7800

Operators Manual

To clear PF Keys
Set up C
Block E BIT 3 ⇒ Ø
local ESC N

PERICOM

Dependable Micro-Technology

Company Profile

Pericom was formed in 1975 at the very beginning of the Micro-Technology revolution. The 6800 Series of micro-based Visual Display Terminals was developed in Milton Keynes, and introduced to the market late in 1977. Since that time the series has evolved to an extent that today Pericom is recognised as one of the leading manufacturers of Visual Display Terminals in the United Kingdom with substantial export markets throughout Europe.

Following a policy of continual product development, backed by a dependable support team on the ground, Pericom have recently expanded the production facility in Milton Keynes with 30,000 sq ft of manufacturing space enabling the demand for their products to be adequately serviced with minimum lead times.

To complement the comprehensive range of Visual Display Terminals, Pericom also distribute a range of high quality printers, carefully selected from the best in the world's market. These are brought into the Pericom engineering base in Milton Keynes, tested, modified as required and commissioned before dispatch in company transport, backed by the same comprehensive warranty, dependability and field service back-up which has become the hall-mark of Pericom success.

PF Key setup

OPERATORS MANUAL

FOR THE

PERICOM 7800

VISUAL DISPLAY TERMINAL

1st Edition - December 1981

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Printed in UK

This document was prepared on a Pericom 7800 microcomputer system using the WordStar word processing system operating under CP/M.

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SECTION 1

INTRODUCTION

1.0 General

The Pericom 7800 is a new generation, buffered, editing, Visual Display Terminal offering technical advancement with high quality, and is designed for a wide variety of data entry and word processing applications.

High reliability and operator convenience are designed into the product from basic principles. The intelligent use of micro-processor technology ensures a flexibility of specification which should enable the 7800 to meet the most sophisticated design requirements.

The 15" screen has a bonded faceplate to protect against tube implosion and provide a large glare free viewing area. Characters are displayed in green or bronze phosphor, generally recognised as the preferred colours for reducing eye strain. There are contrast and brilliance controls on the side of the unit to enable individual operators to select their own viewing characteristics.

The detachable keyboard allows selection of viewing distances up to one metre from the screen with a variety of working positions.

To eliminate many of the problems associated with system interfacing the 7800 is factory programmable with the software in EPROMS. It can be delivered with a variety of "standard" programs to facilitate integration into many of the more popular computer systems. As standard the 7800 is equipped with ANSI compatible escape sequences as used by the DEC VT132 terminal. However, in it's role as a multi-function terminal, the 7800 may be specified with an additional "emulator" mode. This additional mode may be entered either manually or by command from the host machine and enables the terminal to emulate a device other than it's "native" mode function.

In addition, a number of option packages are available for the 7800 range including a PRESTEL (Viewdata) modem, Tektronix compatible graphics controller and a complete microcomputer system incorporating 64K byte memory and twin 800K byte floppy disk sub-system.

The keyboard is also programmable in order to accommodate any layout within the boundaries of the mechanical constraints. The standard sculptured layout is similar to the DEC VT132 with 15 additional function keys.

This manual is specific to the particular 7800 referenced in Section 1.1. All reference data should be quoted in any correspondence relating to service or requests for modifications.

1.1 REFERENCE DATA

MODEL: 7800 AAU

SERIAL NUMBER: 9211

SOFTWARE NUMBER: D2AS0063

KEYBOARD DWG NO.: K23-10-0121

INTERFACE CABLE NO.:

PRINTER CABLE NO.:

Special Modifications:

SECTION 2

GENERAL SPECIFICATIONS

DIMENSIONS

Monitor -	Height	396mm
	Width	473mm
	Depth	382mm
Keyboard -	Height	70mm
	Width	473mm
	Depth	230mm
Minimum Table Depth		585mm

WEIGHT

Monitor	25Kg
Keyboard	3Kg
Shipping Weight	32Kg

ENVIRONMENT

Operating	Temperature	10° to 40° C
	Relative Humidity	10% to 90%
	Altitude	2.4 km (8,000 ft)
Non Operating	Temperature	-40° to 66° C
	Relative Humidity	0% to 95%
	Altitude	9.1 km (30,000 ft)

POWER

Line Voltage	205-255 V RMS Single Phase, 2 wire
Option	100-130 V RMS Single Phase, 2 wire
Line Frequency	50 Hz
Option	60 Hz
Current	2.2 A RMS Maximum at 115 V RMS
	1.1 A RMS Maximum at 230 V RMS
Input Power	100 W Average.
Current Limiting	2 A Normal blow fuse
Power Cord	Detachable, 3 prong, 1.9m (6 ft)

DISPLAY

CRT	15 inch diagonal measure P31 phosphor (other phosphors are optional) with antiglare bonded faceplate.
Format	24 or 25 lines of 80 characters per line or 132 characters per line (selectable).
Character	7 x 12 Dot Matrix with descenders within a 10 x 15 dot character envelope.
Character Size	5mm x 3mm in 80 column mode 5mm x 2mm in 132 column mode
Active Display Size	280mm x 180mm
Character Set	96 characters displayable ASCII subset (upper and lower case numeric and punctuation) and 32 special symbols. Optional up to 256 characters.
Cursor Type	Keyboard selectable, blinking block character or blinking underline.

KEYBOARD

General	109 key detachable unit with a 1.9m (6 ft) coiled cord attached.
Key Layout	66 key arrangement and sculpting similar to standard typewriter keyboard.
Auxiliary Keyboard	28 key numeric pad with period, comma, minus, enter and fourteen factory defined function keys.
Function Keys	15 programmable function keys giving a maximum of 30 user-defined functions.
Visual Indictors	Eight LEDs: three LEDs dedicated to ON LINE, LOCAL and KBD LOCKED, two LEDs User Programmable, plus three Edit Mode LEDs which are User Programmable in Interactive Mode.
Audible Signals	Key-Click sound simulates typewriter bell: 1. sounds upon receipt of BEL code. 2. sounds eight characters from right margin (Keyboard Selectable).

LINE INTERFACE

Type	EIA - CCITT V24
Speeds	Full and Half duplex: 50, 75, 110 (two stop bits) 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, 19,200. (Split speed for TX and RX) Keyboard Selectable.
Code	ASCII
Character Format	Asynchronous
Character Size	7 or 8 bits: Keyboard Selectable.
Parity	Even, Odd, or none - Keyboard Selectable.
Synchronization	Keyboard Selectable via automatic generation of X-ON and X-OFF control codes, or request to send line to control data flow to the VDU.

PRINTER INTERFACE

The same specification as the Line Interface. (No split speed.)

VIDEO ATTRIBUTES

Reduced Intensity
Underline
Inverse Video
Flashing Video
Blank Field
Double Width Character (per line)
(or optionally per character)
Double Height Character (per line)
Or any combination of these attributes.

EDIT FACILITIES

- Field Protect
- Space suppression
- Character insert
- Character delete
- Line insert
- Line delete
- Line transmit
- Page transmit

OTHER SPECIFICATIONS

- Smooth Scroll Mode
- Split Screen Mode
- Set Up Mode (including save "Set Up" in retainable memory)
- All Controls are from the keyboard (including brightness control)
- Monitor Mode

SECTION 3

UNPACKING AND INSTALLATION

The 7800 should arrive in perfect condition. If any transit damage is visible on removal from the box, Pericom should be informed immediately and no power should be applied to the unit.

Each box contains the following:

1. Monitor
2. Keyboard
3. Mains Lead with 13 amp plug.
4. Interface Lead for connection to modem and other equipment.
5. Operators Manual.

The keyboard should be connected to the monitor unti by means of the attached flying lead and connector.

Power can now be applied by depressing the black button on the front left of the monitor unit and the 7800 is ready for use.

A few seconds after the power on, the cursor will appear on the screen.

With the terminal in Local mode it should now be possible to enter from keyboard to screen and operate many of the display orientated features.

SECTION 4

4.0 CONTROLS AND INDICATORS

The only controls on the 7800 are the on/off switch, brightness and contrast controls and the keyboard keys.

4.1 User Controls

Power on/off switch: This shows orange when the unit is switched on, black when switched off. Note that this switch does not rely on the mains supply voltage to show it's orange colour - it is a mechanically operated switch.

Brightness control This is rotated to increase or decrease brightness. Note that brightness is also controlled in Set-Up mode. See Section 5.2.

SECTION 5

5.0 THE KEYBOARD

The keyboard is used for controlling all the features of the 7800 except for power on/off. It is illustrated in Figure 5.1.

Because of the numbers of operations controlled by the keyboard, some keys perform different functions under different conditions or modes.

There are three fundamental modes: Interactive Mode, Edit Mode and Set-Up Mode.

5.1 INTERACTIVE & EDIT MODES

The keyboard is in interactive mode for normal data entry, during which each key generates the character (or one of the characters) shown on the keytop with the exception of certain control and function keys,

i.e. PF1-PF15,SET-UP, HOME, ESC, BREAK, BACKSPACE, TAB, DELETE, CTRL, CAPS LOCK, RETURN, ENTER, NO SCROLL, SHIFT, LINE FEED, CLEAR TO EOL, CLEAR TO EOS, WIDTH (132) 80, (EMUL) ANSI, CLEAR (UNPROT) ALL, INSERT LINE, DELETE LINE, INSERT MODE, DELETE CHAR, (EDIT), (CLR), BACK TAB, PRINT PAGE, MONITR (ON) OFF

None of the Edit Keys with the exception of '(EDIT)' itself is operational in Interactive Mode. - see Section 5.15.

To maximise compatibility of the 7800 to other systems, the 7800 will generate and respond to two different programming standards, VT52 and ANSI. Interactive mode is consequently subdivided into two modes: VT52 and ANSI mode.

Note, however, that alternative emulations are available for the 7800 as an option.

These two modes have no effect other than to change the ESCape sequences which the VDU generates and to change the response of the VDU to ESCape sequences.

In VT52 mode, the 7800 is compatible with software designed around the DEC VT52 VDU. In ANSI mode, the 7800's features can be used to the full. The ESCape sequences conform to ANSI standards X3.41-1974 and X3.64-1977 but only include the sequences described in this manual.

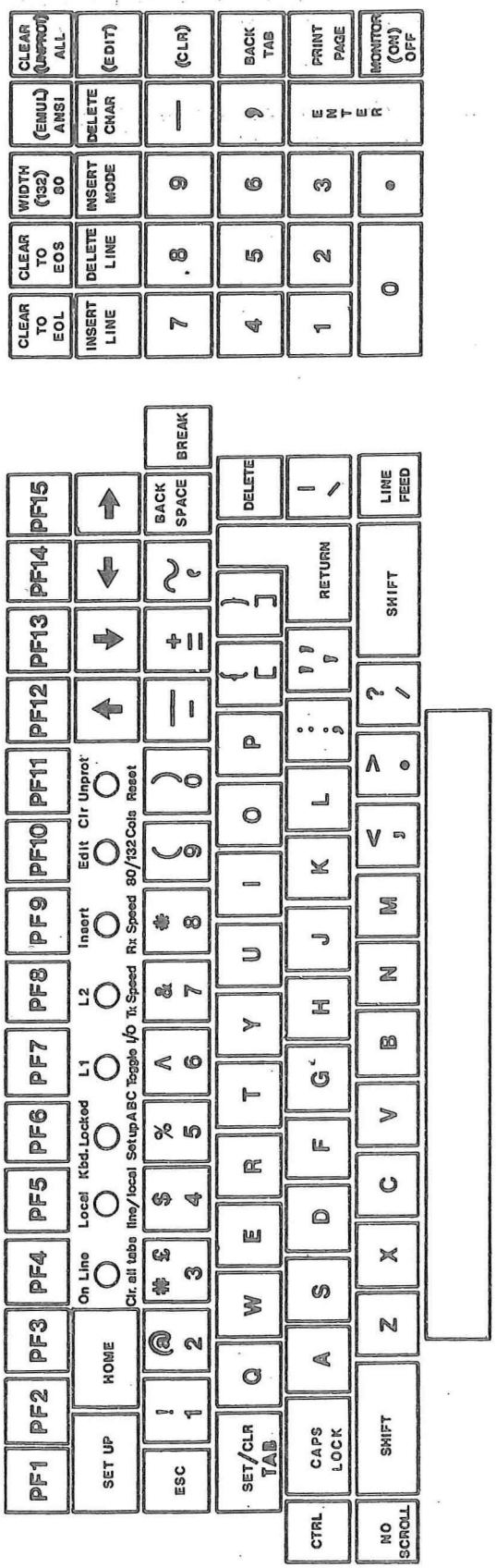
Edit Mode is identical to Interactive Mode from the line, but characters entered from the keyboard do not go to the line, only to the screen, from where they may be transmitted to the line by hitting the 'ENTER' key; the 'RETURN' key behaves normally. Moreover the keyboard behaves differently in that no ESCape sequences may be entered from the keyboard (the ESCape key is ignored) and characters take on the attribute (flashing, inverse, underlined, etc.) already on the screen, rather than the currently selected attribute being used. Protected Fields may not be written into and all Edit Keys are operational in Edit Mode.

The functions of the keys listed above fall into five categories;

5.11 Keys generating a single control code.
5.12 keys generating a sequence of characters.
5.13 Internal function keys.
5.14 The BREAK key.
5.15 Edit Keys.

Warning: ESCape sequences may be entered from the keyboard using the programmable keys.

Fig 5.1.


PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12 PF13 PF14 PF15
SET UP HOME
ESC
SET/CLR TAB
CAPS LOCK
SHIFT
CTRL
NO SCROLL
On Line
Clr. all tabs
Local
line/local
Kbd. Locked
Setup
L1
ABC Toggle
L2
Tx Speed
Insert
Rx Speed
Edit
80/132 Cols
Clr Unprot
Reset
BACK SPACE
BREAK
DELETE
RETURN
LINE FEED
SHIFT
CLEAR TO EOL
INSERT LINE
CLEAR TO EOS
DELETE LINE
WIDTH (132) 80
INSERT MODE
(EMUL) ANSI
DELETE CHAR
(CLEAR UNPROT) ALL
(EDIT)
(CLR)
BACK TAB
PRINT PAGE
MONITOR (ON) OFF
ENTER

5.11 Keys Generating a Single Control Code

These keys generate the most commonly used control codes, thus obviating the need for pressing two keys when one of these codes is required.

The functions of these keys are explained in detail in Section 7, but are listed here for reference

Key	ASCII code	Function Type
BACK SPACE	08	Cursor Movement
TAB	09	
LINE FEED	0A	
RETURN *	0D	
ENTER *	0D	
ESCAPE	1B	First character in ESCape sequence
DELETE	7F	Delete or error code

* See also Section 5.12

5.12 Keys Generating a Sequence of Characters

a) Programmable function keys PF1-PF15. These keys can be programmed by the user to send any sequence of codes required. Full details are given in Section 7.7.

b) Numeric keypad keys. These keys can be used to generate two different groups of code sequences.

(i) In keypad numeric mode, the keys send the characters shown on the keytops, except for ENTER, which sends Hex OD, and keys INSERT LINE, DELETE LINE, INSERT MODE and DELETE CHAR, which send preprogrammed ESCape sequences (see Appendix I).

(ii) In keypad application mode, all the keys send preprogrammed ESCape sequences (See Appendix I).

c) Cursor keys. These keys (↑ ↓ ← → and HOME) generate standard ESCape sequences for moving the cursor up, down, left, right and home, except when the numeric keypad is in Application Mode and Cursor Key mode is set. In this case they generate preprogrammed ESCape sequences. See Appendix I for full details.

d) Return and enter keys. The RETURN and ENTER keys are identical in function . Normally either key just sends the Carriage Return code (OD) but if Auto New Line has been selected, either key will send Carriage Return followed by Line Feed (OD, OA).

All keys which send sequences of codes leave a gap of approximately 0.02 seconds between codes. They also lock the keyboard so that the sequence cannot be corrupted by other keys being pressed.

5.13 Internal Function Keys

a) SET-UP is used to enter Set-Up mode (See Section 5.2 for full details) and also to return to Normal Mode.

b) SHIFT is used in combination with other keys. When held down, either SHIFT key causes the Alpha keys to generate upper case Alpha characters, and any key with two keytop legends to generate the upper one.

c) CAPS LOCK is used to prevent the Alpha keys from generating lower case Alpha characters even when SHIFT is not depressed. CAPS LOCK has no effect on any keys other than the Alpha keys.

d) CONTROL is used in combination with other keys to generate a set of codes known as Control Codes. The functions of these codes are explained in detail in Section 7. e.g. Control G generates a Bell Code (Hex 07) which in turn generates an audible tone when received by the VDU.

e) NO SCROLL is a toggle action key used to stop and restart the flow of data coming into the VDU.
Note: The **NO SCROLL** key must be depressed in combination with the **SHIFT** key if XON/XOFF protocol is disabled.

f) CLEAR TO EOL clears from the cursor position to the End Of Line.

g) CLEAR TO EOS clears from the cursor position to the End Of Screen.

h) WIDTH (132) 80 selects 80 characters per line normally or 132 characters per line if SHIFT is down.

i) (EMUL) ANSI selects ANSI Mode normally or Emulation Mode if SHIFT is down.

j) CLEAR (UNPROT) ALL enables any CLEAR command to clear either All data or only Unprotected Data (the latter is only valid in Edit Mode). To select Clear All Mode, press this key normally; to select Clear Unprotected Only Mode, hold SHIFT down while pressing this key.

k) (CLR) clears the entire screen but only if SHIFT is down.

l) PRINT PAGE copies the screen contents to the printer. If Set-Up C Flag D4 is set to 1, the entire screen is printed; otherwise only the Scrolling Region is printed.

m) MONITR (ON) OFF clears Monitor Mode, i.e. stops Control Codes being displayed instead of actioned, or if SHIFT is down, selects Monitor Mode.

5.14 The Break Key

This key causes a break in the line by forcing the line to its zero state for 0.2 seconds ± 10%. If either shift key is down, this time is increased to 3.5 seconds ± 10% and the DTR signal is also de-asserted for the duration of the 3.5 second break.

5.15 Edit Keys

a) (EDIT) This key enters Edit Mode if the 7800 is in Interactive Mode, or exits Edit Mode if in Edit Mode. This key is only active if SHIFT is down.

b) INSERT LINE causes all lines from the cursor line to the bottom of the Scrolling Region to scroll down one line, leaving the cursor on an inserted blank line. The Character Attributes from the previous Cursor Line are copied to the new blank line.

c) DELETE LINE deletes the line containing the cursor. All lines from the cursor line to the bottom of the Scrolling Region scroll up leaving a blank line at the bottom of the Scrolling Region.

When using INSERT and DELETE LINE, if protected fields exist on the screen, the scrolling is only from the cursor line to the line above the first protected field below the cursor, or nothing happens if a protected field exists on the cursor line. INSERT and DELETE LINE have no effect outside the Scrolling Region.

d) INSERT MODE alternately switches between Insert Mode and Replacement Mode. The operative mode is indicated by the Insert LED which is lit when the 7800 is in Insert Mode. Typing characters in Insert Mode causes all characters to the right of the cursor to move to the right to make way for new characters. In Replacement Mode, typing characters will overwrite any existing characters.

e) DELETE CHAR deletes the character at the cursor position. Any characters to the right of this position will move left to fill the blank space.

Insertion and Deletion of characters causes movement of characters to the right of the cursor, but only as far as the next field, i.e. the next change in character attribute.

f) BACK TAB moves the cursor to the left until it encounters a Tab Stop (as shown in Set-Up A), a new field (i.e. a change in character attribute), or the start of a line. The cursor will not stop in any protected fields whether or not they contain any of the above stop conditions. A protected field wrapping around the end of one line onto the next will cause a backtabbing cursor encountering it to wrap around to the previous line.

g) DELETE In Edit Mode this key behaves differently from its operation in Interactive Mode. In Edit Mode it is effectively a Back Space followed by Delete Character.

5.2 SET-UP MODE

SET UP mode is used to pre-set numerous terminal functions to a chosen default condition. On depressing the SET UP key the terminal will enter SET UP MODE A, whereupon the currently defined TAB positions will be displayed as a letter 'T' in each position in which a tab has been defined. Tab positions may be added by positioning the cursor to the required position (using the cursor left/right keys) and depressing the '2' key or the 'TAB' and SHIFT keys (this will, in fact, operate as a toggle, setting the tab position if it was not previously set or clearing it if it was already set). All tab positions may be cleared by depressing the '3' key.

SET UP MODE B may be entered from Set-Up A by depressing 'B' or '5'. The terminal will now display the current settings for a number of user-definable parameters.

SET UP MODE C may be entered from Set-Up B by depressing 'C' or '5'. The terminal will now display further parameter settings relating to Edit Mode.

Once set these parameters may be retained by typing SHIFT and 'S' whilst in SET UP mode. When the terminal is subsequently powered up or reset (0 keyed whilst in SET UP mode or ESC c received from the line) the stored parameters will be reasserted overriding all changes which have taken place since the last reset.

The parameter displays in SET UP B & C take the form of a single line at the bottom of the display. There are six blocks of 4 digits, each digit being set to a 0 or a 1. The cursor may be positioned to any of the digits by means of the cursor left and right keys. Each digit may be changed to the inverse of it's current value, i.e. changed from a 0 to a 1 or changed from a 1 to a 0, by depressing the '6' key whilst the cursor is positioned immediately above the digit to be changed.

SET-UP B

Block 1

0	1	XXXX
Jump scroll	Smooth scroll	
Autorepeat off	Autorepeat on	
Dark background	Light background	
Underline cursor	Block cursor	

Block 2

0	1	XXXX
Margin bell off	Margin Bell on	
Keyclick off	Keyclick on	
VT52 mode	ANSI mode	
No protocol	XON/XOFF protocol	

Block 3

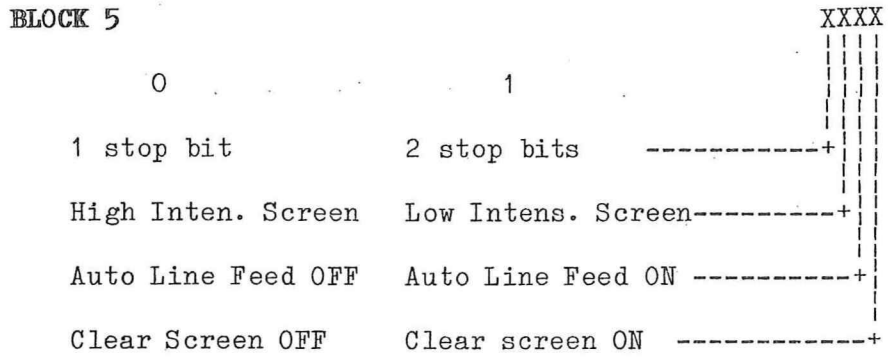
0	1	XXXX
SHIFT 3 = hash	SHIFT 3 = pound	
Line wrap off	Line wrap on	
Auto new line off	Auto new line on	
Interlace !!!!!!	NOT ALTERABLE !!!!!	

Block 4

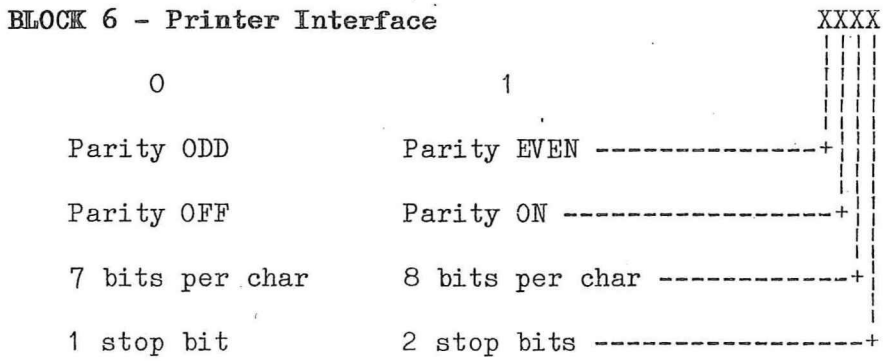
0	1	XXXX
Parity odd	Parity even	
Parity off	Parity on	
7 bits per char	8 bits per char	
Power frequency !!!!	NOT ALTERABLE !!!!	

In addition to the VT132 compatible SET-UP B parameters detailed above, the 7800 has some additional parameters.

BLOCK 5



BLOCK 6 - Printer Interface



SET-UP C

Block A

0	1	XXXX
Edit Mode OFF	Edit Mode ON	4
Edit Key DEFERRED	Edit Key IMMEDIATE	3
Send Only UNPROTECTED	Send ALL Characters	2
Space Compression OFF	Space Compression ON	1

Block B

0	1	XXXX
Transmit PAGE	Transmit LINE	4
Transmit PARTIAL Page	Transmit FULL Page	3
NO Transmit Termination Character	Transmit Termination Character = Form Feed	2
Transmit DEFERRED	Transmit IMMEDIATE	1

Block C

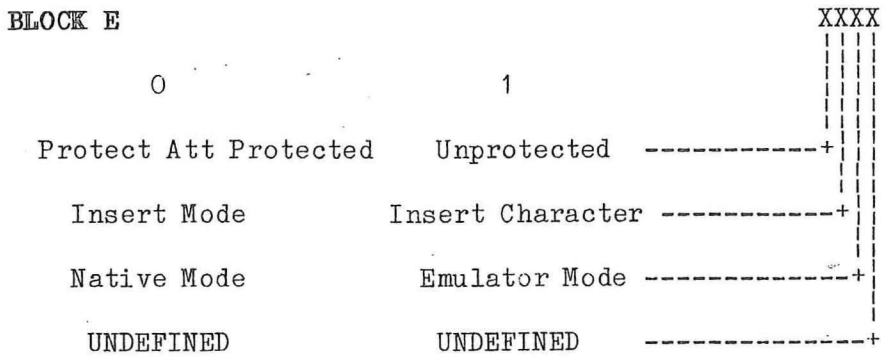
	0	1	XXXX
Bold Protected	NO	YES	4
Underline Protected	NO	YES	3
Flashing Protected	NO	YES	2
Inverse Protected	NO	YES	1

Block D

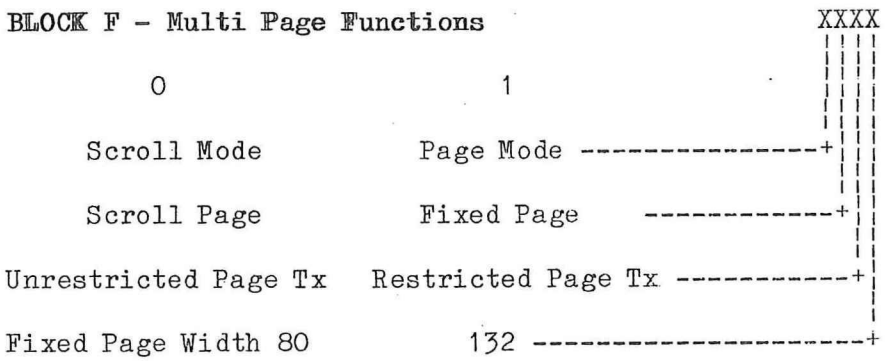
0	1	XXXX
Normal NOT PROTECTED	Normal PROTECTED	4
Erase UNPROTECTED	Erase ALL	3
NO Print Termination Character	Print Termination Character = Form Feed	2
Print SCROLL REGION	Print FULL SCREEN	1

In addition to the VT132 compatible SET-UP C parameters detailed above, the 7800 has the capability for some additional parameters.

BLOCK E



BLOCK F - Multi Page Functions



ADDITIONAL NOTES ON SET-UP B

BLOCK 3, FLAG 3, AND BLOCK 5, FLAG 3

```
1 XXXX   2 XXXX   3 XXXX   4 XXXX   5 XXXX   6 XXXX
                     |                  |
                   B3 F3              B5 F3
```

Both these flags relate to Carriage Return and Line Feed. The Flag B3 F3 is identical in function to the corresponding flag in the DEC VT132. The flag B5 F3 has the same effect as AUTO CR/LF selection on the Pericom 6801-4 series VDUs.

If B3F3 = 1, (i) The RETURN and ENTER keys will send CARRIAGE RETURN followed by a LINE FEED when pressed.

(ii) Receipt of a LINE FEED code causes both a CARRIAGE RETURN and LINE FEED to the screen.

If B3F3 = 0, (i) The RETURN and ENTER keys will send only a CARRIAGE RETURN when pressed.

(ii) Receipt of a LINE FEED code causes only a LINE FEED on the screen.

If B5F3 = 1, (i) Receipt of a CARRIAGE RETURN code causes both a CARRIAGE RETURN and LINE FEED on the screen.

If B5F3 = 0, (i) Receipt of a CARRIAGE RETURN Code causes only a CARRIAGE RETURN on the screen.

BLOCK 5, FLAG 4

```
1 XXXX   2 XXXX   3 XXXX   4 XXXX   5 XXXX   6 XXXX
                                       |
                                     B5 F4
```

If B5F4 = 1, Changing from 80 to 132 characters per line or vice versa, or performing a Shift R in Set-Up B (recalling saved Set-Up features) does NOT clear the screen.

If B5F4 = 0, Changing from 80 to 132 characters per line or vice versa, or performing a SHIFT R in Set-Up B (recalling saved Set-Up features) CLEARS THE SCREEN.

5.21 Keys Operative in SET-UP A, SET-UP B and SET-UP C

a) Cursor up - increases screen brightness
b) Cursor down - decreases screen brightness
c) Cursor right - moves cursor right
d) Cursor left - moves cursor left
e) TAB - moves cursor to next tab stop
f) BACK SPACE - moves cursor left
g) Space - moves cursor right
h) Carriage Return - moves cursor to far left
i) 4 - switches between On Line and Local (indicated by the two leftmost LEDS).
j) 5 - switches from SET-UP A to B, B to C and C to A.
k) 0 - Reset
l) Shift S - Saves all SET-UP variables (including Answerback Message) in battery backed-up memory.
m) Shift R - Restores All SET-UP variables (including Answerback Message) to their values when they were last saved.
n) A selects Set-Up A.
o) B selects Set-Up B.
p) C selects Set-Up C.

5.22 Keys Operative in SET-UP A only

a) 2 - Sets (if clear) and Clears (if set) Tab at present cursor position.
b) 3 - Clears all tabs.
c) 9 - Switches between 80 and 132 characters per line
d) SHIFT TAB - Sets and Clears Tabs (identical to (a) above)

5.23 Keys operative in SET-UP B only

a) 6 - switches between 0 and 1 for the bit below the present cursor position in Blocks 1 - 6, and also between Half Duplex (HD)and Full Duplex (FD) if positioned over the F/H.
b) 7 - Changes the TRANSMIT SPEED as shown on the screen after "TX".
c) Shift 7 (&) - Changes the Printer speed as shown on the screen after "PX" .
d) 8 - Changes the Receive speed as shown on the screen after "RX"
e) Shift A - Enter Answerback Message - See Section 8
f) All Programmable Keys - see Section 7.7

5.24 Keys operative in SET-UP C only

a) 6 - switches between 0 and 1 for the bit below the present cursor position in Blocks A - F.

5.3 KEYBOARD LEDS

Between the row of programmable keys and the numeric keys on the main keyboard are eight indicator lamps (LEDs). Two are for operator use; these are labelled L1 and L2. The left three are used by the VDU; the right three are used by the VDU for Edit Functions, but are accessible to the user.

Whenever power is connected to the keyboard one of the left two LED's lights depending on whether the VDU is switched to LOCAL or ON-LINE. The third LED (KBD LOCKED) lights when either a pre- programmed code sequence is being generated, or the line output buffer is full and consequently unable to accept further data. The sixth LED lights when Insert Mode is on, the seventh when the 7800 is in Edit Mode, and the eighth when the Clear Mode is set to Clear Unprotected Only.

5.4 TECHNICAL DETAILS

The keyboard is connected to the VDU via a serial data link running at 1200 baud. The keys are contactless with consequent high reliability and lack of wear.

The codes generated by the keys are selected by the firmware in the VDU, enabling easy keyboard layout changes or code changes.

N-key rollover is provided as standard, ensuring error free operation even if a key is pressed before the previous one(s) is/are released.

Autorepeat is also firmware controlled and may be switched on or off via Set-Up mode. Autorepeat speed is 25 characters/second (again, firmware controlled) with an initial delay before autorepeat starts of 0.5 seconds. Depressing a key sends a code immediately, and if held down for more than 0.5 seconds, the key sends a string of identical codes at 25Hz until the key is released or another key is pressed.

5.5. BRIGHTNESS CONTROL

There are two ways of controlling screen brightness from the keyboard :

(i) Via SET-UP using the Cursor Up or Cursor Down keys to turn the brightness up or down . This has the disadvantage that the normal screen display is blanked off when in Set-Up mode, so the required level of brightness is difficult to judge without going out of Set-Up to check. Because of this, method two was developed.

(ii) Under normal operating conditions by holding the CTRL key down and using Cursor Up or Down as in Set-Up. The effect on the screen data is immediately visible and this method is easier on the operator as Set-Up mode does not need to be selected and then deselected.

The screen brightness selected by either of the above methods may be saved (along with all other Set-Up variables) by entering Set-Up and typing Shift S.

SECTION 6

6.1 CHARACTER GENERATORS

The 7800 has the capacity for two character generators, although it is only supplied with one as standard. The characters available in the standard character generator are based on a 7 x 12 dot matrix within a 10 x 15 dot envelope and are shown in Appendix III. Characters with descenders (g,y,p, etc.) are displayed with true descenders.

There are 128 characters, 95 of which are normally available. Characters Hex 00 to Hex 1F are also used (a) for graphics and (b) for displaying control codes. Appendix II shows the symbols available in graphics or displaying control codes.

SECTION 7

7.1 TERMINAL COMMANDS

Various conventions and abbreviations are used in the following sections, and are explained here :

* means any number
e.g. ESC [23 C moves the Cursor right 23 columns
(ESC [* C in ANSI mode).

* followed immediately by a lower case character, i.e. with no intervening space, also means any number. The lower case character is present to indicate the order in which two or more parameters occur.

e.g. ESC [7 ; 29 f moves the cursor to the 7th line, 29th column
(ESC *l ; *c f)

^X The upward arrow in front of a character means that the CTRL key on the extreme left of the keyboard must be held down while the 'other character' key is pressed. Refer also to Section 5.13 since some Control Codes have special keys allocated to them.

(L) means 'may also generate a Line Feed under certain conditions. '

(R) means 'may also generate a Carriage Return under certain conditions.'

(S) means 'may cause scrolling under certain conditions'

Sections 7.11 - 7.7 cover terminal commands grouped according to command function, and Section 7.9 lists the command sequences alphabetically. Section 7.8 covers Programmable Function Keys.

In all ANSI ESCAPE SEQUENCES, if a number is omitted zero (0) is assumed.

e.g. (i) ESC [K will clear to end of line, exactly the same as ESC [0 K.

(ii) ESC [A moves the cursor up one space exactly the same as ESC [0 A (and in this case all cursor movement sequences ESC [0 A (or B,C,D,)) are similar to ESC [1 A (or B,C,D,).

If more than one character attribute needs changing, the numbers between '[' and 'm' can be strung together with ';' as a separator, e.g. To switch inverse video, flashing and alternate intensity on, the command would be :

ESC [7 ; 5 ; 1 m OR ESC [5 ; 7 ; 1 m etc.,

The order of the numbers determines the order in which the attributes are changed. If the flashing is now to be turned off, the command is : ESC [0 ; 1; 7 m.

This also applies to the command to switch the programmable LEDs.

e.g. to switch on LEDS L1, L4 and L5: ESC [1 ; 4 ; 5 q

7.11 Cursor Movement

	Cont.	VT52	ANSI
Cursor up one line	-	ESC A	ESC [A
Cursor up * lines	-	-	ESC [* A
Reverse Line Feed (S)	-	ESC I	ESC M
Cursor Down one line	-	ESC B	ESC [B
Cursor down * lines	-	-	ESC [* B
Line Feed (R) (S)	^J ^K ^L	-	ESC D
Cursor right one column	-	ESC C	ESC [C
Cursor right * columns	-	-	ESC [* C
Cursor right to next tab stop	^I	-	-
Cursor left one column	^H	ESC D	ESC [D
Cursor left * columns	-	-	ESC [* D
Carriage Return (L) (S)	^M	-	-
Carriage return with line feed (S)	-	-	ESC E
Cursor Home (top left)	-	ESC H	ESC [H
Direct Cursor Addressing In VT52 mode, nl is a single ASCII character representing line number, and nc is a single ASCII character representing column number. The ASCII character is found by adding 31 to the line/ column number and looking up the character in Appendix III - Decimal ASCII codes. e.g. ESC Y " G for 3rd line down 40th column across.	-	ESC Y nl nc	ESC [*l ; *c H ESC [*l ; *c f
Save present cursor position and character attributes.	-	-	ESC 7

	Cont	VT52	ANSI
Restore saved cursor position and character attributes.	-	-	ESC 8
Wraparound ON	-	-	ESC [? 7 h
Wraparound OFF	-	-	ESC [? 7 l

When the cursor reaches the right hand edge of the screen, any characters fed to the screen will be overprinted in the 80th (or 132nd) column unless Wraparound is ON, in which case the cursor will wrap around to the first position on the following line, and characters will be displayed as normal.

Origin Mode ON	-	-	ESC [? 6 h
Origin Mode OFF	-	-	ESC [? 6 l

Origin mode affects cursor movement in that with Origin Mode ON, the cursor cannot move outside the Scrolling Region (See Section 7.13). Cursor addressing is all relative to the home position which is at the top left corner of the Scrolling Region with Origin Mode ON. With Origin Mode OFF, the cursor can move anywhere on the screen, Cursor Adressing is all relative to home at the top left corner of the screen.

7.12 Tab Stops

Set tab at current column	-	-	ESC H
Clear Tab at current column	-	-	ESC [0 g
Clear all Tabs.	-	-	ESC [3 g

When the TAB key is pressed, the cursor moves to the right until it encounters a Tab or until it reaches the end of the line.

7.13 Scrolling

	Cont.	VT52	ANSI
Scrolling, or movement of the characters on the screen up or down to make way for new data can be performed either smoothly (but slowly) or in the form of a jump to the line above or below. The screen maybe divided into up to three separate regions : (a) The Upper Static Region (b) The Scrolling Region (c) The Lower Static Region The sizes of the various regions may be changed by changing the scrolling region boundaries :			
Change Scrolling Region	-	-	ESC [*t ; *b r
*t is the line number of the top line in the scrolling region. *b is the line number of the bottom scrolled line. e.g. ESC [5 ; 21 r defines the three regions : (a) Upper Static = lines 1- 4 (b) Scrolling = lines 5-21 (c) Lower Static = lines 22-25			
Select Smooth Scroll	-	-	ESC [? 4 h
Select Jump Scroll.	-	-	ESC [? 4 l

7.21 Character Size

	Cont.	VT52	ANSI
Character size is only available on a line basis, i.e. the entire line must be all the same size.			
Double height single width top half.	-	-	ESC # 1
Double height single width bottom half.	-	-	ESC # 2
Double height double width top half.	-	-	ESC # 3
Double height double width bottom half.	-	-	ESC # 4
Single height single width (normal).	-	-	ESC # 5
Single height double width.	-	-	ESC # 6
Characters per line are only available on a screen basis.			
Select 80 characters per line	-	-	ESC [? 3 l
Select 132 characters per line	-	-	ESC [? 3 h

7.22 Character Attributes

The way the characters are displayed can have various forms such as flashing or underlined. These attributes are available on a character by character basis.

Normal	-	-	ESC [0 m
Alternative Intensity	-	-	ESC [1 m
Underline	-	-	ESC [4 m
Flashing	-	-	ESC [5 m
Inverse Video	-	-	ESC [7 m
Blank field	-	-	ESC [254 m

Alternative Intensity gives half intensity characters if the screen is normal intensity or bold characters if the screen is half intensity. Switching screen intensity is done via Set-Up B. Block 5, Flag 2.

Normal Screen	-	-	ESC [? 5 l
Inverse Screen	-	-	ESC [? 5 h

7.23 Character Sets

	Cont.	VT52	ANSI
In VT52 mode, three character sets are available; (i) UK (Shift 3 = Pounds) (ii) US (Shift 3 = Hash) (iii) Graphics			
When in VT52 mode, switching between UK & US is only available via Set Up B. On switch-on, or after switching from ANSI mode to VT52 mode, the UK/US set is selected.			
Select UK/US Character set	-	ESC G	-
Select Graphics character set	-	ESC F	-
In ANSI mode, there are two character sets known as the G0 and G1 sets. Each set can be any one of five sets : (i) UK (Shift 3 = Pounds) (ii) US (Shift 3 = Hash) (iii) Graphics (iv) Alternative character set (v) Alternative graphics			
G0 character set designation :			
(i) UK	-	-	ESC (A
(ii) US	-	-	ESC (B
(iii) Graphics	-	-	ESC (0
(iv) Alternative character set	-	-	ESC (1
(v) Alternative graphics	-	-	ESC (2
G1 character set designation :			
(i) UK	-	-	ESC) A
(ii) US	-	-	ESC) B
(iii) Graphics	-	-	ESC) 0
(iv) Alternative character set	-	-	ESC) 1
(v) Alternative graphics	-	-	ESC) 2

	Cont.	VT52	ANSI
N.B. (iv) & (v) are only available if an alternative character generator ROM is fitted.			
On switch-on, or after switching from VT52 mode or ANSI mode, the G0 character set is selected, and both G0 and G1 sets default to the UK or US character set depending on the Shift 3 flag in SET-UP B.			
Select G0 character set	^O	-	-
Select G1 character set	^N	-	-
e.g. Designate the UK set as the G0 set and Graphics as the G1 set thus:			
ESC (A ESC) 0			
Now to switch between UK and graphics use Control N to select graphics, and Control 0 to select the UK set.			

7.24 Keyboard Features

Autorepeat ON	-	-	ESC [? 8 h
Autorepeat OFF	-	-	ESC [? 8 l
Programmable LED's			
All LED's OFF	-	-	ESC [0 q
L1 ON	-	-	ESC [1 q
L2 ON	-	-	ESC [2 q
L3 ON	-	-	ESC [3 q
L4 ON	-	-	ESC [4 q
L5 ON	-	-	ESC [5 q
Sound Bell	^G	-	-

7.25 Changing Modes

	Cont.	VT52	ANSI
Interactive Mode	-	-	ESC [? 10 l
Edit Mode	-	-	ESC [? 10 h
Replacement Mode	-	-	ESC [4 l
Insert Mode	-	-	ESC [4 h

NOTE: see Section 7.7 for full details of Edit Mode.

VT52 to ANSI	-	ESC <	-
ANSI to VT52	-	-	ESC [? 2 l
VT52 to Emulator mode	-	ESC .	-
ANSI to Emulator mode	-	-	ESC .
Numeric Keypad Numeric Mode	-	ESC >	ESC >
Numeric Keypad Application mode	-	ESC =	ESC =
Cursor keys Cursor Mode	-	-	ESC [? 1 l
Cursor keys Application Mode	-	-	ESC [? 1 h

See Appendix I for full details of codes sent in the various modes.

New Line Mode ON	-	-	ESC [20 h
New Line Mode OFF	-	-	ESC [20 l

With New Line Mode On, the RETURN and ENTER keys each send CARRIAGE RETURN and LINE FEED and receipt of LINE FEED generates an automatic CARRIAGE RETURN. Otherwise, RETURN & ENTER each send just CARRIAGE RETURN, and receipt of LINE FEED is interpreted as just LINE FEED.

7.3 ERASE COMMANDS

From cursor to end of line	-	ESC K	ESC [0 K
From beginning of line to cursor	-	-	ESC [1 K
Entire line containing cursor	-	-	ESC [2 K
From cursor to end of screen	-	ESC J	ESC [0 J
From beginning of screen to cursor	-	-	ESC [1 J
Entire screen	-	-	ESC [2 J

7.4. Printer Commands

	Cont.	VT52	ANSI
Print On Line Anything fed to the screen also goes to the printer.	-	ESC ^	ESC ^
Print Only Anything fed to the screen goes only to the printer, not to the screen.	-	ESC W	ESC W
Print Off Anything fed to the screen goes only to the screen, not to the printer.	- -	ESC X ESC -	ESC X ESC -
Print Page The contents of either the entire screen or just the Scrolling Region (depending on the value of Set-Up C Block D Flag 4) are copied to the printer	-	ESC]	ESC] ESC £ 7

The Printer interface parameters, i.e. Speed, Parity, bits per character & Stop bits are all controlled via Set-Up B. See Section 5.2. for full details.

IMPORTANT
****

The 7800 is designed to respond to XON and XOFF codes transmitted by the printer to control the transfer of data to it's internal buffer. However, in order to utilise this facility it is essential that the cable connecting the 7800 and the printer has **PIN 11 (Data Carrier Detect) AT AN ACTIVE (HIGH) LEVEL AT THE 7800 END.** Alternatively a BUSY status line - Pin 11 - may be used; LOW = BUSY.

7.5. TERMINAL REPORTS

	Cont.	VT52	ANSI
7.51 Cursor Position Report			
Request	-	-	ESC [6 n
Reply	-	-	ESC [*l ; *c R

*l is the present cursor line number
*c is the present cursor column number

7.52 Status Report			
Request (Are you OK)	-	-	ESC [5 n
Reply (If Terminal OK)	-	-	ESC [0 n

7.53 Device Attribute Report			
Request (What are you)	-	ESC Z	ESC Z ESC [0 c
Reply (I am a terminal compatible with the DEC VT132)	-	ESC / Z	ESC [? 4 ; 2 c

7.54 Terminal Parameter Report

	Cont.	VT52	ANSI
Request - What are your Parameters? From now on, send a TPR on exiting Set-Up Mode.	-	-	ESC [0 x
Request - What are your Parameters? From now on, send a TPR only on request.	-	-	ESC [1 x

Reply (ANSI mode only): ESC [2 ; 1 ; 1 ; 0 ; 0 ; 1 ; 0 x

```
                                  3   4   2   8   8
                                  |   5   |  16  16
2 = This is a report -------------+   |   |  24  24
3 = This is a report and the          |   |  32  32
    VDU is only reporting on          |   |  48  48
    request                           |   |  56  56
                                      |   |  64  64
1 = No parity ------------------------+   |  72  72
4 = Odd parity                            |  80  80
5 = Even parity                           |  88  88
                                          |  96  96
1 = 8 bits per character -----------------+ 104 104
2 = 7 bits per character                    108 108
                                            112 112
                                            120 120
Transmit speed ------------------------------+   |
                                                 |
Receive speed ----------------------------------+
```

0	= 50 baud		72	= 1800 baud
8	= 75		80	= 2000
16	= 110		88	= 2400
24	= 134.5		96	= 3600
48	= 300		108	= 7200
56	= 600		112	= 9600
64	= 1200		120	= 19200

7.61 Screen Alignment Test

	Cont	VT52	ANSI
Fill Screen with E's	-	-	ESC # 8

7.62 Reset

Reset may also be performed via Set-Up mode - See Section 5.2.	-	-	ESC c

7.63 Display Control Codes

This is a LOCAL ONLY function used when printing a page, so that control sequences may be copied to the printer as well as normal displayable characters.
It is also useful if communication problems are encountered between the VDU and the host computer, since displaying every code simplifies fault diagnosis.

Display control codes
SHIFT Monitor (ON)
Action control codes
Monitor OFF

7.64 Control Functions

Transmit Answerback Message	^E	-	-
Resume data transmission	^Q	-	-
Stop data transmission	^S	-	-
Cancel ESCape sequence	^X ^Z	-	-

7.7 EDIT MODE FEATURES & PROTECTED FIELDS

7.71 Edit Commands

	Cont	VT52	ANSI
Delete * Characters from Cursor	-	-	ESC [* P
Delete * Lines from Cursor	-	-	ESC [* M
Insert * Lines at Cursor	-	-	ESC [* L

Insert character is performed by entering Insert Mode and typing characters. On typing a character, all characters to the right of the cursor move one space to the right to make way for the new character. See Section 5.15 for full details of Insert and Delete Functions.
e.g. ESC [12 P will delete 12 characters from the current cursor position.
ESC [6 M will delete the line on which the cursor resides and the 5 lines immediately below the cursor.
ESC [4 L will insert 4 lines above the cursor line moving the remainder of the screen down.

Enter Insert Mode	-	-	ESC [4 h
Enter Replacement Mode (Exit Insert Mode)	-	-	ESC [4 l

7.72 Deferred Key Selection

Immediate operation of EDIT Key	-	-	ESC [? 16 h
Deferred operation of EDIT Key	-	-	ESC [? 16 l
Immediate operation of ENTER Key	-	-	ESC [? 14 h
Deferred operation of ENTER Key	-	-	ESC [? 14 l

Immediate operation means that the key immediately performs the Edit or Transmit function.
Deferred operation means that the key sends an ESCape sequence to the host which, in turn, should transmit to the terminal the relevant ESCape sequence to select the required function.

7.73 Data Transmission Commands

TRANSMIT	-	-	ESC 5
Data transmitted = Cursor line	-	-	ESC [? 11 h
Data transmitted = Page	-	-	ESC [? 11 l
Page transmitted = Entire page	-	-	ESC [16 h
Page transmitted = Partial page	-	-	ESC [16 l

A Page is defined as the current Scrolling Region. Partial Page Transmission transmits from the last Partial Page Transmit Marker to the present Cursor Position or from the Top Left Corner of the Page if the last Transmit Marker is after the current Cursor Position.

Transmit All Mode	-	-	ESC [1 h
Transmit Unprotected Only Mode	-	-	ESC [1 l
Space Compression ON	-	-	ESC [13 h
Space Compression OFF	-	-	ESC [13 l

Space Compression causes all trailing spaces in all fields to be suppressed on transmission.

No Transmit Termination Character	-	-	ESC [0 ¦
Transmit Termination Character is Form Feed (ASCII OC)	-	-	ESC [1 ¦

7.74 Protected Fields

Select the following attributes to indicate Protected Fields:

Clear all Protection	-	-	ESC [0 }
Alternate Intensity	-	-	ESC [1 }
Underline	-	-	ESC [4 }
Flashing	-	-	ESC [5 }
Inverse Video	-	-	ESC [7 }
Absence of ALL Attributes	-	-	ESC [254 }

Protected Fields in the 7800 are always associated with character attributes. If more than one attribute is required to mean 'protected', the commands may be combined:

e.g. ESC [5 ; 254 } selects Characters with no attributes and Flashing Characters as Protected.

7.75 Erasure Mode Selection

Erase All Mode	-	-	ESC [6 h
Erase Unprotected Only Mode	-	-	ESC [6 l

7.8 PROGRAMMABLE FUNCTION KEYS (PF1 to PF15)

Each programmable function key can be independently programmed both in SHIFTED and UN-SHIFTED form to send a string of characters and/or control codes to either the line or the screen, i.e. 'local' functions may be programmed in addition to 'on-line' functions. The number of characters which may be programmed into each key is restricted only in that the total number of characters and control codes for all 15 keys cannot exceed 512, e.g. key PF14 may be programmed with 400 characters, key PF10 with 98 characters, keys PF1-PF7 with 2 characters each with all other keys remaining unprogrammed.

7.81 Programming Keys from the Keyboard.

Programming these keys from the keyboard is done in Set-Up Mode B or C, merely by pressing the key to be programmed followed by a 'delimiter', the 'message', and the 'delimiter' again. The 'delimiter' is a character and may be any character not used in the 'message' (the required string of characters). This programs the key with an 'On Line' message. To program a key with a 'Local Only' message, follow the above procedure, but hold CTRL down while pressing the Programmable Key. The line containing the cursor displays 'PF*=' where * is the number of the Programmable Key just pressed. The delimiter and message are displayed after 'PF*=' as they are entered with the exceptions that Control Codes appear as graphic characters and the message is in Inverse Video. As soon as the second delimiter is entered OR ALL 512 BYTES HAVE BEEN USED, the line is cleared and the key is programmed.

e.g. (Key PF8) /ON LINE/ programs key PF8 with an On-Line message: 'ON LINE'. '/' is the delimiter. Pressing PF8 in Interactive Mode will send the message 'ON LINE' to the host computer if the 7800 is On-Line, or to the screen if the 7800 is Local.

(CTRL)(Key PF6) *LOCAL ONLY* programs key PF6 with a Local Only message: 'LOCAL ONLY'. '*' is the delimiter. Pressing PF6 will send the message 'LOCAL ONLY' to the screen under ALL conditions.

A programmable key may be cleared by simply omitting the message in the programming sequence,
e.g. (Key PF7) $$ where '$' is the delimiter.

N.B. Programming a key which has already been programmed automatically clears the previous contents.

7.82 Programming Keys from the Line

An ESCape sequence is used to program a key from the line as follows:

ESC ! for a 'local only' function
ESC @ for an 'on-line' function

This sequence is immediately followed by an upper or lower case letter to identify the key to be programmed, i.e. a selects key PF1, B selects key PF17 (i.e. PF2 SHIFTED) ..... o selects key PF15.

Following the key identifier the 'message' to be stored is input, the start and end of which is identified by the use of a delimiter character. This delimiter character may be any character which does not appear in the 'message' which the key is to generate.

Examples

(i) ESC ! F /INTERNAL ONLY/ programs key PF21 to display "INTERNAL ONLY" on the screen regardless of whether the 7800 is 'on-line' or not. The message is not transmitted to the host computer under any circumstances. The delimiter in this case is '/'.

(ii) ESC @ a *ON LINE* programs key PF1 to transmit "ON LINE" to the host computer if the 7800 is on-line. If the 7800 is in 'local' mode the messge will appear on the screen. The delimiter in this case is '*'

A programmable key may be cleared by simply omitting the message in the programming sequence,

e.g. ESC @ IPP clears key PF24. The delimiter is 'P'
ESC ! b66 clears key PF2. The delimiter is '6'

All programmable keys may be cleared simultaneously, if required, by inputting a special control sequence:

ESC ~

When programming a key, once the key identifier letter (A-O or a-o) has been input, any control characters appear as graphics characters. The display is terminated when the second delimiter is input. To indicate that a key is being programmed the message portion of the command sequence is displayed in Inverse Video*. If the limit of 512 characters (total) is reached during the programming of a key the programming sequence is automatically terminated. This is made obvious to the user since the Inverse Video is turned off when the limit is reached. The portion of the message input prior to the limit being reached is stored as if the second delimiter had been input.

Once the 512 character limit has been reached any unprogrammed keys cannot be programmed.

* If Inverse Video is already ON, it is switched OFF for the display of the program message.

The host computer may cause the contents of any programmable key to be transmitted by transmitting to the 7800 the sequence:

ESC % *

where * is the key identifier letter.

This sequence also permits the messagesof several programmable keys to be concatenated as shown below:

e.g. Key PF1 is programmed - THIS (ESC % b)
Key PF2 is programmed - IS AN (ESC % c)
Key PF3 is programmed - EXAMPLE

Key PF1 will generate the message "THIS IS AN EXAMPLE"
Key PF2 will generate the message "IS AN EXAMPLE"
Key PF3 will generate the message "EXAMPLE"

IMPORTANT NOTE: If a programmable key calls another programmable key the call **MUST** be the last three characters generated by the first key, i.e. control will never be passed back to the first key once the message from the second key has been transmitted.

Any key may be programmed with the contents of another key **WITH THE RESTRICTION** that the key currently being programmed **MUST HAVE A HIGHER PF NUMBER** than the key whose message is to be included.

7.9 COMMANDS AVAILABLE ON THE 7800

7.91 Control Codes

^@	Ignored on input (not stored in input buffer)
^A	-
^B	-
^C	-
^D	-
^E	Transmit Answerback message
^F	-
^G	Sound audible tone
^H	Backspace
^I	Tab to next tab stop
^J	Line Feed
^K	Line Feed
^L	Line Feed
^M	Carriage return
^N	Invoke G1 character set
^O	Invoke GO character set
^P	-
^Q	Resume Data transmission
^R	-
^S	Stop Data transmission
^T	-
^U	-
^V	-
^W	-
^X	Cancel the current ESCape sequence and display an Error code.
^Y	-
^Z	Cancel the current ESCape sequence and display an Error code.
^[	ESCape - introduces control sequences.
^\	-
^]	-
^^	-
^_	-
DELETE	Ignored on input (not stored in input buffer)

7.92 VT52 ESCAPE SEQUENCES

A	Cursor Up
B	Cursor Down
C	Cursor Right
D	Cursor Left
E	-
F	Select Graphics
G	Select UK/US character set
H	Cursor Home
I	Reverse Line Feed
J	Erase from cursor to end of screen
K	Erase from cursor to end of line
L	-
M	-
N	-
O	-
P	-
Q	-
R	-
S	-
T	-
U	-
V	-
W	Print only on
X	Print off
Y nl nc	Direct cursor addressing
Z	What are you?
=	Select application mode for numeric keypad
>	Select numeric mode for numeric keypad
! pk	Program a programmable key (local only function)
@ pk	Program a programmable key (on line function)
% pk	Transmit the contents of a programmable key
<	Select ANSI mode
^	Print on line
_	Print OFF
]	Print page

Note: pk is an upper case letter in the range A - O (inclusive)

7.93 ANSI ESCAPE SEQUENCES

c	Reset	
D	Line Feed	
E	Carriage return and line feed	
H	Set tab at present Cursor column position	
M	Reverse Line Feed	
W	Print only ON	
X	Print OFF	
Z	What are you ?	
=	Select application mode for numeric keypad	
>	Select numeric mode for numeric keypad	
^	Print ON	
-	Print OFF	
]	Print page	
5	Transmit	
7	Save cursor position and character attributes	
8	Restore cursor position and character attributes	
! pk	Program a programmable key (local only function)	
@ pk	Program a programmable key (on line function)	
% pk	Transmit the contents of a programmable key	
# 1	Double height Single width Top half	
# 2	Double height Single width Bottom half	
# 3	Double height Double width Top half	
# 4	Double height Double width Bottom half	
# 5	Single height Single width (normal)	
# 6	Single height Double width	
# 7	Print Page	
# 8	Fill screen with Es	
(A	Select UK Character set	)
(B	Select US Character set	)
(0	Select graphics	) As G0 set
(1	Select alternative character set	)
(2	Select alternative graphics	)
) A	Select UK Character set	)
) B	Select US Character set	)
) 0	Select graphics	) As G1 set
) 1	Select alternative character set	)
) 2	Select alternative graphics	)

Note: pk is an upper case letter in the range A - O (inclusive)

* A	Move cursor up * lines
* B	Move cursor down * lines
* C	Move cursor right * columns
* D	Move cursor left * columns
*l ; *c H	Move cursor to line *l, column *c
0 J	Erase from cursor to end of screen
1 J	Erase from beginning of screen to cursor
2 J	Erase entire screen but do not move cursor
0 K	Erase from cursor to end of line
1 K	Erase from beginning of line to cursor
2 K	Erase entire line but do not move cursor
* L	Insert * lines from the cursor line down
* M	Delete * lines from the cursor line down
* P	Delete * characters from the cursor right

c	Reset
*l ; *c f	Move cursor to line *l, column *c
0 g	Clear tab at present cursor column position
3 g	Clear all tabs

1 h	Select Transmit All Mode
1 l	Select Transmit Unprotected Only Mode
4 h	Select Insert Mode
4 l	Select Replacement Mode
6 h	Select Erase All Mode
6 l	Select Erase Unprotected Only Mode
16 h	Select Full Page Tansmission Mode
16 l	Select Partial Page Transmission Mode
20 h	Select new line mode (Auto Carriage Return ON)
20 l	Clear new line mode (Auto Carriage Return OFF)

0 m	Clear all character attributes
1 m	Select Alternate Intensity attribute
4 m	Select Underline attribute
5 m	Select Flashing attribute
7 m	Select Inverse Video attribute
5 n	Status Request
6 n	Cursor Position Request
0 q	Switch all keyboard LED's OFF
1 q	Switch keyboard LED 1 ON
2 q	Switch keyboard LED 2 ON
3 q	Switch keyboard LED 3 ON
4 q	Switch keyboard LED 4 ON
5 q	Switch keyboard LED 5 ON
*t ; *b r	Select scrolling region from line *t to line *b
0 x	Terminal Parameter Request - Send when exiting SET-UP
1 x	Terminal Parameter Request - Send only on request

[? 1 h	Select cursor key application mode
[? 1 l	Select cursor key mode (normal)
[? 2 h	-
[? 2 l	Select VT52 mode
[? 3 h	Select 132 characters per line
[? 3 l	Select 80 characters per line
[? 4 h	Select smooth scroll
[? 4 l	Select jump scroll
[? 5 h	Select inverse screen video
[? 5 l	Select normal screen video
[? 6 h	Origin mode ON
[? 6 l	Origin mode OFF
[? 7 h	Wraparound ON
[? 7 l	Wraparound OFF
[? 8 h	Autorepeat ON
[? 8 l	Autorepeat OFF
[? 10 h	Edit Mode ON
[? 10 l	Edit Mode OFF
[? 11 h	Transmit Line Mode
[? 11 l	Transmit Page Mode
[? 13 h	Space Compression ON
[? 13 l	Space Compression OFF
[? 14 h	Select Transmit Immediate
[? 14 l	Select Transmit Deferred
[? 16 h	Select Edit Immediate
[? 16 l	Select Edit Deferred

[0 }	No fields Protected
[1 }	Alternate Intensity Protected
[4 }	Underline Protected
[5 }	Flashing Protected
[7 }	Inverse Video Protected
[254 }	All Attributes Off Protected

[0 ¦	No Transmit Termination Character
[1 ¦	Transmit Termination Character

SECTION 8

8.1 THE ANSWERBACK MESSAGE

The Answerback feature of the 7800 is effectively a 31st programmable key, although it can only be programmed from the keyboard, and it is disabled if the terminal is not ON-LINE.

To program the Answerback Message, enter SET-UP B (press "SET-UP" then "5" on the main keyboard) then SHIFT A (CAPS LOCK has no effect at this point). "A=" will appear at the start of the line containing the cursor. Now type "delimiter", "message", "delimiter" exactly as if programming a programmable key. The response displayed on the screen is similar to that for programmable keys except that there is no inverse video field for the message. Moreover, typing the second delimiter clears the cursor line.

The maximum number of characters for the Answerback Message is 20. Typing more than 20 characters has the same effect as typing the second delimiter.

The programmed message is now stored temporarily. To permanently store it (and all other SET-UP variables), type SHIFT S; the bell will sound to confirm the Save operation.

The Answerback Message may be sent to the host computer by the VDU by pressing BREAK while holding CTRL down.

Alternatively the answerback Message may be called up by the host computer by ASCII Code 5 (Control E). The Answerback Message is invisible to the operator since switching to Local disables the sending of the Answerback Message.

IMPORTANT

On fitting software with answerback and Programmable function Keys to VDU's for the first time, the SET-UP Variables will be corrupted and must be reinitialised and saved. It is VERY IMPORTANT that an Answerback Message be programmed in and saved when SET-UP is entered for the first time. It is also VERY IMPORTANT to clear all Programmable keys using ESC ~ before attempting to program or use them.

SECTION 9

9.1 GENERAL

The 7800 is normally equipped with two interfaces, one for the communications line and one for use with an auxiliary device such as a printer. Both interfaces are terminated at a standard D type, 25 way connector.

Line interface - Male Socket

For the auxiliary - Female Socket

Both interfaces are serial asynchronous and comply with EIA RS232C and CCITT V24 standards.

The line interface is suitable for connection to Post Office Modems without the need for additional protection.

9.2 LINE CONNECTOR PIN ASSIGNMENTS

PIN NO	LINE DESCRIPTION	CIRCUIT RS232C	CIRCUIT CCITT.V24
1	Protective Ground	AA	101
2	Transmitted Data	BA	103
3	Received Data	BB	104
4	Request to Send	CA	105
5	Clear to Send	CB	106
7	Signal Ground (Common Return)	AB	102
8	Received Line Signal Detector	CF	109
11	Rate Select		111
20	Data Terminal Ready	CD	108

9.3 SIGNAL DEFINITIONS

Protective Ground (Circuit AA, 101)
This connector when used, is electrically bonded to the machine frame.

Transmitted Data (Circuit BA, 103)
This conductor transfers data from the terminal via a data set for transmission to a remote data terminal. The terminal holds circuit BA in a MARK (-12V) condition during time intervals between character words, or when no data is being transmitted.

Received Data (Circuit BB, 104)
This conductor transfers data from the data set (modem) to the terminal. Circuit BB is held in a MARK condition when no data is received.

Request to Send (Circuit CA, 105)
This control signal is normally turned to +12V when the terminal is Powered ON to indicate the terminal is prepared to transmit data.

Clear to Send (Circuit CB, 106)
This control signal is turned ON by the data set to indicate to the terminal that it is prepared to transmit data to the remote device. Only when this signal is ON (+12V) can the terminal transmit.

Signal Ground (Circuit AB, 102)
This conductor establishes a common ground reference for all interface lines except Circuit AA, 101.

Received Line Signal Detector (Circuit CF, 109)
The data set turns this signal ON to indicate it has received a suitable carrier signal from the data communication equipment. Only when this signal is ON (+12V) the terminal will accept the receiving data. (Not used on standard version)

Data Terminal Ready (Circuit CD, 108)
This signal is used to control switching of the data communication equipment (Modem) to the communication channel. The terminal will send an ON condition (+12V) when ON line mode and an OFF condition (-12V) when in Local Mode.

NOTE

If a simple 3 wire system is being used it will be necessary to connect pins 4 and 5 together in the terminal plug.

9.4 AUXILIARY CONNECTOR PIN ASSIGNMENTS (PRINTER PORT)

PIN NUMBER	DESCRIPTION
1	Protective GND
2	Received Data from Auxiliary Device*
3	Transmitted Data to Auxiliary Device
4	Clear to Send (Busy Line)
7	Signal GND
11	Data Carrier Detect (Connect to high)

* The auxiliary interface can accept XOFF or XON codes from the auxiliary device (printer) to control the data flow to the auxiliary device (printer) only when pin 4, Clear to Send is high.

See also Section 7.4

9.5 INTERFACE CABLES

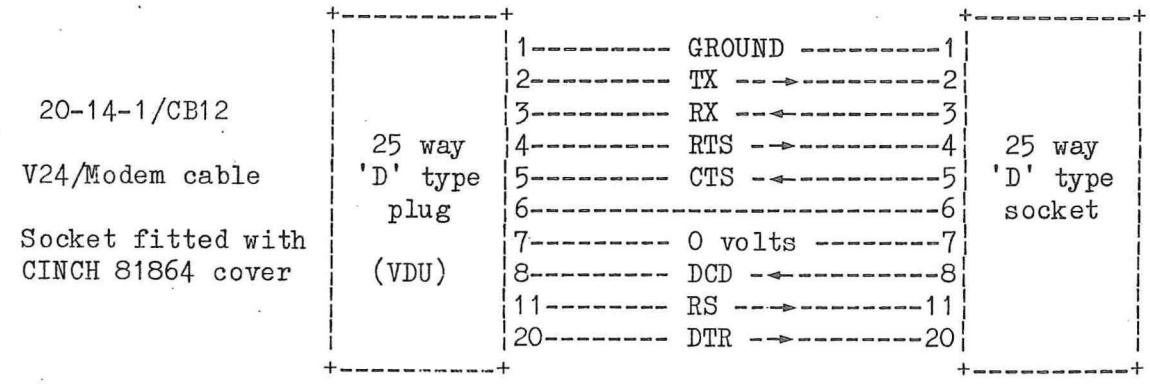
Four types of cables can be supplied with the VDU, see the following drawing:

INTERFACE CABLES

20-14-1/CB12

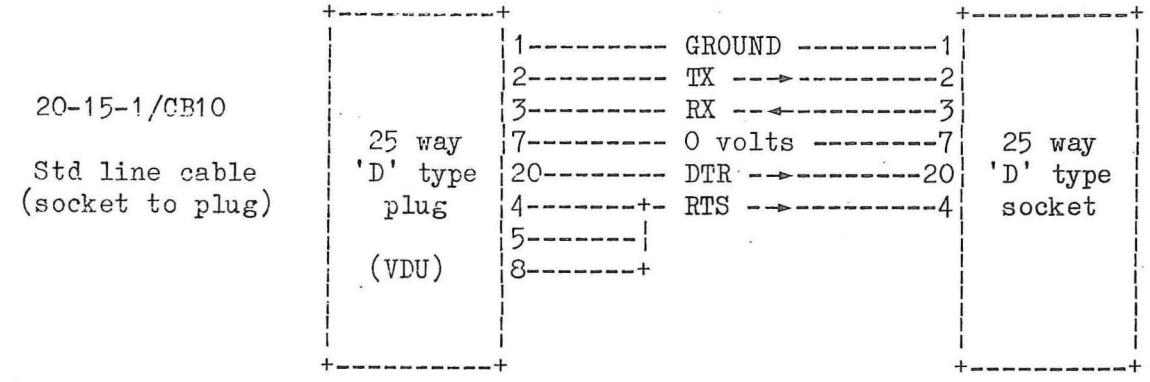
V24/Modem cable

Socket fitted with CINCH 81864 cover



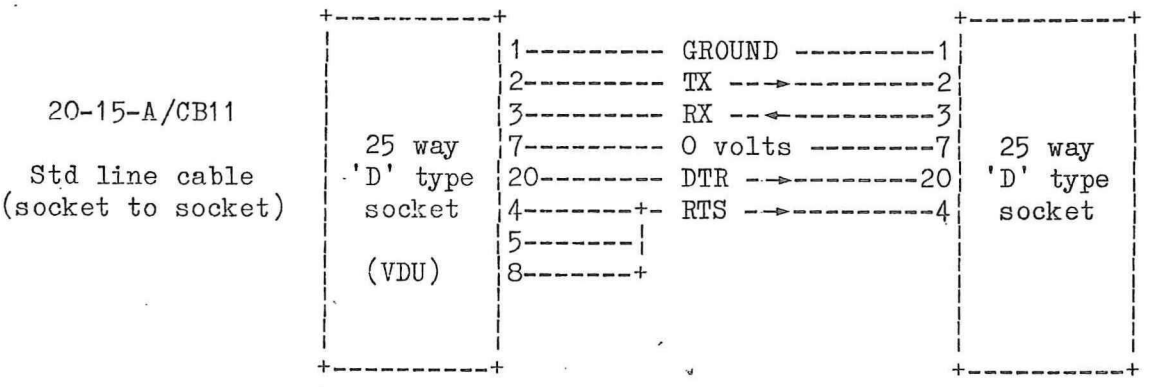
20-15-1/CB10

Std line cable (socket to plug)



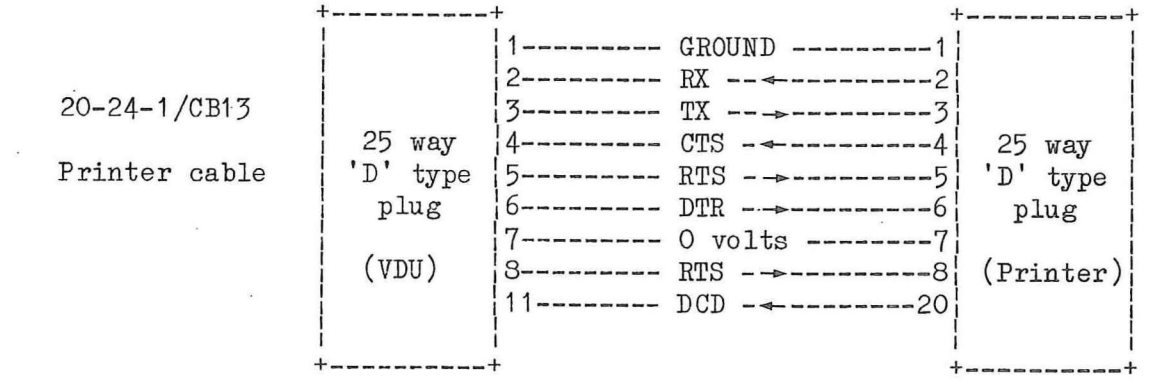
20-15-A/CB11

Std line cable (socket to socket)



20-24-1/CB13

Printer cable



Notes: i) CB10 will be supplied as standard

ii) All cables are 2 metres long. Non standard lengths can be supplied upon request at extra cost.

SECTION 10

10 OPTIONS

The 7800, as a multi-function terminal has many options available, some of which must be factory installed, some of which may be field installed. This section only attempts to give a brief outline of each of the options available - further information is available on request.

10.1 PRESTEL (Viewdata)

PRESTEL is the name of the Viewdata service operated by British Telecom. The system was concieved primarily as a data retrieval system aimed at both business and domestic users utilising a modified domestic TV set to access a remote computer system via a modem (modulator/demodulator) device. Recognising the potential of such a system Pericom have made available an optional PRESTEL adaptor suitable for use with the 7800. When fitted with this option the 7800 has an additional cable protruding from the rear of the base which is terminated in a standard British Telecom Jack 96A.

This jack may be inserted into a standard "PRESTEL" socket (installed by British Telecom) and will give access to the PRESTEL database.

When you take delivery of a new 7800 with PRESTEL option you must register the terminal with British Telecom before access to the PRESTEL database will be permitted. For more information on terminal registeration telephone FREEFONE 2043.

Once registered operation of the terminal is extremely simple. Only 4 keys are used - these keys are engraved with the symbols * # REVEAL and (VDATA) on the right hand keypad.

During the registration process the British Telecom operator will inform you which telephone number(s) to use for access to the PRESTEL service. In order to access the system lift the receiver of the telephone associated with the jack socket, dial the number and wait for a high-pitched tone (this is the carrier tone generated by the PRESTEL system having automatically answered your call. As soon as you hear this high-pitched tone press the CTRL and (VDATA) keys together. The L5 light on the keyboard should light and you may notice the tone reduce in loudness. You may now replace the telephone receiver (the terminal will now hold the call for you) and you should notice the screen clear. Within a few seconds you should see a "Welcome to PRESTEL" message on the screen. Generally each page (the term used for each screen) will inform you how to get to the next. However a few simple rules may be helpful.

Only numeric entry is required unless you wish to utilise the Mailbox facility. Each page will generally give you up to 10 choices (numbered 1 to 0) for the next page to be viewed. At the top of the screen you will see some information relating to the page displayed including the organisation responsible for the page, the page number (from 1 to 9 numerics followed by a lower case letter) and the frame charge. The frame charge will automatically be debited to your PRESTEL account as each page is viewed. Fortunately the majority of pages are free! The page number is of use if you want to directly select a known page without following the 'menu' provided. This can be done by keying *number# substituting the required page number for 'number'. You will notice that you may not directly select any specific frame by it's frame letter. Direct access is only permitted to "a" frames.

If you wish to return to the last page viewed you may, of course, select it directly by it's page number or, more simply, by keying *#. This may be repeated up to 3 times.

If the page you are currently viewing has been corrupted by noise on the telephone line you may obtain a retransmission (free of charge - regardless of frame charge) by keying *00.

If you have reason to believe that the current page has been updated by the Information Provider since you retieved the page you may key *09 to obtain an updated copy. Beware, however, that your account will be debited with the frame charge again regardless of whether any update has taken place.

10.2 Graphics Controller

The Graphics Controller is an option on the basic 7800 terminal providing, in addition to it's already wide repertoire, the ability to emulate the Tektronix 401x series graphic terminals.

Unlike so many other "add-on" grahic controllers the 7800 Graphic Controller offers a full 1024 x 1024 dot resolution with addressing down to an individual dot. The display area only displays 1024 (wide) x 750 (high) but the control software permits the user to scroll vertically to permit any portion of the image to be displayed.

The 7800 Graphics Controller is palnned to be available by the second quarter of 1982.

10.3 Micro-computer System

The **Pericom 7800 Micro-computer System** is a stand-alone, single user system operating under control of the Digital Research CP/M-80 micro-computer operating system.

The main display unit is adapted to also house a 4MHz Zilog Z80A micro-processor, 64K byte random access memory and floppy disk controller mounted in a 5-slot S100 mother board. The floppy disk housing is physically separate and may be mounted in a custom-designed desk unit, on top of a conventional desk, or, in situations where space is at a premium, on top of the main display unit. As standard, two diskette drives are supplied, each having a capacity of 800K bytes. Two additional diskette drives may be added increasing the overall storage capacity to 3.2M bytes.

Additional storage units are planned including a 12Mb Winchester technology disk drive and 8" slimline diskettes.

APPENDIX I

NUMERIC KEYPAD CODES

	Numeric Mode		Application Mode	
Key	VT52	ANSI	VT52	ANSI
,	,	,	ESC ? l	ESC O l
-	-	-	ESC ? m	ESC O m
.	.	.	ESC ? n	ESC O n
ENTER	Same as return	Same as return	ESC ? M	ESC O M
0	0	0	ESC ? p	ESC O p
1	1	1	ESC ? q	ESC O q
2	2	2	ESC ? r	ESC O r
3	3	3	ESC ? s	ESC O s
4	4	4	ESC ? t	ESc O t
5	5	5	ESC ? u	ESC O u
6	6	6	ESC ? v	ESC O v
7	7	7	ESC ? w	ESC O w
8	8	8	ESC ? x	ESC O x
9	9	9	ESC ? y	ESC O y
INSERT LINE (F1)	ESC P	ESC O P	ESC P	ESC O P
DELETE LINE (F2)	ESC Q	ESC O Q	ESC Q	ESC O Q
INSERT MODE (F3)	ESC R	ESC O R	ESC R	ESC O R
DELETE CHAR (F4)	ESC S	ESC O S	ESC S	ESC O S

CURSOR KEY CODES

		ANSI MODE	
KEY	VT52 Mode	Normal	Cursor Key Mode
HOME	ESC H	ESC [H	ESC [H
	ESC A	ESC [A	ESC O A
	ESC B	ESC [B	ESC O B
	ESC C	ESC [C	ESC O C
	ESC D	ESC [D	ESC O D

APPENDIX II

CONTROL CODE TABLE

ASCII CODE	CONTROL CHAR	DISPLAYED SYMBOL*	DESCRIPTION	KEY COMBINATION	GRAPHICS KEY*
00	NUL	◆	Diamond	^@/^'	'
01	SOH	▒	Checkerboard	^A	a
02	STX	H_T	Horizontal Tab	^B	b
03	ETX	F_F	Form Feed	^C	c
04	EOT	C_R	Carriage Return	^D	d
05	ENQ	L_F	Line Feed	^E	e
06	ACK	°	Degree symbol	^F	f
07	BEL	±	Plus/Minus	^G	g
08	BS	N_L	New Line	^H	h
09	HT	V_T	Vertical Tab	^I	i
0A	LF	┘	Lower right corner	^J	j
0B	VT	┐	Upper right corner	^K	k
0C	FF	┌	Upper left corner	^L	l
0D	CR	└	Lower left corner	^M	m
0E	SO	┼	Crossing lines	^N	n
0F	SI	⎺	Horiz line - scan 1	^O	o
10	DLE	─	Horiz line - scan 3	^P	p
11	DC1 (XON)	─	Horiz line - scan 5	^Q	q
12	DC2	─	Horiz line - scan 7	^R	r
13	DC3 (XOFF)	⎽	Horiz line - scan 9	^S	s
14	DC4	├	Left "T"	^T	t
15	NAK	┤	Right "T"	^U	u
16	SYN	┴	Bottom "T"	^V	v
17	ETB	┬	Top "T"	^W	w
18	CAN	│	Vertical Bar	^X	x
19	EM	≤	Less than or equal to	^Y	y
1A	SUB	≥	Grter than or equal to	^Z	z
1B	ESC	π	Pi	^[	{
1C	FS	≠	Not equal to	^\	|
1D	GS	£	Pound Sign	^]	}
1E	RS	•	Centered dot	^~/^^	~
1F	US	■	Solidus	^_	_

* The column headed 'DISPLAYED SYMBOL' gives the symbol displayed for this code whilst the 7800 is in Control Character display mode.

The column headed 'GRAPHICS KEY' gives the key which must be depressed whilst in Graphics mode to obtain the character given in the 'DISPLAYED SYMBOL' column.

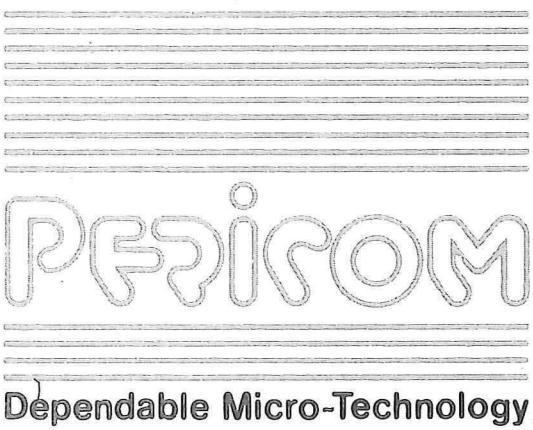
APPENDIX III

DECIMAL ASCII CODES

	0	10	20	30	40	50	60	70	80	90	100	110	120
0	NUL	LF	DC4	RS	(	2	<	F	P	Z	d	n	x
1	SOH	VT	NAK	US	)	3	=	G	Q	[	e	o	y
2	STX	FF	SYN	SP	*	4	>	H	R	\	f	p	z
3	ETX	CR	ETB	!	+	5	?	I	S	]	g	q	{
4	EOT	SO	CAN	"	,	6	@	J	T	^	h	r	|
5	ENQ	SI	EM	£	-	7	A	K	U	-	i	s	}
6	ACK	DLE	SUB	$	.	8	B	L	V	`	j	t	~
7	BEL	DC1	ESC	%	/	9	C	M	W	a	k	u	DEL
8	BS	DC2	FS	&	0	:	D	N	X	b	l	v	
9	HT	DC3	GS	'	1	;	E	O	Y	c	m	w	

HEXADECIMAL ASCII CODES

	0	10	20	30	40	50	60	70
0	NUL	DLE	SP	0	@	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	£	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l	|
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	-	o	DEL



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