

PT-SS30-TERM

User's Manual

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VGA Terminal

The MC6850 at \$E004 is connected to an onboard terminal. The user need only supply a VGA monitor and PS/2 keyboard to communicate with the computer much like connecting a VGA monitor and keyboard to a desktop PC.

The MC6850 at E004 is connected to an MX270F256B-I/SP programmed to act as an RS232 terminal using a VGA monitor and PS/2 keyboard. The terminal currently emulates a VT100.

The terminal will enter setup mode by pressing the Control ALT DEL - the "DEL" key is the one in the Insert/Home/PageUP group. The other "DEL" keys don't work.

If your board was purchased assembled, it will be set for 9600 baud and ready to work. If you build the bare board you **must run VGA setup before you can use the VGA terminal**. You need to ensure your MB and SS30-VGA are also configured for 9600 baud.

At a minimum set the baud rate, stop bits (1), parity none and signal level - TTL .

The terminal emulation circuitry is a modification on the terminal design by Peter Hizalev.

The firmware is open source and can be obtained here -

<https://github.com/petrohi/terminal>

Should the user desire to modify the firmware a Pickit3 in-circuit programmer is required. As of the date of this manual V3.02 is the version used in SS30-TERM.

Features

- Compatible with VT-100
- SETUP utility on Ctrl+Alt+Del;
- Configurable UTF-8, ISO 8859 and IBM PC 437 support;
- Configurable VT-220 and PC/Sun keyboards compatibility;
- Blinking and inverted visual attributes;
- VGA output follows 25MHz pixel clock to get 640x480 resolution at 60Hz refresh rate;
- 8x16 characters and 24 or 30 lines screen buffers configurable in SETUP utility;
- Full range of baud rates from 110 up to 1,500,000;
- Scroll-lock and XON/XOFF flow control;
- Monochrome color is selectable with jumpers.
- US, UK, DE, SE, FR and BE keyboard layouts are supported.

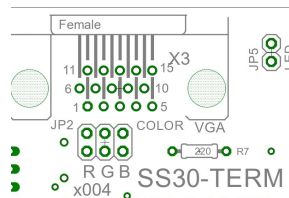
The MC6850 at address E000-E001 is connected to RS232 drivers and brought to a DB-9M connector. The pin outs of the connector are such that a USB to RS232 cable converter will directly plug into the SS30-TERM and connect to a USB port on a PC. One example of this adapter can be found at AMAZON under part number - cablecreation B0769DVQM1.

VGA Setup

You must run setup to configure the VGA terminal before it can be used. Your computer does not need to be fully functional or configured for the correct baud to get to the VGA setup screen. After completing all of your setup choices press the F12 function key. Your selections will be stored and you will not need to enter them again. On power up the VGA terminal will check for the presence of a PS/2 keyboard and inform you if one is not found. The VGA terminal is only reset at initial power up. Pressing the reset button on your computer does not reset the VGA terminal. Should you need to reset the VGA terminal and the CTRL,ALT,DEL key won't enter setup, you will need to power down and restart your computer.

Feel free to experiment with the choices. You can always change them back if you don't like the result. Peter Hizalev wrote the firmware used in the VGA terminal and he didn't do a write up on the setup choices.

The text color of the VGA display is determined by jumper JP2. There are three jumpers. The jumpers represent red, green and blue. At least one jumper must be inserted. Any combination of jumpers can be used. For example, all three jumpers give a white character.



This is the setup screen when pressing the Control ALT DEL key. The left and right arrow keys will move the selection from the "General" to "Video" tab.

ASCII TERMINAL SETUP

General	Serial	Terminal	Video
Startup [message] Keyboard layout: [US]			← → Select menu ↑ ↓ - Select option <Enter> - Edit option <Esc> - Discard and restart <F12> - Save and restart

Under the "Serial" tab you will need to set the baud rate. It must be the **same baud you selected on the JP11 jumper**. Set "Signal levels" to TTL, Stop bits to 1, and parity to none.

ASCII TERMINAL SETUP

General	Serial	Terminal	Video
Baud rate: [19200] Signal Levels: [TTL] Stop Bits: [1 bit] Parity: [none]			← → Select menu ↑ ↓ - Select option <Enter> - Edit option <Esc> - Discard and restart <F12> - Save and restart

Under the "Terminal" tab the default selections should work except for "Backspace Mode". Backspace mode needs to be turned on to erase the character on the screen when you press the backspace key.

ASCII TERMINAL SETUP

General	Serial	Terminal	Video
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Character Set:	[	UTF8]	← → Select menu
Keyboard compatibility:	[	PC/SUN]	↑↓ - Select option
XOFF/XON flow control:	[	on]	<Enter> - Edit option
Receive controls:	[	S8C1T]	<Esc> - Discard and restart
Transmit controls:	[	S7C1T]	<F12> - Save and restart
Send/receive mode (SRM):	[	normal]	
New line mode (LNM):	[	off]	
Cursor key mode (DECCKM):	[	normal]	
Keypad mode (DECNM):	[	off]	
ANSI mode (DECANM):	[	ANSI]	
Auto-wraparound mode (DECAWM) :	[	on]	
Auto-repeat keys mode (DECARM):	[	on]	
Screen mode (DECSCNM):	[	normal]	
Backspace mode (DECBKM):	[	on]	

Settings on the "video" tab are personal choice. The most notable choice is the option of displaying 24 or 30 lines.

General	Serial	Terminal	Video
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Number of lines:	[	24]	← → Select menu
Monochrome transformation:	[	Luminance]	↑↓ - Select option
			<Enter> - Edit option
			<Esc> - Discard and restart
			<F12> - Save and restart

RS-232 INTERFACE INFORMATION

DB-9 pin out

PIN DESCRIPTION

- 1 Ground
- 2 Received data
- 3 Transmitted data

JP1 and JP2 set the baud rate for the MC6850's. For the VGA port (E004) you should set this to the highest baud rate generated by your system. You need to run the VGA setup program to select the same baud rate, set other user preferences, and save the selections.

Different motherboards may give different baud rates on the baud lines so the speeds marked on the SS30-TERM may not match those of your motherboard.

There are two IRQ jumpers for the MC6850's - JP6 for the TERM/VGA port and JP7 for the RS232 port. These are not normally needed for FLEX but will need to be jumpered for OS9.

- JP3 - BootLoad - Only shorted when programming U1
- JP5 - Connection for Pckit3 programmer - not used
- JP5 - Enable IRQ for E004 - needed for OS9
- JP6 - Enable IRQ for E000 - needed for OS9
- JP9 - Not used - Must not be shorted
- JP10 - Baud selection for E000
- JP11 - Baud selection for E004

Memory Map

- E000-E001 ACIA (6850) - RS232
- E004-E005 ACIA (6850) - VGA, PS/2 keyboard

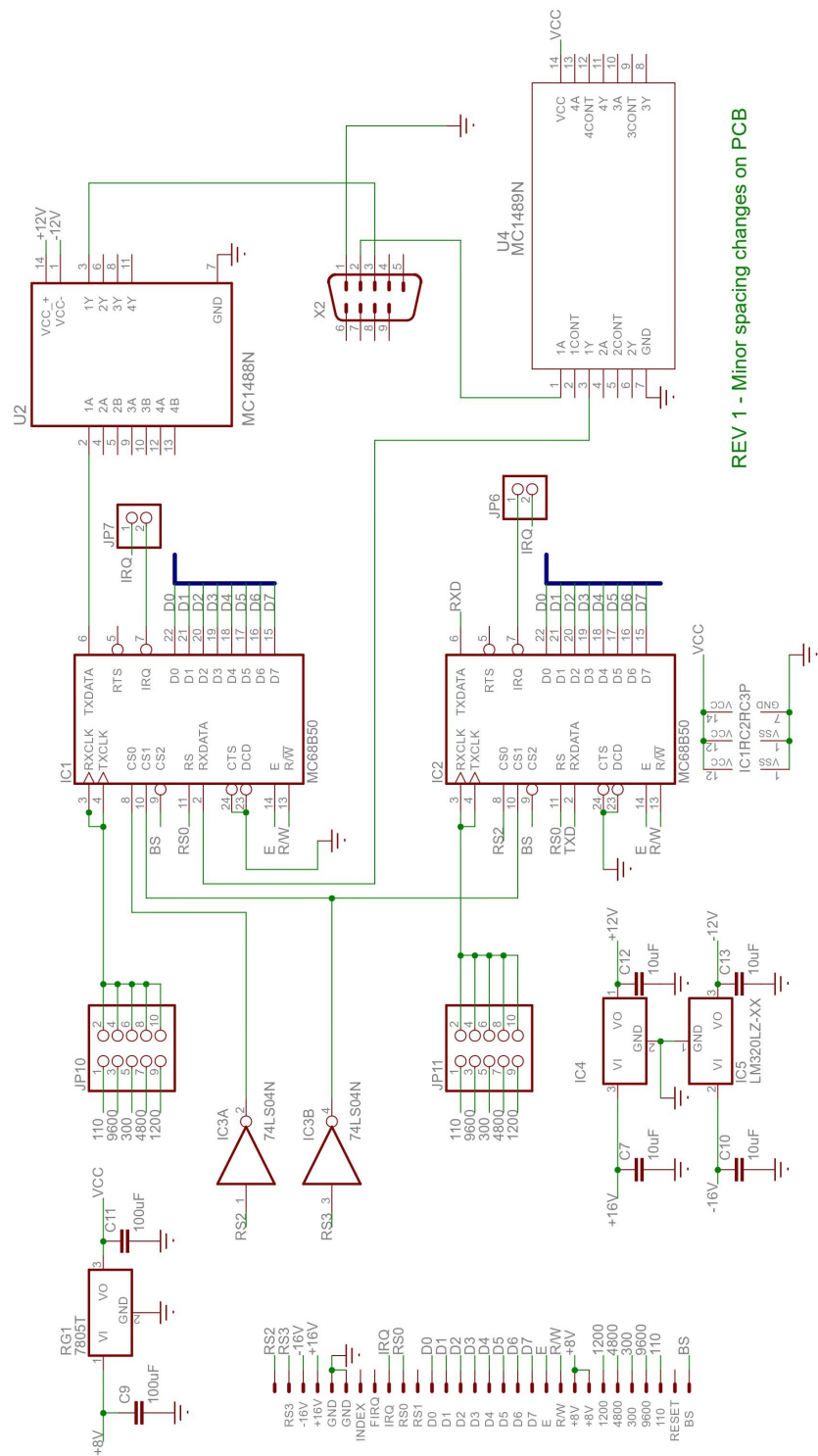
Typically E004-E005 is your terminal address under FLEX or OS9.

PARTS LIST SS30-TERM

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QTY	DESIGNATION	DESCRIPTION
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1	U1	PIC MX270F256B-I/SP
2	IC1, IC2	MC68B50P
1	IC3	SN74LS04
1	IC4	78L12
1	IC5	79L12
1	U2	MC1488
1	IC3	MC1489
1	U3	MPC-1700-3302
1	RG1	7805
4	R1, R3-R5	4700 1/4W RESISTOR
1	R2	82 1/4W RESISTOR
1	R6	INSTALL SHORTING WIRE
1	R7	220 1/4W RESISTOR
1	Y1	20MHZ CRYSTAL
4	C5, C8, C14 C15	0.1 uF Capacitor
2	C1, C2	27 pF Capacitor
7	C3, C4, C6, C7 C10, C12, C13	10uF TANT Capacitor
2	C9, C11	100uF 16v Electrolytic
1		Small Heat Sink for TO-220
2		5x2 header strip
2		3x2 header strip
1		1x6 header strip
4		1x2 header strip
3		14 pin IC socket
2		24 pin IC socket 0.6" wide
1		28 pin IC socket 0.3" wide
1		5 Pin mini DIN socket
1		DB-15F VGA connector
1		DB-9M RS232 connector
3		Molex 10 pin socket
1		Molex Index peg
1		Board
4		shorting shunts
1		LED RED

[illegible]

Schematics



REV 1 - Minor spacing changes on PCB

