

SILENT 700
Electronic Data Terminal
Model 720/30 Series
887
Operating Instructions

720

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TEXAS INSTRUMENTS
INCORPORATED
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SECTION I

GENERAL DESCRIPTION

1-1 SCOPE OF MANUAL.

This is the operating instruction manual for the Silent 700 Electronic Data Terminal, Models 720/30, produced by the Digital Systems Division of Texas Instruments. This manual provides the information necessary for installation and operation of the following models: 720, 721, 722, 723, 730, and 731 Data Terminals.

1-2 DESCRIPTION OF EQUIPMENT.

The terminal is a self-contained electronic page printer designed for a wide variety of telecommunications. (see Figure 1-1) Silent electronic printing is achieved with the use of a dot matrix on a monolithic solid-state printhead that moves across the page, printing 80 characters per 8

inch line. The matrix is composed of 35 separate solid-state heating elements, each electronically controlled. During the printing operation, input data is decoded and voltage is applied to the proper elements, causing a transfer of thermal energy to the heat-sensitive paper which creates the image.

1-2.1 MODEL 720. The Model 720 terminal is a KSR (keyboard send/receive), Input/Output unit. Choice of speeds and options give flexibility in applications such as: timesharing, point-to-point telecommunications, remote access and computer console use.

1-2.2 MODEL 721. The Model 721 terminal is a receive-



Figure 1-1. Silent 700 Electronic Data Terminal

only configuration of the Model 720 and incorporates an EIA serial data interface for receipt of data transmission over private communication lines. Areas of application include public and private telecommunications systems as well as wire service remote stations.

1-2.3 MODEL 722. The Model 722 terminal is a receive-only configuration of the Model 720 with a parallel-by-bit data interface. It may be used as a hard-copy printer with video data terminals, desk-top computers and calculators, or with another remote data terminal. This terminal is designed for hard-wire connection to a source of parallel data output and is similar in appearance and operation to the Model 721.

1-2.4 MODEL 723. The Model 723 terminal is a KSR (keyboard send/receive) configuration of the Model 720 with parallel-by-bit information interchange. It is similar in operation to the Model 722 with the addition of a keyboard for parallel transmission of information.

1-2.5 MODEL 730. The Model 730 terminal is a KSR (keyboard send/receive) unit similar to the Model 720 but designed for telegraph-grade dc signal data transmission. It has special application in areas using low-speed mechanical teletypewriters, such as private and public telecommunications systems, remote terminals and computer consoles. This terminal is provided with a Teletype interface circuit

for direct compatibility with existing terminals.

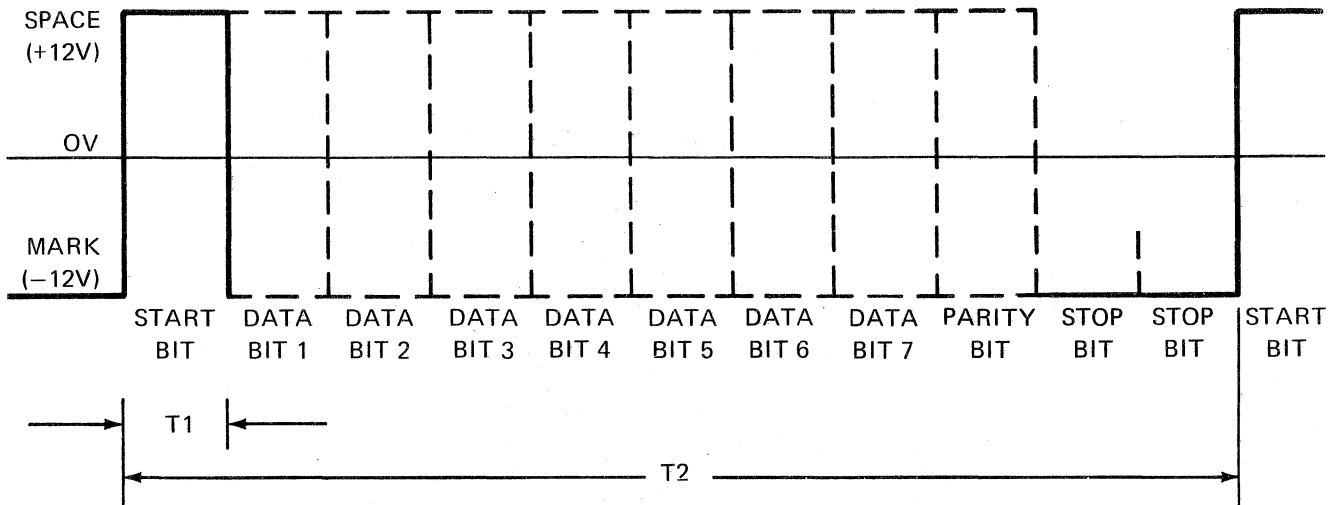
1-2.6 MODEL 731. The Model 731 terminal is a receive-only configuration of the Model 730. It has a dc signal interface for receipt of telegraph-grade data from wire services and other public and private telecommunications systems. This terminal may also be used as a hard-copy printer for desk-top computer, calculators and computer terminal applications.

1-3 STANDARD EQUIPMENT.

The terminal comes complete with printhead, control electronics and data set interfaces.

1-3.1 KEYBOARD AND TRANSMISSION CODE

- a. Model 720/21/30/31 – USASCII, 7-level, 11 bits per character including parity, start and 2 stop bits at 10 characters per second speed; 10 bits per character with 1 stop bit at higher speeds. Standard operating speeds of 10, 15, or 30 characters per second are provided by a selector switch (see Figure 1-2). Printable characters, 68 plus 4 printer control characters and 5 terminal control characters. (See Figure 1-3.)
- b. Model 722/23 – USASCII, 7-level, parallel



CHARACTERS/SEC	T1(MS)	T2(MS)
10	9.09	100
15	6.66	66.6
30	3.33	33.3
40	2.50	25.0

Figure 1-2. Serial Data Timing Diagram

input; printable characters 68, plus 4 printer control characters. (See Figure 1-3.)

1-3.2 DATA FORMAT

- a. Model 720/30 – An internal switch provides choice of half or full-duplex operation. Serial transmission is asynchronous serial-by-bit, serial-by-character. Auxiliary Input/Output parallel-by-bit, serial-by-character.
- b. Model 721/31 – Simplex, asynchronous serial-by-bit, serial-by-character. Auxiliary output parallel-by-bit, serial-by-character.
- c. Model 722 – Simplex, asynchronous parallel-by-bit, serial-by-character. Terminal controlling source must provide required serial characters in the bit parallel. Asynchronous operation obtained by requiring that input lines be strobed when ready. Completion of print operation is indicated by READY-BUSY line.
- d. Model 723 – Full-duplex, asynchronous parallel-by-bit, serial-by-character. (Same as 722)

1-3.3 COMMUNICATION INTERFACE

- a. Model 720/21 – Data set interface per EIA

Standard RS232B. The signals and connector pins involved are described in Table 1-1. A 5-foot data set cable with 25 pin connector is supplied with terminal.

- b. Model 730 – Teletype interface, neutral keying. The signals and connector pins involved are described in Table 1-2.
 - 1. Input current – 60 mA
 - 2. Input switching currents – 30 mA
 - 3. Output current capability – 60 mA
 - 4. Output voltage capability – 130 VDC
 - 5. Signal interface - 4 spade lugs
 - 6. Convertible to 20 mA loop by clipping out one resistor
- c. Model 731 – Teletype interface, neutral keying. The signals and connector pins involved are described in Table 1-2.
 - 1. Operates in receive-only mode on 2 wires.
 - 2. Input current – 60 mA

TABLE 1-1
MODEL 720/21 DATA TERMINAL
SERIAL COMMUNICATION INTERFACE TABLE

Connector Pin Numbers J-13		Pin Function
Terminal (Yellow)	Data Set	
1	1	Protective Ground ⁴
2	2	Transmitted Data ^{4,6}
3	3	Received Data ⁴
4	4	Request to Send ^{1,4,6}
5	5	Clear to Send ^{2,4,6}
6	6	Data Set Ready ^{3,4}
7	7	Signal Ground ⁴
8	8	Data Carrier Detector ⁴
A	20	Data Terminal Ready ^{1,4}
B		
C		
D		Communication Line ⁵
E		
F		
G		
H		Communication Line ⁵

NOTES

¹ Held to a high condition by data terminal.

² Held to a high condition by data set during transmission.

³ Held to a high condition when data set is operative.

⁴ Used only with external modem, EIA interface, and data set cable assembly 215563-0001.

⁵ Used only with internal modem and phone line cable assembly 215619-0001.

⁶ Not present on Model 721.

**TABLE 1-2
MODEL 730/31 DATA TERMINAL
COMMUNICATION INTERFACE**

Pin Number Terminal (Yellow)	Pin Function
1	
2	Teletype Line ^{*,1}
3	
4	
5	
6	Teletype Line ^{2,3}
7	
8	
A	
B	
C	
D	Teletype Line ^{*,1}
E	
F	
G	
H	Teletype Line ^{2,3}

NOTES

¹ Full duplex transmitter output loop.

² Full duplex receiver input loop.

³ Pin D and Pin H must be tied together for half duplex operation.

*Not used on Model 731.

**TABLE 1-3
MODEL 722/23 DATA TERMINAL
SIGNAL INTERFACE TABLE**

Connector Pin Number	Parallel Output Connector (Blue J-11) Output from Keyboard	Parallel Input Connector (Red J-12) Input to Printer	NOTES
1	Data Line 1 ⁸	Data Line 1 ⁸	<p>All logic levels are TTL compatible, i.e.:</p> <p>+5⁺⁰ -2.6 VDC for logic high</p> <p>0^{+0.5} -0 VDC for logic low</p> <p>¹ 1.0 μs minimum high pulse to indicate validity of data lines.</p> <p>² Held to a low condition by the terminal when a character is being printed, indicating busy.</p> <p>³ Not used on Model 723.</p> <p>⁴ 1.0 μs minimum high pulse to initiate print cycle.</p> <p>⁵ 100 μs minimum high pulse to turn on data terminal. (Holds printer to "ON" state when held high.)</p> <p>⁶ 100 μs minimum high pulse to turn off data terminal (Ineffective if printer start held high.)</p> <p>⁷ Used to initiate printing action.</p> <p>⁸ Data line 1 thru data line 7 corresponds to b₁ thru b₇ of ASC-II code (see Figure 1-2). Must precede input strobe by 1 μs.</p> <p>*Not used on Model 722.</p>
2	↑ 2	↑ 2	
3	↑ 3	↑ 3	
4	↑ 4	↑ 4	
5	↑ 5	↑ 5	
6	↑ 6	↑ 6	
7	↑ 7	↑ 7	
8	Data Line 8	Data Line 8	
A		Ready/Busy ²	
B		Signal Ground	
C	Signal Ground	Printer Start ^{3,5}	
D		Input Strobe ^{4,7}	
E		Printer Stop ^{3,6}	
F	Output Strobe ¹		
G			
H			

3. Input switching currents – 30 mA
 4. Signal interface – 2 spade lugs
 5. Convertible to 20 mA loop and polar operations by clipping out resistors.
- d. Model 722 – The red connector, J12, is used to connect the terminal to a source of parallel coded data. The signals and connector pins involved are described in Table 1-3.
- e. Model 723
1. The red connector, J12, is used to connect the terminal to a source of parallel coded data.
 2. The blue connector, J11, is used to provide connection to the terminal's parallel keyboard output. Signals and connector pins involved are described in Table 1-3.

1-3.4 AUXILIARY DEVICE INTERFACE

- a. Model 720/30 – The Model 720 and the Model

730 have identical auxiliary input and output device interfaces. The signals and the connector pins involved are described in Table 1-4.

- b. Model 721/31 – Neither terminal has provisions for use of an auxiliary input device; however both models have identical auxiliary output device interfaces. The signals and the connector pins involved are described in Table 1-4.

1-3.5 INTERRUPT

- a. Model 720 – Allows operator to interrupt transmission from computer to terminal when necessary by means of the BREAK key. Communication is immediately established with the remote computer by transmission of a space for longer than 140 ms, which is interpreted as an interrupt or break. This feature requires a full-duplex modem and/or transmission media.
- b. Model 730 – Same procedure as Model 720, but no modem is used. In full-duplex operation, the break signal is transmitted on the separate send loop while data is being received on the

TABLE 1-4
MODEL 720, 721, 730, 731 DATA TERMINAL
AUXILIARY INTERFACE TABLE

Connector Pin Number	Auxiliary Output Connector (Red) J-11	Auxiliary Input* Connector (Blue) J-12	NOTES
1	Data Line 1 ⁹	Data Line 1 ⁹	<p>All signals are TTL compatible, i.e.:</p> <p>+5⁺⁰ -2.6 VDC for logic high</p> <p>0⁺⁵ -0 VDC for logic low</p> <p>¹ 100μs minimum high pulse to turn on auxiliary output device when "DC2" is received.</p> <p>² 100μs minimum high pulse to indicate validity of output data lines.</p> <p>³ 100μs minimum high pulse to turn off auxiliary output device when "DC4" is received.</p> <p>⁴ 100μs minimum high pulse to turn off auxiliary input device when "DC3" is received.</p> <p>⁵ Held high to indicate terminal is ready to accept data.</p> <p>⁶ Held to a low condition by auxiliary input device when operational.</p> <p>⁷ 100μs minimum high pulse to turn on auxiliary input device when "DC1" is received.</p> <p>⁸ 10.0μs minimum high pulse to indicate validity of data on auxiliary input data lines.</p> <p>⁹ Data line 1 thru data line 7 corresponds to b₁ thru b₇ of ASC II code, (see Figure 1-2).</p> <p>*Not used in Model 721 or 731.</p>
2	↑ 2	↑ 2	
3	↑ 3	↑ 3	
4	↑ 4	↑ 4	
5	↑ 5	↑ 5	
6	↑ 6	↑ 6	
7	↓ 7	↓ 7	
8	Data Line 8	Data Line 8	
A		Auxiliary Input Device Stop ⁴	
B	Signal Ground	Terminal Ready ⁵	
C	Auxiliary Output Device Start ¹	Signal Ground	
D	Auxiliary Output Device Strobe ²	Auxiliary Input Device On ⁶	
E	Auxiliary Output Device Stop ³	Auxiliary Input Device Start ⁷	
F		Auxiliary Input Device Data Strobe ⁸	
G			
H			

receive loop. For half-duplex, the break signal will break the receipt of data from the remote transmitting unit to allow its receiver circuits to sense the interrupt condition.

1-3.6 PARITY CHECKING. No parity check is provided on data received. Even parity is generated with data entered from the keyboard. Through an internal reconnection, parity transmissions can be overridden by causing a logic one to be continuously transmitted for the parity bit.

1-4 OPTIONS

1-4.1 40 CHARACTER/SECOND OPERATION (MODEL 720/21). A fixed speed for serial data transmission and printing of 40 characters per second may be provided in lieu of normal switch-selected speeds for Model 720 and Model 721.

1-4.2 ANSWER-BACK MEMORY (MODEL 720/30). A 21-character, 8-bits-per-character memory is provided. Readout is serial-by-bit and serial-by-character, activated remotely or locally. Readout speed is that of the terminal transmission rate. Message is not printed or transmitted to auxiliary data device.

1-4.3 LOWER CASE (All Models). Lower case alphabetic printing, from a 5 x 5 portion of the 5 x 7 matrix, character size .0715 in x .080 in. giving 94 printable characters, is provided.

1-4.4 BUILT-IN DATA SETS.

a. Model 720 – A field interchangeable modem (DS100TH or DS100TL data set) may be supplied in the form of a plug-in printed circuit card. The connector pins involved are indicated in Table 1-1.

1. DS100TL DATA SET – Compatible with the Bell 103F1 originate mode transmit/receive data set.

Modulation – frequency shift keying

Transmit carrier frequencies – 1270 Hz – mark
1070 Hz – space

Receive carrier frequencies – 2225 Hz – mark
2025 Hz – space

Transmitter output level – 0-15 dbm, adjustable

Receiver input level – operation between +5 dbm and -35 dbm

Input and output line impedances – 600/900 ohms

Transmit-control function – request to send/clear to send, 265 ±65 mc

Receive control function – Carrier detect time operate, 150 ms ±50 ms release, 50 ms ±25 ms

Type facility – 3002 line (no conditioning)

2. DS100TH Data Set – Compatible with the Bell 103F2 answer mode transmit/receive data set. Similar to DS100TL data set except:

Transmit carrier frequencies – 2225 Hz – mark
2025 Hz – space

Receive carrier frequencies – 1270 Hz – mark
1070 Hz – space

b. Model 721 – A field interchangeable modem (DS100RH or DS100RL data set) may be supplied in the form of a plug-in printed-circuit card. The DS100RH is the receive-only version of the DS100TH. The DS100RL is the receive-only version of the DS100TL. The connector pins involved are indicated in Table 1-1.

c. Model 730/31 – Teletype interface, polar keying. The connector pins involved are indicated in Table 1-2.

Input currents – 5 mA to 60 mA

Input switching currents – 5 mA

Output current capability – 60 mA

Output voltage capability – 130 VDC

1-5 SPECIFICATIONS.

1-5.1 PRINTER

- a. Printing method – 5 x 7 dot matrix, electronically heated, printing on heat sensitive paper.
- b. Line length – 8 inches, 80 characters
- c. Line spacing – 6 lines per inch
- d. Paper – (T.I. Part No. 213714-0001) – Roll, 8.5 inches wide by 3.625 inches maximum diameter (300 feet), heat sensitive.

- e. Platen – Friction feed
- f. Carriage/Return time – 195 milliseconds maximum
- g. Line feed time – 25 milliseconds
- h. Printable characters – up to 94, see figure 1-3
- i. Carriage return and Line feed (CR/LF) – Automatic at column 81, No code is transmitted.

b ₄	b ₃	b ₂	b ₁	b ₇	b ₆	b ₅									
				→0	→0	→0	0	0	0	0	1	1	1	1	
							0	1	1	0	0	1	1	1	
							1	0	1	0	1	0	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	d	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	

NOTE: All lower case alphabetic letters will be printed as upper case unless the "Lower Case Alphabetic Print" option is incorporated

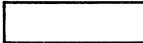

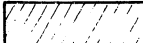

-  PRINTABLE CHARACTER REF: USAS x 3.4-1967
-  PRINTER CONTROL CHARACTER
-  AUXILIARY DEVICE CONTROL CHARACTER
-  CODES GENERATED BY KEYBOARD, BUT NO ACTION TAKEN

Figure 1-3. Code System and Character Set

1-5.2 PHYSICAL.

- a. Terminal size — Width 17.75 inches
See figure 1-4 Depth 18.25 inches
Height 6.75 inches
- b. Terminal weight — Models 720, 723, 730
38 pounds
Models 721, 722, 731
32 pounds
- c. Power requirements — 120 VAC $\pm 10\%$, 50/60
Hz, 240 watts maximum.
240 volt operation
optional, see Section II,
INSTALLATION.

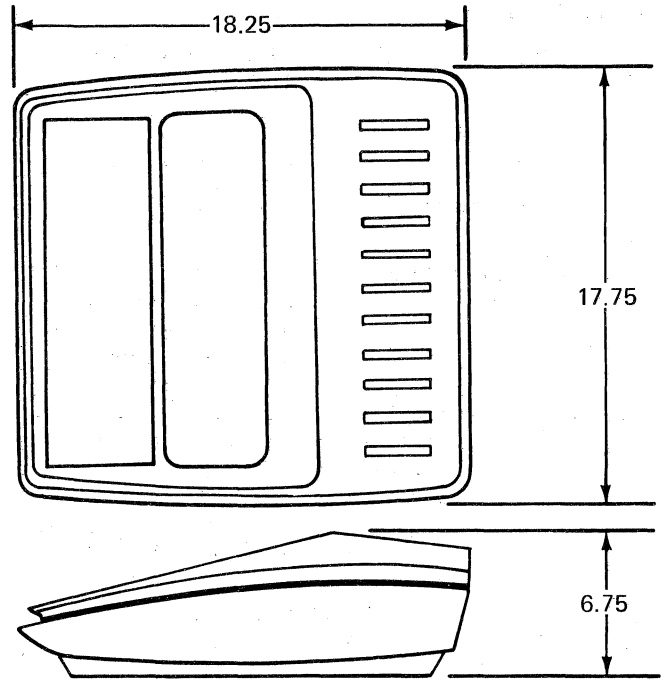


Figure 1-4. Outline Dimensions

SECTION II

INSTALLATION AND CHECKOUT

2-1 EQUIPMENT INSTALLATION

The Electronic Data Terminal is a self-contained unit requiring no auxiliary equipment for usual data terminal operation.

2-1.1 POWER CONNECTIONS. The normal power connection is 120 VAC, 50/60 Hz, 3 wire. To use the optional 240 VAC, 50/60 Hz power changes must be made in the terminal. Disconnect the yellow, brown and green leads from their present location, (See Figure 2-1). Connect these three leads to the center connector of the terminal block. Remove the molded 120 volt plug from the power cord and install a 240 volt, 15 amp rated tandem blade plug.

CAUTION

A visual inspection should be made of the terminal before applying power. Check for obvious shipping damage. Open the top cover and remove the card cover from the card rack. Check that no foreign objects are present. Insure that all cards are tightly plugged into their sockets and that all connectors to the electronics assembly are secured. Replace the card cover and close the top cover. Check that all keys on the keyboard operate freely.

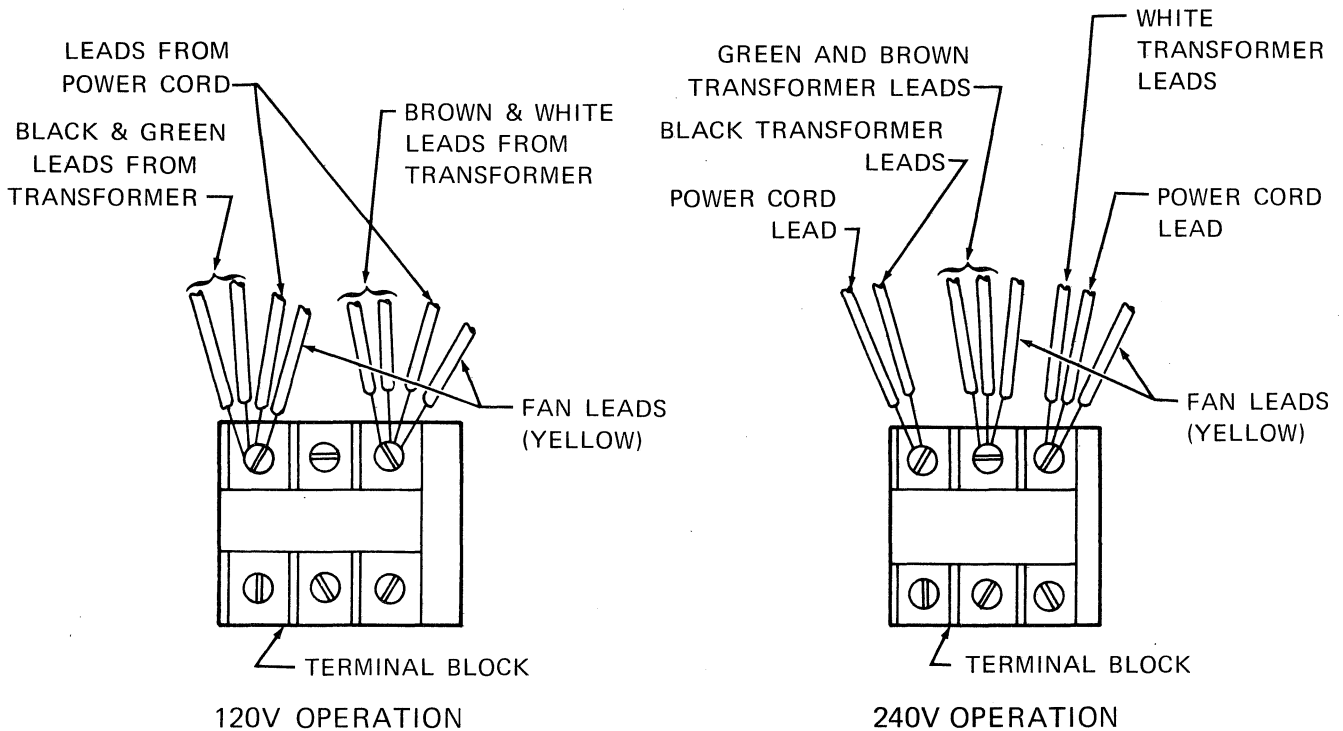


Figure 2-1. 120V and 240V Operations

2-1.2 COMMUNICATION INTERFACE CONNECTION. Connection is made at the rear of the terminal with an edge connector (see Figure 2-2).

- a. Data Set Cable (Part No.215563-1) is used to connect a standard Model 720 or 721 to an external data set. A standard RS232B compatible 25-pin connector is provided at the end of the 5-foot cable. For pin assignments, see Table 1-1.
- b. Phone Line Connection (Part No.215619-1) is used to connect a Model 720 or 721 with the built-in data set option to a phone line. Connection consists of an edge connector for connection to the terminal and a 5-foot cable terminated with two spade lugs for connection to the Bell System Direct Access Arrangement. For pin assignments, see Table 1-1.
- c. Teletype Connection (Part No.215620-1) is used to connect the Model 730 or 731 to the communication line. Connection consists of an edge connector for connection to the terminal and a 5-foot cable terminated with four spade

lugs. The standard Model 730 is shipped with the 60 mA input current level. To set for 20 mA, R2 on card assembly 244552-0002 or -0001 (rearmost card in the card rack) must be clipped out. On Model 731 to set for polar operation, R2 and R1 must be clipped out on 244552-0001. For specific connections, see Figures 2-3, 2-4, 2-5, 2-6, and 2-7.

2-1.3 AUXILIARY INPUT/OUTPUT DEVICE CONNECTION. Connection is made at the rear of the terminal with an edge connector (see Figure 2-2). For pin assignments, see Table 1-4.

2-1.4 MODEL 722 CONNECTION. The parallel input connection is made at the rear of the terminal, below the red dot, with an edge connector (see Figure 2-2). For pin assignments, see Table 1-3. A connector kit 215584-0001 is provided for connection to the terminal.

2-1.5 MODEL 723 CONNECTION. The parallel input is identical to that of the Model 722. The parallel output is made at the rear of the terminal below the blue dot. See Table 1-3 for pin assignments. Two connector kits 215584-0001 are provided for connection to the terminal.

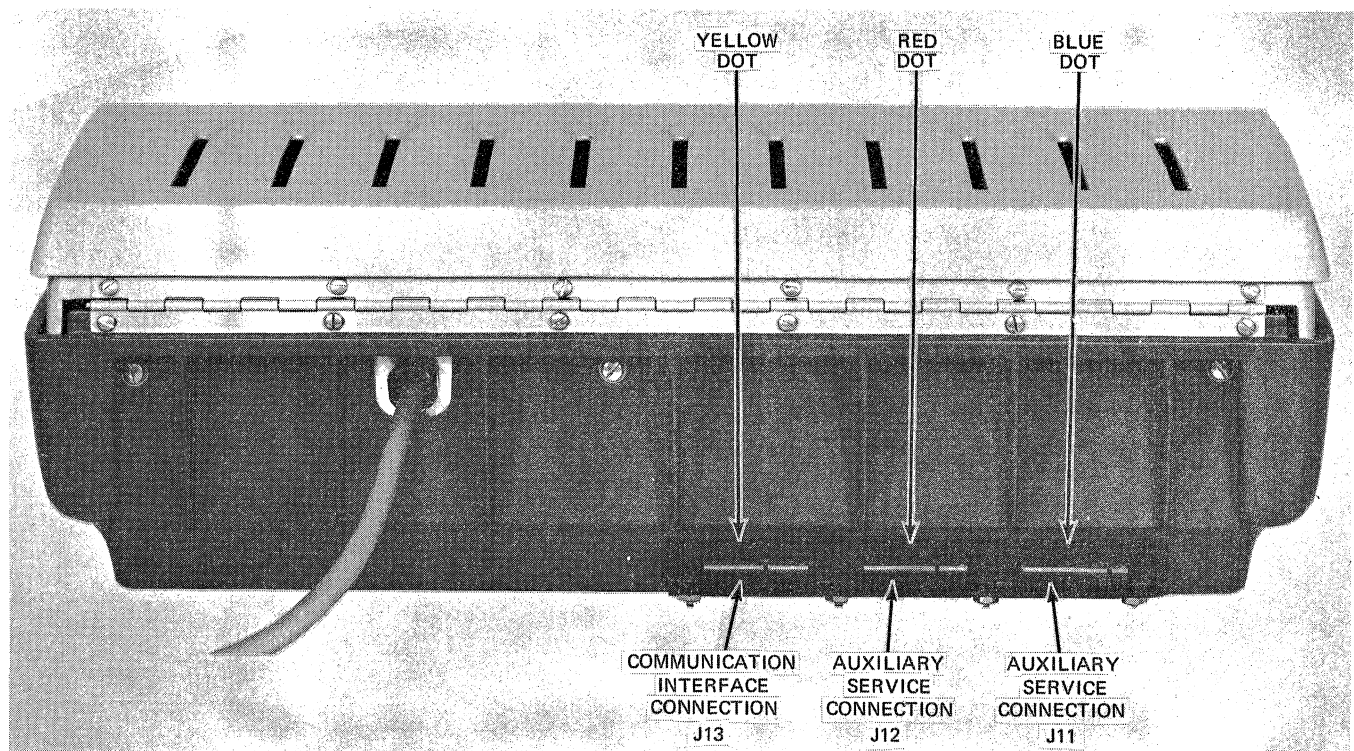


Figure 2-2. Terminals Connections

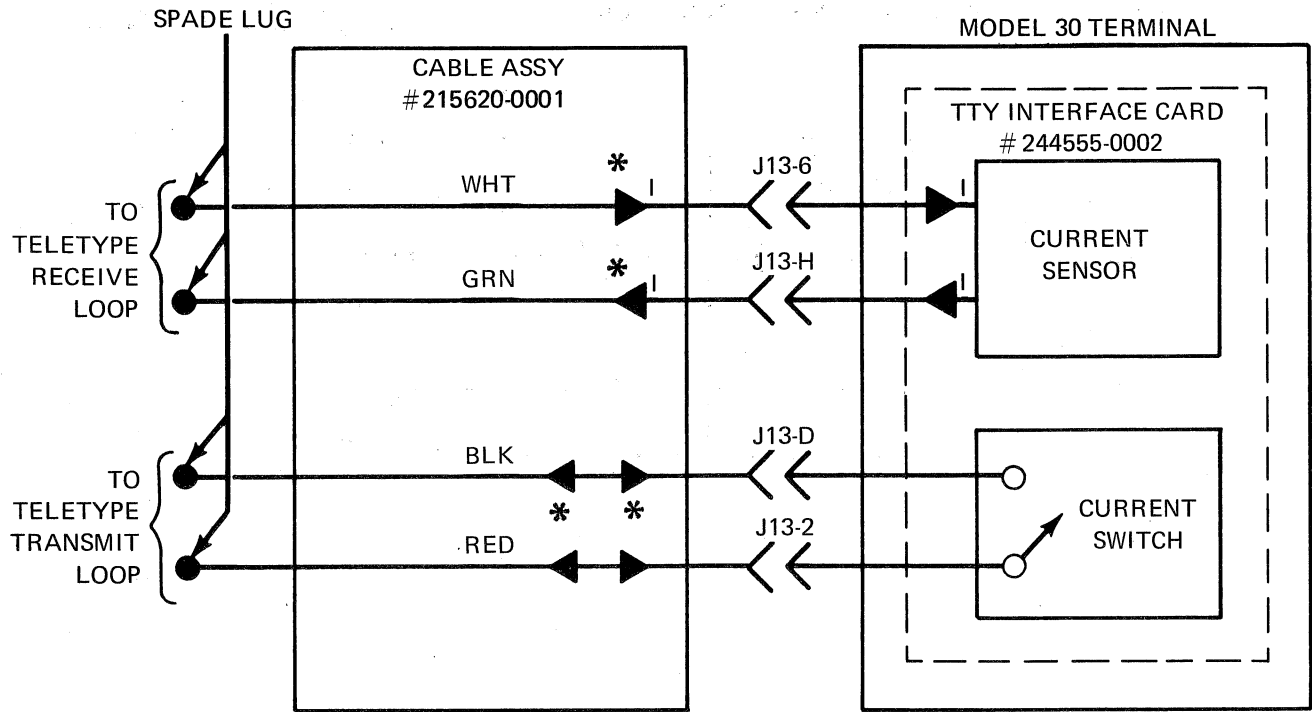


Figure 2-3. TTY Neutral Interface Model 730, Full Duplex Wiring Diagram
(Yellow Dot)

*ARROW INDICATES POSITIVE CURRENT DIRECTION
A DOUBLE ARROW INDICATES POSITIVE CURRENT CAN BE EITHER DIRECTION

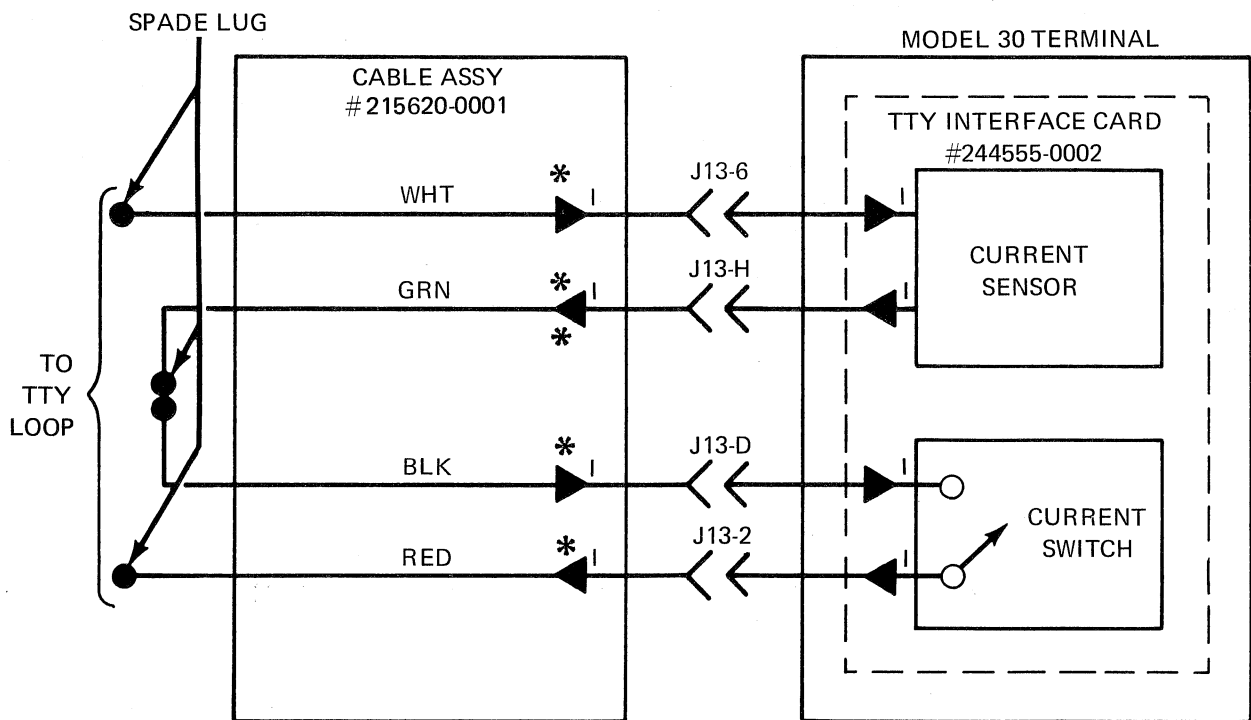


Figure 2-4. TTY Neutral Interface Model 730, Half Duplex Wiring Diagram
(Yellow Dot)

*ARROW INDICATES POSITIVE CURRENT DIRECTION

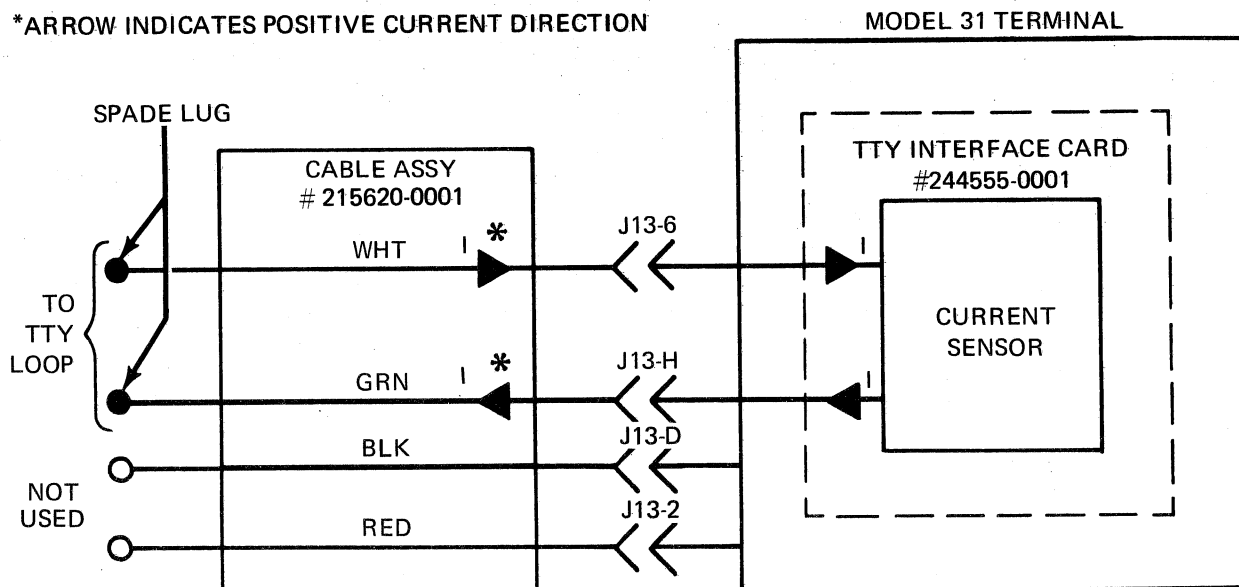


Figure 2-5. TTY Neutral Interface Model 731, Receive only Wiring Diagram (Yellow Dot)

**ARROW INDICATES DIRECTION MARK CURRENT

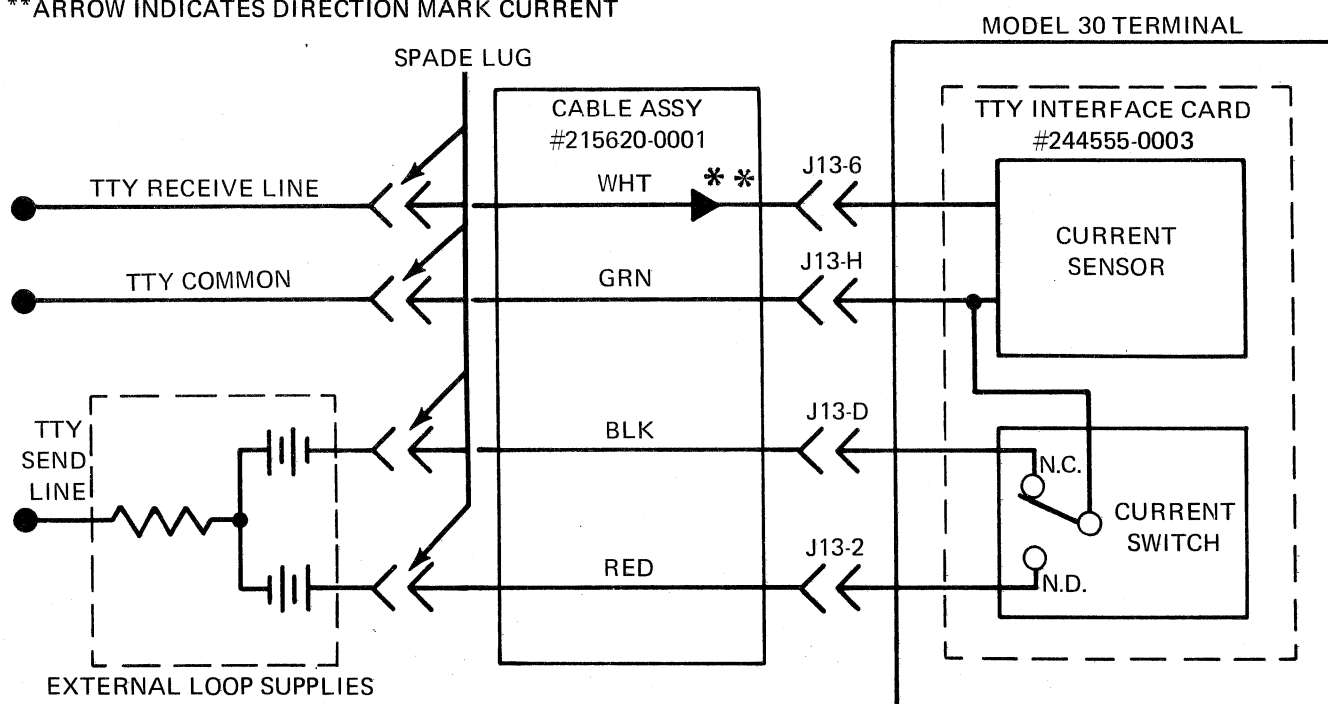


Figure 2-6. TTY Polar Interface Model 730, Full Duplex Wiring Diagram (Yellow Dot)

**ARROW INDICATES DIRECTION MARK CURRENT

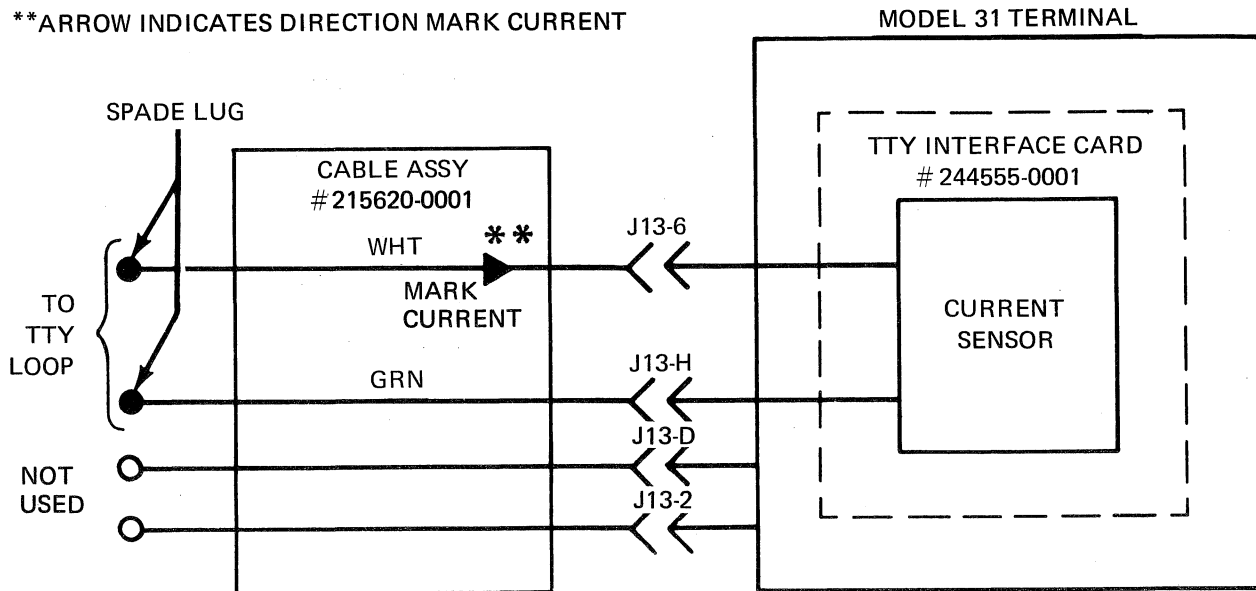


Figure 2-7. TTY Polar Interface Model 731, Receive only Wiring Diagram (Yellow Dot)

2-2 PRELIMINARY CHECKOUT.

A visual check of the data terminal should be made before applying power. Check for any obvious shipping damage such as broken plastic scale, dents in the case or packing material inside the case. Check to see that the top opens freely without interference. Remove the black cover from the top of the cardrack and power supply. Visually check that there are no foreign objects present that could possibly short any of the circuits. Press down on the card ejectors of all cards to be sure they are all plugged into their sockets tightly.

Check to be sure that none of electrical connectors to the cardrack are loose, especially the terminal block. Also check to see that all keys on the keyboard operate properly without binding. Lift the pinch roller and move the printhead across the carriage to see that the printhead moves freely without interference.

Before plugging the power card into a 240-volt outlet verify that the terminal block has been connected as described in Paragraph 2-1.1.

2-3 PAPER LOADING.

CAUTION

Only use paper in this equipment which meets the requirements of TI Specification 213714. Other papers may permanently damage the printhead and/or mechanism.

The terminal must be loaded with paper before turning on power. The paper is loaded as follows:

- a. Open terminal cover and lift pressure pinch roller. (See Figure 2-8.)
- b. Lift out paper supply axle and remove any paper that may be in the drive.
- c. Put a roll of paper on the supply so that the paper feeds as shown in Figure 2-8.
- d. Unroll about 12 inches of paper and form a point to aid in threading the paper.
- e. Thread the paper as shown in Figure 2-8. Be sure the paper is centered in the paper chute.
- f. Lower the pinch roller.
- g. Check that the paper is straight in the feed mechanism.
- h. Turn on the power switch and depress the PAPER ADV key. Feed out about six inches of paper to insure proper operation.
- i. Close the terminal cover, being sure that the paper is fed through the slot in the plastic shield.

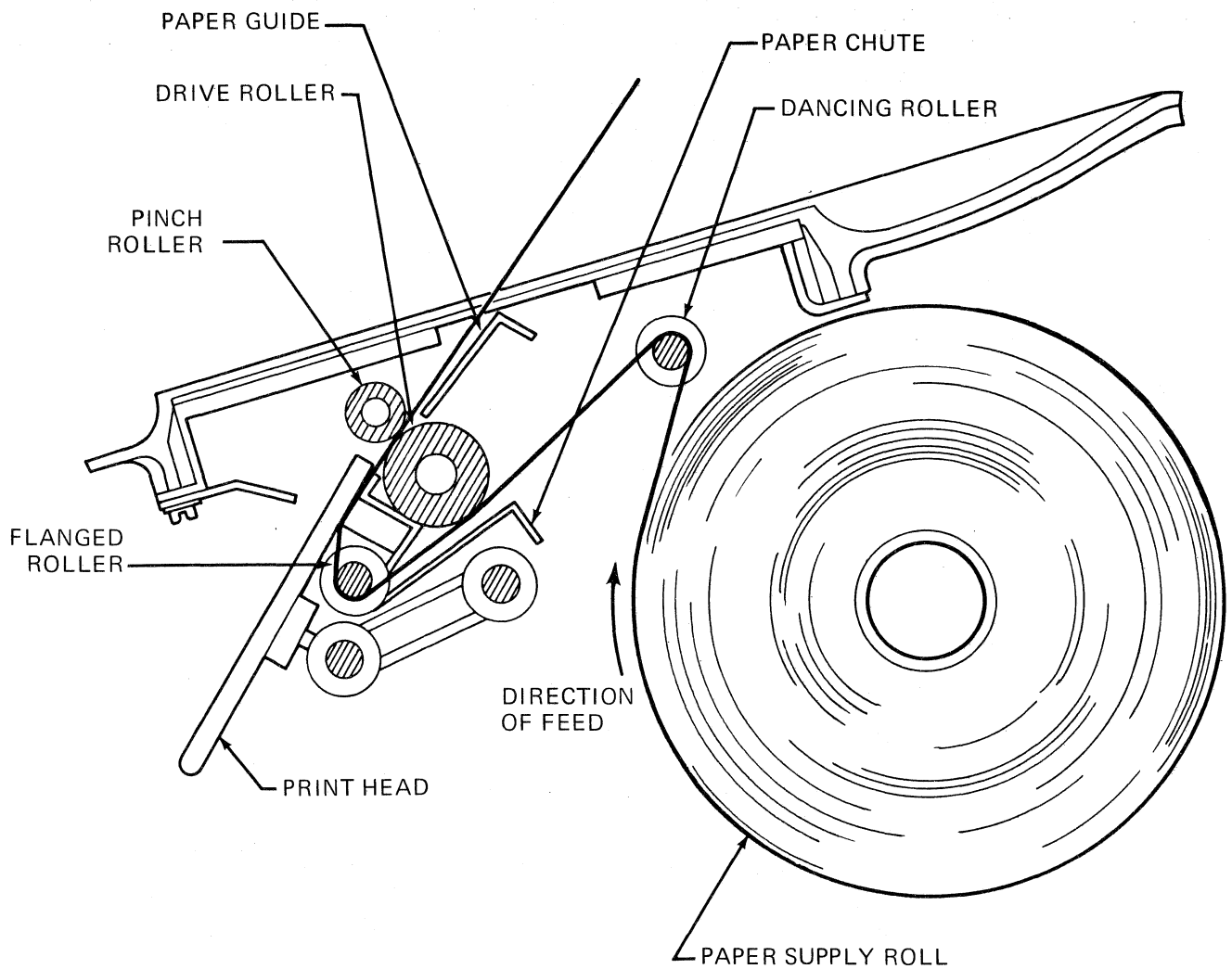


Figure 2-8. Paper Loading Diagram

2-4 PROGRAMMING THE ANSWER-BACK MEMORY OPTION.

The Answer-Back memory is a 8x21 diode matrix which can be programmed for any message desired. The unit is shipped initially with all ONES in the matrix indicated by all diodes in place. A ZERO may be generated in any bit location and any character by clipping out or unsoldering

one end of the appropriate diode. The card assembly is 244531-0001 and is located in position 3 as indicated in Figure 3-1. The data bit number and character number are marked on the cards with diodes CR1 thru CR168 used for the matrix. Note that the delete code with even parity (all ONEs) can not be transmitted as this is the code which resets the memory.

SECTION III

EQUIPMENT OPERATION

3-1 GENERAL.

This section provides the information necessary for an operator to carry out transactions with a computer using any one of the Model 720/30 Series data terminals. Those operations which are common to the entire Series are discussed initially followed by a discussion of each of the different models individually.

3-1.1 MODEL 720/30. From the operator's point of view, the operation of the Model 720 and Model 730 is identical. The only distinction between the two is the type of interface between the terminal and the other device with which it is communicating.

3-1.2 POWER SWITCH. The power switch is located on the keyboard (see Figure 3-1). In the OFF position, both sides of the power line are disconnected from all circuits in the terminal with the exception of the fuse. In the ON position, power is supplied to all circuits in the terminal.

NOTE

In earlier models of the terminal the power switch may be located under the cover.

3-1.3 DATA TRANSMISSION SPEED SWITCH. The data transmission speed switch sets the serial data transmission

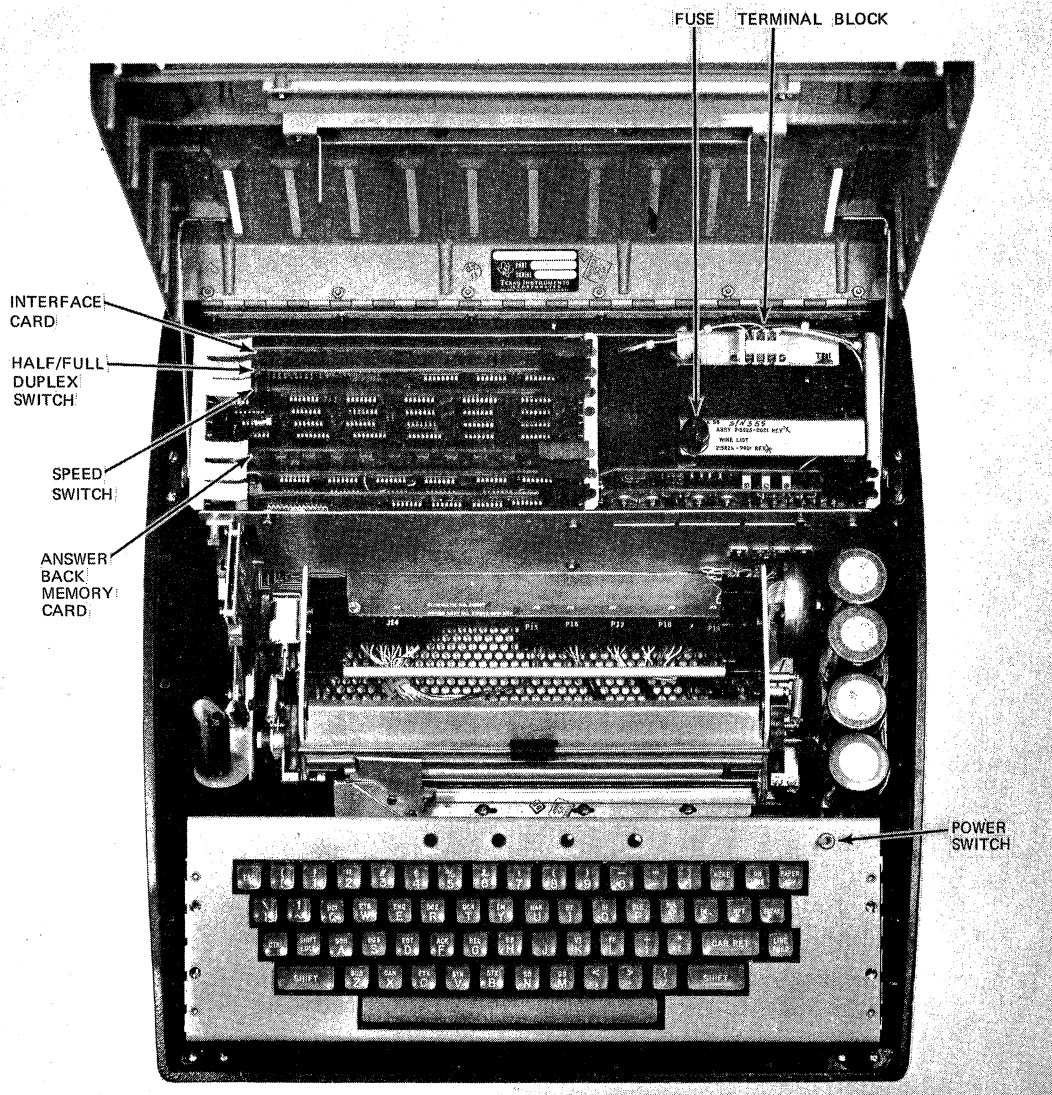


Figure 3-1. Internal Controls

speed at 10, 15, or 30 characters per second. This control is not present in the Model 720 data terminal equipped with the 40 character per second speed option.

3-1.4 TRANSMISSION MODE SWITCH. This switch selects either Half or Full Duplex operation of the communication interface.

3-2 CONTROLS.

The Model 720/30 keyboard arrangement is shown in Figure 3-2. Figure 2-2 shows that the specific codes generated by the terminal and Figures 3-3, 3-4, and 3-5 show the status of the shift and control keys to generate the codes.

PAPER ADV (Paper Advance Key) – The Paper Advance Key is used to advance the paper through the printer during paper loading or clearing of the machine. A manual paper advance knob is also provided on the right side of the printing mechanism.

NOTE

Extended operation of paper advance key may cause fuse to blow. This is designed for maximum protection.

LINE FEED (Line Feed Key) – The line feed key generates the line feed code. Upon receipt of this code the printer advances the paper one line while printhead retains its position on the page.

Backspace Key (BS) – The backspace code is generated when the control key and the BS key are depressed. (See Figure 3-5.) The printhead is stepped one position to the left as long as the printhead is not in column one when code is received by the printer.

Bell (BEL) – The bell code is generated when the control key and the BEL key are depressed (see Figure 3-5). The audible alarm is actuated when this code is received by the printer.

CAR RET (Carriage Return) – The carriage return key generates the carriage return code. The printer causes the

printhead to return to the left-hand margin when CR is received. **NOTE:** The paper is not advanced one line.

REPEAT (Repeat Key) – When the repeat key is depressed in conjunction with any other coded keyboard character, that character is generated repeatedly at the terminal's operating speed.

NOTE

The REPEAT key must be depressed first, prior to the key desired to be repeated.

HERE IS (Here Is Key) – The Here Is key triggers the Answer-Back Memory causing its contents to be transmitted (but not printed).

BREAK (Break Key) – The Break key causes the terminal to transmit a space for greater than 140 ms if the ON-LINE key is depressed. The first time the key is depressed, the BREAK light is turned on and the interrupt signal is transmitted. The light remains on until the BREAK key is depressed again.

ON-LINE (On-Line Key) – The On-Line key is an alternate action key which controls the transmitter and receiver circuit connections to the communication interface. Depressing the key once puts the terminal in the "On Line" state, i.e., connects the transmitter and receiver circuits to the communication line. Depressing the key again puts the terminal in the LOCAL state, i.e., transmitter connected to receive circuits and not to the communication line.

3-3 CONDITION INDICATORS.

POWER – indicates that the power switch is in the ON position.

ON LINE – indicates the On Line key is depressed.

LOCAL – indicates the On Line key is not depressed.

BREAK – indicates the Break key has been depressed.

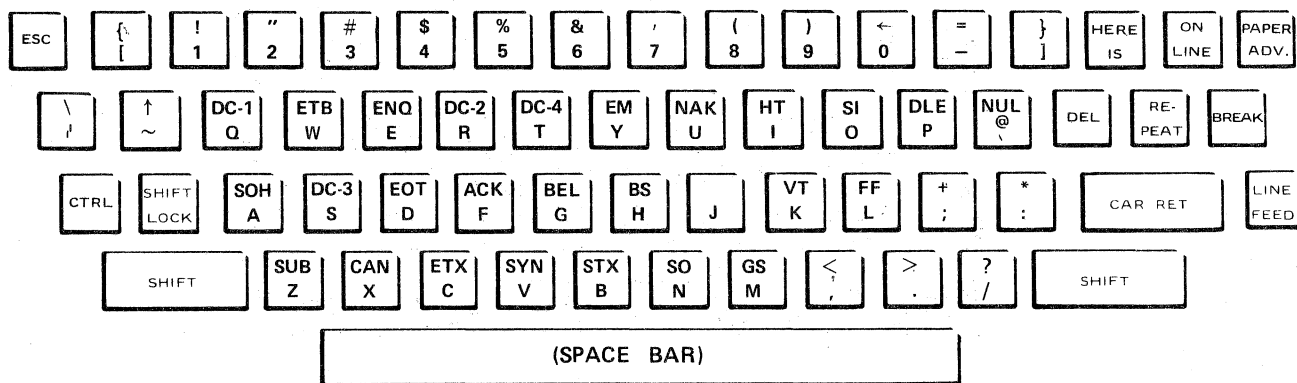
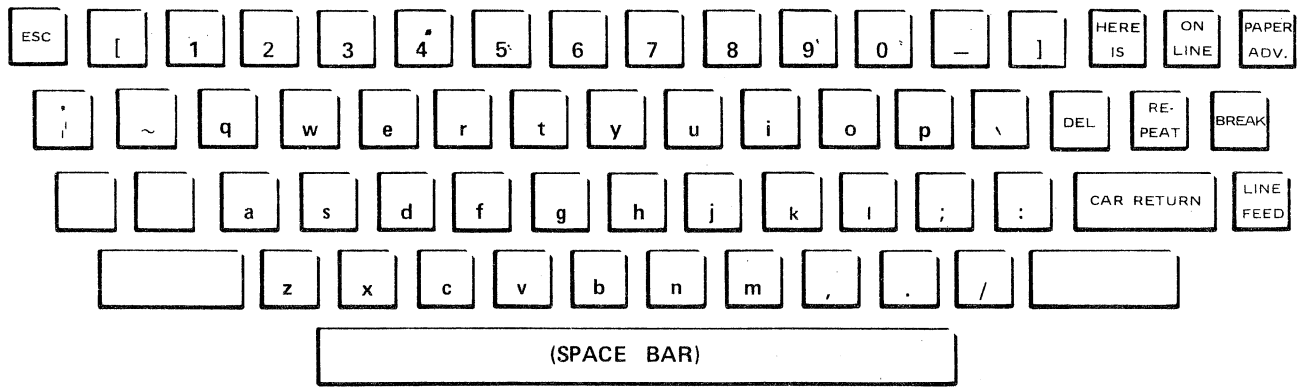


Figure 3-2. Model 720/30 Keyboard Arrangement



NOTE: Upper case alphabet codes are generated unless the lower case option is included.

Figure 3-3. Keyboard Codes Generated when Shift and Control Keys are not Depressed

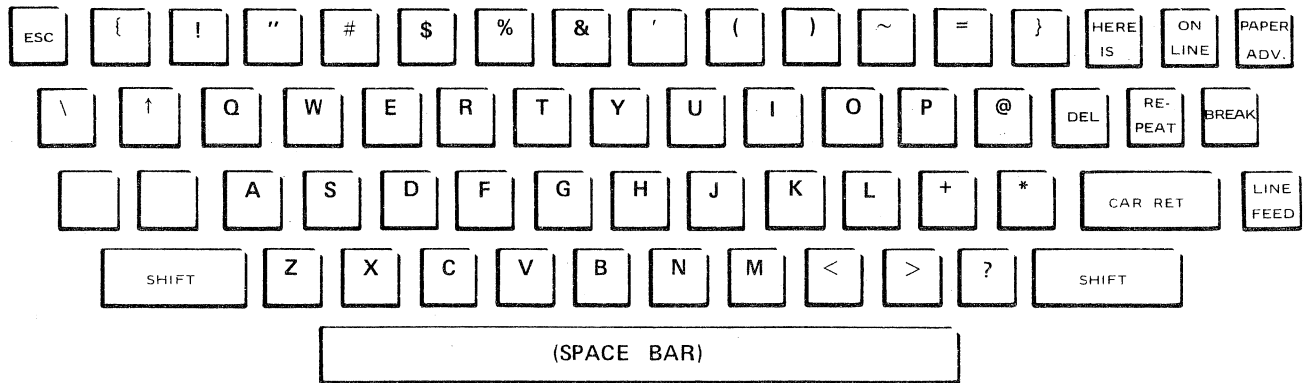


Figure 3-4. Keyboard Codes Generated when Shift Key is Depressed

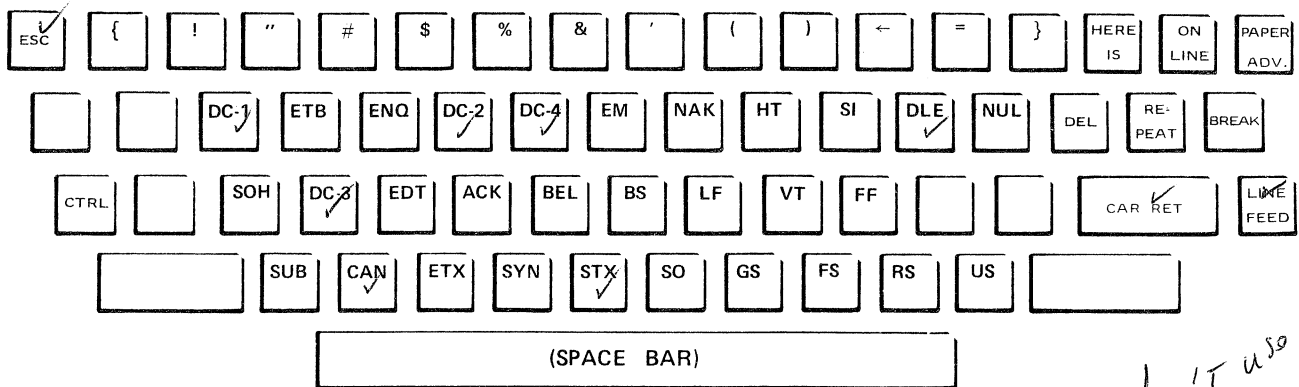


Figure 3-5. Keyboard Codes Generated when Control Key is Depressed

Don't use

3-4 OPERATING SEQUENCE.

3-4.1 OPERATION WITH A REMOTE DEVICE.

- a. Make the appropriate communication interface connection (See Section II).
- b. Lift the top cover and set the switches for the appropriate speed and type of communication.
- c. With the On Line key released, move the power switch to ON.
- d. Lower the top cover, threading the paper through the clear plastic window.

NOTE

The LOCAL and POWER indicators should be on. The terminal is now in the local mode of operation, allowing keyboard information to actuate the printer.

- e. Depress the ON LINE key, turning the LOCAL light off and the ON LINE light on.

The terminal is now in the transmit mode of operation. If the switch is in the Half-Duplex position, keyboard information is allowed to actuate the printer, otherwise no action is taken by the printer when a key is depressed.

3-4.2 OPERATION WITH AUXILIARY INPUT DEVICE.

- a. Connect the terminal to the auxiliary input device (Refer to Section II).
- b. Place the Auxiliary Input Device in a mode such that it can be controlled remotely by the terminal.
- c. Place the terminal in the Local mode by turning on the power switch with the On Line key released.
- d. Depress the control key (CTRL) and the DC1 key (see Figure 3-5) to start the transfer of information from the Auxiliary Input to the terminal.

This transfer continues until the auxiliary input device transmits the DC3 control character or is manually turned off. If the terminal is in the transmit mode, i.e. On Line key depressed, and the switch is in the Full-Duplex position the Auxiliary Input can be turned on and off by the reception of the DC1 and DC3 control characters, respectively. While the Auxiliary Input is operational the keyboard is inoperative

with the exception of the Paper Advance key.

3-4.3 OPERATION WITH AUXILIARY OUTPUT DEVICE.

- a. Connect the terminal to the Auxiliary Output device (Refer to Section II).
- b. Place the Auxiliary Output device in a mode so that it can be remotely controlled by the terminal.
- c. Place the terminal in the local mode by turning on the power switch with the On Line key released.
- d. Depress the control key (CTRL) and the DC2 key (see Figure 3-5) to turn on the Auxiliary Output device.

Each key that is depressed thereafter should be acted upon by the Auxiliary Output device. This continues until the control key (CTRL) and the DC4 key are depressed, turning off the Auxiliary Output device. If the terminal is in the transmit mode, the Auxiliary Output device may be remotely controlled through use of the DC2 and DC4 control characters.

3-4.4 OPERATION WITH ANSWER-BACK MEMORY.

The Answer-Back Memory has the highest priority of input information. When it is used in conjunction with an Auxiliary Input device both the keyboard and Auxiliary Input are disabled while the Answer-Back Memory is sending its message. The Answer-Back Memory may be triggered remotely by the ENQ character or locally by the HERE-IS key. The message stored in the Answer-Back Memory is not printed when it is triggered.

3-5 MODEL 721/31 OPERATING SEQUENCE.

The operation of the Model 721 and Model 731 is identical. The only distinction between the two is the type of interface between the terminal and the device which transmits information to the terminal.

3-5.1 OPERATION WITH A REMOTE DEVICE. Operation with a remote device is accomplished by making the appropriate communication interface connection (see Section II). Set speed switch for the appropriate speed and then turn the power switch ON. The terminal is ready to receive information.

3-5.2 REMOTE DEVICE AND AUXILIARY OUTPUT DEVICE. Connect the terminal to a remote device as above. Then connect the terminal to an Auxiliary Output device (see Section II). The Auxiliary Output is turned on and off through the use of the DC2 and DC4 control characters, respectively.

3-6 MODEL 722 OPERATING SEQUENCE.

All that is necessary to operate a Model 722 is to connect the terminal to a source of parallel data according to Section II and turn the power switch to the ON position.

3-7 MODEL 723.

3-7.1 CONTROLS. The Model 723 keyboard arrangement is identical to that of the Model 720/30 (see Figure 3-2). Figure 1-3 shows the specific codes generated by the terminal and Figures 3-3, 3-4, 3-5 show the status of the shift and control keys to generate the codes.

LINE FEED (Line Feed key) – Generates the line feed code.

Backspace key (BS) – Generates the backspace code.

Bell (BEL) – Generates the bell code.

DEL (Delete key) – Generates the delete code.

CAR RET (Carriage Return) – Generates the carriage return code.

REPEAT (Repeat key) – Inoperative

HERE IS (Here Is key) – Inoperative

BREAK (Break key) – Inoperative

ON LINE (On Line key) – Controls only the status of the LOCAL and the ON LINE indicators.

3-7.2 CONDITION INDICATORS.

POWER – Indicates that the power switch is in the ON position.

ON LINE – Indicates the ON-LINE key is depressed.

LOCAL – Indicates the ON-LINE key is released.

BREAK – Inoperative.

3-7.3 OPERATING SEQUENCE. First the terminal is connected to a source that is able to provide and accept parallel data. (See Section II). The power switch is then turned on and the terminal is ready to accept information and simultaneously provide parallel data at its output.

3-8 ABNORMAL EVENTS.

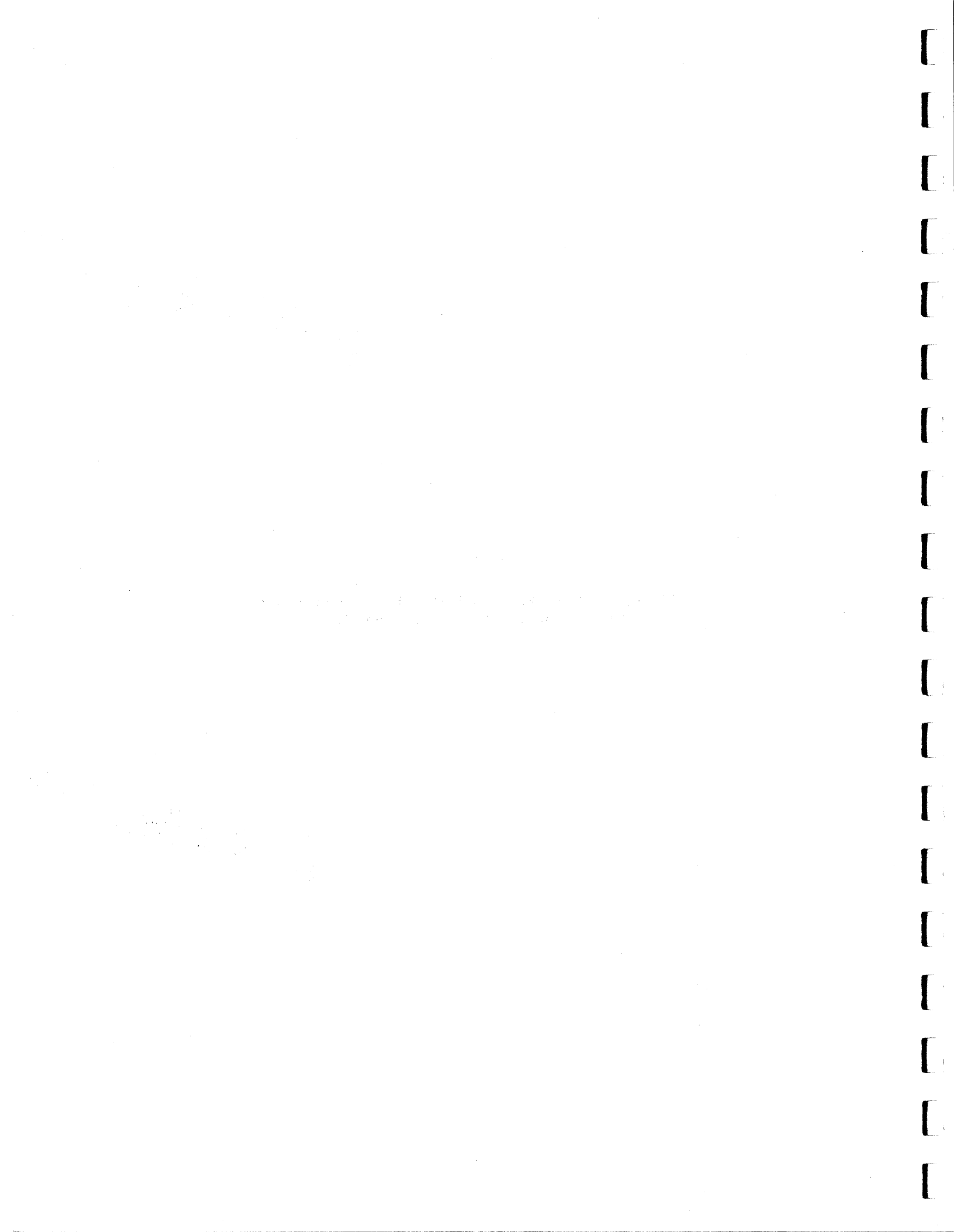
Should the terminal not operate properly check the following prior to calling service personnel:

1. Check power connections
2. Check power switch ON
3. Check fuse
4. Check speed switch
5. Check that external connectors are plugged in and screwed down.
6. Check that paper is properly loaded.



APPENDIX A

**A COMPARISON BETWEEN THE TELETYPE KEYBOARD
AND THE MODEL 720/730 KEYBOARD**



KEY	SHIFT ONLY	CONTROL ONLY	SHIFT & CONTROL	KEY	SHIFT ONLY	CONTROL ONLY	SHIFT & CONTROL
A		SOH		P		DLE	
B		STX		Q		DC1	
C		ETX		O		SI	
H		BS		U		NAK	
K		⏪	ESC	V		SYN	
L		⏩	FS	W		ETB	
M		⏪	GS	X		CAN	
N		SO	RS	Y		EM	
				Z		SUB	

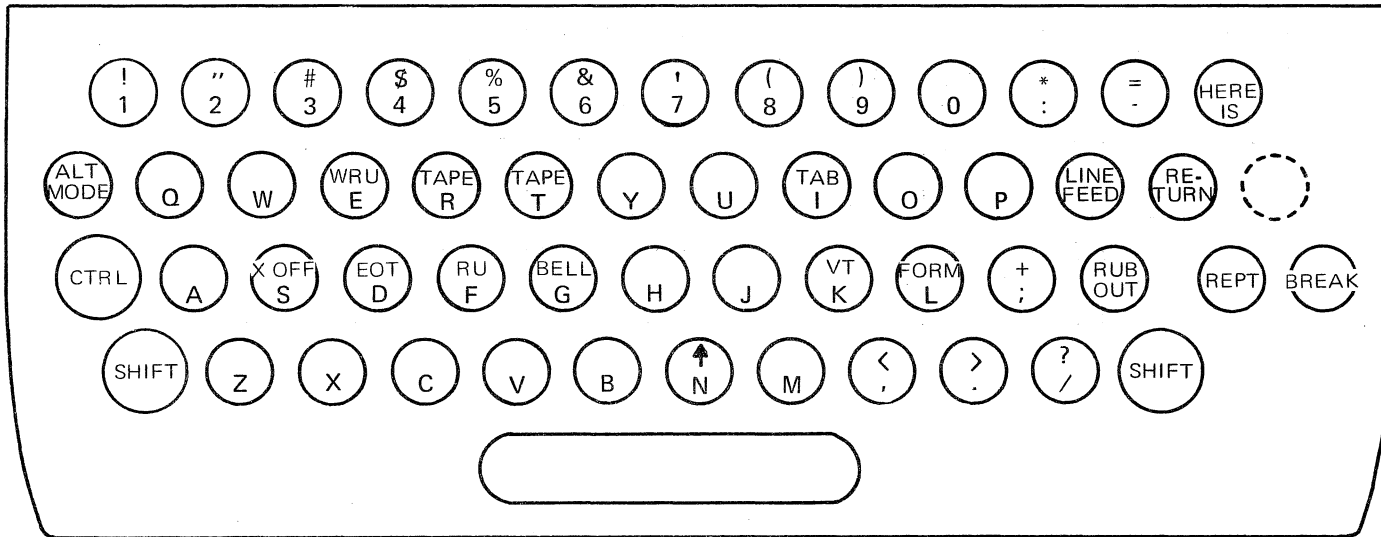


Figure A-1. Teletype Model 733/735 Keyboard Arrangement



SHADED KEYS INDICATE KEYS WHICH ARE LOCATED IN DIFFERENT POSITIONS FROM TELETYPE MODEL 33/35.



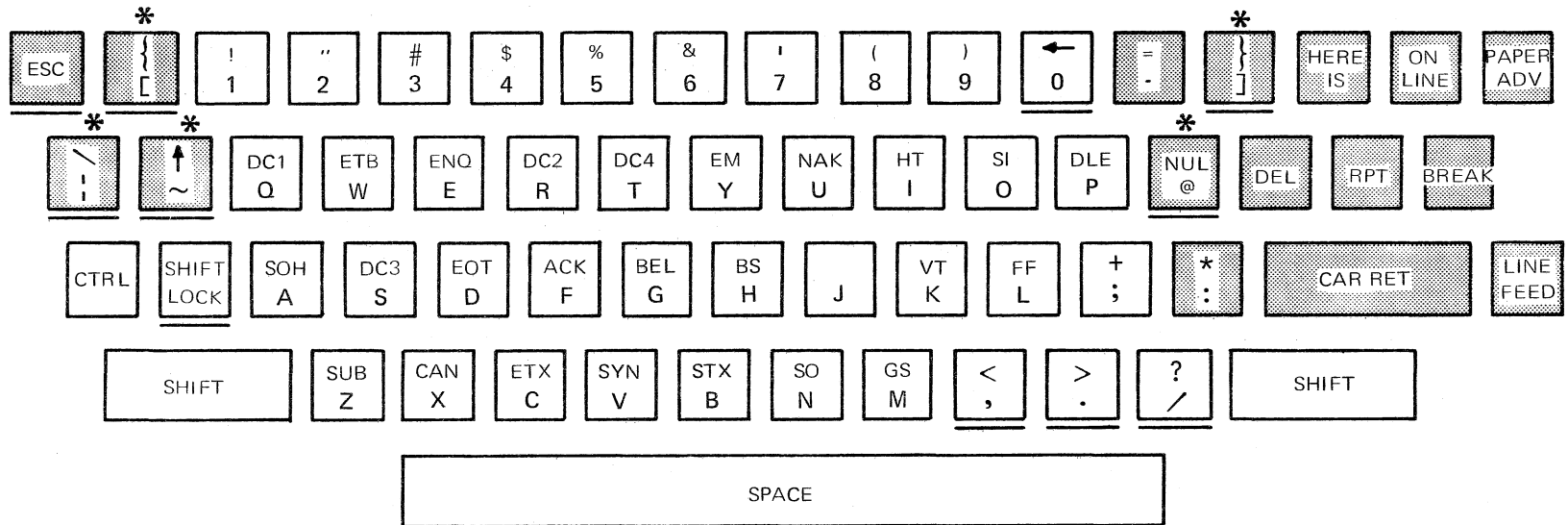
UNDERLINED KEYS INDICATE THOSE KEYS WHICH GIVE DIFFERENT FUNCTIONS AS SHOWN IN TABLE 1.

*



KEYS WITH AN ASTERISK ABOVE THEM INDICATE KEYS WHICH GENERATE CHARACTERS NOT AVAILABLE ON THE TELETYPE MODEL 33/35.

A-2



DEPRESSING THE FOLLOWING KEYS WITH THE CONTROL KEY WILL GENERATE THE FOLLOWING CHARACTERS NOT SHOWN ON THE KEYTOPS.

- . = FS
- : = RS
- / = US

Figure A-2. Model 720/730 Keyboard Arrangement