TRS-80®

MODEL II OWNER'S MANUAL

SUPPLEMENT

Radio Shack®

TO OUR CUSTOMERS:

Your Model 16 (or Enhanced Model II) offers you several ways of using your Model II programs depending on your specific needs. This supplement contains four sections:

SECTION ONE / OVERVIEW - helps you select the Operating System best suited for your needs.

SECTION TWO / USING TRSDOS 2.Ø - shows how to use Model II programs the easy way, with TRSDOS.

SECTION THREE / USING TRSDOS-II - shows how to enhance your TRSDOS programs by using them with TRSDOS-II.

SECTION FOUR / DIFFERENCES BETWEEN TRSDOS AND TRSDOS-II - supplements the Owner's Manual / Model II Mode. Explains the enhancements and differences found in TRSDOS-II.

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SECTION ONE / OVERVIEW

Your Model 16 (or Enhanced Model II) can use three different operating systems:

- TRSDOS-16
- TRSDOS
- TRSDOS-II

TRSDOS-16 is for Model 16 programs

TRSDOS and TRSDOS-II are for Model II programs.

TRSDOS-16

TRSDOS-16 is specifically designed for your Model 16/Enhanced Model II computer. It uses the more efficient way of formatting diskettes that was introduced with the TRS-8Ø Hard Disk System. This formatting technique greatly increases the storage capacity of the floppy diskette.

TRSDOS-16 is fully documented in the Model 16 Owner's Manual.

TRSDOS

All Model II programs distributed by Radio Shack (other than hard disk programs) are currently designed to run under TRSDOS. TRSDOS is the same powerful operating system the Model II has been using since its introduction.

Enhanced Model II Users: You can use your Model II programs with TRSDOS as you always have. They will operate the same. (You can ignore Section Two of this supplement.)

Model 16 Users: You need to use a "patched" version of TRSDOS with your Model II programs. This patched TRSDOS is identical to the Model II TRSDOS documented in the Model II Owner's Manual, except it can be used with the Model 16 Thinline drives. See Section Two of this supplement.

Hard Disk Users: If you don't mind operating under the control of your floppy diskettes, you can use TRSDOS and your programs will run as they always have. (Model 16 users will need to use the "patched" version of TRSDOS.)

TRSDOS-II

TRSDOS-II, originally designed for Model II Hard Disk System, is a greatly enhanced version of TRSDOS and is now available to all Model 16/Enhanced Model II users.

The major enhancement is the more efficient way TRSDOS-II formats diskettes. Model II programs running under TRSDOS-II can store more data per diskette and also store and retrieve information much faster.

Enhanced Model II Users: You can transfer almost all your TRSDOS programs over to TRSDOS-II formatted diskettes. The only Radio Shack program you cannot convert is Model II SCRIPSIT.

Model 16 Users: You can transfer almost all your TRSDOS programs over to TRSDOS-II formatted diskettes. The only Radio Shack program you cannot convert is Model II SCRIPSIT.

Hard Disk Users: The instructions which came with your hard disk show how to copy your Model II programs to the hard disk. You may have done this already.

Once you copy your programs to the hard disk, you will be using the TRSDOS-II operating system. (If your hard disk still operates under TRSDOS-HD, contact your local Radio Shack store for a TRSDOS-II Initialization Diskette (Version 4.1), catalog number 26-415Ø.)

Since the TRSDOS-II which we describe in this supplement is actually the same as your hard disk operating system, you can ignore Sections Three and Four and refer to your hard disk manual instead.

SECTION TWO / USING TRSDOS 2.Ø

```
**************************************************************
*                                                            *
*         This section is for Model 16 Users only.           *
*                                                            *
*         If your system is an Enhanced Model II             *
*         ignore this section.  You can use                  *
*         Model II programs without making the               *
*         patches.                                           *
*                                                            *
*         For your protection, please make backup            *
*         copies of your application programs and            *
*         your Thinline TRSDOS diskette.                     *
*                                                            *
**************************************************************
```

Your Model 16 comes with a diskette (catalog no. 26-491Ø) labeled:

TRSDOS
Model II Disk Operating System
and Basic Interpreter
Version 2.ØA

and stamped "Thinline TRSDOS 2.Øb".

It contains TRSDOS 2.Øb which is **exactly** the same as TRSDOS 2.Øa except it is made to run on the Model 16 Thinline drives. In this section, Thinline TRSDOS 2.Øb will be referred to as **Thinline TRSDOS.**

Model 16 Thinline drives have a built-in feature to reduce the wear on the floppy diskette. If a Thinline drive is not accessed for a minimum of 2Ø seconds, the drive motor shuts off until the next drive access. At the next disk access, it takes approximately 8/1Ø of a second for the motor to reach proper speed.

To allow for this start-up time, **Thinline TRSDOS** will wait up to 1 second when accessing the drive (for the motor to reach proper speed) before generating a "Drive Not Ready" error.

Model 16 Thinline drives can also operate at a faster seek rate than the Model II drives. **Thinline TRSDOS** sets the seek rate faster (3ms per track) than TRSDOS 2.Øa.

There are two ways of running your TRSDOS programs under **Thinline TRSDOS:**

1. Use your Model II TRSDOS diskettes "as is" with your Thinline TRSDOS diskette in Drive Ø.

2. Convert your Model II TRSDOS diskettes to Thinline TRSDOS diskettes.

Using Your Model II TRSDOS Diskette "As Is"

If you have enough drives, you can simply insert the **Thinline TRSDOS** diskette in Drive Ø and insert the Model II diskettes you want to use in the other drives.

Then press the RESET switch. The computer will start-up under **Thinline TRSDOS.** Enter the date and time and TRSDOS READY will be displayed. You can now run your program under **Thinline TRSDOS** as described in the manual for your application program.

Converting Your Model II TRSDOS diskettes to Thinline TRSDOS diskettes

If you do not have enough disk drives for the above method, you will want to convert your Model II diskettes.

A special file called "THINLINE" is supplied on the **Thinline TRSDOS** diskette. This file can be easily copied over to any Model II TRSDOS diskette. When executed, this file makes a patch to TRSDOS which allows it to run on the Thinline drives.

You do not need to do this to data diskettes since they do not contain TRSDOS.

To convert your TRSDOS diskettes, power-up the computer with the **Thinline TRSDOS** diskette in Drive Ø and the Model II TRSDOS diskette in Drive 1. After entering the date and time, type:

COPY THINLINE:Ø :1 <ENTER>

If you have only one floppy disk drive, power-up with the **Thinline TRSDOS** diskette in Drive Ø and type:

COPY THINLINE:Ø :Ø <ENTER>

You will be prompted when to mount the source diskette (**Thinline TRSDOS**) and when to mount the destination diskette (Model II TRSDOS).

When the copy is complete, remove the **Thinline TRSDOS** diskette from Drive Ø. Move your Model II diskette (which now contains the file THINLINE) to Drive Ø. **Without pressing Reset**, type:

DO THINLINE <ENTER>

A patch will then be made to the Model II TRSDOS diskette.

Converting Your Thinline TRSDOS diskettes back to Model II TRSDOS

You may at some time want to "undo" this patch so that you can use your Thinline TRSDOS diskette on a Model II System.

For this reason, your **Thinline TRSDOS** diskette contains a file named UNTHIN.

To reverse the THINLINE patch, power-up with your **Thinline TRSDOS** diskette in Drive Ø and the Thinline TRSDOS diskette to be un-patched in Drive 1. After entering the date and time, type:

COPY UNTHIN:Ø :1 <ENTER>

If you have only one floppy disk drive, power-up with the **Thinline TRSDOS** diskette in Drive Ø and type:

COPY UNTHIN:Ø :Ø <ENTER>

You will be prompted when to mount the source diskette (**Thinline TRSDOS**) and when to mount the destination diskette (Thinline TRSDOS to be unpatched).

When the copy is complete, remove the **Thinline TRSDOS** diskette from Drive Ø. Move your Thinline TRSDOS diskette (which now contains the file UNTHIN) to Drive Ø. **Without pressing RESET,** type:

DO UNTHIN <ENTER>

You can now use the unpatched TRSDOS diskette in a Model II System.

****
*
* Throughout the rest of this supplement the term *
* TRSDOS will be used. To Model 16 users this will *
* mean Thinline TRSDOS 2.Øb, and to Enhanced *
* Model II users this will mean TRSDOS 2.Øa. *
*
****

SECTION THREE / USING TRSDOS-II
Introduction

TRSDOS-II is a greatly enhanced version of the TRSDOS that was originally introduced with the Model II TRS-8Ø.

TRSDOS-II can store and retrieve information much faster, and store much more information on a single diskette (whether you use single or double sided diskettes).

A new command, FCOPY, has been added to make conversion from TRSDOS to TRSDOS-II as easy as possible.

Can you still use your Model II TRSDOS programs under TRSDOS-II?

Yes, but...

There's more involved than just inserting a diskette into a drive and running the program.

Floppy diskettes formatted under TRSDOS-II are different from diskettes formatted under TRSDOS. Diskettes formatted with TRSDOS contain 26 sectors per track. Diskettes formatted with TRSDOS-II contain 32 sectors per track.

Because of this different format, you can't read or write to a TRSDOS formatted floppy diskette directly with TRSDOS-II.

Also, you cannot use a TRSDOS-II formatted floppy diskette when you are operating under TRSDOS.

More information on the different formats will be given in Section Four (Part III - Technical Information).

To use programs that are on TRSDOS formatted diskettes, you will need to copy the programs and data to TRSDOS-II formatted diskettes. A special command, FCOPY, allows you to transfer your programs and data from TRSDOS to TRSDOS-II.

Part I of this section explains how to transfer your Radio Shack System or Application programs from TRSDOS to TRSDOS-II.

Part II explains how to FCOPY your own programs from TRSDOS to TRSDOS-II.

SECTION THREE
PART I / FCOPYing Radio Shack Application Programs To TRSDOS-II

Most Radio Shack Model II Application programs will run directly with TRSDOS-II. However, a few will require slight modifications.

SCRIPSIT Users: SCRIPSIT can not be transferred to TRSDOS-II. It must be used with the TRSDOS supplied on the SCRIPSIT diskette. Use it as described in the SCRIPSIT Manual. Model 16 Users will use the Thinline TRSDOS or apply the THINLINE patches to the SCRIPSIT diskette.

To convert an application program so that it runs under TRSDOS-II, follow these steps:

1. FCOPY the application program to TRSDOS-II
2. Determine if your program will require modifications
3. Make any necessary modifications
4. FCOPY your data diskettes to TRSDOS-II data diskettes.

Before continuing, make backup copies of your Radio Shack program and data diskettes. Instructions for backup are in the application manual that was provided with your Radio Shack program.

Model 16 Users: You must run the patch file THINLINE described in Section One of this manual before attempting to make a backup.

1. FCOPY the application program to TRSDOS-II

Before FCOPYing your application programs, you will probably want to create a minimum TRSDOS-II diskette from your Model 16 Operating Systems Diskette. This is done by deleting those files which are not necessary for normal execution of programs.

- Make a backup of your Model 16 Systems Diskette. Easy to follow instructions for making a backup are in the Model 16 Operators Manual.

- Insert the backup copy of the Model 16 Systems Diskette into Drive Ø. Store your original diskette in a safe place.

- Type in the following:

  PURGE Ø {SYS} <ENTER>

  Enter the disk password when prompted. The password for your Model 16 Systems Diskette is PASSWORD.

  Type <Y> when prompted for the following files, and <N> for all other files:

ASM16/	CONFIG16/SYS
EDIT16	COPY16
LINK16	CPYCBL16
TRSDOS16/SYS	COPY16FD
IFC	BOOT16

You now have a TRSDOS-II diskette with only those files that are necessary to execute your application programs. You are ready to FCOPY the application programs to the TRSDOS-II minimum system diskette.

- Insert your TRSDOS-II minimum system diskette into Drive Ø, and your Model II application program diskette into Drive 1.

. Type:

FCOPY 1 TO Ø {SYS,ALL} <ENTER>

This will FCOPY all necessary program files from your Model II application diskette to the TRSDOS-II diskette.

If the program you wish to transfer consists of more than one program diskette (Drive Ø), you must transfer each diskette individually to a separate operating system diskette. Use the procedure described above.

2. Determine if your program will require modification

If your program is listed in the table below, you will not need to make any modifications. Proceed to step 4, "FCOPY your data diskettes to TRSDOS-II data diskettes".

TABLE 1

Catalog Number	Program Name
26-45Ø4	Accounts Receivable
26-45Ø5	Accounts Payable
26-45Ø7	Mailing List II
26-4511	VISICALC
26-4513	Job Costing
26-452Ø	Time Accounting
26-4545	Litigation Support
26-456Ø	WESTLAW Terminal Program
26-46Ø1	General Ledger (3-diskettes)
26-46Ø4	Accounts Receivable (3-diskettes)
26-46Ø5	Accounts Payable (3-diskettes)
26-46Ø7	Order Entry (3-diskettes)
26-46Ø8	Sales Analysis
26-47Ø3	Model II COBOL Development System
26-47Ø4	Model II COBOL RUNTIME System
26-4713	Series I - Editor Assembler

Model II SCRIPSIT Users: SCRIPSIT will not run under TRSDOS-II. It must be run "as is" on Enhanced Model II systems and on Thinline TRSDOS with Model 16 systems.

Check with your Radio Shack Computer Center for updates to this list.

3. Make any necessary modifications.

If your program was not on Table 1, you will need to modify it. The list below describes the necessary modifications to make. Unless otherwise specified, all modifications are made from the TRSDOS-II Ready mode.

For your protection, make the changes described below to a backup copy of your program diskette.

Contact your Radio Shack dealer if your Radio Shack Model II program is not listed below or in Table 1.

==========

Catalog #: 26-47Ø1
Program Name: FORTRAN

Type:
PATCH EDIT A=5D53 F=CA635D C=ØØØØØØ <ENTER>

PATCH EDIT A=5EDA F=6Ø C=61 <ENTER>

Catalog #: 26-47Ø2
Program Name: Editor Assembler

Same as FORTRAN (26-47Ø1).

Catalog #: 26-47Ø5
Program Name: Compiler BASIC

Type:
PATCH RSBASIC/LIO A=377D F=FD56Ø9FD5EØ8
C=Ø147ØØØ9ØØØØ <ENTER>

PATCH RSBASIC/LIO A=3786 F=ED53 C=ØØ22 <ENTER>

PATCH RSBASIC/OLF R=156 B=126 F=FD56Ø9FD5EØ8
C=Ø147ØØØ9ØØØØ <ENTER>

PATCH RSBASIC/OLF R=156 B=135 F=ED53 C=ØØ22 <ENTER>

When RUNBASIC is chaining a series of programs under TRSDOS-II, it will give an error 25 (PASSWORD PROTECTION) when it attempts to open the ISAM module a second time. This patch will correct this problem.
Type:

```
PATCH RUNBASIC A=2AF2 F=11612B C=CD9D2B    <ENTER>

PATCH RUNBASIC A=2B9D F=ØØØØØØØØØØØØØØØØØØ
                      C=11612B2323233652C9 <ENTER>
```

Catalog #: 26-47Ø6
Program Name: BASIC Runtime

Type:

```
PATCH RSBASIC/LIO A=377D F=FD56Ø9FD5EØ8      C=Ø147ØØØ9ØØØØ
<ENTER>

PATCH RSBASIC/LIO A=3786 F=ED53 C=ØØ22    <ENTER>
```

==========

Be sure to check with your Radio Shack Computer Center for updates to this list.

4. FCOPY your data diskettes to TRSDOS-II data diskettes.

To transfer data diskettes (Drive 1, 2, or 3), you must first format a data diskette with TRSDOS-II.

- Make sure your TRSDOS-II minimum system diskette is in Drive Ø, and insert a blank diskette into Drive 1 and type:

  FORMAT :1 {ABS} <ENTER>

- This will format the diskette in TRSDOS-II format for data storage.

- If you have more than two drives, leave the TRSDOS-II data diskette in Drive 1 and insert the data diskette that you wish to transfer in Drive 2. Type:

  FCOPY 2 TO 1 SYS ALL <ENTER>

- If you have only two drives, type:

  FCOPY 1 TO 1 SYS ALL <ENTER>

  and FCOPY will prompt you when to swap source (TRSDOS formatted diskette) and destination (TRSDOS-II diskette) diskettes.

You are now ready to use your Radio Shack program under TRSDOS-II.

SECTION THREE
PART II / FCOPYing Your Own Programs To TRSDOS-II

FCOPYing Your Programs to a TRSDOS-II Diskette

Before FCOPYing your programs, you will probably want to create a minimum TRSDOS-II diskette from your Model 16 Operating Systems Diskette. This is done by deleting those files which are not necessary for normal execution of programs.

- Make a backup of your Model 16 Operating System diskette. Easy to follow instructions for making a backup are in the Model 16 Operators Manual.

- Insert the backup copy of the Model 16 Operating System diskette Drive Ø, and store your original diskette in a safe place.

- To create a minimum system diskette, you may delete any of the following files that you will not need when running your programs. Type:

  PURGE Ø {SYS} <ENTER>

  Enter the disk password when prompted. The password for you Model 16 Operating System diskette is PASSWORD.

  Type <Y> when prompted for any of the following files that you want to delete. Type <N> for all other files.

ASM16/SYS	CONFIG16/SYS
EDIT16/SYS	COPY16
LINK16/SYS	CPYCBL16
TRSDOS16/SYS	COPY16FD
IFC	BOOT16

You can now FCOPY your programs to the TRSDOS-II Operating System diskette.

The syntax for FCOPY is:

FCOPY source TO destination {options}

A complete description of the FCOPY command is in Section Four of this supplement.

For example, suppose you want to FCOPY the following programs from your Model II diskette to a TRSDOS-II diskette.

DRIVE Ø	DRIVE 1
TRSDOS-II System Diskette	Model II Programs
	MYDATA/DAT
	SAMPLE/CBL

To FCOPY the Model II programs from Drive 1 to Drive Ø, type:

```
FCOPY MYDATA/DAT:1 :Ø {ABS}
FCOPY SAMPLE/CBL:1 :Ø {ABS}
```

FCOPYing Your Programs/Data to a TRSDOS-II Data Diskette

Before you begin FCOPYing your programs or data from TRSDOS to TRSDOS-II, you will need to format some TRSDOS-II data diskettes.

- Make sure you are operating under TRSDOS-II. Insert a blank diskette into Drive 1 and type:

  FORMAT :1 {ABS} <ENTER>

- TRSDOS-II will format the diskette as a data diskette.

You can now FCOPY your programs or data to the TRSDOS-II formatted diskette.

The syntax for FCOPY is:

FCOPY source TO destination {options}

A complete description of the FCOPY command is in Section Four of this supplement.

For example, suppose you want to FCOPY the following program and data file from your Model II diskette to a TRSDOS-II formatted data diskette.

DRIVE Ø	DRIVE 1	DRIVE 2
TRSDOS-II System Diskette	TRSDOS-II Data Diskette	Model II Programs
		MYDATA/DAT
		SAMPLE/CBL

To FCOPY the Model II programs from Drive 2 to Drive 1, type:

```
FCOPY MYDATA/DAT:2 :1 {ABS}
FCOPY SAMPLE/CBL:2 :1 {ABS}
```

To FCOPY the above files to a data diskette on a two-drive system, type:

```
FCOPY MYDATA/DAT:1 :1 {ABS}
FCOPY SAMPLE/CBL:1 :1 {ABS}
```

TRSDOS-II will prompt you when to mount the source diskette (your Model II diskette) and when to mount the destination diskette (TRSDOS-II data diskette).

SECTION FOUR / DIFFERENCES BETWEEN TRSDOS AND TRSDOS-II
PART I / General Information

The following tables summarize the differences between TRSDOS and TRSDOS-II.

Differences Between TRSDOS-II and TRSDOS

Item	TRSDOS-II	TRSDOS
Method of Allocation	Allocation by Sectors	Allocation by Granules
Number of Files	Variable up to 122Ø files -- Defaults 18Ø. See FORMAT	Fixed at 96 files
Flawing Technique	Flawed Areas Locked Out by Sectors	Flawed Areas Locked Out by Tracks

Table 2

New and Enhanced Utilities and Commands

Name	Function
ANALYZE	No longer available -- cannot be used under TRSDOS-II
BACKUP	Enhanced -- Duplicates floppy diskettes.
BUILD	Enhanced -- Creates an automatic command input file.
CLOCK	No longer available -- cannot be used under TRSDOS-II
DIR	Enhanced -- Displays a diskette's directory.
DRIVE	New -- Allows you to gain the optimum use of the floppy disk drive by changing the seek rate, disk swap detect, and wait for drive ready status.
FC	New -- Edits and repeat last command line entered.
FCOPY	New -- Transfers files on floppy diskette TRSDOS 1.2, 1.2a, 2.Ø, 2.Øa, and 2.Øb to a floppy diskette formatted under TRSDOS-II (and vice versa except to TRSDOS 1.2 and 1.2a).
FILES	New -- Displays a list of filesnames in a diskettes directory.
FLOPPY	New -- Tells TRSDOS-II to ignore the drive numbers in all file specifications.
FORMAT	Enhanced -- Formats a diskette for data storage.
FREE	Enhanced -- Displays the number of free contiguous sectors and the total amount of free space on a diskette.

New and Enhanced Utilities and Commands
continued

Name	Function
HELP	Important Note Only -- Gives proper syntax for TRSDOS-II commands.
I	Enhanced -- Lets You Swap Diskettes.
LIB	Enhanced -- Displays Library Commands.
RESTORE	New -- Allows you to retrieve the information stored in compressed form with SAVE.
SAVE	New - Allows you to "compress" and store information onto diskettes for archive purposes
VERIFY	Enhanced -- Verifies readable data.
XFERSYS	No longer available -- cannot be used under TRSDOS-II.

Table 3

Supplemental Information

Item	Description/Difference
Reverse Video Mode	When in reverse video mode (black characters on green background/black characters on white background and in scroll mode, the video will scroll a green line/white line instead of a black line.
Wildcards	TRSDOS-II allows you to use the symbol ! (exclamation point) as a super wildcard symbol. It is the same as */* (used with files that have extensions) and * (used for files that do not have extensions). For example: KILL !:3 would kill all files on Drive 3.
SETCOM With FORMS	With TRSDOS-II, it is not necessary to execute a SETCOM command before "FORMS S" when using a serial printer. "FORMS S" must still be executed before data is sent to the printer.
Power-Up Diagnostics	New Diagnostic Errors: BOOT ERROR CT - indicates a defective CTC Chip. Contact your Radio Shack Repair Center. BOOT ERROR MF - indicates a memory failure in address range X'1ØØØ'-X'7FFF'. Contact your Radio Shack Repair Center. BOOT ERROR ML - indicates a memory failure in address range X'ØØØØ' - X'ØFFF'. Contact your Radio Shack Repair Center.
Error Codes	New Error: ERROR 5Ø -- BAD SPACE DESCRIPTOR

Supplemental Information
(continued)

Item	Description/Difference
	Disregard Errors 2Ø, 21, 22, and 23 which are described in the Model II Owner's Manual. BASIC will not return an Error 49 or Error 5Ø. It will now return an UE ERROR (Undefined Error). BASIC will also return a FL ERROR (too many files). This error was previously undefined.

Table 4

Supervisor Calls (SVCs)

Name	Function	Code
DISKID	Changed -- Reads Disk ID	15
KBPUT	New -- Puts Characters into Type-Ahead Keyboard buffer	3Ø
RDDIR	New -- Reads Next Directory Record and Builds An ASCII string	32
LOCATE	Enhanced -- Returns Record Number	33
DIRRD	Enhanced -- Reads Specified Record	35
OPEN	Enhanced -- Opens/Creates a File	4Ø

Supervisor Calls (SVCs)
(continued)

Name	Function	Code
DIRWR	Enhanced -- Writes Specified Record	44
REWIND	New -- Rewinds disk file to beginning of file	48
RS232C	Enhanced -- Initializes Serial Communication Channels A and B	55
DIRSET	New -- Get Directory Information on a currently open file	59

Table 5

The new SVC's have been created specifically for use under TRSDOS-II.

NOTE: We recommend restricting your use of the SVCs RAMDIR and FILPTR since they are restricted to 96 files each. If you are familiar with these Supervisor Calls, you should change your existing programs to use RDDIR instead.

Memory Requirements

Memory requirements for TRSDOS-II are:

ØH-27FFH	TRSDOS-II Resident Area
28ØØ-2FFF	Utility Command Overlay Area
FØØØ-FFFF	TRSDOS-II Demand Resident Area

SECTION FOUR
PART II / Library Commands and Utility Programs

Introduction

All rules governing TRSDOS commands and utilities apply to TRSDOS-II as well.

All TRSDOS commands and utilities (except XFERSYS) can be used with TRSDOS-II although some have been enhanced slightly. This section discusses the commands and utilities particular to TRSDOS-II and points out specific differences between TRSDOS-II and TRSDOS.

Note that ANALYZE, CLOCK, and XFERSYS are the only TRSDOS commands/utilities which are not used by TRSDOS-II.

LIBRARY COMMANDS

BUILD
Create an Automatic Command Input File

(Enhancements Only)

BUILD now lets you edit a command line of an existing BUILD file.

When the specified BUILD file exists, the first line of the file is displayed, followed by the prompt:

KEEP, DELETE, FIX, REPLACE, INSERT OR QUIT?
ENTER (K/D/F/R/I/Q)..?

The FIX option lets you edit the command line which is displayed. For details on using FIX, refer to FC, later in this manual.

DIR
List Drive Directory

(Enhancements Only)

DIR wildcard:d {SYS,PRT}

wildcard tells TRSDOS-II to list all files that have the specified wildcard.
:d is the drive specification and is a number between Ø-7. If omitted, the primary drive is used.
PRT tells TRSDOS-II to list the directory to the Printer. If omitted, the directory is displayed on the Video.
SYS tells TRSDOS-II to list system files only. If omitted, only user files are listed.

The other DIR parameters described in the Model II Owner's Manual may also be used with this syntax.

If SYS is used, only those system files with a matching extension will be listed.

The TRSDOS-II directory is not limited to 96 files. You can specify the size of the directory you need when you format the diskette with FORMAT.

TRSDOS-II also allows full wildcarding. This means all wildcard specifications may be used. For more details, see Wild Card in the **TRSDOS** section of your Model II Owner's Manual.

The directory display will be in the following form:

```
Disk Name:TRSDOS     Drive:Ø          Ø2/11/82      ØØ.Ø1.44
File Name Created Updated  Atrb Fil  Rec   #of     -Sectors-
          MM/DD/YY MM/DD/YY       Typ  Len Records Alloc. Used

USRPROG1 11/11/81 11/12/81 P*XØ  F   256       3      3     3
FASH/BAS 11/3Ø/81 12/Ø2/81 D*XØ  F   256       1      1     1
```

Examples

```
DIR B*/*
```

will list the files on the first available drive that start with the letter B and have an extension.

```
DIR B*
```

will list the files on the first available drive that start with the letter B and do not have an extension.

DRIVE
Set Drive Options

(used by floppy drives only)

DRIVE :d {options}

:d is a floppy drive number between Ø and 3.

options may be any of the following:

RATE=n sets the seek rate of the floppy disk drive. n is a number between Ø and 3 where:
Ø = 3 milliseconds (for Thinline drives)
1 = 6 milliseconds
2 = 1Ø milliseconds (for Push-Button drives)
3 = 15 milliseconds (for Latch Drives)
If omitted, setting is not changed.

DETECT sets the diskette swap detection. This causes TRSDOS-16 to check the drive hardware for a "door opened" condition. DETECT should be set for Push-Button and Thinline drives.

NODETECT sets the diskette swap "no detection". This causes TRSDOS-16 to ignore any "door opened" conditions received from the drive hardware. Latch drives must be set NODETECT.

WAIT sets TRSDOS-16 to wait for the drive to gain proper motor speed if a "Drive Not Ready" error occurs, then try again. If the error occurs again, then the drive is considered not ready and an error code is generated. WAIT must be set for Thinline drives.

NOWAIT sets TRSDOS-16 to not wait if a "Drive Not Ready" error occurs, but to generate the error code immediately. Push-Button and Latch Drives should be set to NOWAIT.

OFFLINE (for secondary drives only) sets a drive offline. TRSDOS-II ignores the drive entirely.

ONLINE (for secondary drives only) sets a drive online.

The following information offers a thorough explanation of the DRIVE command and all its options. Please read it before using this command.

This command allows you to gain the optimum use of a floppy disk drive by changing the following:

- logical drive disconnect/connect
- seek rate (the rate the computer is able to access the diskette)
- diskette swap detection
- wait (for a drive ready condition)

If you include no options, DRIVE returns the current settings for the specified drive.

When TRSDOS-16 starts up, it initializes each of your drives to the following settings:

DRIVE	SEEK RATE	SWAP DETECT	WAIT/NOWAIT STATUS
Ø	1Ø ms	DETECT	WAIT
1 - 3	15 ms	NODETECT	WAIT

All drives are started up ONLINE.

Any type of Model 16/Model II drive can operate under these settings. However, to get the optimum use out of your particular drive, we suggest you use the appropriate settings.

There are three types of drives. Each type of drive has its own set of specifications that determines how it can be set up.

The three types of drives are:

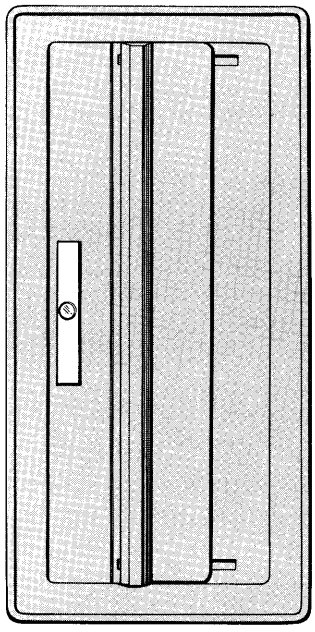
Push-Button	used as Drive Ø in most Model II's and as the secondary drives in some Model II Expansion Bays.
Latch	used as the secondary drives in some Model II Expansion Bays. This drive has both a latch and a door.
Thinline	used in the Model 16 (this is the "thinline" drive). This drive has a lever but not a door.

We suggest you try the following settings for each of these drives.

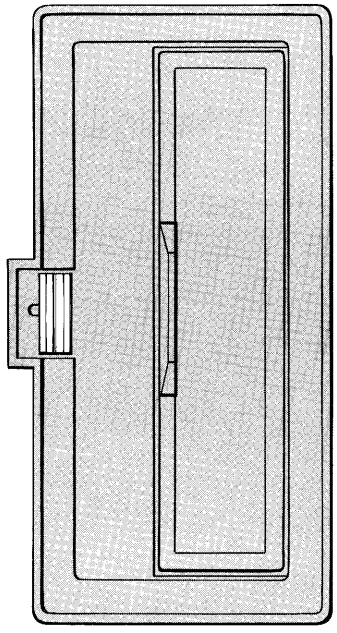
Drive	Minimum Rate	Swap Detect	Wait / Nowait
Push-Button	1Ø ms	DETECT	NOWAIT
Latch	15 ms*	NODETECT*	NOWAIT
Thinline	3 ms	DETECT	WAIT*

* These settings are required for these particular drives and are set this way at start-up.

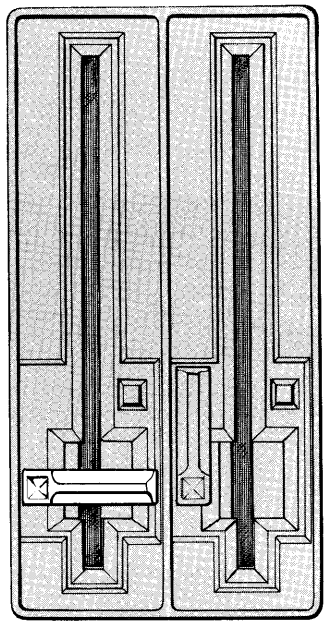
Determine the type drive you have by looking at the pictures following.



Push-Button



Latch



Thinline

The OFFLINE/ONLINE option allows you to logically disconnect a drive. When a drive is turned OFFLINE, TRSDOS-II will ignore it entirely. This can be used to logically disconnect non-existing or unused disk drives to make disk accesses faster.

When using the DRIVE command, be sure to note the following:

- When reset, TRSDOS-16 always returns to the start-up settings. Use the AUTO command (or a DO file) to implement the DRIVE command automatically upon power-up or reset.

- If you receive numerous I/O errors on disk reads/writes after changing the seek rate, you probably set it too fast for that particular drive. To remedy this, either issue the DRIVE command again with the proper seek rate or reset the computer.

- Latch drives cannot properly detect if a drive door has been opened since the last disk access. Always set Latch drives with the NODETECT option.

- Thinline drives have a built-in feature to reduce the wear on the floppy diskette. If a Thinline drive is not accessed for a minimum of 2Ø seconds, the drive motor shuts off until the next drive access. At the next disk access, it takes approximately 8/1Ø of a second from start-up for the motor to reach proper speed.

- Always set Thinline Drives with the WAIT option. If a Thinline drive is run with the NOWAIT option, a "Drive Not Ready" error will occur since the motor could not reach proper speed before the access completes.

Examples

If you have a Model 16, all of your drives are Thinline drives. This command:

```
DRIVE Ø {RATE=Ø,DETECT,WAIT} <ENTER>
```

allows you to get the optimum use out of Drive Ø.

If you have a two drive Model 16, this command:

```
DRIVE 2 {OFFLINE}  <ENTER>
DRIVE 3 {OFFLINE}  <ENTER>
```

tells TRSDOS-II to ignore Drive 2 and Drive 3 since they do not exist.

If you have a Model II, Drive Ø is the Push-Button drive. This command:

```
DRIVE Ø {RATE=2,DETECT,NOWAIT} <ENTER>
```

allows you to get the optimum use out of Drive Ø.

If you have a Model II expansion bay with Push-Button drives, this command:

```
DRIVE 1 {RATE=2,DETECT,NOWAIT} <ENTER>
```

allows you to get the optimum use out of Drive 1.

If you have a Model II expansion bay with Latch drives, this command:

```
DRIVE 1 {RATE=3,NODETECT,NOWAIT} <ENTER>
```

allows you to get the optimum use out of Drive 1.

FC
Edit and Repeat Last Command

(New Command)

FC

When you specify FC ("fix command"), TRSDOS-II will display the last command entered, allow you to edit that command, and then re-execute the command when you press <ENTER>.

This also describes the FIX option used in editing BUILD files.

After a "fix," a command can only be executed when the cursor is in the first character position in the line. (All the way to the left.) To move the cursor to this position, press <ENTER>; press <ENTER> again to execute the "fixed" command.

Use the following subcommands for editing command lines:

Key	Function
<F1>	Insert blank spaces. (Note: Blank spaces are the only insertions that are allowed with FC. If you need to insert characters, insert spaces and type over the spaces with the desired characters).
<F2>	Delete character.
<CTRL> <E>	Moves cursor to the end of line.
<ESC>	Start over; all previous changes are disregarded by TRSDOS-II.
<BREAK>	Abort and return to TRSDOS-II READY.
<ENTER>	Moves cursor to left-most line position. If cursor is already there, the command is executed.

Key	Function
(<-) (leftarrow)	Moves cursor to the left. Wrap-around will not occur.
(->) (rightarrow)	Moves cursor to the right. When cursor reaches the last position on the line, it will return to the left-most position.
<TAB>	Tab (skip) over eight spaces; will not erase characters.
<CTRL> <T>	Back-tab. Will not erase characters.
<CTRL> <W>	Delete to end of line starting at current cursor position.

Example

COPY PAYROLL/DAT:1 :2

To change this command line so TRSDOS-II will COPY to Drive 3, type:

FC <ENTER>

TRSDOS-II will display the line again:

COPY PAYROLL/DAT:1 :2

Move the cursor so it is on top of the number 2 by pressing <TAB> or rightarrow and type: 3. Press <ENTER> to return the cursor to the beginning of the line. Press <ENTER> again to execute the command.

FILES
List Filenames

(New Command)

FILES source {options}

source may be one of the following:
filespec:d where filespec is a valid file specification that may include an optional drive specification (:d).
wildcard:d where wildcard is a valid wildcard (full wildcarding is allowed) that may include a drive specification (:d).
:d specifies a drive number between Ø-7; if omitted, the first available drive is used.
{options} may be one of the following:
SYS will list all System files. SYS is optional; if omitted, only user files will be listed.
PRT will list files on the Printer. PRT is optional; if omitted, files will be listed on the Display.

This command will list filenames that are stored on the specified drive. This is not the same as DIRectory -- only filenames will be listed. The filenames will be alphabetically listed in five columns (from left to right) across the screen.

FILES allows full wildcarding. For details on wildcarding, see your Model II Owner's Manual.

Examples

```
FILES */BAS:2 {PRT}
```

will list all files with the extension /BAS on Drive 2 to the Printer.

```
FILES Ø {SYS}
```

will list all System files on Drive Ø. (The System directory is on Drive Ø.)

FLOPPY
Ignore Drive Specifications

FLOPPY {switch}

switch is ON or OFF. If omitted, the current command status will be displayed.

TRSDOS-II powers-up using FLOPPY {ON}

This command tells TRSDOS-II to ignore the drive numbers within all file specifications. This is especially useful when drive numbers have been "hard-coded" into programs.

When FLOPPY {OFF} is entered, TRSDOS-II will ignore all references to :d within valid filespecs when opening files. TRSDOS-II will go instead to the first available disk drive.

When FLOPPY {ON} is entered, TRSDOS-II will use the :d specifications when included in a file specification.

Only those commands which require file specifications (filename/ext.password:d) are affected by FLOPPY ON/OFF. These include:

ATTRIB	CREATE	LOAD	RENAME
APPEND	DUMP	MOVE	
BUILD	KILL	OPEN	
COPY	LIST	PATCH	

Commands and utilities which **do not require file specifications** are not affected by FLOPPY {OFF}. These include:

BACKUP	FORMAT	PROT
DIR	FREE	PURGE

Examples

FLOPPY {OFF}

TRSDOS-II will ignore all drive numbers within file specifications and start searching for a file on the first available drive.

FLOPPY

TRSDOS-II will display the current status of FLOPPY.

FLOPPY {ON}

TRSDOS-II will use the drive numbers when included in a file specification.

FREE
List Disk Free Space

(Enhancements Only)

FREE :d {PRT}

d is a drive specification and may be any number between Ø-7. d is optional; if omitted, the primary.
PRT tells TRSDOS-II to send the list to the Printer. PRT is optional; if omitted, the list is displayed on the video display.

Since TRSDOS-II space allocation is by sectors (instead of granules), the FREE display is different.

FREE will list areas of contiguous sectors which are available for data and program storage in the format:

nnnn nnnn nnnn nnnn
nnnnn Free Sectors in **n** Extents

nnnn is a decimal number telling you how many free sectors are available in an area. **nnnnn** is the total number of free sectors in **n** extents.

Examples

If you want to know the number of free sectors on Drive Ø, type:

FREE Ø

If you want that information printed on the printer, type:

FREE Ø PRT

HELP
Help With TRSDOS-II Command

(Important Note Only)

The HELP command cannot be used from TERMINAL.
HELP cannot be called from BASIC.

I
Swap Diskettes

(Enhancements Only)

I :d

:d is a number between Ø-3 and specifies a drive. d is optional. If omitted, I will be executed to all drives (Drives Ø-3).

Whenever you swap floppy diskettes, you must execute this command immediately after the swap. This command tells TRSDOS-II to read the diskette ID's on all drives in the system.

Use the I command after:

- Swapping diskettes.
- FORMAT (especially if the directory was moved to a different track location.)
- Inserting a different diskette into Drives Ø-3.
- Using FCOPY
- a BACKUP is complete.

If the diskette which is inserted after the swap is a TRSDOS formatted diskette (instead of a TRSDOS-II format), TRSDOS-II will ignore all references to the drive which contains the TRSDOS formatted diskette.

LIB
Display Library Commands

(Enhancements Only)

The LIB command (described in the Model II Owner's Manual) now includes only those commands located below 28ØØ Hex. Consequently, LIBrary commands can be run with BASIC, TERMINAL, etc. The LIBrary commands CLEAR, DEBUG ON, DEBUG OFF, RESET and DO will return to TRSDOS-II READY.

Some LIBrary commands have been changed to utilities and vice versa. For a complete list of LIBrary commands, type LIB <ENTER>, from the TRSDOS-II Ready mode.

TRSDOS-II utilities are not included in the LIBrary command list but are displayed when you type DIR {SYS} <ENTER>.

VERIFY
Verify Readable Data

(Enhancement Only)

VERIFY {switch}

switch is either ON or OFF. switch is optional; if omitted, current VERIFY status is displayed.

On power-up, VERIFY {ON} is used.

This command controls the verify function. When VERIFY is ON, TRSDOS-II will read after each write operation to verify that the data is readable. If data is not readable, TRSDOS-II will attempt to write it again and try to read it. If it still is not readable, TRSDOS-II will return an error message telling you the operation was not successful.

TRSDOS-II will always verify directory writes. User writes (writing data into a file) are only verified when VERIFY ON is in effect.

Examples

VERIFY ON

Turns the VERIFY function ON.

VERIFY OFF

Turns the VERIFY function OFF.

VERIFY

Displays the status of the VERIFY switch.

UTILITIES

BACKUP
Duplicate a Diskette

(Enhancements Only)

BACKUP source **TO** destination {options}

source and destination are drive numbers in the form of d, where d is a floppy drive (Ø-3) only. source and destination cannot be the same drive number.

options is one of the following:

ABS tells TRSDOS-II not to prompt you if the specified drive contains data. If ABS is omitted, TRSDOS-II will prompt before overwriting any data that already exists.

ID= diskette-name tells TRSDOS-II the diskette name to assign to the destination diskette. If omitted, TRSDOS-II will use the diskette name of the source diskette.

NEW= destination-password tells TRSDOS-II the password to assign to the destination diskette. The master password allows access to all user files via the **PROT** command. If omitted, TRSDOS-II will use the same password as the source diskette.

PW= source-password tells TRSDOS-II the master password of the source diskette. TRSDOS-II will not duplicate the diskette unless you give the correct password. If omitted, TRSDOS-II will assume the password is **PASSWORD.**

This utility allows you to make a "mirror image" of a TRSDOS-II formatted floppy diskette onto another floppy diskette.

BACKUP is also the command to use when you want to make a duplicate of your TRSDOS-II diskette. That is, when you want to create a new operating system diskette.

We suggest that you make backups of all your diskettes, (especially your TRSDOS-II Systems diskette) and store the originals in a safe place. This reduces the possibility of losing important information, because you will have another copy of the diskette to use if something happens to the one you are using.

BACKUP will automatically backup a single-sided diskette to a double-sided diskette. However, an error will occur if you attempt to backup up a double-sided diskette to a single-Gided diskette.

Enhanced Model II Users: You can only use single-sided diskettes on your system.

TRSDOS-II is supplied on a single-sided diskette. Use BACKUP to create a double-sided operating system diskette.

TRSDOS-16 does not permit single drive BACKUPs. Therefore, to make a copy of data diskette, you will need to remove the Operating System diskette when prompted and replace it with a blank diskette.

With TRSDOS-II BACKUP, it is not necessary to format floppy diskettes prior to the BACKUP because BACKUP automatically formats during the duplication.

The TRSDOS-II BACKUP utility is much faster than the TRSDOS BACKUP because it makes a "mirror image" on a track-by-track basis instead of file-by-file.

TRSDOS-II BACKUP does not provide the following TRSDOS options:

- wildcarding.
- prompting before each file.
- NOAUTO.
- SYS.
- single drive BACKUP.

It simply makes a mirror copy of the source diskette.

Examples

To make a backup of your TRSDOS-II diskette, put the original diskette into Drive Ø and a blank diskette into Drive 1. Type:

```
BACKUP Ø TO 1  {PW=PASSWORD}
```

When the backup is complete, store your original TRSDOS-II diskette away in a safe place. Use it only to make new system diskettes.

```
BACKUP 3 TO 1 {PW=ASHER}
```

This will create a backup of the diskette in Drive 3 whose password is ASHER on the diskette in Drive 1.

```
BACKUP 1 TO Ø
```

This command allows you to make a copy of a data diskette. After entering it, you will need to remove the Operating System diskette and place your destination diskette in Drive Ø.

FCOPY
TRSDOS / TRSDOS-II File Transfer

(New Utility)

a. FCOPY source TO destination {options}

source is one of the following:
filespec:d where filespec is a valid file specification and d is a drive specification between Ø and 7.
wildcard:d where wildcard is a valid wildcard and d is a drive specification between Ø and 7.
:d where d specifies the drive and is a number between Ø-7 and must be specified. If this option is used, **ALL** must be specified.

destination specifies the destination drive number in the form of **:d** and is a number between Ø and 7. destination must be specified.

{options} is one of the following:
ABS tells TRSDOS-II not to prompt you if the destination drive already contains the file. If ABS is omitted, TRSDOS-II will prompt before overwriting any data that already exists.
ALL tells TRSDOS-II to copy all non-system files. If :d is used as source, ALL must be used.
PROMPT tells TRSDOS-II to prompt you before a file is copied. Press **Y** (yes), **N** (no), **Q** (quit), or **S** (stop prompting).
SYS allows you to FCOPY Language (e.g. RUNCOBOL) and Application programs. ALL does not transfer System files.

b. FCOPY filespec TO filespec {ABS}

filespec is a valid file specification
{ABS} tells TRSDOS-II not to prompt you if the destination drive already contains the file. If {ABS} is omitted, TRSDOS-II will prompt before overwriting any data that already exists.

c. FCOPY :d {DIR,options}

:d is a number between Ø-7 and specifies a drive number. :d must be specified.

{DIR} will display the directory of the specified drive. The directory will be displayed in the format used by the operating system accessed (i.e. TRSDOS or TRSDOS-II).

options may be one of the following:

PRT is optional. If specified the listing will be output to the printer. If omitted, the listing will be on the video display only.

SYS is optional; if omitted, only user files will be displayed.

Note that the braces are required with this form of FCOPY.

FCOPY allows you to transfer files or data created under TRSDOS to a TRSDOS-II floppy diskette (use form a).

FCOPY can be used to copy an individual file and to change its name as well (use form b).

FCOPY can also be used to display the directory of a specified drive (use form c).

You cannot use FCOPY with FLOPPY {OFF} (see FLOPPY in this supplement).

It is very important to remember that you cannot simply insert a TRSDOS formatted diskette into Drives Ø-3 when the System is controlled by TRSDOS-II.

This is because TRSDOS-II formats floppy diskettes so that there are 32 sectors per track. TRSDOS formatted floppy diskettes are organized into 26 sectors.

You must FCOPY TRSDOS files to TRSDOS-II formatted diskettes, if the files are to be used under TRSDOS-II.

There are four rules governing FCOPY which must be followed:

- You must specify the drive (:d) on both source and destination.
- You cannot FCOPY between like systems (TRSDOS-II to TRSDOS-II or TRSDOS to TRSDOS -- use COPY instead).
- You cannot FCOPY onto TRSDOS 1.2 or 1.2a.
- You can write system files to TRSDOS-II but you cannot write system files to any other version of TRSDOS.

FCOPY allows the following transfer of files or data:

- From TRSDOS floppy diskette to TRSDOS-II floppy diskette and from TRSDOS-II to TRSDOS.
- Single-drive FCOPYs on any drive except Ø. The TRSDOS-II Operating System Diskette must remain in Drive Ø.

FCOPY will not perform password checks on source files when copying to TRSDOS-II.

However, FCOPY will perform password checks on source files when copying from TRSDOS-II to TRSDOS.

To copy password protected files from TRSDOS-II to TRSDOS, both source and destination must be a TRSDOS file specification (use form b).

You cannot FCOPY over existing versions of system files. For instance, an error occurs if you try to copy BACKUP from a TRSDOS diskette to a TRSDOS-II diskette. This is FCOPY's way of protecting its own operating system.

Examples

```
FCOPY NEWFILE/TXT:2 TO :3
```

would transfer the file NEWFILE/TXT from the diskette in Drive 2 to a file of the same name in Drive 3.

```
FCOPY :1 {DIR}
```

would display the DIRectory for the Model II diskette in Drive 1.

```
FCOPY 2 TO 3 {ALL}
```

would FCOPY all files on the diskette on Drive 2 to the diskette in Drive 3.

```
FCOPY FILE/A:1 TO FILE/DAT:2 {PROMPT}
```

would FCOPY the file FILE/A on the diskette in Drive 1 to the file FILE/DAT on the diskette in Drive 2. If FILE/DAT already exists FCOPY will ask you if you want to write over the existing file.

FORMAT
Erase and Initialize a Disk/Diskette

(Enhancements Only)

FORMAT :d {options}

d specifies the drive to be formatted and may be the drive number 1, 2, 3, 5, 6, 7 (Drives Ø and 4 may not be used.) d is optional. If omitted, FORMAT will prompt for the drive number.

{options} is one of the following:

ABS tells FORMAT not to prompt you if the specified drive contains data. If ABS is omitted, FORMAT will prompt you before overwriting any data that already exists.

ID=disk-name tells FORMAT the name to assign to the diskette. If omitted, **TRSDOS** will be used.

PW=password tells FORMAT the master password to assign to the diskette. If omitted, **PASSWORD** will be used. The master password allows access to all user files (via the **PROT** command).

DIR=nnn tells FORMAT where to place the primary directory. nnn can be any number between 1-71. If omitted, cylinder 44 is used (track 44 for single-sided diskettes).

ALT=nnn tells FORMAT where to place the alternate directory. If nnn = ØØ, an alternate directory will be not created. If omitted, the formula directory + 3 will be used to compute the placement of the alternate directory, where 3 represents three cylinders (3 tracks on single sided diskettes).

SIZ=nnn tells FORMAT how many filenames to allow for in the initial directory. nnn can be any number between 1 and 122Ø. FORMAT will round this number to the next multiple of 4. If omitted, 18Ø is used.

verification level is one of the following:

FULL	reads the value of each sector and compares that value with what was written during initialization.
NONE	No verification is done.

verification level is optional; if omitted, **FULL** is used.

With TRSDOS-II, FORMATted diskettes consist of 32 sectors per track instead of 26 sectors as with TRSDOS formatted diskettes.

Because of this format, floppy diskettes formatted by TRSDOS-II **cannot** be used under TRSDOS and vice versa. This is very important.

FORMAT will automatically check to see if the diskette is single or double sided and then format the diskette appropriately.

For more details on FORMAT, see your Model II Owner's Manual.

Examples

```
FORMAT 2
```

would FORMAT the diskette in Drive 2.

```
FORMAT
```

would prompt for a drive number, then FORMAT the diskette in the specified drive.

```
FORMAT :1 {DIR=7Ø}
```

would FORMAT the diskette in Drive 1 and place the directory on cylinder 7Ø.

RESTORE
Restore Archive Diskettes Created With SAVE

(New Utility)

RESTORE source TO destination {options}

source specifies an archive diskette and is one of the following:
filespec:d where filespec is a valid file specification and :d is a drive number defined below.
wildcard:d where wildcard is a valid wildcard and :d is a drive number defined below.
:d specifies a drive number between 1-3 for floppy drive systems and Ø-3 for hard disk systems. If this option is used, **ALL** must be specified.

destination is optional, but may be one of the following:
filespec:d if {options} is {IND}. filespec is a valid file specification and :d a specified drive number between Ø and 7.
:d specifies a drive number between Ø-7, but may not be the same as source.
If omitted, destination is first available drive.
If {DIR} is specified, destination cannot be specified.

{options} and their meanings are:
ABS tells TRSDOS-II that the source and destination disks are ready. It will also not to prompt you if the destination diskette contains data. If ABS is omitted, TRSDOS-II will prompt you to ready the source and destination diskettes and prompt before overwriting any file that already exists.
ALL tells TRSDOS-II to retrieve all non-system files. If **:d** is used as source, ALL must be used.
DIR If VOLUME Ø is in the source drive, TRSDOS-II will display the DATASET directory and identifier; if VOLUME Ø is not in the source drive, TRSDOS-II will display only the DATASET identifier.

IND (indirect) tells TRSDOS-II to use the contents of the destination file as a list of destination filespecs that meet the requirements stated above.
KILL deletes the specified destination file before it is opened for RESTOREing.
PROMPT asks for verification of each file for RESTOREing. Press <**Y**> (yes), <**N**> (no), <**Q**> (quit restoring), or <**S**> (stop prompt).
PRT prints the DIRectory listing on the line printer. This can only be used with the DIR option.
SYS specifies that all System files will be retrieved. This includes System (e.g. RUNCOBOL) and Applications programs. If used with **DIR**, **SYS** will list the directory of System files.

Recovers files that were stored on archive diskettes with the SAVE command. Because SAVE stores files in a special format, RESTORE is the only way to return these files to the TRSDOS-II formatted diskettes.

Note that the TRSDOS-II diskette must remain in Drive Ø on floppy drive systems. Also, single drive SAVE/RESTORES are not allowed (i.e. RESTORE :1 :1 is illegal).

RESTORE reads information from a DATASET created by SAVE. If a VOLUME of this DATASET is entered out of sequence, TRSDOS-II informs you of the mistake. The System also informs you if a VOLUME from a different DATASET is accidentally entered during a RESTORE. (See SAVE for explanation of DATASET and VOLUME.)

When you're RESTOREing files in a DATASET, TRSDOS-II prompts you with:

Mount NEXT Diskette in Drive n -- Press ANY Key to continue.

which instructs you to enter the next VOLUME of the DATASET.

Examples

RESTORE Ø {ALL}

Restores all SAVEd user files on Drive Ø to the first available drive.

```
RESTORE 2 TO 3 {ALL}
```

recovers files from the floppy diskette in Drive 2 and puts them on Drive 3.

```
RESTORE 1 PROGRAMS {IND}
```

where PROGRAMS is an INDirect file containing the files:

```
MAILIST/PRG 3
MAILDAT/TXT 3
CHANGES/TXT 3
```

recovers the files from the floppy diskette in Drive 1, to the filespecs defined in PROGRAMS on Drive 3. Note that "TO" is optional.

```
RESTORE */SRC:Ø 2
```

Restores all user files SAVEd with the extension /SRC on Drive Ø to Drive 2 using the same file names.

SAVE
Save Compressed Data to Archive Diskette

(New)

SAVE source TO destination {options}

source can be one of the following:
- filespec:d if {options} is {IND}. filespec is a valid file specification and :d specifies a drive number between Ø and 7.
- wildcard:d is a valid wildcard and includes a drive number between Ø and 7.
- :d specifies a drive number between Ø and 7, but may not be the same as destination. If this option is used, **ALL** must be specified.

destination specifies a floppy drive and is the following:
- :d specifies a drive number between 1-3 for floppy drive systems and Ø-3 for hard disk systems.

options and their meanings are:
- **ABS** tells SAVE not to prompt if the destination diskette contains data. It formats the destination diskette if it isn't already in SAVE format.
- **ALL** tells TRSDOS-II to retrieve all non-system files. If **:d** is used as source, ALL must be used.
- **DC** value date compares the creation date of each specified source file against the date entered and SAVEs the file if all other criteria are met.
- **DM** value date uses the last modification date in the manner specified above.
- **IND** (indirect) tells SAVE to use the contents of the source file as a list of source filespecs that meet the requirements stated above.
- **PROMPT** asks for a file verification before SAVEing. You may respond with <Y> (yes), <N> (no), Q (quit) or <S> (stop prompting and continue).
- **SYS** specifies that all System files will be retrieved. This includes System (e.g. RUNCOBOL) and Applications programs. If used with **DIR**, **SYS** will list the directory of System files.

Note: value may be one of the following:
< (less than)
> (greater than)
= (equal to).
date must be in the form: MMDDYY

Do not save two files with the same filespec to the same SAVE diskette.

Creates a serial file-by-file copy of source onto destination. Normally, you'll want to use the SAVE command to create an archive copy of your files. This archive will in be a compact form which consumes approximately half the space that it would on a standard TRSDOS-II formatted floppy diskette.

The only way to retrieve a file in this compact format is with the RESTORE command. Any attempt to access a SAVEd diskette using a TRSDOS-II command will cause the System to appear "locked-up" for a short period of time while TRSDOS-II attempts to read the SAVEd diskette.

Note that the TRSDOS-II diskette must remain in Drive Ø on floppy drive systems. Also, single drive SAVE/RESTORES are not allowed (i.e. RESTORE :1 :1 is illegal).

SAVEing Multiple Diskettes

When you are saving a number of files, it may be necessary for SAVE to store information on more than one diskette. In these cases, SAVE prompts for the insertion of a new diskette.

There are two terms relative to SAVE which you need to be familiar with:

DATASET A set of one or more diskettes created by SAVE.

VOLUME An individual diskette that is a member of a DATASET.

TRSDOS-16 numbers the VOLUMEs sequentially from Ø. Each DATASET contains a unique identifier so each SAVE VOLUME is identified by its serial position in a specific DATASET. This prevents the accidental mixing of DATASETS within each other.

If SAVE requires more than one floppy diskette, the DATASET identifier enables you to keep track of diskettes in the same VOLUME. For instance, DATASET identifier 84 4E 56 may include VOLUMEs Ø, 1, and 2. This identifier is used by RESTORE to insure that you do not insert a VOLUME from a different DATASET. (That is, a volume with the DATASET identifier other than 84 4E 56.)

When you are SAVEing files that require more than one Volume, TRSDOS-II prompts with:

Insert NEXT Blank Diskette on Drive n -- Press ANY Key to Continue.

When you do this, TRSDOS-II then prompts with:

The Diskette Presently on Drive n will be referred to as "VOLUME 1"

When all files have been SAVEd, TRSDOS-II then prompts:

Insert "VOLUME Ø" on Drive 1 -- Press ANY Key to Continue

When you re-insert VOLUME Ø, TRSDOS-II then writes its housekeeping information to this diskette. This allows it to record the number of volumes in the DATASET, etc. for use when it RESTOREs the SAVEd files.

Examples

There are a variety of ways to use SAVE. The simplest of these is:

SAVE 1 TO 2 {ALL}

This simply copies all the files on Drive 1 in a compact form onto the diskette in Drive 2.

WILDCARDING
Wildcards also offer a simplified method of saving files (these can be several files, or an entire disk). For example:

```
SAVE */CBL:1 TO 3
```

SAVEs all files with the extension /CBL from Drive 1 to the diskette in drive 3.

Using the INDirect Option
The INDirect option allows you to save groups of files by creating an INDirect file (a file consisting of one or more filespecs). To do this you can use the BUILD command to create a list of filespecs.

At TRSDOS-II Ready, type: BUILD PROGRAMS:Ø <ENTER>

This will create an indirect file called PROGRAMS. When prompted with:

```
Enter command line (1-8Ø)
.....................................
```

Enter your list of file specifications including drive numbers, for example:

```
ORDERS:2 <ENTER>
REPORTS/*:3 <ENTER>
```

To exit the BUILD, press <BREAK>

You are now ready to SAVE your files specified by the INDirect file to the specially formatted floppy diskette. Type:

```
SAVE PROGRAMS:Ø TO 1 {IND} <ENTER>
```

Both ORDERS and REPORTS, found in the file named PROGRAMS on Drive Ø, are saved onto the floppy diskette in Drive 1.

Using the DC and DM option

Another way to SAVE files is to do so in respect to their creation or modification date. For example, suppose directory showed these creation and update dates for your files:

Filename	Created	Updated
MENU/PRG	6/1/81	9/2/81
PRGONE/PRG	6/1/81	8/16/81
PRGTWO/PRG	6/1/81	7/3Ø/81
PRGTHR/PRG	6/1/81	6/16/81
PAYROLL/DAT	9/15/81	1Ø/15/81
CHECKS/DAT	9/15/81	1Ø/15/81
TEST/PRG	1Ø/29/81	1Ø/29/81

If you wanted to save only those files that were created on June 1, 1982, you would use the following command:

```
SAVE */*:Ø TO 1 {DC=Ø6Ø181}
```

and the first four files would be SAVEd to the floppy diskette in Drive 1.

In the same sense, the first four files were modified (updated) on or before September 2, 1981 (9/2/81). Therefore, type:

```
SAVE */PRG:Ø TO 1 {DM<Ø91581} <ENTER>
```

and all files modified before the specified date would be SAVEd.

SECTION FOUR
PART III / Technical Information

What's New About TRSDOS-II

TRSDOS-II formats floppy diskettes into 32 sectors per track instead of the TRSDOS floppy diskette 26 sectors per track (32 x 76 = 2432 total sectors per diskette). These additional sectors are due to a more efficient use of diskette media, allowing more storage space on the same size diskettes.

Each sector is made up of 256 bytes (256 x 2432 = 622,592 total bytes per disk). A sector is the most basic unit of space allocation in TRSDOS-II. Note that granules (the basic unit of space allocation in TRSDOS) are not used by TRSDOS-II

Single-Sided

Diskette	Tracks	Sectors	Bytes
1	76	2,432	622,592
---	1	32	8,192
---	---	1	256

Double-Sided

Diskette	Cylinders	Tracks	Sectors	Bytes
1	77	153	4,896	1,253,376
---	1	2	64	16,384
---	---	1	32	8,192
---	---	---	1	256

Note: Track Ø on the 8-inch floppy diskette is reserved for System use and is not available for user storage. It is formatted single density with 26 sectors that contain 128 bytes each. The total capacity of the floppy diskette is 622,592 + (3,328) = 625,92Ø bytes for single-sided and 1,253,376 + (3,328) = 1,256,7Ø4.

Record Processing Capabilities

Machine-language programming has also been enhanced when you use the extended access mode. For instance:

Under TRSDOS-II control, direct access to record numbers larger than 65534 is possible. A file may contain up to 16,777,216 bytes of storage. (Note: this is larger than a floppy diskette storage capability.)

With TRSDOS, files with record numbers (LRN) larger than 65534 cannot be accessed directly (DIRRD and DIRWR).

However, with TRSDOS-II Direct Access to records 65534-16777214 is done via Extended File Access mode. This is specified when the file is OPENed. The Extended mode specifies the LRN in 3 bytes, thus allowing the larger number.

Therefore, if a 6ØØK file (possible with a data disk) is used with a 3-byte record length, it would hold approximately 2ØØ,ØØØ records. With TRSDOS, it is not possible to access these records directly since the record numbers would get larger than 65534.

To determine the number of records a file will hold, use the formula:

16777216 /logical record length = number of records

For example:

16777216/38 = 441,5Ø5 records

The number of records in this file cannot exceed 441,5Ø5 records.

Record number 16777215 (X'FFFFFF') positions to End of File (EOF).

For a file with a LRL=1, the number of records cannot exceed 16777214.

BASIC is still restricted to the same Logical Record Length because integers in BASIC have a limit of 32,767.

TRSDOS-II Supervisor Calls

Supervisor Calls (SVC's) are Operating System routines available to any user program. The routines alter certain System functions and conditions, provide file access, perform I/O to the Keyboard, Video Display, and Printer and perform various computations.

All of the SVC's described in your Model II Owner's Manual may be used with TRSDOS-II, although a few have been enhanced. In addition, TRSDOS-II makes available another SVC (RDDIR, function code 54) which cannot be used under TRSDOS. It is recommended that you use DIRREC instead of RAMDIR (function code 53) and FILPTR (function code 58) under TRSDOS-II since they are restricted to 96 files. Your old programs will still run.

Note that you may place an "E" in the parameter list under TRSDOS-II and TRSDOS will assume "F" (and work correctly). However, if you programmed your disk reads and writes to effectively use the "E" option, you probably created a difference that would not work under TRSDOS.

For specific details on using SVC's, see your Model II owner's manual.

DISKID
(function code 15)

(Change only)

This routine reads the diskette ID from any or all Drives Ø-3.

Entry Conditions

B = Drive Select Code. If B=Ø, read from Drive Ø, etc. B must be one of the following: Ø, 1, 2, 3, 4, 5, 6, 7 or 255. If B = 255, then routine reads from all drives.

(HL) Buffer to hold the diskette ID(s). If B = Ø, 1, 2, 3, 4, 5, 6, or 7 then buffer must be 8-bytes long. If B = 255, buffer must be 64 bytes long.

Drive Ø ID will be placed in the first 8 bytes, then Drive 1, etc. The last 32 bytes will contain spaces. This is for compatibility with the hard disk system.

A = 15

Exit Conditions

The diskette ID(s) are placed in the buffers pointed to by register-pair HL. If a drive is not ready, blanks are placed into the buffer. If all four drives are read, the last 32 bytes of the 64-byte buffer will be blank; this is for compatibility with hard disk systems.

NZ = Error
A = Error Code

KBPUT
(function code 3Ø)

(New Function)

This routine puts one character into the keyboard type-ahead buffer in the same manner that pressing that key on the keyboard does.

Note: If the character to be put into the buffer is X'ØØ', it will be put into the buffer if HLDKEY SVC is turned off, and will trigger hold processing if HLDKEY SVC is turned on. (See HLDKEY SVC in Model II Owner's Manual for more information.)

If the character is X'Ø3', it will cause BREAK key processing to be invoked (see SETBRK SVC in Model II Owner's Manual for more information).

Entry Conditions

B = Character to be put into the buffer
A = 3Ø

Exit Conditions

Z = Character was put into buffer
NZ = Buffer full -- character could not be put into buffer
A = Error Code

RDDIR
(function code 32)

(New Function)

This routine reads in one directory record from a single drive at a time. It also allows you to use a wildcard mask. The directory record is then put into a 128-byte ASCII string in user memory.

To read the directory of a specific file, use the filename for the wildcard mask. (Do not use the asterisk.) RDDIR will then search for the specified file.

See DIRSET for details on OPEN file directory information.

Entry Conditions

BC= Address of an 8-byte block in user memory defined as:

binary drive #	directory index*						**
	FF	FF	FF	FF	FF	FF	ØØ

* = FF FF FF FF FF FF sets index to beginning of directory
** = end of list terminator

DE = Wildcard Mask. For example:

```
MASK   DEFM   '*/BAS'
       DEFB   ØDH   ;must end with CR
```

If DE = Ø, then no wildcard selection will take place. See the **TRSDOS** section of the Model II Owner's Manual for specific details.

HL = Address of 128-byte area where data is to be placed.

Exit Conditions

HL = Address of 128-byte area where data is placed
This data line will be in the form of the
TRSDOS-II DIR format.

Z set if error does not occur.

RETURN C,NZ = EOF encountered. (i.e., no further directory
entries.)

RETURN NC,NZ = I/O Error occurred. (A = error code)

Example

```
   LOOP    LD      BC,CTLBLK
           LD      DE,MASK
           LD      HL,IMAGE

           LD      A,54
           RST     8
           JR      NZ,END      ; END OR ERROR HAS OCCURRED

           (display "IMAGE")

           JR      LOOP

END        JR      C,EOF       ; INDICATES END OF FILE
           (exit routine, otherwise an error occurred)

CTLBLK     DEFB    Ø1          ; DRIVE #
           DEFB    -1,-1,-1    ; BEGINNING OF DIRECTORY INDEX
           DEFB    -1,-1,-1    ;
           DEFB    Ø           ; END OF LIST TERMINATOR

IMAGE      DEFS    128

MASK       DEFM    '*/BAS'     ; FIND /BAS FILES ONLY
           DEFB    ØDH         ; CR
```

Table 6

Offset Table For HL Buffer

Offset	Description	# bytes
Ø	Length Byte	1
1-12	Filename	12
13	File-Left-Open Marker	1
16-23	Date Created	8
25-32	Date Updated	8
39-42	Attrib	4
45	File Type	1
48-51	Record Length	4
53-61	Number of Records	9
64-7Ø	Sectors Allocated	7
73-79	Sectors Used	7
8Ø-127	Reserved	48

LOCATE
(function code 33)

(Enhancements only)

This function returns the number of the current record, i.e., the number of the last record accessed. You can use this call with fixed-length record files only.

For information on Entry and Exit Conditions, see your Model II Owner's Manual.

If the "E" (Extended) mode was set at file open, then:

BC = Address of 3 bytes of RAM where LRN will be stored in the following format:

upper byte	middle byte	lower byte

where ØØ ØØ ØØ = first record of file.

DIRRD
(function code 35)

(Enhancements only)

This routine reads the specified record, allowing direct access.

For details on Entry and Exit Conditions, see your Model II owner's manual.

If "E" (Extended) mode was set at file open then:

BC = Address of 3 bytes in RAM whose format is:

upper byte	middle byte	lower byte

where ØØ ØØ ØØ = beginning of file (first record)
and FF FF FF = end of file (EOF)

OPEN
(function code 4Ø)

(Enhancements only)

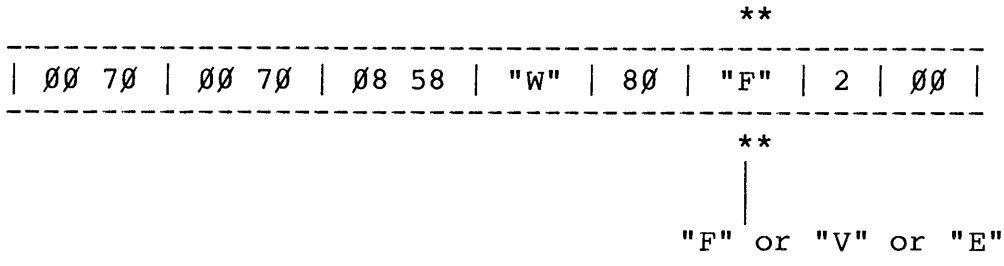
This call handles both the creation and opening of files.

For Entry and Exit Conditions, see your Model II Owner's Manual.

A field in the (HL) parameter list in TRSDOS-II invokes the "E" (Extended) mode. The "E" mode tells the system to use a 24-bit record number. This is used when record numbers over 65534 are to be accessed.

Example

Contents of Parameter List



"V", "F", or "E" (variable- or fixed-length, or fixed-length extended)

This one-byte field contains either an ASCII V for variable-length, or ASCII F for fixed-length, or ASCII E for extended mode. If E, then position read or write (DIRRD or DIRWR) and LOCATE will use a 24-bit, indirect 3-byte record number. The E specifies F (fixed) type of records and an "extended" mode of specifying Logical Record Numbers. The Directory will show F, even though the E mode was specified.

If OPEN finds a program file, a P will be returned in the Read/Write field in the parameter list. For example, a call to OPEN with a parameter list of ØØ7Ø ØØ7Ø Ø858 R 8Ø F ØØ ØØ would return the following if the file found was a program file: ØØ7Ø ØØ7Ø Ø858 P ØØ F ØØ ØØ.

DIRWR
(function code 44)

(Enhancements only)

This routine writes the specified record. It writes your record into the specified record position of the file.

For details on the Entry and Exit Conditions, see your Model II Owner's Manual.

If E mode was set at file open, then:

BC = Address of 3 bytes in RAM whose format is:

upper byte	middle byte	lower byte

where ØØ ØØ ØØ = first record of file
and FF FF FF = record after current end-of-file (EOF + 1)

REWIND
(function code 48)

(New Function)

This routine rewinds a disk file. After this routine is executed, the next read/write will access the first record of that file.

Entry Conditions

DE = DCB of Open File

Exit Conditions

NZ = Error occured
A = Error Code

RS232C
(function code 55)

(Enhancement Only)

This routine sets up or disables either channel A or B.

For Entry and Exit Conditions, see your Model II Owner's Manual.

The (HL) parameter list field called the End of List Marker, allows you to specify a larger receive buffer than the 16-character default buffer.

The format of the old parameter list is:

Channel	Baud Rate	Word Length	Parity	Stop Bits	End of List Marker

The Channel, Baud Rate, Word Length, Parity, and Stop Bits are described in the Model II Owner's Manual.

If the End of List Marker is a ØØH, then the 16-character default receive buffer as described in the Model II Owner's Manual will be used.

New Feature

If the End of List Marker is a Ø1H, then the buffer area specified by the contents of five bytes which follow the End of List Marker will be used to specify the receive buffer:

byte Ø	End of List Marker -- Ø1H
bytes 1 - 2	Buffer Start Address (LSB/MSB)
bytes 3 - 4	Buffer End Address (LSB/MSB)
byte 5	ØØH Terminator

The buffer must be at least 49-bytes long and the entire buffer (both front and back) must reside below 8ØØØH.

To determine the size of the buffer, use the following formula:

n * 2 +15 = buffer size

where **n** is the number of characters you wish the buffer to hold. **n** must be least 17, but small enough where the entire buffer can stored below 8ØØØH.

DIRSET
(function code 59)

(New Function)

To get the directory information on any currently opened file, use DIRSET. This routine sets up the 8-byte block of memory that is one of the entry parameters for RDDIR (function code 32). After the file is opened, you may:

- Find out which drive contains the file (see RDDIR).
- Set up the 8-byte block in user memory (BC) for RDDIR. This allows RDDIR to obtain directory information about the currently open file.

Entry Conditions

DE= Address of the open DCB.
BC= Address of the 8-byte block of user memory.

Exit Conditions

All registers returned unmodified except "A".
BC= Address of 8-byte block of user memory set for RDDIR call to get the directory information of the open DCB (pointed to by DE).
Z= No error.
NZ= I/O error occurred.

Note: Be sure to load register pair DE with zero (LD DE,Ø) after executing DIRSET and before executing the RDDIR. If DE is non-zero, RDDIR will expect a wildcard mask and, in most cases, will not be able to find a match.

ADDENDUM

Removing TRSDOS-16 Files From TRSDOS-II 4.2

The TRSDOS-II 4.2 diskette that came with your computer and/or hard disk includes the TRSDOS-16 system files. To gain more free space, you can remove these files. However, do not remove these files if:

- your computer is a Model 16 or an Enhanced Model II/12, and
- your application program uses TRSDOS-16

To remove the TRSDOS-16 files, follow these instructions:

1. Turn on your computer as instructed in your owner's manual.

   Note: If you are deleting the TRSDOS-16 files from a floppy diskette, make a backup before going further. Instructions for making backups are in your computer's owner's manual.

2. At TRSDOS-II Ready, type:

   ```
   PURGE :Ø {SYS} <ENTER>   (for floppy diskette users)
   PURGE :4 {SYS} <ENTER>   (for hard disk users)
   ```

3. The TRSDOS-II system files are listed one at a time along with the prompt:

   ```
   Delete? (Y/N/Q)
   ```

4. Answer <N>o to all files except TRSDOS-16 files.

   Answer <Y>es to these files, only:

   ```
   IFC        TRSDOS16/SYS        ASM16
   EDIT16     LINK16              BOOT16
   ```

5. When the purge is complete, TRSDOS-II Ready is displayed.