

Model 4 / 4D / 4P Products From M.A.D. Software

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HBUILD6 - Boot your Model 4P, 4 or 4D directly from your Hard Disk

HBUILD6 allows the Model 4, 4D or 4P owner with a hard disk drive to boot directly into LS-DOS 6.3.x or TRSDOS 6 from the hard disk without using a start-up floppy. Completely transparent to the operating system and uses no additional program memory. Certain Model 4P and all Model 4 and 4D systems require a new ROM, which is included. Detailed instructions assist you during the installation which usually takes less than 40 minutes and does not require soldering. HBUILD6 supports hard disk drivers in low or high memory. Also included are utilities to dynamically apply XLR8er accelerator patches (XLR8SET), to position disk drivers in low or high memory (FORCEHI), and to edit command line errors (OOPS). When ordering HBUILD6, use the following chart to determine which part number goes with your system. (The same utilities are provided with all part numbers.)

Disk Driver	Model 4* non-gate-array (includes XROM**)	Model 4* and 4D gate-array (includes XDROM**)	Model 4P all versions (includes disk only)	Model 4P all versions (includes 4P-ROM**)
Radio Shack TRSHD6	4BHB650 \$25.00	4DHB670 \$35.00	4PHB630 \$10.00	4PHB640 \$35.00
Misosys RSHARD6	4BHB652 \$25.00	4DHB672 \$35.00	4PHB632 \$10.00	4PHB642 \$35.00
Misosys MSCSI6	4BHB655 \$25.00	4DHB675 \$35.00	N/A	4PHB645 \$35.00
Powersoft Series RS	4BHB656 \$25.00	4DHB676 \$35.00	4PHB636 \$10.00	4PHB646 \$35.00
*!Powersoft *!Series I	4BHB657 \$25.00	4DHB677 \$35.00	N/A	4PHB647 \$35.00

* To determine if your Model 4 is a gate-array or non-gate-array system, locate the RS232 connector. If it is on the bottom (faces downwards) of the Model 4, the system is a non-gate-array. If the RS232 connector is on the back of the machine, it is a gate-array system. The ROMs required for these systems are not interchangeable.

Note: Model 4's built in 1983 may also require a new "A" ROM to be able to use HBUILD6. To test your machine, boot your system into ROM BASIC (hold down the BREAK key and press RESET.) Once you are in BASIC, type the following statement and a single character will be displayed:

```
PRINT CHR$(PEEK(1490))
```

If the character that was displayed is 'O', then you have the old "A" ROM and must replace it to be able to use HBUILD6. The part number for the latest "A" ROM is listed on the next page.

** The XROM, XDROM and 4P-ROM provide other features in addition to allowing you to boot from a hard disk drive. They are described in detail elsewhere in this catalog.

Requirements:

CPU

Firmware

Model 4/4D/4P systems with a standard Z80A or any superset processor, including the XLR8er adapter.
Model 4 systems with non-gate-array main logic boards must have XROM firmware installed, which is included.
Model 4D or Model 4 systems with gate-array main logic boards must have XDROM firmware installed, which is included.
Model 4P systems with non-Radio Shack hard disk controllers must have new 4P-ROM firmware installed. 4P systems with Radio Shack hard disk controllers do not have to replace the firmware but can if they want to take advantage of the other features the 4P-ROM provides. Use the appropriate part number (see above) to indicate if you desire a 4P-ROM or not. (Look for a detailed description of the 4P-ROM elsewhere in this catalog.)

Floppy Drive

Drive Controller

or

or

A 5.25" SSDD or DSDD floppy drive is used during installation.
A Radio Shack hard disk controller or a programmable equivalent.
A MISOSYS host interface and a Xebec or Adaptec disk controller.
A Western Digital disk controller with the register file located at ports 0x78 - 0x7f. This is compatible with the Powersoft Series I hard disk drivers.

Hard Drive(s)

Configuration

Any drives that are supported by the driver your system uses.
LS-DOS 6.3.x or TRSDOS 6 must be installed and a system drive must start on head 0, cylinder 0 of the primary drive. (Other operating systems that are stored on other parts of the drive or on secondary drives will not be disturbed.)

*! Attention: Powersoft Series I components will be discontinued as of April 1st, 1992. If you intend to obtain any of these products, please order before this date.

XROM - Extended ROM for non-gate-array Model 4 systems

With hard disk driver for Radio Shack WD1000 or TB1 controllers	Specify 4BXR650	\$20.00
With hard disk driver for MISOSYS SCSI Host interface and Adaptec or XEBEC disk controller	Specify 4BXR655	\$20.00
*! With hard disk driver for non-Radio Shack WD1000 controllers that are port-mapped at 0x78 - 0x7f	Specify 4BXR657	\$20.00

XDROM - Extended ROM for gate-array Model 4 and Model 4D systems

With hard disk driver for Radio Shack WD1000 or TB1 controllers	Specify 4DXR670	\$30.00
With hard disk driver for MISOSYS SCSI Host interface and Adaptec or XEBEC disk controller	Specify 4DXR675	\$30.00
With hard disk driver for non-Radio Shack WD1000 controllers that are port-mapped at 0x78 - 0x7f	Specify 4DXR677	\$30.00

The XROM or XDROM improve performance when using any Model III operating system or ROM BASIC. They also allow you to boot directly from a hard disk or Networks III or 4. (This part is included when you order HBUILD6 for the Model 4 or 4D.) These ROMs replace the "C" ROM or "D" ROM in your Model 4 or 4D. Detailed instructions assist you in removing the cover and installing the ROM in your system. Installation takes less than 30 minutes. The new Model III-mode features include:

- The keyboard produces all 128 ASCII characters and handles key-rollover, and performs "debouncing" correctly at 2 and 4 MHz.
- The keyboard repeat rate is adjustable.
- The time-of-day clock keeps correct time even when the system is running at 4 MHz. The cursor also blinks at the same rate regardless of the current CPU speed.
- A fully programmable 6845 CRT controller can be used in place of the 68045.
- All documented calls into the "C" ROM, including those documented by LDOS and Radio Shack produce the same results as in the original part.
- Interrupt-driven software performs more reliably than in the original "C" ROM.

The XROM/XDROM comes with documentation on the new Model III-mode features.

The XDROM includes built-in tests for memory, video, floppy drive, and printer (available via a factory-test hardware strap.)

Requirements:

CPU	Model 4 non-gate-array systems should order "X" ROM. Model 4 or 4D gate-array systems should order "XD" ROM.
Processor	Z80A or a superset processor, including the XLR8er accelerator. *
Floppy Drive	Any Radio Shack-compatible configuration including no drives.
Hard Drive	Any Radio Shack-compatible configuration including no drives.
Software	Operating Systems tested: LDOS 5, TRSDOS 6, LS-DOS 6, CP/M+, NEWDOS, TRSDOS 1.3/1.4.
Firmware	Model 4 owners must make sure that they have the latest "A" ROM, Radio Shack part number 8048364A. **
Hardware	This part is available elsewhere in this catalog. Model 4s built after 1983 and Model 4Ds should have the correct part. The XROM/XDROM may be used with a SmartWatch(TM) clock chip. (Model 4 owners must not have disabled wait-state generation for ROM accesses.)

- * The XLR8er(TM) accelerator is supported provided that it worked with the system prior to the installation of the XROM or XDROM and your system has not been modified to defeat the wait-state generation for ROM accesses.

- ** Model 4's built in 1983 may also require a new "A" ROM to be able to use the "X" ROM. To test your machine, boot your system into ROM BASIC (hold down the BREAK key and press RESET.) Once you are in BASIC, type the following statement and a single character will be displayed:

```
PRINT CHR$(PEEK(1490))
```

If the character that was displayed is 'O', then you have the old "A" ROM and must replace it to be able to use the "X" ROM. The new "A" ROM is listed below.

*!Model 4/4D "A" ROM - 8048364A - Checksum 8F46 Specify 4GR64A0 \$10.00

The latest "A" ROM, used in all Model 4 and 4D systems. Replaces the obsolete 8048364, which was used in early Model 4 production. A 8048364A must be present in a Model 4/4D for HBUILD6 or the XROM/XDROM to work correctly. (Note: This newer "A" ROM cannot be used with an old "C" ROM. The "A" and "C" ROMs are a matched set.)

- *! **Attention:** Powersoft Series I components and the Radio Shack "A" ROM will be discontinued as of April 1st, 1992. If you intend to obtain any of these products, please order before this date.

4P-ROM - Enhanced ROM for Model 4P systems

With hard disk driver for Radio Shack WD1000 or TB1 controllers	Specify 4PBR640	\$30.00
With hard disk driver for MISOSYS SCSI Host interface and Adaptec or XEBEC disk controller	Specify 4PBR645	\$30.00
*! With hard disk driver for non-Radio Shack WD1000 controllers		
*! that are port-mapped at 0x78 - 0x7f	Specify 4PBR647	\$30.00

The 4P-ROM adds new features and improves performance on Model 4P systems. (When ordering HBUILD6 for the Model 4P, this part may be included. See HBUILD6 for more information.) The new features include:

- The Model III-mode ROM-image loads from floppy in less than six seconds.
- Floppy booting (including ROM-image loading) is much more reliable.
- Built-in diagnostics include a full 64K RAM test, disk test and video diagnostics.
- New French and German error messages.
- Hard disk boot-interlock is provided. The system will not try to boot from a hard disk unless the hard disk contains a valid boot track. No more holding the F2 key.
- Hard disk booting is available for several types of disk controllers and drivers. (See the HBUILD6 product for more information.)
- Hard disk booting will wait for slower drives to come on-line. This is useful if you expect your system to power-up unattended.
- A fully programmable 6845 CRT controller can be used in place of the 68045.
- Handles gate-array and non-gate-array systems properly. The original Radio Shack ROM does not handle the floppy disk controller on gate-array systems correctly.

Detailed instructions assist you during the installation of the 4P-ROM which can be done in about 25 minutes. The ROM is a socketed part so no soldering is required.

*!The 4P-ROM can also be customized with your name, address, drivers' license number, or other identifying information that is displayed on demand or when a boot fails, such as when there is no diskette in the drive.

This option is available when the 4P-ROM is ordered by itself or as part of HBUILD6. There is an additional \$10 charge for customizing the ROM. Specify 4PBRCU0 in addition to the 4P-ROM or HBUILD6 part number. Allow an additional week for customizations. Here are the requirements for customization.

1. You are limited to 92 characters total. Leading and trailing spaces do not count against the total number of characters, but embedded spaces do.
2. You can use up to 4 lines on the screen. The lines that will be used are at the bottom of the screen. Each line with text on it subtracts two characters from the total number of characters you can display. For example, if you want to use three lines, you can only display 86 characters total. Each line can have from zero to 64 characters displayed.
3. Text will be centered on each line as best as possible without adding spaces. If you do not want your text centered, or you want to center it yourself, you must state this clearly.
4. You may use ASCII characters plus the special characters on pages A-58 and A-59 of the *TRSDOS 6.2 Disk System Owners Manual*. You cannot use the graphics characters (page A-57) or reverse video.
5. We reserve the right to reject customizations that are in bad taste or could be considered illegal. If you are placing an organizations' name in the message, your order must be on letterhead from that organization.
6. Print or type each character clearly. If you want quotes included be sure to indicate this.

XLR8SET Source Code

Specify 4GXL01

\$10.00

XLR8SET comes with HBUILD6 and is used to initialize the XLR8er adapter each time LSDOS-6 is booted. It also loads modifications (similar to the Houde patches but only uses 37 bytes) to the operating system that allow for faster operation. We have had numerous requests for additional customizations, so we are making the source code available so that you can do it yourself. Written in ALDS Z80 assembly with excellent comments and no macros, XLR8SET can be easily converted to most other assemblers.

*! **Attention:** Powersoft Series I components and 4P ROM customization will be discontinued as of April 1st, 1992. If you intend to obtain any of these products, please order before this date.

Radio Shack ROMs and PALs

These ROMs and PALs were obtained from Radio Shack when they reduced their Model 4, 4D and 4P parts inventories. We carry them for people who desire to make their own repairs or upgrades. *Unless otherwise stated, documentation is not provided with these replacement parts.*

Attention: We will no longer purchase Radio Shack ROM and PALs after March 1st, 1992. We will continue to carry these parts until our supply is exhausted. If you intend to obtain any of these products, please order before this date.

***!Universal Character Generator - used in all Model 4/4D/4P systems** Specify 4GRCG00 \$6.00

If your Model 4 was built before 1984, it may contain an obsolete character generator. About that time, Radio Shack switched to a "universal" character generator which was used in all subsequent U.S. and international versions of the Model 4, 4P & 4D. To check to see if you have the older part, go into Model 4 Disk BASIC and type: ?CHR\$(0);CHR\$(26) <ENTER>

If a vertical line is displayed, then you have the newer part. If you see the letter a or some other character, you should consider upgrading your machine. Instructions for installation of this genuine Radio Shack part are included. Documentation on the universal character set begins on page A-58 of the *TRSDOS 6.2 Disk System Owners Manual*.

***!Model 4 "B" ROM - 8040332 - Checksum 407C** Specify 4BR3200 \$8.00
For non-gate-array (three-ROM) Model 4 and Model III systems.

***!Model 4 U4 PAL - Video clock generator - 8075268** Specify 4PU4000 \$6.00
For non-gate-array Model 4 systems.

***!Model 4 U59 PAL - ROM/Video/Keyboard address decoder - 8075368** Specify 4PU5900 \$8.00
For non-gate-array Model 4 systems.

Upgrades

The following table shows the current release levels for software and ROMS provided by M. A. D. Software.

Product	Current Version
HBUILD6 for all drivers	2(13) (last part of serial number)
XROM and XDROM for SCSI	33 (last two digits of serial number)
XROM and XDROM for RS driver (Radio Shack, Misosys & Powersoft)	32 or 33 (last two digits of serial number)
XROM and XDROM for Powersoft I	32 or 33 (last two digits of serial number)
4P-ROM all versions	38 (last two digits of serial number)
XLR8SET source code	1(4)

If you have an older version of any of these products, you may want to consider upgrading to the current version. Please contact us for details.

Ordering information

M.A.D. Software
P.O. Box 331323
Ft. Worth, Texas 76163

We accept U. S. money orders and checks. We also postal money orders in U. S. currency. Sorry, but we do not accept credit cards. Foreign, non-postal money orders or checks are subject to a \$25 service charge at our bank and are not recommended. Prices are subject to change without notice. Texas residents must add the current state sales tax (6.25%). (The rate for Texas residents of Tarrant County is 7.75%.)

Shipping for one or two items is \$3.00 U.S.A., \$4 Canada, \$7 Foreign. For each additional item, add \$.50. We may ship your order via U.P.S. unless you specify otherwise or if your address is a P.O. Box.

When ordering more than two of the same item, you can request that the documentation not be included with the 3rd through nth copies. You will receive a discount on these copies. Please write for specific pricing on quantity orders.

Please include a daytime phone number that we can use to reach you if there is a question about your order. Most orders will be shipped within ten days. If the order is delayed by more than three weeks, we will contact you and give you the option to cancel.

Coming in 1992 - game and utility releases