



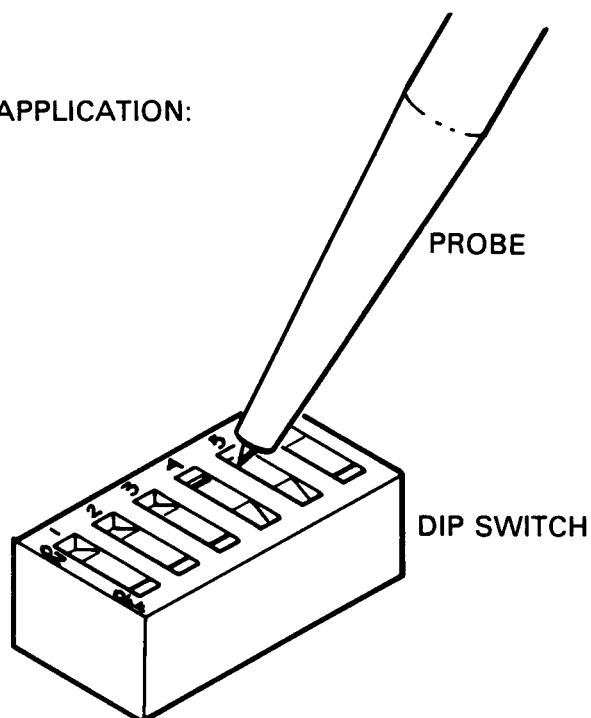
# **ADM 3A Dumb Terminal® Video Display Unit Users Reference Manual**

**LEAR SIEGLER, INC.  
DATA PRODUCTS DIVISION**  
714 NORTH BROOKHURST STREET, ANAHEIM, CALIFORNIA 92803



**PACKAGE INCLUDES ONE PROBE - DIP SWITCH ACTUATOR**

TYPICAL APPLICATION:



**CAUTION:**

*DIP SWITCH ACTUATOR PROVIDED MUST BE USED WHEN PROGRAMMING THE DIP SWITCH. USE OF OTHER TOOLS (PEN, PENCIL, ETC.) MAY DAMAGE DIP SWITCH.*

REPLACEMENT PARTS MAY BE ORDERED USING LSI PART NUMBER 857001



**ADM 3A  
Dumb Terminal®  
Video Display Unit**



LEAR SIEGLER, INC.

**USERS REFERENCE  
MANUAL**



## TABLE OF CONTENTS

SECTION		PAGE
I	GENERAL DESCRIPTION .....	1-1
1.1	INTRODUCTION .....	1-1
1.2	PURPOSE AND USE .....	1-1
1.3	OPERATIONAL DESCRIPTION .....	1-1
1.3.1	Keyboard .....	1-1
1.3.2	Input/Output (I/O) Port .....	1-2
1.3.3	ADM 3A Control Logic .....	1-2
1.3.4	Display Memory .....	1-3
1.3.5	CRT Display Monitor .....	
1.4	PHYSICAL DESCRIPTION .....	1-3
1.5	SPECIFICATIONS .....	1-3
1.5.1	Send/Receive Modes .....	1-3
1.5.2	Character Format .....	1-3
1.5.3	Word Structure .....	1-3
1.5.4	Data Entry and Overflow .....	1-8
1.5.5	Configuration Control .....	1-8
1.6	OPTIONAL FEATURES .....	1-8
1.6.1	Lower Case Characters .....	1-8
1.6.2	Answerback .....	1-8
1.6.3	Numeric Keypad .....	1-8
1.6.4	20mA Current Loop on Extension Port .....	1-8
1.6.5	Split Baud Rate .....	1-8
1.6.6	Beep Defeat .....	1-8
1.6.7	230VAC .....	1-8
1.6.8	Output Cable .....	1-8
1.6.9	Alternate Configuration - Green Phosphor Screen .....	1-8
1.7	RELATED DOCUMENTS .....	1-8
II	INSTALLATION .....	2-1
2.1	GENERAL .....	2-1
2.2	SPECIAL SAFETY REQUIREMENTS .....	2-1
2.3	UNPACKING AND INITIAL INSPECTION .....	2-1

## TABLE OF CONTENTS (Continued)

SECTION		PAGE
2.4	SITE REQUIREMENTS .....	2-1
2.5	INITIAL PREPARATION.....	2-2
	2.5.1 Line Voltage Selection .....	2-2
	2.5.2 Configuration Control Switch Settings .....	2-2
2.6	INTERFACE INFORMATION .....	2-2
	2.6.1 RS-232C Modem Port Interface .....	2-4
	2.6.2 RS-232C Extension Port Interface .....	2-4
2.7	INSTALLING THE ADM 3A .....	2-4
2.8	POWER TURN-ON AND TURN-OFF .....	2-12
2.9	CARE OF THE ADM 3A .....	2-13
	2.9.1 Cleaning .....	2-13
	2.9.2 Inspection .....	2-13
<b>III</b>	<b>OPERATION .....</b>	<b>3-1</b>
3.1	GENERAL.....	3-1
3.2	KEYBOARD OPERATIONS .....	3-1
3.3	INTERFACE CONTROL OPERATIONS .....	3-1
	3.3.1 Data Communication Ports .....	3-1
	3.3.2 Request To Send Operation .....	3-1
	3.3.3 Secondary Channel Turnaround Operation .....	3-4
	3.3.4 Code Turnaround Operation .....	3-4
3.4	PROGRAMMING CONSIDERATIONS.....	3-4
	3.4.1 Remote CTRL Operation .....	3-4
	3.4.2 Remote Load-Cursor Operation .....	3-4
3.5	GATED EXTENSION PORT OPERATION.....	3-5



## LIST OF FIGURES

FIGURE		PAGE
1-1	ADM 3A Video Display Unit .....	viii
1-2	ADM 3A Data Flow Block Diagram .....	1-2
1-3	ADM 3A Graphic Character Set and CTRL Codes .....	1-6
1-4	Word Format Codes with Switch Configurations .....	1-7
2-1	ADM 3A Connector and Configuration Switch Locations.....	2-3
2-2	Typical ADM 3A Application .....	2-9
2-3	Modem and RS-232C Extension Interface Logic .....	2-10
2-4	Current-Loop Interface Logic .....	2-11
2-5	ADM 3A Rear Panel Controls .....	2-12
3-1	ADM 3A Standard Keyboard Operational Characteristics .....	3-3

## LIST OF TABLES

TABLE		PAGE
1-1	ADM 3A Specifications .....	1-4
2-1	Baud Rate Switch Functions .....	2-4
2-2	Configuration Control Switch Functions .....	2-5

## APPENDIX A

ASCII CONTROL CODE CHART.....	A-1
OPERATORS QUICK REFERENCE CHART OF CONTROL AND OPERATORS CODES..	A-2
OPERATORS QUICK REFERENCE CHART OF ABSOLUTE CURSOR POSITIONS .....	A-3

## INDEX

**WARNING**

*This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.*

## SUMMARY OF WARNINGS, CAUTIONS AND NOTES

**WARNING**

Page 2-2

*Dangerous voltages exist within the ADM 3A. Always disconnect the AC power cord before opening the ADM 3A case to access any internal components.*

**CAUTION**

Page 2-1

*To prevent condensation from developing, allow the ADM 3A to temperature stabilize when changing locations. Condensation could develop in the unit and adversely affect the operation of the device.*

Page 2-12

*If power is recycled ON and OFF using the POWER ON/OFF switch, wait 10 seconds between the OFF and ON operations to ensure complete reset of the ADM 3A electronics.*

Page 2-2

*Set DIP switches ON or OFF using DIP Switch Setting Tool 857001. DO NOT use a ball point pen or pencil; the switches could become contaminated with conductive debris.*

## SUMMARY OF WARNINGS, CAUTIONS, AND NOTES (Continued)

### Note

#### Page 2-4

*The peripheral device that is attached to the EXTENSION port must operate at the same baud rate as the communication line.*

#### Page 2-13

*If the Full-Duplex mode is selected, typing at the keyboard will not display characters unless echo-back from the host computer or modem is provided. If Half-Duplex mode is selected, data will be displayed only if CLEAR TO SEND is present or interface cable is disconnected.*

#### Page 3-1

*Typing at the keyboard always generates codes which are transmitted. However, in order for characters to be displayed and for control codes to affect the ADM 3A in FDX mode, the characters must be echoed back from the host computer. All display actions described below assume that the generated codes are properly echoed.*

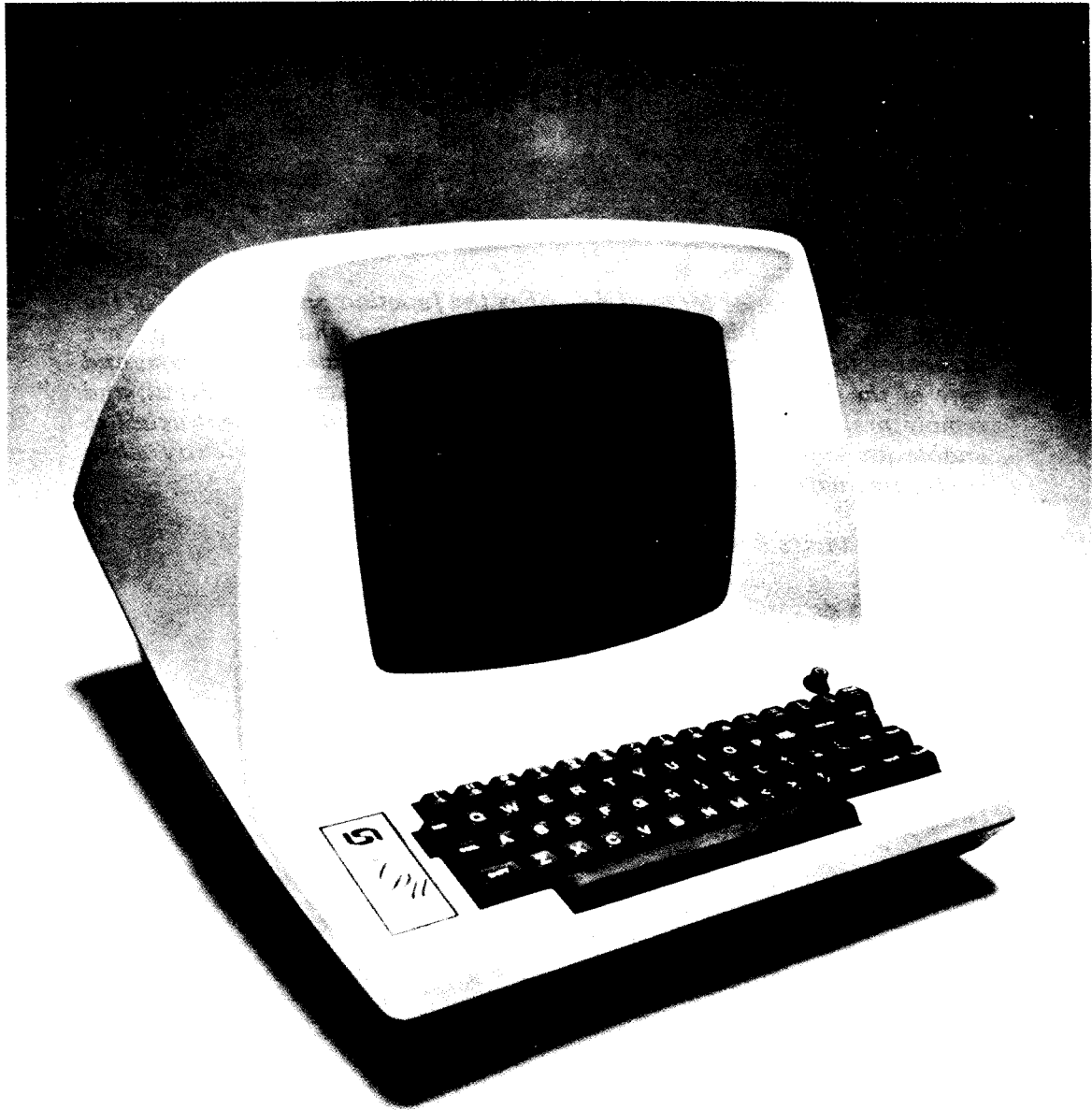


## PREFACE

*This Users Reference Manual describes the function and operation of the ADM 3A Video Display Unit. The instructions and information are presented to aid operational personnel in the installation, operation, and care of the ADM 3A. All operator controls are described in detail, and remote programming considerations are presented in sufficient detail to enable an experienced operator to use the equipment efficiently when confronted with nonstandard applications.*

*The major topics described in the manual include:*

- Section I        General Description*
- Section II        Installation*
- Section III        Operation*
- Appendix A       Operators Quick Reference Charts*
- Index*



219-1

*Figure 1-1. ADM 3A Video Display Unit*

# SECTION I GENERAL DESCRIPTION

## 1.1 INTRODUCTION

This section of the manual describes the primary function of the Lear Siegler ADM 3A Video Display Unit shown in **figure 1-1**. Other information in this section includes specifications, operating features and ranges, physical dimensions, and a list of available options.

## 1.2 PURPOSE AND USE

There are numerous applications of the ADM 3A, all involving the transfer of asynchronous data. In some applications, data transfer may be exclusively unidirectional; either from the ADM 3A to a host computer, or from the computer to the ADM 3A. However, a more frequent application of the ADM 3A, is one in which an operator communicates with the computer, and the computer reacts in accordance with its stored program.

The ADM 3A features the following general capabilities:

- Full 128 ASCII character set with 80 x 24 character nonglare display (12-line display is switch selectable)
- 11 communication rates in full-duplex and half-duplex send/receive modes
- Scrolling
- Absolute cursor positioning
- Variable 9-, 10-, or 11-word structure

- Selectable Auto New Line operation
- Selectable standard RS-232C or 20mA current-loop interface, with RS-232C extension interface for auxiliary devices. (Selectable keyboard lock or gated EXTENSION port). Optional current-loop interface on EXTENSION port.
- Special control character sequences.
- Selectable refresh rate

## 1.3 OPERATIONAL DESCRIPTION

The ADM 3A is an interactive device which is used to enter, display, and send information to a host computer, and to receive and display information from the computer. Using a keyboard similar to that of a teletypewriter, the operator may enter information which is immediately transmitted to the computer, and may be simultaneously displayed on a cathode ray tube (CRT). Data from the computer is received and displayed at baud rates as high as 19200 (the maximum baud rate when using the current loop option is 9600).

### 1.3.1 Keyboard

The keyboard contains 59 keys from which data entry and control functions are initiated. Each keystroke is encoded into a corresponding ASCII character which is immediately transmitted to the host computer. The character is also routed back to the CRT display: **directly in half-duplex operation, or echoed from the host computer via the I/O interface in full-duplex operation.**

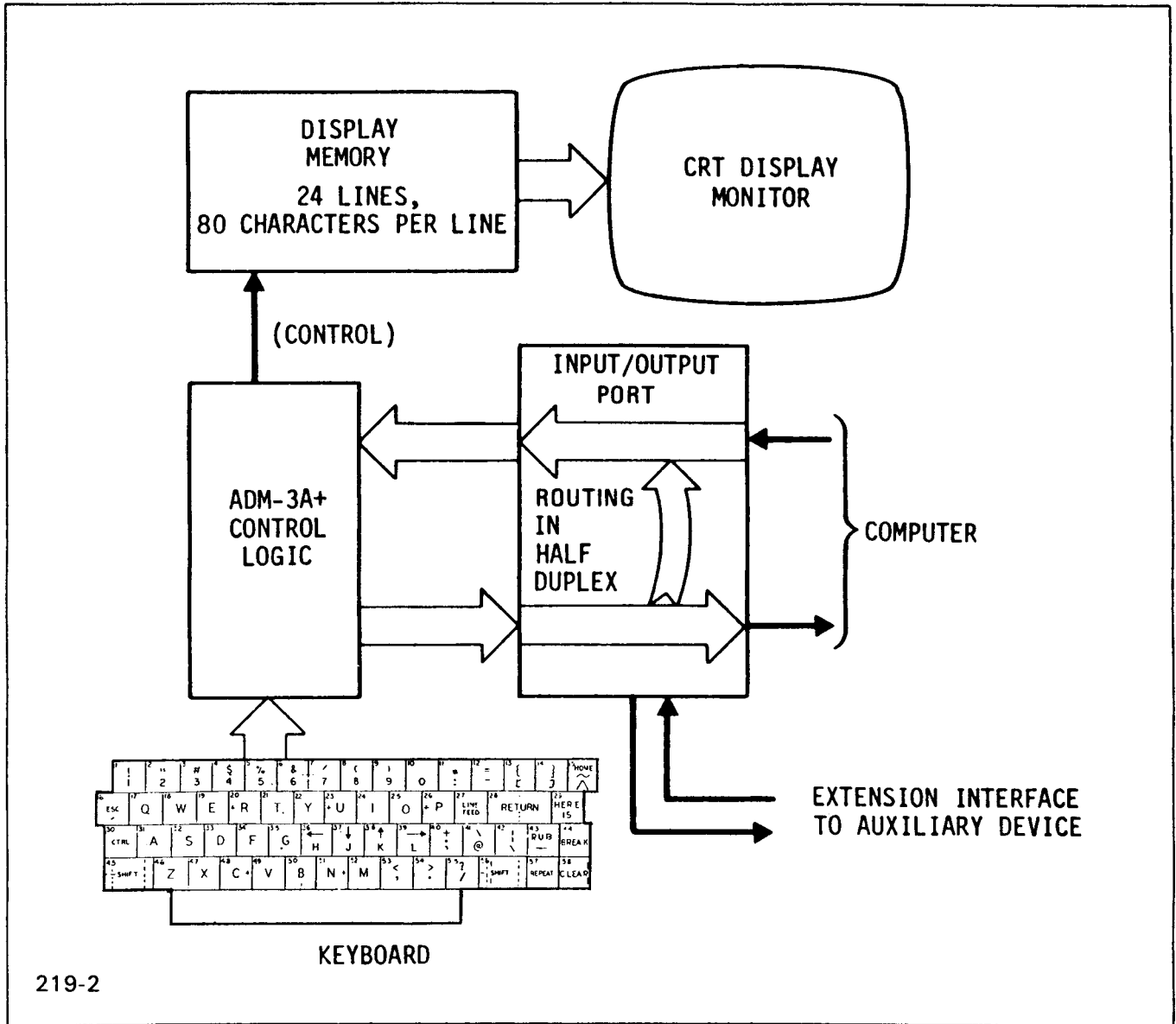


Figure 1-2. ADM 3A Data Flow Block Diagram

### 1.3.2 Input/Output (I/O) Port

The MODEM (I/O) port is the link, or interface, that handles the flow of data in both directions between the ADM 3A and the computer. It may be configured for either RS-232C or 20mA Current Loop operation.

### 1.3.3 ADM 3A Control Logic

The ADM 3A Control Logic interprets the control codes that originate either at the keyboard or host computer, and directs the activities of the ADM 3A accordingly. These activities include data handling, and formatting.



### 1.3.4 Display Memory

The display memory contains a random access memory (RAM), video logic and character generation circuits appropriate for controlling the CRT display. The memory is capable of holding 1920 characters, which are stored in sequentially scanned locations. The scanned data is then sent to the CRT for displaying. Input to the display memory consists of the data character codes from the I/O port or keyboard, under the control of signals from the control logic circuits.

### 1.3.5 CRT Display Monitor

The CRT display monitor is a rectangular screen measuring 12 inches diagonally. Data characters are displayed on 24 or 12 equally-spaced rows, each consisting of 80 (maximum) characters. The 80 character lines are displayed clearly at a refresh rate of either 50 or 60 Hz, corresponding to the AC line frequency.

## 1.4 PHYSICAL DESCRIPTION

The **ADM 3A** is a self-contained unit consisting of three major assemblies: (1) base and cover assembly, (2) main logic board and (3) the CRT monitor. The power transformer, a beeper, and intercomponent cabling are located on the base portion of the terminal. Supports and guide pins are also located on the base, and these are used for installing the main logic board.

The cover portion of the terminal contains the CRT monitor and its associated subassemblies. The cover is hinged to the base at the rear, and when swung open, all components of the **ADM 3A** are exposed.

The main logic board contains all other operating elements of the **ADM 3A** that are not contained in the CRT monitor and the base assembly. This includes the keyboard. The keyboard is made up of integrated key rows, or modules. It is built directly on the main logic board. The logic board rests on supports within the base, and is held in place by guide pins. Two connectors at the rear edge of the logic board provide the RS-232C/current loop interface and the RS-232C extension interface.

The CRT monitor consists of three subassemblies: (1) the CRT itself, (2) a printed circuit board that

contains most of the video circuitry, and (3) the flyback assembly. The monitor display screen measures 12 inches diagonally.

## 1.5 SPECIFICATIONS

The **ADM 3A** specifications are listed in **table 1-1**. In addition, several operational features, such as send/receive modes, character format, word structure, data entry and overflow, and configuration control are discussed in the paragraphs that follow. Specific operational information regarding configuration control, format and word structure, modes, etc., is contained in **Section II** of this manual.

### 1.5.1 Send/Receive Modes

Two-switch-selectable send/receive modes are available in the **ADM 3A**: half-duplex and full-duplex. In the half-duplex mode, each character is transmitted to the computer as it is entered on the keyboard and is simultaneously displayed on the CRT monitor.

In full-duplex operation, the **ADM 3A** can transmit and receive information in both directions simultaneously. Characters are transmitted as they are entered at the keyboard, but are displayed only upon reception. In order to display transmitted characters, they must be echoed back from the host computer or data set.

### 1.5.2 Character Format (Figure 1-3)

The standard **ADM 3A** character set contains 64 ASCII characters. Control characters are not displayed when they are generated. The displayable 64 ASCII characters consists of upper case letters, numerics and punctuation. When a nondisplayable lower case character is typed (lower case option not installed), a lower case code is transmitted, but the character displayed is upper case. The lower case option permits the display of 95 ASCII characters consisting of upper and lower case letters, numerics and punctuation.

### 1.5.3 Word Structure

The **ADM 3A** can transmit and receive data characters in any one of the asynchronous character formats shown in **figure 1-4**. These word format codes are selected by means of DIP switches located on the PC board.

**Table 1-1. ADM 3A Specifications**

**DISPLAY FORMAT**

24 lines x 80 characters  
(12 x 80 switch selectable)

**CRT SCREEN**

12-inch (30.5 cm) diagonal, P4 Phosphor  
with nonglare surface

**REFRESH RATE**

50 Hz or 60 Hz, depending on line  
frequency (switch selectable)

**HORIZONTAL SWEEP RATE**

16.2 kHz

**DISPLAY AREA**

5.8 inches (14.7 cm) high x 8.3 inches  
(21 cm) wide

**CHARACTER SET, GENERATED**

128 ASCII characters (with 32 control  
characters)

**CHARACTER SET, DISPLAYED**

STANDARD: 64 ASCII Characters  
OPTIONAL: 95 ASCII Characters

**CHARACTER MATRIX**

5 x 7 dot matrix 0.074 inch (1.88 mm)  
wide x 0.188 inch (4.77 mm) high

**CHARACTER FIELD**

7 x 9 dot matrix 0.103 inch (2.62 mm)  
wide x 0.241 inch (6.14 mm) high

**CURSOR**

CUR CTRL ON: 7 x 9 dot matrix. Reverse  
image rectangle cursor.  
Homes to upper left of  
screen.

CUR CTL OFF: Double underline, 5 dots  
wide. Homes to first  
position of bottom line.

**CURSOR CONTROLS**

Two-key cursor controls; Backspace  
**CTRL H**, Forespace **CTRL L**, Up  
**CTRL K**, Down **CTRL J**, Home  
**CTRL HOME**

**KEYBOARD**

59 keys, 26-letter alphabet with upper case,  
numerics 0 through 9, punctuation, and  
control. Two-key repeat operation at a rate  
of 22 characters per second.

**FUNCTIONAL CONTROL KEYS**

Escape, Rubout (delete), Break, Return Shift,  
Clear, Repeat, Line Feed, Control, Here Is.

**TRANSMISSION MODES**

Full Duplex, Half Duplex

**COMPUTER INTERFACES (MODEM)**

RS-232C point-to point or 20mA current  
loop.

**DATA RATES**

75, 110, 150, 300 600, 1200, 1800, 2400,  
4800, 9600, 19,200 (Current Loop to 9600)

**PARITY**

Even, odd, mark, space, or none

**WORD STRUCTURE**

Total Word Length: 9, 10, or 11 bits

Data: 7 or 8 bits (8th bit  
0 or 1)

Start: 1 bit

Stop: 1 or 2 bits

**EXTENSION INTERFACE**

RS-232C EXTENSION Port for interfacing serial  
asynchronous ASCII hard copy printer,  
magnetic tape recorder, or other serial  
asynchronous devices using selectable keyboard  
lock or gated EXTENSION Port. (Selectable  
keyboard lock or gated EXTENSION Port).

**Table 1-1. ADM 3A Specifications (cont'd)**

**SWITCH SELECTABLE SETTINGS**

All Available Baud Rates  
Half/Full Duplex  
RS-232C/Current Loop (MODEM)  
Auto New Line ON/OFF  
Upper Case/Lower Case (when lower case option installed)  
Odd/Even Parity  
7 or 8 Data Bits  
1 or 2 Stop Bits  
Parity/Inhibit  
Bit 8 = 0 or 1  
Keyboard Lock/Gated EXTENSION Port  
Disable Keyboard Lock  
Disable Clear Screen  
Secondary Channel  
Cursor Control  
Local  
103 Modem  
102 Modem  
Code (ETX or EOT)

**OPERATING ENVIRONMENT**

Temperature: 41<sup>o</sup>F to 122<sup>o</sup>F (5<sup>o</sup>C to 50<sup>o</sup>C)  
Humidity: 5% to 95%, noncondensing  
Altitude: 10,000 feet (3.048 km) maximum

**POWER REQUIREMENTS**

Standard: 115 VAC  $\pm$  10%, 60  $\pm$ 3 Hz  
60 Watts nominal  
Optional: 230 VAC  $\pm$  10%, 50/60  $\pm$ 3 Hz  
60 Watts nominal  
Heat Dissipation: 205 BTU per hour

**DIMENSIONS AND WEIGHT**

Width: 15.6 inches (39.6 cm)  
Depth: 20.2 inches (51.3 cm)  
Height: 13.5 inches (34.3 cm)  
Weight: 32 pounds (14.5 kg)

**OPTIONS**

Lower Case (95 ASCII character set)  
Answerback Memory  
Numeric Keypad (detached)  
20mA Current Loop on EXTENSION Port  
Split Baud Rate  
Beep Defeat  
Output Cable  
Green Phosphor Screen

HEX		CONTROL		GRAPHIC CHARACTER SET					
		0	1	2	3	4	5	6	7
BITS 4 3 2 1 ↓	BITS 7 6 5 →	0 <sub>0</sub> 0	0 <sub>0</sub> 1	0 <sub>1</sub> 0	0 <sub>1</sub> 1	1 <sub>0</sub> 0	1 <sub>0</sub> 1	1 <sub>1</sub> 0	1 <sub>1</sub> 1
		0	0000	NUL	DLE	SP	0	@	P
1	0001	SOH	DC1	!	1	A	Q	a	q
2	0010	STX	DC2	"	2	B	R	b	r
3	0011	ETX	DC3	#	3	C	S	c	s
4	0100	EOT	DC4	\$	4	D	T	d	t
5	0101	ENQ	NAK	%	5	E	U	e	u
6	0110	ACK	SYN	&	6	F	V	f	v
7	0111	BEEP	ETB	'	7	G	W	g	w
8	1000	BS (←)	CAN	(	8	H	X	h	x
9	1001	HT (TAB)	EM	)	9	I	Y	i	y
A	1010	LF (↓)	SUB	*	:	J	Z	j	z
B	1011	VT (↑)	ESC	+	;	K	[	k	{
C	1100	FF (→)	FS	,	<	L	\	l	!
D	1101	CR	GS	-	=	M	]	m	}
E	1110	SO	RS (HOME)	.	>	N	^	n	~
F	1111	SI	US	/	?	O	-	o	*DEL (RUB)

CONTROL  
CODES

DISPLAYABLE IN  
STANDARD ADM 3A

DISPLAYABLE WITH  
ADM 3A UPPER/LOWER  
CASE DISPLAY OPTION

(GENERATED BY HOLDING  
CTRL KEY WHILE TYPING  
THE CORRESPONDING KEY  
SHOWN IN COLUMNS 4  
AND 5.)

Figure 1-3. ADM 3A Graphic Character Set and CTRL Codes

219-4

WORD FORMAT	FRONT PANEL SWITCHES					9-, 10-, OR 11-BIT WORD STRUCTURE										
	PAR	DATA	STOP	PARITY	BIT 8	BITS										
	SW2	SW3	SW4	SW5	SW6	0	1	2	3	4	5	6	7	8	9	10
Eleven-Bit Word with EVEN Parity and 2 STOP Bits	EVEN	7	2	PARITY	X	START		ACTIVE BITS = 1 OR 0						EVN PAR	STOP	STOP
Eleven-Bit Word with ODD Parity and 2 STOP Bits	ODD	7	2	PARITY	X	START		ACTIVE BITS = 1 OR 0						ODD PAR	STOP	STOP
Ten-Bit Word with EVEN Parity and 1 STOP Bit	EVEN	7	1	PARITY	X	START		ACTIVE BITS = 1 OR 0						EVN PAR	STOP	X
Ten-Bit Word with ODD Parity and 1 STOP Bit	ODD	7	1	PARITY	X	START		ACTIVE BITS = 1 OR 0						ODD PAR	STOP	X
Eleven-Bit Word with No Parity and 2 STOP Bits	X	8	2	INH	0 OR 1	START		ACTIVE BITS = 1 OR 0						1 OR 0	STOP	STOP
Ten-Bit Word with No Parity and 1 STOP Bit	X	8	1	INH	0 OR 1	START		ACTIVE BITS = 1 OR 0						1 OR 0	STOP	X
Eleven-Bit Word with EVEN Parity and 1 STOP Bit	EVEN	8	1	PARITY	0 OR 1	START		ACTIVE BITS = 1 OR 0						1 OR 0	EVN PAR	STOP
Eleven-Bit Word with ODD Parity and 1 STOP Bit	ODD	8	1	PARITY	0 OR 1	START		ACTIVE BITS = 1 OR 0						1 OR 0	ODD PAR	STOP
Nine-Bit Word with no Parity and 1 STOP Bit	X	7	1	INH	0 OR 1	START		ACTIVE BITS = 1 OR 0						STOP	X	X

Figure 1-4. Word Format Codes with Switch Configurations

## 1.5.4 Data Entry and Overflow

New data enters on progressive lines, from top to bottom. When the cursor is on the bottom line, line feed causes upward scrolling of the entire display page. When overflow occurs, the entire display page is scrolled upward one line as new data enters at the beginning of the new bottom line. If **AUTO NEW LINE** is not enabled, a CR/LF must be sent.

## 1.5.5 Configuration Control

Default conditions for the **ADM 3A** are established by the selected positions of 33 DIP switches, which are located on the main logic board. The switches are factory set in accordance with instructions established at the time of purchase of the **ADM 3A**. Section II of this manual shows the locations of these switches so that they may be checked and/or reset at the time of **ADM 3A** installation.

## 1.6 OPTIONAL FEATURES

The following features can be incorporated into the **ADM 3A** by installation of the appropriate option.

### 1.6.1 Lower Case Characters

This option provides the capability of displaying lower case characters.

### 1.6.2 Answerback

When installed, this option is activated by means of the **HERE IS** key. Momentarily pressing this key initiates an identification message (stored in a special **ADM 3A** memory) that identifies the terminal. The **HERE IS** key is included in the keyboard of the **ADM 3A**, but has no function if the Answerback option is not installed. Answerback is activated by a remote **ENQ** code.

### 1.6.3 Numeric Keypad

This option provides 14 keys for operators convenience. These keys consist of 10 numeric (0-9), 3 punctuation (- . .) and **ENTER** (equivalent to **RETURN**) key.

### 1.6.4 20mA Current Loop on Extension Port

This option permits the **EXTENSION** port to be used in a current loop application.

### 1.6.5 Split Baud Rate

This option adds a 12-position rotary switch, adjacent to the **BAUD RATE** switches, that allows the **ADM 3A** to transmit at a specific baud rate (using the **BAUD RATE** switches) and receive at another baud rate (using the rotary switch).

### 1.6.6 Beep Defeat

For this option a switch is added to provide the capability of defeating or not defeating the **BEEP** signal.

### 1.6.7 230VAC

For this option, a 230-volt transformer and appropriate power cord are provided to make the **ADM 3A** suitable for 230-volt operation.

### 1.6.8 Output Cable

A 10-foot output cable, which includes both **RS-232C** and current-loop pin connections, is provided. Other output cables are available in lengths up to 50 feet.

### 1.6.9 Alternate Configuration - Green Phosphor Screen

This option provides a green display screen which has a longer persistence than the standard screen.

## 1.7 RELATED DOCUMENTS

- a. **ADM 3A/3A+ Maintenance Manual DP305.**
- b. **ADM 3A/3A+ Illustrated Parts Catalog DP705.**

## SECTION II INSTALLATION

### 2.1 GENERAL

Installation procedures involving unpacking, site requirements, initial set-up, and operation checkout of the ADM 3A are contained in this section of the manual.

### 2.2 SPECIAL SAFETY REQUIREMENTS

Observe normal safety procedures when installing the ADM 3A. No special safety requirements are imposed.

### 2.3 UNPACKING AND INITIAL INSPECTION

Each ADM 3A is thoroughly inspected and carefully packaged prior to shipment. Every precaution is taken to ensure that each unit is complete and ready for installation at the customer's site. However, it is recommended that each unit be inspected upon receipt for transit damage. Start by examining the exterior of the package for evidence of rough or careless handling; then perform a thorough visual inspection of the internal components and subassemblies. As a rule, most transportation companies will not honor claims for damage unless they are filed promptly; therefore, the following steps should be taken:

1. Verify that each item shown on the Sales Order Packing Slip has been included in the shipment. Contact LSI or your distributor immediately in the event of packing shortage.
2. Check to verify that the serial number of the unit corresponds to that shown on the invoice.
3. Check the hardware to determine if any

assemblies or screws were loosened during shipment. Tighten as required.

4. Inspect for dust or foreign material which may impair electrical contact when cable connections are made. Vacuum to remove any loose dirt.
5. Install and test operation of the ADM 3A as soon as possible after delivery. (This is very important since internal damage to the equipment cannot be determined by visual inspection alone.)
6. If, in your opinion, the equipment has been damaged - either internally or externally - notify the agent of the transportation company immediately, and ask him to make an inspection. If assistance is needed to describe the extent of the damage or the repairs that will be necessary, contact your local Sales and Service Office.

### 2.4 SITE REQUIREMENTS

The ADM 3A may be used conveniently in a normal office environment, as no special mounting provisions are required. However, it is recommended that a weather protected environment with an ambient temperature range of 41°F to 122°F (5°C to 50°C), and relative humidity of less than 95 percent be maintained for equipment use.

#### CAUTION

*To prevent condensation from developing, allow the ADM 3A to temperature stabilize when changing locations. Condensation could develop in the unit and adversely affect the operation of the device.*

Whenever the ADM 3A is physically moved to a warmer environment than its former location, be sure to allow sufficient time for the equipment to equalize with the warmer location before activating the terminal. Condensation developed by the temperature differential may possibly impair ADM 3A operation.

Refer to **Section I** of this manual for physical dimensions of the ADM 3A, as well as installation power and environmental parameters. The basic requirements for reliable installation of the ADM 3A are as follows:

- Table or desk mounting
- Standard three-pronged, 115-volt or 230-volt, power outlet
- Cable connection to the computer, modem, serial printer, or other auxiliary device. If connection to a remote computer is desired, a modem or data set may be required.

## 2.5 INITIAL PREPARATION

Initial preparation includes: making sure that the ADM 3A will not be plugged into an AC line power output that will damage the equipment; and checking and/or resetting the configuration control switches as necessary.

### 2.5.1 Line Voltage Selection

The ADM 3A is shipped properly connected for either 115-volt or 230-volt AC line power, as specified in the purchase order. Any change for operation from a different line voltage requires changing components in the ADM 3A, which should be accomplished only by authorized LSI Maintenance Personnel. (Unauthorized circuit or component changes invalidate the equipment warranty.)

### 2.5.2 Configuration Control Switch Settings

DIP switches located on the main logic board are provided for establishing the default state of selected terminal operating characteristics. These switches are initially set at the factory in accordance with customer requirements, as expressed on the Terminal Ordering Form. Any

required switch settings should be made before attempting to operate the terminal. **Figure 2-1** shows the location and identity of the configuration control switches, as well as connector/pin designations. **Tables 2-1** and **2-2** describe the function and factory setting of each switch.

### WARNING

*Dangerous voltages exist within the ADM 3A. Always disconnect the AC power cord before opening the ADM 3A case to access any internal components.*

### CAUTION

*Set DIP switches ON or OFF using DIP Switch Setting Tool 857001. DO NOT use a ball point pen or pencil; the switches could become contaminated with conductive debris.*

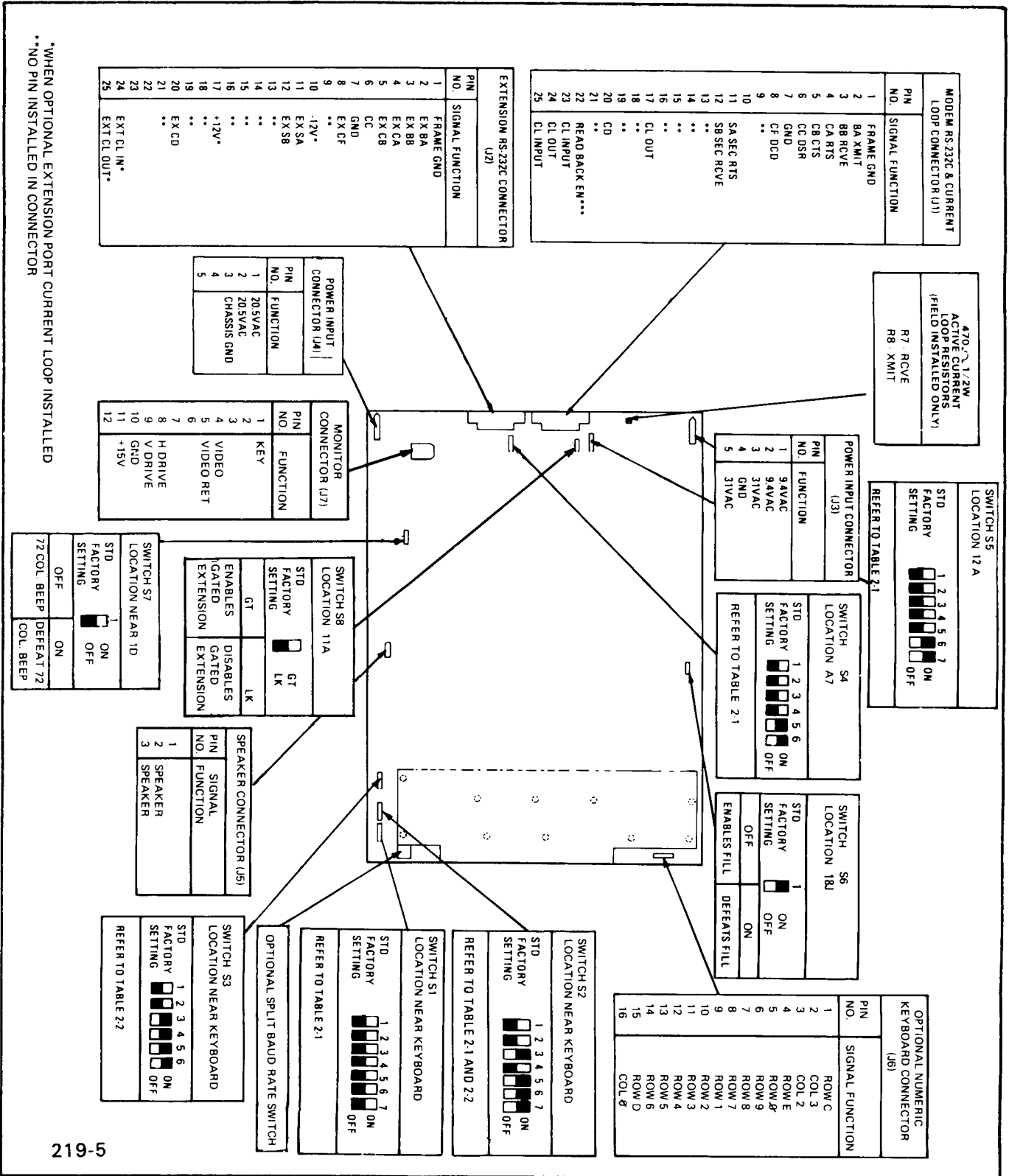
Access to the configuration control switches is obtained by opening the cover of the ADM 3A, as follows:

1. Disconnect the AC power cord from the source receptacle. Also disconnect any external cables, if connected.
2. Remove the two screws located under the front corners of the base and lift the cover upwards and to the rear of the terminal, until it rests on the table or desk supporting the equipment.

## 2.6 INTERFACE INFORMATION

The ADM 3A may be cabled directly to a local computer, or it may be connected via telephone data lines to a remote computer located almost anywhere. Remote computer connections usually require the use of a modem or data set. **Figure 2-1** shows the connector/pin assignments for the MODEM and EXTENSION ports. **Figure 2-2** shows typical ADM 3A application.





**Table 2-1. Baud Rate Switch Functions**

SWITCH NO.	NAME	FUNCTION
S1-1	75 BAUD	BAUD RATE Switches for selecting MODEM port baud rate. SELECT ONE ONLY
S1-2	110 BAUD	
S1-3	150 BAUD	
S1-4	300 BAUD	
S1-5	600 BAUD	
S1-6	1200 BAUD	
S1-7	1800 BAUD	
S2-1	2400 BAUD	
S2-2	4800 BAUD	
S2-3	*9600 BAUD	
S2-4	**19200 BAUD	

\* Factory Setting

\*\* Not applicable for current-loop operation

### 2.6.1 RS-232C Modem Port Interface

The MODEM port interface is used to connect the terminal directly to a computer, modem, or data set in RS-232C or current-loop application. See figures 2-3 and 2-4.

### 2.6.2 RS-232C Extension Port Interface

The EXTENSION port interface extends the standard RS-232C capabilities of the ADM 3A by allowing the connection of a serial RS-232C peripheral.

The gated EXTENSION port mode, when selected by switch S8, allows selective transmission of data from the keyboard, in Half-Duplex mode, or the communication line through the EXTENSION port.

#### Note

*The peripheral device that is attached to the EXTENSION port must operate at the same baud rate as the communication line.*

### 2.7 INSTALLING THE ADM 3A

To install the ADM 3A, proceed as follows:

1. Verify that the POWER ON/OFF switch is OFF (figure 2-5).
2. Connect the interconnect cable(s) using the appropriate information in figures 2-1 and 2-2.
3. Set the configuration control switches to the positions desired. See table 2-2.
4. Set the appropriate (S1 or S2) switches for the desired baud rate. See table 2-1.
5. Connect the power cord to a grounded AC outlet.

**Table 2-2. Configuration Control Switch Functions**

SWITCH NO.	NAME	SETTING	FUNCTION
S2-5	HDX-FDX	ON	HDX: Places ADM 3A in half duplex mode. Each character is sent to the computer as it is entered on keyboard and displayed on CRT.
		OFF	FDX: Places ADM 3A in full-duplex mode. ADM 3A transmits and receives in both directions simultaneously. Each character must be echoed back from the host or modem to be displayed.
S2-6	RS 232-CL	ON	RS 232: Selects RS-232C interface for communication through MODEM connector.
		OFF	CL: Selects 20mA current-loop interface for communication through MODEM connector. Maximum baud rate for CL is 9600
S2-7	AUTO NL-OFF	ON	AUTO NL: Causes the cursor to move to the beginning of the next line automatically after the 80th character position is typed.
		OFF	Disables Automatic New Line Function. Each new character is written into the 80th position. A CR and LF are required.
S3-1	LC EN-UC	ON	LC EN: Causes generation of lower-case characters.
		OFF	UC: SHIFT key operational only for non-alphabetical character keys. Only upper-case characters are generated and displayed whether or not SHIFT key is depressed.
S3-2	PAR ODD-EVEN		NOTE
			This switch is active only when S3-5 is in PARITY (ON)
		ON	PAR ODD: Selects ODD parity
	OFF	EVEN: Selects EVEN parity	

**Table 2-2. Configuration Control Switch Functions (cont'd)**

SWITCH NO.	NAME	SETTING	FUNCTION
S3-3	DATA 7-8	ON	DATA 7: Selects 7-bit data word
		OFF	8: Selects 8-bit data word
S3-4	STOP 1-2	ON	STOP 1: Selects 1 STOP bit
		OFF	2: Selects 2 STOP bits
S3-5	PARITY-INH	ON	PARITY: Enables parity bit after 7- or 8-bit data word.
		OFF	INH: No parity bit after 7- or 8-bit data word.
S3-6	BIT 8 0-1	ON	<p style="text-align: center;">NOTE</p> <p style="text-align: center;">This switch is active only when S3-3 is in position 8.</p>
		OFF	
S4-1	12 LINE-24LINE	ON	12 LINE: Selects 12-line display
		OFF	24 LINE: Selects 24-line display
S4-2	50 Hz - 60 Hz	OFF	Selects 60 Hz refresh rate for data on CRT. Refresh rate should be set to correspond with powerline frequency.
		ON	Selects 50 Hz refresh rate
S4-3	DISABLE-CLR SCRN	ON	DISABLE: Prevents remote CTRL Z from clearing screen.
		OFF	CLR SCRN: Allows remote CTRL Z to clear screen.

**Table 2-2. Configuration Control Switch Functions (cont'd)**

SWITCH NO.	NAME	SETTING	FUNCTION
S4-4	DISABLE-KB LOCK	ON	DISABLE: Prevents keyboard from being locked.
		OFF	KB LOCK: Allows keyboard to be locked by remote control codes.
S4-5	UC DISP-U/L DISP	ON	UC DISP: Characters are displayed upper case only.
		OFF	U/L DISP: Characters are displayed upper and lower case when ADM 3A contains Lower-Case Option.
S4-6	SPACE-ADV	ON	SPACE: Selects destructive cursor. Space code always overwrites the display memory location under cursor and advances cursor.
		OFF	ADV: Selects nondestructive cursor between RETURN and subsequent LINE FEED. Cursor can be advanced with space code or key; however, space code does not overwrite display memory location. Cursor is destructive between LINE FEED and next RETURN.
S5-1 S5-2	EOT-OFF ETX-OFF	See Function	Only one switch may be active in conjunction with 202-type modem operation to select the primary channel turnaround code (See Function Description for S5-3 and S5-4).
S5-3	CODE-SEC	ON	Active only when S5-4 is ON. Used to select method of line turnaround for half-duplex operation as follows:  CODE: Enables line turnaround using primary channel. Turnaround code may be either ETX or EOT.
		OFF	SEC: Enables line turnaround using secondary channel. Both S5-1 and S5-2 must be OFF.

**Table 2-2. Configuration Control Switch Functions (cont'd)**

SWITCH NO.	NAME	SETTING	FUNCTION
S5-4 S5-5 S5-6	202-OFF 103-OFF LOCAL-OFF	See Function	<p>Only one switch may be active at any time. Used to select one of the following methods of communicating with host computer.</p> <p>202: Enables connection to 202-type modem. Secondary channel or line turn-around code changes direction of data in primary channel.</p> <p>103: Enables connection to 103-type modem. CA (RTS) line is held high.</p> <p>LOCAL: Enables direct computer connection without modems. Request to Send (CA) line rises and falls with each character transmitted.</p> <p>All Switches OFF: CA (RTS) line is held low.</p>
S5-7	CUR CTL-OFF	ON  OFF	<p>CUR CTL: Selects reverse block cursor. Cursor moves to HOME position.</p> <p>Selects double underlined cursor. Data entered from bottom of screen. No cursor addressing.</p>
S6	NORM-FILL	ON  OFF	<p>FILL: Enables FILL function. Display is filled with zeros for test purposes.</p> <p>NORM: Disables FILL function.</p>
S7	ON-OFF	ON  OFF	<p>Disables BEEP signal at column 72.</p> <p>Enables BEEP signal at column 72.</p>
S8	GT-LK	ON  OFF	<p>GT: Enables gated EXTENSION port mode which allows ON/OFF control of the EXTENSION port.</p> <p>LK: Disables gated EXTENSION port mode which allows locking and unlocking off keyboard.</p>

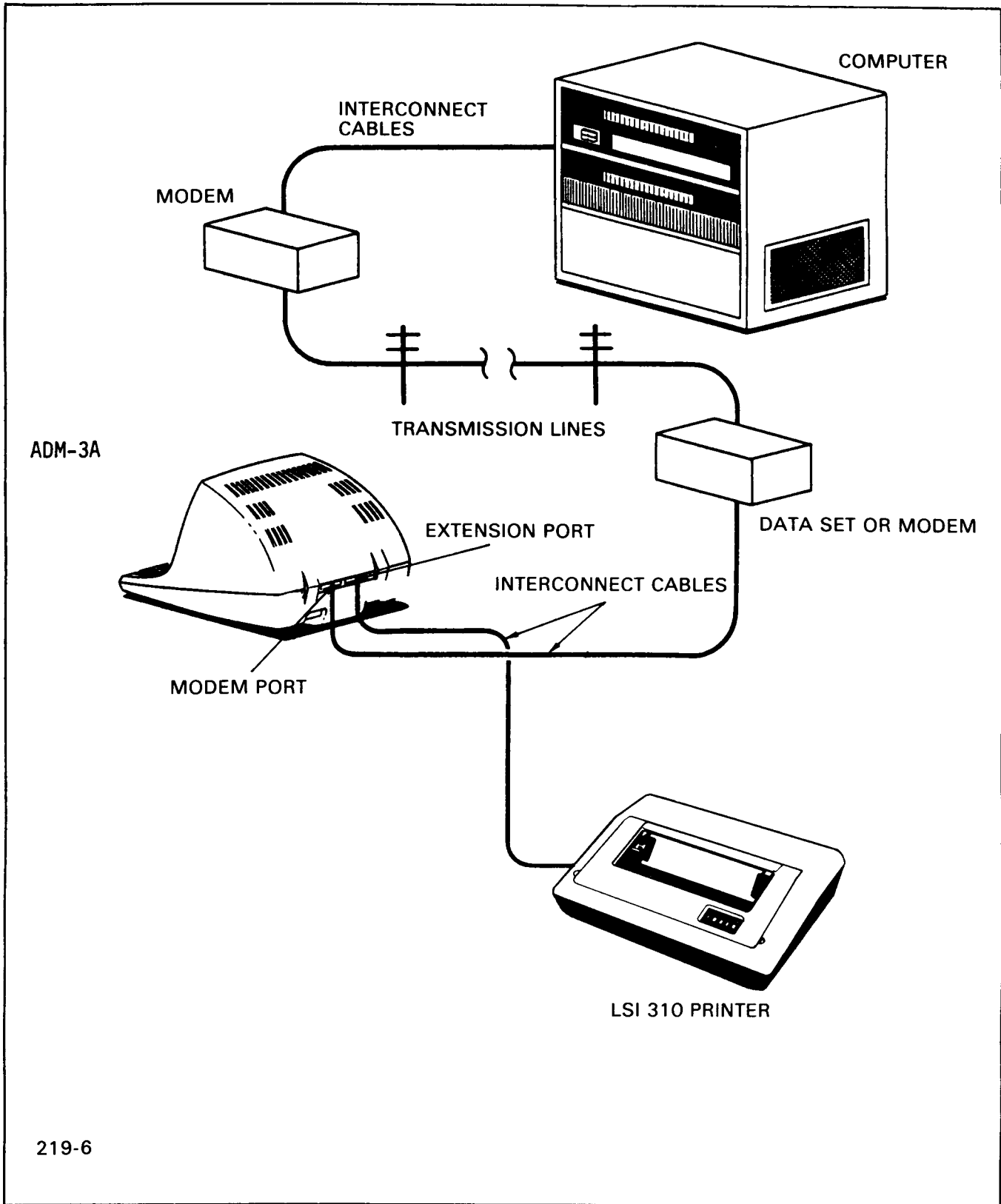


Figure 2-2. Typical ADM 3A Application

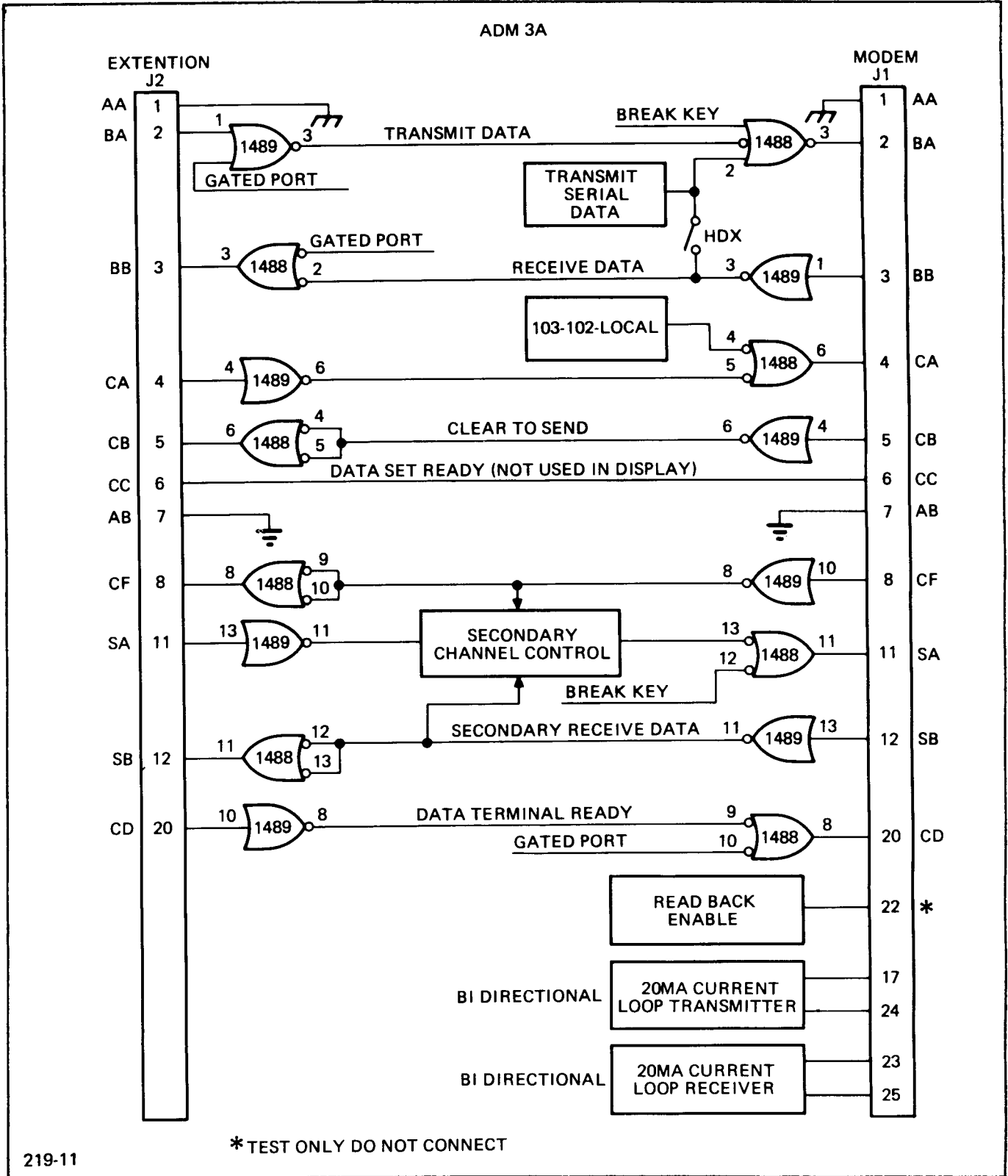


Figure 2-3. Modem and RS-232C Extension Interface Logic



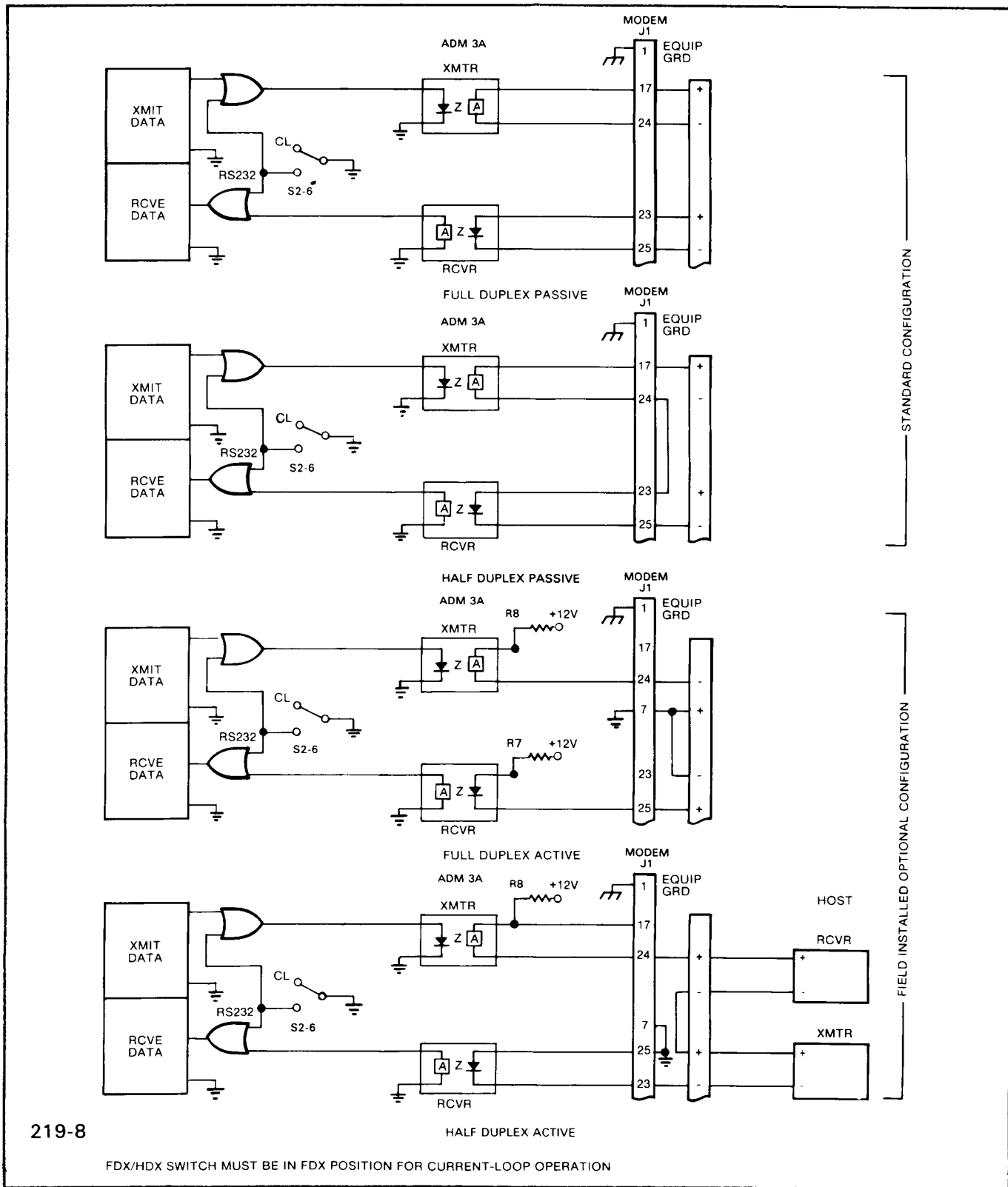


Figure 2-4. Current-Loop Interface Logic

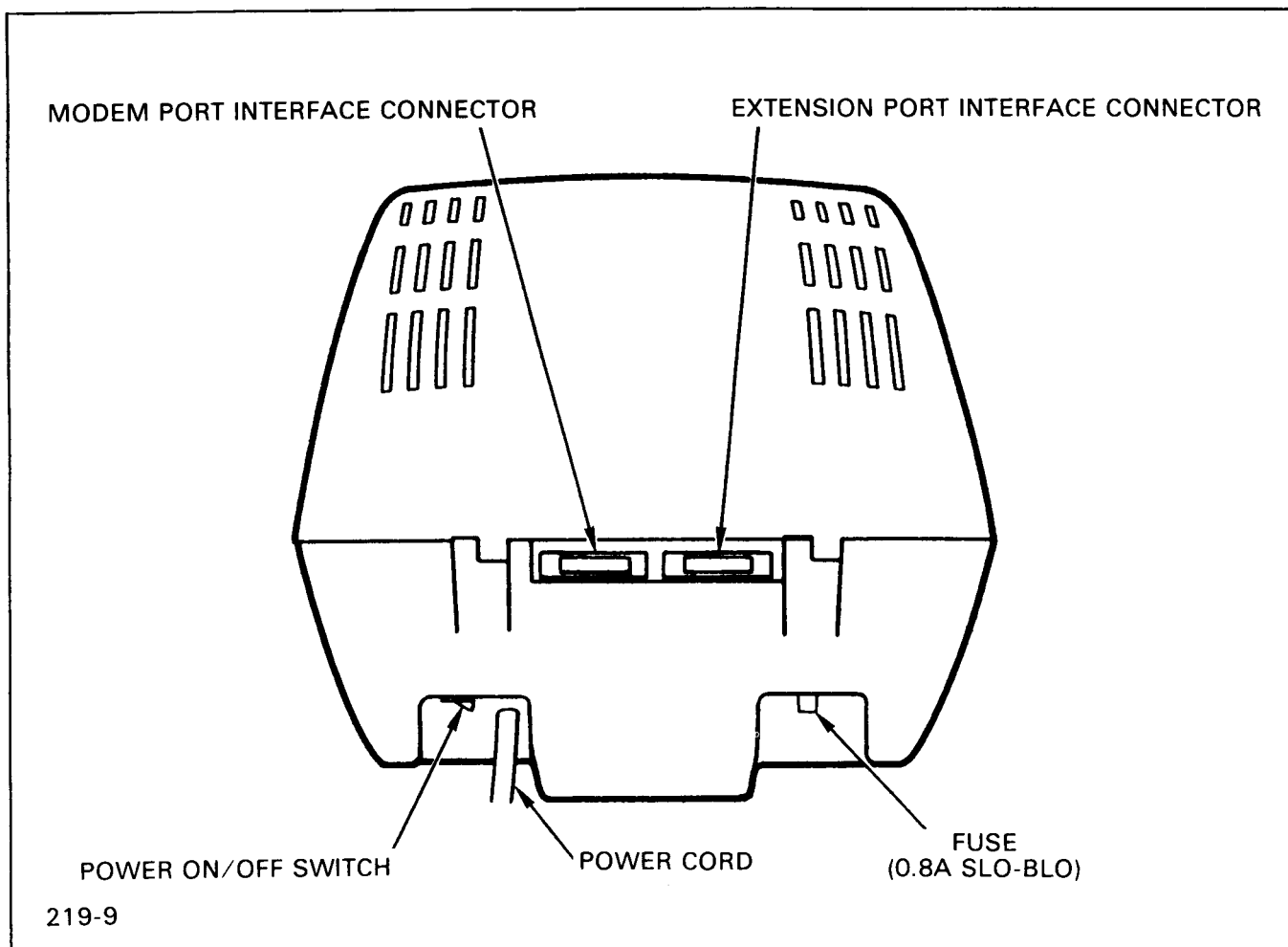


Figure 2-5. ADM 3A Rear Panel Controls

## 2.8 POWER TURN-ON AND TURN-OFF

**CAUTION**

Proceed as follows:

1. Set the POWER ON/OFF switch (figure 2-5) to the ON position.
2. Wait approximately 20 seconds for the unit to warm up.
3. If the CUR CTL-OFF switch (S5-7) is set to CUR CTL (ON) (table 2-2), a reverse block cursor should appear in the upper-left corner of the screen.

*If power is recycled ON and OFF using the POWER ON/OFF switch, wait 10 seconds between the OFF and ON operations to ensure complete reset of the ADM 3A electronics.*

4. If the CUR CTL-OFF switch (S5-7) is set to OFF, a double underline cursor should appear in the bottom-left corner of the screen.

5. If the cursor does not appear, momentarily press the **CTRL HOME** keys. If this fails to produce the cursor, adjust the CONTRAST control on the front panel. The cursor should be present.

**Note**

*If the Full-Duplex mode is selected, typing at the keyboard will not display characters unless echo-back from the host computer or modem is provided. If Half-Duplex mode is selected, data will be displayed only if CLEAR TO SEND is present or interface cable is disconnected.*

## **2.9 CARE OF THE ADM 3A**

This portion of the manual provides the required operator instructions pertaining to routine maintenance for the ADM 3A. Preventive maintenance procedures are limited primarily to cleaning and inspection steps.

### **2.9.1 Cleaning**

At periodic intervals, clean the exterior housing and lightly dust the unit using a soft brush or damp lint-free cloth. However, paper towels may be substituted if desired. Remove smudges from the CRT exterior housing with conventional spray cleaners or alcohol. Do not use petroleum base cleaners, such as lighter fluid, as this could be harmful to the painted surface. Use only a lint-free soft cloth to clean the CRT screen. Be careful not to scratch the CRT screen, and do not use freon cleaners, alcohol, or ammonia.

### **2.9.2 Inspection**

Periodically, inspect keyboard assembly for freedom of movement. Determine that the intensity of character trace on the CRT screen has not diminished. Any required mechanical or electrical adjustment should only be performed by an authorized Lear Siegler Service representative to insure warranty.



## SECTION III OPERATION

### 3.1 GENERAL

The ADM 3A is used to enter, display, and send information to a host computer. It performs a similar function by accepting information from the host and displaying the information on the CRT screen. In this section of the manual, the various keys and specific control codes are described.

### 3.2 KEYBOARD OPERATIONS

The operator uses a keyboard very similar to the keyboard of a teletypewriter to enter data. Information typed by the operator may be displayed on the CRT screen immediately, as during half-duplex operation, or as an echo from the remote computer, as during full-duplex operation.

Figure 3-1 shows the layout of a standard ADM 3A keyboard. Functionally, the keyboard consists of displayable character keys and special function keys. Some of the special function keys can also be used in conjunction with certain displayable character keys to command specific control operations.

In the standard ADM 3A, 63 characters (plus space) are displayed. These characters include upper-case alphabet, numbers, punctuation marks, and most symbols. When a nondisplayable lower-case character is typed (S3-1 set to LC EN), a lower-case code is transmitted. However, the character is displayed as upper case. If the ADM 3A contains a Lower-Case Option, (S3-1 set to LC EN and S4-5 set to U/L DISP), 95 characters are displayed. These characters include upper- and

lower-case alphabet, numbers, punctuation, and all symbols.

#### Note

*Typing at the keyboard always generates codes which are transmitted. However, in order for characters to be displayed and for control codes to affect the ADM 3A in FDX mode, the characters must be echoed back from the host computer. All display actions described below assume that the generated codes are properly echoed.*

### 3.3 INTERFACE CONTROL OPERATIONS

#### 3.3.1 Data Communication Ports

Communication between the ADM 3A and the host computer or modem is accomplished using the MODEM port. Transmission may be in one direction at a time, as in Half-Duplex operation; or in both directions simultaneously, as in Full-Duplex operation.

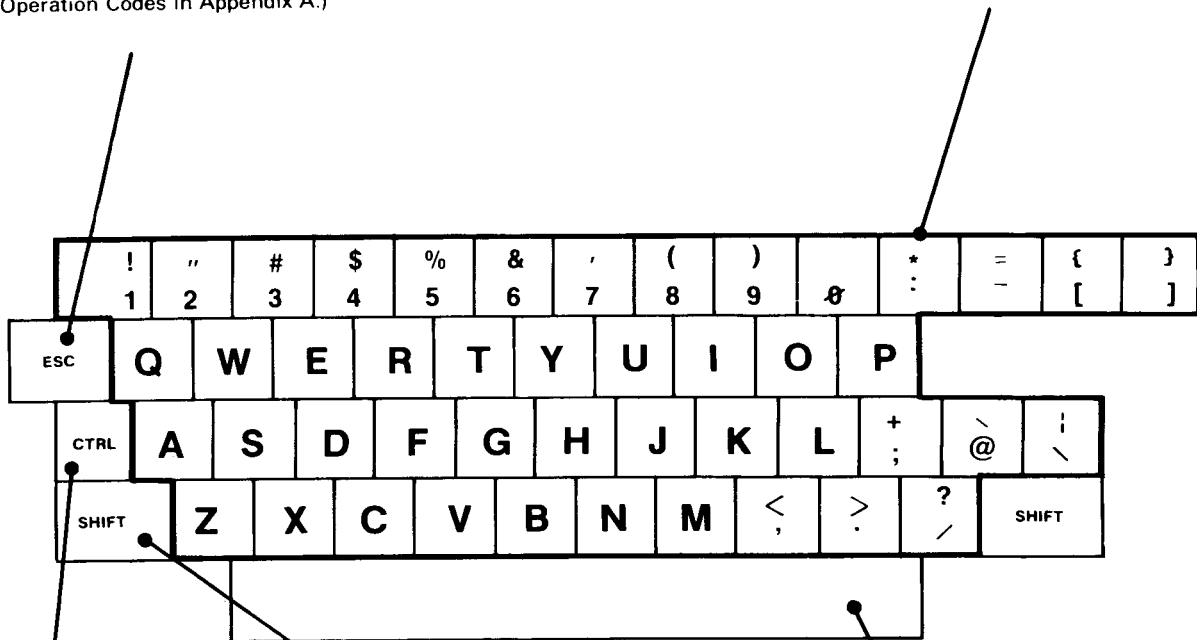
#### 3.3.2 Request To Send Operation

The ADM 3A may receive data at any time over the RCVE line (BB). Data transmission is controlled by Clear to Send (CTS) over line CB.

Request to Send (RTS) is set (high) to inform the host that the ADM 3A wishes to transmit. If CTS (Clear to Send) is low, transmission is inhibited.

**ESC** is used in conjunction with displayable characters to produce an ESC sequence. (See Operators Quick Reference Chart of Control and Operation Codes in Appendix A.)

Alphanumeric, punctuation, and special character keys produce 64 (95 with Lower Case Option) displayable characters. Typing any of these keys with **SHIFT** depressed produces an upper case alpha character or the symbol imprinted on the upper portion of the key.

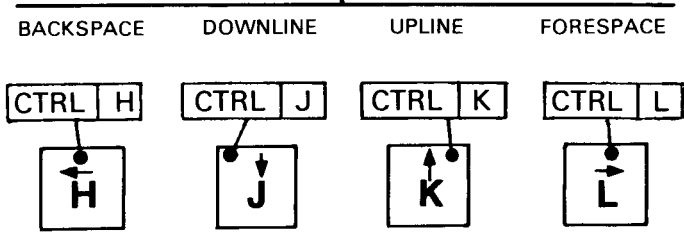


**CONTROL** is held down while typing an otherwise displayable character key to generate one of the 32 control codes. Only 14 control codes are applicable to ADM 3A operation. Refer to Operators Quick Reference Chart of Control Codes in Appendix A.

**SHIFT** must be held down while affected key is typed. Enables upper case alpha characters and symbols, as well as a shift in certain special operations. Refer to table 2-2 for function of S3-1.

**SPACE** bar advances cursor one space to the right each time bar is typed. Any character under cursor is replaced by a SPACE.

Two key operation moves the cursor incrementally in the specified direction as long as keys are depressed. Character under cursor, or characters passed over by cursor are not erased.

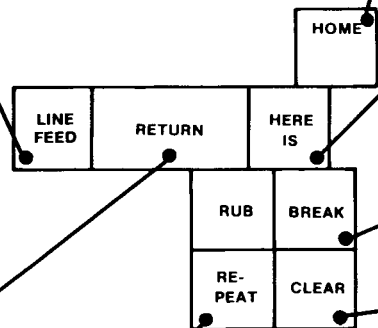


**LINE FEED** moves cursor to same column position of next lower line when CUR CTL-OFF switch (S5-7) is set to CTL (ON). If cursor on bottom line, entire display scrolls upward one line and cursor remains stationary.

When CUR CTL-OFF switch is set to OFF, all data entry is on bottom line, entire display scrolls upward one line and cursor remains stationary.

**RUB** transmits DEL (RUBOUT) character to the host computer. Cursor does not advance after typing **RUB**. May be used by host as a character erase code.

**RETURN** moves cursor to the first character position in the line containing cursor. If SPACE-ADV (S4-6) is set to ADV (OFF), space key is nondestructive between RETURN and subsequent LINE FEED. Cursor can be advanced, space codes do not override characters until LINE FEED is executed.



**REPEAT** allows characters or control functions to be repeated at 22 per second. The repeat rate is reduced to the transmission rate if the ADM 3A is operating at a baud rate less than 300 baud.

**HOME** typing **CTL HOME** moves cursor to first character position (upper left corner) when CUR CTL-OFF switch (S5-7) is set to CTL (ON).

When CUR CTL-OFF switch is set to OFF, cursor moves to first character position on bottom line. (Message is displayed in Half-Duplex Mode.)

**HERE IS** key is operational only if Answerback Option is installed. When typed, key transmits an identification message (stored in a special ADM 3A memory). The message is displayed in Half-Duplex.

**BREAK** causes the transmit data line to go positive (Spacing State) as long as the key is depressed.

**CLEAR** is operational only when **SHIFT** is held down. **SHIFT CLEAR** causes data to be erased from screen and from display memory. All 80 x 24 character positions are filled with SPACE codes. Cursor goes to HOME. CTRL Z from the host may be disabled by setting DISABLE-CLR SCRNR switch (S4-3) to DISABLE.

Figure 3-1. ADM 3A Standard Keyboard Operational Characteristics

RTS may be controlled in one of five ways, as follows:

1. RTS may originate from a peripheral device connected to the EXTENSION port.
2. RTS remains low if LOCAL (S5-6), 103 (S5-5), and 202 (S5-4) switches are all set to OFF (open).
3. LOCAL (S5-6) switch set to ON (closed): RTS rises before transmission of each character and falls when character has been transmitted.
4. 103 (S5-5) switch set to ON (closed): RTS remains high all the time.
5. 202 (S5-4) switch set to ON (closed): RTS is controlled through the **ADM 3A** interface in either code turnaround or reverse-channel turnaround operation. Transmission may be in only one direction at a time (Half-Duplex).

### 3.3.3 Secondary Channel Turnaround Operation

Secondary channel turnaround operation is enabled by setting switch 202 (S5-4) to ON and switch CODE - SEC (S5-3) to SEC (OFF). Both switches EOT (S5-1) and ETX (S5-2) must be set to OFF. In this operation, RTS is controlled by secondary channel signals, instead of turnaround codes on the primary channel.

**ADM 3A** transmission takes place when the host raises SEC RCVE (Secondary Receive Data) over line SB, and DCD (Carrier Detect) on line CF falls to indicate that the host has completed (character) transmission. RTS (Request to Send) over line CA goes high; the CTS (Clear to Send) over line CB from the host initiates **ADM 3A** transmission.

When SEC RCVE (Secondary Receive Data) over line SB goes low while DCD over line CF is high, RTS is unconditionally reset, thus inhibiting **ADM 3A** transmission.

SEC XMIT (Secondary Transmit Data) over line SA rises, allowing the host to transmit. Each time RTS switches between high and low, the **ADM 3A**

ignores any further commands or codes for approximately 250 milliseconds, to allow time for the host to propagate signals.

### 3.3.4 Code Turnaround Operation

Code turnaround operation is enabled by setting switch 202 (S5-4) and switch CODE - SEC (S5-3) to CODE (ON). Additionally either switch EOT (S5-1) or ETX (S5-2) must be set to ON. RTS over line CA is set (high) when DCD (Carrier Detect) over line CF falls as the result of decoding the ETX (EOT) code from the host, indicating that (character) transmission is complete. Data transmission from the **ADM 3A** may take place when CTS (Clear to Send) from the host over line CB is set (high).

When ETX (EOT), terminating each character, is again decoded, RTS (and CTS from the host) are reset to the marking state. **ADM 3A** transmission is inhibited, and the terminal will not recognize any further commands or codes for approximately 250 milliseconds, to allow time for the host to propagate its signal.

## 3.4 PROGRAMMING CONSIDERATIONS

### 3.4.1 Remote CTRL Operation

The host computer has full control over the **ADM 3A**. All control operations which are possible from the keyboard can also be executed from the computer by transmitting the appropriate CTRL codes. (Refer to the Chart of Control and Operation Codes in Appendix A). Displayable characters will be displayed, and valid control codes will be recognized and acted upon, in the same manner as that described for keyboard operations.

### 3.4.2 Remote Load-Cursor Operation

The computer may command the **ADM 3A** cursor to any absolute screen position, as shown in the Chart of Absolute Cursor Positions in Appendix A.



### 3.5 GATED EXTENSION PORT OPERATION

The RS-232C EXTENSION port provides a convenient method for attaching an auxiliary serial asynchronous device to the ADM 3A. The device may be an additional CRT terminal; however, a more common application is for a hard copy device such as a Lear Siegler Model 310 Printer. The EXTENSION port parallels the RS-232C MODEM port, such that any data sent to the terminal through the MODEM port is also passed through the EXTENSION port, unless the port is disabled using the gating function described below.

The gating function allows the host computer to turn the EXTENSION port ON and OFF, using control codes. This function is enabled by setting DIP switch S8 on the main logic board to the GT position. With S8 in this position, the CTRL O command disables the port, while CTRL N enables the port.

When a Model 310 Printer is connected to the EXTENSION port, several control and operation codes used for controlling ADM 3A operations will be passed through the port and affect printer operations also, as shown in the following chart:

COMMAND	ADM 3A	LSI MODEL 310 PRINTER
CTRL L	Increments Cursor by 1	Performs form feed
CTRL N	Enables EXTENSION port when in gated mode	Turns ON elongated print
CTRL O	Disables EXTENSION port when in gated mode	Turns OFF elongated print
ESC G	Sets reverse video or restores standard video	Clears horizontal tabs
CTRL K	Upline	Vertical tab



**APPENDIX A  
OPERATORS QUICK  
REFERENCE CHARTS**





## OPERATORS QUICK REFERENCE CHART OF CONTROL AND OPERATORS CODES

CONTROL CODE		HEX CODE	OPERATION
FROM HOST	FROM KEYBOARD		
ETX	<b>CTRL C</b>	03	Secondary channel line turnaround codes for 202 Modem operation (From Host Only)
EOT	<b>CTRL D</b>	04	
ENQ	<b>HERE IS</b>	05	Initiates ID message when Answerback Option is installed
BEL	<b>CTRL G</b>	07	Sounds audible beep in Video Display Unit
BS	<b>CTRL H</b>	08	Backspace
LF	<b>LINE FEED</b>	0A	Line Feed
VT	<b>CTRL K</b>	0B	Upline
FF	<b>CTRL L</b>	0C	Forward Space
CR	<b>RETURN</b>	0D	Return
SO	<b>CTRL N</b>	0E	With S8 in GT (ON) position, enables gated EXTENSION port and passes CTRL N through the EXTENSION port With S8 in LK (OFF) position, unlocks keyboard (From Host Only)
SI	<b>CTRL O</b>	0F	With S8 in GT (ON) position, disables gated EXTENSION port and passes CTRL O through the EXTENSION port With S8 in LK (OFF) position, locks keyboard
SUB	<b>SHIFT CLEAR</b>	1A	Clears Screen
ESC	<b>ESC =</b>	1B	Initiates load cursor operation
RS	<b>CTRL HOME</b>	1E	Homes Cursor

## OPERATORS QUICK REFERENCE CHART OF ABSOLUTE CURSOR POSITIONS

Keys Used: ESC = ROW  
ASCII COL  
ASCII

ASCII CODES	POSITION		ASCII CODES	POSITION		ASCII CODES	POSITION	
	ROW	COL		ROW	COL		ROW	COL
<span style="border: 1px solid black; padding: 2px;">ESC</span> = <span style="border: 1px solid black; padding: 2px;">SPACE</span>	1	1	<span style="border: 1px solid black; padding: 2px;">ESC</span> = <span style="border: 1px solid black; padding: 2px;">;</span>		28	<span style="border: 1px solid black; padding: 2px;">ESC</span> = <span style="border: 1px solid black; padding: 2px;">V</span>		55
<span style="border: 1px solid black; padding: 2px;">!</span>	2	2	<span style="border: 1px solid black; padding: 2px;">&lt;</span>		29	<span style="border: 1px solid black; padding: 2px;">W</span>		56
<span style="border: 1px solid black; padding: 2px;">"</span>	3	3	<span style="border: 1px solid black; padding: 2px;">=</span>		30	<span style="border: 1px solid black; padding: 2px;">X</span>		57
<span style="border: 1px solid black; padding: 2px;">#</span>	4	4	<span style="border: 1px solid black; padding: 2px;">&gt;</span>		31	<span style="border: 1px solid black; padding: 2px;">Y</span>		58
<span style="border: 1px solid black; padding: 2px;">\$</span>	5	5	<span style="border: 1px solid black; padding: 2px;">?</span>		32	<span style="border: 1px solid black; padding: 2px;">Z</span>		59
<span style="border: 1px solid black; padding: 2px;">%</span>	6	6	<span style="border: 1px solid black; padding: 2px;">@</span>		33	<span style="border: 1px solid black; padding: 2px;">[</span>		60
<span style="border: 1px solid black; padding: 2px;">&amp;</span>	7	7	<span style="border: 1px solid black; padding: 2px;">A</span>		34	<span style="border: 1px solid black; padding: 2px;">\</span>		61
<span style="border: 1px solid black; padding: 2px;">'</span>	8	8	<span style="border: 1px solid black; padding: 2px;">B</span>		35	<span style="border: 1px solid black; padding: 2px;">]</span>		62
<span style="border: 1px solid black; padding: 2px;">(</span>	9	9	<span style="border: 1px solid black; padding: 2px;">C</span>		36	<span style="border: 1px solid black; padding: 2px;">^</span>		63
<span style="border: 1px solid black; padding: 2px;">)</span>	10	10	<span style="border: 1px solid black; padding: 2px;">D</span>		37	<span style="border: 1px solid black; padding: 2px;">_</span>		64
<span style="border: 1px solid black; padding: 2px;">*</span>	11	11	<span style="border: 1px solid black; padding: 2px;">E</span>		38	<span style="border: 1px solid black; padding: 2px;">`</span>		65
<span style="border: 1px solid black; padding: 2px;">+</span>	12	12	<span style="border: 1px solid black; padding: 2px;">F</span>		39	<span style="border: 1px solid black; padding: 2px;">a</span>		66
<span style="border: 1px solid black; padding: 2px;">,</span>	13	13	<span style="border: 1px solid black; padding: 2px;">G</span>		40	<span style="border: 1px solid black; padding: 2px;">b</span>		67
<span style="border: 1px solid black; padding: 2px;">-</span>	14	14	<span style="border: 1px solid black; padding: 2px;">H</span>		41	<span style="border: 1px solid black; padding: 2px;">c</span>		68
<span style="border: 1px solid black; padding: 2px;">.</span>	15	15	<span style="border: 1px solid black; padding: 2px;">I</span>		42	<span style="border: 1px solid black; padding: 2px;">d</span>		69
<span style="border: 1px solid black; padding: 2px;">/</span>	16	16	<span style="border: 1px solid black; padding: 2px;">J</span>		43	<span style="border: 1px solid black; padding: 2px;">e</span>		70
<span style="border: 1px solid black; padding: 2px;">0</span>	17	17	<span style="border: 1px solid black; padding: 2px;">K</span>		44	<span style="border: 1px solid black; padding: 2px;">f</span>		71
<span style="border: 1px solid black; padding: 2px;">1</span>	18	18	<span style="border: 1px solid black; padding: 2px;">L</span>		45	<span style="border: 1px solid black; padding: 2px;">g</span>		72
<span style="border: 1px solid black; padding: 2px;">2</span>	19	19	<span style="border: 1px solid black; padding: 2px;">M</span>		46	<span style="border: 1px solid black; padding: 2px;">h</span>		73
<span style="border: 1px solid black; padding: 2px;">3</span>	20	20	<span style="border: 1px solid black; padding: 2px;">N</span>		47	<span style="border: 1px solid black; padding: 2px;">i</span>		74
<span style="border: 1px solid black; padding: 2px;">4</span>	21	21	<span style="border: 1px solid black; padding: 2px;">O</span>		48	<span style="border: 1px solid black; padding: 2px;">j</span>		75
<span style="border: 1px solid black; padding: 2px;">5</span>	22	22	<span style="border: 1px solid black; padding: 2px;">P</span>		49	<span style="border: 1px solid black; padding: 2px;">k</span>		76
<span style="border: 1px solid black; padding: 2px;">6</span>	23	23	<span style="border: 1px solid black; padding: 2px;">Q</span>		50	<span style="border: 1px solid black; padding: 2px;">l</span>		77
<span style="border: 1px solid black; padding: 2px;">7</span>	24	24	<span style="border: 1px solid black; padding: 2px;">R</span>		51	<span style="border: 1px solid black; padding: 2px;">m</span>		78
<span style="border: 1px solid black; padding: 2px;">8</span>	25	25	<span style="border: 1px solid black; padding: 2px;">S</span>		52	<span style="border: 1px solid black; padding: 2px;">n</span>		79
<span style="border: 1px solid black; padding: 2px;">9</span>	26	26	<span style="border: 1px solid black; padding: 2px;">T</span>		53	<span style="border: 1px solid black; padding: 2px;">ESC</span> = <span style="border: 1px solid black; padding: 2px;">o</span>		80
<span style="border: 1px solid black; padding: 2px;">ESC</span> = <span style="border: 1px solid black; padding: 2px;">:</span>	27	27	<span style="border: 1px solid black; padding: 2px;">ESC</span> = <span style="border: 1px solid black; padding: 2px;">U</span>		54			





# INDEX



## INDEX

### A-B

Absolute Cursor Positioning .....	1-1
ASCII Characters .....	1-1,A-1
Auto New Line .....	1-1

### C

Carrier Detect .....	3-4
Character Format .....	1-3
Cleaning .....	2-14
Clear To Send .....	3-1
Code Turnaround .....	3-4
Configuration Control .....	1-8,2-2
Control Characters .....	1-1
Control Codes .....	3-4,A-2
Control Logic .....	1-3

### D-E

Data Entry and Overflow .....	1-8
Display Memory .....	1-3
Display Monitor .....	1-3
EOT .....	2-7,3-4
ETX .....	2-7,3-4

### F-G-H

Full Duplex .....	2-11,3-1
Gated EXTENSION Port Mode .....	2-4,3-5
Half Duplex .....	2-11,3-1

### I-J-K

Interfaces:	
EXTENSION Port .....	2-4
MODEM Port .....	2-4
Input/Output Channel .....	1-2
Inspection .....	2-14
Installation .....	2-4
Keyboard Operations .....	3-1,3-3
Keyboard Section .....	1-2

## INDEX (Continued)

### L-M-N

Load Cursor Operation .....	3-4
Numeric Keypad .....	1-5,1-8

### O-P-Q

Options:

Alternate Configuration - Green Phosphor Screen .....	1-8
Answerback .....	1-8
Beep Defeat .....	1-8
Lower Case Characters .....	1-8
Numeric Keypad .....	1-8
Output Cable .....	1-8
Power ON/OFF .....	2-13
Primary Channel .....	3-1
Split Baud Rate .....	1-8
20mA Current Loop on EXTENSION Port .....	1-8
230VAC .....	1-8

### R-S-T

Refresh Rate .....	1-1
Remote Load Cursor Operation .....	3-4
Request To Send .....	3-1
Safety Requirements .....	2-1
Secondary Channel .....	3-4
Site Requirements .....	2-1
Specifications .....	1-4

### U-V-W-X-Y-Z

Unpacking .....	2-1
Voltage Selection .....	2-2
Word Structure .....	1-1





**LEAR SIEGLER, INC.**  
**DATA PRODUCTS DIVISION**

714 NORTH BROOKHURST STREET, ANAHEIM, CALIFORNIA 92803  
PHONE: (714) 774-1010    TELEX: 65-5444    TWX: 910-591-1157