



UniDisk 3.5

#4: Accessing Macintosh Disks

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This Technical Note formerly discussed drive-specific SmartPort calls. These calls are now documented in the *Apple IIGS Firmware Reference*. This Note now describes how to access Macintosh disks from a UniDisk 3.5 disk drive, as this information was not documented in the manual.

Macintosh Disk Access

The disk data format used in the UniDisk 3.5 is essentially identical to that used for Macintosh disks. There are three notable differences between the two formats:

- Macintosh blocks are 524 bytes; UniDisk 3.5 blocks are 512 bytes.
- Macintosh MFS disks are single sided; UniDisk 3.5 disks are double sided. (Macintosh HFS disks are double sided.)
- The Macintosh uses a 2:1 physical block interleave; the UniDisk 3.5 uses a 4:1 interleave.

Accessing Blocks on a Macintosh Disk

Reading from a Macintosh disk is accomplished with the use of the READ command (as opposed to the READBLOCK command, which enforces 512 byte data.) A call to load block zero from the Macintosh disk in Unit #1 into memory at \$2000 would look like this:

MacRead	JSR	Dispatch	;Normal SmartPort Entry point
	DFB	\$08	;Character READ command code
	DW	Cmd_List	;The parameter list
	BCS	Error	;Optional error handling...
	...		
Cmd_List	DFB	\$04	;CharRead has four parameters
	DFB	\$01	;Unit number
	DW	\$2000	;Buffer address
	DW	524	;Always transfer 524 bytes
	DFB	\$00	;Block (lo)
	DFB	\$00	;Block (med)
	DFB	\$00	;Block (hi)

Writing to a Macintosh disk is accomplished with the use of the WRITE command. A call to write block zero to the Macintosh disk in Unit #1 with data at memory location \$2000 would look like this:

```
MacWrite      JSR      Dispatch      ;Normal SmartPort Entry point
              DFB      $09           ;Character WRITE command code
              DW        Cmd_List      ;The parameter list
              BCS      Error          ;Optional error handling...
```

The Cmd_List is the same as in the READ example.

Formatting Macintosh Disks

The formatting routine in the UniDisk 3.5 firmware can format single- or double-sided disks of variable physical block interleave. The parameters controlling the interleave and the number of disk sides are located in the controller's zero page and are set to defaults whenever the INIT call is issued to SmartPort. These parameters can be altered by using the SET_DOWN_ADR and DOWNLOAD subcalls of the CONTROL call. Once altered, the FORMAT call uses these values in the formatting process. These zero page locations and their values are detailed below:

Parameter	Location	Values
Interleave	\$0062	\$02 = Mac, \$04 = UniDisk 3.5
DoubleSided	\$0063	\$00 = Single, \$80 = Double-sided

The following code example formats the media in Unit #1 as a Macintosh disk:

```
MacFormat      JSR      Dispatch      ;Set address to patch interleave
              DFB      $04           ;Control call (Set_Down_Adr)
              DW        Cmd_ListA     ;Parameter List
              BCS      Error
;
              JSR      Dispatch      ;Now patch the interleave byte
              DFB      $04           ;Control call (DOWNLOAD)
              DW        Cmd_ListB     ;Parameter List
              BCS      Error
;
              JSR      Dispatch      ;Set address to patch single sided
              DFB      $04           ;Control call (Set_Down_Adr)
              DW        Cmd_ListC     ;Parameter List
              BCS      Error
;
              JSR      Dispatch      ;Now patch the single sided byte
              DFB      $04           ;Control call (DOWNLOAD)
              DW        Cmd_ListD     ;Parameter List
              BCS      Error
;
              JSR      Dispatch      ;Finally...
              DFB      $03           ;This is the actual format call
              DW        Cmd_ListE     ;Parameter List
              BCS      Error
;
              RTS
```

The parameter lists are as follows:

Cmd_ListA	DFB	\$03	;All control calls are 3 parms long
	DFB	\$01	;Unit #1
	DW	Ctrl_ListA	;This has the interleave address
	DFB	\$06	;Set_Down_Adr control code
Ctrl_ListA	DW	\$02	;Two bytes for download address
	DW	\$0062	;Interleave address
Cmd_ListB	DFB	\$03	;All control calls are 3 parms long
	DFB	\$01	;Unit #1
	DW	Ctrl_ListB	;This has the interleave value
	DFB	\$07	;Download control code
Ctrl_ListB	DW	\$01	;Two bytes for download address
	DFB	\$02	;Mac Disk Interleave value
Cmd_ListC	DFB	\$03	;All control calls are 3 parms long
	DFB	\$01	;Unit #1
	DW	Ctrl_ListC	;This has the sides byte address
	DFB	\$06	;Set_Down_Adr control code
Ctrl_ListC	DW	\$02	;Two bytes for download address
	DW	\$0062	;Interleave address
Cmd_ListD	DFB	\$03	;All control calls are 3 parms long
	DFB	\$01	;Unit #1
	DW	Ctrl_ListD	;This has the sides value
	DFB	\$07	;Download control code
Ctrl_ListD	DW	\$01	;Two bytes for download address
	DFB	\$00	;Value for single sided disk
Ctrl_ListE	DFB	\$01	;Format call has just one parameter
	DFB	\$01	;Unit number

Note: You may encounter difficulties when switching 400K single-sided disks and 800K double-sided disks in the same drive. STATUS requests for the number of blocks on the disk in the drive are valid for the disk **last** accessed. Thus, when you READ from an 800K disk, eject it, and insert a 400K disk, a STATUS call will reveal a size of 800K until a READ or WRITE command is issued. Applications which intend to handle both 800K and 400K disks should do a READ before each STATUS call.

Further Reference

- *Apple IIGS Firmware Reference*
- *Apple IIc Technical Reference Manual, Second Edition*