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CHAPTER 3
INSTALLATION

This chapter describes how to install the PCVISION*plus* Frame Grabber in the Personal Computer. The PCVISION*plus* is installed either inside the Personal Computer console or in an expansion unit.

CAUTION

Read the section of this chapter on "Power Requirements" if you have any questions about your computer's ability to provide the power and cooling required by the PCVISION*plus* Frame Grabber.

NOTE

Any attempt by the customer to change the adjustments on the PCVISION*plus* Frame Grabber other than those covered in Chapter 2, will void the factory warranty.

3.1 POWER REQUIREMENTS

Before installing the PCVISION*plus* Frame Grabber, you should consider the power and cooling capabilities of your personal computer. This section specifies the power requirements for two different system configurations of the PCVISION*plus* Frame Grabber, and includes options you should consider if your system unit's power and cooling capacity is not sufficient to support your configuration.

You need a single PCVISION*plus* board to perform monochrome or pseudocolor operations. You need three PCVISION*plus* boards for full 24-bit true color operation. Table 3–1 lists the typical power requirements (in amperes) for monochrome, pseudocolor, and true color operation.

Table 3-1. Power Requirements

Configuration	Power +5V	+12V	-12V
Single Board	2.20A	0.140A	0.030A
Three Boards	6.60A	0.42A	0.090A

3.2 DETERMINING AVAILABLE POWER

To determine the amount of power available for your application, use Table 3-2 as a model. This table shows the power available in the COMPAQ® DESKPRO 386/16™.

Table 3-2. DESKPRO 386/16 Power Availability

Voltage	Current Per Slot	Total Available Current
+5 V	4.5 A	20.0 A
+12 V	1.5 A	5.0 A
-12 V	0.3 A	1.0 A
-5 V	0.2 A	0.5 A

The "typical load" is the power drawn by the mother board, disk controller, and other standard internal options in a PC AT before you add the PCVISION*plus* and other boards. The current available for expansion boards is 11.8A at 5V (current supplied minus typical load).

The typical load of all non-standard expansion boards must be subtracted from the available current. If other expansion boards use +12V and -12V power, they must also be accounted for.

Available current = (power supplied) - (typical load)

3.3 INSTALLATION PROCEDURES

Refer to the instructions provided with your own personal computer for specific directions on removing the system chassis cover and installing options and add–on boards.

1. Turn off the Personal Computer and any attached expansion units.
2. Turn off any external devices attached to the computer.
3. Unplug the computer and any expansion units from the wall outlet.

WARNING

Be sure to remove the power cord before opening the PC AT. This prevents the chance of injury by electric shock.

4. Move the keyboard, Personal Computer Display, and all external options away from the work area.
5. Remove the the cover of the system chassis to expose the mother board and expansion slots. Refer to the PC AT manufacturer's instructions.
6. Select a 16–bit expansion slot in the PC AT for installation of the VFG. Use any open 16–bit (two connectors) slot. The VFG cannot be installed in an 8–bit (one connector) or 32–bit (three connectors) slot. Remove the expansion slot cover if one is present.
7. Install the VFG by sliding it into the selected slot. Hold the board by the edges; avoid touching the pins, connectors, and components. Press the VFG board firmly into place.
8. Make sure that the expansion slot covers are in place for all slots not being used; otherwise, airflow within the computer may not be sufficient to cool it properly.
9. If you are installing more than one Frame Grabber refer to the section of this chapter on "Installing a True Color System" before reinstalling the cover.
10. Replace the cover using the reverse of the procedure used to remove it.
11. Replace the keyboard and Personal Computer Display.

3.4 HOW TO CONNECT THE CABLES

To complete installation of your PCVISION*plus* Frame Grabber, you need to install the cables that connect it to the video source and display monitor. These ca-

bles have a rectangular female connector on one end and four BNC connectors on the other. When the PCVISION*plus* Frame Grabber is installed, two rectangular eight-pin connectors protrude through the back panel of the IBM PC. Plug the corresponding end of the connecting cable into this connector.

The cables are coded with colored tape next to the BNC connector according to their function, as follows:

Standard Cable (upper connector)

Color	Function
White	Camera: Video input 0
Red	Display monitor: red signal
Green	Display monitor: green or monochrome signal, can have composite synchronization
Blue	Display monitor: blue signal

Optional Sync Cable (lower connector)

Color	Function
White	Camera: Video input 1
Black	Camera: horizontal or composite synchronization, input or output
Gray	Camera or Display: vertical synchronization, input or output
Brown	Display: composite synchronization

The cables connections depend on the synchronization mode selected via the board's jumpers. Refer to Chapter 2 for information on the different synchronization modes. Plug the appropriate BNC connectors into the video camera and display monitor as described above.

3.5 INSTALLING A TRUE COLOR SYSTEM

Three PCVISION*plus* Frame Grabbers are needed to process true color images. You must supply separate red, green, and blue inputs. Each color is processed individually by one of the three PCVISION*plus* Frame Grabbers. Composite color is not supported.

In a true color system one PCVISION*plus* Frame Grabber is a master and the other two are slaves. The master supplies all the timing to the slaves via a 10-conductor ribbon cable. The master and slaves are specially callibrated at the factory. Refer to the price list for special ordering codes for a color system of three boards.

3.5.1 Installing the Ribbon Cable

All three PCVISION*plus* Frame Grabbers in a true color system must be installed in adjacent expansion slots in the PC or expansion unit. This is necessary for proper installation of the 10-conductor ribbon cable that synchronizes the three boards.

Using the installation procedure described earlier in this chapter, install the three PCVISION*plus* Frame Grabbers. Do not replace the cover until you have installed the ribbon cable. Install the ten-conductor ribbon cable as shown in Figure 3–1. Press the cable firmly into place on each of the modules. After you have done this, replace the cover.

3.5.2 Camera and Monitor Cables for a True Color System

For full-color systems, you need to connect the camera and monitor cables to each of the three PCVISION*plus* Frame Grabbers. The green module, configured as the master, generates timing for the slaves. The slaves do not obtain synchronization from the video source. Each of the PCVISION*plus* Frame Grabbers is acting monochromatically to digitize and output one color: red, green, or blue. Plug the **green channel** connector from each board into the corresponding red, green, or blue display monitor input. Refer to Figure 3–2.

SION*plus* Frame Grabber is a diagnos-
can run to verify the board is working
of diagnostic tests that verify the proper
the board. The program is easy to run,

software, verify that the host computer
erly. To detect faults in the PC and certain
oftware provided by the host computer

Grabber is configured for the proper mode
2. Install the host computer internal op-
ll associated devices. Attach all cables. To

ating system.

according to the instructions given in the
mmand. The programs are supplied on a

of the supplied program diskette, you may
ixed disk drive if one is installed. Install the
s given in the DOS manual for using the IN-

stic Software

tions that allow you to perform some funda-
functions that you can select from the main
and debug. Initialize the PCVISION*plus*
stic program.

The main menu is displayed with the following commands:

```
exit   configure   help   debug
```

If you have changed the factory configuration of the PCVISION*plus* Frame Grabber addresses (described in Chapter 2), you must type:

```
configure
```

The program shows you the current configuration information and asks:

Do you wish to change this configuration? (y or n)

Type `y` and press Enter

Please input the register base address in hexadecimal . . . .

Enter the hexadecimal value you set on the board and press Enter:

Please input frame memory base address in hexadecimal . . . .

Enter the hexadecimal value you set on the board and press Enter.

Please input frame memory type (0=dual, 1=single) . . . .

Enter 0 or 1 to indicate the frame memory type you set on the board and press Enter.

If you have not changed the factory configuration or you have reconfigured, you can use the other commands, as explained in the following two sections.

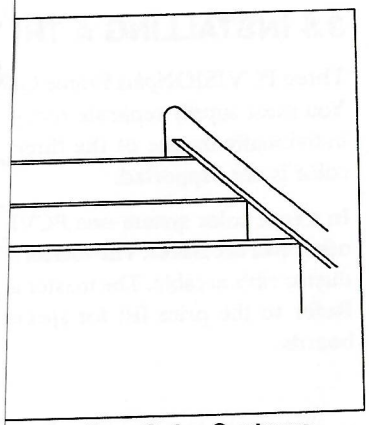
3.6.3 Functions of pcpluscd

The pcpluscd program contains functions that allow you to perform some fundamental imaging operations. These functions test the analog input and output portions of the board by drawing wedges and snapping or grabbing an image.

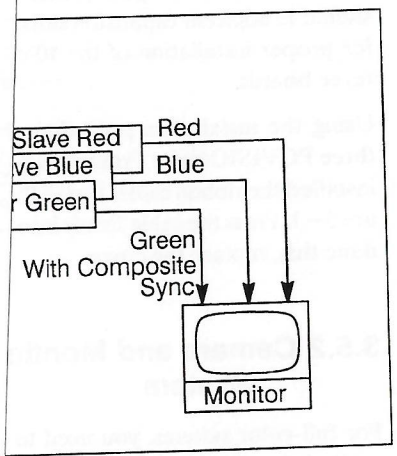
To exercise these functions, type `debug` on the initial menu for the program. The debug menu is displayed. To execute one of these functions type its name and press Enter.

The following functions are performed.

Snap	Acquires a single image frame; requires connection of a camera to the PCVISION*plus*.
Grab	Acquires a continuous (live) image; requires connection of a camera to the PCVISION*plus*.



ion for True Color Systems



a True Color System

CEDURE

ION*plus* Frame Grabber(s) by install-
package provided.

Clear	Clears the contents of the PCVISION*plus* frame memory to the hexadecimal value you specify as an argument. For example, `clear 40` sets all frame memory locations to the value of 40 (hexadecimal).
Exit	Returns you to the program's main menu.
Dump	Displays the contents of all registers on the PCVISION*plus*.
Hwedge	Draws a horizontal intensity wedge in frame memory and displays it if a video monitor is connected. This display is a gradual shading from black on the left, to white on the right. This pattern is repeated twice from left to right.
Vwedge	Draws a vertical intensity wedge in frame memory (and displays it if a video monitor is connected). This display is a gradual shading from black at the top, to white at the bottom.
Init	Sets bank 0 of the red, green, and blue look-up table to a linear function and initializes the registers on the PCVISION*plus*. Initialize the PCVISION*plus* twice when first starting the diagnostic program.
Help	Displays a description of all the above commands.

3.6.4 How to Stop PCPLUSCD

To stop the program from a menu, type exit.

To stop the program while it is running the diagnostic tests, press the <Ctrl> and <C> keys simultaneously.

3.6.5 Failures

In case of failure, first make sure that no system memory or other devices are mapped into the same space as the PCVISION*plus* frame memory or I/O control registers. If there are no mapping conflicts, contact the Imaging Technology In-

corporated Customer Response Center to report the tests that failed. Refer to Appendix D for customer service procedures.

3.7 THE DIAGNOSTIC LEDS

The PCVISION*plus* Frame Grabber contains five red LEDs that provide indications of hardware status. These LEDs are located on the top edge of the board. Refer to figure 2-1 for the location and orientation of these lights.

These LEDs are for use by Imaging Technology's factory technicians. When you apply power to the computer, all the LEDs except DS2 turn on. If they do not, contact Imaging Technology Customer Response Center immediately. For reference, the LEDs indicate the following:

LED	State	Indicates
DS1	*Must always be on*	Vertical Blanking
DS2	On	Phase-locked loop operation
	Off	Crystal-generated synchronization
DS3	*Must always be on*	−12V Power received
DS4	*Must always be on*	+5V Power received
DS5	*Must always be on*	+12V Power received

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