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MODEL 209 TELECOMPUTER

DIGI – LOG SYSTEMS, INC. 666 Davisville Road Willow Grove, Pa. 19090

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ÍNTRODUCTION

This manual was prepared for the operator of the Model 209 TeleComputer. The information provided in this manual will enable users to unpack, install, and operate the terminal and diagnose any minor difficulties that might occur from day to day.

The manual will familiarize the user with the fundamental operation of the terminal: the location of the switches, indicators and connecting points, and the way in which the terminal fits into the system environment. Application areas are briefly covered, and the benefits offered by the terminal are noted.

The manual contains coding information which details the exact codes generated with the depression of a particular key, or the transmission codes which must be sent to the terminal from the computer in order to perform a terminal function.

The check list at the end of the manual contains the diagnostic and troubleshooting procedures for the main problems that occur from time to time, such as losing power, or breaking a telephone connection.

UNPACKING

Your Digi-Log TeleComputer is shipped in a cardboard carton enclosed with foam rubber padding. Carefully unpack the terminal and inspect for any mechanical or physical damage as soon as it is removed from the container. Check it over carefully, as it may have been damaged in transit. Examine the fuse holders on the back of the terminal. The shipping carton and customized liner should be saved for possible future use.

In the event any damage is observed, please notify Digi-Log Systems and the carrier at once. These terminals are shipped f.o.b. Digi-Log Systems, Inc., Willow Grove, Pennsylvania. They are insured, and any claims will be honored.

INSTALLATION

Installation of the TeleComputer is straightforward and requires no special tools or test equipment. Installation should be planned in advance, however, in order to determine the interconnecting cable lengths. The cable lengths will depend upon the location of the TeleComputer, the television monitor, and the telephone or communications line connection.

The terminal is equipped with a six foot power cord. Television monitors normally have a power cord from six to ten feet long. The TeleComputer and the television monitor should be plugged into standard 115 volt, 60 hz power outlets. A video cable must be connected between the terminal and the display; a television set must be tuned to channel 4,5 or 6 (see plate on bottom of terminal) and a TV monitor must be terminated properly. The standard cable is six feet long. A longer cable, or several cables for a daisy chain to to more than one display, may be required. They can be fabricated locally, or ordered from Digi-Log as an option.

The end of the video cable that plugs into the terminal has a BNC connector that must be pushed on and twisted. The monitor end might require the same kind of connector or one that screws on. A clip-on connector is provided for attachment to the VHF antenna terminals of the television set.

The system interface connection can vary with each installation. (See the Interface Section for more details.) The following possibilities exist:

- Built in acoustic coupler system connection is made by inserting the handle of the telephone handset into the cups of the acoustic coupler.
- Separate acoustic coupler the acoustic coupler should be plugged into the 25 pin connector, marked J21, on the rear panel of the TeleComputer through a Digi-Log T cable.
- Modem (dataset) the modem should be plugged into the 25 pin connector, marked J21, on the rear panel of TeleComputer through a Digi-Log T cable.
- Direct computer connection the wires that run from the computer should terminate in a mating connector for J21, found on the rear panel of the TeleComputer, through a Digi-Log T cable.
- Connection to a local terminal (e.g. printer) the local terminal should be connected to the TeleComputer by a Digi-Log M cable, which plugs into J21 on the rear panel.

If the unit has been shipped during cold weather, it should be allowed to adjust to room temperature before it is used. Thirty minutes is adequate.

Multi-Display Systems

A multi-display system uses more than one display with one TeleComputer. Up to ten sets may be connected to a single terminal, and they may be spaced hundreds of feet apart. The sets may be any size. The following guidelines should be considered when installing a multi-display system.



The terminal output complies with EIA standard RS170 for connecting to TV monitors having a composite sync and video signal, and also with RF signals for connecting to the antenna leads of standard television sets..

For a daisy chain of television monitors:

- The last monitor on the chain requires a 75 ohm terminating impedance. There is normally a switch on the rear panel of the monitor marked with high and low impedance positions. (Sometimes it is located inside on the monitor chassis.) The switch should be put in the low impedance position.
- The intermediate monitors on the daisy chain require a high impedance feed through, normally labelled video in and video out. The impedance switch on intermediate monitors should be put in the high impedance position.
- If the distance between monitors is greater than 100 feet
 75 ohm coaxial cable should be used. The cable impedance is not critical for short distances.

For a fan out of television receivers:

- A multiple set coupler, which is found in television shops and radio electronics stores, is required.
- The input side of the coupler is connected to the Tele-Computer and the television sets are connected to the coupler output terminal pairs via antenna cable.
- Should additional output terminal pairs be required, a second multiple set coupler can be connected in series with the first one.

OPERATING PROCEDURES

Initialize

The following procedure will initialize the terminal and make it ready for normal operation.

- Assure that the power cord is plugged into any standard household or office outlet.
- Assure that the video cable is connected between the terminal and the TV set.
- Set the on-off switch, located on the rear panel of the terminal, to the on position. The red power on indicator will illuminate.
- Set TV sets to channel.
- Terminate TV monitors properly.
- Turn on the television. Random characters should appear on the screen reflecting the initial content of the terminal.
- Adjust the contrast and brightness controls on the TV set as necessary for room conditions.
- Depress the clear key on the terminal keyboard to erase the screen.
- The terminal is now ready for operation.

Going On Line

Connecting the terminal to a remote computer through an acoustic coupler is the most common means of operation. The following procedure will establish the proper modes and conditions for the operator.

- Place the terminal remote/local switch into the remote position.
- Place the half/full duplex switch into the half or full position as required by the computer system.
- Place the page/roll switch into the roll position.
- Select the 10 or 30 character per second data transfer rate with the baud rate switch.
- Dial the computer facility through a standard telephone set. Listen for a high pitched tone.
- Place the telephone set in the cushioned cups, being certain that the phone cord is at the right side of the terminal, as marked.
- Note that the green indicator light is illuminated. This indicates that the circuit is complete.

The terminal is now ready to transmit and receive. As characters are received or typed, they will be displayed on the screen at the current cursor position. From this point on, the operator should follow the proper Log On sequence and communicate with the system according to the prescribed system discipline.

GENERAL DESCRIPTION

The Model 209 TeleComputer is an interactive data terminal, unique in that it utilizes a standard television receiver for displaying data. The TV set can be any size. It is a CRT display device that can communicate with the computer directly, or over communication lines. It is small, lightweight, handsome, and portable. The control electronics, the acoustic coupler, and the keyboard are all contained in the same enclosure; while the television set, which displays the output from the terminal or the computer, is separate. Since the TV is separate, it permits the user to connect a number of TV receivers, or monitors, of any desirable size or type of mounting, simultaneously, for multiple viewing of computer output. The TeleComputer is made with integrated circuitry and the latest MOS memory techniques. This circuitry assures the reliability that is inherent in solid state devices.

The terminal is typically used in an environment which requires the transmission of USASCII characters between a remote site and a computer site. To provide the flexibility required in an office environment, an acoustic coupler is normally used as the connection to the communications facility. Acoustic coupling enables a terminal to be moved from place to place without the need for expensive installation and removal costs such as are required with data sets.

In addition, the terminal can be used in a system as a replacement for, or in conjunction with, teletypewriters. The keyboard has the same layout as the Model 33 teletypewriter, the transmission is compatible with the transmission characteristics of the teletypewriter, and the systems software required to operate them is identical. Therefore, anyone who now has a system utilizing teletypewriters can, without any difficulty or expense, add a TeleComputer display terminal to their network and operate without any changes in hardware or software. Many teletypewriters connect with the system through an acoustic coupler or an RS232 interface, while others use 20 ma or 60 ma current loop. Any of these four methods of connection are possible with the Digi-Log Model 209 TeleComputer.

Fundamentally, the Telecomputer, as a CRT display, has several advantages and can provide the following benefits to the user.

- The output can be viewed at a distance.
- The operation is silent.
- The acoustic coupling removes the need for expensive installation.
- The compactness and light weight provides ease of portability.
- The speed of operation saves on-line as well as personnel operating time.
- The use of television monitors means that the computer output can be viewed on large screens and on many screens simultaneously.

The CRT display can be applied profitably in many ways. Primarily, the applications are those that do not require a hard copy of computer output, do require quiet operation, can appreciate higher speed of operation, or are concerned with the over-all cost of the system.

Using the CRT display to monitor changing computer output is an excellent application for the TeleComputer. A complete screen of information can be presented, and under cursor control, selected data can be updated at any time from the computer. In such an environment, the operator is always able to see the latest information displayed on the screen; and the computer must not continually retype an entire page of output because of minor changes in several characters or perhaps one line.

With a visual display, programs can be called out from the computer and modified step by step without the delay required in a teletypewriter bound system, and also without the accumulation of unnecessary amounts of paper.

Perhaps one of the most useful applications of the CRT with teletypewriter compatibility and television compatibility is in the educational environment. It can be used in the classroom for teaching students about computers and programming; it can be used by the students in the solution of their problems; and it can be used by the faculty and programmers in the development of systems programs. In addition, the video display in this environment can be used to benefit the school's administration with applications such as the maintenance of student records and on-line registration.

File inquiry is an on-line application for CRT displays. An inquiry system can be used for credit reference, for reservation requests, or for stock market quotations. The CRT display is the best choice for a file inquiry system when fast access is required; when visual verification of data on the screen is used to reduce input errors; when data is needed in context with other data; or when computer assistance, or operating instructions, are provided to help the user interrogate the files.

The TeleComputer can be equipped, optionally, to provide additional flexibility for systems integration. Parity may be set to odd, even, or none. The serial interface can operate at numerous data rates up to 9600 bits per second, and a parallel interface permits transmission speeds up to one thousand characters per second. Additionally, through the selection of the proper interface cable, the terminal may be connected to peripheral devices, such as printers, tape cassette units and modems. A number of computer interfaces are available, and others will be provided on request.

INDICATORS

There are two indicators on the terminal – a red one for power and a green one for carrier signal. The power indicator will light when the terminal is connected to an AC outlet and the power switch is turned on. The signal indicator will light when a carrier is received from the communication network; it indicates that a circuit has been established and data transmission is possible.

DATA RATE

The standard terminal data rates are 10 characters per second and 30 characters per second. The speed is switch selectable, and the switch is located in the upper corner of the rear panel. (Baud rates up to 9600 bits per second, serial asynchronous are available optionally.)



OPERATING MODES

There are six operating modes for the TeleComputer which are selected by the three switches in the upper right hand corner of the keyboard. The three switches are marked L/R, H/F, and P/R. The six modes of operation are Local, Remote, Half duplex, Full duplex, Page, and Roll. Each of these modes are described below.

Local

In the local mode, the terminal is wired directly to a computer and is not connected through communications facilities. The terminal may be used in this way as a console for a small computer system, and high speed operation is possible. In addition, the local mode may be used for operator training or local preparation of data.

Remote

This is the most common mode of operation for the terminal, and it uses the acoustic coupler to connect through the communications facility to a remote computer. The acoustic coupler, built into the terminal, provides two rubber cups for the insertion of a standard office telephone. The terminal operates with a time sharing system or an on-line system that uses serial, asynchronous, ASCII communications discipline. It will operate without any change in software or hardware with systems that have been developed for the teletypewriter.

Full Duplex

Full duplex means that different information can be transmitted in both directions at the same time. In the full duplex mode, data that is generated at the terminal is sent directly to the remote computer and does not go into the local memory or appear on the CRT screen. Data from the computer is received by the memory and does display on the screen. This mode of operation may be used where the input and output data streams are meant to be independent and contain different information. This mode may also be used to validate input data by echoing it back to the screen from the computer. If the operator sees the data that he is entering appearing in error on the screen, he can assume that an error was made in transmission and can re-initiate the transmission.

Half Duplex

Half duplex means that data can be transmitted only in one direction at a time. In this mode of operation, any information that is typed on the keyboard is transmitted to the computer, stored locally, and simultaneously appears on the screen. Data cannot be sent back from the computer at the same time that the operator is keying on the keyboard. Instead, computer output will not start until the input operation is complete.

Page

In the page mode, data may be entered until the cursor reaches the fortieth position of the sixteenth line, or the last character of the page. At that time, the computer or the operator must make a decision before additional data can be received. The operator typically would perform one of three functions.

- Depress carriage return and prepare to write again over the old data that exists on the last line of the display
- Initiate clear, which would clear the entire page and enable data to be entered once again from the home position
- Generate a cursor home. This does not clear the display; but rather, enables the operator or the computer to write over the existing page of data.

Roll

In the roll mode, data is entered until the cursor reaches the last position of the display or the fortieth position on the sixteenth line. In this position, it is normal to generate a carriage return and a line feed. The carriage return will cause the cursor to be repositioned at the beginning of the sixteenth line and the line feed causes all the lines of data to move up one line. This relocates the sixteenth line of information to the fifteenth line, the second line of information to the first line, and so on. The original first line information is erased from memory. The sixteenth line is cleared and is ready to accept new data.

KEYBOARD

The keyboard, as shown in Figure 1, consists of four rows of alphanumeric, control, and function keys. The layout of the alphanumeric keys is identical to the keyboard layout of a Model 33 teletypewriter. The control and function keys are located next to the alphanumeric keys on both sides and are placed for the convenience of the operator. The bit configuration of every character that can be generated by the keyboard is shown in Table I, Code Set. Different codes will be generated depending upon whethera key is depressed alone or in conjunction with the shift or control keys. Table 2 shows the key/character relationship. Column 0 of Table 2 lists each key on the keyboard and references a symbol that appears on the key top. Column 1 shows the character that is generated when the key is depressed all alone, column 2 shows the character that is generated when the shift key is also depressed, and column 3 denotes the character that results from the simultaneous depression of an alphanumeric key and the control key.

Control Keys

Clear – Clear is a local control key and does not generate a character code. When depressed, the memory is cleared, all characters are erased from the screen, and the cursor returns to the home position (first character, first line) of the display.

Escape – The escape key generates the standard USASCII ESC code. This code is ignored by the terminal while it is transmitted from the terminal to the communication line. ESC is normally used by the computer software to indicate that the full duplex terminal user wishes to have the output transmission halted. Escape is a system control rather than a terminal control.

Space – Depression of the space bar inserts a space in the memory at the present cursor position and moves the cursor one character position to the right on the screen. The space code is transmitted.

Line Feed – Depressing the line feed key will cause the cursor to move down one line without changing its horizontal position on the line. If line feed is depressed when the terminal is in the roll mode and the cursor is on the last line, then depression of the line feed key will cause the screen to roll up one line, leaving the last line blank and the cursor located at the same horizontal position it used to have on the previous line. In all cases the line feed code is transmitted.

Return – Depression of the return key will cause the cursor to move to the left and assume the first position on the same line. In addition, the return code will be transmitted.



FIGURE 1. KEYBOARD

_	/		b`	7 b6 b5		0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1
ł	o4	b3	b2	b1	Col	0	1	2	3	4	5
)	0	0	0	0	х	DLE	SP	0	@	Р
	D	0	0	1	1	SOH	DC1	!	.1	А	Q
	D	0	1	0	2	STX	DC2	"	2	В	R
)	0	1	1	3	ETX	DC3	#	3	С	S
0)	1	0	0	4	EOT	DC4	\$	4	D	Т
(5	1	0	1	5	ENQ	NAK	%	5	Е	U
)	1	1	0	6	ACK	SYN	· &	6	F	V
0)	1	1	1	7	BELL	ETB	'	7	G	W
	l	0	0	0	8	BKSP	CAN	(8	н	х
·	1	0	0	1	9	ΗT	EM)	9	I	Y
	I	0	1	0	10	LINE FEED	SUB	*	:	J	Z
	I	0	1	1	11	VT	ESCAPE	+	;	К]
	I	1	0	0	12	FF	×	,	. (L	١
1	I	1	0	1	13	RETURN	x	-	-	М]
	I	1	1	0	14	SO	x		>	N	1
	I	1	1	1	15	SI	×	/	?	0	~

Legend

x — not available

DEL (all seven 1 bits) is generated by the Rubout Key

TABLE 1 CODE SET

Rubout – Depression of the rubout key will cause the generation of the USASCII DEL code. This code will be transmitted, but it is not recognized by the terminal and performs no terminal function.

Control – The control key is always used in conjunction with another keyboard key. When they are simultaneously depressed, the two keys generate the character that appears in the Control Column, Table 2. All codes will be transmitted, but none of them are stored in the memory. The following keys, when depressed in conjunction with the control key, will generate codes that cause action within the terminal.

- H causes the cursor to backspace one position. If the cursor is at the first position on the line, no action will be taken, and the cursor will remain at the first position.
- I causes the cursor to move right one position. If the cursor is at the eightieth position of a line, the cursor will remain in the eightieth position.

- J will cause the cursor to move in the same manner as described under Line Feed.
- K causes the cursor to move up one line. If the cursor is on the first line of a page, it will remain in the same position.
- L performs the same function as the Clear key.
- M performs the same function as the Carriage Return.
- N will cause the cursor to be returned to the home position, which is the first character on the first line.

Function Keys

Break — Depression of this key causes the output data line to go into a continuous spacing condition without start or stop bits. This condition is used as a system function to indicate to the system that the operator at a half duplex terminal would like to stop the output from the computer. **Shift** – Certain key tops are engraved with two characters which are not control characters, one on the top of the key and one on the bottom. When such keys are depressed in conjunction with the shift key, the character etched on the top of the key will be generated, appear on the screen, be stored in memory, and be transmitted. When a key has only one engraved designation (excluding control characters), it will generate the same character with or without the shift key depression. Refer to Table 2 for more detail.

Repeat – If the Repeat key is depressed and then a character key is depressed along with it, the character will repeatedly be entered into the memory, appear on the screen, and be transmitted at the selected baud rate. If the baud rate switch is set at 30 characters per second, for example, the repeat function will operate at 30 characters per second. Repetition will occur as long as the Repeat key is held down.

INTERFACE

The TeleComputer interface is very flexible and provides different types of signals to meet the demands of a variety of probable attachments. Through selection of the proper interface cable, the interface will appear to be EIA RS232C, TTL levels, or 20 ma current loop.

The cable requirements for a number of uses are as follows:

Use	Cable
1. On line through built in acoustic coupler	none
2. On line through external modem or acoustic coupler	Т
 Hard wired through a 20 ma tele- typewriter port 	т
4. Hard wired to TTL circuits	Customer Supplied
With TTY (20 ma interface) as an output printer	М
6. As an acoustic coupler for another transmit/receive device	М

The schematic of the interface is shown in Figure 2. Figures 3 and 4 show the T cable and M cable respectively. Some additional details presented below will be helpful in determining interface requirements or selecting interface options. In addition, should more information or assistance be required, it can be arranged through the marketing department at the Digi-Log home office.



KEY		CHARACTER	le l
Column 0	Column 1 Normal	Column 2 Shift	Column 3 Control
1	1		- 1 .5
2	2		2
3	3	#	3
4	4	\$	4
5	5	%	5
6 7	6	&	6
7 8	7 8	es, esti cherren (Antonelia Anglania	7
9	8 9		8 9
9	9 0) 0	9
•	Ū	*	U
ESCAPE	ESCAPE	ESCAPE	ESCAPE
Q	0	0	DC1
Ŵ	w	Ŵ	ETB
i de la constante de la constan En la constante de la constante	E	E	ENQ
R	R	R	DC2
T	in the T erminal State	Т	DC4
Y	γ	Y	EM
U	Ú	U	NAK
			нт
0	0	\leftarrow	SI
Ρ	Ρ	Q	DLE
LINE FEED	LINE FEED	LINE FEED	LINE FEED
RETURN	RETURN	RETURN	RETURN
A	A	A	SOH
S	S	S	DC3
D F	D	D F	EOT
F G	F	F G	ACK
H	H ·	H	BELL BKSP
J	о : Ј	- J	
ĸ	ĸ	с. С	VT
Ľ	L.		¢, FF
		+	
RUBOUT	RUBOUT	RUBOUT	RUBOUT
Z	Z	Z	SUB
×	X	×	CAN
C	С	С	ETX
v	V	V	SYN
В	В	В	STX
N	N	1	SO
М	М]	RETURN
•	1	 	
		>	
1	1	?	. 1
PACE BAR)	SPACE	SPACE	SPACE
TABLE 2	KEY/CHABA	CTER RELATI	ONSHIPS



TTL – The logic levels are about +0.5v for a low, logic zero and +4.0v for a high, logic one. Data is received by the TeleComputer at connector J21, pin 4 (J21-4) and its signal ground should be connected to J21-7. Data is transmitted from the TeleComputer via J21-5, and its associated signal ground is on J21-7. Within the TeleComputer, pin 7 is connected to signal ground, and pin 25 is connected to chassis ground.

20 ma Current Loop – The standard interface configuration shown in Figure 2 used with the T cable, Figure 3, allows the TeleComputer to look like a teletypewriter wired for 20 ma four wire service. This combination is used when the TeleComputer is to be hardwired into the teletypewriter port of a computer. Data is received by the TeleComputer at pin 3, and the return signal is on pin 7 of the T cable. Data is transmitted from the TeleComputer via pin 2, and its return signal is on pin 7 of the T cable.

When the standard TeleComputer interface is used with the M cable, Figure 4, a teletypewriter wired for 20 ma four wire service may be used as an output printer; or, the Tele-Computer can serve as the acoustic coupler for the teletype-

writer. Data is received by the TeleComputer at pin 2, and the return signal is on pin 7 of the M cable. Data is transmitted from the TeleComputer via pin 3, and its return signal is on pin 7 of the M cable.

It is not possible for the Digi-Log Model 209 TeleComputer interface to be directly compatible with all versions of interface options that are present in the many different versions of the teletypewriter Model 33.

In the case of incompatibility, please contact Digi-Log for clarification.

EIA RS232C – This option provides a 25 pin input/output connector that conforms to the electrical and logical specifications of the Electronics Industry Association's standard specifications number RS232C. This interface is compatible with commercially available modems and acoustic couplers; also with many output devices.

This option can be used in two ways, each way made possible by the connection of an M or T cable. When a T cable is used, the TeleComputer serves as a "terminal" for connecting to a modem or computer. When an M cable is used, the TeleComputer serves as the "modem" (acoustic coupler) for a foreign attachment like a printer or teletypewriter, and will display the data that passes through in either direction. Also, with a T cable, the following conditions are true at the RS232C interface:

- Receive Data enters the TeleComputer
- Transmit Data leaves the TeleComputer
- Data Terminal Ready is always on
- Request to Send is always on



With an M cable, the following conditions are true at the RS232C interface:

- Receive Data leaves the TeleComputer
- Transmit Data enters the TeleComputer
- Dataset Ready is always on
- Clear to Send is always on

An **M or T cable must be used** in order to obtain a standard RS232C pin configuration.



DIGI - LOG Systems, INC.

OPTIONS

Parity

The basic terminal has even parity, which means that there are an even number of one bits in every character.

Optionally, the terminal can have odd parity, which means that there would be an odd number of one bits in every character.

Optionally, the value of the parity bit can be ignored, or set permanently to a one, or set permanently to a zero.

Interface Cables

There are two interface cables optionally available: T and M. The T cable, Figure 3, makes the TeleComputer look like the "terminal" side of the interface.

The M Cable, Figure 4, makes the TeleComputer look like the "modem" side of the interface.

Refer to the Interface Section for more details.

Video Cables

The normal length cable for connecting the terminal to the television monitor is six feet long. Optionally, longer cables can be provided.

Specialization

The terminal is modular, flexible, and expandable: it also is constructed with integrated circuitry and standard logic modules. This structure makes it possible to customize a terminal to meet special requirements.

Inquiries into special requirements for large numbers of terminals are invited.

CHECK LIST

The following check list will help the terminal operator to locate the minor difficulties that can occur from time to time. By following the steps on the check list, one should be able to return the terminal to normal operation.

The check list should be used before requesting additional assistance.

1. If nothing seems to work -

- a. Be certain that the TeleComputer is plugged into a working 110 volt AC power outlet. A lamp, or radio, can be used to test the outlet and see if it is working.
- b. The red power light on the TeleComputer should be lit. If not, see that the power switch on the rear panel is turned on.
- c. If the power outlet is good and the power switch is on, check the fuse on the rear panel and replace it, if blown, with a 3 AG, ½ amp, 125 volt slo blow fuse.

- 2. If the power is on but the screen of the television is blank
 - a. Be certain that the TV is plugged into a working 110 volt power outlet, and is turned on.
 - b. Be certain that the video cable is connected between the TeleComputer and the monitor.
 - c. If the set is a TV receiver, be sure it is tuned to Channel 4, 5, or 6, as marked on the plate on the bottom of the set.
- 3. If the TV is unstable, or the picture is poor
 - a. Adjust the vertical and horizontal control knobs.
 - b. Adjust the brightness and contrast controls.
 - c. Use fine tuning knob to get clear picture.
- 4. If data cannot be entered from the keyboard
 - a. Depress each key and note that it does not stick down: see that it goes down and up again.
 - b. Be certain that the mode selection switches on the keyboard are set to "Local" and "Half" duplex.
 - c. Depress the Clear key. Note that the data is erased from the screen and that the cursor is positioned in the upper left hand corner of the screen.
- 5. If the TeleComputer operates locally, off line, but will not communicate with the computer
 - a. Note that the data rate switch on the rear panel is on the appropriate setting.
 - b. Be certain that the three mode switches on the keyboard are set properly.
- 6. If the TeleComputer is not communicating with the computer over an acoustic coupler
 - a. Be sure to dial the correct phone number.
 - b. Note a high pitched tone over the telephone line when the computer answers the call.
 - c. Be certain that the phone handle is inserted in the coupler so that the cord is at the proper end.
 - d. Check the data rate switch on the rear of the unit.
 - e. The green light on the keyboard should illuminate if the previous conditions are satisfied.
- 7. If the TeleComputer is not communicating with the computer over a hardwire connection
 - a. Be sure that the computer is up.
 - b. Note that the interface plugs are inserted at the terminal and then, if necessary, at the computer end.
 - c. Be certain that the unit is operating at the same baud rate as the computer.

In the event that a problem remains after conscientiously following the check list, notify the local contact, with responsibility for arranging authorized service.

SPECIFICATIONS

CHARACTERISTICS

MODEL 209 TELECOMPUTER TV TERMINAL

CHARACTERS PER LINE LINES PER DISPLAY TOTAL NO. OF CHARACTERS CHARACTER SIZE ACTUAL DISPLAY SIZE CHARACTER GENERATION CHARACTER SET REFRESH RATE KEYBOARD FORMAT

CONTROLS

MEMORY

COMMUNICATION INTERFACE

PARALLEL INTERFACE BUILT-IN COUPLER HARD-COPY PRINTER MAGNETIC TAPE CASSETTE POWER

DIMENSIONS

40 16 0.25"H x 0.15" W (12" display) Selectable, 12" or 9" displays most common 5 x 7 dot matrix 64 character ASCII 60 cycle Model 33 Teletype layout including additional control keys Entry Cursor: Up, Down, Left, Right, Home Clear Local-Remote Half-Full Duplex Scroll, Page Modes Switch-Selectable 110 and 300 baud (10 and 30 cps.) Higher speeds to 9600 baud are optional Teletype Current Loop or RS232C using ASCII 10 or 11 bit asynchronous code 8 bit, full duplex parallel interface is optional Optional Optional Optional 30 watts 108-132 volts ac 4" H x 11" D x 11" W

10 lbs.

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