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TALLGRASS TECHNOLOGIES

Guide To Operations

FileSecure 150
Tape Backup System

End User Warranty

1. For a period of one (1) year from the date of purchase, Tallgrass Technologies Corporation ("TTC") warrants to the original consumer purchaser ("Purchaser") that this hardware product is free from manufacturing defects in material and workmanship. Upon receipt of the Purchaser's Warranty Registration Form, TTC automatically extends the warranty of this hardware product to two (2) years from date of purchase. The warranty of this hardware product may be extended for an additional one (1) year period for a nominal fee by contacting Customer Support.

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4. This limited warranty covers defects encountered in the normal use of the product and does not apply under the following conditions:
    a. If the product is damaged due to improper or abnormal use, to abuse, mishandling, accident, or improper maintenance, to negligence, or to failure to follow operating instructions;
    b. If the product is defective as a result of sand, dirt, or water damage;
    c. If any factory-sealed enclosure has been opened or shows evidence of an attempt to be opened;
    d. If damage or defects are caused by the use of unauthorized parts or by unauthorized service; or
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Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Part Number 733-5155
Rev B

Foreword

Your *FileSecure 150* tape backup system comes with your *File-Secure 150* tape drive, a *Tallgrass* SCSI Host Adapter board, this Guide to Operations, FileSecure software diskette, and your *File-Secure User's Guide*.

The first section of your *Guide to Operations* tells you how to install the SCSI board in your computer. From there you will need to go to the second section if you have an internal tape drive and then to "Section 4 Operating Your *FileSecure 150*." If you have an external tape unit, you will need to go to "Section 3 Connecting Your FileSecure 150" and then to "Section 4 Operating Your *FileSecure 150*" following installation of the SCSI board. Finally, the appendixes provide you with additional information with which you should be familiar. For information on alternate settings regarding the Dual Mode SCSI board, see Appendix A.

Once you have set up your new drive, you will want to install your *FileSecure* software. Your *FileSecure User's Guide* will take you step by step through the short installation procedure. Following software installation, you will be ready to use your *FileSecure 150* tape backup system.

Section 1
Installing Your
SCSI Host Adapter

Before You Begin

Before you install and use the tape drive, verify that your computer meets the following criteria:

- XT/AT class computer with power supply able to provide an additional 5 V @ 1 A and 12 V @ .8 A nominal, 2.8 A surge.
- Hard disk installed with at least .5MB free space
- Half-height installation bay available (for internal tape drive installation only)
- Expansion slot available

You will need the following items in addition to the *FileSecure 150* tape drive to install/operate your tape unit; the SCSI board, interface cable, tape cartridge, and slide rail kit (if you have an internal drive) are included with the tape drive:

- SCSI Host Adapter board (SCSI board)
- Host interface ribbon cable (interface cable) (internal tape drives)
- AT mounting slide rail kit (internal tape drive)

- External, shielded interface cable (interface cable) (external tape unit)
- #1 Phillips-head screwdriver
- 1/4-inch flat-blade screwdriver
- 3M DC6000 series tape cartridge
- Your computer owner's manual

CAUTION: *Carefully observe the procedure outlined in your computer's manual concerning power and electrical disconnection before you install the tape drive.*

Because computer components are susceptible to charges of static electricity, we recommend that you take anti-static precautions during this procedure, including the use of anti-static mats, straps and proper grounding. When handling the SCSI board, touch the outer edges and corners only.

If you cannot perform this procedure all at one time, store the SCSI board and internal tape drive in the static shield bags supplied with this kit. This precaution will help keep the board and your internal tape drive safe from static electricity. If you have an external tape unit, you will not need to take this precaution. However, you should still store the SCSI board in the static shield bag.

SCSI Board Installation

Your SCSI Host Adapter Board (SCSI board) has been pre-configured at the factory. Should you need to change the address setting on the board because of a device conflict, refer to Appendix A at the back of this guide.

1. Turn off your computer and all externally attached devices. If your computer has a key lock, unlock it and remove the key.

   Unplug the power cord, and disconnect all cords and cables from the back of the computer.

2. Remove the cover of your computer. Refer to your computer owner's manual if you need assistance.

3. Remove the cover of an available expansion slot.

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4. Insert the SCSI board into the expansion slot, as shown in Figure 1, and tighten the screw of the retaining bracket. Note that the 50-pin header for internal tape drive connection or the 25-pin D-sub connector for external tape unit connection. These connectors are shown in Figure 2.
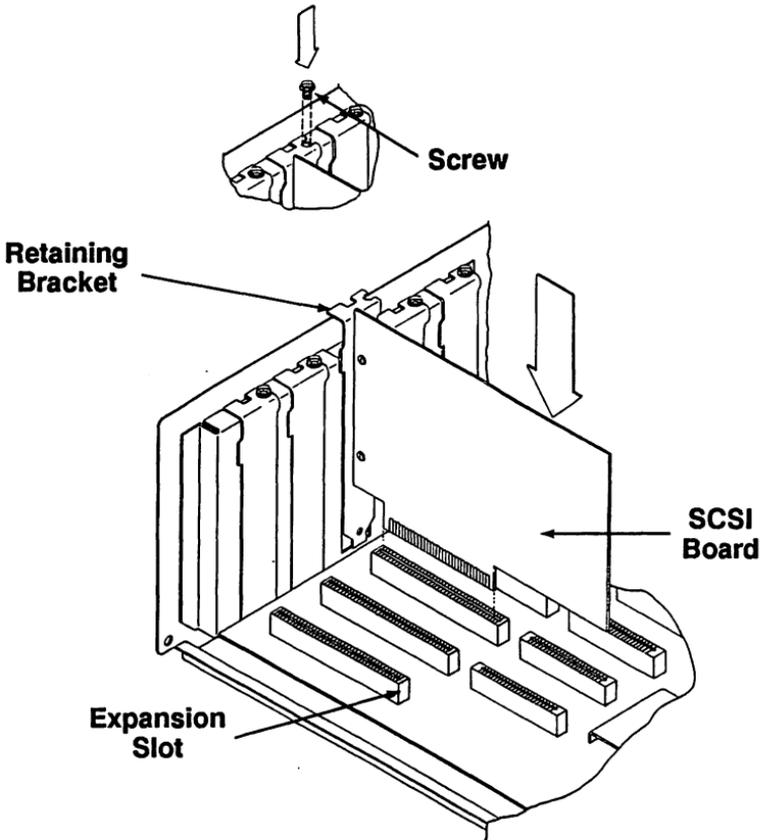
Figure 1. Installing the SCSI Board

**50-Pin
Header**

**25-Pin
D-Sub
Connector**
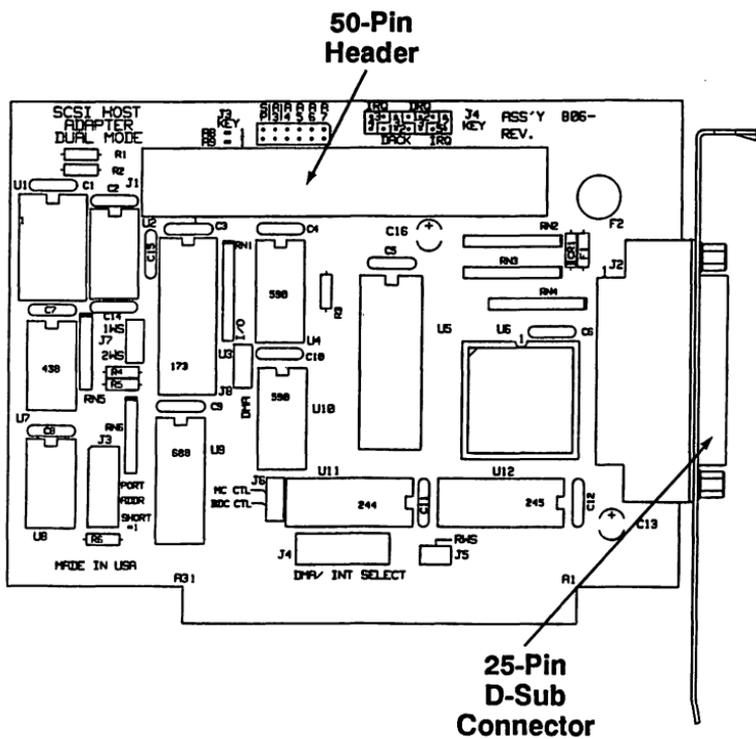
Figure 2. Dual Mode SCSI Host Adapter Board

If you have an internal tape drive, skip steps 5 and 6. Continue with steps 5 and 6 ONLY if you have an external tape unit.

5. Carefully replace the computer's cover, making sure that the cover does not snag or tear any of the cables.

6. Reconnect the cords and cables you disconnected earlier.

You have completed the installation of your SCSI board. If you have an internal tape drive, go on to "Section 2 Installing Your Internal *FileSecure 150.*" If you have an external tape drive unit, go on to "Section 3 Connecting Your External *FileSecure 150.*" For information on alternate settings regarding the Dual Mode SCSI board, see Appendix A.

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Section 2
Installing Your Internal
FileSecure 150

This section describes how to install a *FileSecure 150* internal tape drive in an IBM AT class computer directly below the diskette drive. You should have already installed the SCSI board. If you have not installed the SCSI board as yet, turn to "Section 1 Installing the SCSI Host Adapter" and follow the instructions there before proceeding with tape drive installation.

Note: *The instructions that follow are for an IBM AT computer. If you have a compatible or "clone," see your computer owner's manual for cover removal/replacement and card installation instructions.*

Tape Drive Installation

1. Remove mounting clips 1 and 2 and the IBM cover plate, as shown in Figure 3. You will use these mounting clips later to secure the drive to the computer.

    Note: *If you remove diskette drive B to install the tape drive, you will need to also change the System Configuration to indicate that there is no diskette drive B installed. Refer to your computer owner's manual for details on running your system's "setup" program.*

2. Check for the presence of a load resistor in the middle bay of the computer. A load resistor is used to put a "dummy" load on the power supply in order to provide stable power in the absence of other devices. If it is present, disconnect the load

resistor cable from the power supply. See Figure 4 for the location of the load resistor and the cable connection.
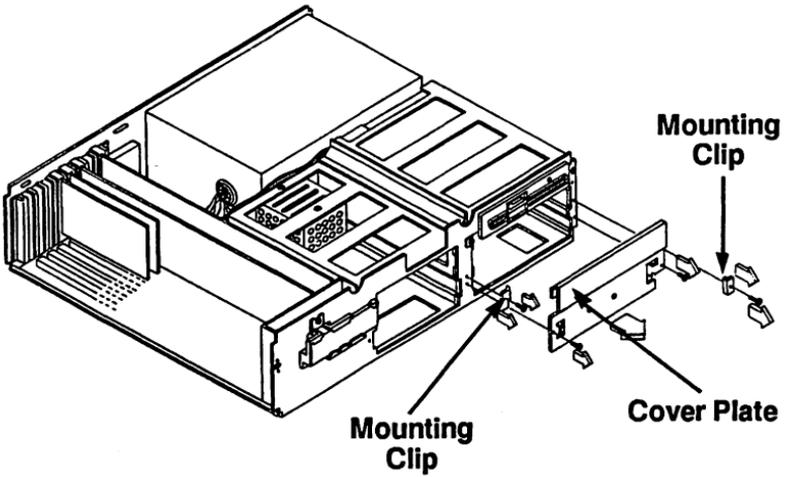

Figure 3. Removing the Cover Plate

Rear View
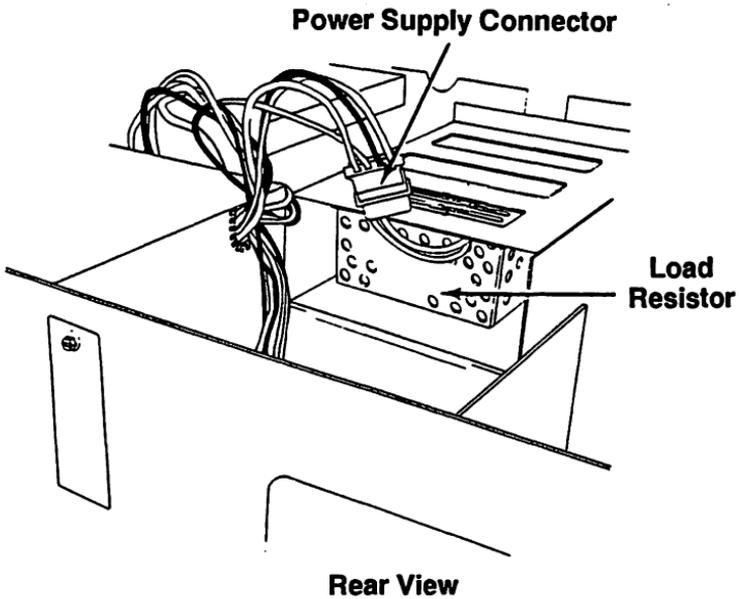
Figure 4. Load Resistor

3. Attach the two AT slide rails to the sides of the tape drive, as shown in Figure 5, using the four #6 – 32 x 1/4" screws included in the rail kit. (**Do not** use the colored, shorter metric screws also packaged with the slide rails.) The tapered end of each rail should point toward the rear of the drive.
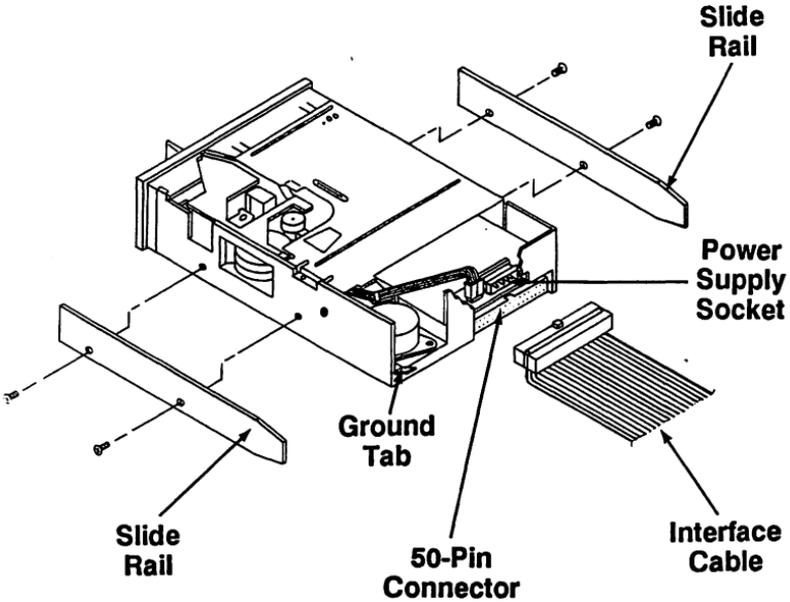
Figure 5. Attaching the Slide Rails

4. Attach either end of the interface cable to the 50 pin connector on the back of the tape drive. The connector is keyed so that it can be connected only one way. See Figure 5 for the location of this connector.

5. Set the tape drive in front of the computer. Thread the free end of the interface cable through the bay beneath the floppy diskette drive. Then, with one hand holding onto the cable, use your other hand to guide the tape drive into the drive bay until the drive is fully seated.

6. Route the interface cable from the tape drive to the SCSI board, making sure that the cable is clear of other devices and that it cannot be pinched between sharp objects.

7. Attach the free end of the interface cable to the 50 pin dual row header on the SCSI board. The interface cable connector is

keyed so that it can be connected in only one way. If you need to, refer to Figure 2 for the location of the header.

8. Connect the power supply wire harness from the AT to the power supply socket of the tape drive. See Figure 5 for the location of the power supply socket on the tape drive.

   Note: *You may find it easier to attach the power connector and grounding cable (next step) to the tape drive if the floppy disk drive is partially slid forward.*

9. Find an unconnected grounding cable in the AT and connect it to the ground tab on the tape drive. See Figure 5 for the location of the ground tab on the tape drive.

10. Check that the connections of the wire harnesses and ribbon (interface or other) cables are secure and that the SCSI board is seated correctly in the expansion slot.

11. Move any ribbon cables from the power supply fan or vents to allow good air circulation in that area.

12. Reattach mounting clips 1 and 2 to the front of the chassis.

13. Carefully replace the computer's cover, making sure that the cover does not snag or tear any of the cables.

14. Reconnect the cords and cables you removed earlier.

15. Plug in the power cord and turn on the computer.

You have completed the installation of your *FileSecure 150* internal tape drive. Go on to "Section 4 Operating Your *FileSecure 150.*" For information on alternate settings regarding the Dual Mode SCSI board, see Appendix A. For guidelines on how to handle tape cartridges and maintain your tape drive, see *Maintaining Your Tape Drive* later in this guide. For complete instructions on setting up and using your software, go to the *FileSecure User's Guide* that came with your software.

Section 3
Connecting Your
External FileSecure 150

This section describes how to connect a *FileSecure 150* external tape unit to an XT/AT computer. You should have already installed the SCSI board. If you have not installed the SCSI board, turn to "Section 1 Installing Your SCSI Host Adapter" before proceeding with these instructions.

IMPORTANT

The external, shielded interface cable, supplied with this unit to complete the external connection between the tape drive and the computer, MUST be used for FCC compliance. Do NOT lengthen or modify the shielded interface cable in any way.

Note: *The instructions that follow are for an IBM XT or AT class computer. If you have a compatible or "clone," see your computer owner's manual for cover removal/replacement and card installation instructions.*


Tape Unit Connection

WARNING

DO NOT make the electrical connection to your tape drive or to your computer until after you have installed the external, shielded interface cable and insured that it is well-connected. Failure to follow these instructions may result in **damage** to your SCSI Host Adapter Board.

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1. Set the tape drive next to the computer.

2. Connect one end of the interface cable to the D-sub connector on the SCSI board and the other end to the D-sub connector on the tape drive. See Figure 6.

SCSI Connector

Interface Cable

From SCSI Board Connector in Computer
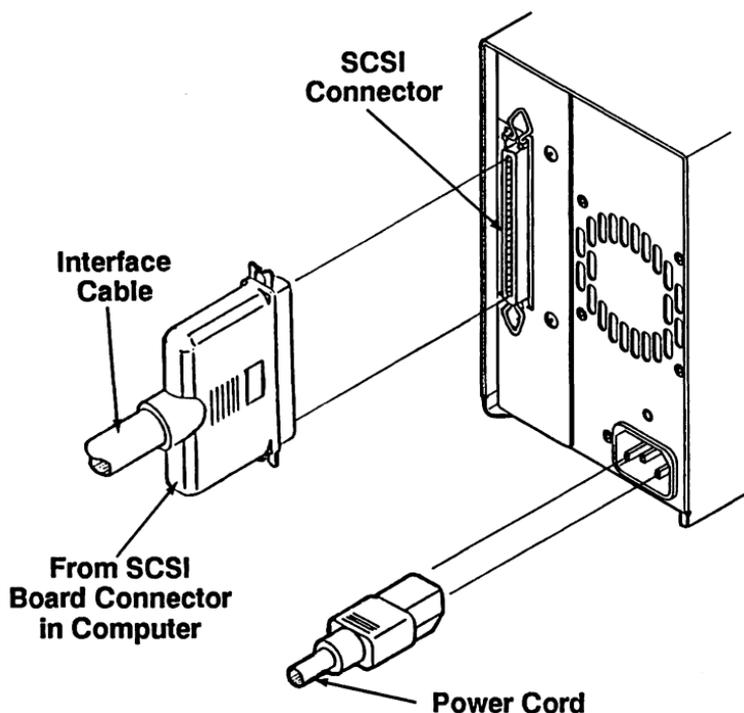
Power Cord

Figure 6. Connecting Your External Tape Unit

3. If there is a voltage switch present on the rear of the tape unit, verify that it is set to the appropriate voltage.

4. Connect the power cord to the tape drive and plug it in. Turn on the tape drive and the computer in that order.

You have completed the installation of your *FileSecure 150* external tape unit. Go on to Section 4 for information on the operation of your *FileSecure 150*. For information on alternate settings regarding the Dual Mode SCSI board, see Appendix A. For instructions on setting up and using your software, go to the *FileSecure User's Guide* that came with your software.

Section 4 Operating Your FileSecure 150

Using Your FileSecure Software

The *FileSecure User's Guide* that came with your software is written to be used with several different types of tape drives and a variety of configurations. For various reasons, not all the features described in your *FileSecure User's Guide* are available to you when you are using your *FileSecure 150* tape drive.

One major reason that some features described in your *FileSecure User's Guide* are not available to you while using your *FileSecure 150* Tape Drive is the QIC 150 standard itself. All QIC 150 tape drives are "append only," which means that data can only be appended (added) to data previously recorded. Append-only drives cannot overwrite previously recorded data unless the entire tape is erased (cleared or reformatted).

Generally, if a described feature appears as a menu option, it is available to you for use with your *FileSecure 150* tape unit. Specifically:

- Under Utilities Information, the number of "total bytes available" will not be shown.
- You will not receive on screen information, when a backup begins, that it will take more than one tape (no overflow indication).

- In the event that a backup is NOT completed because of a power failure, a backup < ESC >, or a computer reboot, no new backups can be appended until the tape is erased. However, existing File Sets can still be restored. If a backup is not completed, it will result in a partial File Set. The next backup attempted using this tape, will result in an error message "Error writing to tape." Erasing the tape will eliminate the problem.

Maintaining Your Tape System

This part describes how to handle your tape cartridges and how to maintain your tape drive. See the figures "Loading a Tape" and "Unloading a Tape."

Loading a Tape

1. Raise the cartridge release lever.

2. Orientate the cartridge so that the metal base-plate is to the left and the flip-open door and re-cord switch are pointing down.

Metal Base Plate

Record Switch

Cartridge Release Lever
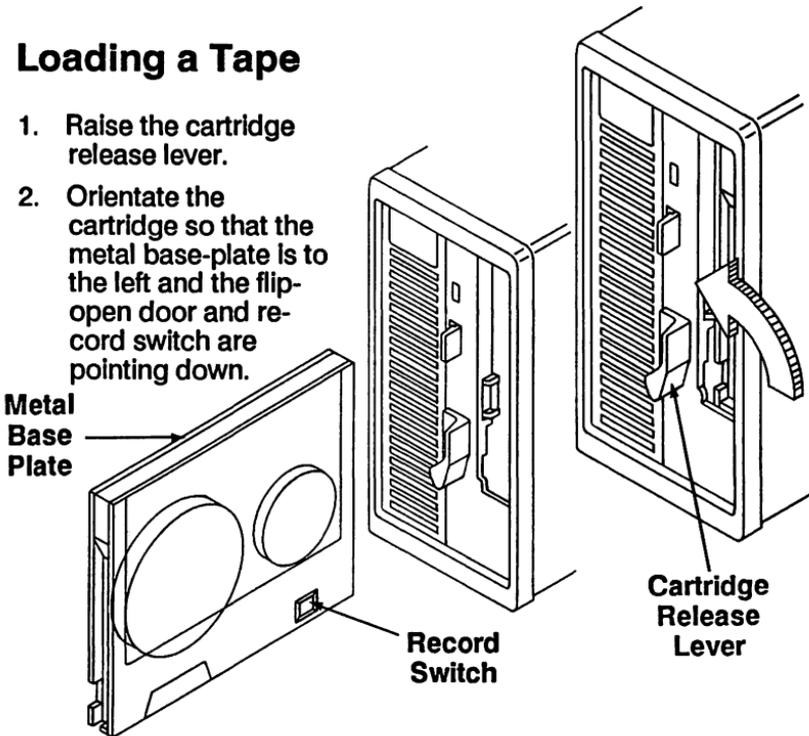
Figure 7a. Loading a Tape

3. Push the tape cartridge into the tape drive until the cartridge is locked in the drive.

4. Lower the cartridge release lever.

Cartridge Release Lever
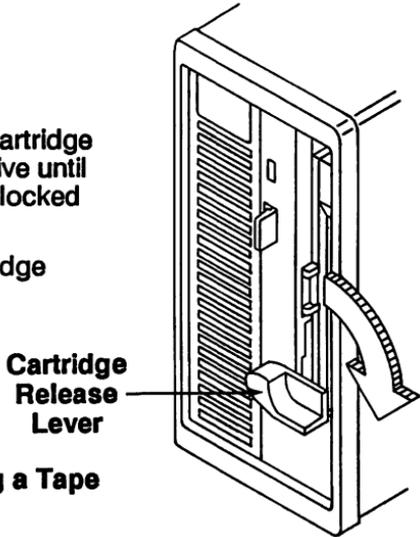
Figure 7b. Loading a Tape

Note: *If you have an internal tape drive, load the tape cartridge with the metal base plate facing downward and the record switch facing to the right.*

Unloading a Tape

1. Raise the cartridge release lever and press the eject button.This will partially eject the tape cartridge.

2. Remove the tape cartridge from the drive.

Eject Button

Cartridge Release Lever
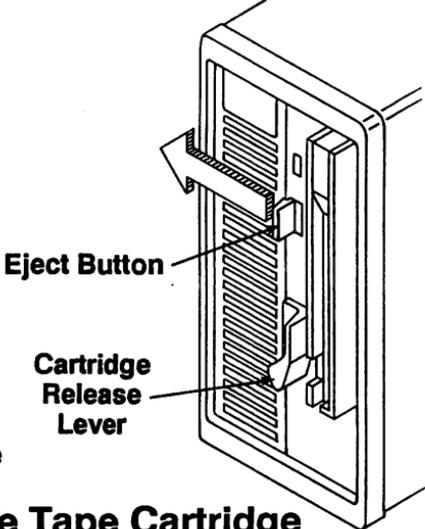
Figure 8. Unloading a Tape

Write-Protecting the Tape Cartridge

Each tape cartridge has a write-protection mechanism designed to reduce the possibility of destroying data by accidentally erasing or writing over it with new data.

When a tape is write-protected, you can only read from it. When a tape is NOT write-protected, you can both read from AND write to it.

You can check a tape's protection status by looking at the write-protect indicator on the tape cartridge. When the pointer on the button points toward the word SAFE, the tape is write-protected; when the pointer is turned 180 degrees from the word SAFE, the tape is NOT write-protected.

Tape Care Tips

Observe the following tips to obtain maximum performance from your tapes throughout their life span.

- Handle ONLY the tape cartridge. Touching the tape surface contaminates the recording media.

- Keep tapes away from magnetic fields. Devices, such as electric motors and telephones, generate strong magnetic fields. Magnetic fields scramble or erase information on the tape.

- Never leave a tape in direct sunlight. Extreme temperature changes can damage a tape.

Head Cleaning

To maintain your tape system at its operating peak, clean the read/write head after every 8 hours of tape operation or after approximately 20 backups or restores.

If cleaning the tape drive head does not solve the problem, the tape you are using may be wearing out. Replace worn tapes **before** you lose valuable data.

Important: DO NOT *use the 3M data cartridge head cleaning kit (part no. DC051111 12465) to clean your FileSecure 150 tape drive.* **Use of this head cleaning cartridge may void your warranty.** *The head cleaning cartridge will load in your tape drive and clean the tape head; however, when you try to remove the cartridge from the tape drive, the cartridge will jam. Forced removal of the cleaning cartridge will break the tape cartridge retention spring of your tape drive.*

Appendix A
SCSI Board
Alternate Settings

This appendix explains the capabilities and lists alternate settings for the Tallgrass Dual Mode SCSI Host Adapter Board.

Functional Description

There are two different ways that the Tallgrass Dual Mode SCSI Host Adapter board can transfer data to and from your Tallgrass tape drive. One way is buffered transfer mode. The other way is DMA transfer mode.

The board is set at the factory to operate in the DMA transfer mode. The DMA transfer mode utilizes the host DMA controller chip to get data from host memory to the SCSI bus interface controller. The DMA transfer mode may be required due to the type and speed of the computer you are using.

The buffered transfer mode utilizes an 8K buffer on the host adapter board. The host microproccessor is able to prepare host memory with 8K bytes of data for the next transfer while the SCSI bus interface controller chip is transferring the previous 8k buffer contents to the tape drive.

See the list of trouble-shooting hints at the end of this appendix for more information.

Jumper Settings

J3 - Port Address

The jumpers of J3 form a binary I/O address that when matched with the same address within *FileSecure*, allows the software to communicate with the tape drive hardware. Listed below are some alternate address settings (see J3 examples).

Jumper Selections					
I/O Start Address	A7	A6	A5	A4	A3
308-30F	0	0	0	0	1
310-317	0	0	0	1	0
320-327	0	0	1	0	0
340-347	0	1	0	0	0
380-387	1	0	0	0	0
318-31F	0	0	0	1	1
328-32F	0	0	1	0	1
330-337	0	0	1	1	0

			Jumper Selections (Continued)		
I/O Start Address	A7	A6	A5	A4	A3
348-34F	0	1	0	0	1
350-357	0	1	0	1	0
360-367	0	1	1	0	0
388-38F	1	0	0	0	1
390-397	1	0	0	1	0
3A0-3A7	1	0	1	0	0
3C0-3C7	1	1	0	0	0
Key: Jumper On = 1; Jumper Off = 0; Default 390-397					

J4 - Interrupt and DMA channel

Interrupt request level is determined by the location of a two position jumper on this header. Options are provided for interrupt levels 3, 4, 5 and 7. Default = 5

DMA control signals DRQ and DACK are connected using (2) two position jumpers on this header also. Three options are provided, DMA channels 1, 2 and 3. Default = 1

Note: *The host adapter is shipped from the factory with the DMA channel enabled. If buffered mode operation is desired, you will need to change the jumper on J8 to buffered transfer mode by*

A-3

*moving the jumper to the upper two pins. If buffered mode opera-
tion is used, DMA channel is not needed. Therefore, you can re-
move the two jumpers used to select the DMA channel, and this
should prevent problems from occurring with other printed cir-
cuit controller boards that may be installed in your system.*

The silkscreened J4 key between the J1 connector and the edge
of the board shows the jumper positions for the various interrupt
and DMA channel options (see examples).

J5 - Bus Cycle Time Control Disconnect

Allows for the disconnection of -0WS (zero wait state) signal from
the host adapter in case of incompatibilities. Host data transfer
time will increase in most cases if the jumper is removed. Opera-
tion is affected only in buffered transfer mode. Default = shorted

J7 - Wait State Selector

Allows the choice of bus cycle termination following the insertion
of either one or two wait states. Silkscreen labeling shows "1WS"
for one wait state and "2WS" for two wait states. Operation is af-
fected only in buffered transfer mode. Default = "1WS"

J8 - Data Transfer Mode Selector

This jumper selects between the buffered or DMA data transfer
modes. The positions are the silk screened "I/O" for buffered
mode and "DMA" for DMA mode. Default = "DMA"

Figure A-1. J3 Port Address Examples. (Refer to the table on the previous pages.) Shown here are three examples of jumper settings. In the first example, a single jumper is used at A6 to select port address 340 - 347. In the second example, one jumper is used at A5 and one jumper at A4 to select port address 330 - 337. In the third example, one jumper is used at A7 and one jumper is used at A4 to select port address 390 - 397, which is the DEFAULT port address.

Note: *The following examples are based on the J3 silk-screened diagram (key) at the top of the SCSI board. The J3 jumper actually is situated 90° from the way the diagram or key is orientated. The beveled corner on both the key and on jumper block J3 will help orientate you to the position of J3 . See Figure A-3 for a detailed view of the SCSI board.*

Example 1
340 - 347

J3
KEY

Example 2
330 - 337

J3
KEY
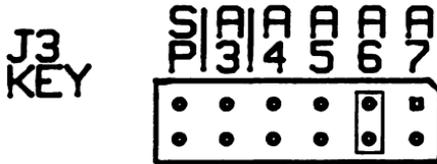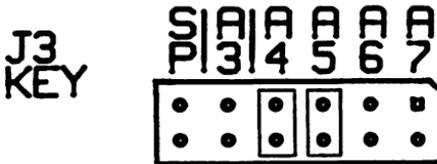
Example 3
390 - 397
(DEFAULT)

J3
KEY
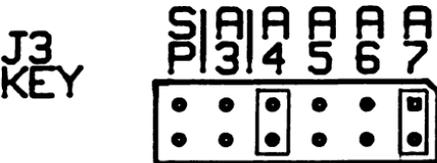
Figure A-2. Interrupt and DMA Channel. Shown here are three examples of interrupt and DMA Channel settings. In the first example, the jumper for the interrupt is set at 5, the jumper for the DMA Acknowledge (DACK) is set at 2, and the jumper for the DMA Request (DRQ) is set at 2. In the second example, the jumper for the interrupt is set at 3, the jumper for the DMA Acknowledge (DACK) is set at 3, and the jumper for the DMA Request (DRQ) is set at 3. In the third example, the jumper for the interrupt is set at 5, the jumper for the DMA Acknowledge (DACK) is set at 1, and the jumper for the DMA Request (DRQ) is set at 1(Default).

Note: *As in the port address examples, interrupt and DMA examples use the silk-screened diagram (key), not the jumper block itself. Note that interrupt settings 3 and 4 are diagonal from interrupt settings 5 and 7. Neither the key nor the jumper block J4 have a beveled corner, because the key is not rotated in relationship to the jumper block position.*

Example 1
IRQ = 5; DACK = 2;
DRQ = 2
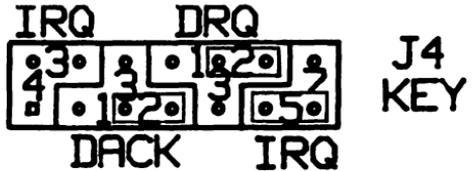
Example 2
IRQ = 3; DACK = 3;
DRQ = 3
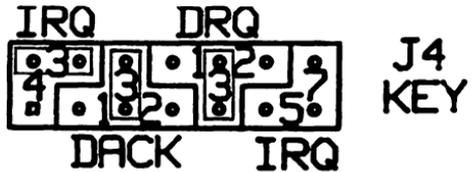
Example 3
IRQ = 5; DACK = 1;
DRQ = 1 (Default)
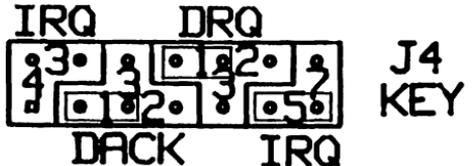
Figure A-3. Detail of Dual Mode SCSI Host Adapter Board.
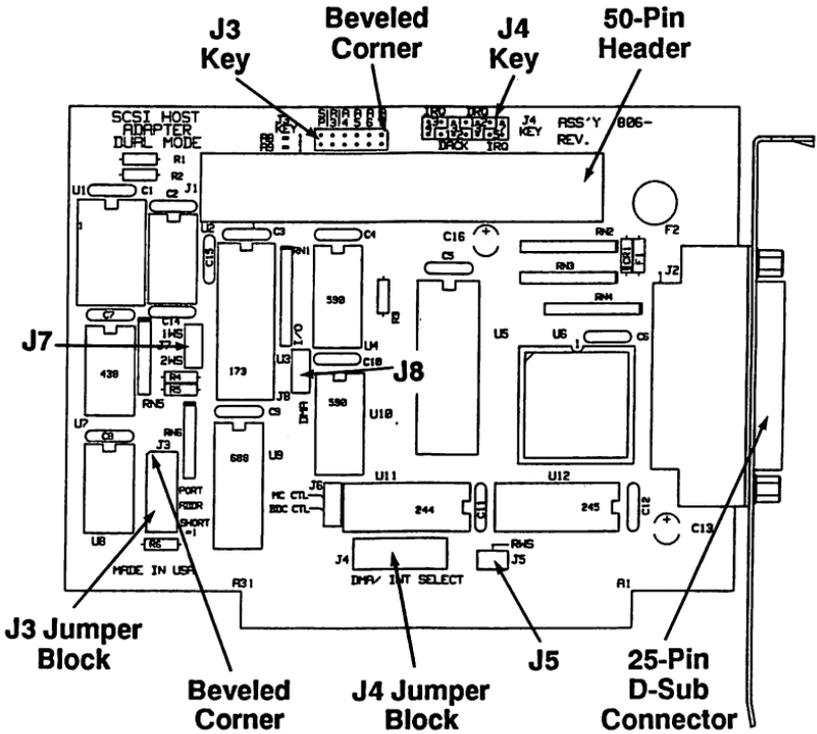
Troubleshooting Hints

For peak performance of your system with the Dual Mode SCSI board installed, it is important to have adequate buffers (20 for example) and files (15 for example) statements in your CONFIG.SYS file. See your DOS manual for an explanation of buffers and files and also about creating a CONFIG.SYS file.

If you are using the buffered transfer mode and you are experiencing parity checks or system lock-up problems and you have determined that all the hardware is installed and connected correctly, you can try removing Jumper J5 and try the software operation again. If trouble still persists you can switch the host adapter board over to DMA transfer mode.

8088/86 class computers (e.g. IBM PC)

You can only operate the host adapter board in the DMA transfer mode. Set J8 to the DMA transfer mode by moving the jumper to the bottom 2 pins (with the board oriented as it would be placed in the computer). You must also choose a DMA channel that works in your system by setting the two jumpers on J4 to appropriate pin positions (see "J4 - Interrupt and DMA Channel" under the heading "Jumper Settings."

ALR FlexCache 33MHz

Tests have shown DMA data transfer mode to be faster in this machine due to the lack of accomodation for bus cycle shortening.

Acer 33MHz

Host memory accesses are disturbed when using one wait state in buffered mode. J7 needs to be set to the "2WS" position.

Appendix B
Specifications

Tape Drive Specifications

Dimensions and Weight

Internal

Chassis Height	1.625 inches (41.3 mm)
Chassis Width	5.75 inches (146.2 mm)
Chassis Depth	8.0 inches (203.3 mm)
Weight	2.2 lbs (1.0 kg)

External

Cabinet Width	4.00 inches (101.6 mm)
Cabinet Height	7.33 inches (186.2 mm)
Cabinet Depth	15.12 inches (384.0 mm)
Weight	10.5 lbs (4.8 kg)

Power Requirements (Internal Model)

	+12 V	+5 V
DC Voltage	+12 V	+5 V
Tolerance	+/- 5%	+/- 5%
Operating Current (streaming mode)	.8 Amp	1 Amp
Start-up Surge Current	2.8 A max	
Power Dissipation	15 watts (streaming)	

Power Requirements (External Model)

AC Input Voltage

90 - 264 VAC
 universal input

Input Frequency

47 - 63 Hz, single phase

Power Dissipation

24 watts max.

Interface

Device Interface

SCSI

Buffer Size

64 KB

Data Handling

Format Standard

QIC 150 w/QFA (using
 DC6150 or DC6250 tape)
QIC 120 w/QFA (using
 DC600A tape)

Data and Directory Partition Sizes *

Tape Cartridge Type	Data	Directory
DC600A	118.1 MB	6.9 MB
DC 6150 or DC 600XTD	141.7 MB	8.3 MB
DC6250	236.1 MB	13.9 MB

Max number of backup sessions
 per tape cartridge

128

Max number of directory entries

65,000 filenames and/or
 directories per backup
 session

Recording Tracks

18

Data Density

10,000 BPI +/- 7%

Raw Transfer Rate

112.5 KB/sec

Max Data Transfer Rate

5 MB/min

Recording Code

4/5 GCR

Recording Density

12,500 FTPI +/- 7%

Start/Stop Time

300 ms or less

* Tape cartridge dependent.

Reliability

Soft Error Rate	1×10^8
Hard Error Rate	1×10^{10}
Mean Time Between Failures	Greater than 13,000 hours with 20% duty cycle
Mean Time To Repair	Less than 0.5 hours to unit level

Environmental Requirements

Altitude (Operational)	-1000 to +15,000 ft.
Shock (Operational)	2.5 g 1/2 sine, 11ms duration
Vibration (Operational)	1 g @ 5 to 500 Hz

Temperatures

Operating	+5 to +45 degrees C (+41 to 113 degrees F)
Non-operating	-30 to +60 C (-22 to + 140 degrees F)
Relative Humidity	20% to 80% non-condensing

SCSI Host Adapter Specifications

Power Requirements

DC Voltage	+5 V, +/-5% @ .5 A Max.
Maximum Power	4 watts
Cable length max	6.0 meters*

*Note: *Single ended configuration using 50 pin conductor ribbon cable with a characteristic impedance between 90 and 140 ohms.*

Appendix C
Radio and Television
Interference

This device generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference to radio and television reception.

Your Tallgrass product has been tested and complies with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if a "rabbit ear" TV antenna is used. (A "rabbit ear" antenna is the telescoping rod type usually contained on TV receivers.)

You can determine whether your computer is causing interference by turning it off. If the interference stops, it was probably caused by the computer or its peripherals. To further isolate the problem:

- Check that all wires, cables, and connectors have been installed.
- Turn the TV or radio antenna until the interference stops.
- Move the computer to one side or the other of the TV or radio.
- Move the computer farther away from the TV or radio.

- Plug the computer into an outlet that is on a different circuit from the TV or radio. (That is, make certain that the computer and the TV or radio are on circuits controlled by different circuit breakers or fuses.)

If necessary, consult your dealer or an experienced radio/television technician for additional suggestions.

You may also find the booklet *How to Identify and Resolve Radio-TV Interference Problems* helpful. It is prepared by the Federal Communications Commission and is available from the U.S. Government Printing Office, Washington, DC 20402, stock number 004-000-00345-4.

Appendix D
Customer Support
Services

To resolve any problems with your tape drive, complete the following procedures in the order listed:

- Refer to the section of your installation and/or operations guide that discusses the part of the tape drive with which you are experiencing difficulty.
- Call your dealer or service representative.
- Call Tallgrass Customer Support.

Reaching Customer Support

If you have questions regarding the operation of your tape drive that you cannot answer by consulting the manuals or your dealer or service representative, you can call Tallgrass Customer Support at 913-492-6002. You can also reach Customer Support by Telefax, 913-492-2465.

Before you call Customer Support, gather the following information to help isolate the problem.

- Tape drive serial number (found on the rear of the tape drive or the bottom of an external tape drive unit).
- Tape drive model number.
- Computer brand name and model (name or number).
- RAM available.

- Any special add-on equipment not a part of a standard integrated system.
- Tape software name and version number.
- Operating system (DOS, UNIX, OS/2, etc.) version number.
- Software programs with which you are having trouble.

Be ready to provide an exact description of your problem, including what you were doing prior to the problem, what happened when the problem occurred, and what you expected to happen differently. Also, if an error message occurred, write it down exactly as it appeared on the screen.

Moving Your Tallgrass Unit

FOR INTERNAL TAPE DRIVES: If your internal tape drive needs repairs, you must first remove it from the computer. If you do not feel comfortable removing the internal drive yourself, contact your dealer for assistance.

To ship your tape drive or move it a long distance, repack it in the original shipping container and packing materials. If you do not have the original shipping container, contact your dealer or service representative for shipping instructions. If you do not properly protect your unit for shipping, you might void your warranty.

Returning Your Tape Drive to the Factory

If your tape drive requires repair and you need to return it to the factory for service, follow these instructions to ensure rapid, accurate turnaround.

1. Call Tallgrass Customer Support at 913-492-6002. Obtain a Return Materials Authorization (RMA) number.

2. Pack the tape drive in its original shipping container and packing materials. If you do not have the original container, you can obtain one from your dealer or Tallgrass Customer Support.

3. Include a description of the problem with the unit in the shipping container.

4. For warranty claims, include a copy of the original purchase receipt showing the tape drive's serial number, or indicate that you sent in your Warranty Registration card. One of these is required for proof of date of purchase.

5. Be sure to write the RMA number on the outside of the shipping container. Otherwise, Tallgrass will not accept the package.

6. Write your return address on the outside of the shipping container.

If the product is covered under the End User Warranty, there is no charge for parts or labor required for the repair.

If Tallgrass finds no problems with a unit returned under warranty, a nominal testing fee is charged.

If the product is not covered under warranty, there is a labor charge plus parts cost for each item replaced.

RECORD THE MODEL AND SERIAL NUMBER OF YOUR DRIVE
AND DATE OF PURCHASE BEFORE YOU INSTALL THE UNIT.

TAPE DRIVE MODEL NUMBER:

_____

TAPE DRIVE SERIAL NUMBER:

_____

DATE OF PURCHASE:

_____

D-4