| The BG-3 &
The BG-7 | Multiple Test Pattern
Generator with Field
Programmable ID Option |

Manual Version   Ver 1.0
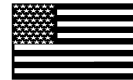
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Congratulations on your purchase of the Burst Electronics model BG-3 or BG-7 Test Pattern Generator with Field Programmable ID Option. The BG-3 is a single output device that allows an end user to select between some of the most common test patterns for calibration of a television studio's broadcast equipment. The BG-7 has a single selectable test pattern output, as well as, six (6) synchronous black burst outputs. Both of these products have the ability to accept a full color bitmap (24-bit BMP) image that can be used as a station identifier. Unless otherwise specified, all functions are universal to both devices.

Front Panel

The front panel presents you with (from left to right) a USB-B connector, an OSD LED (On-Screen Display), a 10-position rotary switch, an OSD On/Off toggle switch, Power LED, and a Power switch.

USB-B connector
Facilitates connection to your Windows XP based PC for installing a station identifying OSD image (24-Bit BMP).

OSD LED (On-Screen Display)
When ON, your station ID is being overlaid upon the "Test Pattern" BNC output. During upload of the BMP image, the LED flashes rapidly.

10-Position Rotary
Allows selection of the test pattern that is routed on the "Test Pattern" BNC output. Rotate this switch to select each pattern. On the BG-7, the black burst outputs will not have the OSD image displayed. Selectable patterns;

Red	Green
Blue	Window
5-Step Luma	5-Step Chroma
10-Step Chroma	PGM OSD (Black Burst)
SMPTE Bars	75% Full Field Bars

OSD On/Off
Allows the OSD image to be turned on or off.

Power LED
Indicates if the unit is powered.

Power Switch
Allows you to turn the unit on or off.

Rear Panel

The BG-3 rear panel has two (2) connectors, one (1) 12Vdc power connector and one (1) Test Pattern BNC connector. The BG-7 rear panel (shown above) has eight (8) connectors, one (1) 12Vdc power connector, six (6) Black Burst BNC connectors, and one (1) Test Pattern BNC connector.

Hardware Installation USB

Place the BG Program Files Installation CD into your CD-ROM drive. Connect the BG hardware to power and turn the unit on. Connect the USB2.0 cable to the computer and then to the LG hardware. A pop-up window appears stating New Hardware Found (see Figure USB1)
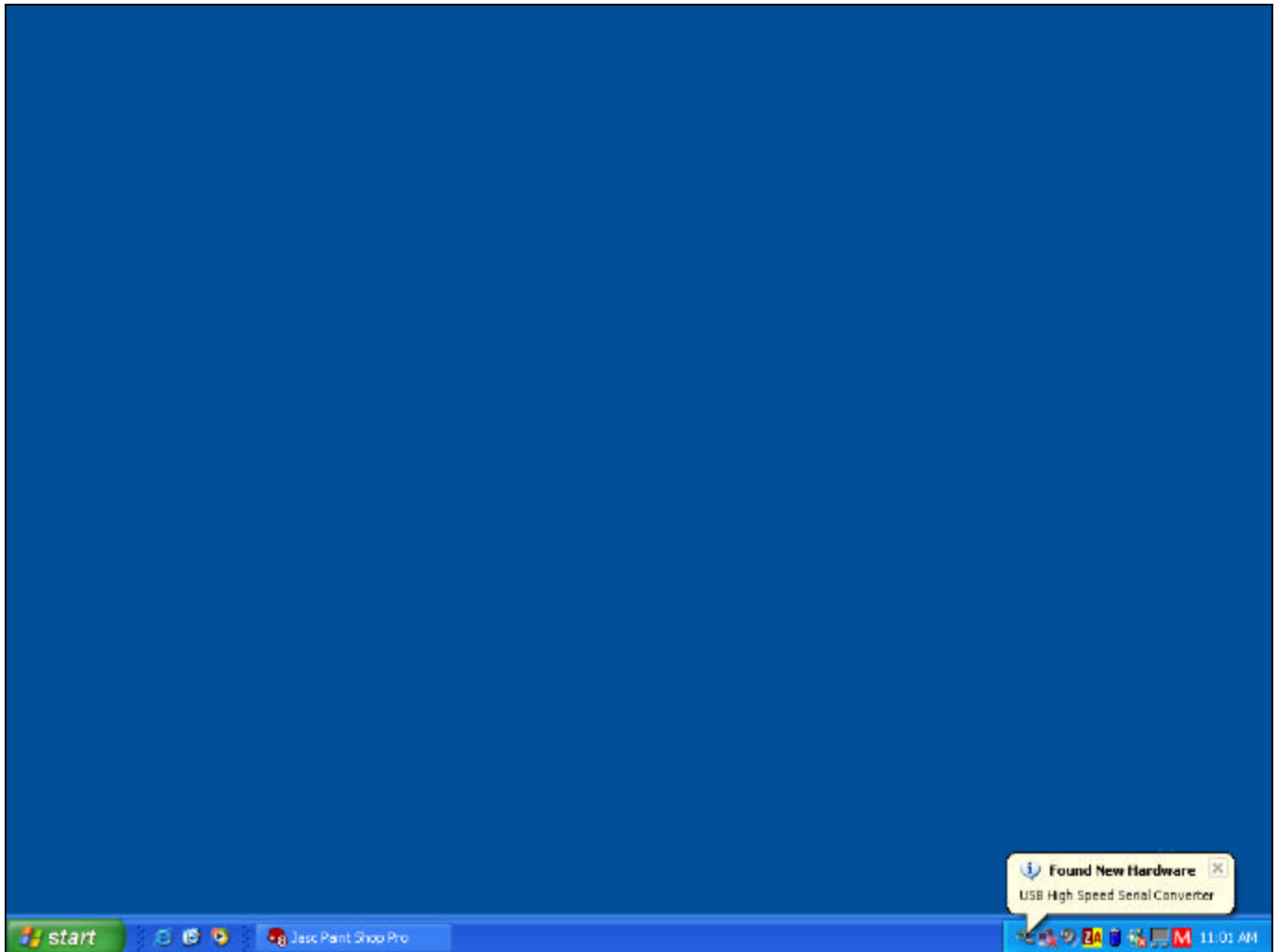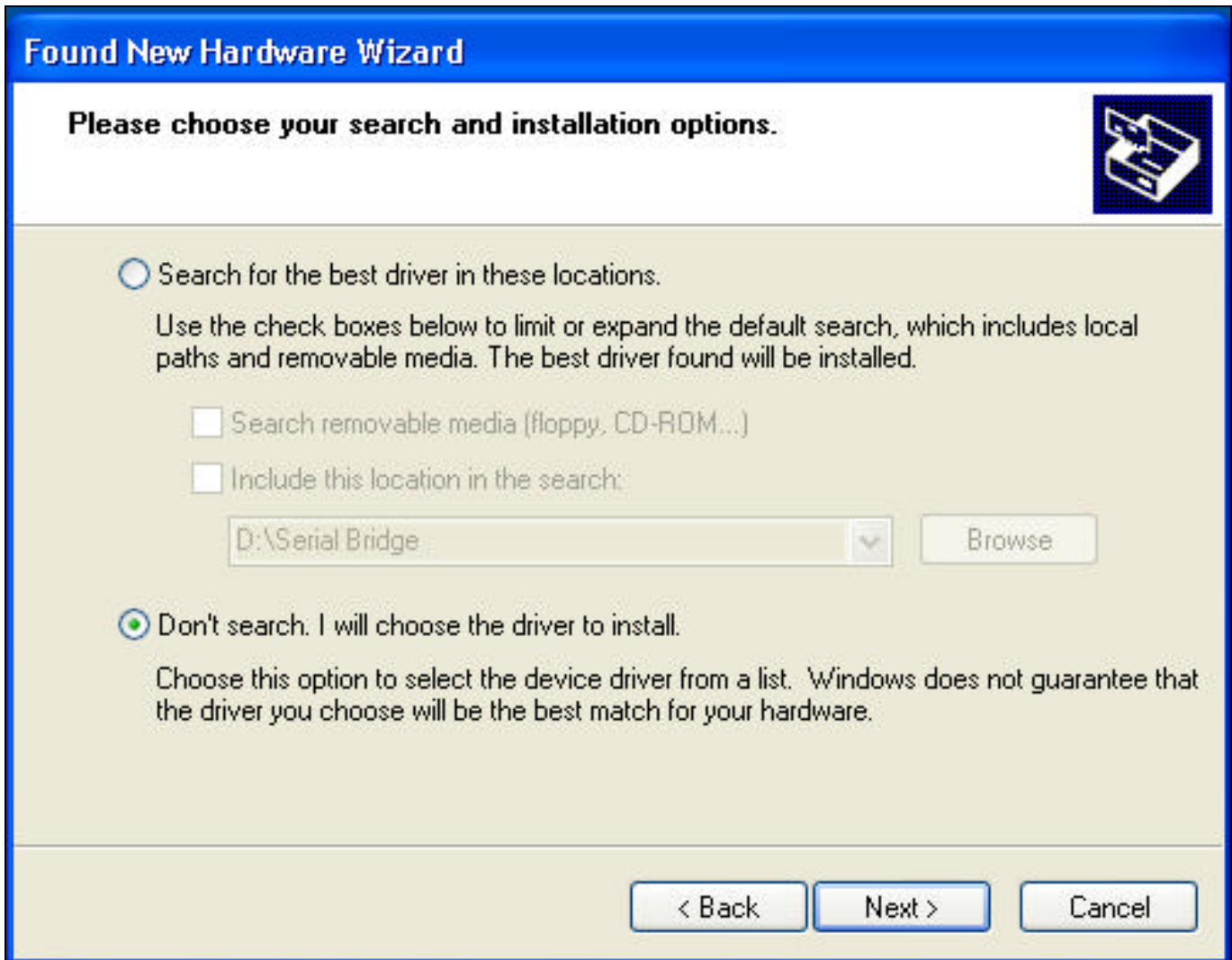

(Figure USB1)

The Found New Hardware Wizard pops up next. Click on Install from a list or specific location (Advanced). Click Next. (see Figure USB2)
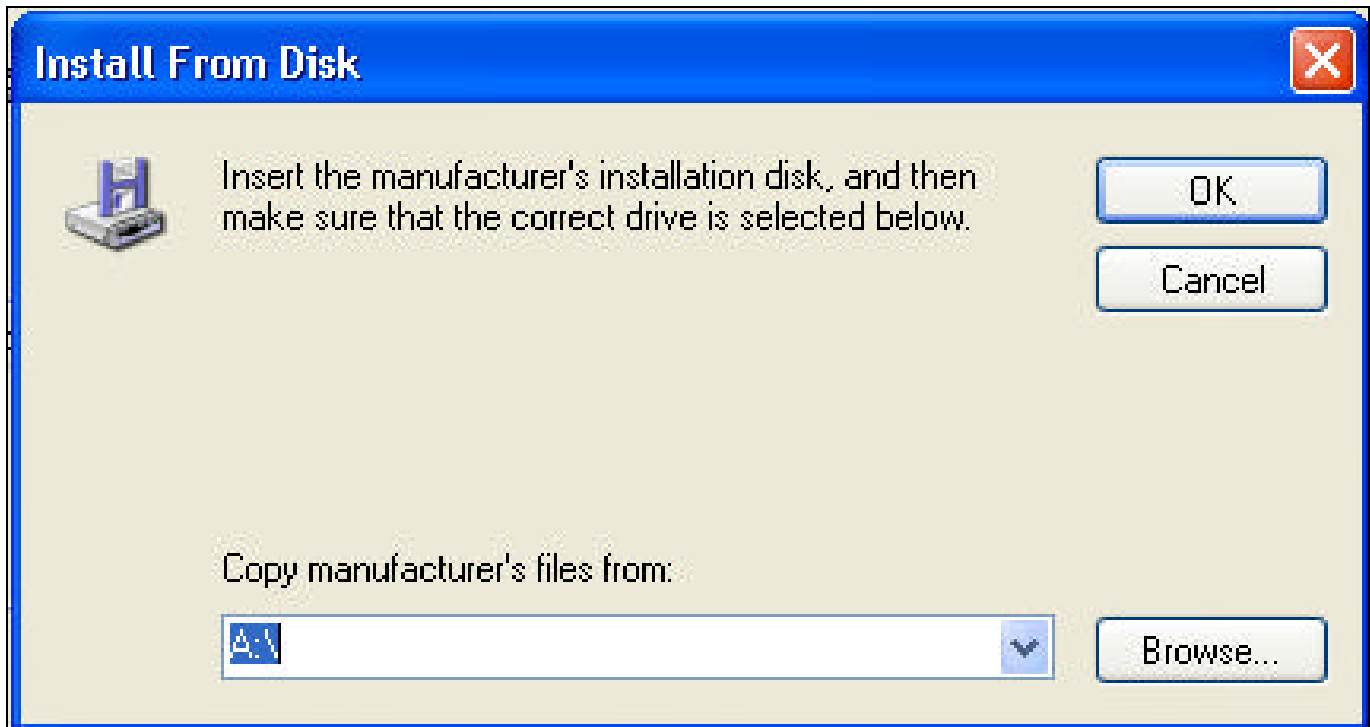

(Figure USB2)

The next window asks to search for the location of the driver. Click on Don't Search. Click Next (see Figure USB3).

Found New Hardware Wizard

Please choose your search and installation options.

○ Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

☐ Search removable media (floppy, CD-ROM...)

☐ Include this location in the search:

[D:\Serial Bridge]   [v]   [Browse]

⦿ Don't search. I will choose the driver to install.

Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
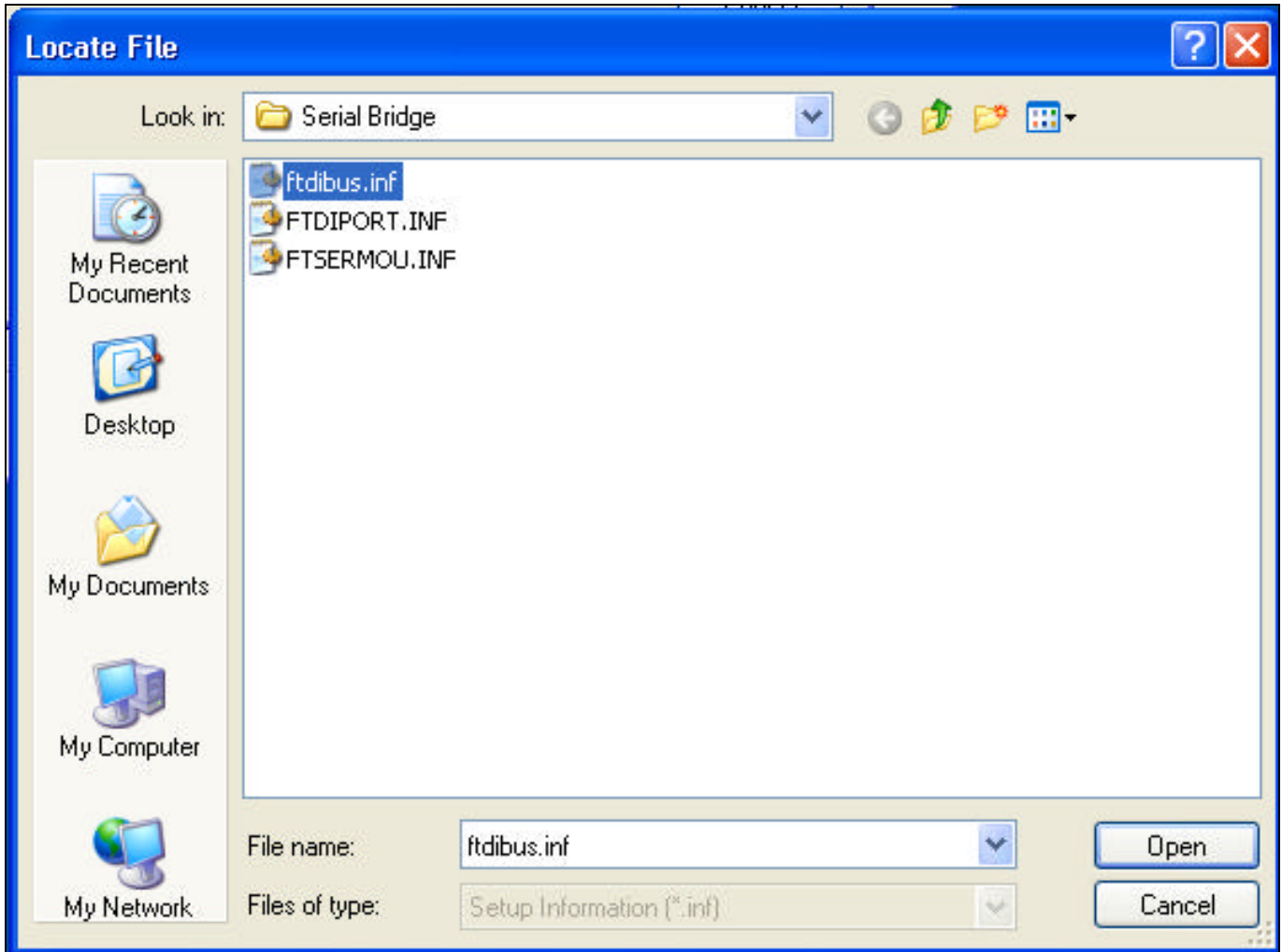
[< Back]   [Next >]   [Cancel]

(Figure USB3)

The next window asks for the location of the driver. Click on Browse
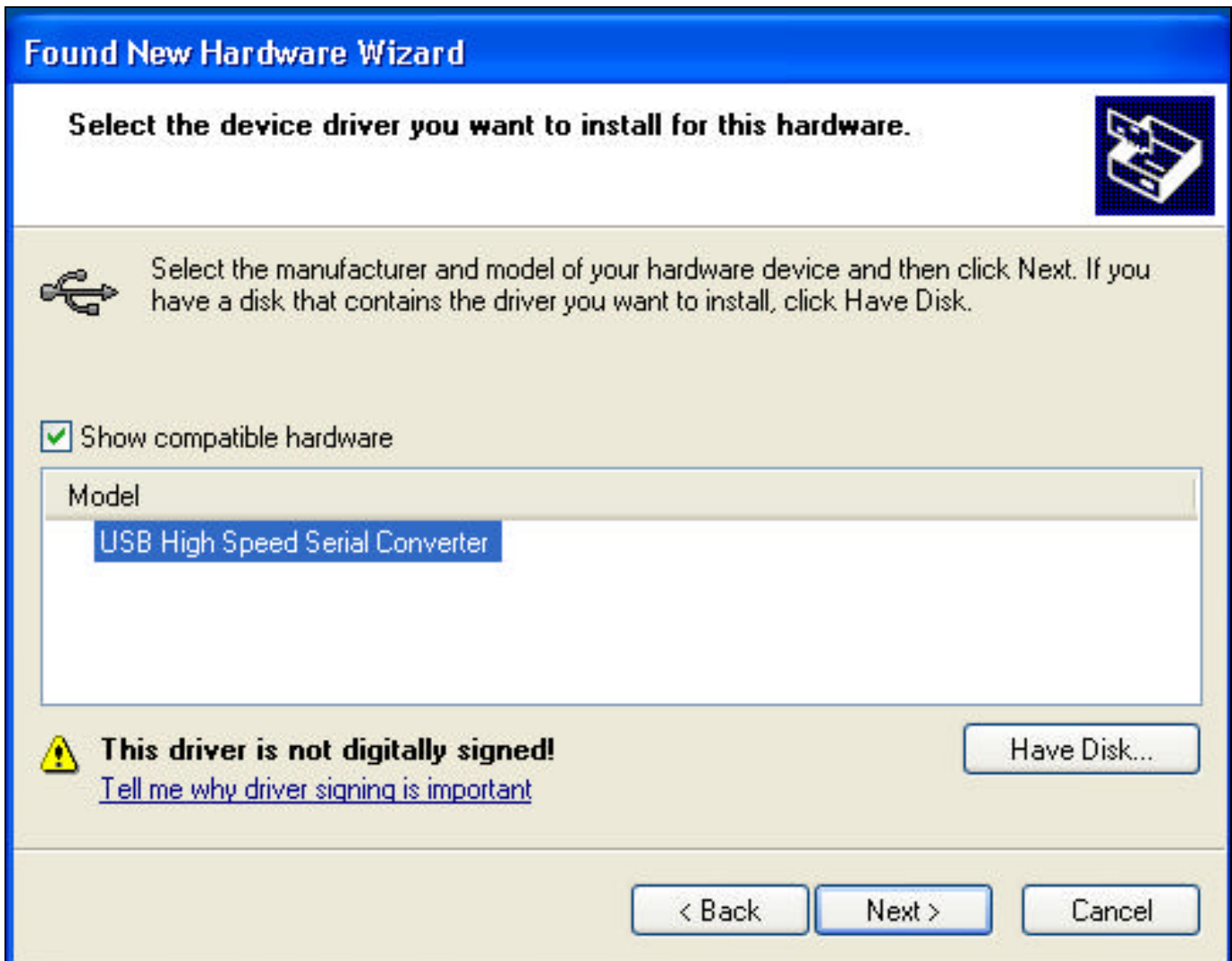(see Figure USB4)

(Figure USB4)

Browse to the CD-ROM drive that has the BG Installation Disk. Select D:\Serial Bridge\ftdibus.inf (where "D" is the letter of your CDROM drive) and click Open (see Figure USB5).

(Figure USB5)

The next window asks the user to select compatible hardware. Select USB High Speed Serial Converter and click Next (see Figure USB6).
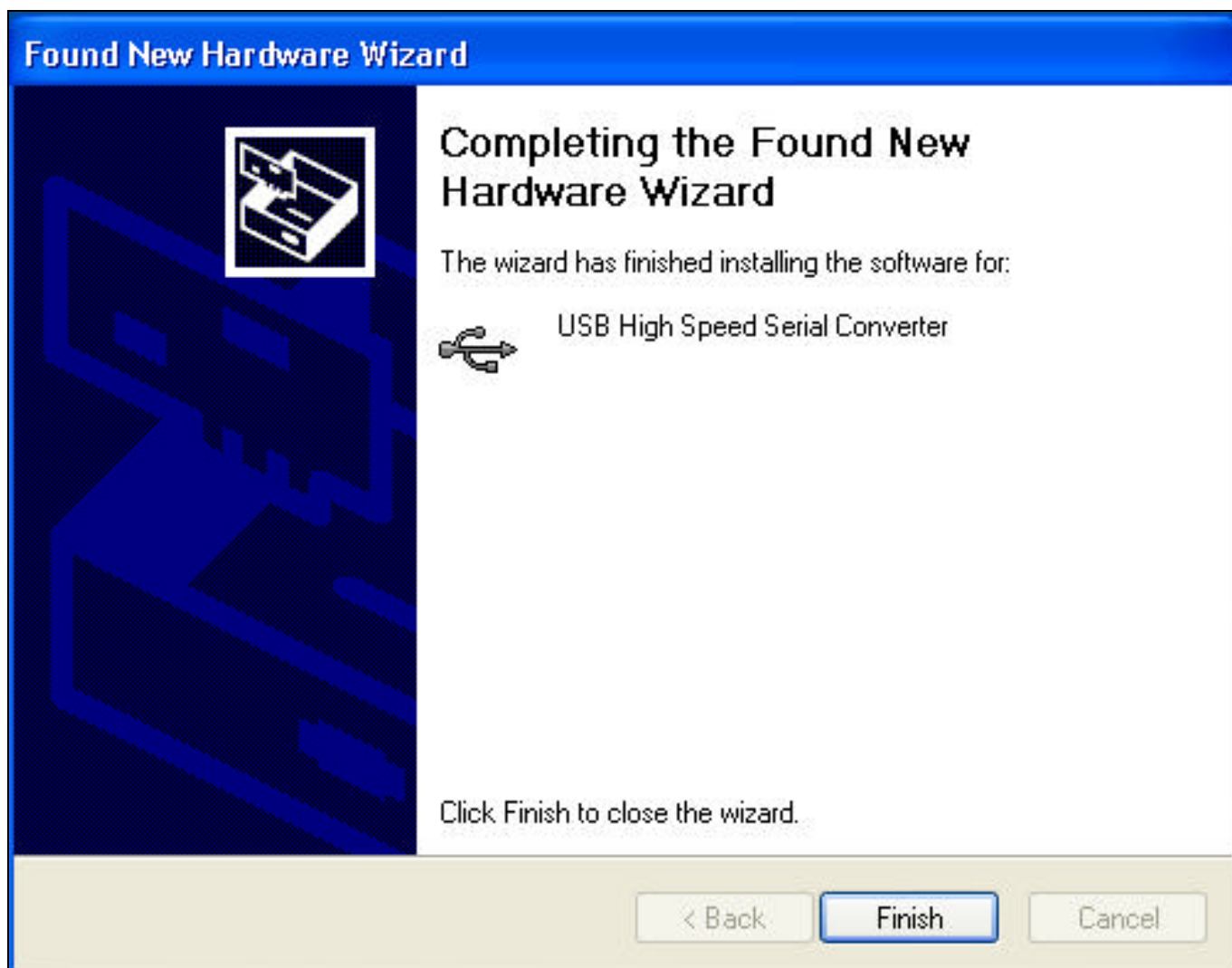

(Figure USB6)

A warning window stating that this driver has not passed Windows Logo testing will appear, just click on Continue Anyway (see Figure USB7)

Hardware Installation

The software you are installing for this hardware:

USB High Speed Serial Converter

has not passed Windows Logo testing to verify its compatibility with Windows XP. ([Tell me why this testing is important.])

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.

[Continue Anyway]   [STOP Installation]

(Figure USB7)

Click Finish on the Completing the Found New Hardware Wizard (see Figure USB8).

Found New Hardware Wizard

Completing the Found New Hardware Wizard

The wizard has finished installing the software for:

USB High Speed Serial Converter

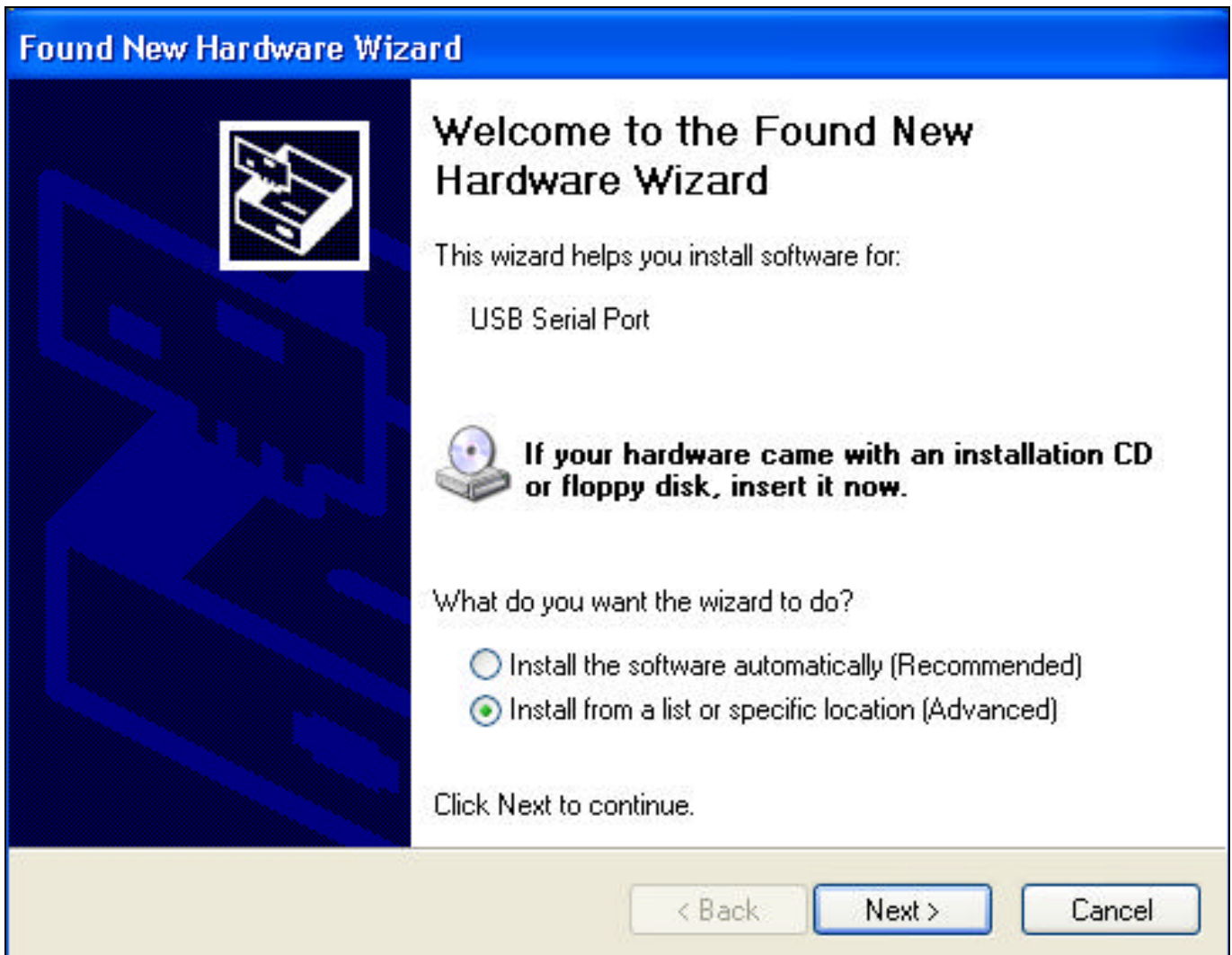Click Finish to close the wizard.

< Back   Finish   Cancel

(Figure USB8)

Windows will now show another Found New Hardware; USB Serial Port pop-up above the Taskbar (see Figure USB9)
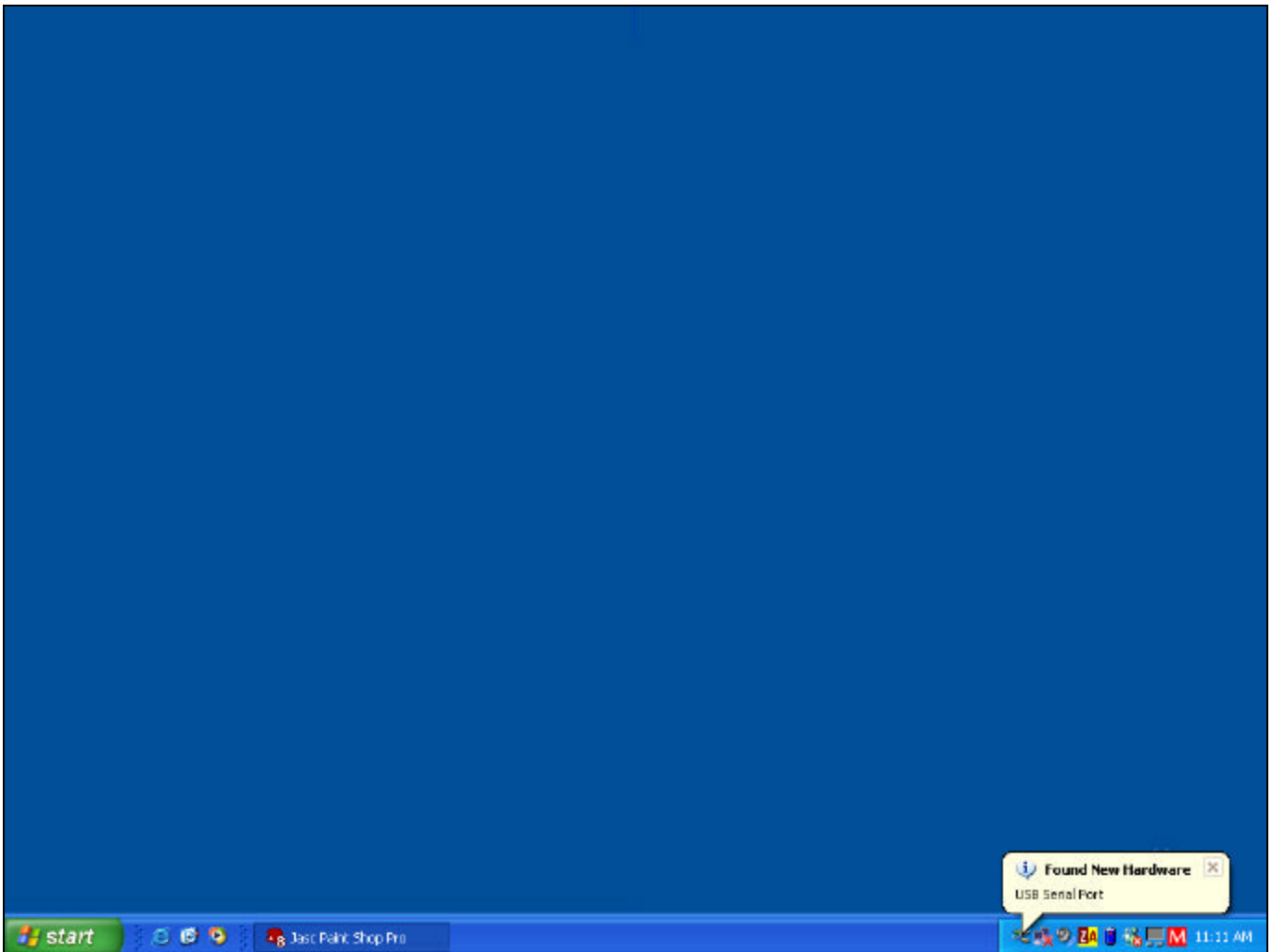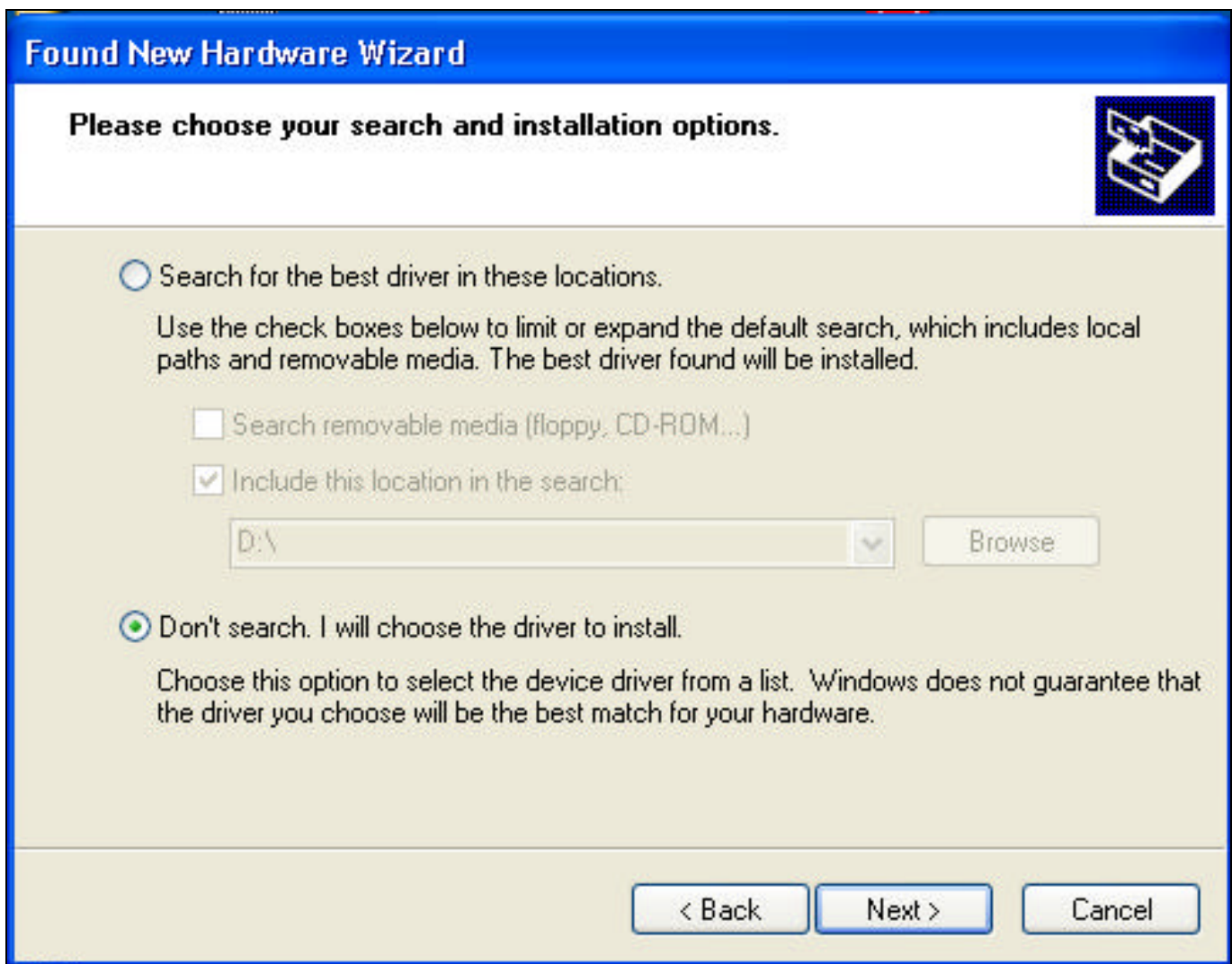

(Figure USB9)

Windows will then restart the Found New Hardware Wizard. Select Install from a list or specific location. Click Next (see Figure USB10).
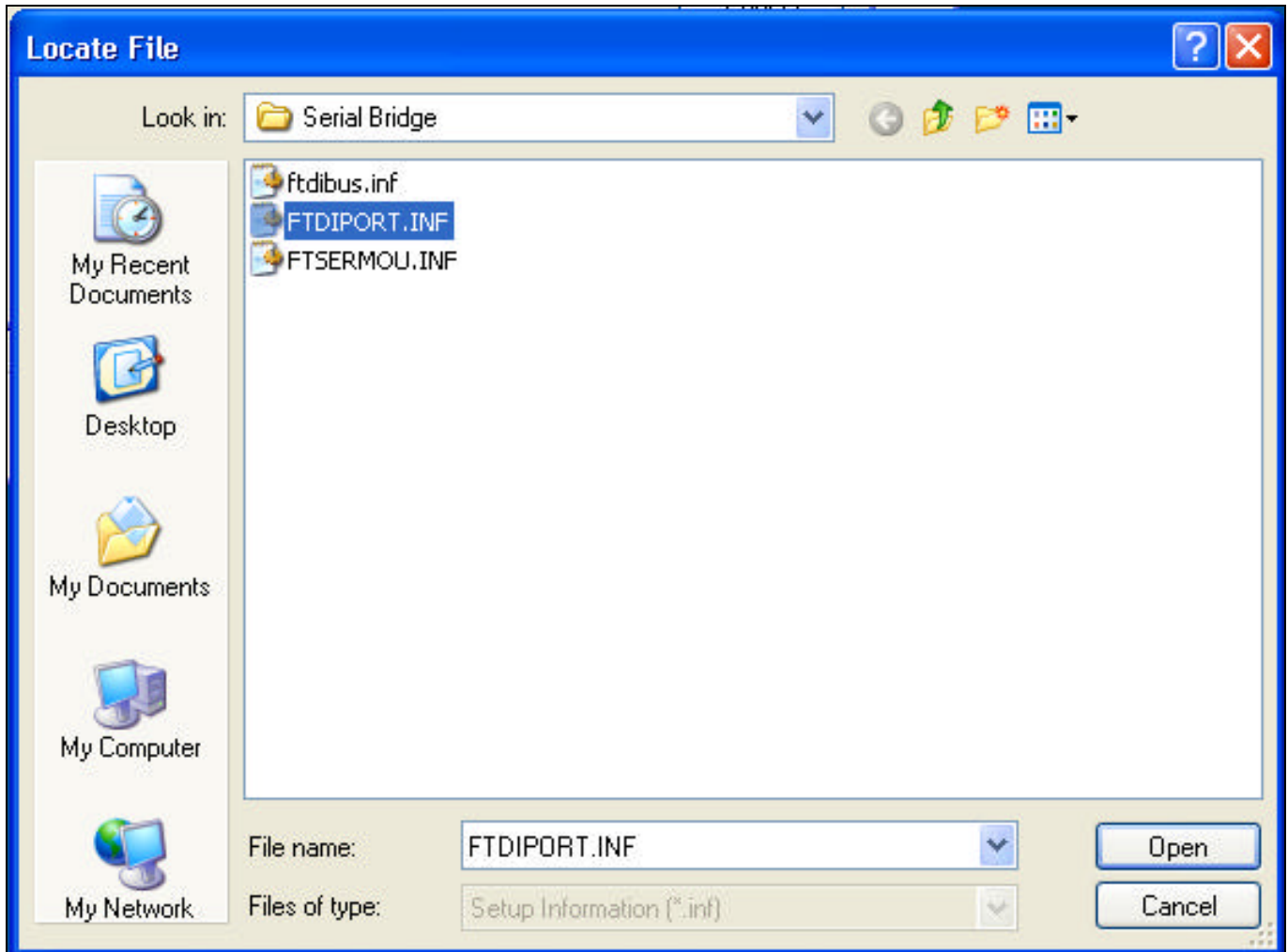

(Figure USB10)

The next window asks to search for the location of the driver. Click on Don't Search. Click Next (see Figure USB11).

Found New Hardware Wizard

Please choose your search and installation options.

○ Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

☐ Search removable media (floppy, CD-ROM...)

☑ Include this location in the search:

| D:\ | ⌄ | Browse |

⦿ Don't search. I will choose the driver to install.

Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
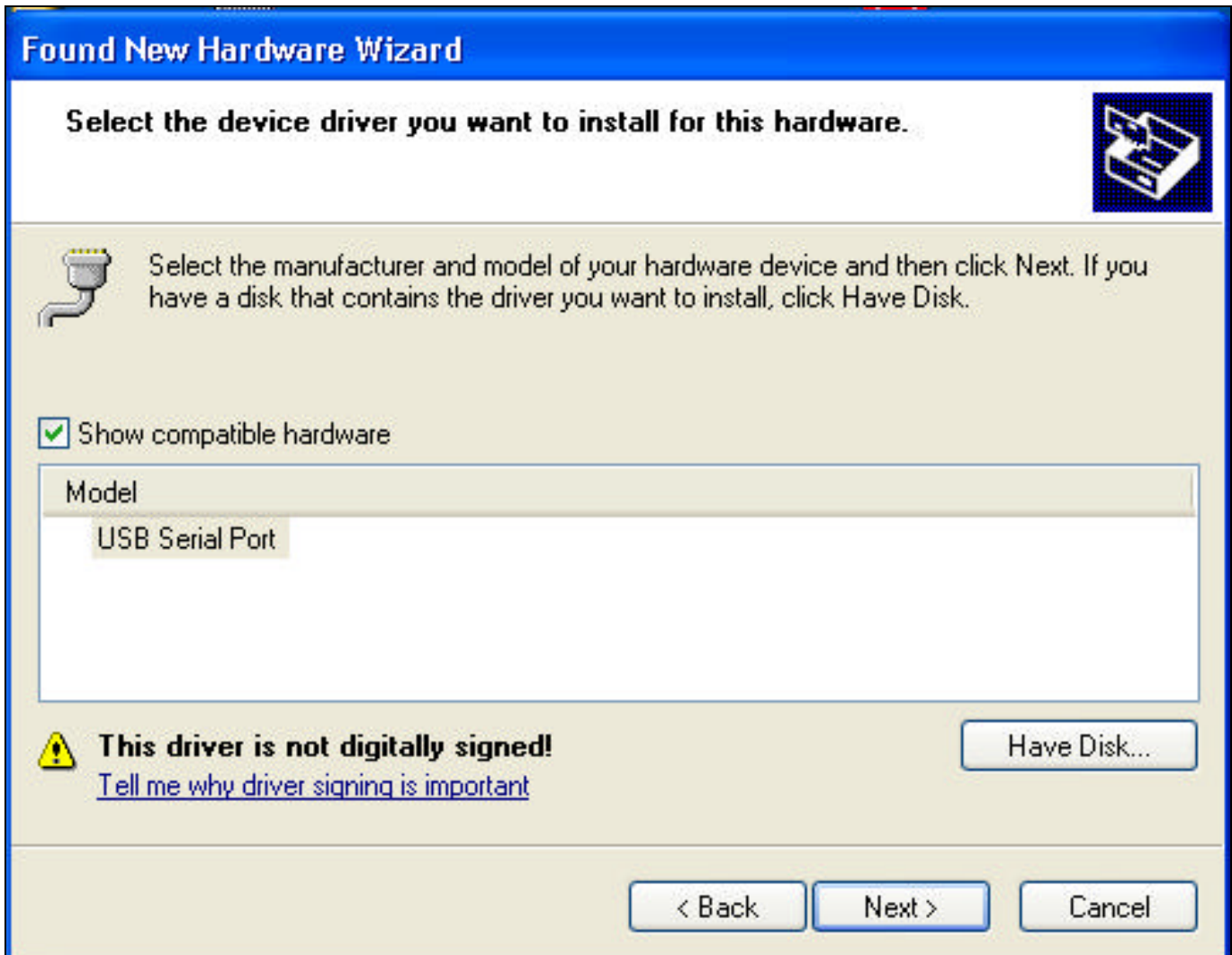
[< Back] [Next >] [Cancel]

(Figure USB11)

Browse to the CD-ROM drive that has the BG Installation Disk. Select D:\Serial Bridge\FTDIPORT.INF (where "D" is the letter of your CDROM drive) and click Open (see Figure USB12).

(Figure USB12)

The next window asks the user to select compatible hardware. Select USB High Speed Serial Converter. Click Next (see Figure USB13).

Found New Hardware Wizard

Select the device driver you want to install for this hardware.

Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.

☑ Show compatible hardware

Model
USB Serial Port

⚠ **This driver is not digitally signed!**
Tell me why driver signing is important
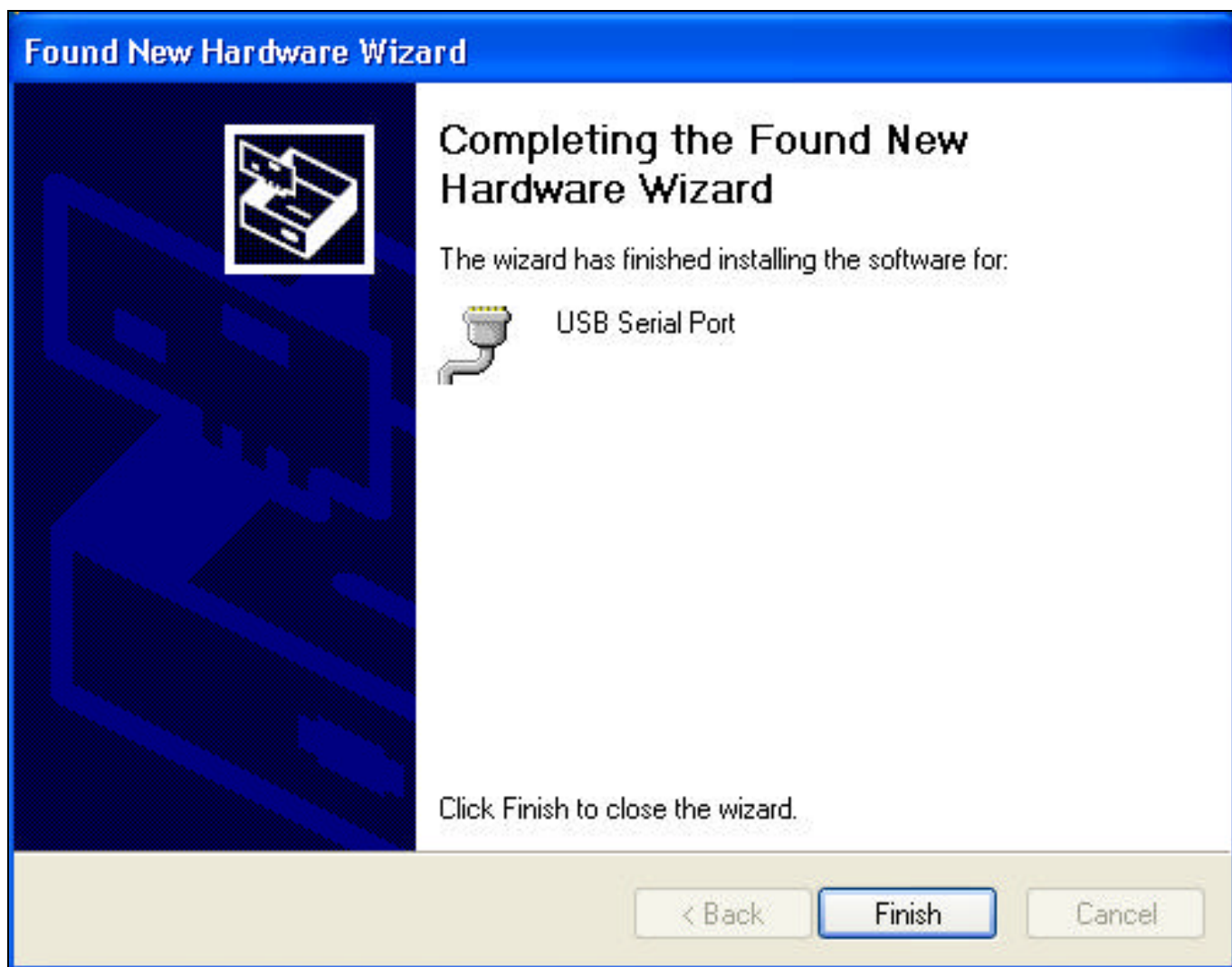
Have Disk...

< Back   Next >   Cancel

(Figure USB13)

A warning window stating that this driver has not passed Windows Logo testing will appear, just click on Continue Anyway (see Figure USB14).

(Figure USB14)

Click Finish on the Completing the Found New Hardware Wizard (see Figure USB15).

(Figure USB15)

The USB drivers are now installed and ready to use.

Software Installation

Locate the SETUP.EXE (Application) file on your BG-3/BG-7 Installation CDROM and launch this application. Follow the on screen instructions to complete the automated installation. Once complete, there will be a new icon placed on your desktop and a shortcut placed in your Start Menu.

Software Operation (BG3/BG7 Programmer)

Locate your new Desktop shortcut "BG3/BG7+" (or Start, All Programs, BG-7) and launch this application.

The software presents you with a Menu Bar, a Relative Screen Position, Image Data window, and a status bar (at the bottom of the screen)

The Menu Bar contains several selections; File, COM, Zoom, Paintbrush_Editor, Logo, and Help. The Relative Screen Position will help to determine the actual position for your ID seen on the Test Pattern output. The Image Data window shows information pertaining to your image (position, image dimensions, EEPROM size, etc.)

File

Open OSD Image File
Allows selection of 24-Bit BMP image to be used as an ID.

Download OSD Image to EEPROM
Sends the currently selected image to the BG-3/BG-7. Once download is complete, your image appears upon the Test Pattern output. This function also sends positioning information regarding the placement of your image with respect to the Relative Screen Position. You should do image placement in the software before downloading.

Erase Image in EEPROM
Use this function before changing the image stored within the BG-3/BG-7 to avoid improper appearance of your image on the Test Pattern output.

File History
This is a list of up to eight (8) recently opened image ID files.

COM

The COM menu allows selection of the USB port used to communicate with the BG-3/BG-7. By default only physical COM ports are listed (commonly COM1 and COM2), however, the software needs to be refreshed with the new USB to Serial port driver. First, connect the USB cable to the BG-3/BG-7 and power up the unit (if this is your first time connecting the unit to your computer, refer to USB Driver Installation). Click on Search for COM ports to command the software to find the new USB port. Now click on COM again and select the newly labeled COM port (commonly COM3 or COM4). Your unit is now ready to receive a new image ID.

ZOOM

The Zoom feature has two (2) selections, either On or Off. If On, the OSD image is stretched to fit within the confines of the Relative Screen Position. If off, your OSD image is shown as actual size with respect to the dimension your OSD image as it will appear when overlaid upon the selected Test Pattern.

Paintbursh_Editor

This menu item gives you a link to Windows Paint (as long as it is installed on your computer). This feature will load the currently selected OSD image into Windows Paint for editing.

OSD

This menu item pull down gives you the ability to select a luminance value for transparency of your OSD image. By default 255 is used. Basically this means that if you have a pixel with a value of Red = 255, Green = 255, and Blue = 255 (RGB=255), then that pixel is transparent. This menu item also give you the ability to place a SMPTE bar pattern (with a Safe Title Area) on the Relative Screen Position to help you determine the actual placement of your OSD image. This is not a precise placement tool, just an picture to help give you an idea of where an OSD image will be placed on your monitor.

Help

This menu item pull down gives you access to the electronic manual (BG3_BG7_Manual.PDF), and About (product version). When you click on Manual, the software will attempt to spawn Acrobat Reader and open this users manual. About will launch the program splash screen telling you about the software version and copyright information.

Image Data

This pane, located on the right side of the software interface screen, gives information regarding the image being shown under the Relative Screen Position. When an image is loaded, the file name is displayed at the top.

Directly beneath are two boxes where you may manually input a starting position for your image ("H" for horizontal and "V" for vertical). This starting position refers to the upper leftmost pixel of your ID image.

The Image Size relays information regarding the dimensions of the currently selected OSD image, as well as, the total pixel count (maximum of 65280).

The Start Position relays information regarding a pixel location of the upper left most pixel of your OSD image. (Minimum 0 "H" and "0" V, Maximum 716 "H" and 484 "V"). You will note that at the maximum Start Position you can place your image off screen. The hardware will not allow an image to invade into the synchronization signals being generated from the BG-3/BG-7, so the pixels of data that would invade this portion of the video are not written to the hardware.

The EEPROM Size is reminder of the maximum pixel count for the image you load into the software. The maximum pixel count is 65,280.

The Video Mode allows for the OSD image to be loaded into either a NTSC (525 line) frame, or a PAL (625 line) frame. PAL and NTSC test patterns are selected by use of a jumper that is internally mounted within the BG-3/BG-7 hardware (JP2).

A large EXIT button has also been placed in this field that is used to exit the program.

Status Bar

This field is located across the bottom of the software interface. Within this field, data being transmitted from both the software and hardware is displayed. There is also a small box on the far right indicating the selected COM port and whether communication has been established. There are three (3) colors associated with this box, Red meaning no communication between software and hardware, Cyan meaning an attempt at communication is progressing, and Green meaning that communication has been established.

NTSC / PAL Selection

Both a software change and a hardware change must be made to change the video standard the BG-3/BG-7 outputs. In software, change the Video Mode to the appropriate standard you wish to use. This is located on the main screen near the bottom right under the heading Video Mode. In hardware, you must remove the top cover and replace the jumper to the video standard you wish to use. This jumper is labeled JP2 and also has the labeling PAL-NTSC. It is a 3 pin header with a jumper installed for NTSC (inside pin to center for NTSC, outside pin to center for PAL). Once this jumper has been placed, all you need to do is cycle power to have the change take affect (or create a momentary short between the RESET pins at JP5 if power is still on).

Creating OSD Images

The BG-3/BG-7 uses a 24-bit full color bitmap (BMP) as the OSD image. The OSD image size must not exceed 65,280 pixels. Also, the width of the OSD image must not exceed 720 pixels and the height must not exceed 508 pixels. This does not mean that the maximum OSD image size is 720x508. The Width of the OSD image must be divisible by 4, and the Height must be divisible by 2. This does seem a little complex, but if you follow the following rules, you will be able to create just about any OSD image you like.

Maximum color depth -   24-Bit
Maximum pixel count -   65,280
Maximum Width -   720 (must be evenly divisible by 4)
Maximum Height -   508 (must be evenly divisible by 2)
Default Transparency -   RGB = 255 (Red = 255, Green = 255, Blue = 255)

An example maximum width OSD image of 720 would have a max height of 90. 720 is evenly divisible by 4 and 90 is evenly divisible by 2, also 720 x 90 is 64,800 which is less than 65,280.

This example would create a thin strip horizontally across your monitor.

Another example using a max height of 508 would have a max width of 128. 508 is evenly divisible by 2 and 128 is evenly divisible by 4, also 508 x 128 = 65,024. This example would create a thin strip vertically down your monitor.

Any size of OSD image can be created as long as the above rules are not violated. For example, a very small OSD image of 4x2 is valid. 4 is evenly divisible by 4, and 2 is evenly divisible by 2 and does not exceed 65,280 pixels.

To create a area of transparency within your OSD image, set the RGB value of the pixels to 255 (R = 255, Green = 255, and Blue = 255). This area will appear white in both Paint and BG-3/BG-7 interface software, but once installed into the hardware, these pixels will appear clear. The software also has the ability to change the Transparency Value. The number displayed in this field converts this RGB value to transparent. For example, if you change this value to 128, then all pixels with RGB = 128 (Red = 128, Green = 128 and Blue = 128) will become transparent. This allows you to make any RGB value clear. When creating an area of black, we recommend using an RGB value of no less than RGB = 25. A value of RGB = 25 will create black at 7.5IRE. A value of RGB = 0 will create black at 0IRE (which can be troublesome for NTSC). If creating an OSD image in PAL, then RGB = 0 is just fine. When creating an area of white, a value of RGB = 254 (note RGB = 255 by default is transparent) will create white at approximately 85IRE.

Included with the BG-3/BG-7 software are several example OSD images to help you in creating an OSD image that this product can accept. These OSD images are located on the CDROM under the folder named IMAGES (and also on your hard drive at \Program Files\Burst\BG7 \Images). These images are;

128x508.bmp
256x254.bmp
256x254-w-Transparent-Box.bmp
508x128.bmp
508x128-w-Transparent-Box.bmp
720x90.bmp
BURST-logo-BG7-24C.bmp
White-256x254.bmp

It is also recommended that any horizontal line be at least 2 pixels tall. This is due to the fact that one pixel in height will write to only one line of video (example Field 1 line 120 has data, but field 2 line 121 does not). This can cause a one pixel horizontal line to appear jumpy. The most simple way to avoid this is to draw your horizontal line with 2 pixels high (so both field 1 and field 2 have data).

Loading OSD Images

Loading an OSD image into the BG-3/BG-7 is accomplished by the following steps (this assumes that you have connected the hardware to the computer and that you have established communication to the hardware);

1. Create your image in any paint program and save that image as a bitmap file (see Creating OSD Images for specifications regarding how your image must be configured).
2. Open BG-3/BG-7 interface.
3. Click on FILE
4. Click on Open OSD Image File, and browse to the OSD image that you wish to use.
5. Use your mouse and drag (left click and hold) the newly opened OSD image to the approximate location you would like the picture to be displayed
6. A default OSD image has been preinstalled and must be erased. Click on Erase Image in EEPROM. You will be given two (2) consecutive warning windows. The first asks if you are sure you wish to erase the EEPROM, click on Yes. The second explains that you must wait ten (10) seconds before continuing, click Ok. You will be given another Status Window stating the EEPROM has been successfully erased after approximately ten (10) seconds, Click on OK.
7. Click on File
8. Click on Download OSD Image to EEPROM. You will again be presented with two (2) consecutive warning windows asking if you are sure you wish to perform this operation. The first just confirms that you wish to continue, click on Yes. The second explains that the EEPROM must be erased to avoid corrupting the currently installed image, click on Ok.
9. After the download has completed, your OSD image is now installed into the BG-3/BG-7 hardware.
10. Push the OSD switch up to overlay your newly installed OSD image upon the Test Pattern output.

1kHz Tone (Optional)

If your BG-3 or BG-7 was orders with the optional 1kHz tone feature, you will see another connector on the rear panel. There are two (2) types of Tone Option, Balanced and Unbalanced. Both options output 1kHz (+/- 100Hz) audio tone at 2Vp-p (+/- 0.2Vp-p). If Unbalanced Tone has been installed then an RCA (phono style) connector has been installed. If Balanced Tone has been installed then a male Mini-XLR connector has been installed. This connector is wired the same as a standard XLR audio connector (pin 1 = ground, pin 2 = negative, and pin 3 = positive). The Mini-XLR connector was chosen due to space constraints on the rear panel.

Specifications

Power	12Vdc @ 290mA (polarity insensitive)
Power Supply	120V 60Hz to 12Vdc 500mA (max) Center Positive
Size	5.6W x 1.5H x 7.3D inches
Output	1Vp-p Composite video (NTSC, PAL)
BG-3	1 BNC (Selectable Test Pattern)
BG-7	1 BNC (Selectable Test Pattern), 6 BNC (Black Burst)
Image	Up to 24-Bit bitmap (BMP)
	pixel count not to exceed 65,280
	Maximum Width = 720 pixels (must be evenly divisible by 4)
	Maximum Height = 510 pixels (must be evenly divisible by 2)
Input	USB2.0
Software	Windows 2000, XP compatible
Minimum Requirements	500MHz CPU, 128Mb RAM, 800x600 screen resolution
	CD-Rom Drive (for installation), USB port, mouse
	5Mb available hard drive space
Options	1kHz Balanced Tone (Mini-XLR)
	1kHz Unbalance Tone (RCA)