



IBM Commercial Desktop Computers

Technical Information, Tips, and Techniques

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Troubleshooting IBM PC 300 & PC 700 Hardware Setup Problems

If you are having trouble getting an ISA or PCI Adapter to work in the PC 300 or PC 700, perform the following steps.

- (1) Please ensure that your IBM PC 300 or PC 700 system is using the latest BIOS release for that system. Later BIOS releases correct problems that users have experienced with the earlier releases. Refer to the BIOS section to determine if you need to update your system's BIOS.
- (2) Check the documentation that accompanies the ISA or PCI adapter to determine what system resources are required. The type of resources that need to be determined are memory address range, I/O address range, DMA assignments, and IRQ assignments. Determine whether the ISA adapter card contains ROM or uses a RAM buffer by reviewing the adapter documentation. If the adapter card uses a buffer, record the starting address and size of the buffer used by the card. Make sure that no upper memory conflicts exist between internal devices and any adapters installed in the system.
- (3) Power on the system and press F1 when the memory count appears (to access the setup utility).
- (4) From the setup utility main menu, select "Advanced Setup." Then select "ROM Shadowing."
- (5) If the ISA adapter card contains ROM or uses a RAM buffer, disable ROM shadowing for the address range(s) used by the ISA adapter card. Each field under ROM shadowing on page 4 of the setup utility is 32KB in size. For example, if the ISA adapter card contains a rom that is 32KB in size and is located at D4000, disable ROM shadowing at D4000-DBFF.
- (6) Select "ISA legacy resources" from the main menu of the setup utility. Select each of the options from the "ISA legacy resources" to configure a ISA adapter. Use the "IRQ resources" selection from the main menu to configure a PCI adapter. Follow the steps below to correctly configure the system for the adapter. When complete, return to the main menu.
 - (6a) **ISA Adapters** - change the fields under each of the menu selections under "ISA legacy resources" from "available" to "not available" that correspond to the resources that are used by the ISA adapter. For example, if an ISA adapter uses I/O ranges 220-240h, DMA channel 7, and IRQs 9 and 10, set each of these selections to "not available" under the appropriate menu of "ISA legacy resources." Make sure that no I/O Address, DMA Channel, and IRQ conflicts exist between internal devices and any adapters installed in the system. Also ensure that adapters do not conflict with each other.
 - (6b) **PCI Adapters** - if a PCI adapter is installed that uses an interrupt, at least one of the interrupts that can be used by the PCI bus (3,5,9,10 & 11) must be set to "available" under "IRQ resources" in order for the PCI adapter to operate correctly. Select an interrupt that is not currently being used by an ISA adapter and set it to "available."
- (7) Press the Esc key until the screen appears that allows the changes made to be saved. Select yes and press enter to save the changes.

The ISA or PCI adapter may now be installed and tested using the adapter diagnostics.

Latest BIOS Version

<u>Model</u>	<u>Description</u>	<u>Latest BIOS Release</u>	<u>Filename on IBM BBS</u>
IBM Personal Computer Systems			
6560	PC 340 Pentium Systems	LXKT20A	LXJT20A.EXE
6571 & 6581	PC 330 & PC350 486 Systems	LEKT67A	LEJT67A.EXE
6573 & 6583	PC 330 & PC350 486 Systems	LEKT67A	LEJT67A.EXE
6575 & 6585	PC 330 & PC350 Pentium Systems	N1KT84A	N1JT84A.EXE
6576 & 6586	PC 330 & PC350 Pentium Systems	LPKT60A	LPJT60A.EXE
6577 & 6587	PC 330 & PC350 Pentium Systems	LVKT26A	LVJT26A.EXE
6589	PC 365 PentiumPro Systems	LUKT27A	LUJT27A.EXE
6598	PC 360 PentiumPro Systems	LTKT16A	LTJT16A.EXE
6875 & 6885	PC 730 & PC 750 ISA Systems	N1KT85A	N1JT85A.EXE
6876 & 6886	PC 730 & PC 750 MicroChannel Systems	N2KT47A	N2JT47A.EXE
6877 & 6887	PC 730 & PC 750 ISA Systems	LQKT40A	LQJT40A.EXE
IBM ValuePoint Systems			
6382, 6384, 6387	ValuePoint II	L6ET69AUS	L6JT69A.DSK
6381	ValuePoint Si	L8ET48AUS (or L9)	L8JT48A.DSK
6472 , 6482, 6492	ValuePoint Performance Series	LDET75AUS	LDJT75A.DSK
6474, 6484, 6482	ValuePoint Performance Series	LDET75AUS	LDJT75A.DSK
6384	ValuePoint Pentium -	1.00.06.AV0M	VPP60FL6.DSK

To access the System Configuration Utility, from a cold boot wait until memory count has begun and the box has appeared in the top right corner of the screen. Press F1 at this time to access System Configuration.

Latest Video Drivers For IBM Desktop Systems

<u>IBM BBS File Name</u>	<u>Driver Description</u>	<u>Version</u>	<u>File Date</u>
PC 330 & PC 350 486 Based Systems:			
CL30DS11.EXE	Cirrus Logic GD5430 DOS	1.1	08-03-95
CIRRUS.ZIP	Cirrus Logic GD5430 OS/2	1.3	09-01-95
K543X2E1.ZIP	Cirrus Logic GD5430 Windows (also get K543X2E3.ZIP)	1.24	01-31-96
PC 330 & PC 350 (Models 6576 & 6586) and PC 700 (Models 6877 & 6887):			
Z01T33A.EXE	S3 Trio64/64 V+ OS/2	2.85-07	12-11-96
Z02T06A.EXE	S3 Trio64/64 V+ Windows 3.1	1.62-02	09-25-96
Z03T10A.EXE	S3 Trio64/64 V+ Windows 95	2.10-10	10-01-96
Z04T06A.EXE	S3 Trio64/64 V+ Windows NT	1.31-08	10-01-96
PC 700 Systems (6875, 6876, 6885, & 6886) and PC 330 & PC 350 Pentium 60MHz Systems:			
S3VDS12.EXE	S3 Vision864 DOS	1.2	06-16-95
N71102A.DSK	S3 Vision864/868 OS/2 Disk 1	1.0	03-27-96
N71202A.DSK	S3 Vision864/868 OS/2 Disk 2	1.0	03-27-96
N72T00A.DSK	S3 Vision864/868 Windows 3.1	1.0	03-27-96
N74T00A.DSK	S3 Vision864/868 Windows NT	1.0	03-27-96
PC 330, PC 350, PC 365 & PC 700 Systems (Models 6577, 6587, 6589, 6877 & 6887):			
Z01T33A.EXE	S3 Trio64/64 V+ OS/2	2.85-07	12-11-96
Z02T06A.EXE	S3 Trio64/64 V+ Windows 3.1	1.62-02	09-25-96
Z03T10A.EXE	S3 Trio64/64 V+ Windows 95	2.10-10	10-01-96
Z04T06A.EXE	S3 Trio64/64 V+ Windows NT	1.31-08	10-01-96
PC 340 Systems (Model 6560):			
LZ0T03A.EXE	Cirrus Logic GD5436 DOS	1.12F	07-25-96
LZ1T13A.EXE	Cirrus Logic GD5436 OS/2	1.12F	07-25-96
LZ2T07A.EXE	Cirrus Logic GD5436 Windows 3.1	1.12F	07-25-96
LZ3T07A.EXE	Cirrus Logic GD5436 Windows 95	1.12F	07-25-96
LZ4T05A.EXE	Cirrus Logic GD5436 Windows NT	1.12F	07-25-96

Memory Map For IBM Commercial Desktop Systems

<u>Memory Location</u>	<u>Size</u>	<u>IBM PC 300, PC 340, 350 IBM PC 730, 750</u>	<u>ValuePoint Si, Performance Series, ValuePoint Pentium</u>	<u>ValuePoint I ValuePoint II</u>
0000 - 9FFF	640KB	System RAM	System RAM	System RAM
A000 - AFFF	64KB	Video Graphics	Video Graphics	Video Graphics
B000 - B7FF	32KB	Mono Video	Mono Video	Mono Video
B800 - BFFF	32KB	Video Text	Video Text	Video Text
C000 - C7FF	32KB	Video BIOS	Video BIOS	Available
C800 - CFFF	32KB	Available	Available	Available
D000 - DFFF	64KB	Available	Available	Available
E000 - E7FF	32KB	Available	Available	Video BIOS
E800 - EFFF	32KB	Configuration Utility	Configuration Utility	Configuration Utility
F000 - FFFF	64KB	System BIOS	System BIOS	System BIOS

¹ Available means open for usage by either a Shared-RAM Adapter or for mapping as upper memory blocks.

Note: Some PC300 Systems reserve EA00-EBFF for Plug & Play Configuration Work Area. However, if you are not using a Plug & Play Operating System (Such As Microsoft Windows95), this area can be included.

Note: The Configuration Utility (located at E800-EFFF) is only used at system startup. This memory region can be safely used by memory managers such as EMM386.EXE.

Memory Management Tips

- (1) Listed below are the valid upper memory regions that can be included for use by a DOS memory manager (such as EMM386.EXE) assuming that no Shared RAM adapters are installed in the system:

IBM PC 700 Systems	X=C000-C7FF	I=C800-EFFF
IBM PC 300 Systems	X=C000-C7FF	I=C800-EFFF
IBM ValuePoint Performance Series	X=C000-C7FF	I=C800-EFFF
IBM ValuePoint Pentium	X=C000-C7FF	I=C800-EFFF
IBM ValuePoint Si	X=C000-C7FF	I=C800-EFFF
IBM ValuePoint I & II	I=C000-DFFF	X=E000-E7FF I=E800-EFFF

Some versions of EMM386.EXE do not recognize that the ValuePoint I and ValuePoint II Models use E000-E7FF for Video BIOS. To increase upper memory on these systems, the E000-E7FF range must be manually excluded and the C000-C7FF range must be manually included.

- (2) If you are not using the monochrome video mode (most applications do not), the Monochrome Video Area (B000-B7FF) can be mapped (by adding I=B000-B7FF to the EMM386.EXE line in CONFIG.SYS). If using Microsoft Windows, add a Device=C:\DOS\MONOUMB.386 statement to the [386Ehn] section of SYSTEM.INI. The MONOUMB.386 driver comes with IBM PC-DOS 6.3 & 7.0.
- (3) If installing an IBM Token-Ring Adapter, be sure to exclude memory areas for ROM (typically CC00-CDFF or DC00-DDFF) and RAM (typically D800-DBFF or C800-CBFF). Since the Token-Ring Adapter does not initialize until the device driver opens the adapter, EMM386 can map the areas used by the adapter. Later, when the device driver (such as DXMA0MOD.SYS, IPX, or TOKEN.COM) attempts to open the adapter, the adapter will not initialize and the device driver will report that a Token-Ring Adapter was not found.

When using an IBM Token-Ring Adapter, to maximize the amount of contiguous upper memory assign the Token-Ring RAM area to C800-CBFF and the ROM area to CC00-CDFF. This will allow you to include the CE00-EFFF region on most IBM Desktop systems. The Token-Ring RAM address is set by software. The first software driver that opens the adapter sets the RAM Address. Listed below are several methods of moving the RAM Address:

- (1) IBM LAN Support Native Drivers: DEVICE=C:\LSP\DXMC0MOD.SYS N ,C800,0,0,0
- (2) NDIS Drivers (PROTOCOL.INI File): MEM=0xC800
- (3) Novell Netware ODI Drivers (NET.CFG File): Link Driver TOKEN (Or LANSUP)
MEM #1 CC000
MEM #2 C8000
- (4) Novell Netware IPX: IPX o,mem=C800

- (4) If you are using an IBM Token-Ring Adapter or an IBM EtherJet Adapter in a Docking Station, download the IBM LAN Client Code from the IBM BBS. This code loads 802.2 Support, Netbios, the Netware Requester, and a TCP/IP stack into extended memory (not upper memory). It can reduce the DOS memory consumption of these protocols to 5KB.
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Interrupt Assignments

<u>IRQ</u>	<u>Assignment</u>
NMI	Parity or channel check
IRQ0	Timer
IRQ1	Keyboard
IRQ2	Cascade Interrupt Requests from IRQ8-IRQ15
IRQ8	Real-time Clock
IRQ9	Redirect Cascade (can be used by ISA, PCI, or MicroChannel Adapters)*
IRQ10	Available (can be used by ISA, PCI, or MicroChannel Adapters)
IRQ11	Available (can be used by ISA, PCI, or MicroChannel Adapters)
IRQ12	Mouse
IRQ13	Math Coprocessor exception
IRQ14	IDE Hard Disk Drive #1
IRQ15	IDE Hard Drive #2 (otherwise, can be used by ISA, PCI, or MicroChannel Adapters)
IRQ3	Serial Port Alternate (otherwise, can be used by ISA, PCI, or MicroChannel Adapters)
IRQ4	Serial Port Primary (otherwise, can be used by ISA, PCI, or MicroChannel Adapters)
IRQ5	Available (can be used by LPT2)
IRQ6	Floppy Diskette Drive
IRQ7	Parallel Port

* IRQ9 can be used as the vertical retrace interrupt by some software.

DMA Channel Assignments

<u>Channel</u>	<u>IBM PC 300 & 700</u>	<u>ValuePoint Pentium</u>	<u>VP I, VP II, VP Si, and ValuePoint Performance Series</u>
DRQ0	Unused (8-bit)	Unused (8-bit)	Unused (8-bit)
DRQ1	Unused (8-bit)	Unused (8-bit)	Unused (8-bit)
DRQ2	Diskette Drive (8-bit)	Diskette Drive (8-bit)	Diskette Drive (8-bit)
DRQ3	Unused (8-bit)*	Unused (8-bit)*	Unused (8-bit)*
DRQ4	Cascade	Cascade	Cascade
DRQ5	Unused (16-bit)	Unused (16-bit)	Unused (16-bit)
DRQ6	Unused (16-bit)	Unused (16-bit)	Unused (16-bit)
DRQ7	Unused (16-bit)	Hard Disk Drive (16-bit)	Unused (16-bit)

* Used by the Parallel Port if set for ECP (Extended Capabilities Mode) in System Configuration. The PC/AT Compatible Mode is default.

Installing an IBM Auto 16/4 Token-Ring ISA Adapter in an IBM PC 300 or PC 700 System

Why You May Experience Problems

The IBM Auto 16/4 Token-Ring ISA Adapter is a Plug & Play Adapter and the IBM PC 300 and PC 700 Systems are Plug & Play compatible computers. With Plug & Play, the system BIOS will set the Upper Memory Address, IRQ, and I/O Address of the adapter so that they do not conflict with any other device in the system. If you installed the Auto Token-Ring Adapter, used the LAN Drivers that accompany the adapter, and do not use an upper memory manager (such as EMM386.EXE), you should not have any problems. However, most users do not fit these conditions.

Many users install an older version of the LAN software. Older versions of the Token-Ring Drivers cannot search for the IRQ and upper memory block used by the adapter. Most users utilize an upper memory manager, which will conflict with adapter. If you encounter difficulties, please use the follow procedures:

Update System BIOS

Please ensure that your PC 300 or PC 700 is at the latest BIOS level. Please see BIOS Section for latest BIOS levels. The IBM Auto Token-Ring 16/4 ISA Adapter does not function correctly with early versions of PC 300 BIOS (before Level 48A) and early versions of PC 700 BIOS (before Level 62A) .

Obtain Latest Version of Auto Token-Ring Drivers

Please ensure that you are using Auto Token-Ring 16/4 ISA LAN AID Version 1.40 or later. If you do not have the latest version, please download TRIAU1.ZIP from the IBM BBS. On the Internet, TRIAU1.ZIP is located in /pub/network. TRIAU2.ZIP and TRIAU3.ZIP contain the latest drivers.

Selecting an IRQ

The Auto 16/4 Token-Ring ISA Adapter allows the use of IRQ 9/2, 3, 10, and 11. If you do not plan to use the Token-Ring Drivers provided with the adapter, you must use either IRQ 9/2 or IRQ 3. Only the newer versions of LAN Support Drivers, NDIS Drivers, and Netware VLM Drivers provided with the Adapter recognize IRQ 10 or IRQ 11. These instructions assume that you will use IRQ 9/2.

Selecting RAM & ROM Memory Addresses

The original IBM Token-Ring ISA Adapter set an 8KB ROM area at CC00-CDFF and a 16KB RAM area at D800-DBFF. These are the recommended settings for OS/2 systems. For DOS Systems, in order to increase the amount of contiguous upper memory, please set the RAM address to C800-CBFF and the ROM address to CC00-CDFF.

Installing an IBM Auto 16/4 Token-Ring ISA Adapter in an IBM PC 300 or PC 700 System

Modifying System Configuration

- (1) Reboot System. Access System Setup By Pressing F1 When the Prompt Appears.
- (2) In Advanced Setup, disable ROM Shadowing for C800-CFFF, D000-D7FF, and D800-DFFF.
- (3) In ISA Legacy Resources, mark IRQ 9, and the appropriate memory areas as not available.

Setting the Configuration for the Auto 16/4 Token-Ring ISA Adapter (Using LANAID 1.40)

- (1) Boot From the LANAID diskette and select Startup Option 2:
IBM Auto 16/4 Token-Ring ISA Configuration Using LANAID
- (2) Ignore the Conflict Warning Message and hit any key to continue
- (3) Select Continue, Then Select Standard Install
- (4) Select Configuration
- (5) Choose Plug & Play Enabled. Then select Locked Resources.
- (6) Choose IRQ 9 (2). Ignore the in use message
- (7) Select I/O A20-A23 Primary; ROM 0CC000-0CDFFF; RAM 0C8000-0CBFFF for DOS; For OS/2 Select 0D8000-0DBFF for RAM
- (8) Select 16KB RAM Size
- (9) Select Other Options as Appropriate for Your LAN
- (10) Store the Information to the Adapter (If you chose IRQ9(2), Ignore the Warning that the IRQ 9(2) is In Use)
- (11) After Updating the Adapter, Please Power Off the System. Updates Do Not Take Affect Until Power Up.
- (12) Run Extended Test from the LANAID Diskette to verify correct installation.

Modifying the Memory Manager (DOS Only)

Be sure to specifically exclude the adapter ROM and adapter RAM address (add X=C800-CDFF to the EMM386.EXE line).

Software Setup

The Token-Ring RAM address is set by software. The first software that OPENS the adapter sets the RAM Address. Listed below are several methods of setting the RAM Address:

- | | |
|--|---|
| (1) IBM LAN Support Native Drivers: | DEVICE=C:\LSP\DXMC0MOD.SYS N ,C800,0,0,0 |
| (2) NDIS Drivers (PROTOCOL.INI File): | MEM=0xC800 |
| (3) Novell Netware ODI Drivers (NET.CFG File): | Link Driver TOKEN (Or LANSUP)
MEM #1 CC000
MEM #2 C8000 |
| (4) Novell Netware IPX: | IPX o,mem=C800 |

Obtaining Updated Drivers

IBM PC Company Bulletin Board System

BBS Phone Number	919-517-0001
Baud Rate	300-14400 bps
Parity/Data Bits/Stop Bits	N/8/1

IBM PC Company Internet FTP Site

`ftp.pcco.ibm.com` `cd /pub` and get the `allfiles.txt` file for a listing of available files

IBM PC Company World Wide Web Site

`www.pc.ibm.com`

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<code>701_tips.txt</code>	ThinkPad 701 Tips in ASCII format.
<code>750_tips.pdf</code>	ThinkPad 360, 750, 755 Base Models Tips in Acrobat format.
<code>750_tips.txt</code>	ThinkPad 360, 750, 755 Base Models Tips in ASCII format.
<code>755_tips.pdf</code>	ThinkPad 755 Enhanced Models Tips in Acrobat format.
<code>755_tips.txt</code>	ThinkPad 755 Enhanced Models Tips in ASCII format.
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