**** SPLITHD ****

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This product allows you to divide your hard disk storage device, either 8 Meg or 12 Meg unit, between TRSDOS 4.2 and XENIX. Once XENIX and TRSDOS have been installed on your hard disk with this product, you will be given the option of running either TRSDOS or XENIX each time you reset your system. Secondary hard disks can also be divided if desired. The procedure for splitting a secondary is provided separately. This procedure applies to the splitting of the primary hard disk, drive number 4.

This process requires 4 steps as outlined below:

1. Determination of percentage to be devoted to XENIX. This decision is aided by a program that calculates the impact of different percentages.

2. Formatting of Hard Disk unit under TRSDOS. If drive 4 is being formatted, then TRSDOS is also installed during this step.

3. XENIX installation. From step 2, you will be informed of the number of cylinders to use for the XENIX installation. Be sure and write down that number before installing XENIX.

4. Re-initialization of TRSDOS on the hard disk. Once this step is completed, resetting the system will give you the option of running either TRSDOS or XENIX .

INSTALLING TRSDOS 4.2

1. You first must reset (or boot) your system from the provided SPLITHD system disk. To get the system to reset from the floppy disk rather than the Hard Disk requires that you press the <ESC> key several times (rapidly) during the reset process. One individual has referred to this process as "Whacking on the <ESC> key!". In any case, flip the RESET switch and immediately "WHACK" on the <ESC> key until you can see activity on floppy drive # 0. Answer the date and time questions to get to the TRSDOS READY prompt. *** * * W A R N I N G * * *: DON'T OVER-"WHACK" ON THE <ESC> KEY. STOP WHEN YOU SEE FLOPPY DRIVE 0 ACTIVATE.** There is an error in the boot rom that dumps excess <ESC>'s into low memory which destroys the operating system.

2. Start the split process by typing in the command:

   SPLITHD and press the <enter> key

3. You will be asked for the number of heads to be found on your hard disk unit. For 8 Meg drives, the answer is 4. For 12 Meg drives, the answer is 6. Be sure and press the <ENTER> key after typing in your answer. You can also chain in the Mod III/4 five Meg drives as secondaries. If you've done this, use 4 for number of heads and 153 for number of cylinders. One person has found that the 5 Meg units can be dedicated to the SWAP space with significant speed up in performance.

4. You will now be asked for the number of cylinders. For 8 Meg units, answer 256 and for 12 Meg units, answer 230 (use 153 for 5 Meg units). Press <ENTER> after typing in the correct answer.

5. "What percentage do you wish to allocate to XENIX?" is the next question. At least 10 or more cylinders must be dedicated to XENIX. You might try 50% as an initial number.

6. You will now see the computed affects of your selection and the option to either Quit, Recalculate, or Proceed with the split process. Reply with either a Q, R or P and press <ENTER>.

7. Once you decide to proceed, you will be asked which drive is to be formatted. You should reply with either 4,5,6, or 7. Since you are splitting the primary, you should reply with a 4 and press the <ENTER> key.

8. You'll be asked if you wish to suppress the alternate directory or not. The reply here is either Y or N and press <ENTER>.

   Suppressing the alternate directory can result in faster operation of the system under TRSDOS but does leave you slightly more vulnerable to data loss should the primary directory to your files be destroyed. You can still SAVE your files with the primary directory clobbered and the alternate directory intact.

9. You will be given the option of supplying a different number for directory size. The default is 336; ie 336 files stored on your hard disk at one time. If you have lots of files, you may want to use a larger number. Simply pressing <ENTER> will cause the system to use the default value.

10. You will be given the option of supplying a different interleaving factor (See ILV parameter of FORMAT for more information). The default is 10. Press <ENTER> if you do not wish to change the interleaving factor. For 8 Meg drives, the optimal interleave factor has been found to be 16.

11. Finally, you will be given one last chance to abort the process. If you reply P for proceed at this point, formatting of the hard disk unit will begin. *** **WARNING** *** Once formatting begins, all data previously on the hard disk unit will be lost. Be sure you SAVE your files before beginning this process. Two SAVE's is not a bad idea if the data is particularly critical.

At the end of the formatting process, you will see a message concerning the number of cylinders to specify for the XENIX format. Be sure and write this number down. If you incorrectly specify this number when doing the XENIX format, loss of TRSDOS data can result.

If you are splitting secondary drives as well, you should now repeat the previous steps beginning with the SPLITHD command. Do this for each secondary you wish to split. Be sure and enter the proper drive number. in step 7.

Now you can do your XENIX installation. Some notes have been provided on how to make good use of a secondary hard disk with XENIX. You should read this material. When doing any systems activities such as this procedure be sure and operate as the "root" user. You should be logged into XENIX as "root".

*** * * * * I M P O R T A N T * * * * ***: The first step of installing XENIX uses a program called "diskutil" to format your hard disk. The installation procedure talks about the **"MEDIA ERROR MAP"** located in the plastic envelope on the underside of your hard disk drive. In addition to the information supplied there, you must also tell XENIX that tracks 2 and 3 are flawed. This is to protect the TRSDOS information on your hard disk. XENIX will lock out a total of 24 tracks regardless of how many tracks you indicate are flawed and those are counted as part of the 24 total. Thus, you will not lose any space as a result of this procedure unless more than 24 tracks are indicated as flawed.

When diskutil asks for your flawed track list, **be sure** and start with the following responses before typing in the media error map information:

0,2 and press the <enter> key
0,3 and press the <enter> key

Failure to do this above step will result in the destruction of necessary TRSDOS Boot information and will cause TRSDOS to fail to boot

XENIX format any secondaries using diskutil before you continue with the XENIX installation. You needn't lock out tracks 2 and 3 of secondaries as you must do with the primary.

Once XENIX has been installed and before you shut down XENIX for the last TRSDOS step, it is necessary to transfer some files from the SPLITHD system disk (be sure you are logged in as "root"). If you need to upgrade your XENIX system to a newer version, you should do so now before preceeding. The initial release of XENIX was 1.1.0. The development system installs 1.2.0 and Radio Shack can provide you with the 1.2.0 upgrade if you do not have the development system. Upgrades of XENIX will sometimes destroy the TRSDOS information. Don't dispair, simply repeat the **. bootdo4** command to get it back.

1. Load your SPLITHD system disk into drive 0.

2. Type the XENIX commands (UPPER/lower case is important as shown):

   tx -a BOOT* . :0 and press the <enter> key
   . bootdo4 and press the <enter> key

3. For each secondary drive do the command

   . bootdoN and press the <enter> key where "N" is 5,6, or 7

   ie; **. bootdo5** or **. bootdo6** etc.

4. Now shut down the XENIX system. The "shutdown" command is a better practice but you can use the following for now.

sync;haltsys and press the <enter> key

Now you can finish the SPLITHD process. This will require booting the system from the SPLITHDdisk again. Once you get to TRSDOS ready, type the command:

DO LASTSTEP and press the <enter> key

Now, whenever you reset your system you will be given the option of selecting TRSDOS or XENIX as your operating system. From the first reset screen, simply type a <T> for TRSDOS or an <X> for XENIX. ENJOY!!!!!!!

POSSIBLE PROBLEMS:

If TRSDOS should fail to boot properly for any reason, you should try the reset again. If you have repeated failures then try the following recovery procedure:

1. Boot the XENIX system. If it will not come up, you probably have a hardware problem. A "BOOT ERROR H0" is often the result of a problem with the boot rom in your computer. Simply resetting again will probably clear the problem. Check with your computer center for a new rom and have your system fixed when it is available.

2. Once you are logged in as the root, type the command:

   . **bootdo4** and press the <enter> key

After bringing down XENIX you should be able to get TRSDOS to boot. This problem may be the result of your not locking out tracks 2 and 3 as previously mentioned. The TRSDOS information could have also been destroyed by the installation of a newer version of XENIX.

Another problem you may encounter, envolves the failure of XENIX to come up. after pressing the <X> key. You may notice that the 64K RAM message does not preceed the first XENIX screen. In some cases this problem actually locks up the machine to the extent that the reset button becomes disabled. In such a case, simply power down your system, **wait 10 seconds** and then power it back up. This is a bug in Radio Shack's own boot routine for which a patch is being developed.

One final problem which you may encounter during installation envolves the over-"whacking" of the <ESC> key when resetting the system from floppy. Stop whacking as soon as you see activity on floppy drive 0. **DON'T** use the <REPEAT> key with the <ESC> key.

XENIX/TRSDOS SPACE REQUIREMENTS

TRSDOS, without user files or programs, requires 204,028 characters of diskette space. Data and program files require additional space above this amount. If you are currently using TRSDOS on the hard disk, you can use the FREE command to determine how much space is available on the hard disk unit. The free space is given in terms of free sectors, each sector having 256 bytes. By multiplying the number of sectors available by 256 and then subtracting from the total available on the drive, you can get a good idea of what your TRSDOS space requirements might be. Always leave some room for expansion.

The "core" XENIX system, without user files and programs, requires about 1,400,000 bytes of space for its system files and about 1,100,000 bytes for temporary "swap area" (Swap area is addressed in another section of this documentation). In addition, 226,304 bytes are locked out for a boot track, for a diagnostics track, and for 24 arbitrary tracks (26 tracks total equalling 226,304 bytes). In total therefore, the core XENIX package will require about 2,726,304 bytes of disk space.
The current set of available XENIX products from Radio Shack require space as shown below:

-- PKG NAME --------	BLOCKS	BYTES
SOFTWARE DEVEL.TOOLS	4045	2,071,040
TEXT PROCESSING	1762	902,144
MANUAL PAGES	1555	796,160
GAMES	443	226,816
COMMUNICATIONS	342	175,104
LEARN PACKAGE	1280	655,360
MBASIC	197	100,864
MULTIPLAN	268	137,216
Total	9892	5,064,704

All of the packages listed above, except the last two, are included in the development package. The other two, MSBASIC and MULTIPLAN, are sold separately.

If all of the packages are installed, they will occupy a total of 7,791,008 bytes of disk space, including the space for the "core" system. If you use 75% of a 12 meg drive for XENIX, the total theoretical space available is 8,982,528 bytes which will leave 1,191,520 bytes for user files. Please accept a warning however. These numbers have been taken from the first edition of documentation related to the XENIX products. As things change, these numbers could change as well.

Since each package can be installed separately from the others, you can reduce the XENIX space requirements. Another option uses another hard drive for additional XENIX space.

SPLITTING SECONDARY HARD DISKS

Again, you must begin the process by resetting the system from the SPLITHD system floppy disk. Optionally, you may do steps 1 and 2 below after you TRSDOS format your primary unit and before you go to the XENIX format step. This will reduce the number of times you have to reset your system.

1. Type the command **SPLITHD** and press <ENTER>.

2. Answer all the questions as before except you will specify a hard disk drive number other than 4; ie 5, 6, or 7. Be sure and record the number of cylinders for XENIX.

3. After the formatting of the hard disk secondary has been completed, reset the system and select XENIX by pressing the <X> key. At the XENIX prompt, type the name **diskutil** and press the <ENTER> key. Use the number of cylinders specified by step 2. You do not need to lock out tracks 0,2 and 0,3 as you did when you split the primary hard disk.

4. Once the diskutil format has been completed, again reset the system and bring up XENIX and "login" as "root". Have the SPLITHD system disk in drive 0 and type the following commands:

   *** * * where you see "N" in the command, type the drive number (5, 6 or 7); that is bootdoN must be typed as bootdo5 or bootdo6 or bootdo7**

   - **bootdoN** and press the <ENTER> key

   If you are doing this in conjunction with the splitting of the primary, be sure and do the **tx *BOOT . :0** command **prior** to the above command.

   DON'T do this command to secondaries you totally devote to TRSDOS. You will be unable to read data from the disk if you do.

5. You are now done except for defining the secondary to XENIX as discussed below. You do not need to return to TRSDOS for the LASTSTEP as you did when you split the primary hard disk.

To use a secondary hard disk unit with XENIX, do the following steps:

1. Format the secondary hard disk unit with diskutil. This will have already been done if you split the secondary as discussed in the previous procedure.

2. It is assumed that you've already installed the core system, or more on the primary hard drive. This process will move all required modules from the primary to the secondary.

3. Bring up XENIX and login as the root so you can do maintenance.

4. Now do the following commands: (Press the <ENTER> key after each command)

   You must calculate the number of blocks envolved before you can issue the **mkfs** command shown below. Where "N" is shown, type in the number you compute by: (((HDS * CYL) - 26) * 17). This uses the numbers you gave to **diskutil** for heads and cylinders. Take number of heads times number of cylinders. Subtract from that result 26 and then multiply that result by 17. For an unsplit 12 Meg drive, the result should be 23018 (6 heads and 230 cylinders). For an unsplit 8 Meg drive, 16966.

   mkfs /dev/rhd1 N 1 17 to make the file system on the secondary drive.

   mount /dev/hd1 /mnt to mount your secondary unit for XENIX to recognize and use it properly

copy -lomrv /usr /mnt	to copy all /usr based files to the secondary hard disk
rm -r /usr	deletes all /usr based files that are on the primary hard drive
mkdir /usr	creates the linkage from the primary directory, on the primary drive. To the /usr directory we've copied to the secondary drive. The last mount command then activates the /usr on the secondary drive
umount /dev/hd1	temporarily removes the secondary drive from the system so we can bring it back as /usr via the next command
mount /dev/hd1 /usr	puts us in business for the secondary

5. To make sure your come up properly upon resetting the system, it is necessary to change the file **/etc/rc** to automatically do the proper mount for the /usr directory during startup.

   Immediately after the line reading

   > /etc/mtab add the following lines

```
if /etc/mount /dev/hd1 /usr
then echo 'hd1 is OK' > /dev/console 2>&1
else fsck -y /dev/hd1 > /dev/console ; /etc/haltsys > /dev/console
fi
```

Memo to users of 512k memory boards.

1) Setting of DIP switch positions:
There are four valid settings of these switches:

2 only	Board is addressed at 000000
2, 3	Board is addressed at 040000
2, 5	Board is addressed at 080000
2, 3, 5	Board is addressed at 0c0000

For 512k memory boards, only two of the above are acceptable, 000000 and 080000. If you have only one 512k memory board, set it for 000000. If you have two 512k boards, set one at 000000 and one at 080000. If you have one 512k board, and one 256k board, set the 512k board at 000000, and the 256k board at 080000. If you have one 512k board and two 256k boards, you may EITHER set the 512k board at 000000, one 256k board at 080000, and one 256k board at 0c0000, or set one 256k board at 000000, one at 040000, and the 512k board at 080000.

2) Fitting the board into your card cage:
If you have a 16b (or upgraded 12), just slide the board into any convenient slot, and connect the cables.
If you have a 16a (or upgraded II), the cage is VERY TIGHT on clearance. Use a thin cardboard separator between boards to prevent shorts from the component side of the memory board(s) to the trace side of the adjacent board.

3) Reliablity of the board:
Because we have enabled parity checking on the entire 512k of RAM, if any error occurs in the memory, you will be notified immediately by a XENIX message 'panic: memory parity'. This is much better than finding out LATER that bad memory has caused garbage to be put in your files.

4) Our limited warranty:
For ninety days following the purchase of this board, SNAPP warrants it to be free of defects in materials and workmanship. Should a defect be discovered within this period, the customer must return the board to SNAPP, who will repair or replace the board at its option. Annual service contracts are available, and post-warranty service will be provided upon request.

5) Potential heat problems:
We have become aware that a 16b (or upgraded 12) has a problem with air circulation in the card cage, which tends to cause many problems. The problem is most likely to occur when more than four boards are mounted, but could occur even with only four boards. The problem is NOT specific to our memory boards, but can easily occur, for example in a 512k system with all Tandy parts. We understand that Tandy is busy working on a retrofit fix of some type, perhaps a more powerful fan or additional vent holes, or a combination thereof. We speculate that such retrofit fixes will be provided at low (or no) cost to existing customers. In the meantime, if you experience problems (including panic: memory parity), we suggest that you do one of the following: a) remove the back panel, and position a small fan so as to blow air INTO the card cage, or b) have a circular hole cut into the back panel, and mount thereon a muffin fan so as to blow air OUT of the card cage.