to be easy to use and the primary aid when troubleshooting the electronic operations of the 1025. When a line terminates with a letter inside a circle, locate the chart that begins with that letter in a circle and continue the diagnosis. The flowcharts are arranged in alphabetical order. The disassembly procedures referenced in the flowchart are found in Section 4.

SWAPOUT PROCEDURES

Many places in the diagnostic flowchart, a box tells you to "swapout" a chip or a number of chips in a particular order. The "swapout" instruction means that you should replace the indicated components one at a time with a known good component of the same type. The 1025 should then be tested with the new, known-good component in place to see whether the "swapout" solved the problem being checked. If the swapout did not fix the problem, the known-good component should be left in, and the next component inserted. Once the problem is solved, you then place the suspected bad chips one by one into the system to determine whether or not those you pulled out are truly defective. In this way, you avoid needlessly replacing good components.

CAUTION

Extreme care should be taken when handling the integrated circuit chips. They are all very sensitive to static electricity and can easily be damaged by careless handling. Always keep the chips in their plastic carrier tubes or on conductive foam when not handling them. Make certain you are well grounded when handling the chips. Atari strongly recommends that you wear a conductive grounding band (which ties from your arm to ground) when handling the chips.

The chips are also susceptible to damage from stress when being removed from or inserted into the sockets. Always use a chip-puller when removing the chips. Do not pry chips out with a screwdriver or any other tool.

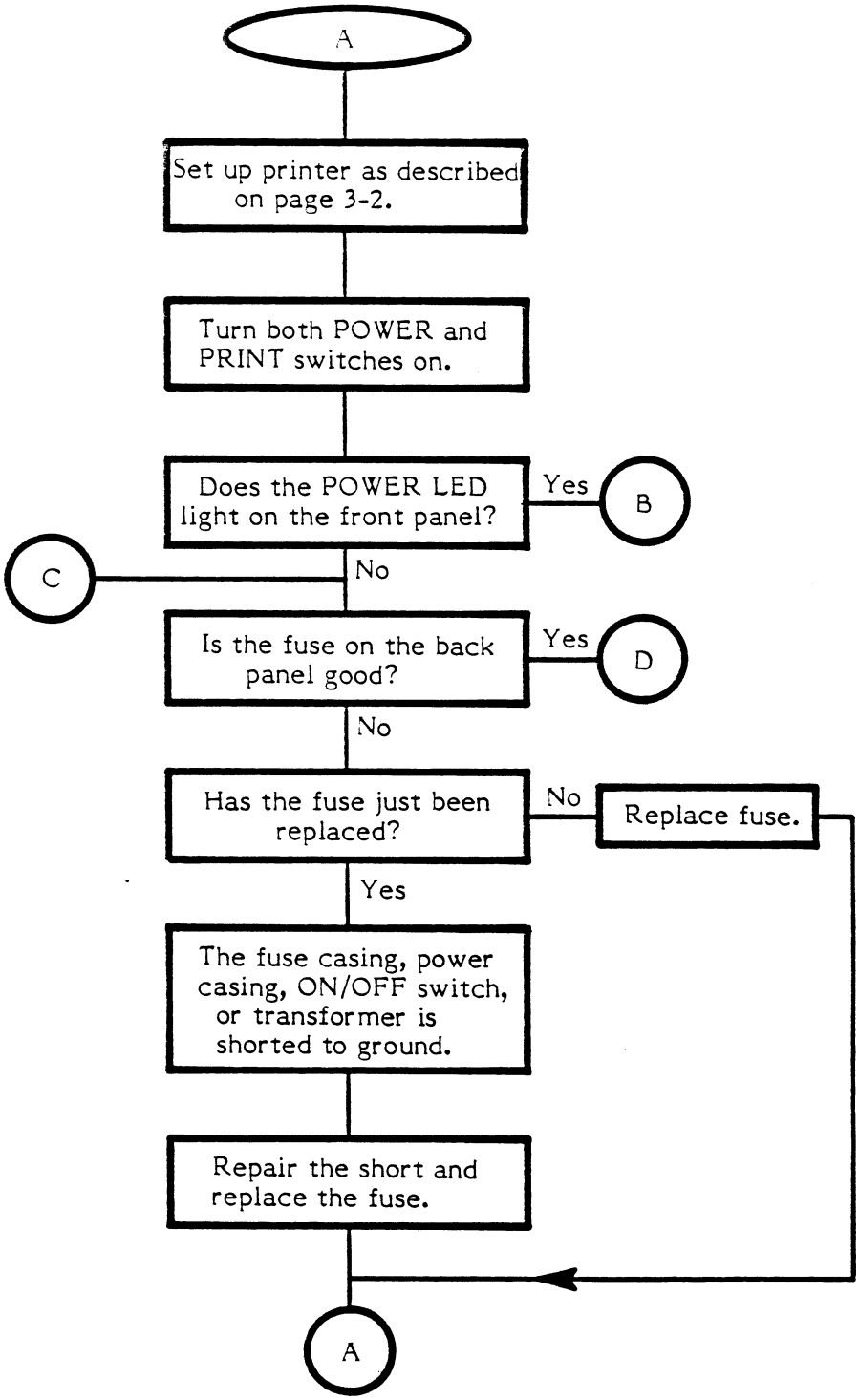
Failure to follow the above guidelines results in unusually high chip failure rates and extra expense.

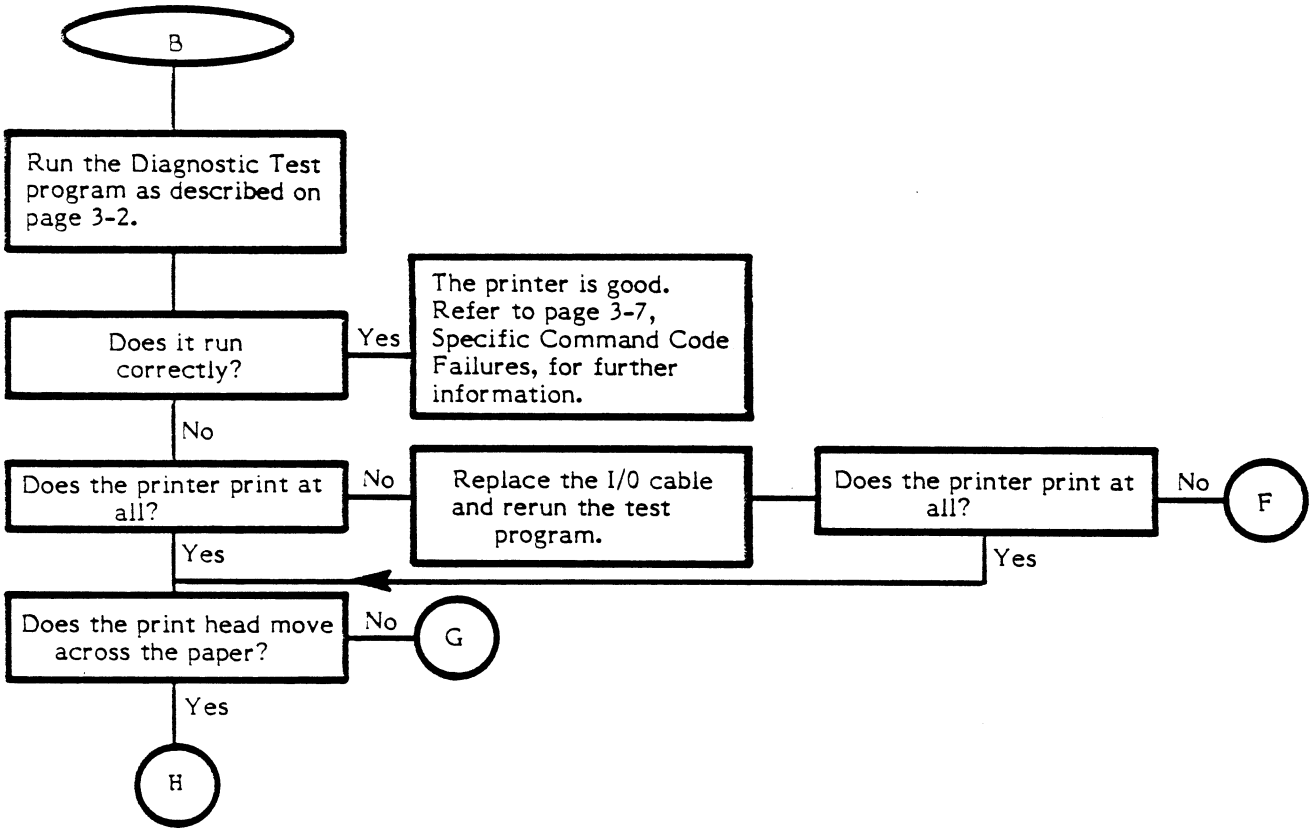
Should a problem persist despite your having followed all of the prescribed repair procedures, call the ATARI Techline Specialist:

Inside California
(800) 672-1466

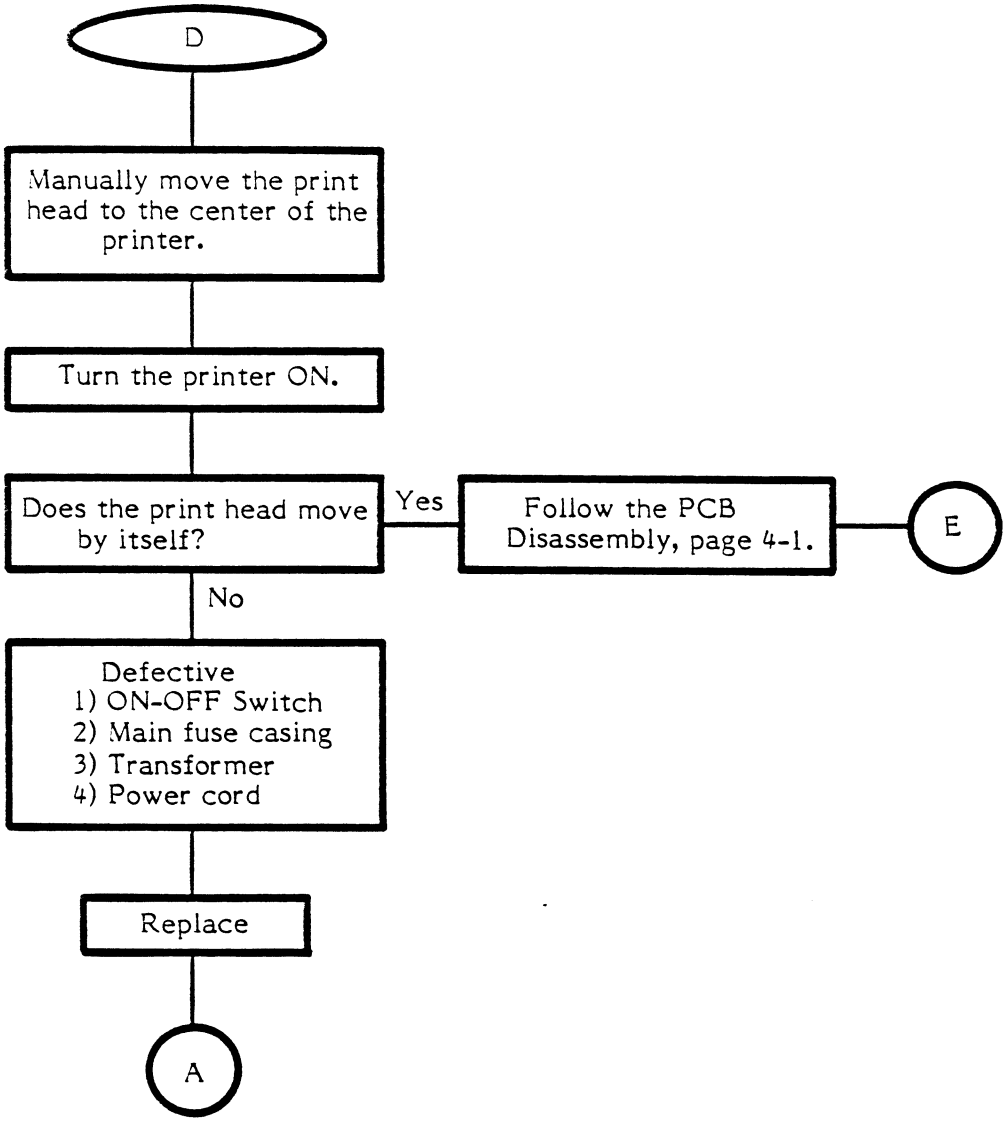
Outside California
(800) 538-1535

1025 DIAGNOSTIC FLOWCHART

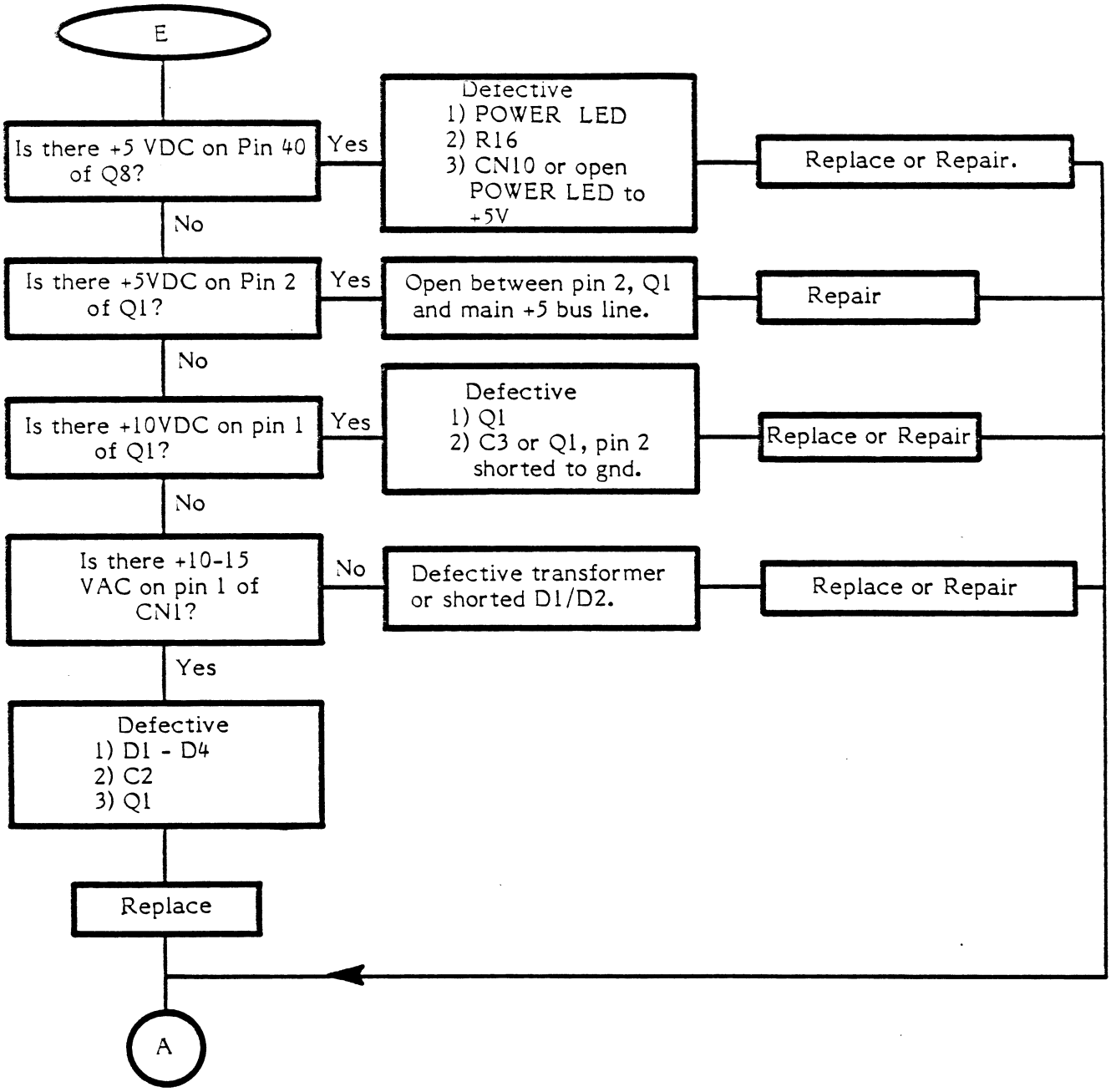



B
Run the Diagnostic Test program as described on page 3-2.
Does it run correctly?
Yes
The printer is good. Refer to page 3-7, Specific Command Code Failures, for further information.
No
Does the printer print at all?
No
Replace the I/0 cable and rerun the test program.
Does the printer print at all?
No
F
Yes
Yes
Does the print head move across the paper?
No
G
Yes
H

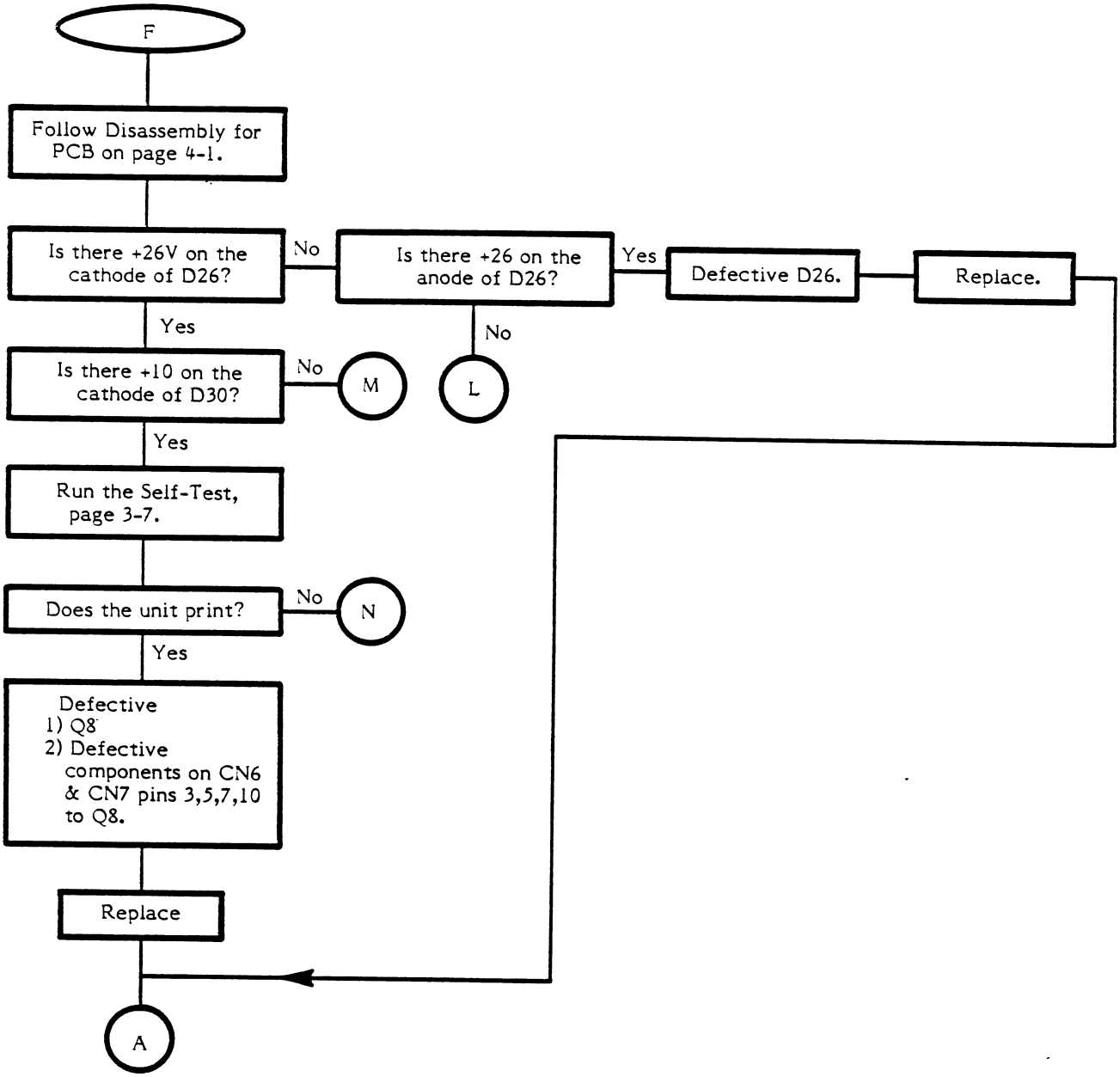
NO POWER LED TROUBLESHOOTING



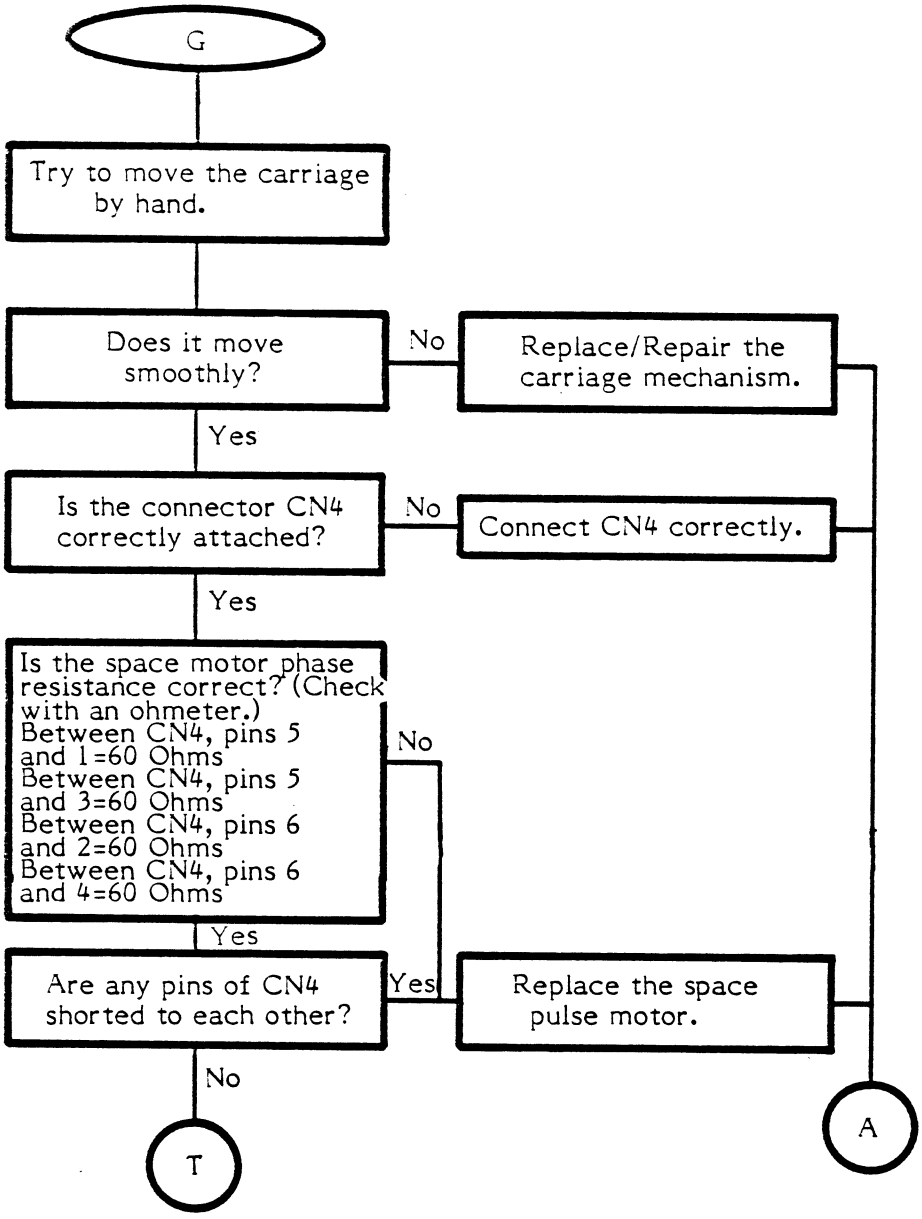
NO POWER LED TROUBLESHOOTING (Continued)

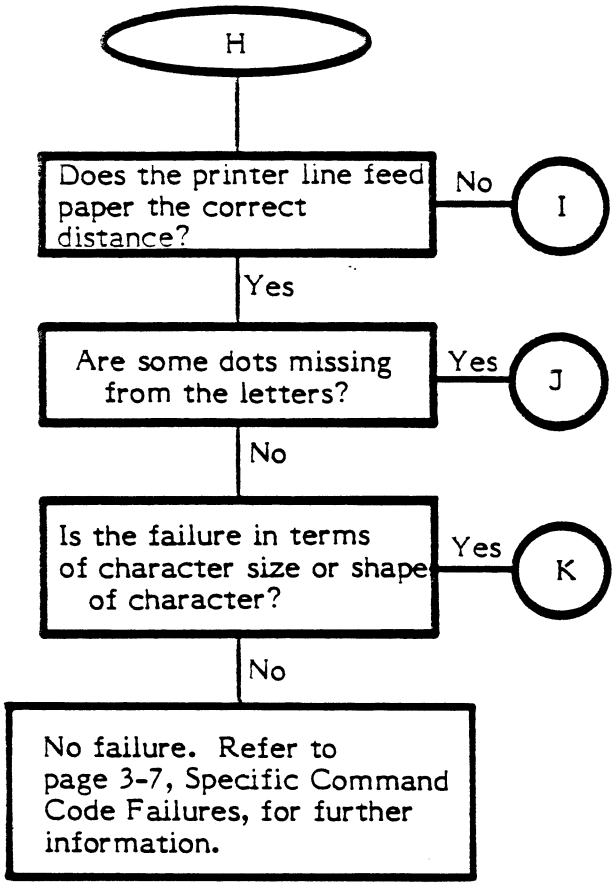


NO PRINTING TROUBLESHOOTING

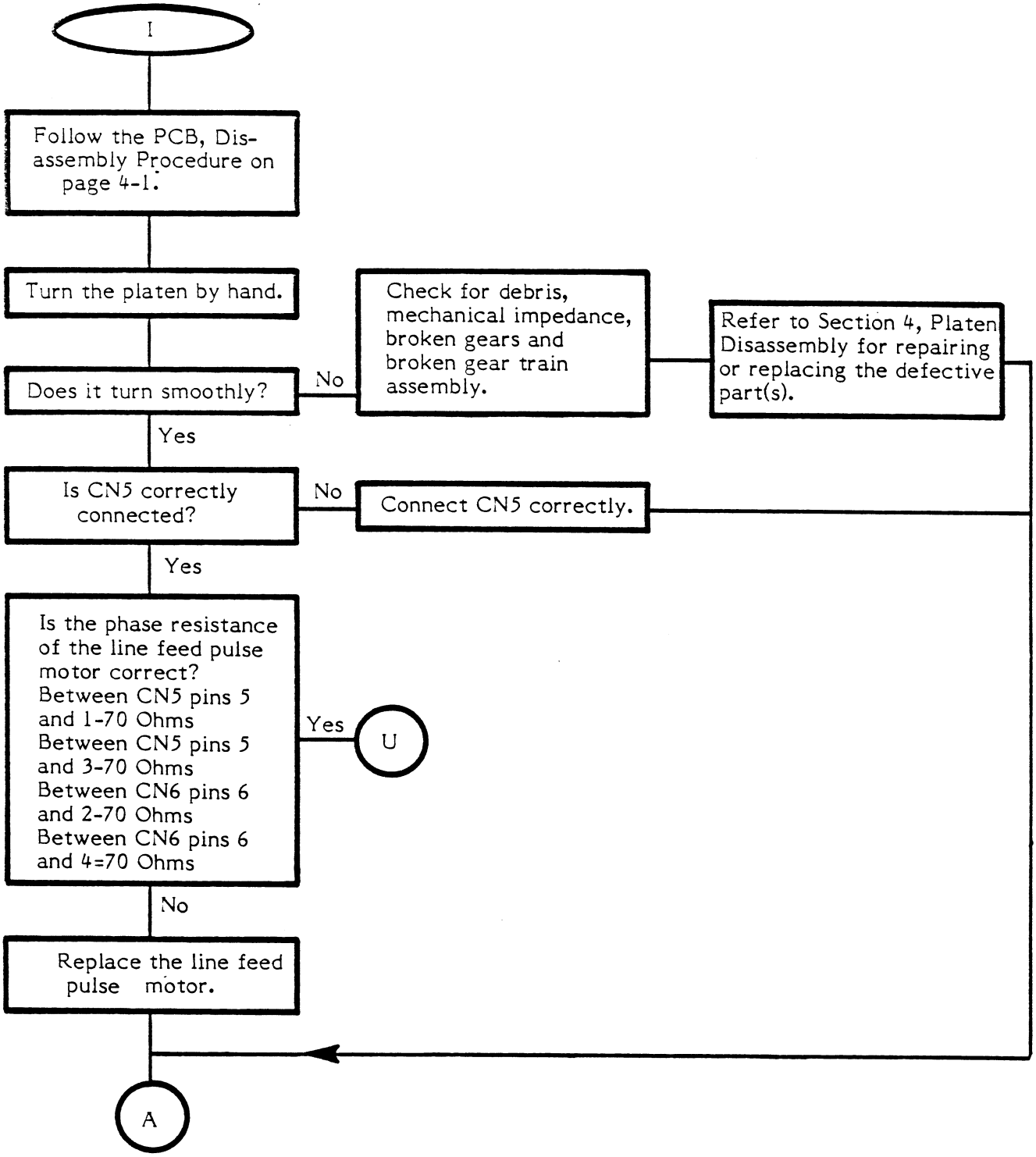


CARRIAGE DOES NOT MOVE

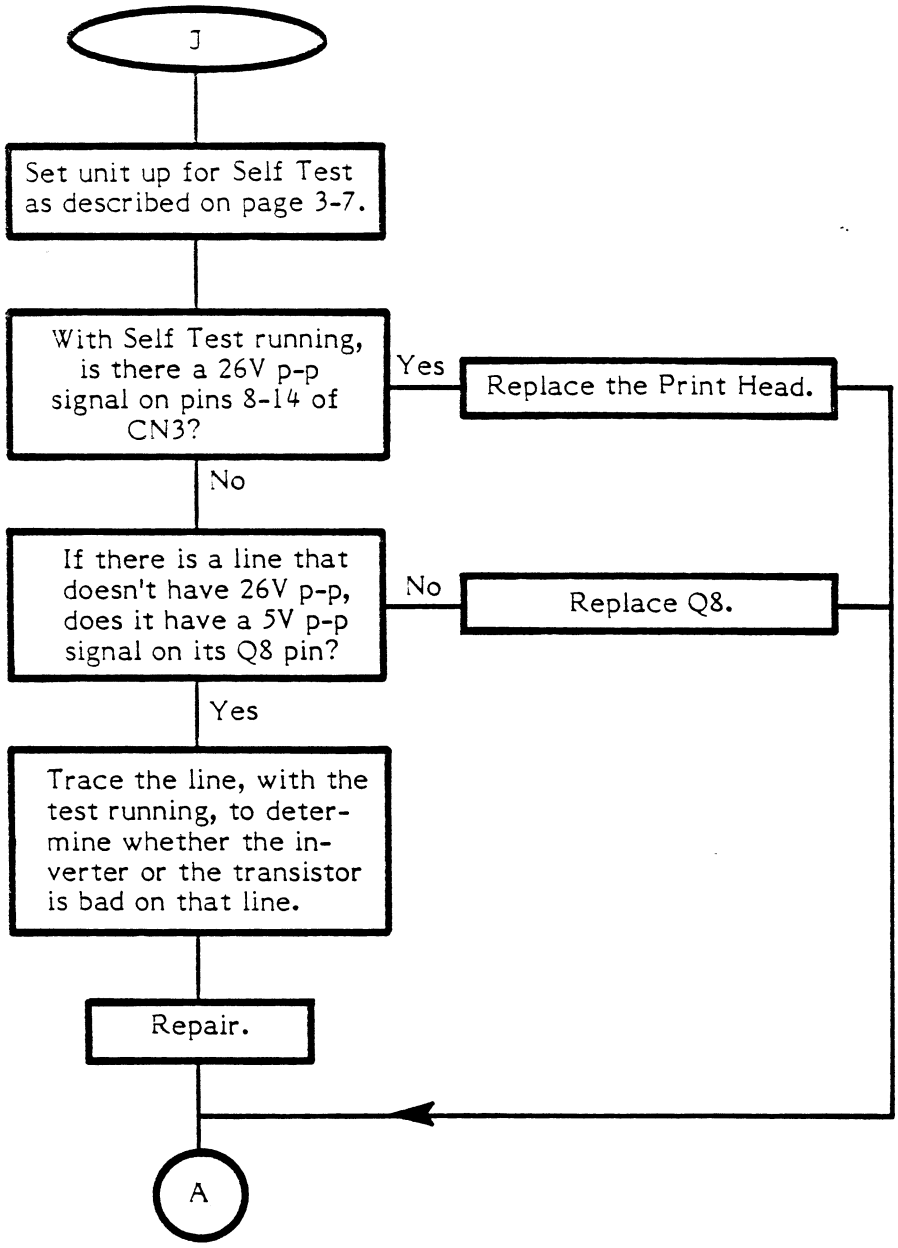



H
Does the printer line feed paper the correct distance?
No
I
Yes
Are some dots missing from the letters?
Yes
J
No
Is the failure in terms of character size or shape of character?
Yes
K
No
No failure. Refer to page 3-7, Specific Command Code Failures, for further information.

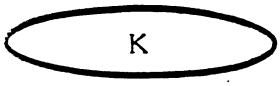
PRINTER DOES NOT LINE FEED



PRINT HEAD DROPS DOTS



INCORRECT ROM READING

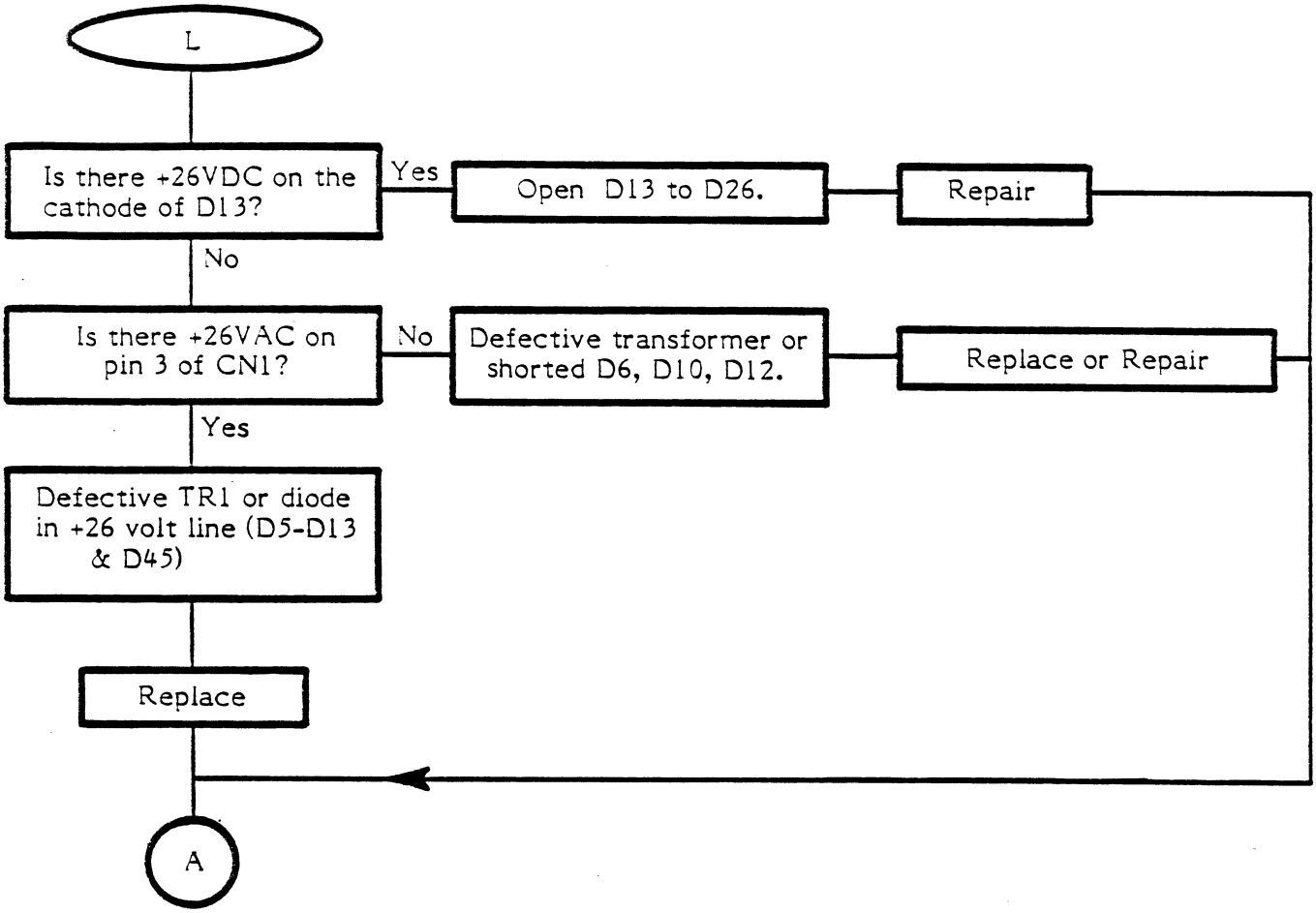


This failure is caused by an incorrect reading of the ROM chip. To repair it swapout in this order:

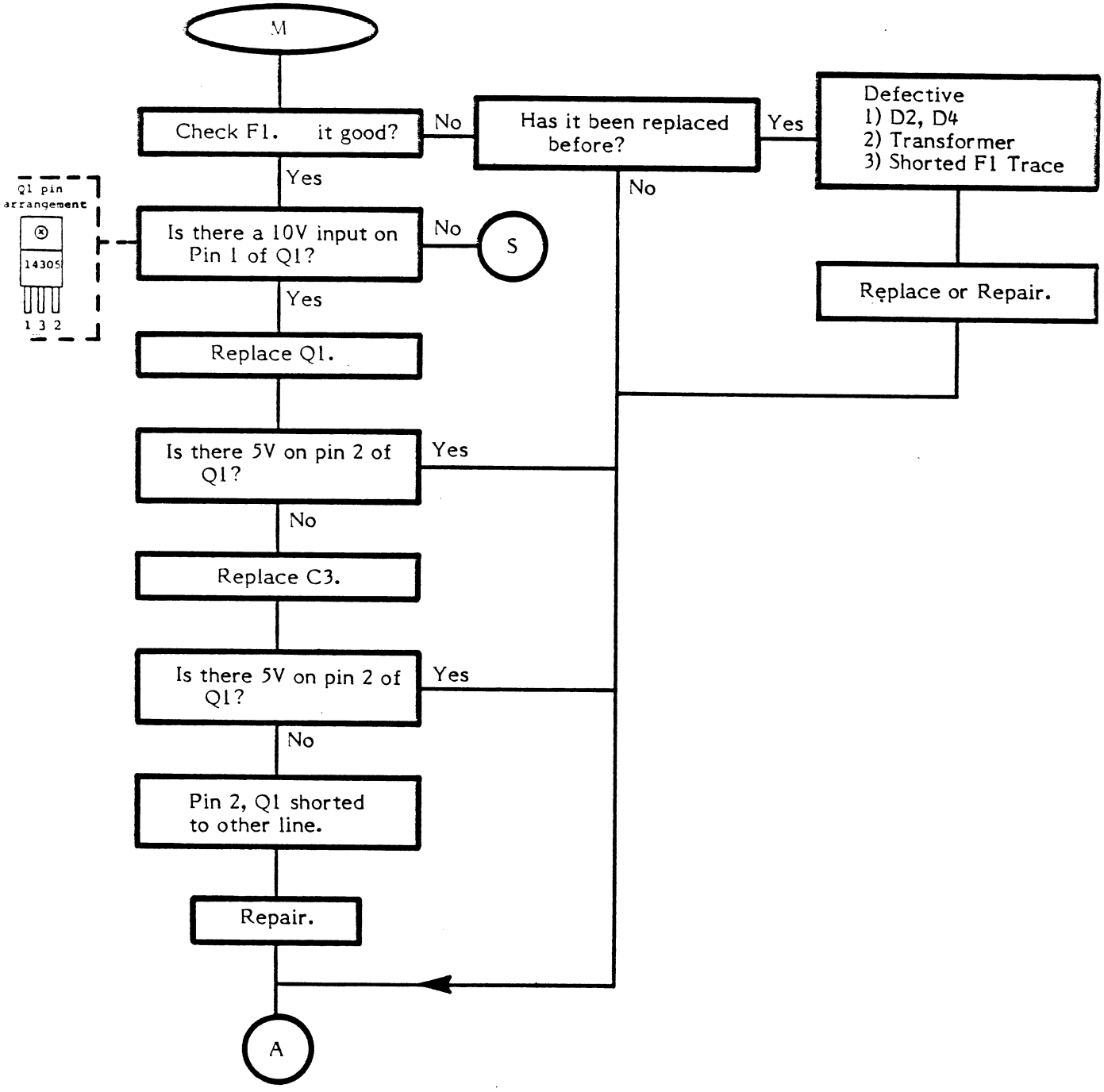
1) Q7
2) Q8
3) Q6
4) Q5

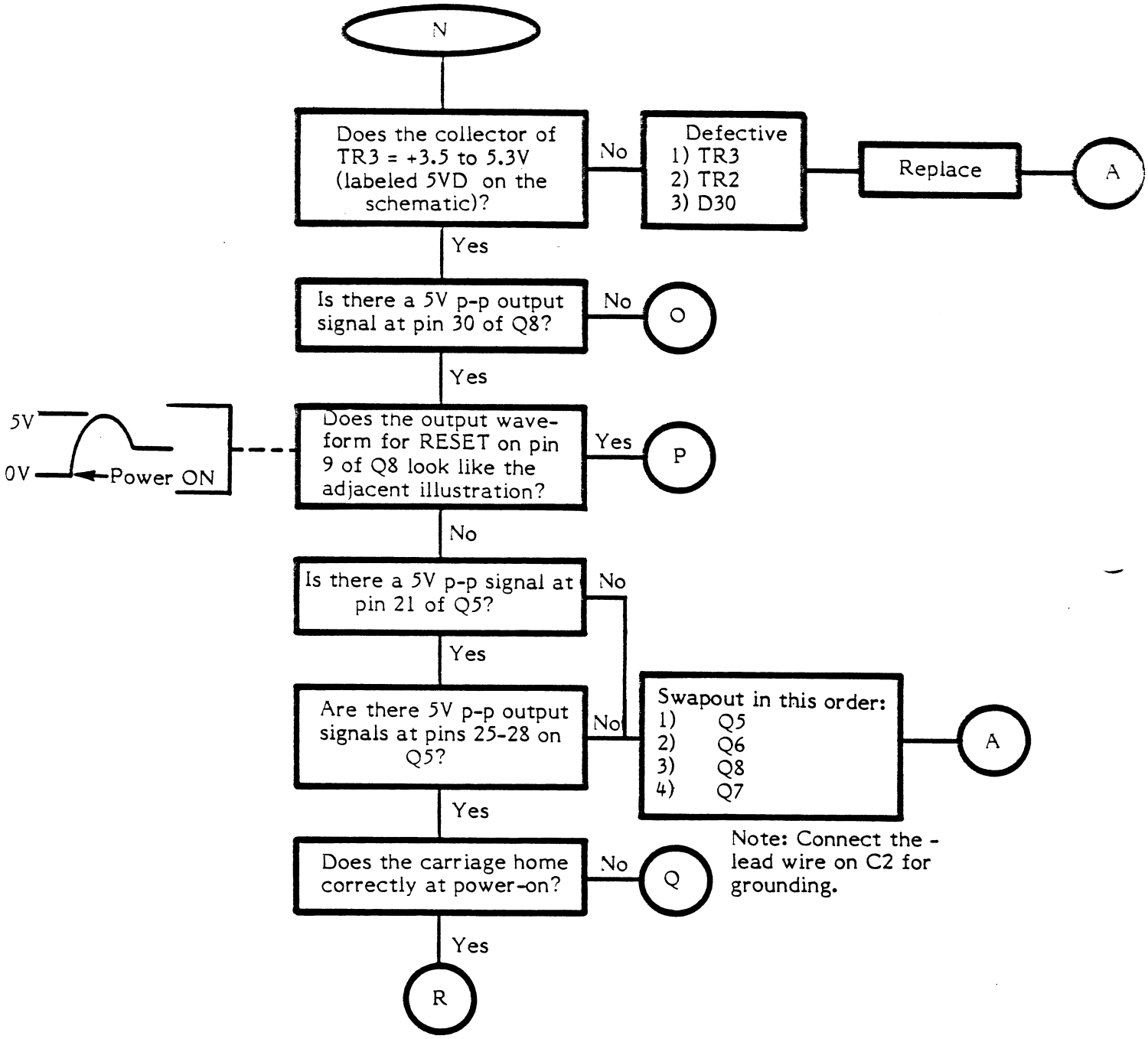
If this does not solve the problem, then there is an open PQ line from Q8 to Q1. Repair it.

NO +26 VDC TROUBLESHOOTING

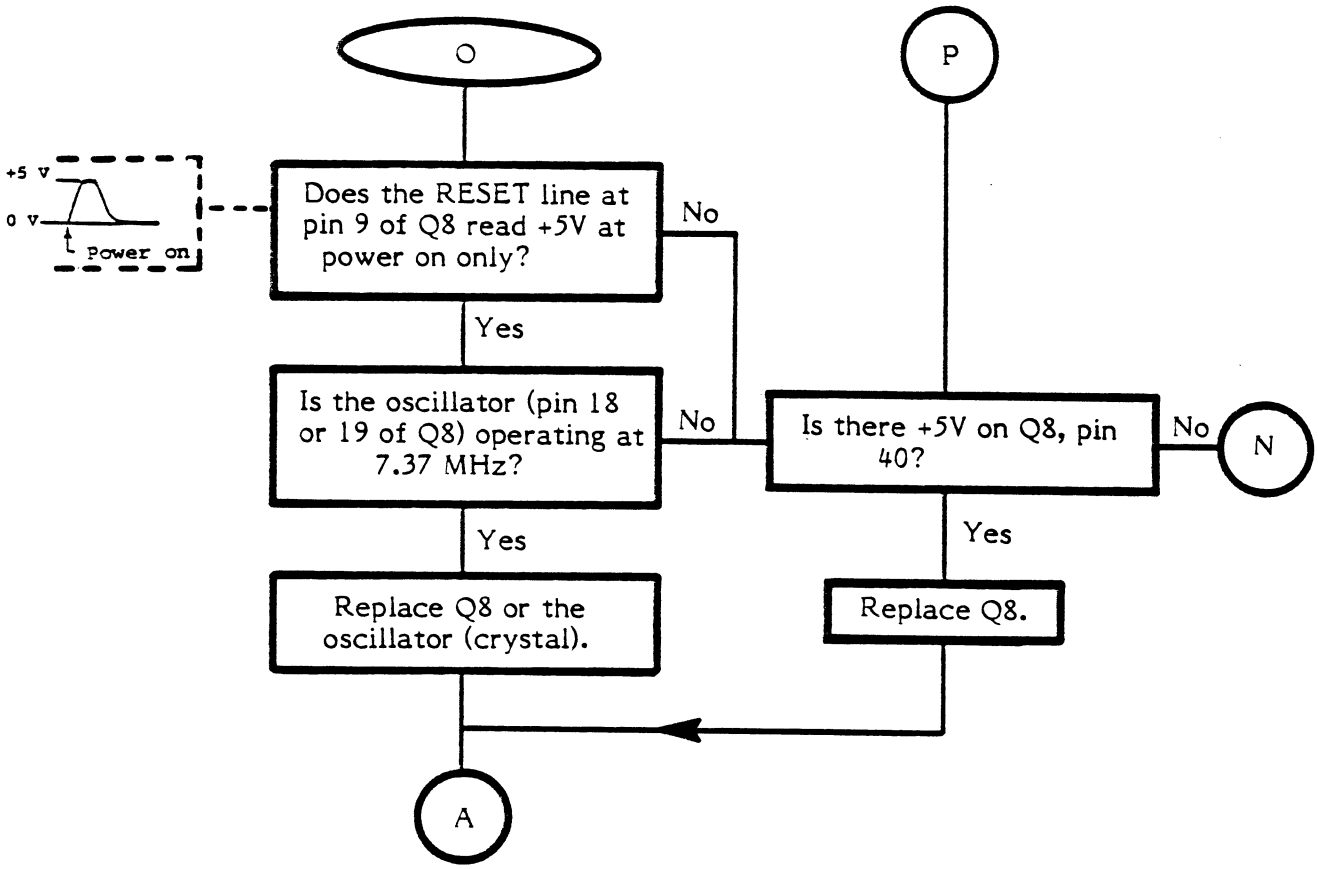


NO +10VDC TROUBLESHOOTING

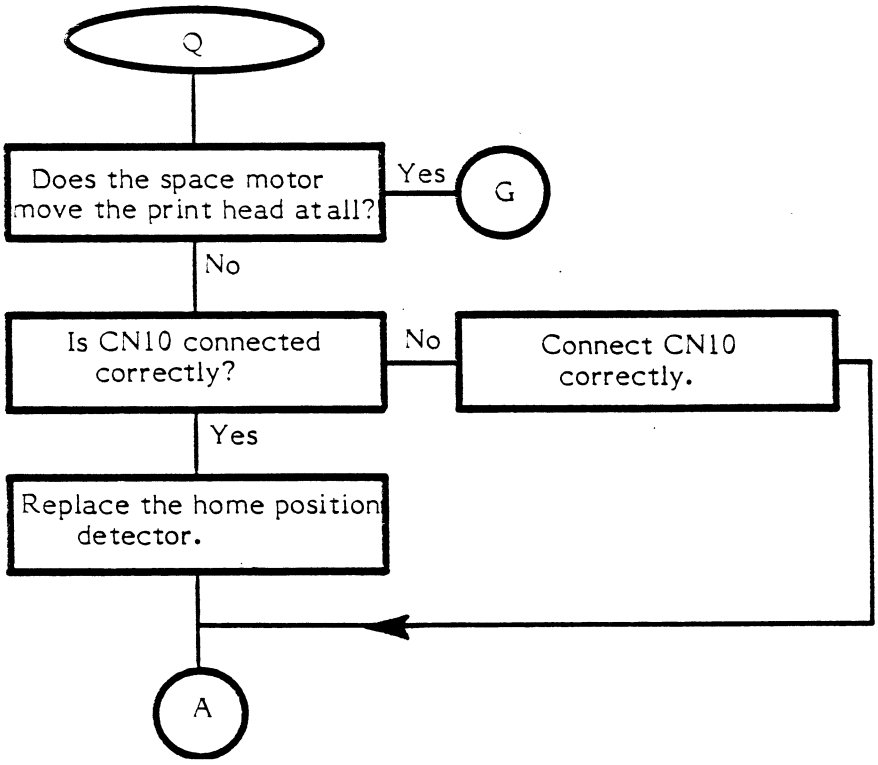



N
Does the collector of TR3 = +3.5 to 5.3V (labeled 5VD on the schematic)?
No
Defective
1) TR3
2) TR2
3) D30
Replace
A
Yes
Is there a 5V p-p output signal at pin 30 of Q8?
No
O
Yes
5V
0V
Power ON
Does the output waveform for RESET on pin 9 of Q8 look like the adjacent illustration?
Yes
P
No
Is there a 5V p-p signal at pin 21 of Q5?
No
Yes
Are there 5V p-p output signals at pins 25-28 on Q5?
No
Swapout in this order:
1) Q5
2) Q6
3) Q8
4) Q7
A
Yes
Does the carriage home correctly at power-on?
No
Q
Note: Connect the - lead wire on C2 for grounding.
Yes
R

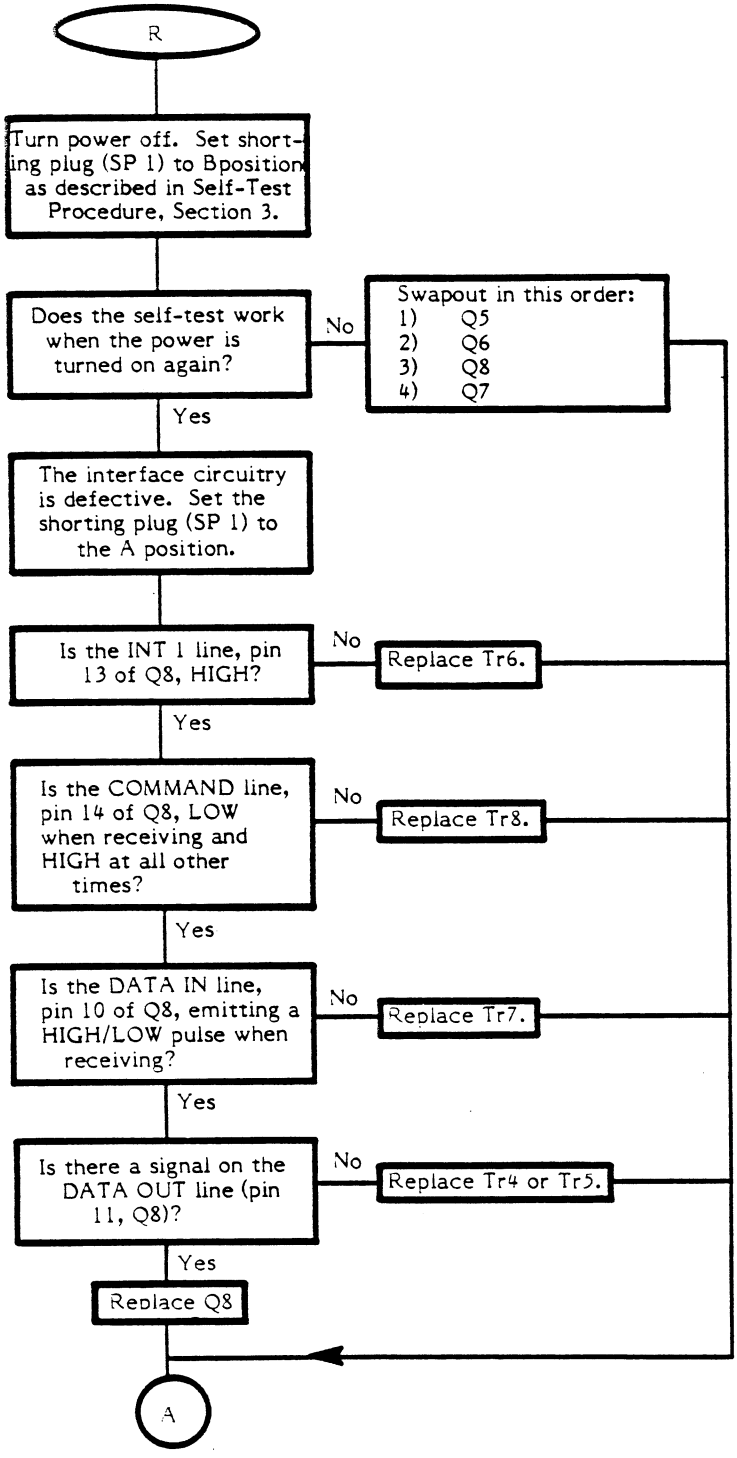
NO OUTPUT AT ALE LINE



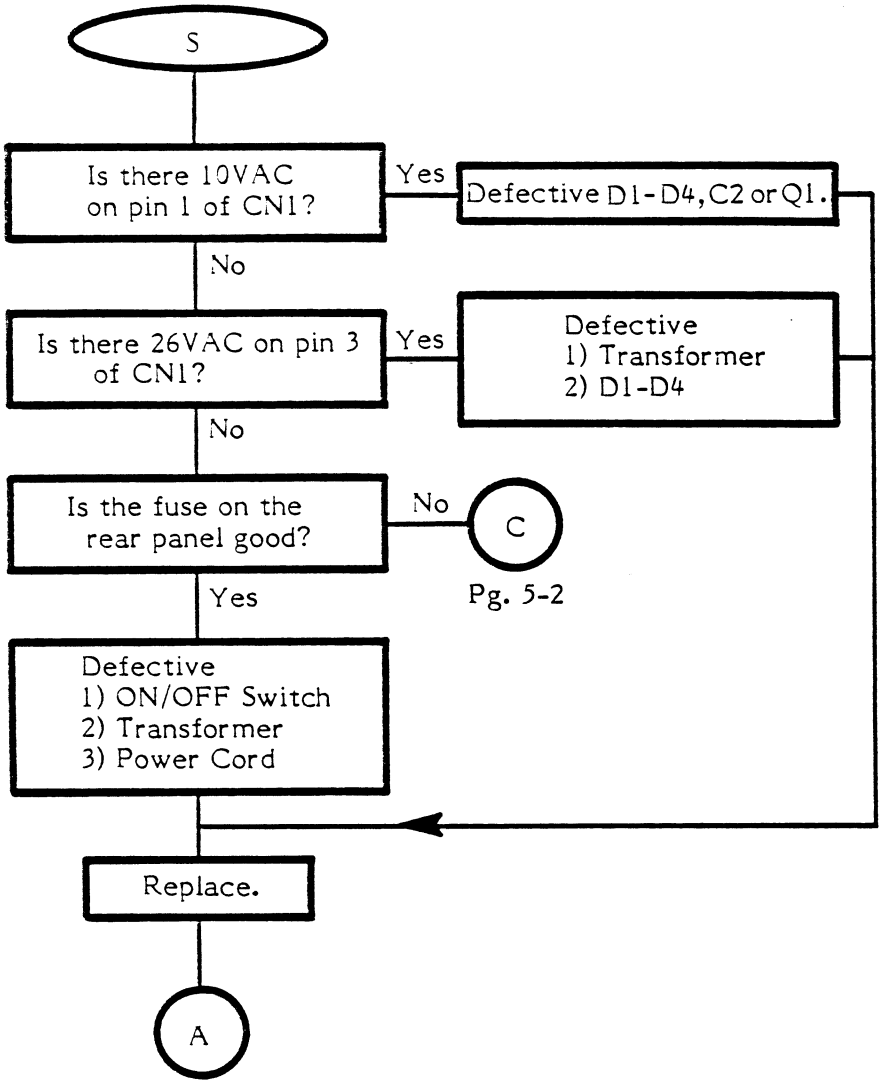
CARRIAGE DOES NOT HOME CORRECTLY



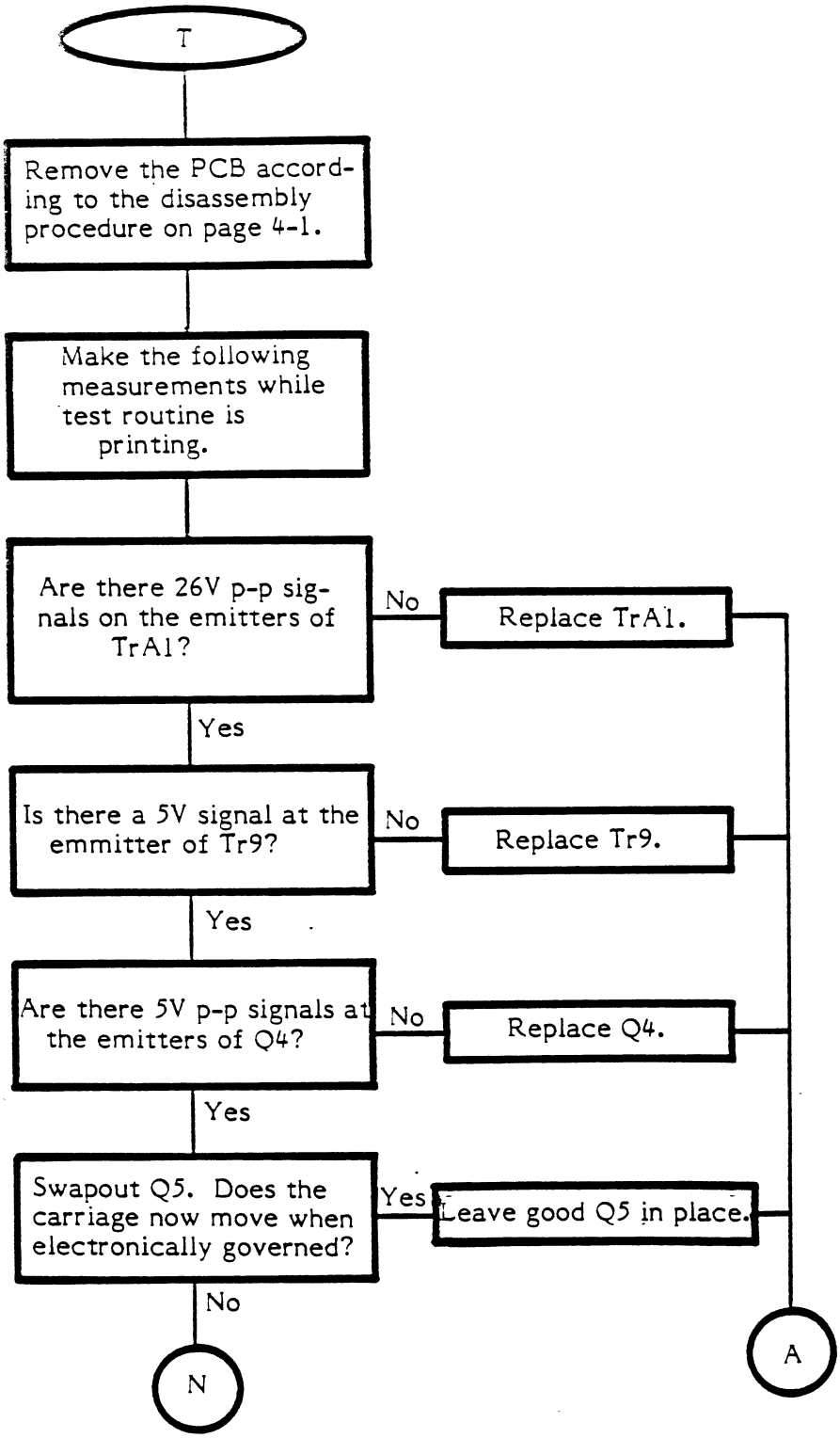
PRINTER DOES NOT LINE FEED (CONTINUED)



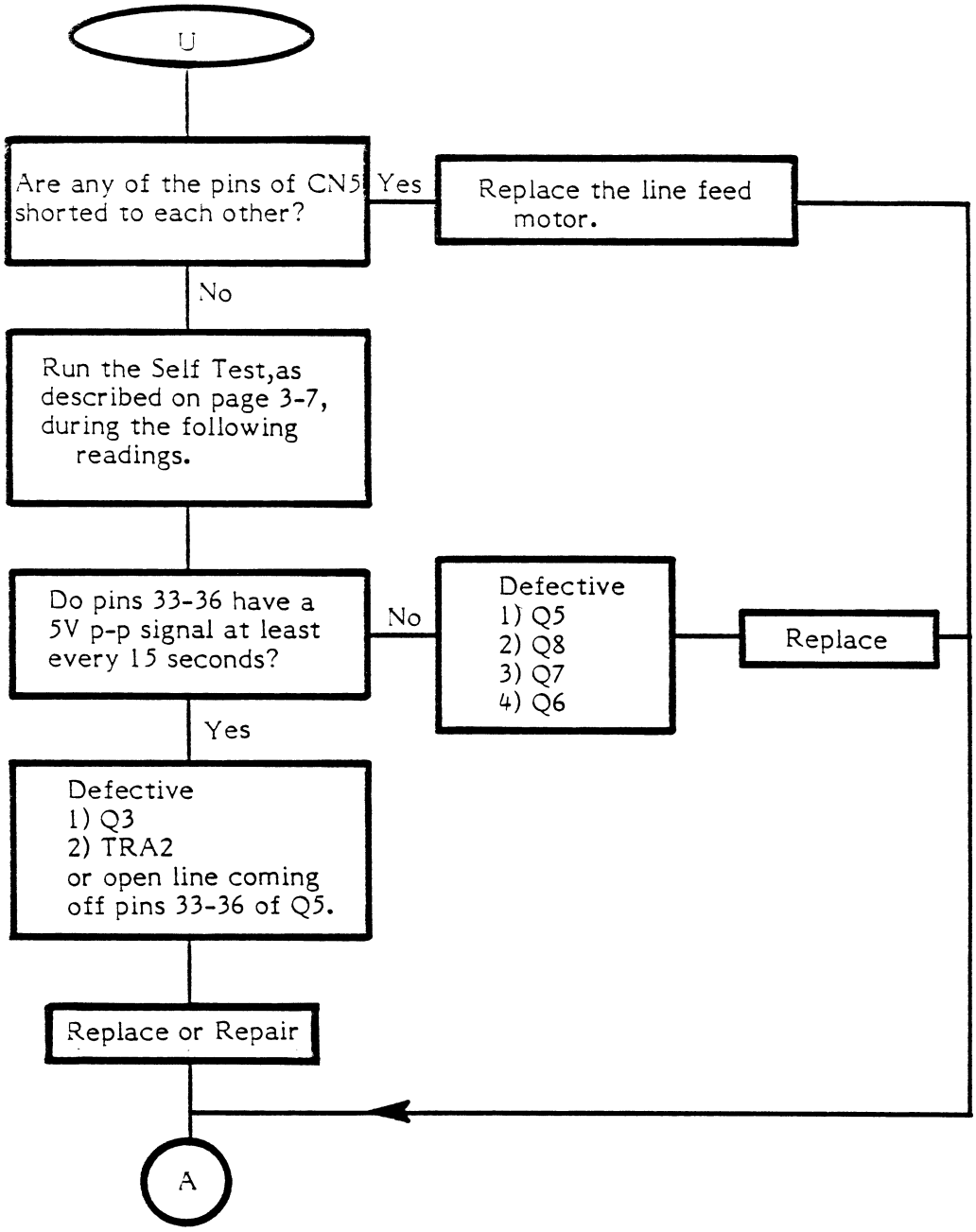
NO +10VDC TROUBLESHOOTING (CONTINUED)



CARRIAGE DOES NOT MOVE (CONTINUED)



PRINTER DOES NOT LINE FEED (CONTINUED)



SECTION SIX

SYMPTOM CHECKLIST

The Symptom Checklist is designed to assist the experienced technician arrive at a rapid diagnosis of 1025 problems. The checklist is not intended to replace the Diagnostic Flowchart as the primary troubleshooting guide but is designed to supplement it.

Symptom	Possible Cause	Flowchart Entry Point
POWER LED Does Not Light	LED, Transformer, Q1, or CN9	D
LED Lights But Printer Does Not Print	Q8, Q5, Q7, Q6, Transformer, Print Head, or Crystal	F
Printer Does Not Move Across Paper	Print Head, Space Motor, Q5, Q4, TRA 1	G
Printer Doesn't Line Feed the Correct Distance	Print Head, Line Feed Motor, Q5, Q3, TRA2	I
Print Head Drops Dots	Print Head, Q2, Q3, Q4, Q8, TRA3, TRA4	J
Characters Not Correctly Shaped	Q7, Q8	K

SECTION SEVEN

PARTS LIST

MECHANICAL PARTS

Mechanical Drawing Locator (Figure #, Part #)		Part Number
4-2, P	**Switch Assembly (front)**	FA100410
4-2, A	Paddle Rocker Switch	FC100408
4-2, B	LED (with holder)	FC100409
4-2, Q	**Cover Unit**	FA100411
4-2, C	Upper Cover	FC100412
4-2, 2	Top Cover	FC100413
4-2, D	Lower Cover	FC100414
4-2, E	Transformer	FC100415
4-2, F	Fuse (1.75A)	FC100416
4-2, 11	Flip-Flop switch, back of unit	FC100417
4-1, R	**Printer Mechanism**	FA100418
4-1, 15	Print Head Assembly	FA100419
4-1, 1	Platen Knob	FC100420
4-3, S	**Carriage Assembly**	FA100434
4-3, G	Ribbon Protector	FC100435
4-3, 15	Belt Clamp	FC100436
4-4, T	**Base Support Assembly**	FA100437
4-4, 18	Space Motor (Carriage)	FC100438
4-4, H	Line Feed Motor (Platen)	FC100439
4-4, I	Idle Pulley Bracket (clinched)	FC100440
4-4, 36	Idle Gear (Platen)	FC100441
4-4, J	Pressure Roller (Platen)	FC100442
4-4, K	Photo Interrupter Assy.	FA100443
4-4, 30	E-Snap Ring	FC100430
4-4, 35	E-Snap Ring	FC100431
4-4, W	E-Snap Ring	FC100444
4-6, U	**Ribbon Drive Assembly**	FA100421
4-6, 24	Ribbon Spool Gear	FC100422
4-6, L	Ribbon Intermediate Gear	FC100423
4-6, 28	Ribbon Drive Gear	FC100424
4-6, M	Friction Spring	FC100425

PARTS LIST (Continued)

MECHANICAL PARTS (Continued)

Mechanical Drawing Locator (Figure #, Part #)		Part Number
	Ribbon Drive Assembly (Continued)	
4-6, 26	Detent Spring	FC100426
4-6, 22	Special Washer	FC100427
4-6, N	Belt,Ribbon/Carriage Drive,Space	FC100428
4-6, O	Pressure Roller, Ribbon Drive	FC100429
4-6, 42	E-Snap Ring	FC100430
4-6, 20	E-Snap Ring	FC100431
4-6, 21	Washer, Plastic	FC100432
4-6, 25	Friction Felt	FC100433
4-4, V	**Platen Assembly**	FA100445
4-4, X	**Paper End Switch Assembly**	FA100446

PARTS LIST (Continued)

ELECTRONIC PARTS

Silkscreen Locator		Part Number
	PCB Assy.	FA100447
Q7	2732 EPROM	FC100448
Q8	8051 CPU-001 (Rev. 2)	FC100387
Q5	8155, I.C.	FC100389
Q6	74LS373, I.C.	FC100390
Q2-Q4	74LS05, I.C.	FC100391
Q1	Voltage Regulator FS7805, I.C.	FC100392
TRA3	STA303, Transistor Array	FC100393
TRA 1,2,4	STA403, Transistor Array	FC100394
TR1,2,9,10,11,12	2SC2719, Transistor	FC100395
TR3	2SA952, Transistor	FC100396
TR4,5,6,7,8	2SC2001,Transistor	FC100397
D8,9,11,12	Diode, EM1Z	FC100398
DA1	Diode Array DA0604	FC100399
D30,43,44	Diode, 1S2075	FC100400
D27,28	Diode, 5.1 VZD, Zener	FC100401
D29	Diode, 6.2 VZD EB2, Zener	FC100402
D13	Diode, 24 VZD, Zener	FC100403
D1-6	Diode, GP15B	FC100404
D7,10	Thyristor, CSM2A2	FC100405
D45	Diode, RD5.1EB2	FC100406
D26,46	Diode, AU01-20, Zener	FC100407

SECTION EIGHT

SERVICE BULLETINS

This section is to be used by you to file the three classifications of service bulletins that are periodically released by the Director of Technical Support.

The following are brief descriptions of each classification:

FIELD CHANGE ORDER

A Field Change Order describes mandatory hardware or software changes to ATARI Computer products and instructs how to implement these changes. The changes must be performed on all units serviced or repaired.

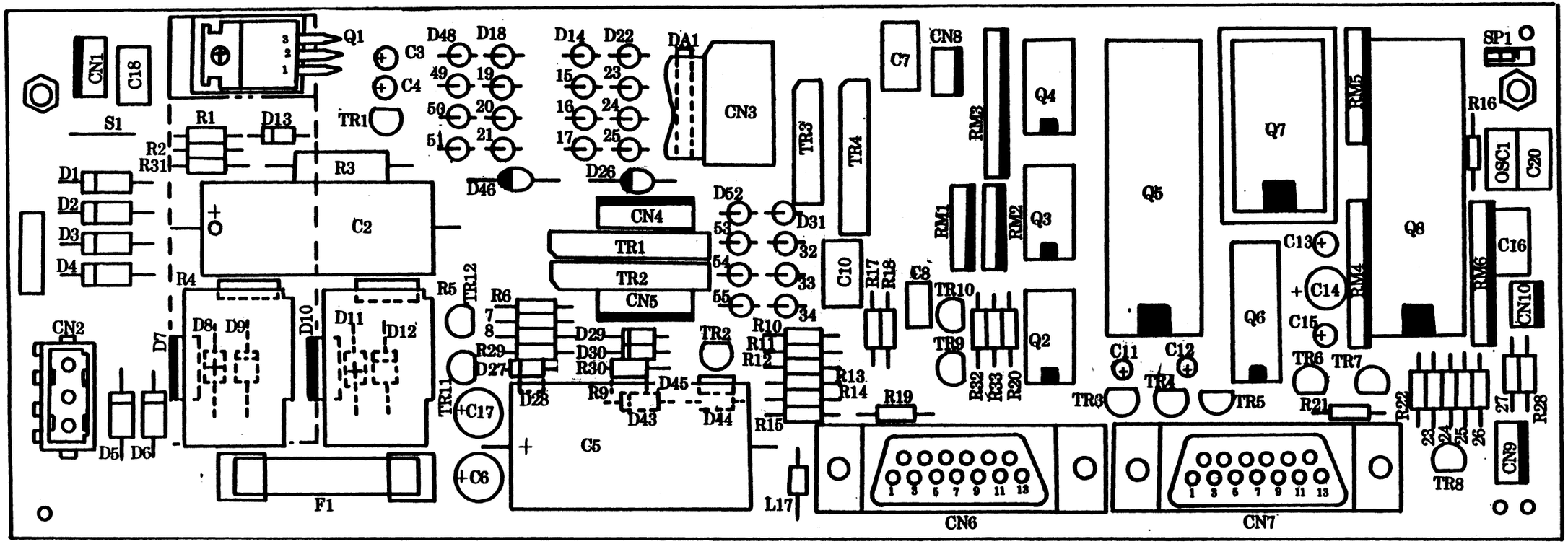
UPGRADE BULLETIN

An Upgrade Bulletin describes product improvements or modifications that the consumer may wish to purchase. These bulletins allow you to modify the customer's unit to add capabilities which may not have been available when the unit was originally manufactured.

TECH TIP

A Tech Tip is a document of a general nature which transmits routine service or repair information. By communicating methods developed since you attended training classes, Tech Tips aid to continuously improve repair skills and increase knowledge of ATARI Computer Products.

Other times, Tech Tips alert you to units that have been modified and are now standard for ATARI Manufacturing, but are different from many existing units and require different repair techniques.


CN1
C18
Q1
C3
C4
D48
D18
D14
D22
DA1
CN3
C7
CN8
SP1
R16
S1
R1
D13
TR1
R2
R31
R3
D1
D2
D3
D4
C2
D46
D26
CN4
TR1
TR2
CN5
D52
D31
TR3
TR4
RM3
Q4
RM1
RM2
Q3
C10
R17
R18
C8
TR10
TR9
Q2
Q5
Q7
RM5
Q8
OSC1
C20
C16
RM6
CN10
C13
C14
C15
RM4
Q6
TR6
TR7
R4
R5
TR12
R6
D29
D30
R29
D27
R30
D28
R9
D43
D45
D44
TR2
R10
R11
R12
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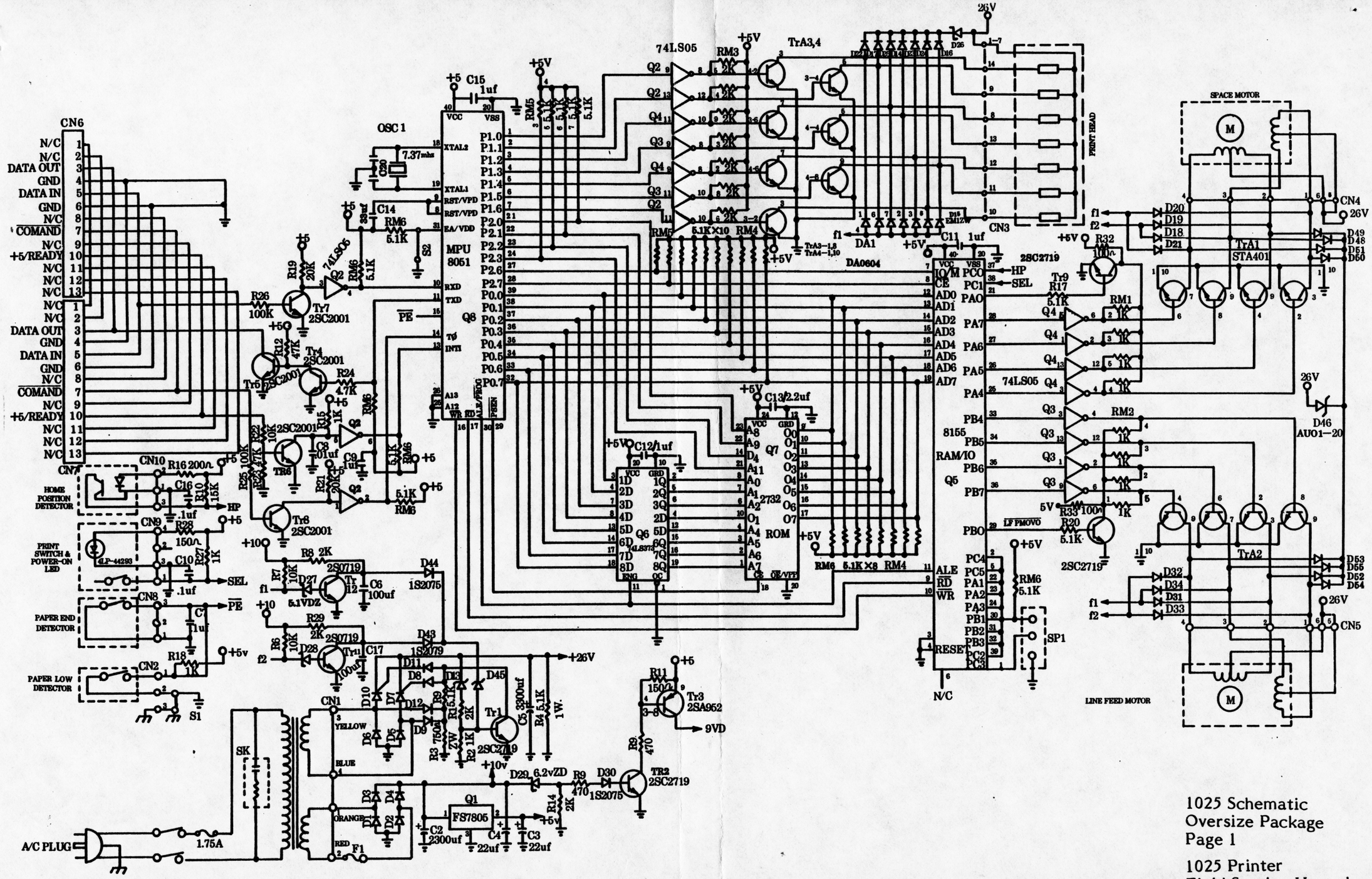
CN2
D7
D8
D9
D10
D11
D12
D5
D6
TR11
C17
C6
C5
F1
L17
CN6
CN7
1 3 5 7 9 11 13
1 3 5 7 9 11 13



1025 Schematic
Oversize Package
Page 1

1025 Printer
Field Service Manual