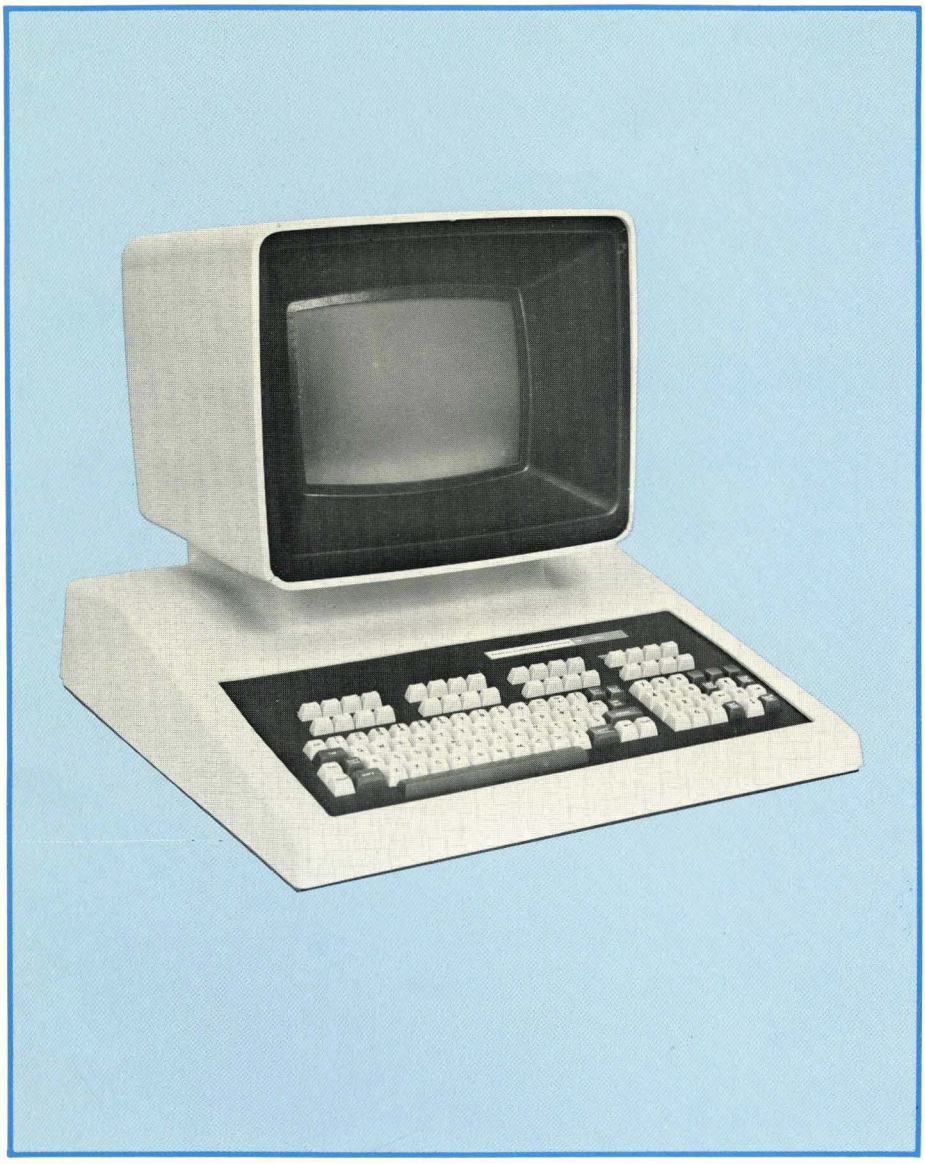
OWL-1200

USER'S MANUAL



PERKIN-ELMER DATA SYSTEMS | TERMINALS DIVISION
Route 10 and Emery Avenue • Randolph, New Jersey 07801

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Preface

This manual contains installation, functional test, operations, and user maintenance information on the Owl-1200 Editing Terminal. The contents of the manual are proprietary and may not be reproduced without written authorization of Perkin-Elmer Data Systems/Terminal Division.

Related documentation includes:

- Owl-1200 Maintenance Manual, 59300-0023-00.

Table of Contents

LIST OF ILLUSTRATIONS

LIST OF TABLES

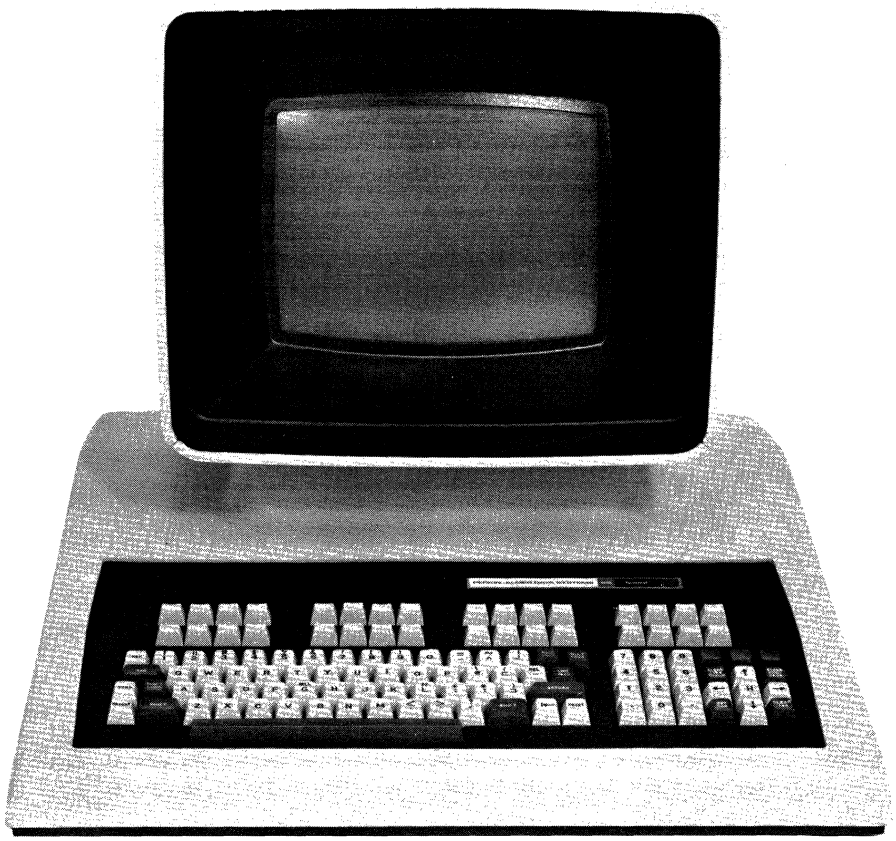


Figure 1-1. Owl-1200 Editing CRT Terminal

Section 1
INTRODUCTION

1.1 GENERAL DESCRIPTION

The Owl-1200 editing CRT is a sophisticated multipurpose video display unit human engineered for easier operation, higher throughput, and simplified host computer programming.

The Owl-1200's built-in microprocessor allows the programmer to command complete information on status and communications settings at any time. Special function keys permit quick access to specific information or even instruct the host computer to run a complete operation. Other features permit the terminal to transmit all data, only modified data, or only data in unprotected fields. The terminal also has a "Request-to-Send" mode which allows full optimization of host memory allocation.

Additionally, the Owl-1200 transparent mode of operation significantly simplifies program debugging. In this mode, the terminal ignores control commands and displays all data coming down the communication line, including control and field attribute characters.

For the operator, the Owl-1200's 9 by 12 character matrix yields uniquely sharp, clear, well-formed characters. The hooded display reduces glare and ensures privacy. The display is at eye level to minimize eye fatigue. Numeric data are easily entered with the numeric pad. The pad, which contains the numbers 1 through 9 plus a period and a comma, increases throughput and helps to eliminate errors. Silent operation is ensured by fan-free, convection-cooled design.

1.2 GENERAL SPECIFICATIONS

The Owl-1200 operates on 115V, 60 Hz with 230V; 50 Hz available for countries other than the U.S. The Owl-1200 is designed for use with an on-line computer as a high speed, silent, interactive terminal in either serial asynchronous mode (character by character) or in buffered (block) mode. Transmission is by a line, field, or page.

The Owl-1200 is a completely self-contained, desk-top unit incorporating keyboard, power supply, display electronics, and interface for data communications and local printer. The interfaces can be either the standard EIA RS232C or 20ma current loop. Additional factory installed options are available and are described under options.

1.3 ENVIRONMENTAL SPECIFICATIONS

The Owl-1200 operates through an ambient temperature range of 0°c to +45°c with a maximum relative humidity of 80% (non-condensing). When not in operation, the terminal will withstand temperatures ranging from -40°c to +65°c with maximum relative humidity of 95% (non-condensing).

1.4 DETAILED SPECIFICATIONS

Screen Format

Screen capacity	1920 characters
Characters per line	80
Number of lines	24
Screen size	12 inches (diagonal)
Color	P4 phosphor (white)
Displayable characters	128 (Upper/lower case, numbers, punctuation and controls)
Character matrix	9 x 12
Character generation	7 x 11
Number of scans	12 per character
Refresh rate	60 Hz (50) non-interlaced

Keyboard Format

Character code	ASCII (expanded through multicode sequence)
Keyboard layout	ASCII (bit pairing)
Repeat key rate	15 cps (60 Hz) or 12.5 cps (50 Hz)

Switch Options

Baud rate	75, 110, 200, 300, 600, 1200, 1800, 2400, 4800, 7200, 9600
Stop bits	1 or 2
Transmission	Full or half duplex
Parity	Space, mark, even, or odd
Program mode	Enables setting and display of attributes
Auto tab	Automatic tabbing to unprotected fields
Inverse video	Normal or inverse

Factory Options

Cursor	Blinking, non-blinking
"Here Is" ROM	32 character (max.) answerback message.
Power	115V (60 Hz) or 230V (50 Hz)
Polling Select	One character device address
Graphic mode	Generates 31 graphic characters

Communication Interface	EIA RS232C (standard) 20 ma current loop (optional)
Modem Control	202/212 modem compatible interface (103 modem is standard)
16 Function/ Control Keys	User defined keys (expands to 32 functions using shift key.
Multicode Key	Choice of ASCII prefix other than ESC for multicode sequencing.
Keyboard Security	Keyswitch to inhibit keyboard entry.
Printer Interface	EIA RS232C (standard) 20 ma current loop (optional)
Printer Port Strap	Strapable baud rates to 9600 baud
Extended Communications	• Trailing nulls suppression in "Send All" mode. • EOT or ETX follows CR in "Send Line" mode. • EOT or ETX follows end of "Send Page" or "Send Message." • CR follows every line in "Send Page" or "Send Message."

Section 2
INITIAL CHECKOUT AND FUNCTIONAL TEST

2.1 UNPACKING AND VISUAL INSPECTION

All Owl-1200 CRT terminals are thoroughly inspected at the factory for loose or missing hardware, scratches, and dents. Upon removal of the terminal from the shipping container, inspect the unit for any damage incurred during shipment. Refer to the sales order and/or shipping papers to verify the presence of terminal options.

If any damage or missing parts are observed, notify the Perkin-Elmer Data Systems Customer Service Department immediately. Technical Support representatives and Customer Engineers are available for consultation and assistance on request. A list of Perkin-Elmer Terminals Sales and Service offices is given at the end of this manual.

Retain the packing material and container for possible repacking and shipment. Improper repacking can result in negation of certain warranties.

2.2 SPACE AND ENVIRONMENTAL REQUIREMENTS

The Owl-1200 terminal operates reliably in a typical office environment. Uncomfortably high temperature, coupled with low humidity, can cause high voltage static discharges, which should be considered in evaluating the installation site.

Place the Owl-1200 on a typewriter stand, low desk, or any other surface normally provided for any office typewriter.

Note that the terminal is cooled by drawing cool air from the base and exhausting warm air at the rear of the CRT. The terminal base must be kept clear of papers or other materials that would obstruct air flow.

2.3 POWER REQUIREMENTS

Proper power sources and grounding are essential for optimum terminal performance. Wire a utility outlet directly to the main power panel for a constant power source. Ensure that this line is free of outlets servicing other business equipment, i.e., copying machines, calculators, typewriters, etc. These machines create large amounts of electrical noise that may be transmitted through power lines and, under certain conditions, cause terminal malfunction. Similarly, an uninterrupted ground wire must be attached between the terminal power connector and the main power-panel ground.

2.4 FUNCTIONAL TEST PROCEDURES

To test all functions of the Owl-1200 prior to operation, proceed as follows:

1. Set the Power ON/OFF switch on the rear panel to ON. The audible alarm should sound for half a second. Allow 30 seconds for warmup.
2. Ensure LINE key is released (unlatched).

3. Adjust the INTENSITY control on the rear panel to the desired comfort level.
4. Depress each alphanumeric key, both in upper and lower case, to verify CRT display of the selected character.
5. Home the cursor by depressing the H key of the cursor control pad.
6. Depress the PRINT key and verify that the contents of the display appear on the printout (if local printer option was selected).
7. Place the terminal in the transparent mode by depressing CTRL-P, followed by CTRL-B.
8. Depress all the standard ASCII "CTRL" codes as listed and described in Tables 2-1 and 4-1. Verify that the correct code appears on the CRT.
9. Return the terminal to normal mode by depressing CTRL-P followed by CTRL-C.
10. Test all special function keys as described under Special Functions in this Section 4.

Final test can be performed with the Owl-1200 on-line in FDX mode if the host computer can be programmed for the ECHOPLEX mode. Repeat this test at different baud rates to verify that data-line capability is operational. Refer to Section 4 for initial setup procedures.

Table 2-1. Standard ASCII Code

Bits b7 b6 b5 →					*** Control codes		*					
					0_0	0_1	0_1	0_1	1_0	1_0	1_1	1_1
b4	b3	b2	b1	COLUMN → / ROW ↓	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	C	k	{
1	1	0	0	12	FF	FS	,	<	L	/	l	¦
1	1	0	1	13	CR	GS	—	=	M	C	m	}
1	1	1	0	14	SO	RS	.	>	N	C	n	~
1	1	1	1	15	SI	US	/	?	O	___	o	DEL

* Standard 96-character ASCII Set

** 64-character ASCII Set displayed when U/C key is enabled. (DEL is a legal character in this mode and is stored and displayed when preceded by a MULT-CODE Key.)

*** In transparent mode, all control codes are displayed. In normal display mode, control characters are not displayed. DEL is displayed as a quadrangle with alternate dots.

Section 3
INTERFACING

3.1 DATA COMMUNICATIONS

The terminal transmits ASCII coded data in asynchronous format. Each character is preceded by a start bit and followed by one or two stop bits. The terminal is provided with either an EIA RS 232C interface (25-pin connector) or an optional 20ma current loop interface (15-pin connector). Those EIA signals which apply to this class of terminal (asynchronous data communication) are assigned to pins in accordance with EIA Specification RS232C for interfacing data communication equipment. Both the standard EIA circuit name and the circuit name used in Europe (CCITT Specification V.24) are shown in Table 3-1 EIA Data Interface.

Table 3-1. EIA Data Interface

P1 (16-Pin) Internal	25-Pin External	EIA RS232C	CCITT V.24	Signal Name
1	1	AA	101	Chassis Ground
2				-12V
3	4	CA	105	Request to Send
4	5	CB	106	Clear to Send
5	11	SCA/SA		Supervisory Transmitted Data
6	2	BA	103	Transmit Data
7	3	BB	104	Receive Data
8	6	CC	107	Data Set Ready
9	7	AB	102	Logic Ground
10	8	CF	109	Carrier On
11	20	CD	108.2	Data Terminal Ready
12				+12V
13	12	SCF/SB	122	Supervisory Received Data
14	19	SCA/SA	120	

Jumper

EIA Data Interface

Most applications do not require all signals on this interface. The following pin and signal descriptions are grouped from most commonly used to least frequently used.

- Pin 1 - AA Protective Ground
- Pin 7 - AB Logic Ground

Pin 1 and Pin 7 wires should be carried in a cable to a device such as a modem that is wired in accordance with RS232C. These signals are internally tied within the terminal.

- Pin 2 - BA Transmitted Data (from terminal)
- Pin 3 - BB Received Data (to terminal)

The primary-channel data lines are connected to Pin 2 and Pin 3. Pin 2 and Pin 3 lines carry data to and from the terminal.

- Pin 8 - CF Carrier On
- Pin 6 - CC Data Set Ready

When both signals are generated by the CPU, the data lines are enabled. Absence of either signal inhibits the lines regardless of the position of the terminal LINE key.

- Pin 20 - CD Data Terminal Ready

The Pin 20 signal is normally held high. It is held low for one second when a "DLE-EOT" multicode sequence is processed.

- Pin 4 - CA Request to Send
- Pin 5 - CB Clear to Send

Pin 4 and Pin 5 signals are used if a continuous carrier signal is not to be transmitted, i.e., when the terminal is operating on half duplex channel such as a two-wire modem or when it is connected to a multidrop network. The computer or modem senses CA to determine when the terminal is ready to transmit. Signal CB is used by the computer, or modem, to permit the terminal to transmit. Signals CA and CB must be linked when a modem does not provide a "Clear to Send" signal, such as a 103 modem.

- Pin 11 - SCA/SA Supervisory Transmitted Data
- Pin 12 - SCF/SB Supervisory Received Data

The Pin 11 SCA signal is used to control echo suppressors on long, switched lines and may also be used to interrupt the CPU. SCA is held "on" when the terminal is receiving data, except when the operator presses the BREAK key, which causes an "off" condition to occur on SCA.

The Pin 12 SCF signal is used by the computer to force the terminal from transmit state to receive state. If SCF goes to the "off" state, the terminal aborts a buffered transmission, if one is in progress.

NOTE: If SCF is open (not connected), the interface treats it as an "on" condition.

Current Loop Interface

The current loop cable has an integral converter board. The board converts the RS232C into 20ma current-loop levels. Signals generated by the interface are listed in Table 3-2.

NOTE: The current loop interface restricts transmission speed to 2400 baud or below.

Two techniques for utilizing the current loop are illustrated in Figure 3-1.

1. The terminal supplies the 20ma current for the loop.
2. The user's device supplies the 20ma current for the loop.

Frequently, a combination of both techniques is employed, e.g., the user provides 20ma to the terminal but receives contact-closure outputs from the terminal. (Most TTY's are strapped to accept a loop current and provide contact closure outputs.)

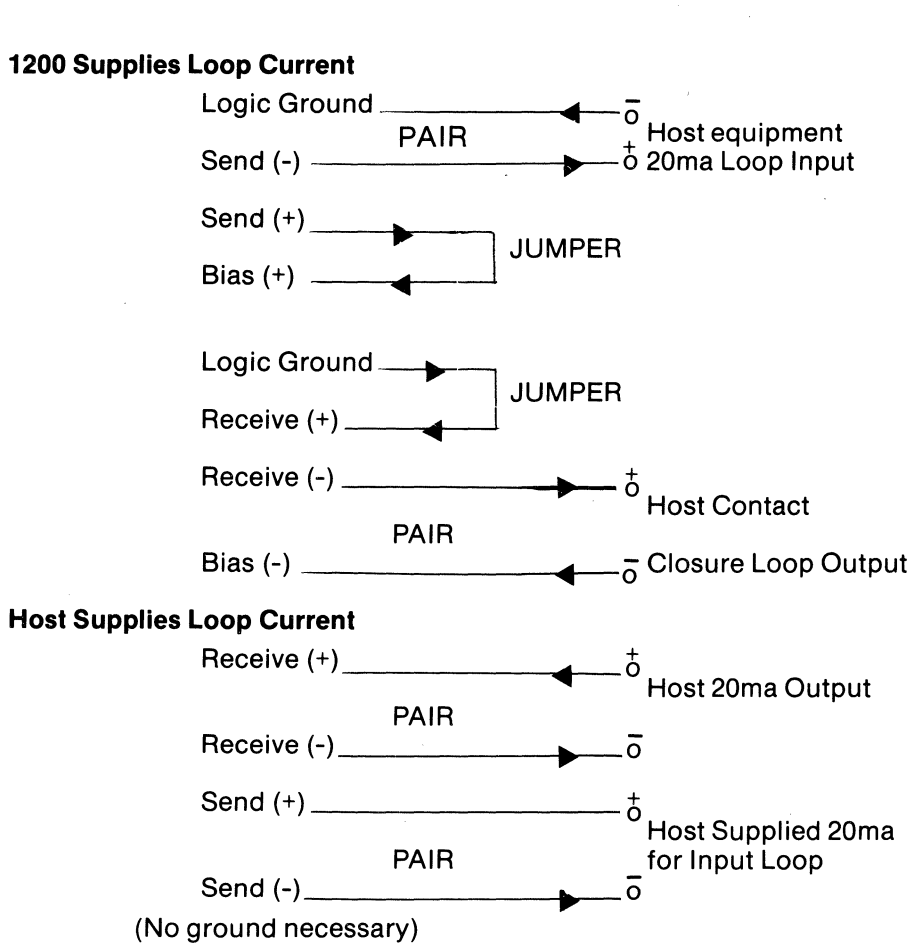
Table 3-2. Current Loop Interface

J16* Pin	Signal
1	Chassis Ground
2	Bias -
10	Send -
9	Send +
15	Logic Ground
12	Receive -
11	Receive +
7	TDU (Rec +/TDU current loop terminal on-line
3	Bias +

*J16 is an AMP 205205-1 15-pin female connector.

Figure 3-1. Current Loop Cable

(Arrows show direction of conventional current flow)



3.2 PERIPHERAL INTERFACE

A local peripheral device, such as a printer, can be connected to the Owl-1200 via the peripheral interface port located on the rear panel of the terminal. The port is unidirectional and is intended to interface serial devices adhering to EIA RS232C signal conventions. The port also can be wired as a 20ma current-loop interface.

RS232C

Table 3-3 lists the pin-to-pin connections and signal names used on the RS232C interface. Pin 5 - Clear to Send is a printer-generated signal used to control buffer overflow. When high (+12V) data transmission is stopped.

Peripheral Current Loop

The peripheral current loop cable has an integral converter board. The board converts the RS232C signals into 20ma current loop levels. The signals generated by the interface are listed in Table 3-4.

Table 3-3. EIA Peripheral Interface

J4 (11-Pin) Connector	J8 (25-Pin) Connector	Signal Name
5	5	Clear to Send
7	8	Carrier On
8	7	Logic Ground
9	3	Printer Data

Table 3-4. Peripheral Current Loop

J19* Pin	Signal
13	Busy (+)
14	Busy (-)
3	Bias (+)
2	Bias (-)
12	Send (-)
11	Send (+)
15	Logic Ground
1	Logic Ground

*J19 is an AMP 205206-1 15-pin male connector.

Section 4
OPERATIONS

4.1 INITIAL SETUP

Before data are transmitted over communications lines, perform the following:

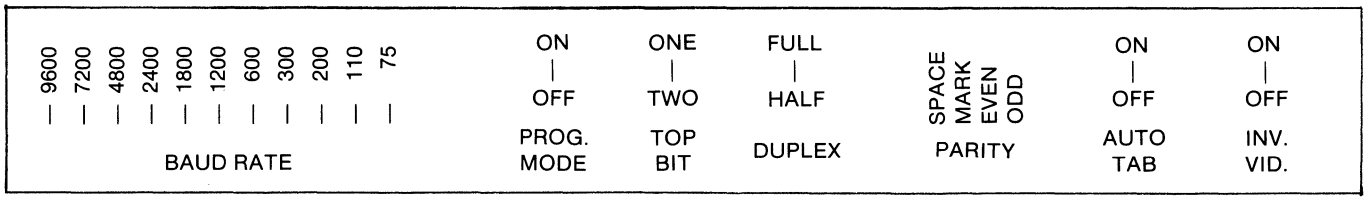
1. Set the Power ON/OFF switch to the ON position. The audible alarm will sound for half a second.
2. Allow 30 seconds for warmup.
3. Enable the keyboard by turning the keyswitch, if this option was selected.
4. Place the terminal in the local mode by releasing the LINE key (undepressed).
5. Adjust the BRIGHTNESS control at the rear panel to the desired intensity level.
6. Type a message and verify that it is correctly displayed on the screen.

4.2 COMMUNICATIONS LINE SETUP

Access the front panel switches by prying the nameplate from the keyboard shield. The underside of the nameplate illustrates the relative positions of the front panel switches located below the nameplate (Figure 4-1). Arrange the switches as follows:

1. Set the BAUD RATE switch to the transmission rate of the host computer.
2. Set the STOP BIT switch to ONE or TWO depending on the selected baud rate.
3. Set the DUPLEX switch to FULL or HALF depending on the transmission mode desired.
4. Set the PARITY switch to the parity state required by the host computer.
5. Set PROG MODE, AUTO TAB, and INV VID switches to OFF.
6. Depress the LINE key on the keyboard.
7. Depress the CLEAR ALL key twice, to initialize all the switch settings.

Figure 4-1. Front Panel Switches



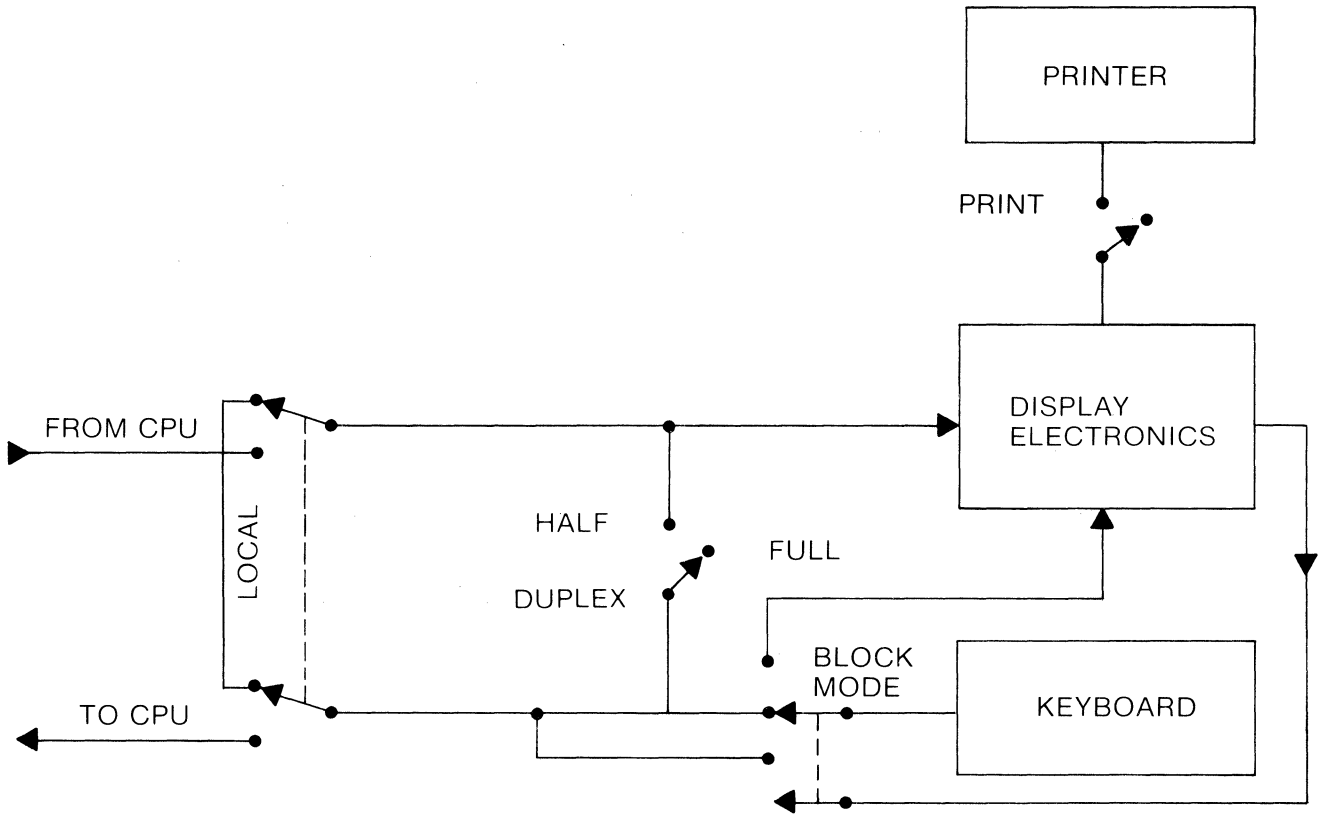
4.3 COMMUNICATIONS

The next step depends upon the communications link used by the computer. If the computer is accessed via private wire, phone line, or direct cable connection, the Owl-1200 is ready for operation. If the Owl-1200 is connected by switched telephone lines, the computer must be called to establish the line.

4.4 OPERATIONS

Operation of the Owl-1200 CRT terminal is controlled by the host computer and/or the keyboard, depending on the transmission mode. Figure 4-2 illustrates the various selectable modes of transmission.

Figure 4-2. Transmission Modes



Conversational Mode

This mode enables the terminal to transmit and receive data on a character-by-character basis in a manner identical to that of a teletypewriter.

In the conversational mode a scroll type of presentation may be employed. When the cursor is at the bottom line of the display and an attempt is made to advance to a new line, all data lines are advanced upward. The visual effect is an upward scroll with new data entered from the bottom moving upward one line at a time. When in the conversational mode, the terminal can be set to operate in half or full duplex.

In full duplex mode, data transmitted via the keyboard do not appear on the CRT unless the host computer is programmed to echo the characters (Echoplex).

In the half duplex mode, Echoplex is not required since a direct tie to the display electronics is effected. Queries and acknowledgements from both the host CPU and the keyboard are displayed as entered. However, if the keyboard and CPU generate data simultaneously, the resultant display shows intermixed characters.

Block Mode

In this mode, an entire block of data can be entered into display memory, edited, and then transmitted to the host CPU. Transmission does not take place until the terminal receives a specific transmit command from either the keyboard or the host computer.

Editing can consist of insertions and deletions of characters, lines, and fields, cursor positioning, tab setting and clearing, and clearing an entire page of data. Data transmission is effected as a line unit, message unit, or an entire page, depending on the selection of transmission keys. Editing can be curtailed within a formatted screen due to protected fields or security fields.

Local Mode

Note that in local mode, no data are transmitted over the line. Keyboard entries cause the appropriate action to take place directly on the display. In all cases, display memory stores and displays all displayable input characters. Non-displayable characters (control codes and DEL) are not normally stored nor displayed unless preceded by a multicode key or the terminal is operating in the transparent mode.

Transparent Mode

In the transparent mode, control characters are displayed but not acted on, e.g., carriage return and line feed are displayed as "CR" and "LF" respectively, but the cursor is not returned to position one of the next line. The screen only reacts to a DLE code. To enter the transparent mode, depress CTRL-P (DLE) followed by CTRL-B (STX). The screen will fill with null characters starting at the cursor-present position to the end of display. In a formatted screen, all attribute characters are displayed. To store and

display the DLE character in the transparent mode, CTRL-P must be depressed twice. To return to the normal display mode, depress CTRL-P followed by CTRL-C (ETX). The transparent mode is a useful editing and debugging tool. In transparent mode, SCROLL is disabled, and NEW LINE enabled, regardless of the settings of the local control keys.

Print Mode

Hard copy of the display can be obtained in both the on-line and local mode by depressing the PRINT key to cause a display-memory dump to the printer, starting at the Home position to the end of display. The PRINT MSG and PRINT LINE keys render a hard copy equivalent to the SEND MSG and SEND LINE keys.

Formatted Display

Operations involving data storage, display, printing, or transmission are best managed through the use of fields. Organizing the display data into fields makes transfer and display operations easier for both the programmer and the operator. The programmer uses special codes to format the fields and the nature or attribute of the data that follow. The code itself, called the attribute character, is embedded in terminal memory and is not normally displayed. Each attribute character, plus all data following it up to the next attribute character, define the field. A formatted display intentionally restricts or inhibits undesirable keyboard entries.

Some of the following common field-attributes can be used singularly or in combination.

1. Protected Field - May not be overwritten by the operator.
2. Security Field - Permits supervisory personnel to enter access authorization codes without the code being displayed.
3. Numeric Field - Rejects inputs of alpha characters where arithmetic data are required.
4. Emphasis Field - May blink, use inverse video, display data at half intensity, or any combination in order to emphasize pertinent data.

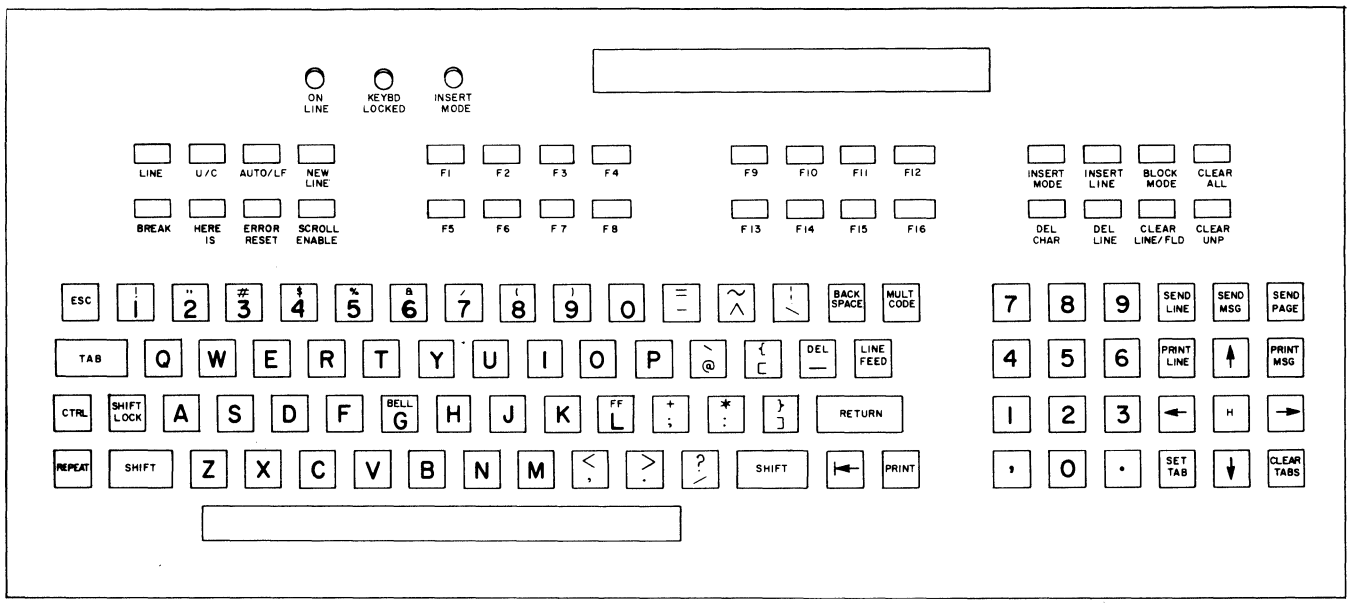
Illegal or erroneous entries into a formatted display always result in keyboard lockout. The keyboard is released when the ERROR RESET key is depressed.

4.5 KEYBOARD FUNCTIONS

The terminal keyboard in Figure 4-3 is separated into two basic groups of keys: alphanumeric keys used to enter data, and function keys used to edit, control peripherals, control cursor, initiate transmission, erase screen, etc.

All alphanumeric keys generate ASCII codes, which, depending on the transmission mode, are immediately transmitted or stored in terminal memory. The function keys, however, may or may not generate an ASCII code.

Figure 4-3. Owl-1200 Keyboard



A "Typamatic" feature of the Owl-1200 causes a repetition rate of 15 cps after any key is held down for one second. The following keyboard description lists each key and its function with a single asterisk (*) to designate alternate action switch, double asterisks (**) to designate momentary action switch, and an "@" to designate ASCII character generation.

Hazeltine/OWL

Control Key	Function
LINE	*When set - Places terminal on-line. When released (local) - Used for editing purposes. Displays only data entered via the keyboard. No data will be received or transmitted via the communications line.
U/C	*Lower case alpha characters are converted to upper case, plus the following: \ to @, { to [, ¦ to \ , } to] and ~ to ^ .
AUTO/LF	*Automatically advances the cursor to the next line on a carriage return command.
NEW LINE	*Automatic carriage return upon entry of a displayable character beyond the 80th position. The entered character is displayed on the first position of the next line.
BREAK	**Presents the communications line with a space (break) for as long as key is depressed. No effect when in local mode. If the 202/212 option is installed, the reverse channel transmit lead is dropped.
HERE IS	@**Transmits the contents of the answerback read-only-memory chip - (32 characters maximum).
ERROR RESET	**Used to release the keyboard when locked due to an erroneous entry.
SCROLL ENABLE	Permits additional lines to be entered on the CRT display (when capacity is exhausted) by shifting the display up one line per new line entry. Each shift destroys the top most line of the display. Inoperative if screen is formatted.
F1 THRU F16	@**Function Control Keys (optional) - Software programmable keys which expand to 32 functions using the shift key. (Refer to Section 6.3).
INSERT MODE	*In this mode alphanumeric characters are entered at the present cursor position (within an unprotected field). All characters to the right of the cursor shift right one (1) space. The right shift terminates at the expense of the first null character encountered. An attempt to insert a character in the absence of a null character within a field, in a protected field, or in an attribute character position, will result in a keyboard lockout.
INSERT LINE	**Causes the insertion of a line of nulls at the present line location of the cursor. All data on and below the line will move down one (1) line. If the screen contains any attribute characters, operation is confined to the current field. If unformatted, data on the bottom line of the screen is destroyed; if formatted, the field must contain a line of nulls, otherwise keyboard lockout will occur.

Control Key	Function
BLOCK MODE	*Causes a change of transmission mode from conversational to block (when depressed) and vice versa when released.
CLEAR ALL	**Simulates a Power-up sequence; display memory is cleared, cursor goes to Home, tabs are set at every 8th position, communications options are read, and all interfaces initialized. To avoid accidental clearing, the key must be depressed twice. Note that holding the key down longer than one second, causes typamatic operation to affect a "Clear All."
DEL CHAR	**Deletes characters under the cursor. Characters to the right of the cursor move one (1) position to the left. If the field encompasses more than one (1) line, wrap around will occur. The trailing edge of the shift left movement will generate nulls in the positions vacated. Any attempt to delete a character in a protected field, or an attribute character, will result in a keyboard lockout.
DEL LINE	**Causes the line at the location of the cursor to be deleted. All lines (within the field) below the deleted line move up. The last 80 characters of the field are cleared to nulls. Lockout will occur if an attribute character is embedded in the current line or if the field is protected.
CLEAR LINE/ FLD	**Will clear line to nulls starting with present cursor position to end of line or field whichever occurs first.
CLEAR UNP.	**Will clear all unprotected data to nulls starting from the present cursor position through end of display. Will not reset tab stops.
PRINT MSG.	**Initiates a local printout starting at the character following the previous message sent (or start of page), and ending at current cursor position.
PRINT LINE	**The line of data in which the cursor is located is transmitted to the auxiliary serial interface.
SET TAB	**Will set tab at present cursor location.
CLEAR TABS	**Will clear all tab stops.
H	**Moves the cursor to "Home" (position one [1] line one [1]).
↑	**Moves cursor up by one (1) line. If in line one (1), cursor will wrap around to line twenty-four (24).
↓	**Moves cursor down by one (1) line. If in line twenty-four (24), cursor will wrap around to line one (1).

Control Key	Function
→	**Moves cursor one (1) position to the right. When cursor is moved beyond position eighty (80), the cursor will wrap around to position one (1) on the following line if "New Line Enable" is selected. If "New Line Enable" is not selected, cursor will wrap to position one (1) of current line.
←	**Moves cursor one (1) position to the left. When cursor is moved beyond position one (1), the cursor will wrap around to position eighty (80) on the previous line if "New Line Enable" mode is selected. If not, cursor will remain at position one (1), of current line.
SEND LINE	**On a formatted screen, initiates transmission of the field following the cursor position. If screen is not formatted, a single line is transmitted.
SEND MSG	**Initiates transmission of message starting at the character following the previous message sent (or start of page), and ending at current cursor position.
SEND PAGE	**Initiates transmission of screen contents. Starting point is defined by a preceding multicode sequence (Multicode-E or Multicode-F) as Home or current cursor position respectively.
NUMERIC PAD	@**Function is identical to keyboard numerics. The numeric pad is arranged in "calculator" format to expedite arithmetic entries.
ESC	@**Escape Key - Used in conjunction with other keys to enable specific functions.
TAB	@**Horizontal Tab (HT) - Used to move the cursor to the next tab position or the first data character of the next unprotected field, whichever occur first. Will terminate at the end of a line. If "New Line Enable" is set, will position cursor to first tab position on next line.
CTRL	**Control Key - Used in conjunction with other keys to enable specific functions, e.g., CTRL+P creates a data link escape command.
SHIFT LOCK	*Used to maintain the SHIFT key in a depressed state. A second depression will release the SHIFT key.
REPEAT	**Used in conjunction with other keys to provide an instant and continuous repetition of the depressed key. Repeat rate is 15 cps (60 Hz) or 12.5 cps (50 Hz).
SHIFT	**Permits the entry of all upper case characters depicted on the keyboard.

Control Key	Function
BACK SPACE	@**Moves the cursor to the left one (1) position (BS). The cursor will remain at position one (1) for all additional backspace unless "New Line Enable" is selected, then the cursor wraps around to position eighty (80) of the previous line. The cursor will not move beyond the Home position.
MULT CODE	@**Used in conjunction with other keys to enable a specific function, e.g., Multicode+H generates a cursor Home command.
DEL ——	@**Shift up - Will generate an ASCII DEL character. Shift down - Will generate an underline character.
LINE FEED	@**(LF) - Used to move the cursor down one (1) line without changing the cursor column position.
RETURN	@**Carriage return (CR) - Returns the cursor to the first position of the current line.
|◄——	**Back tab - Moves the cursor to the left, one tab position, or first character in an unprotected field. If the cursor is past the first tab position, it will move to column one (1) of the current line. If "New Line Enable" is selected, and there are no tabs set, the cursor will return to Home position.
SPACE and all other displayable characters	@**Writes characters at the current position and moves cursor one (1) position to the right. The cursor will stop at the last position (eighty, 80) unless "Return" or "New Line Enable" is selected.
PRINT	**Initiates a local printout; data from the home position to the present cursor position is transmitted to the auxiliary serial interface.
ON LINE	Indicator - Illuminates when terminal is in the On-line mode and receiving the "Data Set Ready" signal from the communication interface.
KEYBD LOCKED	Indicator - Illuminates whenever the keyboard is locked. A program controlled keyboard lockout occurs during block transmission, print operations, or whenever a keyboard lock multicode sequence is executed. The keyboard can be locked via an operator error. In this case the ERROR RESET key must be depressed to release the keyboard and to extinguish the indicator.
INSERT MODE	Indicator - Illuminates when the terminal is in the Insert mode (INSERT MODE key depressed).

ASCII Character Functions

The American Standard Code of Information Interchange (ASCII) provides a set of 32 transmittable characters which are generated by simultaneously depressing the CTRL key and the function key as indicated in Table 4-1. The codes are functionally grouped as follows:

Communications Control Characters - Functional characters that control or facilitate transmission of information over communications networks.

Format Effector Codes - Functional characters that control the layout or position of information in printing or display devices.

Information Separator Codes - group of four characters used in graded order that separates and qualifies information.

Table 4-1. Keyboard Codes

CTRL & KEY	CODE	FUNCTION
@	*NUL (Null)	All-zeros character which can be used to accomplish time and media fill.
A	SOH (Start of Heading)	Communications control character used at beginning of sequence of characters constituting machine-sensible address or routing information.
B	STX (Start of Text)	Communications control character which precedes transmission of message text. Used, following DLE, to enter the transparent mode.
C	ETX (End of Text)	Communications control character used to terminate a message. Used, following DLE, to exit the transparent mode.
D	EOT (End of Transmission)	Communications control character used to indicate conclusion of message transmission. Used, following DLE, to initiate a modem disconnect.
E	ENQ (Enquiry)	Communications control character used as request for response from remote station. Triggers the answerback ROM.
F	*ACK (Acknowledge)	Communications control character transmitted by receiver as affirmative response to sender.
G	BEL (Bell)	Character used to cause audible alarm to sound at remote terminal.
H	BS (Backspace)	Format effector causing movement of cursor one space backward on same line.
I	HT (Horizontal Tabulation)	Format effector causing movement of cursor to next-in-series of predetermined positions along line.

*Ignored by the Owl-1200

CTRL & KEY	CODE	FUNCTION
J	LF (Line Feed)	Format effector causing advancement of cursor to next line.
K	*VT (Vertical Tabulation)	Format effector causing movement of cursor to first predetermined line on next form or page.
L	FF (Form Feed)	Format effector which causes all unprotected fields to clear and cursor to Home. In scroll mode, equivalent to line feed.
M	CR (Carriage Return)	Format effector which causes cursor to position itself at first position next line.
N	SO (Shift Out)	Code used to indicate that code combinations which follow will be interpreted as outside of character set of standard ASCII Code Chart until SI character is reached. Used to enter the graphic mode.
O	SI (Shift In)	Code used to indicate that code combinations which follow will conform to codes listed on standard ASCII Code Chart. Used to exit the graphic mode.
P	DLE (Data Link Escape)	Communications control character which will change meaning of limited number of continuously following characters. Used to enter and exit the transparent mode.
Q-T	*DC1, DC2, DC3, DC4 (Device Controls)	Used for control of auxiliary devices associated with communications systems, especially switching devices on or off.
U	*NAK (Negative Acknowledgement)	Communications control character transmitted by receiving station as negative response to sending station.
V	*SYN (Synchronous Idle)	Communications control character used by synchronous transmission system.
W	*ETB (End of Transmission)	Communications control character used to indicate end of block data.
X	*CAN (Cancel)	Control character used to indicate that the data with which it is sent is in error or is to be disregarded.
Y	*EM (End of Medium)	Control character used to indicate physical end of medium, or end of unwanted portion of information recorded on medium.
Z	*SUB (Substitute)	Character used for substitution of character determined to be invalid or in error.

*Ignored by the Owl-1200

CTRL & KEY	CODE	FUNCTION
[	ESC (Escape)	Control character used to provide code extension. The Escape character itself is a prefix affecting interpretation of limited number of suffix characters.
/] ^ -	*FS (File Separator) GS (Group Separator) *RS (Record Separator) *US (Unit Separator)	Information separators used within data, in optional fashion. FS is most inclusive; US is least inclusive.
No CTRL Key	DEL (Delete)	Character used primarily for time or media fill.

*Ignored by the Owl-1200

4.6 SPECIAL FUNCTIONS

Several of the multi-character functions, covered in Section 6.2 Multicode Sequence, may be of use to the operator and are, therefore, included in the Section. The special functions are:

DLE STX	Enter Transparent Mode - This mode is entered by depressing CTRL-P followed by CTRL-B. All subsequent characters, including control codes, are stored in memory and displayed. New Line Enable and Scroll Enable are activated; no control action takes place. New line is enabled and scroll disabled, regardless of the settings of the local control keys.
DLE ETX	Exit Transparent Mode - Depressing CTRL-P followed by CTRL-C returns the terminal to the normal mode.
DLE EOT	Disconnect - Upon processing of a CTRL-P followed by CTRL-D, the terminal drops the Data Terminal Ready (DTR) lead to the modem for one (1) second, disconnecting a switched connection.
MULTICODE-X	Direct Cursor Address - Character Position. Moves the cursor horizontally to any position specified by the character following Y as shown in Table 6-2.
MULTICODE-Y	Direct Cursor Address - Line Position. Moves the cursor vertically to any line specified by the character following X as shown in Table 6-2.
MULTICODE-2	Clear Tab - The tab stop at the present cursor position is cleared.

Section 5
MAINTENANCE

The solid-state circuitry of the Owl-1200 and relative absence of moving parts renders the terminal virtually free from required operator maintenance. Preventive maintenance is, therefore, limited to cleaning and troubleshooting.

5.1 CLEANING

Brush accumulated dust from active areas of the terminal as required. Care should be exercised that foreign objects such as staples, pins, etc., do not fall into the keyboard.

Clean the cover case, keyboard and other exterior surfaces with a commercially available liquid cleaner or a mild detergent and lukewarm water.

5.2 OPERATOR CHECKLIST

Table 5-1 lists the various symptoms and possible causes of common procedural or usage errors. These errors are correctable at the operator level, thereby reducing the incidence of unnecessary service calls.

Table 5-1. Troubleshooting

Symptom	Possible Cause
1. No display	• Blown fuse • Terminal unplugged • Power switch OFF • Intensity too low
2. Display shows excessive delete symbols (rubout).	• Parity switch erroneously set
3. Unintelligible data is displayed in on-line mode - operative in local mode.	• Erroneous baud rate setting
4. Double display in full duplex mode.	• HALF/FULL duplex switch set erroneously to HALF.

5.3 FUSE REPLACEMENT

Fuses exhaust in much the same manner as light bulbs burn out. If this is the case, and a simple fuse replacement still blows out, it may be a symptom of an internal short requiring the services of a technician.

To replace a fuse, proceed as follows:

1. Set the power switch to OFF.
2. Rotate the fuse cap (rear panel) counterclockwise and remove the fuse.
3. Replace blown fuse with a 2 amp, SLO-BLW for a 115V (60 Hz) terminal or a 1 amp, SLO-BLO for a 230V (50 Hz) terminal.

Section 6
PROGRAMMER NOTES

6.1 INTRODUCTION

The Owl-1200 is uniquely flexible for the programmer who has full control of the terminal via the host computer applications program. This section provides the necessary data required to generate a custom application program for the Owl-1200 Editing CRT terminal.

This section includes a complete listing of the multicode sequence codes and descriptions, brief descriptions of the user-defined direct-function keys, tabulated explanation of the attribute characters used by the terminal, keyboard equivalence of graphic characters, reverse channel modem operations, and an explanation of multidrop polling protocol.

Response Mode

The Owl-1200 can be placed into one of three general response modes:

- Conversational
- Immediate
- Request-to-Send

In Conversational mode, the terminal is compatible with the Fox-1100 and similar TTY compatible terminals.

In the Immediate mode, data are entered from the keyboard and stored in terminal memory until the operator depresses a Send key. The stored data are then transmitted to the host CPU. This mode is further subdivided into three programmable transmission modes: Send Immediate All, Send Unprotected, and Send Modified. These modes permit, respectively, either transmission of all data in terminal memory, only data in unprotected fields, or only data in fields modified by the operator. The operator, in turn, can select transmission of a single line, a message starting at the termination of last message or Home position and ending at the current cursor position, or an entire page.

The Request-to-Send mode allows the system designer to optimize fully the allocation of host-CPU memory. As in the Immediate mode, no data are transmitted while the operator is editing a page to be entered. However, when a Send key is depressed, the terminal transmits a three-character Request-to-Send sequence only. This three-character sequence informs the program of which Send key was depressed, i.e., Send Line, Send Message, or any of the 16 Special Function keys (See Section 6.3). The program then identifies the depressed key, allocates the necessary buffer storage, and issues the required Read multicode sequence to initiate transmission. The Request-to-Send mode permits all of the preceding at the discretion of the host CPU. In addition, the programmer can use a Send Key override command to permit the program to select the correct send mode if the operator's choice of keys is unacceptable.

Buffer Versus Cursor Addressing

The Set Buffer Address Multicode sequence permits the program to write data into a specific address in terminal memory without changing the present cursor address. All ASCII control and data functions then refer to terminal memory address, i.e., the position to which data are written from the line. The default condition is cursor mode, in which both line and keyboard data move the cursor. A direct (Multicode X, Y or H) or relative (Multicode A, B, C, or D) cursor-movement multicode sequence from the line returns the terminal to the cursor mode.

6.2 MULTICODE SEQUENCE

Multicode sequences provide the programmer with simple means for implementing the full range of terminal operations.

The standard method for executing multicode operations from the host computer involves transmission of an ESC character to the terminal, immediately followed by a character designated unique to the function being performed. For example, by transmitting the sequence ESC, A, the host commands the terminal to move the cursor up one line.

Most multicode sequences also can be initiated from the keyboard by depressing the Multicode key and then depressing the designated character key.

A factory-installed option allows the user to designate any unused ASCII character as the multicode prefix character in place of ESC. This enables the programmer to use any available character to initiate multicode sequences even when the ESC character is dedicated to another system function.

Standard and optional multicode sequence characters are not normally displayed, except in transparent mode when all control characters are ignored and all data are visible. However, the programmer can display the multicode character alone by immediately preceding it with an additional multicode character.

The following multicode sequences described are primarily for the programmer. However, some of the commands are usable by the operator and have been listed in Section 4. Note that some multicode sequences are categorized as "(line only)" indicating that they may not be executed from the keyboard. If entered from the keyboard, lockout will occur.

For convenience the multicode sequences have been summarized in Table 6-1.

MULTICODE-A	Cursor Up (↑) Moves cursor up by one (1) line. If in line one (1), cursor will wrap around to line twenty-four (24).
MULTICODE-B	Cursor Down (↓) Moves cursor down by one (1) line. If in line twenty-four (24), cursor will wrap around to line one (1).

MULTICODE-C	Cursor Right (►) Moves cursor one (1) position to the right. When cursor is moved beyond position eighty (80), the cursor will wrap around to position one (1) of the following line if terminal is in "New Line Enable" mode; (line one [1] follows line twenty-four [24]). It will remain in column eighty (80) if"New Line" is not enabled.
MULTICODE-D	Cursor Left (◄) Moves cursor one (1) position to the left. When cursor is moved beyond position one (1) the cursor will wrap around to position eighty (80) of the previous line if terminal is in "New Line Enable" mode.
MULTICODE-H	Cursor Home (H) Moves cursor to position one (1), line one (1) (Home).
MULTICODE-X	Direct Cursor Address - Line Position. Moves cursor vertically to any line as specified by the character following "X", as shown in Table 6-2.
MULTICODE-Y	Direct Cursor Address - Column Position. Moves the cursor horizontally to any position on a line. The character following "Y" specifies the horizontal character position, as specified in Table 6-2.
MULTICODE-Z	Read Cursor Address (line only) In response, terminal will transmit the line and then the character position of the cursor, as specified in Table 6-2.
MULTICODE-1	Set Tab A tab stop is set at the cursor position. The tab stops may be set when the cursor is in any of the twenty-four (24) lines of the display. It will then be effective for all lines. A tab stop at position one (1) of any line is illegal.
MULTICODE-2	Clear Tab The tab stop at the cursor location is cleared.
MULTICODE-3	Clear All Tabs All tab stops are cleared.

NOTE: The following seven multicode sequences require a delay before characters may be stored in the affected area. See Section 6-10 Timing.

MULTICODE-K	Clear All Will clear display memory to nulls, all tab stops are cleared.
MULTICODE-I	Clear Line Will clear line (reset to nulls) starting with present cursor position to end of line.
MULTICODE-J	Clear Unprotected Will clear all unprotected fields (reset to nulls) starting with present cursor location to end of page.
MULTICODE-L	Insert Line Function same as Insert Line key.
MULTICODE-M	Delete Line Function same as Delete Line key.
MULTICODE-N	Insert Character The function of the multicode sequence "Insert Character" differs from the "Insert Mode." Multicode-N allows insertion at the cursor location of a single character; the character following the Multicode-N is the character to be inserted.
MULTICODE-O	Delete Character Function same as Delete Character key.
MULTICODE-S	Set Buffer Address (line only) Moves the Buffer Address (i.e., the screen position into which data is being written from the communications line) to anywhere on the screen without changing the cursor address (the position at which keyboard data is entered). Line and character address are specified by the two characters which follow.
MULTICODE-T	Insert Cursor (line only) Sets the Cursor Address to the current Buffer Address.
MULTICODE-P	Poll/Select (line only) On CRT's equipped with this option, the following device address character (repeated twice) selects the CRT to receive all subsequent data or commands. If the polled CRT has data to transmit, it will respond with an appropriate "Request to Send" sequence otherwise an EOT is transmitted.

MULTICODE-*	Broadcast Select (line only) All CRTs are selected to receive data from the host; none may transmit.
MULTICODE-+	Group/Fast Select (line only) Characters following Multicode-+, up to STX, select a group of CRTs to receive data from the host; none may transmit.
MULTICODE-$	Read Status Immediate If Multicode-$ is recieved, terminal will immediately transmit status byte to host (Figure 6-1).
MULTICODE-%	Read Status When Ready When the terminal completes the next or current Insert/Delete or print operation, it transmits status byte to host. If no operation is in progress, status is transmitted immediately.
MULTICODE-E	Set Full Screen Mode Defines start of transmission as Home for "Send Page."
MULTICODE-F	Set Partial Screen Mode Defines start of transmission as the cursor position for "Send Page."
MULTICODE-!	Set Field Attribute The character following Multicode-! is the Field Attribute character as defined in 6.4. Bit 0 is transmitted based on the parity options. When stored in display memory, it is always set to one (1). To enter this command via the keyboard, the PROG MODE switch must be set to ON.
MULTICODE-&	Read Option (line) The terminal will respond with two bytes indicating the setting of the various options, as shown in Figures 6-2 and 6-3.
MULTICODE-;	Set Print Options The character following Multicode-; is an ASCII digit from 1 to 6 (hex 31 to hex 36), which determines the operation of auxiliary serial interface, if enabled. Option I: No printout. The printout currently in progress is allowed to finish, then printing stops. Option 2: Print Screen from Home. The entire screen is printed, up to the end of the screen.

Option 3: Print Screen from Cursor. The screen is printed, from the current cursor position to the end of the screen.

Option 4: Simulprint (FF Control) - Upon receipt of a Form Feed character, the contents of the screen are printed. If "Read Status When Ready" is in effect, a status byte is transmitted when printing is complete. In any case, the normal effect of the Form Feed (Clear Unprotected and Home Cursor) does not take place until printing is complete.

Option 5: Simulprint (continuous) - In this mode, characters are simultaneously printed and displayed, as they are received from the line. If the printer is running too slowly for the line, one of two protocols may be used to control the data rate. If the 202 option is installed and the terminal is in the HDX mode, the Secondary Channel Transmit lead to the mode is held low when the printer buffer is almost full. If the terminal is in the FDX mode, it transmits a DC4 control character to request that the host pause transmission; DC2 is transmitted to indicate that the host may resume transmission.

Option 6: Simulprint (continuous, non-display) - This option differs from the previous only in that characters are not displayed on the screen; they are only transferred to the printer port. Reverse Channel or DC2/DC4 signalling protocol is used in the same manner as above.

NOTE 1: On all printouts; attribute, graphic characters, and fields specified as "Non-display," are printed as spaces.

NOTE 2: The following multicode sequences are used to program meanings of the "Send Line," "Send Page," and "Send Message" keys. For data formats refer to Section 6.8.

MULTICODE-U — Set "Send Immediate All" mode.

Upon depression of Send, terminal transmits contents of memory. Field attribute codes and graphics characters are prefaced by their equivalent multicode sequences and transmitted.

MULTICODE-V — Set "Send Immediate Unprotected" mode.

Upon depression of Send, terminal transmits contents of all unprotected fields.

MULTICODE-W — Set "Send Immediate Modified" mode.

Upon depression of Send, terminal transmits content of modified fields only, that is, fields where MDT (Modified Data Tag) has been set to one.

MULTICODE-R "Request to Send"

Receiving this multicode sequence, the terminal will be placed into "Request to Send" mode. Upon depression of either Send key, the terminal will transmit to the host a "Request to Send" multicode sequence. The host can start a transmission by sending one of three multicode sequences; "Read Immediate All," "Read Immediate Modified," or "Read Immediate Unprotected."

MULTICODE-G Set Conversational Mode

Returns the terminal to conversational mode; Send keys are disabled.

MULTICODE-= "Read All"

Initiates transmission of all data in terminal memory.

MULTICODE- > "Read Unprotected"

Initiates transmission of all unprotected data in terminal memory.

MULTICODE-? "Read Modified"

Initiates transmission of data in modified fields.

MULTICODE-< Send Key Override

The character following the multicode sequence determines the type of transmission to be initiated, regardless of the Send key depression by the operator, on the next "Read" - type multicode received. Note that this multicode sequence only remains in effect for only one transmission; it must follow the operator's send key depression and precede the "Read" multicode sequence. It is thus only useful in "Request-to-Send" mode.

1 (hex 31) = Send Page
2 (hex 32) = Send Line
3 (hex 33) = Send Message

MULTICODE-(Lock Keyboard (line only)

The keyboard is locked, and the appropriate status indicator lit. The keyboard may only be unlocked by a "Clear All" or an "Unlock Keyboard" multicode sequence from the line. "ERROR RESET" has no effect.

MULTICODE-) Unlock Keyboard (line only)

The keyboard is unlocked, if previously locked from the line.

MULTICODE-Q Reset MDT

All Modified Data Tags are reset.

Table 6-1. Summary of Multicode Sequences

Key	Function	Key	Function
!	Set Attributes	F	Set Partial Screen
$	Read Status Immediate	G	Set Conversational Mode
%	Read Status When Ready	H	Home Cursor
&	Read Options	I	Clear Line/Field
(	Lock Keyboard	J	Clear Unprotected
)	Unlock Keyboard	K	Clear Display
*	Broadcast Select	L	Insert Line
+	Group/Fast Select	M	Delete Line
1	Set Tab	N	Insert Character
2	Clear Tab	O	Delete Character
3	Clear All Tabs	P	Poll/Select
;	Set Print Options	Q	Reset Modified Data Tags
<	Send Key Override	R	Request to Send
=	Read All	S	Set Buffer Address
>	Read Unprotected	T	Insert Cursor
?	Read Modified	U	Set Send Immediate All
A	Cursor Up	V	Set Send Immediate Unprotected
B	Cursor Down	W	Set Send Immediate Modified
C	Cursor Left	X	Set Cursor-Line
D	Cursor Right	Y	Set Cursor-Column
E	Set Full Screen	Z	Read Cursor Position

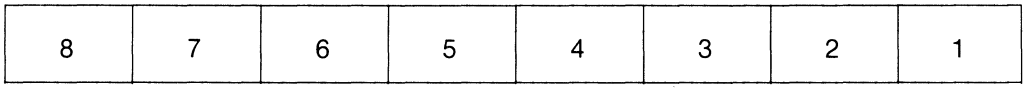
Table 6-2. Cursor Addressing

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

LINE

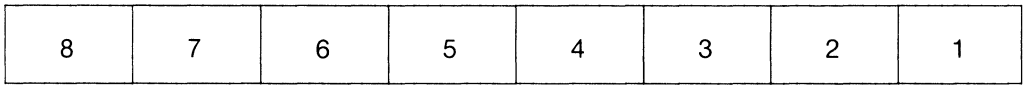
NOTE: To move cursor to column 50 line 5, depress (in sequence) MULT, Y, Q and MULT, X, $.

Figure 6-1. Status Byte Format



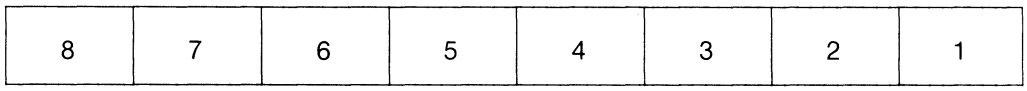
8 - Parity Bit (set accordingly)
7 - Overrun = 1
6 - Parity Error = 1
5 - Printer Error = 1
4 - Printer Busy = 1
3 - Keyboard Locked = 1
2 - Command Error = 1
1 - Background Busy = 1

Figure 6-2. Option Byte 1 Format



8 - Parity Bit (set accordingly)
7 - Send Page Terminator, ETX = 0, EOT = 1
6 - CR Line Terminator Enabled = 1
5 - Upper Case Only (U/C) = 1
4 - AUTO LF Enabled = 1
3 - SCROLL ENABLE = 1
2 - Full/Partial Screen, Full = 1
1 - Conversational Mode = 1

Figure 6-3. Option Byte 2 Format



8 - Parity Bit (set accordingly)
7 - Transmission Mode (nonconversational)
6 - Send Immediate All = 00
Send Immediate Unprotected = 01
Send Immediate Modified = 10
Request to Send = 11
5 - Parity Option - Space = 00,
4 - Mark = 01, Even = 10, Odd = 11
3 - Null Suppress All = 1
2 - Send Line Terminator Enable = 1
1 - Send Line Terminator EOT = 1, ETX = 0

6.3 DIRECT FUNCTION CONTROL KEYS

The Owl-1200 offers, as an option, 16 direct function control keys. The number of control codes generated can be expanded to 32 by depressing "SHIFT" and one of the 16 direct function control keys. These keys generate a multicode sequence followed by an attention identifier (AID) character. The keys are User definable to meet software program needs. Table 6-3 lists the function control keys and their associated AID characters.

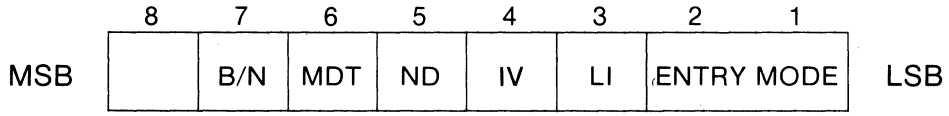
Table 6-3. Attention Identifiers

Function Control Key	AID Characters Transmitted (Hex)	
	SHIFTED	UNSHIFTED
1	A (41)	a (61)
2	B (42)	b (62)
3	C (43)	c (63)
4	D (44)	d (64)
5	E (45)	e (65)
6	F (46)	f (66)
7	G (47)	g (47)
8	H (48)	h (68)
9	I (49)	i (69)
10	J (4A)	j (6A)
11	K (4B)	k (6B)
12	L (4C)	l (6C)
13	M (4D)	m (6D)
14	N (4E)	n (6E)
15	O (4F)	o (6F)
16	P (50)	p (70)
SEND PAGE	1 (31)	
SEND LINE	2 (32)	
SEND MSG	3 (33)	

6.4 ATTRIBUTE CHARACTERS

Attribute characters are used to define the start of a field, and the mode in which the field is displayed. The end of field is defined by a second attribute entry which defines the start of the next field.

To enter an attribute character from the keyboard, the front panel PROG MODE switch must be set on ON. The multicode sequence can be entered from the line regardless of the position of the PROG MODE switch. The multicode sequence Multicode-! is typed followed by an ASCII character. The binary equivalent of the ASCII character determines the display mode. The binary format is defined as follows:



Bit	Meaning
8	Parity bit
7	0 = normal field 1 = blinking field
6	Modified Data Tag - identifies modified fields for Read/Send modified transmissions. 0 = not modified 1 = modified
5	0 = display field 1 = nondisplay field (security)
4	0 = normal video 1 = inverse video
3	0 = normal intensity 1 = low intensity
2-1	00 = alphanumeric 01 = numeric entry only (1-9 . , + - $) 10 = protected field 11 = graphics (bits 7-3 = graphic characters).

NOTE: Multicode-! followed by ASCII character "CTRL-@" is equivalent to binary 10000000 which defines a normal screen and may logically be considered as a field attribute delimiter.

Attribute characters may be defined from the line or at the keyboard (in PROG MODE). On return from program mode, the attribute character is displayed as a space.

6.5 GRAPHICS

A "Shift Out" command (SO or CTRL-N on the keyboard) will cause the terminal to enter the graphic mode. All subsequent input ASCII characters are interpreted as characters from the line drawing graphic character set.

Character encoding, as received following "SO" is shown in Table 6-4. A "Shift In"command (SI or CTRL-O on the keyboard) will return the terminal to normal character interpretation.

Table 6-4. Line Drawing Characters

b7 → / b6 → / b5 → / BITS					X X 0		X X 1	
b4	b3	b2	b1		0/2/4/6		1/3/5/7	
0	0	0	0	0	a	—	P	└
0	0	0	1	1	A	|	Q	┌
0	0	1	0	2	B	┼	R	┐
0	0	1	1	3	C	┴	S	┘
0	1	0	0	4	D	┬	T	├
0	1	0	1	5	E	└	U	┤
0	1	1	0	6	F	┌	V	Ç
0	1	1	1	7	G	┐	W	£
1	0	0	0	8	H	┘	X	÷
1	0	0	1	9	I	├	Y	>
1	0	1	0	A	J	┤	Z	<
1	0	1	1	B	K	━	[	→
1	1	0	0	C	L	¥	\	←
1	1	0	1	D	M	┼	]	↑
1	1	1	0	E	N	┴	^	↓
1	1	1	1	F	O	┬	-	

6.6 202/212 MODEM INTERFACE

If the 202/212 modem interface option is installed, the terminal is capable of operation with modems providing the Clear-to-Send (CB) signal and/or Secondary (Reverse) Channel Receive (SCF/SB) signal(s). In HDX mode, the terminal controls the Secondary (Reverse) Channel Transmit (SCA/SA) lead to the modem. Reverse channel signalling protocol is used in HDX mode to control echo suppressors on long lines. The terminal transmits on the reverse channel while receiving on the main channel and vice-versa. The reverse channel may also be used to transmit a break signal. The transmit lead to the modem is dropped when the BREAK key is depressed or in Simulprint mode, when the host computer is transmitting too rapidly for the printer. The two instances may be identified by the fact that the terminal transmits a break signal on the main channel during BREAK, while for a transmission pause request, there will be no carrier transmitted on the main channel by the terminal. If during buffered transmission, the secondary channel receive lead from the modem is dropped (on-to-off transition), transmission is aborted.

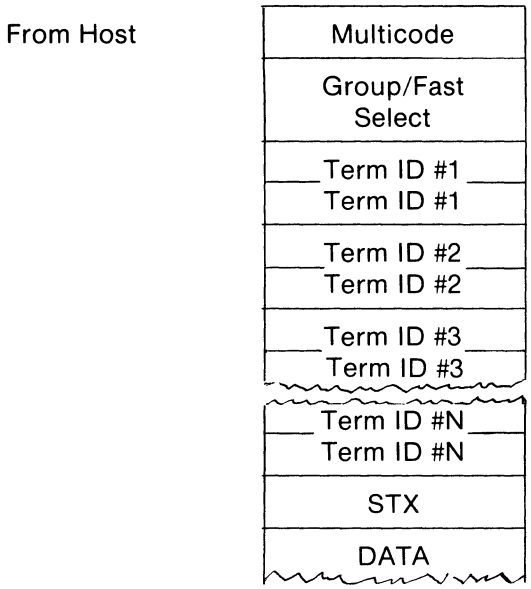
6.7 MULTIDROP POLLING PROTOCOL

The Multidrop Polling option adds several additional formats to the Owl-1200's repertoire. The Poll/Select multicode sequence (Multicode-P) is used in normal sequential polling operations when response time is not critical. The host sends the Poll/Select multicode sequence followed by the terminal identification character (each terminal has a unique one-character address). The one-character address is transmitted twice for reliability purposes; the terminal then responds with either a Request-to-Send multicode sequence, followed by an AID character, or an EOT character if no data is to be transmitted. The host may then transmit until a Poll/Select multicode sequence is issued.

If the host has a message to send to all terminals on the data line, the Broadcast Select multicode sequence (Multicode-*) is used. All data transmitted by the host is received by all terminals. No terminal may transmit until Poll/Select multicode sequence is issued.

The Group/Fast Select multicode sequence serves two functions: (1) it allows the host to send a message to some, but not all, terminals on the line (no terminal may transmit during this time); (2) it allows the host to send a message to a single terminal without waiting for a response via a Poll/Select multicode sequence. A Poll/Select must be issued, of course, before the terminal may respond. An example of a Group/Fast Select sequence is shown in Figure 6-4.

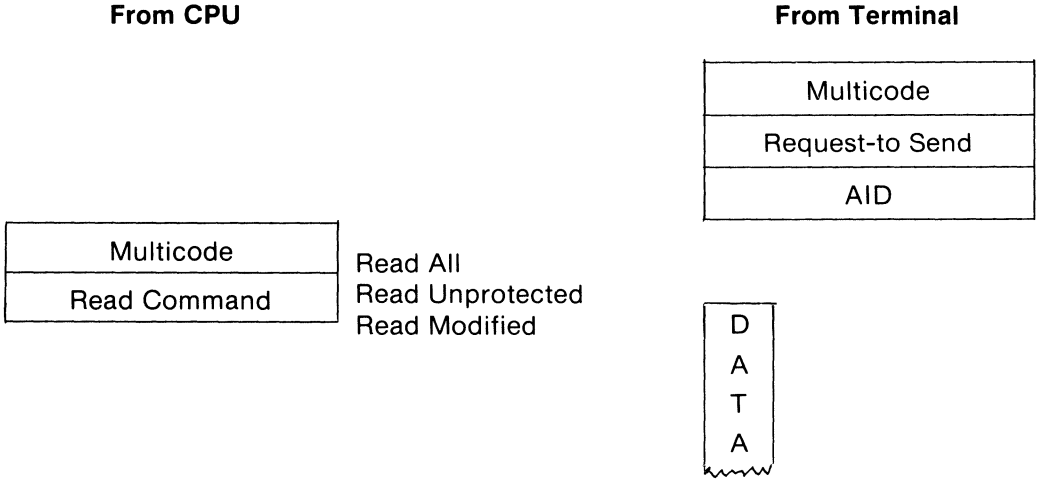
Figure 6-4. Group/Fast Select Format



6.8 DATA FORMAT

The general sequence of Read-type operations in nonconversational mode with the Owl-1200 is shown in Figure 6-5. The first exchange (Request to Send from the terminal, followed by a Read command from the CPU) is performed whenever a Function key is depressed. It is also initiated by depression of a "Send" key in "Request to Send" mode. In "Send Immediate" mode, the terminal sends the contents of the data buffer immediately upon depression of the appropriate "Send" key. The "Request-to-Send" multicode is always followed by an AID (Attention Identifier) character as shown in Table 6-3. The format of the data buffer transmitted depends on the terminal mode or the command issued, and is illustrated in Figure 6-5.

Figure 6-5. Read Command Sequence



Read/Send All

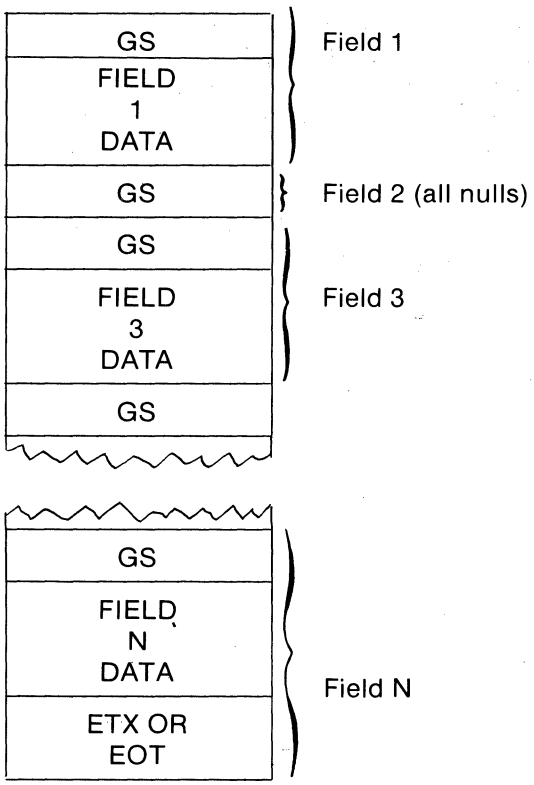
Based on the setting of the Full/Partial Screen mode, for a page transmission, data are transferred starting either from Home or the current cursor position, respectively. If the "Null Suppress All" option is enabled, nulls are suppressed. If the CR line terminator option is enabled, the end of a line within a page or message transmission is indicated by transmission of a carriage return (CR) character (hex 'OD'). Line feed (hex 'OA') is transmitted following CR if AUTO/LF is enabled. Based on the setting of the "Send Page Terminator" option, transmission may end with EOT or ETX.

Read/Send Unprotected

If the screen is unformatted (i.e. contains no fields) this operation has the same effect as "Read/Send All." If the screen is formatted, only unprotected fields are transmitted; nulls are suppressed. If a field contains all nulls, its presence is indicated by the transmission of a single Group Separator (GS) character. This data format is illustrated in Figure 6-6.

A "Send Line" attempt in a formatted screen will result in transmission of the first field following the cursor. Terminator options are as in "Read/Send All."

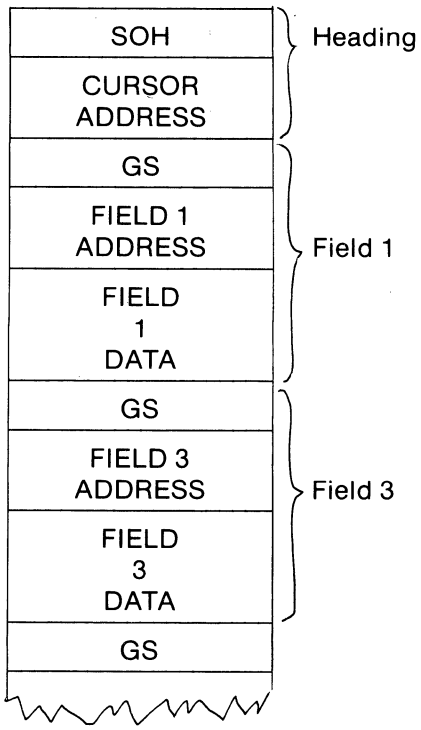
Figure 6-6. Read/Send Unprotected Format



Read/Send Modified

This type of operation is only legal on a formatted screen, it results in transmission of only those fields for which the Modified Data Tag is set in the Field Attribute character. Transmission starts with an SOH, followed by a two-character cursor address sequence, then the modified fields. Each field is preceded by a Group Separator (GS) character and the buffer address of the first data character in the field. Nulls are suppressed. This format is illustrated in Figure 6-7 (assuming fields 1 and 3 have been modified, and field 2 has not).

Figure 6-7. Read/Send Modified Format



Extended Communications Options

Table 6-5 indicates the effects of the various Extended Communications Options switches, the transmission modes for which they are applicable, and the applicable switch numbers. (The Extended Options are contained on the DIP switch at IC location D1. Refer to the Maintenance Manual for details.)

Table 6-5. Extended Communications Options

Option	Switch	Effect	Applicable Modes					
			Unformatted			Formatted		
			Line	Page	Msg	Line	Page	Msg
CR Line Terminator in Send Page	1	If **ON**, CR follows every line in unformatted Send Page or Send Message.		X	X			
Null Suppress All	2	If **ON**, Nulls are suppressed in unformatted transmission (Nulls are always suppressed for formatted transmission.)	X	X	X			
Line Terminator Enable	3	If **ON,** Send Line Transmission is followed by terminator selected by switch 4. If **OFF**, no terminator is transmitted.	X			X		
Line Terminator EOT/ ETX	4	If switch 3 is **ON,** selects Send Line Terminator as follows: ON = EOT OFF = ETX	X			X		
Page Terminator EOT/ ETX	5	Selects Send Page or Send Message Terminator as follows: ON = EOT OFF = ETX		X	X		X	X

6.9 FRONT PANEL SWITCHES

Once configured to system requirements, the front panel switches should remain relatively undisturbed. The system designer, however, may wish to access the PROG MODE switch from time to time to affect minor changes in the program mode via the keyboard. The following descriptions, list the front panel switches and define their applications.

Switch	Function
BAUD RATE	11-position switch used to set the rate at which data is transmitted. Predetermined by the host CPU.
PROG MODE	Places the terminal in the Program Mode. Permits the programmer to define fields using the attribute command (reference Section 6.4).
STOP BIT	May be set to transmit 10-or 11-bit code (one or two stop bits). It is customary to use an 11-bit format at 110 baud or below, and 10 bits at higher speeds, however, the Owl-1200 is flexible both in transmission and reception.
DUPLEX	May be set to either HALF or FULL duplex mode. Note that all multicode sequences affecting the screen are not operable in the full duplex mode.
PARITY	If either EVEN or ODD is selected, the terminal will append the proper parity bit to outgoing data and check parity on all incoming data. If SPACE or MARK is selected, outgoing data is always parity 0 or 1, and parity is not checked on incoming data.
AUTO TAB	In the ON state, the cursor will automatically jump over protected fields without causing keyboard lockout. For other defined fields, the cursor jumps over the attribute character which defines the field. In the OFF state, within a formatted screen, the operator is restricted to tabbing past attribute characters in order to access defined fields. Protected fields are not accessible in either case.
INV VID	The OFF state of this switch defines a normal screen. With inverse video ON, an attribute character calling for an inverse screen will result in a normal screen presentation.

6.10 TIMING

Most normal operations take place well within the shortest possible intercharacter interval (1.04 ms) and do not require the insertion of null characters for time fill.

There are, however, several operations which involve the modification of large areas of the screen. These operations occupy the microprocessor for a significant period of time. These are:

- Clear All
- Clear Unprotected
- Insert Line
- Delete Line
- Insert Character
- Delete Character

It should be noted that it is possible to enter data from the line or keyboard while any of the above operations is in progress. However, there is the risk that the data entered may be overwritten if certain time constraints are not adhered to.

The "Clear All" operation requires an initial delay of 1.5 ms immediately following the Multicode-K sequence (one null character is sufficient at 9600 baud). After this, the "Clear All" operation proceeds at a rate of 2 ms per line of the screen. Thus, the program can enter characters in the second line 3.5 ms after the start of "Clear All' operations, 5.5 ms for the third line, and so on.

All other operations listed above, require 5.5 ms per line affected. A single null should follow a "Clear Unprotected" (or Form Feed in nonscroll mode) after which characters may be entered in the first line affected. The entire interval required for a field (or the entire screen - 132 ms) should be taken into account before attempting to enter data in an area affected by an Insert/Delete type operation.

The "Background Busy" status bit (logical one) indicates that one of the above operations is in progress. To determine the logic zero state, the programmer may either; perform the actual timing computation, issue a "Read Status Immediate" multicode or a repetitive basis, or issue a "Read Status When Ready" multicode sequence. In the latter case, the terminal will return status only after any background task and/or print operation is completed.

RETURN OF PRODUCTS FOR REPAIR

Products being returned to PERKIN-ELMER DATA SYSTEMS, TERMINALS DIVISION for repair must be assigned a Repair Material Authorization (RMA) number prior to their shipment to PERKIN-ELMER TERMINALS. RMA numbers may be obtained by calling the Depot Repair Supervisor at (201) 366-5550, Ext. 26 or (800) 631-9388.

The following information is required prior to the issuing of the RMA number:

1. Contact and telephone number
2. Ship to address.
3. Return shipping method.
4. Proper packing container with packing instructions.
5. Terminal model number and serial number.
6. Failure information.
7. Purchase order number if out of warranty.
8. Billing address.
9. Tax status.

The items being returned are to be shipped prepaid by the customer and will be returned collect by PERKIN-ELMER TERMINALS. The RMA number is to appear on the outside of the shipping carton and on any corresponding documentation. A synopsis of the failure(s) should accompany any material returned for repair.

NOTE:
PERKIN-ELMER TERMINALS is not responsible for products returned for repair without a preassigned control number. Unauthorized returns, and returns where the RMA number does not appear on the outside of the shipping container are subject to delay or loss. Further additional time and expense is required to determine the status of PERKIN-ELMER TERMINALS products returned without control numbers. A $50.00 handling fee will be charged in the event an item is returned without proper authorization or if it is returned unidentified.

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