

COLUMBIA UNIVERSITY CENTER FOR COMPUTING ACTIVITIES

TERMINAL AND PLOTTER USER MANUAL



Columbia University Center
for Computing Activities

Terminal and Plotter
User Manual

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INTRODUCTION

OVERVIEW

The *Terminal And Plotter User Manual* explains how to operate the public computer terminals and graphics plotters made available by CUCCA (Columbia University Center for Computing Activities). This manual will help you select the terminal which best suits your needs, and once having done so, operate it successfully; no knowledge of computing or computer terminals is required. Included for those who have never used a computer terminal before are special introductory sections as well as a glossary. For advanced users, general technical information and terminal settings are provided for reference.

In addition to the sections on public terminals, instructions are included for using the DEC WS78 and DECMATE word processors as ASCII terminals to connect to the IBM 3031, 4341, and DECSYSTEM-20 computers. Privately purchased, these word processors are located in many administrative and academic offices; they are not made available by CUCCA. Information about the word processors is presented in Appendix I.

Non-technical information relating to terminal usage and availability is detailed in the CUCCA *Guide To Research and Instructional Facilities* and the *Newsletter*, both available in the Reference Room in the SSIO (Self-Service Input-Output) area (see immediately below for location). Similarly, for instructions on how to establish communications with the computer (logging in), please refer to the IBM 4341 Log In Procedures sheet or the DECSYSTEM-20 Reference Card, both available in the Reference Room. Software for setting up many terminal features is explained in the DEC-20 Reference Card, the IBM 4341 Wylbur Manual and the CMS Wylbur Technical Note.

Copies of the *Terminal And Plotter User Manual* are available in the Reference Room, 115A, in the SSIO area located in the basement of Uris Hall, or by calling 280-4330.

HOW TO USE THIS MANUAL

Chapter 1, *The First Step In Using The Computer*, is extremely valuable for new users, and more advanced users can reference the information about terminal settings as needed. The remaining chapters are divided by category: crt terminals, hardcopy terminals and graphics terminals. Each section contains the technical information you need to use the terminals, and provides a reference to vendor manuals. Particularly, the subsection *Setting Up the Terminal*, included for every terminal, tells you precisely how to use that terminal for either the IBM or DEC-20 systems. A subsection on specific problems, *Troubleshooting*, outlines the common problems which you might encounter while using a specific terminal.

Also included is a chapter on repair and installation procedures, an appendix on common terminal problems and their remedies, and a summary of Hewlett-Packard terminal information. The Table of Contents is very specific, and can refer you directly to the section you need. If you want to know something very specific and very quickly, e.g., how to

change the parity on the Concept APL-8 terminal, please check the index under the logical headings, in this case either "Concept-APL, Parity, changing" or "Parity, Concept-APL."

SELECTING A TERMINAL

Choosing a terminal depends on need and availability. Crt (cathode ray tube) terminals are best for programming, text entry and editing, and can print at higher baud rates (speeds) than hardcopy terminals. Crt terminals have screens similar to a television screen, and are also referred to as vdt's (video display terminals), although there are some differences. Hardcopy terminals have print elements but do not have screens, and are used for printing output, either text or graphics, although they also can be used for programming and editing.

Some terminals combine both video and printing features. Graphics terminals often have both a video screen and a hardcopy capability. Some hardcopy units are independent of the crt, some are attached.

All CUCCA terminal keyboards have upper and lower case. CUCCA also provides terminals with APL character sets, and terminals specifically for graphics. All the terminals described in this *Manual* can be used with both the DECSYSTEM-20 and IBM 4341 computers.

SUMMARY OF TERMINALS

New terminals are continually being installed on the Morningside campus. The list provided below presents a brief description of those currently available. Further explanations, information about availability, restrictions, or special equipment are provided in the specific sections.

TERMINALS AND PLOTTERS

CRT

1. Hewlett-Packard 2621A. The 2621A offers a large range of special functions. It is widely used at CUCCA.
2. Hewlett-Packard 2621 A/P (National). The same as the HP 2621A with additional natural language features for international use.
3. Concept-APL8. An APL character set is available, as is hardware windowing for use with EMACS on the DEC-20. The Concept APL8 also has a 132 column display capability.
4. Perkin-Elmer Fox 1100. An older terminal without an APL character set.
5. Datamedia 1520. An older terminal with an APL character set.
6. Intertec SuperBrain. A micro-computer used primarily for transferring files from the IBM 4341 and the DEC-20 to floppy disks. *Scheduling for use.*
7. VT101. Manufactured by the Digital Equipment Corporation, the VT101 has a detachable keyboard and 132 column display capability.
8. Hewlett-Packard 2623A. See opposite.
9. Tektronix 4013 (Graphics). A graphics terminal with vector graphics capability. ASCII and APL character sets are available. Used in conjunction with the 4631 hardcopy unit (see opposite).

HARDCOPY

1. DECwriter (Matrix). The most widely used hardcopy terminal at CUCCA, it is a dot matrix printer (not letter quality) which allows you to make a record of your session or print output. The DECwriter uses 11x14 output paper and can accommodate narrower widths.
2. Diablo 1620 (Daisy). A letter-quality printer to produce final copies of essays, reports, dissertations etc. Prints in 10 or 12 pitch. Wheels and ribbons must be purchased. *Scheduling for use.*
3. Tektronix 4631 (Graphics). The hardcopy unit used in conjunction with the 4013 crt. The 4631 prints the crt image.
4. Hewlett-Packard 2623A (Graphics). The 2623A has a built-in heat copier capable of printing both the alphanumeric and the graphics memory. *Scheduling for use.*
5. Hewlett-Packard 7221S (Plotter). Four-color graphics pen plotter with vectors, rotation, scaling and clipping facilities. Paper is available but pens must be purchased. *Scheduling for use.*
6. Gould 5100 (Plotter). The Gould electrostatic plotter is currently available only through operator service for the IBM 4341. It is not described in this manual. Please consult the Gould Technical Note available in the Reference Room for information on usage.

NOTES FOR NEW USERS

CUCCA offers several kinds of computer terminals to meet different needs. The preceding paragraphs should familiarize you with the facilities. However, if you have never used a computer terminal before, a few points might make your adjustment easier and thus expedite your work.

USING A COMPUTER TERMINAL FOR THE FIRST TIME

If you have never used a computer terminal, it is best that someone show you the basics. Consultants are available in the SSIO area and in Room 272A Engineering Terrace to answer your questions and instruct you in the operation of the terminals. However, you may wish to take instructions directly from the *Manual*.

A HELPFUL COMPARISON

For many new users, the sight of the computer terminal keyboard immediately brings to mind a typewriter. This is particularly true of hardcopy terminals, which have print elements instead of screens. The terminal keyboard closely resembles the keyboard of an electric typewriter. The alphabetic and numeric arrangements are identical, although some terminals have separate number pads as well. Backspace, caps lock, and shift keys perform the same function as on a typewriter. The carriage return key is located on the right-hand side of the second bank of keys, as it is on an electric typewriter, and performs roughly the same function. For further explanations of these keys as they relate to typewriters and terminals, see the *Concept 108 Users Manual* pps. 1-4:1-6, available in the Reference Room in the SSIO area.

CHAPTER 1 THE FIRST STEP IN USING THE COMPUTER

1.1. PROCEDURES

The procedures for using the computer, listed in order of occurrence, are as follows:

1. Set up the terminal.
2. Turn on the PACX box and make a connection to the system.
3. Log in.
4. Do your work.
5. Log out.

This chapter presents comprehensive information about point 1.

1.2. SETTING UP THE TERMINAL IN THEORY AND PRACTICE

The first step in using most computer systems is to make sure that your terminal is set up or "configured" for the system you will be using. This includes setting baud rate (terminal speed), parity, duplex and other parameters. (See the *Glossary* on p. 71 for definitions of these terms.)

There are three distinct aspects to consider when configuring your terminal:

1. The IBM and DEC-20 systems require different values for certain settings, e.g., parity, duplex etc.
2. Each terminal differs in the kinds of settings which are available and have to be changed, although most terminals do share some common settings (see below, section 1.4). For example, not all terminals have a handshake parameter, but many have a duplex parameter. In short, different terminals have different features; what you must change on one will not necessarily be present on another. This will become clear after you have used at least two different makes of terminals.
3. Each terminal differs in the physical manner in which these values are established, i.e., older terminals tend to have switches and buttons, while the newer terminals take typed-in sequences.

1.3. TWO BASIC RULES TO FOLLOW

1. Turning on the terminal is the first step in using one; it must be turned on before it can be configured. If you do not hear a beep or the screen brighten after a minute to signify it is powered on, the terminal may be out of order, although you should check to see that the brightness is turned up and that the unit is plugged in. For hardcopy terminals you may physically feel that the power is on if there are no indicator lights, but usually the print element moves slightly to signal power on.
2. You should configure your terminal for the proper system *before* making a connection with the computer through the PACX Gandalf blue box located near the terminal. Some systems will not recognize changes in settings once you have logged in, although others will. For PACX information see the 4341 Log In Procedures sheet or the DEC-20 Reference Card.

1.4. COMMON AND IMPORTANT TERMINAL SETTINGS

No matter what terminal or system you are using, you should be aware of the following three parameters. Please note however that when using graphics terminals and plotters, certain values must be synchronized with the host terminal. (Baud rates are subject to change. See below the special note on baud rates, section 1.4.0.1 for further information.)

1. *Baud Rate*. The speeds appear as 300; 1200; 1800; 4800; 7200; 9600.
2. *Parity*. Parity value names differ for each terminal, but should generally be set to *none* for both systems, although some terminals equate *mark* with *none*. Please check each section for the choices.
3. *Duplex*. The settings will always appear as *half* or *full*.

The current values for these settings are:

SETTINGS	DEC-20	IBM 4341
Baud Rate	4800	1800
Parity	None*	None*
Duplex	Full	Half

Table 1-1: IBM 4341 and DEC-20 Settings

* The equivalent of Mark on some terminals.

1.4.0.1. SPECIAL NOTE ON BAUD RATES

The speeds indicated above are the maximum that PACX, not hardwired terminals, can comfortably support. Development work is currently underway to allow a higher baud rate for the IBM systems. But at present, 1800 is the maximum baud rate for terminals connected through the PACX. Users also should note that individual crt's may have built-in restrictions and therefore may not be capable of operating at the maximum speeds listed above.

Hardcopy Baud Rates

Unless otherwise indicated, CUCCA's hardcopy terminals must be run at speeds of 300 baud or lower.

Graphics Terminals and Plotters

The HP pen-plotter can be run only at 1200 baud or lower. All other graphics terminals may be run at the specified baud rate for that system. But the baud rate must be synchronized with the host terminal. Consult the individual sections.

CHAPTER 2 CRT TERMINALS

2.1. CONCEPT-APL8

The Concept-APL8 terminal is a microprocessor-based terminal which offers an APL character set and advanced features such as hardware windowing, which are well supported by EMACS on the DEC-20. The Concept-APL8 also has a 132 column display capability.

2.1.1. DOCUMENTATION

Copies of the Concept Manual and Reference Card are available in the Reference Room in SSIO.

2.1.2. TURNING ON THE TERMINAL

The ON/OFF switch for the Concept is located in the rear center of the terminal. It should be pressed to the left to turn on the terminal. The brightness knob is located on the left side of the terminal under the screen housing. Turn it counterclockwise to brighten the display.

2.1.3. SETTING UP THE TERMINAL -- CONFIGURATION MODE

RESET/STAT Key

The Concept uses typed-in characters rather than switches to set its operation modes. After turning on the terminal, press the RESET/STAT key on the Cursor Control Pad on the upper right side of the keyboard (see photograph 2-3). This will display the inverse video status line (white background with dark lettering), across the bottom of the screen. The status may display many different values. Following is a mode line configured for the DEC-20:

```
KB 4800 FULL 1STOP NONE/OFF REM PROG CHAR U/L 047:003 ASC 000,000,048,080 F0100
```

Figure 2-1: Concept-APL Mode Line

Photographs: Peter Sprung



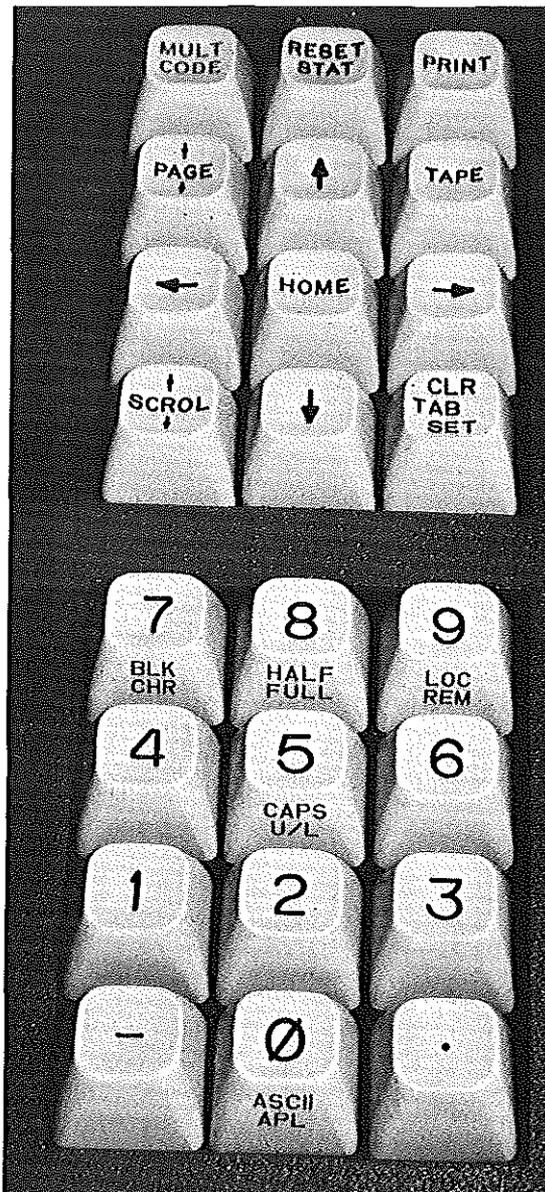
Photograph 2-1: Concept-APL8



Photograph 2-2: Concept-APL8 Keyboard

Note: Unlike some other terminals, the Concept APL does not display the names of the settings, only the values, i.e., 4800 in the second field above refers to baud rate.

You need not be concerned with all the fields displayed on the mode line. The instructions below correspond to the mode line, reading from left to right. Important settings are noted in italics.



Photograph 2-3: Concept APL-8 Cursor Control Pad and Numeric Pad

2.1.3.1. CHANGING THE SETTINGS

The MULT CODE Key

The values of the settings are changed by issuing MULT CODE character sequences. That is, each sequence is prefaced by pressing the MULT CODE key located on the Cursor Control Panel on the upper right side of the keyboard. You press it only once with regular pressure, and do not hold it down. Unfortunately, nowhere is it indicated that the MULT CODE has been depressed. In MULT CODE sequences, the case of the letters is extremely important. Often a feature is enabled or disabled depending on the case of the letter, i.e., upper or lower case. In the following, unless the word *shift* precedes a letter, be sure to use the lower case or unshifted form. *Shift* indicates that you enter a capital letter by depressing the *shift* key. If you do not change the setting as desired on the first try, you must begin the entire sequence over again, i.e., by depressing the MULT CODE key again, followed by the proper command. The MULT CODE key cannot be depressed repeatedly to achieve the desired setting.

NOTE: Before attempting the following, you must place the terminal in Programmer Mode, which is included in the list below, by pressing MULT CODE Shift U. Otherwise, the MULT CODE sequences will have no effect. Important settings are in italics.

KB Keyboard mode. If set to anything but KB, press the RESET/STAT key twice.

BAUD RATE Symbols such as % and (are used for setting the baud rate. The Concept keyboard is an APL keyboard, so to quickly find these symbols you should look on the front of the numeric keys, not on the top of the numeric keys, as is the case with most keyboards.

To change the baud rate press: MULT CODE Shift O (capital letter O), followed by:

%	300	+	3600
'	1200	,	4800
(1800	.	9600
*	2400		

DUPLEX For IBM (half) enter MULT CODE Shift 8; for DEC-20 (full) enter MULT CODE 8 .

STOP Should be set to 1STOP for speeds over 300; MULT CODE Space < ". (Space means press the space bar.)

PARITY Set to NONE/OFF for all systems; MULT CODE Shift P Space.

REMILOC Must always be set to REMOTE in order to use the computer. MULT CODE 9.

<i>PROG</i>	Programmer mode. MULT CODE Shift U. Can also be set to User mode by MULT CODE u, but you cannot configure the terminal in user mode.
CHAR	Should always be set to CHAR. If not, press MULT CODE 7.
U/L	Upper and lower case letters. MULT CODE % for upper case; MULT CODE 5 for upper and lower case.
CURSOR POSITION	Indicates the position of the cursor on the screen.
<i>ASCII/APL</i>	To enable for APL, MULT CODE 0 (numeral). To disable and return to ASCII for regular use, MULT CODE SHIFT 0.

The Numeric Keypad -- An Easy Way to Setup the Terminal

Note that some of the settings are clearly displayed on the Numeric Pad on the right side of the keyboard (see photograph 2-3). For instance, "8" corresponds to Duplex, "9" to Local/Remote, "5" to upper/lower case, and "0" to ASCII/APL. Those markings on the top half of the keys indicate that you use them in *shifted* mode, i.e., while depressing the shift. You may use these numeric keys after typing a MULT CODE instead of the numeric keys on the top row of the regular keyboard.

2.1.4. COMPLETING CONFIGURATION AND CLEARING THE STATUS LINE

You are now ready to use the computer. You can clear the status line by pressing the RESET/STAT key. Recall the status line by pressing the RESET/STAT key again.

2.1.5. RESETTING THE TERMINAL

Resetting the terminal puts it back to the state it was in when it was first turned on. Press Shift RESET/STAT simultaneously.

2.1.6. OPTIONAL FEATURES

2.1.6.1. 80/132 COLUMN DISPLAY

You may vary the display width between 80 columns, which is the default, and 132 columns, for typeout or editing. The change to 132 columns, enter the sequence MULT CODE " (quotation marks). To return to 80 columns, enter MULT CODE ! (exclamation point).

2.1.6.2. REVERSE VIDEO

The Concept APL has a reverse video mode that is very easy to set. Most terminals offer only white characters on a dark background. This is the default for the Concept, but you can also invoke reverse video mode, i.e., dark characters on a white background. Do this by pressing MULT CODE Shift D. Adjust the brightness with the knob on the left under side of the screen. Turn off the reverse video, that is, go back to normal video, by pressing MULT CODE d. It is not a part of the standard configuration procedure; it does not appear on the mode line nor does it affect the operation of the terminal.

2.1.7. TROUBLE-SHOOTING

Problem	Cause/Remedy
No Power	If you accidentally turn off the terminal in the middle of a session, the terminal will revert to the settings it had when first turned on. Your program should be intact, but you may have to reconfigure the terminal. Press carriage return or refresh the screen. No power or a loss of power will also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.
Dark Screen	If you cannot see the cursor on the screen, the brightness knob is turned all the way down. Turn counterclockwise until cursor appears or screen lightens. If this does not work, see below "Strange" Modes.
Upper Case Only	Make sure U/C button on left is unlit; depress to turn off light. Check the status line to indicate U/L and not CAP.
Computer Does Not Respond	Check to see that <i>Remote</i> and not <i>Local</i> is enabled.
INSRT Mode Enabled	Insert Mode. The light will be lit. This may cause disruption of text, especially while using EMACS on the DEC-20. To disable, reset the terminal; see above.
"Strange" Modes	Unspecific symptoms include buzzing, strange patterns on the screen, a missing cursor, bright vertical lines etc. Turn off the terminal for about 10 seconds, and turn it back on. You may need to reconfigure the terminal.

2.2. DATAMEDIA 1520

The Datamedia 1520 has an APL character set. It has baud rates of 300, 1800 and 4800. The Datamedia has been locally modified to allow a 4800 baud rate.

2.2.1. DOCUMENTATION

The Datamedia 1520 manual is available in the Reference Room in the SSIO area.

2.2.2. TURNING ON THE TERMINAL

The ON/OFF switch is located on the right rear side of the screen housing. The positions are clearly marked; push the switch on the top to turn on the terminal. To focus the screen first rotate the brightness knob, and then the contrast knob on the lower right hand side of the casing (both are clearly marked). The volume of the bell can also be adjusted by rotating the knob located on the right side of the keyboard.



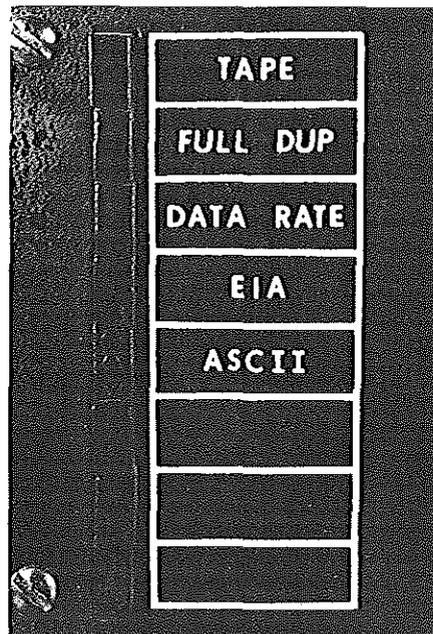
Photograph 2-4: Datamedia 1520

2.2.3. SETTING UP THE TERMINAL

2.2.3.1. SWITCHES

The front panel of the Datamedia 1520 has the following 8 switches which should be depressed to record settings. When you want to change a setting push all the way in and release. Labels have been placed on the buttons to indicate their functions. The sixth and seventh buttons (those not marked) are inoperative. Important settings are in italics.

<i>TAPE</i>	Place in OUT POSITION at all times.
<i>DUPLEX</i>	IN for Full Duplex for the DEC-20; OUT for Half Duplex for the IBM.
<i>DATA RATE</i>	IN for all systems. When the Data Rate is OUT a 300 baud rate is established.
<i>EIA</i>	IN position at all times.
<i>ASCII</i>	IN for ASCII alphanumerics; OUT for APL character set.
<i>LAST (8th) BUTTON</i>	IN for 4800; OUT for 1800 for baud.



Photograph 2-5: Datamedia Switches

2.2.4. TROUBLE-SHOOTING

Problem	Cause/Remedy
No Power	If you accidentally turn off the terminal in the middle of a session, turn it back on; all the settings will remain. Your program should also be intact. Press carriage return or refresh the screen. No power or a loss of power will also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.
Dark Screen	The brightness knob is not adjusted correctly; turn clockwise until screen lightens.
No Bell	The volume is turned all the way down. Adjust the knob.
"Strange Characters"	Either the TAPE or the TAPE LOAD buttons have been depressed. Make sure both are released (out). Also, check to see that the ASCII button is in.



Photograph 2-6: Datamedia Keyboard

2.3. HEWLETT-PACKARD 2621A

The HP 2621A offers an attractive character set and a large range of special functions which give it the versatility necessary for use with much of the software currently available at Columbia. For a summary of instructions about the HP 2621A and HP2621 National terminals, please see Appendix III, p. 76



Photograph 2-7: Hewlett-Packard 2621A

PLEASE NOTE

The HP 2621A and the HP 2621 A/P National terminals are physically identical, but they have slightly different settings. Still, almost all of the information listed in this section applies to the HP National as well, and thus is not repeated in that section. Currently, most of the HP National terminals are located in the Carman terminal room, although this may change.

The easiest way to determine which terminal you are using is to enter Configuration Mode (see below section 2.3.3 p. 19) and examine the lower mode line. If *LANGUAGE* instead of *EXIT* appears in the left most setting of the *lower* mode line it is a National terminal. The mode lines are the white blocks with dark lettering which appear at the top and bottom of the screen. Check p. 20 to see the mode line for the HP 2621A. Also, check the *Straps* parameter on the upper mode line. If it does not appear exactly as specified on p. 20, i.e., the National has an "a" in the field on the upper mode line, see below, 2.4, p. 25.

2.3.1. DOCUMENTATION

Copies of the HP 2621A Owner's Manual are available in the Reference Room and the consultant's offices in the SSIO area and Room 272A Engineering Terrace.

2.3.2. TURNING ON THE TERMINAL

The ON/OFF switch for the HP 2621A is located on the bottom right hand side on the back of the terminal. It is a wide black rocker switch which should be pushed to the right to turn on the power. The brightness and contrast are preset, and should not be changed.



Photograph 2-8: Hewlett-Packard 2621A Keyboard



Photograph 2-9: Hewlett-Packard Function Key Group

2.3.3. SETTING UP THE TERMINAL

2.3.3.1. FUNCTION KEY GROUP

The Function Key Group consists of eight Function Keys located across the top of the keyboard (as illustrated opposite), and the *Labels* Key (the only blank key), located to the right above the carriage return. These keys are used in a *shifted* mode, i.e., while holding down the *shift* key, to configure the terminal for a given computer system. When the keys are used without the *shift* key, they control cursor and scrolling functions. When using these keys to configure your terminal, the computer has no knowledge that the cursor has been moved. You cannot use these keys to position the cursor when using an editor, e.g., EMACS.

After the terminal is turned on, eight labels--the Primary Labels--will appear along the bottom of the screen. Each label corresponds to one of the eight function keys located along the top of the keyboard.

There are six different sets of labels that may appear, depending upon what mode the terminal is in. For the HP 2621A however, we will discuss only two sets, the *Primary Labels* and the *Configuration Mode Labels*.

Note: When depressed, the *Labels* key calls back the primary labels, no matter what mode you are in.

2.3.3.2. EXECUTING TERMINAL FUNCTIONS

Each of the labels along the bottom of the screen names a terminal function that you may execute to achieve a desired effect.

There is a one-to-one correspondence between these labels and the function keys (arrows) on the top of the keyboard. The functions are executed by pressing the corresponding function key while holding down the *shift* key.

When the terminal is turned on, the Primary Labels are initially displayed. In order to set the values of various configuration parameters, you must put the terminal into *Configuration Mode*.

NOTE: It is impossible to enter Configuration Mode unless the Primary Labels are currently displayed. At any time you may recall the Primary Labels by pressing the *Labels* key, the blank key on the right.

To enter *Configuration Mode*, hold down the *shift* key while pressing the  key. Parameter labels and values will appear along the top of the screen, and the bottom labels will change to the Configuration Mode labels. The labels for the upper mode line are displayed as follows for the DEC-20:

Baud Rate	Parity	Duplex	Straps	Handshake	Hz	Start Col	Return
4800	NONE(0)	FULL	bCGHxz	etx	60	1	[cr]

Figure 2-2: Hewlett-Packard 2621A Upper Mode Line Labels

Only those values below in italics should be changed. The recommended values for the configuration parameters are:

SETTING	DEC-20	IBM 4341
<i>Baud Rate</i>	<i>4800</i>	<i>1800</i>
<i>Parity</i>	<i>NONE(0)</i>	<i>NONE(1)</i>
<i>Duplex</i>	<i>Full</i>	<i>Half</i>
<i>Straps</i>	<i>bCGHxz</i>	<i>bcGHxz</i>
Handshake	etx	etx
Hz	60	60
Start Col	1	1
Return	[cr]	[cr]

Table 2-1: Hewlett-Packard 2621A Value Settings

The lower mode line will also be displayed:

EXIT NEXT PREVIOUS MODM OFF REMOTE* CAPS LK LN MODE AUTO LF

Figure 2-3: Hewlett-Packard 2621A Lower Mode Line Labels

Note: Only the REMOTE function is enabled (*). See below 2.3.3.4, p. 22.

2.3.3.3. STEP 1--CHANGING UPPER MODE LINE PARAMETERS

Change the values if they do not conform to the above chart. This is very easy to do, and once you have changed one parameter, you will understand how to change the remainder.

First select the parameter that needs to be changed, i.e., baud rate, parity etc. Do this by positioning the cursor under the proper field using the  and  keys on the upper right side of the keyboard, *unshifted*, that is, without pressing the *shift* key.

Each parameter is changed by pressing the shift and the  key and/or the shift and the  key.

Once the parameter is changed to the proper value, press the  or  keys to move to the next field and repeat the procedure. Those parameters in italics are different for each system.

BAUD RATE

To change the baud rate, press the *shift* and the  key. Once may not be enough however to get the proper value. To change the value again, continue to press the  key **while holding down the shift** until the desired value appears. In other words, don't remove your finger from the shift key, but continue to press the  key. The  key returns higher values. The  key returns lower values. You can use either one.

PARITY

The parity is changed in the same manner as the baud rate. After positioning the cursor to the proper location, press the *shift* and  key until the proper setting appears. For the IBM 4341 the setting is NONE(1) and for the DEC-20 NONE(0).

DUPLEX

Same as above. For the DEC-20 it is set to Full, for the 4341 to Half.

STRAPS

Straps operate slightly differently, since the cursor is positioned under each letter instead of the entire field. If one of the letters is not in the correct case, you must change it by moving the cursor underneath the letter that must be changed (using the  and  keys *unshifted*), and then pressing the *shift* and  key.

HANDSHAKE

Handshake works the same as Straps. If the current Handshake setting is eTx, and you must change this to etx, do the following. First, position the cursor under the T in eTx by using the  and/or  keys. Then press *shift* . The upper case T will change to a lower case t, leaving the Handshake parameter with the value, etx.

Hz

Should not be changed if set to 60. If it is not set properly, change in the same manner as indicated above.

START COL

Should not be changed if set to 1. If it is not set properly, change in the same manner as indicated above.

RETURN

This generally should not be changed. However, if it is ever anything other than [cr], you may change it as follows: First position the cursor so that it is immediately to the right of the left bracket [, using the  and/or  keys. Then press the RETURN key followed by the SPACE bar.

2.3.3.4. STEP 2--CHANGING LOWER MODE LINE PARAMETERS

The last four labels in Configuration Mode control the settings of four modes. Each mode is either enabled (on) or disabled (off). When a particular mode is enabled, an asterisk * will appear inside the label box. To change the state of one of these modes, you use the right-hand side function keys  ,  ,  , and  in *shifted* mode.

The modes should be set as follows. Those in italics should be noted.

REMOTE

This mode *MUST* be enabled if you wish to communicate with any of the computers at Columbia. To enable *Remote* press *shift*  and the * will appear. Often this mode is accidentally disabled, and users think that the terminal is broken or the line is bad. Please check to see that this function is enabled before reporting the terminal or line out of order. To disable the Remote mode, simply repeat the same function, i.e., press the  again while holding down the *shift* key.

CAPS LK

When this mode is enabled all lower-case alphabetic characters typed at the keyboard will be transmitted to the computer as the corresponding upper-case characters. An * will appear in the corresponding label to signify it is enabled. To disable CAPS LK, press *shift*  and the asterisk should disappear. To enable, simply repeat the function. Non-alphabetic keys are not effected, and no characters received from the computer are translated.

LN MODE

This is a special mode that should be disabled. If it is accidentally enabled, press *shift*  to disable it. If enabled, you cannot connect to the computer.

AUTO LF

This mode should generally be disabled, but may be enabled as a convenient method for typing out a piece of text with double spacing. To enable, press *shift* .

MODM OFF

This function has no effect on any of the Columbia systems.

2.3.4. COMPLETING CONFIGURATION MODE AND EXITING

Once the parameters are properly set, you may exit Configuration Mode. The EXIT function is used to restore the screen to the state it was in before entering Configuration Mode and display the Primary Labels at the bottom of the screen. To exit, simply repeat the function for entering, i.e., press *shift*  . The top labels will disappear. You may also exit by pressing the *Labels* key. Use the *Labels* key if some other mode is accidentally selected. You are now ready to make a connection with the computer.

2.3.5. CLEARING AND RECALLING THE LABELS

If you do not wish to see the Primary Labels while you are using the computer, hold down both the *shift* and *Control* (ctrl) keys while pressing the *Labels* key; the labels will disappear. To bring back the labels, (and you must have them displayed to enter Configuration Mode), simply depress the Labels key.

2.3.6. THE COLUMN COUNTER

Another reason for recalling (or leaving) the Primary Labels, other than as an intermediate step for getting into Configuration Mode, is that the column counter appears in the middle of the line of Labels. This counter always displays the screen column in which the cursor is currently located. It is often useful when entering data into tables or according to some strict format.

2.3.7. ENTERING CONFIGURATION MODE WHILE CONNECTED TO THE COMPUTER

If you wish to change a setting during a session, enter Configuration Mode as previously described. As long as the Primary Labels are displayed, simply press the *shift* and  key to display the settings.

2.3.7.1. RESETTING THE TERMINAL

Resetting the terminal puts it back to the settings when it was first turned on. If the battery is dead, it will revert to factory settings. To reset, press the *Break* key while holding down both the *shift* and *Control* keys.

You may at this point have to enter Configuration Mode and change some of the mode and parameter settings. If this does not correct the problem, please report the terminal to Systems Assurance, 280-3100.

2.3.8. TROUBLE-SHOOTING

Problem	Cause/Remedy
No Power	If you accidentally turn off the terminal in the middle of a session, turn it back on; all the settings will remain. Your program should also be intact. Press carriage return or refresh the screen. No power or a loss of power will also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.
No Labels/Wrong Labels	Press the <i>Labels</i> key to display the Primary Labels.
Upper Case Only	Press the <i>CAPS</i> key on the left of the keyboard. Check the lower Configuration Mode labels to make sure that <i>CAPS LK</i> is disabled (no *).
Alphabetic Keys Transmit Digits	The numeric keypad feature has been accidentally enabled. Press the <i>NUM</i> key once to disable.
Computer Does Not Respond	Check to see that <i>Remote</i> is enabled (with a *). Make sure <i>LN MODE</i> is disabled (no *).
Test Mode	If you wanted to enter Configuration Mode and accidentally pressed the  key instead of the  key you will be placed in test mode, which displays an alphabetic pattern. This mode only lasts for a few seconds; after it is finished, enter Configuration Mode as indicated previously.

2.3.8.1. SPECIAL PROBLEMS

If when the terminal is turned on the Configuration Mode labels instead of the Primary Labels are initially displayed, simply continue as if you had intentionally placed the terminal in Configuration Mode, and inform Systems Assurance of the number of the terminal.

2.4. HEWLETT-PACKARD NATIONAL

The HP 2621A/P National terminal is almost identical to the HP 2621A except for an additional strap in the Configuration Mode labels, and an additional Language Mode. Language in this case does not refer to computer languages but to natural language. The two terminals are physically identical, and you may not be able to discern which one you are using until you enter Configuration Mode, since the Primary Labels (the labels you see when first the terminal is turned on) are also identical.

NOTE: The straps and the US language setting are the only settings that are different on the HP Nationals. Therefore, only these will be explained below. For all other instructions for the HP National terminal, please see above, section 2.3.

2.4.1. DOCUMENTATION

Copies of the HP 2621 A/P National Owner's Manual are available in the Reference Room and the consultant's offices in the SSIO area and Room 272A Engineering Terrace.



Photograph 2-10: Hewlett-Packard National

2.4.2. SETTING UP THE TERMINAL -- CONFIGURATION MODE

2.4.2.1. CHANGING THE STRAPS

You enter Configuration Mode in the same manner as you do for the HP 2621A.

Once the upper mode line is displayed, you will see that all the straps are the same as the HP 2621A except for an additional Escape Sequence Transmission parameter, "a" in the strap field. This must be disabled, i.e., lower cased. Place the cursor under the "a" and execute the proper function. See above p. 21 for instructions on how to adjust the strap.

The upper Configuration Mode line appears as follows:

Baud Rate	Parity	Duplex	Straps	Handshake	Hz	Start Col	Return
1800	NONE(1)	HALF	abcGHxz	etx	60	1	(cr)

Figure 2-4: Hewlett-Packard National Upper Mode Line Labels

2.4.2.2. LOWER MODE LINE

The lower mode line of the Configuration Mode is the same as on the HP 2621A with the exception of *LANGUAGE* appearing on the lower left. Still, *Remote* must be enabled, and this is accomplished in the same manner as stated above on p. 22.

LANGUAGE	NEXT	PREVIOUS	MODM	OFF	REMOTE*	CAPS LK	LN MODE	AUTO LF
----------	------	----------	------	-----	---------	---------	---------	---------

Figure 2-5: Hewlett-Packard National Lower Mode Line Labels

2.4.3. LANGUAGE MODE

The Language Mode, which is not available on the HP 2621A, must also be configured. You cannot enter the Language Mode directly; you must first be in Configuration Mode. When in the initial Configuration Mode, you enter the Language Mode by pressing *shift* . The labels on the bottom of the screen will change to the following:

D DK/N E F S/SU UK US*

Figure 2-6: Hewlett-Packard National Language Mode

US (United States) must be enabled for proper transmission. *Shift*  to enable US. An "*" means it is enabled.

Please note however, that you are in a mode other than Configuration. You must exit this mode to get back to Configuration Mode.

2.4.4. COMPLETING CONFIGURATION MODE AND EXITING

This is a two-step process. First you exit Language mode, and only then can you exit the first Configuration Mode. Exit Language Mode by pressing the Labels key; you will be returned to Configuration Mode. Exit Configuration Mode by pressing the Labels key again. You are now ready to login to the computer.

2.4.5. CLEARING AND RECALLING THE LABELS

If you do not wish to see the Primary Labels while you are using the computer, hold down both the *shift* and *Control* keys while pressing the *Labels* key; the labels will disappear. To bring back the labels, (you must have them displayed to enter Configuration Mode), simply depress the Labels key.

2.4.6. RESETTING THE TERMINAL

Resetting the terminal puts it back to the settings when it was first turned on. If the battery is dead, it will revert to factory settings. To reset, press the *Break* key while holding down both the *shift* and *Control* keys. You may at this point have to enter Configuration Mode and change some of the mode and parameter settings. If this does not correct the problem, please report the terminal to Systems Assurance.

2.5. INTERTEC SUPERBRAIN

The SuperBrain is a Z80-based 8-bit microcomputer manufactured by Intertec Data Systems Corp. It is equipped with two double-density 5-1/4 inch "minifloppy" disk drives with a capacity of approximately 160K characters each. Up to 64 files can be stored on a single floppy. The SuperBrain runs the Intertec Data Systems version of the CP/M operating system.

The primary purpose of the SuperBrain is as a facility for copying files from either the DEC-20 or IBM 4341 to floppy disks. It can only be used as a terminal if no other users wish to copy files. See below section 2.5.1 for information on how to copy files, and section 2.5.2 for further policy on usage. Information on how to use the micro as an ASCII terminal is also presented below. Currently there is one SuperBrain terminal available in Room 272A Mudd.



Photograph 2-11: Intertec SuperBrain

2.5.1. DOCUMENTATION FOR FILE TRANSFER

KERMIT is the program used for copying files to and from the DEC-20 or IBM computers. The Kermit Technical Note for the IBM 4341 is available free of charge. For the DEC-20, the Kermit Manual is available for purchase, but an excerpt of the Manual is also available free of charge in the Reference Room in the SSIO area, room 115A.

2.5.2. USAGE POLICY AND SCHEDULING

The primary purpose of the SuperBrain is for file transfer to and from floppy disk. Anyone using them for other purposes, i.e., as a terminal, must yield to users who need to transfer files. Signup sheets are provided for scheduling of 20-minute slots. The length of the slot may be adjusted depending on requirements and demand. During periods of heavy usage, t(he end of the semester), CUCCA reserves the right to limit use of the micro for floppy access only.

2.5.3. OPERATING THE SUPERBRAIN

2.5.3.1. TURNING ON THE TERMINAL

To turn on the SuperBrain, flip up the toggle switch located on the back right-hand side.¹ This is known as a *cold start*. On a cold start the micro is automatically "booted", i.e. the operating system is loaded into memory from the System floppy and started. After the appropriate disks are loaded, (see below section 2.5.5), the following message will appear:

```
64K SUPERBRAIN DOS VER 3.1 FOR CP/M 2.2
```

```
A>
```

The "A>" is the micro's prompt, which signifies it is ready to accept input.

2.5.3.2. INTERRUPTING THE PROGRAM

There are two red keys located at the bottom corners of the main keypad. If these two keys are depressed at the same time a *warm start* takes place; this means that whatever program may be running is interrupted, the operating system is reinitialized, and you are put back at CP/M command level. This is preferable to shutting off the terminal.

¹These sections are excerpted from the Kermit Users Guide and Specification by Bill Catchings, Frank da Cruz, and Daphne Tzoar.

2.5.4. USING THE SUPERBRAIN AS AN ASCII TERMINAL

The SuperBrain emulates a VT52 terminal. Start up the micro with the system disk mounted in the A drive. The B drive should be empty.

2.5.5. USING FLOPPY DISKS WITH THE SUPERBRAIN

The SuperBrain uses a pair of 5-1/4 inch single-sided, double density, soft-sectored floppies, A (left) and B (right).

The System floppy disk should be mounted in Drive A, and should not normally be removed. The System Floppy is available from the consultant when you leave your ID card. The system disk contains the CP/M operating system and utilities, and the SuperBrain version of Kermit, Kermit-80.

Drive B is available for user floppies. It is the vertical opening on the right. To insert a disk in Drive B, open the drive by applying a very slight outward pressure on the small flat door located in the center of the opening. Insert the disk with the label facing right, away from the screen, notched edge up. Make sure the disk is all the way in by applying a gentle pressure on the rear edge of the disk. Once you are certain that the disk is fully inserted, you may close the disk drive door by applying a slight pressure on the door, pulling it back in the direction from which it was originally opened. Once the micro has been started, you may give it commands.

When you are finished using the SuperBrain, remove the disks and turn it off. **Turning of the terminal with the disks still in place can cause damage.**

2.5.5.1. DEC-20

Then run Kermit and login on the DEC-20 as follows. You type what is in italics. All text starting with a "!" to the end of the line is a comment, and everything else represents computer typeout.

A>B:	! Switch to your disk.
B>A: <i>KERMIT</i>	! Run Kermit.
Kermit V1.1	
Kermit-80>	! Kermit prompt on the micro
Kermit-80> <i>CONNECT</i>	! Connect to the DEC-20.
	! Set PACX to 12, etc.

2.5.5.2. IBM

Set up the systems disk as indicated above, then do the following:

B>A:Kermit

<i>Kermit-80>Set loc on</i>	! Indicate half duplex
<i>Kermit-80>Set ibm on</i>	! Cause line turn around wait
<i>Kermit-80>Set baud</i>	! Will list 15 baud rates - choose 1800

<i>Kermit-80></i>	! Kermit prompt on the micro
<i>Kermit-80>CONNECT</i>	! Connect to the IBM.
	! Set PACX to 13.

The micro will act as a regular terminal from now on. Login as you would normally.

Logging Out

For both the DEC-20 and and IBM systems, logout as indicated for both systems. Then type Control-] C. Control means the control key. You are returned to the micro.

For documentation on Kermit, see above p. 29.

2.5.6. NOTES ON FLOPPY DISKS

Floppy disks (flexible disks, diskettes), provide economical "removable media", i.e., a cheap way to store files offline such that they can be restored at a later time. Floppies consist of a flexible platter mounted permanently inside a square cardboard jacket. The platter turns inside the jacket. The machine's read-write head actually comes in contact with the surface of the platter through a slot in the jacket. The rubbing of the platter against the inside of the jacket and the read-write head can cause the the floppy to wear out after prolonged or repeated use.

The jacket, in turn, is often kept in a paper envelope. The floppy is taken out of the paper envelope and inserted in the drive with its jacket on. Floppies should never be removed from their cardboard jackets. The shiny surface of the disk should never be touched; always handle disks by their jackets. Disks should be stored in a box or solid container. Never have the disks in their drives while the power is being turned on or off. Do not bend the disk, or allow liquids or moisture to come in contact with the disk. Do not place disk where they might be subject to magnetic fields, temperature extremes, dust, or other contaminants. Finally, to not write on the jacket with a ball point pen.

2.5.6.1. STORAGE CAPACITY

One floppy can hold about 160,000 characters (equivalent to about 60 DEC-20 file pages), in up to 64 files.

2.5.6.2. PURCHASE OF FLOPPY DISKS

Users may purchase floppy disks in the User Services Office, 115 Computer Center. CUCCA cannot guarantee that disks purchased elsewhere will be compatible with the SuperBrain.

2.6. PERKIN-ELMER 1100

The Perkin-Elmer 1100 crt terminal is an older terminal which features upper and lower case, but has no APL character set.

2.6.1. DOCUMENTATION

The Perkin-Elmer 1100 manual is available in the Reference Room, 115B, and in the consultant's office in Room 272A.



Photograph 2-12: Perkin-Elmer 1100

2.6.2. TURNING ON THE TERMINAL

The ON/OFF switch is located on the right hand side on the back of the terminal. Press it to the right to turn on the terminal. The terminal will beep and blink if it is working properly. The brightness knob is located just above the ON/OFF switch. Clockwise movement makes the screen darker.

2.6.3. SETTING UP THE TERMINAL

Terminal settings can be made with the terminal on or off, and while you are signed on to the computer. Terminal switches are located in a well beneath the logo plate in the upper right-hand corner of the keyboard and a series of configuration keys is on the left-hand side of the terminal.

2.6.3.1. SWITCHES

Pry up the logo plate to reveal the switches (do not forget to replace it). The back of the logo plate has all the markings necessary for configuring the terminal. Turn it over after removing it, and place it horizontally to correspond to the switches and use it as a guide.

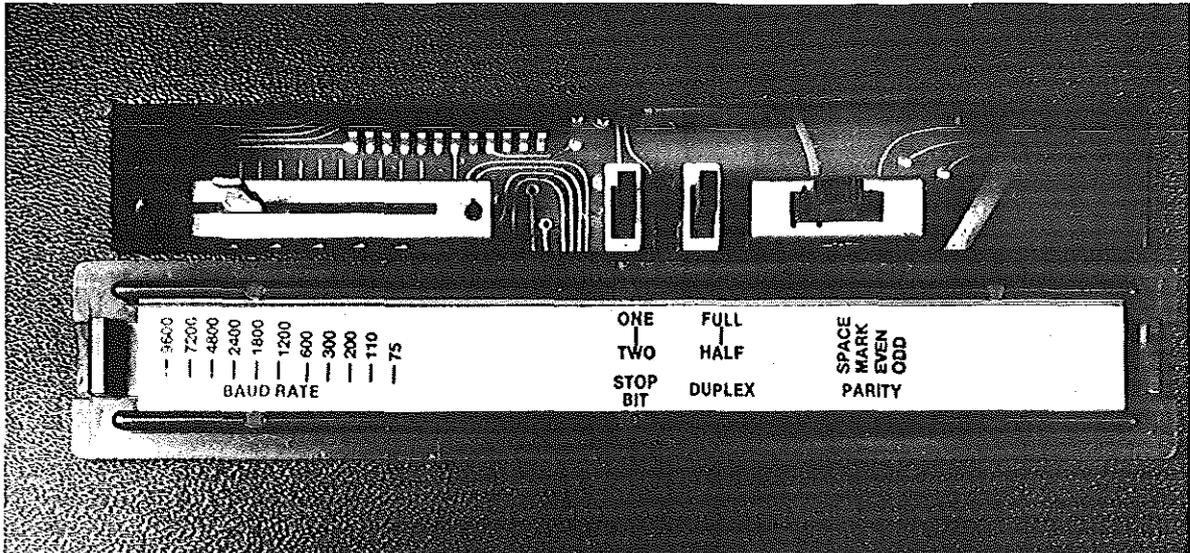
From left to right:

9 7 0 2 1 1	ONE	FULL	S
6 2 0 4 8 2 6 3 2 1			P M E
0 0 8 0 0 0 0 0 0 1 7	TWO	HALF	A A V O
0 0 4 0 0 0 0 0 0 0 5			C R E D
			E K N D
BAUD RATE	STOP BIT	DUPLEX	PARITY

Figure 2-7: Perkin-Elmer 1100 Settings

Usually, all that should be changed on the Perkin-Elmer are the baud rate and duplex.

BAUD RATE	Move switch horizontally, guided by the settings on the back of the logo plate, until it corresponds to the proper settings.
STOP BIT	Leave at ONE (upper) for all systems.
DUPLEX	HALF (down) for IBM 4341; FULL (up) for DEC-20.
PARITY	MARK for the IBM; SPACE for the DEC-20. If you have to change the setting while the terminal is on, press the <i>Clear All</i> button to record the change.



Photograph 2-13: Perkin-Elmer Switches and Logo Plate



Photograph 2-14: Perkin-Elmer Keyboard and Configuration Buttons

2.6.3.2. CONFIGURATION BUTTONS

There are a series of configuration buttons on the lefthand side of the terminal (see photograph 2-14). Important settings are noted in italics. They should be set by depressing them.

<i>LINE</i>	Must be depressed to connect to the computer. The same as the REMOTE function on the HP and Concept terminals.
<i>NEW LINE ENABLE</i>	For the DEC-20, should be in an UP (disabled) position. Should be DOWN (enabled) for the IBM.
BREAK	For use with all systems as indicated. Not a configuration key.
<i>SCROLL ENABLE</i>	Should be depressed for all systems.
U/C	When depressed, will produce only upper-case output.
AUTO LF	Inserts an extra line feed for double spacing.
CLEAR ALL	Clears the screen of all text and leaves the cursor in the upper-lefthand corner and records settings made with the terminal on. Also does a reset on the terminal.
HERE IS	Inoperative on CUCCA systems.
PRINT	Inoperative on CUCCA systems.

2.6.4. COMPLETING CONFIGURATION

Once you have correctly set all the values, replace the logo plate. Press the CLEAR ALL button to initialize the settings. You are now ready to make a connection to the computer through the Gandalf blue box.

2.6.5. TROUBLE-SHOOTING

Problem	Cause/Remedy
No Power	If you accidentally turn off the terminal in the middle of a session, turn it back on; all the settings will remain. Your program should also be intact. Press carriage return or refresh the screen. No power or a loss of power will also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.
Dark Screen	If you cannot see the cursor on screen, the brightness knob may be turned all the way down. Turn it counter-clockwise until cursor appears or screen lightens.
Overwriting lines	Depress the <i>SCROLL ENABLE</i> key.
Cursor does not move	Depress the <i>LINE</i> key.
Upper Case Only	Make sure <i>UIC</i> button on left is in the up position.
Double Spacing	<i>AUTO LF</i> (automatic line feed) button is in the up position.
Everything is correct	Press <i>Clear All</i> to initialize the settings.

2.7. VT101

The VT101, like the Concept-APL8, uses typed-in characters for configuration. It also has a 132 column display capability.

2.7.1. DOCUMENTATION

The VT101 User Guide and Reference Card are available in the Reference Room in the SSIO area. In addition, the VT101 Set-Up Card, listing all the proper values for the settings, is available at each terminal on the reverse side of the keyboard (see photograph 2-16).

2.7.2. TURNING ON THE TERMINAL

The ON/OFF switch is a cylindrical toggle switch located on the left rear side of the terminal. Push it up to turn on the terminal. For adjusting the brightness, see below section 2.7.3.1.



Photograph 2-15: VT101

2.7.3. SETTING UP THE TERMINAL -- SET UP MODES A AND B

There are two set up modes on the VT101; A and B. *You must enter Mode A before Mode B.* Enter Set Up Mode A by pressing the Set-Up key in the upper left-hand corner; it is clearly marked. Enter Set-Up Mode B from Mode A by pressing the number 5 key.

2.7.3.1. SET-UP MODE A

You change the following settings in this mode:

Tabs	The SET/CLEAR tab and CLEAR ALL tabs use the number 2 and 3 keys respectively, as indicated on the main keyboard. To set tabs manually, use the < and > keys on the upper right side of the terminal to set the tabs in the position you want them then press SET/CLEAR. When tabs are set, a "T" will appear above the mode line. Software is available on the DEC-20 to automatically set up the tabs. IBM users may set tabs in Wylbur.
Brightness	Adjust the brightness by pressing the up-arrow and down-arrow keys located on the right side of the upper row of the main keyboard. Press as many times as necessary to achieve the desired brightness.
Local/Online	MUST be set to ONLINE for all systems. Press the number 4 key on the main keyboard to switch between the two modes. The corresponding lights above the keyboard will show which mode you are in.
80/132	Choose between using a normal 80 column width or 132, for wider files. To do this, press the number 9 key. You should immediately see the change in character width on your screen. To get back to 80 columns, press 9 again.

2.7.3.2. EXITING SET-UP MODE A

When first configuring your terminal, you must enter Set-Up Mode B before exiting Set-Up Mode A. If you have already configured your terminal however, and simply want to enter and exit from Set-Up Mode A, press the Set-Up key, as indicated on the terminal screen.

2.7.3.3. SET-UP MODE B

To enter Set-Up B mode from Mode A, press the number 5 key on the main keyboard. Seven settings will appear along the bottom of the screen. The four left most settings vary

between 0 for off and 1 for on. Using the < and > keys, position the cursor directly over the setting, then use the Toggle I/O key (the number 6 key) to vary between 0 and 1. Only the fourth block, third position, Duplex need be changed for the different systems. All others should be left at the following settings:

```

0101  0010  0000  0010 (for IBM)
                   0000 (for DEC-20)

```

Figure 2-8: VT101 Set-Up Mode B--Four Left Fields

The three right fields are displayed as follows:

```

P= 7M  T= 1800 R= 1800 (for IBM)
P= 8N  T= 4800 R= 4800 (for DEC-20)

```

Figure 2-9: VT101 Set-Up Mode B--Three Right Fields

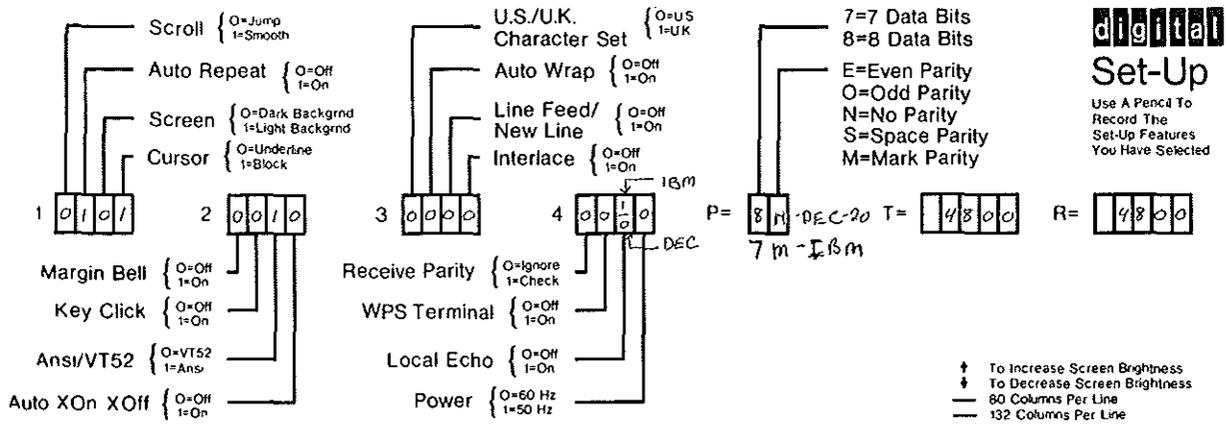
Parity (P=)	Set to 8N (8 No parity for the DEC-20) by pressing the <i>shift</i> key and then depressing the P key until the proper value appears. Set to 7M (7 Mark) for the IBM in the same manner.
Baud Rate(T=/R=)	Press the number 7 key to alter the <i>transmit</i> speed and the number 8 to modify the <i>receive</i> speed. These must be synchronized. Keep depressing these keys until the desired values appear.

2.7.3.4. EXITING SET-UP MODE B

As instructed on the screen, you exit this mode by pressing the Set-Up key again. If you wish to return to Set-Up Mode A, press the number 5 key on the main keyboard. You may reenter Set-Up mode A at anytime by pressing the SETUP key.

2.7.4. RESETTING THE TERMINAL

If you want to reset the terminal to its settings when it was first turned on, while in either A or B configuration mode press the RESET key (numeral 0) in the keyboard.



Answer Back:

Tabs:

1618499 01

Photograph 2-16: VT101 Set-Up Card

2.7.5. OPTIONAL FEATURES

2.7.5.1. 80/132 COLUMN DISPLAY

You may change the display width from the 80 columns, which is the default, to 132 columns, for typeout or editing. See above p. 39 for instructions.

2.7.5.2. REVERSE VIDEO

The VT101 has a reverse video mode that is very easy to set. Most terminals offer only white characters on a dark background. This is the default for the VT101, but you can also invoke reverse video mode, i.e., dark characters on a white background. Do this in SET-UP Mode B, setting the fourth field in the first block of boxes to 1, i.e., 0111. Turn off the reverse video by setting it back to 0. It is not a part of the standard configuration procedure; it does not appear on the mode line nor does it affect the operation of the terminal.

2.7.6. TROUBLE-SHOOTING

Problem	Cause/Remedy
No Power	If you accidentally turn off the terminal in the middle of a session, turn it back on; all the settings will remain. Your program should also be intact. Press carriage return or refresh the screen. No power or a loss of power may also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.
No Repeating Action	In Set-Up Mode B, check the first field, second box. Should be set to 1 for ON.
Keyboard Lock	If XOFF is not set, that is, if XON is accidentally enabled, you will lock the keyboard and will not transmit characters. You will have some trouble connecting to the IBM. The <i>Keyboard Lock</i> light will go on. If this happens, you must set XOFF. The XON/XOFF (handshaking) parameter is in the second block of boxes in Set-UP Mode B, in the fourth or last field. See the diagram above in section 2.7.3.3. It should be set as follows: 0010 -- the last 0 meaning XOFF is enabled.

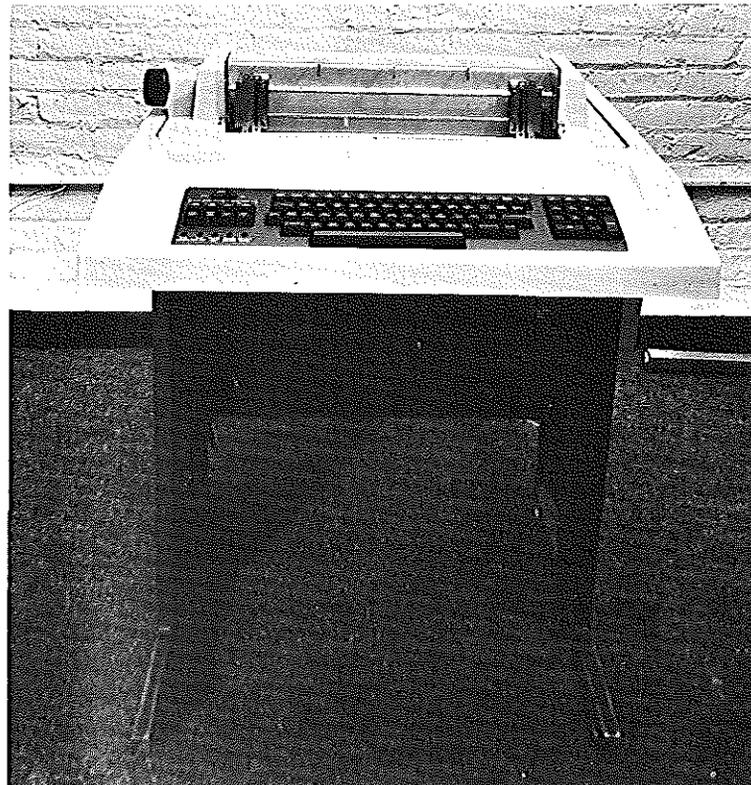
CHAPTER 3 HARDCOPY TERMINALS

3.1. DECWRITER LA36 MATRIX PRINTER

The DECwriter is the most widely-used hardcopy terminal available at CUCCA. The printing element forms tiny dots which together produce the likeness of the keyboard character set. CUCCA provides the standard continuous-form, pin-feed type paper in size 11x14 inches for these terminals. The DECwriter LA36 matrix printer offers upper-lower case, 110, 150 and 300 Baud rates, and an APL character set.

3.1.1. DOCUMENTATION

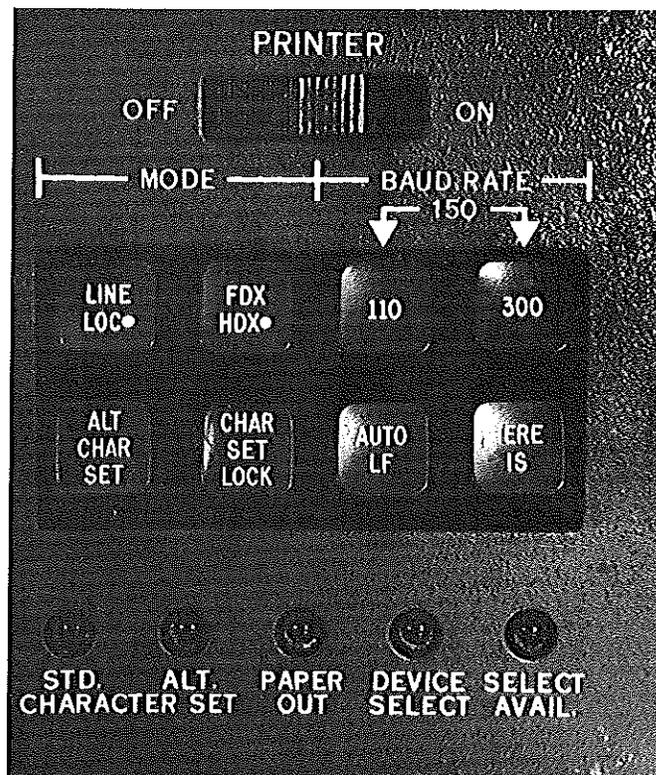
A copy of the LA36 DECwriter manual is available in the Reference Room in the SSIO area.



Photograph 3-1: LA36



Photograph 3-2: LA36 Keyboard



Photograph 3-3: LA36 Switches

3.1.2. PAPER

The paper for the DECwriter is fed into the roller from a box located under the terminal on the floor. Please make sure the paper is held firmly by the tractor. After your session is finished, tear off the paper by rotating the roller on the left-hand side until the perforation is visible. If there is no paper in the terminal or the ribbon is very faded or otherwise mangled, please inform Systems Assurance.

3.1.3. TURNING ON THE TERMINAL

The DECwriter is an extremely easy terminal to operate. All the switches are located on the left side of the keyboard and are clearly marked.

The ON/OFF switch is clearly marked and should be pushed to the right to turn on the terminal.

All the other switches are the push-to-set type. The dot on the switch indicates the function of the switch when depressed. Please note those settings in italics.

3.1.4. SETTING UP THE TERMINAL

<i>LINE:LOC</i>	UP for computer usage; DOWN for local usage.
ALT CHAR SET	UP for ASCII; DOWN for APL.
CHAR SET LOCK	To lock terminal in current character set. DOWN to lock, UP to unlock.
<i>FDX/HDX</i>	UP is FULL DUPLEX for the DEC-20; DOWN is HALF DUPLEX for the IBM.
HERE IS	INOPERATIVE.
110	IN for 110 Baud Rate. Baud Rate switch 300 should be in the up position.
300	IN for 300 Baud Rate. Baud Rate switch 150 should be in the up position. To establish a 150 baud rate both the 110 and 300 switches should be down.
AUTO LF	DOWN for double spacing; UP for single spacing.

Special Note on the PACX Gandalf Blue Box

PACX boxes are usually attached to the DECwriter terminals on the right hand side of the base.

3.1.5. TROUBLE-SHOOTING

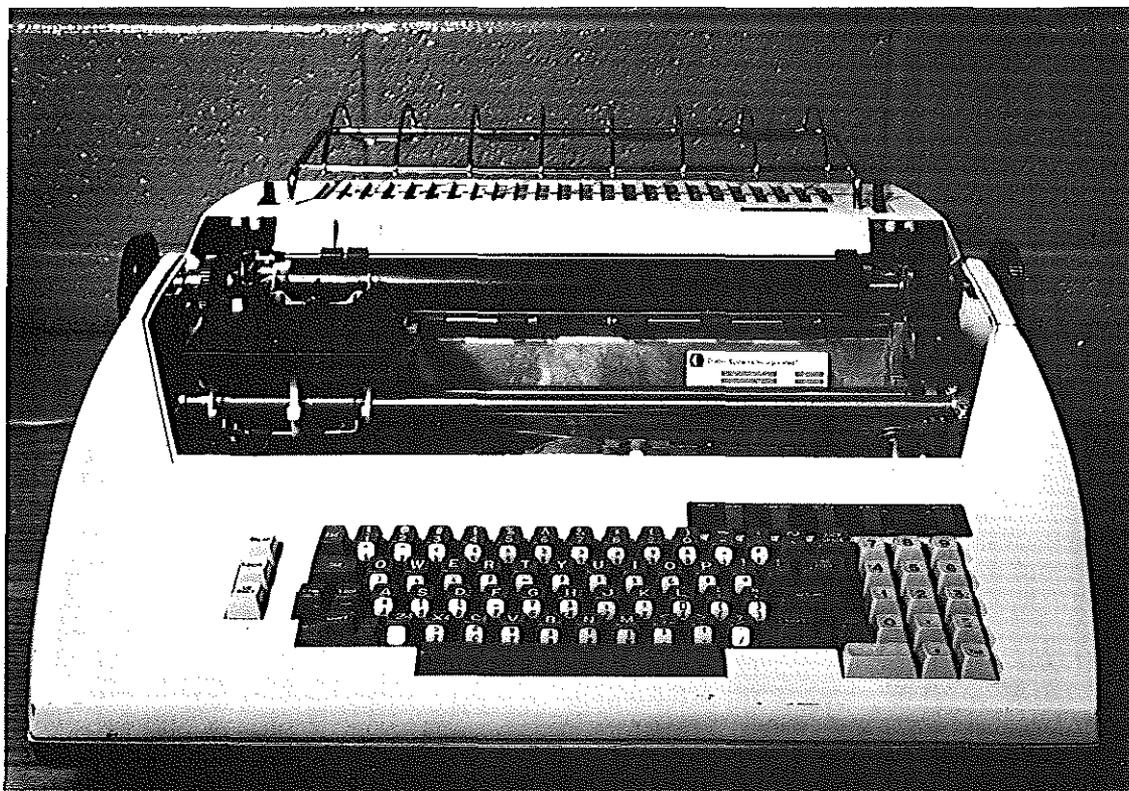
Problem	Cause/Remedy
No Power	If you accidently turn off the terminal in the middle of a session, turn it back on; all the settings will remain. Your program should also be intact. Press carriage return or refresh the screen. No power or a loss of power may also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.
Bad Ribbon	If the ribbon is too light or otherwise mangled, please report it to Systems Assurance, 280-3100.
No Paper	Please report to Systems Assurance, 280-3100.

3.2. DIABLO 1620 HYTERM PRINTER

The Diablo 1620 terminal is a letter-quality printer which is used to print final copies of essays, dissertations, etc. The quality of Diablo output is comparable to that of an electric typewriter. Unlike most hardcopy terminals at CUCCA, the Diablo has been modified to run at 1200 as well as 300 baud. The higher speed will expedite your work. To use this terminal you must purchase a print wheel and ribbon available in the User Services Office, Room 115, Computer Center (see below section 3.2.2). The Diablo terminal is located in Room 272A Engineering Terrace.

3.2.1. USAGE POLICY AND SCHEDULING

The Diablo should not be used in lieu of a crt terminal but expressly as a printer. A log book is maintained in Room 272A for scheduling purposes. Access is on a first come, first served basis, but users are encouraged to reserve a time slot in advance. Time slots are limited to a maximum of 1 1/2 hours of consecutive usage if others are waiting. Demand is usually very heavy at the end of the semester.



Photograph 3-4: Diablo 1620

3.2.2. DIABLO SUPPLIES

A print wheel and ribbon cartridge can be purchased from CUCCA's User Services Office, Room 115, in the SSIO area during working hours. Payment can be made through a requisition, charged to a project number, or with cash. No checks are accepted.

3.2.2.1. PRINT WHEELS

Two print wheels are made available by CUCCA. The standard Courier 72 wheel which can be used in 10 (wider spacing) or 12 pitch (pinched spacing) is currently priced at \$9.00. The Pica 10 wheel, which can only be used in 10 pitch, and has smaller print than the Courier wheel, is currently priced at \$12.00. Please note that these prices are subject to change. Many other wheels are available, and wheels can be made for special applications (see immediately below).

3.2.2.2. RIBBONS

Users may purchase a multiple pass (reusable) cloth ribbon (black) for \$5.00, or a single pass carbon ribbon (black) for \$8.00. A carbon ribbon has a 360,000 character capacity (*character*, not word), approximately 300-350 double spaced typewritten pages. Carbon ribbons tend to snap, so it is best to have a cloth or another carbon ribbon available. Exchanges are made on defective ribbons. The ribbon is finished when a series of colored x's appear. You also can check the top of the ribbon to see how much has been used. For further information on ribbons see below, p. 54. Ribbons are also available in a variety of colors. Please refer all inquiries about special Diablo supplies to the Matrix Computer Corp., 45 West 34 Street, New York, New York 10001, 564-2464. You may also contact the Xerox Corporation directly.

3.2.3. PAPER

CUCCA supplies scrap output paper, the standard continuous-form, pin-feed type in size 11x14 inches for login and logout procedures. All other paper must be supplied by the user. Do not print directly on the platen; always print on paper.

3.2.4. AN IMPORTANT WARNING ABOUT DIABLO USAGE

The front cover plate has been removed in order to facilitate usage with several computers. Warning messages are printed inside the terminal chassis. Please keep your fingers, pens, etc. out of this area. The Diablo print head can move very quickly: if a glitch character is encountered during transmission or receiving, if a system goes down, or there is difficulty in attaching to a PACX line during the login procedure, the print head



Photograph 3-5: Diablo 1620 Keyboard

occasionally moves from the initial left margin to the far right margin with great speed.

Do not have anything in its path. Do not put anything in the corridor formed by the print head moving in either direction along the guide bar. Injury may occur.

3.2.5. BEFORE TURNING ON THE TERMINAL

Print Wheel and Ribbon Installation

To prepare the terminal for operation, first install the print wheel and ribbon cartridge. These two operations must be done with the terminal power off (power light will be off). NEVER attempt to install these items when the power switch is ON.

All CUCCA consultants have been instructed in the proper use of the Diablo. Please ask the consultant how to install the ribbon and wheel as well as how to handle the feeding and alignment of paper.

3.2.6. SETTING UP THE TERMINAL

There are three control panels on the Diablo, all of which should be checked before use.

3.2.6.1. INSIDE CONTROL PANEL

Note: These switches should be set with the terminal off.

Because of poor design, these switches are located within the housing of the terminal. The cover plate has not been installed so that you may have access to these switches. All

switches are clearly marked. Please note those in italics.

- FORM LENGTH Should be kept at 11, but can be set to 14 for legal size sheets.

- SPEED* Controls the baud rate. *Must* initially be set to 30 (300) baud for all systems. It can be changed to 1200 by using another switch. See below 3.2.7

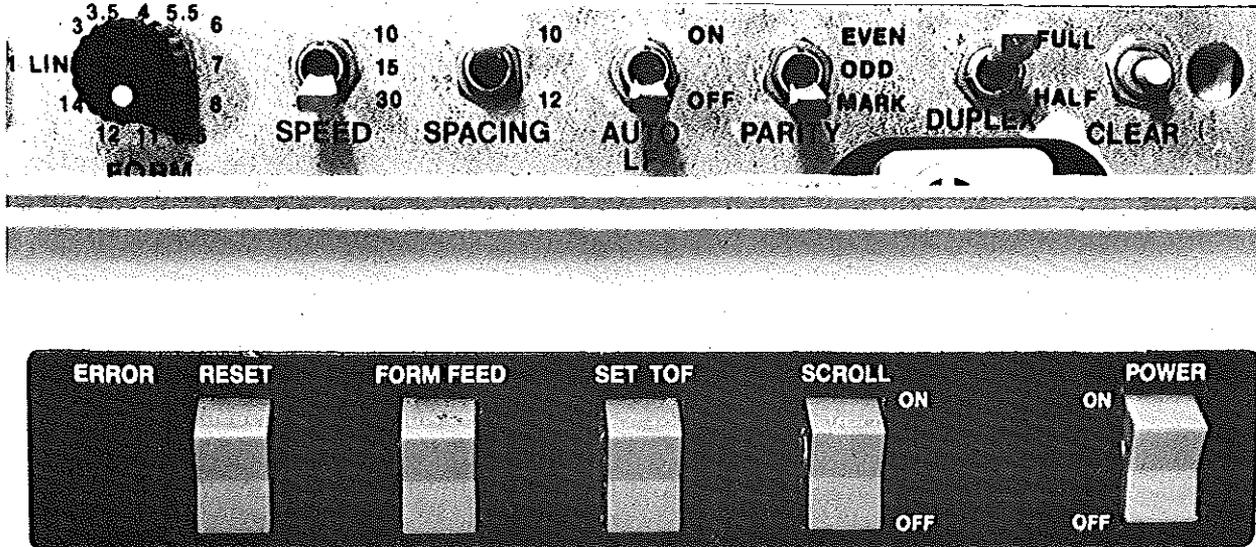
- SPACING* This controls the pitch or spread of the characters being printed; 10 is regular and 12 is pinched for the standard Courier 72 wheel. Some text formatting programs (SCRIBE) ignore this parameter.

- AUTO LF Set ON for terminal controlled double spacing; OFF for single spacing.

- PARITY* Leave at *MARK* for all systems.

- DUPLEX* *FULL DUPLEX* for DEC-20; *HALF DUPLEX* for IBM 4341.

- CLEAR (Red Button) Clears settings and moves print head back to left margin. Should be used to reset the terminal only after pressing the *Reset* button, since it will interrupt the program. See section 3.2.11.



Photograph 3-6: Diablo Inside and Right Control Panels

3.2.7. CHANGING THE BAUD RATE

CUCCA has installed a special switch to enable you to use the Diablo at 1200 instead of 300 baud.

NOTE: Please be aware however, that the baud rate switch on the inside control panel *must* be set initially to 30 for either system. The Diablo terminal may only be used reliably at 1200 baud in conjunction with specifically designed programs. The Diablo program on the DEC-20 is the only such program supplied by CUCCA. If you are experiencing problems at 1200 baud, it is advisable to switch back to 300 baud. DEC-20 users must reset the speed of the terminal before using this switch.

The 1200 baud toggle switch is located under the keyboard on the left side of the terminal. It is clearly marked for both speeds; DOWN for 300 baud; UP for 1200 baud.

3.2.8. TURNING ON THE TERMINAL

Only after setting the above switches and installing the print wheel and ribbon should the terminal be turned on. The ON/OFF switch is the red rocker switch on the upper right hand side of the terminal. Press it to the ON position.

3.2.8.1. RIGHT CONTROL PANEL--RED ROCKER SWITCHES

Several red rocker switches which provide more terminal control are located on the front panel above the keyboard and to the right (see photograph opposite).

ERROR LAMP	A red light to indicate a problem with the software or terminal.
RESET	To be depressed once the error lamp is lit to clear the error condition and extinguish the light. For more information on error recovery see below, 3.2.11.
FORMFEED	Primarily for use with forms tractor which is not supplied in Room 272A.
SET TOF	Used with Formfeed.
SCROLL	ON or OFF; leave off.
POWER	ON or OFF. The main power switch.

NOTE: Because the front cover plate is not installed, the white cover button located directly in the middle of the terminal must be kept in the middle position (it will lock). If this button is in the down or up positions, the terminal will not operate.

3.2.8.2. LEFT CONTROL PANEL

Three buttons are located on the left side of the terminal. They should be used as follows:

Break	For use with all systems as indicated.
Local	UP for computer usage; DOWN for local usage. The button should only be depressed if you wish to use the Diablo as an electric typewriter.
UC Only	When depressed prints only in upper case.

3.2.9. IMPRESSION CONTROL SWITCH

To the right of the inside control panel is a black toggle switch which controls the print impression. It ideally should be set to the center for medium intensity for normal printing. If your copy is too light, set it to the up position for high intensity; to the down position for low intensity or lighter printing.

3.2.10. PRINTER CONTROLS

The controls on the Diablo are almost identical to a typewriter.

- Platen Knobs: To manually rotate the platen, as with a typewriter. Used to insert and correctly position the paper.
- Platen Adjust Lever: Depending on the thickness of the paper, or the number of carbons desired, this should be set to A for one sheet, or B-E for additional sheets.
- Paper Bail Levers and Paper Bail: The paper bail holds the paper against the platen. To insert paper, pull the lever forward. Position the rollers across the page. Do not forget to push the paper bail back into place after inserting the paper.
- Paper Release Lever: To reposition the paper, pull forward. To secure paper in the platen for printing, push back.

3.2.11. RESETTING THE TERMINAL AND ERROR RECOVERY

Reset Button

When the *Error* lamp is lit an alarm will sound. Press *Reset* to clear the condition. The terminal settings, i.e., baud rate, duplex, etc. remain the same. See below "Trouble-shooting."

Clear Button

The red *Clear* button located on the right most side of the inside of the control panel resets the terminal to the original settings. The print head is returned to the left. It should be used to clear a printer check error, or when the *Reset* button does not extinguish the error light. Be aware however that the *Clear* button can clear all the software settings, although it leaves the baud rate etc. as set. It should be used only if pressing the *Reset* button does not clear the condition.

3.2.12. TROUBLE-SHOOTING

There could be a number of reasons why the error light is lit and the alarm sounds. At times, it could be an erroneous error message which really does not require pressing the *Reset* button, i.e., you could continue with the error lamp lit. However, to be safe you should press *Reset* to extinguish the light. What follows is a brief summary of the most common problems.

Problem	Cause/Remedy
Computer Does Not Respond	Check all the important settings, but be particularly mindful of the <i>Local</i> switch on the left control panel. Make sure it is in the up (disabled) position. Also check the white cover button, and make sure it is in the middle position.
Error light lit while logging in	While trying to log in, the error light goes on. This is usually not a fatal error; press <i>Reset</i> . If this does not correct the problem, check the cover button (the white button) on the inside of the terminal. TURN OFF THE TERMINAL and lock the button in the middle position. After placing it in the middle position, turn the terminal back on, press <i>Reset</i> to extinguish the light or if necessary press <i>Clear</i> button. Settings will remain.
Paper scrolls Continuously	When logging in, the paper may not stop scrolling. Press the <i>Reset</i> button if the lamp is lit. Failing that, press the <i>Clear</i> button to return to print head to its original position and proceed as usual.
Power Off	If you accidentally turn off the terminal in the middle of a session, simply turn it back on; all the settings will remain. Your program however may not remain.

The following problems will cause the Error lamp to light and the alarm to sound.

Ribbon Ended

When using a single-strike film ribbon, a series of colored x's will appear to signal the end of the ribbon. You should also check the window on the top of the ribbon. You can only print a few more pages after seeing the x's. If possible, *replace the ribbon when the Diablo stops* by pressing LOCAL and removing the cartridge. If, unfortunately, the ribbon reaches the end in the middle of a program, the Error Lamp will light and the alarm will sound. Put the terminal in LOCAL, replace the ribbon and press *Reset*, and your program should continue exactly where it left off, so be sure to position your paper correctly.

Printer Overflow

You have overflowed the buffer, possibly because the baud rate is too high. Press *Reset* and continue. If this does not correct the problem, lower the baud rate.

Printer Check

Press the *C/ear* button. You will have to restart the program.

If you are unable to solve the problem, please talk with the consultant.

CHAPTER 4 GRAPHICS TERMINALS

4.1. HEWLETT-PACKARD 2623A

The HP 2623A graphics terminal physically resembles one of the many HP 2621A and National terminals found at campus terminal sites. However, the HP 2623A is a graphics terminal. It contains both an alphanumeric and a graphics display memory. The 2623A has a built-in heat copier, which is capable of copying both the alphanumeric and the graphics memory. The resolution of the graphics memory is 512 pixels across by 390 pixels up and down the screen. In graphics mode, characters can be plotted in one of 8 different sizes and at various slants, although there is only one hardware font available.

A certain level of competence is assumed for those using this and other graphics terminals. Thus, we will cover only the most basic configuration information. Users should consult the HP manual available in room 272A Mudd.

The Hewlett-Packard graphics terminals and plotters were donated to CUCCA by an alumnus employed by Hewlett-Packard.



Photograph 4-1: Hewlett-Packard 2623A

4.1.1. DOCUMENTATION

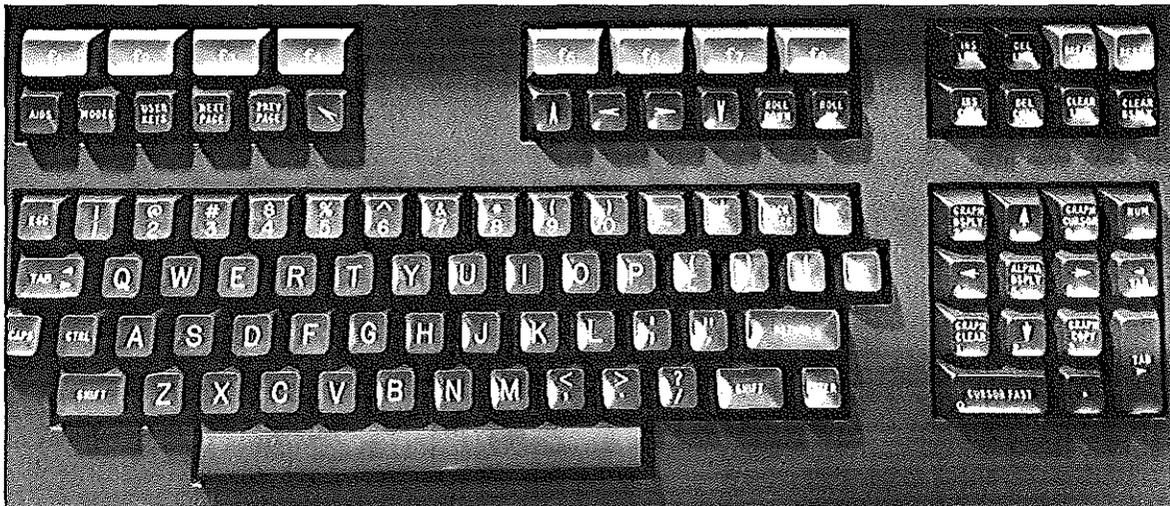
The HP 2623A user manual is available in the consultant's office in 272A Mudd. The HP Graphics Plotter Operating and Programming manual is also available. The consultant can assist you in the operation of the terminals.

4.1.2. A SPECIAL NOTE ON BAUD RATES

The HP 2623A can be used at 4800 baud for the DEC and 1800 for the IBM. However, when used in conjunction with the pen plotter (see below 4.2), it must be set to 1200 baud for both systems.

4.1.3. TURNING ON THE TERMINAL

Like the other HP terminals, the ON/OFF switch is a wide black rocker switch on the back right side of the terminal. Push it to the right to turn on the terminal.



Photograph 4-2: Hewlett-Packard 2623A Keyboard

4.1.4. SETTING UP THE TERMINAL -- CONFIGURATION MODES

There are several terminal configuration menus which are accessed via the function keys F1 through F8 (Fn keys) located on the top row of the keyboard. Each of the Fn keys corresponds to one of the 8 lit windows along the bottom of the screen. There are three top nodes in the setup menu, selected by the AIDS, MODES, or USER keys. Unless you program your own functions into the Fn keys, you should only be concerned with the AIDS

and MODES menus. Furthermore, unless someone before you has changed all of the default modes, you should be concerned with only a few settings.

The Mode Labels are displayed initially. If no windows are lit, press the AIDS or MODES keys on the upper left-hand side of the terminal.

4.1.4.1. TERMINAL CONFIGURATION MODE

Enter Terminal Configuration mode by pressing the AIDS key, which displays the AIDS mode. Within this menu are two sub-menus, Terminal Configuration and Datacomm. After pressing the AIDS key, press F8 (CONFIG KEY), followed by the F5 (TERMINAL CONFIG KEY). Remember each key corresponds to a lit box on the bottom of the screen.

This places you in *terminal configuration mode*, clearly specified at the top of the screen. The only setting you should be concerned with here is *Local Echo* (duplex). Set to OFF for the DEC-20 and ON for the IBM.

To change any of the fields, move the cursor with the local cursor controls keys which are the left, right, down and up arrow keys located just under the row of Fn keys on the right side. You may also use the Tab and Backtab keys. Position the cursor in the window of choice. Change the values by using the F2 (NEXT CHOICE) or the F3 (PREVIOUS CHOICE) keys to alter the field. Depress the keys repeatedly until the proper setting appears.

All other settings should appear as specified on p. 5-5 of the HP User Manual. They should not be changed. If you accidentally change the settings, follow the instructions above.

4.1.4.2. SAVING THE SETTINGS AND EXITING

When you have correctly set the parameters in this menu, you must *save* them. Press the F1 (SAVE CONFIG) key to save the settings.

Then press the AIDS key again to choose the next menu.

4.1.4.3. DATACOMM CONFIGURATION MODE

After pressing the AIDS key, you must choose the Datacomm menu. Press the F8 and then the F3 keys and the menu will be displayed. In Datacomm Configuration mode you set baud rate and parity. All other settings should remain as shown on p. 5-6 in the User Manual.

The settings are changed the same way as in terminal configuration mode described directly above. Place the cursor under the field and press the F2 and F3 keys until the desired values appear. Please note the following settings.

Baud Rate	Usually, the terminal should be left at 1200 baud, which is good for both the DEC and IBM systems. This is also the maximum speed at which the plotter runs, and the two <i>must</i> be synchronized. If you are not using the plotter, you may set the baud rate to 4800 for the DEC and 1800 for the IBM by positioning the cursor under the values and pressing the F2 and F3 keys.
Parity	Set to NONE (the default) for all systems. It should not have to be changed.

4.1.4.4. SAVING THE SETTINGS AND EXITING

Press F1 (SAVE CONFIG) to save the settings. Press the AIDS key again to enter the next menu if necessary.

4.1.4.5. GRAPHICS MODE

To place the terminal in graphics mode, press the ALPHA DISPLAY key followed by the GRAPH DISPLAY key, both of which are located on the numeric pad on the right side of the terminal. These two keys toggle their respective modes.

Note: If keys on the numerics pad only prints digits, press the NUM key so that the graphics control functions are enabled.

4.1.4.6. RESETTING THE TERMINAL

There are two kinds of resets for this terminal. A Soft reset is achieved by pressing the *Reset* key on the right side of the terminal. All the software settings remain, but the keyboard is unlocked. This should be done if you are having trouble in graphics mode.

A Hard reset is achieved by pressing the Control key while holding down the Shift and Reset keys. All of the settings are put back to the default, i.e., the way they were when the terminal was turned on. All data in the display is destroyed. Most problems are related to the plotter; see section 4.2.5

4.1.5. TROUBLE-SHOOTING

Problem

Cause/Remedy

No Power

If you accidentally turn off the terminal in the middle of a session, turn it back on; all the settings will remain. Your program should also be intact. Press carriage return or refresh the screen. No power or a loss of power may also occur if the unit is not plugged in. Check the power cord. If the terminal is plugged in and powered on and there still is no power, the fuse may have blown. Report the condition to Systems Assurance, ext. 3100.

Keyboard Locked

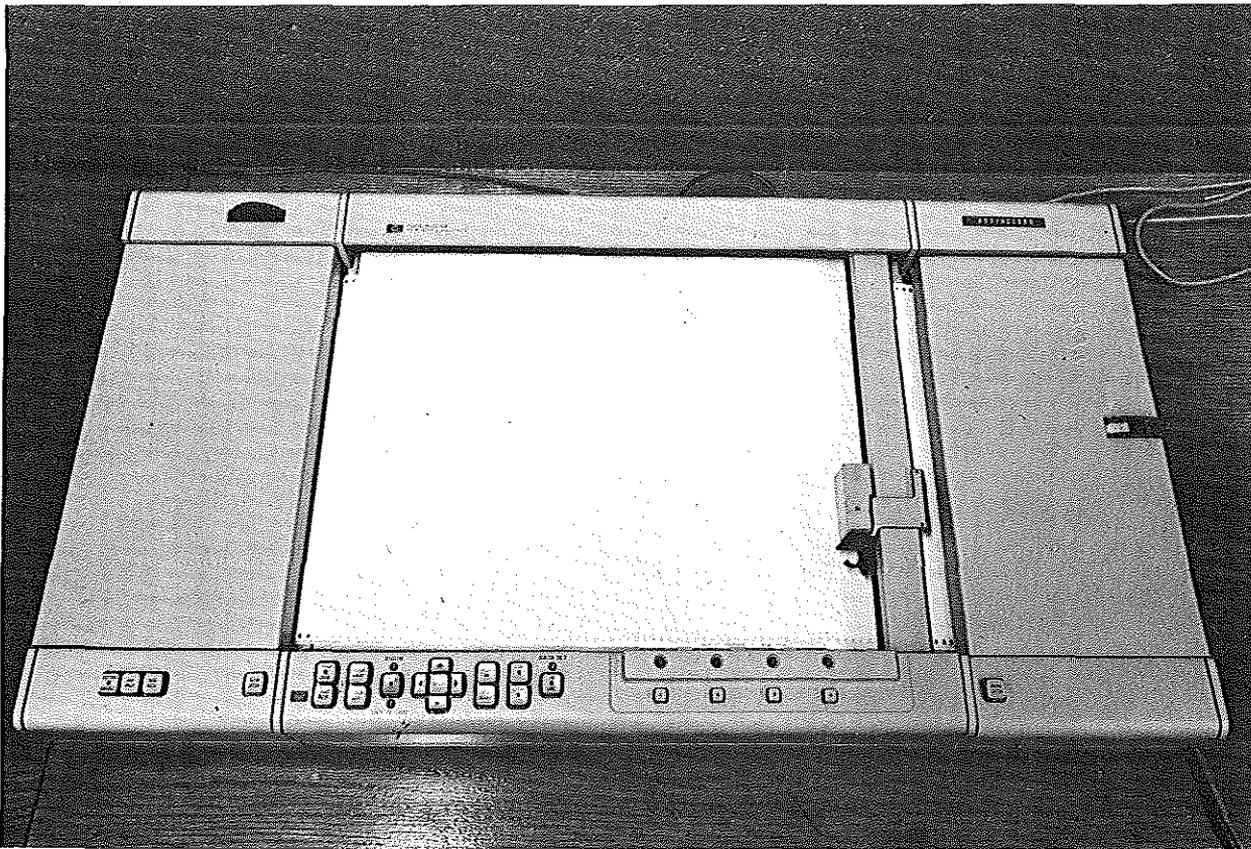
Press Reset.

4.2. HEWLETT-PACKARD 7221S GRAPHICS PLOTTER

The HP four-color pen plotter is currently connected to the HP 2623 graphics terminal. Baud rates for the 2623A and the plotter must be synchronized and not set to more than 1200 baud.

4.2.1. DOCUMENTATION

The HP 7221S plotter Operating and Programming Manual manuals are available in the Reference Room in the SSIO area and in 272A Mudd.



Photograph 4-3: Hewlett-Packard 7221S Graphics Plotter

4.2.2. PLOTTER SUPPLIES

4.2.2.1. PENS

Pens may be purchased for \$1.50 each in Room 115 in the SSIO area. Available colors

are black, red, blue and green, in .3mm or .7mm widths. Prices are subject to change.

4.2.2.2. PAPER

Rolled paper is provided in the plotter room. You may also purchase special paper in Room 115. Gridless paper in sizes 8 1/2 x 11 and 11 x 15 1/2 is also available.

4.2.3. TURNING ON THE PLOTTER

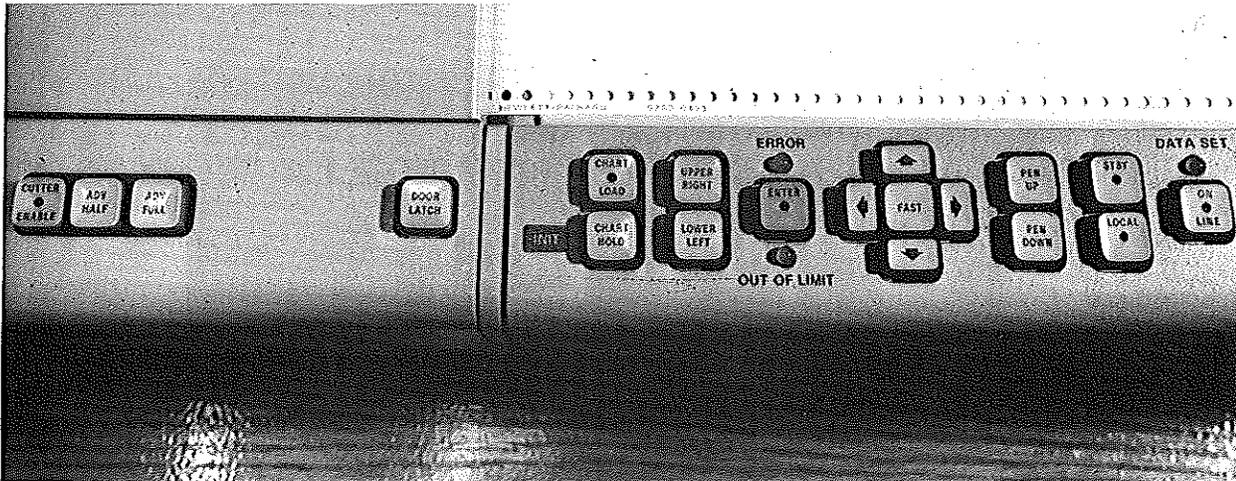
The power switch is located underneath the front panel. Push it in to turn on the plotter.

4.2.4. SETTING UP THE TERMINAL

The plotter can be in one of three basic modes:²

1. Plotter is powered off. An internal relay within the plotter connects the host computer directly to the terminal. The plotter never sees incoming or outgoing data. The host computer may operate at any baud rate that the terminal and modem allow. This is not the case when the plotter is powered on.
2. Plotter is powered on but not in plot mode. The plotter, when powered on, passes data between the host computer and the terminal in the same way as when the plotter is turned off, with two exceptions: (1) Since the plotter is now powered up, it is actually interpreting the incoming data from the host computer. Therefore, the baud rate setting in the back of the plotter is significant. This setting should be left at 1200 baud all the time, as should the terminal and the host computer, to avoid confusion. (2) Since the plotter is interpreting data when it is powered on, it can at any time intercept a "plotter on" instruction from the host computer, at which point the plotter is in mode 3 below.
3. Plotter is powered on and in plot mode. At this point, the plotter will intercept and interpret all incoming data from the host computer as plot data up to the next "plotter off" command. The only thing seen at the terminal at the time a "plotter on" instruction is sent is the "plotter on" instruction itself. All other data following the "plotter on" instruction is intercepted by the plotter and is not passed to the terminal until a "plotter off" instruction is sent.

²The sections on the operation of the 7221S were written by Ken Rossman.



Photograph 4-4: Hewlett-Packard 7221S Front Control Panel

4.2.4.1. MANUAL CONTROL

There are several buttons for manual control of the plotter on the top of the front panel of the plotter. Their functions are all listed in detail in Chapter Two of the HP User's Manual. They are briefly listed here (from left to right on the plotter):

Cutter Enable	Enables/disables the built-in paper cutter, which cuts the roll paper when one of the paper advance buttons is pressed.
Adv Half	Advance (optionally cut) roll paper in half size sheets (8 1/2 by 11 inch sheet).
Adv Full	Advance (optionally cut) roll paper in full size sheets (11 by 17 inch sheet).
Door Latch	One for each end door. The left door latch is for the takeup spool door, and the right door latch is for the paper supply roll door.
Chart Load	Pressing this button while there is no roll paper in the plotter turns off the electrostatic paper hold so that a single sheet of paper may be inserted onto the plotter bed.
Chart Hold	After a single sheet of paper has been inserted in the appropriate position on the plotter bed, pressing this button actuates the electrostatic paper hold. If the Enter key is pressed prior to pressing this button, the plotter goes through its hardware initialization sequence instead.

Upper Right	Move plotter arm to current upper right corner of plotting area. If the Enter key is pressed prior to pressing this key, the plotter sets the current arm position to be the new upper right corner of the plotting area.
Lower Left	Move plotter arm to current lower left corner of plotting area. If the Enter key is pressed prior to pressing this key, the plotter sets the current arm position to be the new lower left corner of the plotting area.
Enter	Enables alternate functions for some keys. When the Enter key is pressed, the light in the center should start flashing and continue to do so until another key is pressed which executes the alternate function.
Pen position controls	The four buttons grouped around a larger button marked "fast" are for manually positioning the plotter arm. Pressing one of the buttons with the arrows on them moves the plotter arm in that direction at the rate of 4.8 mm/sec. Holding two adjacent direction buttons will move the arm in a 45 degree angle between the directions specified by the arrows. Pressing the "fast" button in conjunction with any of the direction buttons causes the plotter arm to move in the specified direction at a rate of 93.2 mm/sec. If the plotter is in LOCAL mode and the Enter key is pressed prior to pressing one of the direction keys, a rotation angle is stored in the plotter causing subsequent relative plots to be referenced in the direction of the arrow.
Pen Up	Raise pen arm off of the paper.
Pen Down	Lower pen arm on to paper.
Stby	Standby mode. When this button is pressed, the light in the center of the button comes on, the plotter buffer is cleared of all unexecuted instructions, and the plotter passes all data between the host computer and the terminal unaltered. The computer no longer has program control over the plotter.
Local	Local mode. When this button is pressed, the plotter is "listening" solely to the terminal. The light in the center of the button comes on and any instructions currently in the plotter buffer continue to be executed until the buffer is empty. The host computer is disconnected from both the plotter and the terminal. The plotter interprets instructions coming from the terminal keyboard directly. If this button is pressed repeatedly, the plotter goes alternately into and out of "plotter on" mode. This is indicated by the light flashing when in "plotter on" mode. Graphics instructions from the terminal are interpreted by the plotter only when in "plotter on" mode (i.e., when the light is flashing).

On Line Plotter on line mode. When this button is pressed, the plotter is "listening" to the host computer. The light in the center of the button comes on and if the button is pressed repeatedly, the plotter alternates between "plotter on" mode and "plotter off" mode, as indicated by the light flashing when in "plotter on" mode. Any graphics instructions currently in the plotter buffer continue to execute uninterrupted.

Pen select buttons The four buttons marked with the digits 1 through 4 are the pen select buttons. Pressing one of these buttons causes the plotter arm to pick up the corresponding pen, returning any pen it already had to its stall. Pressing the Enter key prior to pressing one of these keys has the effect of returning the pen to that stall if the stall is empty, and not picking up another pen.

Almost all of the above functions can be done under computer control, thus allowing the user to maintain full interactive control over the plotter from the terminal.

4.2.5. TROUBLE-SHOOTING

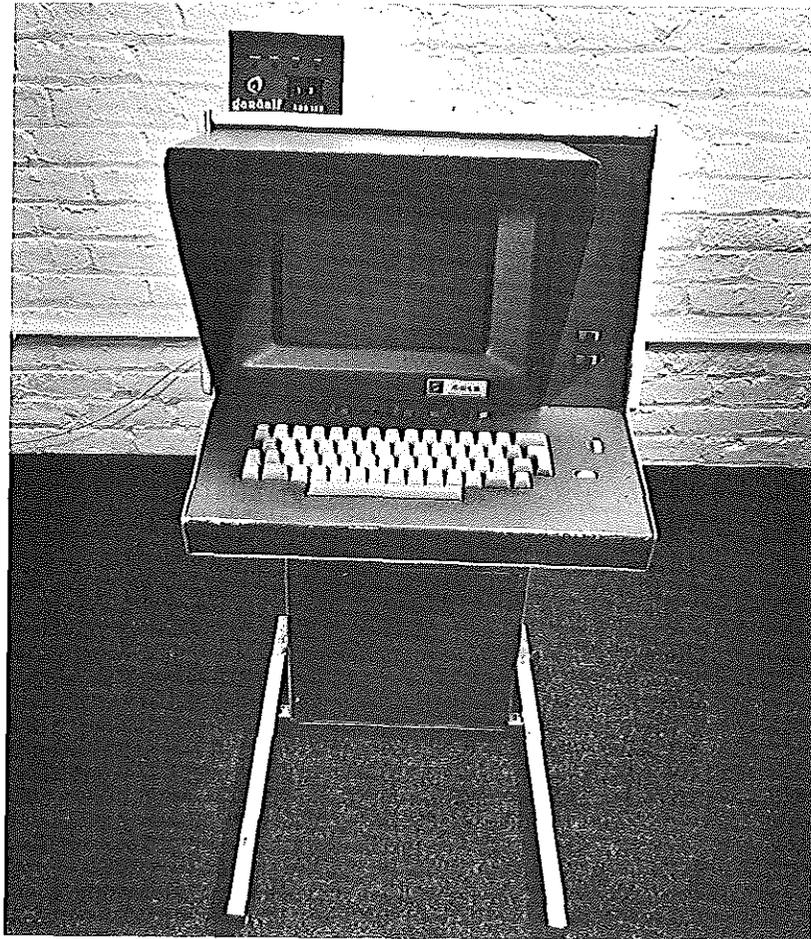
Problem	Cause/Remedy
2623 Does Not Respond	The plotter may be in plot mode. All communications are cut off. Press the <i>Standby</i> switch to turn it off. Don't forget to put the plotter back ONLINE when you want to use it.

4.3. TEKTRONIX 4013

The Tektronix 4013 terminals are distinguished by their green color screen. They are storage tube type terminals, which means that nothing can be erased from the screen without clearing it entirely. The 4013 provides the extremely fine resolution necessary for graphic displays. CUCCA currently has two Tektronix model 4013 terminals located in the SSIO area. These terminals have an APL character set. Graphics are printed on the Tektronix 4631 hardcopy unit explained below in section 4.4. This terminal is used in the same manner as are other crt's for communicating with a system. Baud rate and duplex must be set for the proper system. Users doing graphics are given priority access.

4.3.1. DOCUMENTATION

A copy of the Tektronix manual is available in the Reference Room.



Photograph 4-5: Tektronix 4013

4.3.2. TURNING ON THE TERMINAL

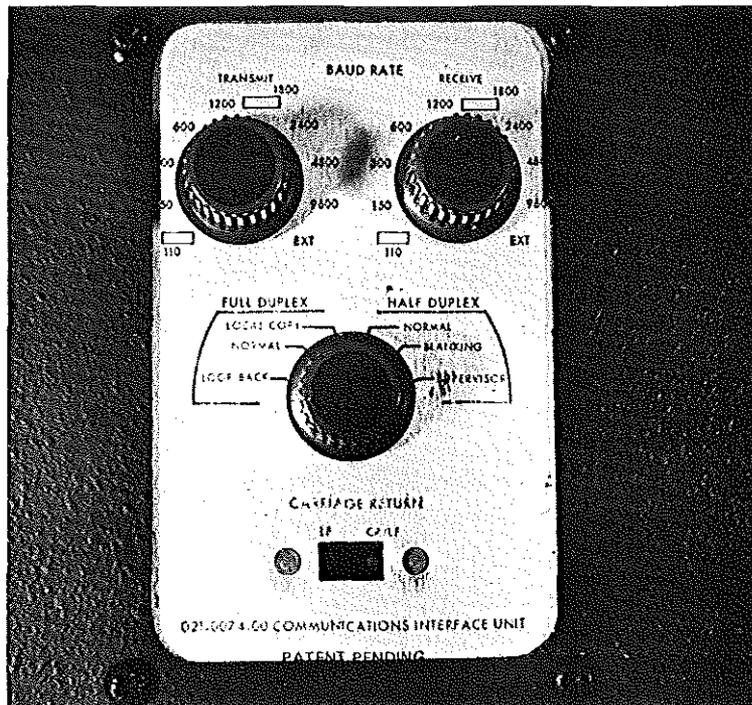
The ON/OFF switch is located on the pedestal below the keyboard on the right hand side. It is in a very awkward position. Push to the right to turn on, and the green power light on the top of the keyboard will light up.

4.3.3. SETTING UP THE TERMINAL

4.3.3.1. KNOBS

There are three knobs, one for transmission baud rate, one for receiving baud rate, and one for duplex located on the back right hand side of the pedestal. There is also a switch for line feed/carriage-return. Please note that for use with CUCCA computers, the transmission and receiving baud rates must be identical.

Baud Rate-Transmission	Set to the proper speed for each system. Must be matched with Receiving.
Baud Rate-Receiving	Same as above.
Duplex	<i>Full Duplex Normal</i> for DEC-20; <i>Full Duplex Local</i> for the IBM.
LF-CR	Set to the left or <i>LF</i> for all systems.



Photograph 4-6: Tektronix Knobs

4.3.3.2. SWITCHES

Terminal Mode switches are located above the keyboard. They should be set as follows:

LOCAL:LINE	Push to right for LINE for online operation.
Switch 1	Unused
Switch 2	APL/ASCII: APL - Push to Left for APL/ASCII; to the Right for APL only. If the terminal is currently displaying only APL characters, push this switch to the left and then press SHIFT and RESET/PAGE simultaneously to switch to the ASCII character set.
Switch 3	Unused
Switch 4	Make Copy. When you are ready to print out your graphic, press this switch to the right.

4.3.4. CLEARING THE SCREEN AND RESETTING THE TERMINAL

To clear the screen, press the *Reset Page* key, located on the upper left side of the keyboard. To reset the terminal, press *Shift* and *Reset Page* simultaneously. This returns the terminal to its initial status. Clear the screen when you are finished with the terminal.

4.3.5. TROUBLE-SHOOTING

Problem	Cause/Remedy
Computer Does Not Respond	Check to see that the baud rates are set exactly the same for receiving and transmission. Make sure the LF-CR switch is set to the left for LF.
"Funny" Characters	Make sure you have selected ASCII and not APL.

4.4. TEKTRONIX 4631

The Tektronix 4631 hardcopy unit is used in conjunction with the Tektronix 4013 graphic display terminal discussed above. Essentially, this terminal takes a photograph, or *raster scan*, after the image is generated and displayed on the crt screen.

The ON/OFF switch is clearly marked on the front of the terminal, as are all other controls. Turn on the unit a few minutes before use. Display your graphic on the crt then push the *Make Copy* switch on the right side of the 4013. Your print will eject automatically from the unit in a few seconds. Adjust the darkness/lightness dial on the front of the terminal as needed.



Photograph 4-7: Tektronix 4631

4.4.1. TROUBLE-SHOOTING

Problem	Cause/Remedy
No Copy	If no copy is produced, either the unit is out of paper or the paper is jammed. Please report the problem to the consultant.

4.4.2. GRAPHICS SOFTWARE

A variety of software is available for use with these graphics devices. DEC-20 users should type "Help Graphics" for further information. IBM users should consult the *SAS/Graph User's Manual*, the *SAS/Graph Enhancement and Update Manual* and the *SAS User's Manual* as well as the SAS Technical Note available in SSIO.

CHAPTER 5 TERMINAL REPAIR AND INSTALLATION PROCEDURES

5.1. TERMINAL PROBLEMS

5.1.1. REPORTING TO SYSTEMS ASSURANCE

Hardware problems with CUCCA installed terminals and other teleprocessing equipment should be reported to the Systems Assurance Group, 280-3100, or to the consultants in SSIO, 280-3631, or in 272A Mudd, 280-3185. Each terminal has a two-digit identification number printed on red tape on the top of the terminal casing. Please tell Systems Assurance the identification number as well as the location of the terminal. Don't attempt to repair CUCCA terminals yourself.

PACX problems should also be reported to 280-3100. Contact Systems Assurance if you are planning to install teleprocessing equipment.

5.2. PURCHASING A TERMINAL

It is strongly recommended that you consult with CUCCA before purchasing hardware which is intended for use with any of the University's computer systems. Requests for information concerning types, performance, features of terminals, and possible discounts should be directed to the Manager of User Services, Columbia University Computer Center, 612 W. 115th Street, New York, New York 10025, 280-3259. Selecting the proper terminal is especially important if you are considering using both the IBM 4341 and DECSYSTEM-20 in conjunction with PACX.

GLOSSARY AND ABBREVIATIONS

- ASCII** Most standard computer terminals are capable of transmitting 128 different characters that can be recognized by the computer at the other end of the wire. These character codes make up what is known as the ASCII (American Standard Code for Information Interchange) character set.
- Baud Rate** A baud is a unit of signaling speed and refers to the number of times the state of a line changes per second. Simply, it is the *speed* of transmission to which the terminal is set, e.g. 300 baud, 1200 baud, 1800 baud, or 4800 baud. *Baud* is the shortened form of the name J. M. E. Baudot, who designed a code for the French telegraph system in 1877. The baud rate is generally 10 times the *characters per second* (300b = approx. 30cps).
- Cursor** The cursor is a special symbol--usually a blinking or constant block of light, or an underscore, that signifies that the terminal is on and charts your position on the screen. It is roughly the equivalent of a print head on a printing terminal.
- Duplex** A *full duplex* terminal line is capable of transmitting data in both directions simultaneously; a *half duplex* line can transmit in either direction, but only in one direction at a time. The duplex switch will normally determine whether or not the terminal displays characters as they are typed, regardless of the type of line being used to transmit those characters to the computer.
- Handshake** *Handshaking*, is the exchange of predetermined sequences of control signals or control characters between two systems to establish a connection, and/or control the flow of data. A common handshake is XON/XOFF.
- Local** Not connected to the computer; using the terminal in local mode. To use the computer you must be "online" or in Remote mode. See below *Remote*.
- Logging In** Log in or logging on--also signing on--to the computer. It means identifying yourself to the system as a specific user. You log in to the system by typing in your ID name and password. Each system differs in this procedure. You cannot use the computer until you log in.

Logging Out	Log out or signing off, the opposite of logging in, means that you have finished your work on the system and want to terminate your connection to the computer.
Parity	Since no transmission medium is totally reliable, it is important in some applications for computers and terminals to notice when information is garbled during transmission. Parity checking consists of sending one extra bit with each character code transmitted. The extra bit contains information that can then be used for consistency checking with the rest of the code.
Remote	Also referred to as <i>ONLINE</i> or <i>LINE</i> . You must be in Remote mode to use the computer. The opposite of Local or LOC.
CR	Carriage return often written as <cr> or (cr). The key located on the right side of the keyboard. Usually marked <i>Return</i> .
LC	Lower case.
LF	Line Feed. Moves the cursor to the next line. Also as AUTO LF for automatic line feed. Also CR/LF, carriage return/line feed.
LOC	Local. Not connected to the computer.
REM	Remote or connected to the computer.
TTY	Abbreviation for <i>terminal</i> , derived from <i>teletype</i> .
UC	Upper case.

APPENDIX I DEC WS78 AND DECMATE WORD PROCESSORS

The DEC WS78 and DECMATE word processors can be used as ASCII terminals to connect to CUCCA's IBM 3031, 4341 A and B, and DEC-20 systems. The instructions below will only tell you how to configure the word processor to connect to these systems; knowledge of how to use the word processors is assumed. These word processors, which are used by many administrative and academic departments, are not available for general use. For information on how to login and logout for the DEC-20 and IBM 4341 systems, please consult the DEC-20 Reference Card and IBM 4341 Log In Instruction sheet in the Reference Room, 115A SSIO, ext.4330.

I.1. SETTING UP THE WORD PROCESSOR

After the word processor is turned on and the software is loaded, proceed in the order explained below for the appropriate system.

I.2. THE IBM SYSTEMS

1. From the Main Menu, invoke the Systems Option Menu by typing *SO*. Then press carriage return.
2. Once in the Systems Option Menu, type *CC* and press carriage return. You set the baud rate (speed) here. For all IBM computers, set to 1800 by typing *B 1800*. Then press carriage return.
3. Complete the process by returning to the Main Menu by typing *Gold M* twice.

PREPARING TO LOG IN

Once the above procedures are completed, do the following:

1. From the Main Menu, type *CX* and then press carriage return. When the Communications Menu appears, *press the space bar once*, and then type *KS* followed by a carriage return. The screen will now be blank.
2. Set the Gandalf PACX box to the desired service class and follow the login procedures for each system.

How to Log In

Documentation for the login procedure for the IBM 3031 is available from the User's Help Desk, 280-2629.

APPENDIX III HP 2621A AND HP 2621 NATIONAL SUMMARY

Please refer to the appropriate sections above for more detailed information and instructions.

Function	Procedure
Entering Configuration Mode	Display the Primary Labels, then press Shift 
Exiting Configuration Mode	Press the Labels key.
Recalling the Primary Labels	Press the Labels Key.
Clearing the Primary Labels	Shift-Control-Labels.
Resetting the terminal	Shift-Control-Break.
Enabling Remote	In Configuration Mode press Shift  so an * appears in the Remote window.
Disabling LN Mode	In Configuration Mode press Shift  until the * disappears. Then enable Remote.

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