

PCjr MEMORY OPTIONS
TECHNICAL REFERENCE MATERIAL

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I. Introduction

The PCjr Memory Options diskette contains four files in support of expanded PCjr memory:

- 1. INSTALL.COM - Automatic Installation Program
- 2. CONFIG.SYS - Default DOS Configuration File
- 3. PCJRMEM.COM - Expanded Memory Device Driver
- 4. RAMDISK.COM - Memory Disk Device Driver

In order for your expanded PCjr memory to be fully utilized by DOS and your applications, you must install the Expanded Memory device driver on your backup DOS diskette(s) (ie, the DOS diskette you use to start your PCjr.) You can also install a Memory Disk device driver on your expanded PCjr. This will give your PCjr the capability to have a "logical" second diskette drive that is part of your PCjr memory rather than being a real diskette drive. To install these device drivers, you can run the automatic installation program (see Section II) or you can create/edit the DOS configuration file yourself (see Section V.)

II. Automatic Installation Program

The automatic installation program (INSTALL) is the simplest way to install the Expanded Memory device driver and your Memory Disk device driver onto your DOS backup diskette(s). The "Update to Disk Operating System 2.10 for the IBM PCjr Memory Options" describes how to operate this program.

In configuring for expanded memory, the files CONFIG.SYS and PCJRMEM.COM are placed onto your backup DOS diskette. To verify this you could list the directory to see the two new files.

The next time you start the PCjr from this DOS backup diskette, the expanded PCjr memory will be available to DOS and all applications which are loaded by DOS.

If you have other DOS backup diskettes, you can install the Expanded Memory device driver on each of them by following the instructions from INSTALL.

If you have application diskettes that contain DOS for automatic start-up, you can also install the Expanded Memory device driver onto them provided there is enough room (2048 bytes of available space is necessary) and provided the application can run with expanded memory. For applications that contain DOS, follow these steps:

- 1. Install DOS onto the application diskette by following the instructions that come with your application. You can of course use that diskette "as is" without taking advantage of expanded PCjr memory.

All applications which run on the 128k PCjr will still run the same with expanded memory even if the Expanded Memory device driver is not installed.

Some applications may not take advantage of the expanded PCjr memory, so it is not absolutely essential to install the Expanded Memory device driver for their use. Also some applications have been written to operate only in the original 128k PCjr environment. In these cases, you should maintain a DOS backup diskette without installing the Expanded Memory device driver.

- 2. Verify that the application can run with expanded memory by following these steps:

- * - Insert the "PCjr Memory Options" diskette in the diskette drive and switch your PCjr on or do a System Reset (Ctrl-Alt -Del.)
- * - Insert your application diskette in the drive and activate it by specific command (follow application instructions or type AUTOEXEC.)

- 3. If the application runs and takes advantage of the expanded memory, then you could install the Expanded Memory device driver to the application diskette. The application diskette must already have DOS on it before you run the INSTALL program.

If your DOS or Application/DOS diskette already has a DOS configuration file (CONFIG.SYS), then the automatic installation program will append the appropriate device drivers to the end of the current CONFIG.SYS file. If you run INSTALL and these new device drivers are already present in CONFIG.SYS, then the new configuration (eg, memory disk size) will replace the old.

The automatic installation program installs the Expanded Memory device driver to allow for the maximum amount of user memory to be available for applications while providing full PCjr text and normal PCjr graphic capabilities. Applications which use enhanced PCjr graphics (such as 320x200 16 color, 640x200 4 color, or multiple graphic pages) require the Expanded Memory device driver to be specified with a special parameter (see Section III.)

As the diagram shows, the expanded PCjr memory is present but is not available to DOS for loading applications larger than 88K. This is because the default PCjr video buffer is located at the top 16K of the PCjr's first 128k bytes of memory. The expanded memory is still usable and applications could address the expanded memory directly but must skip over the video buffer or move the video buffer themselves. Your BASIC programs could BLOAD directly into the expanded memory leaving the video buffer alone.

In order for DOS and applications loaded by DOS to take advantage of the expanded PCjr memory, the Expanded Memory device driver must be installed on the DOS backup diskette. See Section II or V. The name of the Expanded Memory device driver is PCJRMEM.COM and it can be specified in any one of three different ways corresponding to one of three different modes of operation.

The Expanded Memory device driver modes of operation:

Mode	Specify	User Memory	PCjr Video Memory	Video Modes Allowed
Normal	DEVICE=PCJRMEM.COM	Maximum for Normal Applications	16k	All text modes 160x200 16 color 320x200 4 color 640x200 2 color 1 graphic page
Enhanced	DEVICE=PCJRMEM.COM /E	Maximum for Enhanced Applications	32k	All text modes 160x200 16 color 320x200 4 color 640x200 2 color 320x200 16 color 640x200 4 color 1 32k page 2 16k pages
Compatible	DEVICE=PCJRMEM.COM /C	Applications Use Only The Expanded Memory	128k	All text modes 160x200 16 color 320x200 4 color 640x200 2 color 320x200 16 color 640x200 4 color 4 32k pages 8 16k pages

This mode allows for the maximum amount of memory to be available for applications while providing a 16k PCjr video buffer. This mode provides for full PCjr text capabilities and IBM PC compatible graphic capabilities (i.e., 160x200 16 color, 320x200 4 color, and 640x200 2 color.) This mode does not support the PCjr enhanced graphic modes of 320x200 16 color or 640x200 4 color, since they require a 32k PCjr video buffer.

The size of DOS including the Expanded Memory device driver is variable dependent upon what other device drivers and DOS buffers are also included in the DOS configuration file. Also, the order of the device drivers could be significant, since the Expanded Memory device driver will position the PCjr video buffer at a 16k byte boundary. So if you do specify other device drivers, make sure you order them to your best advantage.

Enhanced Mode:

Specifying DEVICE=PCJRMEM.COM /E will configure the device driver for enhanced graphic capability. In this mode, the PCjr video buffer will be moved inside of DOS yet allows all PCjr text and graphic modes. The rest of the PCjr memory will be contiguous and available for applications loaded by DOS. The following illustrates the PCjr memory when configured in "Enhanced Mode":

```

OK *****
*
*          DOS 2.1          *
*
* +-----+
* !                               !
* ! PCjr VIDE0 BUFFER      !
* !                               !
* !                               32K!
* +-----+
*
*                               84K
84K *****
*
*
*          DOS
*
*          AVAILABLE
*
*          MEMORY
*
*          FOR
*
*          LOADING
*
*          APPLICATIONS
*
*
*
*
*****

```

This mode allows for the greatest amount of memory to be available for applications while providing 32k for PCjr video usage. This mode provides for full PCjr text capabilities and full PCjr graphics capabilities (including the enhanced PCjr modes of 320x200 16 color and 640x200 4 color.) Since 32k is available for PCjr video, either a single enhanced graphic page (32k) or two normal graphic pages (16k each) are available for applications.

The size of DOS including the Expanded Memory device driver is variable dependent upon what other device drivers and DOS buffers are also included in the DOS configuration file. Also, the order of the device drivers could be significant, since the PCjr Memory Expansion device driver will position the PCjr video buffer at a 32k byte boundary. So if you do specify other device drivers, make sure you order them to your best advantage.

This mode provides for full PCjr text and graphic capabilities including multiple graphic pages and compatible direct video buffer addressing. This mode does not allow the maximum amount of memory to be available for most applications which only need text or normal graphic modes; thus, it may not be the most desirable. This mode does guarantee that applications will execute in the expanded PCjr memory.

IV. Memory Disk Device Driver

The Memory Disk device driver when installed will transform part of your PCjr memory into a "logical" disk. Thus, you have another disk in which to save and load programs and files. Programs and files that are stored in the memory disk are treated just like programs and files on a real diskette except that they are saved and loaded much faster and (unfortunately) if you power off your computer they will be lost. Thus, if you want to save information from your "memory" disk, make sure you COPY the files/programs to a real diskette before you power off your computer or perform a system reset (Ctrl/Alt/Del).

The Memory Disk is referenced by the diskette drive identification of "C:". Most of the DOS diskette commands will apply to the memory disk such as DIR, COPY, ERASE, CHKDSK, etc.; and all applications will access programs and files from the memory disk merely by prefixing the filename with the drive ID of "C:". Of course since the disk is in memory, you effectively have a single diskette always loaded that does not need to be FORMATED. It could be thought of as a "hard" file in memory.

To install the Memory Disk device driver, you can use the INSTALL program (see Section II) or you can create/edit the DOS configuration file (CONFIG.SYS) on your DOS backup diskette (see Section V.)

The Memory Disk device driver is a file named RAMDISK.COM.

You can specify the amount of memory you want to allocate for your memory disk in K (1024) byte increments as a parameter after the device driver filename. The number must be in the range of 10 to 512 or the memory disk will be allocated with the default size of 60K bytes. If you specify a number larger than the available memory on your PCjr, then you will receive a memory disk of only the amount available less approximately 64k.

For example:

```
DEVICE=RAMDISK.COM /128
```

will create a memory disk with the capacity of 128k bytes or 131,072 characters.

Part of the memory disk (approximately 5k) is used for directory space, so all 128k bytes are not available for programs and files.

For example:

```
DEVICE=RAMDISK.COM /88
```

will create a memory disk with the capacity of 88k bytes.

If you install the Memory Disk device driver, then the memory you allocate for the disk is not available for your application programs. Therefore, make sure you leave enough memory for your applications to be loaded and run efficiently. The amount you specify must leave enough memory for DOS, the device driver itself (approximately 1k), and your application programs.

If you try to install the Memory Disk device driver without specifying the Expanded Memory device driver, only 88k bytes of memory is available because of DOS and the PCjr video buffer. You MUST install the Expanded Memory device driver to take advantage of any expanded memory. Also you MUST (I repeat MUST) specify the Expanded Memory device driver ahead of the Memory Disk device driver in your CONFIG.SYS file.

V. Create/Edit The DOS Configuration File

To install any device driver to your DOS backup diskette(s) you must create the DOS configuration file named CONFIG.SYS and specify the device driver filename following the characters "DEVICE=". To do this you can use any file editor such as EDLIN or Personal Editor. You can also create it from the keyboard using the DOS command "COPY CON: CONFIG.SYS". For more information on these topics refer to your DOS reference manual.

The filename for the Expanded Memory device driver is PCJRMEM.COM.
The filename for the Memory Disk device driver is RAMDISK.COM.

An example in creating the DOS configuration file is as follows:

STEP ACTION

1 Insert your DOS backup diskette with the write protect tab removed into the drive and close the door.

2 Enter:

COPY CON: CONFIG.SYS

3 Enter:

DEVICE=PCJRMEM.COM
DEVICE=RAMDISK.COM /80

4 Press Fn then 6 and Enter

5 The message "1 FILE(S) COPIED" and the DOS prompt ">" should appear when CONFIG.SYS creation has completed.

6 Insert the PCjr Memory Options diskette into the drive, and close the door.

7 Enter:

COPY PCJRMEM.COM B:

The message appears:

Insert diskette for drive B: and strike any key when ready

8 Insert your DOS backup diskette into the drive, close the door, and press any key.

9 Insert the PCjr Memory Options diskette into the drive, and close the door.

10 Enter:

```
COPY RAMDISK.COM B:
```

The message appears:

```
Insert diskette for drive B: and strike any key when ready
```

11 Insert your backup DOS diskette into the drive, close the door, and press any key.

The Expanded Memory device driver and the Memory Diskette Drive device driver are now installed on your DOS backup diskette.

The next time you start from this DOS diskette the expanded PCjr memory will be available to DOS and all applications which are loaded by DOS; and you will have an 80k byte disk located in your PCjr memory.