

Software Product Description

Product Name: **PTERM**
Product Description: PROM based Terminal Emulator for Rastergraf 34020-based boards
Products Supported: VCL-V
VCL-M

PTERM Description

The Rastergraf PTERM terminal emulator supports Rastergraf's 34020-based 8-bit and 24-bit VCL display controllers (described on other side). The code is supplied in on-board EEPROM.

PTERM uses the screen of the Rastergraf graphics board as if it were a standard character type serial terminal. In order to communicate with the host CPU, a serial data cable must be connected between a serial port on the graphics board and the console port on the host CPU.

While this may not seem as elegant as having the CPU talk directly to the graphics board, it is the only practical solution. The alternative would be to have each CPU vendor port the CPU's console PROM to the Rastergraf graphics card.

PTERM is intended to be used as a start-up console, for booting the operating system, and for doing occasional editing when the normal X Server is not running. The terminal emulation is complete enough to use of the Unix *vi* editor. This includes support for cursor escape sequences.

Console Serial I/O

PTERM runs the console link at 9600 baud, selects automatically between PC Keyboard or LK401 Keyboard and can be jumper configured for 7 or 8 bit data, and

RTS/CTS or XON/XOFF. The XON/XOFF (software) flow control only applies to data being sent *to* PTERM. Furthermore, PTERM has an 8 KB input buffer which must fill before triggering an XON/XOFF flow control sequence.

Hardware flow control is done by enabling the graphics board UART's RTS/CTS control function. It is unlikely that the CTS signal will be asserted because the 34020 should in general service UART interrupts prior to the next character being received. The RTS signal will control output from PTERM to the host. If this signal is not connected, the UART will not send characters to the host.

Keyboard and Mouse Support

PTERM supports both RS-232 (LK401) and PS/2 (PC compatible) keyboards. PTERM automatically senses the keyboard type on power-up. If no keyboard is detected it defaults to the serial keyboard type.

Since PTERM is a character based program, there is *no* support provided for mouse or other pointing device.

Display Characteristics

PTERM uses the full screen for its display, so the screen size varies from board to board as a function of the display initialization parameters.

The screen display parameters can be changed in the field by running a utility program available under certain operating systems. This program changes the contents of the graphics board's 512 byte serial Electrically Erasable Programmable Read Only Memory (EEPROM) which contains the display table.

Although PTERM is character oriented, the graphics boards are, of course, pixel based. PTERM makes liberal use of the special graphics functions of the on-board 40 MHz Texas Instruments TMS34020 Graphics

System Processor and Rastergraf's CLP Graphics Subroutine Package to accelerate scrolling operations, character and cursor display and movement, and implement serial I/O.

Start-up Diagnostics

As part of its start-up procedures, PTERM performs a variety of diagnostics. It reports the results as an information "bar" at the top of the screen (which scrolls off after the screen has been filled). Included are various configuration details of the board including PTERM version, keyboard type (PC or LK401), memory size, display size, and board serial number, etc.

Restarting PTERM

As the graphics board's primary use in a system is not as a PTERM vehicle but rather to run PX Windows X Server or the Rastergraf Graphics Subroutine Package, some planning must be done to permit this dual use.

PTERM supports a restart function which allows you to exit PX Windows server and restart PTERM. This is done by typing <ctrl-alt-del>. However, it is not a true hot-key switch because the context switch is destructive - once back in PTERM you can't go back to X without restarting the server from the operating system.

At this time, there is no provision for restarting PTERM from a Graphics Subroutine Package application.

PTERM Customization

Upon special request and acceptance of NRE charges, Rastergraf is prepared to make certain modifications to PTERM. These are handled on a case by case basis. Please contact Rastergraf for more information.

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PTERM Specifications

Diagnostics

PTERM reports the following information as part of its startup:

- PTERM Version
- Board serial number
- Initialization table number and source
- Video memory size
- User Jumper settings
- Keyboard type

If PTERM reaches the beginning of its initialization routine, the **TEST** LED will be lit. If PTERM gets to its input loop (waiting for keyboard or console input), the **TEST** LED will be turned off and the **PASS** LED will be lit. Certain failure modes will cause the **FAIL** LED to be turned on instead.

Graphics Board Memory Requirements

1 MB Flash EEPROM (control store)
1 MB 34020 system DRAM (stack, etc.)
512 byte Serial EEPROM (display tables)

Serial EEPROM

At boot time, PTERM extracts from the Serial EEPROM the board's serial number, one of four initialization tables (selection is made by two user jumpers), and hard-coded versions of the user jumpers.

Display Format

Two user jumpers allow one to select which table stored in Serial EEPROM is to be used. If an invalid table entry is found (perhaps because the user jumpers were set incorrectly), PTERM defaults to table 0.

A special display format can be specified at order time and depending on the graphics board's capabilities, ranges from 640 x 480 to 2048 x 1536.

Keyboard Compatibility

PTERM automatically detects the presence of either a serial (LK401) or PS/2 (PC compatible) keyboard.

Ordering Information

PTERM is the designation for the EEPROM based Rastergraf Terminal Emulator. Four 32-pin PLCC Flash EEPROM make up the distribution set. PTERM is licensed on a single board basis, so that a new set of PTERM parts must be purchased for each graphics board.

Graphics Board	PTERM Order Number
VCL-V/24	PTERM-VCL-V/24
VCL-V/8	PTERM-VCL-V/8
VCL-M/8	PTERM-VCL-M/8

Console Port Compatibility

9-pin standard D-Sub RS-232 serial port. An adapter can be used for consoles which require a 25-pin D-Sub. Jumpers select data size and flow control mode.

User Jumpers

- XON/XOFF or RTS/CTS flow control
- 7 bit even parity or 8-bit no parity data
- One of four standard display formats (display size depends on board model)
- full screen or 24 line x 80 column
- 7 bit even parity or 8-bit no parity data

Note: If the *override user jumpers option* has been set in the Serial EEPROM, the user jumpers are ignored and the options extracted from Serial EEPROM are used.

VCL Series Boards

Rastergraf's VCL graphic boards are based on the 40 MHz TMS 34020 Graphics Processor. Features include:

- optional 34082 Floating Point Coprocessor/Accelerator (VCL-V only)
- programmable video timing and refresh
- Reprogrammable EEPROM
- 2 serial I/O ports
- PC type mouse and keyboard ports
- programmable color map
- hardware cursors, pan, zoom, and scroll
- hardware byte swapper
- external sync capability
- low power 6U VMEbus or PMC design
- extended temperature range options
- sufficient display memory to support double buffered displays

The VCL-V/8 and VCL-M/8 boards have an 8-bit/pixel primary plane plus an 8-bit/pixel overlay plane. The boards support analog RGB and/or analog and digital color and monochrome flat panel (EL, LCD, and plasma) display output. Analog display resolution ranges from 640 x 485 up to 2048 x 1536 pixels. Digital display resolution ranges from 640 x 480 up to 1280 x 1024 pixels.

The VCL-V/24 series boards offer the same features as the VCL-V/8 with the additional enhancement of a true color (24-bit/pixel primary plane) .

Performance Features

The VCL series boards and software make full use of the 34020, which provides hardware assisted line drawing, fills, and bitblt. Performance enhancements include optional 34082 FPU (VCL-V only), hardware byte swapper and Video RAM writemask, color register, VFILL, VBLT, and page mode functions. The VRAM functions yield a 160 Mpixel/second fill rate for the VCL-V/8.

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