

## HARD DISK SETUP for MODEL 4 80/64

RIGID (HARD) DISK DRIVER for MODEL 4/4P and TANDY (RADIO SHACK) DRIVE.

You should have the following six files on the DRIVER DISK:

1. FLOPPY/CMD
2. T4FBOOT/CIM
3. T4IBOOT/CMD
4. T4INIT/CMD
5. T4RBOOT/CIM
6. T4RDIO/CIM

FLOPPY/CMD is used to place the modified T4FBOOT/CIM (T4 -> Tandy MODEL 4, FBOOT -> Floppy Bootstrap) file onto a floppy data diskette to boot the rigid drive.

T4FBOOT/CIM is modified by SYSGEN when you are setting up the initial rigid system drive. During the setup procedure, when you are asked to input the xxFBOOT/CIM file, key in T4FBOOT/CIM.

T4IBOOT/CMD is also modified by SYSGEN. T4IBOOT/CMD is used to boot the rigid drive from a floppy system or an alien DOS system. For example, if you have divided your rigid drive with TRSDOS having part of the total volume and MULTIDOS having the balance, you should place T4IBOOT/CMD on one of the TRSDOS' volumes. When you are using TRSDOS and want to come up to MULTIDOS, simply key in T4IBOOT<ENTER> and you're there.

T4INIT/CMD is required to communicate with the rigid drive during SYSGEN setup. T4INIT/CMD requires the LOGICAL drive number of the rigid drive during setup. Once the rigid drive is setup, the rigid drive becomes LOGICAL drive zero. However, during setup the rigid drive cannot be LOGICAL drive zero. T4INIT/CMD is executed after you have the configuration set for the rigid drive, and before you SYSGEN the system information onto the rigid drive.

T4RBOOT/CIM is modified then placed onto the rigid drive's cylinder zero, sector one during setup. The copy on the rigid drive has Drive Control Table, DCT, information and the directory cylinder on relative byte two. If, for some reason (typically via ZAP/CMD), you overwrite cylinder zero, sector one do not copy T4RBOOT/CIM to this sector believing you have properly patched the rigid drive's boot sector. On the other hand, you can copy cylinder zero, sector one to T4RBOOT/CIM, thus having a viable backup copy of your rigid disk boot sector. Overwriting T4RBOOT/CIM this way does not inhibit you from setting up your rigid drive differently. SYSGEN will overwrite the DCT and directory cylinder data each time you use SYSGEN to setup a rigid disk. This is also true for T4FBOOT/CIM and T4IBOOT/CMD.

T4RDIO/CIM is the actual rigid disk I/O code. T4RDIO/CIM is also modified by SYSGEN and is placed on relative sector 25 of the rigid disk.

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### PHYSICAL DRIVE (zero to seven)

MULTIDOS can handle eight rigid drives at once, but only four floppies. You can have six rigid drives and two floppies, or any combination of rigid and floppies up to eight with a maximum of four floppies. The CONFIG Library command is used to assign physical drives to a logical drive. Please read the section covering CONFIG in your manual. The actual PHYSICAL number of the floppies is determined by the location on the drive cable (typical of RADIO SHACK configuration). The first rigid disk you connect to your computer is PHYSICAL drive zero. Yes ZERO! You can have up to two PHYSICAL drive zeros, two PHYSICAL drive ones, two PHYSICAL drive twos, and two PHYSICAL drive threes. The DCT will know if it's a floppy or rigid drive.

### LOGICAL DRIVE (zero to seven)

The logical drive is the drive number we use to access a particular file. e.g., MYFILE:4, the logical drive is four (4). The physical drive can be zero, one, two, three, four, five, six, or seven if it's a rigid drive. Or the physical drive can be zero, one, two, or three if it's a floppy drive. When you begin to setup the rigid system, logical drive zero contains the MULTIDOS system diskette. The rigid's LOGICAL drive may be from one to seven. And the rigid's PHYSICAL drive is ZERO!

### DRIVE PARTITIONING

Before you setup the rigid drive's configuration, you must decide if and how you want the drive partitioned. Partitioning is having more than one LOGICAL drive assigned to one PHYSICAL drive. MULTIDOS has the capability to handle a single 5", 13+ megabyte PHYSICAL drive as one LOGICAL drive. Although there is no drive made to exactly match MULTIDOS' capability, you can have a 5", 192 cylinder, four platter (12,582,912 bytes) physical drive as one logical drive.

There are physical limitations in using the established directory format established by Randy Cook for the TRS-80. Without completely rewriting the directory routines, consuming a lot of resident memory, and all file access system overlays, rendering MULTIDOS completely incompatible with commercial software accessing the directory directly, the limit of 204 cylinders is the maximum for a single LOGICAL drive.

If you rigid drive has less than 205 cylinders, you can have the configuration set for one LOGICAL drive. This should be considered only if you are going to have more than one rigid drive. If you are not going to have more than two rigid drives, then you should partition the PHYSICAL drive into two or more LOGICAL drives.

MULTIDOS has two methods to partition a rigid disk. The first method is head/cylinder-offset (head offset), and the second method is cylinder offset. The difference is head offset can have fewer sectors per granule than cylinder-offset making a more efficient use of the rigid disk space. Although cylinder-offset is faster, the speed advantage is not perceivable.

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### TYPICAL PARTITIONING (RADIO SHACK 5 meg rigid drive)

This drive has 153 cylinders, and two platters.

The LDOS/TRSDOS configuration is head offset with 16 sectors per granule and two granules per cylinder. This configuration is required to accommodate four 5 meg drives (each being one logical drive).

Typical SYSGEN menu for TRSDOS 6.xx compatibility.

The configuration for the destination disk is:

Logical drive = 3, Left arrow = previous choice.  
Physical drive = 0, Right arrow = next choice.  
<ENTER> when configuration is set.  
Media = RIGID, <---  
Type = (not applicable),  
Number of sides = 1,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 16,  
Granules per cylinder = 2,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 153.

If you are not going to have four 5 meg drives, then consider the following alternate partitionings. Typically the directory cylinder is the number of cylinders divided by two. e.g., CYL=153, DIR CYL=76 and CYL=76, DIR CYL=38.

Two logical drives.

CYLINDER OFFSET                      Directory Cylinder = 38  
FIRST LOGICAL:  
Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 0, Number of cylinders = 76

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 3, Left arrow = previous choice.  
Physical drive = 0, Right arrow = next choice.  
<ENTER> when configuration is set.  
Media = RIGID, <---  
Type = (not applicable),  
Number of sides = 4,  
Step code = 0,  
Directory cylinder = 38,  
Sectors per granule = 16,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 76.

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## **SECOND LOGICAL:**

Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 76, Head offset = 0, Number of cylinders = 76

## FIRST LOGICAL:

Sides = 2, Sectors/Gran = 8, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 0, Number of cylinders = 153.

#### Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 3, Left arrow = previous choice.  
Physical drive = 0, Right arrow = next choice.  
<ENTER> when configuration is set.

```
Media = RIGID,      <--  
Type = (not applicable),  
Number of sides = 2,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 8,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 153.
```

## SECOND LOGICAL:

Sides = 2, Sectors/Gran = 8, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 2, Number of cylinders = 153.

### Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 4, Left arrow = previous choice.  
Physical drive = 0, Right arrow = next choice.  
<ENTER> when configuration is set.

Media = RIGID, <--  
Type = (not applicable),  
Number of sides = 2,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 8,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 2,  
Number of cylinders = 153.

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Three logical drives

CYLINDER OFFSET                      Directory Cylinder = 25  
FIRST LOGICAL:  
Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 0, Number of cylinders = 51.

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 3,                      Left arrow = previous choice.  
Physical drive = 0,                      Right arrow = next choice.  
    <ENTER> when configuration is set.  
Media = RIGID,                        <---  
Type = (not applicable),  
Number of sides = 4,  
Step code = 0,  
Directory cylinder = 25,  
Sectors per granule = 16,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 51.

SECOND LOGICAL:

Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 51, Head offset = 0, Number of cylinders = 51.

THIRD LOGICAL:

Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 102, Head offset = 0, Number of cylinders = 51.

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 5,                      Left arrow = previous choice.  
Physical drive = 0,                      Right arrow = next choice.  
    <ENTER> when configuration is set.  
Media = RIGID,                        <---  
Type = (not applicable),  
Number of sides = 4,  
Step code = 0,  
Directory cylinder = 25,  
Sectors per granule = 16,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 102,  
Head offset = 0,  
Number of cylinders = 51.

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Head offset is not possible for this rigid drive when it is partitioned into three logical drives. Note the number of Sectors/Gran is 16 for both two and three logical drive cylinder-offset partitioning. You will also see that the number of Sectors/Gran is 16 for cylinder-offset partitioning into four logical drives.

### Four logical drives

CYLINDER OFFSET                              Directory Cylinder = 19  
FIRST LOGICAL:  
Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 0, Number of cylinders = 38.

### Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 3,                          Left arrow = previous choice.  
Physical drive = 0,                          Right arrow = next choice.  
    <ENTER> when configuration is set.  
Media = RIGID,                                <-->  
Type = (not applicable),  
Number of sides = 4,  
Step code = 0,  
Directory cylinder = 19,  
Sectors per granule = 16,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 38.

### SECOND LOGICAL:

Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 38, Head offset = 0, Number of cylinders = 38.

### THIRD LOGICAL:

Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 76, Head offset = 0, Number of cylinders = 38.

### FORTH LOGICAL:

Sides = 4, Sectors/Gran = 16, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 114, Head offset = 0, Number of cylinders = 39.

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HEAD OFFSET    Directory Cylinder = 76  
FIRST LOGICAL:  
Sides = 1, Sectors/Gran = 4, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 0, Number of cylinders = 153.

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 3,                                  Left arrow = previous choice.  
Physical drive = 0,                                  Right arrow = next choice.  
    <ENTER> when configuration is set.  
Media = RIGID,                                        <---  
Type = (not applicable),  
Number of sides = 1,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 4,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 153.

### SECOND LOGICAL:

Sides = 1, Sectors/Gran = 4, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 1, Number of cylinders = 153.

### THIRD LOGICAL:

Sides = 1, Sectors/Gran = 4, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 2, Number of cylinders = 153.

### FORTH LOGICAL:

Sides = 1, Sectors/Gran = 4, Grans/Cyl = 8, Directory file size = 30,  
Cylinder offset = 0, Head offset = 3, Number of cylinders = 153.

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 6,                                  Left arrow = previous choice.  
Physical drive = 0,                                  Right arrow = next choice.  
    <ENTER> when configuration is set.  
Media = RIGID,                                        <---  
Type = (not applicable),  
Number of sides = 1,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 4,  
Granules per cylinder = 8,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 3,  
Number of cylinders = 153.

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A less efficient head offset configuration, but necessary if planning to add an additional 5 meg drive.

### FIRST LOGICAL:

Sides = 1, Sectors/Gran = 8, Grans/Cyl = 4, Directory file size = 30,  
Cylinder offset = 0, Head offset = 0, Number of cylinders = 153.

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 3, Left arrow = previous choice.  
Physical drive = 0, Right arrow = next choice.  
<ENTER> when configuration is set.  
Media = RIGID, <---  
Type = (not applicable),  
Number of sides = 1,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 8,  
Granules per cylinder = 4,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 0,  
Number of cylinders = 153.

### SECOND LOGICAL:

Sides = 1, Sectors/Gran = 8, Grans/Cyl = 4, Directory file size = 30,  
Cylinder offset = 0, Head offset = 1, Number of cylinders = 153.

### THIRD LOGICAL:

Sides = 1, Sectors/Gran = 8, Grans/Cyl = 4, Directory file size = 30,  
Cylinder offset = 0, Head offset = 2, Number of cylinders = 153.

Typical SYSGEN menu:

The configuration for the destination disk is:

Logical drive = 5, Left arrow = previous choice.  
Physical drive = 0, Right arrow = next choice.  
<ENTER> when configuration is set.  
Media = RIGID, <---  
Type = (not applicable),  
Number of sides = 1,  
Step code = 0,  
Directory cylinder = 76,  
Sectors per granule = 8,  
Granules per cylinder = 4,  
Directory file size = 30,  
Cylinder offset = 0,  
Head offset = 2,  
Number of cylinders = 153.

### FORTH LOGICAL:

Sides = 1, Sectors/Gran = 8, Grans/Cyl = 4, Directory file size = 30,  
Cylinder offset = 0, Head offset = 3, Number of cylinders = 153.

## HARD DISK SETUP for MODEL 4 80/64

For head offset partitioning this rigid drive into two volumes, the product of Sectors/Gran and Grans/Cyl is 64. Because the maximum number of granules per cylinder is eight, you cannot have the configuration set to 4 Sectors/Gran and 16 Grans/Cyl. However, you can have a configuration of 16 Sectors/Gran and 4 Grans/Cyl, or 32 Sectors/Gran and 2 Grans/Cyl. For head offset partitioning this rigid drive into four volumes, the product of Sectors/Gran and Grans/Cyl is 32. Because the maximum number of granules per cylinder is eight, you cannot have the configuration set to 2 Sectors/Gran and 16 Grans/Cyl. However, you can have a configuration of 16 Sectors/Gran and 2 Grans/Cyl, or 32 Sectors/Gran and 1 Grans/Cyl.

### SYSGEN

Key SYSGEN<ENTER>. When you receive the first prompt:

Which drive contains the source SYSTEM disk (0-7)? .

press the "\*" key. This puts SYSGEN into its configuration mode. The next prompt will be:

Which drive for the Drive Control Table setup (0-7)? .

Enter the LOGICAL, not physical, drive the rigid disk will be addressed as. Typically, if you have four floppies use 4, if you only have two floppies use 2. You may use any number between 1 and 7. If you pressed the wrong key, press <\*> again.

You will now receive the configuration menu. Disregard the Physical drive at this time. Now setup the configuration as determined by the partitioning you desire. Use the up and down arrows keys to select the item to modify, and the right and left arrow keys to change the parameters. The easiest way to setup is set the Media to RIGID then immediately modify the Number of Cylinders. After the Number of cylinders is set, you can now set the directory cylinder to a number greater than one but less than the number of cylinders. Press <ENTER> after you have the desired configuration set.

If the parameters were acceptable, enter ZERO as the PHYSICAL drive for the rigid disk. Press <ENTER> to the query

Do you want the DCT locked (N/Y)? .

Press <BREAK> to the query

Which drive for the Drive Control Table setup (0-7)? .

You have now set the configuration of the rigid drive. Although the logical drive is not zero. SYSGEN will modify the DCT for the rigid disk to set the logical drive to zero.

## HARD DISK SETUP for MODEL 4 80/64

Execute the file T4INIT/CMD by keying

T4INIT/CMD :d<ENTER>

where d is the LOGICAL drive previously entered.

Again key in SYSGEN<ENTER>. When you receive the first prompt, enter the LOGICAL drive a COMPLETE MULTIDOS SYSTEM diskette is mounted in. (This does not necessarily have to be logical drive zero).

For the destination, enter the LOGICAL drive previously entered for the configuration setup. When you receive the configuration menu this time the Physical drive = 0 should be displayed. Review the data, if correct, press <ENTER>. If the data is not correct, correct the data, then press <ENTER>.

Enter PHYSICAL drive ZERO [again], and press <ENTER> when you receive the DCT lock query. When the prompt

Press <ENTER> when the destination disk is in drive d

Press <ENTER> if the data was correct, or press <BREAK> if you had to correct the DCT configuration. If the DCT data had to be corrected, you will have to execute the file T4INIT/CMD again, then SYSGEN again.

SYSGEN will copy all /SYS, /EXT, /DOL, and /BOL file to the rigid drive.

Use VFU/CMD to copy the balance of the MULTIDOS files.

VFU<ENTER>

Choice C

Condition (A/C/D/E/O/S)? C

Press "S" for selective, or "T" for total T {"S" is ok here also}

Include "INVISIBLE" files? Y

Include "SYSTEM" files? N

Source drive? O Destination Drive d {the LOGICAL for the rigid disk}

## FLOPPY

The modified version of the file T4FBOOT/CIM must be available on a mounted disk. Place a formatted data, NOT A SYSTEM, diskette into one of your floppy drives, then execute the command:

FLOPPY :d<ENTER>

d = the logical drive the data diskette is mounted in.

You will be prompted to enter the xxFBOOT/CIM file. Key in T4FBOOT/CIM then press <ENTER>. This command places a modified bootstrap sector onto cylinder zero sector one of the floppy data diskette. You can use this data diskette in floppy drive zero to boot the MULTIDOS rigid system.

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