

Service Manual



**MTS 100
MPEG Test System
Serial Number B040000 and Above
070-9521-04**

Warning

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.



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In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

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Repair Protection extends priority repair services beyond the product's warranty period; you may purchase up to three years of Repair Protection.

Calibration Services provide annual calibration of your product, standards compliance and required audit documentation, recall assurance, and reminder notification of scheduled calibration. Coverage begins upon registration; you may purchase up to five years of Calibration Services.

Service Assurance Advantages

- Priced well below the cost of a single repair or calibration
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- Eliminates unexpected service expenses

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For more information or to order Service Assurance, contact your Tektronix representative and provide the information below. Service Assurance may not be available in locations outside the United States of America.

Name	VISA or Master Card number and expiration
Company	date or purchase order number
Address	Repair Protection (1, 2, or 3 years)
City, State, Postal code	Calibration Services (1, 2, 3, 4, or 5 years)
Country	Instrument model and serial number
Phone	Instrument purchase date

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of the system. Read the *General Safety Summary* in other system manuals for warnings and cautions related to operating the system.

Injury Precautions

Use Proper Power Cord. To avoid fire hazard, use only the power cord specified for this product.

Avoid Electric Overload. To avoid electric shock or fire hazard, do not apply a voltage to a terminal that is outside the range specified for that terminal.

Avoid Overvoltage. To avoid electric shock or fire hazard, do not apply potential to any terminal, including the common terminal, that varies from ground by more than the maximum rating for that terminal.

Avoid Electric Shock. To avoid injury or loss of life, do not connect or disconnect probes or test leads while they are connected to a voltage source.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Do Not Operate Without Covers. To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

Use Proper Fuse. To avoid fire hazard, use only the fuse type and rating specified for this product.

Do Not Operate in Wet/Damp Conditions. To avoid electric shock, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere. To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Product Damage Precautions

Use Proper Power Source. Do not operate this product from a power source that applies more than the voltage specified.

Use Proper Voltage Setting. Before applying power, ensure that the line selector is in the proper position for the power source being used.

Provide Proper Ventilation. To prevent product overheating, provide proper ventilation.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:



WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.



CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:



DANGER
High Voltage



Protective Ground
(Earth) Terminal



ATTENTION
Refer to Manual



Double
Insulated

**Certifications and
Compliances**

Refer to the specifications section for a listing of certifications and compliances that apply to this product.

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power. To avoid electric shock, disconnect the main power by means of the power cord or, if provided, the power switch.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Preface

This manual contains the servicing information for MTS 100 MPEG Test Systems based on the Compaq ProLinea 2500 server platform, serial number B040000 and above. The instrument is a personal computer (hereafter called the server) equipped with application-specific hardware and software.

The following sections of this manual explain how to verify, service, troubleshoot, and repair the test system to the module level:

Specifications describes functional characteristics and performance requirements for the MTS 100 MPEG Test System.

Operating Information tells you how to install and operate the instrument.

Theory of Operation provides descriptions of the test system modules.

Performance Verification describes how to verify the functional performance of the test system.

Adjustment Procedures describes how to adjust the oscillator frequency.

Maintenance contains the following information:

- How to safely handle static-sensitive modules and components
- How to remove and replace modules
- Diagnostic and Troubleshooting information and procedures

Options.

Replaceable Parts gives all module and mechanical parts that comprise the test system. Parts are identified on an indexed illustration to make them easier to identify.

Appendices consist of the following items:

- *Software Repair* to help you replace damaged software.
- *MTS 100 Test System Application Software* lists the directories and files that make up the applications.

Related Manuals

The MTS 100 MPEG Test System documentation consists of the following:

MTS 100 MPEG Test System User Manual details how to operate the test system.

MTS 100 MPEG Test System Read this First provides additional information that will help a user understand the test system.

Manual Conventions

The following terms and conventions are used throughout this manual:

- The term *test system* is used interchangeably with the more formal term MTS 100 MPEG Test System.
- The term *server* refers to the personal computer (PC) that hosts the MTS 100 MPEG Test System.
- Signal names that have overbars represent active low signals.

Introduction

This manual contains maintenance information for the MTS 100 MPEG Test System. Take a few minutes to read this short introduction before doing any repair or service work on the instrument.

Before You Begin

This manual is for servicing the MTS 100 MPEG Test System. To prevent injury to yourself or damage to the test system, fulfill the following requirements before you attempt service:

- Be sure you are a qualified service person.
- Read the Safety Summary found at the beginning of this manual.
- Read *Service Strategy*, below.

When using this manual to service your test system, be sure to heed all warning, cautions, and notes.

Service Strategy

This manual contains the following MTS 100 MPEG Test System maintenance and repair procedures:

- Periodic maintenance
- Performance verification
- Module removal and replacement
- Module-level fault diagnosis

Once you isolate a problem with a module, use the *Replaceable Parts List* in this manual to determine the correct module part number to order from Tektronix.

Tektronix Service Offerings

Tektronix provides service to cover repair under warranty. Other services are available that may provide a cost-effective answer to your service needs.

Whether providing warranty repair service or any of the other services listed below, Tektronix service technicians, trained on Tektronix products, are best equipped to service your MTS 100 MPEG Test System. Tektronix technicians are

informed of the latest improvements to the product as well as the latest product options.

Warranty Repair Service

Tektronix warrants this product for one year from the date of purchase. (The warranty appears after the title and copyright pages of this manual.) Tektronix technicians provide warranty service at most Tektronix service locations worldwide. Your Tektronix product catalog lists all service locations; if necessary, contact your nearest Tektronix representative for more information or assistance.

Repair Service

Tektronix offers single per-incident and annual maintenance agreements that provide Depot Service repair of this test system.

Of these services, the annual maintenance agreement offers a particularly cost-effective approach to service for many owners of the MTS 100 MPEG Test System. Such agreements can be purchased to span several years.

Self Service

Tektronix supports repair to the module level by offering a Module Exchange program. The Module Exchange service can reduce down time for repair by allowing you to exchange most modules for remanufactured ones. Tektronix ships you an updated and tested exchange module from the Beaverton, Oregon service center. Each module comes with a 90-day service warranty.

For More Information

Please contact your local Tektronix service center or sales engineer for more information on any of the repair or adjustment services previously described.



Specifications

Specifications

This section lists the electrical, physical, and environmental characteristics of the MTS 100 MPEG Test System.

Product Description

MTS 100 MPEG Test System is installed a computer platform (called the server) that uses Microsoft® Windows NT™ as its operating system. The Test System is made up of a server, monitor, keyboard, mouse, and a software enabler key, or HASP®, along with the MTS 100 MPEG Test System Application software. See Figure 1-1.

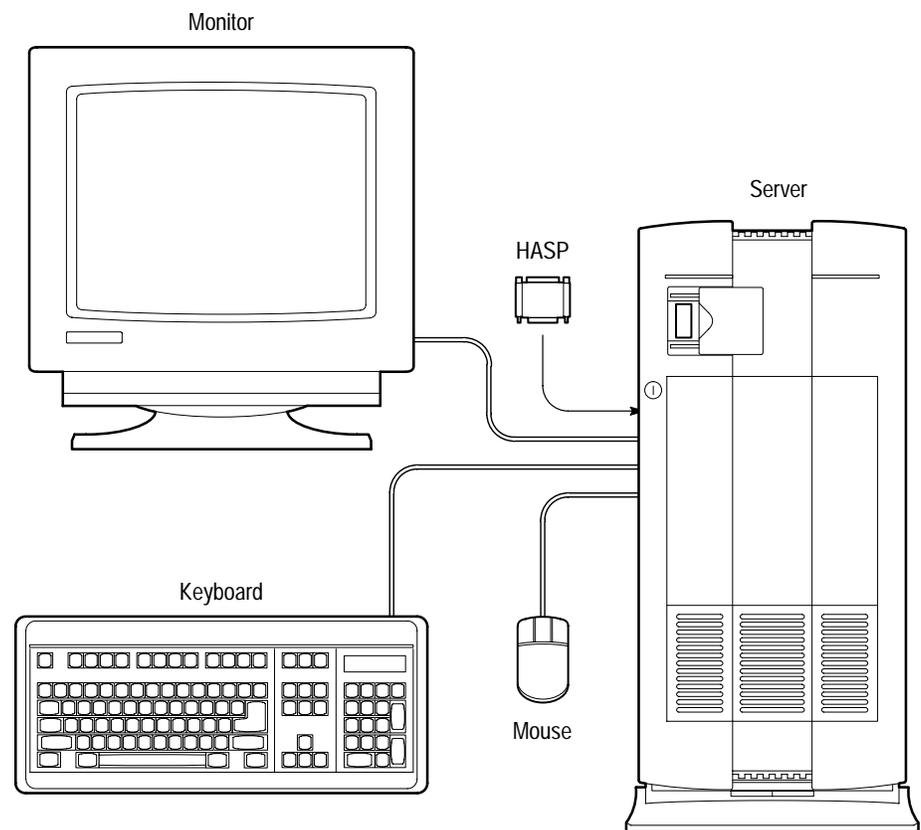


Figure 1-1: Components of the MTS 100 MPEG Test System

The MTS 100 MPEG Test System has the following features:

- The Test System generates, acquires, and analyzes MPEG2 transport streams containing MPEG1 or MPEG2 elementary streams.
- The key system components, installed in the server, are the Data Store circuit board and four Data Store hard disk drives.
- The Data Store I/O provides a variety of hardware interconnections, consisting of TTL serial, G.703 serial, 10 Mbit serial, and ECL parallel and serial.
- MTS 100 MPEG Test System application software consists of six application programs: Analyzer, Multiplexer, Table Editor, Channel Coder, Data Store Administrator, and Packet Jitter.

Specification Tables

The tables that begin on page 1–3 list the specifications for the MTS 100 MPEG Test System. Refer to the following definitions for an explanation of each specification table column heading.

Characteristic	Characteristics are properties of the product.
Performance Requirement	Performance requirements are statements that define a characteristic, usually in limit form. These statements are considered to be binding on the company (seller), and can be verified by performing the appropriate portions of the Performance Verification procedure, or by a separate and available procedure.
Supplemental Information	Supplemental information provides explanations for the information in the performance requirement column, or typical performance characteristics for the instrument. Statements in this column are not considered to be guaranteed performance and are not ordinarily supported by a Performance Verification procedure.

Performance Conditions

The Performance Requirements are valid within the environmental limits if the instrument is adjusted at 25° C ±5° C, and a minimum warm-up time of 20 minutes is allowed.

Hardware Electrical Specifications

I/O Ports The following tables give the specifications for the MTS 100-specific I/O ports.

Table 1-1: G.703 — 8.448 MHz

Characteristics	Performance requirements	Supplemental information
Standards Conformance		ITU-CCITT G.703, G.823
Connector		SMB
Line Encoding		HDB3
Serial Bit Rate	8.448 Mbytes/s \pm 10 ppm	
Generation/Acquisition Test	Error free	Tested with a 10 Mbyte file (within the constraints of synchronization)
Input		
Voltage Levels		Standard level within 0 to 4 dB cable attenuation at 1/2 clock Standard Levels: Mark from 2.033 V to 2.607 V Space from -0.237 to $+0.237$ Volts
Return Loss (75 Ω)		12 dB – 211 kHz to 422 kHz 18 dB – 422 kHz to 8.448 MHz 14 dB – 8.448 to 12.672 MHz
Connector		Male SMB (shared with the 34.36 Mbit input)
Jitter Tolerance		177 ns peak-to-peak 20 Hz to 400 Hz 23.6 ns peak-to-peak 3 kHz to 400 kHz Log prorated – 400 Hz to 3 kHz
Output		
Pulse Width		59 ns nominal
Pulse "Mark" Amplitude	$2.37 \text{ V} \pm 0.237 \text{ V}$	
No-Pulse "Space" Voltage	$0 \pm 0.237 \text{ V}$	
Pulse Shape		Conforms to 8.448 MHz Pulse Mask, G.703 Figure 16 (see Figure 1-2)
Required Receiver Termination		75 Ω nominal resistive

Table 1-1: G.703 — 8.448 MHz (cont.)

Characteristics	Performance requirements	Supplemental information
Jitter		15 ns peak-to-peak with a 20 Hz lower cut-off and a 400 kHz upper cut-off filter 5 ns peak-to-peak with a 3 kHz lower cut-off and a 400 kHz upper cut-off filter Allows a cascade of ten different regenerators before system limit is reached
Connector		Male SMB
Return Loss		12 dB – 211 kHz to 422 kHz 18 dB – 422 kHz to 8.448 MHz 14 dB – 8.448 to 12.672 MHz

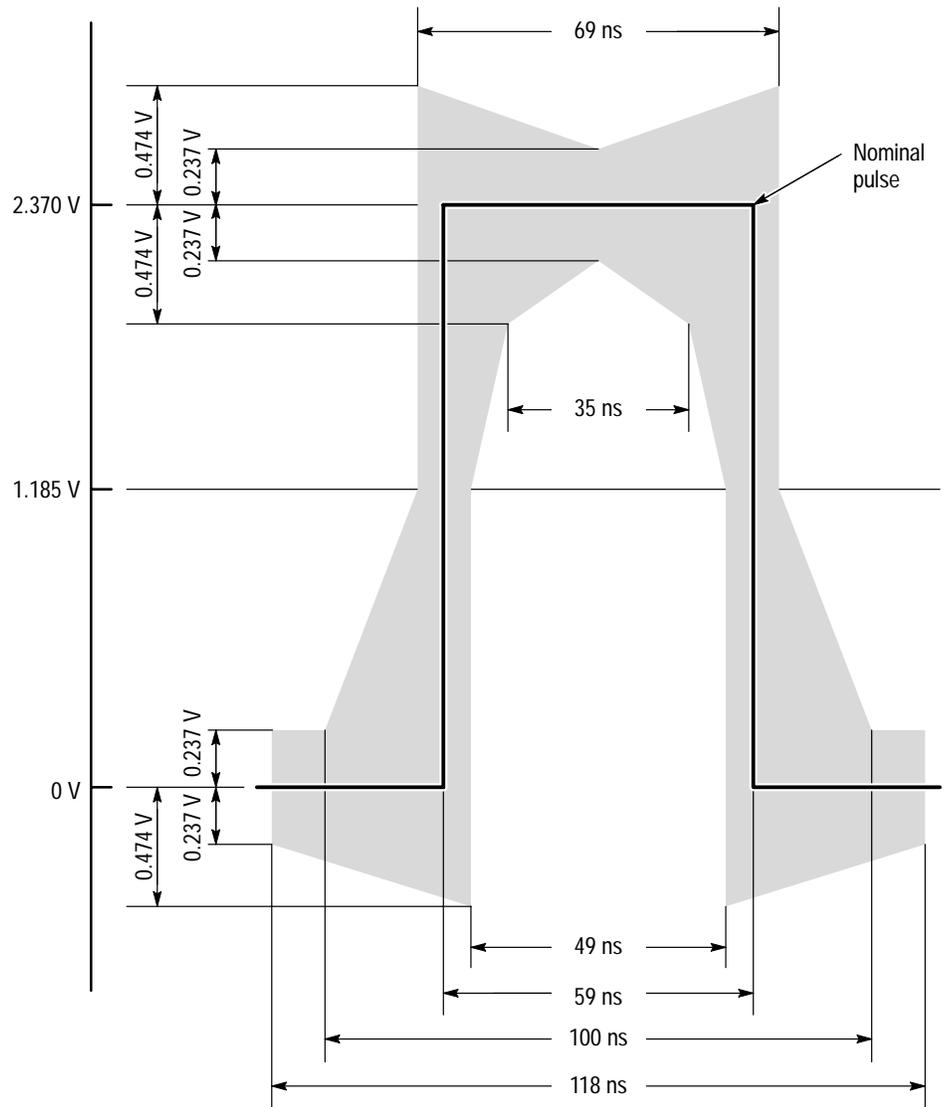


Figure 1-2: Pulse specification for a G.703 8.448 MHz pulse

Table 1-2: G.703 — 34.368 MHz

Characteristics	Performance requirements	Supplemental information
Standards Conformance		ITU-CCITT G.703, G.823
Connector		SMB
Line Encoding		HDB3
Generation/Acquisition Test	Error free	Tested with a 10 Mbyte file (within the constraints of synchronization)
Serial Bit Rate	34.368 Mbits/s \pm 20 ppm	
Input		
Voltage Levels		Standard level within 0 to 4 dB cable attenuation at 1/2 clock Standard level: Mark from 0.9 V to 1.1 V Space from -0.1 V to +0.1 V
Return Loss (75 Ω)		12 dB 860 kHz to 1.72 MHz 18 dB 1.72 MHz to 34.368 MHz 14 dB 34.368 to 51.55 MHz
Connector		Male SMB (shared with the 8 Mbit input)
Jitter Tolerance		43.7 ns peak-to-peak – 100 Hz to 1 kHz 4.37 ns peak-to-peak – 10 kHz to 800 kHz Log prorated – 1 kHz to 10 kHz
Output		
Pulse Width		14.5 ns nominal
Pulse "Mark" Amplitude	1.0 V \pm 0.1 V	
No-Pulse "Space" Voltage	0 \pm 0.1 V	
Pulse Shape		Conforms to 34.368 MHz Pulse Mask, Figure 17/G.703 (see Figure 1-3)
Required Receiver Termination		75 Ω nominal resistive
Jitter		10 ns peak-to-peak with a 100 Hz lower cut-off and a 800 kHz upper cut-off filter 2.45 ns peak-to-peak with a 10 kHz lower cut-off and a 800 kHz upper cut-off filter Allows a cascade of ten different regenera- tors before system limit is reached
Return Loss		12 dB – 860 kHz to 1.72 MHz 18 dB – 1.72 MHz to 34.368 MHz 14 dB – 34.368 MHz to 51.55 MHz

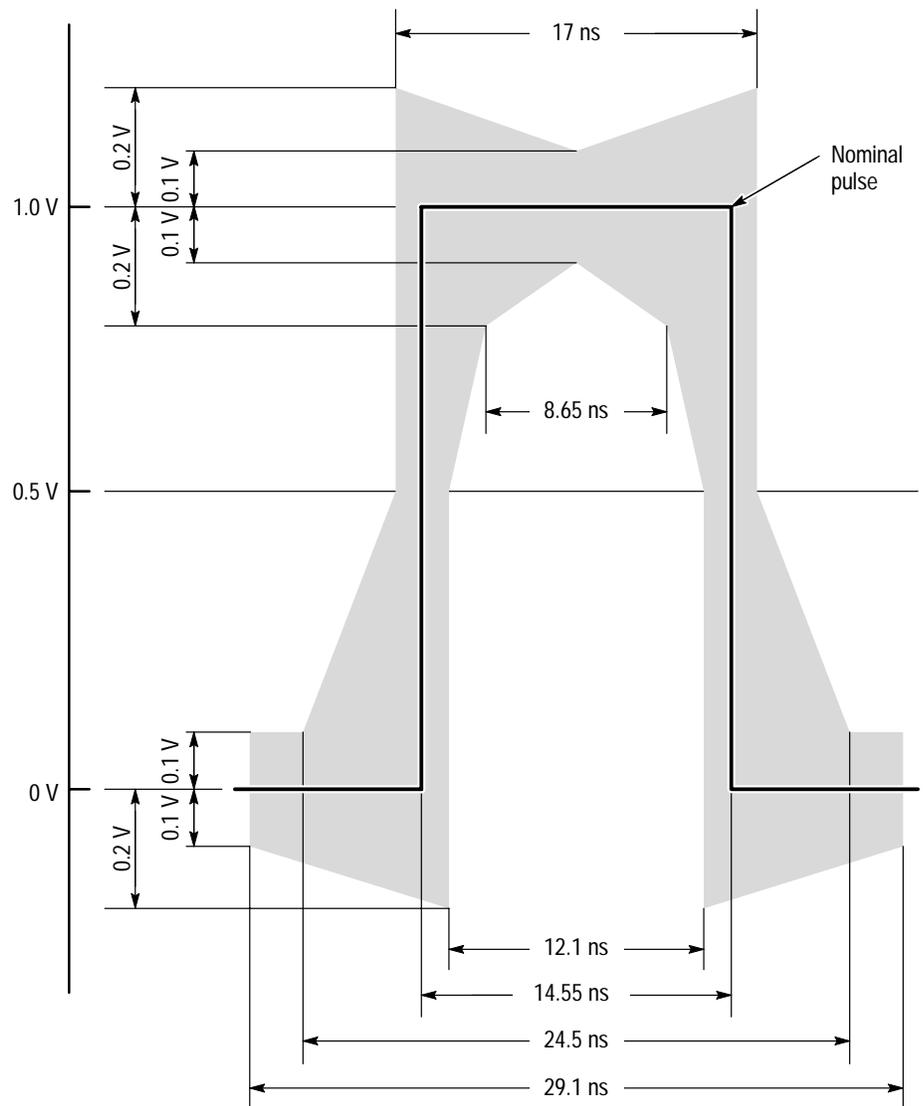
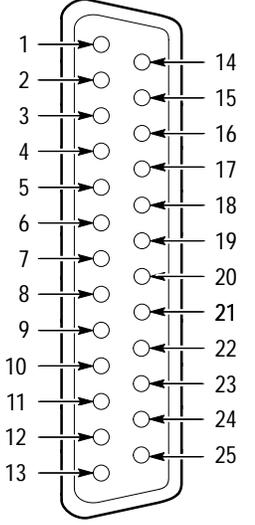


Figure 1-3: Pulse specification for G.703 34.368 MHz

Table 1-3: ECL parallel, serial, and control ports

Characteristics	Performance requirements	Supplemental information
Connector		Parallel Data: D25 (pinout is given in Table 1-4) Serial Data: D25 (pinout is given Table 1-5) Flow Control: D9 (pinout is given in Table 1-6)
Generation/Acquisition Test Master/Slave Slave/Master (w/control)	All error free	Tested with a 10 Mbyte file at maximum data rates (within the constraints of synchronization)
Digital Format		Binary, positive logic
Input		
Maximum Data Rate		Serial: 55 Mbits/s Parallel: 7.5 Mbytes/s
Minimum Data Rate		Clock Rate: 1 MHz Serial: 1 Mbits/s Parallel: 125 Kbytes/s
Signal Level Amplitude		Differential ECL Compliant with the ECL 100K levels
Time Reference		Rising edge of the clock
Output		
Maximum Data Rate		Serial: 55 Mbits/s Parallel: 7.5 Mbytes/s
Minimum Data Rate		Clock rate: 1 MHz Serial: 1 Mbits/s Parallel: 125 Kbytes/s
Clock to Data Timing		Data changes within 5 ns of falling clock edge
Signal Level Amplitude		Differential ECL Compliant with the ECL 100K levels
Required Receiver Termination		110 Ω , line-to-line

Table 1-4: ECL parallel data pinout

ECL parallel port	Pin	Function	Pin	Function
	1	DCLK	14	$\overline{\text{DCLK}}$
	2	Ground	15	Ground
	3	DATA 7	16	$\overline{\text{DATA 7}}$
	4	DATA 6	17	$\overline{\text{DATA 6}}$
	5	DATA 5	18	$\overline{\text{DATA 5}}$
	6	DATA 4	19	$\overline{\text{DATA 4}}$
	7	DATA 3	20	$\overline{\text{DATA 3}}$
	8	DATA 2	21	$\overline{\text{DATA 2}}$
	9	DATA 1	22	$\overline{\text{DATA 1}}$
	10	DATA 0	23	$\overline{\text{DATA 0}}$
	11	DVALID	24	$\overline{\text{DVALID}}$
	12	PSYNC	25	$\overline{\text{PSYNC}}$
	13	Shield		

Asserted Low differential signal.

Table 1-5: ECL serial data pinout

ECL serial port	Pin	Function
	1	DCLK
	2	Ground
	3 - 9	Not Managed
	10	DATA 0
	11	DVALID
	12	PSYNC
	13	Shield
	14	$\overline{\text{DCLK}}$
	15	Ground
	16 - 22	Not Managed
	23	$\overline{\text{DATA 0}}$
	24	$\overline{\text{DVALID}}$
	25	PSYNC

Asserted Low differential signal.

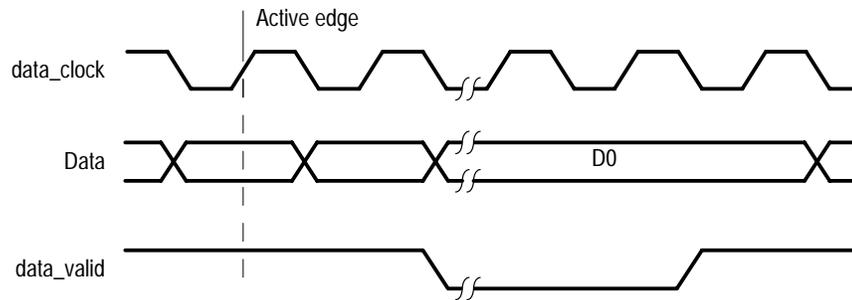
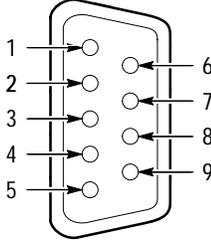


Figure 1-4: Timing diagram for the ECL serial port

Table 1-6: ECL control port pinout

ECL control port	Pin	Function
	1	CHCLK (Channel Clock)
	2	Ground
	3	CHSYNC (Channel Sync)
	4	CHCLKEN (Channel Clock Enable)
	5	Shield
	6	$\overline{\text{CHCLK}}$ (Channel Clock)
	7	Ground
	8	$\overline{\text{CHSYNC}}$ (Channel Sync)
	9	$\overline{\text{CHCLKEN}}$ (Channel Clock Enable)

Asserted Low differential signal.

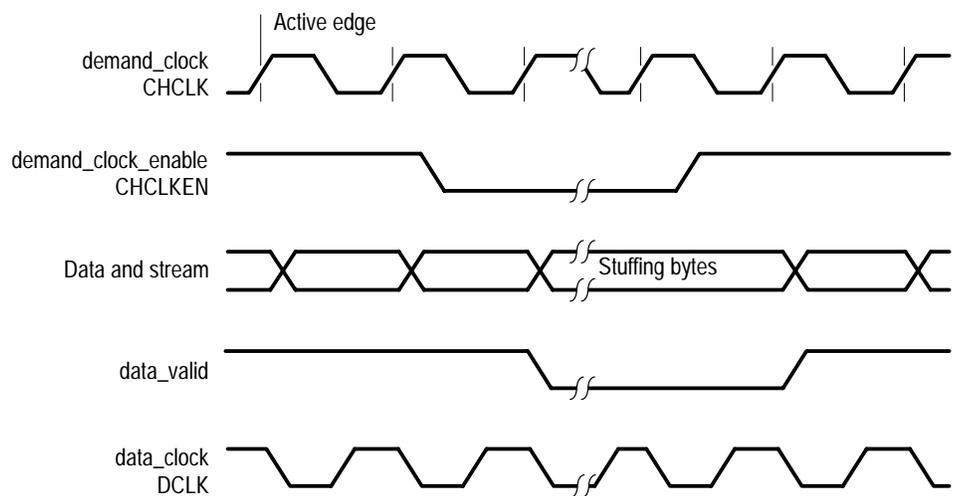


Figure 1-5: ECL Timing diagram with control port

Table 1-7: 50 Ω TTL I/O

Characteristics	Performance requirements	Supplemental information
Connectors		Male SMB
Rise & Fall Times		Between 2 ns and 6.5 ns
Signal swing into 50 Ω (output)	Low < 0.3 V High > 2.65 V	
Digital Format		Binary, positive logic
Maximum Data Rate		45 Mbits/s
Minimum Data Rate		1 Mbit/s
Generation/Acquisition Test	Error free	Tested with a 10 Mbyte file at maximum data rates (within the constraints of the stop/start bits)
Termination (input)		50 Ω nominal resistive
Timing Diagram		DATA signal is stable on the leading edge of the clock signal (see Figure 1-6)
Clock to Data Timing		Data changes within 5 ns of falling clock edge
Signal Level Amplitude (input)		TTL Low < 0.8 V High > 2.0 V

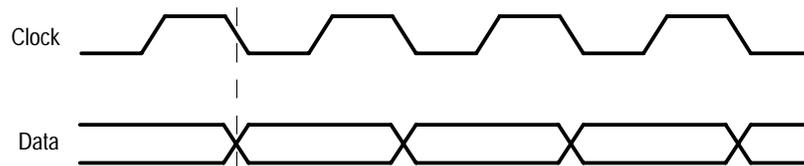


Figure 1-6: Timing for the TTL port and the separate clock input

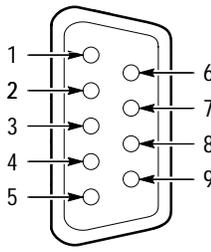
Table 1-8: 10 Mbit serial port (RS-422 levels I/O Port)

Characteristics	Performance requirements	Supplemental information
Connector		9-pin sub-miniature D-type connector (see Table 1-9)
10 Mbit Serial Voltage Levels		Differential outputs measured single-ended
Output		Low < 0.5 V High > 2.5 V
Input		Low < -0.5 V differential High > 0.5 V differential

Table 1-8: 10 Mbit serial port (RS-422 levels I/O Port) (cont.)

Characteristics	Performance requirements	Supplemental information
Common Mode Range		± 5 Volts
10 Mbit Serial Rise and Fall Times		Between 2 ns and 12 ns
Maximum Data Rate		10 Mbit/s
Minimum Data Rate		1 Mbit/s
Clock to Data Timing		Data changes within 10 ns of falling clock edge
Generation/Acquisition Test	Error free	Tested with a 10 Mbyte file at maximum data rates (within the constraints of the stop/start bits)

Table 1-9: 10 Mbit serial port pinout

10 Mbit serial port	Pin	Function
	1	DATA IN
	2	CLK IN
	3	DATA OUT
	4	CLK OUT
	5	Ground
	6	$\overline{\text{DATA IN}}$
	7	$\overline{\text{CLK IN}}$
	8	$\overline{\text{DATA OUT}}$
	9	$\overline{\text{CLK OUT}}$

Asserted Low differential signal.

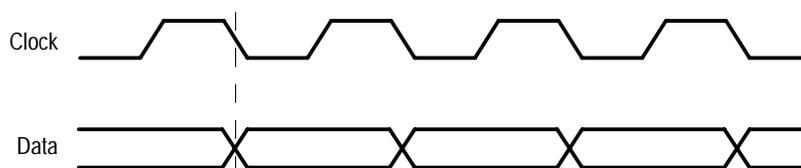


Figure 1-7: Timing diagram for the 10 Mbit Serial port

Table 1-10: Clock Port

Characteristics	Performance requirements	Supplemental information
Clock Port Voltage Levels		TTL Low < 0.8 V High > 2.0 V
Termination		50 Ω , nominally resistive
Range		125 kHz to 45 MHz

Table 1-11: PLL

Characteristics	Performance requirements	Supplemental information
Range		125 kHz to 60 MHz
Resolution		1 Hz
Jitter	0.2 UI peak-to-peak over a 1000 UI delay	
Settling Time		3 seconds after frequency change
Frequency Accuracy		10 ppm \pm resolution

Power Specifications

Table 1–12: Power requirements

Characteristics	Performance requirements	Supplemental information
Line Voltage		100 to 240 VAC
Line Frequency		60 Hz / 50 Hz
Rated Input Current		6 A to 3 A
Power Consumption (without monitor)		160 Watts nominal

Mechanical (Physical) Characteristics

Table 1–13: MTS100 mechanical characteristics

Characteristics	Supplemental information
Dimensions	Base unit (does not include monitor, keyboard, pedestal, or mouse)
Height	17.92 inches (45.52 cm)
Width	8.83 inches (22.43 cm)
Depth	22.67 inches (57.58 cm)
Net Weight	65 lb (without accessories) (29.54 kg)
Shipping Weight	104 lb (47.17 kg) (with all accessories except monitor; monitor is shipped separately)

Environmental Characteristics

Table 1–14: MTS100 environmental characteristics

Characteristics	Supplemental information
Temperature	
Non-operating (storage)	–20° C (–4° F) to +60° C (140° F) (max. rate of change 20° C or 36° F per hour)
Operating	+10° C (50° F) to +35° C (95° F) (max. rate of change 10° C or 18° F per hour)
Altitude	
Non-operating	0 to 30,000 feet (9144 meters)
Operating	0 to 10,000 feet (3048 meters)
Humidity	
Operating	20% to 80% (max. rate of change 10% per hour)
Non-operating	5% to 90% humidity, non-condensing

Table 1-15: Safety standards

Category	Description
U.S. Nationally Recognized Testing Laboratory Listing	UL1950 – Safety of Information Technology Equipment, Including Electrical Business Equipment
Canadian Certification	CAN/CSA C22.2 No. 950 M89 – Safety of Information Technology Equipment, Including Electrical Business Equipment
European Union Compliance	Low Voltage Directive 73/23/EEC; amended by 93/68/EEC: EN60950 – Safety of Information Technology Equipment, Including Electrical Business Equipment
Additional Compliance	IEC950 – Safety of Information Technology Equipment, Including Electrical Business Equipment

Table 1-16: Safety certification compliance

Category	Description
Temperature (operating)	+10° C (50° F) to +35° C (95° F)
Altitude (maximum operating)	2000 Meters
Relative Humidity (maximum operating)	80% for temperatures up to 31° C (88° F), decreasing linearly to 50% to at 40° C (104° F)
Safety Class	Class I – grounded product

Table 1–17: Certifications and compliances

Category	Standard
EC Declaration of Conformity	<p>Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive 73/23/EEC for Product Safety.</p> <p>Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:</p> <p>EN 50081-1 Emissions: EN 55022 Class A Radiated and Conducted Emissions</p> <p>EN 50082-1 Immunity: IEC 801-2 Electrostatic Discharge Immunity IEC 801-3 RF Electromagnetic Field Immunity IEC 801-4 Electrical Fast Transient/Burst Immunity</p> <p>Conditional Statements:</p> <ol style="list-style-type: none"> 1) Using the high quality Tektronix shielded cables attached to the ECL Ser/Par and ECL Control ports that it was qualified with. 2) Using conductive EMI gasketing applied to the chassis top/center at the area of contact with the top cabinet panel. <p>Low Voltage directive 73/23/EEC, amended by 93/68/EEC: EN 60950 Safety of Information Technology Equipment, Including Electrical Business Equipment</p>



Operating Information

Operating Information

This section provides installation instructions and gives a brief overview of how to operate the MTS100 MPEG Test System. For detailed operating information, refer to the *MTS100 MPEG Test System User Manual* provided with the instrument or software upgrade kit.

Installation

The installation of the MTS 100 involves selecting an installation site, installing the server tower pedestal and door, and connecting all the cabling. Once all items have been unpacked, the assembly of the individual items making up the system should only require a few minutes. Save the shipping carton and all inserts for use if reshipment of the MTS 100 server becomes necessary. Refer to the repackaging instructions beginning on page 6–28 in the *Maintenance* section of this manual.



CAUTION. To avoid damage to the MTS100 during shipping, retain the original shipping carton. Shipping the MTS100 in any other packaging may void the warranty.

Standard Accessories

Standard accessories are shipped with the test system; all items except the monitor are in the carton containing the Server. When you unpack the test system note that the following items are shipped with it:

- Tektronix 17 inch monitor and monitor cable (monitor power cord is shipped in the MTS 100 accessories package)
- Compaq server with the Data Store board and Data Store disk drives already installed (referred to as the MTS 100 server)
- Keyboard
- Mouse
- Tower pedestal
- Server door
- Software enable key (HASP) for the parallel port (installed on the server parallel port)
- *MTS 100 MPEG Test System User Manual*

- Compaq documentation and back-up copies of the Compaq software
- Windows NT software (already installed) and documentation package (backup software is provided in case the loaded version becomes corrupted)
- Emergency repair disk (use this disk as described in the Windows NT System Guide)
- MTS 100 Installation Software CD ROM (provided for reinstalling the MTS 100 software in case it becomes corrupted)
- CD ROM containing the MPEG-2 Elementary Streams for MTS 100.
- Two power cords (one each for the MTS 100 server and the monitor)
- Six SMB to BNC adaptors (three with 50 Ω cables and three with 75 Ω cables)
- One 9-pin cable (use this cable to meet EMI requirements)
- One 25-pin cable (use this cable to meet EMI requirements)

Assembling the MTS100 MPEG Test System

Before you begin to assemble the MTS 100, please make sure that you have selected an appropriate location. A good site, as specified by Compaq, includes the following features:

- A sturdy, level site that includes dedicated and properly grounded circuits, air conditioning equipment, and static electricity protection
- A 3 inch (7.6 cm) clearance at the front and back of the computer for proper ventilation (You will probably want additional access to the rear panel for connecting signals.)
- A separate electrical circuit for the MTS 100
- No heavy electrical equipment nearby

Once a good site has been selected, begin assembling the MTS 100 MPEG Test System (shown in Figure 2-1) using the procedure given below.

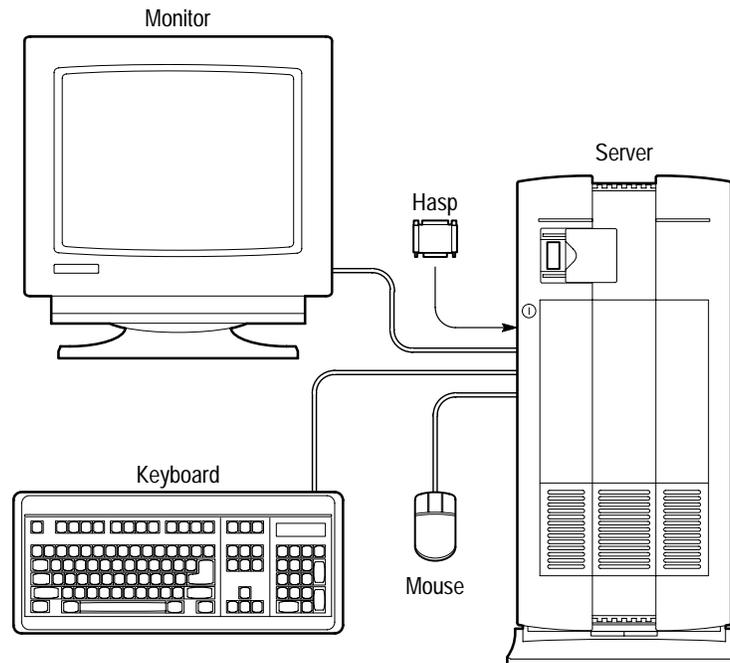


Figure 2-1: The MTS 100 MPEG Test System



WARNING. Be careful lifting and moving the MTS 100 server. It is heavy.

1. Install the pedestal on the MTS 100 server.
 - a. Carefully set the server on its top.
 - b. Align the post on the pedestal with the slots in the server case.
 - c. Slide the pedestal into the slots until the retaining clip on the pedestal snaps into place on the server base.
 - d. Carefully turn the server over to set it upright on the pedestal.
2. Install the door on the front of the server.
 - a. Line up the hinge pins of the two hinges on the right side of the server door with the hinge pin holes in the server chassis.
 - b. Lower the hinge pins into the hinge pin holes and close the door.
3. Connect the keyboard to the keyboard port on the rear panel of the MTS 100 server.
4. Connect the mouse to the mouse port on the rear panel of the MTS 100 server.

5. Verify the software key (HASP) is attached to the parallel port on the rear panel of the MTS 100 server. (It should already be connected as shipped from the factory.) The rear panel is illustrated in Figure 2–2.

NOTE. If you need to use the parallel port for another function, connect the cable through the HASP.

6. If the MTS 100 is being connected to a network, connect it now. Two types of ethernet ports are provided: AUI and RJ45, as shown in Figure 2–2. The ethernet ports do not require termination.

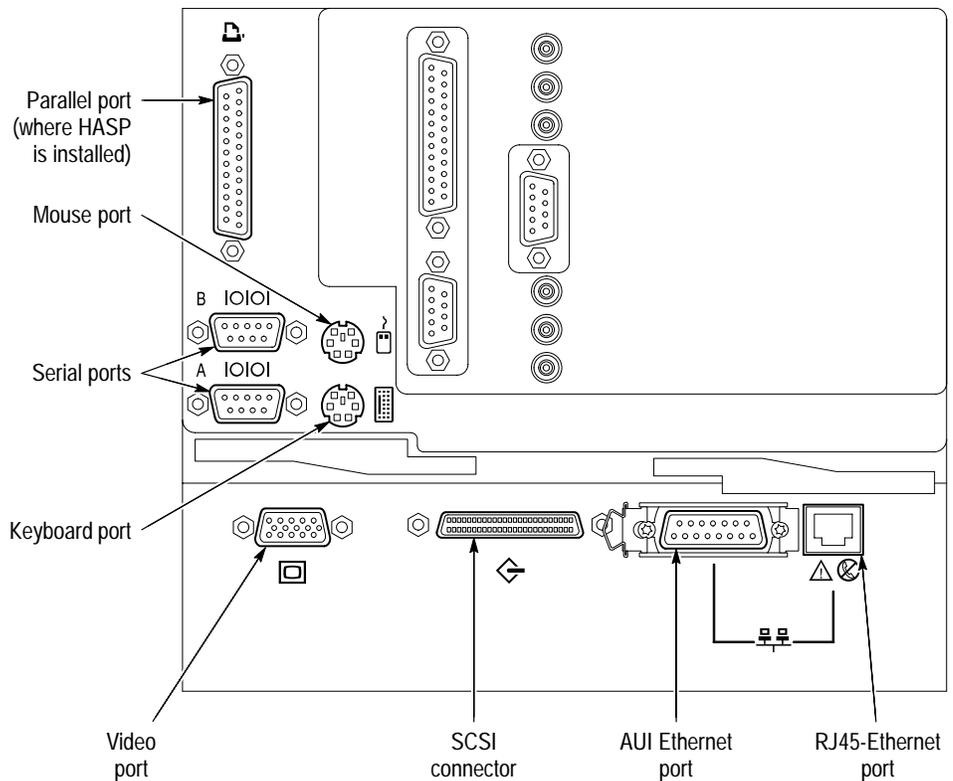


Figure 2–2: The rear panel of the MTS 100 server

NOTE. Although the MTS 100 is based on a standard computer platform, you should not use the MTS 100 for any other purpose, nor should you install expansion boards other than those provided or recommended by Tektronix. Doing so may cause your system to operate in an unexpected manner.

7. Connect the monitor cable between the monitor and the video port on the MTS 100 rear panel.

8. Connect the power cord to the monitor and to a power source.
9. Connect the power cord to the MTS 100 server and to an appropriate power source.

Power Requirements

The MTS 100 server and monitor are designed to operate from a single-phase power source having one of its current-carrying conductors at or near earth ground (the neutral conductor). Systems that have both current-carrying conductors live with respect to ground, such as phase-to-phase or multiphase systems, are not recommended as power sources. A protective ground connection, by way of the grounding conductor in the power cord is essential for safe operation.



CAUTION. *This equipment is designed for connection to a grounded (earthed) AC outlet. The grounding plug is an important safety feature. To avoid risk of electrical shock or damage to your equipment, do not disable this feature.*

Mains Voltage Range. The MTS 100 server (the ProLiant 2500) operates from 100 VAC to 230 VAC power mains; it is not necessary to set a voltage selection switch or jumper.

The monitor operates on either 115 VAC or 230 VAC source also without having to set a voltage selection switch.

Mains Frequency. Both the server and the monitor operate at either 50 or 60 Hz line frequencies.



CAUTION. *To prevent damage to the MTS 100 server, you should protect the instrument from power fluctuations and temporary interruptions with a regulating uninterruptable power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes. In addition, it keeps the system in operation during a power failure.*

Power Cord Options

The server and monitor are delivered from the factory with power cords for North American 60 Hz/117 VAC power supplies, unless purchased with a power cord option. Table 7-1 in the *Options* section of this manual shows the available power cord options.

Parallel Port

The software enable key (HASP) must be installed on the parallel port; the MTS 100 software does not operate without it.

HASP. The software is enabled by a software enable key which is referred to as a HASP (see Figure 2–3). The HASP is installed on the parallel port during manufacture and is transparent to parallel port applications, such as connection to a printer. The HASP must be in place on the ProLiant parallel port for the MTS 100 to operate. Do not lose the HASP. The software enabler (HASP) should remain with the MTS 100 at all times. If the entire instrument is returned for service, ship the HASP with the server.



CAUTION. Do not lose the HASP (software enable key). The MTS 100 will not operate unless the HASP is installed on the parallel port. The HASP is also required by the Tektronix Service Center if the ProLiant server must be returned for repair.

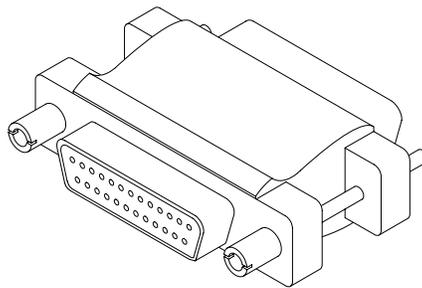


Figure 2–3: MTS 100 HASP

Cabling the Test System Inputs/Outputs

The MTS 100 is supplied with adapters for connecting the Data Store system SMB connectors to standard BNC connectors. It may be necessary to acquire or assemble other connecting cables and adapters in order to install the MTS 100 in your facility.

The test system interfaces place restrictions on the types of cables that can be used for signal input and output. See Table 2–1 to select the type and length of cable that will interface with the test system.

Cables and Mating Connectors

The maximum usable cable length for the various ports is a function of data rate, cable type, and ambient environment. Low data rates tolerate longer cable lengths than the higher data rates. Low-loss coaxial cable and low-capacitance properly pair-twisted cable can support longer transmission than miniature coaxial cable or ribbon cable. Excess RF noise can induce noise in the cable which will also reduce the usable length.

The only ports designed as a transmission system are the G.703 I/Os. The other ports are basically short-range interconnects. Note that cable delay matching is critical for most ports in order to maintain clock-to-data timing margin, which protects data integrity.

Table 2-1: Cable selection criteria

Port	Rate, Mbits/s	Maximum length	Cable type	Comments
G.703	8.448	275 meters	Belden 8281	4 dB atten at 4.224 MHz
G.703	34.368	125 meters	Belden 8281	4 dB atten at 17.18 MHz
10 MBit (RS422)	1	100 meters	24 AWG unshielded twisted pair	Ref. ANSI/TIA/EIA-422-B-1994
10 MBit (RS422)	10	15 meters	24 AWG unshielded twisted pair	Ref. ANSI/TIA/EIA-422-B-1994
TTL	10	50 meters	RG58 type	Calculated Value
TTL	50	25 meters	RG58 type	Calculated Value
ECL Parallel	1	50 meters	Belden 8112	Calculated Value
ECL Serial	45	5 meters	Belden 8112	Calculated Value

Adapters

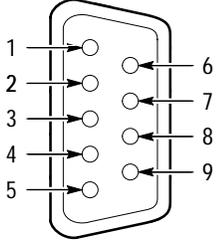
The MTS 100 Test System comes with six SMB-to-BNC adapter cables. Three of the adapters are 75 Ω to match the impedance of the G.703 inputs and outputs. The other three adapters are 50 Ω for use with the Clock input and the TTL serial port (Clock and Data). The cables are marked with their impedance.

NOTE. Do not leave an SMB-to-BNC adapter cable on an unused G.703 output. Doing so can cause the test system to exceed EMC emission standards.

Transport Stream I/O

The test system rear panel connectors are located in two EISA slots on the server rear panel, as shown in Figure 2-4. I/O port voltage levels, bit rates, return loss, and other I/O data are listed in the *Specifications* section of this manual.

Table 2-2: ECL control port pinout

ECL control port	Pin	Function
	1	CHCLK (Channel Clock)
	2	Ground
	3	CHSYNC (Channel Sync)
	4	CHCLKEN (Channel Clock Enable)
	5	Shield
	6	$\overline{\text{CHCLK}}$ (Channel Clock)
	7	Ground
	8	$\overline{\text{CHSYNC}}$ (Channel Sync)
	9	$\overline{\text{CHCLKEN}}$ (Channel Clock Enable)

Asserted Low differential signal.

ECL Parallel/Serial I/O Port

The ECL Parallel/Serial I/O port receives and transmits MPEG-2 transport streams at ECL levels. It is a differential, bidirectional port that operates independently or in conjunction with the ECL Control Port. The port transmits or receives either parallel or serial data depending on settings made in the Data Store Administrator application.

Operating Modes. When the ECL Parallel/Serial I/O port is used independently of the ECL Control Port there are three operating modes:

- Slave acquisition. Captures input signals using the clock signal on the ECL Parallel/Serial I/O port as the timing source.
- Master generation. Outputs signals using the MTS 100 internal clock.
- Master generation with external clock. Outputs signals using a timing signal applied to the external clock input (Clk In).

When the ECL Parallel/Serial I/O port is used in conjunction with the control port, there are three additional operating modes:

- Master acquisition. Captures input signals using control signals from the ECL Control Port to drive the signal source.
- Master acquisition with external clock. As above, but uses a timing signal applied to the external clock input (Clk In) as the clock source.
- Slave generation. Outputs signals using the ECL control port inputs as the timing source.

NOTE. Master — The unit provides the clock for data transmission.
 Slave — The unit does not generate the data clock. The unit returns the clock provided by an external source.

Parallel Pinout. The parallel data pinout of the ECL Parallel/Serial I/O port is shown in Table 2-3.

Table 2-3: ECL parallel data pinout

ECL parallel port	Pin	Function	Pin	Function
	1	DCLK	14	$\overline{\text{DCLK}}$
	2	ground	15	ground
	3	DATA 7	16	$\overline{\text{DATA 7}}$
	4	DATA 6	17	$\overline{\text{DATA 6}}$
	5	DATA 5	18	$\overline{\text{DATA 5}}$
	6	DATA 4	19	$\overline{\text{DATA 4}}$
	7	DATA 3	20	$\overline{\text{DATA 3}}$
	8	DATA 2	21	$\overline{\text{DATA 2}}$
	9	DATA 1	22	$\overline{\text{DATA 1}}$
	10	DATA 0	23	$\overline{\text{DATA 0}}$
	11	DVALID	24	$\overline{\text{DVALID}}$
	12	PSYNC	25	PSYNC
	13	shield		

Asserted Low differential signal.

Serial Pinout. The serial data pinout of the ECL Parallel/Serial I/O port is shown in Table 2-4.

Table 2-4: ECL serial data pinout

ECL serial port	Pin	Function
	1	DCLK
	2	ground
	3 - 9	Not Managed
	10	DATA 0
	11	DVALID
	12	PSYNC
	13	shield
	14	$\overline{\text{DCLK}}$
	15	ground
	16 - 22	Not Managed
	23	$\overline{\text{DATA 0}}$
	24	$\overline{\text{DVALID}}$
	25	PSYNC

Asserted Low differential signal.

G.703 Interface

This serial interface complies with the electrical characteristics of ITU-T Recommendation G.703 (HDB3 code) for 8.448 and 34.368 Mbit/s. It consists of three Data Store circuit board mounted SMB connectors.

G.703 Output (8.448 Mbit/s and 34.368 Mbit/s) & G.703 Input. One of the SMB connectors is a dedicated input for both bit rates. The two remaining connectors are dedicated outputs, one for the 34.368 Mbit/s output and the second for the 8.448 Mbit/s output. See Figure 2-4 on page 2-8. To reduce spurious emissions, only the output currently being used should be connected.

This interface can use any one of three operating modes:

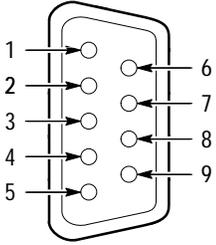
- The generation mode uses an internal clock source.
- The acquisition mode locks to the incoming signal and provides self clocking (frequency must be specified) and acquires packets in pattern synchronization mode.
- The acquisition mode locks to the incoming signal and provides self clocking (frequency must be specified) without synchronization.

NOTE. Do not leave an SMB-to-BNC adaptor cable on an unused G.703 output. It will cause the test system to exceed EMC emission standards.

**10 Mbit Serial Port
(RS-422 Levels I/O Port)**

The 10 Mbit Serial port can transmit and receive MPEG transport signals. It has bidirectional clocks and data pairs. The maximum operating frequency is 10 Mbit/sec. It uses RS-422 voltage levels, with line-to-line input termination of 110 Ω. The pinout is shown in Table 2-5.

Table 2-5: 10 Mbit serial port pinout

10 Mbit serial port	Pin	Function
	1	DATA IN
	2	CLK IN
	3	DATA OUT
	4	CLK OUT
	5	ground
	6	DATA IN
	7	CLK IN
	8	DATA OUT
	9	CLK OUT

Asserted Low differential signal.

The 10 Mbit Serial port uses the following signals:

- Data In and Data Out. These are MPEG serial bit streams.
- Clock In and Clock Out. These are continuous data transmission clocks.

You can choose from the following three modes of operation:

- Acquisition. Captures an input signal using external timing reference.
- Internal generation. Generates an output signal using the MTS 100 internal clock as the timing reference.
- External generation. Generates an output signal using the Clock input as the timing reference.

Clock Input

The Clk In connector provides optional timing input for the ECL Serial, ECL Parallel, TTL and 10 Mbit Serial outputs. Its maximum operating frequency is 45 MHz.

**TTL 50 Ω Serial Port
(Data & Clock I/O)**

The TTL 50 Ω Serial Port receives and transmits at TTL levels. It consists of clock and data inputs with dedicated connectors. The Data signal is a serial bit stream, and the Clock signal is a continuous data transmission clock. The maximum operating frequency is 45 Mbits/s.

There are three modes of operation:

- Acquire. Captures an input signal.
- Internal Generation. Generates a signal that is locked to the internal clock.
- External Generation. Generates a signal locked to an external reference (the Clock Input).

Operating Information

This information takes you through power up, log in, and to the point where you select an application. Specific information about using the applications is contained in the *MTS100 MPEG Test System User Manual*.

Power Up

Once you have installed the MTS 100 MPEG Test System, it is ready to operate. Turn on the power switch located on the front of the MTS 100 server. Slide the power switch cover plate to the right as shown in Figure 2-5 and press in the power switch. Whenever you power on the MTS 100, it goes through the Windows NT initialization process. During normal start up, *do not* press F10 for the system partition utilities or press the spacebar to invoke the last known good menu (For more information on the Windows NT initialization process, please see the Windows NT documentation). When initialization is finished, press CTRL + ALT + DELETE, as prompted in the **Begin Logon** message box. This displays the login dialog box.

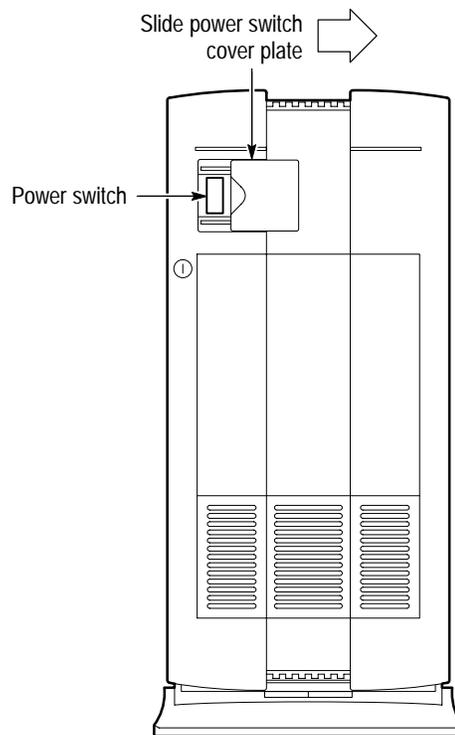


Figure 2-5: Turning on the MTS 100 MPEG Test System

Log In

When servicing the MTS 100, log in as **administrator** and enter the password **MPEG2**; for normal operation, log in as **MTS100**. No password is required for the user MTS100. If you are not allowed to log on, someone may have changed

the password. When servicing the test system always log in as an administrator, which has extra privileges. You are required to use this log in when performing any software upgrades.

Operators should always log in as user **MTS100**. This log in does not require a password; press return when the password is requested. This type of login is limited and does not allow full access of servicing.

There are two other types of users. The first is **guest** and requires no password. A guest has only limited access to files and applications. The second is **admin-tek-service**. This log in provides full administrative privileges to Tektronix service personnel for instrument repair. It has a secret password that cannot be changed by the user.



CAUTION. The “administrator” user has all the privileges of an administrator. If you are connected to a network, you may have more privileges than you realize within the network. If the Test System is connected to a network, it is recommended that you do not perform normal operations while logged in as administrator.

You can change the administrator password or establish a password for user or guest. You can not change the password for the “admin-tek-service.” If you change any of the passwords, be sure to create a new emergency repair disk, which allows you to reinstall the data base that contains the user, guest, and administrator passwords.

The MTS100 Submenu

Once you have correctly completed the log in you have access to the Tektronix MTS100 submenu, as shown in Figure 2–6.

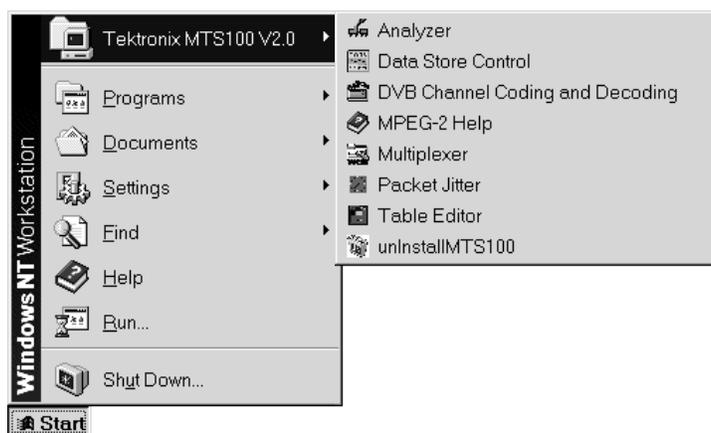


Figure 2–6: The Tektronix MTS 100 submenu (V2.0 shown)

The MTS 100 applications are outlined in Table 2–6. Refer to the *MTS 100 MPEG Test System User Manual* for additional information.

Table 2–6: MTS 100 applications

Icon	Application Name	Function
	Analyzer (MPEG2 System Analyzer application)	Analyze transport stream files and packetized elementary streams.
	Data Store Control (Data Store Administrator)	Manage the Data Store Disks. It also controls acquisition and generation of MPEG-2 transport streams.
	DVB Channel Coding and Decoding (Coder/Decoder application)	Code and decode transport stream files to DVB specifications.
	Multiplexer (MPEG2 Transport Multiplex Generator)	Create transport stream files from PSI and SI table files, elementary stream files, and data files.
	Packet Jitter	Add jitter to the PCR data in the transport stream file.
	Table Editor (Edit Table application)	Create and edit PMT, NIT, SDT, BAT, and EIT files.
	Set Carb (visible as a menu item and icon in version 2.1 only)	Set parameters of the Data Store system.
	Error Injector (version 2.1 only)	Insert or correct errors in transport stream packets.

Running the Software

To start an application, select it from the MTS100 submenu or double-click its icon in the MTS100 program group.

NOTE. Except for the Data Store Control application, the HASP must be installed for the applications to operate.

Software Repair

If you cannot get the software to run, one or more program files may be corrupted. A full set of software is shipped with each MTS 100 Test System. You can reload all the software, including the Windows NT operating system, if necessary. Refer to *Appendix A* (for instruments running software version 2.0) or *Appendix B* (for instruments running version 2.1) for more information.



Theory of Operation

Theory of Operation

The Tektronix MTS100 MPEG Test System consists of Data Store circuitry that is added to a computer platform. The computer portion of the system is referred to as the server. The Data Store circuit board is installed in the server EISA card cage. It talks to the server over the EISA bus. See Figure 3–1. The application software that runs on the Windows NT operating system is resident on the server system hard disk.

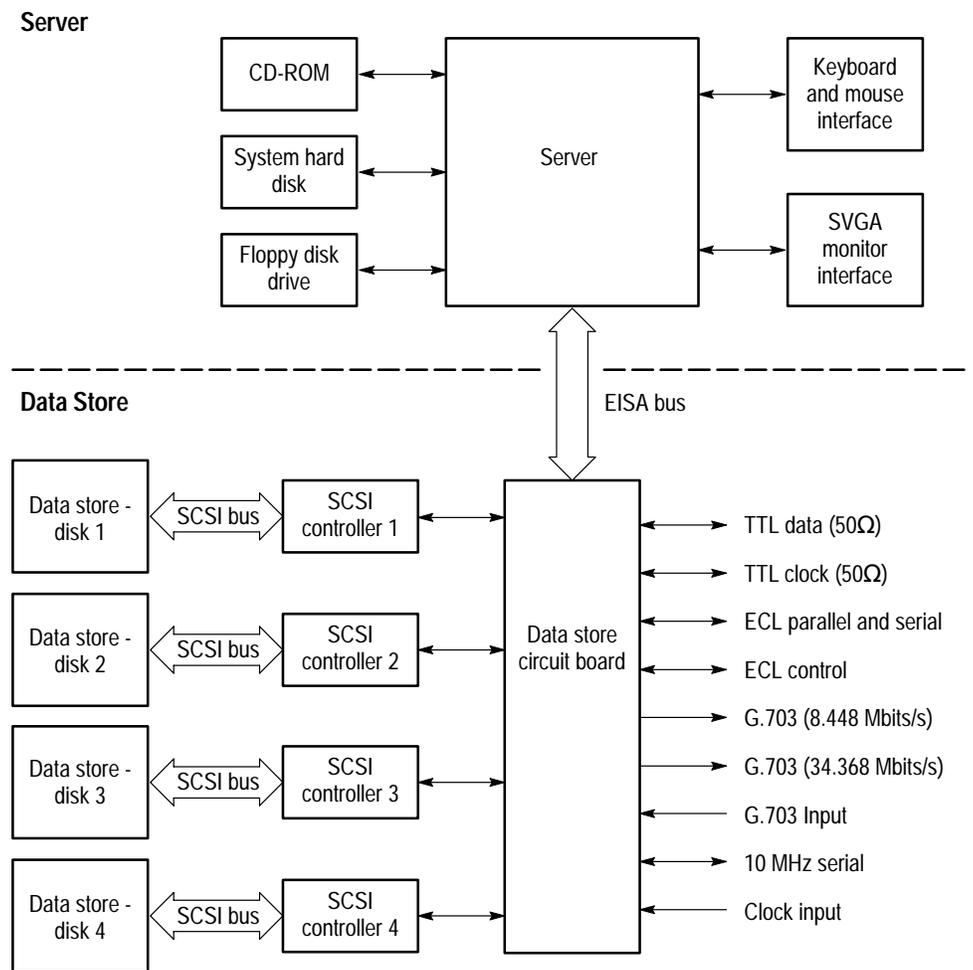


Figure 3–1: Test System block diagram

The Data Store circuit board, the four SCSI Controller circuit boards, and the four added hard disk drives are the heart of the test system. The system can acquire and generate transport streams of up to the size of the total Data Store disk drive storage in length without looping.

The mouse and keyboard provide user control of the system. The mouse interface uses the standard Windows “point and click.” The graphical user interface (GUI) displays Windows NT compliant icons, menus, and drop-down lists on an SVGA monitor.

External I/O

There are four separate transport stream I/Os in this Test System:

- The G.703 serial interface acquires and generates MPEG transport streams that comply with the ITU-T G.703 standard.
- The 10 Mbit/s serial interface is a differential I/O that incorporates both data and clock. It operates at RS-422 voltage levels.
- The TTL interface is a bidirectional serial interface that uses a continuous data transmission clock.
- The ECL parallel/serial port provides a differential, bidirectional interface for 100k ECL transport streams. The separate control port can be used to control this parallel/serial port to provide additional operating modes.

G.703 The G.703 serial interface consists of a single input to and two outputs from the Data Store circuit board. The input port accepts ITU-T Recommendation G.703 (HDB code) 8.448 Mbits/s and 34.368 Mbits/s streams and operates in the unframed mode.

The two G.703 outputs provide 8.448 Mbit/s and 34.368 Mbit/s transport streams. These output streams use the internal crystal controlled clock for their timing reference.

10 Mbit Serial Port

The 10 Mbit serial port inputs and outputs both differential data and a differential clock. The port has separate pins for incoming data and outgoing data. Input lines are terminated 110 Ω line-to-line. Output lines should be terminated at the far end. This port can use either the internal clock or an external clock as its timing reference.

TTL 50 Ω Serial Port The TTL 50 Ω serial port consists of a serial data line and a continuous data transmission clock. Its maximum operating rate is 45 Mbits/s. The port acquires a transport stream using the transmission clock as its timing reference. The output transport stream can be locked to either the internal phase locked loop or an external clock to provide the timing reference. The enhanced output drives a 50 Ω grounded load.

ECL Parallel and Serial Port A single connector supports both parallel and serial differential I/O functions. The operating levels for both parallel and serial interfaces are 100k ECL. All input lines are terminated 110 Ω line-to-line. The ports are bidirectional and can use either the internal phase locked loop or an external clock as a timing reference.

Serial data rates to 55 Mbits/s are possible using the internal PLL. Parallel data rates are limited to the maximum serial rate divided by eight (7.5 Mbytes/s).

A separate control port can be used to provide additional slave generation and master acquisition data transfer modes. When using the control port, hand-shaking signals from the master system control the data transfer. This means the direction of signal flow from the control port is opposite the data transfer direction. For example, in the master acquisition operating mode the master system sends the control signals and receives the data. The slave system receives the control signals and sends the data.

Data Store

The Data Store circuitry controls the acquisition, storage, and output of the data that makes up the MPEG transport stream. It outputs test signals that can be used to evaluate downstream circuits. The Data Store system consists of the Data Store circuit board, four SCSI Controller boards, and four Data Store disk drives.

Data Store Circuit Board The Data Store circuit board controls the acquisition, storage, and output of transport stream data. The board contains a 16 MHz central processing unit (CPU) and an 8-bit common bus with a 16 Mbyte/s transfer rate. Communication between the server and the Data Store circuit board occurs over the EISA bus. Data transfers from the server to the Data Store Disks use a 32-bit direct memory access (DMA) with a read/write enable to the Data Store CPU.

The Data Store circuit board generates several clocks for synchronization. A phase lock loop synthesizer locks to either internal or external clocks to produce clock signals ranging from 1 MHz to 60 MHz. Two crystal oscillators provide internal clocks at the 8.448 MHz and 34.368 MHz G.703 bit rates.

SCSI Controllers There are four SCSI Controller boards mounted on the Data Store circuit board. The SCSI Controller boards provide the interface between the Data Control board and the Data Store Disks. Each SCSI Controller board has 512 Kbytes of random access memory (RAM) buffer to support transfers between the Data Control board and one of the four Data Store Disks.

Data Store Disk Drives The four hard disk drives, numbered 1 through 4, are located in the server drive bay. The drives share a common power supply from the server mainframe. Each drive connects directly to a SCSI Controller board through a dedicated SCSI bus cable.



Performance Verification

Performance Verification

This section contains procedures for verifying that the instrument meets the performance requirements listed in the *Specifications* section.

It is common for MTS 100 MPEG Test System operators to use only one or two of the I/O ports. To reduce the test time, you can verify only the I/O ports that are used by the system operators. Refer to the *Procedure Structure* section on page 4–5 for information about running tests for specific I/O ports.

If the instrument is not able to pass these tests, refer to the *Maintenance* section for troubleshooting procedures.

NOTE. To perform the procedures in this section, you must have a basic understanding of the Windows NT operating system and the MTS100 Data Store Control application. For detailed operating instructions, refer to the Windows NT manuals and the MTS 100 MPEG Test System User manual.

Test Interval

Perform the procedure once every 2000 hours of operation or every 12 months to ensure that the performance is within tolerance.

Incoming Inspection Test

The *MTS 100 MPEG Test System User Manual* contains a functional check that you can perform to verify that the instrument is operational.

Prerequisites

The tests in this section comprise an extensive, valid confirmation of performance and functionality when the following performance conditions have been met:

- The instrument must be in an environment with temperature, altitude, humidity, and vibration within the operating limits described in the *Specifications* section.
- The instrument must have had a warm-up period of at least 20 minutes.

Equipment Required

Table 4–1 lists the test equipment required for the Performance Verification procedure. The table identifies examples and minimum tolerances where applicable. If you substitute other equipment for the examples listed in Table 4–1, the equipment must meet or exceed the tolerances.

Table 4–1: Required equipment list

Test equipment	Minimum requirements	Example
MTS100 Service Data Files disk	Contains files to perform the test procedures	Tektronix part number 063-2578-00
Test Oscilloscope	Bandwidth DC to 500 MHz	Tektronix TDS 540A with 10X voltage probes
50 Ω SMB to BNC Adapter cables (4 required)		Tektronix part number 174-3578-00 (shipped as a standard accessory)
75 Ω SMB to BNC Adapter cables (4 required)		Tektronix part number 174-3579-00 (shipped as a standard accessory)
50 Ω BNC to BNC Cable (1 required)		Tektronix part number 012-0057-01
50 Ω BNC Adapter (2 required)	Female-to-female connectors	Tektronix part number 103-0028-00
50 Ω Feed-through Terminator (2 required)		Tektronix part number 011-0049-01
75 Ω Feed-through Terminator		Tektronix part number 011-0103-02
Frequency counter	Accuracy and resolution to 8 decimal places, or used with an external reference (WWV, Loran C, or GPS) that will improve the accuracy to 8 decimal places. 1 MHz to 60 MHz range.	Tektronix CDC250 Counter
MTS100 MPEG Test System	Used to test data transfer	Tektronix MTS100
Pulse Generator	5 MHz, 0-3 V amplitude output	Tegam PG502
10 MHz Signal Interconnect Fixture	Male-to-male adapter, 9 pins, use with Tektronix part number 174-3603-00	A user built test fixture (see Figure 4–18)
Interconnecting Cable for ECL Data Port	25-pins, female-to-female connectors	Tektronix part number 174-3562-00
Interconnecting Cable for ECL Control Port	9-pins, female-to-female connectors	Tektronix part number 174-3603-00

Test Record

Use this form to record the results of the Performance Verification procedure for the MTS 100 MPEG Test System.

Serial number	Procedure performed by	Date
Performance verification step	Requirement	Test result
Internal Clock Test		
1 MHz clock	999,990 Hz to 1,000,010 Hz	
8.448 MHz clock	8,447,915 Hz to 8,448,085 Hz	
24.9 MHz clock	24,899,751 Hz to 24,900,249 Hz	
25.1 MHz clock	25,099,749 Hz to 25,100,251 Hz	
34.368 MHz clock	34,367,312 Hz to 34,368,688 Hz	
45 MHz clock (B020000 and above)	44,999,555 Hz to 45,000,450 Hz	
G.703 I/O Port Tests		
8 Mbits/s pulse mark voltage	+2.13 V to +2.60 V and -2.13 V to -2.60 V	
8 Mbits/s No-pulse space voltage	0 V \pm 0.237 V	
8 Mbits/s master generation	Error free transfer	
34 Mbits/s pulse mark voltage	+0.9 V to +1.1 V and -0.9 V to -1.1 V	
34 Mbits/s No-pulse space voltage	0 V \pm 0.1 V	
34 Mbits/s master generation	Error free transfer	
TTL 50 Ω Port Tests		
Clock pulse amplitude	<0.3 V and >2.65 V	
Data I/O amplitude	<0.3 V and >2.65 V	
High speed clock slave acquisition and master generation	Error free transfer	
Low speed clock slave acquisition and master generation	Error free transfer	
External clock generation	Error free transfer	
10 Mbits/s (RS-422) Port Tests		
High speed clock slave acquisition and master generation	Error free transfer	

Performance Verification

Performance verification step	Requirement	Test result
Low speed clock slave acquisition and master generation	Error free transfer	
External clock generation	Error free transfer	
ECL Parallel Port Tests		
Slave acquisition and master generation	Error free transfer	
External clock generation	Error free transfer	
Master acquisition and slave generation	Error free transfer	
ECL Serial Port Tests		
Slave acquisition and master generation	Error free transfer	
External clock generation	Error free transfer	
Master acquisition and slave generation	Error free transfer	

Procedure Structure

The Performance Verification procedure is structured so that you can test one I/O port or the entire instrument. Before performing any tests you must turn the instrument on, log in, and load the service data files (if they are not already loaded on your Test System). After the instrument warm up time, perform the Internal Clock test, beginning on page 4–8. Then refer to Table 4–2 and perform the individual I/O port tests as desired.

Table 4–2: The I/O port tests

Test name	Begins on
G.703 I/O Port Tests	page 4–10
TTL 50 Ω Port Tests	page 4–24
10 Mbits/s (RS-422) Port Tests	page 4–36
ECL Parallel Port Tests	page 4–46
ECL Serial Port Tests	page 4–56

Turn On/Log In Procedure

This is the turn-on and log in procedure for the Performance Verification procedure. It is the starting point for all of the other procedures.

1. Connect the MTS 100 MPEG Test System power cord to an appropriate power source.
2. Turn on the power switch located on the front of the Server. Initialization takes between one and two minutes. It is *not* necessary to press shift to “invoke the Hardware Profile/Last Known Good menu” during normal startup.
3. When initialization is complete, press CTRL + ALT + DELETE, as instructed by the message box.
4. Log in as “administrator” and use the password MPEG2. (If you cannot log in someone may have changed the password.)

- Once you have correctly completed the log in, you can start the individual MTS 100 applications through the Tektronix MTS100 V2.0 submenu, shown in Figure 4–1.

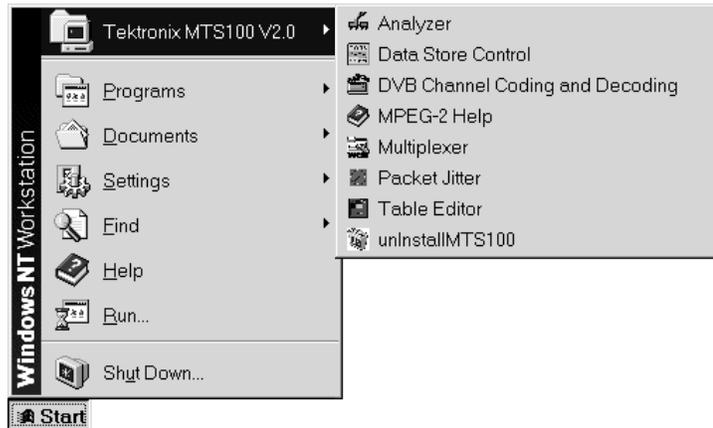


Figure 4–1: The Tektronix MTS100 V2.0 submenu

Loading Data Files from the MTS100 Service Data Files disk

The MTS100 Service Data Files disk is shipped as a standard accessory with this manual. The disk contains the following files required for the Performance Verification procedures:

File Name	Purpose
11meg.ver	Data file for test procedures
tr11meg.ver	Data file for test procedures

NOTE. The data order (LSB or MSB first) for the serial ports must match for both MTS100 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Systems with serial numbers between B010100 and B019999 always use the LSB first data order.

Before performing the tests in this section you must install the service data files on drive C on both MTS100 systems (the device under test and the test system). One of the service data files, 11meg.ver, must be transferred to the CARB (Data Store) disk on both systems. Use the following procedures to install the files onto drive C and to transfer the files to the CARB disk.

**Copying the Data Files
onto Drive C**

Install the MTS100 Service Data Files disk contents onto drive C of both test systems with the following procedure:

***NOTE.** You will need 20 MBytes of disk space on your MTS100 system disk to install the Service Data Files.*

1. Insert the MTS100 Service Data Files disk into drive A of one test system.
2. Select Command Prompt from the Programs submenu (of the Start menu) to open a Command Prompt window.
3. In the Command Prompt window, enter `cd \temp` to change to the TEMP directory.
4. Type `a:\service`. The install program on the MTS100 Service Data Files disk copies and expands the service data files into the TEMP directory.
5. Eject the disk from drive A.
6. Repeat steps 1 through 5 for the second test system.

**Transferring Files to the
CARB Disk**

Transfer the files to the CARB disk on both test systems using the following procedure:

1. Start the MTS 100 Data Store Control application.
2. Under the File menu, select PC File Write to CARB. The File Write to CARB dialog box appears on the screen.
3. Click the Browse button and select `C:\temp\11meg.ver` from the File Name list.
4. Click OK to select the file for transfer. The File Write to CARB dialog box returns to the screen.
5. Verify that the 11meg.ver file name appears in the Name of the CARB file box.
6. Click Start to begin the file transfer.

Internal Clock Test

This section tests the internal clock frequency accuracy at frequencies that verify the performance of the phase locked loop (PLL), the 8.448 MHz clock, and the 34.368 MHz clock.

1. Connect the equipment as shown in Figure 4–2.

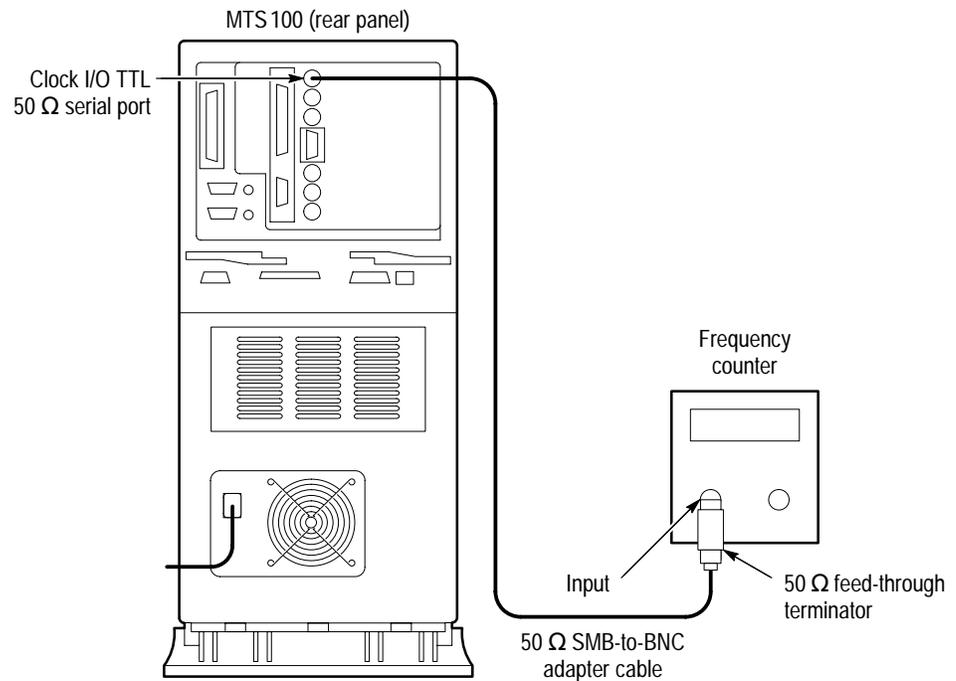


Figure 4–2: Setup for measuring internal clock output accuracy

2. Choose Data Store Control from the Tektronix MTS100 V2.x submenu (of the Start menu) to start the Data Store administrator application.
3. Click the G (generator) command button to display the GENERATION dialog box.

4. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	Any file in the list
Protocol	Master
Port	TTL
Output Clock	PLL (see note below)
Frequency	1,000,000 Hz
Loop	On (X)

NOTE. When testing the 8.448 MHz and 34.368 MHz clock rates, set the Output Clock value to 8.448 MHz and 34.368 MHz, respectively. When testing these clock frequencies you do not need to enter the clock rate.

5. Click Start and wait five seconds.
6. Trigger the frequency counter for a stable display.
7. Verify that the frequency display is within the limits shown in Table 4–3.

Table 4–3: Internal clock accuracy limits

Clock Rate	Minimum Frequency	Maximum Frequency
1 MHz	999,990 Hz	1,000,010 Hz
8.448 MHz	8,447,915 Hz	8,448,085 Hz
24.9 MHz clock	24,899,751 Hz	24,900,249 Hz
25.1 MHz clock	25,099,749 Hz	25,100,251 Hz
34.368 MHz	34,367,312 Hz	34,368,688 Hz
45 MHz clock	44,999,550 Hz	45,000,450 Hz

8. Click the hand (stop) command button and then the G (Generator) icon so you can enter a new clock rate.
9. Repeat steps 4 through 8 for each clock rate shown in Table 4–3. Verify that the frequency display is within the limits shown for each clock rate.

G.703 I/O Port Tests

This section contains 8 Mbits/s and 34 Mbits/s G.703 I/O port tests for pulse mark amplitude and no pulse space voltage, slave acquisition, and master generation.

NOTE. *The data order (LSB or MSB first) for the serial ports must match for both MTS 100 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Systems with serial numbers between B010100 and B019999 always use the LSB first data order.*

8 Mbits/s Pulse Mark Amplitude and No-Pulse Space Voltage

This procedure verifies the following parameters:

- Pulse mark amplitude (+2.13 V to +2.60 V and -2.13 V to -2.60 V)
 - No-pulse space voltage (0 V ± 0.237 V)
1. Connect the equipment as shown in Figure 4-3.
 2. If necessary, start the MTS 100 Data Store Control application.
 3. Click the G (generator) command button to display the GENERATION dialog box.
 4. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	Any file in the list
Protocol	Master
Port	G.703
Output Clock	8.448 Mbits
Loop	On (X)

5. Click Start and wait 5 seconds.

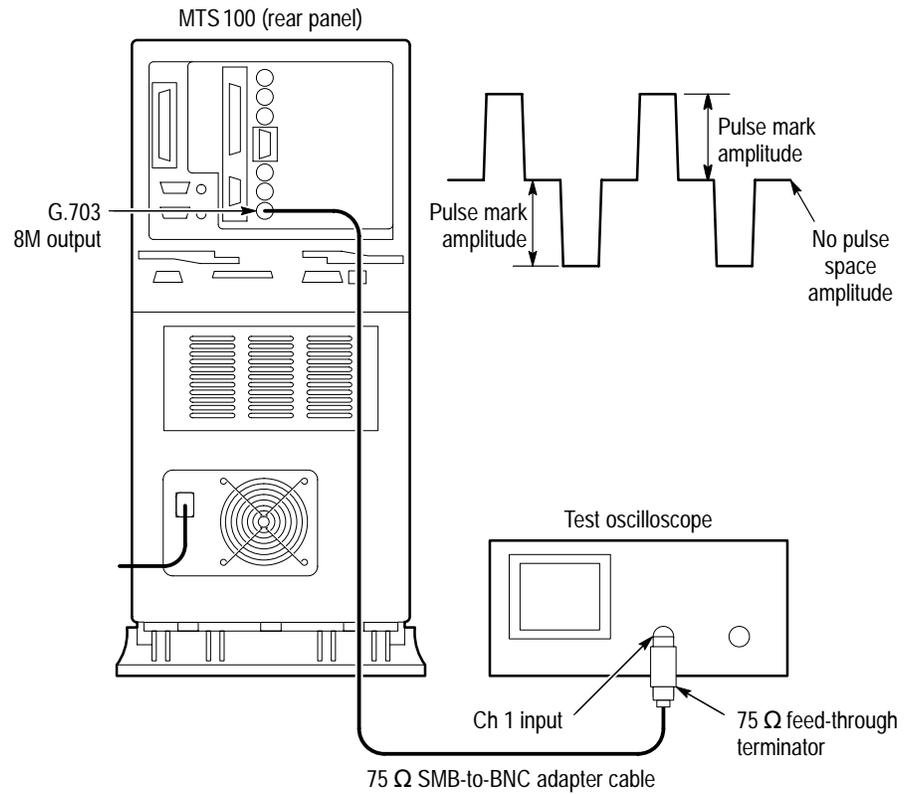


Figure 4–3: Setup for measuring 8.448 Mbits/s signal parameters

6. Trigger the oscilloscope to obtain a stable display as shown in Figure 4–3.
7. Verify the pulse mark amplitude is within +2.13 V to +2.60 V (positive pulse) and –2.13 V to –2.60 V (negative pulse), and the no-pulse space voltage is $0\text{ V} \pm 0.237\text{ V}$.

G.703 - 8 Mbits/s Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “test system.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between the test system and the DUT.

1. Connect the equipment as shown in Figure 4-4.

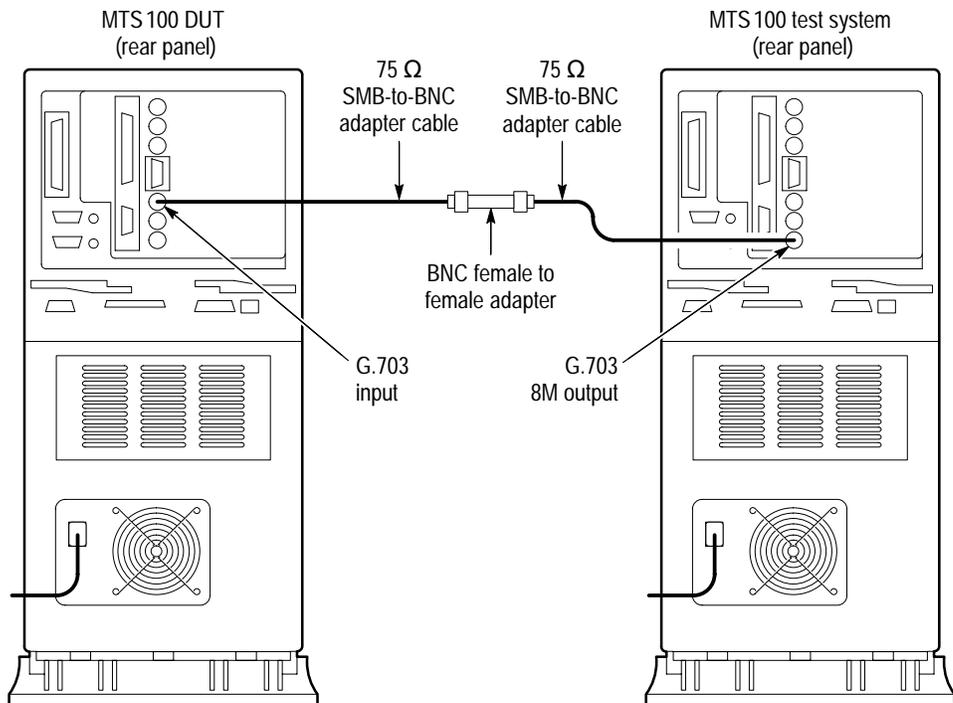


Figure 4-4: Setup for testing G.703 8.448 Mbits/s slave acquisition

2. On the DUT, click the Data Store Administrator hand (stop) command button.
3. Click the A (acquisition) command button to display the ACQUISITION dialog box.
4. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (8mbit1.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G.703

Parameter	Setting
Internal Clock	8.448 MHz
Synchronization	Pattern

5. Click Start to begin the DUT acquisition.
6. At the test system, start or switch to the Data Store Control application, if necessary.
7. Click the G (generator) command button on the test system to display the GENERATION dialog box.
8. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	G.703
Output Clock	8.448 MHz
Loop	Off (No X)

9. Click Start to begin test system generation and wait for the transfer to complete.
10. Save the acquired test file to the DUT C drive as follows:
 - a. On the DUT, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 4 (such as 8mbit1.tst).
 - c. Enter the following name for the PC file:
 C:\temp\<filename>
 where <filename> is the name you entered in step b (such as 8mbit1.tst).
 - d. Click Start to save the file to the hard disk.
11. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Start or switch to the Windows NT Command Prompt application (Figure 4–5).

- b. Enter the following command at the command prompt:

```
fc/b C:\temp\tr11meg.ver C:\temp\<>file name<
```

where <filename> is the name you entered in step 4 (such as 8mbit1.tst).

- c. Press ENTER to begin the file comparison.

- 12. Check the Command Prompt window for the comparison results (Figure 4–5). If no differences are detected, the test passes.



Figure 4–5: Example file comparison results

- 13. Reconnect the equipment as shown in Figure 4–6.

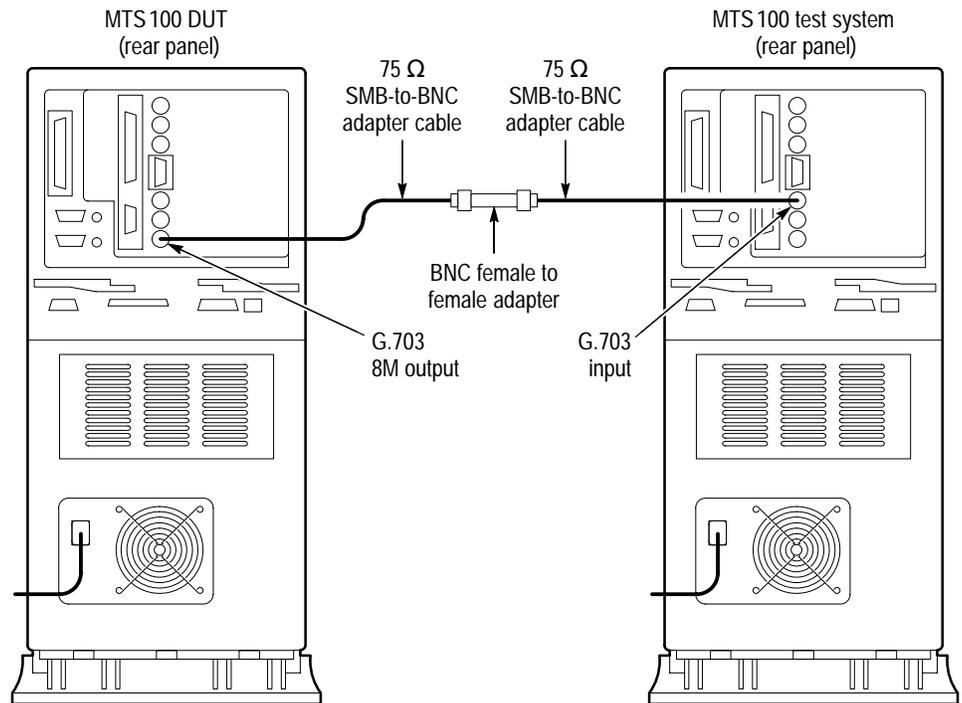


Figure 4-6: Setup for testing G.703 8.448 Mbits/s master generation

14. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
15. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (8mbit2.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G.703
Internal Clock	8.448 MHz
Synchronization	Pattern

16. Click Start to begin the test system acquisition.
17. On the DUT, switch to the Data Store Administrator window and click the G (generator) command button to display the GENERATION dialog box.
18. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver (from pull down list)
Protocol	Master
Port	G.703
Output Clock	8.448 MHz
Loop	Off (No X)

19. Click Start to begin DUT generation; wait for the transfer to complete.
20. Save the acquired test file to the test system C drive as follows:
 - a. On the test system, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 15 (such as 8mbit2.tst).
 - c. Enter the following name for the PC file:
`C:\temp\<filename>`
where <filename> is the name you entered in step b (such as 8mbit2.tst).
 - d. Click Start to save the file to the hard disk.
21. On the test system, use the Windows NT Command Prompt to perform a file compare as follows:
 - a. Start or switch to the Windows NT Command Prompt application (Figure 4-7).
 - b. In the Command Prompt window, enter the following command:
`fc/b C:\temp\tr11meg.ver C:\temp\<file name>`
where <filename> is the name you entered in step 15 (such as 8mbit2.tst).
 - c. Press ENTER to begin the file comparison.
22. Check the Command Prompt window for the comparison results (Figure 4-7). If no differences are detected, the test passes.



```
Command Prompt
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1995 Microsoft Corp.

C:\users\default>fc /b C:\temp\trilineg.ver C:\temp\8mbit2.txt
Comparing Files C:\TEMP\TR11MEG.VER and C:\TEMP\8MBIT2.TST
FC: no differences encountered

C:\users\default>
```

Figure 4-7: Example file comparison results

34 Mbits/s Pulse Mark Amplitude and No Pulse Space Voltage

This procedure verifies the following parameters:

- Pulse mark amplitude (+1 V \pm 0.1 V)
 - No-pulse space voltage (0 V \pm 0.1 V)
1. Connect the equipment as shown in Figure 4-8.
 2. Click the G (generator) command button in the Data Store Administrator window to display the GENERATION dialog box.

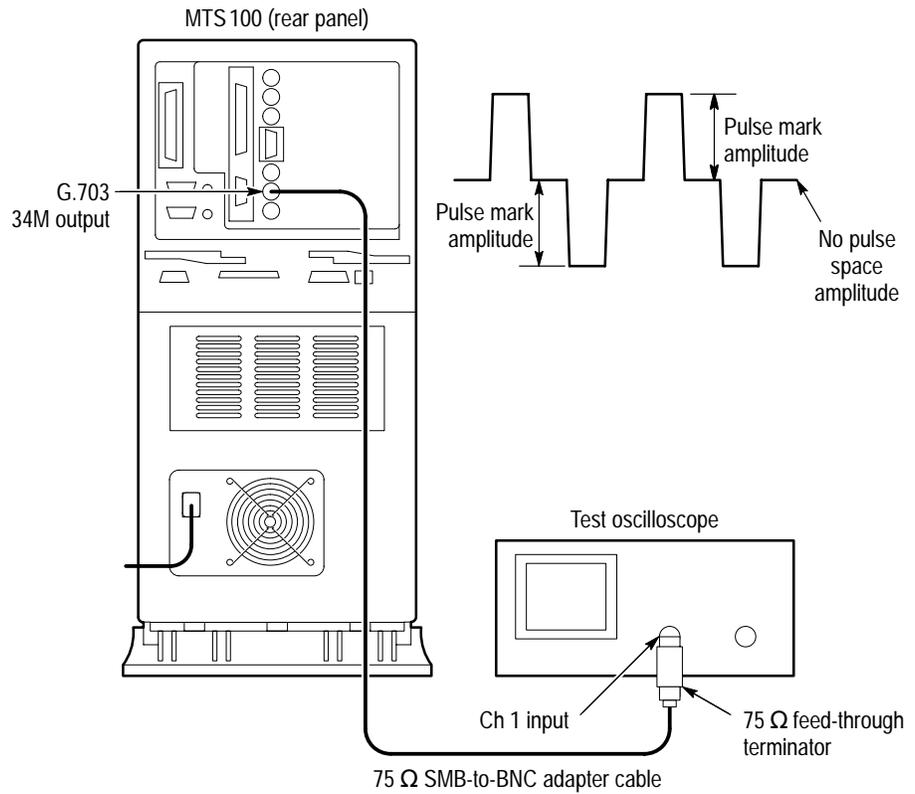


Figure 4-8: Setup for measuring 34Mbps/s signal parameters

3. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	Any file in the list
Protocol	Master
Port	G.703
Output Clock	34.368 MHz
Loop	On (X)

4. Click Start and wait 5 seconds.
5. Trigger the oscilloscope to obtain a stable display as shown in Figure 4-8.
6. Verify the pulse mark amplitude is $+1\text{ V} \pm 0.1\text{ V}$ and the no-pulse space voltage is $0\text{ V} \pm 0.1\text{ V}$.

G.703 34 Mbits/s Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “test system.” Within this procedure the MTS 100 you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between the test system and the DUT.

1. Connect the equipment as shown in Figure 4–9.

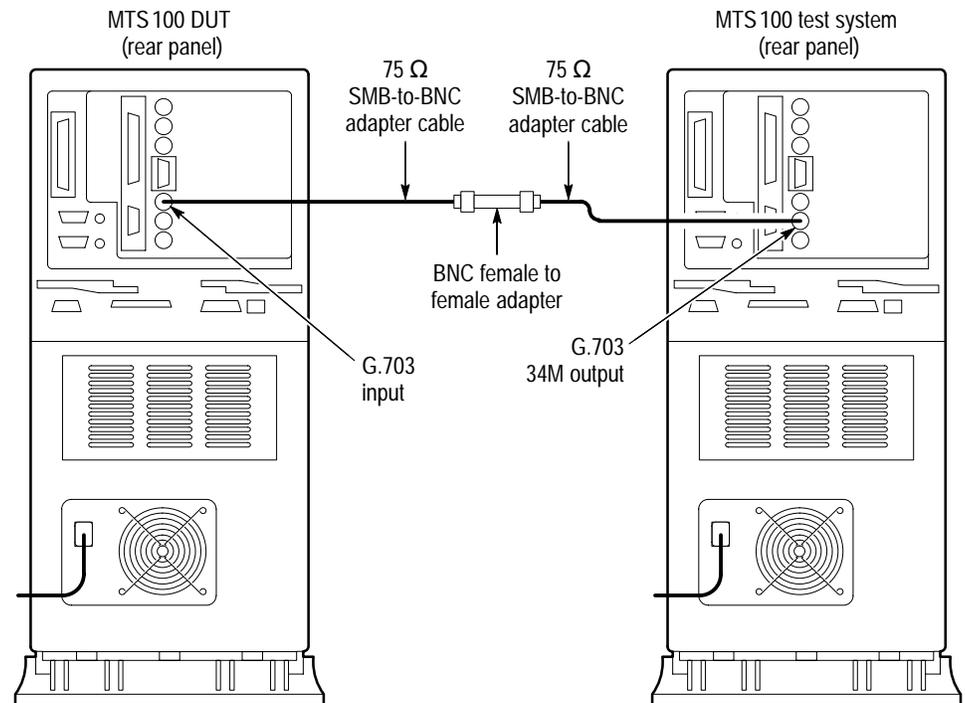


Figure 4–9: Setup for testing G.703 34.368 Mbits/s slave acquisition

2. In the DUT Data Store Administrator window, click the hand (stop) command button and the A (acquisition) command button to display the ACQUISITION dialog box.
3. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (34mbit1.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G.703

Parameter	Setting
Internal Clock	34.368 MHz
Synchronization	Pattern

4. Click Start to begin the DUT acquisition.
5. At the test system, start or switch to the Data Store Control application, if necessary.
6. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
7. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	G.703
Output Clock	34.368 MHz
Loop	Off (No X)

8. Click Start to begin the test system generation and wait for the transfer to complete.
9. Save the acquired test file to the DUT C drive as follows:
 - a. On the DUT, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 4 (such as 34mbit1.tst).

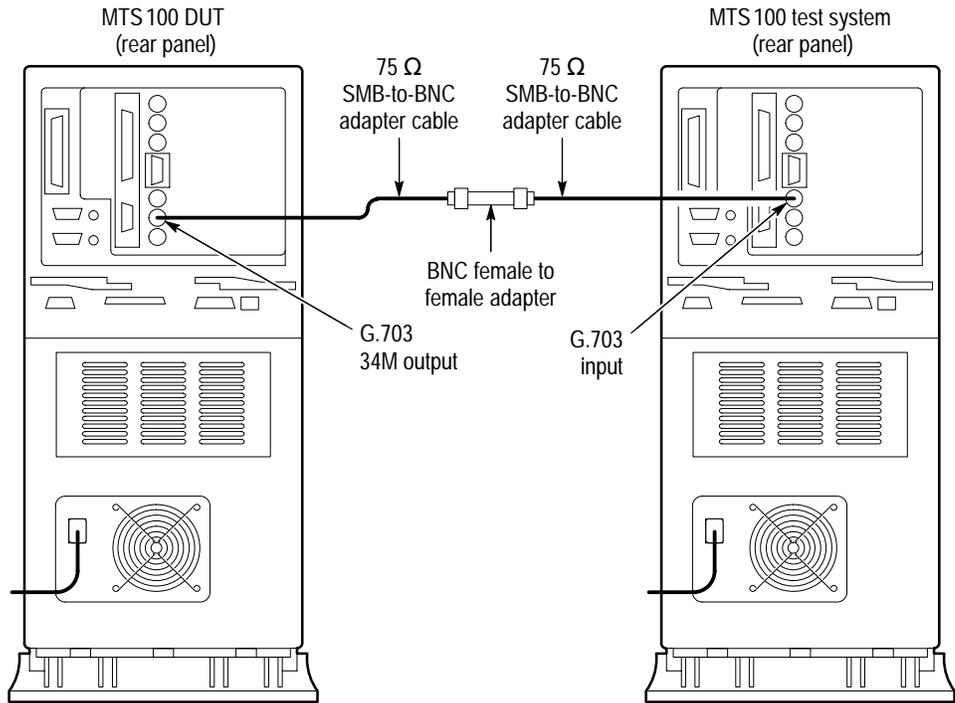


Figure 4-11: Setup for testing G.703 34.368 Mbits/s master generation

13. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
14. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (34mbit2.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G.703
Internal Clock	34.368 MHz
Synchronization	Pattern

15. Click Start to begin the test system acquisition.
16. On the DUT, switch to the Data Store Control application.
17. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

18. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	G.703
Output Clock	34.368 MHz
Loop	Off (No X)

19. Click Start to begin DUT generation and wait for the transfer to complete.

20. Save the acquired test file to the test system C drive as follows:

- a. On the test system, click the R (CARB file read to PC) command button.
- b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 14 (such as 34mbit2.tst).
- c. Enter the following name for the PC file:

C:\temp\<filename>

where <filename> is the name you entered in step b (such as 34mbit2.tst).

- d. Click Start to save the file to the hard disk.

21. On the test system, use the Windows NT Command Prompt to perform a file compare as follows:

- a. Switch to the Command Prompt application.
- b. In the Command Prompt window, enter the following command:

fc/b C:\temp\tr11meg.ver C:\temp\<file name>

where <filename> is the name you entered in step 14 (such as 34mbit2.tst).

- c. Press ENTER to begin the file comparison.

22. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

TTL 50 Ohm Port Tests

This section contains 50 Ω TTL I/O tests for clock pulse amplitude, high speed clock slave acquisition and master generation, low speed clock slave acquisition and master generation, and generation using an external clock.

NOTE. The data order (LSB or MSB first) for the serial ports must match for both MTS100 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Systems with serial numbers between B010100 and B019999 always use the LSB first data order.

TTL 50 Ohm Serial Port Clock Pulse Amplitude

This procedure checks the following clock signal parameters:

- TTL low is <0.3 V
- TTL high is >2.65 V

1. Connect the equipment as shown in Figure 4–12.

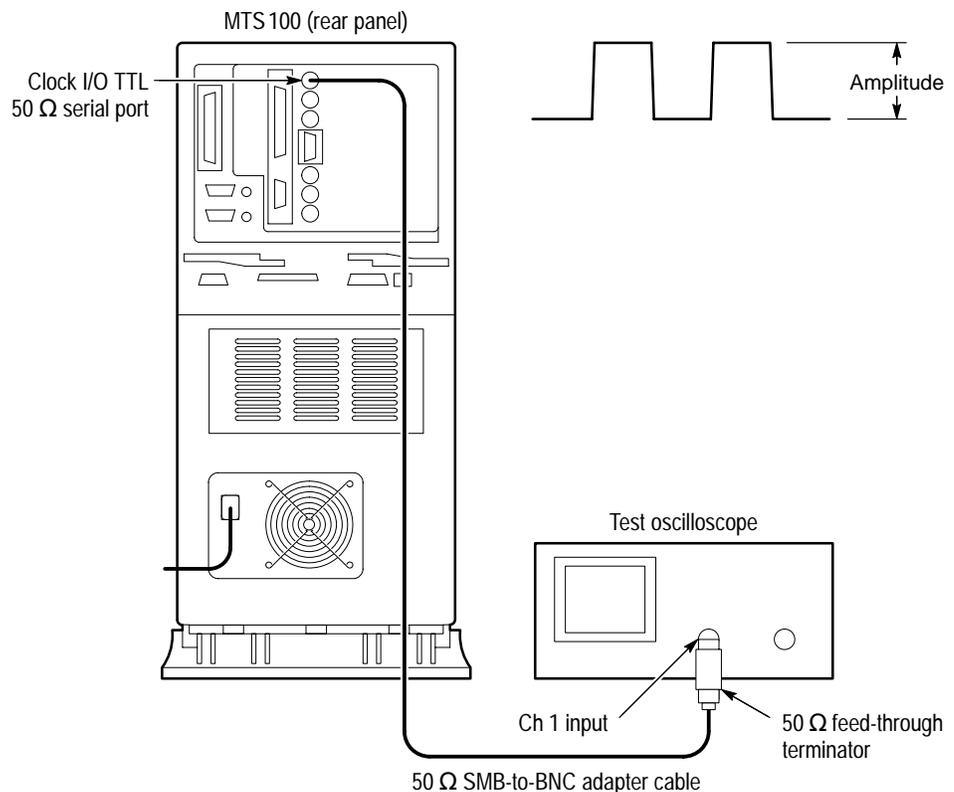


Figure 4–12: Setup for measuring TTL 50 ohm clock pulse amplitude

2. Start the Data Store Control application, if necessary.
 - Choose Data Store Control from the Tektronix MTS100 V2.0 submenu (of the Start menu).
3. In the Data Store Administrator window, click the G (generator) command button.
4. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	Any file in the list
Protocol	Master
Port	TTL
Output Clock	PLL
Rate	1,000,000 Hz
Loop	On (X)

5. Click Start and wait 5 seconds.
6. Trigger the oscilloscope to obtain a stable display as shown in Figure 4–12.
7. Verify the positive peak is >2.65 V and the negative peak is <0.3 V.

TTL 50 Ohm Serial Port High Speed Clock Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “test system.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–13.

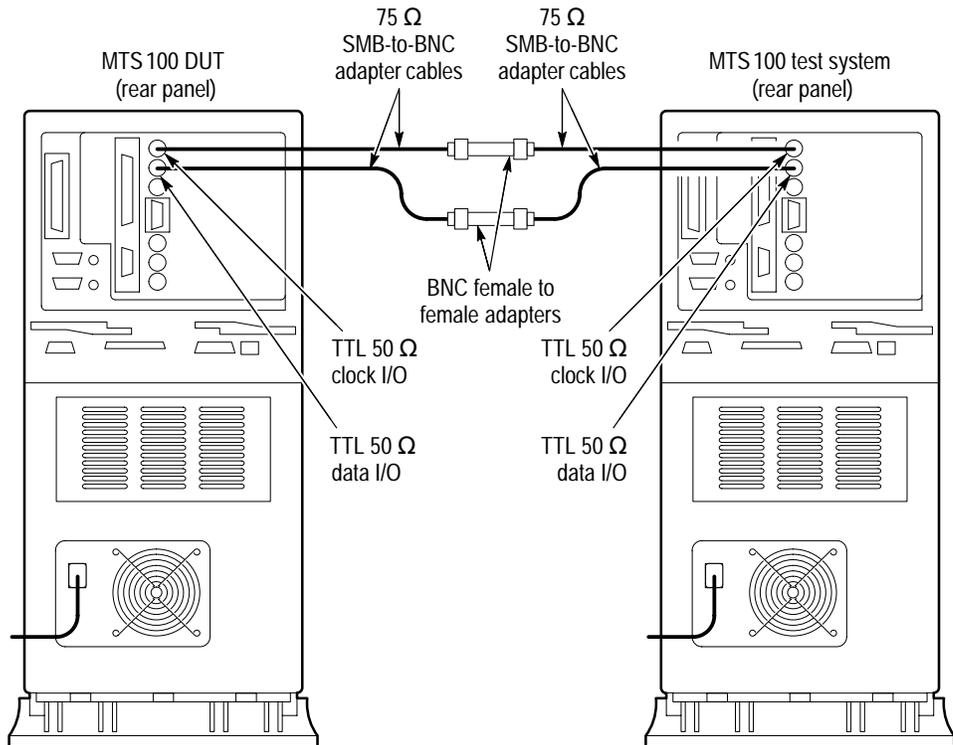


Figure 4-13: TTL 50 ohm slave acquisition and master generation setup

2. Click the A (acquisition) command button in the DUT Data Store Administrator window to display the ACQUISITION dialog box.
3. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (TTL1.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	TTL
Synchronization	Pattern

4. Click Start to begin DUT acquisition.
5. On the test system, start or switch to the Data Store Control application, if necessary.
6. Click the G (generator) command button in the test system Data Store Administrator window to display the GENERATION dialog box.

7. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	45 MBit/s
Loop	Off (No X)

8. Click Start to begin test system generation.
9. When the transfer is complete, save the acquired test file to the DUT C drive as follows:
- a. On the DUT, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 4 (such as TTL1.tst).
 - c. Enter the following name for the PC file:
C:\temp\<filename>
where <filename> is the name you entered in step b (such as TTL1.tst).
 - d. Click Start to save the file to the hard disk.
10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
- a. Start or switch to the Command Prompt application (Figure 4–10).
 - b. In the Command Prompt window, enter the following command:
fc/b C:\temp\tr11meg.ver C:\temp\<file name>
where <filename> is the name you entered in step 4 (such as TTL1.tst).
 - c. Press ENTER to begin the file comparison.
11. Check the Command Prompt window for the comparison results (Figure 4–10). If no differences are detected, the test passes.



Figure 4-14: Example high speed slave acquisition file comparison results

12. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
13. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (TTL2.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	TTL
Synchronization	Pattern

14. Click Start to begin test system acquisition.
15. On the DUT, switch to the Data Store Control application.
16. Click the G (generator) command button in the DUT Data Store Administrator window to display the GENERATION dialog box.
17. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL

Parameter	Setting
Frequency	45 MBit/s
Loop	Off (No X)

18. Click Start to begin DUT generation; wait for the transfer to complete.
19. Save the acquired test file to the test system C drive as follows:
 - a. On the test system, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 13 (such as TTL2.tst).
 - c. Enter the following name for the PC file:
 C:\temp\<filename>
 where <filename> is the name you entered in step b (such as TTL2.tst).
 - d. Click Start to save the file to the hard disk.
20. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Start or switch to the Command Prompt application.
 - b. In the test system Command Prompt window, enter the following command:
 fc/b C:\temp\tr11meg.ver C:\temp\<file name>
 where <filename> is the name you entered in step 13 (such as TTL2.tst).
 - c. Press ENTER to begin the file comparison.
21. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

TTL 50 Ω Serial Port Low Speed Clock Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “test system.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–13 (on page 4–26).
2. In the DUT Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.

3. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (TTL3.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	TTL
Synchronization	Pattern

4. Click Start to begin the DUT acquisition.
5. On the test system, switch to the Data Store Control application.
6. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
7. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	1 MBit/s
Loop	Off (No X)

8. Click Start to begin test system generation.
9. When the file transfer is complete, save the acquired test file to the DUT C drive as follows:
- On the DUT, click the R (CARB file read to PC) command button.
 - From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 3 (such as TTL3.tst).
 - Enter the following name for the PC file:
C:\temp\<filename>
where <filename> is the name you entered in step b (such as TTL3.tst).
 - Click Start to save the file to the hard disk.

10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application.
 - b. In the Command Prompt window, enter the following command:
`fc/b C:\temp\tr11meg.ver C:\temp\
 where <filename> is the name you entered in step 3 (such as TTL3.tst).`
 - c. Press ENTER to begin the file comparison.
11. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.
12. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
13. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (TTL4.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	TTL
Synchronization	Pattern

14. Click Start to begin test system acquisition.
15. On the DUT, switch to the Data Store Control application.
16. In the DUT Data Store Administrator window, Click the G (generator) command button to display the GENERATION dialog box.
17. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	1 MBit/s
Loop	Off (No X)

18. Click Start to begin the DUT generation and wait for the transfer to complete.
19. Save the acquired test file to the test system C drive as follows:
 - a. On the test system, click the R (Board to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 13 (such as TTL4.tst).
 - c. Enter the following name for the PC file:
C:\temp\<filename>
where <filename> is the name you entered in step b (such as TTL4.tst).
 - d. Click Start to save the file to the hard disk.
20. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application (Figure 4–15).
 - b. In the Command Prompt window, enter the following command:
fc/b C:\temp\tr11meg.ver C:\temp\<file name>
where <filename> is the name you entered in step 13 (such as TTL4.tst).
 - c. Press ENTER to begin the file comparison.
21. Check the Command Prompt window for the comparison results (Figure 4–15). If no differences are detected, the test passes.



```
Microsoft Windows NT [TM]
Copyright 1985-1995 Microsoft Corp.

C:\users\default>fc/b C:\temp\tr11meg.ver C:\temp\ttl4.tst
Comparing Files C:\TEMP\TR11MEG.VER and C:\TEMP\TTL4.TST
FC: no differences encountered

C:\users\default>
```

Figure 4–15: Example Command Prompt comparison results

TTL 50 Ω Serial Port External Clock Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “test system.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–16.

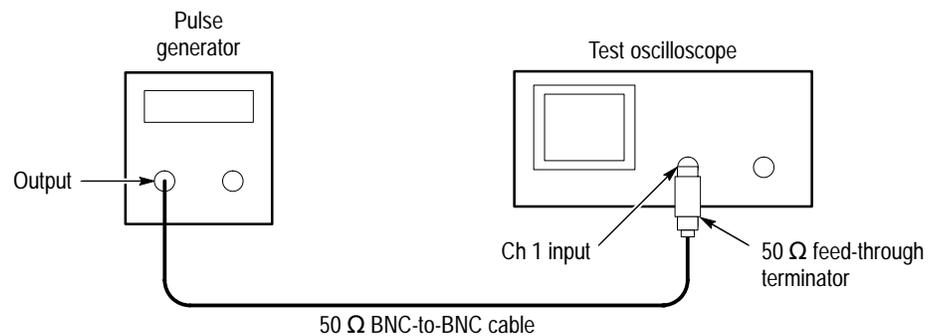


Figure 4–16: Setup for measuring the pulse generator output

2. Set the pulse generator output for a 5 MHz square wave with an amplitude that switches between 0 V and 3.0 V.
3. Connect the equipment as shown in Figure 4–17.
4. On the test system, switch to the Data Store Control application.
5. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.

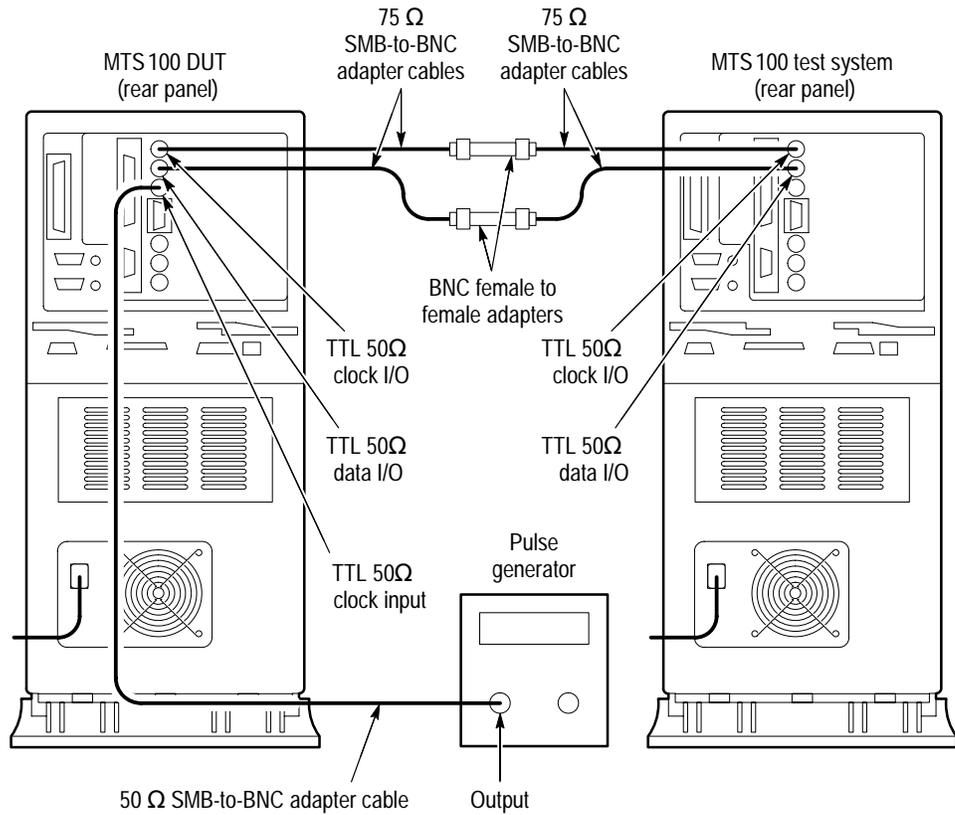


Figure 4-17: Setup for checking 50 ohm external clock generation

6. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (TTL5.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	TTL
Synchronization	Pattern

7. Click Start to begin test system acquisition.

8. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

9. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Port	TTL
Output Clock	External Clock
Loop	Off (No X)
Protocol	Master

10. Click Start to begin DUT generation.
11. When generation is complete, save the acquired test file to the test system C drive as follows:
- On the test system, click the R (CARB file read to PC) command button.
 - From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 6 (such as TTL5.tst).
 - Enter the following name for the PC file:
C:\temp\<filename>
where <filename> is the name you entered in step b (such as TTL5.tst).
 - Click Start to save the file to the hard disk.
12. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
- Switch to the Command Prompt application.
 - In the Command Prompt window, enter the following command:
fc/b C:\temp\tr11meg.ver C:\temp\<file name>
where <filename> is the name you entered in step 6 (such as TTL5.tst).
 - Press ENTER to begin the file comparison.
13. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

10 Mbits/s (RS-422) Port Tests

This section contains 10 Mbits/s (RS-422) I/O tests for high speed clock slave acquisition and master generation, low speed clock slave acquisition and master generation, and generation using an external clock.

NOTE. The data order (LSB or MSB first) for the serial ports must match for both MTS100 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Systems with serial numbers between B010100 and B019999 always use the LSB first data order.

10 Mbit Serial Port High Speed Clock Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “test system.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Construct the 10 MHz signal interconnect fixture as shown in Figure 4–18.

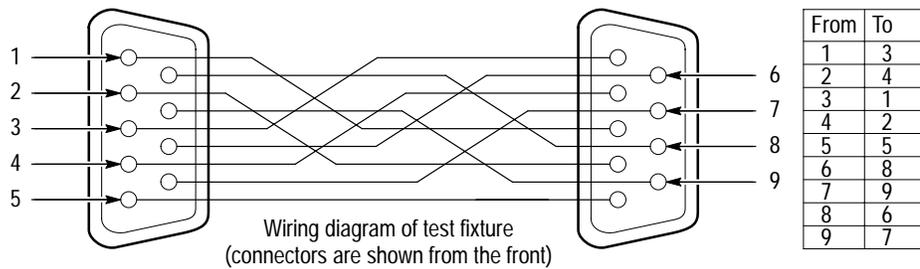


Figure 4–18: 10 MHz signal interconnect fixture

2. Connect the equipment as shown in Figure 4–19.

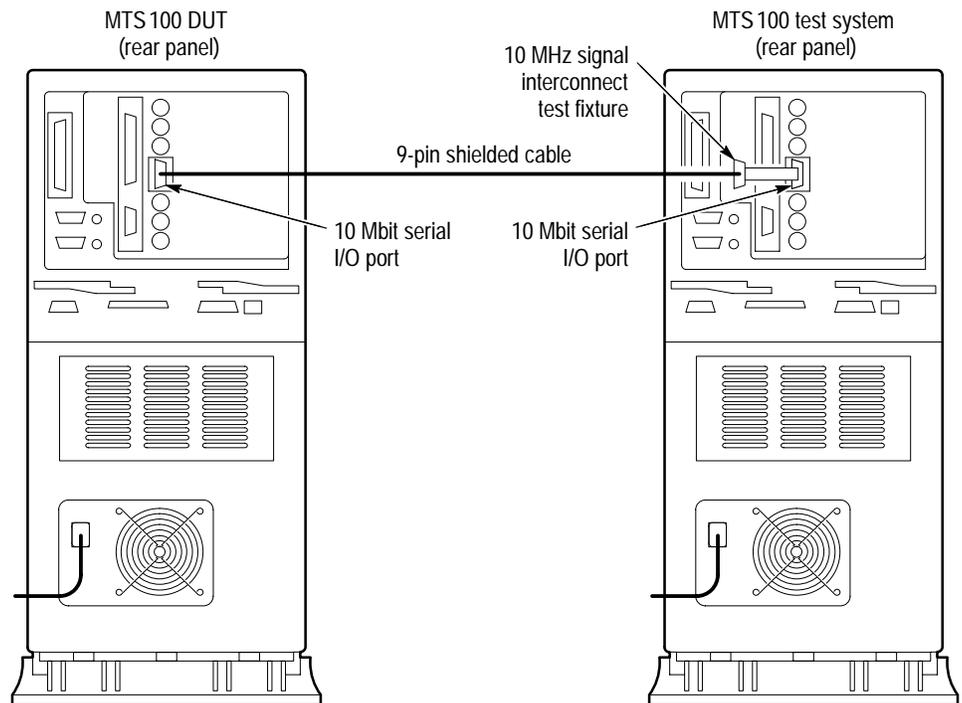


Figure 4–19: Setup for checking 10 Mbit serial port high speed clock slave acquisition and master generation

3. On the DUT, start or switch to the Data Store Control application, if necessary.
4. In the DUT Data Store Administrator window, Click the A (acquisition) command button to display the ACQUISITION dialog box.
5. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (RS4221.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	10 Mbits
Synchronization	Pattern

6. Click Start to begin the DUT acquisition.
7. On the test system, start or switch to the Data Store Control application, if necessary.

8. In the test system Data Store Administrator window, Click the G (generator) command button to display the GENERATION dialog box.
9. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	10 Mbits
Output Clock	PLL
Frequency	10 Mbits/s
Loop	Off (No X)

10. Click Start to begin test system generation.
11. When the transfer is complete, save the acquired test file to the DUT C drive as follows:
 - a. On the DUT, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 5 (such as RS4221.tst).
 - c. Enter the following name for the PC file:
`C:\temp\<filename>`
where <filename> is the name you entered in step b (such as RS4221.tst).
 - d. Click Start to save the file to the hard disk.
12. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Start or switch to the Windows NT Command Prompt application.
 - b. In the Command Prompt window, enter the following command:
`fc/b C:\temp\tr11meg.ver C:\temp\<file name>`
where <filename> is the name you entered in step 5 (such as RS4221.tst).
 - c. Press ENTER to begin file comparison.
13. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

- 14.** In the Test System Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
- 15.** Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (RS4222.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	10 Mbits
Synchronization	Pattern

- 16.** Click Start to begin test system acquisition.
- 17.** On the DUT, double-click the Data Store Control icon to open the application.
- 18.** On the DUT, click the G (generator) command button to display the GENERATION dialog box.
- 19.** Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	10 Mbits
Output Clock	PLL
Frequency	10 Mbits/s
Loop	Off (No X)

- 20.** Click Start to begin DUT generation and wait for the transfer to complete.
- 21.** Save the acquired test file to the Test System C drive as follows:
- a.** On the Test System, click the R (CARB file read to PC) command button.
 - b.** From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 15 (such as RS4222.tst).

- c. Enter the following name for the PC file:

C:\temp\

where <filename> is the name you entered in step b (such as RS4222.tst).

- d. Click Start to save the file to the hard disk.

- 22. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:

- a. Start or switch to the Command Prompt application.

- b. In the Command Prompt window, enter the following command:

fc/b C:\temp\tr11meg.ver C:\temp\

where <filename> is the name you entered in step 15 (such as RS4222.tst).

- c. Press ENTER to begin the file comparison.

- 23. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

10 Mbit Serial Port Slave Slow Speed Clock Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

- 1. In the DUT Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
- 2. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (RS4223.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	10 Mbits
Synchronization	Pattern

- 3. Click Start to begin DUT acquisition.
- 4. On the test system, switch to the Data Store Control application.

5. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
6. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	10 MBits
Output Clock	PLL
Frequency	1 Mbits/s
Loop	Off (No X)

7. Click Start to begin test system generation and wait for the transfer to complete.
8. Save the acquired test file to the DUT C drive as follows:
 - a. On the DUT, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 2 (such as RS4223.tst).
 - c. Enter the following name for the PC file:

C:\temp\<filename>

where <filename> is the name you entered in step b (such as RS4223.tst).
 - d. Click Start to save the file to the hard disk.
9. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application.
 - b. In the Command Prompt window, enter the following command:

fc/b C:\temp\tr11meg.ver C:\temp\<file name>

where <filename> is the name you entered in step 2 (such as RS4223.tst).
 - c. Press ENTER to begin the file comparison.
10. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

11. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.

12. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (RS4224.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	10 Mbits
Synchronization	Pattern

13. Click Start to begin test system acquisition.

14. On the DUT, switch to the Data Store Control application.

15. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

16. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	10 Mbits
Output Clock	PLL
Frequency	1 Mbits/s
Loop	Off (No X)

17. Click Start to begin DUT generation and wait for the transfer to complete.

18. Save the acquired test file to the Test System C drive as follows:

- a.** On the Test System, click the R (CARB file read to PC) command button.
- b.** From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 12 (such as RS4224.tst).

- c. Enter the following name for the PC file:
`C:\temp\`
 where `<filename>` is the name you entered in step b (such as `RS4224.tst`).
 - d. Click Start to save the file to the hard disk.
- 19.** On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
- a. Close the Data Store application.
 - b. Open the Windows NT Command Prompt application.
 - c. In the Command Prompt window, enter the following command:
`fc/b C:\temp\tr11meg.ver C:\temp\`
 where `<filename>` is the name you entered in step 12 (such as `RS4224.tst`).
 - d. Press ENTER to begin the file comparison.
- 20.** Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

10 Mbit Serial Port External Clock Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–20.

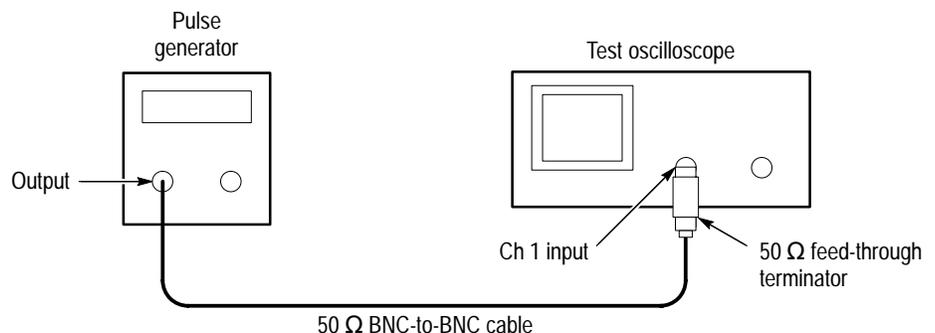


Figure 4–20: Setup for measuring the pulse generator output

2. Set the pulse generator output for a 5 MHz square wave with an amplitude that switches between 0 V and 3.0 V.
3. Connect the equipment as shown in Figure 4–21.

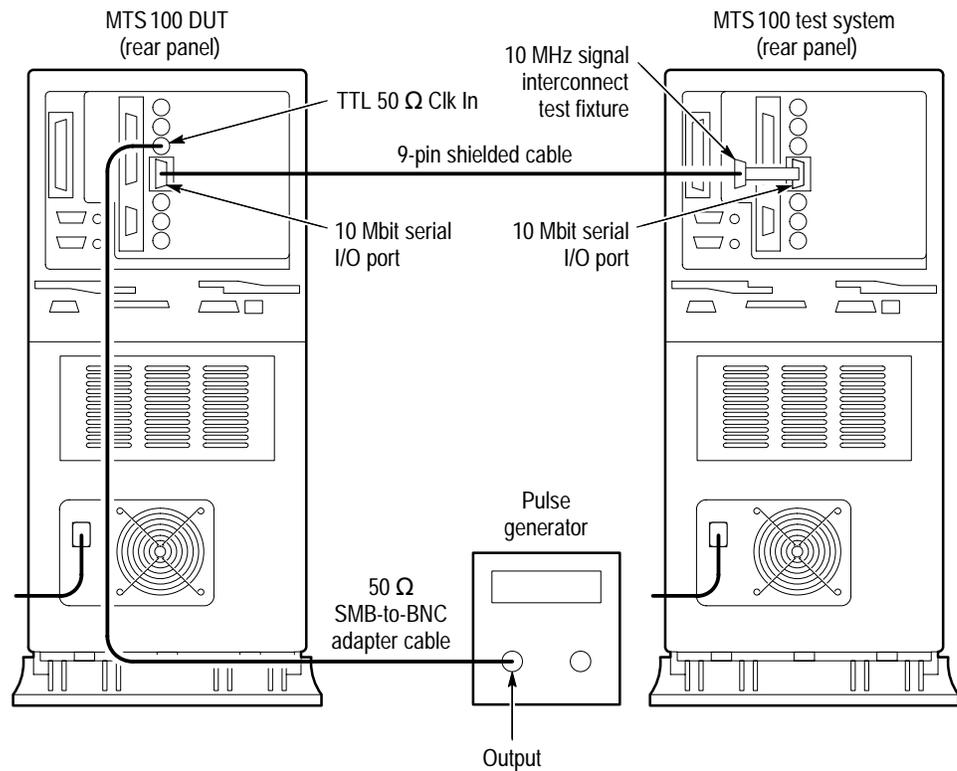


Figure 4–21: Setup for checking 10 Mbit external clock generation

4. On the test system, switch to the Data Store Control application.
5. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
6. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (RS4225.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	10 Mbits
Synchronization	Pattern

7. Click Start to begin test system acquisition.
8. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
9. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	10 Mbits
Output Clock	External Clock
Loop	Off (No X)

10. Click Start to begin DUT generation and wait for the transfer to complete.
11. Save the acquired test file to the Test System C drive as follows:
 - a. On the Test System, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 6 (such as RS4225.tst).
 - c. Enter the following name for the PC file:

C:\temp\<filename>

 where <filename> is the name you entered in step b (such as RS4225.tst).
 - d. Click Start to save the file to the hard disk.
12. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application.
 - b. In the Command Prompt window, enter the following command:

fc/b C:\temp\tr11meg.ver C:\temp\<file name>

 where <filename> is the name you entered in step 6 (such as RS4225.tst).
 - c. Press ENTER to begin the file comparison.
13. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

ECL Parallel Port Tests

This section contains ECL parallel port tests for slave acquisition, master generation, generation using an external clock, master acquisition, and slave generation.

ECL Parallel Port Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–22.

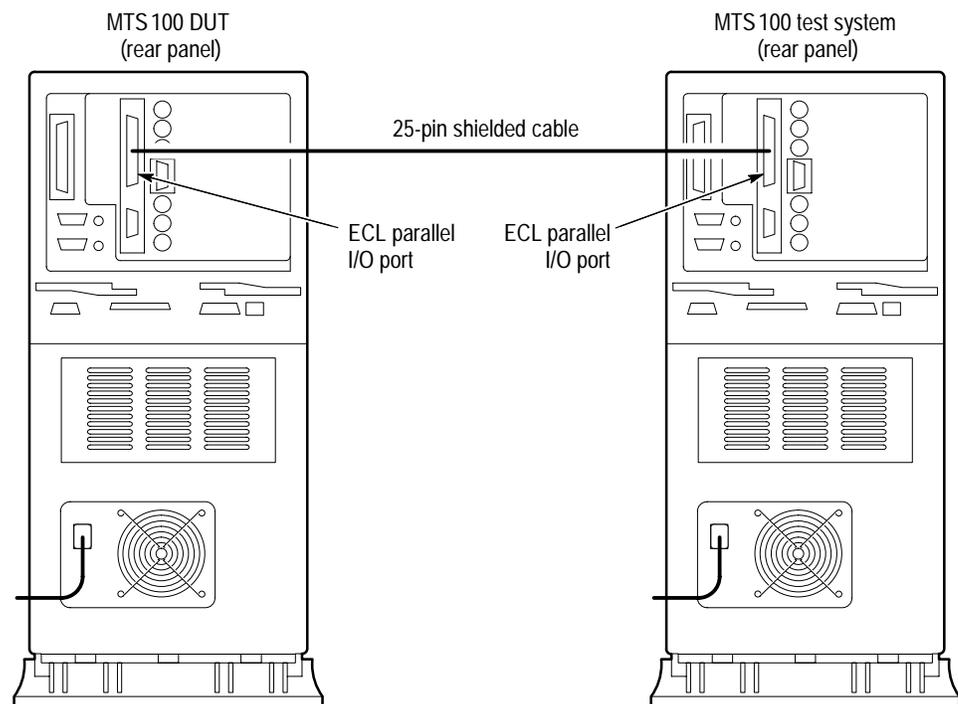


Figure 4–22: Setup for checking ECL parallel port data transfer

2. On the DUT, start the Data Store Control application (if necessary).
 - Choose Data Store Control from the Tektronix MTS100 V2.0 submenu (of the Start menu).
3. In the DUT Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.

4. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (ECL1.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	ECL Parallel Input
Synchronization	Psync

5. Click Start to begin DUT acquisition.
6. On the test system, start or switch to the Data Store Control application, if necessary.
7. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
8. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	ECL Parallel Output
Output Clock	PLL
Frequency	Maximum (5.625 Mbits/s or 7.5 Mbits/s)
Loop	Off (No X)

9. Click Start to begin test system generation.
10. When the transfer is complete, save the acquired test file to the DUT C drive as follows:
- On the DUT, click the R (CARB file read to PC) command button.
 - From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 4 (such as ECL1.tst).
 - Enter the following name for the PC file:
C:\temp\<<filename>
where <filename> is the name you entered in step b (such as ECL1.tst).

14. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (ECL2.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	ECL Parallel Input
Synchronization	Psync

15. Click Start to begin test system acquisition.

16. On the DUT, switch to the Data Store Control application.

17. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

18. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	ECL Parallel Output
Output Clock	PLL
Frequency	Maximum (5.625 Mbits/s or 7.5 Mbits/s)
Loop	Off (No X)

19. Click Start to begin DUT generation.

20. When the transfer is complete, save the acquired test file to the test system C drive as follows:

- a.** In the test system Data Store Administrator window, click the R (CARB file read to PC) command button.
- b.** From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 14 (such as ECL2.tst).
- c.** Enter the following name for the PC file:

C:\temp\<<filename>

where <filename> is the name you entered in step b (such as ECL2.tst).

- d. Click Start to save the file to the hard disk.
21. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application.
 - b. In the Command Prompt window, enter the following command:
`fc/b C:\temp\11meg.ver C:\temp\
 where <filename> is the name you entered in step 14 (such as ECL2.tst).`
 - c. Press ENTER to begin the file comparison.
 22. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

ECL Parallel Port External Clock Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–24.

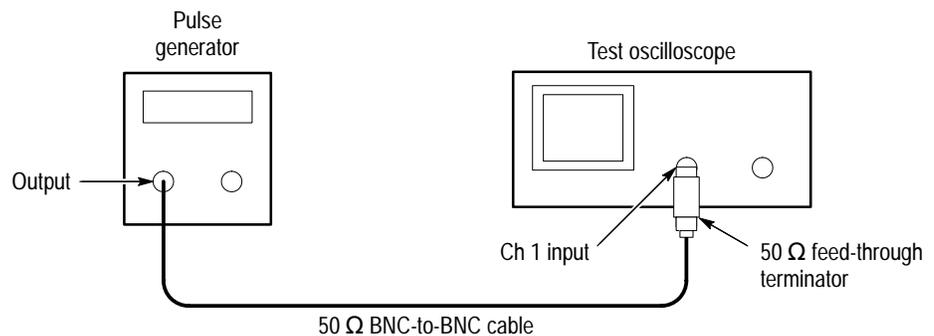


Figure 4–24: Setup for measuring the pulse generator output

2. Set the pulse generator output for a 5 MHz square wave with an amplitude that switches between 0 V and 3.0 V.
3. Connect the equipment as shown in Figure 4–25.

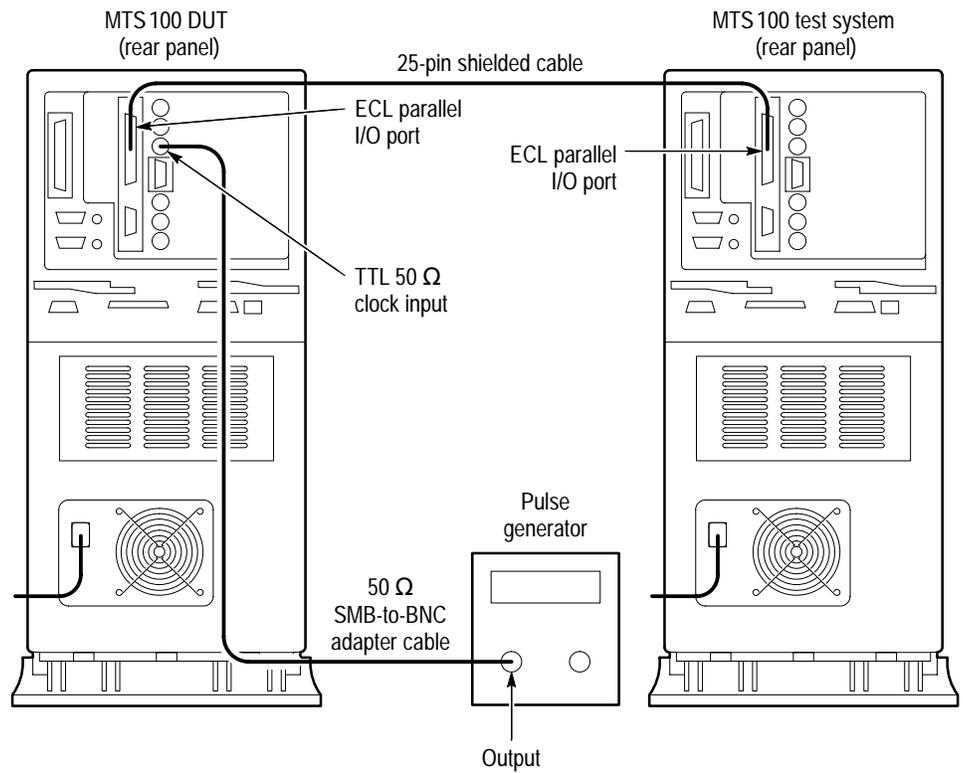


Figure 4–25: Setup for checking ECL parallel port generation with an external clock

4. On the test system, switch to the Data Store Control application.
5. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
6. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (ECL3.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	ECL Parallel Port Input
Synchronization	Psync

7. Click Start to begin test system acquisition.
8. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

9. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	ECL Parallel Output Port
Output Clock	External Clock
Loop	Off (No X)

10. Click Start to begin DUT generation.

11. When file transfer is complete, save the acquired test file to the test system C drive as follows:

- a. In the test system Data Store Administrator window, click the R (CARB file read to PC) command button.

- b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 6 (such as ECL3.tst).

- c. Enter the following name for the PC file:

C:\temp\

where <filename> is the name you entered in step b (such as ECL3.tst).

- d. Click Start to save the file to the hard disk.

12. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:

- a. Switch to the Command Prompt application.

- b. In the Command Prompt window, enter the following command:

fc/b C:\temp\11meg.ver C:\temp\

where <filename> is the name you entered in step 6 (such as ECL3.tst).

- c. Press ENTER to begin the file comparison.

13. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

ECL Parallel Port Master Acquisition and Slave Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–26.

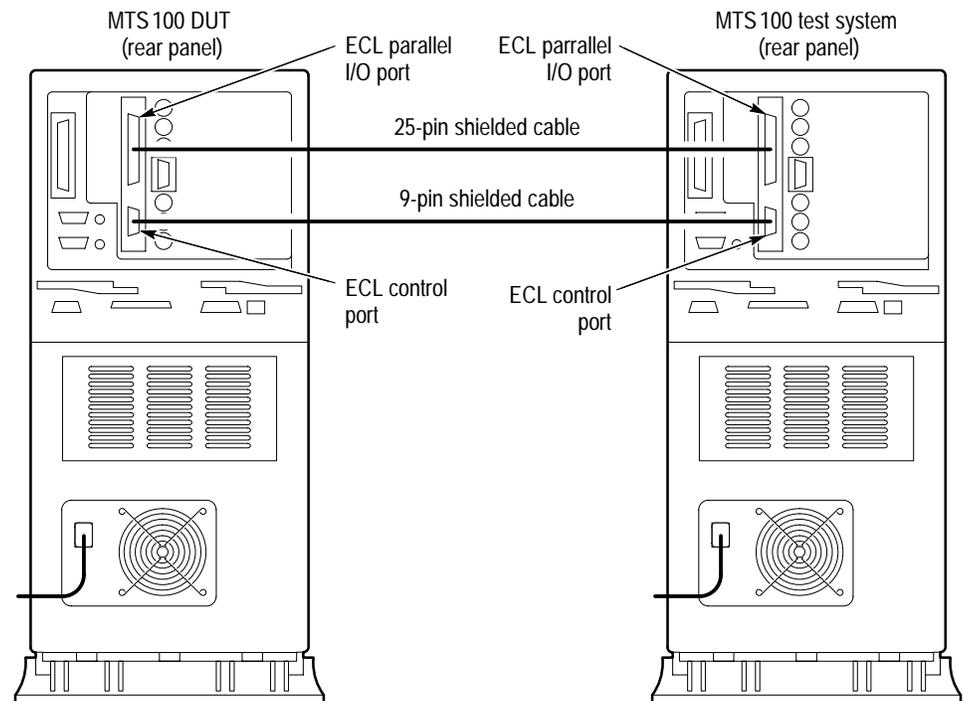


Figure 4–26: Setup for checking ECL parallel port master acquisition and slave generation

2. In the DUT Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
3. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (ECL4.tst, for example)
Protocol	Master
File Size	10,941,600
Port	ECL Parallel Port Input
Output Clock	PLL

Parameter	Setting
Frequency	Maximum (5.625 Mbits/s or 7.5 Mbits/s)
Synchronization	Psync
Control Port	Useful bytes: 188 Stuffing bytes: 16 Syncro. byte size: 1

4. Click Start to begin DUT acquisition.
5. On the Test System, switch to the Data Store Control application.
6. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
7. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Slave
Port	ECL Parallel Output Port
Loop	Off (No X)

8. Click Start to begin test system generation.
9. When the transfer is complete, save the acquired test file to the DUT C drive as follows:
 - a. In the DUT Data Store Administrator window, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 3 (such as ECL4.tst).
 - c. Enter the following name for the PC file:
C:\temp\<<filename>

where <filename> is the name you entered in step b (such as ECL4.tst).
 - d. Click Start to save the file to the hard disk.
10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application.

- b.** In the Command Prompt window, enter the following command:

```
fc/b C:\temp\11meg.ver C:\temp\

```

where <filename> is the name you entered in step 3 (such as ECL4.tst).

- c.** Press ENTER to begin the file comparison.

- 11.** Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.
- 12.** In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
- 13.** Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (ECL5.tst, for example)
Protocol	Master
File Size	10,941,600
Port	ECL Parallel Port Input
Output Clock	PLL
Frequency	Maximum (5.625 Mbits/s or 7.5 Mbits/s)
Synchronization	Psync
Control Port	Useful bytes: 188 Stuffing bytes: 16 Syncro. byte size: 1

- 14.** Click Start to begin test system acquisition.
- 15.** On the DUT, switch to the Data Store Control application.
- 16.** In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
- 17.** Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Slave
Port	ECL Parallel Output Port
Loop	Off (No X)

18. Click Start to begin DUT generation.
19. When the transfer is complete, save the acquired test file to the test system C drive as follows:
 - a. In the test system Data Store Administrator window, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 13 (such as ECL5.tst).
 - c. Enter the following name for the PC file:
`C:\temp\<filename>`
where <filename> is the name you entered in step b (such as ECL5.tst).
 - d. Click Start to save the file to the hard disk.
20. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. On the test system, switch to the Command Prompt application.
 - b. In the Command Prompt window, enter the following command:
`fc/b C:\temp\11meg.ver C:\temp\<file name>`
where <filename> is the name you entered in step 13 (such as ECL5.tst).
 - c. Press ENTER to begin the file comparison.
21. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

ECL Serial Port Tests

This section contains ECL serial port tests for slave acquisition, master generation, generation using an external clock, master acquisition, and slave generation.

NOTE. The data order (LSB or MSB first) for the serial ports must match for both MTS100 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Systems with serial numbers between B010100 and B019999 always use the LSB first data order.

ECL Serial Port Slave Acquisition and Master Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–27.

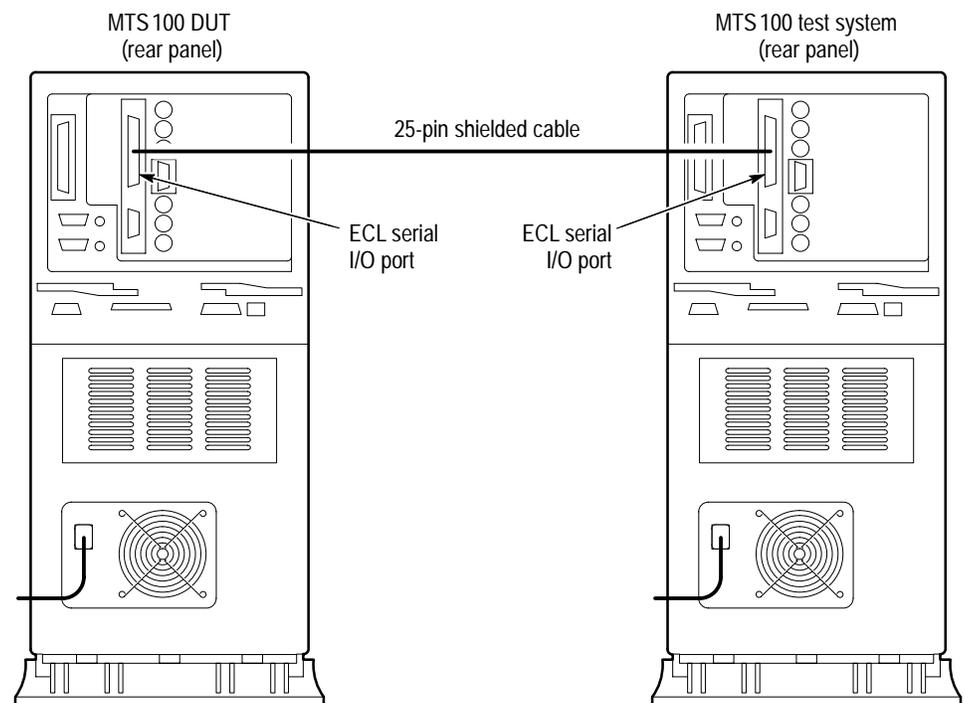


Figure 4–27: Setup for checking ECL serial port slave acquisition and master generation

2. On the DUT, start or switch to the Data Store Control application, as necessary.
3. In the DUT Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
4. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (serial1.tst, for example)
Protocol	Slave
File Size	10,941,600

Parameter	Setting
Port	ECL Serial Port Input
Synchronization	Psync

5. Click Start to begin DUT acquisition.
6. On the test system, start or switch to the Data Store Control application, as necessary.
7. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
8. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	ECL Serial Output Port
Output Clock	PLL
Frequency	45 Mbits/s (to serial number B019999) 55 Mbits/s (all other instruments)
Loop	Off (No X)

9. Click Start to begin test system generation.
10. When the transfer is complete, save the acquired test file to the DUT C drive as follows:
 - a. In the DUT Data Store Administrator window, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 4 (such as serial1.tst).
 - c. Enter the following name for the PC file:
`C:\temp\<filename>`
where <filename> is the name you entered in step b (such as serial1.tst).
 - d. Click Start to save the file to the hard disk.
11. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Start or switch to the Command Prompt application (Figure 4–28).

- b. In the Command Prompt window, enter the following command:
`fc/b C:\temp\11meg.ver C:\temp\
 where <filename> is the name you entered in step 4 (such as serial1.tst).`
 - c. Press ENTER to begin the file comparison.
12. Check the Command Prompt window for the comparison results (Figure 4–28). If no differences are detected, the test passes.



```

Command Prompt
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1995 Microsoft Corp.

C:\users\default>fc/b C:\temp\11meg.ver C:\temp\serial1.tst
Comparing Files C:\TEMP\11MEG.VER and C:\TEMP\SERIAL1.TST
FC: no differences encountered

C:\users\default>_

```

Figure 4–28: Example file comparison results

13. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
14. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (serial2.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	ECL Serial Port Input
Synchronization	Psync

15. Click Start to begin test system acquisition.
16. On the DUT, switch to the Data Store Control application.
17. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

18. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	ECL Serial Output Port
Output Clock	PLL
Frequency	45 Mbits/s (to serial number B019999) 55 Mbits/s (all other instruments)
Loop	Off (No X)

19. Click Start to begin DUT generation.

20. When the transfer is complete, save the acquired test file to the test system C drive as follows:

- a.** In the test system Data Store Administrator window, click the R (CARB file read to PC) command button.
- b.** From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 14 (such as serial2.tst).
- c.** Enter the following name for the PC file:
`C:\temp\<filename>`
where <filename> is the name you entered in step b (such as serial2.tst).
- d.** Click Start to save the file to the hard disk.

21. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:

- a.** Switch to the Command Prompt application.
- b.** In the Command Prompt window, enter the following command:
`fc/b C:\temp\11meg.ver C:\temp\<file name>`
where <filename> is the name you entered in step 14 (such as serial2.tst).
- c.** Press ENTER to begin the file comparison.

22. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

ECL Serial Port External Clock Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–29.

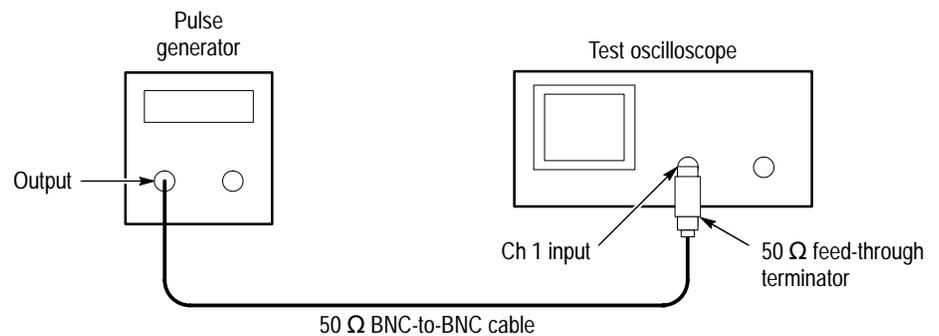


Figure 4–29: Setup for measuring the pulse generator output

2. Set the pulse generator output for a 5 MHz square wave with an amplitude that switches between 0 V and 3.0 V.
3. Connect the equipment as shown in Figure 4–30.

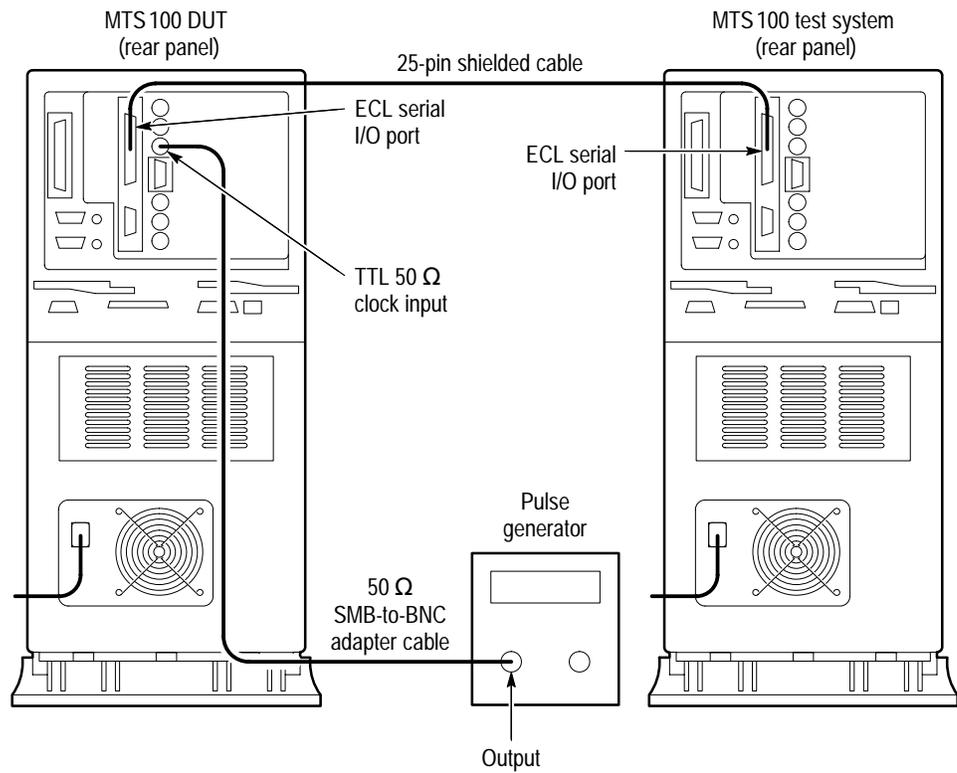


Figure 4-30: Setup for checking ECL serial port generation with an external clock

4. On the test system, switch to the Data Store Control application.
5. In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
6. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (serial3.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	ECL Serial Port Input
Synchronization	Psync

7. Click Start to begin test system acquisition.
8. In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.

9. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Master
Port	ECL Serial Output Port
Output Clock	External Clock
Loop	Off (No X)

10. Click Start to begin DUT generation.

11. When the transfer is complete, save the acquired test file to the test system C drive as follows:

- a. In the test system Data Store Administrator window, click the R (CARB file read to PC) command button.

- b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 6 (such as serial3.tst).

- c. Enter the following name for the PC file:

C:\temp\<filename>

where <filename> is the name you entered in step b (such as serial3.tst).

- d. Click Start to save the file to the hard disk.

12. On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:

- a. Start or switch to the Command Prompt application.

- b. In the Command Prompt window, enter the following command:

fc/b C:\temp\11meg.ver C:\temp\<file name>

where <filename> is the name you entered in step 6 (such as serial3.tst).

- c. Press ENTER to begin the file comparison.

13. Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.

ECL Serial Port Master Acquisition and Slave Generation

This test requires a second MTS 100 MPEG Test System that is designated as the “Test System.” Within this procedure the MTS 100 MPEG Test System you are testing is designated the “Device Under Test” (DUT).

Performance Requirement: Error free file transfer between two MTS 100 MPEG Test Systems.

1. Connect the equipment as shown in Figure 4–31.

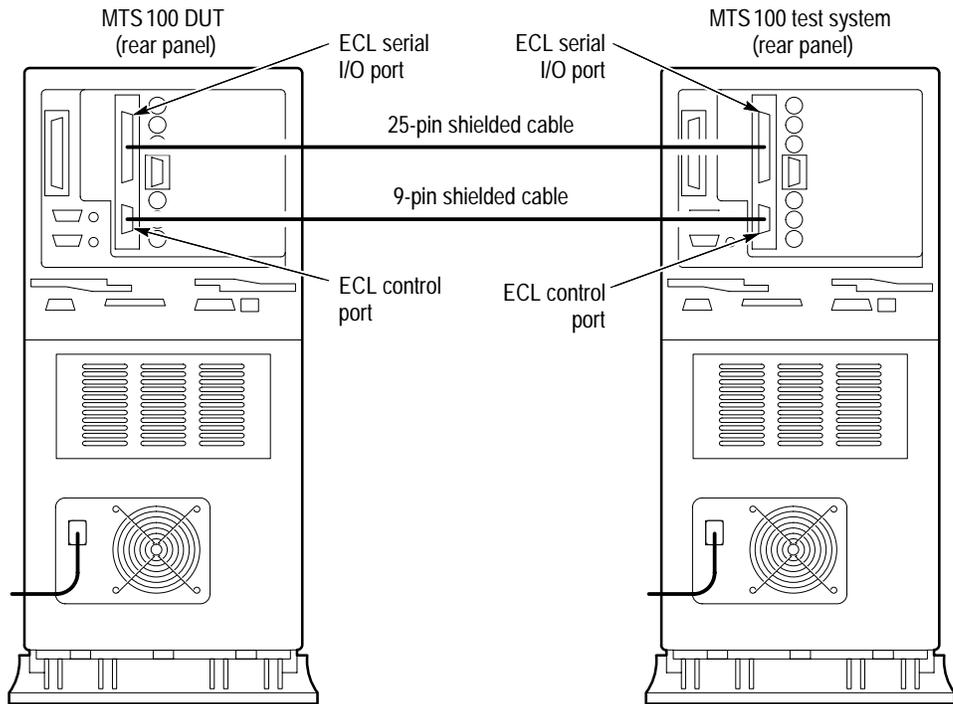


Figure 4–31: Setup for checking ECL serial port slave generation

2. In the DUT Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
3. Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (serial4.tst, for example)
Protocol	Master
File Size	10,941,600
Port	ECL Serial Port Input
Output Clock	PLL
Frequency	45 Mbits/s (to serial number B019999) 55 Mbits/s (all other instruments)

Parameter	Setting
Synchronization	Psync
Control Port	Useful bytes: 188 Stuffing bytes: 16 Syncro. byte size: 1

4. Click Start to begin DUT acquisition.
5. On the test system, switch to the Data Store Control application.
6. In the test system Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
7. Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Slave
Port	ECL Serial Output Port
Loop	Off (No X)

8. Click Start to begin test system generation.
9. When the transfer is complete, save the acquired test file to the DUT C drive as follows:
 - a. On the DUT, click the R (CARB file read to PC) command button.
 - b. From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 3 (such as serial4.tst).
 - c. Enter the following name for the PC file:
 C:\temp\<filename>
 where <filename> is the name you entered in step b (such as serial4.tst).
 - d. Click Start to save the file to the hard disk.
10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a. Switch to the Command Prompt application.

- b.** In the Command Prompt window, enter the following command:

fc/b C:\temp\11meg.ver C:\temp\

where <filename> is the name you entered in step 3 (such as serial4.tst).

- c.** Press ENTER to begin the file comparison.

- 11.** Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.
- 12.** In the test system Data Store Administrator window, click the A (acquisition) command button to display the ACQUISITION dialog box.
- 13.** Enter the following parameters in the ACQUISITION dialog box:

Parameter	Setting
CARB File	Any (serial5.tst, for example)
Protocol	Master
File Size	10,941,600
Port	ECL Serial Port Input
Output Clock	PLL
Frequency	45 Mbits/s (to serial number B019999) 55 Mbits/s (all other instruments)
Synchronization	Psync
Control Port	Useful bytes: 188 Stuffing bytes: 16 Syncro. byte size: 1

- 14.** Click Start to begin Test System acquisition.
- 15.** On the DUT, switch to the Data Store Control application.
- 16.** In the DUT Data Store Administrator window, click the G (generator) command button to display the GENERATION dialog box.
- 17.** Enter the following parameters in the GENERATION dialog box:

Parameter	Setting
CARB File	11meg.ver
Protocol	Slave
Port	ECL Serial Output Port
Loop	Off (No X)

- 18.** Click Start to begin DUT generation.
- 19.** When the transfer is complete, save the acquired test file to the test system C drive as follows:
 - a.** In the test system Data Store Administrator window, click the R (CARB file read to PC) command button.
 - b.** From the Name of the CARB file list, select <filename>, where <filename> is the name you entered in step 13 (such as serial5.tst).
 - c.** Enter the following name for the PC file:
`C:\temp\<filename>`
where <filename> is the name you entered in step b (such as serial5.tst).
 - d.** Click Start to save the file to the hard disk.
- 20.** On the test system, use the Windows NT Command Prompt to perform a file comparison as follows:
 - a.** Switch to the Command Prompt application.
 - b.** In the Command Prompt window, enter the following command:
`fc/b C:\temp\11meg.ver C:\temp\<file name>`
where <filename> is the name you entered in step 13 (such as serial5.tst).
 - c.** Press ENTER to begin the file comparison.
- 21.** Check the Command Prompt window for the comparison results. If no differences are detected, the test passes.



Adjustment Procedures

Adjustment Procedures

This section contains the procedure for adjusting the 8.448 MHz oscillator.

NOTE. *It is not necessary to do this adjustment and it should not be attempted if the oscillator frequency is within specification when checked in the performance verification procedure. Preparing to adjust the oscillator requires removal of the Data Store board and repartitioning of the Data Store disk drives.*

If the oscillator is not working or cannot be adjusted, refer to the *Maintenance* section for Data Store circuit board replacement instructions.

Equipment Required

Table 5–1 lists the test equipment needed to perform the adjustment procedure. The table identifies examples and provides the minimum tolerances, where applicable. If equipment is substituted, it must meet or exceed the tolerances listed.

Table 5–1: Required equipment list

Test Equipment	Characteristic	Example
50 Ω SMB to BNC adapter cable		Tektronix part number 174-3578-00 (shipped as an standard accessory)
Frequency counter	8 MHz to 45 MHz range	Tektronix CDC250 Counter
Screwdriver with T-15 Torx Tip		Standard tool
Adjustment tool	Plastic handle, small metallic bit. Less than three inches overall.	Tektronix part number 003-1433-01

Oscillator Frequency Adjustment



CAUTION. *All data on the Data Store disks is lost during this procedure. If possible, save important files to the system disk, a network drive, or another MTS 100.*

You must remove one SCSI controller board to access the oscillator frequency adjustment. Removing SCSI controller board 2 disables all but one of the Data Store (CARB) disks (SCSI disk 1) and requires that you partition the directory information. Partitioning erases the file directory information and prevents you from accessing the previously files when all the Data Store disk drives are restored to operation. Therefore, if you have important files stored on the Data Store disks, save those files to the system disk, another MTS 100, or a network drive before proceeding. See the *Using the Data Store Administrator* section of the User manual for more information.



CAUTION. *To avoid electrical damage to the instrument, turn power off before removing the Data Store circuit board.*

If the MTS 100 is powered on, close all applications and log off of Windows NT before continuing.

- Choose Shut Down from the Start menu. Select “Shut down the computer?” in the resulting **Shut Down Windows** dialog box and then click Yes.

Wait until the message “It is now safe to turn off your computer” appears on the MTS 100 screen before turning off the server.

Remove the Data Store Circuit Board

The Data Store circuit board is in the card cage at the top of the server. The Data Store circuit board and the four SCSI controller circuit boards are a single module. You may not place an order for a SCSI controller circuit board separately from the Data Store circuit board. Use the following procedure to remove the circuit board assembly.



WARNING. *The server card cage can not be removed through the rear panel of the server with the SCSI cables installed.*

1. Be sure that you are wearing a static grounding wrist strap.
2. Unplug all rear-panel cables from the Data Store connectors. Also, disconnect the AC power cord.
3. Remove the four screws that secure the rear panel to the server cage frame (see Figure 5–1). Tilt the bottom of the rear panel out to clear the board slot screws and remove the rear panel.

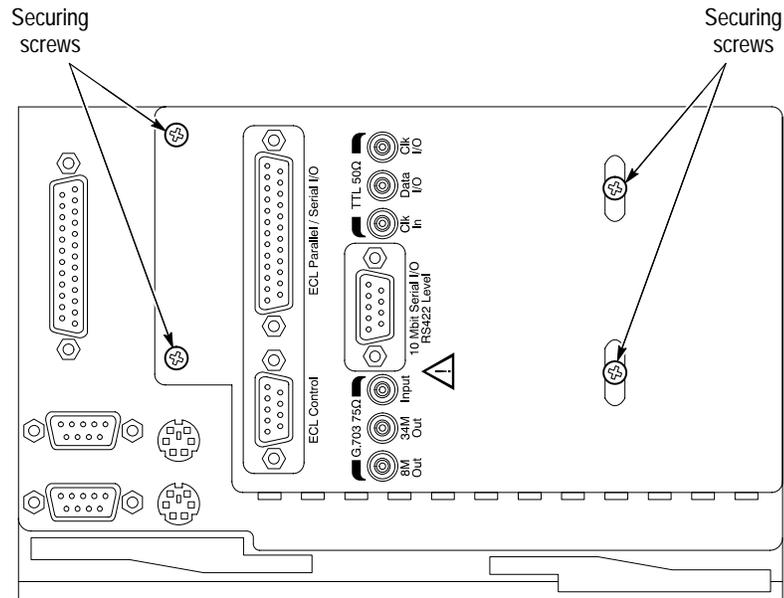


Figure 5-1: Rear panel securing screws.

4. Use a screwdriver with a T-15 Torx tip to remove the securing screws that hold the Data Store and Filter circuit board mounting bracket to the server cage.
5. Unplug the four SCSI cables from the SCSI controller circuit boards. See Figure 5-2.

NOTE. The SCSI connectors are difficult to disconnect from the SCSI controller boards. Start at the rear most connector (4). You may have to wiggle the connector and pull alternately on the top and bottom of the connector to get it to release. Be careful not to damage the wires to the connector. You can wait until the Data Store board is partially removed from the server card cage to disconnect the cable to SCSI controller board 1.

6. Grasp the circuit board near its front and back corners. Pull the circuit board straight up. It may be hard to disconnect the board from the EISA bus connector. You can pull on the front and rear of the board alternately to loosen the connector.
7. After the EISA bus connector is disengaged, carefully guide the SMB connectors past the rear edge of the server card cage as you lift the Data Store board out.
8. Place circuit board assembly on a static-free surface, such as a static grounding work station.

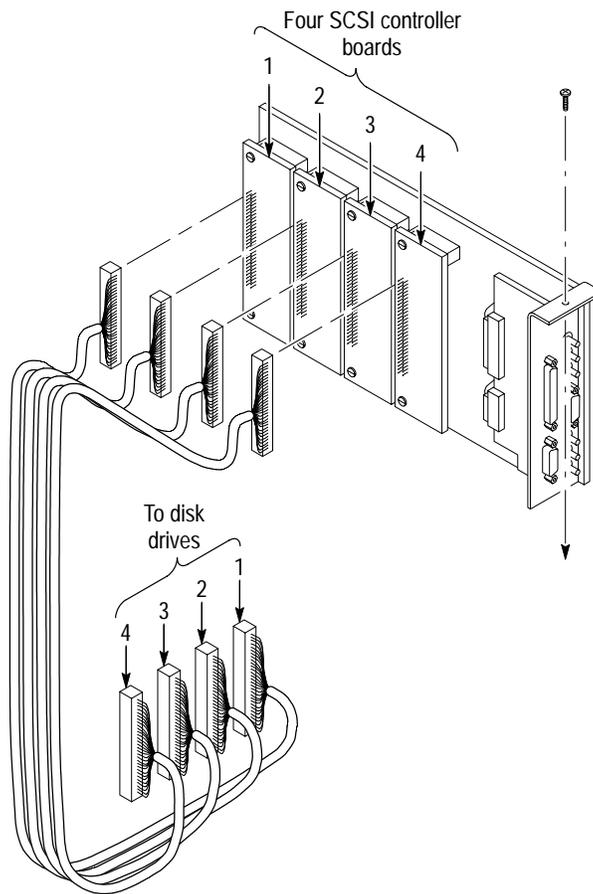


Figure 5-2: Removing the Data Store circuit board

If the circuit boards are to remain out of the server for any length of time, wrap the board in an anti-static material. This can be an anti-static circuit board bag, such as the type used to ship the exchange module, or other anti-static wrapping.

Remove the SCSI controller Board

The adjustment is located beneath the SCSI controller circuit board shown in Figure 5-3. Use the following procedure to remove the SCSI controller board:

1. Remove the two screws that secure the the SCSI controller circuit board to the Data Store circuit board.
2. Remove the SCSI controller circuit board and carefully place it on a static-free surface.

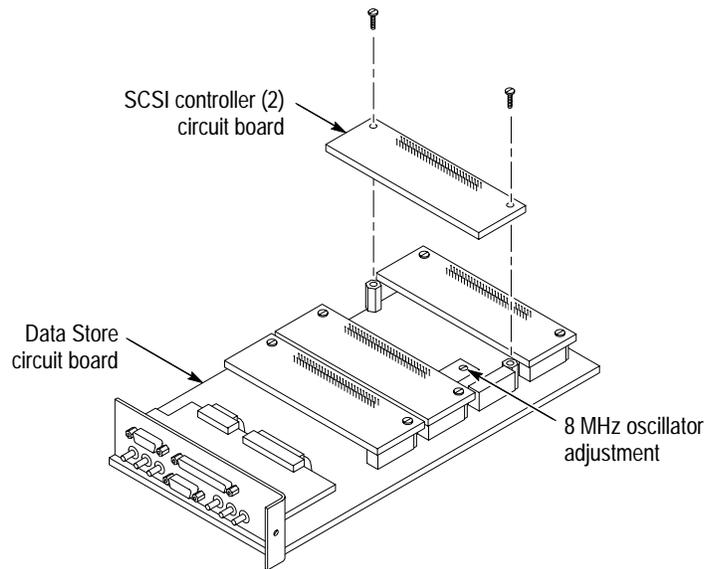


Figure 5-3: Location of the 8.448 MHz oscillator adjustment

Reinstall the Data Store Circuit Board

You must temporarily reinstall the Data Store circuit board to perform the oscillator frequency adjustment. Use the following procedure:

1. Move the four SCSI cables out of the way so that you can reinstall the Data Store circuit board into the server.
2. Hold the circuit board at the top near the front and back corners.
3. Align the circuit boards with the cage guides for the second slot.
4. Carefully slide the circuit board into the slot. You will have to guide the SMB connectors on the circuit board around the edge of the server cage as the board is lowered into the slot. Do not plug the board into the EISA connector yet.

NOTE. Only SCSI 1 cable needs to be reconnected to perform the adjustment.

5. Reconnect the first SCSI (1) cable to the first SCSI controller board (1). You can raise the Data Store board up part way to assist in reconnecting this connector.
6. Align the circuit board edge connector with the fixed connector in the cage.
7. Push the card in firmly but carefully until the edge connector is seated. You may have to wiggle the card some and alternately press down on the front and rear of the card to get it to seat completely.

Power On Procedure

After the Data Store circuit board is temporarily installed, turn the MTS 100 MPEG Test System on and log in as the administrator.

1. Switch the computer on.
2. When initialization is complete, press CTRL + ALT + DELETE as instructed by the message box.
3. Log in as the administrator; the factory password is **MPEG2** (all uppercase).
4. Once you are logged in, you can start the individual MTS 100 applications through the Tektronix MTS100 V2.0 submenu, shown in Figure 5–4.

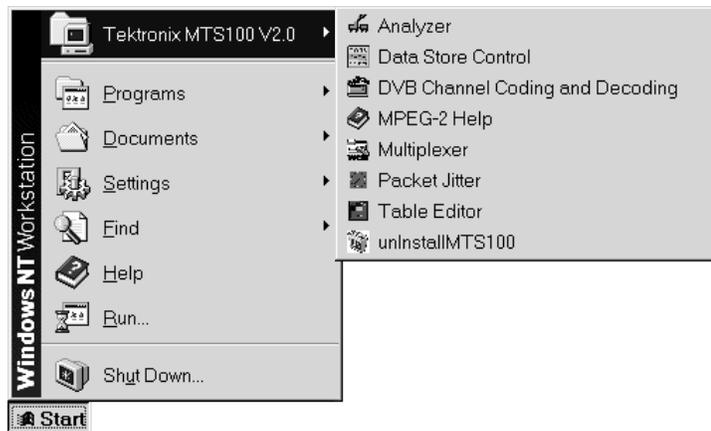


Figure 5–4: The Tektronix MTS100 V2.0 submenu

5. Start the Data Store Control application. To do so, select Data Store Control from the submenu.

Repartition the Data Store disks

You must repartition the Data Store disks and save a transport stream file to those disks before continuing. Use the following procedure:

1. Select Disks Partitionning from the Data Store Administrator Service menu shown in Figure 5–5.

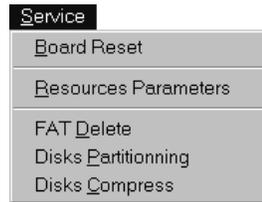


Figure 5–5: Disk manager Service menu

2. The Partitionning dialog box opens. Select Single shot from the Partition type list box.
3. Click OK to partition the drives.
4. When partitioning is complete, click the W command button on the Data Store Administrator toolbar to open the **File Write to CARB** dialog box.
5. Click Browse and locate a transport stream (.trp) file on the system disk. If you can find no larger .trp files, select c:\Mts100\Cfg-trp\Sample.trp.
6. Enter an appropriate name in the **Name of CARB File** text box. Click OK to copy the file onto the Data Store disks.

Adjust the Oscillator

1. Connect the equipment as shown in Figure 5–6.

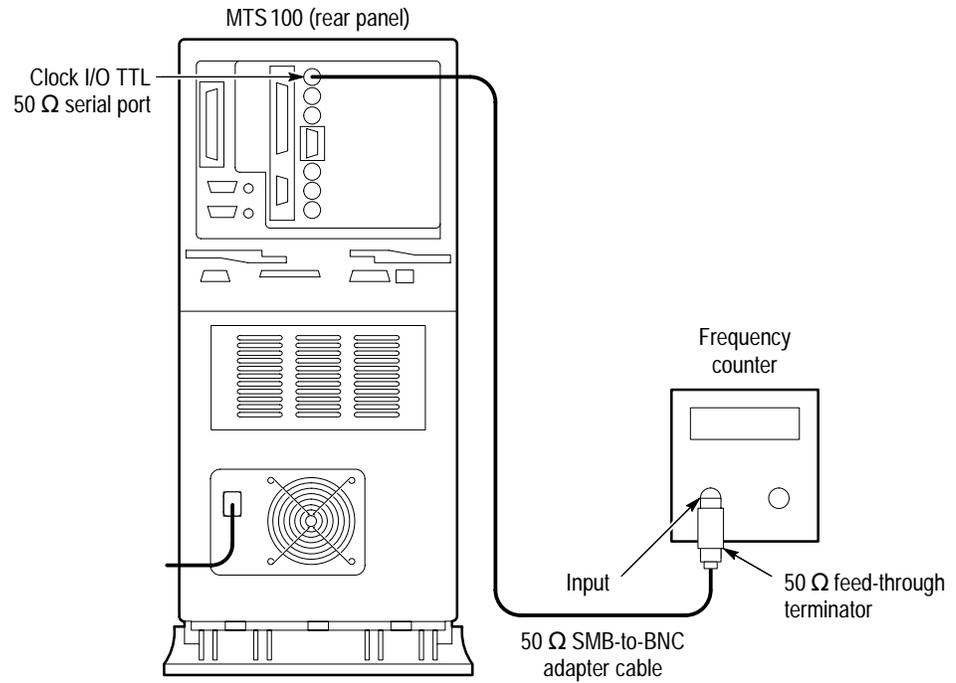


Figure 5–6: Setup for adjusting the clock frequency

2. In the MTS 100 Data Store Administrator window, click the G (generator) icon.
3. Select the following parameters to output a clock signal:

Parameter	Setting
CARB file	The file transferred after partitioning (example: Sample.trp)
Loop	On (X)
Protocol	Master
Port	TTL
Output Clock	8.448 MHz

4. Click Start to generate the clock output signal.
5. Trigger the frequency counter to obtain a stable display.
6. Position the adjustment tool to align the tool with the hole in the oscillator can and insert the bit of the tool in the slot in the adjustment.

NOTE. *This adjustment is temperature sensitive. The server should be allowed to warm up for a few minutes before attempting to make the final adjustment to the limits given in step 7. This centers the operating range of the oscillator so that it will remain in specification with aging and temperature variations.*

7. Adjust ST1 for for a frequency of 8,448,000 Hz \pm 1 Hz.

Reassemble the Test System

After adjusting the oscillator frequency, perform the following steps to reassemble the MTS 100 MPEG Test System:

1. Exit the Data Store Control application.
2. Shut down Windows NT and then switch the MTS 100 MPEG Test System off.
3. Remove the Data Store circuit board from the server, install the SCSI controller board, and then reinstall the complete Data Store circuit board in the server.
4. Replace the MTS 100 Test System subpanel.
5. Replace the instrument top panel.

Repartition the Data Store disks

Finally, after replacing the SCSI controller board, you must repartition the Data Store disks.

1. Switch the instrument on and log in to Windows NT.
2. Start the Data Store Control application.
3. Select Disks Partitionning from the Data Store Administrator Service menu.
4. Select the appropriate partition type and size in the Partitionning dialog box.
5. Click OK to repartition the disks.



Maintenance

Maintenance

This section provides the service information you need to keep the MTS 100 MPEG Test System operating. The section provides information about the following topics: Handling Static-Sensitive Components, Cleaning and Inspection, Removal and Replacement Instructions, server Diagnostics, and Troubleshooting.

Preparation

These maintenance instructions are for qualified technicians. Be sure to read the Safety Summaries at the front of the manual before beginning service.

Before removing the covers from the server, read *Handling Static-Sensitive Components*.

Handling Static-Sensitive Components

This instrument contains electrical components that are susceptible to damage from static discharge. Static voltages from 1 kV to 30 kV are common in unprotected environments. Table 6–1 shows the relative static discharge susceptibility of various semiconductor classes.

Table 6–1: Static susceptibility

Semiconductor Class	Voltage
ECL	200 V - 500 V
Shottky Signal Diodes	250 V
Shottky TTL	500 V
HF Bipolar Transistors	400 V - 600 V
JFETs	600 V - 800 V
Linear Microcircuits	400 V - 1000 V
Low Power Schottky TTL	900 V
TTL	1200 V

Observe the following precautions to avoid damaging static-sensitive devices:

1. Minimize handling of static-sensitive components.
2. Transport and store static-sensitive components or assemblies in their original containers, on a metal rail, or on conductive foam. Label any package that contains static-sensitive components or assemblies.
3. Discharge the static voltage from your body by wearing a wrist grounding strap when handling static-sensitive components. (Always service assemblies that contain static-sensitive components at a static-free work station.)
4. Remove any device capable of generating or holding a static charge from the work station surface.
5. Whenever possible keep the component leads shorted together.
6. Pick up components by the body, never by the leads.
7. Do not slide components over any surface.
8. Avoid handling components in areas where the floor or work surface covering is capable of generating a static charge.
9. Use a soldering iron that is connected to earth ground.
10. Use only special antistatic suction or wick-type desoldering tools.

Cleaning and Inspection

Preventive maintenance consists of cleaning and visual inspection. The schedule depends on the severity of the operating environment. Under average conditions, perform preventive maintenance after 2000 hours of operation.

Clean the entire Test System often enough to prevent dust and dirt from accumulating. Dirt can act as a thermal insulating blanket that prevents effective heat dissipation. In addition, dust buildup can provide high-resistance electrical leakage paths between conductors or components in a humid environment.

Exterior. Cleaning the exterior consists of an occasional wiping of the outside surfaces with a damp soft cloth. Do not use commercial cleaners because they could discolor or damage the finish.

Check all of the server and Monitor air vents on a regular schedule to ensure that there is not a dust buildup that could impede the flow of cooling air.

Monitor. The screen requires occasional cleaning. Turn the Monitor off before cleaning its screen. Use a commercial glass cleaner and a soft, lint-free cloth to remove surface grime and polish the faceplate. Use the minimum amount of cleaner necessary.

Keyboard. The keyboard may require occasional cleaning to remove lint or oil buildup. Use the following procedure to clean the keyboard.

1. Turn off the main power switch.
2. Unplug the keyboard from the server.
3. Clean all lint and loose debris from the keyboard with either clean, dry, low velocity air or with a clean, soft brush.
4. Clean the external surfaces with a soft cloth dampened with a solution of mild detergent and water. Do not allow solution to run into the keyboard.

NOTE. *If liquids such as coffee or soft drinks have gotten into the keyboard, intermittent operation can occur. If this has happened, consider replacing the keyboard.*

Mouse. Occasional cleaning is necessary to remove accumulated lint, which hampers smooth ball movement. Use the following procedure to clean the inside of the ball cavity. If the mouse is damaged, replace it.

1. Turn off the main power switch.
2. Unplug the mouse from the server.
3. Turn over the mouse and loosen the roller ball retaining ring by inserting your fingers into the slots and turn in the direction indicated by the arrows (counterclockwise) approximately 45 degrees.
4. Turn the mouse right side up, cupping the bottom of the mouse in your hand, and gently tap until the retaining ring and roller ball drop into your hand.
5. Clean all lint and loose debris from the ball cavity with either clean, dry, low velocity air or with a clean, soft brush. Next, clean any remaining foreign material from the ball cavity with a soft, clean cloth. Do not use hydrocarbon or chemical-based cleaning solutions inside the roller ball cavity.
6. Replace the mouse roller ball and retaining ring. Rotate the retaining ring clockwise (opposite direction to the arrows) until the ring locks into place.



WARNING. *To avoid any potential of electrical shock, disconnect power before removing the server side panels or Monitor covers.*

Interior. Interior cleaning is not recommended, but if necessary, use low-velocity, dry air to blow away dust or lint. If air alone does not remove all of the dust and lint, use a soft brush to complete the task. Exercise extreme care not to disturb components on the plug-in circuit boards during cleaning.



CAUTION. *This instrument contains static sensitive devices that can be damaged by static discharge. Wear a wrist grounding strap when working on or with modules inside the server cabinet.*

Removal and Replacement Instructions

The following procedures tell you how to remove and replace the Data Store circuit board and Data Store disk hard drives. Part numbers for both the circuit board and the hard disks are in the *Replaceable Parts List*. In compliance with the EISA standard, the Data Store circuit board and its associated SCSI Controller circuit boards are in the server card cage accessible with the top server cover removed. The Data Store hard disk drives are in the server front access drive bays.

Recommended Tools

The following tools are recommended for MTS 100 MPEG Test System assembly removal and replacement:

- An anti-static wrist strap for safe handling of assemblies containing static sensitive devices
- A screwdriver with T15 Torx tip to remove the module mounting screws
- A 1/4 inch or larger flat tip screwdriver to remove server side panel screws

NOTE. *Security screws are installed to prevent the server card cage, the CPU unit, and the fan from being removed from the server. These screws are accessed by removing the server side panel. Attempting to force removal of the modules with the security screws installed can cause the release mechanisms to be broken.*

Accessing the Top Card Cage

The Data Store circuit board and the associated SCSI Controller circuit boards are located in the top server card cage. Before removing the top cover, shut down the server and unplug the power cord.

NOTE. *The server card cage can not be removed through the rear panel of the server with the SCSI cables installed.*

Removing the server top panel. One knurled thumbscrew holds the top panel in place. In most cases it is only finger-tight; if necessary, use a coin in the slot for

added leverage. The panel thumbscrews for the top and left side panels are located in the front of the server behind the front door.

1. If locked, unlock the front door and open the door.
2. Completely loosen the knurled screw that holds the top panel in place.
3. Slide the top panel toward the rear of the instrument about 0.75 in (1.9 cm).
4. Disengage the top panel tabs from the top of the server by sliding the top panel out about 0.375 in (1 cm).
5. Lift up and remove the top panel to gain access to the server EISA card cage. See Figure 6-1.



CAUTION. The server interior can overheat, resulting in component damage, if the instrument is operated with the cover removed. Do not operate the server with any of the covers removed as they are an integral part of the cooling system.

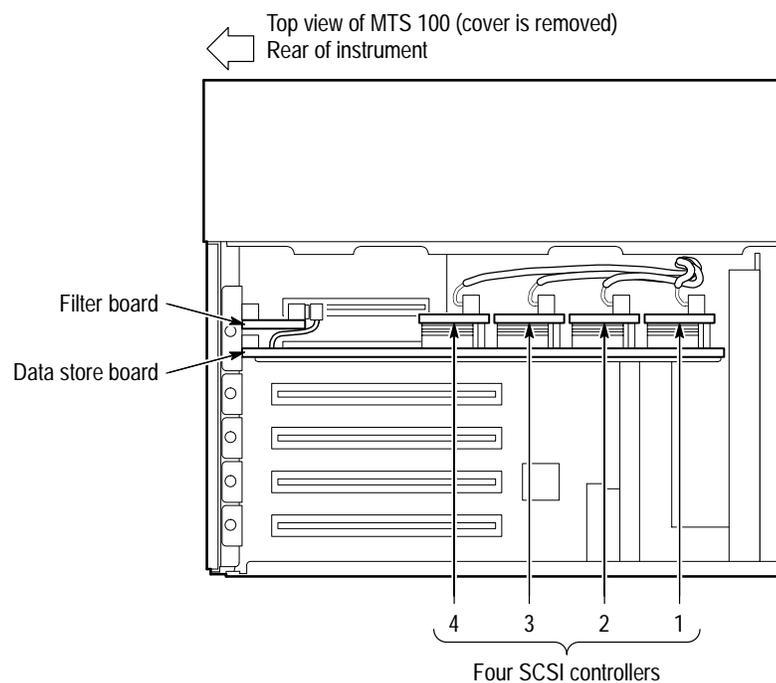


Figure 6-1: Top view of the server

Reinstalling the server top panel. The server top panel must be in place before powering up in order to assure adequate cooling. Use the following procedure to reinstall the server top panel.

1. Set the top panel on top of the chassis rail.
2. Align the tabs on top panel to the server chassis slots and push the panel all the way on.
3. Slide the top panel forward until the front of the top panel is aligned with the front of the server.
4. Push in on the thumbscrew to start it and tightened it to hold the top panel in place.
5. Close the front door.

Removing the Data Store Circuit Board

The Data Store circuit board is in the card cage at the top of the instrument. See Figure 6–1. The Data Store circuit board and the four SCSI Controller circuit boards are a single unit. It is not possible to order a SCSI Controller circuit board separately from the Data Store circuit board. Use the following procedure to remove the circuit board assembly.



WARNING. *The server card cage can not be removed through the rear panel of the server with the SCSI cables installed.*

1. Be sure that you are wearing a static grounding wrist strap.
2. Unplug all rear-panel cables from the Data Store connectors.
3. Remove the four screws that secure the rear panel to the server cage frame (see Figure 6–2). Tilt the bottom of the rear panel out to clear the board slot screws and remove the rear panel.

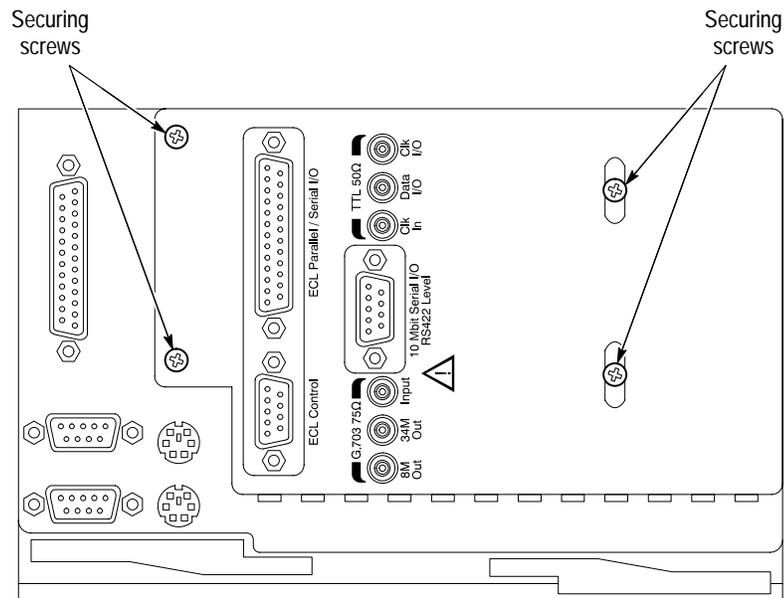


Figure 6–2: MTS 100 rear panel securing screws

4. Use a screwdriver with a T-15 Torx tip to remove the securing screw that holds the Data Store and Filter circuit board mounting bracket to the server cage. There may be two screws used to secure the board in place.
5. Unplug the four SCSI cables from the SCSI Controller circuit boards. See Figure 6–3.

NOTE. The SCSI connectors are difficult to disconnect from the SCSI controller boards. Start at the rear most connector (4). You may have to wiggle the connector and pull alternately on the top and bottom of the connector to get it to release. Be careful not to damage the wires to the connector. You can wait until the Data Store board is partially removed from the server card cage to disconnect the cable to SCSI controller board 1.

6. Grasp the circuit board near its front and back corners. Pull the circuit board straight up. It may be hard to disconnect the board from the EISA bus connector. You can pull on the front and rear of the board alternately to loosen the connector.
7. After the EISA bus connector is disengaged, carefully guide the SMB connectors past the rear edge of the server card cage as you lift the Data Store board out.
8. Place circuit board assembly on a static-free surface, such as a static grounding work station.

If the circuit boards are to remain out of the server for any length of time, wrap the board in an anti-static material. This can be an anti-static circuit board bag, such as the type used to ship the exchange module, or other anti-static wrapping.

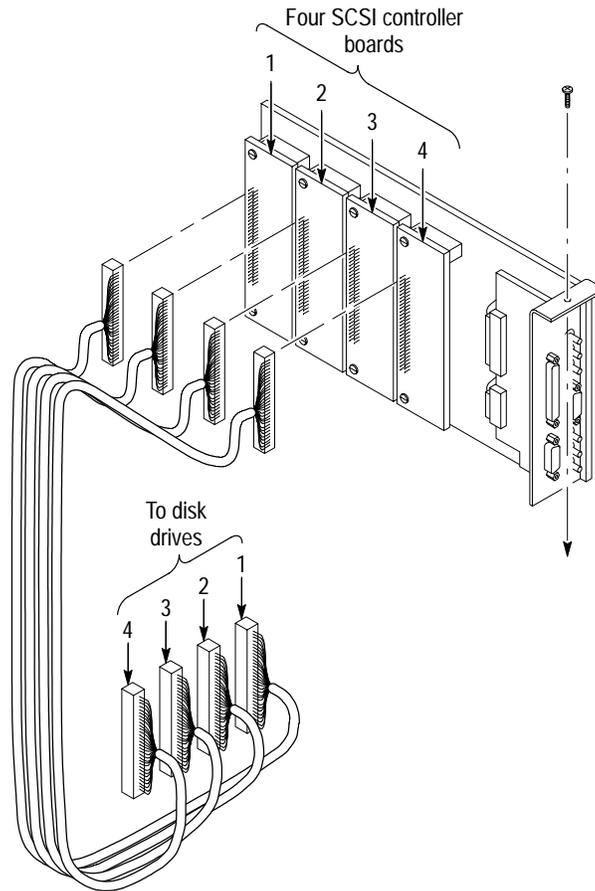


Figure 6-3: Removing the Data Store circuit board

Reinstalling the Data Store Circuit Board

When reinstalling the circuit board or installing a replacement module, be sure to inspect it for obvious damage or foreign material on its surfaces.

1. Wear a static grounding wrist strap when handling circuit boards; take special care not to touch IC leads.
2. Grasp the circuit board near the front and back corners.
3. Align the circuit boards with the cage guides for the second slot. See Figure 6-1.

4. Carefully slide the circuit board into the slot. You will have to guide the SMB connectors on the circuit board around the edge of the server cage as the board is lowered into the slot. Do not plug the board into the EISA connector yet.
5. Reconnect the first SCSI (1) cable to the first SCSI Controller board (1). You can lift the Data Store board up part way to assist in reconnecting this connector.
6. Align the circuit board edge connector with the fixed connector in the cage.
7. Push the card in firmly but carefully until the edge connector is seated. You may have to wiggle the card some and alternately press down on the front and rear of the card to get it to seat completely.
8. Reattach the remaining SCSI cables to the SCSI Controller connectors. See Figure 6–3 for the correct order. Align the connectors with the receptacles and push in on the top and bottom of the SCSI connector to seat them.
9. Use a screwdriver with a T-15 Torx tip to install the screw(s) securing the circuit board mounting bracket to the server circuit board cage and firmly tighten.
10. Reattach the MTS 100 rear panel. Tilt the top of the rear panel in to clear the screws holding in the slot panels and hold the panel in place to install the four screws to hold the rear panel on. Only slightly tighten these screws; overtightening them can bend the rear panel.
11. Reconnect the signal I/O cables to their rear panel connectors.

If this completes the operation, replace the server top cover.

Removing a Data Store Hard Disk

The Data Store disks reside in the server front access disk bay. The server side panel must be removed to access the power cable and the SCSI cables to the drives. Each of the drives has its own SCSI cable to the Data Store circuit board and a connection to the disk drive power cable. See Figure 6–5.

1. Be sure that you are wearing a static grounding wrist strap.
2. Open the front door of the server.
3. Remove the four screws that secure the disk drive access door to the server chassis (see Figure 6–4). Loosen completely the captive thumbscrew that holds the disk drive access door shut and lift the access door away from the server.

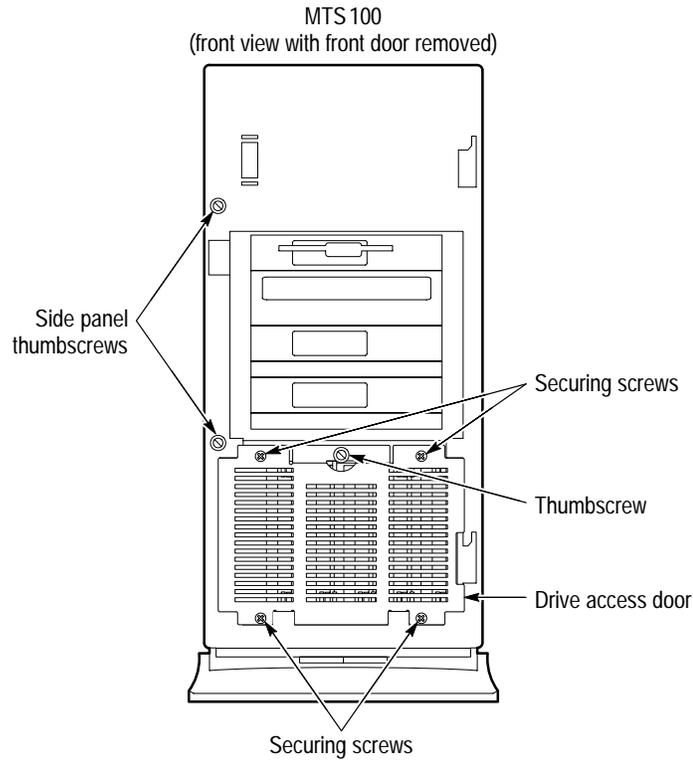


Figure 6-4: Front of server shown disk drive access

4. Loosen completely the two captive thumb screws securing the left side cover to the server chassis. In most cases they are only finger-tight; if necessary, use a coin in the slot for added leverage to loosen them.
5. Slide the side cover back about 1 inch to disengage the tabs on the side cover from the slots in the server chassis and remove the side cover.
6. Unplug the disk drive power plug of the drive or drives being removed. See Figure 6-5. More than one can be removed to gain better access to any connector being disconnected.
7. Unplug the SCSI cable of the drive or drives being removed.

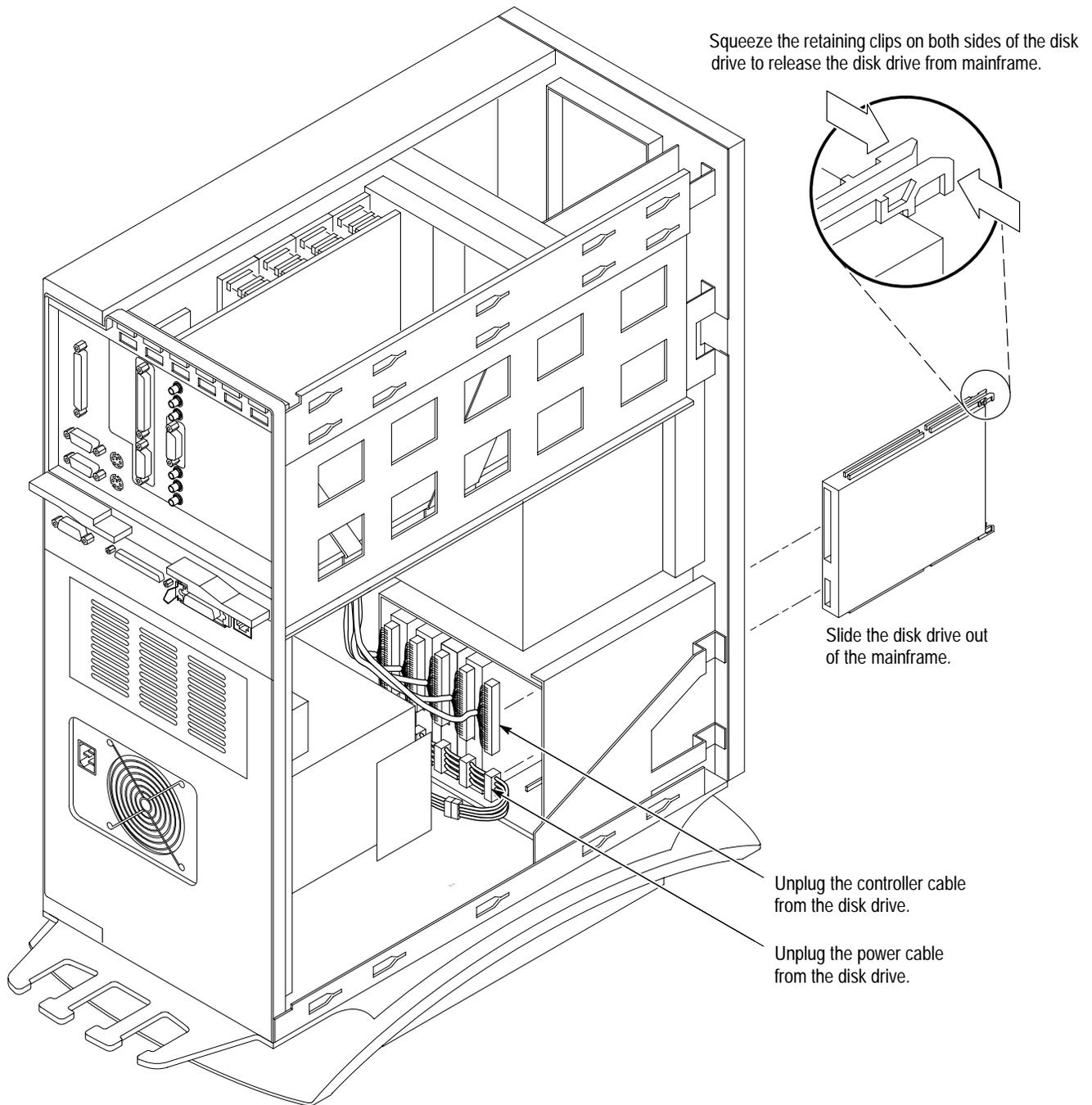


Figure 6-5: Removing Data Store hard disk drives

8. Grasp the plastic retaining clips that secure the disk drive in the bay (see Figure 6-5). Squeeze the retaining clips and pull the drive straight out about half way.
9. When the disk drive is part way out, place one hand under the drive to support it and pull the drive out of the server.
10. Place the drive on a static free work area.

Installing a Data Store Hard Disk

1. Wear a static grounding wrist strap when handling a disk drive. Take care not to touch the components on the side of the drive.
2. Dress all cables away from the disk bay so that they do not interfere with installing the disk drive.
3. Check to be sure that there is no obstruction in the disk bay where the drive is going to be installed.
4. Holding the disk drive from the bottom, start the drive guides into the tracks.
5. Once the drive has started in, push in on the front of the drive until the retaining clips lock into place.
6. Connect the power and SCSI control cables to the drive(s).
7. Insert the tabs on the bottom of the front access door in the slots in the server chassis.
8. Close the door and push in the captive thumbscrew to start the screw threads and tighten the screw.
9. Replace the four screws that hold the front access door to the server chassis. These screws provide for additional grounding to reduce EMI to and from the server. Tighten the screws firmly.
10. Align the tabs on the side panel with the slots in the server chassis and push the side panel tabs all the way into the slots. Then slide the side panel forward to its correct position.
11. Push in on the captive thumb screws to get them started, and tighten them to secure the side panel to the server.
12. Reinstall the top cover panel if it is not installed.

Server Diagnostics and Data Store Troubleshooting

The MTS 100 MPEG Test System consists of two major elements, the server computer and the Data Store hardware and software that are added to it. The server has built-in diagnostic routines that check to see that critical items are present and can be accessed. The Data Store hardware in instruments running MTS 100 software version 2.0 and earlier relies on isolating the defective module as the means of locating a failure. Instruments running MTS 100 software version 2.1 and later also have built-in diagnostic utilities. *Appendix B: Software Repair* has instructions for reloading both the operating system (Windows NT) and the application software.

There are two types of server diagnostics. One is a set of tests that are automatically performed each time that the power is turned on. A second and more complete set is called in from a menu and provides the user with a choice of tests.

The Data Store troubleshooting routines are designed to isolate failures of the MTS 100 MPEG Test System Data Store system hardware. The key hardware elements are the Data Store circuit board and the four associated SCSI channels (controllers, buses, and hard disks) that are added to the server.

Refer to *Data Store Diagnostics*, beginning on page 6–19, for information and instructions applicable to instruments running software version 2.1 and later.

Server Diagnostics

The server diagnostics ignore the added Data Store circuitry and deal only with the server. The power-on, self-test (POST) is run each time the server is powered on to determine that its hardware is operational. The diagnostics (DIAGS) are a set of user selected test routines that can be used to look at specific areas of server operation. For more information consult the server user manual.

Power-On Self-Tests (POST). This is a set of tests that run automatically at power up. If a system error occurs, an error code is displayed. For some error conditions, an audible alarm (consisting of one or more “beeps”) is generated. Operation of the following server assemblies is checked:

- System Board
- Power Supply
- Memory and Memory Expansion Boards
- Controllers
- Floppy Disk Drive
- Keyboard

A complete list of “*Error Codes and Instructions*” is in the server user manual.

Diagnostic Routines (DIAGS). These are the routines called from “Diagnostics and Utilities” selection of the “EISA Configuration Utility” menu. They provide routines to test, to inspect, to upgrade, and to diagnose the server. The following routines are called from the “*Diagnostics and Utilities*” menu:

- Test Computer
- Inspect Computer
- Upgrade Firmware
- Remote Utilities
- Diagnose Drive Array

For more information on any of these items, consult “*Diagnostic Tools*” in the server user manual.

If the diagnostic program passes all tests, troubleshoot the Data Store system.

Troubleshooting the Data Store System

Shutting down the MTS 100 MPEG Test System for several minutes can clear a number of minor Data Store system errors. If you are experiencing difficulty with the Data Store system, first shut down Windows NT and then switch server power off for five minutes. Always switch the instrument back on and verify that the difficulty still exists before beginning troubleshooting or diagnostic procedures.

To troubleshoot the Data Store system, try running the Data Store Administrator application. If the application runs, you can test the Data Store disk system. If the application does not run, either the application software or the Data Store circuit board has failed. Software repair instructions are located in *Appendix B*.

Before you attempt to repair the Data Store system, read the preliminary information that follows. Refer to the *Troubleshooting Procedure* on page 6-17 for fault isolation instructions for the Data Store disk system.

Data Store Administrator Application. Select Data Store Control from the Tektronix MTS100 V2.0 submenu to start the application. See Figure 6-6.

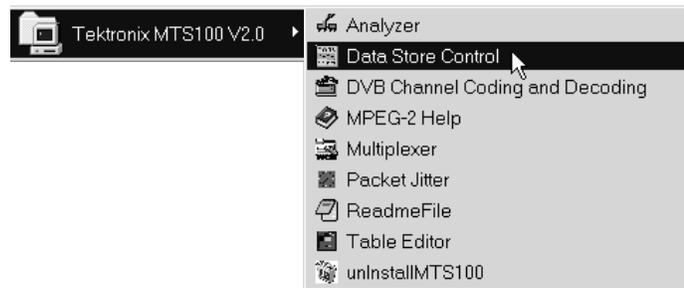


Figure 6-6: Start the application

The Data Store Administrator application window resembles Figure 6-7.

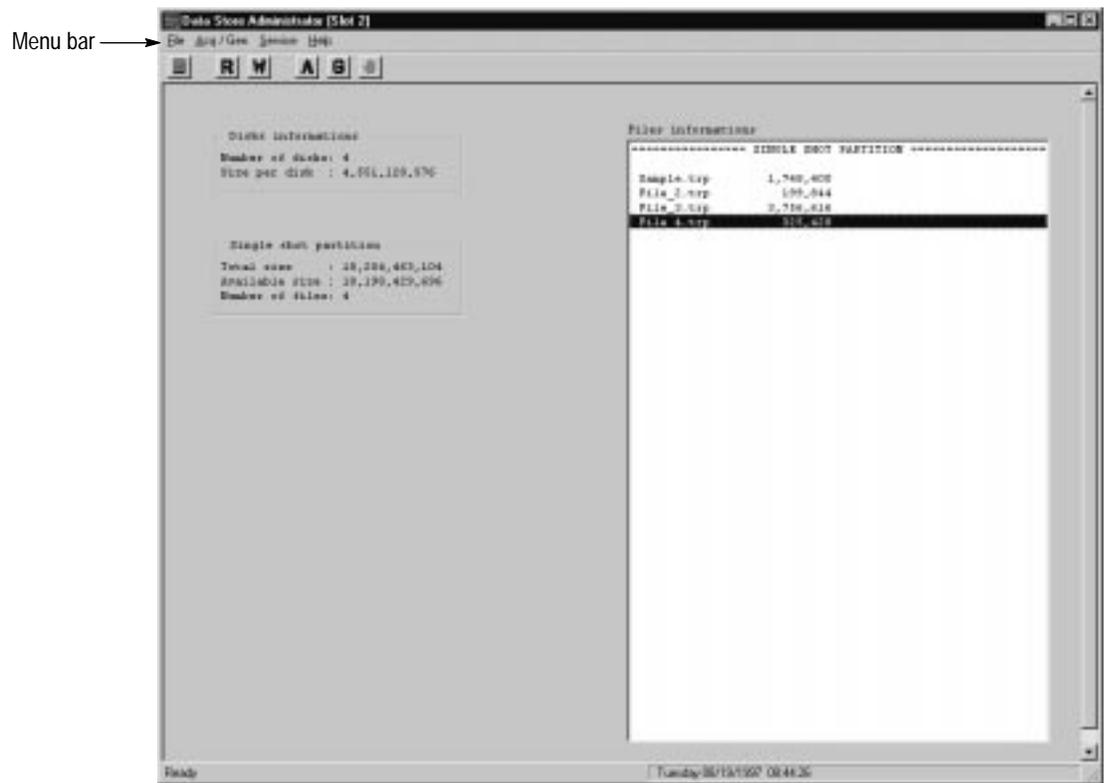


Figure 6-7: The Data Store Administrator application window

The menu bar in this window contains the names of the currently available menus. The procedures that follow use the File and Service menus to troubleshoot the Data Store circuit board and drives.

Finding Addressable Disks. An essential piece of the troubleshooting procedure is determining how many of the four disk drives are available. This information is available from the File menu in the CARB administrator window. The utility is Fat Read. See Figure 6–8.

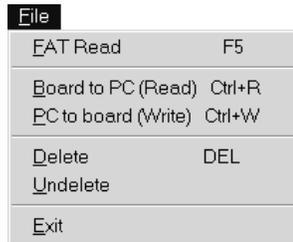


Figure 6–8: The Data Store Administrator File menu

The Fat Information table displays information about the disks that are installed in the server. See Figure 6–9.



Figure 6–9: The FAT Information



CAUTION. Repartitioning destroys all data stored on the Data Store disks. Repartitioning is a necessary repair function whenever a Data Store disk fails.

Repartitioning Disks. The Data Store system can run with fewer than four disk drives, but to do so the group of disks must be repartitioned. To repartition the disks, select Partitioning from the Data Store Administrator Service menu shown in Figure 6–10.

NOTE. If a disk drive has failed, you may not be able to repartition. Refer to the Troubleshooting Procedure on page 6–17 for instructions.

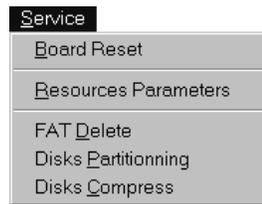


Figure 6–10: CARB administrator Service menu

To begin the partition, select Single shot (Figure 6–11) and click on OK.

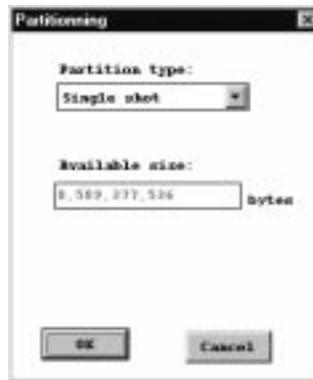


Figure 6–11: The Partitioning dialog box

Troubleshooting Procedure

The MTS 100 MPEG Test System Data Store system consists of the following replaceable components installed in the server:

- Data Store circuit board
- SCSI cables (4)
- Data Store disks (4)

NOTE. The SCSI Controller boards are part of the Data Store circuit board.

See Figure 8–1 in the *Replaceable Mechanical Parts* section for an exploded view showing the part locations.



CAUTION. It is possible to damage the server or disk drives by disconnecting them when the power is turned on. Do not remove or connect power connectors or SCSI cables with the server power switch turned on.

The Data Store system consists of four identical hard disk drives. You can interchange parts to isolate the defective drive. The system can operate on fewer than four Data Store disks, but the disks are read in the following order: 1, 2, 3, 4. See Figure 6–12 for the order of the installed disk drives.

NOTE. *The maximum data transfer rate is reduced when the Data Store system uses fewer than four drives.*

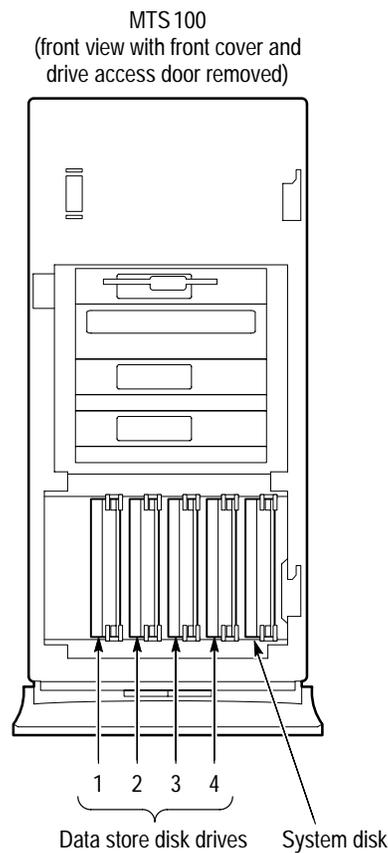


Figure 6–12: Data Store disk drive order

The FAT Information dialog box (see Figure 6–9 on page 6–16) displays the number of Data Store disks that are recognized by the server. If a Data Store disk is defective or missing, Table 6–2 shows how to use the “Number of Disks” readout to locate the defective disk drive.

Table 6–2: Identifying defective data store disks

FAT Information “Number of Disks”	Defective data store disk drive
0	Data Store disk Drive 1
1	Data Store disk Drive 2
2	Data Store disk Drive 3
3	Data Store disk Drive 4
4	No defective disks

After replacing a Data Store disk, you must repartition the Data Store system. Use the data transfer tests in the *Performance Verification* section to verify operation of the repartitioned system as follows:

- To test basic performance, transfer a small file between test systems.
- To test for intermittent failures or total disk space, transfer an 8-GByte file (18 Gbyte in instruments with serial numbers above B060000) between test systems. You can loop the output of the generating system to do so.

NOTE. Use the ECL parallel port for the fastest data transfer times. An 8 GByte file transfer requires approximately 20 minutes using the ECL parallel port at the maximum data rate.

Data Store Diagnostics

This section applies to MTS 100 MPEG Test System instruments running software version 2.1 and later. These instruments are limited to those with serial number B050000 and above and earlier instruments that have been upgraded by a Tektronix service facility.

The diagnostics tool is used to find and localize a fault on the Data Store and SCSI boards. This section describes how to use the diagnostics tool.

Starting Diagnostics

To start diagnostics open the Start menu and select **Run**. Enter the following in the text box (TEST must be uppercase) as shown in Figure 6–13:

```
C:\MTS100\bin\matracom.exe TEST
```



Figure 6-13: Enabling the Data Store diagnostics

When the Data Store Administrator starts, click **Tests** in the application window menu bar. The **Test choices** dialog box appears as shown in Figure 6-14.

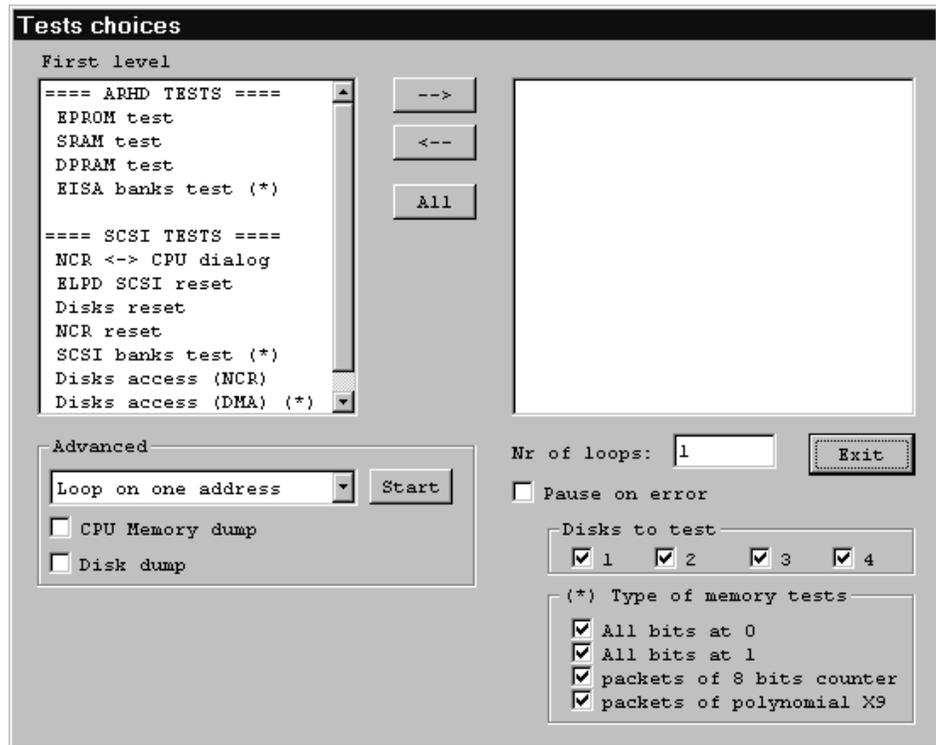


Figure 6-14: Test choices dialog box

First Level Tests

The available first level tests are listed on the left side of the dialog box. You can easily select all of the tests to run by clicking on the **All** button. Every first level test will then be listed in the test list on the right side of the dialog box. To select an individual test, double click the test name on the **First level** list and it will appear in the test list.

Some of the test choices end with an asterisk (*). At the bottom right side of the dialog box there are selections for those particular tests. It is recommended that all of the selections be checked.

Enter the number of times you want the tests to run in the **Nr of loops** text box. If you want an individual test to run more often than the other tests, double click the test name in the right-hand test list and enter the number in the resulting **Input** dialog box.

NOTE. *Looping all tests several times can result in false EISA bank test failures.*

You may also specify which SCSI disks you want to test. It is recommended that you test all disks. In the **Test choices** dialog box, the SCSI disks are number 1 through 4. These correspond to disks 0 through 3 that are listed elsewhere in this manual.

Once the choices are selected, the dialog box changes as shown in Figure 6–15. Click the **Start** button located between the two lists to begin testing.

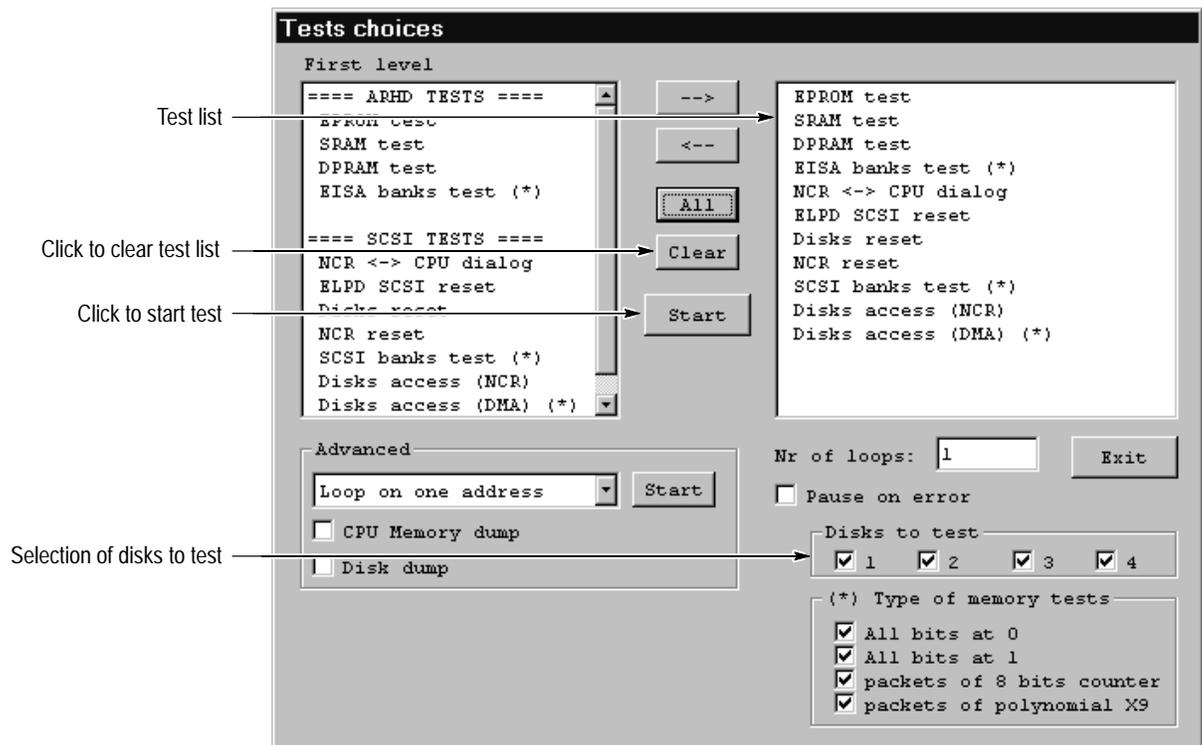


Figure 6–15: Example test choices

Once you click **Start**, the **Test choices** dialog box changes again as shown in Figure 6–16.

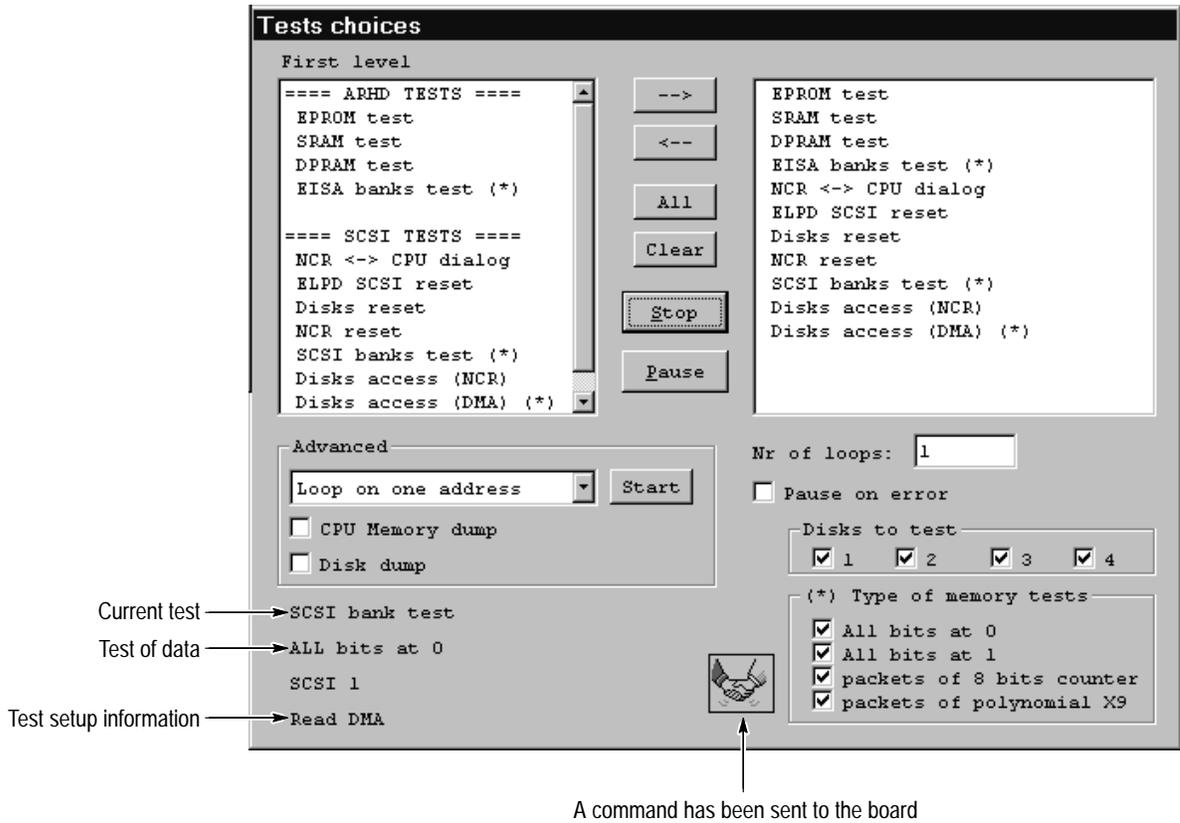


Figure 6–16: Test choices dialog box while tests are running

- The **Start** button changes to **Stop**.
- The **Exit** button disappears.
- A **Pause** button appears.
- The current test being executed, the type of data for the test, and test step information appears in the lower left corner of the window.
- A handshake icon appears when a command is sent to the Data Store board.

NOTE. The mouse cursor does not change to the conventional hour glass symbol.

Output Window. Once you start the tests the **Output** window appears. The result of each completed test is displayed in this box. Figure 6–17 shows the **Output** window.

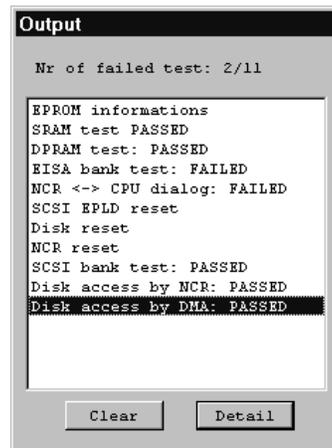


Figure 6–17: Output window

Test Result Details. You can view test result details by selecting a test result line in the **Output** window and clicking **Detail**. Figure 6–18 shows the **Detail** dialog box when a SCSI board has failed.

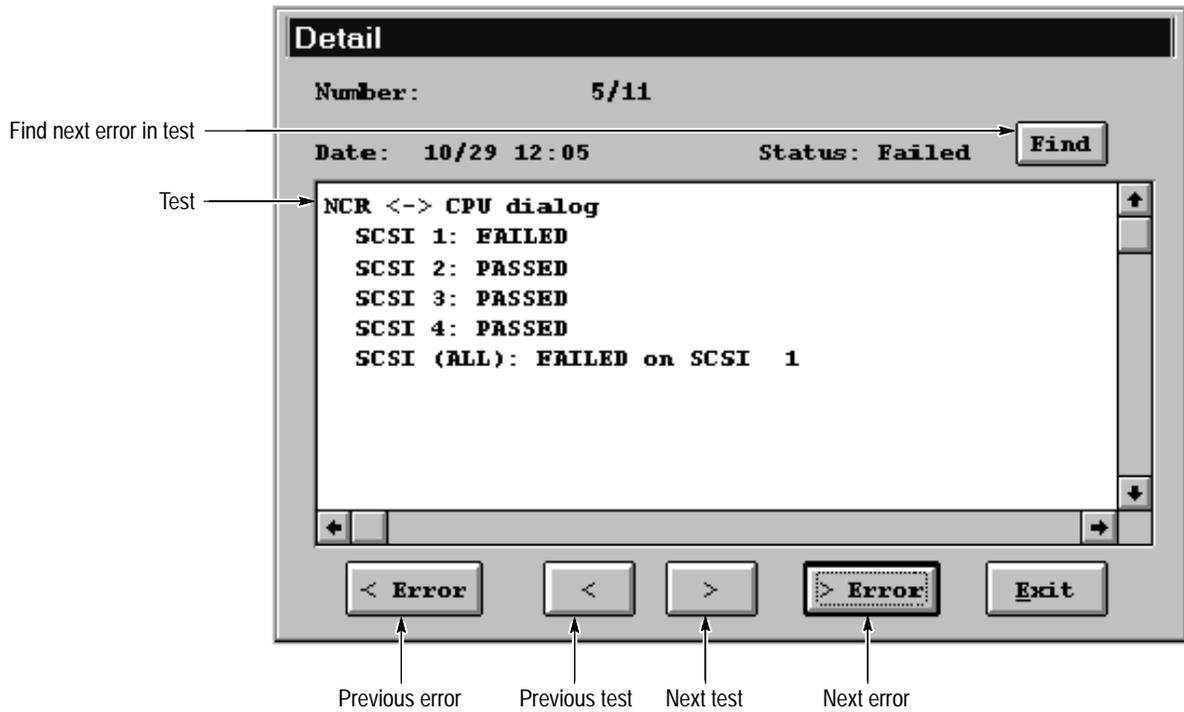


Figure 6-18: Detail dialog box

First Level ARHD Tests

The first level tests of the Data Store board (listed as ARHD in the Test choices dialog box) consists of the following:

- EPROM checksum test. The CPU adds all bytes of its own EPROM in a 16 bits wide result. The results in the Detailed dialog box shows the MTS100 version number, the checksum in hex, and any comments.
- SRAM. This selection tests the board’s main CPU RAM. For the SRAM test the **Detail** dialog box displays error addresses as shown in Figure 6-19.



Figure 6–19: SRAM failure

- DPRAM. This selection test the Dual Port RAM. This test confirms that communication between the PC and the CPU is accurate. For the DPRAM test the Detail dialog box displays where the error is located, the PC (DRIVER) or the Data Store (CARB) board. Figure 6–20 shows a CARB error with the offset address.

NOTE. The term “CARB” is a French acronym referring to the Data Store disks or the Data Store board. In this case it refers to the Data Store board.



Figure 6–20: DPRAM failure

- EISA banks test *. This selection tests the two banks of the EISA cards cage. Each bank is 1 Meg byte and 32 bits wide. The asterisk (*) indicates that you have different types of data to use when performing this test. The types are listed in the lower right side of the **Test choices** dialog box. It is recom-

mended you select all of the types. Figure 6–21 shows the **Detail** dialog box with an EISA failure. The box shows the test that was running when the failure was found, the name of the bank (FLIP), and which chip failed.



Figure 6–21: EISA failure

NOTE. Looping all tests several times can result in false EISA banks test failures. If the EISA banks test fails during a loop of all tests, run or loop only the EISA banks test to determine the validity of the failure.

First Level SCSI Tests

The first level test of the SCSI test consists of the following:

- NCR <->CPU dialog. This test checks the link between the Data Store board (CPU) and the SCSI controller (NCR). Figure 6–22 show the **Detail** dialog box when a NCR <->CPU failure occurs.



Figure 6–22: NCR <-> CPU failure

- EPLD SCSI reset. This is not actually a test. This function resets the SCSI drive. Use this function if you suspect that the drive is frozen or temporarily not functioning properly.
- Disk reset This function resets the SCSI bus. Use this function if you suspect that the drive is temporarily not functioning properly.
- NCR reset. This function resets the SCSI controller board. Use this function if you suspect that the SCSI system is temporarily not functioning properly.
- SCSI banks test. This test checks the read and write access of the memory bank of each selected SCSI controller board. In order for this test to report correct results, the EISA banks test must not have any failures. The **Detail** dialog box reports component failures as shown in Figure 6–23.

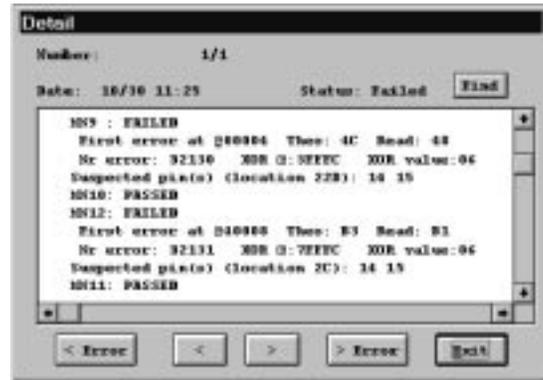


Figure 6–23: SCSI banks failures

- Disk access by NCR. This test checks the link between the Data Store board and the disks through the SCSI controller boards. This test verifies the link to all disks irregardless of what is selected in the Test choices dialog box. The test automatically runs all types of memory tests. Figure 6–24 shows the **Detail** dialog box when a failure occurs.



Figure 6–24: Disk access by NCR failure

- Disk access by DMA. This test checks the read and write access to each disk. In order for this test to report correct results, the EISA banks test must not have any failures. The asterisk (*) indicates that you have different types of data to use when performing this test. The types are listed in the lower right side of the **Test choices** dialog box. It is recommended you select all of the types. Figure 6–25 shows the **Detail** dialog box when a failure occurs.



Figure 6–25: Disk access by DMA failure

Advanced Tests

On the lower left side of the Test choices dialog box are selections for advance testing. Advanced testing requires external test equipment and is performed only at the factory.

Repackaging

The MTS 100 MPEG Test System is shipped in a carton designed to provide it with the maximum protection. If the instrument is subsequently shipped you will

need to use this carton and the instrument support inserts to provide adequate protection.

NOTE. *The MTS100 shipping carton must be used to return the instrument to Tektronix service centers. We cannot honor the warranties if it is not shipped in its original carton or a purchased replacement carton.*

Obtaining Replacement Packaging

New packaging material is available from Tektronix. The part numbers are in Table 6–3. Packaging components are shown in Figure 6–26. Each component has an index number which also appears in Table 6–3. Contact your nearest Tektronix office or representative to obtain new packaging parts.

Table 6–3: Packaging Material

Item	Tektronix part number	Index number
Top cushion (Cardboard Insert)	004-4912-00	1
Instrument support inserts; top and bottom	004-4913-00	2
Shipping box	004-4914-00	3

Repackaging the Server

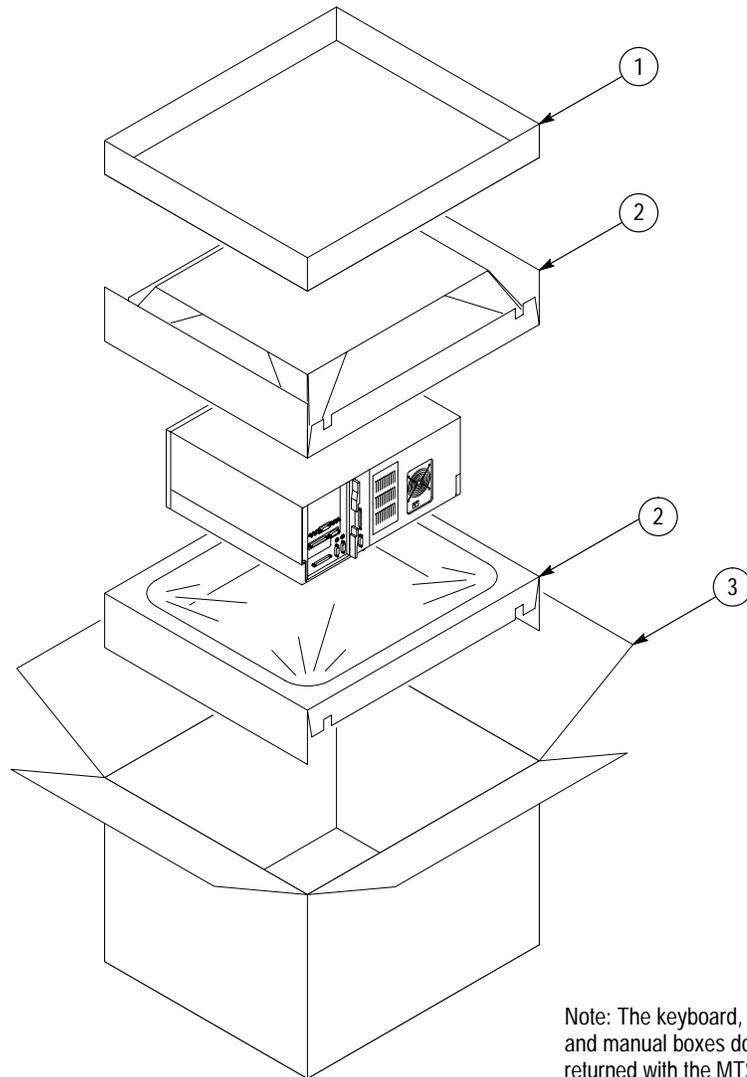
When the server is shipped, it is important to provide it with the maximum protection. Figure 6–26 shows how to repack the server for shipment. As the figure shows, it is not necessary to have the keyboard, mouse, server front door, or server pedestal in the package for reshipment. However, the server pedestal and front door must be removed from the server for reshipment to prevent damage to the packaging or server parts.

NOTE. *The software enabler key (HASP) is required by the Tektronix Service Center if the ProLiant server is returned for repair.*

Remove the server door first. Open the door all the way and lift up on the door to disengage the hinge pins of the two hinges on the right side of the server door from the hinge pin holes in the server chassis.

Then remove the server pedestal as follows:

1. Carefully place the server on its top.
2. Locate the retaining clip that holds the pedestal on the server.
3. Use your thumb to release the retaining clip and slide the pedestal to disengage the pedestal from the server.



Note: The keyboard, mouse, pedestal and manual boxes do not need to be returned with the MTS100 for servicing.

Figure 6-26: Repackaging the MTS100 server

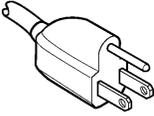
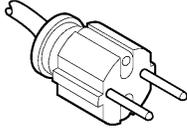
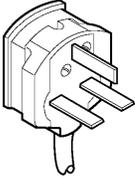
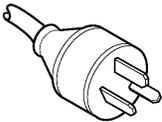
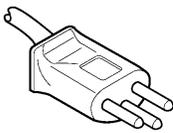


Options

Options

The power cord options shown in Table 7-1 are available for the MTS100 MPEG Test System.

Table 7-1: Power cord options

Plug Configuration	Normal Usage	Option Number
	North America 125 V/15A Plug NEMA 5-15P	Standard
	Europe 230 V	A1
	United Kingdom 230 V	A2
	Australia 230 V	A3
	Switzerland 230 V	A5



Replaceable Parts

Replaceable Parts

This section contains a list of the replaceable modules for the MTS100 MPEG Test System. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Module Servicing

Modules can be serviced through one of the following three options. Contact your local Tektronix service center or representative for repair assistance.

Module Exchange

In some cases you may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, call 1-800-TEK-WIDE, extension 6630.

Module Repair and Return

You may ship your module to us for repair, after which we will return it to you.

New Modules

You may purchase replacement modules in the same way as other replacement parts.

Using the Replaceable Parts List

This section contains a list of the mechanical and/or electrical components that are replaceable for the MTS100 MPEG Test System. Use this list to identify and order replacement parts. The following table describes each column in the parts list.

Parts List Column Descriptions

Column	Column Name	Description
1	Figure & Index Number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix Part Number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial Number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entries indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & Description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
7	Mfr. Code	This indicates the code of the actual manufacturer of the part.
8	Mfr. Part Number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations Abbreviations conform to American National Standard ANSI Y1.1–1972.

Mfr. Code to Manufacturer Cross Index The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers cross index

Mfr. Code	Manufacturer	Address	City, State, Zip Code
04963	3M COMPANY	ADHESIVE COATING & SEALERS DIV 3M CENTER	ST PAUL, MN 55101-1428
06383	PANDUIT CORP	17303 RIDGELAND AVE	TINLEY PARK, IL 60477-3048
0B445	ELECTRI-CORD MFG CO INC	312 EAST MAIN STREET	WESTFIELD, PA 16950
0J9P9	GEROME MFG CO INC	PO BOX 737 403 NORTH MAIN	NEWBERG, OR 97132
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214-4657
18565	CHOMERICS INC	77 DRAGON COURT	WOBURN, MA 01880
2W733	BELDEN WIRE & CABLE COMPANY	2200 US HWY 27 SOUTH PO BOX 1980	RICHMOND, IN 47374
30817	INSTRUMENT SPECIALTIES CO INC	EXIT 53, RT 80 BOX A	DELAWARE WATER GAP, PA 18327
5F520	PANEL COMPONENTS CORP	PO BOX 115	OSKALOOSA, IA 52577-0115
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077-0001
80126	PACIFIC ELECTRICORD CO	747 WEST REDONDO BEACH PO BOX 10	GARDENA, CA 90247-4203
TK1547	MOORE ELECTRONICS INC	19500 SW 90TH CT PO BOX 1030	TUALATIN, OR 97062
TK1943	NEILSEN MANUFACTURING INC	3501 PORTLAND RD NE	SALEM, OR 97303
TK2469	UNITREK CORPORATION	3000 LEWIS & CLARK HWY SUITE 2	VANCOUVER, WA 98661
TK2541	AMERICOR ELECTRONICS LTD	UNIT-H 2682 W COYLE AVE	ELK GROVE VILLAGE, IL 60007
TK2548	XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON, OR 97005
TK2607	VANSTAR CORPORATION	OREGON CORP ACCOUNTS DIVISION 16280 SW UPPER BOONES FERRY RD	PORTLAND, OR 97224
TK6075	ALADDIN SOFTWARE SECURITY INC	350 FIFTH AVE SUITE 6614	NEW YORK, NY 10118

Replaceable parts list

Fig. & Index Number	TektronixPart Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
8-1	174-3556-01			4	CABLE ASSY, SP:SHLD RIBBON,SCSI,IDC,28 AWG,18L,2X25, 0.1 CTR,RCPT,CTR PLZ,W/FERRITE BOTH ENDS	80009	174-3556-01
-2	118-9285-03			1	CKT BD ASSY:STOR BD ASSY,SUPPORTING MPEG-2 TRANSPORT MUX GEN. SOFTWARE,ADONUM MPEG-2	80009	118-9285-03
-2	118-9285-04	B050000		1	CKT BD ASSY:STOR BD ASSY,SUPPORTING MPEG-2 TRANSPORT MUX GEN. SOFTWARE,ADONUM MPEG-2	80009	118-9285-04
-3	118-9284-03			1	COMPUTER,PC:PENTIUM,PC,200-MHZ,32MEG RAM,CD-ROM,HARD DRIVE,PROLIANT 2500R	TK2607	118-9284-03
	348-0274-00			1	SHLD GSKT,ELEK:FINGER TYPE, 0.5 FT.	30817	97-555-05
	348-1527-00			1	GASKET, WIRE:WIRE MESH,EMI,0.125 H X 0.188 X 0.002 D, 2.5 FT.	18565	6593
-4	119-5173-02		B059999	4	DISK DRIVE:WINCHESTER,3.5LP,2.15GB,SCSI,8MS	80009	119-5173-02
	119-5731-01	B060000		4	DISK DRIVE:WINCHESTER,3.5 INCH,4.55GB,SCSI,TESTED	80009	119-5731-01
-5	174-3578-00			3	CABLE ASSY,RF:COAXIAL,RFD,50 OHM, 39.5L,SMB,PLUG,FEMALE,CONTACT X BNC, MALE	80009	174-3578-00
-6	174-3579-00			3	CABLE ASSY, RF:COAX,RFD,75 OHM,39.5L,SMB,PLUG, FEMALE CONTACT X BNC,MALE	80009	174-3579-00
-7	161-0066-00			1	CA ASSY,PWR:3,18 AWG,250V/10A,98 INCH,STR,IEC320, RCPT X NEMA 5-15P,US (STANDARD ONLY)	0B445	ECM-161-0066-00
-8	174-3603-00			1	CABLE ASSY:SHLD CMPST,CRC,9,24 AWG,TWPR,MALE, DSUB,BOTH ENDS,1 TO 1 CONNECTION,PAIRS 1-6,2-	80009	174-3603-00
-9	174-3562-00			1	CA ASSY,SP:SHLD CMPST,25,28 AWG,72 INCH,DB25M X DB25M,25 POS,DSUB,MALE,BOTH ENDS,1 TO 1,WI	80009	174-3562-00
-10	333-4243-00			1	PANEL,REAR:6.200 X 3.850,0.00075 IN MIN NICKEL,BRIGHT,MTS100	TK1943	333-4243-00
-11	063-1938-00			1	SOFTWARE ITEM:SOFTWARE PROTECTION DEVICE MEMOHASP-1	80009	063-1938-00
-12	386-6981-00			1	PLATE:REAR PANEL NUTPLATE,CRS,2.7 X 1.375,MTS100	OJ9P9	386-6981-00
-13	386-6980-00			1	BRACKET:CIRCUIT BD,CRS,4.782 X 1.700,MTS100	80009	386-6980-00
-14	213-1094-00			12	SCREW,TPG TF:6-32 X 0.250,PNH,STL,ZINC,T-15 TORX,TAPTITE	80009	213-1094-00
					STANDARD ACCESSORIES		
	386-6908-00			2	BRACKET,SUPPORT:SIDE ACCESS DRIVE CLIPS KIT	80009	386-6908-00
	063-1888-02			1	SOFTWARE PKG:BACKUP DISK,MTS100,VERSION2.0	80009	063-1888-02
	063-1912-01			1	SOFTWARE PKG:WINDOWS NT 4.0,CDROM	80009	063-1912-01
	063-1913-00			1	EMERGENCY REPAIR DISK, BLANK,3.5 FLOPPY,MTS100	80009	063-1913-00
	063-1914-00			1	SOFTWARE PKG:CDROM STREAM DATA DISK	TK2548	063-1914-00
	070-9578-05			1	MANUAL, TECH:READ ME FIRST MANUAL,MTS100	80009	070-9578-05
	070-9578-06	B050000		1	MANUAL, TECH:READ ME FIRST MANUAL,MTS100	80009	070-9578-06
	070-9376-04			1	MANUAL,TECH:USER,MTS100,SOFTWARE V2.0	80009	070-9376-04
	070-9376-05	B050000		1	MANUAL,TECH:USER,MTS100,SOFTWARE V2.1	80009	070-9376-05

Replaceable parts list (cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
	119-5426-00			1	MONITOR,COLOR:17 INCH,30-69 KHZ MULTI SYNC,TCO, 0.27MM DOT PITCH,FLAT CRT,PWR SAVING,ON SCREEN	80009	119-5426-10
					OPTIONAL ACCESSORIES		
	161-0066-09			1	CA ASSY,PWR:3,0.75MM SQ,250V/10A,99 INCH,STR,IEC320, RCPT,EUROPEAN (EUROPEAN OPTION A1 ONLY)	2W733	ORDER BY DESCR
	161-0066-10			1	CA ASSY,PWR:3,0.1MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT X 13A,FUSED UK PLUG(13A FUSE),UNIT (UNITED KINGDOM OPTION A2 ONLY)	TK2541	ORDER BY DESCR
	161-0066-11			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT,AUSTRALIA (AUSTRALIA OPTION A3 ONLY)	80126	ORDER BY DESCR
	161-0154-00			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT,SWISS (SWISS OPTION A5 ONLY)	5F520	86515030
	070-9521-03			1	MANUAL,TECH:SERVICE,MTS100	80009	070-9521-03

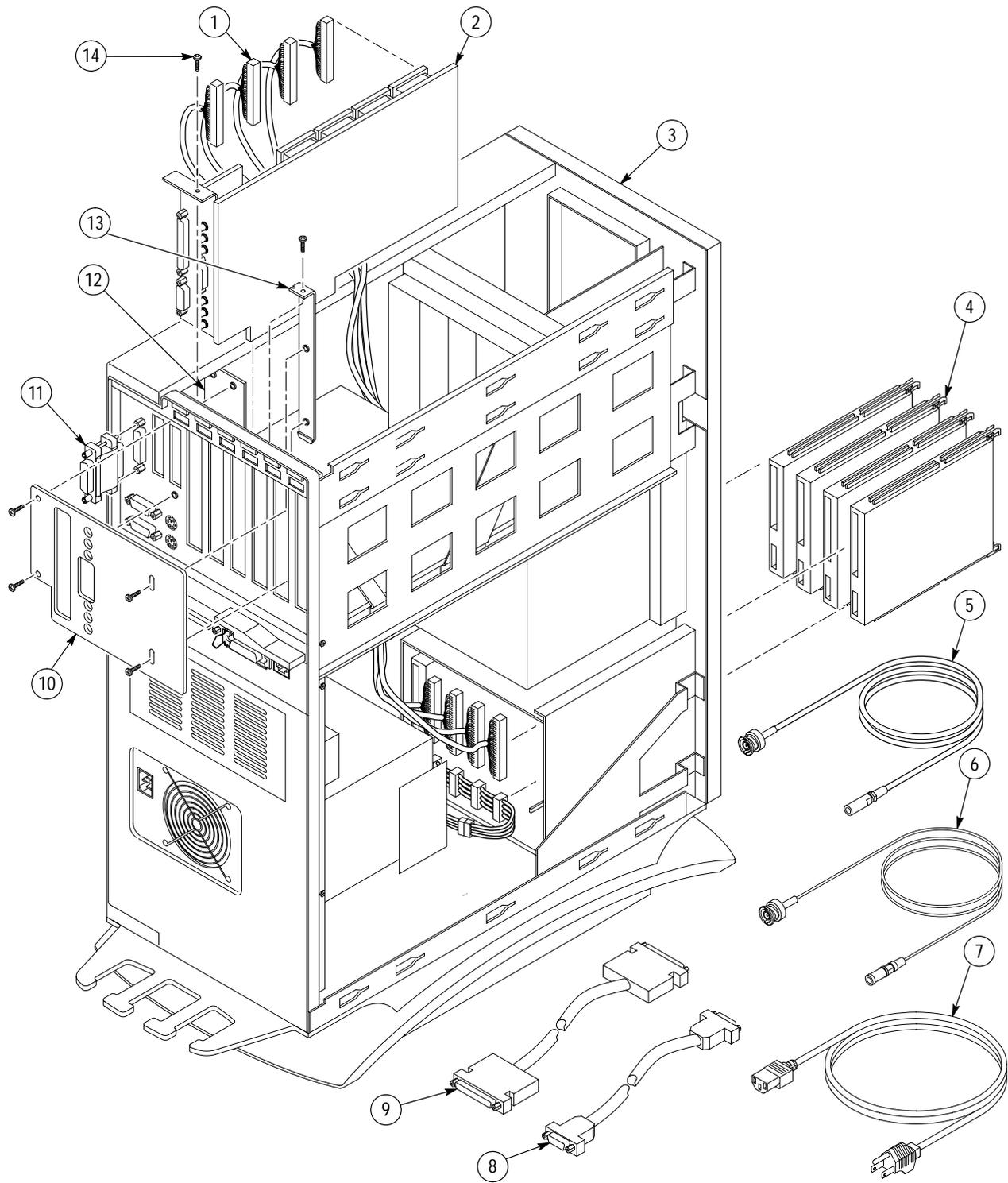


Figure 8-1: MTS100 MPEG Test System



Appendices

Appendix A: Software Repair (Software Version 2.0)

This appendix applies to instruments with serial numbers B040000 and higher that use Windows NT 4.0 and MTS 100 software version 2.0. There are four parts to this appendix:

- *If an Application Locks* (below) tells how to shut down an application that no longer responds to input.
- *Creating and Using an Emergency Repair Disk* (page A–2) explains how to create and use a system-specific repair disk.
- *Reinstalling the MTS100 Version 2.0 Software* (page A–5) tells what to do if one or more of the MTS 100 application files are corrupted.
- *Installing the Software on a New System Disk* (page A–16) explains the procedure for restoring the MTS 100 software in the unlikely event that you must replace the system disk.

***NOTE.** If your test system has been upgraded to software version 2.1, follow the procedures in Appendix B.*

If an Application Locks

As with all software, the MTS 100 MPEG Test System applications occasionally lock up. In most cases the easiest way out is through the Windows NT End Task utility. However, if you are in the Data Store Control (CARB) application, you can go to the CARB administrator menu to access the Service menu and click on Card Reset, which may unlock this application.

If that does not work, or you are in another application, try closing the application using the Windows NT Security dialog box. The following procedure will use this utility to unlock the application.

1. Press CTRL+ALT+DEL to access the Windows NT Security dialog box.
2. Click Task Manager... to open the **Task Manager** window.
3. Click the Applications tab and then select the locked application, as shown in Figure A–1.

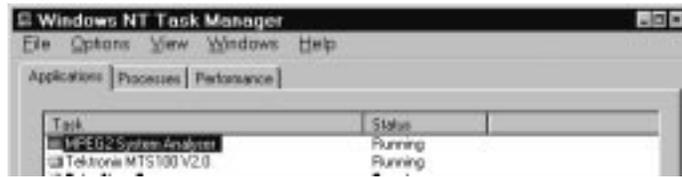


Figure A-1: Select the locked application in the Task Manager window

4. Click End Task. This should exit the locked application.

If the above procedure does not close the locked application, try performing the following three-step procedure.

1. Press CTRL+ALT+DEL to access the Windows NT Security dialog box.
2. Click Shutdown to open the Shutdown Computer dialog box.
3. Select Shutdown and Restart and then choose OK.

If this does not end the application or shut down the unit, power the Server down for a few seconds and then proceed with a normal power up.

NOTE. *It is not good practice to power down the Server without first exiting Windows NT. Only use this method if the Server is not responsive.*

Creating and Using an Emergency Repair Disk

An emergency repair disk, specific to the system, is supplied with each MTS 100 MPEG Test System. Whenever you upgrade the software or change your password, it is strongly recommended that you also create a new emergency repair disk. This will minimize the chances that you will need to completely re-load the operating software for minor problem.

Use the emergency repair disk to restore your system to its initial setup state if your system files become corrupt and you are unable to recover the previous start up configuration (Last Known Good — the Windows NT startup screen option). If you don't have the emergency repair disk, you will have to reinstall Windows NT. Please see the Windows NT System Guide, provided with your back-up copy of Windows NT, for the procedure required to restore your system.

You may also need the emergency repair disk is to restore user passwords if they are forgotten. Be sure to update the emergency repair disk each time you add a user or change a password.



CAUTION. The files on the Emergency Repair Disk are MTS 100-specific; that is, the disk shipped with an MTS 100 is the **ONLY** one that will work with that unit. Do not lose this disk. If you lose the Emergency Repair Disk provided with your MTS 100, create a new one as described below.

Creating an Emergency Repair Disk

To create an emergency repair disk, mark a High Density 3.5-inch disk clearly as the emergency repair disk for MTS 100 serial number B04nnnn (the serial number of your MTS 100) and then perform the following steps.

NOTE. The emergency repair disk is MTS 100-specific. Make sure that the emergency repair disk is clearly marked with its MTS 100 serial number. The serial number of your MTS 100 MPEG Test System appears on the original emergency repair disk and on the server rear panel, near the power input connector.

1. Choose Run from the Windows NT Start menu.
2. Type `rdisk` in the Run dialog box. The Repair Disk Utility dialog box, as shown in Figure A-2, opens.

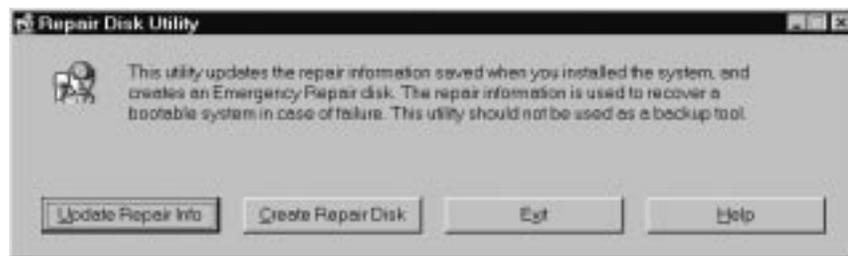


Figure A-2: The Repair Disk dialog box

3. Click Update Repair Info to save your current configuration. A message appears to remind you that earlier repair information is overwritten. Click Yes to continue.
4. When the process is complete, a message appears to ask if you wish to create an Emergency Repair Disk. Click Yes. The message shown in Figure A-3 appears.

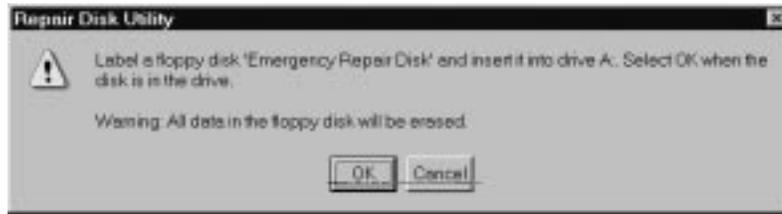


Figure A-3: All data on the disk will be erased

5. Insert a 3.5-inch disk in drive A and click OK. Rdisk formats the disk and copies the configuration files onto it.
6. When the operation is complete, click Exit in the Repair Disk Utility dialog box. Remove the disk from drive A and keep it in a safe place.

Using the Emergency Repair Disk

Always refer to the Windows NT documentation if you need more information.

1. Verify that you have a source of setup information available (the Windows NT back up software package).
2. Insert the Windows NT Setup disk.
3. Restart the MTS 100.
4. When the Windows NT Setup Screen appears, press R (repair).
5. When prompted, insert the emergency repair disk.
6. The emergency repair disk performs the following:
 - Runs CHKDSK.EXE on the WINNT and SYSTEM partitions.
 - Verifies each file in the installation and replaces any that are missing or corrupt.
 - Replaces the System, Security, and Security Accounts Manager hives in the registry.
 - Reinstalls the Boot Loader (the boot sector, BOOT.INI, etc.).

Reinstalling the MTS 100 Version 2.0 Software

Use the procedures below to reinstall your MTS 100 software if it is accidentally deleted or becomes corrupted. Software has been supplied on CD-ROM.

NOTE. *The following instructions are for reinstalling MTS 100 V2.0 software on a machine running Windows NT Workstation 4.0 only; procedures for upgrading the software may be different. If you are installing a software upgrade, follow the instructions provided with the upgrade kit.*

Reinstalling the software involves four procedures:

- Copying the program files
- Resetting the Data Store Administrator resource parameters.
- Configuring the MTS 100 program group and Start menu



CAUTION. *The software routines that uninstall and reinstall the MTS 100 version 2.0 applications are not optimized for the Windows NT 4.0 operating system or the Proliant platform. Information in this manual supersedes many instructions displayed during uninstallation and reinstallation. To ensure correct operation of the MTS 100 applications, follow the instructions in this manual carefully.*

Copying the Program Files

1. Restart Windows NT.
2. Log in to Windows NT as administrator (Username = administrator; password = MPEG2). You must log in as administrator in order to install applications.
3. Quit any applications that started at login.
4. If you are reinstalling because the MTS 100 software has become corrupted, you should uninstall the software using unInstall MTS100, available through the Tektronix MTS 100 V2.0 submenu.
 - a. To remove the existing MTS 100 software, click unInstall MTS100 (see Figure A-4).



Figure A-5: Run d:\setup to reinstall the software

12. Type **d:\setup** in the Open: text box. Click OK to begin MTS 100 software installation with the dialog box shown in Figure A-6.



Figure A-6: The MTS100 software installation dialog box

13. Read the text in the dialog box and then click **Next** to proceed to the **Choose Destination Directory** dialog box shown in Figure A-7.



Figure A-7: Specifying the destination directory

14. Specify the directory into which the MTS 100 software should be installed. The default directory is c:\MTS100. If you wish to use a different directory name, click **Browse**. To accept the default directory, click **Next** (or press ENTER). The **Select Program Folder** dialog box shown in Figure A-8 appears.

NOTE. It is strongly recommended that you use the default directory name.



Figure A-8: The Select Program Folder dialog box

15. Click **Next** to accept the default name and continue.

The setup program begins installing the MTS 100 software. The progress indicator shown in Figure A-9 is displayed to show the percentage of installation that is complete.

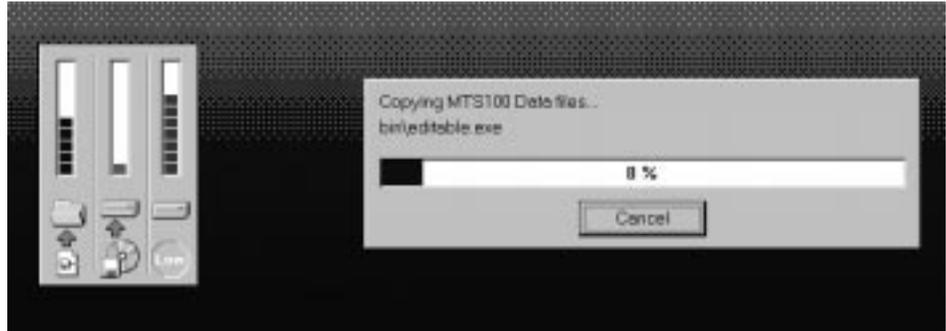


Figure A-9: The progress dialog box and activity gauges

16. After the setup program has copied all files to the hard drive, an information window is displayed to describe Program Folder and Icon creation. This step *is not* performed under Windows NT 4.0 as described. Press OK to continue.
17. Next, an Information box, shown in Figure A-10, is displayed to remind you to verify that the HASP is installed. *Be sure* that the HASP is installed as described on page 2-6 of this manual; then click **OK** to continue.



Figure A-10: Check HASP installation

18. After the HASP Device Driver is installed, the dialog box in Figure A-11 appears. Click on **OK** to continue.



Figure A-11: Notice to reboot your system

19. The installation program completes the process then displays an Information box that asks you to reboot the system and read the Read_Me_First file. Click OK and wait a moment for the **Restart Windows** dialog box, shown in Figure A-12, to open.

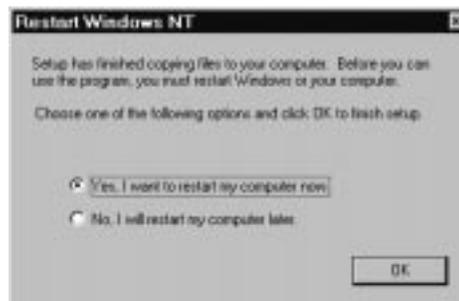


Figure A-12: The Restart Windows NT dialog box

20. Select **No, I will restart my computer later** and then click **OK**.

NOTE. Because the version 2.0 installation script configures the Data Store board incorrectly for the Proliant 2500 server, you will be unable to use the Data Store Administrator application unless you perform the following procedure before restarting the computer.

21. Start the Data Store Administrator application through the Run item on the Windows NT Workstation Start menu.
 - a. Select Run from the Start menu as shown in Figure A-13.



Figure A-13: Select Run from the Start menu

- b. Enter `c:\Mts100\Bin\Matracom.exe` into the **Open** text box as shown in Figure A-14.



Figure A-14: Specify `c:\Mts100\Bin\Matracom.exe`

- c. Click **OK** (or press ENTER) to start the Data Store Administrator.
22. The message shown in Figure A-15 appears. Click **OK**.

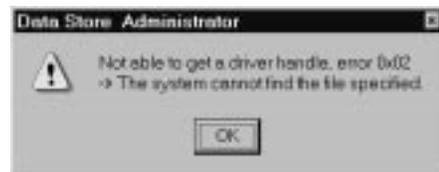


Figure A-15: The resource parameters have not been reset

23. Choose **Resources Parameters** from the Service menu to open the **Resources Parameters** dialog box.

***NOTE.** When you reload V2.0 software into a ProLiant 2500 server, you must change the slot number to slot 2.*

24. Enter **2** in the dialog box **Slot** field and then click **OK** to close the dialog box.

25. A message appears to remind you that you must restart the computer to take the changes into account. Click **OK** to continue and then exit the application.
26. Restart the computer (select Shut Down from the Start menu, select **Restart the Computer?** in the resulting **Shut Down Windows** dialog box, and click **Yes**).

Configuring the Program Group and Start Menu

Follow these directions to configure the MTS 100 program group and start menu, if necessary, and to ensure that the Windows shortcuts point to the correct directories and files.

1. Log in again as the administrator (Username = administrator; password = MPEG2).
2. Choose Taskbar from the Settings submenu (of the Windows NT Start menu), as shown in Figure A-16.



Figure A-16: Choose Taskbar from the Settings submenu

3. Click the Start Menu Programs tab on the resulting Taskbar Properties dialog box; then click Advanced, as shown in Figure A-17.



Figure A-17: Choose Advanced Start Menu Settings

- The **Exploring** window opens with the contents of the Administrator\Start Menu folder visible on the right side. Open the Programs folder by double-clicking the icon, as shown in Figure A–18.

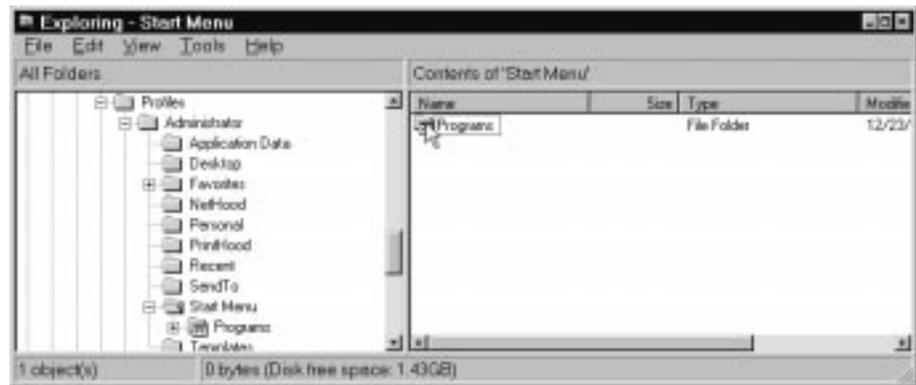


Figure A–18: Open the Programs folder

- Hold the CTRL key down and select the Analyzer, Data Store Control, DVB Channel Coding, Multiplexer, Packet Jitter, and Table Editor shortcuts, as shown in Figure A–19. Then drag the shortcuts into the Tektronix MTS 100 V2.0 file folder, also on the right side of the **Exploring** window (immediately above the Analyzer shortcut in Figure A–19).

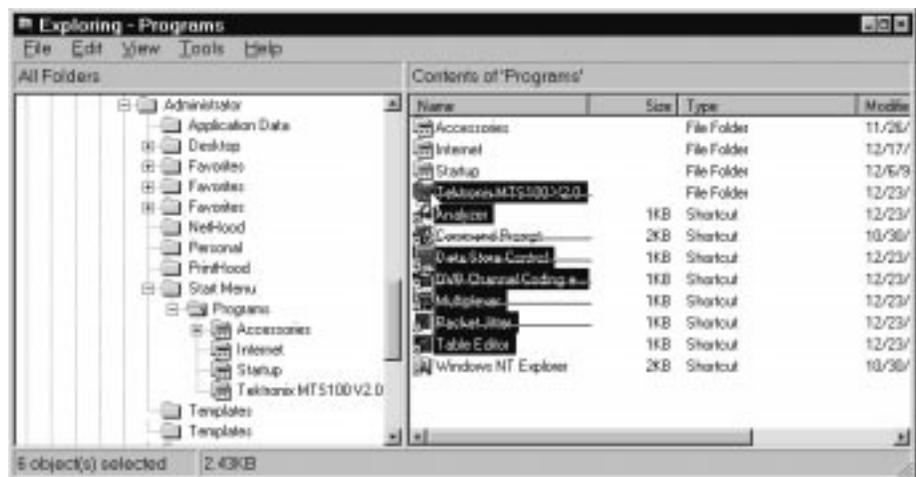
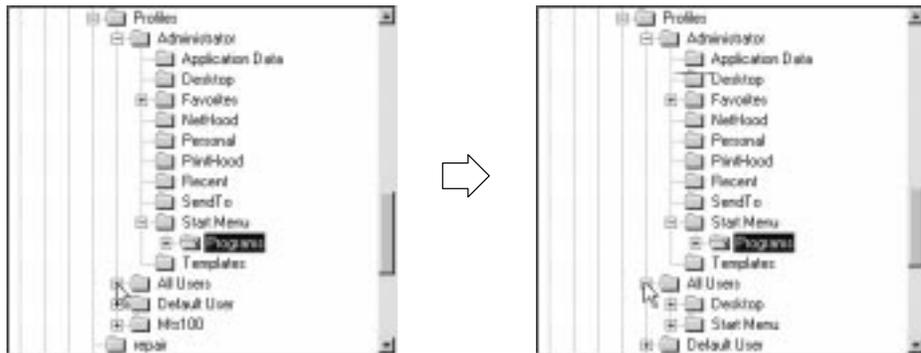


Figure A–19: Move the MTS 100 shortcuts into the file folder

- Click on the + box to the left of C:\Winnt\Profiles\All Users in the All Folders hierarchy to expand the folder.



7. Drag the Tektronix MTS 100 V2.0 file folder from the right side of the **Exploring** window to the C:\Winnt\Profiles\All Users\Start Menu folder on the left (All Folders) side of the window, as shown in Figure A-20.

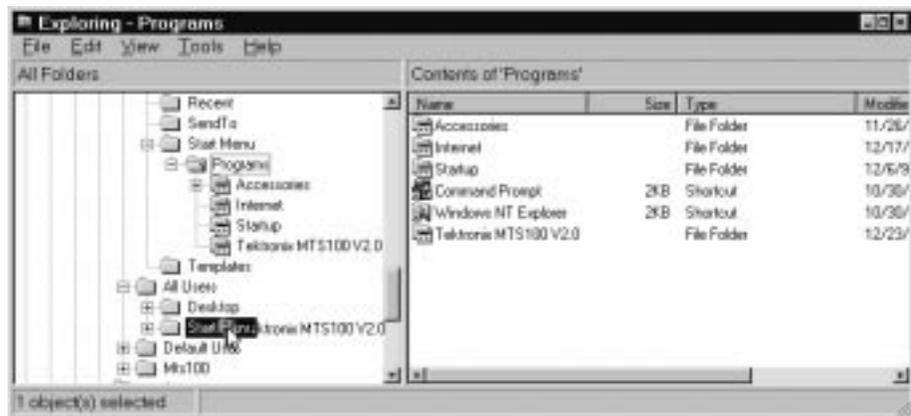


Figure A-20: Replace the old MTS 100 V2.0 file folder with the new

8. To create a new “program group” window on the MTS 100 desktop, first click the + box next to the C:\Winnt\Profiles\All Users\Start Menu folder; then hold the CTRL key down while dragging the MTS 100 V2.0 folder onto the C:\Winnt\Profiles\All Users\Desktop folder, as shown in Figure A-21.



Figure A–21: Copy the MTS 100 V2.0 folder to the desktop folder

9. Close the **Exploring** window and click **OK** in the **Taskbar Properties** dialog box. Open the Windows NT Start menu and check both the Tektronix MTS 100 V2.0 submenu and the Programs submenu to confirm that all MTS 100 shortcuts are available in only the Tektronix MTS 100 V2.0 submenu, as shown in Figure A–22.

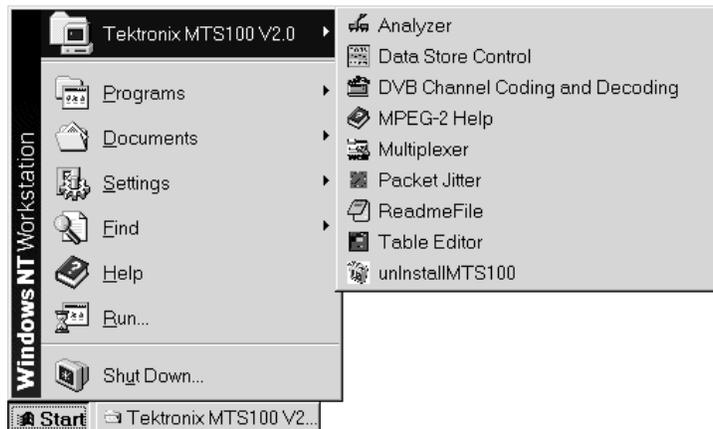


Figure A–22: The correct Tektronix MTS100 V2.0 submenu

10. Reboot the system and log in as MTS100 (Username = mts100; no password is required).
11. To open the MTS 100 program group, double-click on the Tektronix MTS 100 V2.0 folder that appears on the desktop. Choose Large Icons from the view menu of the resulting window. You may also wish to deselect the Status Bar. The window should resemble Figure A–23; size and position the window as desired.



Figure A-23: The Tektronix MTS100 V2.0 program group window

Your reinstallation of the version 2.0 software is complete.

Installing the Software on a New System Disk

If it becomes necessary to replace the MTS 100 system disk, use the following procedure to restore instrument function. If you have any questions about Compaq SmartStart or Windows NT installation or setup, refer to the manufacturer's documentation for more information.

1. After installing a new system disk, place the Compaq SmartStart CD-ROM into drive D and reboot the computer.
2. Follow the on-screen instructions to update the system partition.
3. Choose *not* to configure hardware or copy .cfg files at this time; the configuration file for the Data Store disks, !isa7000.cfg, is available after the MTS 100 software has been installed.
4. Select the appropriate language, country, and keyboard.
5. At the next Compaq SmartStart display, exit SmartStart, remove the CD-ROM from drive D, place the Windows NT setup boot disk 1 into drive A, and then press CTRL+ALT+DELETE to begin Windows NT setup.
6. Follow the on-screen instructions to install and configure Windows NT.
 - Have the Windows NT system setup disk 2, disk 3, and CD-ROM ready to place into the appropriate drive when prompted.
 - Create one, maximum-sized partition on the unpartitioned space of the system disk (highlight the unpartitioned space to select it).

NOTE. *The maximum Windows NT partition size is 4095 MB. You may need to create a small, unused partition of 8 MB.*

- Format the partition using the FAT format system.
 - Accept the default directory, \Winnt, for the Windows NT files.
 - Skip Exhaustive Examination of the system disk.
 - Enter **Tektronix, Inc.** as both the Name and Organization when you are prompted.
 - When asked for the product ID, enter the number from the CD Key label on the CD-ROM sleeve.
 - Give the computer any appropriate name. As manufactured, the computer name is **MTS100** and the workgroup is **MTS_100**.
 - Enter MPEG2 (all uppercase) as the administrator account password.
 - Create an emergency repair disk when prompted. It is a good idea to use the original emergency repair disk supplied with your instrument; if the original is not available, use any blank, high density 3.5 inch disk. Be sure to write the MTS 100 serial number on the emergency repair disk.
 - Choose to install the appropriate Windows NT components. The groups installed during manufacture are Accessibility Options, Accessories, and Games, although no components are required for MTS 100 operation.
 - Select the Network options that apply to your installation. The MTS 100 contains an AMD PCNET-family ethernet adapter. If you have an ethernet drop, the appropriate choices are:
 - Wired to network
 - TCP/IP protocol
 - AMD PCNET adapter defaults
- Ask your system administrator for TCP/IP configuration parameters and other assistance, if required.
- At the **Finishing Setup** display, set the correct date, time, and time zone.
 - Set the following **Display Parameters**:
 - Color Palette: 256 colors
 - Desktop Area: 1024 by 768 pixels
 - Font Size: Small Fonts
 - Refresh Frequency: 72 Hertz

7. Select Restart when you are finished with NT setup. Log in as the administrator (the password is MPEG2).
8. Through the Start menu, select Programs > Administrative Tools (Common) > User Manager, as shown in Figure A–24.



Figure A–24: Start the User Manager

9. Select New User from the User menu of **User Manager** window to open the **New User** dialog box shown in Figure A–25. Make the following changes:
 - Enter **MTS100** in the **Username:** text box
 - Clear the **User Must Change Password at Next Login** option
 - Select the **Password Never Expires** option



Figure A–25: The New User window

10. Click OK to confirm the settings and dismiss the **New User** window, and then close the **User Manager** window.
11. Select Settings > Control Panel from the Start menu; then select System Properties. Click the **Startup/Shutdown** tab in the resulting window to reveal the system startup and recovery settings as shown in Figure A–26.
12. Select the following recover options:
 - Write an event to the system log
 - Write debugging information to [%SystemRoot%\MEMORY.DMP]
 - Overwrite any existing file



Figure A–26: The system startup and recovery options

13. Click OK. Click No in the resulting message window that asks if you want to restart your computer. You can install the MTS 100 application software before restarting.
14. Place the MTS 100 Installation Software CD-ROM into drive D; then follow the procedure under *Copying the Program Files*, on page A–5.
15. Step 20 of the MTS 100 software installation procedure (on page A–10) restarts the computer; when prompted during system start up, press the F10 key to run the Compaq system partition utilities.

- 16.** Select System Configuration from the system partition utilities MAIN MENU display; then select Configure Hardware from the System Configuration submenu.
- 17.** Configure slot two for the Data Store (CARB) board.
 - a.** Highlight **Step 2: Add or remove boards** and then press ENTER.
 - b.** Highlight **Slot 2 (empty)** and then press ENTER.
 - c.** Press F7 (as often as necessary) to change the directory and locate the c:\Mts100\Bin\!isa7000.cfg configuration file.
 - d.** Select **Slot 2**.
 - e.** Press F10 to indicate that you are done.
 - f.** Highlight **Step 5: Save and exit** and then press ENTER.
 - g.** Finally, highlight **Save configuration and restart the the computer** and then press ENTER.
- 18.** Log in again as the administrator and follow the procedures under *Configuring the Program Group and Start Menu* on page A-12 to finish MTS 100 software installation.

When you finish software installation, your MTS 100 is ready for use.

Appendix B: Software Repair (Software Version 2.1)

This appendix applies to instruments with serial numbers B040000 and above that use Windows NT 4.0 and MTS 100 software version 2.1. There are four parts to this appendix:

- *If an Application Locks* (below) tells how to shut down an application that no longer responds to input.
- *Creating and Using an Emergency Repair Disk* (page B–2) explains how to create and use a system-specific repair disk.
- *Reinstalling the MTS100 Version 2.1 Software* (page B–4) tells what to do if one or more of the MTS 100 application files are corrupted.
- *Installing the Software on a New System Disk* (page B–14) explains the procedure for restoring both Windows NT and the MTS 100 software in the unlikely event that you must replace the system disk.

***NOTE.** If your test system is running software version 2.0, follow the procedures in Appendix A. Contact your Tektronix representative for information about upgrading to version 2.1.*

If an Application Locks

As with all software, the MTS 100 MPEG Test System applications occasionally lock up. In most cases the easiest way out is through the Windows NT End Task utility. However, if you are in the Data Store Control (CARB) application, you can go to the CARB administrator menu to access the Service menu and click on Card Reset, which may unlock this application.

If that does not work, or you are in another application, try closing the application using the Windows NT Security dialog box. The following procedure will use this utility to unlock the application.

1. Press CTRL+ALT+DEL to access the Windows NT Security dialog box.
2. Click Task Manager... to open the **Task Manager** window.
3. Click the Applications tab and then select the locked application, as shown in Figure B–1.



Figure B-1: Select the locked application in the Task Manager window

4. Click End Task. This should exit the locked application.

If the above procedure does not close the locked application, try performing the following three-step procedure.

1. Press CTRL+ALT+DEL to access the Windows NT Security dialog box.
2. Click Shutdown to open the Shutdown Computer dialog box.
3. Select Shutdown and Restart and then choose OK.

If this does not end the application or shut down the unit, power the Server down for a few seconds and then proceed with a normal power up.

NOTE. *It is not good practice to power down the Server without first exiting Windows NT. Only use this method if the Server is not responsive.*

Creating and Using an Emergency Repair Disk

An emergency repair disk, specific to the system, is supplied with each MTS 100 MPEG Test System. Whenever you upgrade the software or change your password, it is strongly recommended that you also create a new emergency repair disk. This will minimize the chances that you will need to completely re-load the operating software for minor problem.

Use the emergency repair disk to restore your system to its initial setup state if your system files become corrupt and you are unable to recover the previous start up configuration (Last Known Good — the Windows NT startup screen option). If you don't have the emergency repair disk, you will have to reinstall Windows NT. Please see the Windows NT System Guide, provided with your back-up copy of Windows NT, for the procedure required to restore your system.

You may also need the emergency repair disk is to restore user passwords if they are forgotten. Be sure to update the emergency repair disk each time you add a user or change a password.



CAUTION. The files on the Emergency Repair Disk are MTS 100-specific; that is, the disk shipped with an MTS 100 is the **ONLY** one that will work with that unit. Do not lose this disk. If you lose the Emergency Repair Disk provided with your MTS 100, create a new one as described below.

Creating an Emergency Repair Disk

To create an emergency repair disk, mark a High Density 3.5-inch disk clearly as the emergency repair disk for MTS 100 serial number B04nnnn and then perform the following steps.

NOTE. The emergency repair disk is MTS 100-specific. Make sure that the emergency repair disk is clearly marked with its MTS 100 serial number. The serial number of your MTS 100 MPEG Test System appears on the original emergency repair disk and on the server rear panel, near the power input connector.

1. Choose Run from the Windows NT Start menu.
2. Type `rdisk` in the Run dialog box. The Repair Disk Utility dialog box, as shown in Figure B-2, opens.

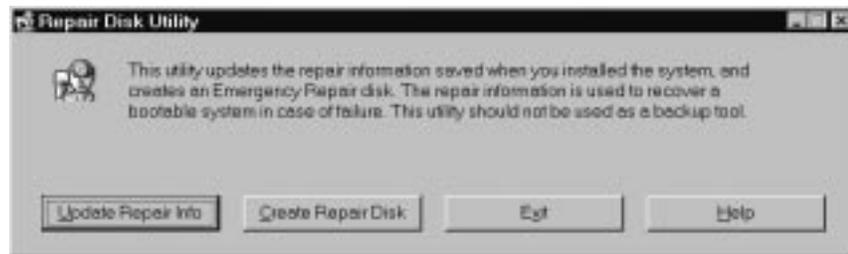


Figure B-2: The Repair Disk dialog box

3. Click Update Repair Info to save your current configuration. A message appears to remind you that earlier repair information is overwritten. Click Yes to continue.
4. When the process is complete, a message appears to ask if you wish to create an Emergency Repair Disk. Click Yes. The message shown in Figure B-3 appears.

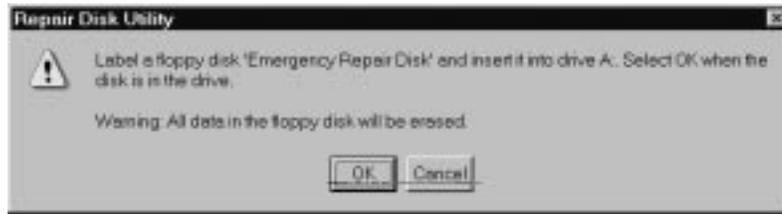


Figure B-3: All data on the disk will be erased

5. Insert a 3.5-inch disk in drive A and click OK. Rdisk formats the disk and copies the configuration files onto it.
6. When the operation is complete, click Exit in the Repair Disk Utility dialog box. Remove the disk from drive A and keep it in a safe place.

Using the Emergency Repair Disk

Always refer to the Windows NT documentation if you need more information.

1. Verify that you have a source of setup information available (the Windows NT back up software package).
2. Insert the Windows NT Setup disk.
3. Restart the MTS 100.
4. When the Windows NT Setup Screen appears, press R (repair).
5. When prompted, insert the emergency repair disk.
6. The emergency repair disk performs the following:
 - Runs CHKDSK.EXE on the WINNT and SYSTEM partitions.
 - Verifies each file in the installation and replaces any that are missing or corrupt.
 - Replaces the System, Security, and Security Accounts Manager hives in the registry.
 - Reinstalls the Boot Loader (the boot sector, BOOT.INI, etc.).

Reinstalling the MTS 100 Version 2.1 Software

Use the procedures below to reinstall your MTS 100 software if it is accidentally deleted or becomes corrupted. Software has been supplied on CD-ROM.

NOTE. The following instructions are for reinstalling MTS100 V2.1 software on a machine running Windows NT Workstation 4.0 only; procedures for upgrading the software may be different. If you are installing a software upgrade, follow the instructions provided with the upgrade kit.

Reinstalling the software involves four procedures:

- Uninstalling the software
- Copying the program files
- Configuring the MTS 100 program group and Start menu

Uninstalling the Software

If you are reinstalling because the MTS 100 software has become corrupted, you should uninstall the software using unInstallMTS100, available through the Tektronix MTS 100 V2.1 submenu.

1. Restart Windows NT.
2. Log in to Windows NT as administrator (Username = administrator; password = MPEG2). You must log in as administrator in order to install the MTS 100 applications.
3. Quit any applications that automatically started at login.
4. Select **unInstallMTS100** (see Figure B–4).



Figure B–4: Uninstall the software

5. When the dialog box asks you to confirm the file deletion, click Yes.
6. A window appears to show the progress of the uninstall process. When uninstall is successfully completed, click **OK** to continue.
7. Close the **Tektronix MTS100 V2.1** window; then drag the **Tektronix MTS100 V2.1** folder from the desktop to the Recycle Bin.

8. Start Windows NT Explorer (through the Programs submenu of the Windows NT Start menu).
9. If the MTS100 folder remains on the C drive, drag that folder to the Recycle Bin.
10. Open the c:\Winnt\Profiles\All Users\Start Menu folder; then drag the **Tektronix MTSV2.1** folder from the Start Menu folder to the Recycle Bin.
11. Close the Windows NT Explorer window.

Copying the Program Files

1. If you are continuing directly from the uninstall procedure, go directly to step 4; if you did not uninstall the software, restart Windows NT now.
2. Log in to Windows NT as administrator (Username = administrator; password = MPEG2). You must log in as administrator in order to install the MTS 100 applications.
3. Quit any applications that automatically started at login.
4. Verify that the system disk on the MTS 100 workstation has at least 80 MB of free space. The program will not install if the system disk has less than 80 MB of free space.
5. Place the MTS 100 Installation Software CD-ROM, part number 063-1888-03, into the CD-ROM drive.
6. The setup application should start automatically in a few seconds; if it does not, choose **Run** from the Start menu to open the **Run** dialog box shown in Figure B-5.



Figure B-5: Run d:\setup to reinstall the software

Type **d:\setup** in the **Open** text box. Click **OK** to begin MTS 100 software installation with the dialog box shown in Figure B-6.



Figure B-6: The MTS100 software installation dialog box

7. Read the text in the dialog box and then click Next to proceed to the **Choose Destination Directory** dialog box shown in Figure B-7.



Figure B-7: Specifying the destination directory

8. Specify the directory into which the MTS100 software should be installed. The default directory is c:\MTS100\. If you wish to use a different directory name, click **Browse**. To accept the default directory, click **Next**.

NOTE. It is strongly recommended that you use the default directory name.

After you click **Next**, the dialog box shown in Figure B-8 appears.



Figure B-8: The Select Program Folder dialog box

9. Click **Next** to accept the default folder name (Tektronix MTS100 V2.1) and continue.

The setup program begins installing the MTS 100 software. The activity and progress gauges shown in Figure B-9 appear to show that the installation process is progressing.

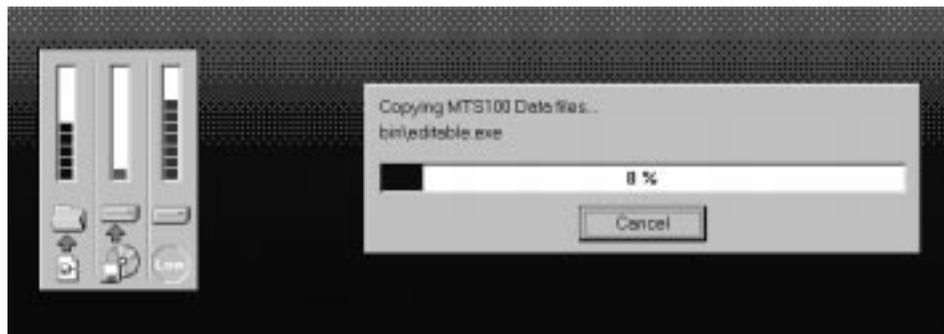


Figure B-9: The progress dialog box and activity gauges

10. At approximately 93% completion, the install program sets up the Registry and fonts and then opens an information window that describes Program Folder and Icon creation. Click **OK** to continue.

11. Next, an information dialog box, shown in Figure B–10, reminds you to verify that the HASP is installed. *Be sure* that the HASP is installed as described on page 2–6 of this manual; then click **OK** to continue.



Figure B–10: Check HASP installation

12. After the HASP Device Driver is installed, the dialog box shown in Figure B–11 appears. Click **OK** to continue; *do not* reboot at this time.



Figure B–11: Click OK; you will reboot later

13. Next, the dialog box shown in Figure B–12 appears. Click **Next** (or press ENTER) to accept the **Slot 2 – Proliant 2500 platforms** default selection.



Figure B–12: Select Slot 2 (serial number B040000 and above)

14. The installation program installs the Data Store driver and then displays an information dialog box that reminds you to reboot the system and read the Readme file. Click **OK** and wait a moment for the **Restart Windows NT** dialog box (shown in Figure B–13) to open.



Figure B–13: The Restart Windows NT dialog box

15. Click **OK** to restart the system. Log in again as the administrator.

Configuring the Program Group and Start Menu

When you restart the MTS 100, the **Tektronix MTS100 V2.1** program group window will be visible on the Windows desktop. As installed, however, the group window is not easily reopened if accidentally closed. Follow these directions to recreate the original MTS 100 program group and Start menu configuration.

1. Choose **Taskbar** from the Settings submenu (of the Windows NT Start menu), as shown in Figure B–14.



Figure B–14: Choose Taskbar from the Settings submenu

2. Click the **Start Menu Programs** tab on the resulting **Taskbar Properties** dialog box; then click **Advanced**, as shown in Figure B–15.



Figure B-15: Choose Advanced Start Menu Settings

3. The **Exploring** window opens with the contents of the Administrator\Start Menu folder visible on the right side, as shown in Figure B-16.

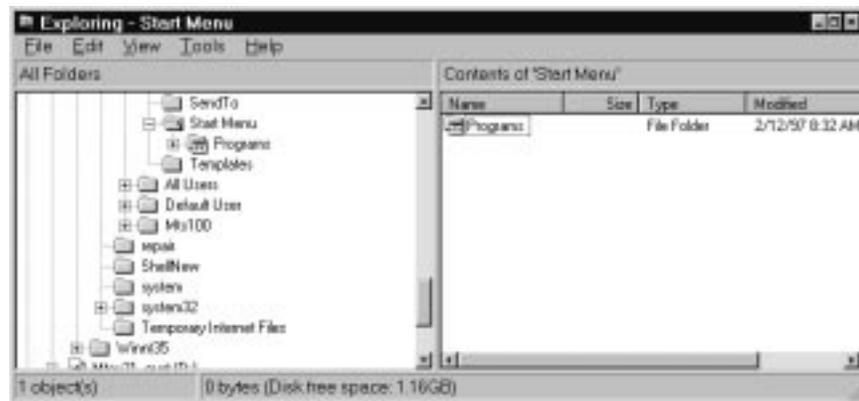


Figure B-16: The Exploring – Start Menu window

4. Scroll the left-hand directory hierarchy to locate c:\Winnt\Profiles\All Users. Then click the folder + boxes to expand the hierarchy and reveal the contents of the All Users\Start Menu\Programs folder as shown in Figure B-17.

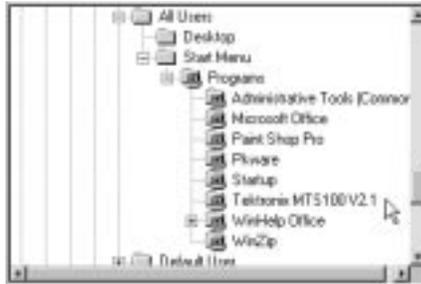


Figure B-17: Open the c:\Winnt\Profiles\Start Menu\Programs folder

5. Drag the Tektronix MTS100 V2.1 folder from the Programs folder up to the Start Menu folder, as shown in Figure B-18.

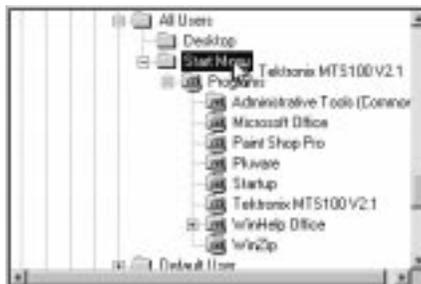


Figure B-18: Move the Tektronix MTS100 V2.1 folder to the Start Menu

6. Press and hold the CTRL key down while dragging the Tektronix MTS100 V2.1 folder from the Start Menu folder to the c:\Winnt\Profiles\All Users\Desktop folder as shown in Figure B-19. Doing so copies the folder onto the desktop.

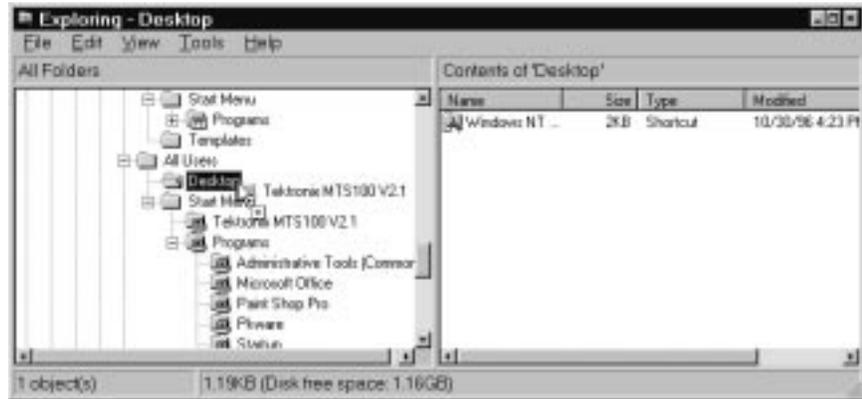


Figure B-19: Copy the Tektronix MTS100 V2.1 folder onto the Desktop

7. Close the **Exploring** window.
8. Click **OK** in the **Taskbar Properties** window.
9. Reboot the system and log in as MTS100 (Username = mts100; no password required).
10. To open the MTS 100 program group, double-click on the Tektronix MTS100 V2.1 folder icon that appears on the desktop. The window should resemble Figure B-20; adjust the size and position the window as desired.



Figure B-20: The Tektronix MTS100 V2.1 program group window

11. Open the Windows Start menu and confirm that the Tektronix MTS100 menu item and submenu appear as shown in Figure B-21.

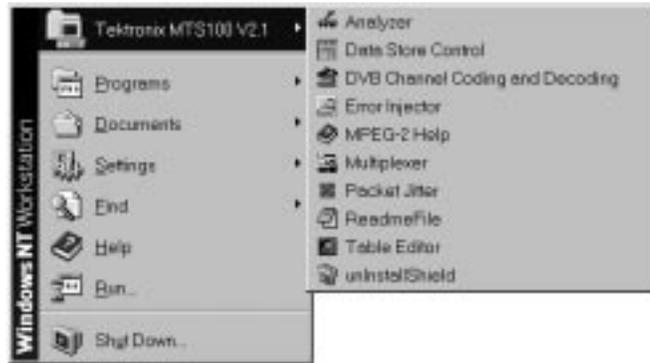


Figure B-21: The correct Tektronix MTS100 V2.1 submenu

Your reinstallation of the Version 2.1 software is complete.

Installing the Software on a New System Disk

If it becomes necessary to replace the MTS 100 system disk, use the following procedure to restore instrument function. If you have any questions about Compaq SmartStart or Windows NT installation or setup, refer to the manufacturer's documentation for more information.

1. After installing a new system disk, place the Compaq SmartStart CD-ROM into drive D and reboot the computer.
2. Follow the on-screen instructions to update the system partition.
3. Choose *not* to configure hardware or copy .cfg files at this time; the configuration file for the Data Store disks, !isa7000.cfg, is available after the MTS 100 software has been installed.
4. Select the appropriate language, country, and keyboard.
5. At the next Compaq SmartStart display, exit SmartStart, remove the CD-ROM from drive D, place the Windows NT setup boot disk 1 into drive A, and then press CTRL+ALT+DELETE to begin Windows NT setup.
6. Follow the on-screen instructions to install and configure Windows NT.
 - Have the Windows NT system setup disk 2, disk 3, and CD-ROM ready to place into the appropriate drive when prompted.
 - Create one, maximum-sized partition on the unpartitioned space of the system disk (highlight the unpartitioned space to select it).
 - Format the partition using the FAT format system.

- Accept the default directory, \Winnt, for the Windows NT files.
 - Skip Exhaustive Examination of the system disk.
 - Enter **Tektronix, Inc.** as both the Name and Organization when you are prompted.
 - When asked for the product ID, enter the number from the CD Key label on the CD-ROM sleeve.
 - Give the computer any appropriate name. As manufactured, the computer name is **MTS100** and the workgroup is **MTS_100**.
 - Enter MPEG2 (all uppercase) as the administrator account password.
 - Create an emergency repair disk when prompted. It is a good idea to use the original emergency repair disk supplied with your instrument; if the original is not available, use any blank, high density 3.5 inch disk. Be sure to write the MTS 100 serial number on the emergency repair disk.
 - Choose to install the appropriate Windows NT components. The groups installed during manufacture are Accessibility Options, Accessories, and Games, although no components are required for MTS 100 operation.
 - Select the Network options that apply to your installation. The MTS 100 contains an AMD PCNET-family ethernet adapter. If you have an ethernet drop, the appropriate choices are:
 - Wired to network
 - TCP/IP protocol
 - AMD PCNET adapter defaults
- Ask your system administrator for TCP/IP configuration parameters and other assistance, if required.
- At the **Finishing Setup** display, set the correct date, time, and time zone.
 - Set the following **Display Parameters**:
 - Color Palette: 256 Colors
 - Desktop Area: 1024 by 768 pixels
 - Font Size: Small Fonts
 - Refresh Frequency: 72 Hertz
7. Select Restart when you are finished with NT setup. Log in as the administrator (the password is MPEG2).
 8. Through the Start menu, select Programs > Administrative Tools (Common) > User Manager, as shown in Figure B-22.



Figure B-22: Start the User Manager

9. Select **New User** from the **User** menu of **User Manager** window to open the **New User** dialog box shown in Figure B-23.
 - Enter **MTS100** in the **Username:** text box
 - Clear the **User Must Change Password at Next Login** option
 - Select the **Password Never Expires** option.



Figure B-23: The New User window

10. Click **OK** to confirm the settings and dismiss the **New User** window, and then close the **User Manager** window.
11. Select **Settings > Control Panel** from the **Start** menu; then select **System Properties**. Click the **Startup/Shutdown** tab in the resulting window to reveal the system startup and recovery settings as shown in Figure B-24.

12. Select the following recover options:

- Write an event to the system log
- Write debugging information to [%SystemRoot%\MEMORY.DMP]
- Overwrite any existing file



Figure B-24: The system startup and recovery options

13. Click **OK**. Click **No** in the resulting message window that asks if you want to restart your computer. You can install the MTS 100 application software before restarting.
14. Place the MTS 100 Installation Software CD-ROM into drive D; then follow the procedure under *Copying the Program Files*, on page B-6.
15. After installation, but before you attempt to run the MTS 100 software, restart the computer and, when prompted during system start up, press the F10 key to run the Compaq system partition utilities.

NOTE. You must configure the appropriate EISA-bus slot for the Data Store board before you can use the Data Store system to capture, store, or output transport stream files.

- 16.** Select **System Configuration** from the system partition utilities MAIN MENU display; then select **Configure Hardware** from the System Configuration submenu.
- 17.** If the **Configuration Complete** window appears, highlight **Review or modify hardware settings** and press ENTER.
- 18.** Configure slot two for the Data Store (CARB) board.
 - a.** Highlight **Step 2: Add or remove boards** and then press ENTER.
 - b.** Highlight **Slot 2 (empty)** and then press ENTER.
 - c.** Press F7 (as often as necessary) to change the directory and locate the c:\Mts100\Bin\!isa7000.cfg configuration file.
 - d.** Select !isa7000.cfg and then confirm (Board Name: CARB) your selection.
 - e.** Select **Slot 2**
 - f.** Press F10 to indicate that you are done.
 - g.** Highlight **Step 5: Save and exit** and then press ENTER.
 - h.** Highlight **Save configuration and restart the the computer** and then press ENTER (as often as necessary) to reboot.

Your MTS 100 is ready for use.

Appendix C: MTS100 Test System Application Software

This appendix lists the directories and files that make up the MTS 100 MPEG Test System software. There are slight differences between versions 2.0 and 2.1; the list of version 2.1 directories and files begins on page C-4.

Software Version 2.0

The application software for the MTS 100 consists of a number of directories and files. Note that four directories are installed on the system drive (c:\) and the application files are loaded into these directories. The path is provided for each directory and file.

Path: C:\MTS100

Audio	<Dir>
Bin	<Dir>
Cfg-trp	<Dir>
Video	<Dir>

Path: C:\MTS100\AUDIO

- 10khz_.mp2
- 15kz_064.mp2
- 15kz_128.mp2
- 15kz_256.mp2
- 15kz_192.mp2
- 1khz_.mp2

Path: C:\MTS100\BIN

- !isa7000.cfg
- Adn_carb.exe
- Adonum.hlp
- Bc453rtl.dll
- Bids47f.dll
- Byteflip.exe
- Canal.exe
- Canal.gid
- Canal.hlp
- Carbfile.dll
- Cw3215.dll
- Editable.exe
- Editable.gid
- Editable.hlp
- Gigue.exe

Gigue.hlp
Matracom.exe
Mfc30.dll
Mfc30d.dll
Mpeg2nt.gid
Mpeg2nt.hlp
Msvcr20.dll
Mux_carb.exe
Mux_mpg2.gid
Mux_mpg2.hlp
Owl253f.dll
Setcarb.exe
Synt204a.dll
Synt205.dll

Path: C:\MTS100\CFG-TRP

!!cfg.ndx
Default.bat
Default.cfg
Default.eit
Default.nit
Default.pmt
Default.sdt
Default.trp
Sample.trp

Path: C:\MTS100\VIDEO

525 <Dir>
625 <Dir>

Path: C:\MTS100\VIDEO\525

Testpat <Dir>
Mobl_015.mp2
Mobl_060.mp2

Path: C:\MTS100\VIDEO\525\TESTPAT

100b_015.mp2
100b_060.mp2

Path: C:\MTS100\VIDEO\625

Testpat <Dir>
Bars_015.mp2
Bars_060.mp2
Demo_015.mp2
Demo_060.mp2

Mobl_015.mp2
Mobl_060.mp2

Path: C:\MTS100\VIDEO\625\TESTPAT

100b_015.mp2
100b_060.mp2

Path: C:\MTS100

Deisl1.isu
Readme.txt

Path: C:\WINNT

Adonum.ini
Mux.ini
Uninst.exe

Path: C:\WINNT\SYSTEM

Ctl3d.dll
Ctl3dv2.dll
Tek.fot
Tek.ttf

Path: C:\WINNT\SYSTEM32

Ctl3d32.dll
Haspdos.sys
Haspvdd.dll

Path: C:\WINNT\SYSTEM32\DRIVERS

Drvcarb.sys
Haspnt.sys

Software Version 2.1

Path: C:\MTS100

Audio <Dir>
Bin <Dir>
Cfg-trp <Dir>
Video <Dir>
Deisl1.isu
Readme.txt

Path: C:\MTS100\AUDIO

10khz.mp2
15kz_064.mp2
15kz_128.mp2
15kz_192.mp2
15kz_256.mp2
1khz .mp2

Path: C:\MTS100\BIN

!Isa7000.cfg
Adn_carb.exe
Adonum.cnt
Adonum.gid
Adonum.hlp
Bc453rtl.dll
Bds501f.dll
Bids47f.dll
Bids50f.dll
Byteflip.exe
Canal.cnt
Canal.exe
Canal.hlp
Carbfile.dll
Cw3215.dll
Cw3220.dll
Dynamic.avi
Editable.cnt
Editable.exe
Editable.hlp
Einjwin.cnt
Einjwin.exe
Einjwin.hlp
Gigue.cnt
Gigue.exe
Gigue.hlp

Matracom.exe
Mfc30.dll
Mfc30d.dll
Mpeg2nt.hlp
Msvcr20.dll
Mux_carb.exe
Mux_mpg2.cnt
Mux_mpg2.gid
Mux_mpg2.hlp
Owl253f.dll
Owl50f.dll
Setcarb.exe
Synt207.dll

Path: C:\MTS100\CFG-TRP

!!cfg.ndx
Default.bat
Default.cfg
Default.eit
Default.nit
Default.pmt
Default.sdt
Default.trp
Sample.trp

Path: C:\MTS100\VIDEO

525 <Dir>
625 <Dir>

Path: C:\MTS100\VIDEO\525

Testpat <Dir>
Mobl_015.mp2
Mobl_060.mp2

Path: C:\MTS100\VIDEO\525\TESTPAT

100b_015.mp2
100b_060.mp2

Path: C:\MTS100\VIDEO\625

Testpat <Dir>
Bars_015.mp2
Bars_060.mp2
Demo_015.mp2
Demo_060.mp2

Mobl_015.mp2

Mobl_060.mp2

Path: C:\MTS100\VIDEO\625\TESTPAT

100b_015.mp2

100b_060.mp2

Path: C:\WINNT

Adonum.ini

Mux.ini

Uninst.exe

Path: C:\WINNT\SYSTEM

Ctl3d.dll

Ctl3dv2.dll

Tek.fot

Tek.ttf

Path: C:\WINNT\SYSTEM32

Ctl3d32.dll

Haspdos.sys

Haspvdd.dll

Path: C:\WINNT\SYSTEM32\DRIVERS

Drvcarb.sys

Haspnt.sys