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PCM-3521 PC/104 Flat-panel/CRT VGA Module

Introduction

The PCM-3521 Flat-panel/CRT VGA Module supports a wide range of popular LCD, EL and gas plasma flat-panel displays and traditional analog CRT monitors in high resolution display modes, while maintaining complete register, gate and BIOS compatibility with IBM VGA displays. A flat-panel display and a CRT VGA display can be used simultaneously.

Specifications

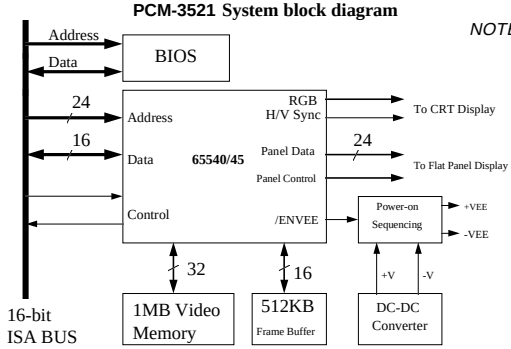
- Standard 16-bit PC/104 form factor
- C&T 65545
- Supports CRT and flat-panel (EL, LCD, and gas plasma) displays. Simultaneous usage of CRT and flat panel.
- Resolution:

  Non-interlaced CRT monitor: up to 800 x 600 @ 256 colors

  Flat panel: up to 800 x 600 @ 256 colors
- On-board 1MB display memory
- On-board 512 KB frame buffer
- DC to DC converter supplies LCD bias voltage (V_{EE} -35 V ~ +35 V)
- Supports 3.3 V / 5 V LCDs
- On-board variable resistor for panel contrast adjustment (may be extended by wires to display)

System block diagram

PCM-3521 System block diagram



Initial inspection

Your shipping box should contain the following items:

- One PCM-3521 Flat-panel/CRT Display Module
- One software diskette with display drivers
- One bracket with 15-pin connector for VGA CRT
- One PC/104 support package
- One PCM-3521 Startup Manual
- One PCM-3521 User's Manual disk

Your PCM-3521 was carefully inspected both mechanically and electrically before being shipped. It should be free of marks and scratches and should be in perfect working order.

When unpacking, check the unit for any signs of damage (scratches, dents, torn shipping box, etc.). If there is any damage to the unit or if it fails to meet the specifications, please notify our service department or your local sales representative immediately. In addition, you should contact the carrier and refain the shipping carton and packing material for inspection by the carrier. Advantech will then make arrangements to either repair or replace the unit.

WARNING!



Discharge your body's static electric charge by touching the back of the grounded chassis of the system unit (metal) before handling the board. You should avoid contact with materials that hold a static charge such as plastic, vinyl, and styrofoam. The board should be handled only by its edges to avoid static damage to its integrated circuits. Avoid touching the exposed circuit connectors.

NOTE:

1. For more detailed information on the PCM-3521, please refer to the full manual contained in the accompanying CD-ROM or disk (in PDF format).

2. Acrobat Reader is acquired to view any PDF files. Acrobat Reader can be downloaded at www.adobe.com/Prodindex/acrobat/readstep.html (Acrobat is a trademark of Adobe)

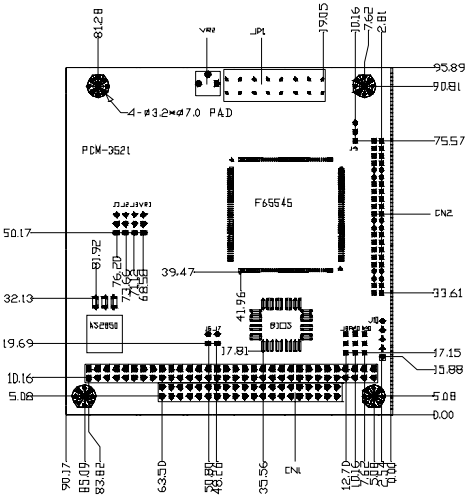
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Video BIOS

The PCM-3521's hardware supports a wide variety of flat-panel and analog CRT displays. However, special software routines and parameters are needed to interface with any given display. These routines are stored on the PCM-3521 in a 64 KB ROM BIOS chip. The high performance CHIPS 65545 VGA, BIOS used within this unit is optimized for usage with 65545 VGA Flat-panel/CRT controller chips.

Display support

The 65545 VGA BIOS supports monochrome LCD, EL, plasme, color TFT and STN LCD flat-panel displays. It is fully compatible with IBM VGA displays - even with interlaced and non-interlaced analog monitors (VGA color and VGA monochrome) in high-resolution mode. Multiple frequency (multisync) monitors ar esupported as analog monitors. Both CRT and panel displays can be used simultaneously. However, digital monitors, such as MDA, CGA, EGA are not supported.



Configuration

Although the PCM-3521 is compatibile with many types of displays, its configuration is quite simple, since most of the configurations are done in the BIOS setup. The section describes the hardware settings necessary to get your display operational. Furthermore, some of the PCM-3521's special features are given in this section.

Quick reference jumper setting

For safe installing, refer to the user's manual for detailed information.

Jumper settings

J1: Panel Power setting

Pins	Signal
1-2	+5 V
2-3	+3.3 V

J2: Power V_{EE} setting

Pins	Signal
1-2	+5 V ~ +35 V
2-3	-5 V ~ -35 V

VR1, VR2: Power V_{EE} adjustment			
VR1 (pin 1,2)	**VR1 (pin 3)**	**VR2**	**Function**
Short (default)		1 ~ 50 K ohm	for internal adjustment of the LCD V_{EE}
connects to the external VR	connects to the external VR	0 ohm	for external adjustment of the LCD V_{EE} - an additonal VR is required

J3: ENABKL setting

Pins	Signal
1-2	ENABKL
2-3	-ENABKL

J6 & J7: BIOS setting

Signal	J7	J6	LCD
BANK0	S	S	24TFT
BANK1	O	S	EL
BANK2	S	O	MONO
BANK3	O	O	STN

J8: Contrast setting

Pins	Signal
1-2:	$+V_{EE}$ or $-V_{EE}$
2-3:	0 V ~ +3.3 V

J9: SHFCLK setting

Pins	Signal
1-2:	SHFCLK
2-3:	-SHFCLK

J10: LCD control

Pins	Signal
1:	+12 V
2:	GND
3:	ENBKL
4:	0 V ~ +5 V
5:	+5 V

Connectors

CN1	PC/104 connecotr
CN2	LCD connector

Adjustments

R28	+3.3 V contrast VR connect
R30	brightness VR connect
VR1	+/-V_{EE} contrast VR connect

Installation

After all of the jumpers have been set, you can install the PCM-3521 on your CPU card. If this is the first time you are installing a CPU card, you should check its jumpers before installing the PCM-3521, as they may later be inaccessible. Next, carefully slide the pins of the PCM-3521 into the PC/104 connector on the card. Secure the PCM-3521 onto the card with the screw provided.

Adjusting the V_{EE} output

It could happen that the V_{EE} output needs to be adjusted to suit the Advantech LCD panel. In this case, just power up the system and connect a voltmeter to pin 1 (LCD VEE) and pin 39/40 (GND) of P2. Use a screwdriver to adjust the variable rsistor VR1 until you reach the proper V_{EE} output for your display.

Connectors

Attach the panel cable to the correct connector on the PCM-3521, then connect the other end of the cable to your display. Install the CPU card according to the instructions given in the CPU manual. Consequently, power up your system. Should any problems arise, please refer to the section 'Troubleshooting'.

Display Drivers and Utilities

The Display Driver diskettes provided with your VGA adapter contain all the necessary software for installation and operation of your drivers.

The VGA adapter is based on the CHIPS VGA flat-panel/ CRT controller and is fully IBM VGA compatible. This controller offers a large set of extended functions and high resolutions. If you intend to use the VGA adapter in the VGA mode only, you de not need to install any of these drivers. Since the VGA adapter is fully compatible, it does not require any special drivers to operate in the standard mode.

The purpose of the enclosed software drivers is to take advantage of the extended features of the CHIPS VGA flat-panel/CRT controller. Its capabilities include:

- High performance in Microsoft Windows
- Resolutions up to 800 x 600 in graphics mode with 256 colors
- Resolutions up to 640 x 480 in graphics mode with 256 colors
- 132 column text mode

The Windows drivers included in this package have several special features:

- Pen Windows Extensions
- Panning Drivers
- Linear Acceleration Drivers

Hardware configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to the CRT-only mode, rather than the flat panel or the simultaneous mode. Some high-resolution drivers wil display properly only in the CRT mode.
2. If a high-resolution mode is not supported on your system, try using a lower-resolution mode. For example, if the 1024 x 768 mode will not work, choose the 800 x 600 mode.
3. The 65510 flat-panel VGA controller supports only those drivers that display 640 x 480 panels. Refer to the following section on driver resolutions and filenames for a list of the drivers that can be used on the 65510.
4. The 65545 and 65540 flat-panel VGA controllers support additional drivers that function with the F65535 and F65540 only. See the following section on driver resolutions and filenames for a list of these drivers.

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These software drivers support the following software applications in the filenames and resolutions listed:

Driver Resolution & Filenames

Application	Filename	Resolution	Colors	Notes
Windows 3.1	LINEAR4.DRV	640x480	16	510
		800x600	16	
	LINEAR8.DRV	640x480	256	510
		800x600	256	
		1024x768	256	545/540
	LINEAR15.DRV	640x480	32K	545/540
	LINEAR16.DRV	640x480	64K	545/540
	LINEAR24.DRV	640x480	16M	540
	W3LM600P.DRV	800x600	16	
	W3LM768P.DRV	1024x768	16	
	W3PM480.DRV	640x480	256	510
	W3PM600P.DRV	800x600	256	
	R12.DRV	480x640	16	510
OS/2 Version	SV480256.DLL	640x480	256	
2.1	PD600256.DLL	800x600	256	
	PD768256.DLL	1024x768	256	
AutoCAD	DLDVGA.EXE	640x480	16	510
		800x600	16	
		1024x768	16	
		640x480	256	510
Lotus 1-2-3	V132X25.DRV	132x25(text)	16	
	V132X50.DRV	132x50(text)	16	
Word 5.0	VGA600.VID	800x600	16	
	VGA768.VID	1024x768	16	
Word 5.5	VGA55600.VID	800x600	16	
	VGA55768.VID	1024x768	16	
Wordperfect	CHIPS600.WPD	800x600	16	
5.0	CHIPS768.WPD	1024x768	16	
Wordperfect	VGA600.VRS	800x600	16	
5.1	VGA768.VRS	1024x768	16	

Notes:

510 - can be used on the 65510 controller.

545/540 - operates with the 65545 and 65540 controllers only.

540 - functions with the 65540 controller only.

Windows

These drivers are designed to work under Microsoft Windows version 3.1 and Pen Windows version 3.1..

Driver installation

1. Install Windows as you normally would for a VGA display. Run WIndows to make sure that it is working correctly. Then exit from Windows.
2. Place the Display Driver Diskette # 1 in driver A. Type A: <ENTER> to make this the default drive. Type SETUP <ENTER> to run the driver setup prgram. Press any key to get to the applications list. Using the arrow keys, select Windows version 3.1 and press the <ENTER> key. Use the <ENTER> key to select All Resolutions, then press <END> to begin the installation procedure. At this point, you will be asked for the path to your Windows system directory (default C:\WINDOWS). When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.
3. Change to the directory where you installed Windows (usually C:\WINDOWS).
4. Type SETUP <ENTER> to run the Windows setup program, which will show the current Windows configurations. Use the up arrow key to move to the Display line and press <ENTER>. A list of display drivers will be shown. Then use the arrow keys to select one of the drivers starting with an asterix (*) and press <ENTER>.
5. Follow the directions on the screen to complete the setup. In most cases, you may press <ENTER> to accept the suggested option. When the setup is done, it will automatically return to DOS. Type WIN <ENTER> to start Windows with the new display driver.

Changing display drivers from DOS

To change display drivers from DOS, change to the Windows directory and run Setup, repeating steps 4 and 5 from the previous section. Besides the special display drivers marked by an asteriks (*), you should be able to use the following standard drivers:

VGA: 640 x 480, 16 colors

Super VGA: 800 x 600, 16 colors

Changing display drivers from Windows

Select the Windows Setup icon from the main window, which will then show the current setup configuration. Select change system settings from the option menu. Click on the arrow at the end of the display line to access the list of display drivers. Select the driver preferred, then click on the OK button. FOllow the directions to complete the setup procedure.

Changing color schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange as different drivers have different default colors. In order to change the color schemes, open the control panel within the main window and select the color icon. Choose the color scheme preferred and click on the OK button.

Panning drivers

Special panning drivers are provided to allow high-resolution modes to be displayed on a flat panel or CRT. these drivers will show a section of a larger, and will automatically pan or scroll the screen horizontally

and vertically when the mouse pointer reaches the edge of the display.

Linear acceleration drivers

A special high-performance linear acceleration driver is provided for the 256-color mode. This driver may require special hardware and may not be supported on all systems. This driver is only available for Windows 3.1. One feature quoted is QuickTime-Aware.

OS/2

These drivers are designed to function with the OS/2 2.1 operating system.

Driver installation

Note: Always sue the INSTALL, CMD for the FIRST installation of the video device drivers. To change video resolutions, use the DSPINSTL program.

1. Install the OS/2 the same way you would a VGA display. Open an OS/2 full screen or window session.
2. Place the Display Driver Diskette # 3 in drive A. Type A: <ENTER> to make this the default drive. The type INSTALL A: C: <ENTER>. Once the drivers are installed, the DSPINSTL program is automatically invoked. Follow the progam's instructions to set up the OS/2 drivers in your system. Once the installation is complete, the system must be shut down and restarted for the changes to take effect.

Driver diskette copy

Note: Diskette copies of the OS/2 drivers must have a VOLUME LABEL that reads "DISP 1" in order to be an installable diskette.

To copy the OS/2 Display Driver Diskette # 3, follow these instructions:

1. Copy all files from the Display Driver Diskette # 3 to any other diskette.
2. Place the diskette in drive A. At the C:\prompt, type LABEL A: DISK 1 to properly label your diskette. Then store your diskette copy in a safe place. For proper installation of OS/2 drivers, all diskette copies must be properly labeled "DISK 1".

AutoCAD

These drivers are designed to work with Autodesk AutoCAD and AutoCAD/386 Release 10 and 11, and corresponding versions of AutoShade. They all conform to the Autodesk Device Interface (ADI) for rendering devices and display drivers. These drivers accelerate redraw, pan, and zoom functions.

Driver installation

1. Place the Display Driver Diskette # 1 in drive A. Type A: <ENTER> to make this the default drive. Type SETUP <ENTER> to run the setup program. Press any key to get to the applications list. Using the arrow key, select AutoCAD and AutoCAD/386 Release 10 & 11 and press <\ENTER>. This will display a list of supported driver resolutions. Press the <ENTER> key to select All resolutions, then press <END> to begin the actual installation. At this point, you will be asked for a drive and directory to copy the driver files to. Enter the drive and directory, which contains the installed AutoCAD. You might be asked to change the display driver diskettes, and if the destination directory does not exist, you will be asked for confirmation. When the installation is complete, press any key to continue. Then press <ESC> followed by Y to exit to DOS.
2. Go to the AutoCAD directory where the new drivers were installed and run the driver installation program by typing DLDSETUP <ENTER>. This program will configure your new and fast display, and will create a batch file under the name FASTACAD.BAT.
3. Configure the colors for AutoCAD by using one of the following settings: COLOR16 <ENTER>, if a 16-color mode is used, or type COLOR256 <ENTER> if a 256-color mode is used. Start by pressing A to select the standard AutoCAD ADI colors. Press S to save these color settings in DLDCOLOR.DAT. For further information about these color utilities see Changing Colors later in this section.
4. Prior to starting an AutoCAD or AutoShade session, the display driver must be installed in the computer memory. To do so, execute the batch file created by typing FASTACAD <ENTER>. To remove the display driver from memory when finished useing AutoCAD, you can typ DLDVGA-U <ENTER>.

Configuring AutoCAD

The firs time you use AutoCAD with ADI driver, you need to configure the AutoCAD application for an ADI display. Select CONFIGURE AUTOCAD from the AutoCAD main menu. The select CONFIGURE VIDEO DISPLAY. Select ADI display as your new driver (installed at interrupt 7A hex). Save the new configuration and return to the main menu.

Configuring AutoShade

Before using AutoShade with an ADI driver, you should configure your AutoShade application in the proper settings. Before running AutoShade, remove the file SHADE.CFG (use DOS DELETE command if needed). Then run AutoShade. The program will ask for a display and rendering driver. Select ADI for both drivers and indicate that you have a dual display system. When you exit the AutoShade program, a new SHADE.CFG will be created.

Changing colors

To change the colors that AutoCAd uses fro drawings, backgrounds, menus, and text fro°°rmats, use the utility COLOR16 (for a 16-color mode) or COLOR256 (for a 256-color mode). When running these utilities, use the ? key at any time to access context-sensitive help messages, which will explain how to use the program.

For example, when you want to change AutoCAD's background color to the 16-color mode, run the utility COLOR16. Press O for object. Use the left and right arrow keys to move through the different objects (shown at the top of the screen) unitl Graphics Area Background appears. Press <ENTER> to select this object.. The current color will be shown at the bottom of the screen. Use the left and right arrow keys to move to a new color and press <ENTER> to select.

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When you are done changing objects, press <ESC> to exit to the main menu. Press S to save these colors in the file DLDCOLOR.DAT. Then press E to exit.

Lotus 1-2-3 Lotus Symphony

These drivers are designated for applications such as Lotus 1-2-3 version 2.0, 2.01 and 2.2, and with Lotus Symphony version 1.0 and 1.1.

Driver installation

1. Place Display Driver Diskette # 1 into drive A and make this the default drive by typing A: <ENTER>. Then run the setup program by by typing SETUP <ENTER>. Press any key to display a list of the applications supported. Use the arrow keys to select Lotus/Symphony and press <ENTER>. A list of supported screen resolutions will be displayed. Agian, use the arrow keys to select the desired screen resolution and press <ENTER> (make sure that your monitor is able to to display the resolution you have just selected). In order to begin the installation procedure, press <END>. A default drive and directory will be displayed, simply use the backspace key to erase the current default, and then type in the 123 directory. You might be prompted to insert one of the other driver diskettes. You also might be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS. Copy all the files which were just created in the temporary directory onto a formatted floppy diskette.
2. Go to the 123 directory and start the installation program. Type the following commands:

   `C: <ENTER> INSTALL <ENTER>`
3. The Lotus installation program will load and present the installation menu. From this menu, choose ADVANCED OPTIONS. Then, from the advanced options menu, select ADD NEW DRIVERS TO LIBRARY. This will open up en new menu from which you select MODIFY CURRENT DRIVER SET. Then choose TEXT DISPLAY and opt for one of the drivers.
4. After the selection of the appropriate VGA display driver, you will need to exit this menu and return to the main Lotus installation menu. Do this by selecting RETURN TO MENU.
5. In the main menu, choose SAVE CHANGES.
6. The installation program will prompt you for the name of your new Lotus configuration file. Lotus will display the default value - 123.SET. However, you do not have to use this name. You may want to use a filename that indicates the resolution of the driver it contains.For instance, if you have installed a 132 column by 25 line driver, we suggest you name it 132X25.SET. Likewise, a 80 by 50 driver can be saved as 80X50.SET.
7. The installation of your Lotus 1-2-3 driver is now complete. At the main Lotus installation menu, select EXIT.

If you use a name for the driver set that is different from 123.SET, you have to remember to place the filename of your driver set on the command line when you start Lotus 1-2-3. In other words, if you named your driver set 132X25.SET, give the following command to start Lotus 1-2-3:

```
123 123X25.SET <ENTER>
```

WordPerfect

These drivers are for WordPerfect version 5.0 and 5.1. They further support 132-column display in editing mode and high-resolution graphics in preview mode.

Driver installation

1. Place Display Driver Diskette # 1 into drive A and make it the default driver by typing A: <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select WordPerfect and press <ENTER>. A list of screen resolutions will appear, you can use the arrow keys to select the preferred resolution and press <ENTER> (make sure that your monitor is able to display this resolution). Then press <END> to commence the installation procedure. A default drive and directory path will be displayed. Erase this default setting with the backspace key and type in the WordPerfect directory. You might be prompted to insert one of the other driver diskettes. In addition, you might be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to list of supported applications. Press <ESC> followed by Y to exit to DOS.
2. Start WordPerfect and press <SHIFT> + <F1> to enter the setup menu. Select D for DISPLAY and G for GRAPHICS SCREEN TYPE and then choose the desired Chips VGA resolution.

Configuring WordPerfect 5.0 for 132 columns

1. Use the SETCOL program to set 132 columns and 25 rows.Then type `SETCOL 132, 25 <ENTER>`
2. Start WordPerfect. The program will detect the number of rows and columns automatically. If for some reason WordPerfect is unable to adapt to 132 columns by 25 rows, strat WordPerfect by typing: `WP / SS=25,132 <ENTER>`

Configuring WordPerfect 5.1 for 132 columns

Start WordPerfect and press <SHIFT> + <F1> to enter the setup menu. Select D for DISPLAY and T for TEXT SCREEN TYPE. Then select Chips 132 Columns Text.

Display Drivers and Utilities

This section describes the operation and installation of the following software utilities supplied on the Display Driver Diskettes: CHIPSCPL and SETCOL.

The CHIPSCPL utility program

This utility program works on a Microsoft Windows version 3.1 platform.

Installing the utility

The CPL within CHIPSCPL is a Windows-based utility to select resolutions and color depth. It is a Control Panel Applet with its own icon that is automatically installed when setting up the CHIPS Windows 3.1 linear drivers. The control panel icon is in the main windows group. To invoke the control panel applet, simply click on the icon. The driver resolution and color depth take effect only after Windows is rebooted with the new driver.

Operating the utility

SIZE <ALT> + <S>

allows you to select from the following resolutions:

640 x 480 800 x 600 1024 x 768 1280 x 1024

By selecting the resolution first, it will determine the allowable selections for color depth.

COLOR <ALT> + <O>

permits you to select the number of colors from the following:

16 (4 bits per pixel) 256 (8 bpp) 32 K (15 bpp)
64 K (16 bpp) 16 M (24 bpp)

Selecting the color depth first, will determine the options for resolutions.

DISPLAY TYPE <ALT> + <D>

will give you the ability to choose a display type:

CRT only <ALT> + <C>

LCD (flat panel) only <ALT> + <L>

Both CRT and flat panel <ALT> + <B>

POWER SAVER <ALT> + <P>

with this function, you can save power by turning off either the back light or the panel after a certain period of inactivity. This feature is available for the 65535 and 65540 only.

FONT <ALT> + <F>

will allow you to choose between larger or smaller fonts.

VERSION <ALT> + <V>

displays version information regarding the current driver.

BIG CURSOR <ALT> + <G>

enables you to select a big cursor for better visibility on the flat panel.

The SETCOL utility program

This utility program is used to provide 132 text columns in popular text-based applications such as WordPerfect. If you do not intend to use the 132 columns text mode, we advise you not to install this utility.

Installing the utility

1. Determine where you wnat to store the program. Locate a directory on your hard disk where you havee other utility programs. For your convenience, this directory should be specified in the PATH=statement in your AUTOEXEC.BAT file.
2. PLace Display Driver Diskette # 1 into drive A and make it the default driver by typing A: <ENTER>. Run the setup program by typing SETUP <ENTER>. Press any key to display the list of supported applications. Use the arrow key to select Utilities and press <ENTER>. A list of utilities will be displayed, so use the arrow keys to choose the preferred utility and press <ENTER>. Proceed with pressing <END>, which will start the installation of the utility. When a default drive and directory path are displayed, use the backspace key to erase the defaults and type in the proper directory. You might be prompted to insert one of the other diskettes. Furthermore, you might be asked to create a directory if it did not already exist. After all files have been installed, press any key to return to the list of applications, then press <ESC> follwed by Y to exit to DOS.

Operating the utility

The SETCOL utility program enables you to specify the number of rows and columns on screen. You can set values to the SETCOL program by placing them after the name SETCOL on the command line. The proper format for the command is:

```
SETCOL COLUMNS, ROWS <ENTER>
```

Valid values for columns and rows are:

```
Columns Rows 80 or 132 25 or 50
```

If you want to set set 132 columns with 25 rows, give the following command:

```
SETCOL 132, 25 <ENTER>
```

If you
WordS
progra
size. P
how to
Please
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Monitor	Rows
IBM Monochrome	25
IBM Color Graphics Display	25
IBM Enhanced Graphics Display	25
IBM VGA Display (analog)	25 or 50
Mutli-frequency Display	25 or 50

specific screen
this manual on
s cannot display 50
re limitations. The
can be displayed

Troubleshooting

If you experience a problem after installing the PCM-3521, check the following:

- Make sure all electrical cords and cables are properly connected, and that all plugs are firmly seated in their sockets.
- See to it that the display itself is properly connected, and that its power is switched on.
- Check if the module is correctly attached to your CPU card.

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- Be sure that the CPU card is operating correctly.
- See if no other devices, such as a Flash/RAM/ROM disk, CPU card, or DA&C card occupy the same I/O address as the PCM-3521. If this is the case, consult the device's manual to set it to an alternative address. The PCM-3521 uses I/O addresses from 3BCH, 3BDH and 3BEH which are reserved by the system for its parallel ports.

If the problem persists, please refer to your flat-panel display manual

Boot test audible signals

The 65545 BIOS runs tests on the display system during boot up. If an error occurs, you will be notified by one long beep, followed by a number of short beeps. See table below:

Audible signals

Beep Pattern	Error Condition
1 long, 2 short	Horizontal retrace failed
1 long, 3 short	DAC test failed
1 long, 4 short	Monitor sense failed
1 long, 5 short	Vertical retrace failed
1 long, 6 short	Video memory test failed

Connector pin assignments

PC/104 Connector pin assignments

Pin	Signal	Pin	Signal
A01	---	B01	GND
A02	SD7	B02	RESDRV
A03	SD6	B03	+5 V
A04	SD5	B04	IRQ9
A05	SD4	B05	---
A06	SD3	B06	---
A07	SD2	B07	---
A08	SD1	B08	-0WS
A09	SD0	B09	+12 V
A10	RDY	B10	GND
A11	AEN	B11	---
A12	---	B12	---
A13	---	B13	-IOW
A14	---	B14	-IOR
A15	A16	B15	---
A16	A15	B16	---
A17	A14	B17	---
A18	A13	B18	---
A19	A12	B19	-REFSH
A20	A11	B20	---
A21	A10	B21	---
A22	A09	B22	---
A23	A08	B23	---
A24	A07	B24	---
A25	A06	B25	---
A26	A05	B26	---
A27	A04	B27	---
A28	A03	B28	ALE
A29	A02	B29	+5 V
A30	A01	B30	---
A31	A00	B31	GND
A32	GND	B32	GND

JP1: Analog CRT VGA monitor pin assignments

pin	function	pin	function
1	R	2	---
3	G	4	GND
5	B	6	---
7	---	8	---
9	GND	10	HSC
11	GND	12	VSC
13	GND	14	---
15	GND	16	---

CN2: LCD flat-panel connector assignment

pin	signal	pin	signal
1	+12 V	2	+12 V
3	GND	4	GND
5	+5 V	6	+5 V
7	VEE	8	GND
9	P00	10	P01
11	P02	12	P03
13	P04	14	P05
15	P06	16	P07
17	P08	18	P09
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19

29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM
37	M/DE	38	LP
39	GND	40	ENABKL
41	NC	42	NC
43	CONTRAST VR1	44	CONTRAST VR2

PCM-3521 Jumper settings

Pin	Signal	Pin	Signal
C01	GND	D01	GDN
C02	-SBHE	D02	-MEMCS16
C03	LA23	D03	-IOCS16
C04	LA22	D04	---
C05	LA21	D05	---
C06	LA20	D06	---
C07	LA19	D07	---
C08	LA18	D08	---
C09	LA17	D09	---
C10	-MEMR	D10	---
C11	-MEMW	D11	---
C12	SD08	D12	---
C13	SD09	D13	---
C14	SD10	D14	---
C15	SD11	D15	---
C16	SD12	D16	---
C17	SD13	D17	+5 V
C18	SD14	D18	---
C19	SD15	D19	GND
C20	GND	D20	GND

PCM-3521 Interface with Toshiba LTM-09C015-1 (640 x 480 512 color TFT LCD panel)

PCM-3521 P2 connector	PCM-3521	Toshiba	Panel connector
Pin	Function	Function	Pin
2	P7 (G2)	G0	CN1-9
8	P4 (B4)	B2	CN2-5
10	P3 (B3)	B1	CN2-3
12	P2 (B2)	B0	CN2-1
15	ASHFCLK	NCLK	CN1-1
20	P14 (R14)	R2	CN1-7
21	P9 (G4)	G2	CN1-13
22	P13 (R3)	R1	CN1-5
23	P8 (G3)	G1	CN1-11
24	P12 (R2)	R0	CN1-3
29	BLANK# (DE)	ENAB	CN2-7
33	VCC	VCC	CN2-9
34	VCC	VCC	CN2-10
30 ~ 40	GROUND	GND	CN1-2 / 1-4
			CN1-6 / 1-8
			CN1-10 / 1-12
			CN1-14 / 2-2
			CN2-4 / 2-6
			CN2-8

PCM-3521 Interface with Sharp LM64P83 (640 x 480 Monochrome LCD DD panel)

PCM-3521 Pin	PCM-3521 Function	Sharp Function	Sharp Pin
1	VEE	VEE	7
2	P7	DL0	12
3/7	VDD (+5 V)	VDD/DISP	5/4
4	P6	DL1	13
6	P5	DL2	14
8	P4	DL3	15
10	P3	DU0	8
11	FLM (VS)	S1	---
12	P2	DU1	9
13	LP (HS)	CP1	2
14	P1	DU2	10
15	ASHFCKL	CP2	3
16	P0	DU3	11
31/32	+12 V	---	---
39/40	GROUND	VSS	6

Dimensions are in inches (± 0.005). Drawing is not to scale.

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