TRS-80™ VIDEOTEX TERMINAL

OWNER'S MANUAL

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CUSTOM MANUFACTURED IN THE U.S.A. BY RADIO SHACK A DIVISION OF TANDY CORPORATION

TRS-80

VIDEOTEX

TERMINAL

OWNER'S MANUAL

Radio Shack®

A DIVISION OF TANDY CORPORATION
FORT WORTH, TEXAS 76102

The FCC Wants You to Know . . .

The operator of a TV Interface Device who is advised by the Federal Communications Commission that his device is causing harmful interference shall promptly stop operating the device and shall not resume its operation until the condition causing the harmful interference has been corrected.

It is most unlikely, but if your Videotex unit should cause problems on the phone line, the phone company has the right to discontinue your service temporarily. Before they do so, the company will notify you in writing so you have a chance to take whatever action is necessary to ensure uninterrupted phone service.

If you are having trouble with your Videotex Terminal, disconnect it from your TV and telephone circuits. Return it to a Radio Shack store for repair.

Notice: There are no user-repairable or adjustable circuits contained within the Videotex Terminal. Only an authorized Radio Shack representative is permitted to open and repair these units.

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Welcome to TRS-80 Videotex Terminal

TRS-80 Videotex is a computer terminal. What's that?

It's a device that can communicate with another computer (called a "host"). In simple terms, a terminal sends and receives information, and the host processes information as well as sends and receives it. See Figure 1.

While connected to a host computer, the terminal has access to all the services and information offered by the host. These may include news, weather, sports, entertainment and financial information. Library resources are often available.

You may be able to perform a variety of transactions, including banking, shopping, paying bills, and communication via "electronic mail".

You may even be able to create computer programs to run on the host computer. In this case, you'll be able to make up your own applications for your Videotex Terminal.

Here are some outstanding features of your Videotex Terminal:

- A 53-key standard-layout keyboard
- A television interface that lets you connect the Terminal to any color television set for full-color displays
- Permanently stored terminal program — ready to use as soon as you turn on the unit
- Comes with 4K of memory (optional 16K expandability, not standard machine). 4K units can store up to eight TV-screenfuls; 16K, up to 32 TV-screenfuls
- Telephone Interface that lets you connect the unit directly to the telephone circuit — no need for an acoustic coupler
- Controlled by the powerful 6809E microprocessor chip
- Three modes of operation — online, offline, and advance entry. Send and receive information online; then go offline to examine the received information at your leisure. Advance entry allows you to enter text before going online so the host computer can receive it at high speed (Advance entry may not be supported by the host computer).

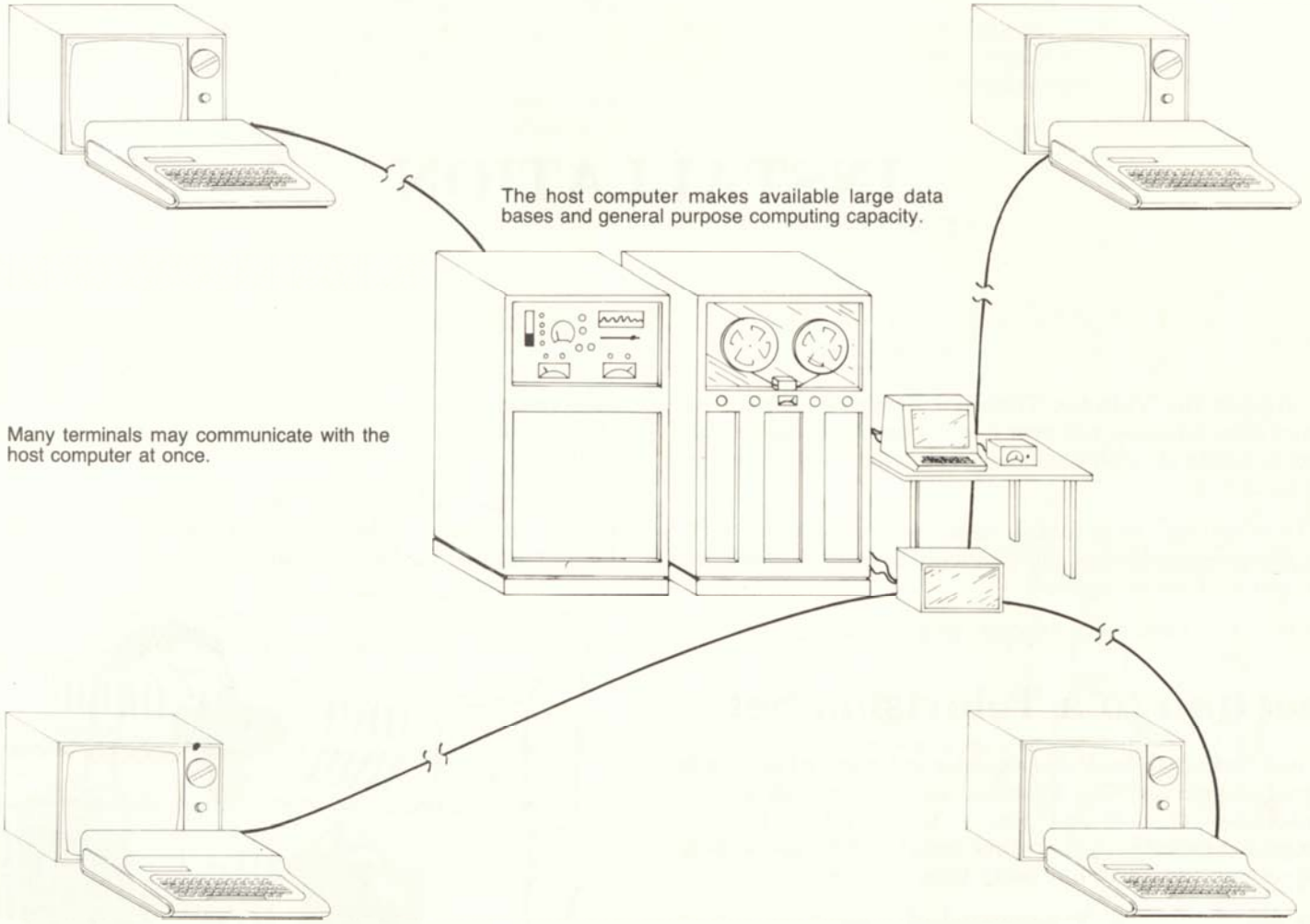


Figure 1. A typical terminal/host system.

INSTALLATION

Carefully unpack the Videotex Terminal. Remove all packing material and save it in case you ever need to transport the Terminal. Be sure to locate all cables and papers that may be included in the shipping carton.

Place the Terminal on a solid surface near the television set you'll be using. An appropriate power source should be nearby, so that an extension cord will not be needed.

Do not connect the Terminal to the AC power source yet.

Connection to a Television Set

The Terminal contains a built-in television interface which sends a VHF signal to your set. The Terminal also comes with an Antenna Switchbox that allows you to select either normal television-station reception or Terminal input without connecting and disconnecting the Terminal every time it's used.

This Antenna Switchbox is comprised of a short section of twin-lead cable, two screw terminals, a coaxial connector, and a slide switch. Make the connections described later, but only connect **one** antenna to the Switchbox.

Mounting the Switchbox

We suggest you attach the Switchbox to the back of your TV set as shown in Figure 2.

Select a smooth, flat surface on the TV set that is well within reach of the antenna cables. Wipe off any dust, dirt or grease from the mounting surface.

Remove the backing from the double-sided tape (one side is already attached to the Switchbox) to expose the sticky surface. Press it against the back of your TV cabinet in the desired location.

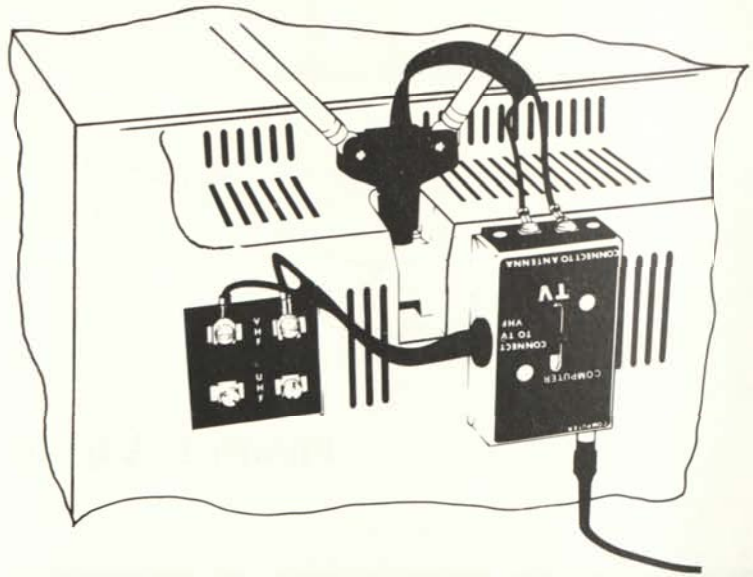


Figure 2. Mounting Switchbox onto TV Set (Connections may vary, depending on your antenna installation).

Antenna Connection

You need to route your television's VHF antenna through the Antenna Switchbox. If there are wires presently connected to the VHF terminals on your TV set, disconnect them.

What you do next depends upon the type of antenna installation you have. Read the following paragraphs and study Figures 3 through 7 to decide which installation you have.

Connection to a TV with Screw Terminals and an Internal Antenna (Figure 3)

Connect the internal antenna leads to the terminals labeled "CONNECT TO ANTENNA" on the Antenna Switchbox. Then connect the short twin-lead from the Antenna Switchbox to your TV's "VHF" screw terminals.

Connection to a TV with Twin-Lead and External or "Rabbit Ears" Antenna (Figures 4 and 5)

Connect the lead-in from your antenna to the terminals labeled "CONNECT TO ANTENNA" on the Antenna Switchbox. Connect the short twin-lead from the Antenna Switchbox to your TV's "VHF" screw terminals.

Connection to a TV with a 75-Ohm Coaxial Lead-In (Figure 6)

You will need to obtain a special 75-ohm to 300-ohm matching transformer such as Radio Shack's Catalog Number 15-1140. Connect your coaxial cable lead-in to the transformer and connect the transformer's twin-lead to the screw terminals on the Antenna Switchbox.

Next move the slider to the "closed" position.

Connect the short twin lead from the Antenna Switchbox to your TV's "VHF" screw terminals.

Connection to a TV with a 75-Ohm Coaxial Lead-In and Matching Transformer (Figure 7)

Connect the short twin-lead from the transformer to the screw terminals on the Antenna Switchbox. Connect the short twin-lead from the Antenna Switchbox to your TV's "VHF" screw terminals.

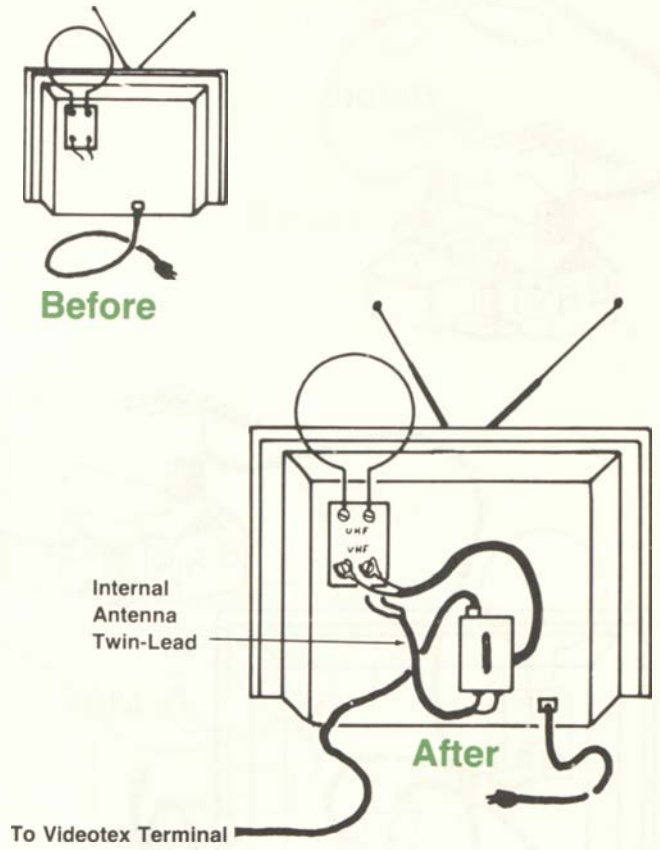


Figure 3. Rear View of TV with Screw Terminals and Internal Antenna.

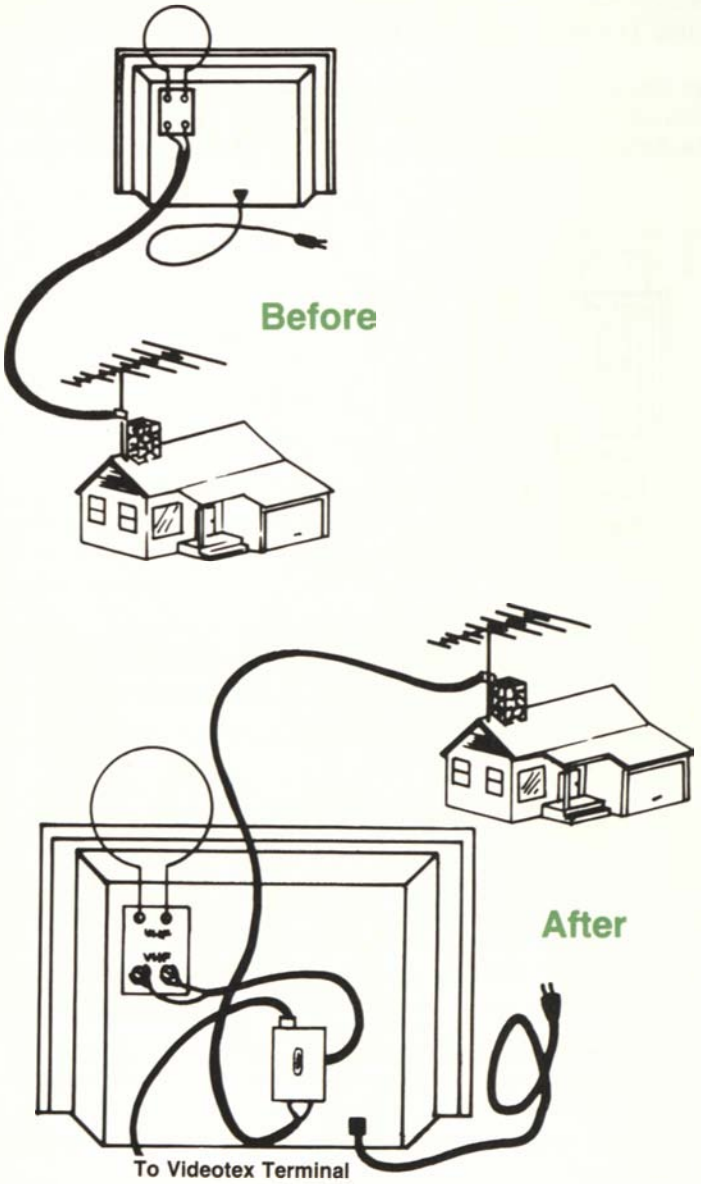


Figure 4. Rear View of TV with Twin-Lead and an External Antenna.

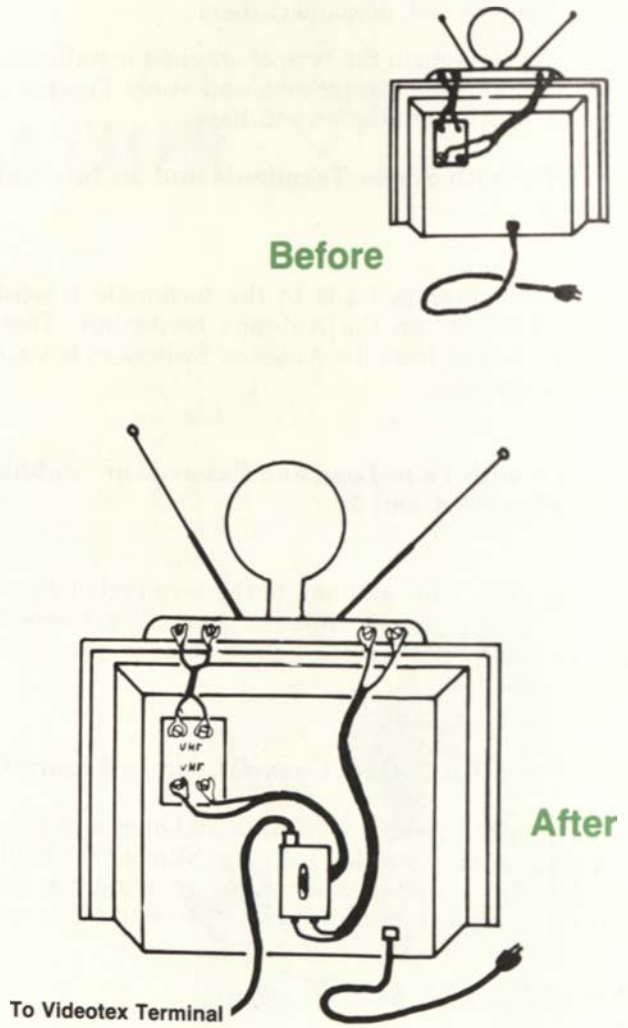


Figure 5. Rear View of TV with Twin-Lead and "Rabbit Ears" Antenna.

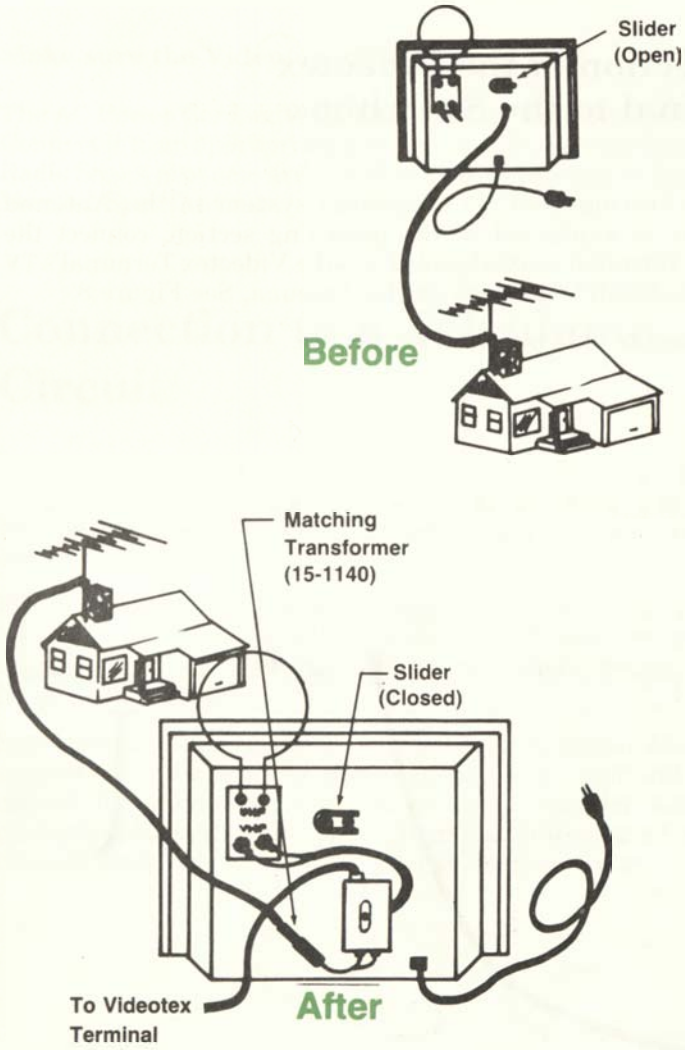


Figure 6. Rear View of TV with 75-Ohm Coaxial Cable.

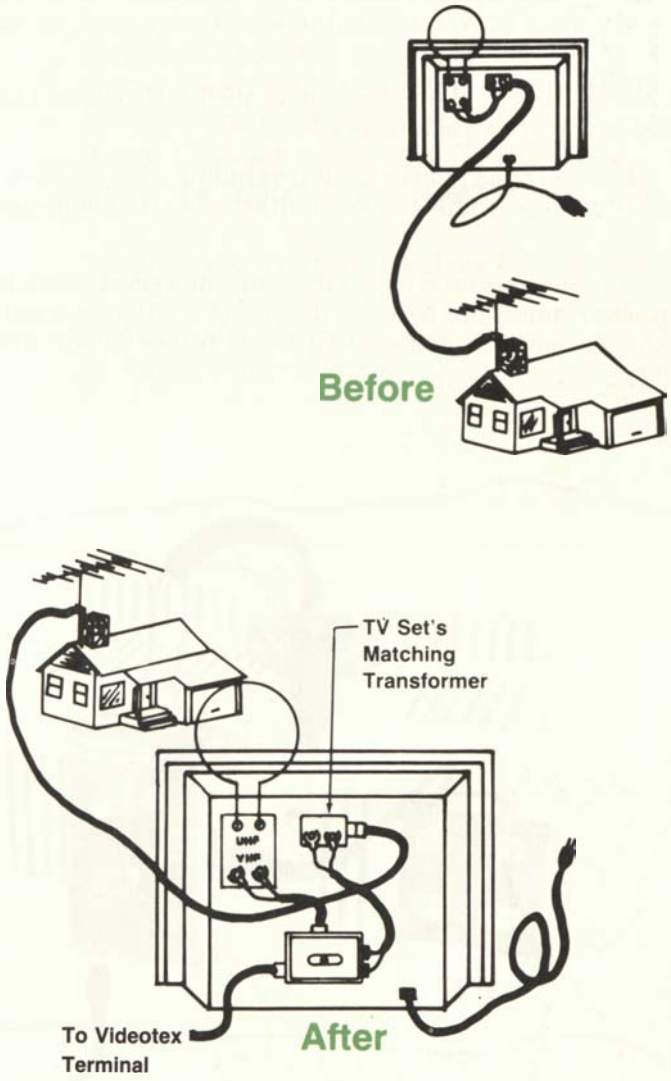


Figure 7. Rear View of TV with a 75-Ohm Coaxial Cable and a Matching Transformer.

Other Types of Antenna Installations

We have shown five typical TV antenna installations. There are some other antenna types and features you may need to be aware of.

If your TV set has a 75/300-ohm switch on the back, be sure the switch is set to the 300-ohm position.

If your TV set has a round jumper cable protruding from the back, be sure that the jumper cable has been attached to the connector next to it.

If your TV's antenna system is one of these just described, there is no problem. The connections between the other TV antenna terminals and the Antenna Switchbox will be as in one of the five illustrations.

If you have cable TV, it may be advisable to call in a qualified service technician.

Connection of the Videotex Terminal to the Switchbox

After connecting your TV's antenna system to the Antenna Switchbox as explained in the preceding section, connect the Videotex Terminal coaxial cable from the Videotex Terminal's TV jack to the COMPUTER jack on the Antenna. See Figure 8.

Your Videotex unit is now ready for use.

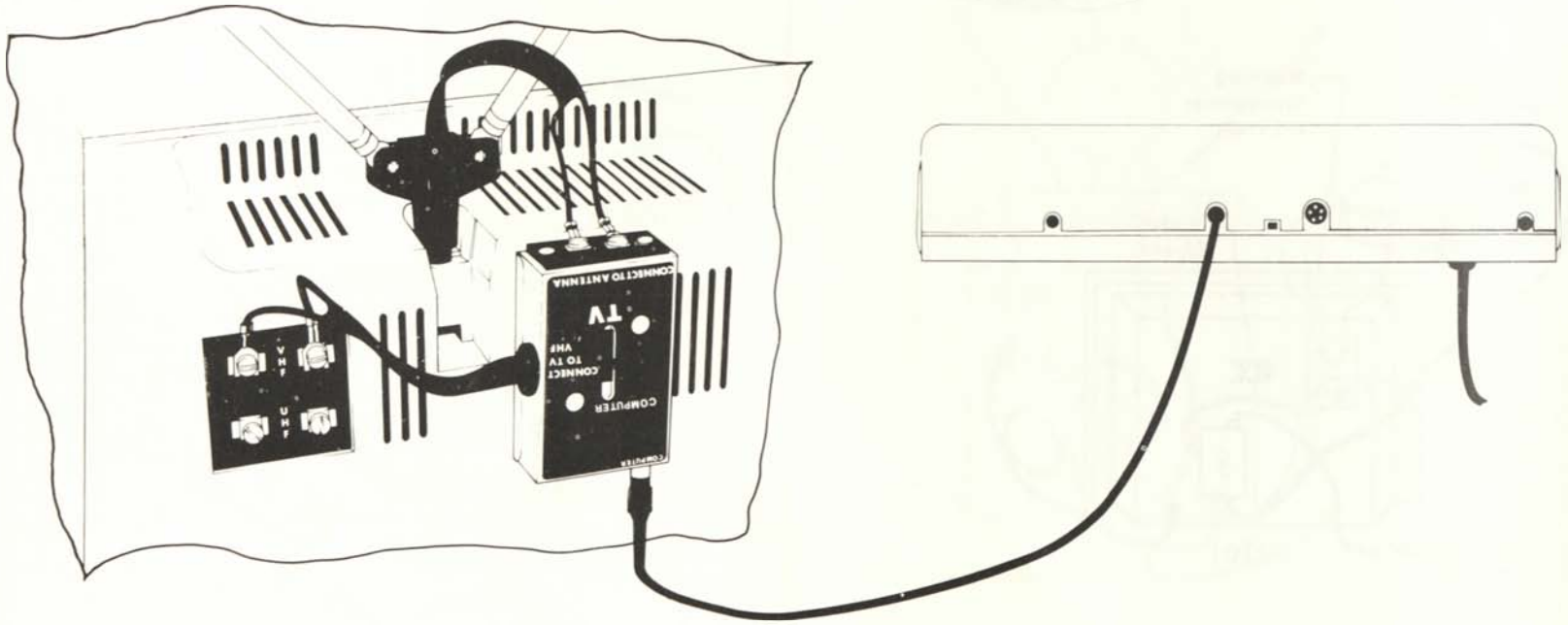


Figure 8. Connection of Videotex Terminal to the Antenna Switchbox.

Connection to an AC Power Source

Make sure the Videotex unit is turned OFF.

The AC Power Cord exits from the rear of the Videotex Terminal. Connect it to an appropriate power source. Power requirements for Radio Shack products are specified on the units and in the Owner's Manual Specifications.

Connection to a Telephone Circuit

Figure 9 shows the connection of a Videotex Terminal to the telephone lines that use the new modular connectors. If your telephone connects like this, attach your Videotex Terminal as shown in this figure.

Figure 10 shows the older four-prong connection for the telephone. You will need an adapter that allows the Videotex Terminal to be used in parallel with your telephone. (Radio Shack Catalog Number 279-0360).

Some telephone use the wired wall connection. If your telephone is connected to the wall as shown in figure 11, you will need to contact the phone company and request a modular wall mount connector plate. After the plate is installed, you can use Figure 9 to connect your Videotex unit to your telephone circuit.

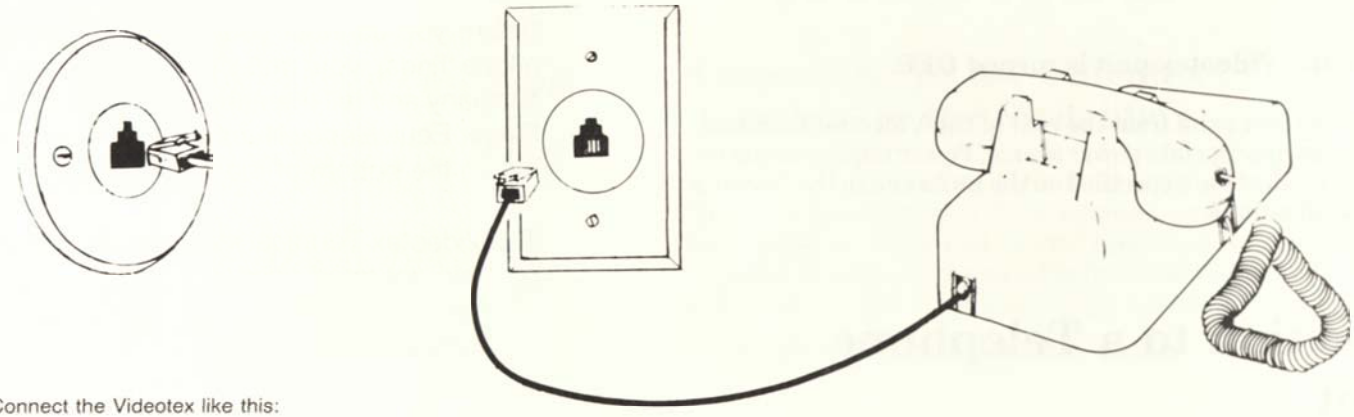
Important Note:

Before you connect your Videotex Terminal to the phone lines, you must contact your local phone company and tell them the Registration Number and Ringer Equivalency Number. Both of these numbers are on the bottom of the Videotex unit.

The Videotex Terminal must not be connected to:

- ☒ Coin-operated phones
- ☒ Party-line phones
- ☒ Multiple-line phones.

If your telephone hook-up looks like this:



Connect the Videotex like this:

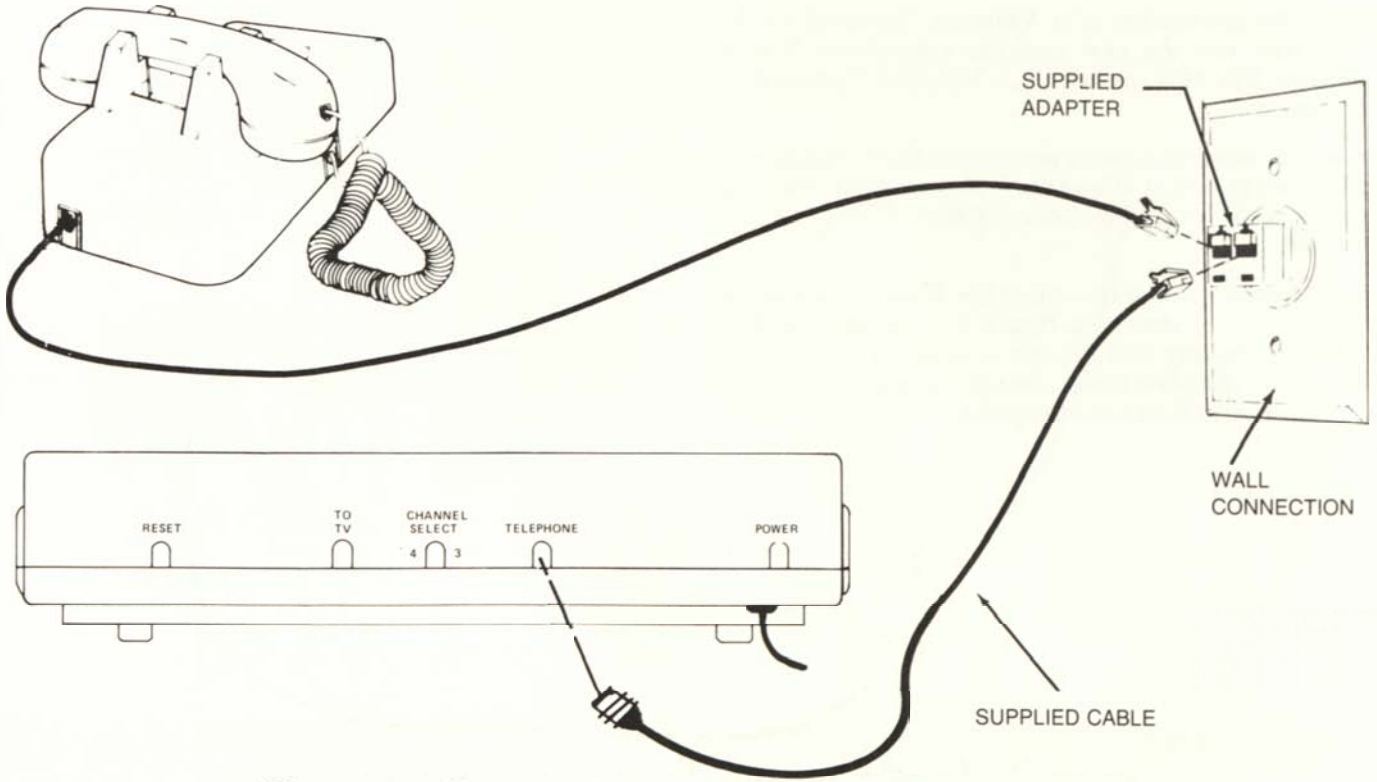
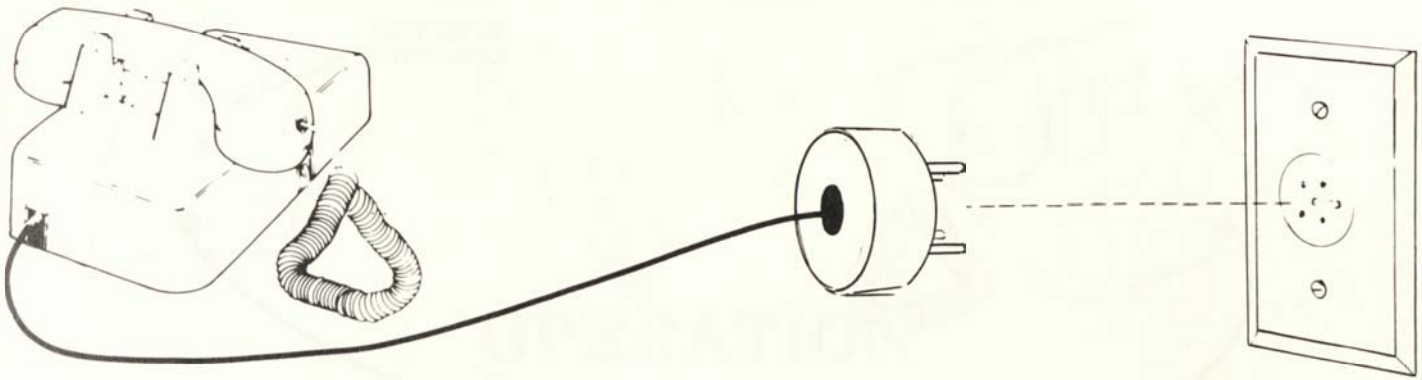


Figure 9. Connection to Modular Phone Jacks.

If your telephone hook-up looks like this:



Connect the Videotex like this:

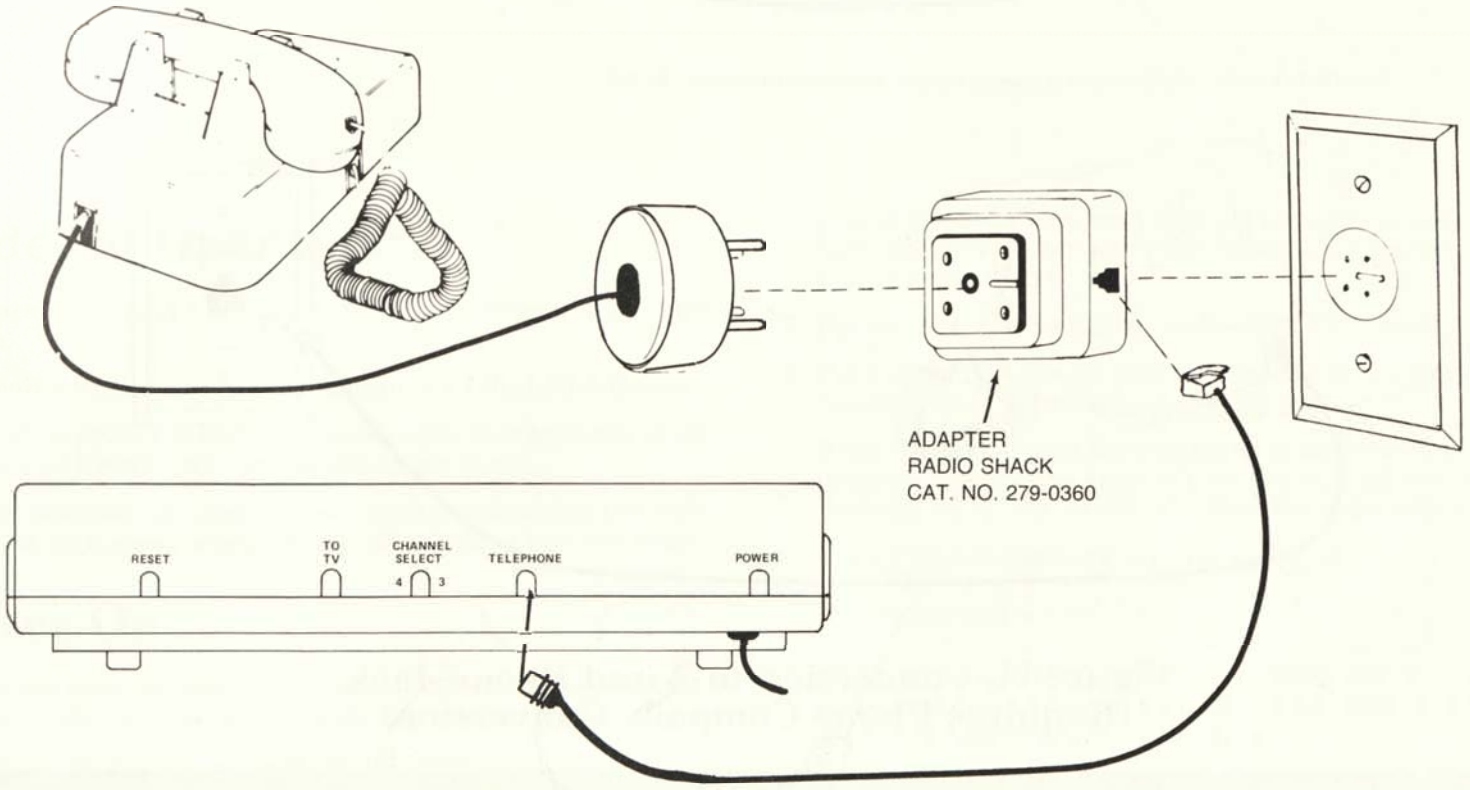
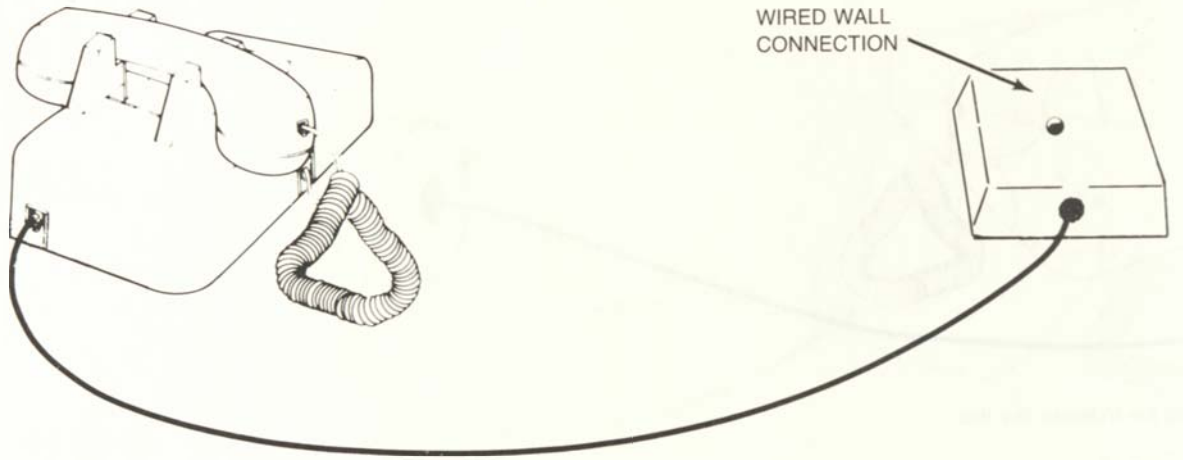


Figure 10. Connection to Four-Prong Phone Jacks.

If your telephone hook-up looks like this:



Call the Telephone Company and request a modular telephone connection like this:

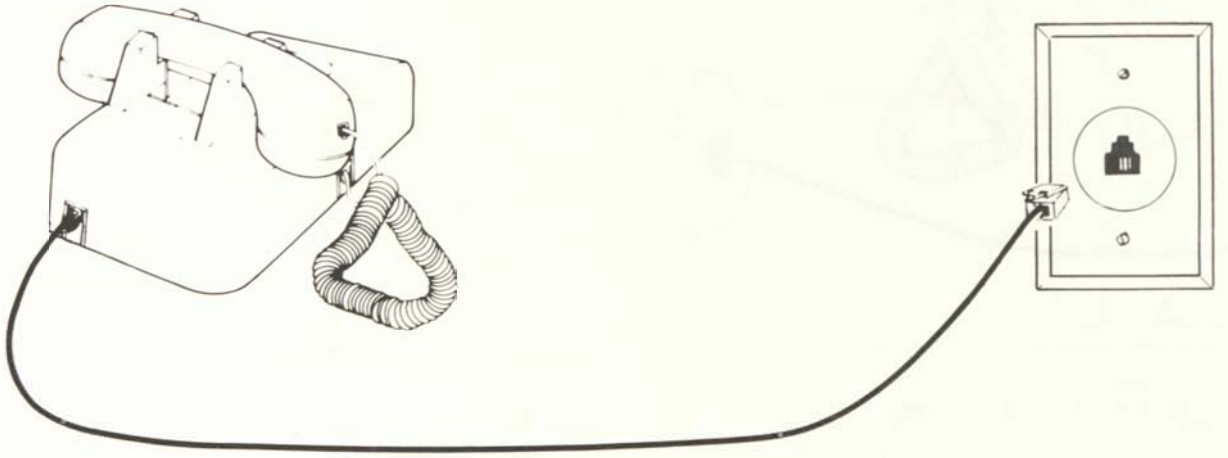


Figure 11. Connection to Wired Phone Jack.
(Requires Phone Company Conversion)

OPERATION

Modes of Operation

There are three modes of operation: online, offline and advance storage.

In the online mode you can communicate with the host computer.

In the offline mode you can view the material that has been saved automatically while you were in the online mode.

In the advance storage mode you can enter material that can later be sent at high speed when you go online with a host computer.

Power-On

Be sure you have connected your Videotex Terminal to your telephone and television as shown in the Installation section. Then:

1. Turn on the television, and turn the volume down.
2. Select channel 3 or 4 (whichever is either weaker or not used in your area). Select the same channel on the slide switch on the back of your Videotex unit. (See Figure 12, Videotex Terminal Controls and Connections.)
3. Set the Antenna Switchbox to the COMPUTER position.
4. Turn on your Videotex unit by pressing in the power switch button located on the left rear of the unit.

   Note: To start over at the beginning of the Videotex Terminal program, you do not have to turn the unit off and on again. Pressing the RESET switch will have the same effect.

   Your Videotex Terminal will respond with:

   ```
   VIDEOTEX x.y■
   ```

   where x.y is a pair of numbers specifying which version and release you have. The blue rectangle is the cursor and indicates where the next character will appear.

   If the message does not appear see **Troubleshooting and Maintenance**.

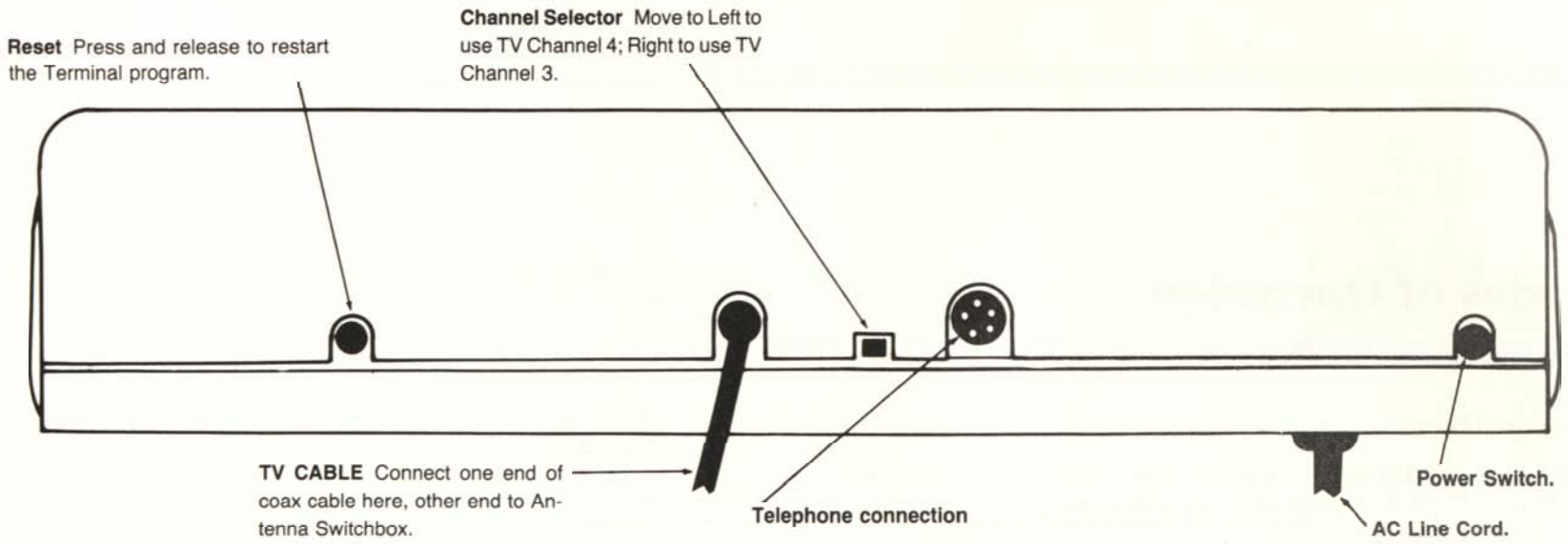


Figure 12. Videotex Terminal Controls and Connections

Use

1. Press the (BREAK) key and your Videotex unit will display:

   PLACE CALL■

   Notice the first message you received after applying power to the unit was erased.

2. Dial your host computer phone number.

3. When the phone call is answered, you will hear a computer generated tone. This is the computer saying "Hello?" Upon hearing the tone, press any key on the Videotex Terminal.

4. The red DATA lamp at the top of the unit will light. Hang up the telephone. The red lamp will stay lit. This is your indication that the Videotex Terminal told the host computer "Hello."

   You are now online and you may begin the standard log-on procedure for the host program. See the host program instructions (For example: *CompuServe Information Service User's Manual*) for details.

When you have logged off and broken communications with the host program, the DATA lamp will turn off and your Videotex Terminal will go offline (release the phone line at your end).

Your Videotex Terminal will tell you it went offline by displaying:

OFF LINE■

a few lines below the sign-off message the host computer sent you.

The Videotex Terminal can save or "remember" the dialog that went on between you and the host computer. 4K systems can save up to eight screenfuls; 16K, 32 screenfuls. Each screenful is referred to as a "page".

To view the saved text in the offline mode, press ↓. Your Videotex unit will start by showing the contents of page 1. This is usually the oldest information (see **Hints and Tips**). Each time you press ↓, the Videotex unit will show you the next page of text in memory. Press ↑ to see previous pages in memory.

If you had a short online session with the host computer, chances are very good that everything received by the Videotex Terminal will be retained in memory. If your session was very long, the text buffer will contain only those pages most recently sent to you. The text memory is active all the time you are communicating with a time sharing service. If the memory is filled, the oldest information it holds will be replaced by the incoming text one page at a time.

Power-Off

If you turn off the Videotex Terminal for any reason, leave it off for at least 15 seconds before turning it back on again. The Videotex Terminal's reset circuitry needs this time to recover before starting up again.

Whenever you turn off the Videotex unit, all stored information is lost.

Hints and Tips

1. The TRS-80 Videotex Terminal is capable of generating eight distinct colors and black. The colors are nominally defined as: Green, Yellow, Blue, Red, Buff, Cyan, Magenta, and Orange. However, the actual color tones, will depend on the quality and color adjustment of your television set — not on the Videotex Terminal.

2. You may be inadvertently disconnected from the network if you have call-waiting service and there is an incoming call signal.

3. Use of extensions while online will probably not cause disconnection, however, you may receive data errors.

4. Attempts to connect to a network may be unsuccessful because the host computer may be broken or it may be the wrong time of day.

5. Text is stored sequentially, starting at page 1. If the amount of text exceeds the capacity of your Videotex Terminal, the incoming text "wraps around" to page 1, erasing the information that was stored there previously.

   Whenever you go offline, the Videotex Terminal displays the contents of page 1. This is usually the oldest text (the first text received). However, if too much text was received, causing the "wrap-around" mentioned previously, page 1 may contain more recent information. Use the ↑ and ↓ keys to find the beginning of the oldest text.

Using the Keyboard

The keyboard of your Videotex Terminal allows you to enter all the standard text and many control characters. As with ordinary typewriters, use (SHIFT) to enter the upper symbol on those keys with two symbols. For example, to enter a !, press (SHIFT) (1).

Capitals and Lowercase

Whenever you turn on your Videotex unit, you are automatically in the all-capitals mode, in which the keyboard will always generate capital letters.

To switch to the lowercase mode, press and hold the (SHIFT) key so that the A-Z keys will produce lowercase letter code.

The TRS-80 Videotex Terminal can only generate capitals on the TV screen. When a lowercase letter is output to the TV screen, it is displayed as a capital letter.

You may want to use the lowercase mode when typing information for output to another computer.

Special Keys and Functions

Certain keys have special functions.

In the online mode you may send many special test and control characters:

Key	Function
(↓)	Acts as a control key in the online mode. When used with an A-Z key a Control Character will be output to the host computer. (See Appendix A for a complete list of control characters.)

Examples: (↓) C "control C"
(↓) J causes a line feed
(↓) M causes a carriage return

(BREAK)	Sends a control-C, echoed as "^C".
(ENTER)	Enters the line. Most commands must be terminated with (ENTER).
(←)	Backspaces. Use this to correct errors before you press (ENTER).
(→)	Tabs
(CLEAR)	Escape character
(SHIFT) (←)	Sends a "["
(SHIFT) (→)	Sends a "]"
(↑)	Enters the code for an up arrow.

In the offline mode:

(↓)	Causes the Videotex Terminal to display Page 1 and to step through the text in memory one page at a time. (See Hints and Tips for further explanation.)
(↑)	Displays the previous page in memory.
(CLEAR)	Resets to start of Videotex Terminal program (doesn't clear buffer)

In the advance entry mode:

(↓)	Stores a down-arrow.
(↑)	Stores an up-arrow.
(←)	Backspaces
(→)	Tabs
(SHIFT) (←)	Stores a "["
(SHIFT) (→)	Stores a "]"

For further details on keyboard characters, see the Appendix.

TROUBLESHOOTING AND MAINTENANCE

If you have problems operating your TRS-80 Videotex Terminal, check the following table of symptoms. Hopefully, you'll find the cure as well.

If you still can't remedy the problem, take the unit to your local Radio Shack where it will be promptly fixed and returned to you.

Symptom	Cure
The power-up message doesn't appear when you turn on the Videotex Terminal	1. No AC power. Check the power cord connection. 2. Incorrect power-up sequence. 3. Your television screen needs adjustment. Check the contrast, brightness, or fine tuning controls. 4. Antenna Switchbox should be set to "COMPUTER", not to "TV".
Poor reception or fuzzy display.	1. Make sure the TV is set on the proper channel (3 or 4 — whichever gives the best display). 2. Check the antenna connections to be sure they are connected both securely and properly. 3. Your television set needs adjustment. Check the contrast, brightness and fine tuning controls.

Symptom	Cure
The Videotex Terminal "hangs up" during normal operation, requiring RESET or Power-off/on.	1. Fluctuations in the AC power supply. See **AC Power Sources.** 2. Defective or improperly installed connector. Check all connection cables to see they are securely attached and that they are not frayed or broken.
"Ghosts" or mixed Videotex host computer and TV reception	Try using the other TV channel (3 or 4).

AC Power Sources

Videotex Terminals are sensitive to fluctuations in the power supply at the wall socket. This is rarely a problem unless you are operating in the vicinity of heavy electrical machinery. The power source may also be unstable if some appliance or office machine in the vicinity has a defective switch which arcs when turned on or off.

Your Videotex unit is equipped with a specially designed, built-in AC line filter. It should eliminate the effects of ordinary power-line fluctuations.

However, if the fluctuations are severe, you may need to take some or all of the following steps:

- Install bypass or isolation devices in the problem-causing devices.
- Fix or replace any defective (arcing) switches on lights or appliances.
- Install a separate power-line for the Videotex unit.
- Install a special line filter designed for computers and other sensitive electronic equipment.

Power line problems are rare and many times can be prevented by proper choice of installation location. The more complex the system and the more serious the application, the more consideration you should give to providing an ideal power source for your Videotex Terminal.

Maintenance

Your Videotex Terminal requires little maintenance. It's a good idea to keep it clean and free of dust build-up. This is especially important for the keyboard. Radio Shack sells a custom designed Color Computer dust cover (26-3006) which was designed also for the Videotex Terminal.

If you need to clean the Videotex Terminal case, use a damp, lint-free cloth.

Notes on Video Centering

The Videotex Terminal generates a rectangular image designed to fill most of your TV's screen. Use the horizontal- and vertical-centering controls on your TV set to center this image as much as possible.

Don't worry if you can't get a perfectly centered image, or if you notice a slight distortion in certain areas of your TV screen. These minor variations depend on the condition of your TV set. (If they are severe, you should consult a qualified TV service technician.)

SPECIFICATIONS

AC Power Supply

Power Requirements	105-130 VAC, 60 Hz
Current Drain	0.20 Amps RMS

Microprocessor

Type	6809E
Clock Rate	0.895 MHz

APPENDIX: CHARACTER TABLE

The following table lists all the ASCII codes, the keys that generate them, and the display character produced when they are received.

Code Dec	Code Hex	Function/ Display Character	Press Key(s)
0	00	None	None
1	01	None	↓ A
2	02	None	↓ B
3	03	None	↓ C or BREAK
4	04	None	↓ D
5	05	None	↓ E
6	06	None	↓ F
7	07	None	↓ G
8	08	None	↓ H
9	09	None	↓ I
10	0A	Line feed	↓ J
11	0B	None	↓ K
12	0C	None	↓ L
13	0D	Return	↓ M
14	0E	None	↓ N
15	0F	None	↓ O
16	10	None	↓ P
17	11	None	↓ Q
18	12	None	↓ R
19	13	None	↓ S
20	14	None	↓ T
21	15	None	↓ U
22	16	None	↓ V
23	17	None	↓ W
24	18	None	↓ X
25	19	None	↓ Y
26	1A	None	↓ Z
27	1B	Escape	CLEAR
28	1C	None	None
29	1D	None	None
30	1E	None	None
31	1F	None	None
32	20	Space	SPACEBAR
33	21	!	SHIFT 1
34	22	"	SHIFT 2
35	23	#	SHIFT 3
36	24	$	SHIFT 4
37	25	%	SHIFT 5
38	26	&	SHIFT 6
39	27	'	SHIFT 7
40	28	(	SHIFT 8
41	29	)	SHIFT 9
42	2A	*	SHIFT :
43	2B	+	SHIFT ;
44	2C	,	,

Code Dec	Code Hex	Function/ Display Character	Press Key(s)
45	2D	−	(−)
46	2E	.	(.)
47	2F	/	(/)
48	30	0	(0)
49	31	1	(1)
50	32	2	(2)
51	33	3	(3)
52	34	4	(4)
53	35	5	(5)
54	36	6	(6)
55	37	7	(7)
56	38	8	(8)
57	39	9	(9)
58	3A	:	(:)
59	3B	;	(;)
60	3C	<	(SHIFT) (,)
61	3D	=	(SHIFT) (−)
62	3E	>	(SHIFT) (.)
63	3F	?	(SHIFT) (/)
64	40	@	(@)
65	41	A	(A)
66	42	B	(B)
67	43	C	(C)
68	44	D	(D)
69	45	E	(E)

Code Dec	Code Hex	Function/ Display Character	Press Key(s)
70	46	F	(F)
71	47	G	(G)
72	48	H	(H)
73	49	I	(I)
74	4A	J	(J)
75	4B	K	(K)
76	4C	L	(L)
77	4D	M	(M)
78	4E	N	(N)
79	4F	O	(O)
80	50	P	(P)
81	51	Q	(Q)
82	52	R	(R)
83	53	S	(S)
84	54	T	(T)
85	55	U	(U)
86	56	V	(V)
87	57	W	(W)
88	58	X	(X)
89	59	Y	(Y)
90	5A	Z	(Z)
91	5B	[	(SHIFT) (←)
92	5C	/	None
93	5D	]	(SHIFT) (←)
94	5E		(↑)

Code Dec	Code Hex	Function/ Display Character	Press Key(s)
95	5F	←	
96	60	\	None
97	61	a	SHIFT A
98	62	b	SHIFT B
99	63	c	SHIFT C
100	64	d	SHIFT D
101	65	e	SHIFT E
102	66	f	SHIFT F
103	67	g	SHIFT G
104	68	h	SHIFT H
105	69	i	SHIFT I
106	6A	j	SHIFT J
107	6B	k	SHIFT K
108	6C	l	SHIFT L
109	6D	m	SHIFT M
110	6E	n	SHIFT N
111	6F	o	SHIFT O
112	70	p	SHIFT P
113	71	q	SHIFT Q
114	72	r	SHIFT R
115	73	s	SHIFT S
116	74	t	SHIFT T
117	75	u	SHIFT U
118	76	v	SHIFT V
119	77	w	SHIFT W
120	78	x	SHIFT X
121	79	y	SHIFT Y
122	7A	z	SHIFT Z
123	7B	{	None
124	7C	|	None
125	7D	}	None
126	7E	~	None
127	7F	None	None

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