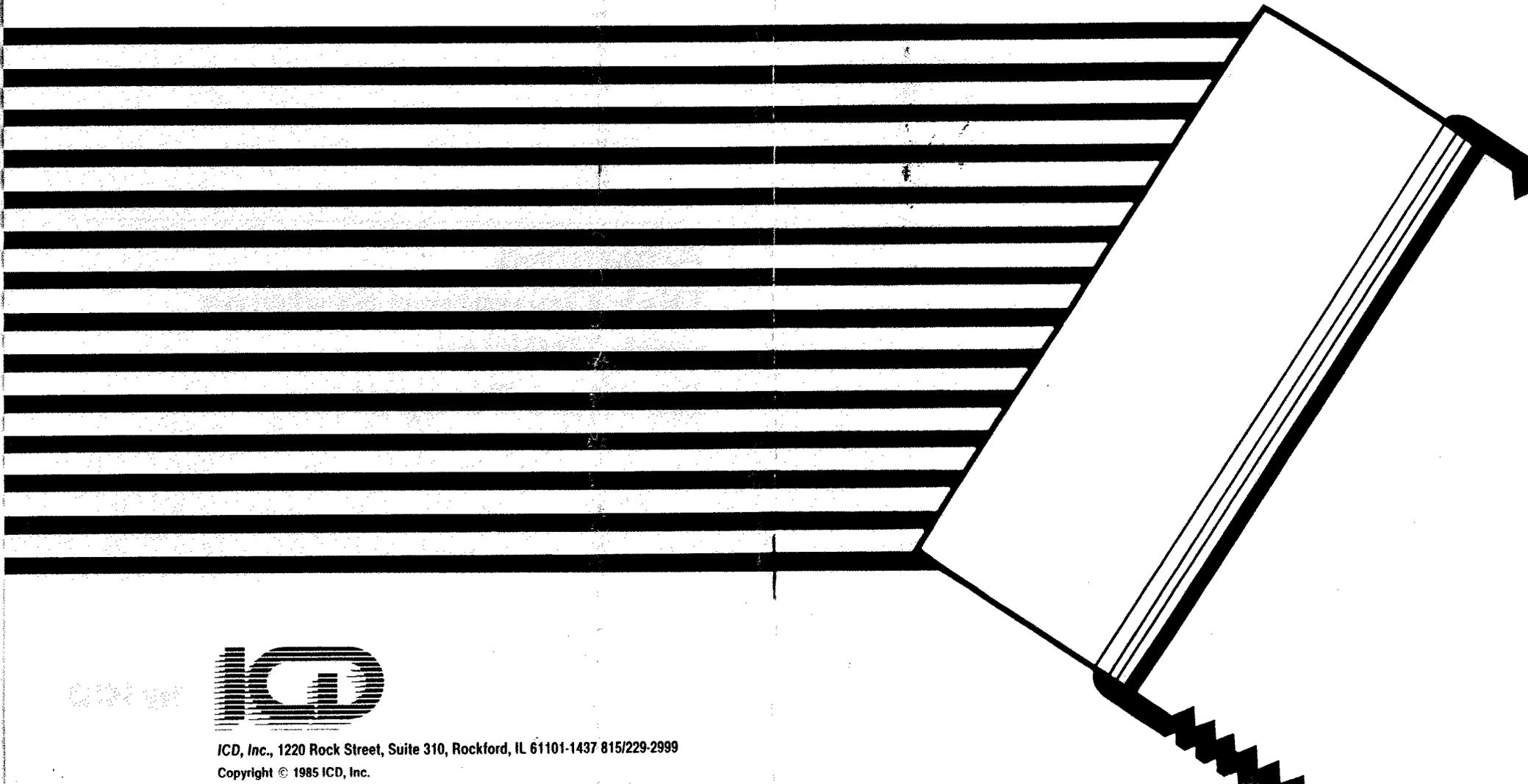


# R-Time 8 / SDCS Supplement

(for use with Atari Computers)



ICD, Inc., 1220 Rock Street, Suite 310, Rockford, IL 61101-1437 815/229-2999

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# **The SpartaDOS Construction Set**

(R-Time 8 Owners Manual &  
Supplement to SDCS Owners Manual)

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**Advanced  
Disk Operating Systems  
with Utilities  
for Atari Computers**

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**by ICD**

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## FORWARD

The R-Time 8 now adds another dimension to the SpartaDOS Construction Set family which began with SpartaDOS version 1.1 and the US Doubler. Although the TD/XTD/TSET commands have been around for quite some time, they have been modified several times as problems arose. Their method of time/date support simply did not allow the flexibility that is now needed. As part of our ongoing development of SpartaDOS, we have developed a new SpartaDOS version which has built in TD and TSET functions. Accompanying the R-Time 8 is this new SpartaDOS version 3.2.

The R-Time 8 package includes: 1) this supplement; 2) the R-Time 8 cartridge; 3) a double sided diskette with SpartaDOS 3.2 and updated command files on the front side. The back side is in Atari DOS 2 format and has the R-Time 8 generic 'Z:' handler (RTIME8.COM) and its source code (RTIME8.SRC).

The SpartaDOS Construction Set package includes: 1) a diskette containing the standard SpartaDOS version 1.1 on the front and public domain games with the LOGOMENU program on the back side; 2) a diskette containing both SpartaDOS version 2.3 and 3.2 with their supporting command files; 3) this supplement; 4) the SDSC Owner's Manual. If you purchased the US Doubler, you receive the 2 US Doubler chips along with the SDSC package.

This manual is supplied with both the latest SpartaDOS Construction Set and the R-Time 8 package. The divisions of the manual and their contents are as follows:

**Chapter 1—Introduction to the R-Time 8**

**Chapter 2—Overview of SpartaDOS 3.2**

**Chapter 3—Commands Added to SpartaDOS 3.2**

**Chapter 4—Update on the Technical Structure**

**Chapter 5—The Time/Date 'Z:' Handler Functions**

**Chapter 6—Using the Supra Hard Disk Interface with SpartaDOS**

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## CHAPTER 1—INTRODUCTION TO THE R-TIME 8

This chapter is a brief introduction to the R-Time 8 cartridge. Explanations are included on how to use the R-Time 8 files with six different versions of DOS, and which versions of DOS you may use with your computer.

### Installation (Plugging it in)

Install the R-Time 8 cartridge as you would install any other cartridge for the Atari 8 bit computer line. The flap on top with the ICD logo faces toward the front of the 800 and 800XL computers. On the Atari 800 computers (which have both left and right slots), you may use whichever slot is most convenient (normally the right since most other cartridges use the left slot). Notice that the top of the R-Time 8 cartridge has an expansion port. You may use it to plug in your language cartridge (Pilot, ACTION, BASIC XE, etc.) on top of the R-Time 8.

### Booting Your Computer

First you must choose which DOS to use. Although any DOS should work, your choice governs the flexibility and ease of use of the R-Time 8. For example, if you use Atari DOS 2.5, you lose the powerful TIME, DATE, and TD commands supported from SpartaDOS 3.2. Most importantly, **no version or derivative of Atari DOS 2 supports time and date stamping of files.** This was the whole premise for making the R-Time 8—to time/date stamp SpartaDOS files. A standard 'Z:' handler is implemented for which ever DOS you choose. With this interface to the cartridge, you may use BASIC (or whatever language you wish to use) to access the R-Time 8 for a wide variety of applications.

## DOS Choices and Their Use with the R-Time 8

### SpartaDOS 3.2 (for use with 800XL, 1200XL, 130XE and most operating systems)

If you have one of these computers, this is the choice to make. The command processor has the commands TIME, DATE, and TD built in, which allow you to read, and set the time and date. TD allows you to turn on and off a time/date display line; however, the actual handler code (TDLIN) must be loaded before the first use of the internal TD command. To install the 'Z:' handler, you must enter the command ZHAND.

NOTE: ZHAND is only necessary if you wish to address the R-Time 8 as the 'Z:' device. This is generally for easy access from BASIC or other language programs.

### SpartaDOS 2.3 (for use with 800XL, 130XE using the standard OS only)

This version of SpartaDOS has a MEMLO of under \$E00 which gives almost an extra 4000 bytes of free user memory over Atari DOS. Use the external TD or XTD commands to provide the interface between SpartaDOS 2.3 and the R-Time 8. (The external TD command also provides the time/date display line.) Neither of these supply the 'Z:' handler, but they take less memory. An alternative to TD/XTD is the RTIME8 command. This supplies the 'Z:' handler as well as the DOS to R-Time 8 interface. The TSET command is used to set the time or date and may be used while either RTIME8 or TD/XTD is installed.

### SpartaDOS 1.1 (works with any 8-bit Atari computer with at least 32K RAM)

If you have an 800 or need a translator, use this version; if not, it is better to use version 3.2 or 2.3. The same commands work for this version as for SpartaDOS 2.3. This version of DOS has a much higher MEMLO than 2.3 or 3.2 and is not capable of reading Atari DOS 2 diskettes directly. There are several different 1.1 versions (e.g. NOCP, NOWRITE, SPEED, STANDARD) which work around its deficiencies.

## Use one of the following DOS types if you don't have SpartaDOS

### Atari DOS 2 or 2.5 (and its many followers i.e. MYDOS, TOPDOS, SMARTDOS etc.)

You must rename the RTIME8.COM file to AUTORUN.SYS and boot your DOS 2 diskette. (The back side of the diskette supplied with the R-Time cartridge is an Atari DOS 2 format with the RTIME8.COM handler and the RTIME8.SRC source file.) The handler will load and relocate itself at MEMLO.

NOTE: the time/date display line will automatically be turned off when you enter DOS (by the DOS command from BASIC).

### DOS XL (by OSS)

To install the R-Time 8 handler, enter the command RTIME8 from the command processor. Since this is a CP (Command Processor) type of DOS, the time/date display line will remain on (as in SpartaDOS) when you enter DOS (by the DOS command from BASIC).

### Atari DOS 3

If you have this DOS, we strongly recommend that you do not use it anymore. Go out and purchase the SpartaDOS Construction Set. Atari DOS 3, a product of the old Atari, will become a nightmare since: 1) it is not supported by Atari or any software company; 2) it is very difficult to convert DOS 3 files to any other disk operating system.

## Some Examples Using the 'Z:' Handler with BASIC

These examples all assume that you have BASIC installed in your computer (either internal or a cartridge) and wish to access the R-Time 8 in a program. For more details on the 'Z:' handler functions, see Chapter 5 of this supplement. To install the 'Z:' handler, choose a DOS and perform one of the following operations depending on your selection:

**SpartaDOS 3.2**

Boot the DOS and enter the commands:

```
TDLINE
ZHAND
CAR
```

**SpartaDOS 2.3, 1.1, DOS XL**

Boot the DOS and enter the commands:

```
RTIME8
CAR
```

**Atari DOS 2 (and family)**

Move RTIME8.COM to DOS diskette and rename it to AUTORUN.SYS.

Now boot that diskette; the handler will install automatically.

**Turning the Clock On and Off**

To turn the clock display on, enter the following command (from BASIC):

```
XIO 38,#1,0,0,"Z:"
```

An extra display line will appear on top of the screen containing the correct time and date. Most programs from BASIC should work with this display line turned on; however, there are many exceptions. Practically all programs that use custom display lists or vertical blank routines will not work correctly. In most cases, the display line will simply be lost.

One inherent problem with Atari DOS 2 is the non-resident nature of the DUP.SYS program. The time/date display can't be on while using DUP (because DUP loads on top of the interrupt handler). Since it is inconvenient to always turn the display off before typing 'DOS', it is automatically done for you. There is absolutely no problem when using SpartaDOS or OSS DOS XL. The time/date will remain on since no DUP.SYS is needed.

To remove the time/date line from the display, enter the command:

```
XIO 39,#1,0,0,"Z:"
```

**Reading the Clock Using BASIC**

Your BASIC programs (or any language) may read the time and date in either formatted or unformatted form. This is accomplished by performing an XIO call followed by several GETs or an INPUT on an open IOCB. For example, to read the **formatted** time, type and run the program:

```
10 DIM TIMES$(10)
20 OPEN #1,4,0,"Z:"
30 XIO 32,#1,0,0,"Z:"
40 INPUT #1,TIMES$
50 PRINT "Current Time is ";TIMES$
60 CLOSE #1
```

**Setting the Clock**

Your BASIC program may set the time or date by performing an XIO and a sequence of three PUT statements. The following is an example of setting the date:

```
10 OPEN #1,8,0,"Z:"
20 PRINT "Enter Date (MM,DD,YY) ";
30 INPUT MONTH,DAY,YEAR
40 XIO 35,#1,0,0,"Z:"
50 PUT #1,DAY : PUT #1,MONTH : Put #1,YEAR
60 CLOSE #1
```

When setting the time, the hour must be given using a 24 hour clock where 12:00 midnight is 0, 12:00 noon is 12, 4:00 PM is 16, etc. The order of the PUT's is important. For date, it is: day, month, year; for time it is: hour, minute, second.

**R-Time 8 Use from SpartaDOS**

To use R-time 8 with SpartaDOS version 3.2, study the commands in Chapter 3 of this supplement. To use it with version 1.1 and 2.3, review Chapter 12 and Appendix D in the SpartaDOS Construction Set Owner's Manual. For R-Time 8 support of Bulletin Board Construction Set 1.6 or earlier, use SpartaDOS version 2.3 and the XTD handler.

### R-Time 8 Access from Machine Language

Although we strongly recommend that programmers using a standard DOS should access the R-Time 8 through the 'Z:' handler, we have included the source code for RTIME8 (RTIME8.SRC) on the back side of the R-Time 8 distribution diskette (Atari format). This gives detailed information on the inner workings of the clock chip to anyone familiar with machine language programming. Also refer to Chapter 4 of this supplement for information on the TIME/DATE vectors of SpartaDOS 3.2.

### R-Time 8 Maintenance and Service

This accurate timing device has been built to supply you with years of trouble free service. The accuracy is determined by the frequency of the crystal at location Y1 and the adjustor at YC1. To open the case, carefully pry it apart equally at both ends with a flat blade screwdriver. To adjust for greater accuracy turn the small slot at the center of YC1 slightly to the right or left. If adjustment is needed, calibrate the R-Time 8 once a week with an accurate watch and adjust accordingly if it is gaining or losing seconds. It should be possible to get very close with this method and a little patience. Battery life is calculated for 3-5 years. The battery is a 200mah 3 volt Lithium cell. Replacement batteries are currently available for \$5.00 including shipping. Full service including repair, calibration, and battery replacement is currently \$20. This does not include damage due to abuse.

## CHAPTER 2—OVERVIEW OF SPARTADOS 3.2

This chapter briefly describes the changes between SpartaDOS 3.2 and SpartaDOS 2.3. Improvements have been made in the following areas:

- Better time/date support (internal TD, TIME, DATE commands)
- Internal R-TIME 8 interface
- Internal JIFFY clock interface (for non-R-TIME 8 users)
- Internal 32 character keyboard buffer (and KEY command)
- Automatic mini-buffer system for fast single byte PUT/GET functions
- New vectors added for machine language support
- Control returned to DOS if DOS was active during RESET
- Supports both a STARTUP.BAT and an AUTORUN.SYS file
- Compatible with BASIC XE, 1200XLs, and many modified operating systems
- BASIC ON/OFF command operation from within a batch file (not end only)
- NOISY I/O flag recognized
- Support for the Supra Hard Disk Interface
- All command entry in upper or lower case
- Full read capability for Atari DOS 2.5 type dual density format

### Internal Real Time Support

Three new internal commands, time/date support vectors, an internal clock, and access to the R-Time 8 cartridge, have been added for convenience and easy access.

Operating on the jiffy counter (at location \$12-\$14), the internal clock determines the number of jiffies (1/60th sec) between the current and the last access. Time is then added to the internal clock based on this difference. Unfortunately a RESET zeros the jiffy counter, thus the time between the last access and RESET is lost! The command TDLIN fixes this problem by updating the internal clock each half second while displaying the time/date on the top of the display. Unfortunately this method must use the vertical blank interrupt which runs the risk of interfering with other user applications. The TIME command from older SpartaDOS versions is similar to TDLIN in its inherent problems.

If you have an R-Time 8 cartridge installed, SpartaDOS 3.2 will recognize it and use the R-Time 8 in place of the internal jiffy clock.

The new internal TIME and DATE commands are used to set/display the time and date. The new internal TD command is used to turn the time/date display line on and off (i.e. TD ON or TD OFF) once TDLINE has been installed.

The old external time/date support commands (TD, TSET, XTD, TIME, SET) have not been changed. They may still be used with SpartaDOS 2.3 and 1.1. The reason for this will become apparent later.

### **Keyboard Buffer**

A 32 byte keyboard buffer is now standard. The repeat rate has been doubled for faster operation. The keyboard buffer allows you to type ahead of the computer (up to 32 characters) even while disk I/O is occurring. You may disable this keyboard buffer by the KEY OFF command. (Use KEY ON to turn the buffer back on.)

### **Mini-buffering**

Due to the nature of the CIO and the large database needed for SpartaDOS to operate, single GET/PUT operations tended to be slow. SpartaDOS 3.2 now contains mini-buffering that allows these operations to be performed faster. This also means faster INPUT/PRINT operations on disk files. (Mini-buffering is not used with Atari DOS 2 formatted diskettes.)

### **RESET**

Now when you press RESET while in DOS with a cartridge present, control will remain with DOS. This also solves the conflict involving the warm start of BASIC that may have occurred under unusual situations. Optionally, AUTOBAT.COM can be used which causes a particular batch file to execute after pressing RESET.

### **AUTORUN.SYS and STARTUP.BAT**

When SpartaDOS is booted, it will try to load an AUTORUN.SYS file. If successful, this file will run and then pass control to the cartridge. Otherwise, SpartaDOS will try starting a STARTUP.BAT file. If successful, control will pass to the command processor of DOS; otherwise, control will pass to the cartridge.

### **BASIC XE**

The original reason for writing version 3.2 was to be compatible with BASIC XE. This has been done, but resulted in some major changes. First MEMLO had to be drastically increased (to just below Atari DOS 2). As long as MEMLO had to be increased, it may as well be pushed up near Atari DOS 2 with many extras added.

### **Supra Hard Disk Interface**

Support for the Supra Hard Disk Interface has been added, including the new BYPASS command which allows the use of floppy drives as 1 & 2, with the hard disks as 3 & 4. This differs from the default set up with a 'fake' floppy as 1, a real floppy as 2, and the hard disks as 3 & 4.

### **DOS 2.5 Extended Read Capability**

SpartaDOS version 3.2 can directly read all sectors on an Atari DOS 2.5 formatted diskette in dual density. This means you can boot SpartaDOS 3.2, insert a full Atari DOS 2.5 dual density diskette, and RUN or COPY files from the directory which extend past sector 720. You still cannot write to this area of the diskette, however, read capability should be sufficient for most users.

## CHAPTER 3—COMMANDS ADDED TO SPARTADOS 3.2

The following is a summary of the new commands added to SpartaDOS 3.2

### TIME Command

#### Purpose

This command displays the current time and allows you to set the time.

#### Syntax

TIME

#### Type and Restrictions

Internal under CP version 3.2

(This is totally different from the old external TIME command)

#### Remarks

This command produces the following output:

Current time is 12:34:56pm

Enter new time: \_\_\_\_\_

You may enter the new time or press RETURN if you don't want to set a new time. Enter the time in the format: "hh:mm:ssx" where 'hh' is the hours, 'mm' is the minutes, 'ss' is the seconds and 'x' is an 'A' or a 'P' to distinguish between AM and PM.

**NOTE:** time is entered using a 12 hour clock rather than a 24 hour clock as in the older commands.

**DATE Command****Purpose**

This command displays the current date and allows you to set the date.

**Syntax**

DATE

**Type and Restrictions**

Internal under CP version 3.2

**Remarks**

This command produces the following output:

Current date is 10/07/85

Enter new date: \_\_\_\_\_

You may enter the new date or press RETURN if you don't want to set a new date. Enter the date in the format: "mm/dd/yy" where 'mm' is the month, 'dd' is the date, and 'yy' is the year.

**TD Command****Purpose**

This command allows you to turn the time/date display line on and off.

**Syntax**

TD ON or TD OFF

**Type and Restrictions**

Internal under CP version 3.2

(This is totally different from the old external TD command)

**Remarks**

The time/date display line is not supported internally by SpartaDOS. If you want the time/date display, you must first enter the TDLINE command to install the handler. This is explained further in the description of the time/date vectors.

**TDLINE Command****Purpose**

This command installs the time/date display line handler. The internal TD command controls this handler.

**Syntax**

TDLINE

**Type and Restrictions**

External under CP version 3.2

(This command may not be used with earlier versions)

**Remarks**

This command installs a handler into the system that gets accessed by the SpartaDOS time/date vectors. The functions TDON and FMTTD are provided by this handler. The TDON function causes this handler to patch itself into the vertical blank interrupt. During the interrupt, it calls the FMTTD function through SpartaDOS (returns the formatted time/date line), converts it to display format, and then displays it on the expansion top line.

**RTIME8 Command****Purpose**

This command installs the routines needed to access the R-TIME 8 cartridge for SpartaDOS versions 2.3 and 1.1. It is also used with Atari DOS as an AUTORUN.SYS file. RTIME8 contains the ZHAND and TDLINE functions.

**Syntax**

RTIME8

**Type and Restrictions**

External under CP versions 2.3, 1.1, and as AUTORUN.SYS with Atari DOS

**Remarks**

The RTIME8 installs the 'Z:' handler into the system. Under SpartaDOS 2.3 and 1.1, it updates TIMER/DATER (in COMTAB) for file time/date stamping. It is **not** to be used in conjunction with TD or XTD. It is provided for the 'Z:' handler compatibility.

NOTE: RTIME8 will also work with version 3.2 but it is preferable to use ZHAND and TDLINE instead. RTIME8 uses 178 more bytes than ZHAND and TDLINE combined. Also, ZHAND and TDLINE work with both the internal clock and the R-TIME 8 cartridge under version 3.2 (the vectors are there). RTIME8 only supports the R-TIME 8 cartridge but works with all versions of SpartaDOS.

## ZHAND Command

### Purpose

This command installs a 'Z:' handler that allows easy access to time/date functions from BASIC.

### Syntax

ZHAND

### Type and Restrictions

External under CP version 3.2  
(This may not be used with earlier versions)

### Remarks

This command installs a device handler that provides an interface from a high level language to time/date functions. This handler converts requests from the CIO into calls to the SpartaDOS time/date vectors and visa versa. This may be used with either the R-Time 8 cartridge or the internal time/date in SpartaDOS. Further documentation on the 'Z:' handler is provided later in this document.

## KEY Command

### Purpose

This command enables or disables the internal keyboard buffer.

### Syntax

KEY OFF or KEY ON

### Type and Restrictions

Internal under CP version 3.2

### Remarks

You will normally want the keyboard buffer on. It turns out to be quite handy. (Use it for a while.) In rare cases, the keyboard buffer may interfere with a software program. If this happens, simply disable the buffer by the KEY OFF command.

## RAMDISK Command

### Purpose

These commands install a RAMDISK device in place of a physical disk drive. Since these commands depend on specific hardware, the correct RAMDISK command must be used or an error will result.

### Syntax

RD Dn: [/NE]

RD260 Dn: [/N]

### Type and Restrictions

External under all CP versions—command must match hardware

### Remarks

These new RAMDISKs support hardware modifications which can be made to the 800XL, 1200XL, and 130XE to provide large RAMDISKs. Both commands format the RAMDISK automatically in the 128 byte sectors unless the '/N' parameter is used.

RD.COM supports the standard 130XE, the 130XE with 64K RAM upgrade (from Ron Boling), and the new 256K RAMBO XL upgrade for the 800XL and 1200XL computers. The RAMBO XL upgrade is available from ICD either installed or in kit form. RD.COM, used with the RAMBO XL, gives a 192K RAMDISK which holds a full double density disk! RAMBO XL also makes your 800XL or 1200XL fully compatible with BASIC XE and other 130XE programs that take advantage of its extra memory!

The '/E' parameter (supported with RD.COM only) reserves the first 64K bank area for programs which use the extended memory of the 130XE (such as BASIC XE). For example: 'RD D2: /E' will install a 128K RAMDISK when using an 800 XL modified with RAMBO XL.

RD260.COM supports the 800XL RAM upgrade to 256K as published in the September 1985 BYTE magazine by Claus Buchholz. It is used like RD.COM and gives a 192K RAMDISK! This upgrade banks the lower 32K of memory unlike RAMBO XL which banks memory from \$4000 - \$7FFF like the 130XE.

The '/N' parameter indicates that the RAMDISK is not to be formatted. This allows you to reboot the system and be able to retrieve the data that was in the RAMDISK.

**CAUTION:** you may not power down the computer to reboot; it must be done with a RESET that causes a reboot (coldstart). This is accomplished by setting memory location \$244 to a non-zero value and then pressing RESET. This is very useful for running a BBS from the RAMDISK. If the DOS crashes, you may be able to recover everything from the RAMDISK.

## SCOPY Command

### Purpose

This command is used: to perform a straight sector copy, to compact an entire diskette into a file on another diskette, or to expand a file onto an entire diskette.

### Syntax

SCOPY Dn:[[path>]fname] [/UR] Dn:[[path>]fname] [/UR]

### Type and Restrictions

External under all CP versions

### Remarks

SCOPY is a sector copier that has 3 modes of operation. It can do a disk to disk copy (like DUPDSK except that it formats the destination and it copies all sectors—this means it will copy Atari DOS 2 diskettes also). The other two modes of operation allow either: the compaction of an entire diskette to a file on a destination diskette, or the creation of a destination diskette from a previously compacted file. This is an easy method for making multiple copies of the same diskette (non-copy protected) using a RAMDISK. (In fact, this is how ICD creates its distribution diskettes.)

The mode of operation is strictly determined by the syntax of the command. The first disk/file is always the source and the second disk/file is always the destination of the operation (as is true with the COPY command). The three modes of operation are basically:

disk to disk	(simple sector copy)
disk to file	(compact diskette to file)
file to disk	(expand file to diskette)

If a file name follows the 'Dn:', then that item is considered a compacted 'file'; with no filename, it is considered a 'disk'. A 'file to file' operation is illegal with SCOPY.

The destination diskette is automatically formatted in the same density as the source disk was. The compacted file stores density information from the original disk it was created from. It does not matter what density the file resides on. Skew may be changed between US skew and standard Atari skew with the '/U' parameter described later.

**CAUTION:** for disk to file and file to disk copies, no prompt is given; the operation is performed without intervention. **Always make sure your destination disk can be formatted. (You will lose all previous information stored on it.)** For disk to disk copies, you are prompted for source and destination diskettes as required.

A 'disk' parameter may be followed by either a '/R' or '/U' parameter. The '/U' indicates that the diskette is US Doubler sector skew (for source) or is to be formatted in US sector skew (for destination). The '/R' parameter indicates that the diskette is really a RAMDISK. **Only the RD.COM RAMDISK will act as a 'disk' with SCOPY.** RD.COM creates a RAMDISK which is a complete model of a true disk drive. (It allows formatting, configuring, read configuration, and status commands.) The other RAMDISK handlers do not. Always use a 'space' as the delimiter between the device or filename and the slash (/) before the parameter.

When using SCOPY, the copy process is performed as efficiently as possible. This means that if a drive contains a US Doubler and the diskette is not in US skew, SCOPY will adjust and optimize for fastest copy time. SCOPY will work with single, double, and 1050 dual density diskettes. It is not intended for the specialty (eight inch or double sided) drives.

An example of disk to disk copy using a single US Doubler 1050 drive follows:

```
SCOPY D1: /U D1: /U
```

This will cause a US sector skew diskette to be duplicated. (Leave out the '/U' when copying standard Atari DOS diskettes.) For multiple disk duplication using a RAMDISK and a single drive, a typical pair of batch files would be:

```
RD D3:
COPY SCOPY.COM D3:
COPY BAT2.BAT D3:
D3:
; Insert diskette to copied in drive 1
PAUSE
SCOPY D1: /U D3:MYDISK
-BAT2
```

```
; Insert destination diskette in drive 1
PAUSE
SCOPY D3:MYDISK D1: /U
-BAT2
```

The second group of commands would be in the batch file 'BAT2.BAT'; the first group would be 'BAT1.BAT'. This sequence will use 'D1:' as source and destination while using 'D3:' as a temporary drive.

Note that SCOPY with NOT prompt in this sequence, thus the PAUSE command is used for the switching of diskettes in drive 1. You are prompted when performing drive to drive duplication as in the first example.

For more information about batch files and how they work, see Chapter 14 in the SpartaDOS Construction Set Owner's Manual.

## BYPASS Command

### Purpose

This is a special command for the Supra Hard Disk Interface to allow the use of a floppy drive 1.

### Syntax

```
BYPASS
```

### Type and Restrictions

External under CP version 3.2

### Remarks

This command is similar to the RAMDISK commands in that it will knock out the partitioned hard disk drive 1 and replace it with floppy drive 1 (assuming there is a physical floppy drive configured as 1). BYPASS patches itself into the SIO vector (of SpartaDOS) and checks for a drive 1 access. If so, then it passes control directly to the SpartaDOS serial I/O routines, thus the front end parallel I/O is skipped. BYPASS is needed if you wish to use a floppy drive a #1 rather than the drive 1 partition of the hard disk.

**CAUTION:** If used from a batch file, make sure that the batch file is running from a drive other than drive 1.

## AUTOBAT Command

### Purpose

AUTOBAT causes the specified batch file to be run whenever RESET is pressed.

### Syntax

```
AUTOBAT [Dn:][path>]fname[.ext]
```

### Type and Restrictions

External under CP version 3.2

### Remarks

This command patches itself into the SpartaDOS INIT vector (refer to the technical structure update) to cause control to be passed to the specified batch file after RESET is pressed. Refer to Chapter 14, 'Input/Output Redirection' in the SpartaDOS construction Set Owner's Manual for information about batch files.

## CHAPTER 4—UPDATE ON TECHNICAL STRUCTURE

Another version of SpartaDOS . . . why not? Actually, the major reason we decided to design another version of SpartaDOS was to achieve compatibility with BASIC XE which was released right after SpartaDOS version 2.3 came out. The actual problem was that BASIC XE was determined to use the memory at \$C000-\$CBFF and \$D800-\$DFFF which was already occupied by SpartaDOS 2.3. Since everybody seems to like BASIC XE (including us), it was decided that we would give up that area and move the code down to low memory. End of story? —no, of course not. As long as MEMLO had to be pushed up, we may as well start adding features . . . and add we did . . .

### SpartaDOS Time/Date and other Vectors

SpartaDOS 3.2 contains many vectors pertaining to the setting, reading, displaying of the time and date, executing command lines, initializing the system and many more. These vectors are contained in the RAM under the operating system starting at address \$FFC0. They may be accessed by the following instructions:

```
lda $D301 ; PIA
pha      ; save old value of port on stack
and #$FE ; set bit 0 to OFF
sta $D301 ; enable RAM under the OS
jsr VGETTD ; call routing at $FFC0
pla
sta $D301 ; restore the port (enable OS)
```

These functions each contain a jump (JMP) instruction to the appropriate function. If a function is not initially supported (as in TDON), the vector will contain a SEC and RTS instruction rather than a JMP. The following vectors are currently supported:

**VGETTD (\$FFC0)**

This function returns the current time/date at **TIMER** and **DATER** (locations at **COMTAB**—see page 110 of the SpartaDOS manual). On return, the carry is **SET** if the function failed. When a file is opened for write, SpartaDOS makes a call here to update **TIMER/DATER** so it can move this data into the directory entry. Also the **TIME** and **DATE** internal commands make calls here to get the current time. **TDLINE** and **ZHAND** also use this vector.

**VSETTD (\$FFC3)**

This function sets the time/date. On entry, the new time and date are at **TIMER** and **DATER** (locations at **COMTAB**—see page 110 of the SpartaDOS manual). On return, the carry is **SET** if the function failed. This vector is used by the commands **TIME**, **DATE**, and the **ZHAND** set functions.

**VTDON (\$FFC6)**

This function turns the time/date display line on or off. On entry, the **Y** register contains 0 if to turn the line off, or 1 if to turn the line on. On return, the carry is **SET** if the function failed. This function is not supported internally by SpartaDOS. The **TDLINE** handler patches into this vector for use by the **TD** command along with the **ZHAND** functions 38 and 39. (See the **TDLINE** command.)

**VFMTTD (\$FFC9)**

This function returns the formatted time/date line into a user supplied buffer. On entry, the **X** and **Y** registers contain the high and low byte of the buffer address respectively. On exit, the carry is **SET** if the function failed. This function is not supported internally by SpartaDOS. The **TDLINE** handler patches into this vector for use by **TDLINE** and **ZHAND** routines. (See the **TDLINE** command.)

**VINITZ (\$FFCC)**

This vector is called after SpartaDOS has finished initializing itself after a **RESET** occurs. The command **AUTOBAT** patches into this vector to start a batch file right after **RESET**. (By initialization, we mean as a result of making a call through **DOSINI**—e.g. **JMP (DOSINI)**). The OS monitor routine calls this vector before it enters a cartridge or **DOS**.)

**VINITZ2 (\$FFCF)**

This vector is called after SpartaDOS has finished initializing itself after a **NON-RESET** occurs. Several SpartaDOS commands (such as **SPCOPY** and **UNERASE**) will initialize **DOS** before and after they perform their function. They do this by jumping through the **DOSINI** vector as does the OS monitor routine after a **RESET**.

**VXCOMLI (\$FFD2)**

This vector calls the command processor to execute a command line given at **LBUF**. **BUFOFF** should be 0 on entry. Any errors that may occur as a result of executing the command line shall be printed as usual. No prompts are printed before or after command execution. This is the method that a future **DUP.SYS** for SpartaDOS could use to perform its functions.

**VCOMND (\$FFD5)**

This vector calls the main command processor program entry point. You may patch into this vector if you wish to supply your own command processor. (The current one simply prints the prompt, inputs a line, calls **VXCOMLI**, and jumps back to the beginning.) This is the method **DUP.SYS** uses to gain entry from a **DOS** command in **BASIC**.

**VPRINT (\$FFD8)**

This vector points to the SpartaDOS general print routine. The calling method is:

```
JSR VPRINT
```

```
DB 'This is a message', $9B, -1
```

**VKEYON (\$FFDB)**

This function turns the keyboard buffer on or off. On entry, the Y register contains 0 if to turn the buffer off, or 1 if to turn the buffer on. This function is supported internally by SpartaDOS.

**Updates in the COMTAB Data Table**

Several updates to COMTAB locations have been made. For general information about COMTAB, refer to the SpartaDOS Construction Set Owner's Manual, pages 108-111.

**DWARM [COMTAB-21]**

This location contains a copy of the WARMFLG (location 8) that will be used when a cartridge is entered; it indicates if user memory is valid and a 0 indicates that a destructive command was entered (such as COPY) or that a binary file was loaded.

**DDENT [COMTAB-19]**

This is the table of bytes per sector for each drive (1-8). A 0 indicates 256 bytes per sector and a 128 indicates 128 bytes per sector.

**WARMST [COMTAB-1]  
NOT USED****SBUFF [COMTAB + 28]**

This is the start address of SpartaDOS sector buffers.

**SMEMLO [COMTAB + 30]**

This is the top of SpartaDOS low memory. Handlers added since boot take up the memory between SMEMLO and MEMLO.

**INCOMND [COMTAB + 32]**

A -1 here indicates that we are in the command processor (entering commands, etc.). A 0 indicates that we are in BASIC or some cartridge program. This is used by the initialization routine to determine whether to enter the command processor or not.

**SpartaDOS Version Identification**

When writing new commands, it is necessary to distinguish between versions of the DOS. From now on, two identification bytes at \$700 and \$701 are contained in all versions (from 2.5 on). Location \$700 will always contain a \$53 and location \$701 will contain the version number (\$25, etc).

**Other Notes About Version 3.2**

Since the DOS initialization now gives control directly to the command processor (CP) if INCOMND is true (-1), the CP may inadvertently be entered when a user program performs a warm RESET (through \$E474 vector). To avoid this, a -1 placed at memory location \$702 will disable the initialization routine from running the CP.

**BASIC XE Notes**

To be compatible with BASIC XE, SpartaDOS could not use memory from \$D800-\$DFFF or \$C000-\$CBFF. However, normally SpartaDOS uses these areas: the first area for buffers and the second for both AINIT and the verbal error messages. Thus, when using BASIC XE: both the AINIT command and verbal error messages are disabled, and eight buffers are allocated just below MEMLO (increasing MEMLO by \$400 bytes). The eight buffers are a decrease from the sixteen buffers normally maintained at \$D800-\$DFFF.

**Supra Hard Disk and Parallel Bus Notes**

To be compatible with the Supra Hard Disk Interface and any future parallel bus devices, it was necessary to vacate \$D800-\$DFFF (as with BASIC XE). Parallel bus use is determined and automatically compensated for by checking PDVMSK (\$247) to see if any parallel devices are on line. If a device is present, DOS uses eight buffers at low memory and does not use \$D800-\$DFFF (therefore increasing MEMLO by \$400).

## CHAPTER 5—THE TIME/DATE 'Z:' HANDLER FUNCTIONS

The following is a list of Time/Date 'Z:' handler functions and how to implement them from BASIC through XIO statements. The DOS command, if applicable, follows the function name in parenthesis.

### General Notes

It is assumed that a 'Z:' handler has been installed into your system. This is accomplished by the command 'ZHAND' under SpartaDOS 3.2. (Also install the display with 'TDLINE' if using a display function under 3.2.) If using an earlier version of SpartaDOS or Atari DOS 2 (or versions thereof), you must use the 'RTIME8.COM' file. Type 'RTIME8' if using a command processor driven DOS (like SpartaDOS), or rename the file to 'AUTORUN.SYS' and boot the diskette if using a DUP.SYS type of DOS (like Atari DOS 2.5.)

Throughout these examples, 'IOCB' represents an Input/Output Control Block number from 1 through 7.

### Turn Time/Date Display ON (TD ON)

#### Syntax

XIO 38,#IOCB,0,0,"Z:"

#### Notes

An extra line will appear at the top of the display containing the current time and date. The SpartaDOS version number will also be displayed. If you are using the 'RTIME8' handler for Atari DOS 2, the message 'R-Time 8' will appear instead of the SpartaDOS version message. An error (139—Device NAK) will occur if the 'TDLINE' handler has not yet been installed under SpartaDOS 3.2.

**Turn Time/Date Display OFF (TD OFF)****Syntax**

```
XIO 39,#IOCB,0,0,"Z:"
```

**Notes**

The extra line at the top of the display is removed. This has no effect on SpartaDOS's internal time keeping.

**Read Date (Formatted)****Syntax**

```
XIO 34,#IOCB,0,0,"Z:"
INPUT #IOCB,DATE$
```

**Notes**

This sequence will read the date into 'DATE\$'. This string should be at least 13 characters long (as defined by the BASIC 'DIM' statement). The string will be returned in the format 'Mon 21-Oct-85'. Attempts to read more characters will return an EOF error (error number 136). The IOCB must be opened for read prior to the execution of these statements (e.g. OPEN #1,4,0,"Z:"). An error 139 (NAK) will be returned if the TDLIN handler has not yet been installed when using SpartaDOS 3.2.

**Read Time (Formatted)****Syntax**

```
XIO 32,#IOCB,0,0,"Z:"
INPUT #IOCB,TIME$
```

**Notes**

This sequence will read the time into 'TIME\$'. This string should be at least 10 characters long (as defined by the BASIC 'DIM' statement). The string will be returned in the format '10:20:46am'. Attempts to read more characters will return an EOF error (error number 136). The IOCB must be opened for read prior to the execution of these statements (e.g. OPEN #1,4,0,"Z:"). An error 139 (NAK) will be returned if the TDLIN handler has not yet been installed when using SpartaDOS 3.2.

**Read Date (Unformatted) (DATE)****Syntax**

```
XIO 35,#IOCB,0,0,"Z:"
GET #IOCB,DAY : GET #IOCB,MONTH : GET #IOCB,YEAR
```

**Notes**

This sequence will read the numerical date into the variables: 'DAY', 'MONTH', and 'YEAR'. The year is returned as the last two digits of the actual year (e.g. 1985 is returned as YEAR = 85). Attempts to read more characters will return an EOF error (error number 136). The IOCB must be opened for read prior to the execution of these statements (e.g. OPEN #1,4,0,"Z:"). No error will occur with this command under SpartaDOS 3.2 since this function is internal to the DOS.

**Read Time (Unformatted) (TIME)****Syntax**

```
XIO 33,#IOCB,0,0,"Z:"
GET #IOCB,HOURL : GET #IOCB,MINUTE : GET #IOCB,SECOND
```

**Notes**

This sequence will read the numerical time into the variables: 'HOURL', 'MINUTE', 'SECOND'. The hour is returned using the 24 hour clock where 0 is midnight, 12 is noon, and 15 is 3 PM. Attempts to read more characters will return an EOF error (error number 136). The IOCB must be opened for read prior to the execution of these statements (e.g. OPEN #1,4,0,"Z:"). No error will occur with this command under SpartaDOS 3.2 since this function is internal to the DOS.

**Set Time (TIME)****Syntax**

```
XIO 36,#IOCB,0,0,"Z:"
PUT #IOCB,HOUR : PUT #IOCB,MINUTE : PUT #IOCB,SECOND
```

**Notes**

This sequence will set the time from the variables: 'HOUR', 'MINUTE', and 'SECOND'. The hour is given using the 24 hour clock where 0 is midnight, 12 is noon, and 15 is 3 PM. Attempts to write more characters will return an EOF error (error number 136). The IOCB must be opened for write prior to the execution of these statements (e.g. OPEN #1,8,0,"Z:"). An error 139 (NAK) will occur if the handler is unable to set the time. The set function is an internal function of SpartaDOS 3.2.

**Set Date (DATE)****Syntax**

```
XIO 37,#IOCB,0,0,"Z:"
PUT #IOCB,DAY : PUT #IOCB,MONTH : PUT #IOCB,YEAR
```

**Notes**

This sequence will set the date from the variables 'DAY', 'MONTH', and 'YEAR'. The year is given as the last two digits of the actual year (e.g. 1985 is given as YEAR = 85). Attempts to write more characters will return an EOF error (error number 136). The IOCB must be opened for write prior to the execution of these statements (e.g. OPEN #1,8,0,"Z:"). An error 139 (NAK) will occur if the handler is unable to set the date. The set function is an internal function of SpartaDOS 3.2.

**Some Examples Using the 'Z:' Handler**

The following program will keep a constant time display:

```
10 DIM TIME$(13) : POKE 752,1 : REM turn cursor off
20 OPEN #1,4,0,"Z:"
30 XIO 32,#1,0,0,"Z:"
40 INPUT #1,TIME$
50 POSITION 2,0
60 PRINT TIME$
70 GOTO 30
```

Do not be alarmed if the time/date display line seems to stop while running this program. This is because both the TDLINE and the ZHAND routines try to use the SpartaDOS time/date vectors and priority is given to ZHAND rather than the interrupt display handling. If using the 'RTIME8' handler under Atari DOS or SpartaDOS 2.3 and earlier versions, there is no conflict.

## CHAPTER 6—USING THE SUPRA HARD DISK INTERFACE WITH SPARTADOS

Supra Corp. (formerly MPP) has released a parallel interface for hard disk drives (winchester type). As previously promised, SpartaDOS is ready to be the DOS of choice for hard disk use. If you already have a Supra Hard Disk System up and running under another DOS, then skip the section on formatting and proceed to the section entitled "Configuring for SpartaDOS". If you are starting from scratch, then please read on.

### Formatting the Hard Disk

The hard disk system stores important information about the type of hard drive being used on the first track of the disk. This information is written when the disk is formatted by the FORMWIN program. When the computer is powered-up, the interface tries to read this information. If the information is not present (your drive has not been formatted before), the interface assumes that the hard disk is not usable and **turns the computer system back to normal (without a hard disk)!** Thus, there are two methods to format the hard disk, depending on: 1) if the disk has already been formatted by FORMWIN (go to the "Configuring for SpartaDOS" section), or 2) not (read on).

The first time the hard disk system is powered-up the hard disk is totally blank. Since the drive information is not present, the interface will disable the hard disk and attempt to boot off of floppy drive 1. (You must have a floppy drive set up as drive 1.)

If this is **not** the first time (and the first track has not been trashed), the hard disk interface will attempt to boot from the 'fake' floppy on the hard disk drive. If the system still needs to be booted from the floppy disk (set up as drive 2), **hold down the <HELP> key while powering up the computer.** This will allow the system to recognize the hard disk drive, but still **boot from floppy disk drive 2.**

Before powering-up the computer system, make sure there is a correct floppy disk drive attached and configured for drive 1 or drive 2 as per the information in the preceding paragraph. Turn on the hard disk sub-system and wait for it to come up to speed. Insert the SpartaDOS 3.2 master diskette into the correct disk drive. Remove all cartridges and hold down the <OPTION> key to disable BASIC. Turn the computer on (**hold down the <HELP> key also if this is not the first time the system has been powered-up**). If everything is correctly connected and turned on, the computer should boot from the floppy.

The first step in setting up the hard disk system is to format the hard disk. Use the external command 'FORMWIN' (just type 'FORMWIN <return>'). This program will ask for drive number 0 or 1; type '0 <return>'. The next prompt will ask for drive type (0 through 8). Choose the drive type number from the following table that corresponds to the type of hard disk attached to the hard disk system.

Number	Size	Type	Specifications
0	5 Meg	ST-506	153 Cyl / 4 Hds
1	5 Meg	TM-501/ST-706	320 Cyl / 2 Hds
2	10 Meg	TM-502/ST-712	320 Cyl / 4 Hds
3	10 Meg	ST-506	230 Cyl / 6 Hds
4	11 Meg	TM-503	306 Cyl / 6 Hds

(Select '2' if you have a Supra Corp. Hard Disk System.)

The format program will warn you that **all data on the hard disk will be lost**; answer 'Y <return>'. The hard disk will be formatted and then verified for bad tracks. This process will take from 10 to 20 minutes.

When the format program is finished, **turn only the computer OFF**. Now attach a floppy disk drive configured as drive 2 and re-boot the computer while holding the <HELP> and <OPTION> keys down. Now you must configure the hard disk for SpartaDOS.

## Configuring for SpartaDOS

First, use the XINIT command to initialize drive 1 and write SpartaDOS 3.2 to it (the 'fake' floppy.) (**You should first type 'D2: <return>' and then 'XINIT <return>' since the floppy is in drive 2.**) You should initialize the drive 1 portion of the hard disk as a 40 track, single-sided, double-density drive. Answer 'N' to US sector skew.

Next use the HDINIT command (**type 'HDINIT <return>'**) to initialize drive 3 (the large portion of the hard disk). All that is required is a volume name and the drive number (3). Drive 4 will be initialized if you are using a second hard disk drive connected to your XEBEC controller board.

Now the hard disk is totally configured and you should never have to initialize it again. Now re-boot the computer (do not hold down the <HELP> key, simply watch the speed as the DOS loads in).

## Using the Hard Disk

The hard disk sub-system (the physical drive unit) is the only sensitive part of a hard disk system. When the hard disk sub-system is running it should never be moved or bumped. The heads in the hard disk are extremely close to the surface of the hard disk and any movement may cause the heads to hit the media surface causing a literal head crash.

The hard disk system should be turned on in a specific sequence. First turn on the hard disk sub-system and wait for it to come up to speed (the motor sound should be steady). If the computer is turned on before the hard disk is ready, the computer will either try to boot off the floppy drive 1 or give 'BOOT ERROR'. To boot the computer from a floppy disk, put the diskette into disk drive 2 and hold down the <HELP> key while turning the computer on.

The following is a description of the utility programs by Supra Corporation for use with the hard disk.

- FORMWIN This program formats and verifies the whole hard disk.
- LOCK1 This program write-protects the 'fake' floppy drive.
- OPEN1 This program un-write-protects the 'fake' floppy drive.
- LOCK34 This program write-protects hard disk drives 3 and 4.
- OPEN34 This program un-write-protects hard disk drives 3 and 4.
- ADDLF This program adds line-feeds to all carriage returns that are issued to the parallel printer port on the interface.
- RMVLF This program stops the adding of line feeds to carriage returns issued to the parallel printer port.
- PARK This program positions the heads at the innermost track. (A good practice before moving the hard disk system.)

### Some Notes About SpartaDOS

You may also use the SpartaDOS commands: LOCK, UNLOCK, PROTECT, and UNPROTECT, to prevent accidental erasure of your files on the hard disk system. The BYPASS command from SpartaDOS allows the use of a floppy as drive 1. SpartaDOS will support 128 files per directory with an unlimited number of directories, and up to 16 megabytes as one drive. Use and enjoy.