

APPENDICES

APPENDIX A: BACKUP DISKS AND FILES

This appendix contains introductory information about using the following operating system commands:

- . BACKUP
- . COPY
- . MOVE
- . SAVE/RESTORE

For complete information on the TRSDOS-II commands, refer to the TRSDOS-II Reference Manual.

TRSDOS-II BACKUP

The TRSDOS-II BACKUP command makes a copy of a diskette. If you have two or more floppy diskette drives, use BACKUP to copy:

- . The TRSDOS-II System Diskette
- . Other TRSDOS-II system diskettes, including TRSDOS-II application program diskettes
- . TRSDOS-II data diskettes

Remember that you cannot backup double-sided to single-sided diskettes.

Backing Up TRSDOS-II System Diskettes

If you have two or more floppy diskette drives, you can back up the TRSDOS-II System Diskette or any other diskette that contains the TRSDOS-II system by following these steps:

1. Power up your Computer. Insert the TRSDOS-II system diskette you wish to copy (source diskette) into Drive 0.
2. Enter the date and time.

3. When TRSDOS-II Ready appears, insert the destination diskette into Drive 1 (use a double-sided destination diskette for maximum storage space), type:

```
BACKUP Ø TO 1 <ENTER>
```

4. The message:

```
Backup Successfully Completed  
Drive 1 Disk ID is: TRSDOS  
TRSDOS-II Ready
```

is displayed when the backup is finished.

Backing Up TRSDOS-II Data Diskettes Using a Floppy Diskette System

Follow these steps to make a backup of a TRSDOS-II data diskette:

1. Power up your Computer. Insert a TRSDOS-II System Diskette into Drive Ø and the source data diskette into Drive 1.
2. Enter the date and time.
3. If you have three or four floppy drives, insert the destination diskette into Drive 2. Use a double-sided destination diskette for maximum storage space.

- 4a. Users with Three Floppy Drives:

```
Type: BACKUP 1 TO 2 <ENTER>
```

"Backup Successfully Completed" appears when the BACKUP is finished.

- 4b. Users with Two Floppy Drives:

```
Type: BACKUP 1 TO Ø <ENTER>
```

The message

Replace system diskette with destination diskette.
Ready? (Y)..

appears. Remove your TRSDOS-II system diskette from Drive 0 and insert the destination diskette. Type Y <ENTER> and the backup will continue.

When the backup is complete, the message

Mount system disk. Ready? (Y)..

is displayed. Remove the destination diskette from Drive 0 and insert your TRSDOS-II system diskette. Press Y <ENTER> and TRSDOS-II Ready appears.

Backing Up TRSDOS-II Data Diskettes Using a Hard Disk System

You need two floppy diskette drives for this method.

1. Power up under hard disk control.
2. Insert the TRSDOS-II data diskette into Drive 0.
Insert the destination diskette into Drive 1. Use a double-sided diskette for maximum diskette storage space.
3. Enter the date and time.
4. When TRSDOS-II Ready appears, type:

BACKUP 0 TO 1 <ENTER>

"Backup Successfully Completed" appears when the backup is finished.

TRSDOS BACKUP

The TRSDOS BACKUP command copies a TRSDOS diskette. It is slightly different from the TRSDOS-II BACKUP command. You can use it to copy:

- . The TRSDOS System Diskette
- . Other TRSDOS 2.0b system diskettes
- . TRSDOS data diskettes

Backing Up TRSDOS System Diskettes

To backup the TRSDOS System Diskette or any other diskette that contains the TRSDOS system (Version 2.0b), use the following steps:

1. Power up or reset the Computer. If you have a hard disk, operate under floppy diskette control.
2. Insert the TRSDOS diskette you wish to copy (source diskette) into Drive 0.
3. Enter the date and time. TRSDOS READY appears.
- 4a. Multi-Drive Users:

Insert the single-sided destination diskette into Drive 1. Type:

```
FORMAT 1 <ENTER>
```

When TRSDOS READY reappears, type:

```
BACKUP 0 TO 1 <ENTER>
```

TRSDOS READY appears when the backup is finished.

- 4b. Single-Drive Users:

Type:

```
FORMAT 0 <ENTER>
```

Place the destination diskette in Drive 0 when prompted.

When TRSDOS READY reappears, make sure the TRSDOS diskette is in Drive 0. Type:

```
BACKUP 0 TO 0 <ENTER>
```

Swap the source and destination diskettes when prompted. TRSDOS READY appears when the backup is finished.

Backing Up TRSDOS Data Diskettes

Use this method to back up TRSDOS 2.0a and 2.0b data diskettes. (You can also use this method to back up TRSDOS 2.0b system diskettes.) You need two or more floppy diskette drives.

1. Turn on or reset the Computer with a TRSDOS 2.0b diskette in Drive 0. If you have a hard disk, operate under floppy diskette control.
2. Enter the date and time.
- 3a. Two-Drive Users:

When TRSDOS READY appears, insert the single-sided destination diskette into Drive 1. Type:

```
FORMAT 1 <ENTER>
```

When TRSDOS READY appears again, remove the destination diskette from Drive 1. Insert the diskette you wish to copy. Type, at TRSDOS READY:

```
I <ENTER>  
BACKUP 1 TO 0 <ENTER>
```

When the message "Destination Diskette Ready? (Y/Q)" appears, remove your TRSDOS system diskette from Drive 0 and insert the formatted destination diskette.

When the backup is finished and TRSDOS READY is displayed, you are prompted to insert a system diskette into Drive 0.

3b. Three- or Four-Drive Users:

When TRSDOS READY appears, insert the diskette you wish to copy into Drive 1. Insert a single-sided destination diskette into Drive 2.

When TRSDOS READY appears, type:

```
FORMAT 2 <ENTER>
```

When TRSDOS READY appears again, type:

```
BACKUP 1 TO 2 <ENTER>
```

TRSDOS READY appears when the backup is finished.

Making SAVE/RESTORE Compressed Copies

The SAVE utility stores files in a special, compact form on floppy diskettes. Because of the special format, files occupy less space they normally would on floppy diskettes. TRSDOS-II cannot directly read files stored in this format.

The RESTORE utility returns saved information to a TRSDOS-II formatted disk. It is the only way to retrieve to information stored by SAVE.

SAVE is a good way to make archive copies of hard disk files. To decide how often to make save copies of your hard disk files, think how much time, effort, and money could be lost if your hard disk files suddenly were destroyed. We suggest hard disk users keep two major sets of archive files:

- . Monthly Save Set -- A set of save diskettes containing everything on your hard disks, including your programs. Make this set on the first day of each month. Always keep a previous month's save set and a current month's save set.
- . Daily Save Set -- A set of save diskettes containing the files that were created or changed since the current monthly save set was made. Make this set at the end of each day. Always keep a previous daily save set and a current daily save set.

If you enter large amounts of data every day, you might want to make more than one "daily" save set each day. No matter how much data you enter, however, never wait longer than three days before making a daily save set.

Note: The examples in this section use Drive 4 (hard disk) as the source and Drive 0 as the destination. This is because SAVE and RESTORE are intended for hard disk use. However, SAVE and RESTORE can also be used to save files from a TRSDOS-II formatted floppy diskette to a SAVE formatted diskette.

When using SAVE and RESTORE between two floppy diskette, be sure:

- . the source and destination drive numbers are different
- . the destination drive number is not Drive 0, since Drive 0 must contain a TRSDOS-II system diskette

Creating a Monthly Save Set

Creating a monthly save set takes time, but it's worth it. Have several blank, unformatted diskettes ready.

To save all the files (including system files) and programs from hard disk Drive 4 to a floppy diskette in Drive 0, insert a floppy diskette into Drive 0. At TRSDOS-II Ready, type:

```
SAVE :4 :0 {SYS,ALL,ABS} <ENTER>
```

TRSDOS-II displays a "volume number" which identifies the diskette in Drive 0. A "dataset signature" identifies the set of diskettes. Write down the volume number and dataset signature. When you later remove the diskette from the drive, write this information on the diskette's label.

When the diskette is full, TRSDOS-II prompts you to insert another diskette. When all the files are saved, TRSDOS-II prompts you to reinsert the first diskette of the set (Volume 0). It then updates the diskette with housekeeping information.

TRSDOS-II Ready appears when the SAVE is finished. Make sure you have labeled all the save diskettes. Store them in a safe place.

At the beginning of the next month, create a new monthly save set using a different set of diskettes. This set becomes the "current monthly save set." The other set becomes the "previous monthly save set."

Rotating Monthly Save Sets

When you have two monthly save sets, begin rotating the diskettes. When you make a new monthly save set, use the older monthly save set diskettes instead of blank diskettes.

Creating a Daily Save Set

To create a daily save set of all the Drive 4 files that were created or changed since the monthly save set was created, type:

```
SAVE !:4 :Ø {DM>mmddy,ABS,SYS} <ENTER>
```

Instead of typing "mmddy," type the date that you made the most recent monthly save set.

At the end of the next day, create a new daily save set, using different diskettes. This set becomes the "current daily save set." The other set is the "older daily save set."

Rotating Daily Save Sets

Once you have two daily save sets, rotate the diskettes. When you make a new daily save set, use the older daily save set diskettes instead of blank diskettes.

Restoring your Files

To restore information to a hard disk other than Drive 4, replace "4" with the desired drive number in each of the following commands.

Restoring One File

If you want to restore only one file, insert Volume Ø of your most recent save set into Drive Ø and type:

```
RESTORE filespec:Ø :4 {ABS} <ENTER>
```

where filespec is the name of the file you want to restore.

Restoring a Group of Files

To restore a group of files, insert Volume Ø of your most recent save set into Drive Ø. Type:

```
RESTORE :Ø :4 {PROMPT} <ENTER>
```

TRSDOS-II prompts you before restoring each file. Press <Y> to restore a file. Press <N> if you don't wish to restore the file.

Restoring All Files

If you lose most or all of the data on your hard disk(s), follow these steps to recover the lost data:

1. If Drive 4's operating system is damaged, re-transfer TRSDOS-II and BASIC from the diskette supplied with your hard disk to Drive 4. Instructions are in your Hard Disk Owner's Manual.

If you are sure Drive 4's operating system is not damaged, go to Step 2.

2. Insert Volume Ø of your current monthly save set into Drive Ø. At TRSDOS-II Ready, type:

```
RESTORE :Ø :4 {ABS,SYS} <ENTER>
```

Follow TRSDOS-II's prompts.

3. Insert Volume Ø of your current daily save set into Drive Ø. At TRSDOS-II Ready, type:

```
RESTORE :Ø :4 {ABS,SYS} <ENTER>
```

4. Re-enter any information added to the hard disk since the last current daily save set was created.

MOVE

The MOVE command copies files. For example, to copy all user files from the diskette in Drive 1 to the diskette in Drive 2, type:

```
MOVE 1 TO 2 {ALL} <ENTER>
```

The MOVE command is especially useful if you have two or more hard disks. You can copy all the files from one hard disk drive onto a second hard disk drive and then turn the second drive off-line. This procedure quickly copies your files and then protects the copies by making them temporarily inaccessible. You can access the copies by turning the drive back on-line.

To create a command file that copies files from Drive 4 onto Drive 5 and then turns Drive 5 off-line, follow these steps:

1. At TRSDOS-II Ready, type:

```
BUILD DISKMOVE:4 <ENTER>
```

2. When the message

```
Enter command line (1-80)
```

is displayed, type:

```
MOVE 4 TO 5 {ALL} <ENTER>
```

3. The line you typed is highlighted and the following question appears:

```
Store Line? (cr/esc)
```

If the highlighted line is correct, press <ENTER>. If the line is incorrect, press <ESC> and type the line again. Do this whenever the Store Line? prompt appears.

4. Type:

```
DRIVE 5 {OFFLINE} <ENTER>
```

5. To end to command file, press <ENTER> instead of typing a new command line. TRSDOS-II Ready reappears.

After following Steps 1 - 5, you can copy all the user files from Drive 4 to Drive 5 and then turn Drive 5 off-line by typing:

```
DO DISKMOVE:4 <ENTER>
```

COPY

To copy one file at a time, use the COPY command. For example, to copy a file named SAMPLE from a diskette in Drive 1 to a diskette in Drive 2, type:

```
COPY SAMPLE:1 TO 2 <ENTER>
```

APPENDIX B: MORE ABOUT TRSDOS-II

For an introduction to four often-used TRSDOS-II commands -- DRIVE, HELP, KILL, and PURGE -- read this appendix.

For an introduction to:

- . BACKUP, COPY, MOVE, SAVE, and RESTORE, refer to Appendix A, "Making Backups."
- . DIR, refer to Chapter 3, "Sample Session."
- . FORMAT, refer to Chapter 3, "Sample Session," and Chapter 4, "Floppy Diskette System Preparation."

For detailed information about all the TRSDOS-II commands, see the TRSDOS-II Reference Manual.

Increasing Drive Efficiency -- Using the DRIVE Command

When TRSDOS-II starts up it establishes the settings that determine how your drives work. However, these automatic drive settings might not be the best way to run your Computer's drives. The DRIVE command lets you specify the best settings for your Computer.

For the best results, enter a separate DRIVE command for the four floppy diskette drives, even if your Computer doesn't have them all.

In addition, if you have a hard disk system, enter a separate command for each hard disk drive you don't have.

By creating a comand file that automatically executes the DRIVE commands, you can avoid typing the commands each time TRSDOS-II is loaded. The following steps explain how.

- 1a. Floppy Diskette System Users:
Place a TRSDOS-II System Diskette in Drive Ø.
- 1b. Hard Disk System Users:
Power up under hard disk control.

2. At TRSDOS-II Ready, type:

BUILD DRIVESSET <ENTER>

3. When:

Enter command line (1-80)

is displayed, type:

DRIVE 0 {RATE=0,DETECT,WAIT} <ENTER>

4. The line you typed is highlighted and the question:

Store Line? (cr/esc)

appears. If the highlighted line is correct, press <ENTER>. If the line is incorrect, press <ESC> and type the line again. Do this whenever the Store Line? prompt appears.

5. If you have Drive 1, type:

DRIVE 1 {RATE=0,DETECT,WAIT} <ENTER>

If you do not have Drive 1, type:

DRIVE 1 {OFFLINE} <ENTER>

Do the same for Drives 2 and 3, substituting the appropriate drive number.

- 6a. Floppy Diskette System Users and Users with Four Hard Drives:

Press <ENTER> instead of typing a new command line to end the DO file. You are now ready to execute the file. To do so, type at TRSDOS-II Ready:

AUTO DO DRIVESSET <ENTER>

6b. Hard Disk System Users with Less Than Four Hard Drives:

If you do not have Drive 5, type:

```
DRIVE 5 {OFFLINE} <ENTER>
```

Do the same for each hard drive not present in your system, substituting the appropriate drive number.

Press <ENTER> instead of typing a new command line to end the DO file. You are now ready to execute the file. To do so, type at TRSDOS-II Ready:

```
AUTO DO DRIVESET <ENTER>
```

Now, whenever you use this disk to start up your Computer, the drives run as set by the commands. When you add drives, you can use the KILL command to delete the DRIVESET program and create a new command file or use the BUILD edit function to edit the file. (BUILD is described in your TRSDOS-II Reference Manual.)

HELP

The HELP command displays information about TRSDOS-II. For example, to display a list of subjects for which help is available, type, at TRSDOS-II Ready:

```
HELP <ENTER>
```

The display is similar to the following:

```
APPEND  copies contents of a file to the end of another file
ATTRIB  assigns or changes the password and protection level of a file
AUTO    stores a command for automatic execution after system startup
.       .
.       .
.       .
FLOPPY  ignores all references to floppy drive numbers in files
```

Press any Key to continue

Pressing <ENTER> displays the next screen of information.

To display the "syntax" (command format) for one of the subjects listed, enter the HELP command with that subject. For example, at TRSDOS-II Ready, type:

```
HELP DIR <ENTER>
```

and TRSDOS-II displays:

```
DIR [fs | wc] [:d] {[SYS] [PRT]}
```

To interpret a syntax display, type:

```
HELP SYNTAX
```

The Computer displays the syntax symbols and their meanings.

KILL

Use the KILL command to delete one or more files. For example, at TRSDOS-II Ready, type:

```
KILL SAMPLE:Ø <ENTER>
```

and TRSDOS-II deletes a file named SAMPLE from a diskette in Drive Ø.

APPENDIX C: MAKING A MINIMUM SYSTEM DISKETTE

Using TRSDOS-II and double-sided diskettes gives you more space than using TRSDOS and single-sided diskettes. If, however, you need even more space, you can make a "minimum system" diskette.

This is a diskette that contains only the part of the operating system that your program needs. To make a minimum system diskette, follow these steps:

1. Insert a backup TRSDOS-II diskette into Drive Ø.
2. At TRSDOS-II Ready, type:


```
PURGE Ø {SYS} <ENTER>
```
3. Enter the diskette's password when prompted. The password for the TRSDOS-II diskette is PASSWORD.
4. When prompted, press <Y> to delete a file or <N> to keep a file. Never delete a file unless you are sure you do not need it. The following chart contains guidelines to help you decide which files to delete.

File	Brief Description
SYSRES/SYS	Contains the operating system information needed to start TRSDOS-II. (keep this file)
SYSTEM/SYS	Contains the operating system information that is needed on all diskettes used in Drive Ø. (keep this file)
BASIC	Contains the BASIC Interpreter program. You may delete this file, if you do not plan to use a BASIC program.
APPEND	Copies a file onto the end of another file. (You may delete this file.)
BACKUP	Makes a mirror-image copy of a diskette. (keep this file)

File	Brief Description
BUILD	Creates a command input file which is executed with the DO command. (You may delete this file.)
COPY	Copies a file. (You may delete this file.)
CREATE	Creates a file and pre-allocates space for it. (You may delete this file.)
DRIVE	Changes floppy diskette drive settings and turns floppy or hard disk drives offline or online. (keep this file)
DUMP	Copies a machine-language program from memory to disk. (You may delete this file.)
FCOPY	Copies a TRSDOS file to a TRSDOS-II disk. (You should keep this file.)
FILES	Displays or prints an alphabetical list of the filenames on a disk. (You may delete this file.)
FORMAT	Prepares a blank disk for use. (keep this file)
HELP	Displays information about commands and certain subjects. (You may delete this file.)
LIST	Lists the contents of a file, including the record numbers and hexadecimal codes. (You may delete this file.)
MEMTEST	Tests the Computer's random access memory (RAM). (You may delete this file.)
MOVE	Copies files and reduces fragmentation of the files. (You may delete this file.)
PATCH	Makes minor corrections to disk files. (You should keep this file.)

File	Brief Description
PRINT	Prints the contents of a file, omitting the record numbers and hexadecimal codes. (You may delete this file.)
RECEIVE	Lets you receive object code into RAM from another device. (You may delete this file.)
RESTORE	Recovers files stored on floppy diskettes by the SAVE command. (You may delete this file.)
SAVE	Copies files onto floppy diskettes in a special, compressed format. (You may delete this file.)
TERMINAL	Transforms a Computer into a terminal. (You may delete this file.)

APPENDIX D: GLOSSARY

- Application program** -- A computer program that lets you perform various applications such as word processing, graphics, and bookkeeping.
- Application data diskette** -- A data diskette that is used only with a particular application program.
- Application program diskette** -- A diskette that contains an operating system and all or part of an application program.
- Backup diskette** -- A mirror-image copy of a diskette.
- BASIC** -- Beginners' All-purpose Symbolic Instruction Code. A programming language.
- Boot up** -- To turn on a computer system (including all peripherals) and load an operating system or program.
- Command** -- A function the computer performs upon your instructions.
- Cursor** -- The flashing, white box (on the display) where you enter data or instructions.
- Data disk** -- A diskette that can store information, but does not contain an operating system. A formatted disk.
- Disk** -- A storage device. A floppy diskette or a hard disk.
- Diskette** -- A storage device. See the illustration at "Floppy Diskette."
- Double-sided diskette** -- A floppy diskette that lets you store information on both sides.
- Floppy diskette** -- A removable storage device.

- Floppy diskette control** -- Under the control of an operating system on a diskette in Drive 0.
- Floppy diskette drive** -- A device that stores information on a removable magnetic medium (floppy diskette).
- Floppy diskette expansion unit** -- External (not in the display console) floppy drives.
- Floppy diskette operation** -- Computer operation controlled by an operating system on a diskette in Drive 0.
- Floppy drive** -- See "Floppy diskette drive."
- Formatted disk** -- A disk that has been formatted with the FORMAT command. A disk that can store information.
- Hard disk** -- See "Hard disk unit."
- Hard disk control** -- Under the control of an operating system in Drive 4.
- Hard disk drive** -- See "Hard disk unit."
- Hard disk unit** -- A storage device with non-removable media.
- Hard disk operation** -- Operation under the control of an operating system in Drive 4.
- Master diskette** -- The original diskette you received when you purchased the product.
- Off-line** -- Status of equipment in which the computer considers it unusable.
- On-line** -- Status of equipment in which the computer consider it usable.
- Operating system** -- A program that enables you to use the computer and peripheral equipment.
- Operating system disk** -- A disk that contains an operating system.
- Power up** -- To turn on the computer system (including all peripheral equipment).

- Program** -- Instructions that tell a computer how to do something.
- Program disk** -- A disk that contains a program.
- Software** -- Operating systems and application programs.
- System files** -- The programs that make up the system operating routine. These can include certain language and application programs. To see a list of system files, type DIR {SYS} at TRSDOS-II Ready.
- Thinline drives** -- The internal drives of the Model 12 Computer, so named because they are only half as wide as the standard 8-inch disk drives.
- TRSDOS 2.0b** -- A version of the TRSDOS 2.0a operating system that can run on Thinline drives. Called "TRSDOS" in this manual.
- TRSDOS system diskette** -- Any diskette that contains TRSDOS 2.0b. It can contain other information, also.
- TRSDOS System Diskette and Basic Interpreter** -- The system diskette that came with your Model 12; it contains TRSDOS 2.0b and BASIC. TRSDOS 2.0b allows you to use TRSDOS 2.0a programs on the Model 12's Thinline drives.
- TRSDOS-II** -- The Model 12's native operating system.
- TRSDOS-II system diskette** -- Any diskette that contains TRSDOS-II. Can be used in Drive 0.
- TRSDOS-II System Diskette and BASIC Interpreter** -- The system diskette that came with your Model 12; it contains TRSDOS-II and BASIC.
- User files** -- Non-system files, which include user-created files and most application programs.
- Working diskette** -- A backup of an original diskette, used on an everyday basis.

Write-enable tab -- A gummed tab placed over a diskette's write-protect notch to enable you to change the information stored on the diskette. See "floppy diskette" for an illustration of the write-protect notch.

Write-enabled disk -- A disk that can have its information changed.

Write-protected disk -- A disk that cannot have its information changed.

APPENDIX E: PROBLEMS AND ERROR MESSAGES**Unreadable Disks, Files, and Programs**

If you suddenly cannot use your disk, files, or programs, static electricity might be the cause. Try humidifiers and anti-static carpets to get rid of static electricity.

There are other causes. The Model 12's built-in AC line filter shields the Computer from minor changes in AC power, but extreme changes can ruin programs and files. If you think this is the problem, try these remedies:

- . Fix defective switches on nearby machines
- . Install bypass/isolation devices on noisy machines in your area
- . Install a separate power line to your Computer

Error Messages

If a displayed error message looks like:

- . ** ERROR 24 **, see the Operating System Errors table
- . BOOT ERROR DC, see the Boot Errors table
- . Neither of the above, see your application program manual. (It might also be a descriptive operating system error generated by the application program.)

When an error message is displayed:

- . Try the operation several times.
- . Look up boot errors and operating system errors in the following tables and take the recommended actions.
- . Try using other diskettes.
- . Reset the Computer and try the operation again.
- . Check all the power connections.
- . Check all interconnections.
- . Remove all diskettes from drives, turn off the Computer, wait 15 seconds, and turn it on again.
- . If you try all these remedies and continue to get an error message, contact a Radio Shack Service Center.

Note: If there is more than one thing wrong, TRSDOS-II sometimes waits until you correct the first error before displaying another error message.

RSSC = Radio Shack Service Center.

Operating System Errors Table

Code	Message	Explanation/Action
Ø	No Error Found.	No error occurred.
1	Bad Function Code On SVC Call Or No Function Exists.	Check the function code number used on the SVC call.
2	Character Not Available.	No record or character was available when you you called the SVC.
3	Parameter Error On Call.	Parameter is incorrect or a required parameter is missing.
4	CRC Error During Disk I/O.	Try the operation again, using a different diskette. If the problem occurs often, contact RSSC.
5	Disk Sector Not Found.	Try a different diskette.
6	Attempt To Open A File Which Has Not Been Closed.	Close the file before re-opening.
7	Illegal Disk Change.	TRSDOS-II detected an illegal disk swap.
8	Disk Drive Not Ready.	Drive door is open or the diskette is not in the drive. On Thinline drives, check the DRIVE command settings.
9	Invalid Data Provided By Caller.	Data stream to be processed has illegal characters.

Code	Message	Explanation/Action
10	Maximum Of 16 Files May Be Open At Once.	Too many files are open at once.
11	File Already In Directory.	Filename already exists as a directory entry. Kill the existing file, choose another filename, or specify a drive number.
12	No Drive Available For An Open.	No on-line drive a. is write enabled b. has enough space to create a new file, or c. has a system directory.
13	Write Attempt To A Read Only File.	File was opened for read only, not for read/write.
14	Write Fault On Disk I/O.	Error occurred during a write operation. Try a different diskette. If the problem continues, contact RSSC.
15	Disk Is Write Protected.	Write enable the disk.
16	DCB Is Modified And Is Unusable.	DCB (used in machine- language programming) has been modified since the last disk access (while the file was open).
17	Directory Read Error.	Error occurred during an attempt to read the directory. Use a different diskette.

Code	Message	Explanation/Action
18	Directory Write Error.	Error occurred during an attempt to write to the directory. Use a different diskette.
19	Improper File Name (Filespec).	Filespec you gave does not meet TRSDOS-II standard file specifications.
20	** Unknown Error Code **	
21	** Unknown Error Code **	
22	** Unknown Error Code **	
23	** Unknown Error Code **	
24	File Not Found.	Filename you gave was not found on the available disks or the file is the incorrect type for the desired operation.
25	File Access Denied Due To Password Protection.	You gave an incorrect password. See the ATTRIB command.
26	Directory Space Full.	Number of filenames has reached the amount set when you formatted the disk.
27	Disk Space Full.	No space is available on the disk.
28	Attempt To Read Past EOF.	Specified record number is past the EOF.
29	Read Attempt Outside Of File Limits.	Use valid record numbers.

Code	Message	Explanation/Action
30	No More Extents Available (16 Maximum).	Use the COPY command to copy the files and reduce fragmentation. See also SAVE/RESTORE and MOVE.
31	Program Not Found.	Specified program is not found on the available disks.
32	Unknown Drive Number (Filespec).	Specified drive number is not valid.
33	Disk Space Allocation Cannot Be Made Due To Fragmentation Of Space.	Use the COPY command to copy the files and reduce fragmentation.
34	Attempt To Use A NON Program File As A Program.	File specified for execution is not a program file or the load address given is illegal. Make sure you have a system diskette in Drive 0.
35	Memory Fault During Program Load.	Program is loaded incorrectly, possibly because of faulty memory or a "bad" load address.
36	Parameter For Open Is Incorrect.	Check the OPEN statements or the DCB for errors.
37	Open Attempt For A File Already Open.	File specified for open is already open.
38	I/O Attempt To An Unopen File.	Open the file before access.

Code	Message	Explanation/Action
39	Illegal I/O Attempt.	<ul style="list-style-type: none"> a. I command not given after a diskette swap. b. Can be caused by an I/O attempt to a differently formatted disk. Format the disk under the current version of TRSDOS-II or use FCOPY. c. When initializing a hard disk, you must also format the secondary drives.
40	Seek Error.	<ul style="list-style-type: none"> a. Data cannot be read from the disk -- faulty disk.
41	Data Lost During Disk I/O (Hardware Fault).	Contact RSSC.
42	Printer Not Ready.	Check the connections, power, ribbon, on-line status, and so on.
43	Printer Out Of Paper.	Check the printer's paper supply.
44	Printer Fault (May Be Turned Off).	Check the connections, power, ribbon, on-line status, and so on.
45	Printer Not Available.	Check the connections, power, ribbon, on-line status, and so on.
46	Not Applicable To VLR Type Files.	Operation performed is not valid for VLR files.
47	Required Command Parameter Not Found.	Required parameter or argument is missing from the command.

Code	Message	Explanation/Action
48	Incorrect Command Parameter.	Option or argument given in the command is incorrect.
49	Hardware Fault During Disk I/O.	Contact RSSC.
50	Invalid Space Descriptor.	The space descriptor that tells TRSDOS-II which extent to read next is invalid. Try a different diskette.
51-255	** Unknown error code **	

Boot Errors Table

Error	Message	Explanation/Action
BOOT ERROR CK	Checksum error -- possibly a defective ROM.	Contact RSSC.
BOOT ERROR CT	Defective CTC chip.	Contact RSSC.
BOOT ERROR DC	Floppy disk controller error. a. Defective diskette. b. Floppy disk expansion unit not on. c. System not powered properly. d. Defective FDC Chip or Drive.	a. Try a different diskette. b. Turn on the floppy disk expansion unit. c. Turn off your computer and power up properly. d. Contact RSSC.
BOOT ERROR DM	DMA chip failure.	Contact RSSC.
BOOT ERROR DØ	Drive not ready. a. Improperly inserted diskette. b. Defective diskette. c. Defective drive.	a. Insert the diskette again and press <RESET>. b. Try a different diskette. c. Contact RSSC.
BOOT ERROR HA	Controller error. Aborted command: Problem during boot-up of hard disk.	Re-initialize the hard disk or contact RSSC.
BOOT ERROR HC	CRC error. Invalid data in data field.	Re-initialize the hard disk or contact RSSC.

Error	Message	Explanation/Action
BOOT ERROR HD	Controller error. Busy not reset.	a. Re-initialize the hard disk. b. Power down, wait 10 seconds, and power up. If the error occurs again, contact RSSC.
BOOT ERROR HI	CRC error. Invalid data in ID field.	Re-initialize the hard disk.
BOOT ERROR HM	Data address mark not found.	Re-initialize the hard disk.
BOOT ERROR HN	ID not found. No Boot Track.	Re-initialize the hard disk.
BOOT ERROR HØ	Track Ø error on hard disk. a. Didn't find Track Ø before time-out. b. Secondary hard disk drives not turned on.	a. Press <RESET>. b. Turn on your secondary hard disk drives.
BOOT ERROR HT	Time-out while waiting for Ready. a. Hard disk drive not powered up. b. Hard disk drive isn't turned on and ready within 10 seconds after the computer. c. Hard disk drive is disconnected.	a. Follow correct procedure: Turn on the hard disk first. b. Press <RESET>. c. Connect the hard disk drive or operate under floppy disk control.

Error	Message	Explanation/Action
BOOT ERROR LD	Lost data during read -- FDC (floppy disk controller) or drive fault.	Try another TRSDOS-II diskette or contact RSSC.
BOOT ERROR MF	Memory failure in address range X'1000'-X'7FFF'.	Contact RSSC.
BOOT ERROR MH	Memory failure in address range X'8000'-X'FFFF'.	Contact RSSC.
BOOT ERROR ML	Memory failure in address range X'0000'-X'0FFF'.	Contact RSSC.
BOOT ERROR PI	Defective PIO Chip.	Turn on the expansion bay if it is off. If the error occurs again, contact RSSC.
BOOT ERROR RS	The diskette in Drive 0 is not Radio Shack operating system format.	Insert a TRSDOS-II formatted diskette into Drive 0 and press <RESET>.
BOOT ERROR SC	CRC Error. Invalid data on diskette or defective diskette.	Try a different diskette.
BOOT ERROR TK	Record not found bootstrap track. Improperly formatted or defective diskette.	Re-format your diskette or try a different diskette.

Error	Message	Explanation/Action
BOOT ERROR Z8	Defective CPU.	Contact RSSC.
NOT A SYSTEM DISK	Diskette in Drive Ø isn't a TRSDOS-II operating system diskette.	Insert a TRSDOS-II operating system diskette into Drive Ø.

APPENDIX F: SPECIFICATIONS

The Radio Shack TRS-80 Model 12 is a disk-based Computer system with two major parts:

- A display console with one or two built-in, double-sided, double-density floppy disk drives
- A detached keyboard which can be positioned for your comfort and efficiency

The operating system software is loaded from an operating system disk in Drive 0 or Drive 4 by a built-in read-only memory (ROM) "bootstrap" program.

Console

Processor

- Z80-based microprocessor with 80K of memory: 64K bytes of user random access memory (RAM) and a 16K memory bank used by the operating system.
- The processor receives power-up and reset instructions from ROM. After the operating system initialization program is loaded from disk, ROM is electronically switched out of the system and replaced with RAM.
- Compatibility with existing Model II software.

Sound

Capable of generating two types of sound :

- Audible Alarm (see the SOUND SVC in the TRSDOS-II Reference Manual)
- Keyboard Click (see the CLICK command in the TRSDOS-II Reference Manual)

Video Display

LSI Controller Chip

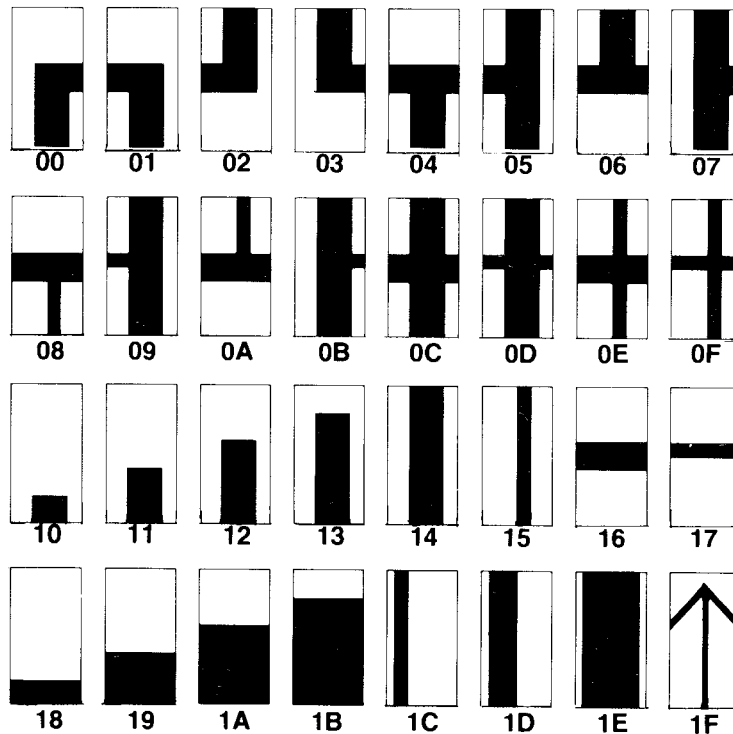
Frees the processor from much of the overhead required to update and maintain the video display.

Four Modes

- . Green on black (normal display)
- . Black on green (reversed display)
- . 80 characters by 24 lines
- . 40 characters by 24 lines

Displayable Characters

- . Full ASCII set
- . 32 graphics characters



Keyboard

- LSI Controller frees the processor from keyboard scan and related tasks
- Located in separate case for convenience
- Connected to display console via a built-in coiled cord exiting at the lower, back part of the keyboard
- Standard typewriter keys, repeat key, and eight general-purpose function keys
- Four modes with the following priority (highest to lowest):
 1. Control
 2. Shift
 3. Caps
 4. Unshift

Floppy Diskette Drives

Minimum

One built-in, 8-inch, double-sided floppy diskette drive and one to four hard disks

or

Two built-in, 8-inch, double-sided floppy diskette drives

Preventive Maintenance Interval

- Typical usage (3,000 power-on hours per year): Every 8,000 power-on hours
- Heavy usage (8,000 power-on hours per year): Every 5,000 power-on hours

Required Media

Radio Shack double- or single-sided, 8-inch floppy diskettes

Data Transfer Rate is 500,000 bits per second (except Track 0 which has 250,000 bps)

Diskette Life is 3.5 million passes per track. To prevent limiting life by improper handling, follow diskette-care recommendations.

Power Supply

Power Requirements

- . 105-130 VAC, 60 Hz
- . 240 VAC, 50 Hz (Australian)
- . 220 VAC, 50 Hz (European)
- . Grounded outlet

Maximum Current Drain

2.0 Amps @ 120 VAC, 60 Hz

Typical Current Drain

1.5 Amps @ 120 VAC, 60 Hz

Ambient Operating Temperature

- . 55 to 95 degrees Fahrenheit
- . 0 to 43 degrees Celsius

Peripheral Interfaces

Standard

- . Serial port A (RS-232C)
- . Serial port B (RS-232C)
- . Parallel input/output channel, for connection to TRS-80 standard parallel interface line printers
- . Floppy diskette input/output channel for connection of a floppy diskette expansion unit

Optional

Card Cage which gives an additional six slots to accommodate:

- . Hard Disk Drive Interface
- . Graphics Board
- . 16-Bit Enhancement
- . Memory Board
- . and more!

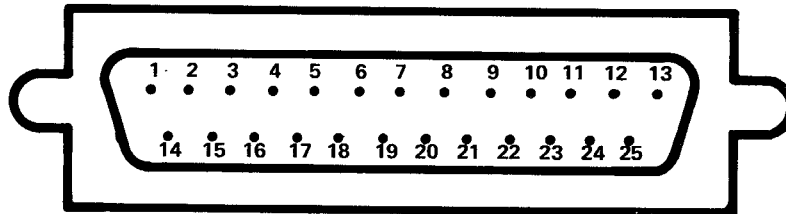
Serial Interface

Two Ports:

- Channel A allows asynchronous or synchronous communication
- Channel B allows asynchronous communication only
- Both conform to the RS-232C standard
- Both use the DB-25 connectors on the back of the display console

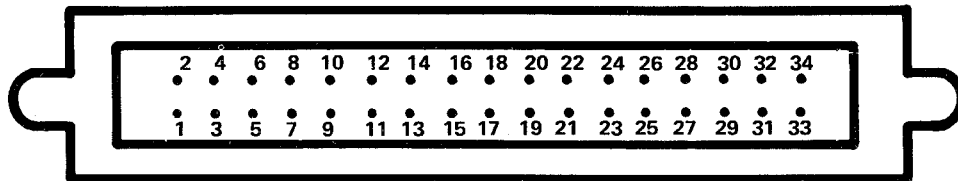
The DB-25 connector pin-outs and signals available are listed below.

Channel A		Channel B	
Standard RS-232C Signal	Pin #	Standard RS-232C Signal	Pin #
I/O Transmit S.E.T.	15	Ground	1,7
Ground	1,7	Receive Data	3
Receive Data	3	Receiver Xmitter Clock	17
Receiver Clock	17	Data Set Ready	6
Transmit Clock	24	Clear-to-Send	5
Data Set Ready	6	Carrier Detect	8
Clear-to-Send	5	Transmit Data	2
Carrier Detect	8	Request-to-Send	4
Transmit Data	2	Data Terminal Ready	20
Request-to-Send	4		
Data Terminal Ready	20		



Parallel Interface

- . Connection to a line printer via the 34-pin connector on the back panel of the display console
- . Eight data bits are output in parallel
- . Four data bits are input
- . All levels are TTL compatible



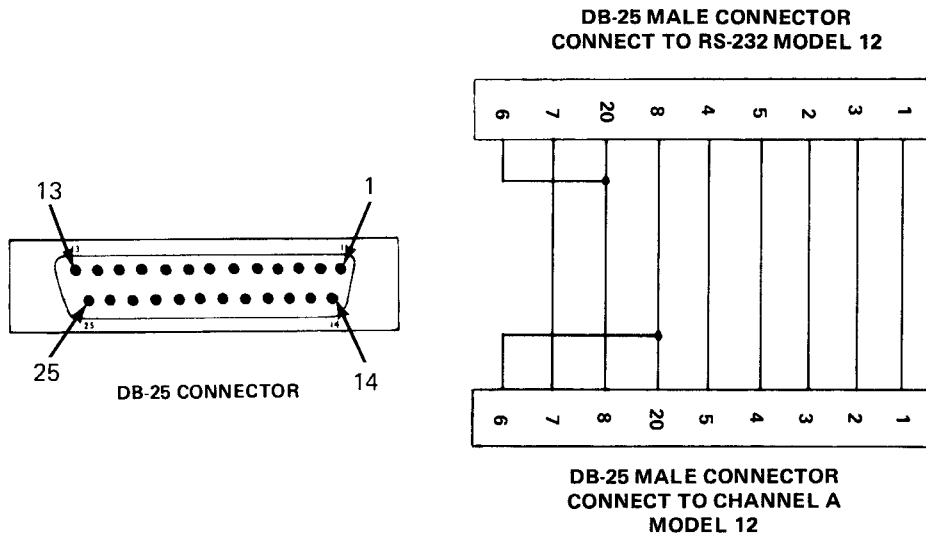
Signal	Function	Pin #
STROBE	1 microsecond pulse to clock the data from the processor to the printer	1
DATA 0	Bit 0 (lsb) of the output data byte	3
DATA 1	Bit 1 of the output data byte	5
DATA 2	Bit 2 of the output data byte	7
DATA 3	Bit 3 of the output data byte	9
DATA 4	Bit 4 of the output data byte	11
DATA 5	Bit 5 of the output data byte	13
DATA 6	Bit 6 of the output data byte	15
DATA 7	Bit 7 (msb) of the output data byte	17

Signal	Function	Pin #
ACK*	Input to the Computer from the printer; low indicates data byte is received	19
BUSY	Input to the Computer from the printer; high indicates busy	21
PAPER EMPTY	Input to the Computer from the printer; high indicates no paper -- if the printer doesn't provide this, the signal is forced low	23
SELECT	Input to the Computer from the printer; high indicates device is selected	25
PRIME*	Output to the printer to clear the buffer; reset the printer logic	26
FAULT*	Input to the Computer from the printer; low indicates fault (paper empty, light detect, deselect, and so on)	28
GROUND	Common signal ground	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 27, 31, 33
NC	Not connected	29, 30, 32, 34

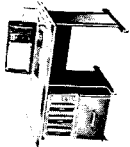
*These signals are active-low.

Model 12/Model 12 Communications

For hard-wiring between two Model 12s without a modem, use the wiring arrangement illustrated below (Model 12 to Model 12 only).



Connection Diagram, Model 12 (Channel A or B) to Model 12 (Channel A or B). Use stranded wire, 24-gauge, to connect two DB-25 connectors as illustrated. If the wire length exceeds 50 feet, twist Lines 7 (GND), 2 (TD), and 3 (RD).



APPENDIX

Keyboard Code Map

The keyboard map (see foldout page) presents the actual code that TRSDOS will return to the user for each key on the keyboard, in each of the four modes-- unshift, shift, caps, and control.

A program executing under TRSDOS --for example, BASIC-- may translate some of these codes into other values. Consult the program's documentation for details.





Note: The **BREAK** key (code X'03') is always intercepted by TRSDOS. It will never be returned as a character to the user.

ESC 1B	! 21 1 31	@ 40 2 32	# 23 3 33	\$ A4 4 34	% 25 5 35	^ 5E 6 36	& 26 7 37	* 2A 8 38	(28 9 39) 29 0 30	- 7F - 5F - 2D	+ 2B = 3D = 3D	BACK SPACE 08	BREAK 03
TAB 09	Q 11 51 71	W 17 57 77	E 05 45 65	R 12 52 72	T 14 54 74	Y 19 59 79	U 15 55 75	I 09 49 69	O 4F 4F 6F	P 10 50 70	[5B { 7B] 5D } 7D	HOLD 00	
CTRL LOCK	A 01 41 61	S 13 53 73	D 04 44 64	F 06 46 66	G 07 47 67	H 08 48 68	J 0A 4A 6A	K 0B 4B 6B	L 0C 4C 6C	:	3A ; 22 ; 3B ; 27	:	ENTER 0D	
CAPS SHIFT	Z 1A 5A 7A	X 18 58 78	C 03 43 63	V 16 56 76	B 02 42 62	N 0E 4E 6E	M 0D 4D 6D	< 3C , 2C	> 3E - 2E	>	? 3F / 2F	/ 2F	SHIFT REPEAT	

20

LEGEND:

XX	CONTROL
XX	SHIFT
XX	CAPS
XX	UNSHIFT

 1C	7 38	8 38	9 39	F1 01
 1D	4 34	5 35	6 36	F2 02
 1E	1 31	2 32	3 33	ENTER 0D
 1F	0 30		. 2E	

Application programs	28	FCOPY	4
BACKUP	4,19	Floppy drive	
TRSDOS-II		Efficiency	57-59
System		Maintenance	42
Diskette	20-21,45	Thinline Patch	34-35
Data Diskettes	46-47	FORMAT	5,37-38
TRSDOS		Hard Disk	
System		Preparation	39-40
Diskette	22-25,48	TRSDOS Programs	39
Data Diskettes	49-50	TRSDOS-II Programs	39
BASIC	28-30	Backup library	40
Boot Error Table	77-80	HELP	5,59-60
Brightness control	8	Installation	
Contrast control	8	Model 12	13-14
COPY	4	Peripherals	15
Data, Safeguarding	25	KILL	5,60
DIR	4	Minimum System	
Disk Files	30-31	Diskette	61-63
Disk Format	30-31,37	Model 12	
Diskettes		Boot Errors	77-80
Care	41-42	Brightness control	8
Drive Maintenance	42	Communications	89
Inserting	9	Contrast control	8
Files	31	Drive light	8
Formatting	31,37-38	Features	1
Label	12	Installation	13-14
Removing	32	Keyboard	10
Swapping	32	Keyboard Code Map	91
Write-protect notch	12	Power light	8
DRIVE	4,57-59	Power Switch	8
Drive light	8	Reset button	8
Error Messages	69-80	Specifications	81-89
		MOVE	5,55
		Optional equipment	12
		Operating Systems	27

Peripherals		Swapping diskettes	32
Installation	15	Thinline patch	34-35
Power light	8	TRSDOS	
Power switch	8	Backup	48-50
Power Up	4,16-17	Using TRSDOS 2.0b	34
Power Down	4,17	Patching TRSDOS	34-35
Reset button	8	Thinline Patch	34-35
RESTORE	5,51-54	TRSDOS-II	
SAVE	5,51-54	Application Programs	33
Safeguarding Data	25	Backup	45-47
Startup message	18	Converting TRSDOS	
Storing Information	30	Programs	36
		Error Messages	69-80
		Loading	18
		Minimum System	
		Diskette	61-63
		Using TRSDOS	
		Application	
		Programs	33