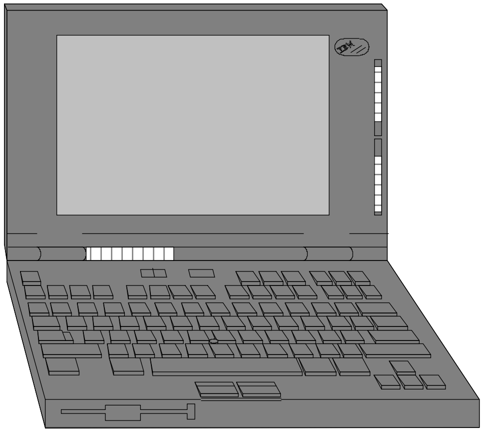

ThinkPad 365

365C, 365CD, 365CS, 365CSD,
365E, 365ED,365X, & 365XD

Technical Information, Tips, and Techniques

Version 3.4
December 1996

Troubleshooting IBM Thinkpad Hardware Setup Problems

If you should experience problems setting up PCMCIA Cards, please follow the procedures listed below:

(1) Please ensure that your ThinkPad 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 ThinkPad BIOS section to determine if you need to update your system's BIOS.

(2) Make sure that your software drivers are at the correct release level and are setup properly. Refer to the ThinkPad PCMCIA Drivers section to see if you need to update your system's PCMCIA device drivers. If you are using Point Enablers, please ensure that they are at the latest release level.

(3) Determine if any upper memory conflicts exist between the areas claimed by ThinkPad BIOS, Card & Socket Services, and Point Enablers Refer to the ThinkPad Memory Map section.

The Device Driver DICRMU01.SYS /MA=C800-CFFF (DOS PCMCIA Resource Map Utility) sets the upper memory addresses used by Card & Socket Services. The /MA parameter tells Card Services what locations in upper memory can be used by PCMCIA cards or Card Services, and must match or be a subset of an excluded memory range on the EMM386 line of CONFIG.SYS.

(4) Microsoft Windows can overwrite the upper memory address used by Card & Socket Services. To prevent this, add an EmmExclude=XXXX-XXXX statement to the [386 Enh] section of SYSTEM.INI (Where XXXX-XXXX is the same as the memory region as used in the /MA parameter for the DICRMU01.SYS driver). If you are using point enablers, be sure to exclude any upper memory used by the enabler by adding an EmmExclude statement to SYSTEM.INI.

(5) Make sure that no interrupt conflicts exist between ThinkPad devices and PCMCIA Cards. Refer to the ThinkPad Interrupt Assignments section to view the default interrupt assignments. Please note that the ThinkPad System Setup Utility allows you to view and change interrupt assignments for many internal devices.

(6) Those ThinkPad 365X and 365XD Models with audio use I/O 220 as the default audio I/O address. This setting will conflict with a Token-Ring Adapter (At I/O A20). Use the ThinkPad Utilities to change the I/O address for audio to 240. This will resolve the conflict.

Installing Windows 95 on the ThinkPad 365C, 365CD, 365CS, & 365CSD

(1) For complete Windows 95 directions, please download TPWIN95.EXE from the IBM BBS.

(2) It is STRONGLY RECOMMENDED that you update your system BIOS to the latest BIOS release before installing Windows 95 on your system. Refer to the BIOS section for the latest BIOS level for you ThinkPad.

(3) Install Windows 95.

(4) The ThinkPad Features Program for Windows works on Windows 95. If you install Windows 95 on a blank hard disk or you haven't installed ThinkPad Features Program, follow the instructions of "ThinkPad Features Program - Installing for Windows" in the ThinkPad User's Guide. Please ensure that you are at the latest levels (refer to Driver Levels section of this document).

(5) Windows 95 comes with the integrated PCMCIA support. To use the Windows 95 PCMCIA support functions, refer to the Windows 95 documentation or on-line help. Note: to use PCMCIA function, you must run the PC Card Wizard in Control Panel under My Computer.

If you want to use ThinkPad PC Card Director (or EasyPlaying), you can still use ThinkPad DOS PCMCIA device drivers. Follow the instructions in the ThinkPad User's Guide for "Installing the PCMCIA drivers - Installing for DOS." Make sure that you use the latest PCMCIA drivers.

(6) The video device driver for ThinkPad 365 system is included with Windows 95. You do not need to install the ThinkPad Windows video device driver. To verify that the correct video driver is installed, select "My Computer", select "Control Panel", open "Display", then select "Change Display Type". Make sure that "Chips & technology Accelerator" is selected.

(7) Configure Audio Support. Select "My Computer", select "Control Panel", open "Multimedia", then select "Advanced". Go to "Audio Devices" in the list of "Multimedia Devices", then select "Audio for ESS ES1688 Plug & Play AudioDrive". Select "Settings", then select "Use Single Mode DMA".

(8) If you are using an IBM PCMCIA Token-Ring Adapter, download TRCC1.EXE for an updated driver for Windows 95.

(9) Windows 95 treats the IBM Ethernet Credit Card Adapter as a Plug & Play Adapter. However, some older versions of this adapter do not support Plug & Play. If you insert this adapter into a system running Windows 95, the system may lock until you remove the adapter. To correctly configure this adapter for Windows 95, boot in Safe Mode, go into Device Manager, and manually configure the adpater for I/O 300, IRQ 9, Mem Address D400.

Installing Windows NT 4.0 on the ThinkPad 365X & 365XD

(1) Note: Microsoft Windows NT is only supported on the ThinkPad 365X and 365XD models. Windows NT 4.0 has not been tested on the ThinkPad 365C, 365CD, 365CS, 365CSD, 365E, and 365ED models.

(2) Update your system BIOS to the latest BIOS release before installing Windows NT on your system.

(3) Download the latest ThinkPad Windows NT 4.0 Installation Instructions (TPWINT40.TXT) from the IBM BBS or Web site. Also download the latest drivers required for your system (see Drivers for Windows NT section for the files to download)

(4) Install Windows NT on the ThinkPad.

(5) After NT has been installed, update the ThinkPad 365 Windows NT Video Device Driver. Use the ThinkPad Video Driver you downloaded from the BBS. Insert the diskette in Drive A. Select Control Panel, then Display, then Settings, then Display Type, then Change, then Have Disk. Choose IBM ThinkPad (Cyber 9320/9382/9385). Restart Windows NT after installation. After restart, select the proper resolution.

(6) Install the Windows NT version ThinkPad Utilities program. Using this program, you can change your hardware configuration, display the fuel gauge, and set the device stand-by timers (same as in the Windows 3.1 or Windows 95 environments). Logoff and log back on to enable the ThinkPad Utilities. Once you install the ThinkPad Utilities, Suspend/Resume and Power Management are supported under Windows NT.

(7) For the ThinkPad 365X & 365XD, install the ThinkPad PIIX Busmaster IDE Driver using the file from the IBM BBS. Close any running applications. Insert the diskette in Drive A. Select Control Panel, then SCSI Adapters, then Drivers, the Add, the Have Disk. Select OK. The Select IBM ThinkPad PIIX IDE Driver, then OK. Restart NT when prompted.

(8) For the ThinkPad 365X & 365XD models, Windows NT Audio Support is provided via a file from the IBM BBS. Install Audio support using the appropriate diskette.

(9) Install ThinkPad infrared support using the file from the IBM BBS.

Currently, the following functions are not supported on Windows NT:

Hibernation functions are not supported on NTFS partitions.

Latest Version of ThinkPad BIOS

ThinkPad Model	Latest BIOS Version	Date
365C, 365CD, 365CS, 365CSD	2.0.14	07/23/96
365E, 365ED	2.0.14	07/23/96
365X, 365XD	91G1798	08/14/96

The 365C/CD/CS/CSD/E/ED BIOS version can be viewed on the ThinkPad screen at power up.
The 365X/XD BIOS version can be viewed by pressing and holding F1 screen at power up.

To get the latest BIOS for the ThinkPad 365C, 365CD, 365CS, 365CSD download SY36B2141.EXE & SY36B2142.EXE from the IBM BBS.
To get the latest BIOS for the ThinkPad 365X and 365XD download SY36X102.EXE from the IBM BBS.

Upgrading The ThinkPad Flash BIOS

- You need an AC adapter and a charged battery pack to update the system program.
- If your computer is attached to a ThinkPad Docking Station or a port replicator, turn off the computer and detach it before proceeding.

(1) Firmly connect the AC adapter to the computer.

(2) Insert the System Program Service Diskette into the diskette drive and turn on the computer.

(3) Select "Update system program" and follow the instructions on the screen.
Warning: Do not turn off or suspend the computer until the update has been completed. IF YOU TURN OFF OR SUSPEND THE COMPUTER WHILE THE UPDATE IS STILL IN PROGRESS, THE SYSTEM BOARD MAY HAVE TO BE REPLACED.

(4) Wait until the BIOS is completely falshed. The computer will prompt you with a message at the end of the BIOS update.

(5) Remove the System Program Service Diskette from the diskette drive and turn off the computer.

Latest Version of DOS Card & Socket Services Drivers for ThinkPad 365C, 365CD, 365CS, 365 CSD, 365E, & 365ED

File Name	Driver Description	Version	File Date	File Size
IBMDSS01.SYS	DOS PCMCIA Socket Services Driver	1.36	07-10-95	14830
IBMDOSCS.SYS	DOS PCMCIA Card Services Driver	2.21	04-17-95	29535
DICRMU01.SYS	DOS PCMCIA Resource Map Utility	1.16	12-01-94	10806
$ICPMDOS.SYS	DOS PC Card Power Management Driver	2.22	12-01-94	4500
AUTODRV.SYS	DOS PCMCIA PC Card Auto Configurator	1.09	11-11-94	13644

Latest Version of OS/2 Card & Socket Services Drivers for ThinkPad 365C, 365CD, 365CS, 365 CSD, 365E, & 365ED

File Name	Driver Description	Version	File Date	File Size
IBM2SS01.SYS	OS/2 PCMCIA Socket Services Driver	1.36	07-10-95	15987
PCMCIA.SYS	OS/2 PCMCIA Card Services Driver	1.33	03-17-95	47622
VPCMCIA.SYS	OS/2 Virtual Card Services Driver		04-22-93	592
ICRMU01.SYS	OS/2 PCMCIA Resource Map Utility	1.16	12-01-94	8943
$ICPMOS2.SYS	OS/2 PC Card Power Management Driver	1.22	12-01-94	5841
AUTODRV2.SYS	OS2 PCMCIA PC Card Auto Configurator	1.03	02-16-95	10718

Latest Version of DOS Card & Socket Services Drivers for ThinkPad 365X & 365XD

File Name	Driver Description	Version	File Date	File Size
IBMDSS01.SYS	DOS PCMCIA Socket Services Driver	2.02	04-03-96	16502
IBMDSS04.SYS	DOS PCMCIA Socket Services Driver	2.02	04-19-96	14036
IBMDSS14.SYS	DOS PCMCIA Socket Services Driver	2.02	04-19-96	15506
IBMDOSCS.SYS	DOS PCMCIA Card Services Driver	3.11	05-13-96	41264
DICRMU01.SYS	DOS PCMCIA Resource Map Utility	1.28	05-13-96	12733
$ICPMDOS.EXE	DOS PC Card Power Management Driver	3.03	05-13-96	20092
AUTODRV.SYS	DOS PCMCIA PC Card Auto Configurator	2.01	06-13-95	8361

Latest Version of OS/2 Card & Socket Services Drivers for ThinkPad 365X & 365XD

File Name	Driver Description	Version	File Date	File Size
IBM2SS01.SYS	OS/2 PCMCIA Socket Services Driver	2.02	04-03-96	19014
IBM2SS04.SYS	OS/2 PCMCIA Socket Services Driver	2.02	04-19-96	14926
IBM2SS14.SYS	OS/2 PCMCIA Socket Services Driver	2.02	04-19-96	19400
PCMCIA.SYS	OS/2 PCMCIA Card Services Driver	1.44	04-22-96	48646
VPCMCIA.SYS	OS/2 Virtual Card Services Driver	1.40	04-22-96	13824
ICRMU01.SYS	OS/2 PCMCIA Resource Map Utility	1.24	04-22-96	10381
$ICPMOS2.SYS	OS/2 PC Card Power Management Driver	2.06	07-08-96	5992
AUTODRV2.SYS	OS/2 PCMCIA PC Card Auto Configurator	2.01	03-22-96	9178

Latest Drivers for ThinkPad 365C, 365CD, 365CS, 365 CSD, 365E, & 365ED

IBM BBS File Name	Driver Description	Version	File Date
PB36BW31.EXE	PCMCIA Drivers	1.40	09-17-96
UT36B120.EXE	Utility Disk (ThinkPad Utility Programs)	1.20	09-17-96
VF36BW31.EXE	Video Drivers - Windows	3.23	08-02-96
VF36BW95.EXE	Video Drivers - Windows 95	1.10	08-02-96
VF36BOS2.EXE	Video Drivers - OS/2	3.22	08-26-96
ATADO200.EXE	PCMCIA Hard Disk Device Drivers	2.00	03-21-94
IR36B120.EXE	Infrared Drivers	1.20	09-17-96
AF36BW31.EXE	Audio Drivers Windows 3.11	3.05	08-02-96
AF36BOS2.EXE	Audio Drivers OS/2	1.01	09-17-96
CD36B100.EXE	CD-ROM Drivers	1.00	04-24-96

Latest Drivers for ThinkPad 365X & 365XD

IBM BBS File Name	Driver Description	Version	File Date
Drivers for DOS/Windows 3.1x:			
PCTPGW31.EXE	DOS/Windows 3.1X PCMCIA Drivers	4.03	10-15-96
UTTPGDOS.EXE	ThinkPad Utility Programs - DOS	3.51	10-31-96
UTTPGWIN.EXE	ThinkPad Utility Programs - Windows 3.1X/Windows 95	3.51	10-31-96
VFTPGW31.EXE	Windows 3.1X Video Drivers	1.10	08-20-96
AFTPGW31.EXE	365XD Windows 3.1 Audio Driver	1.00	10-15-96
IRTPGALL.EXE	Infrared Drivers	3.01	10-15-96
CDTPGW31.EXE	CD-ROM Drivers	2.03	10-15-96
ATADO200.EXE	PC Card Hard Disk Drive Device Drivers	2.00	03-21-94

Latest Drivers for ThinkPad 365X & 365XD

IBM BBS File Name	Driver Description	Version	File Date
Drivers for Windows 95:			
PCTPGO95.EXE	Windows 95 & OS/2 PCMCIA Drivers		10-31-96
UTTPGDOS.EXE	ThinkPad Utility Programs - DOS	3.51	10-31-96
UTTPGWIN.EXE	ThinkPad Utility Programs - Windows 3.1X/Windows 95	3.51	10-31-96
VFTPGW95.EXE	Windows 95 Video Drivers	1.10	10-03-96
AFTPGW95.EXE	365XD Windows 95 Audio Driver	1.00	10-15-96
IRTPGALL.EXE	Infrared Drivers	3.01	10-15-96
Drivers for OS/2:			
PCTPGO95.EXE	Windows 95 & OS/2 PCMCIA Drivers		10-31-96
UTTPGDOS.EXE	ThinkPad Utility Programs - DOS	3.51	10-31-96
UTTPGOS2.EXE	ThinkPad Utility Programs - OS/2	3.51	10-31-96
VFTPFOS2.EXE	OS/2 Warp Video Drivers	1.10	08-26-96
AFTPGOS2.EXE	365XD OS/2 Audio Driver	1.01	10-15-96
IRTPGALL.EXE	Infrared Drivers	3.01	10-15-96
Drivers for Windows NT:			
UTTPGWNT.EXE	ThinkPad Utility Programs - Windows NT	1.00	10-31-96
VFTP3WNT.EXE	Windows NT 3.51 Video Drivers	1.10	10-31-96
VFTP4WNT.EXE	Windows NT 4 Video Drivers	1.00	10-31-96
TPIDEWNT.EXE	Busmaster IDE Driver	1.00	08-28-96
AFTP3WNT.EXE	Windows NT 3.51 Audio Driver - 365X, 560, 760L & EL	1.10	10-31-96
AFTP4WNT.EXE	Windows NT 4 Audio Driver - 365X, 560, 760L & EL	1.00	10-31-96
IRTPGWNT.ZIP	Infrared Drivers - Windows NT	1.00	01-06-97

ThinkPad 365C, 365CD, 365CS, & 365CSD Memory Map

BIOS Dated Before 2/2/96

Location	Use
0000 - 9FFF	System RAM
A000 - AFFF	Video Graphics
B000 - B7FF	Mono Video
B800 - BFFF	Video Text
C000 - C9FF	Video BIOS
CA00 - CFFF	Available - Cannot be used for PCMCIA
D000 - DFFF	Available - Can be used for PCMCIA
E000 - E5FF	System Setup
E600 - E9FF	Available - Cannot be used for PCMCIA
EA00-EFFF	Power Management
F000 - FFFF	System BIOS

BIOS Dated On or After 2/2/96

Location	Use
0000 - 9FFF	System RAM
A000 - AFFF	Video Graphics
B000 - B7FF	Mono Video
B800 - BFFF	Video Text
C000 - C5FF	System Setup
C600 - C7FF	Available - Cannot be used for PCMCIA
C800 - DFFF	Available - Can be used for PCMCIA
E000 - E9FF	Video BIOS
EA00 - EFFF	Power Management
F000 - FFFF	System BIOS

ThinkPad 365C, 365CD, 365CS, & 365CSD Interrupt Assignments

	2	3	4	5	7	9	10	11	15
Cascade Interrupt Req From IRQ 8-15	Default								
Serial Port		Optional	Default						
Audio				Default	Optional				
Parallel Port				Optional	Default				
PCMCIA Cards		Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Infrared		Optional							
CD-ROM Drive (on CD Models)									Default

Note 1
The following interrupts are used by the system: IRQ 0 (Timer), IRQ 1 (Keyboard), IRQ 6 (Floppy Diskette Drive), IRQ 8 (Real-time Clock), IRQ 12 (Mouse/Trackpoint), IRQ 13 (Math Coprocessor), and IRQ 14 (Hard Disk Drive).

ThinkPad 365X & 365XD Memory Map

Location	Use
0000 - 9FFF	System RAM
A000 - AFFF	Video Graphics
B000 - B7FF	Mono Video
B800 - BFFF	Video Text
C000 - C7FF	Video BIOS
C800 - DFFF	Available
E000 - EFFF	Available
F000 - FFFF	System BIOS

ThinkPad 365X & 365XD Interrupt Assignments

	2	3	4	5	7	9	10	11	15
Cascade Interrupt Req From IRQ 8-15	Default								
Serial Port		Optional	Optional						
Infrared		Optional	Default						
ESS Audio				Default	Optional		Optional	Optional	
Parallel Port				Optional	Default				
PCMCIA Cards		Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional
MIDI Port (on Port Replicator)				Default	Optional		Optional	Optional	

The following interrupts are used by the system: IRQ 0 (Timer), IRQ 1 (Keyboard), IRQ 6 (Floppy Diskette Drive), IRQ 8 (Real-time Clock), IRQ 12 (Mouse/Trackpoint), IRQ 13 (Math Coprocessor), and IRQ 14 (Hard Disk Drive/CD-ROM Drive).

ESS Audio, Sound Blaster, and the MIDI Port in the Port Replicator share the same IRQ.

ThinkPad 365X & 365XD DMA Channel Assignments

DMA	Default Assignment	Other Possible Uses
DRQ0	Infrared	Parallel Port, ESS Audio
DRQ1	ESS Audio	Parallel Port
DRQ2	Diskette Drive	
DRQ3	Infrared	Parallel Port
DRQ4	Cascade	
DRQ5	Unused	
DRQ6	Unused	
DRQ7	Unused	

IBM Card & Socket Services Drivers for ThinkPad 365

DEVICEHIGH=C:\THINKPAD\IBMDSS01.SYS (DOS PCMCIA Socket Services Driver for PCMCIA Socket Services 2.0)

Socket Services uses between 6KB and 7KB of memory .

DEVICEHIGH=C:\THINKPAD\IBMDOSCS.SYS (DOS PCMCIA Card Services Driver for PCMCIA Socket Services 2.0)

Card Services uses 29KB of memory.

DEVICEHIGH=C:\THINKPAD\DICRMU01.SYS /MA=D700-CFFF (DOS PCMCIA Resource Map Utility)

The /MA parameter tells Card Services what locations in upper memory can be used by PCMCIA cards or Card Services, and must match or be a subset of an excluded memory range on the EMM386 line. The PCMCIA Resource Memory Map Utility Driver does not remain in memory.

DEVICEHIGH=C:\THINKPAD\$ICPMDOS.SYS (DOS PC Card Power Management Driver)

This driver uses 3KB of memory.

DEVICEHIGH=C:\THINKPAD\AUTODRV.SYS

This statement loads the PCMCIA Super Client Driver (AUTODRV.SYS) into upper memory. AUTODRV.SYS recognizes many popular modems, 3270 cards, and SCSI cards. It does not recognize 5250 PCMCIA cards, SDLC cards, or LAN PCMCIA cards. AUTODRV.SYS uses 13KB of memory.

Please note that Card & Socket Services also requires a 4KB block of upper memory.

Memory Management Without PCMCIA Cards

(1) If you do not intend to use PCMCIA Cards, there is no reason to load Card & Socket Services. Remove all IBM Card and Socket Services Device Drivers from CONFIG.SYS (see previous page).

(2) Review the ThinkPad Memory Map for your system. Include any upper memory areas not used by adapter cards in the Docking Station. Be sure to exclude the address of the SCSI adapter in the Docking Station if SCSI support is needed.

(3) If you are not using the monochrome video mode (most applications do not), the Monochrome Video Area (B000 - B7FF) may 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.

THINKPAD DOS/WINDOWS MEMORY MANAGEMENT TIPS

Memory Management With PCMCIA Cards

(1) Many PCMCIA card manufacturers provide Point Enablers with their products. Point Enablers are small programs that provide an interface directly to the PCMCIA controller; therefore they must be written to support a particular type of controller.

Point Enablers are relatively simple to configure, do not require Card & Socket Services Drivers, consume no memory (they remove themselves from memory after configuring the card), and provide the maximum DOS memory for your ThinkPad. However, with Point Enablers, you must specify the slot number of the card (therefore , the card must always be in a specific slot). You must also manually assign any upper memory blocks and IRQs used by that card. In addition, hot-plugging of the card is prohibited (in fact, it may damage the card). If Point Enablers are provided with the PCMCIA card(s) you are using, decide whether to use the Point Enablers or Card & Socket Services.

(2) If you use Card & Socket Services, decide whether to use the Super Client Driver (AUTODRV.SYS) or the drivers that are provided with your PCMCIA card(s). The Super Client Driver automatically recognizes many popular PCMCIA cards (including modems, 3270 cards, and SCSI adapters -- it does not recognize 5250 PCMCIA cards, SDLC cards, or LAN PCMCIA cards.). However, the Super Client Driver can consume more memory than do the drivers provided with the PCMCIA card.

(3) Determine the amount and location of upper memory required by your PCMCIA card(s), Docking Station, and ISA Adapter cards. If possible, locate upper memory required by all PCMCIA cards and ISA Adapters in one contiguous block. If using Card & Socket Services, these drivers require a 4KB upper memory block that can be located anywhere in upper memory.

(4) Review the ThinkPad Memory Map for your system. Exclude from EMM386.EXE's usage the upper memory areas used by (a) the PCMCIA card(s), (b) Card & Socket Services (4KB), (c) the upper memory area used by the SCSI Adapter in the ThinkPad Docking Station (if applicable), and (d) the upper memory areas used by any ISA adapters in the ThinkPad Docking Station. Include any available upper memory areas not excluded above.

(5) If using Card & Socket Services, modify the DEVICE=C:\THINKPAD\DICRMU01.SYS /MA=XXXX-XXXX line in CONFIG.SYS. Make the XXXX-XXXX range match the upper memory area used by any PCMCIA cards (plus the 4KB used by Card & Socket Services).

(6) Exclude any memory area allocated to PCMCIA Cards from usage by Microsoft Windows by adding an EmmExclude=XXXX-XXXX line to the [386Enh] section of the SYSTEM.INI File. Where XXXX-XXXX is the upper memory range allocated to the PCMCIA cards. If you are using Card & Socket Services, the EmmExclude range must match the /MA= range of the DICRMU01.SYS Driver.

(7) If you are not using the monochrome video mode (most applications do not), the Monochrome Video Area (B000-B7FF) may 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.

(8) If you are using an IBM PCMCIA Token-Ring Adapter, 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.

Sample Config: IBM PCMCIA Token-Ring Adapter Installed in ThinkPad 365 Systems

Note: Those ThinkPad 365 Models with audio use I/O 220 as the default audio I/O address. This setting will conflict with a Token-Ring Adapter (At I/O A20). Use the ThinkPad Utilities to change the I/O address for audio to 240. This will resolve the conflict.

Recommended Memory Locations

IBM Token-Ring PCMCIA Adapter ROM	CC00-CDFF	Note: To use these memory locations, you must update BIOS to latest release.
IBM Token-Ring PCMCIA Adapter RAM	C800-CBFF	
IBM Card Services (If Used)	CE00-CEFF	

Card Services CONFIG.SYS (Please ensure that you are using the latest Card & Socket Services Drivers)

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=C000-CEFF I=CF00-EFFF
DEVICE=C:\THINKPAD\IBMDSS01.SYS
DEVICE=C:\THINKPAD\IBMDOSCS.SYS
DEVICE=C:\THINKPAD\DICRMU01.SYS /MA=C800-CEFF
```

Note: Latest IBM Token-Ring Credit Card Adapter Drivers are Version 3.06 (TRCC1.EXE & TRCC2.EXE on the IBM BBS).

Point Enabler CONFIG.SYS

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=C000-CDFF I=CE00-EFFF
DEVICE=C:\POINTTR.EXE SB RS=16 MMIO=CC00 IRQ=9 SRAM=C800,16
```

Where: SB is Slot B (Bottom Slot) and RS is Ring Speed

Microsoft Windows SYSTEM.INI

```
[386Enh]
EmmExclude=C800-CDFF
```

(or EmmExclude=C800-CEFF if using Card Services)

Setting the Token-Ring ROM & RAM Address

(1) Novell Netware ODI Drivers (NET.CFG File):

```
Link Driver TOKEN  (Or TOKENCS Or LANSUP)
        MEM #1 CC000
        MEM #2 C8000
```

(2) For IBM LAN Support Native Drivers:

```
DEVICE=C:\LSP\DXMC0MOD.SYS N ,C800,0,0,0
```

(3) The IBM LAN Support NDIS Drivers (PROTOCOL.INI File):

```
RAM = 0xC800
MMIO = 0xCC00
RAMSIZE = 16
```

Sample Config: IBM PCMCIA Ethernet Adapter Installed in ThinkPad 365 Systems

Recommended Memory Locations

IBM Ethernet PCMCIA Adapter RAM	C800-CBFF	Note: To use these memory locations, you must update BIOS to latest release.
IBM Card Services (If Used)	CC00-CCFF	

Card Services CONFIG.SYS (Please ensure that you are using the latest Card & Socket Services Drivers)

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=C000-CCFF I=CD00-EFFF
DEVICE=C:\THINKPAD\IBMDSS01.SYS
DEVICE=C:\THINKPAD\IBMDOSCS.SYS
DEVICE=C:\THINKPAD\DICRMU01.SYS /MA=C800-CCFF
```

Note: Latest IBM Ethernet Credit Card Adapter Drivers are Version 2.06 (ETCC.EXE on the IBM BBS).

Point Enabler CONFIG.SYS

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=C000-CBFF I=CC00-EFFF
DEVICE=C:\NET\POINTETH.SYS SB IRQ=9 SRAM=C800 IO=300
```

Where: SB is Slot B (Bottom Slot)

Microsoft Windows SYSTEM.INI

```
[386Enh]
EmmExclude=C800-CBFF
```

(or EmmExclude=C800-CCFF if using Card Services)

Setting the Ethernet RAM Address

(1) Novell Netware ODI Drivers (NET.CFG File):

```
Link Driver PCMDMCS
    PORT 300
    INT 9
    MEM C8000
```

(2) The IBM LAN Support NDIS Drivers (PROTOCOL.INI File):

```
RAMADDRESS = 0xC800
INTERRUPT = 9
IOBASE = 0x300
```

IBM PCMCIA MODEM CONFIGURATION

Using the IBM Super Client Driver (AUTODRV.SYS)

(1) The IBM Super Client Driver will automatically recognize IBM PCMCIA Modems. Sample CONFIG.SYS file:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS X=D000-D7FF
DEVICE=C:\THINKPAD\IBMDSS01.SYS
DEVICE=C:\THINKPAD\IBMDOSCS.SYS
DEVICE=C:\THINKPAD\DICRMU01.SYS /MA=D000-D7FF
DEVICE=C:\THINKPAD\$ICPMDOS.SYS
DEVICE=C:\THINKPAD\AUTODRV.SYS C:\THINKPAD\AUTODRV.INI
```

Using the IBM PCMCIA Modem Point Enabler (Note: Not All IBM PCMCIA Modems Support this Point Enabler)

(1) The IBM PCMCIA Modem Point Enabler (called PCCOMDOS.SYS) does not require Card & Socket Services. It does reside in memory and requires 16KB. Using the Point Enabler can save up to 36KB (if you do not load Card & Socket Services or AUTODRV.SYS). However, with the IBM Point Enabler hot-plugging of the card is prohibited (in fact, it will damage the card).

(2) Be sure to exclude a 4KB block for the modem in upper memory. If you are also using card services, do not include the 4KB block in the /MA=XXXX-XXXX parameter of the DICRMU01.SYS driver.

(3) Sample CONFIG.SYS file:

```
DEVICE=C:\PCCOMDOS\PCCOMDOS.SYS COM2 /BEEP /WINBIOS /AMEM CE
```

Where:	COM2 is the COM 1, 2, 3, or 4	COM 2 is recommended
	/AMEM is the memory location for the modem's 4KB block	CA00 is recommended

Using the IBM PCMCIA Modem Driver

(1) The IBM PCMCIA Modem Driver (called ESTDFM.EXE) does require Card & Socket Services. It does reside in memory and requires 25KB. Therefore, I recommend that you use the AUTODRV.SYS driver since it takes less memory. ESTDFM.EXE is loaded via the AUTOEXEC.BAT:

ESTDFM.EXE S1C2	Where:	S1 is the Slot Number
		C2 is the Communications Port (C1, C2, C3, or C4)

MEGAHERTZ MODEM CONFIGURATION

Using the IBM Super Client Driver (AUTODRV.SYS)

(1) The IBM Super Client Driver will automatically recognize most Megahertz PCMCIA Modems. Sample CONFIG.SYS file:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS X=D000-D7FF
DEVICE=C:\THINKPAD\IBMDSS01.SYS
DEVICE=C:\THINKPAD\IBMDOSCS.SYS
DEVICE=C:\THINKPAD\DICRMU01.SYS /MA=D000-D7FF
DEVICE=C:\THINKPAD\$ICPMDOS.SYS
DEVICE=C:\THINKPAD\AUTODRV.SYS C:\THINKPAD\AUTODRV.INI
```

Using the MegaHertz PCMCIA Modem Point Enabler

(1) The MegaHertz PCMCIA Modem Point Enabler (called SETMHZ.EXE) does not require Card & Socket Services. In addition, it removes itself from memory once it has configured the modem. This can save up to 49KB (if you eliminate Card & Socket Services). However, with the MegaHertz Point Enabler, you must specify the slot number of the card (therefore , the card must always be in a specific slot). In addition, hot-plugging of the card is prohibited (in fact, it will physically damage the card).

(2) Obtain the latest Megahertz Point Enabler. Versions before 3.1 do not support the ThinkPad 360 & 755. Latest version is 4.3. Be sure to exclude a 4KB block for the modem in upper memory. If you are also using card services, do not include the 4KB block in the /MA=XXXX-XXXX parameter of the DICRMU01.SYS driver.

(3) The SETMHZ program is loaded via the AUTOEXEC.BAT file. Format of the SETMHZ.EXE Program:

```
SETMHZ.EXE /cn /in /sn /pnnnn /dnnnn
```

Where:		
	/cn is COM 1, 2, 3, 4	COM 2 is recommended
	/in is IRQ 1 .. 15	IRQ 3 is recommended
	/sn is Slot A, B, C, or D	
	/pnnnn is the memory location	CA00 is recommended
	/dnnnn is the delay in milliseconds	1500 is recommended

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

Obtaining Updated Version of this Document

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365_tips.ps	ThinkPad 365 Tips in PostScript format.
365_tips.txt	ThinkPad 365 Tips in ASCII format.
701_tips.ps	ThinkPad 701 Tips in PostScript format.
701_tips.txt	ThinkPad 701 Tips in ASCII format.
750_tips.ps	ThinkPad 360, 750, 755 Base Models Tips in PostScript format.
750_tips.txt	ThinkPad 360, 750, 755 Base Models Tips in ASCII format.
755_tips.ps	ThinkPad 755 Enhanced Models Tips in PostScript format.
755_tips.txt	ThinkPad 755 Enhanced Models Tips in ASCII format.
760_tips.ps	ThinkPad 760 Tips in PostScript format.
760_tips.txt	ThinkPad 760 Tips in ASCII format.
cdtips.ps	Commercial Desktop Tips in PostScript format.
cdtips.txt	Commercial Desktop Tips in ASCII format.