TEKTRONIX®

CT 8101

PRINTING TERMINAL

USER'S

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
070-2360-00

Serial Number _____

First Printing MAY 1977

WARRANTY

The 8002 μProcessor Lab System (including options) is warranted against defective materials and workmanship under normal use and service for a period of 90 days from date of initial shipment. CRTs found to be defective within 12 months from the date of shipment will be exchanged at no charge (this does not include installation).

On site warranty repair is provided during normal working hours (for the 90-day period). Travel to the site is confined to those areas in which Tektronix states it has service facilities available for this product.

Tektronix shall be under no obligation to furnish warranty service if:

a. Attempts to install, repair, or service the equipment are made by personnel other than Tektronix service representatives.

b. Modifications are made to the hardware or software by personnel other than Tektronix service representatives.

c. Damage results from connecting the 8002 μProcessor Lab System to incompatible equipment.

Specifications and price change privileges reserved.

The following manual is prepared by Texas Instruments Incorporated for the model 743 Electronic Data Terminal and is reprinted by permission of Texas Instruments Incorporated, Houston, Texas.

Products of Tektronix, Inc. and its subsidiaries are covered by U.S. and foreign patents and/or pending patents.

PREFACE

The TEKTRONIX CT 8101 Printing Terminal is a light weight electronic printing data terminal capable of operating at speeds up to 30 characters per second. The CT 8101 Terminal is built by Texas Instruments Incorporated, Houston, Texas, especially for Tektronix, Inc. Therefore most of the instrument references throughout this user's manual are to the International Models 743 and 745 Electronic Data Terminals. In all correspondence with Tektronix Inc., regarding the CT 8101, refer to the CT 8101 rather than Model 743 or 745.

WARRANTY SERVICE

Should your CT 8101 Terminal require service during the warranty period, call the Tektronix Field Office or representative nearest you. Only Tektronix service personnel will perform repair or maintenance work under terms of the Tektronix, Inc., warranty.

THIS MANUAL

This manual is a guide to the procedures required to operate the TEKTRONIX CT 8101 Printing Terminal.

RELATED DOCUMENTS

CT 8101 Service Manual
8001 or 8002 μPROCESSOR LAB System Service Manual
8001 or 8002 μPROCESSOR LAB System User's Manual

TABLE OF CONTENTS

TABLE OF CONTENTS (Concluded)

INTRODUCTION

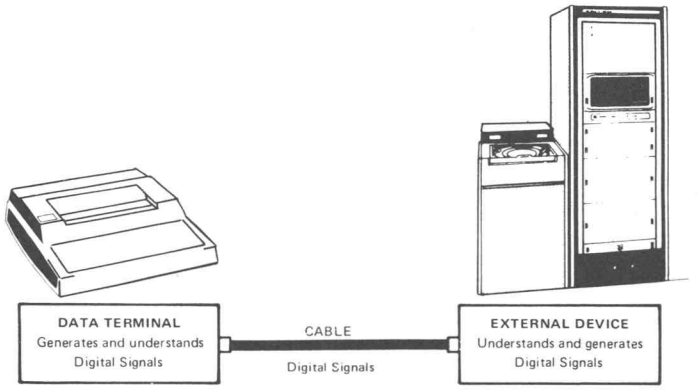
You are about to learn how to operate the Texas Instruments Silent 700® Model 743 Keyboard Send-Receive (KSR) Data Terminal. Even if you have no previous data processing or data terminal experience, you should find the Model 743 simple to operate.

What is a KSR data terminal? How does it differ from a standard typewriter?

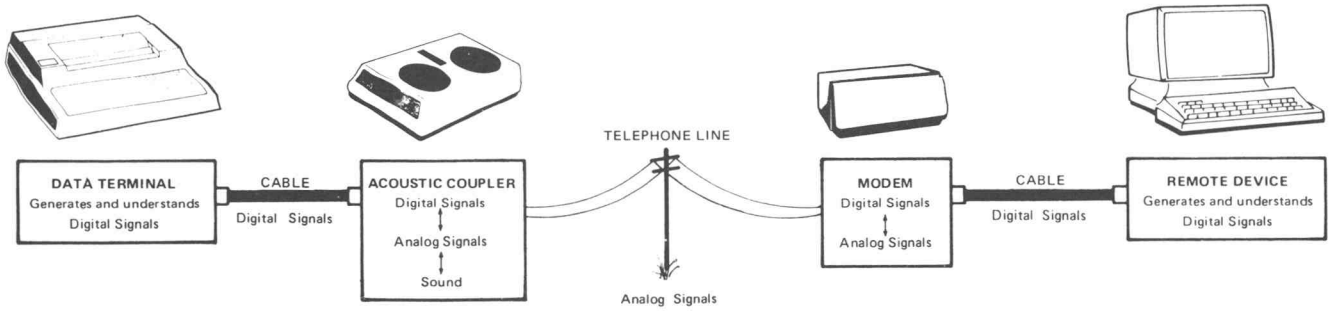
The difference between a KSR data terminal and a standard typewriter is the ability of a data terminal to generate codes through the keyboard. The codes can be transmitted to, and printed by, its own printer and/or transmitted to, and understood by, another device (data terminal, computer, data logger, CRT, etc.). The KSR also understands and prints codes received from another device.

The code system used by the Model 743 is the ASCII Code System and Character Set, commonly called ASCII (pronounced "as-key"). The ASCII Code System consists of different combinations of *ones* and *zeros* (corresponding to numbers, alphabetic letters, and symbols) which are communicated as *digital signals* (⊓⊔⊓⊔). Generally, a *one* is an *on* signal and a *zero* is an *off* signal. For example, if you look on page A-1, you will notice that a *"U"* is represented by a 1010101 (b_1 through b_7). When you depress the *U* key, the terminal generates an *on off on off on off on*. (Think of a light switch being flipped on and off.)

How are these digital signals passed from one device to another? If the distance is not too great (50 feet usually is the limit), only cables are necessary and the terminal is said to be *hard wired* to the other device. For example, when a data terminal is used as a computer console, it is usually *hard wired* to the computer.

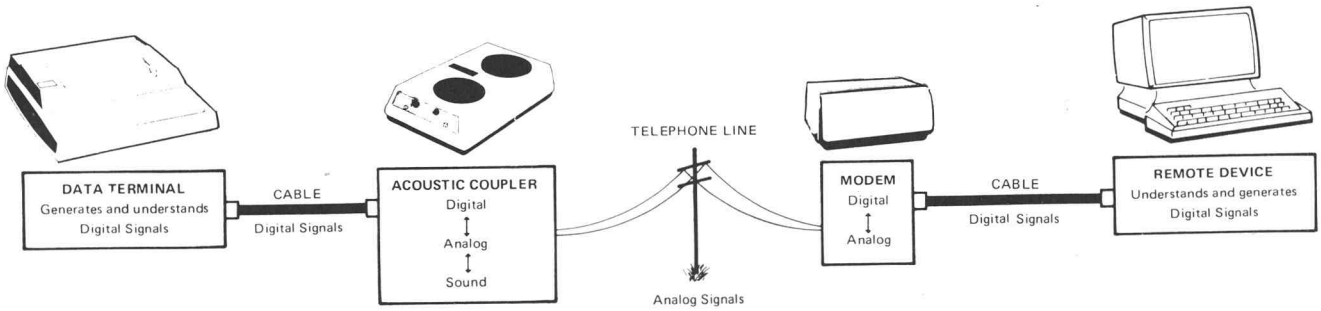


For longer distances, telephone lines often are necessary; and the digital signals (*ones* and *zeros*) must be converted to *analog signals* (∿∿∿). The device used to convert digital signals (compatible with data processing equipment) to analog signals (compatible with transmission facilities) and analog to digital is called a *modem* or *data set*. A modem can be built-into, or be external to a data terminal,



computer, data logger, CRT, etc.; a modem is required on each end of the telephone line. (By the way, if the modem is external to the terminal, the terminal is *hard wired* to the modem, and the modem will be *hard wired* to the telephone line since they are in close proximity; but the data terminal is not *hard wired* to the remote device since a telephone line separates them.)

Still another way to transmit and receive data over telephone lines is available: that is, through the use of a standard telephone handset. However, if a handset is used, the digital signals must first be converted to sound; then the sound is converted to analog signals before the data is transmitted over the telephone line. The device used for this purpose is called an *acoustic coupler*. All acoustic couplers contain a modem. An acoustic coupler also can be external or internal (built-in) to a data terminal.



The Model 743 is capable of operating in several communications configurations, depending on the optional equipment ordered. All available configurations are described in this manual.

While you are learning to operate the Model 743, you may notice another difference between it and a standard typewriter . . . the Model 743's silent printing. In fact, like most typewriters, most data terminals use impact printing techniques. The quiet, nonimpact printing of the Model 743 is achieved by a miniature five-by-seven-dot matrix of 35 tiny heating elements mounted on a solid-state printhead, which creates characters on heat-sensitive paper.

ABOUT THIS MANUAL . . .

All operators should read the GENERAL OPERATING GUIDELINES and the first three sections to become familiar with the basic operations of the Model 743. Many of the operations described in these sections are repeated in subsequent sections, but in less detail. If you will be operating the Model 743 with the optional Internal Modem or the optional Auxiliary EIA Interface Cable Kit, determine the particular configuration you will use, then read the appropriate operating instructions in Section IV. If you will be responsible for installing the Model 743, read the appropriate installation instructions in Section V. Finally, if you want to know more about the controls and keyboard, read Section VI.

NOTE

If you don't know the meaning of a technical term, you may find its definition in Appendix C.

GENERAL OPERATING GUIDELINES

1. All operating instructions in Sections I, II, III, and IV of this manual assume that the Model 743 is correctly installed in the desired configuration. If the data terminal is not installed, determine the configuration you will require and connect the terminal as described in the appropriate instructions in Section V.

2. *External device* denotes: a minicomputer, data logger, CRT, computer, plotter, or any other device which communicates with the local Model 743 over a cable (hard wired). *External modem* denotes: a modem which is hard wired to the local Model 743. *Local equipment* denotes: the Model 743, or the Model 743 with an external modem and/or an external device.

3. *Remote device* denotes: a minicomputer, data terminal, CRT, computer, data logger, plotter or any other device which communicates with the local Model 743 over telephone lines. *Remote modem*: a modem which is hard wired to the remote device. *Remote equipment* denotes: the remote device, remote modem, and any other associated data equipment.

4. *Communication line* (or simply *line*) denotes the cable or telephone line over which data is transmitted to, and received from, the Model 743.

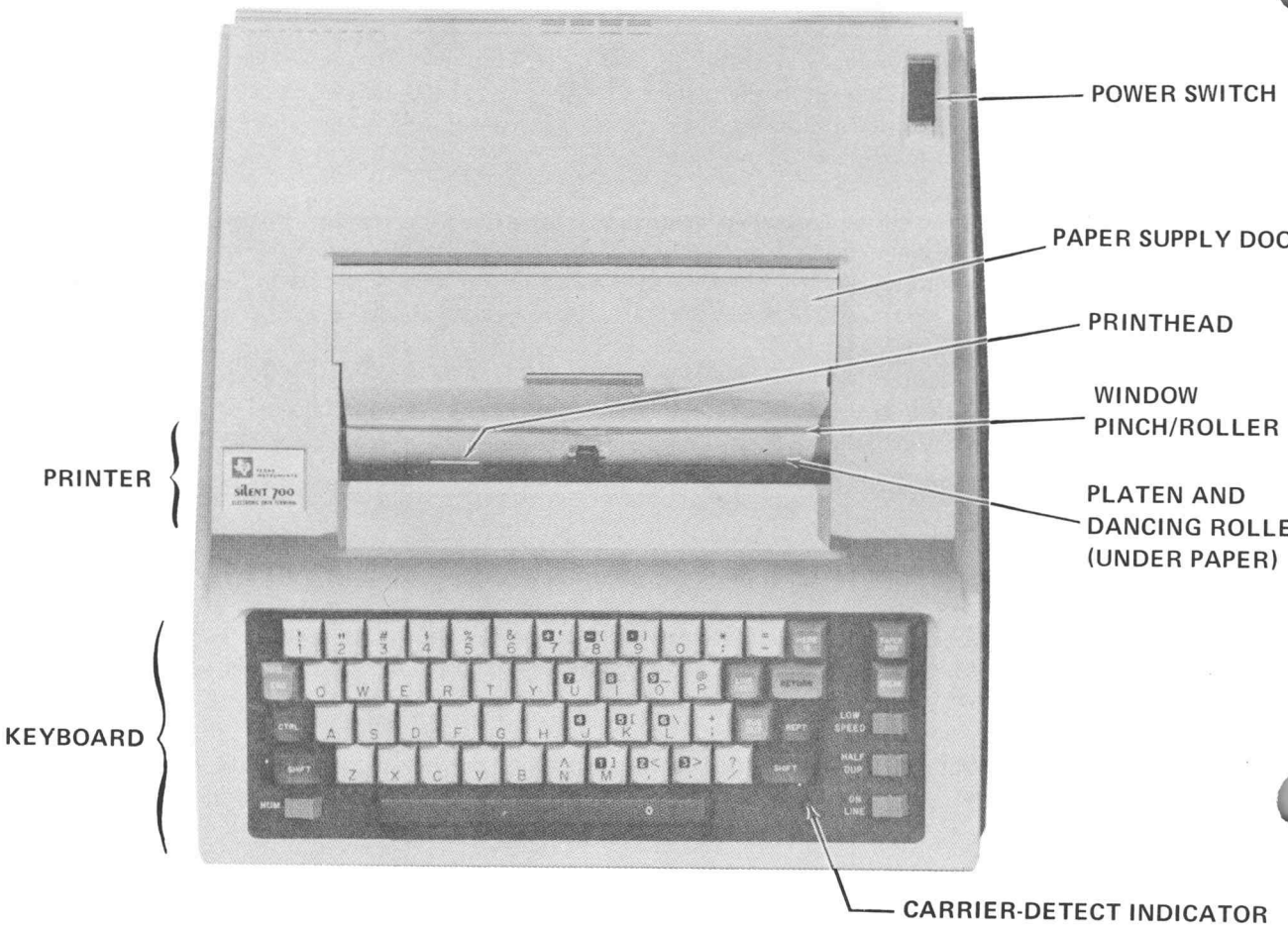
5. *Depress* means: momentarily push down the designated key and then release it. *Press* means: push down a switch until it locks. *Press and hold* means: push down and hold the key until some stated action is completed.

6. Depress the PAPER ADV key to return the printhead to the left margin and advance the paper. Use this key when you do *not* wish to generate a code to be transmitted to the communication line.

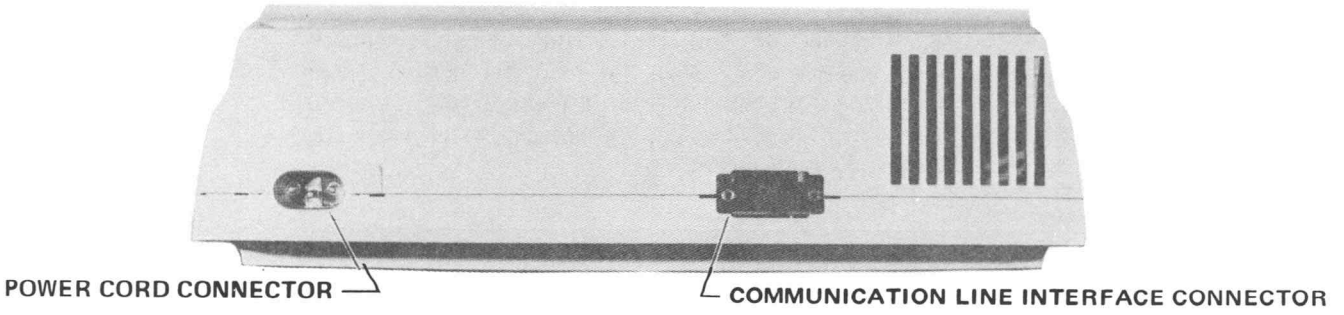
7. Depress both LINE FEED and RETURN keys at the end of a typed line when you *do* wish to generate the respective codes to be transmitted to the communication line.

NOTE

Some Model 743 Data Terminal keyboards are equipped with alternate-action keys for the LOW SPEED, HALF DUP, and ON LINE functions instead of rocker switches. Press down the desired key once to gain the labeled mode; press again to release the key.



(REAR VIEW)



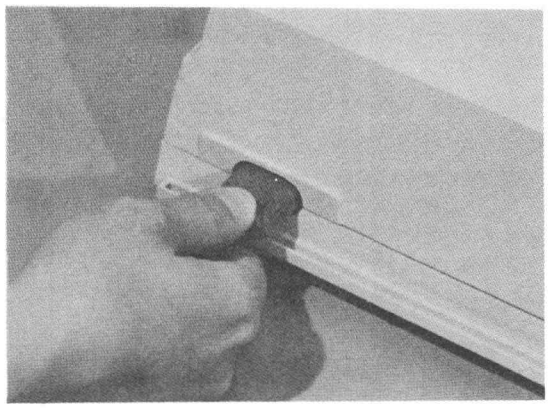
MODEL 743 KEYBOARD SEND/RECEIVE (KSR) ELECTRONIC DATA TERMINAL

SECTION I
BECOMING FAMILIAR WITH THE MODEL 743

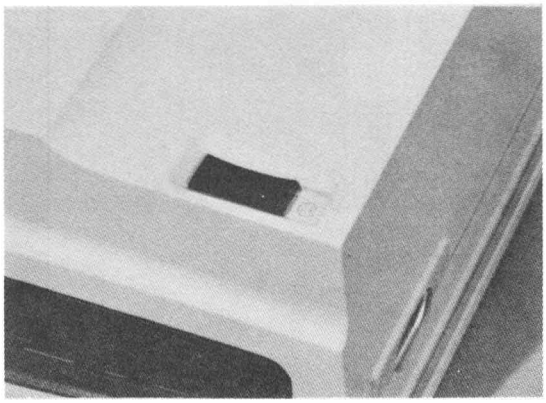
Connect the Model 743 to the communication line as described in Section V of this manual before attempting on-line communications. However, to practice using the terminal and its controls, it is not necessary to connect any communication lines.

SWITCHING THE TERMINAL ON AND OFF

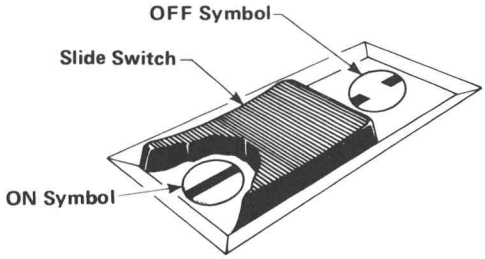
1. Check that the power cord is plugged into the terminal and wall outlet.



2 To switch on the terminal, slide the power switch, located on the top right rear corner of the terminal, toward the *rear* of the terminal.



3 To switch off the terminal, slide the power switch toward the *front* of the terminal.

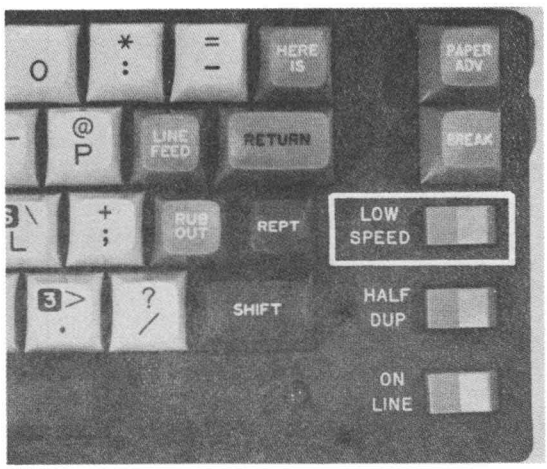


SETTING THE PRINTING SPEED

Determine whether you will be transmitting and receiving data at 10 or 30 characters-per-second, then set the terminal printing speed to the same rate as follows:

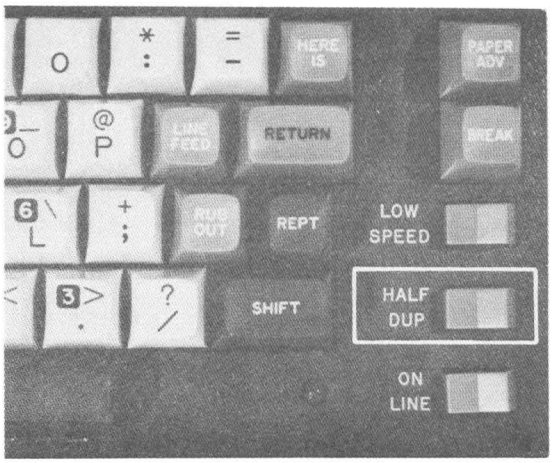
1. Press the left side of the LOW SPEED switch (to the LOW SPEED position) to set the printing speed to 10 characters-per-second.

2. Press the right side of the LOW SPEED switch to set the printing speed to 30 characters-per-second



SETTING THE TERMINAL TO HALF- AND FULL-DUPLEX

As generally defined in the computer industry, *half duplex* describes the mode in which a device is capable of transmitting and receiving data, but *not* simultaneously; *full duplex* describes the mode in which a device transmits and receives data simultaneously. Typically, when a data terminal is set to the *full duplex* mode, data typed on the keyboard is transmitted, but not printed by its printer (or other output device). Since the Model 743 is capable of transmitting and receiving data simultaneously, *full duplex* is defined as *full duplex operation with no local printout of transmitted data*, and *half duplex* is defined as *full duplex operation with local printout*. Therefore, when the Model 743 is in the *half duplex* mode, all data entered via the keyboard is transmitted, even when the printer is busy printing received data. Determine whether or not you want local printout of transmitted data, then set the HALF DUP key accordingly.

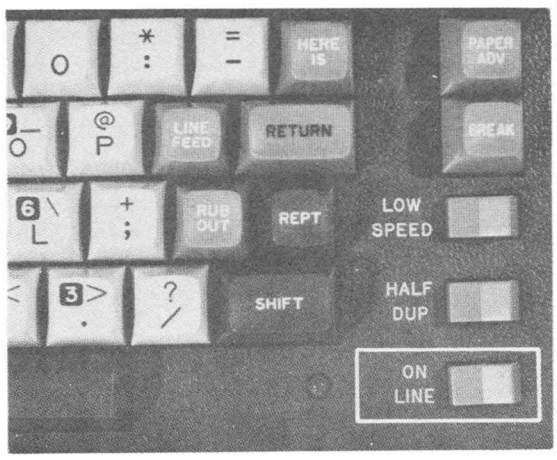


1. To set the terminal to the half-duplex mode, press the left side of the HALF DUP switch (to the HALF DUP position).

2. To set the terminal to the full-duplex mode, press the right side of the HALF DUP switch.

SETTING THE TERMINAL TO ON-LINE AND LOCAL

Whether you use the Model 743 in a hard wired configuration or over a telephone line, it must be internally connected to the communication line so that it can communicate with the external or remote device. Otherwise, it only communicates with itself and merely is an electronic typewriter. When the terminal is connected to the line, it is said to be *on-line*; if it is not, it is said to be in the *local* mode.



1. To connect the terminal to the communication line (*on-line*), press the left side of the ON LINE switch (to the ON LINE position).

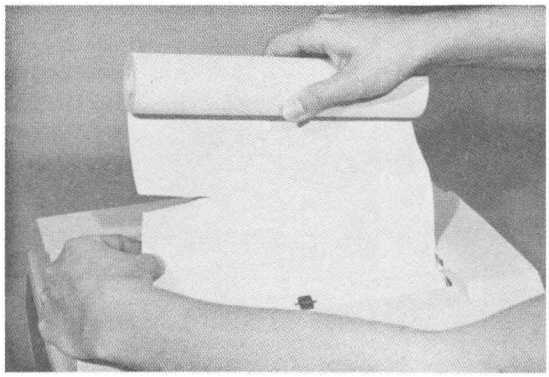
2. To disconnect the terminal from the communication line (*local*), press the right side of the ON LINE switch.

LOADING PAPER

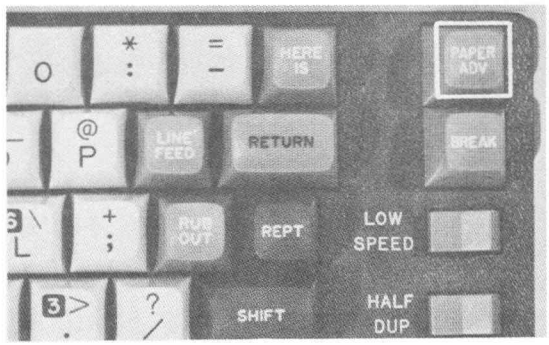
1. Switch the terminal power ON.

2. Lift the paper door.

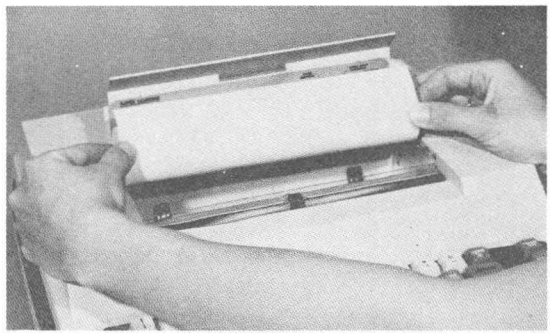
3. If a usable amount of paper remains on the paper supply roll, grasp the used roll and lift it from the paper compartment. Tear the paper halfway between the roll and the dancing roller, then remove the roll. If no paper remains, simply remove the empty core.



4. Press and hold the PAPER ADV key so that any remaining paper is ejected from the paper chute.

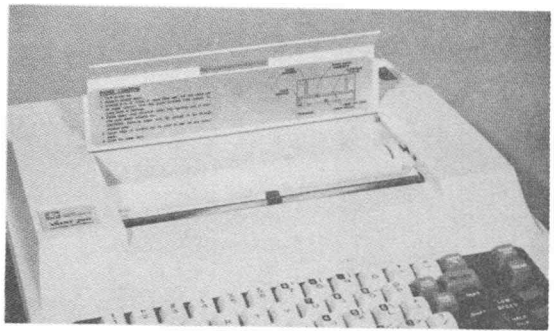


5. Grasp the new paper roll so that the loose end of the paper is toward you with the end pointing up.

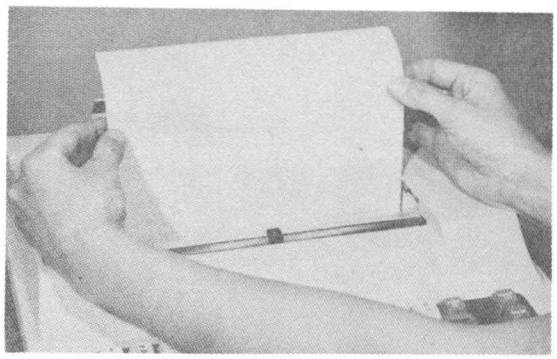


IMPORTANT NOTE

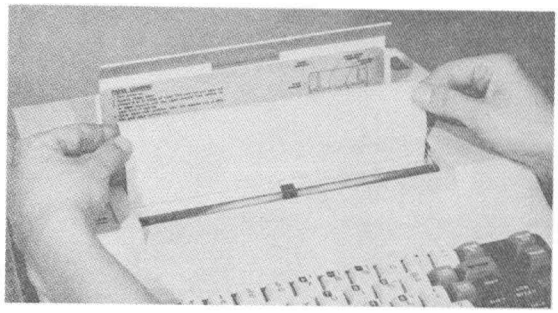
The warranty and/or service contract on the thermal printhead is subject to nullification if the thermal printing paper used in the Silent 700 Data Terminal does not meet TI Specification 972603-0001.



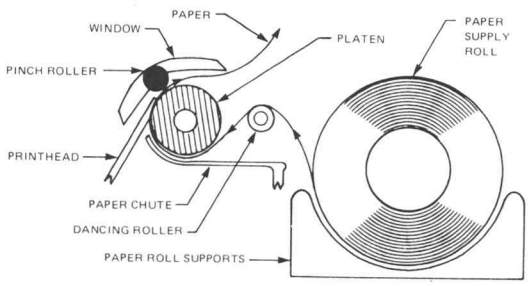
6. Place the paper roll on the paper roll supports, checking that the roll can rotate freely.



7. Grasp both corners of the loose end of the paper and gently pull up about 6 inches.



8. Feed the paper over the dancing roller and down through the paper chute until it appears behind the window. The paper will not slide behind the printhead because the printhead is pressed against the platen.



(SIDE VIEW)

9. Press and hold the PAPER ADV key until the paper feeds behind the printhead, then under the window.

NOTE

If the paper does not feed freely, gently push the paper down the paper chute and simultaneously press and hold the PAPER ADV key.

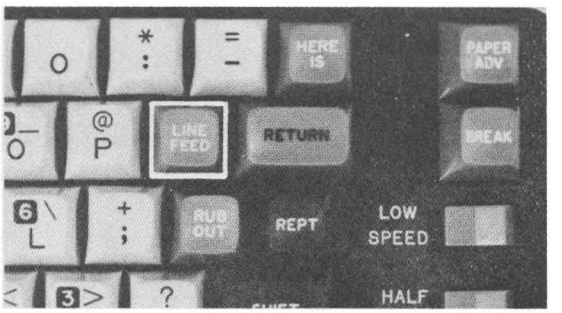
10. Tear off the excess paper by pulling forward over the tear off edge of the window.

11. Close the paper door and switch terminal power OFF, then ON (to initialize the electronics).

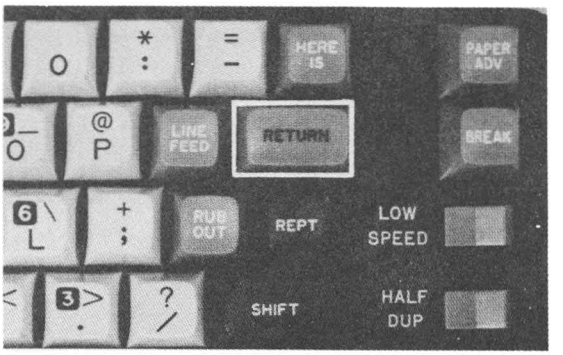
TYPING ON THE KEYBOARD

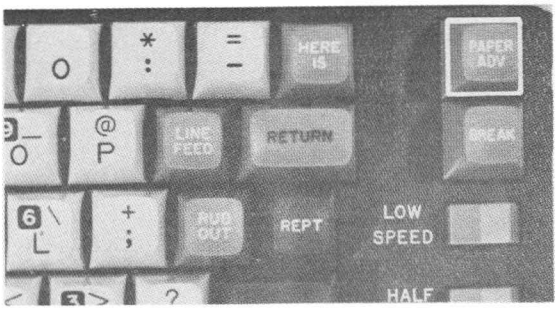
Briefly study the keyboard and note the similarities and differences from the keyboard to which you may be accustomed. For example, you must depress both the LINE FEED and RETURN keys on the Model 743 keyboard to accomplish the same action as a RETURN key on a standard typewriter. The NUM switch, unavailable on standard typewriter keyboards, permits you to use the "shadow box" numeric keypad on the Model 743 for fast entry of numbers. Finally, the CTRL key, when pressed and held in conjunction with one of the other keys, generates *control characters* which may initiate actions locally and/or remotely.

1. Depress the LINE FEED key to advance the printhead vertically one line; the printhead will not return to the left hand margin.

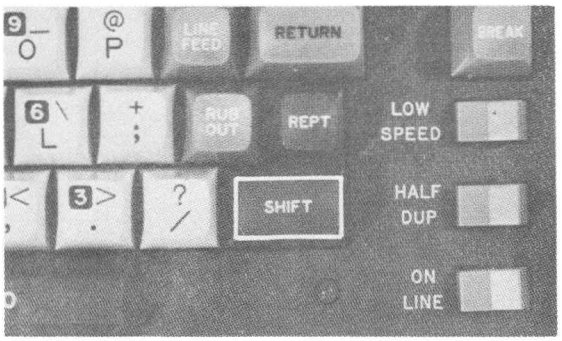


2. Depress the RETURN key to return the printhead to the left hand margin.

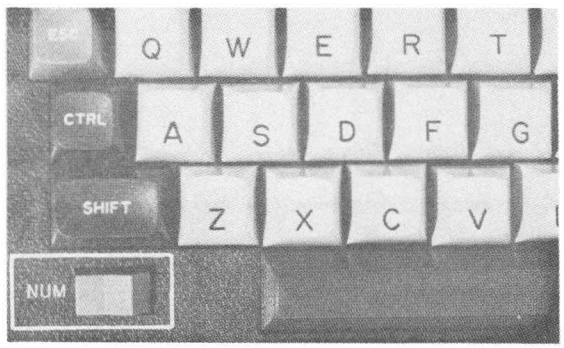




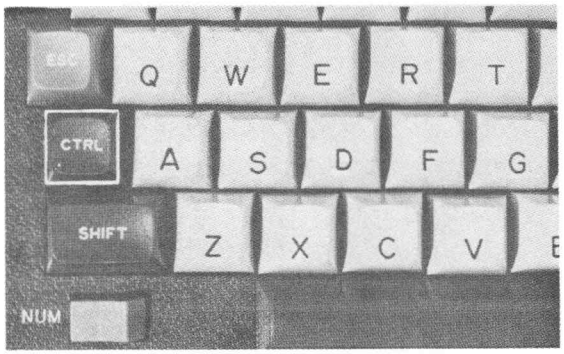
3. Press and hold the PAPER ADV key to return the printhead to the left margin, then continuously line feed as long as the key is pressed. Since the PAPER ADV key does not generate a code, use it when you want to perform line feed and carriage return actions locally and not transmit their corresponding codes to the line.



4. Press and hold the SHIFT key while simultaneously depressing one of the keys marked with two or more characters, to print the upper character on the key (except the "shadow box" numbers).



5. Press the left side of the NUM switch (to the NUMeric position) to print/generate the "shadow box" numbers. Note that the "0" (zero) is on the space bar.

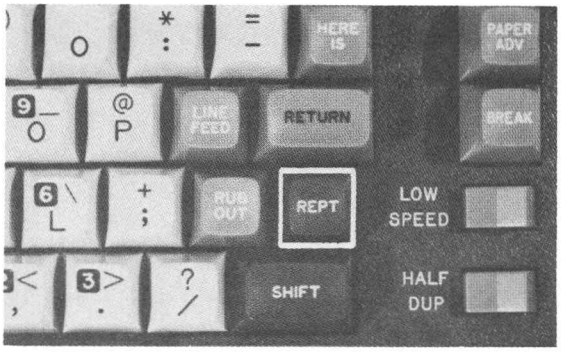


6. Press and hold the CTRL key while simultaneously depressing one of the alphabetic keys or the - , . / keys to generate the ASCII control characters (see page A-1).

NOTE

For practice, depress the G, H, J, and M keys in conjunction with the CTRL key to see what actions are performed. These four control characters are the only ones that initiate some action by the Model 743's printer when generated by the keyboard or received from the line. However, other control characters, when transmitted to an external or remote device may initiate some action in that device.

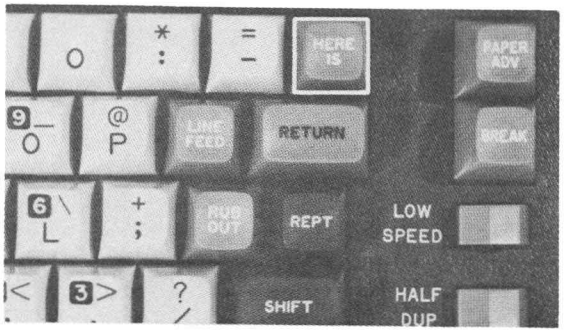
7. Press and hold the REPT key while momentarily depressing another key to repeat a character.



8. Depress the HERE IS key to transmit the contents of the answer-back memory (if this option is installed in your Model 743).

NOTE

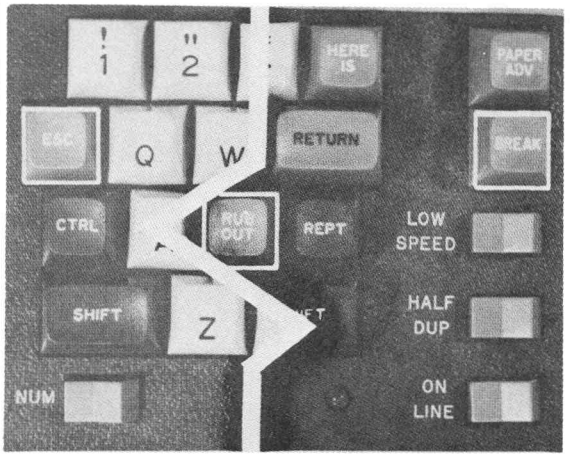
To protect proprietary data and/or to prevent entry of erroneous data, many systems are designed to check each data terminal attempting to establish communications to determine if the terminal is authorized to communicate. One method of making such a check is to install an answer-back memory, which can contain up to 21 predefined ASCII characters, into each authorized terminal. When a particular terminal attempts to establish communications, the remote equipment can check the contents of the answer-back memory to verify that the terminal is authorized to communicate with the system.



9. Depress the ESC, RUBOUT, and BREAK keys when your system requires their corresponding codes.

NOTE

In some systems the codes generated by these keys have special meaning. Check their significance to your system.

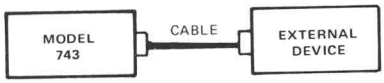


SECTION II
OPERATING THE MODEL 743 WITH NO OPTIONAL EQUIPMENT

If you will be operating the Model 743 with a standard EIA interface or a standard dc-current loop interface, but without any optional equipment (except the answer-back memory), follow the operating instructions in this section. Even if you will be operating the Model 743 with optional equipment, study this section, since most basic terminal operations are described.

OPERATING THE TERMINAL WITH AN EXTERNAL DEVICE (EIA)

Perform the following instructions if you will be operating the Model 743 with an external device (e.g., minicomputer, CRT, data logger, or computer), but not transmitting/receiving over a telephone line. A typical example is the use of the Model 743 as a console to a minicomputer, where the terminal is the means of input and output to the minicomputer.



Terminal Setup

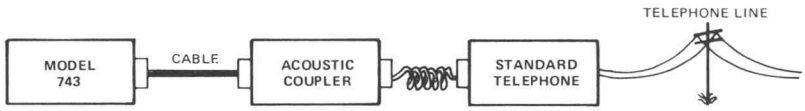
1. If the Model 743 is not connected to the external device, ensure that it is installed as described on page 27 if you will be using an EIA interface, or on page 28 if you will be using a dc-current loop interface.
2. Switch the terminal power ON.
3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.
4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.
5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.
6. Set the terminal to ON-LINE.
7. Set all necessary controls on the external device.

Operation

8. Begin communications according to your system's procedures.

OPERATING THE MODEL 743 WITH AN EXTERNAL ACOUSTIC COUPLER

If you will be using the Model 743 to transmit data to, and receive data from, the telephone line via an external acoustic coupler, perform all of the following steps.



Terminal Setup

1. If the Model 743 is not connected to the external acoustic coupler, ensure that it is installed as described on page 27 if you will be using an EIA interface, or on page 28 if you will be using a dc-current loop interface.

2. Switch the terminal power ON.

3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.

4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.

5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.

6. Set all necessary controls on the external acoustic coupler.

Operation

The following instructions are general and may vary from one model acoustic coupler to another.

7. Set the Model 743 to the *local* mode (off-line) by pressing the right side of the ON LINE switch.

8. Pick up the telephone handset and dial the appropriate number; an audible high frequency signal (data tone) can be heard when the call is answered.

9. As soon as you hear the data tone, place the telephone handset into the acoustic coupler muffs as described in the operator's manual for the acoustic coupler. The acoustic coupler will, in turn, transmit a data tone to the remote modem or acoustic coupler.

10. Immediately set the Model 743 to the *on-line* mode (by pressing the left side of the ON LINE switch) to connect the terminal to the remote device. When the connection is complete, the small

green lamp (called the *carrier detect* indicator) located on the keyboard, will illuminate

NOTE

If the carrier detect lamp goes out, communications have been lost, and you must return to step 7.

11. Begin communications according to your system's procedures.

NOTE

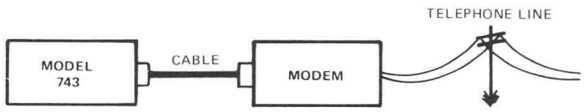
After prolonged operation the carbon particles in the telephone handset may settle, causing data errors. If this occurs, rap the handset several times in the palm of your hand.

12. If required, press the Model 743 HERE IS key to transmit the contents of the answer-back memory.

13. When you are finished, terminate communications according to your system's procedures, set the Model 743 to *off-line,* then remove the telephone handset from the acoustic coupler muffs and replace it in its cradle.

OPERATING THE TERMINAL WITH AN EXTERNAL MODEM

If you will be using the Model 743 with an external modem to transmit data to, and receive data from, the remote device, determine whether the modem will *originate* or *answer* the data call. If the external modem will answer the call, perform only steps 1 through 7; communications will be established automatically. If the terminal will originate the call, determine whether you will be operating with or without a data access arrangement (DAA), then perform the appropriate steps below.



Terminal Setup

1. If the Model 743 is not connected to the external modem, ensure that it is installed as described on pages 27 through 29.

2. Switch the terminal power ON.

3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.

4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.

5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.

6. Set the terminal to ON LINE.

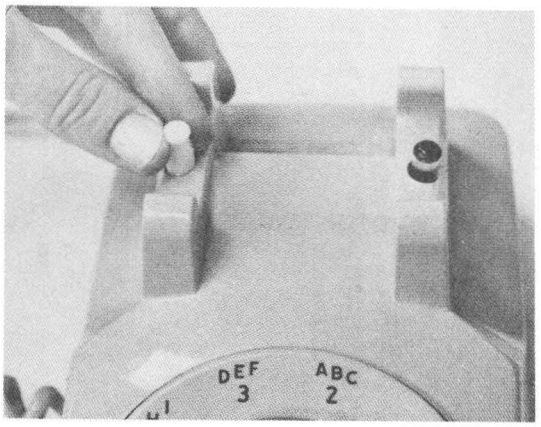
7. Set all necessary controls on the external modem.

Operation With a DAA

The DAA installed by the telephone company may operate in one of two ways, depending on how the white DATA key on the telephone cradle is wired. If you hear a dial tone when you pick up the handset from the cradle, proceed as follows . . .

8. Pick up the telephone handset and dial the appropriate number; an answer tone can be heard when the call is answered.

9. Lift up the white DATA key on the telephone cradle when the answer tone begins.



10. Place the handset on the table and proceed to step 14 below.

CAUTION

Do not hang up the handset or you will terminate the connection.

-OR-

. . . if you *do not* hear a dial tone when you pick up the handset, proceed as follows . . .

11. Lift up the white DATA key on the telephone cradle and wait for a dial tone.

12. Dial the appropriate number; an answer tone will be heard when the call is answered.

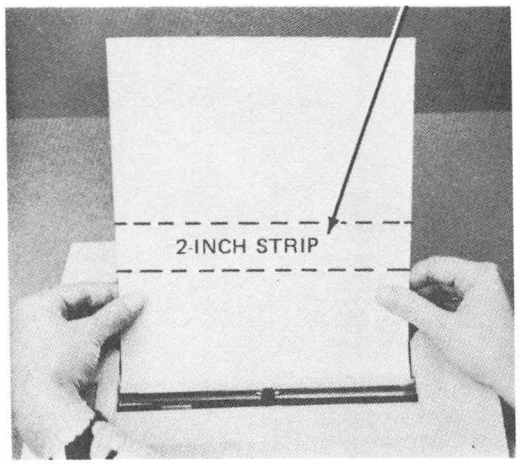
13. Replace the handset on the telephone cradle.

14. When the connection is complete (the *carrier detect* lamp will illuminate), begin communications according to your system's procedures.

15. If your system requires, press the keyboard HERE IS key to transmit the contents of the answer-back memory.

SECTION III
CLEANING AND ADJUSTING THE MODEL 743

Wet with denatured alcohol



CLEANING THE PRINTHEAD

The printhead should be cleaned each time a new roll of thermal paper is loaded into the terminal. Clean more often if the printed image begins to fade because of residue accumulating on the printhead.

1. Remove all thermal paper from the paper chute (refer to page 7).

2. Using denatured alcohol, wet a 2-inch wide strip across a sheet of good quality bond paper. Insert the sheet down the paper chute in the same manner as described for the thermal paper on page 9.

NOTE

Denatured alcohol is available from TI in pint containers (TI Part No. 230007-0000).

3. Print five lines on the bond paper across the 2-inch strip wetted with alcohol. Use the REPT key to accelerate the process. Then advance the paper to a dry area and print two more lines.

NOTE

The printhead will not print a visible image on the bond paper.

4. Press and hold the PAPER ADV key until the bond paper is ejected from the paper chute.

CLEANING THE CASE

Use a soft, damp cloth or sponge and any nonabrasive household-type detergent to clean the exterior surfaces of the Model 743 case. Take care not to spill liquids on any electrical components: short-circuits could result.

ADJUSTING THE PRINT CONTRAST

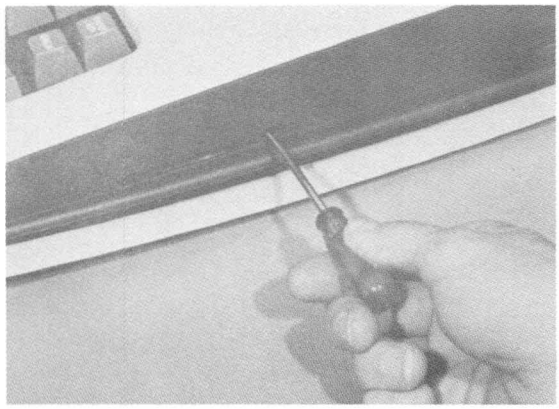
You will probably never have to adjust the printing contrast since it is preset at the factory for optimum clarity. But if the contrast has been changed and you want a darker or lighter image, here's how to adjust.

1. For *darker* print insert a small standard screwdriver into the hole marked CONTRAST located on the right side of the terminal; then rotate the screwdriver clockwise (toward *D*), while printing characters from the keyboard, until the printed image is dark enough.

   NOTE

   If the print blurs, you've rotated the screwdriver too far. If so, adjust it to a lighter print.

2. For *lighter* print rotate the screwdriver counterclockwise (toward *L*), while printing characters from the keyboard, until the printed image is light enough.



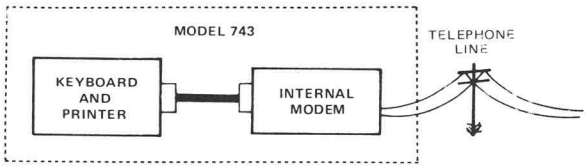
SECTION IV
OPERATING THE MODEL 743 WITH OPTIONAL EQUIPMENT

Basically, there are two parts to the Model 743: keyboard and printer. These two parts interconnect and operate in conjunction with one another. When the optional Internal Modem is installed in the terminal, it is interconnected to the keyboard and printer and all three parts operate in conjunction. However, when the optional Internal Modem *and* optional Auxiliary EIA Interface Cable Kit are ordered with the terminal, the keyboard and printer are disconnected from the modem. This permits the keyboard and printer to be connected to an external device and/or modem, and the internal modem to be connected to an external device.

This section describes the variety of configurations made possible by use of (1) the optional Internal Modem and (2) the optional Internal Modem and the optional Auxiliary EIA Interface Cable Kit.

OPERATING THE TERMINAL WITH THE OPTIONAL INTERNAL MODEM

Perform the following steps if you will be using the Model 743 with the optional Internal Modem to transmit data to, and receive data from, the remote device. Since the modem is an *originate* modem, you will do the calling.



Terminal Setup

1. If the Model 743 is not connected to the telephone line, ensure that it is installed as described on page 29.
2. Switch the terminal power ON.
3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.
4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.
5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.
6. Set the terminal to ON LINE.

Operation

The DAA installed by the telephone company may operate in one of two ways, depending on how the white DATA key on the telephone cradle is wired. If you hear a dial tone when you pick up the handset from the cradle, proceed as follows . . .

7. Pick up the telephone handset and dial the appropriate number; an answer tone can be heard when the call is answered.

8. Lift up the DATA key (white) on the telephone cradle when the answer tone begins.

9. Place the handset on the table and proceed to step 13 below.

CAUTION

Do not hang up the handset or you will terminate the connection.

-OR-

. . . if you *do not* hear a dial tone when you pick up the handset, proceed as follows . . .

10. Place the handset on the table and proceed to step 14 below.

11. Lift up the white DATA key on the telephone cradle and wait for a dial tone.

12. Dial the appropriate number; an answer tone will be heard when the call is answered.

13. When the connection is complete (the carrier detect lamp will illuminate), begin communications according to your system's procedures.

NOTE

If the carrier detect lamp goes out, communications have been lost and you must return to step 7.

14. If required, press the Model 743 HERE IS key to transmit the contents of the answer-back memory.

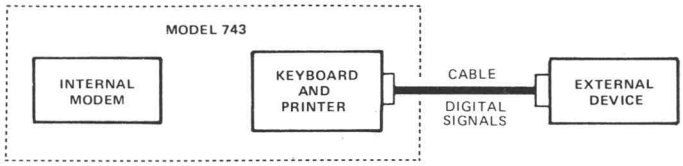
15. When you are finished, terminate communication according to your system's procedures, then hang up the handset.

OPTIONAL INTERNAL MODEM AND OPTIONAL AUXILIARY EIA INTERFACE CABLE KIT

The Model 743 must be equipped with the optional Internal Modem to permit addition of the optional auxiliary EIA Interface Cable.

OPERATING THE TERMINAL WITH THE OPTIONAL INTERNAL MODEM AND AN EXTERNAL DEVICE – CONFIGURATION I

At times you may want to disconnect the Model 743 from the telephone line and use its keyboard and printer, but not its modem. A typical example is the use of the Model 743 as a console to a minicomputer, where the terminal is the means of input and output to the minicomputer.



Terminal Setup

1. If the Model 743 is not connected to the external device, ensure that it is installed as described on page 31.
2. Switch the terminal power ON.
3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.
4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.
5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.
6. Set the terminal to ON LINE.
7. Set all necessary controls on the external device.

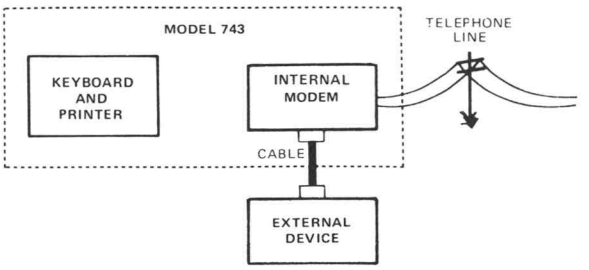
Operation

8. Begin communications according to your system's procedures.

OPERATING THE TERMINAL WITH THE OPTIONAL INTERNAL MODEM AND AN EXTERNAL DEVICE – CONFIGURATION II

If you have an external device equipped with its own keyboard and printer, but no means of communicating with a remote device over the

telephone line, you may want to "borrow" the Model 743's internal modem on a temporary basis. For example, a video terminal may normally be *hard wired* to a computer, but occasionally needs to be put *on line* to a remote device.



Terminal Setup

1. If the Model 743 is not connected to the external device, ensure that it is installed as described on page 31.

2. Switch the terminal power ON.

3. Set all necessary controls on the external device.

Operation

The DAA installed by the telephone company may operate in one of two ways, depending on how the white DATA key on the telephone cradle is wired. If you hear a dial tone when you pick up the handset from the cradle, proceed as follows . . .

4. Pick up the telephone handset and dial the appropriate number; an answer tone can be heard after the call is answered.

5. Lift up the DATA key (white) on the telephone cradle when the answer tone begins.

6. Place the handset on the table and proceed to step 10 below.

CAUTION

Do not hang up the handset or you will terminate the connection.

–OR–

. . . if you *do not* hear a dial tone when you pick up the handset, proceed as follows . . .

7. Lift up the white DATA key on the telephone cradle and wait for a dial tone.

8. Dial the appropriate number; an answer tone will be heard when the call is answered.

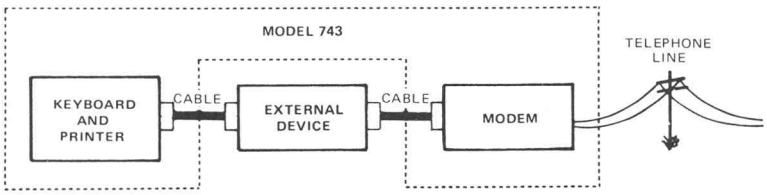
9. Replace the handset on the telephone cradle.

10. When the connection is complete, begin communications according to your system's procedures.

11. When you are finished, terminate communications according to your system's procedures, then hang up the handset.

OPERATING THE TERMINAL WITH THE OPTIONAL INTERNAL MODEM AND AN EXTERNAL DEVICE – CONFIGURATION III

At times you may want to use the Model 743 with an external device (such as a magnetic tape cassette recorder, data logger, CRT, plotter, or a minicomputer), using all three parts of the terminal. For example, with a cassette recorder connected to the terminal, you can type data on the keyboard, store it on cassette tape, then transmit the data to a remote computer via the terminal's modem either simultaneously or at a later time. Or, data can be received from the remote computer via the internal modem, stored on cassette tape, then printed either simultaneously or at a later time. Typically, if an external device has data storage capability, when data is received from the input device (keyboard), it will be transmitted at a later time. When an external device has no storage capability, all operations must occur simultaneously.



Terminal Setup

1. If the Model 743 is not connected to the external device, ensure that it is installed as described on page 31.

2. Switch the terminal power ON.

3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.

4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.

5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.

6. Set all necessary controls on the external device.

Operation

Operation of the Model 743 will differ slightly, depending on whether you want data to be transmitted to the telephone line via the internal modem at the same time or at a later time than it is received from the keyboard; and whether you want data to be printed via the printer at the same time or at a later time than it is received from the line via the internal modem.

To Transmit Data to the Line at the Same Time You Type it From the Keyboard:

7. Set up the external device to receive data from the terminal's keyboard and to transmit data to the line via the terminal's modem.

8. Set the Model 743 to ON LINE.

9. Complete communications as described below, beginning at step 23.

10. Type the data on the Model 743 keyboard; the data will be transmitted to the external device, then to the line.

To Print Data on the Printer at the Same Time it is Received From the Line:

11. Set up the external device to receive data from the line via the terminal's modem and to transmit data to the terminal's printer.

12. Set the Model 743 to ON LINE.

13. Complete communications as described below, beginning at step 23; the data will be received by the external device, then printed on the terminal's printer.

To Transmit Data to the Line at a Later Time Than You Type it From the Keyboard:

14. Set up the external device to receive data from the terminal's keyboard.

15. Set the Model 743 to ON LINE.

16. Type the data on the Model 743 keyboard; the data will be transmitted to the external device and stored.

17. When you are ready to transmit the data to the line, set up the external device to transmit data to the line via the Model 743 modem.

18. Complete communications as described below, beginning at step 23; the data will be transmitted to the line by the external device when transmission is initiated.

To Print Data on the Printer at a Later Time Than it is Received From the Line:

19. Set up the external device to receive data from the line via the Model 743 modem.

20. Complete communications as described below, beginning at step 23; the data will be stored by the external device when received from the line.

21. When you are ready to print the data, set up the external device to transmit data to the Model 743 printer.

22. Set the Model 743 to ON LINE; the data will be printed by the terminal's printer when transmission is initiated.

To Complete Communications

The DAA installed by the telephone company may operate in one of two ways, depending on how the white DATA key on the telephone cradle is wired. If you hear a dial tone when you pick up the handset from the cradle, proceed as follows . . .

23. Pick up the telephone handset and dial the appropriate number; an answer tone can be heard when the call is answered.

24. Lift up the DATA key (white) on the telephone cradle when the answer tone begins.

25. Place the handset on the table.

CAUTION

Do not hang up the handset or you will terminate the connection.

-OR-

. . . if you *do not* hear a dial tone when you pick up the handset, proceed as follows . . .

26. Lift up the white DATA key on the telephone cradle and wait for a dial tone.

27. Dial the appropriate number; an answer tone will be heard when the call is answered.

28. Replace the handset on the telephone cradle.

29. When the connection is complete, begin communications according to your system's procedures.

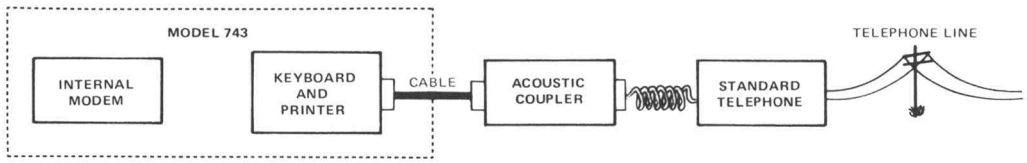
30. If required, press the HERE IS key to transmit the contents of the answer-back memory.

NOTE

When you are finished, terminate communications according to your system's procedures.

OPERATING THE MODEL 743 WITH THE OPTIONAL INTERNAL MODEM AND AN EXTERNAL ACOUSTIC COUPLER

When you want to move the Model 743 to a location where there is no access to the telephone line for a modem, but an acoustic coupler and a standard telephone are available, perform the following steps to establish communications.



Terminal Setup

1. If the Model 743 is not connected to the external acoustic coupler, ensure that it is installed as described on page 32.

2. Switch the terminal power ON.

3. Open the paper door and check that the terminal is properly loaded with a sufficient supply of TI Silent 700 printing paper.

4. Set the printing speed (LOW SPEED switch) to 10 or 30 characters-per-second according to your system's requirements.

5. Set the operating mode to half- or full-duplex (HALF DUPlex switch) according to your system's requirements.

6. Set all necessary controls on the external acoustic coupler.

Operation

The following instructions are general and may vary from one acoustic coupler to another.

7. Press the right side of the ON LINE switch to place the Model 743 in the *local* mode (off line).

8. Pick up the telephone handset and dial the appropriate number; an audible high frequency signal (data tone) can be heard when the call is answered.

9. As soon as you hear the data tone, place the telephone handset into the acoustic coupler muffs as described in the operator's manual for the acoustic coupler. The acoustic coupler will, in turn, transmit a data tone to the remote modem or acoustic coupler.

10. Set the Model 743 to ON LINE and begin communications.

SECTION V
INSTALLATION

When the Model 743 is ordered without an Internal Modem or Auxiliary EIA Interface Kit, the keyboard is connected to the printer. An interface to the communication line is accomplished through one of two cables, depending on whether an EIA interface or a dc-current loop interface is specified in the original purchase order.

When the optional Internal Modem is ordered, it is connected to the keyboard and printer; and all three parts operate in conjunction. Interfacing to the communication line is accomplished through another cable which is designed to connect the terminal to a Data Access Arrangement (DAA).

Finally, when the Internal Modem *and* Auxiliary EIA Interface Cable Kit are ordered with the Model 743, the keyboard and printer are disconnected from the modem, thus permitting the keyboard and printer to be connected to external equipment and the modem to be connected to external equipment. The Auxiliary EIA Interface Cable Kit includes a three-branch cable to connect the terminal to a variety of external equipment.

NO OPTIONAL EQUIPMENT

The standard Model 743 KSR Data Terminal is delivered with an EIA interface cable for connection to a 103A or 113A (or equivalent) data set or with a dc-current loop (TTY) interface cable.

Installing the Terminal Using the Standard EIA Interface

Provided with the EIA interface is a 6-foot cable (TI Part Nos. 983848 for 103A-type or 983854 for 113A-type data sets). Pin assignments are listed in Table 5-1.

1. Set the terminal on a table close to the external equipment.

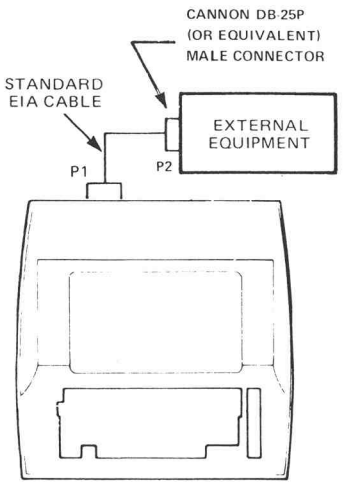


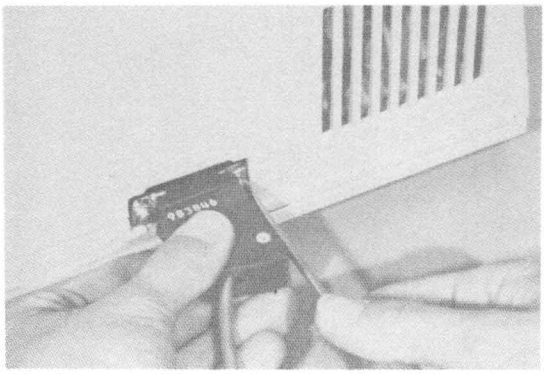
Table 5-1. Standard EIA Interface Cable Pin Assignments

103A Data Set (Cable Part No. 983848)		
P1 Connector to Model 743	**P2 Cable Termination**	**Function**
P1-9	P2-1	Protective Ground
P1-13	P2-2	Transmit Data
P1-12	P2-3	Receive Data
P1-1	P2-7	Signal Ground
P1-11	P2-8	Data Carrier Detect[1]
P1-15	P2-20	Data Terminal Ready[2]
P1-10	P2-4	Request to Send[3]

113A Data Set (Cable Part No. 983854)		
Connector to Model 743	**Cable Termination**	**Function**
P1-9	P2-1	Protective Ground
P1-13	P2-2	Transmit Data
P1-12	P2-3	Receive Data
P1-1	P2-7	Signal Ground
P1-15	P2-20	Data Terminal Ready[3]
P1-10 ┐		{ Terminal Carrier Detect
P1-11 ┘		{ Biased ON

NOTES

[1] Must be > +3 V to receive data.
[2] Function of ON LINE switch: > +3 V when on-line
< −3 V when off-line.
[3] > +3 V when power is ON.



2. Plug EIA cable connector P1 into the Communication Line Interface Connector at the rear of the Model 743.

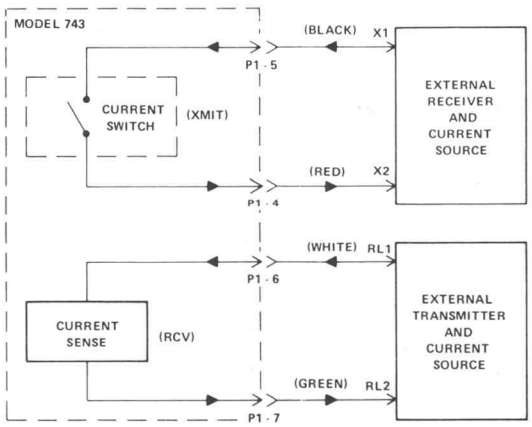
3. Plug EIA cable connector P2 into the external equipment.

4. Plug the three-socket female connector of the ac power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

Table 5-2. Standard dc-Current Loop Interface Cable Pin Assignments (Cable Part No. 983850)

P1 Connector to Model 743	Cable Termination	Function
P1-6	RL1 lug (white wire)	743 Rcv. Loop Input
P1-7	RL2 lug (green wire)	743 Rcv. Loop Return
P1-5	X1 lug (black wire)	743 Xmit Loop Input
P1-4	X2 lug (red wire)	743 Xmit Loop Return
P1-13 ┐ P1-3 ┘		Transmit Jumper
P1-12 ┐ P1-8 ┘		Receive Jumper
P1-11 ┐ P1-2 ┘		Terminal Carrier Detect biased ON

Full Duplex



Installing the Terminal Using the Standard dc-Current Loop Interface

Provided with the dc-current loop interface is a 6-foot cable (TI Part No. 983850). Pin assignments are listed in Table 5-2. Determine whether you will be operating in the half- or full-duplex mode; then complete the appropriate steps below.

Full Duplex

1. Set the Model 743 on a table close to the external equipment.

2. Plug connector P1 of the standard dc-current loop interface cable into the Communication Line Interface Connector at the rear of the Model 743.

3. Connect X1 (spade lug with black wire) to the transmit/receive return line of the external equipment.

4. Connect X2 (spade lug with red wire) to the receiver input line of the external equipment.

5. Connect RL1 (spade lug with white wire) to the transmitter output line of the external equipment.

6. Connect RL2 (spade lug with green wire) to the transmitter return line of the external equipment.

7. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

Half Duplex

8. Set the Model 743 on a table close to the external equipment.

9. Plug connector P1 of the standard dc-current loop interface cable into the Communication Line Interface Connector at the rear of the Model 743.

10. Connect X1 (spade lug with black wire) to the transmit/receive return line of the external equipment.

11. Connect RL2 (spade lug with green wire) to the transmit/receive input line of the external equipment.

12. Connect X2 (red wire) to RL1 (white wire) to form a jumper.

13. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

OPTIONAL INTERNAL MODEM

Installing the Terminal With the Optional Internal Modem

Provided with the optional Internal Modem is a 6-foot cable (TI Part No. 983849-0001). Pin assignments are listed in Table 5-3.

1. Set the Model 743 on a table close to the DAA.

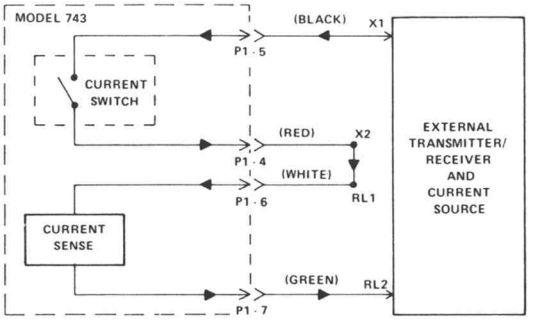
2. Plug connector P1 of the optional Internal Modem Interface Cable into the Communication Line Interface Connector at the rear of the Model 743.

3. Connect the spade lug with the red wire to the *DT* (data tip) connector of the DAA.

4. Connect the spade lug with the black wire to the *DR* (data ring) connector of the DAA.

5. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

Half Duplex



Internal Modem

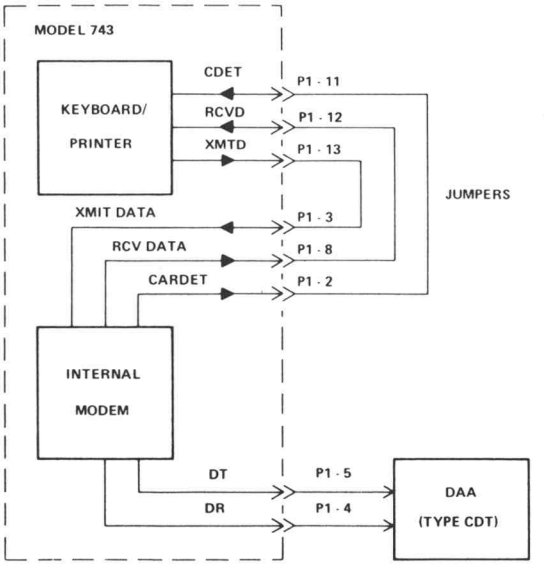


Table 5-3. Optional Internal Modem Interface Cable Pin Assignments (Cable Part No. 983849)

P1 Connector to Model 743	Connector to DAA	Function
P1-5	lug (red wire)	Data Tip (DT)
P1-4	lug (black wire)	Data Ring (DR)
P1-13 ┐ P1-3 ┘		Transmit Jumper
P1-12 ┐ P1-8 ┘		Receive Jumper
P1-11 ┐ P1-2 ┘		{ Carrier Detect Jumper

Optional Internal Modem and Optional Auxiliary EIA Interface Cable

Provided with the optional Auxiliary EIA Interface Cable is a three-branch cable (TI Part No. 983855). Each branch is at least 6-feet long. Pin assignments are listed in Table 5-4. Access to the three parts of the terminal is diagrammed in the figure below.

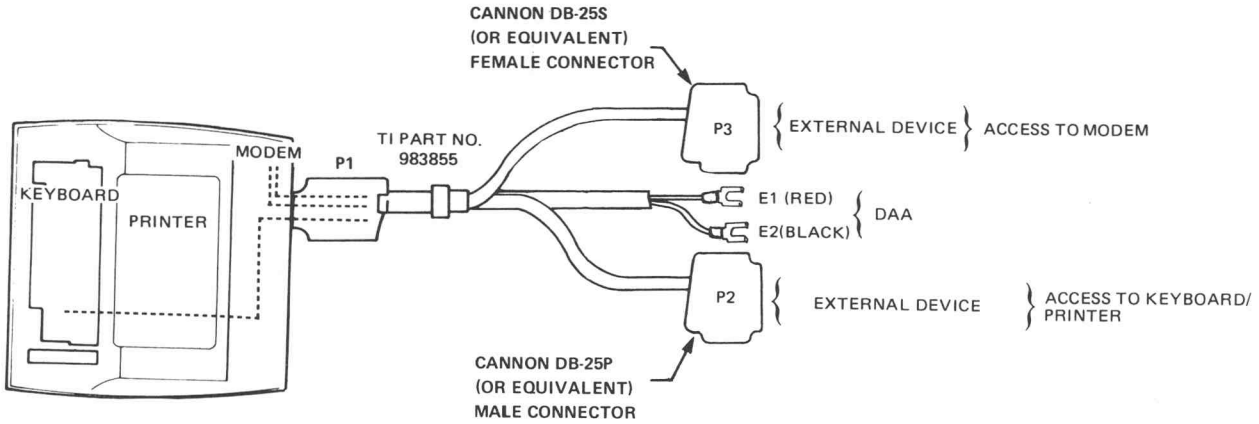


Table 5-4. Optional Auxiliary EIA Interface Cable Pin Assignments (Cable Part No. 983855)

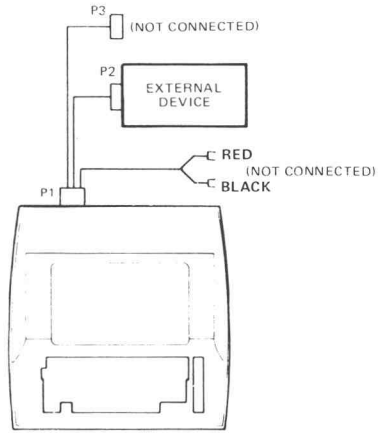
P1 Connector to Model 743	Cable Termination	Function
743 Printer/Keyboard		
P1-9	P2-1	Protective Ground[1]
P1-13	P2-2	Transmit Data[1]
P1-12	P2-3	Receive Data[1]
P1-10	P2-4	Request to Send[1,4]
P1-1	P2-7	Signal Ground[1]
P1-11	P2-8	Data Carrier Detect[1,5]
P1-15	P2-20	Data Terminal Ready[1,3]
Modem		
P1-9	P3-1	Protective Ground[2]
P1-8	P3-3	Receive Data[2]
P1-3	P3-2	Transmit Data[2]
P1-1	P3-7	Signal Ground[2]
P1-2	P3-8	Carrier Detect[2]
P1-6	P3-5	Clear to Send[4]
P1-7	P3-6	Data Set Ready[4]
To DAA		
P1-5	lug (red wire)	Data Tip (DT)
P1-4	lug (black wire)	Data Ring (DR)

NOTES

[1] Relative to keyboard and printer (P2).
[2] Relative to internal modem (P3).
[3] Function of ON LINE switch:
> +3 V when on-line
< −3 V when off-line
[4] > +3 when power is ON.
[5] Must be > +3 V to receive data.

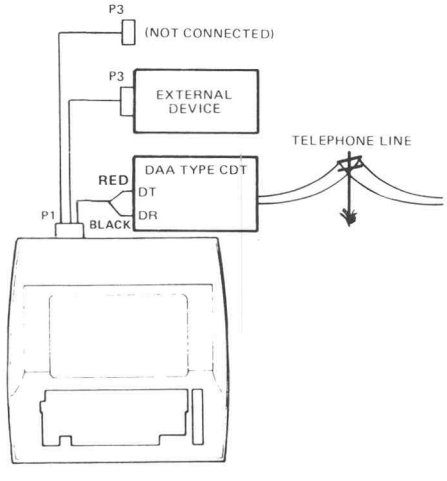
Installing the Terminal With the Optional Internal Modem and an External Device

Configuration I — Use of Keyboard/Printer *Only*



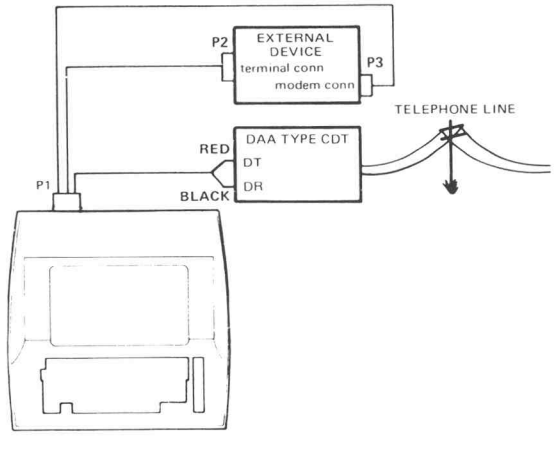
1. Set the Model 743 on a table close to the external device.
2. Plug connector P1 of the optional EIA Auxiliary Modem Interface Cable into the Communication Line Interface Connector at the Rear of the Model 743.
3. Plug Connector P2 into the external device to connect the keyboard/printer to the external device.
4. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

Configuration II — Use of Internal Modem *Only*

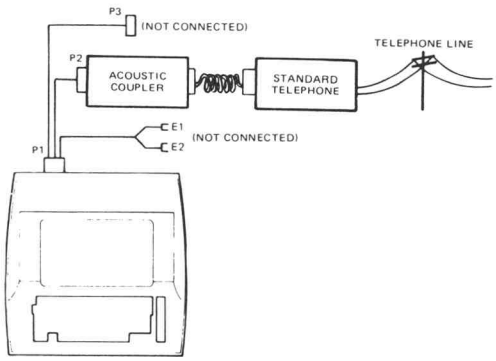


1. Set the Model 743 on a table close to the external device and the DAA.
2. Plug connector P1 of the optional EIA Auxiliary Modem Interface Cable into the Communication Line Interface Connector at the rear of the Model 743.
3. Plug connector P3 into the external device to connect the internal modem to the external device.
4. Connect the spade lug with the red wire to the *DT* terminal of the DAA.
5. Connect the spade lug with the black wire to the *DR* terminal of the DAA.
6. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

Configuration III — Use of Keyboard/Printer *and* Modem



1. Set the Model 743 on a table close to the external device and the DAA.
2. Plug connector P1 of the optional Auxiliary EIA Interface Cable into the Communication Line Interface Connector at the rear of the Model 743.
3. Plus connector P3 into the external device modem connector.
4. Plug connector P2 into the external device terminal connector.



5. Connect the spade lug with the red wire to the *DT* terminal of the DAA.

6. Connect the spade lug with the black wire to the *DR* terminal of the DAA.

7. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

Configuration IV – Use of Keyboard/Printer and An External Acoustic Coupler

1. Set the Model 743 on a table close to the external acoustic coupler and a standard telephone.

2. Plug connector P1 of the optional Auxiliary EIA Interface Cable into the Communication Line Interface Connector at the rear of the Model 743.

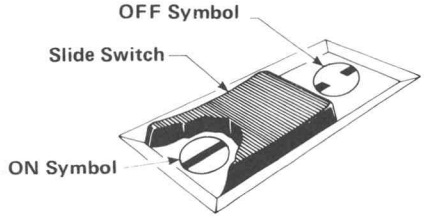
3. Plug connector P2 into the external acoustic coupler to connect it to the 743 keyboard/printer.

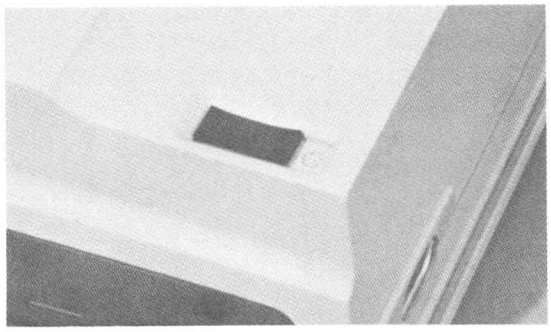
4. Plug the three-socket female connector of the power cord into the Power Connector at the rear of the Model 743 and the three-prong male connector into an ac wall outlet.

SECTION VI
LEARNING MORE ABOUT THE CONTROLS AND KEYBOARD

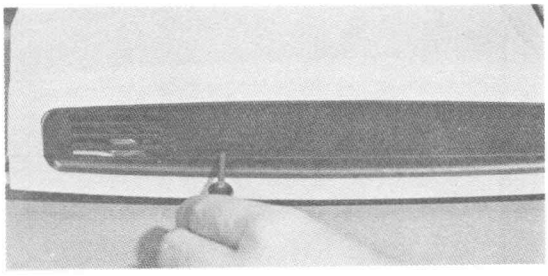
CONTROLS

a. Power switch. Located on the top right rear corner of the Model 743, this slide switch either disconnects the ac power line from all circuits in the data terminal (forward position) or connects the ac power line to the terminal (rear position).

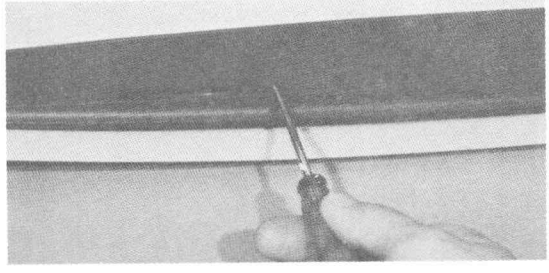




b. TRANSMIT LEVEL control. The transmit level is factory-calibrated for optimum performance with most U. S. telephone systems. However, because of the conditions of some handsets and since line losses occur in some areas, it may be necessary to increase or decrease the transmit level to compensate for unusual conditions. Adjust the transmit level for optimum performance by inserting a small screwdriver into the hole marked TRANSMIT LEVEL; rotate clockwise to improve log-on or counterclockwise to reduce data errors.



c. CONTRAST control. Located on the right side of the terminal, this potentiometer darkens or lightens the printed characters. To increase (darken) print contrast rotate the control clockwise (toward the "D") with a screwdriver; to decrease (lighten), rotate counterclockwise (toward the "L").

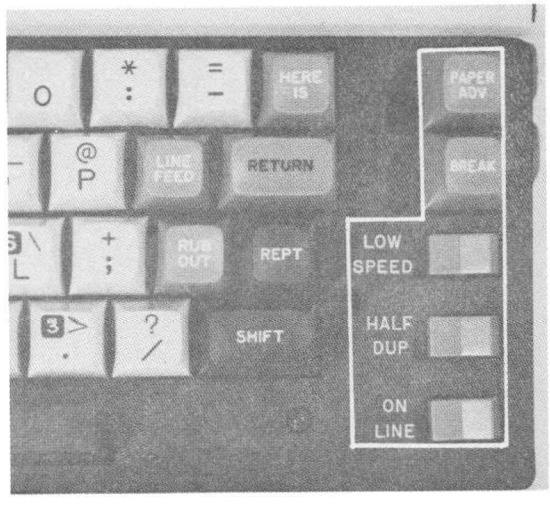


The following controls (keys) are located in a row on the right side of the keyboard:

d. PAPER ADV key. Pressing and holding this key returns the printhead to the left margin, and continuously feeds paper until the key is released. No code is generated.

e. BREAK key. Depressing this key transmits a continuous *space* over the communication line as long as the key is depressed (if the terminal is set to *on-line*). Generally, the BREAK key is used in full-duplex communications networks to interrupt transmission from the remote equipment.

f. LOW SPEED switch. Pressing this rocker switch to the left sets the data transmission and reception speeds to 10 characters-per-second; pressing to the right sets the transmission and reception speeds to 30 characters-per-second.



g. HALF DUP rocker switch. Pressing this switch to the left sets the operating mode to half-duplex; pressing to the right sets the operating mode to full-duplex.

NOTE

Set to *full-duplex* to prohibit local printout of transmitted data; set to *half-duplex* to enable local printout of transmitted data.

h. ON LINE rocker switch. Pressing this switch to the left connects the terminal to the communication line (*on-line* mode); pressing to the right disconnects the terminal from the communication line (*local* mode).

STANDARD KEYBOARD

The Model 743 standard keyboard is shown in Figure 6-1. The Model 743 generates the ASCII code and character set described in Appendix A.

Special Purpose Controls

a. HERE IS key. Depressing this key transmits the contents of the optional Answer-Back Memory (if installed) to the communications line.

b. LINE FEED key. Depressing this key advances the paper one line. The printhead does not move.

c. RETURN key. Depressing this key returns the printhead to the left margin. The paper is not advanced.

NOTE

Both LINE FEED and RETURN must be depressed to obtain the equivalent to a standard typewriter carriage return.

d. REPT key. Pressing and holding this key while momentarily depressing another character key repeats that character until either the REPT key is released or another character key is depressed.

e. SHIFT key. Releasing this key permits generation of the characters shown in Figure 6-2; pressing and holding this key permits generation of the characters shown in Figure 6-3.

f. CTRL key. Pressing and holding this key permits generation of the characters shown in Figure 6-4.

g. NUM rocker switch. Pressing this switch to the left permits generation of the characters shown in Figure 6-5.

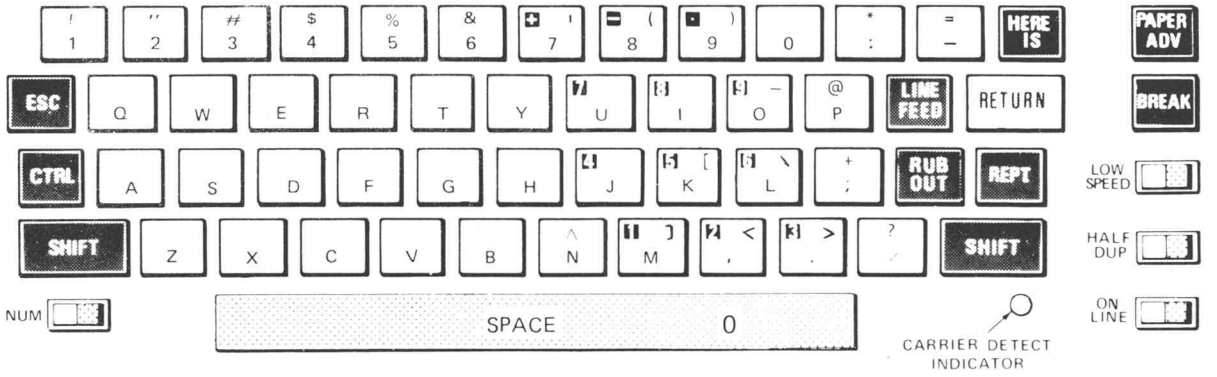


Figure 6-1. Model 743 Standard Keyboard Layout and Symbolization.

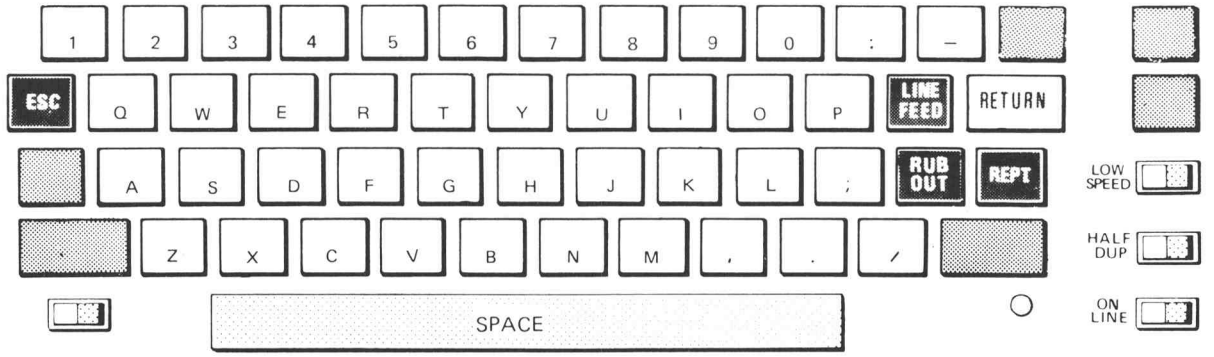


Figure 6-2. Codes Generated with no Mode Keys Activated (Standard Keyboard).

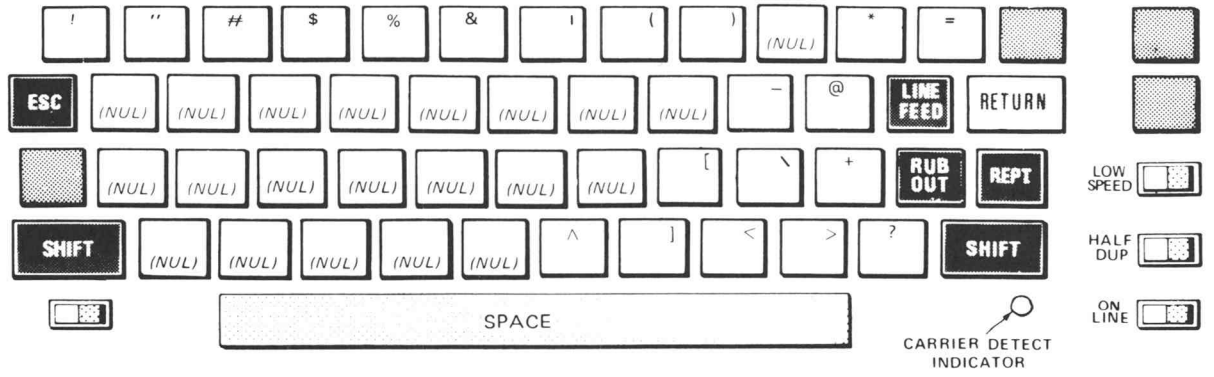
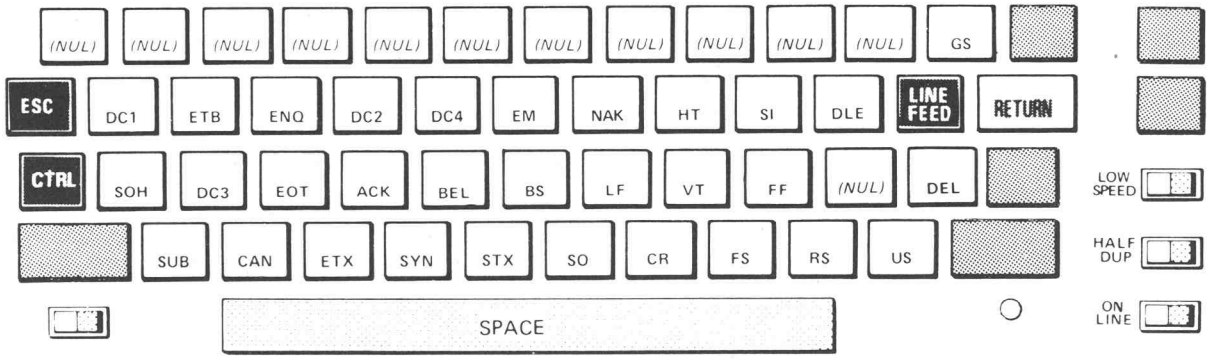
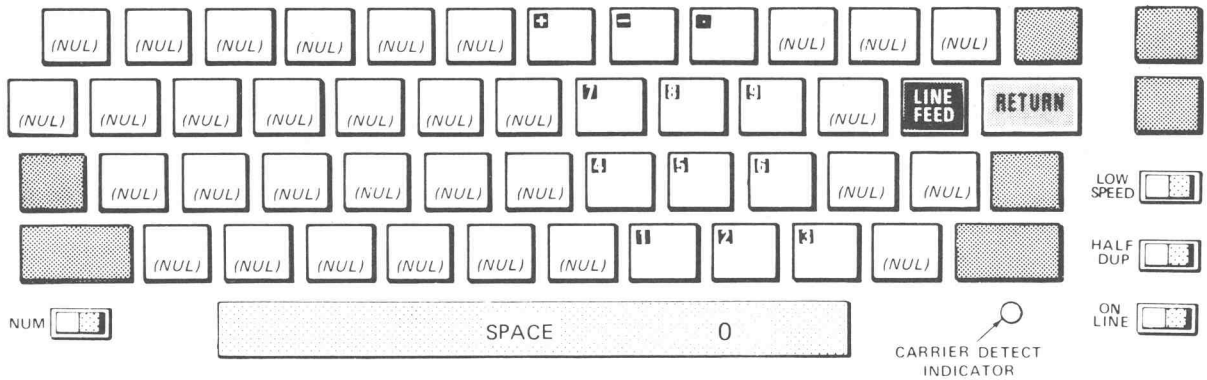


Figure 6-3. Codes Generated with the SHIFT Key Pressed and Held (Standard Keyboard).



NOTE: The CTRL (Control) key overrides the SHIFT key.

Figure 6-4. Codes Generated with the CTRL Key Pressed and Held (Standard Keyboard).



NOTE: The NUM (Numbers) switch overrides the SHIFT and CTRL keys.

Figure 6-5. Codes Generated with the NUM Switch Set (Standard Keyboard).

Indicators

a. Carrier detect indicator. When illuminated, this green lamp indicates the presence of the receive-data carrier frequency.

b. Bell indicator. An audible sound is emitted when the BEL code is received from the keyboard or communication line.

FULL ASCII KEYBOARD

The optional full-ASCII keyboard is shown in Figure 6-6. This keyboard features the capability to transmit/receive and print both uppercase and lowercase alphabet characters, using the SHIFT key as on a standard typewriter. A special UPPER CASE rocker switch is provided on the full-ASCII keyboard to permit generating/printing uppercase-only characters. All *special purpose controls* and *indicators* on the full-ASCII keyboard function the same as on the standard keyboard (see pages 34, 35, & 36 for a description). Figures 6-7 through 6-9 show the characters and codes generated by the full-ASCII keyboard in the unshifted, shifted, and control modes, respectively.

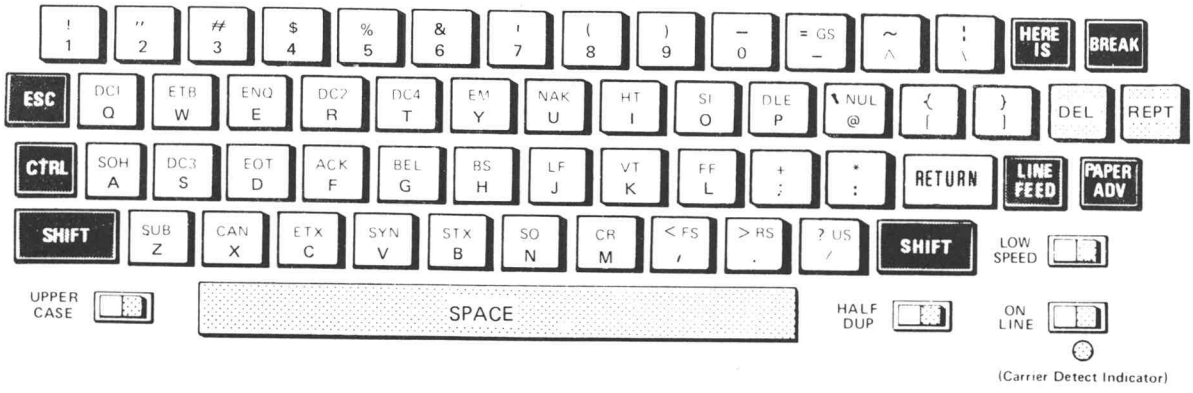
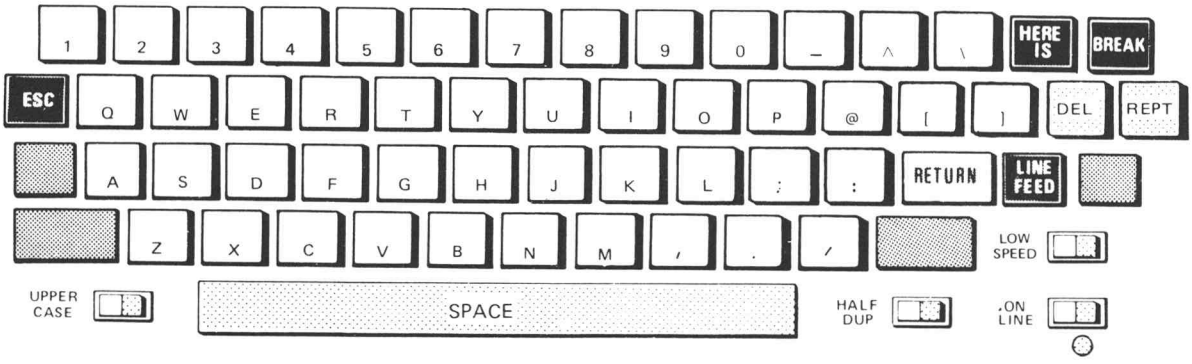
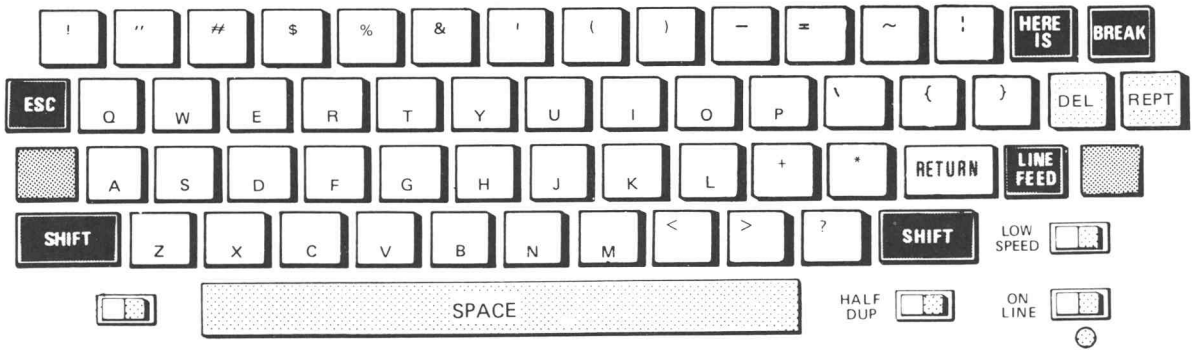


Figure 6-6. Model 745 Optional Full-ASCII Keyboard Layout and Symbolization.



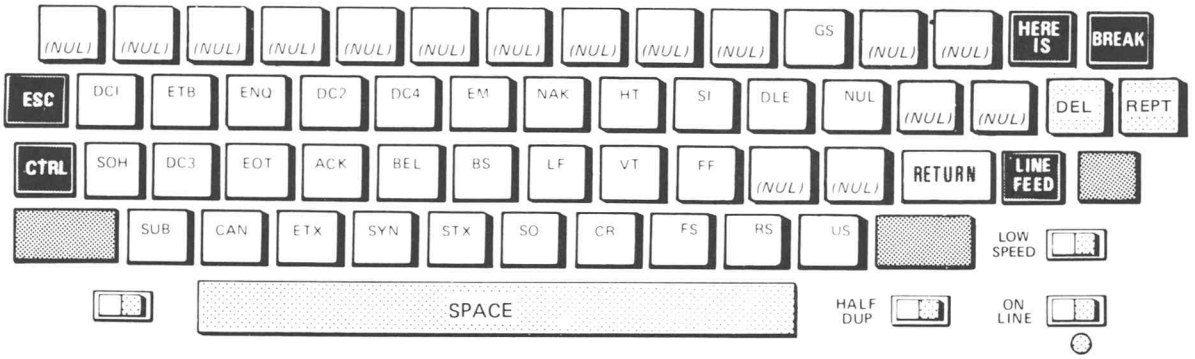
UPPER CASE not selected (A to Z in lowercase)
UPPER CASE selected (A to Z in UPPERCASE)

Figure 6-7. Codes Generated with no Mode Keys Activated (Full-ASCII Keyboard).



SHIFT key overrides UPPER CASE switch

Figure 6-8. Codes Generated with the SHIFT Key Pressed and Held (Full-ASCII Keyboard)



NOTE: The CTRL (Control) key overrides the SHIFT key and UPPER CASE Switch.

Figure 6-9. Codes Generated with the CTRL Key Pressed and Held (Full-ASCII Keyboard).

APPENDIX A
ASCII CODE SYSTEM AND CHARACTER SET

b_4 b_3 b_2 b_1	b_7 → 0 b_6 → 0 b_5 → 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
0 0 0 0		NUL	DLE	SP	0	@	P	`	p
0 0 0 1		SOH	DC1	!	1	A	Q	a	q
0 0 1 0		STX	DC2	"	2	B	R	b	r
0 0 1 1		ETX	DC3	#	3	C	S	c	s
0 1 0 0		EOT	DC4	$	4	D	T	d	t
0 1 0 1		ENQ	NAK	%	5	E	U	e	u
0 1 1 0		ACK	SYN	&	6	F	V	f	v
0 1 1 1		BEL	ETB	'	7	G	W	g	w
1 0 0 0		BS	CAN	(	8	H	X	h	x
1 0 0 1		HT	EM	)	9	I	Y	i	y
1 0 1 0		LF	SUB	*	:	J	Z	j	z
1 0 1 1		VT	ESC	+	;	K	[	k	{
1 1 0 0		FF	FS	,	<	L	\	l	|
1 1 0 1		CR	GS	-	=	M	]	m	}
1 1 1 0		SO	RS	.	>	N	^	n	~
1 1 1 1		SI	US	/	?	O	—	o	DEL

Printable characters

Printer control characters

Codes generated and transmitted by the terminal, but no action is taken locally

On standard (limited-ASCII) keyboard only: translated to uppercase equivalents when received by the terminal

On standard (limited-ASCII) keyboard only: printed when received but not generated

ASCII CONTROL CHARACTERS
(From American Standards Institute Publication X3.4–1968)

ACK	acknowledge
BEL	bell
BS	backspace
CAN	cancel
CR	carriage return
DC1	device control 1
DC2	device control 2
DC3	device control 3
DC4	device control 4 (stop)
*DEL	delete
DLE	data link escape
EM	end of medium
ENQ	enquiry
EOT	end of transmission
ESC	escape
ETB	end of transmission block
ETX	end of text
FF	form feed
FS	file separator
GS	group separator
HT	horizontal tabulation
LF	line feed
NAK	negative acknowledge
NUL	null
RS	record separator
SI	shift in
SO	shift out
SOH	start of heading
STX	start of text
SUB	substitute
SYN	synchronous idle
US	unit separator
VT	vertical tabulation

*not strictly a control character

A0001113

APPENDIX B
EQUIPMENT SPECIFICATIONS

1. KEYBOARD

Code	ASCII (American Standard Code for Information Interchange)
Character Set	
Standard Keyboard	97 codes generated 64 printable characters 33 control characters
Optional Keyboard	128 codes generated 95 printable characters 33 control characters
Numeric Keypad	(Standard Keyboard only) Embedded, 13-key calculator style, numeric cluster

2. PRINTER

Method	Nonimpact, thermal-paper printing; five by seven, 35-element matrix, electronically heated
Paper	TI Thermographic Printing Paper, TI Part No. 972603 (white); 8-1/2 inches x 100 feet; last 10 feet color-coded
Platen	Friction-feed
Character Set	
Standard Keyboard	69 printable characters (lowercase characters are translated to uppercase equivalents upon reception)
Optional Keyboard	95 printable characters
Character Size	0.105 inches x 0.080 inches, maximum
Line Length:	8 inches 10 characters per inch 80 characters per line
Line Spacing	6 lines per inch
Printing Rate	Switch-selectable, 10 or 30 characters-per-second
Visibility	At least 50 previous lines of print, including current line and last character printed
Carriage Return/ Line Feed	Automatic at column 81; no code is transmitted
Carriage Return Time	195 milliseconds; no filler characters required after carriage return
Line Feed Time	33 milliseconds (one character-time)

3. OPERATOR CONTROLS

SPEED	10/30 characters-per-second
DUPlex	HALF/full
Transmit Level	Low to high
Contrast	Light to dark
PAPER ADVance	30 lines per second while key pressed and held
NUM	(Standard Keyboard only) Enables numeric keypad
Status	ON LINE/Local
UPPER CASE	(Optional Keyboard only) Enables uppercase characters

4. INDICATORS

Carrier	Carrier detect lamp
Bell	250-millisecond audible tone

5. DATA TRANSMISSION

Method	Asynchronous; serial-by-bit, serial-by-character
Code	ASCII; 11 bits per character including parity, start, and two stop bits at 10 characters-per-

	second speed; 10 bits per character with one stop bit at 30 characters-per-second speed
Mode	Switch-selectable: half or full duplex
Parity	Optional odd, even, or mark parity
Buffer	Character buffering on received data, permitting true 30 characters-per-second operation

6. COMMUNICATIONS INTERFACE

EIA RS-232-C Serial Data Interface

Signal Levels	As required by EIA RS-232-C:
	Data marking, Control signals OFF: −3 V to −25 V
	Data spacing, Control signals ON: +3 V to +25 V
Cable	TI Part No. 983848 or 983854; 6 feet standard EIA cable with 25-pin male connector (Cannon No. DB-25P or equivalent)

dc-CURRENT LOOP SERIAL DATA INTERFACE

Cable	TI Part No. 983850-0001; 6 foot cable with four spade lugs
Maximum Current	100 milliamp (transmit or receive)
Nominal Current	20 milliamp
Maximum Voltage Drop	3V (receive) and 1V (transmit) while marking
Maximum transmit Voltage	50 V while spacing

300-BAUD INTERNAL MODEM

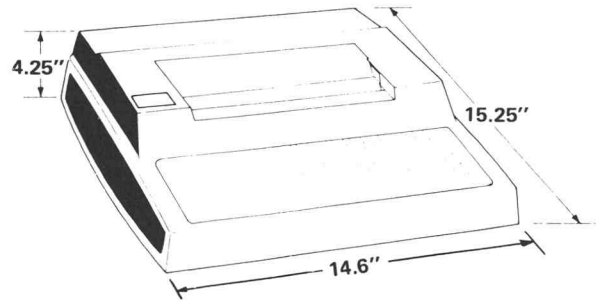
Cable	TI Part No. 983849-0001), 6 foot cable with two spade lugs
Compatibility	Bell 103A data set
Mode	Originate
Modulation	Frequency Shift Keying (FSK)
Connection	Bell Data Access Arrangement CDT

EIA AUXILIARY MODEM INTERFACE CABLE KIT

Cable	TI Part No. 983855-0001; 3-legged cable, each leg minimum 6 feet long
Keyboard/Printer Leg (P2)	Standard EIA cable with 25-pin male connector (Cannon No. DB-25P or equivalent)
Modem Connector (P3)	Standard EIA cable with 25-pin female connector (Cannon No. DB-25S or equivalent)
Modem Connector (E1/E2)	Standard DAA cable with two spade lugs
Compatibility	EIA Specification RS-232-C

7. PHYSICAL

Size	Width: 14.6 inches Depth: 15.25 inches Height: 4.25 inches
Weight	11.2 pounds (including paper)



8. POWER REQUIREMENTS

Voltage	115 volts RMS; + 10%, − 15%
Frequency	47 through 63 Hz
Power	75 watts maximum

9. ENVIRONMENT

Temperature	Operating: 10°C to 40°C Storage: -30°C to 70°C (not including paper); -30°C to 40°C (including paper)
Humidity	Operating: 10% to 90% (no condensation) Storage: 10% to 95% (no condensation)
Shock	Operating: 0G, Storage: 20G,for 11 milliseconds
Vibration	Operating: 0.5G, 10 to 60 Hz Storage: 1.5G, 5 to 500 Hz

APPENDIX C
DEFINITIONS

ASCII – an eight-level (7 bits + parity) code from the American Standard Code for Information Interchange.

analog – the representation of numerical quantities by means of physical *variables*; e.g., translation, rotation, voltage, or resistance. (Contrast with *digital*.)

baud – a unit of data transmission speed equal to the number of code elements (bits) per second.

bit – an abbreviation for binary digit; the smallest unit of information in a binary system of notation.

character – one symbol of a set of elementary symbols, such as a letter of the alphabet; a character is made up of a group of 7 bits (ASCII code).

code – a system of symbols (bits) for representing data (characters). The Model 743 utilizes the ASCII code.

data – a general term for any type of information.

data set – a device which performs modulation/demodulation and control functions to enable data transmission/reception over telephone lines between two data devices.

digital – the representation of numerical quantities by means of *discrete integer numbers*. It is possible to express in digital form all information stored, transferred, or processed by dual-state condition; e.g., on-off, open-closed, and true-false.

duplex – describes two operations, such as transmitting and receiving; full duplex means simultaneous transmission and reception; half duplex means transmission or reception, but not both at the same time.

line, communications – describes cables, telephone lines, etc. over which data is transmitted to, and received from, the terminal. Also referred to as the "line".

local – see *off-line*.

modem – acronym for data set (*mo*dulator/*dem*odulator)

off-line (local) – describes equipment or devices which are not connected to the communications line.

on-line – describes equipment or devices which are connected to the communications line.

signal – The event, phenomenon, or electrical quantity, that conveys information from one point to another.

TEKTRONIX®
committed to technical excellence

MANUAL CHANGE INFORMATION

PRODUCT LP8200/LP8200-1, CT 8101 USER'S & SERVICE

CHANGE REFERENCE C2/778

DATE 7-20-78

CHANGE:	DESCRIPTION

LP8200/LP8200-1 LINE PRINTER USER'S (070-2361-00)

CT 8101 PRINTING TERMINAL USER'S (070-2360-00)

CT 8101 PRINTING TERMINAL SERVICE (070-2363-00)

NOTE

IN THIS MANUAL, ALL REFERENCES TO THE "8002 μPROCESSOR LAB" APPLY EQUALLY TO THE 8002A μPROCESSOR LAB.

The TEKTRONIX 8002A μProcessor Lab, containing a standard 32k-byte program memory, replaces the TEKTRONIX 8002 μProcessor Lab with its standard 16k-byte program memory. At the time of this writing, the 8002A μProcessor Lab functions identically to the 8002 μProcessor Lab.

Contact your Tektronix field service representative to order manuals for the 8002A μProcessor Lab.

TEKTRONIX®
committed to technical excellence

MANUAL CHANGE INFORMATION

PRODUCT CT 8101
070-2360-00

CHANGE REFERENCE C1/877
DATE 8-31-77

CHANGE:	DESCRIPTION

TEXT CORRECTION

Page i PREFACE

Add the following paragraph under the WARRANTY SERVICE heading:

"The use of paper not specified for the CT 8101 will void the warranty. When replacement paper is needed, it should be ordered from Tektronix, Inc., by Part No. 006-2602-00, or from Texas Instruments, Inc., by TI Specification 972603-0001."