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**BT-540CF/545C PC/AT  
SCSI Host Adapter  
Quick Installation**



## BT-540CF/545C PC/AT SCSI Host Adapter Quick Installation

### Introduction

The BusLogic PC/AT SCSI BT-540CF and BT-545C (BT-54XC) Host Adapters are intelligent ISA to SCSI bus master host adapters, supporting up to seven SCSI devices. They offer driver support for widely-used standard operating systems. The BT-540CF features a Centronics external connector. The BT-545C offers a high-density SCSI-2 external connector as well as a floppy controller and connector.

### Installation Checklist

Host adapter installation involves the following steps:

1. Unpacking the host adapter and opening up the host system for adapter and SCSI device installation.
2. Setting the SCSI ID for all devices being attached to the host adapter.
3. Terminating SCSI devices.
4. Configuring board switch settings.
5. Installing and cabling the adapter and SCSI devices.
6. Updating your host system CMOS.
7. Configuring optional adapter operating parameters.
8. Testing adapter connectivity.
9. Low-level formatting (if needed) the hard drive(s).
10. Setting up the hard drive(s).
11. Installing the device drivers onto the hard drive(s).

### Step 1. Unpacking

1. Before handling the BT-54XC, **touch** your computer on a metal part to discharge static electricity. The board should always be held by the edges even after static electricity is discharged.
2. Verify that no physical damage occurred during shipping by inspecting the board for bent pins, loose parts, broken traces, and chipped or broken connectors.

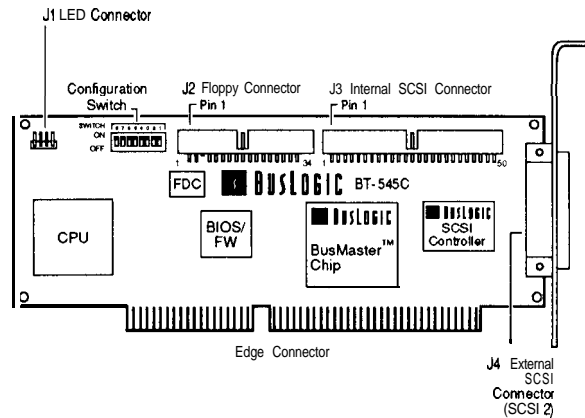


Figure 1. BT-545C Board Layout

You may need the following items during installation:

- Small screwdriver and small needle-nosed pliers
  - 50-pin SCSI flat ribbon cable to connect to internal devices
  - 50-pin SCSI cable to attach to external devices
  - 34-pin flat ribbon cable to connect to a floppy drive (BT-545C only)
  - Optional 4-pin cable to connect to the drive LED
  - Your computer owner's manual
  - Manuals for SCSI devices (e.g., hard drive, CD-ROM or tape backup drives)
  - Computer (e.g., SETUP) and operating system (partition, high-level format) software
3. Power down the host system
  4. Referring to your computer owner's manual, open the case to gain access to the motherboard and expansion slots.

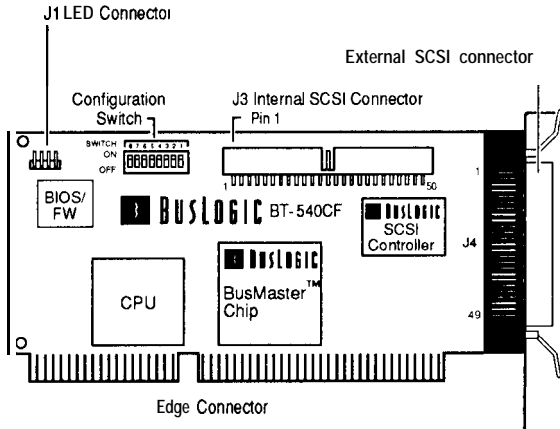


Figure 2. BT-540CF Board Layout

## Step 2. Setting the SCSI Device ID

Each SCSI device must be assigned a unique SCSI ID ranging from 0 through 7. Most SCSI peripheral devices are shipped with a pre-assigned SCSI ID. Your BusLogic adapter is set to SCSI ID 7 by default.

*Note: The SCSI ID for your boot drive must be lower than other drives. BIOS scans from ID 0 to find the boot drive.*

If needed, change the SCSI ID for the peripheral devices as recommended in the owner's manual. The only time you may need to change the adapter ID is when multiple adapters share a common SCSI bus (see the *AutoSCSI™ Host Adapter SCSI ID option* (Step 7)).

## Step 3. Terminating SCSI Devices

The first and last SCSI devices connected together on a SCSI bus must have terminators installed or enabled. Terminators, which can be connected to either SCSI devices or SCSI cables, are required for reliable operation of the SCSI bus.

If more than two SCSI devices are connected in a SCSI daisy chain, you must remove/disable the terminators on the middle device(s).

If the BT-54XC is not being installed at either end of the SCSI bus, disable its terminators by using the *Adapter SCSI Terminators ON* option on the *AutoSCSI Configuration Menu* (see Step 7).

## Step 4. Configuring Switch Settings

Before installing the adapter, check the switch settings to verify that the default settings for BIOS Address and Port Address do not conflict with other installed cards.

SW	Function
8	BT-545C: floppy controller BT-540CF: not used
7, 6, 5	BIOS address
4	Not used
3, 2, 1	I/O port address

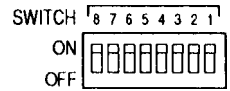


Figure 3. BT-54XC Switch Detail

- The I/O Port Address must be unique. The adapter is factory-shipped with Port Address 330. Check for conflicts with other cards.
- One card in the system must have BIOS enabled. By default the BT-54XC's BIOS is *enabled* at address DCOOOH. If unavailable, change to one of the other addresses listed in the table below.
- Switch 8 enables/disables the floppy connector on the BT-545C. Switch 8 is ON (enabled) by default.

SW 3	SW 2	SW 1	Port Address
ON	ON	ON	330 (default)
ON	ON	OFF	334
ON	OFF	ON	230
ON	OFF	OFF	234
OFF	ON	ON	130
OFF	ON	OFF	134
OFF	OFF	X	X

SW 7	SW 6	SW 5	BIOS Address
ON	ON	ON	DC000 (default)
ON	ON	OFF	D8000
ON	OFF	ON	D4000
ON	OFF	OFF	Do000
OFF	ON	ON	cc000
OFF	ON	OFF	C8000
OFF	OFF	X	Disabled

SW 8	Floppy Connector (BT-545C only)
ON	Enabled (default)
OFF	Disabled

(SW 4=Not Used) (X=Don't Care)

## Step 5. Installing and Cabling the Adapter

1. Remove the **mounting** screw and the existing bracket from the rear panel behind the 16-bit slot where you want to install the **BT-54XC**.
2. Press the BT-54XC downward into the selected 16-bit slot, align the mounting bracket, and reinstall the mounting screw. Make sure that the board is properly seated in the slot.
3. Connect the 50-pin SCSI cable to the adapter's single-ended SCSI connector attaching the other end to the SCSI device connector. Before plugging in cable connectors, check that the "▼" mark molded on the connector or the colored stripe on the cable (indicating the location of Pin 1) matches Pin 1 of the connector on the BT-54XC.
4. If connecting to a floppy drive, insert the 34-pin floppy cable from the floppy drive into the floppy connector (BT-545C only).

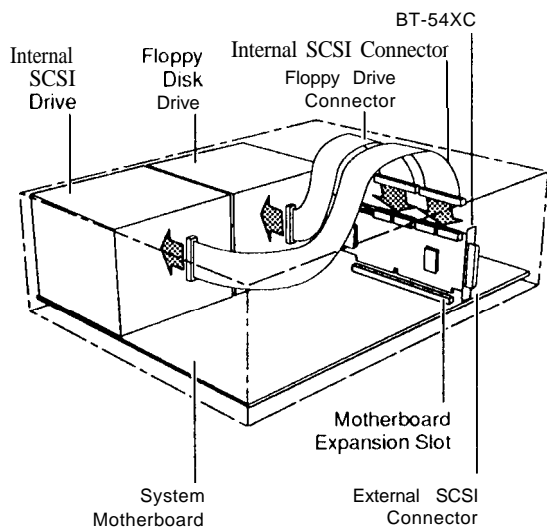


Figure 4. BT-54XC Installation

5. Insert the optional four-pin header connector for the drive activity LED on the front panel of the host to connector **J1** on the BT-54XC. This connector may be plugged into **J1** either way.
6. Verify that all connections are secure.

7. Reassemble the host computer as described in the system owner's manual.
8. Power up the system.

## Step 6. Updating System CMOS

1. Run **SETUP** and configure the host CMOS RAM options. Set the drive type option for the SCSI drive to **No Hard Drive Installed**.
2. Reset the system to activate your **SETUP** changes.

## Step 7. Configuring the BT-54XC

Host adapter configuration is optional. You may skip the following and proceed to Step 8.

For most card installations, the factory settings are suitable for successful operation. You can, however, further configure the BT-54XC to suit your operating environment, using the AutoSCSI Utility described below.

### The AutoSCSI Utility

The BT-54XC comes with an on-board configuration utility, AutoSCSI, which resides in Read Only Memory (ROM). AutoSCSI is available when the system is first powered up and at every system reset. Press **Ctrl-B** at the system prompt.

Use AutoSCSI to set or change SCSI and BIOS-related parameter configuration. AutoSCSI also offers diagnostic and disk utilities.

*Tip: When needed, use the **Auto Config All Adapters** option on the AutoSCSI Configuration Menu to return the adapter to its factory default values.*

### Adapter Configuration

**Host Adapter Interrupt Channel (IRQ).** The system automatically configures an IRQ value for the adapter based on its port address. (Def=11)

**Host Adapter DMA Channel.** The system automatically configures this value. The adapter uses the DMA channel setting for data transfers between the adapter and system memory. (Def=5)

**DMA Transfer Rate.** This field shows the DMA data transfer rate. (Def=5 MB/s)

**Host Adapter SCSI ID.** Use this option to change the adapter's SCSI ID on the SCSI bus. (Def=7)

**SCSI Parity ON.** This setting determines whether parity on the SCSI bus is detected by the adapter or not. (Def= Yes)

**Host Adapter SCSI Terminators ON.** Use this option to set adapter SCSI termination. Only terminators on devices at both ends of the SCSI chain should be turned on. (Def=Yes)

## Device Configuration

**Enable Fast Transfer (10MByte).** Many devices are capable of transferring data across the SCSI bus at 5 to 10 MBytes/sec. This option can increase performance in some applications if the attached device can also support the faster 10MByte/sec data rate. Used together with the *Enable Sync Negotiation* option. (Def=Yes)

**Enable Sync Negotiation.** Use this option to enable the adapter to initiate the synchronous data transfer negotiation between itself and each SCSI device connected to the SCSI bus. (Def=Yes)

**Enable Disconnection.** Use this option to enable or disable SCSI disconnection on each target device. When enabled, it allows SCSI devices to perform seek operations in parallel and thus improve overall SCSI bus performance. (Def=Yes)

**BIOS Sends Start Unit Command.** This option allows you to specify the SCSI devices whose motor spin up is sequentially controlled by BIOS at power-up. (Def=No)

Ignore in **BIOS Scan.** This option lets you exclude selected drives from BIOS scan and registration. (Def=No)

## Advanced Configuration

**Host Adapter BIOS Enabled.** This read-only field displays whether BIOS is enabled or disabled for this adapter.

**Host Adapter BIOS Uses INT 19 for System Boot.** This option allows you to include or exclude the adapter onboard BIOS in the DOS boot process. (Def=Yes)

**Host Adapter BIOS Supports DOS Space >1GB.** This option enables the adapter onboard BIOS to support up to 8 Gigabytes per drive of DOS disk space. The >1 GByte support must be turned on under the following two conditions: (1) the combined space of all the DOS partitions exceeds 1 GByte or (2) >1 GByte disk accesses are required to boot the operating system. (Def=No)

**BIOS Supports Removable Disks as Fixed Disks.** This option enables the adapter BIOS to register removable disks as fixed disks and access them via Interrupt 13H. (Def=No)

**BIOS Supports > 2 Drives (DOS 5.0 or Above).** This option turns on BIOS support for more than two hard disk devices on the SCSI bus. (Def=Yes)

**Enable BIOS Interrupt Mode.** Enable if your version of DOS is multitasking (e.g., PC-MOS). (Def=Yes)

**Support Floptical Drive.** When this option is enabled, BIOS registers and controls floptical devices. (Def=No)

**Enable SCSI Bus Reset.** When this option is enabled, the adapter asserts a SCSI bus reset signal upon detecting a hard reset. (Def=Yes)

**Resewed RAM for BIOS access (Segment: Offset) 0.** Use this option to allocate system memory for BIOS parameter storage. (Def=200)

**Set Host Adapter I/O Port Address as Default.** This option is always enabled for this product.

## Step 8. Testing Adapter Connectivity

Use the *DMA Test on I/O Port* option on the AutoSCSI Diagnostics Menu to test adapter connectivity to the motherboard. This test writes and reads data between the adapter and the motherboard. Press <ESC> to end the test. If the test fails, check your cable connections.

## Step 9. Formatting the Hard Drive

Because most off-the-shelf hard drives are factory formatted, it is unlikely that you need to perform this procedure and you may proceed to Step 10. If, however, you have an un-formatted disk, or if you are experiencing problems with your hard drive that indicate the need for a low-level format, use the *Format Disk* option on the AutoSCSI Utilities Menu.

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*Caution: This procedure will erase everything on your drive. Back up your hard drive before proceeding.*

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The format duration depends on the size of your hard drive. You cannot stop the format once it's started. Once it is completed, you may run the *Verify Disk* option to check the format.

## Step 10. Setting Up the Hard Drive

You will need to take the following steps to configure your hard drive for operation:

- Create a partition on the drive for your operating system and high-level format the drive.

- Install the operating system.

These procedures differ depending on the operating system you are installing. Refer to your operating system documentation for details.

## Step 11. installing the Device Driver

Device drivers are **needed** to allow devices attached to the adapter to be recognized by and operate with the operating system. Where the operating system has embedded support, you can install up to a specific number of hard drives without needing additional software. For example, drivers supporting BusLogic SCSI host adapters are embedded in NetWare v3.12 and 4.X.

You will need to install drivers when going beyond built-in support or when installing devices such as CD-ROM or tape backup drives, etc.

When you install BusLogic device drivers, you will have support for:

- Up to three BusLogic host adapters
- Up to seven SCSI peripheral devices (hard drives, etc.) per host adapter
- Connectivity to SCSI CD-ROM drives, photo CDs, tape drives, magneto optical (MO) disk drives and other devices.

### DOS and NetWare Driver Installation

To install the DOS and NetWare drivers using the utility included with your device driver software:

1. If you have not already done so, insert the floppy diskette containing the DOS and NetWare drivers into the floppy drive. If the driver floppy is in Drive A:, enter: a: **install**
2. **You** are prompted to indicate the drive containing the floppy or press <ENTER> to accept the default.
3. You are next prompted to select the installation method:
  - If you select Express, the DOS drivers will be installed automatically.
  - If you select Custom, you will be prompted to specify the DOS or NetWare drivers to be installed.
4. The next step depends on which drivers you're installing.

### BusLogic DOS Driver Installation:

You will be asked if you want the utility to automatically update your system CONFIG.SYS and AUTOEXEC.BAT files. If Yes, the system updates the DOS configuration files and renames your old files to CONFIG.BL and AUTOEXEC.BL. If No, you will have to update your DOS configuration files manually. Proceed to Step 5.

### BusLogic NetWare Driver Installations:

- If you are installing update drivers for NetWare 3.11, installation is complete. Proceed to Step 5.
  - If you are installing the NetWare 3.11 operating system for the first time, you will need to continue with operating system installation. See the *SCSI Adapter Driver Software Installation Guide* for further details. Proceed to Step 5.
  - If you are installing update drivers for NetWare 3.12 or 4.X, driver installation will be complete after you modify your STARTUP.NCF file to reflect the new driver names as indicated in the message screen. Proceed to Step 5.
5. Once installation is complete, re-boot your system to activate the new device drivers. You won't be able to access the new devices until you do so.

Refer to the *BusLogic SCSI Adapter Driver Software Installation Guide* or third-party documentation for device driver installation details.

## Troubleshooting

- Review installation steps for correct procedure.
- Be sure all connectors are firmly seated.
- Check cable orientation. Be sure that Pin 1 on the cable matches Pin 1 on the SCSI device connector.
- Be sure that you've followed termination rules. If the **BT-54XC** is in the middle of the SCSI chain, use **AutoSCSI** to disable termination.
- Check that you have correctly set the hard drive option to **not installed** in the system SETUP file.
- Be sure that settings for the adapter I/O Port Address, BIOS Address, IRQ and DMA Channel do not conflict with those of other installed cards.
- If you changed any parameters using AutoSCSI, use the *AutoConfig All Adapters* option to return the board to factory defaults.

- If necessary, repeat the steps to format, partition and install the operating system on the hard drive. Be sure to backup the drive before proceeding.

## Warranty Information

If damage to the board has occurred, return it in the protective envelope and original packaging with this manual to your BusLogic board supplier. The shipping agent should also be notified if the unit has been damaged during shipment.

## Specifications

<b>Dimensions</b>	BT-540CF: 6.5" x 3.5" BT-545C: 8.0" x 3.25"
<b>Electrical</b>	
Operating Voltage	5±0.25V
Operating Current	.5 A Max.
Max. Ripple/Noise	100 mV
<b>Environmental</b>	
Temperature	0°C to 60°C (32°F to 128°F)
Relative Humidity	10% to 95% non-condensing
Altitude	0 to 10,000 ft. operating 0 to 15,000 ft. non-operating
<b>Interface Connections</b>	
<b>SCSI Internal</b>	<b>50-pin</b> double-row connector
SCSI External	BT-540CF: <b>50-pin</b> shielded Centronics SCSI connector BT-545C: <b>50-pin</b> shielded high-density SCSI connector
<b>Floppy</b>	<b>34-pin</b> AT-compatible ribbon style (BT-545C only)
System Interface	IBM PC/AT standard <b>36-pin</b> and <b>62-pin</b> edge connector
MTBF	90,000 hours

Meets requirements of:  
FCC Part 15, Class B  
EN 55 022:1987 (CISPR 22:1985/BS 6527:1988), Class B  
BMPT Vfg 243/1991



**BUSLOGIC**

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P/N 3002613 REV. A