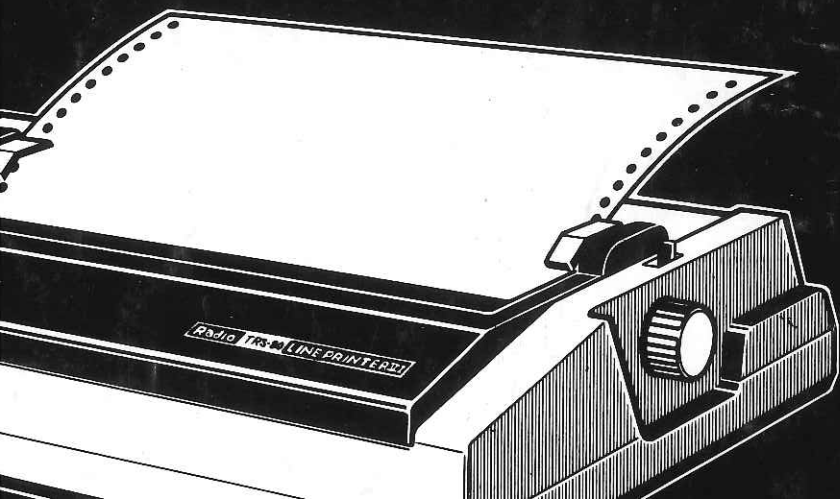


VI

**Radio Shack<sup>®</sup>**  
**TRS-80**  
**MICRO**  
**COMPUTER**  
**SYSTEM**

**HARDWARE**



## **Congratulations for selecting this Radio Shack Computer Product!**

The Line Printer VI is a high-speed, dot-matrix impact printer. The Printer includes a parallel interface for connection to the TRS-80 Expansion Interface, TRS-80 Model II or Model III. A built-in microprocessor controls the Printer and the communication with TRS-80. Basic operating instructions, self-test routines, and character patterns are resident in read-only memory (ROM).

Other exceptional features include:

- Bidirectional, minimum-distance access carriage action, for very efficient line-output.
- Upper and lower case English letters, English symbols, European symbols, and graphic patterns.
- Software-selectable print densities (5, 7.5, 10, or 15 characters per inch).
- Up to 132 characters per line.
- Software-selectable line densities (6, 8, or 12 lines per inch).
- Selectable friction feed or tractor feed for advancing printer paper.
- Accepts paper width up to 15 inches.
- Handless single or multi-part forms (Original + up to 2 copies).
- Paper Out sensor automatically stops Printer if paper runs out.
- ON-LINE/OFF-LINE Modes.
- Manual controls for LINE-FEED,  $\Delta 1/12$  LINE, and RESET.
- Basic functional checks with SELF-TEST printing.

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# SETTING UP

Carefully unpack the Printer. Be sure to locate the ribbon, the fuse, and the paper tray. Keep the empty box and insulation material in case you ever need to transport the printer. Then remove two ties holding the paper bail to platen.

**Caution:** Remove the protective plastic tube from the rear carriage guide. Unless this part is removed, turning on the power could damage the printer.

## Ribbon Replacement (Refer to Fig. 1 and Fig. 2)

If the ribbon is already installed, simply check to see that it is threaded properly. Compare with Fig. 10 (page 16).

If the ribbon cassette is not installed, or if it is necessary to replace the ribbon (fraying or faint printing at proper penetration setting), follow the instructions below.

1. Set Power switch to OFF position. (Note that when you turn power off, any information stored in the printer's buffer will automatically be lost. So avoid this situation during program printing.)
2. Open printer plastic cover and move Penetration Control lever fully backward (away from platen).
3. Ribbon is in cassette which is held down at lower left and right sides to the cassette holder by stopper claws. Lift up the platen end slightly and remove by lifting up the entire cassette horizontally.
4. Tension the ribbon in new cassette by turning its knob in arrow direction.
5. Press down cassette until firmly secured by stopper claws.

**Caution:** If claws fail to hook on properly when cassette is pressed down, the cassette knob will not fit properly into shaft from the carriage. Do not force cassette down, but fit it in gradually while turning cassette knob in arrow direction.

6. Insert portion of ribbon extending out from cassette into print head ribbon guide.
7. Manually move carriage to left and right to check that ribbon feeds out properly.

**Note:** Unless ribbon has been fitted properly into print head ribbon guide, printing and ribbon feed will not operate smoothly.

8. Adjust Penetration Control Lever in accordance with instructions in section of "Paper Loading and Penetration Adjustment".

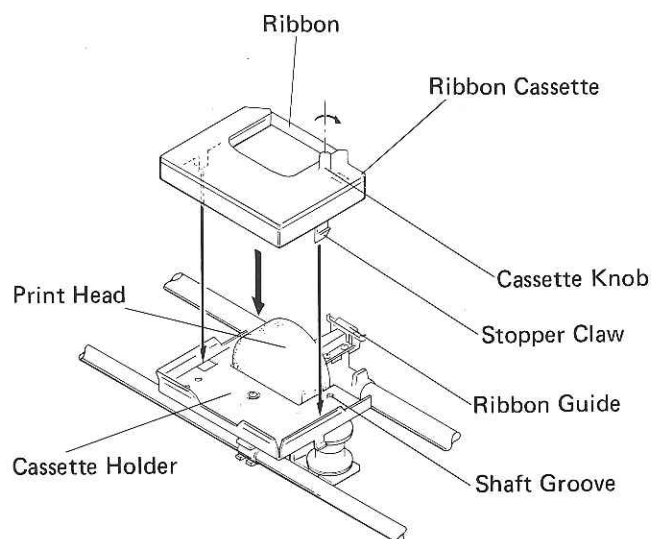


Figure 1

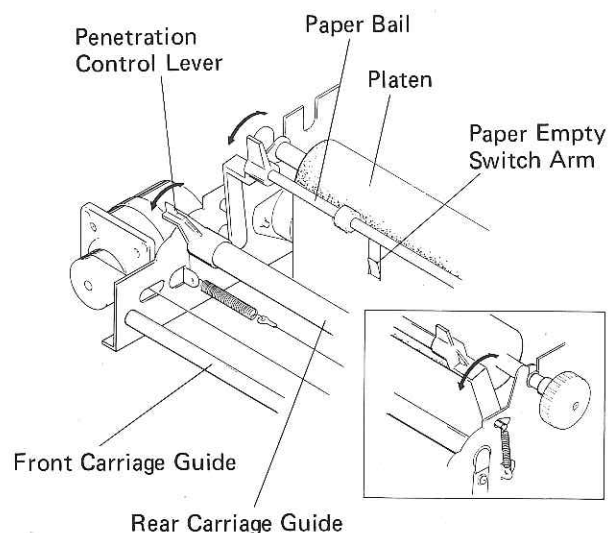


Figure 2

## Tractor Installation and Removal

With this printer, you can use either the tractor feed system or friction feed system. For tractor feed, use the sprocket hole paper with the tractor already installed. When you want to use friction feed, you can leave the tractor installed (but you'll find operation easier if you remove it). For friction feed, no need for paper with holes.

Refer to Fig. 3.

### To Remove Tractor

The printer comes supplied with the tractor already installed. When you want to use the printer with friction feed, remove the tractor as outlined below.

1. Set Power switch to OFF position and remove upper plastic cover.
2. Hold the tractor cover at left and right sides with both hands, unlock by pulling up the rear part, and pull upward.
3. Install upper plastic cover.
4. Set Power switch to ON position (set to operating condition).

### To Install Tractor

To use the printer with the tractor feed system, install the tractor as outlined below.

1. Set Power switch to OFF position and remove upper plastic cover.
2. Hold the tractor cover at the left and right sides with both hands, and insert claw slots on lower front sides of the tractor into printer studs.
3. Press the tractor cover back part until snaps into place.
4. Turn paper feed knob and check sprocket feed unit rotates.
5. Install upper plastic cover.
6. Set Power switch to ON position. (Printer now ready for operation.)

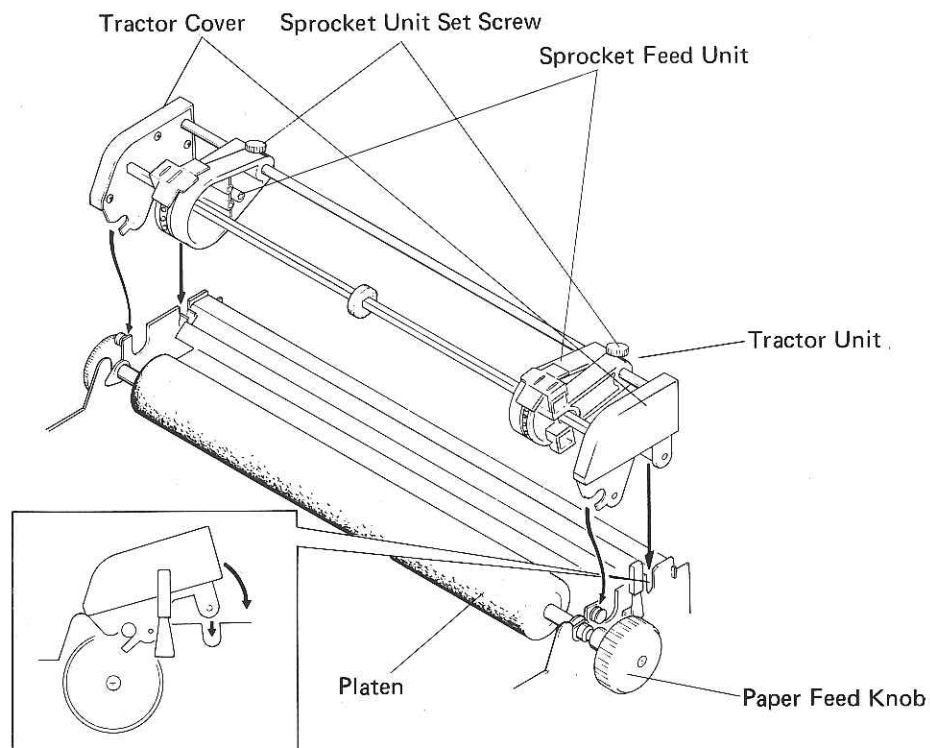


Figure 3

# Paper Loading and Penetration Adjustment

## When Operating With Friction Feed System

You do not have to use paper with holes, but you should not use continuous-form paper. Refer to Figures 4, 5, and 6 as you go through followings.

1. Remove plastic cover.
2. Move penetration control lever fully backward (away from platen).
3. Pull release lever toward the front.
4. Release paper bail from platen by tilting backward.
5. Insert paper through paper insertion opening at upper center of the printer and return release lever. Turn paper feed knob until paper appears between the platen and paper scale.
6. Pull release lever.
7. Pull out about 1-1/2" (3 or 4cm) of the paper and align the paper top. Return the release lever to normal position.
8. Return paper bail to its position against paper and platen.
9. Adjust Penetration Control for optimum print quality as follows:

### Single-Part Forms

Move Penetration Control Lever completely toward the platen. This provides maximum print head penetration. For single-part forms, use this setting.

### Multi-Part Forms

Move Penetration Control Lever toward platen until smudging appears on paper when carriage is manually moved back and forth. Then back off the lever setting slightly till there is no smudging when the carriage or paper is moved. Leave lever setting at the closest catch-point to this setting.

**Note:** If you use carbon-paper (or other duplicate form paper) with the friction feed system, take extreme care when setting up and using paper. There may be slight shifting of paper between original and copy, resulting in poor printing or improper registration.

10. Replace plastic cover.

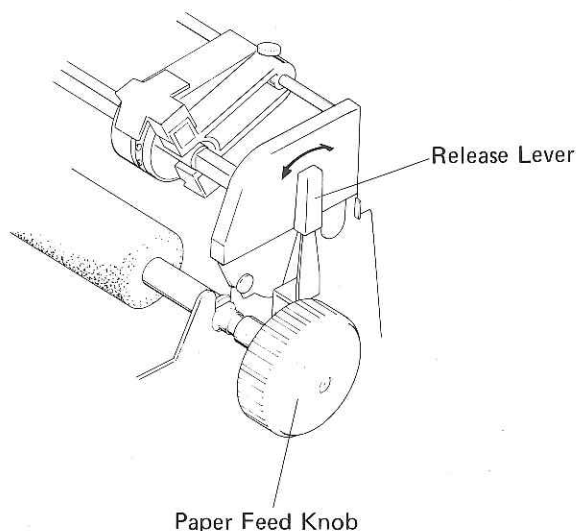


Figure 4

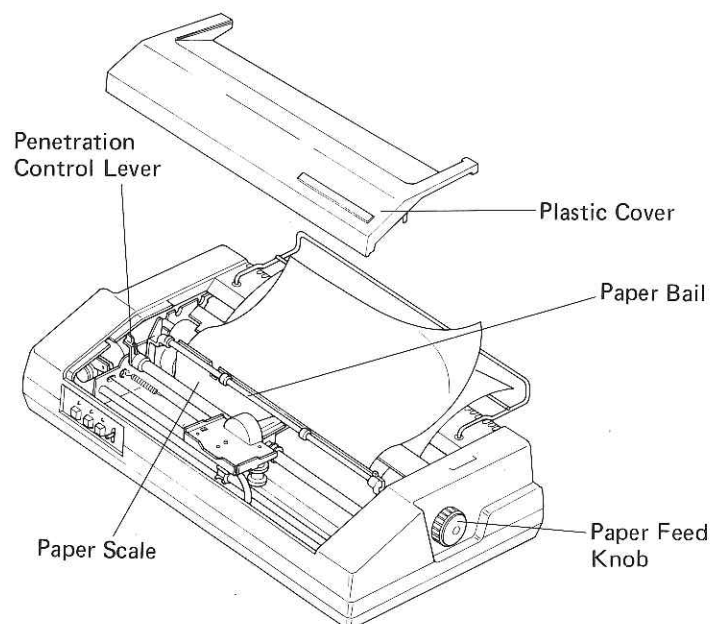


Figure 5

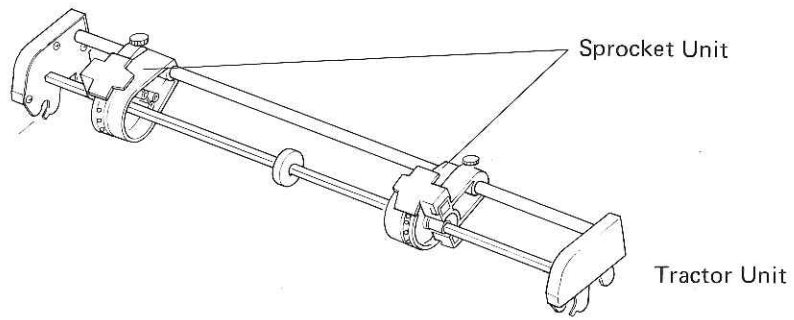


Figure 6

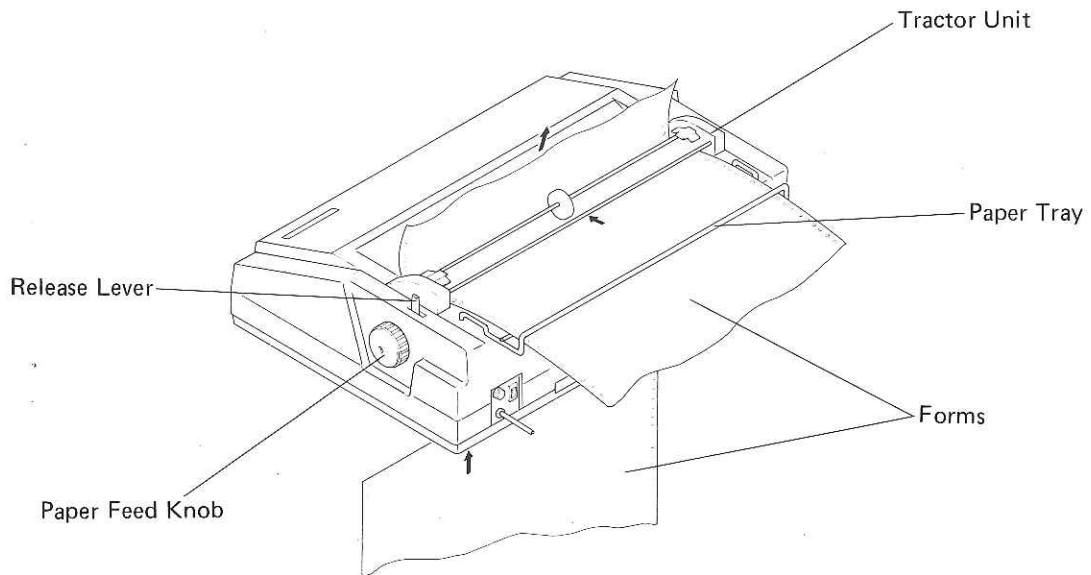


Figure 7

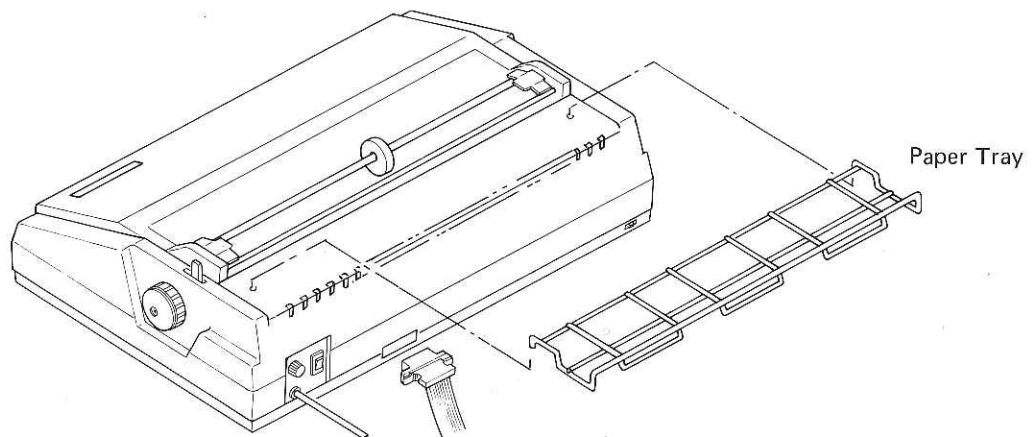


Figure 8

## Operating with Tractor Feed System

The printer will accept any standard tractor-feed paper from mailing label strips up to 15" (standard 132-character paper). Paper can be single or multi-part, up to 3 parts total.

Refer to Fig. 4, 6, and 7 as you follow these instructions

1. Remove plastic cover.
2. Move penetration control lever fully backward (away from platen).
3. Pull release lever toward the front.
4. Be sure to install paper tray if not already in place. Refer to Fig. 8 for installation method.
5. Release paper bail from platen by tilting it backward.
6. Pass the paper through center part of paper tray and then through paper insertion opening at upper center of printer. Return release lever. Turn paper feed knob until paper forward end appears between platen and paper scale.
7. Pull release lever toward the front.

**Note:** There is another paper-entry slot in the center bottom of the printer. Use this slot if your Printer stand allows paper to enter directly into the bottom of the Printer. This is convenient for loading paper directly out of the paper box.

\* Release the paper bail from platen. Insert paper through bottom paper insertion opening and push the paper up until it appears between the platen and paper scale.

8. Pull paper out about 6" (15 cm).
9. Raise tractor paper holders and lay the paper over feed sprockets. Align paper holes with sprockets and snap paper holders back on to the sprockets.

**Note:** 1. If paper sprocket holes do not fit properly over the sprockets, loosen the screws on sprocket unit and shift the unit for proper position and retighten set screws. If paper is stretched too tightly or is loose and wrinkled, paper may not be fed properly.

2. When tractor feed is used, always have release lever pulled back.

10. Adjust Penetration Control for optimum print quality as follows:

### Single-Part Forms

Move Penetration Control completely to the platen for maximum print head penetration. Use this setting for all single-part forms.

### Multi-Part Forms

Move Penetration Control lever toward the platen until paper smudges when carriage is shifted manually back and forth across the paper. Then return the lever slightly backward until the paper does not smudge when carriage is shifted; leave lever at the closest locking setting.

**Note:** Do not allow the printed paper to pile on top of the unprinted paper stock, and take care about the paper not to be led on the bent route (it could cause improper paper feed).

## Connection to Computer and Self-Test

Before plugging the power cord into an AC power outlet, (120V AC for USA/Canada, 220/240V AC for Europe/Australia) check the following:

- (1) Is AC power line voltage full nominal value?
- (2) Is printer Power switch in OFF position?
- (3) Have you removed the black plastic protective tube from the carriage guide?
- (4) Has ribbon cassette been set?
- (5) Has 15" size print paper been set? If loaded with paper narrower than 15". be sure you don't print wider than paper. Printing on the platen will shorten print head life (note that the self-test uses the full width of 15" for printing).

If above is all OK, make a print check before connecting the printer to the computer.

1. Plug Printer into AC power (rated voltage) outlet.
2. Set power switch to ON.
3. Set control switch to OFF-LINE.
4. Set the Self-Test switch on the rear to ON. Printer should print all characters in a continuous sequence. Printing will continue until Self-Test switch is set to OFF or when control switch is set to On-Line.
5. If test characters are printed too close to left margin (or extending out from left or right margin), adjust paper to correct position by loosening screws on both sprocket units.
6. If printing is too light, move Penetration Control lever toward the platen. If printing is too dark or is smudged, move Penetration Control lever backward (away from platen).
7. Set Self-Test switch to OFF and Power switch to OFF.
8. Install the cable for connection to Computer. Make sure that one end is provided with molded male plug. Insert this plug into connector in the rear of the Printer. Do not force the plug. If it won't go on one way, turn it over and try again. (See Fig. 9)

**Note:** If the computer on hand is a TRS-80 Model I, use Catalog number 26-1401 interface cable.  
If it is a TRS-80 Model II, use Catalog number 26-4401 interface cable.

9. Connect the other end of the cable to the Computer. If the Computer is a TRS-80 Model I, make the connection to Line Printer Card Edge Connector of Expansion Interface. For a Model III connect to the Line Printer connecten on the bottom. If it is a Model II, use the connector on the lower back of the computer. Again if won't go in one way reverse the plug and try again.

You may also use the "active" interface cable, 26-1411, connected directly to the 40 pin bus of the model I eliminating the need for the expansion interface.

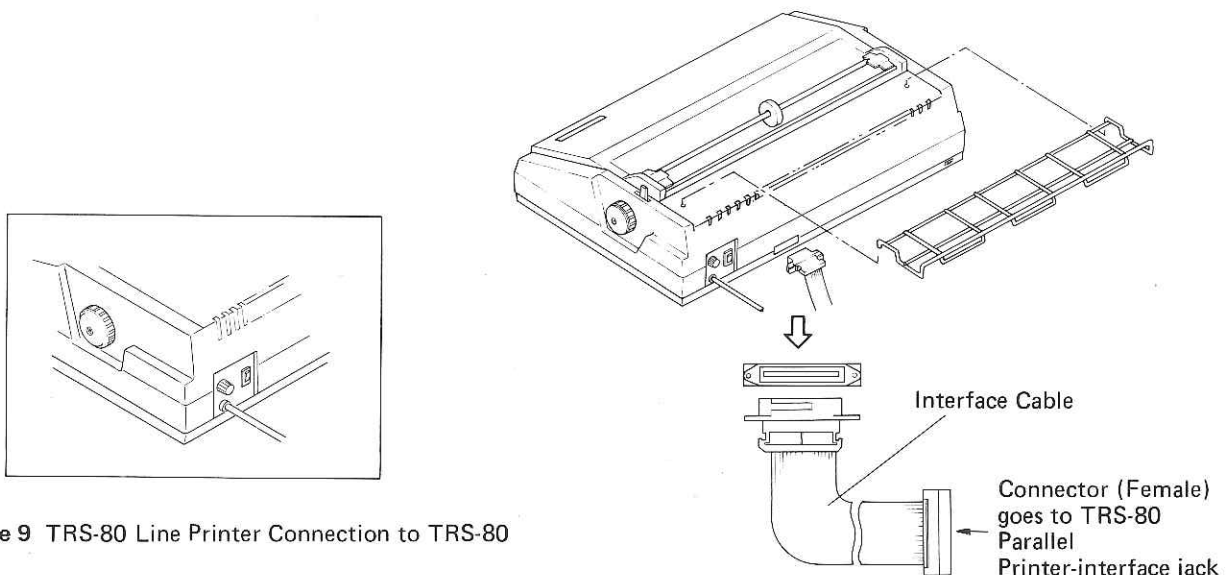


Figure 9 TRS-80 Line Printer Connection to TRS-80



# OPERATION

## Power ON/OFF

The power-up sequence varies slightly depending upon the computer system used. With Model I and Model III systems, all peripherals (printers included) should be turned on before applying power to the CPU. Following the recommended procedure for Model II systems, when the "INSERT DISKETTE" message appears, turn on the Printer and other peripherals — then insert system diskette.

Power lamp will remain lit while Printer is on. It is essential that the Printer remain on while connected to the computer. An inactive printer can cause erratic operation of the system. Remember, also, that if the power is removed or applied to the Printer while the CPU is running a program, voltage spikes could cause program malfunction and/or loss of RAM memory.

## Controls and Indicators

**Tip to ON-LINE** . . . . . Printer will be in ON-LINE condition. When loaded with paper, READY lamp will come on, and the Printer will be ready to accept data from the Computer.

**Note:** · When Printer has stopped due to Out-of-Paper condition, ALERT lamp lights and automatically Printer goes OFF-LINE condition. After inserting paper, press RESET switch once. Printer then returns ON-LINE. Buffer data remains fully protected and printing will proceed as normal.

**Caution:** Buffer data will be erased if RESET is pressed twice.  
· If ERROR is detected due to carriage striking on left or right end, clogged paper or other causes. Return Printer to initial state by pressing RESET switch (you should realize that under this condition the buffer data will be erased).

**Special Note for Model II computer:** After encountering an alert condition error with a Model II system, you may have to type CONTINUE, and then the printer will continue printing from the stopped head position. However, you should be aware that the entire current line will be restarted from this location: therefore there may be some printing duplication at this stopped line.

**Tip to OFF-LINE** . . . . . Printer will be in OFF-LINE state. Information from computer will not be received when at OFF-LINE condition, but following keys and switch operations are possible.

**LINE FEED key** . . . . . Press this key and Printer will advance paper one line. (If line feed pitch has been changed by software control incremental advance will be per pitch selection). Pressing key for several seconds will cause paper to feed continuously.

**△1/12 LINE key** . . . . . Press to advance paper by 1/72 inch (1/12 line at 6 characters/inch mode).

**SELF-TEST switch** . . . . . This switch is located on the rear of Printer. Set to ON and the Printer will produce a full line of characters. This is useful for checking ribbon condition and print quality. **Do not use Self-Test switch unless the Printer is loaded with 15" paper (or print head will strike the platen).**

RESET key ..... When Printer runs out of paper, inserting new paper and pressing this key once will cause Printer to return to the state before Out-of-Paper. **If pressed during machine trouble or when pressed more than once after replacing run-out the printer will return to the original on-line state (and data in buffer will be lost).**

### Other Switches and Indicators

| Switch/Indicator   | Location                                 | Function   |
|--------------------|--|--|
| POWER switch       | Right rear of Printer                    | ON-OFF of Printer power<br>(Do not turn off Power switch when using Computer)                                      |
| Paper Empty switch | Inside printer, near print graduations 2 | Notifies Printer control logic that paper has run out. When actuated, ALERT lamp lights and Printer goes OFF-LINE. |
| READY lamp         | On control panel                         | Indicates Printer is ON-LINE.  |
| ALERT lamp         | On control panel                         | Indicates paper empty or carriage fault.   |
| POWER lamp         | On control panel                         | Indicates Printer is ON  |

### Control Codes

According to American Standard Code for Information Interchange (ASCII), there are 34 control codes in addition to the printable character codes. Control codes are sent as data which the receiving device interprets as abbreviated instructions, communications-status messages, etc.

The Line Printer VI recognizes and executes 10 kinds of control codes and treats all other codes as spacing a character.

| Codes     |           |         |         | Function  |
|-----------|-----------|---------|---------|---|
| Decimal   | Octal     | Hex     | Symbol  |   |
| 0         | 000       | 00      | NUL     | These are ignored.  |
| 1         | 001       | 01      |         |   |
| 10 or 138 | 012       | 0A      | LF      | Line Feed. When buffer information is printed out, paper advances one line.   |
| 13 or 141 | 015       | 0D      | CR      | Carriage return, All buffer information printed out and next character printed from start of next line. CR code following after CR or LF is ignored.  |
| 27 · 14   | 033 · 016 | 1B · 0E | CON STR | Sets to condensed-character mode. When this two-code sequence is received, a CR is issued and subsequent characters will be in 2/3 pitch of previous characters pitch. Thus, if normal (10 characters/inch) characters has been used, 15 character/inch pitch will be set. If elongated characters (5 characters/inch) has been used, 7.5 character/inch pitch will be set. <b>Next character will be printed from start of new line.</b> |

| Codes   |           |          |         | Function   |
|---------|-----------|----------|---------|--|
| Decimal | Octal     | Hex      | Symbol  |  |
| 27 · 15 | 033 · 017 | 1B · 0F  | CON END | Cancels condensed character command. When this two-code sequence is received return to character pitch before condensed character was selected. <b>Next data will be printed from beginning of the line.</b> |
| 27 · 28 | 033 · 034 | 1B · 1C  | 1/12"L  | Selects 12 Lines/inch mode. When this two-code sequence is received all subsequent line spacing will be 12 lines per inch. This is normally used for graphic pattern printing.                               |
| 27 · 54 | 033 · 066 | 1B · 36  | 1/6"L   | Select 6 Lines/inch mode. When this two-code sequence is received all subsequent line spacing will be 6 lines per inch. Printer is in this condition when power is turned on.                                |
| 27 · 56 | 033 · 068 | 1B · 38  | 1/8"L   | Select 8 Lines/inch mode. When this two-code sequence is received successively, all subsequent line spacing will be 8 lines per inch.  |
| 30      | 036       | 1E       | NOR     | Cancels elongated character command. Printer is in this condition mode when power is turned on.  |
| 31      | 037       | 1F       | ELN     | Select elongated character mode. All subsequent character pitches will be twice that of normal characters.   |
| 127     | 177       | 7F or FF | DEL     | These are ignored.   |
| 255     | 377       | FF       |         |  |

### Special Note

The condensed mode commands should be written into the center (or end) of a program line. When executed, the CON STR brings the print head to the starting point of a line, **but does not include a line feed**. As a result you will get overprinting on the same line (if executed after some information has already been printed for that line). Normal and expanded mode printing can be intermixed on the same line (but condensed mode can not be mixed with any other).

## Printable Characters, Symbols, and Graphics

Line Printer VI can print alphanumeric codes from hexadecimal 20 through hexadecimal 7E (decimal 32 through decimal 126), European codes from hexadecimal A0 through hexadecimal BF (decimal 160 through decimal 191), and graphic patterns from hexadecimal E0 through hexadecimal FE (decimal 224 through decimal 254).

| Code |     |      | Char.   | Code |     |      | Char. | Code |     |      | Char. | Code |     |      | Char.   | Code |     |      | Char.   |
|------|-----|------|---------|------|-----|------|-------|------|-----|------|-------|------|-----|------|---------|------|-----|------|---------|
| Dec. | Hex | Oct. |         | Dec. | Hex | Oct. |       | Dec. | Hex | Oct. |       | Dec. | Hex | Oct. |         | Dec. | Hex | Oct. |         |
| 32   | 20  | 40   | (Space) | 64   | 40  | 100  | @     | 96   | 60  | 140  | \     | 160  | A0  | 240  | (Blank) | 224  | E0  | 340  | (Blank) |
| 33   | 21  | 41   | !       | 65   | 41  | 101  | A     | 97   | 61  | 141  | a     | 161  | A1  | 241  | à       | 225  | E1  | 341  | ■       |
| 34   | 22  | 42   | "       | 66   | 42  | 102  | B     | 98   | 62  | 142  | b     | 162  | A2  | 242  | ç       | 226  | E2  | 342  | ■       |
| 35   | 23  | 43   | #       | 67   | 43  | 103  | C     | 99   | 63  | 143  | c     | 163  | A3  | 243  | £       | 227  | E3  | 343  | ■       |
| 36   | 24  | 44   | \$      | 68   | 44  | 104  | D     | 100  | 64  | 144  | d     | 164  | A4  | 244  | (Blank) | 228  | E4  | 344  | ■       |
| 37   | 25  | 45   | %       | 69   | 45  | 105  | E     | 101  | 65  | 145  | e     | 165  | A5  | 245  | μ       | 229  | E5  | 345  | ■       |
| 38   | 26  | 46   | &       | 70   | 46  | 106  | F     | 102  | 66  | 146  | f     | 166  | A6  | 246  | °       | 230  | E6  | 346  | ■       |
| 39   | 27  | 47   | '       | 71   | 47  | 107  | G     | 103  | 67  | 147  | g     | 167  | A7  | 247  | ▼       | 231  | E7  | 347  | ■       |
| 40   | 28  | 50   | (       | 72   | 48  | 110  | H     | 104  | 68  | 150  | h     | 168  | A8  | 250  | †       | 232  | E8  | 350  | ■       |
| 41   | 29  | 51   | )       | 73   | 49  | 111  | I     | 105  | 69  | 151  | i     | 169  | A9  | 251  | §       | 223  | E9  | 351  | ■       |
| 42   | 2A  | 52   | *       | 74   | 4A  | 112  | J     | 106  | 6A  | 152  | j     | 170  | AA  | 252  | (Blank) | 234  | EA  | 352  | ■       |
| 43   | 2B  | 53   | +       | 75   | 4B  | 113  | K     | 107  | 6B  | 153  | k     | 171  | AB  | 253  | ©       | 235  | EB  | 353  | ■       |
| 44   | 2C  | 54   | ,       | 76   | 4C  | 114  | L     | 108  | 6C  | 154  | l     | 172  | AC  | 254  | ¼       | 236  | EC  | 354  | ■       |
| 45   | 2D  | 55   | -       | 77   | 4D  | 115  | M     | 109  | 6D  | 155  | m     | 173  | AD  | 255  | (Blank) | 237  | ED  | 355  | ■       |
| 46   | 2E  | 56   | .       | 78   | 4E  | 116  | N     | 110  | 6E  | 156  | n     | 174  | AE  | 256  | ½       | 238  | EE  | 356  | ■       |
| 47   | 2F  | 57   | /       | 79   | 4F  | 117  | O     | 111  | 6F  | 157  | o     | 175  | AF  | 257  | ¶       | 239  | EF  | 357  | ■       |
| 48   | 30  | 60   | 0       | 80   | 50  | 120  | P     | 112  | 70  | 160  | p     | 176  | B0  | 260  | ¥       | 240  | F0  | 360  | ┘       |
| 49   | 31  | 61   | 1       | 81   | 51  | 121  | Q     | 113  | 71  | 161  | q     | 177  | B1  | 261  | Ä       | 241  | F1  | 361  | -       |
| 50   | 32  | 62   | 2       | 82   | 52  | 122  | R     | 114  | 72  | 162  | r     | 178  | B2  | 262  | Ö       | 242  | F2  | 362  | ┘       |
| 51   | 33  | 63   | 3       | 83   | 53  | 123  | S     | 115  | 73  | 163  | s     | 179  | B3  | 263  | Ü       | 243  | F3  | 363  | ┘       |
| 52   | 34  | 64   | 4       | 84   | 54  | 124  | T     | 116  | 74  | 164  | t     | 180  | B4  | 264  | ¢       | 244  | F4  | 364  | ┘       |
| 53   | 35  | 65   | 5       | 85   | 55  | 125  | U     | 117  | 75  | 165  | u     | 181  | B5  | 265  | (Blank) | 245  | F5  | 365  |         |
| 54   | 36  | 66   | 6       | 86   | 56  | 126  | V     | 118  | 76  | 166  | v     | 182  | B6  | 266  | ä       | 246  | F6  | 366  | ┘       |
| 55   | 37  | 67   | 7       | 87   | 57  | 127  | W     | 119  | 77  | 167  | w     | 183  | B7  | 267  | ö       | 247  | F7  | 367  | ┘       |
| 56   | 38  | 70   | 8       | 88   | 58  | 130  | X     | 120  | 78  | 170  | x     | 184  | B8  | 270  | ü       | 248  | F8  | 370  | ┘       |
| 57   | 39  | 71   | 9       | 89   | 59  | 131  | Y     | 121  | 79  | 171  | y     | 185  | B9  | 271  | β       | 249  | F9  | 371  | ┘       |
| 58   | 3A  | 72   | :       | 90   | 5A  | 132  | Z     | 122  | 7A  | 172  | z     | 186  | BA  | 272  | (Blank) | 250  | FA  | 372  | +       |
| 59   | 3B  | 73   | ;       | 91   | 5B  | 133  | [ (↑) | 123  | 7B  | 173  | {     | 187  | BB  | 273  | e       | 251  | FB  | 373  | ■       |
| 60   | 3C  | 74   | <       | 92   | 5C  | 134  | \ (↓) | 124  | 7C  | 174  |       | 188  | BC  | 274  | ù       | 252  | FC  | 374  | ▲       |
| 61   | 3D  | 75   | =       | 93   | 5D  | 135  | ] (←) | 125  | 7D  | 175  | }     | 189  | BD  | 275  | è       | 253  | FD  | 375  | ▼       |
| 62   | 3E  | 76   | >       | 94   | 5E  | 136  | ↑ (→) | 126  | 7E  | 176  | ~     | 190  | BE  | 276  | ·       | 254  | FE  | 376  | ▲       |
| 63   | 3F  | 77   | ?       | 95   | 5F  | 137  | ← (-) |      |     |      |       | 191  | BF  | 277  | f       |      |     |      |         |

- Note:**
1. European symbols and graphic patterns cannot be printed directly through key input, but printing can be done by utilizing LPRINT CHR\$ (decimal code).
  2. If a non-defined code or hexadecimal 20 is received, the Printer will issue a handle it as space data (set a space for one character). Since the carriage moves only the shortest distance, the action will take place without unnecessary movement. If a blank code (in the above table) is received, the carriage will move in the same manner as when receiving a printable character. When printing using blank code can be very convenient, and produce attractive/useful print-out.
  3. When using graphic code to prepare diagrams, line feed should be set to 1/12" per line. If other paper feed pitch is used, the diagram will not be accurate.

4. If optional characters are desired, please contact your local Radio Shack store or Computer Center.

## Details of Printer Operation

The Printer starts a Print cycle under any of the following conditions.

- (A) Data buffer receives the 132nd character.

Normal width characters and elongated characters can be sent together. An elongated character is counted as two characters. In case the 132nd character is of elongated one, the elongated character corresponding to the 132nd (and 133rd) character is printed at the start of next line. In the condensed mode, the buffer will still fill and dump after the 132nd character. Because the pitch (characters per inch) is increased, the line length decrease to about 8.8" (22cm) long.

- (B) When print data for at least one character is in the buffer and carriage return or line feed code is received.

- (C) When print data for at least one character is in the buffer and the next data is not received within approximately one second.

- (D) With normal or elongated mode specified, when condensed character command is received (CHR\$ (27); CHR\$ (14)).

- In this case after all data in the buffer is printed the carriage will return to beginning of the line before printing the condensed characters which follow. Without special care in programming insertion of a CON STR command in the middle of a line will cause over-printing of characters.

- (E) With condensed mode selected, when condensed mode cancellation code is received (CHR\$ (27); CHR\$ (15)).

- In this case after all data in the buffer is printed, the carriage will return to the beginning of the line before continuing to print the characters which may follow. Condensed characters should not be combined with other modes in the same line without special programming care.

**Note:** While in the elongated character mode and if an elongated character mode code is received, or  
While in normal character mode and an elongated character mode cancellation code is received, or  
While in or condensed character mode and condensed character mode code is received, or  
While normal character mode and condensed character cancellation code is received.  
When a CR or LF code is received and after completing operation, a second CR code is again received.

All of the above under-lined (repetition of existing states) codes will be ignored.

- You can have your printer changed so that CR code is not ignored after receiving CR or LF code. For details, see your nearest Radio Shack store or Computer Center.

## Programming Examples

The basic statements LPRINT and LLLIST output to the Line Printer. See the Level II, Model II or Model III BASIC Reference Manual for details of syntax.

### Examples:

LLIST

Lists the resident program to the Printer.

LPRINT "THIS IS A TEST"

Prints the message in quotes and tells the Printer that the next printable character begins a new line.

LPRINT "THIS IS PART OF A LINE "; : LPRINT "THIS IS THE REST"

Prints both messages on same line (because of the semicolon). The next printable character received starts a new line.

LPRINT "SMALL"; CHR\$ (31); "LARGE"; CHR\$ (30); "SMALL AGAIN"

Printing of normal and double-size characters on same line demonstrated.

LPRINT CHR\$ (27); CHR\$ (14); "CONDENSED"

Prints condensed characters.

LPRINT CHR\$ (27); CHR\$ (15); "NORMAL CHARACTER"

Cancels condensed character mode and returns to normal character.

LPRINT CHR\$ (27); CHR\$ (28)

Prints all subsequent lines at 12 lines per inch pitch.

LPRINT CHR\$ (27); CHR\$ (56) (or LPRINT CHR\$ (27) "8")

Prints all subsequent lines at 8 lines per inch pitch.

LPRINT CHR\$ (27); CHR\$ (54) (or LPRINT CHR\$ (27) "6")

Prints all subsequent lines at 6 lines per inch pitch.

## Hints and Tips

1. Always plug printer into a 3-wire grounded receptacle.
2. Ensure that upper cover is closed and secured while in operation.
3. Never operate printer without paper. If paper used is less than 15" wide, take care to see that printing does not exceed paper width.
4. Avoid leaning objects against printer or placing anything on top. If any object is accidentally dropped into the machine, turn power off and carefully take it out.
5. Be sure to turn off power before adjusting print head or replacing ribbon.

**Note:** When you turn power off, all data stored in Printer's buffer will be lost; keep this in mind as you perform routine maintenance. Remember that toggling the printer's power can also cause erratic operation of the CPU.

6. Use only lint-free cloth to clean printer surface. Do not use solvents or harsh cleaning agents. Mild detergent solution or desk top cleanser may be used sparingly.
7. Keep hands away from carriage mechanism while printer is in operation. Since carriage moves with considerable force, inserting hand would be extremely hazardous.
8. Printer must be kept dry. If water is accidentally spilled on machine, turn off power immediately and wipe dry. Do not turn on power until completely dry.
9. In case AC power voltage is above or below the rated voltage, use a constant voltage regulated supply to ensure stability.

# CARE AND MAINTENANCE

## Caution

- Do not use organic solvents or alcohol when cleaning the cover.
- Never operate Printer when upper plastic cover is opened because this is very dangerous.
- When replacing a fuse, be sure to use the same type and rating (3A 250V).
- Never set the printer where it is exposed to direct sunlight.
- Set the printer on a strong secure stand secure to prevent it from vibrating while printing.

## Maintenance (Refer to Fig. 10)

- If the print head becomes clogged with ribbon material or paper lint, carefully remove such material with a finely pointed tool (needles, etc.). This should be checked regularly.
- Lightly oil the two carriage guides every three months. Use high-grade ester lubricating oil, but if not available, use high-grade sewing machine oil. Lubricate carriage guide (1) by directly oiling the oil ring (felt) installed in a 4-mm hole in the carriage. Lubricate carriage guide (2) directly at the oil ring in carriage.
- Lubricate platen revolving shaft (3), wire pulley shaft (4), and ribbon feed revolving shaft (5), gear revolving shafts (6), and tractor unit sprocket revolving bearing (7) every three months. Use molybdenum disulfide compound for lubrication.

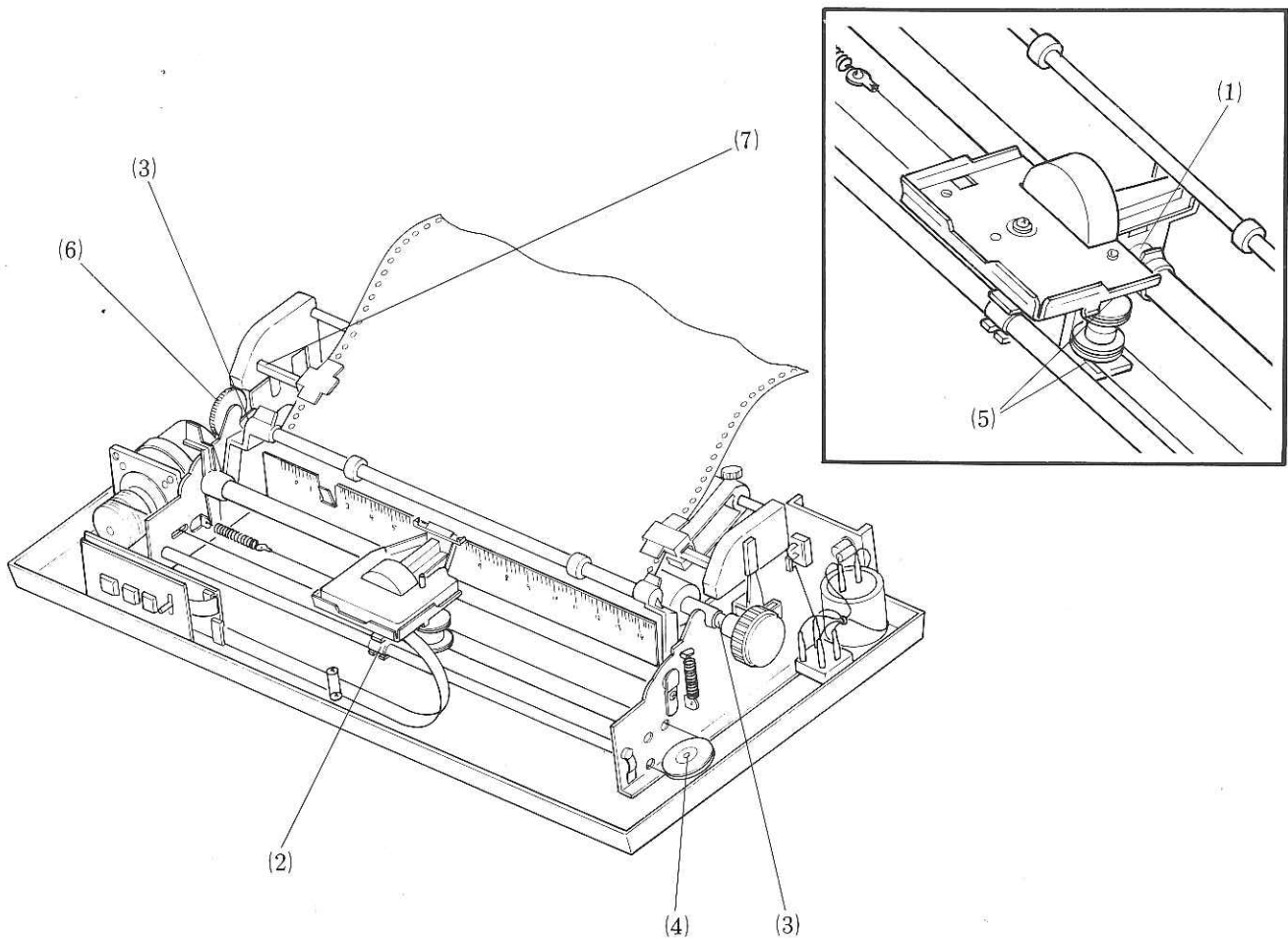


Figure 10

# IF YOU HAVE PROBLEMS

If printer fails to operate properly, try to solve the trouble by using the following table.

| SYMPTOM   | INSPECTION and ADJUSTMENT   |
|---|---|
| <p>Printer does not operate when POWER switch is turned ON.</p> <p>Printer stops before paper runs out.</p> | <ul style="list-style-type: none"> <li>• Is power cord properly connected?</li> <li>• Has fuse blown? If so, replace with same rating type (3A 250V).</li> <li>• Is paper empty switch's arm bent? If bent, correct by lightly bending to former shape.</li> <li>• Is power source voltage too low? Printer may stop if below 90% of rated voltage. Use constant voltage regulator.</li> <li>• Is carriage guide dirty? If dirty, wipe clean with soft cloth and apply high-grade Ester Lubricant Compound or high-grade sewing machine oil.</li> </ul> |
| <p>Ribbon fails to track properly.</p>  | <ul style="list-style-type: none"> <li>• Is ribbon cassette properly set?</li> <li>• Has ribbon come off from Print head ribbon guide and is loose?</li> <li>• Is ribbon so worn so that it does not feed smoothly from cassette?</li> </ul>  |
| <p>Poor print quality.<br/>(Smudging, light printing)</p>   | <ul style="list-style-type: none"> <li>• Is ribbon old and/or worn?</li> <li>• Is penetration control lever set at proper position?<br/>If not, refer to Page 5 and 7.</li> <li>• Is tip of print head dirty? If dirty, clean off with a toothpick or needle.</li> </ul>  |
| <p>Printer stops with ALERT lamp lit.</p>   | <ul style="list-style-type: none"> <li>• Is paper loaded properly?</li> <li>• Is carriage guide dirty?</li> <li>• Has some object dropped inside printer?</li> <li>• If nothing is wrong, press RESET key.</li> </ul>   |

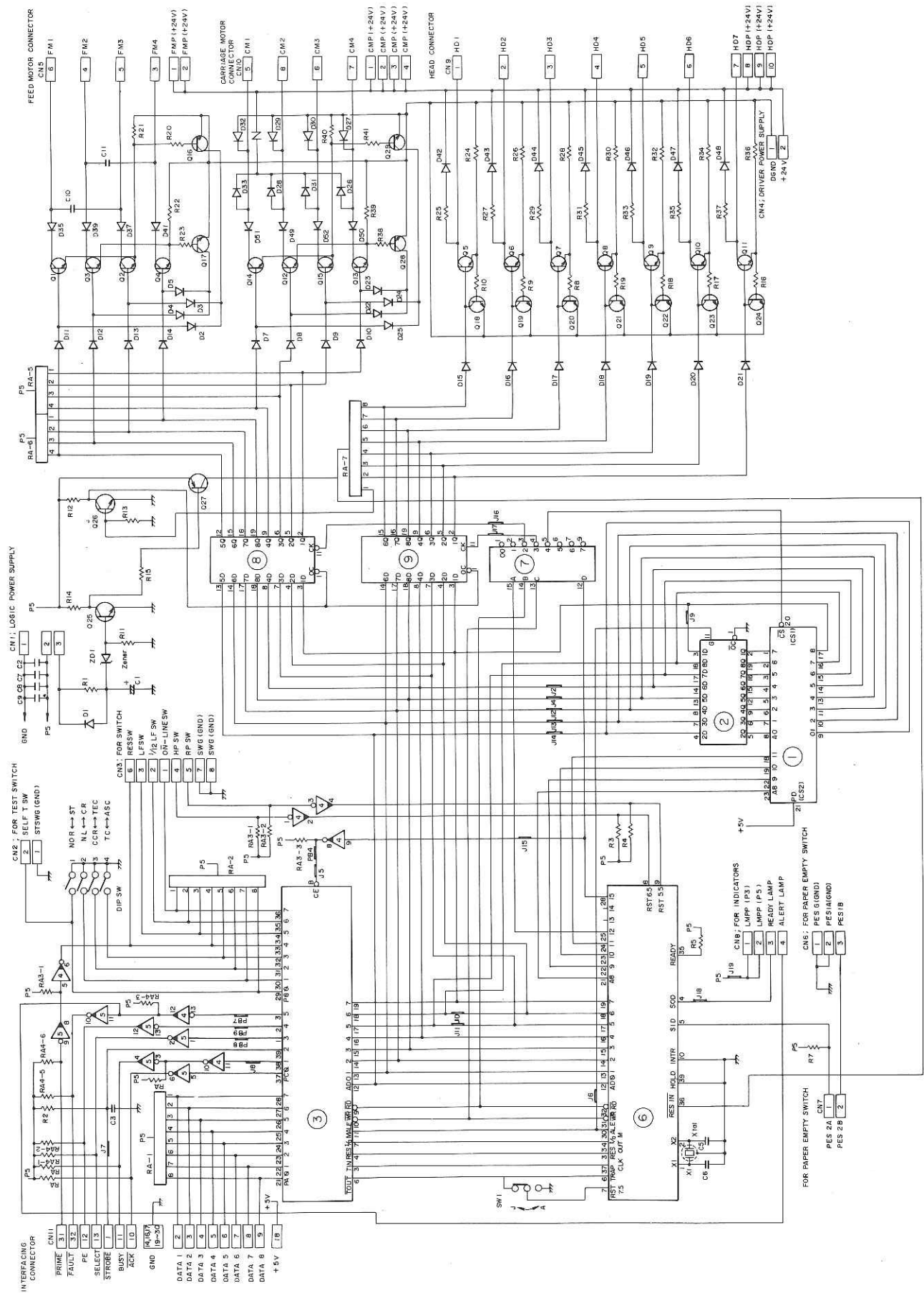
If the trouble cannot be corrected after making the above check-up and adjustment, check for secure contacts of all connectors. If the Printer Self-Test works okay, some other component in the system may be at fault. If you can't eliminate the problem, bring the unit to your Radio Shack Store or Computer Center for repair. We'll have it back to you ASAP!

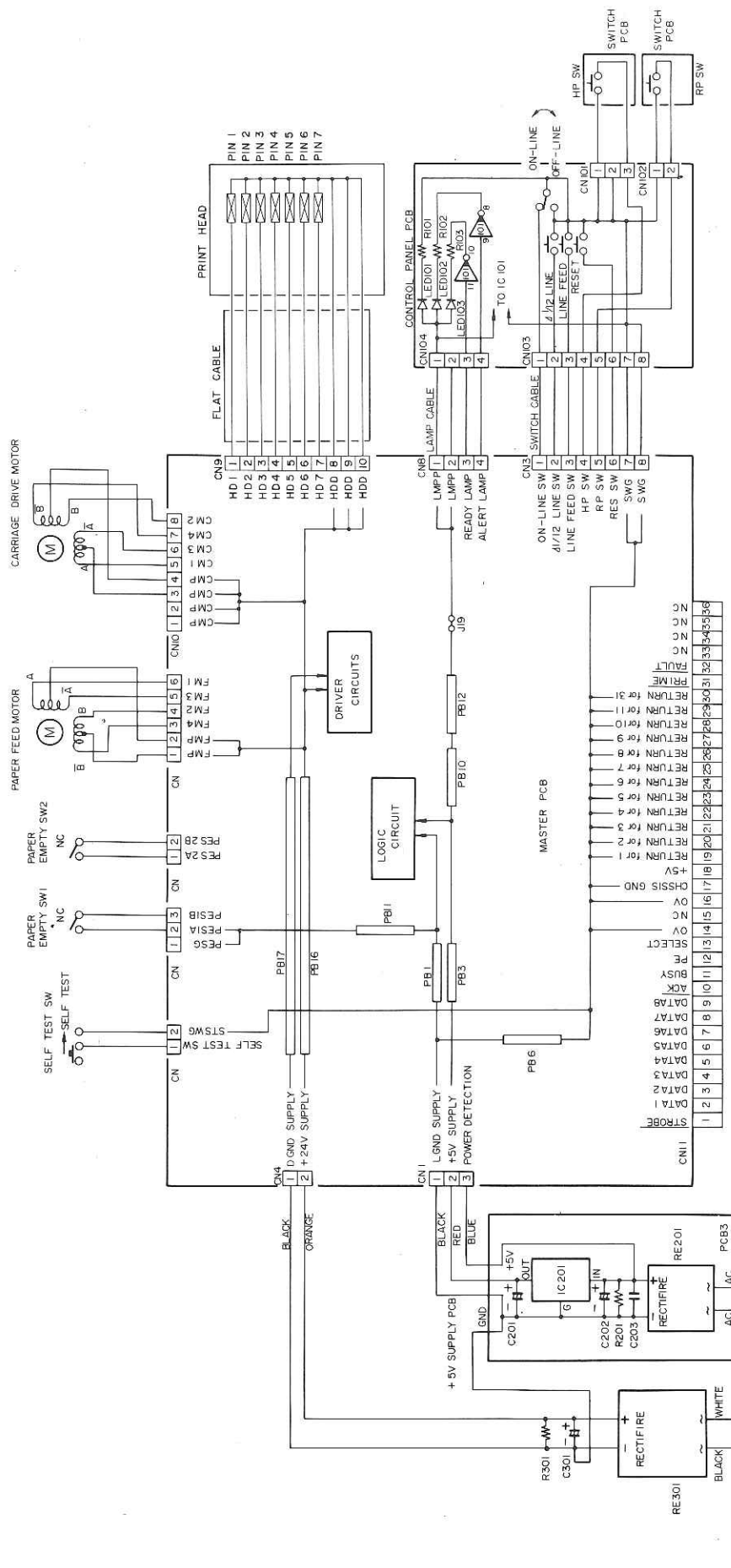


# SPECIFICATIONS

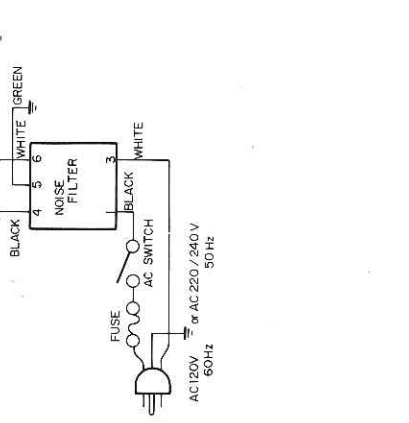
|                                   |  |                       |                       |
|-----------------------------------|--|-----------------------|-----------------------|
| <b>Printing Speed</b> .....       | Normal characters  | 100 characters/sec.   | 33 lines/min.         |
|                                   | Condensed characters   | 120 characters/sec.   | 37 lines/min.         |
| <b>Characters per Line</b> .....  | 132 maximum  |                       |                       |
| <b>Character Form</b> .....       | 9mm (wide) x 7mm (high) dot matrix   |                       |                       |
| <b>Vertical Spacing</b> .....     | 6, 8, or 12 lines per inch (software selectable)   |                       |                       |
| <b>Horizontal Spacing</b> .....   | Normal characters  | 10 per inch           | } Software selectable |
|                                   | Elongated characters   | 5 per inch            |                       |
|                                   | Condensed characters   | 15 per inch           |                       |
|                                   | Elongated condensed characters   | 7.5 per inch          |                       |
| <b>Print Head Life</b> .....      | 100 million characters   |                       |                       |
| <b>Other Mechanism Life</b> ..... | 5 million lines  |                       |                       |
| <b>Character Set</b> .....        | Modified ASCII alphanumeric characters 94,<br>European symbols 26, and graphic patterns 30 |                       |                       |
| <b>Paper Feed</b> .....           | Friction or Tractor  |                       |                       |
| <b>Interface</b> .....            | 8-bit data, 4-bit status parallel  |                       |                       |
|                                   | Expansion interface (26-1140) .....  | } for TRS-80 Model I  |                       |
|                                   | Printer interface cable (26-1411) ...  | } for TRS-80 Model II |                       |
|                                   | Printer interface cable (26-4401) ...  |                       |                       |
| <b>Temperature range</b>          |  |                       |                       |
| <b>Operating</b> .....            | 41° F (5° C) to 104° F (40° C)   |                       |                       |
| <b>Storage</b> .....              | -40° F (-40° C) to 160° F (71° C)  |                       |                       |
| <b>Humidity range</b>             |  |                       |                       |
| <b>Operating</b> .....            | 40% to 80% (No condensation)   |                       |                       |
| <b>Storage</b> .....              | 20% to 90% (No condensation)   |                       |                       |
| <b>Paper</b> .....                | Continuous business forms with sprocket holes in both sides                                |                       |                       |
|                                   | Width 4 to 15 inches (ISO/R216)  |                       |                       |
|                                   | (1) One original paper   |                       |                       |
|                                   | 88 to 132 lbs (40 to 60kg) good quality paper  |                       |                       |
|                                   | (2) Copy paper (1 original + 2 copies)   |                       |                       |
|                                   | 75 lbs (34kg) non-carbon paper   |                       |                       |
|                                   | (3) Carbon paper (two parts)   |                       |                       |
|                                   | 99 lbs (45kg) good quality paper, 38 $\mu$ carbon paper                                    |                       |                       |
| <b>Ribbon</b> .....               | Radio Shack Catalog Number 26-1418   |                       |                       |
| <b>Size</b> .....                 | 24.2"(W) x 6.3"(H) x 13.3"(D)  |                       |                       |
| <b>Power Requirements</b> .....   | 120V AC, 60Hz, Maximum 85W, 1.5A   |                       |                       |
|                                   | 220V/240V AC, 50Hz, for European/Australian models   |                       |                       |

# SCHEMATIC DIAGRAMS





INTERFACING CONNECTOR



AC 120V or AC 220 / 240 V  
60Hz 50Hz

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