Service Manual

Tektronix

**MPEG Test System
Compaq Prosignia Platform**

071-0151-00

www.tektronix.com

WARRANTY

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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.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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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 service information for Tektronix MPEG Test Systems that use the Compaq Prosignia 500 platform. Please read this introduction before doing any repair or service work on the instrument.

This MPEG Test System is composed of a personal computer (hereafter called the Server) that contains customized hardware and software. The software applications are documented in the user manuals that arrived with your Server. The information included in this manual explains how to verify, service, troubleshoot, and repair the test system to the module level:

- *Specifications* describes functional characteristics and performance requirements for the 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 List* gives all module and mechanical parts that comprise the test system. Parts are identified on an indexed illustration to make them easier to identify.

- The appendices consist of the following items:

    - *Software Repair* to help you replace damaged software.

    - *MTS 100 Test System Application Software* is the list of directories and files that make up the applications.

Related Manuals

For operating information, always refer to the Tektronix MPEG Test System documentation that is appropriate to your installed version of software. Refer to the parts list beginning on page 8–4 for a list of manuals by version number. Consult the readme file, C:\Mts100\Readme.txt or C:\Mts200\Readme.txt to discover the installed software version.

Manual Conventions

The following terms and conventions are used throughout this manual:

■ The term *test system* is used interchangeably with the more formal term MPEG Test System.

■ The term *server* refers to the personal computer (PC) that hosts the MPEG Test System.

■ Signal names that have $\overline{\text{overbars}}$ represent active low signals.

Before You Begin

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 the *Service Strategy* section, below.

⚠ *WARNING. When using this manual to service your test system, be sure to heed all warnings, cautions, and notes. Failure to attend to this information could result in injury to yourself, damage to your test system, or lost or corrupt data.*

Service Strategy

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

■ Performance verification procedures

■ Adjustment procedures

■ Periodic maintenance

■ 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.

Contacting Tektronix

Product support	For questions about using Tektronix measurement products, call toll free in North America: 1-800-833–9200 6:00 a.m. – 5:00 p.m. Pacific time
	Or contact us by e-mail: tm_app_supp@tek.com
	For product support outside of North America, contact your local Tektronix distributor or sales office.
Service support	Tektronix offers extended warranty and calibration programs as options on many products. Contact your local Tektronix distributor or sales office.
	For a listing of worldwide service centers, visit our web site.
For other information	In North America: 1-800-833–9200 An operator can direct your call.
To write us	Tektronix, Inc. P.O. Box 500 Beaverton, OR 97077–0001 USA
Web site	www.tektronix.com

Specifications

Specifications

The tables in this section list the electrical, physical, and environmental characteristics of the MPEG Test System. Refer to the following definitions for an explanation of each specification table column heading:

- **Characteristics.** Characteristics are properties of the product. Characteristics identified with a check mark ($\checkmark$) 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.

- **Descriptions.** Descriptions are statements that define the characteristic, often in limit form.

- **Supplemental Information.** Supplemental information explains or adds to the information in the performance requirement column; it may include 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 specifications are valid for test systems under the following conditions:

- The test system is operating within the environmental limits listed in Table 1–21.

- The test system has been adjusted at 25° C ±5° C.

- The test system has been operating a minimum of 20 minutes and has reached normal operating temperature.

Electrical Specifications, Data Store System

The following tables pertain to the MPEG Test System Data Store I/O ports.

Table 1–1: G.703 — 8.448 MHz

Characteristic	Description	Supplemental information
Standards Conformance		ITU-CCITT G.703, G.823
Line Encoding		HDB3
✔ Serial Bit Rate	8.448 Mbyte/s ± 10 ppm	
Generation/Acquisition Test	Error free	Tested with a 10 MB 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 V
Return Loss (75 ohm)		12 dB, 211 kHz to 422 kHz
		18 dB, 422 kHz to 8.448 MHz
		14 dB, 8.448 MHz to 12.672 MHz
Connector	Male SMB	Shared with the 34.36 megabit 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, nominal	59 ns	
✔ Pulse "Mark" Amplitude	2.37 V ± 0.237 V	
✔ No-Pulse "Space" Voltage	0 ± 0.237 V	
Pulse Shape		Conforms to 8.448 MHz Pulse Mask, G.703 Figure 16 (see Figure 1–1)
Required Receiver Termination	Resistive, 75 ohm nominal	
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

Table 1–1: G.703 — 8.448 MHz (cont.)

Characteristic	Description	Supplemental information
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
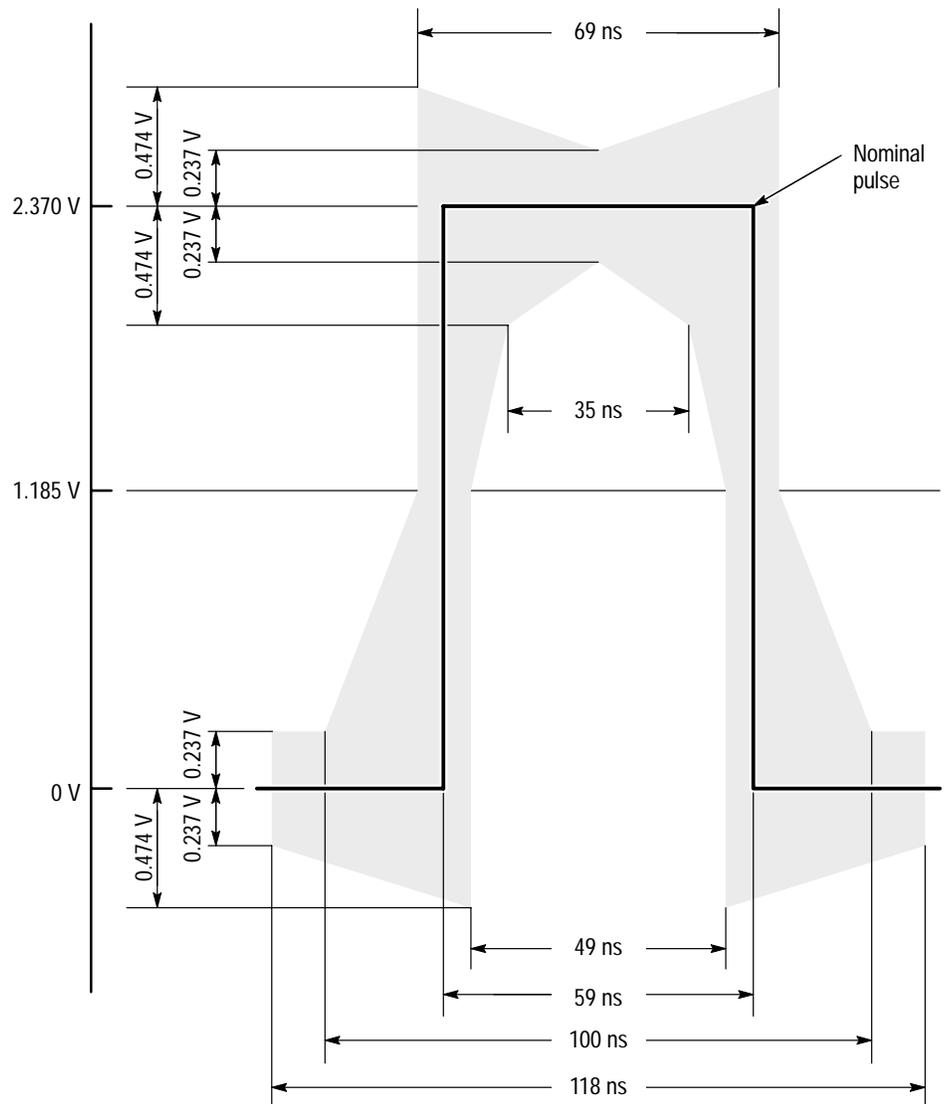
Figure 1–1: Pulse specification for a G.703 8.448 MHz pulse

Table 1–2: G.703 — 34.368 MHz

Characteristic	Description	Supplemental information
Standards Conformance		ITU-CCITT G.703, G.823
Connector	Male SMB	
Line Encoding		HDB3
✓ Generation/Acquisition Test	Error free	Tested with a 10 MB file (within the constraints of synchronization)
✓ Serial Bit Rate	34.368 Mbps ± 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 ohm)		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 megabit 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 ± 0.1 V	
✓ No-Pulse Space Voltage	0 ± 0.1 V	
Pulse Shape		Conforms to 34.368 MHz Pulse Mask, Figure 17/G.703 (see Figure 1–2)
Required Receiver Termination		75 ohm nominal resistive
Jitter		10 ns peak-to-peak with a 100 Hz lower cut-off and an 800 kHz upper cut-off filter 2.45 ns peak-to-peak with a 10 kHz lower cut-off and an 800 kHz upper cut-off filter Allows a cascade of ten different regenerators 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
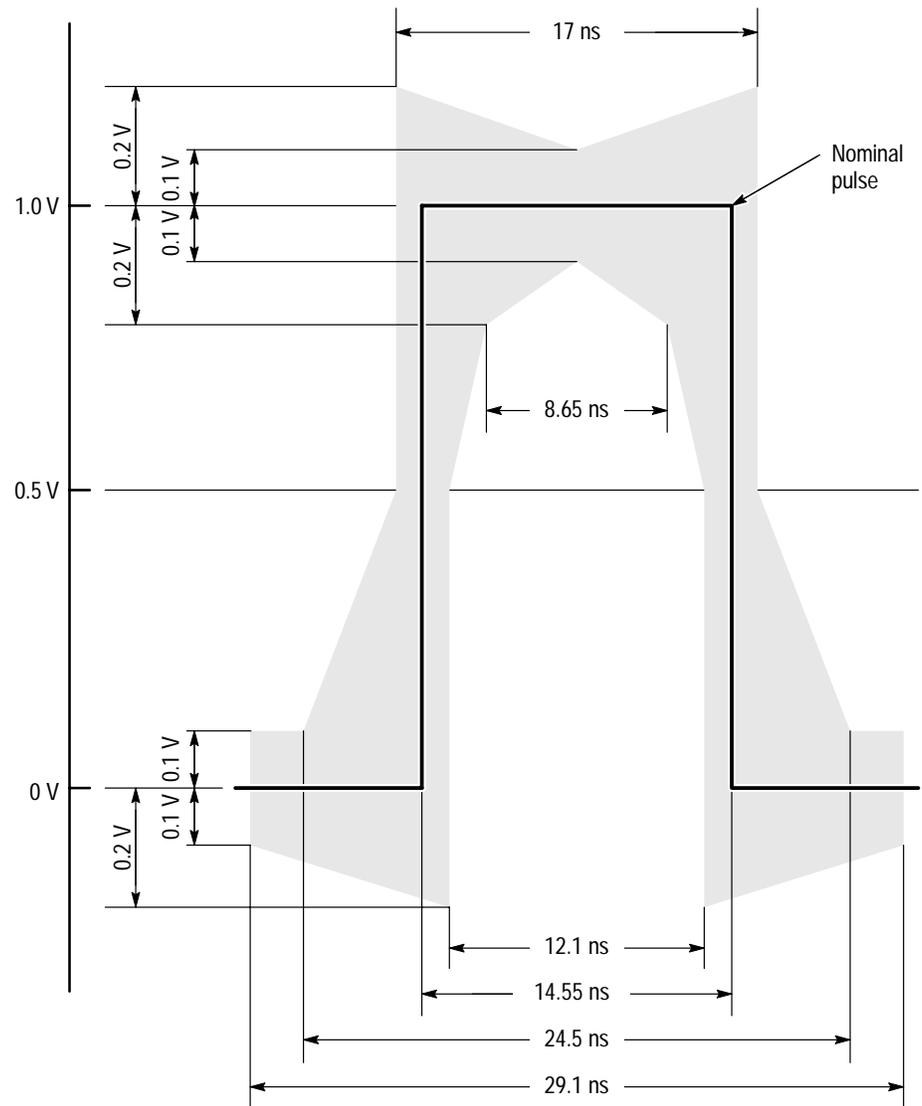
Figure 1–2: Pulse specification for a G.703 34.368 MHz pulse

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

Characteristic	Description	Supplemental information
Connector	Female D25	Parallel Data (pinout described in Table 1–4)
	Female D25	Serial Data (pinout described in Table 1–5)
	Female D9	Flow Control (pinout described in Table 1–6)
✓ Generation/Acquisition Test Master/Slave Slave/Master (w/control)	All error free	Tested with a 10 MB file at maximum data rates (within the constraints of synchronization)
Digital Format		Binary, positive logic
Input		
Maximum Data Rate		Serial: 55 Mbps Parallel: 60 Mbps (7.5 Mbytes/s)
Minimum Data Rate		Clock Rate: 1 MHz Serial: 1 Mbps Parallel: 1 Mbps (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 Mbps Parallel: 60 Mbps (7.5 Mbytes/s)
Minimum Data Rate		Clock rate: 1 MHz Serial: 1 Mbps Parallel: 1 Mbps (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 ohm, 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.

Figure 1–3: Parallel data timing, 188-byte packets

Packet length = 188 bytes + 16 dummy bytes
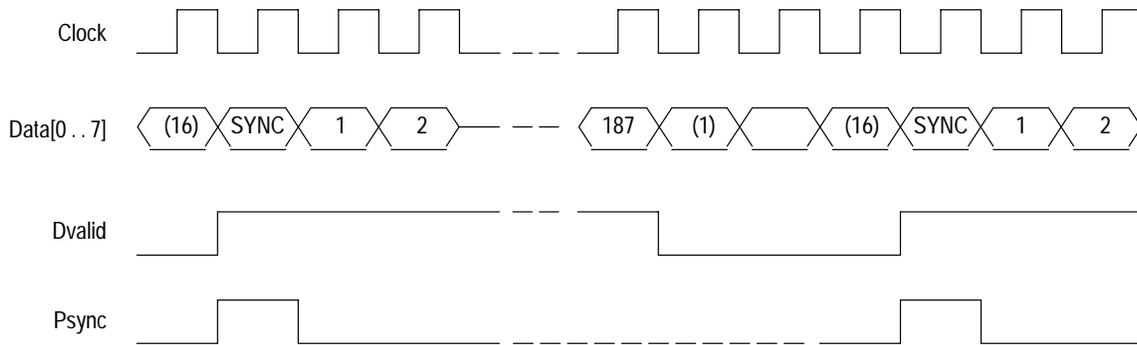
Packet length = 204 bytes (Reed-Solomon encoded)
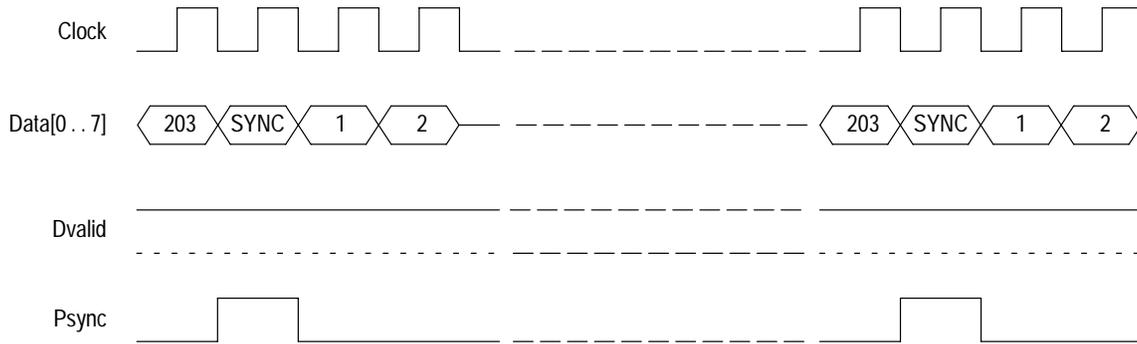
Figure 1–4: Parallel data timing, 204-byte packets

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	$\overline{\text{PSYNC}}$

Asserted Low differential signal.
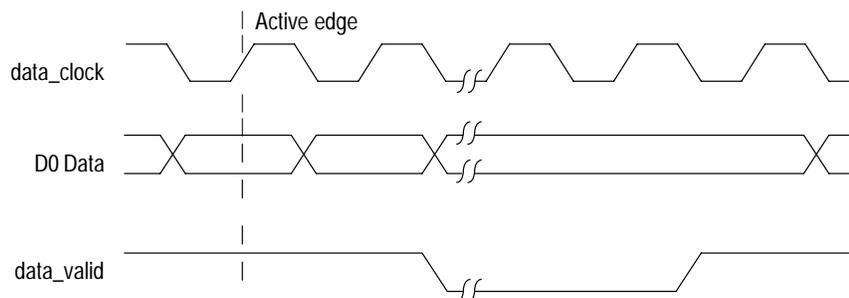
Figure 1–5: Timing diagram for the ECL serial port

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)
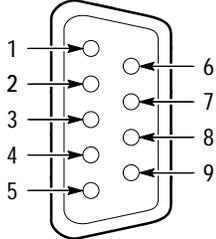
$\overline{Asserted\ Low}$ differential signal.
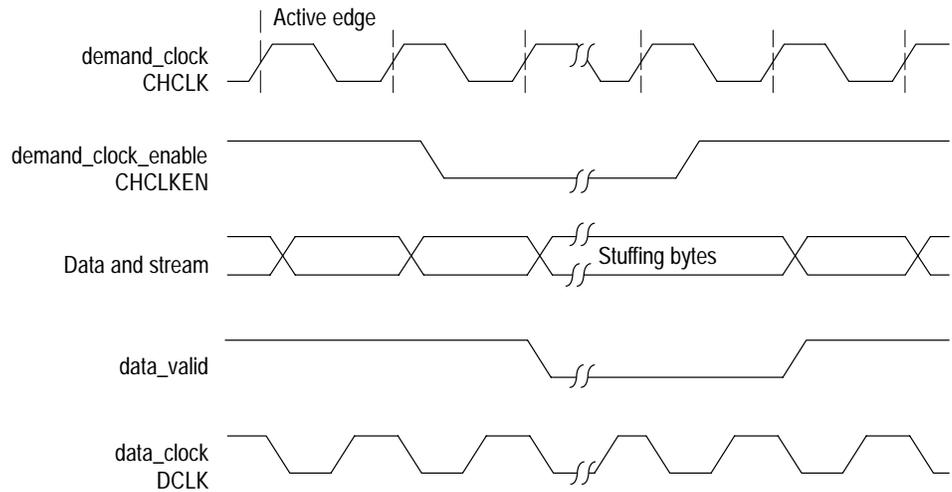
Figure 1–6: ECL Timing diagram with control port

Table 1–7: 50 ohm TTL I/O

Characteristic	Description	Supplemental information
Connectors	Male SMB	
Rise & Fall Times		Between 2 ns and 6.5 ns
✔ Signal swing into 50 ohm (output)	Low < 0.3 V High > 2.65 V	
Digital Format		Binary, positive logic
Maximum Data Rate		45 Mbps
Minimum Data Rate		1 Mbps
✔ Generation/Acquisition Test	Error free	Tested with a 10 MB file at maximum data rates (within the constraints of the stop/start bits)
Termination (input)		50 ohm nominal resistive
Timing Diagram		DATA signal is stable on the rising edge of the clock signal (see Figure 1–7)
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

Table 1–8: TTL 50 ohm Clock In port

Characteristic	Description	Supplemental information
Clock port voltage levels		TTL Low: < 0.8 V TTL High: > 2.0 V
Termination		50 ohm, nominally resistive
Range		125 kHz to 45 MHz
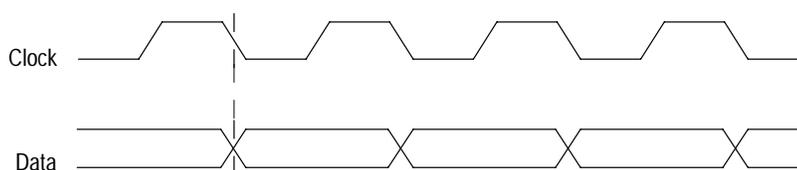
Figure 1–7: Timing for the TTL port and the separate clock input

Table 1–9: 10 megabit serial port (RS-422 levels I/O Port)

Characteristic	Description	Supplemental information
Connector	9-pin sub-miniature D-type	(Pinout shown in Table 1–10
10 megabit 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
Common Mode Range		± 5 Volts
10 megabit Serial Rise and Fall Times		Between 2 ns and 12 ns
Maximum Data Rate		10 Mbps
Minimum Data Rate		1 Mbps
Clock to Data Timing		Data changes within 10 ns of falling clock edge
✓ Generation/Acquisition Test	Error free	Tested with a 10 MB file at maximum data rates (within the constraints of the stop/start bits)

Table 1–10: 10 megabit serial port pinout

10 megabit 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	$\overline{\text{CLK OUT}}$
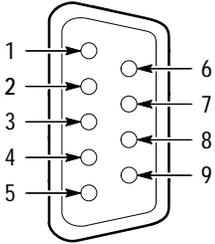
$\overline{\text{Asserted Low}}$ *differential signal.*
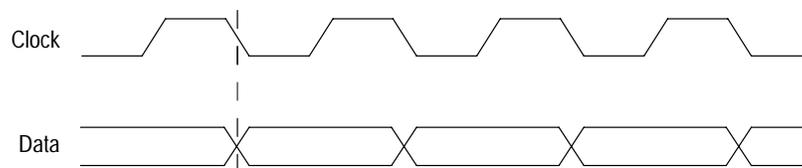
Figure 1–8: Timing diagram for the 10 megabit Serial port

Table 1–11: PLL

Characteristic	Description	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 ± resolution

Electrical Characteristics, Real-Time Analyzer

Table 1–12: Parallel input port

Characteristic	Description	Supplemental information
Connector	Female D25	Pinout shown in Table 1–14
✔ Input Data Rate	60 Mbps maximum, 1 Mbps minimum	
Signal Amplitude, typical	2.0 V_{pp} maximum, 100 mV_{pp} minimum	
Signal Common Mode Range, typical	–1.8 V to +2.5 V	
Termination, nominal	100 ohms resistive	Line-to-line
Timing Reference	Rising edge of clock	
Clock-to-data Timing	Data must be stable ± 5 ns of rising clock edge	

Table 1–13: Parallel output port

Characteristic	Description	Supplemental information
Connector	Female D25	Pinout shown in Table 1–14
Signal Amplitude	LVDS or modified ECL levels, software selectable	Modified Differential ECL is less than the typical 100K ECL level of ≈ 700 mVpp
✔ LVDS	454 mV_{pp} maximum, 247 mV_{pp} minimum	908 mV_{pp} max, 494 mV_{pp} min, differential 100 ohm line-to-line termination
✔ Modified ECL	454 mV_{pp} maximum, 247 mV_{pp} minimum	908 mV_{pp} max, 494 mV_{pp} min, differential 100 ohm line-to-line termination
Common Mode Voltage		
✔ LVDS Output	+ 0.70 V mininmum, + 1.40 V maximum	
✔ Modified ECL Output	− 1.80 V maximum, − 1.50 V minimum	

Table 1–14: 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		

$\overline{\textit{Asserted Low}}$ *differential signal.*

Figure 1–9: Parallel data timing, 188-byte packets

Table 1–15: ASI input port

Characteristic	Description	Supplemental information
Connector	BNC	Female
Input Bit Rate		270 Mbps $\pm$ 100 ppm
Signal Amplitude, typical	800 mV$_{pp}$ maximum, 200 mV$_{pp}$ minimum	
Termination, nominal	75 ohms	
Return Loss, typical	–17 dB minimum	27 MHz to 270 MHz
Data Formats	Accepts both Burst and Packet modes	

Table 1–16: ASI output port

Characteristic	Description	Supplemental information
Connector	BNC	Female
Output Bit Rate		270 Mbps $\pm$ 100 ppm
✓ Signal Amplitude	880 mV$_{pp}$ maximum, 500 mV$_{pp}$ minimum	Into a 75 ohm load
Rise and Fall Times, typical	1.2 ns maximum	20% to 80%

Power Specifications

Table 1–17: Power

Characteristics	Performance requirements	Supplemental information
Power Consumption		
Data Store Board only		30 Watts

Table 1–18: Power requirements

Characteristics	Performance requirements	Supplemental information
Range Line Voltage		100 to 120 VAC (–10%, +6%) 220 to 240 VAC (–10%, +6%)
Line Frequency		60 Hz / 50 Hz
Fuse		8 / 4 A

Mechanical (Physical) Characteristics

Table 1–19: Data Store board mechanical characteristics

Characteristics	Supplemental information
Dimensions	
Height	3.40 inches (8.64 cm)
Width	5.5 inches (14 cm)
Length	13.9 inches (35.3 cm)
Net Weight	2.063 lbs. (.937 kg)
Shipping Weight	2.438 lbs. (1.107 kg)

Table 1–20: MPEG Test System mechanical characteristics

Characteristics	Supplemental information
Dimensions	Base unit (does not include monitor, keyboard, or mouse)
Height	21.93 inches (55.8 cm)
Width	8.96 inches (22.8 cm)
Length	17.25 inches (43.8 cm)
Net Weight	54.0 lbs. (20.5 kg) (without monitor – monitor is shipped separately)
Shipping Weight	72 lbs. (without monitor – monitor is shipped separately)

Environmental Characteristics

Table 1–21: Environmental characteristics

Characteristics	Supplemental information

Temperature
    Non-operating
    Operating
	
	$-20°$ C to $+60°$ C, Maximum rate of change: $20°$ C/hour
	$+10°$ C to $+35°$ C, Maximum rate of change: $5°$ C/hour

Altitude
    Non-operating
    Operating
	
	0 to 30,000 feet (9144 meters)
	0 to 10,000 feet (3048 meters)

Humidity
    Operating
    Non-operating
	
	20% to 80% (Maximum 10% change/hour)
	5-90% humidity, non-condensing

Table 1–22: 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 1–23: Safety certification compliance

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

Table 1–24: Certifications and compliances

Category	Standard

EC Declaration of Conformity	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive 73/23/EEC for Product Safety.
	
	Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:
	
	EN 50081-1 Emissions:
	    EN 55022 Class A Radiated and Conducted Emissions
	
	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
	    IEC 801-5 Power Line Surge Immunity
	
	Conditional Statements:
	1) Using high quality shielded cables attached to the ECL Ser/Par and ECL Control ports including the cables shipped with the instrument.
	2) Using conductive tape applied inside the rear edge of the PC side panel.
	
	Low Voltage directive 73/23/EEC, amended by 93/68/EEC:
	    EN 60950 Safety of Information Technology Equipment, Including Electrical Business Equipment

Operating Information

Operating Information

This section contains installation instructions and gives a brief overview of how to operate the MPEG Test System. For detailed operating information, see the MPEG Test System user manual that pertains to your software. Refer to the parts list beginning on page 8–4 for a list of manuals by version number. Refer to the readme file, `C:\Mts100\Readme.txt` or `C:\Mts200\Readme.txt` to determine the installed software version.

Installation

Retain the shipping cartons and padding in the event that additional shipment of the MPEG Test System or any of its components is required.

⚠ *CAUTION. To avoid damage to the test system during shipping, retain the original shipping carton and use it if you need to ship the instrument back to Tektronix for repair. Shipping the test system 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 a new test system, check that the following items are included:

- Tektronix 17 inch monitor and the monitor cable; the monitor power cord is shipped in the accessories package in the server carton

- Server with the Data Store board and Data Store disks already installed

- Keyboard

- Mouse

- Software key that is installed on the server parallel port

- 50 ohm terminator installed on the network port

- The *MPEG Test System Installation Software* CD-ROM

- *MPEG2 Elementary Streams, Volume 1* CD-ROM

- Back up copies of software and the associated documentation supplied by the computer manufacturer.

■ Windows NT software and documentation package (Windows NT is pre-loaded on the test system; the software is provided as a backup in case the loaded version becomes corrupted)

■ Windows NT emergency repair disk

■ Two power cords (one for the server and one for the monitor)

■ Six SMB-to-BNC adaptors, three with 50 ohm cables and three with 75 ohm cables

■ A nine-pin cable (use this cable on the ECL control port in order to meet EMI requirements)

■ A 25-pin cable (use this cable on the ECL parallel/serial port in order to meet EMI requirements)

Assembling the MPEG Test System

Before you begin to assemble the test system, make sure that you have selected an appropriate location. The features of a good site include the following:

■ A sturdy, level site that includes dedicated and properly grounded circuits, air conditioning equipment, and static electricity protection for the test system.

■ A location that allows at least three inches (7.6 cm) clearance at the front and back of the server for proper ventilation. You will probably want additional access to the rear panel for connecting input and output cables.

■ A place where no heavy electrical equipment will be located near the server.

After you have selected a good site, use the following procedure to assemble the test system as shown in Figure 2–1.

Service Manual Standard Accessories

The following media is shipped with each service manual:

■ 063–2578–00   One floppy disk containing the files required for the Data Store performance verification procedures

■ 063–3203–00   A two-disc set of CDROMs containing the test transport streams for the RTA performance verification procedures
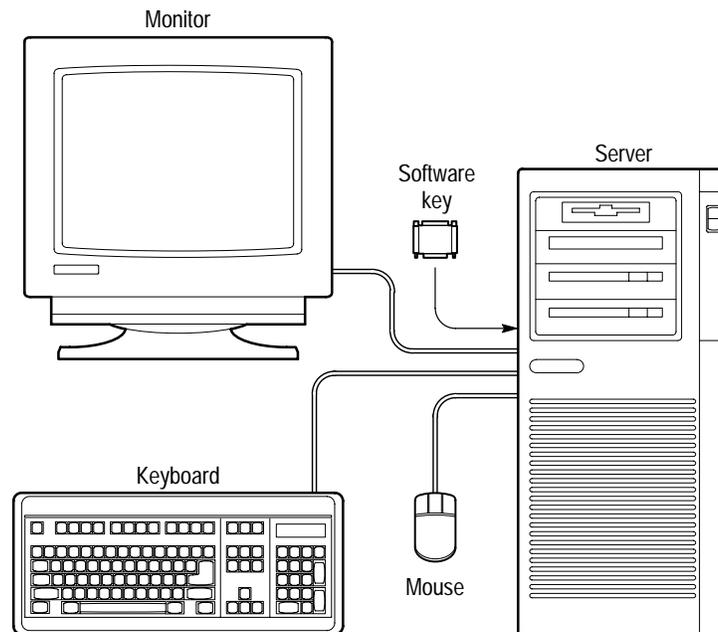
Figure 2–1: The MTS100 MPEG Test System

1. Check that the input voltage selection switch, on the server rear panel, is set to the appropriate input voltage. See Figure 2–2.
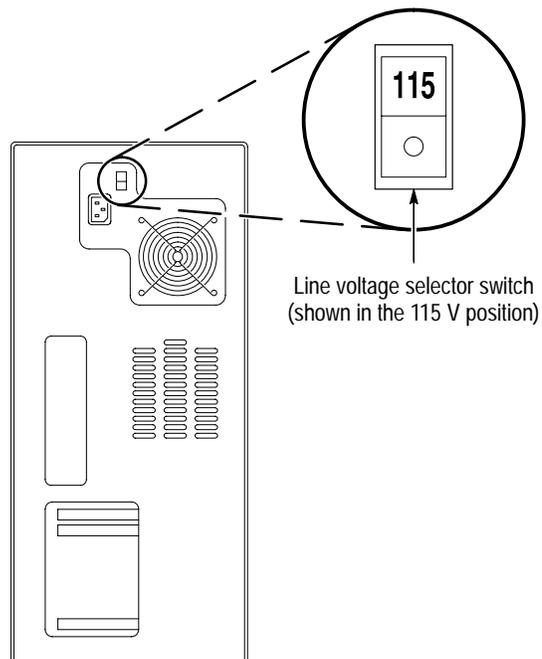
Figure 2–2: Server voltage selection switch

2. Connect the monitor cable from the monitor to the server rear panel video port. See Figure 2–3.

3. Connect the keyboard to the server rear panel keyboard port.

4. Connect the mouse to the to the server rear panel mouse port.

Keyboard port

Mouse port

Video port

Serial port

SCSI connector

Parallel port
(where the software
key is installed)

RJ45-Ethernet port

A

BNC port
(50 Ω terminator installed)

B
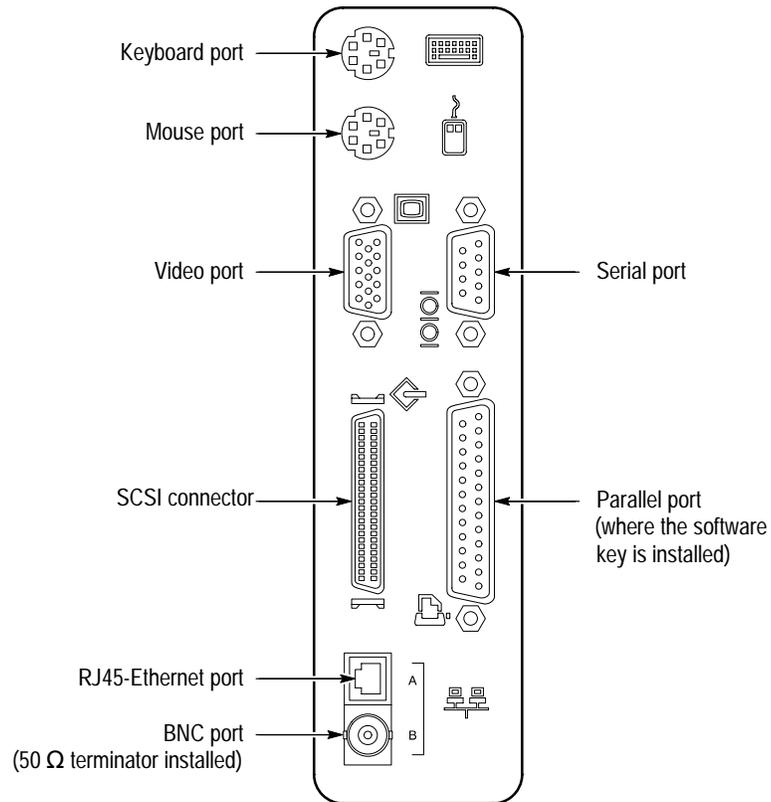
Figure 2–3: The rear panel of the server

5. If it is not already installed, connect the software key to the server rear panel parallel port. See Figures 2–3 and 2–4.
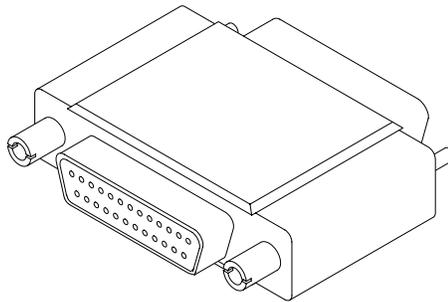
Figure 2–4: MPEG Test System software key

NOTE. If you need to use the parallel port for another function, such as a printer port, connect that cable through the software key. Note that with the software key installed, some peripherals may not work correctly.

6. If you are connecting the server to a network, connect it now and remove the 50 ohm BNC ethernet terminator. If you are not connecting the test system to a network make sure that the 50 ohm terminator is installed on the BNC port. See Figure 2–3.

7. Connect one of the two supplied power cords from the monitor to the power source. See the *Options* section of this manual for power cord information.

8. Connect the other supplied power cord from the server to the power source.

Power Mains   The server and monitor are designed to operate from a single-phase power source with 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 multi-phase systems, are not recommended. A protective ground connection 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.*

The monitor operates on either 115 VAC or 230 VAC source 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. The computer manufacturer recommends protecting the instrument from power fluctuations and temporary interruptions with a regulating, un-interruptable power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes. In addition, a UPS continues to supply power if there is 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 each available power cord option.

Parallel Port and Ethernet   You must install the software key (also called the HASP) on the parallel printer port to operate the test system. In addition, the ethernet port requires a connection to a network or an external 50 ohm termination.

The Software Enable Key   The software is enabled by a software enable key. See Figure 2–4 on page 2–5. The software key is installed on the parallel port and is transparent to its applications. Without the software key in place, the MPEG Test System software will not operate.

The software key must remain on the server parallel port at all times.

NOTE. If you return the test system for service, you must also ship the software key.

Ethernet Termination   If the test system is operating in a stand-alone mode, one of the ethernet connectors must be terminated. When shipped, the server has a 50 ohm BNC terminator installed on the ethernet connector. If the termination is not installed when operating in a stand-alone mode, the software will generate network error messages.

Connecting the Data Store System Input and Outputs

The Data Store system is an integral part of all MPEG Test Systems; it enables transport stream capture and output at up to 60 Mbps.

Figure 2–5 on page 2–8 shows the Data Store System input and output (I/O) connectors on the computer rear panel. A detailed description of each connector follows the illustration. For I/O port specifications, refer to the *Specifications* section of this manual.

Use the I/O ports that best suit your operating environment and signal sources. To receive ASI input, use the optional D6002 DVB-PI adaptor. (Contact your Tektronix representative for ordering information.)
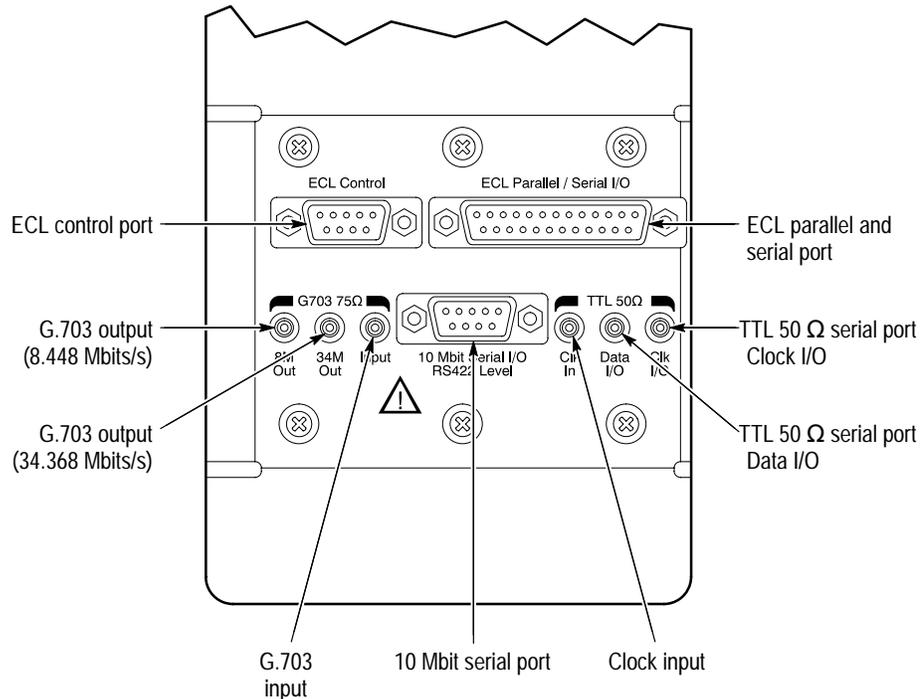
Figure 2–5: Data Store input and output ports

ECL Parallel/Serial I/O Port

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

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

■ Slave acquisition mode. Captures input signals using the ECL Parallel/Serial I/O port clock signal as the timing source.

■ Master generation mode. Outputs signals using the test system internal clock as the timing source.

■ Master generation with external clock mode. Outputs signals using the external clock input (Clk In) as the timing source.

Using the ECL Parallel/Serial I/O port in conjunction with the ECL Control port provides the following additional operating modes:

■ Master acquisition mode. Captures input signals using control signals from the ECL Control port to drive the signal source.

- Master acquisition with external clock mode. Same as Master aquisition mode, but uses a timing signal from the external clock input (Clk In) as the timing source.

- Slave generation mode. Outputs signals using the ECL Control port inputs as the timing source.

NOTE. A"Master" generates the data transmission clock. A "Slave" returns an external clock as the source.

Pinouts. For pinouts of the ECL Parallel/Serial I/O port, see Tables 1–4 and 1–5 beginning on page 1–7.

ECL Control Port

Using the ECL Control port is optional. This bidirectional differential control port adds flexibility to the ECL Parallel and Serial Ports, providing three control signals and two more operating modes. For a pinout of the ECL Control port, see Table 1–6 on page 1–10.

G.703 Output (8.448 and 34.368 Mbit/s) and G.703 Input

The G.703 serial interface complies with the electrical characteristics of ITU-T Recommendation G.703 (HDB3 code) for 8.448 Mbit/s and 34.368 Mbit/s.

The G.703 port operates in the following modes:

- Acquisition mode. Locks to the incoming signal and is self clocking.

- Generation (internal clock source) MODE. Uses an internal clock source.

The G.703 serial interface uses three Data Store circuit-board mounted SMB connectors. One connector is a dedicated input for both bit rates. The other two connectors are dedicated outputs, one for the 34.368 Mbit/s output and the other for the 8.443 Mbit/s output. To reduce spurious emissions, connect only the output being used.

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

The 10 Mbit Serial port transmits and receives MPEG transport signals and includes bidirectional clocks and data pairs. The maximum operating frequency is 10 Mbit/sec. The port uses RS-422 voltage levels with a line-to-line input termination of 110 ohm. For a pinout of the 10MBit Serial port, see Table 1–10 on page 1–12.

The 10 Mbit Serial port uses the following signals:

- Data In and Data Out (MPEG serial bit streams).

- Clock In and Clock Out (continuous data transmission).

The 10 Mbit Serial port operates in the following modes:

- Acquisition mode. Captures an input signal using an external timing reference.

- Internal generation mode. Generates an output signal using the MPEG Test System internal clock as the timing reference.

- External generation mode. Generates an output signal using the Clock input as the timing reference.

Clock Input

The Clk In connector provides an optional timing input for the ECL Serial, ECL Parallel, TTL, and 10 Mbit Serial outputs. The input operates at a maximum frequency of 45 MHz.

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

The TTL 50 ohm Serial Port consists of dedicated clock and data inputs that transmit and receive at TTL levels. The Data signal is a serial bitstream that uses a continuous data transmission clock. The maximum operating frequency is 45 Mbits/s.

The TTL 50 ohm Serial Port operates in the following modes:

- Acquire mode. Captures an input signal.

- Internal Generation mode. Generates a signal locked to the internal clock.

- External Generation mode. Generates a signal locked to an external reference supplied by the Clock Input.

Data Store I/O Cables and Mating Connectors

The MPEG Test System includes adapters to connect the Data Store SMB connectors to standard BNC connectors. You may also need to acquire or assemble other signal-connecting cables and adapters to install the test system in your facility.

Cable Lengths. Maximum cable length is a function of data rate, cable type, and ambient environment as summarized in Table 2–1. In general, low data rates tolerate long cable lengths better than high data rates. Low loss coaxial cable and low capacitance properly pair-twisted cable support longer transmission paths than do miniature coaxial cable or ribbon cable. Induced RF noise can further limit usable cable length.

The only test system ports designed for data transmission are the G.703 I/O ports. All other ports are intended for short-range interconnects. With most ports, you must control cable delay matching to maintain clock-to-data timing margins, or data integrity will suffer.

Table 2–1: Estimated maximum cable lengths

Port	Rate, Mbps	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 MPEG Test System includes six SMB-to-BNC adapter cables. Three of the adapter cables match the impedance of the G.703 75 ohm inputs and outputs. The other three match the impedance of the TTL 50 ohm Serial Port (CLK I/O, DATA I/O, and CLK IN).

NOTE. Do not leave SMB-to-BNC adapter cables on unused G.703 outputs. Doing so can cause the test system to exceed EMC emission requirements.

Connecting the Real-Time Analyzer (RTA) Input and Outputs

Systems with upgrade kit MTS1F05 installed include the Real-Time Analyzer. Figure 2–6 shows the Real-Time Analyzer input and output (I/O) connectors on the computer rear panel. A detailed description of each connector follows the illustration. For I/O port specifications, refer to the *Specifications* section of this manual.
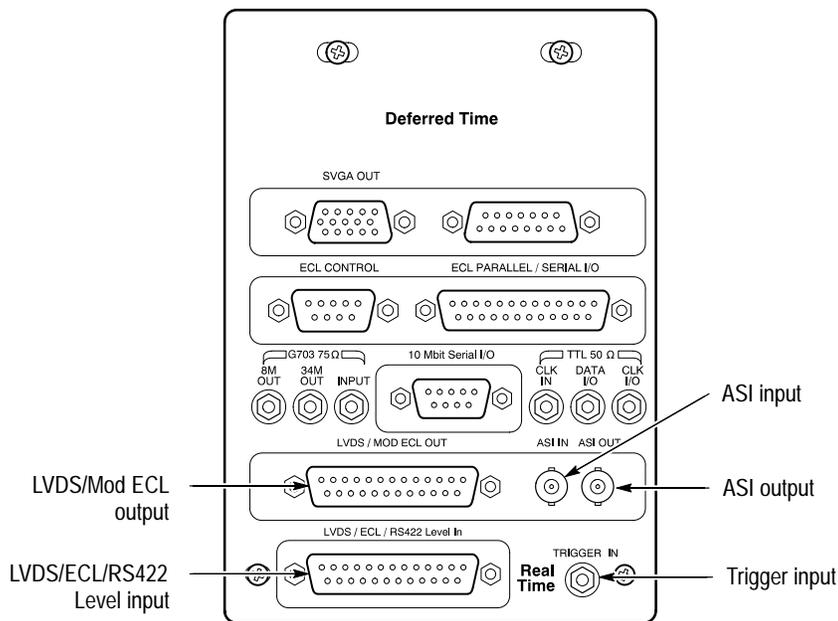
Figure 2–6: Real-Time Analyzer input and output ports (computer rear)

Input   You must provide input to the Real-Time Analyzer to monitor an MPEG-2 or DVB bitsream. The RTA accepts LVDS or ECL parallel input or ASI serial input. In the standard configuration, either LVDS or ECL parallel input is accepted as the default. If you provide serial input, you must change the software configuration before monitoring an input data stream. To change the software configuration, see the *Operating Basics* section of the *Real-Time Analyzer User Manual*.

Output to the Data Store System

To capture and save portions of the input bitstream on the Data Store disks, connect the parallel RTA output to the parallel Data Store input as shown in Figure 2–7. Use the 25-conductor straight-through shielded cable provided with the test system. From the Settings/Hardware Configuration menu, select **Modified ECL**. For further details, see the *Operating Basics* section of the *MTS200 Series Real-Time Analyzer User Manual*.
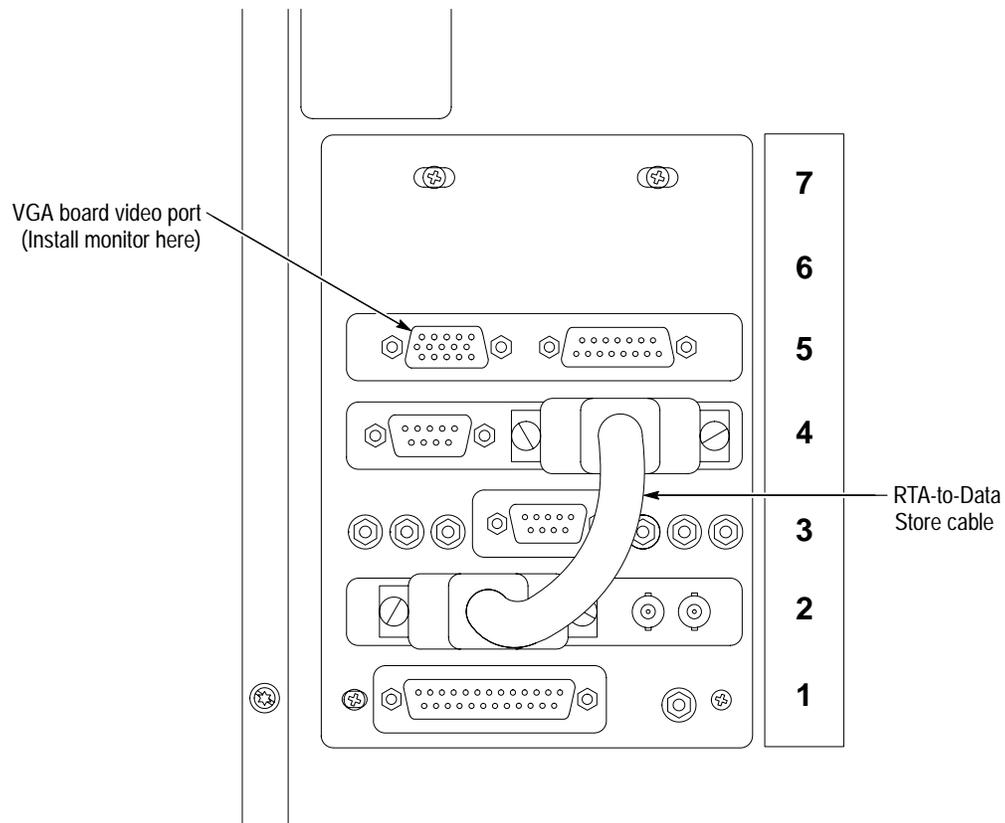
Figure 2–7: RTA output to Data Store input connection

Output to Other Equipment

The Real-Time Analyzer can output all or part of the input stream through parallel and serial (ASI) connectors.

Parallel Output. Real-Time Analyzer parallel output is active only when the RTA is running and analysis is occurring. The output level can be either LVDS or modified ECL; refer to Table 1–13 on page 1–13 for parallel output characteristics.

Parallel output can be filtered by the Real-Time Analyzer software. For complete information, refer to the *MPEG Test System Real-Time Analyzer User Manual*.

Serial (ASI) Output. With data input through the ASI connector, the serial output is continuously active. With a parallel input, the serial output is disabled when Data Storage through the parallel output occurs.

The Serial output stream is always equivalent to the input stream and is not affected by selections made on the Filtering Configuration tab of the Real-Time Analyzer Settings window.

Refer to Table 1–16 on page 1–15 for serial output characteristics.

Trigger Input

The trigger input accepts a TTL level (0 to +5 V) signal you can use to control capture of the Real-Time Analyzer input stream to the Data Store system (MTS 215 only). You can configure the system to start/stop data capture on either the rising edge (low to high transition) or the falling edge (high to low transition) of the trigger signal. Refer to the *Real-Time Analyzer User Manual* for further information.

First Time Operation

To power on the computer following installation, press the power switch on the front panel of the server.

The Windows NT initialization process takes up to two minutes. Under normal circumstances, no action is required until the Begin Logon message appears. (For further information on the Windows NT initialization process, see the Windows NT documentation included with the test system.) When the Begin Logon message appears, simultaneously press the `Ctrl + Alt + Delete` keys to open the Logon Information dialog box.

Logging On

To log on to the test system, enter `MTS100` in the User name box, leave the Password box blank, and press `ENTER` (these are the default values set at the factory). Use this logon for most of your work.

There are two other logons and passwords available. The first is `guest` with no password. This level has only limited access to files and applications. The second level is `administrator` with `MPEG2` as the password. This user has administrator privileges for the test system. You must use this logon when performing all software upgrades.

⚠ *CAUTION. The* `administrator` *user logon includes all privileges. If you are connected to a network, you may have special privileges within the network. Do not use this logon to perform normal operations.*

Changing the Passwords. You can change passwords at this time. See the Windows NT documentation for instructions. If you change any password, be sure to create a new emergency repair disk as explained in the *Software Repair* appendix of the test system user manuals.

Starting MPEG Test System Applications

When logon is complete, the Tektronix MPEG Test System program group window appears, similar to the window shown below. Double-click the appropriate icon to start the application.

Exiting MPEG Test System Applications

To exit an MPEG Test System application, select Exit/Quit from the File menu or click the close button in the upper-right corner of the application window.

The current configuration is preserved and used the next time you run the application.

Shutting Down the Tektronix MTS 200 Series MPEG Test System

To avoid loss of data and possible problems during subsequent Windows NT initialization, always shut down Windows NT before switching the computer power off. To shut down Windows NT, use the following procedure:

1. Select **Shut Down** from the Start menu.

2. In the Shut Down Windows dialog box, select **Shut down the computer?**, and then click **Yes**.

⚠ *CAUTION.* Do not *switch the computer power off until after the following message appears*: It is now safe to turn off your computer. *Turning your computer power off before this message appears can cause you to lose data and may make restarting Windows NT more difficult.*

After a few seconds, the Shutdown Computer window appears with the following message: *It is now safe to turn off your computer.*

3. Press the power switch on the front of the computer to turn the computer off.

Software Repair

If the software does not run, it may be corrupted. A full set of software is shipped with each MPEG Test System. You can reload all the software, including the Windows NT operating system. Refer to *Appendix A: Software Repair (to Serial Number B029999)* or *Appendix B: Software Repair (Serial Number B030000 and Above)* for more information.

Changing Registry Values

When acquiring a signal over a long time with Version 1.0 of the MTS100 software, error checking occasionally stops the acquisition process. To prevent error checking from stopping the acquisition process, you can set the value of the DefaultPeriodeStatus registry parameter to 0, which eliminates error checking. In MTS100 software versions 1.1 and above, it is no longer necessary to change the value of the DefaultPeriodeStatus registry parameter for long acquisitions.

To turn off the display of the dialog box after every transfer, change the DefaultAlwaysDialogBox registry parameter. The possible settings for the DefaultAlwaysDialogBox are shown in Table 2–2.

Table 2–2: Values for DefaultAlwaysDialogBox registry parameter

Value	Description
1	A dialog box is displayed after all transfers (default).
0	A dialog box is not displayed after transfers.

NOTE. You do not have to be logged in with System Administrator rights to change the DefaultAlwaysDialogBox parameter.

Use the following path to access the DefaultAlwaysDialogBox registry parameter.

    C:\HKEY_CURRENT_USER\SOFTWARE\CARB\CARBO

⚠ *CAUTION. To prevent file corruption, verify that the Data Store Administrator is not running before editing the DefaultAlwaysDialogBox parameter. When the Data Store Administrator quits, it writes to the registry file and may overwrite the value of the DefaultAlwaysDialogBox you have set.*

To change the value of the DefaultAlwaysDialogBox registry parameter, use the REGEDT32.EXE program. The REGEDT32 program is located in the C:\WINNT35\SYSTEM32 or C:\WINNT\SYSTEM32 directory.

Theory of Operation

Theory of Operation

An MPEG Test System consists of a Personal Computer platform to which a Data Store system and/or a Real-Time Analysis (RTA) system are added. The computer portion of the system is referred to as the server. The Data Store and RTA circuit boards are installed in the server EISA card cage. The boards communicate with the server via the EISA bus. See Figure 3–1 for a block diagram of the MPEG Test System. The application software that runs on the Windows NT operating system is resident on the server system disk (the C:\ drive).

The Data Store circuit board, the four SCSI Controller daughter circuit boards, and the four hard disk drives make up the Data Store system. The system can acquire and generate transport streams of up to the size of the total Data Store disk drive capacity without looping. Data store capacity of standard Prosignia-based test systems and is 8 Gbytes; capacity after installation of the MTS1F03 or MTS1F05 upgrade kits is 18 Gbytes.

The RTA circuit board decodes and instantaneously analyses many input stream characteristics. The Real-Time Analyzer software displays the results of these analyses in a graphical format.

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

Real-Time Analyzer
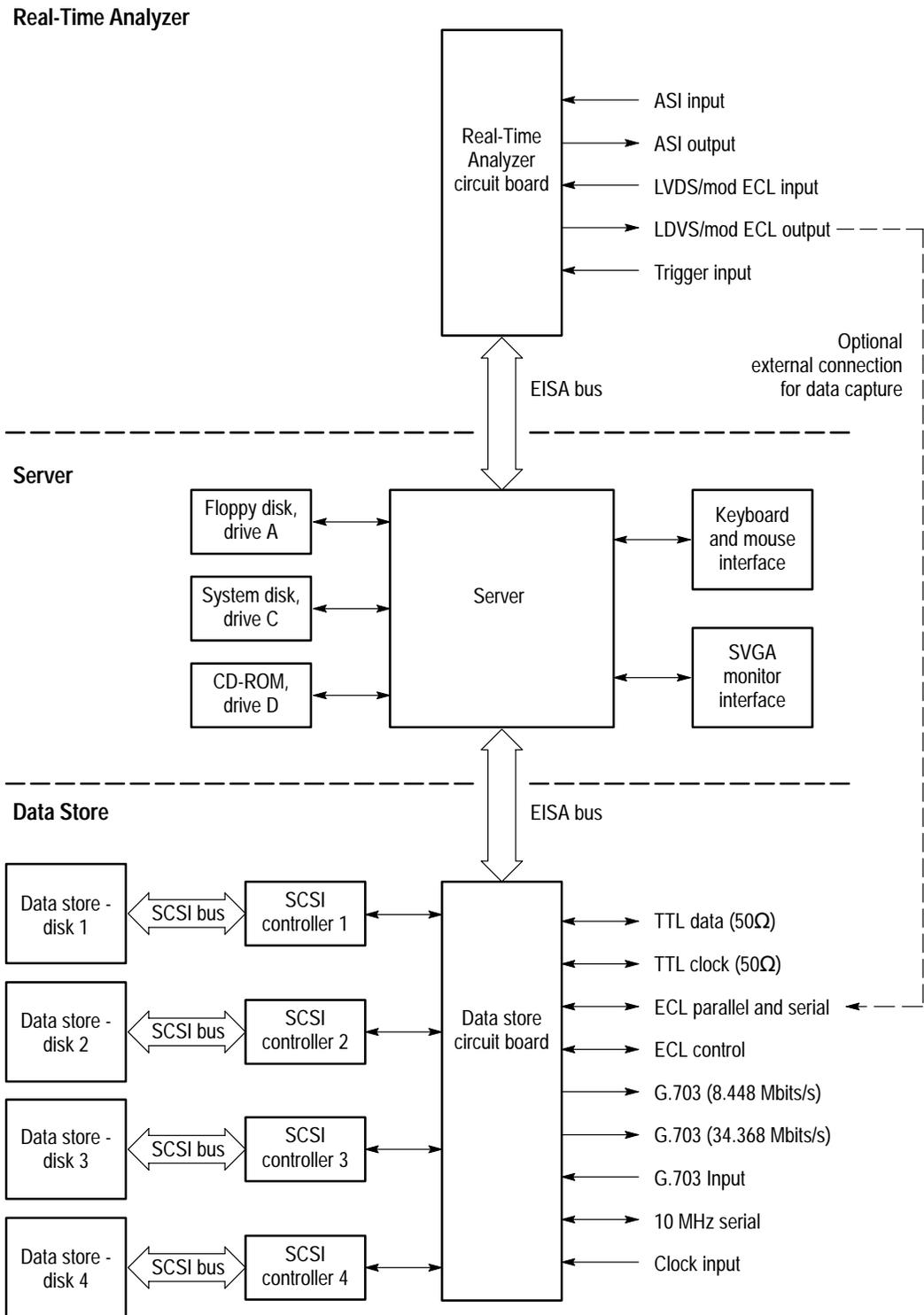
Figure 3–1: Test System block diagram

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.

External I/O

There are four separate transport stream I/Os in the Data Store 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 ohm 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 Ohm Serial Port. The TTL 50 ohm 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 ohm 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 ohm 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. The maximum parallel data rate is 60 Mbits/s (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.

Real-Time Analysis

The real-time analysis (RTA) hardware and software can continuously monitor input bit streams for compliance with MPEG-2 and DVB-SI standards.

Real-Time Analyzer Circuit Board

The Real-Time Analyzer circuit board contains circuitry that decodes incoming transport stream packets so that analysis can be performed. The board also contains a DSP to generate rate and allocation data for the PIDs and Programs carried in the transport stream. Packets that contain PCRs are time-stamped so that the application can perform PCR jitter, frequency offset, and arrival interval analyses.

External I/O

The RTA contains both parallel and ASI (Asynchronous Serial Interface) ports for data input and output. You can select the input through the RTA Configuration menu. The parallel output is live whenever the RTA is analyzing an input stream; however, the ASI output is active only when the ASI input is used.

Parallel Input. The parallel port is a 25-pin D-connector; pin assignments correspond to the DVB SPI interface standard. All input lines are differential and are terminated with 100 ohms line–to–line. The input is functional with signal levels of LVDS, ECL, or TTL (RS–422).

ASI Input. The ASI input port is a BNC connector terminated in 75 ohms.

Parallel Output. The parallel output port is intended primarily as a method to transfer a portion of the input transport stream to the Data Store system for capture and in-depth, deferred-time analysis. Capture may be initiated manually or triggered by a selected error in the transport stream. You can configure the parallel output to either LVDS or modified ECL levels through the RTA Configuration menu. When capturing to the Data Store system, select modified ECL output levels.

The input transport stream, or selected portions of the input stream, are passed to the parallel output whenever analysis is occurring. You can specify, using the RTA configuration menu, which PIDs or programs are to be passed through to the output. The RTA uses the DEN line to accomplish this PID-based filtering.

ASI Output. When the ASI Input is selected, the input data is also present in the ASI output. Parallel input is not passed to the ASI output, and PID-based filtering does not affect ASI output.

Performance Verification

Performance Verification, Data Store System

This section contains procedures for verifying that the Data Store system, an integral part of the Tektronix MPEG Test System, meets the performance requirements listed in the *Specifications* section.

It is common for MPEG Test System operators to use only one or two of the I/O ports. To minimize 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 cannot 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 MPEG Test System Data Store Administrator application. For detailed operating instructions, refer to the Windows NT documentation and the appropriate MPEG Test System user manual.

Verification 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

A functional check procedure for the Data Store system appears in Appendix E of the user manuals listed in Table 4–1. If necessary, perform the functional check to verify that the instrument is operational.

Table 4–1: Manuals containing the functional check

Software version	User manual title	Tektronix part number
2.0	MTS100 MPEG Test System	070-9376-04
2.1	MTS100 MPEG Test System Software V2.1	070-9376-05
2.2	MTS210 and MTS215 Deferred-Time Applications	071-0078-XX

Table 4–1: Manuals containing the functional check (Cont.)

Software version	User manual title	Tektronix part number
2.5	MPEG Test System Deferred-Time Applications	071-0078-XX
3.0	MTS200 Series MPEG Test System Data Store Administrator	071-0536-XX

Prerequisites

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

■ The instrument must be operating within the environmental limits described in the Table 1–21, in the *Specifications* section of this manual.

■ The instrument must have had a warm-up period of at least 20 minutes.

Equipment Required

Table 4–2 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 4–2, the equipment must meet or exceed the tolerances.

Table 4–2: Required equipment

Test equipment	Minimum requirements	Example
MPEG Test System (an additional system, not the device under test)	Used to test data transfer	Tektronix MTS 210 or 215
MTS100 Service Data Files disk	Contains files required for the test procedures	Tektronix part number 063-2578-00, supplied with this manual
Test Oscilloscope	Bandwidth DC to 500 MHz	Tektronix TDS 540A with 10X voltage probes
50 ohm SMB-to-BNC Adapter cables (4 required)		Tektronix part number 174-3578-00 (shipped as a standard accessory)
75 ohm SMB-to-BNC Adapter cables (4 required)		Tektronix part number 174-3579-00 (shipped as a standard accessory)
50 ohm BNC to BNC Cable (1 required)		Tektronix part number 012-0057-01

Table 4–2: Required equipment (cont.)

Test equipment	Minimum requirements	Example
50 ohm BNC Adapter (2 required)	Female-to-female connectors	Tektronix part number 103-0028-00
50 ohm Feed-through Terminator (2 required)		Tektronix part number 011-0049-01
75 ohm 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
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 4–13 on page 4–34)
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

Definitions

The following terms are used throughout this section:

CARB (Carte d'Acquisition / Restitution Binaire)
   (French for Binary Acquisition/Restitution Board) The MPEG Test System Data Store system, which can capture, store, and output MPEG-2 compliant transport streams. The term is used in this section where necessary for consistency with the Data Store Administrator user interface.

DUT (Device Under Test)
   The MPEG Test System that contains the Data Store System that you are checking for proper operation.

Reference System
   The MPEG test system that is used to verify DUT performance. The reference system, typically an MTS 210 or 215, must contain a Data Store System.

Test Record

Use this form to record the results of the Data Store system Performance Verification procedure.

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 ±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 ±0.1 V	
34 Mbits/s master generation	Error-free transfer	
TTL 50 ohm 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		

Performance verification step	Requirement	Test result
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	
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 20 minutes, perform the Internal Clock test that begins on page 4–8. Then refer to Table 4–3 and perform the individual I/O port tests as desired.

Table 4–3: The I/O port tests

Test name	Begins on
G.703 I/O Port Tests	page 4–10
TTL 50 ohm Port Tests	page 4–22
10 Mbits/s (RS-422) Port Tests	page 4–34
ECL Parallel Port Tests	page 4–45
ECL Serial Port Tests	page 4–56

Power On/Log In Procedure

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

1. Connect the 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 + DEL, 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.)

5. Once you have correctly logged in, you can start the individual MPEG Test System applications through the MPEG Test System program group window or the corresponding Windows NT Start submenu.

Loading Data Files

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

Before performing the tests in this section, install the service data files on drive C:\ of both the MPEG Test System under test and the MPEG Test System used for test purposes (referred to as the reference system). One of the service data files, 11meg.ver, must be transferred to the Data Store disks of both systems. Use the following procedures to install the files onto drive C and then transfer the files to the Data Store system.

Copying the Data Files into C:\Temp

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

NOTE. *You must have 20 MBytes of free system disk space to install the service data files.*

---

1. Insert the service data files disk into drive A of the MPEG Test System under test.

2. Select **Command Prompt** from the Programs submenu (of the Window NT Start menu).

3. In the resulting **Command Prompt** window, enter `cd\temp` to change to the TEMP directory.

4. Type `a:\service` and then press **ENTER**. The install program on the service data files disk copies and expands the compressed service data files into the TEMP directory.

5. Eject the disk from drive A.

6. Place the disk into drive A of the reference system and repeat steps 2 through 5.

Transferring Files to the Data Store Disks

Use the following procedure to transfer the files to the Data Store disks on both test systems:

1. Start the MPEG Test System Data Store Administrator application.

2. Select **PC to Board (Write)** from the Data Store Administrator File menu. The **File Write to CARB** window appears.

3. Click **Browse** and then select C:\temp\11meg.ver from the resulting **Open** window.

4. Once you select the file (by clicking **OK** or double-clicking the file name), the **File Write to CARB** window returns to the screen. Verify that the 11meg.ver file name appears in the **Name of the CARB file** field.

5. Click **Start** to copy the file onto the Data Store disks.

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 4–1.
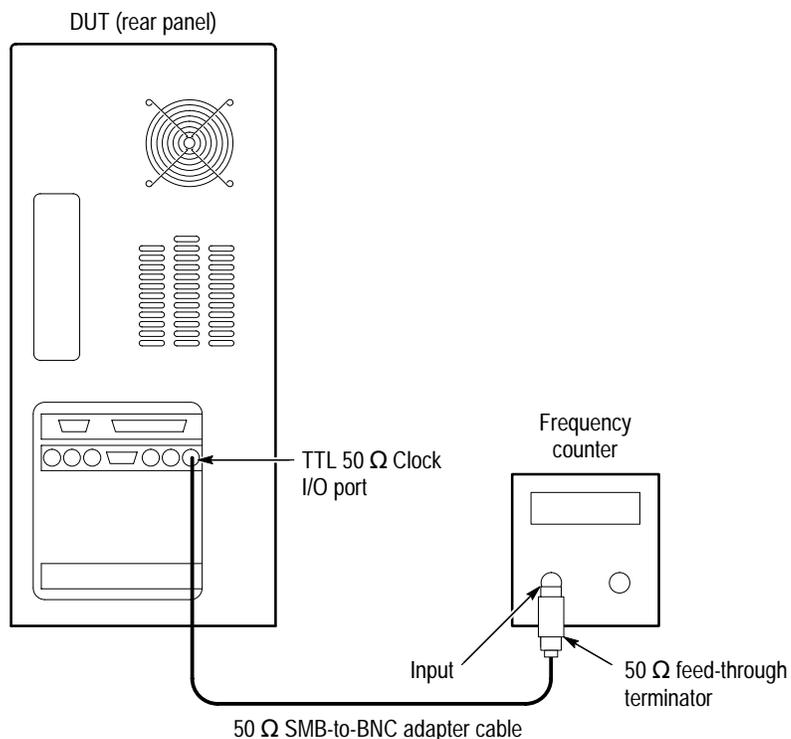
Figure 4–1: Setup for measuring internal clock output accuracy

2. Start the Data Store Administrator application, if necessary.

3. Select (highlight) *11meg.ver* in the **File information** list, then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	The highlighted file
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	1,000,000 Hz
Loop	Selected

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 4–4.

Table 4–4: 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) button so you can enter a new clock rate.

9. Repeat steps 3 through 8 for each clock rate shown in Table 4–4. 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 MTS100 MPEG Test Systems used during the Performance Verification procedure. If the data store screen on either of your systems allows you to change the data order, set the data order to the same setting for both systems.

Systems with serial numbers between B010100 and B019999 that have not been upgraded to at least software version 2.1 always use the LSB first data order. If one system has a serial number within that range, be sure the other system is also set for LSB first.

---

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 $\pm$ 0.237 V)

1. Connect the equipment as shown in Figure 4–2 on page 4–11.

2. Select (highlight) *11meg.ver* in the **File information** list, then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
File name	Any file in the list
Protocol	Master
Port	G703
Output Clock	8.448 MHz
Loop	Selected

MTS 100 (rear panel)

Pulse mark
amplitude

Pulse mark
amplitude

No pulse
space
amplitude

G.703
8M
Output

Test oscilloscope

Ch 1 input

75 Ω feed-through
terminator

75 Ω SMB-to-BNC adapter cable
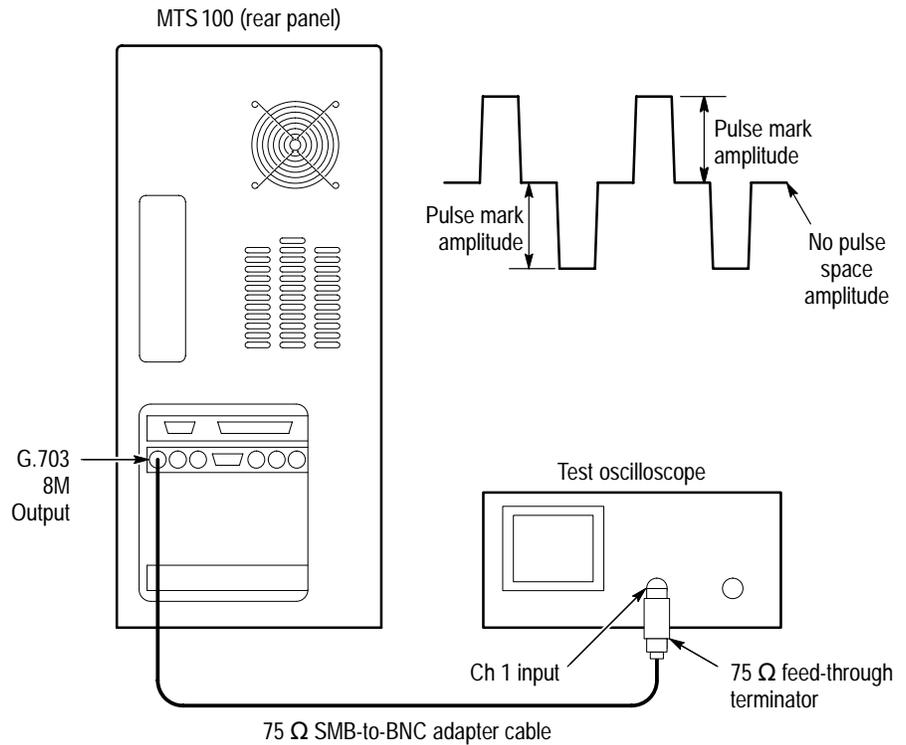
Figure 4–2: Setup for measuring 8 Mbits/s signal parameters

4. If necessary, start the MPEG Test System Data Store Administrator
application.

5. Click **Start** and wait 5 seconds.

6. Trigger the oscilloscope to obtain a stable display.

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 V $\pm$ 0.237 V.

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

This test requires a second MPEG Test System that is designated as the reference system In this procedure, the MPEG Test System that you are testing is referred to as the DUT (Device Under Test).

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

1. Connect the equipment as shown in Figure 4–3.
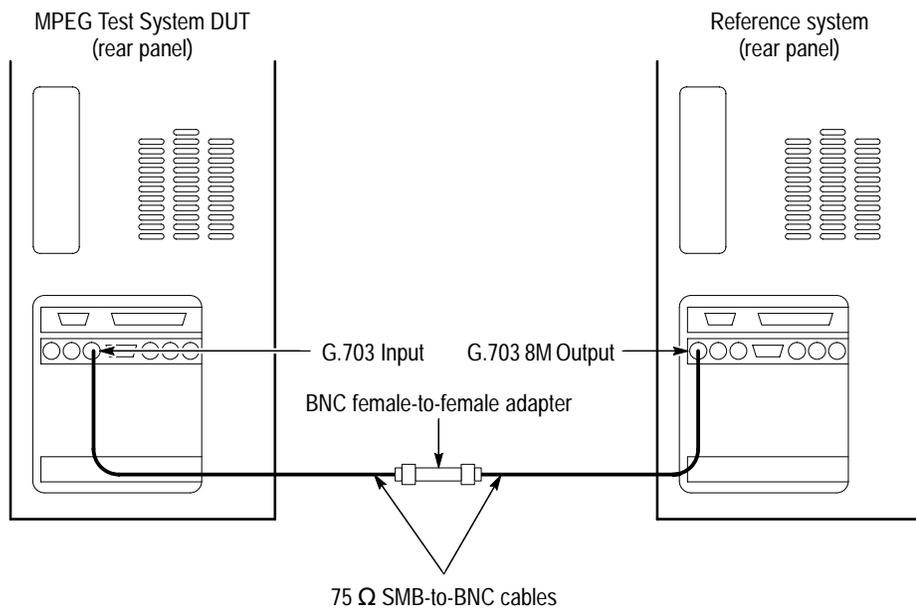
Figure 4–3: Setup for testing G.703 8.448 Mbits/s slave acquisition

2. On the DUT, click the Data Store Administrator red 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
Board file	Any (8mbit1.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G703
Internal Clock	8.448 MHz

Parameter	Setting
Synchronization	Pattern
MSB first	Match the reference system

NOTE. *The data order (LSB or MSB first) for the serial ports must match for both the MPEG Test System under test and the system used for verification. Select the **MSB first** option for acquisition only if you also select the option for generation on the reference system.*

5. Click **Start** to begin the DUT acquisition.

6. At the reference system, start or switch to the Data Store Administrator application, if necessary.

7. Select (highlight) **11meg.ver** in the File information list, then click the **G** command button to display the GENERATION dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	G703
Output Clock	8.448 MHz
Loop	Not selected

9. Click **Start** to begin reference 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, highlight any file name on the File information list and then click the **R** (CARB file read to PC) command button to open the File Read from CARB window.

   b. From the **Name of the CARB file** drop-down selection box, select the file name that you entered in step 4 (such as 8mbit1.tst).

   c. Enter the following in the **Name of the PC file** text box:

   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: click **Start** | **Programs** | **Command Prompt** (see Figure 4–4).

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 4–4). If no differences are encountered, error-free file transfer is verified.
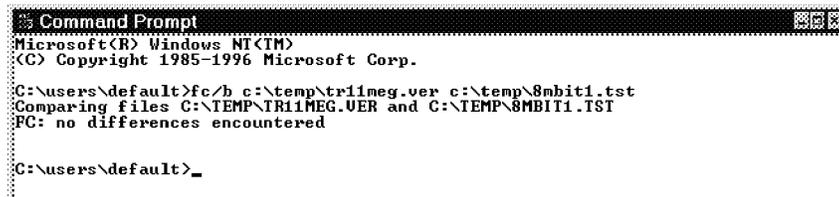
```
Command Prompt
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

C:\users\default>fc/b c:\temp\tr11meg.ver c:\temp\8mbit1.tst
Comparing files C:\TEMP\TR11MEG.UER and C:\TEMP\8MBIT1.TST
FC: no differences encountered


C:\users\default>_
```

Figure 4–4: Example file comparison results

13. Reconnect the equipment as shown in Figure 4–5.
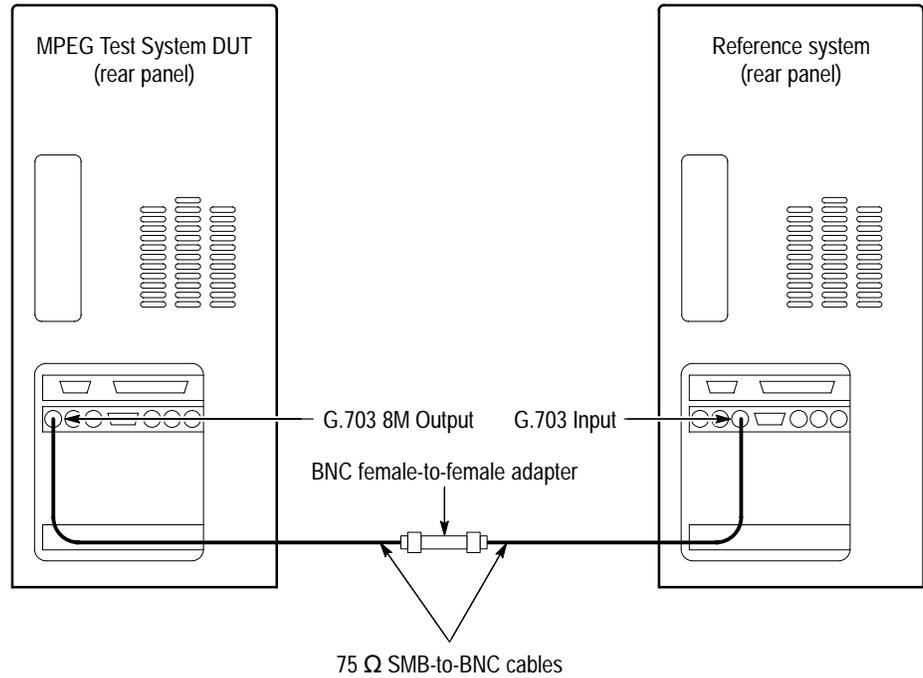
Figure 4–5: Setup for testing G.703 8.448 Mbits/s master generation

14. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

15. Enter the following parameters in the **ACQUISITION** dialog box:

Parameter	Setting
Board file	Any (8mbit2.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G703
Internal Clock	8.448 MHz
Synchronization	Pattern

16. Click **Start** to begin the reference system acquisition.

17. On the DUT, switch to the Data Store Administrator window, select 11meg.ver from the **File information** list, and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	G703
Output Clock	8.448 MHz
Loop	Not selected

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

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

   a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 15 (such as 8mbit2.tst).

   c. Enter the following in the **Name of the PC file** text box:

   `C:\temp\<filename>`

   where <filename> is the name you entered in step 20b (such as 8mbit2.tst).

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

21. On the reference 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.

   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 (see Figure 4–4 on page 4–14). If no differences are encountered, error-free file transfer is verified.

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 4–6.

2. Select (highlight) a file name in the **File information** list and then click the **G** command button in the Data Store Administrator window to display the **GENERATION** dialog box.
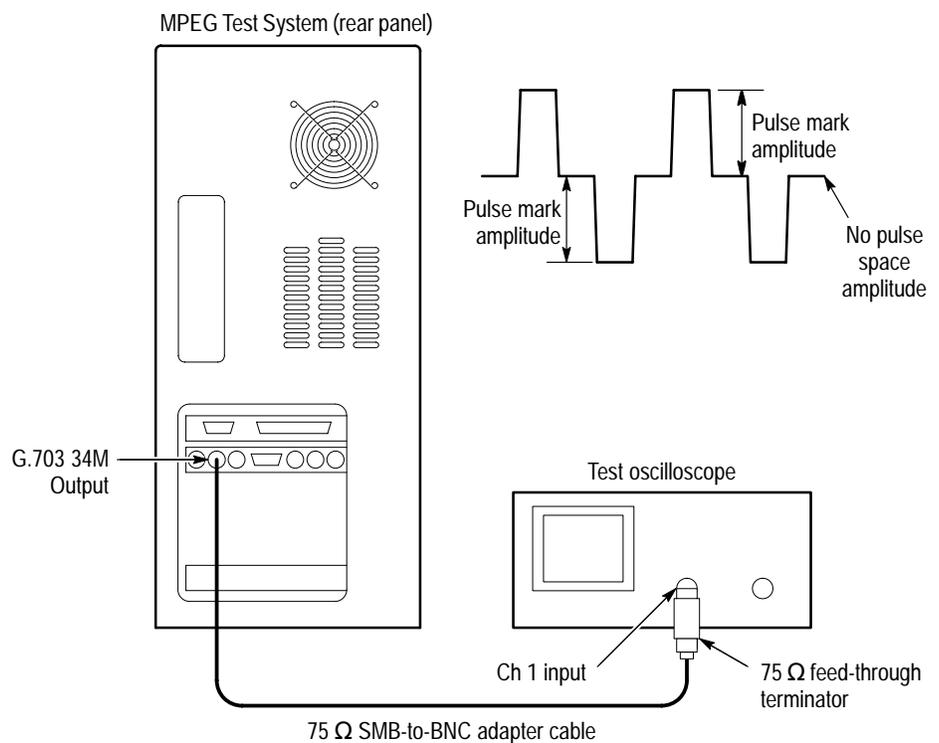
Figure 4–6: Setup for measuring 34 Mbits/s signal parameters

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

Parameter	Setting
Board file	Any file in the list
Protocol	Master
Port	G703
Output Clock	34.368 MHz
Loop	Selected

4. Click **Start** and wait 5 seconds.

5. Trigger the oscilloscope to obtain a stable display as shown in Figure 4–6.

6. Verify that the pulse mark amplitude is +1 V $\pm$ 0.1 V and the no-pulse space voltage is 0 V $\pm$ 0.1 V.

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

This test requires a second MPEG Test System that is referred to as the reference system. Throughout this procedure, the MPEG Test System that you are testing is referred to as the DUT (Device Under Test).

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

1. Connect the equipment as shown in Figure 4–7.
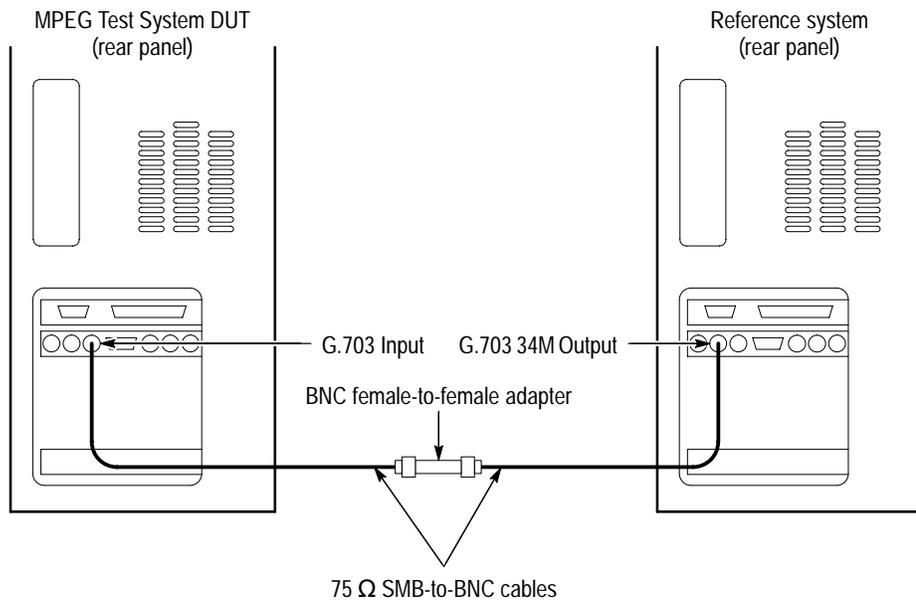
Figure 4–7: Setup for testing G.703 34.368 Mbits/s slave acquisition

2. In the DUT Data Store Administrator window, click the hand (stop) command button and the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (34mbit1.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G703
Internal Clock	34.368 MHz
Synchronization	Pattern

4. Click **Start** to begin the DUT acquisition.

5. At the reference test system, start or switch to the Data Store Administrator application, if necessary.

6. In the reference test system Data Store Administrator window, select 11meg.ver in the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	G703
Output Clock	34.368 MHz
Loop	Not selected

8. Click **Start** to begin the reference 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, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 3 (such as 34mbit1.tst).

    c. Enter the following in the **Name of the PC file** text box:

        `C:\temp\<filename>`

    where <filename> is the name you entered in step 9b (such as 34mbit1.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 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 4 (such as 34mbit1.tst).

    c. Press ENTER to begin the file comparison.

11. Check the **Command Prompt** window for the comparison results (see Figure 4–4 on page 4–14). If no differences are encountered, error-free file transfer is verified.

**12.** Reconnect the equipment as shown in Figure 4–8.
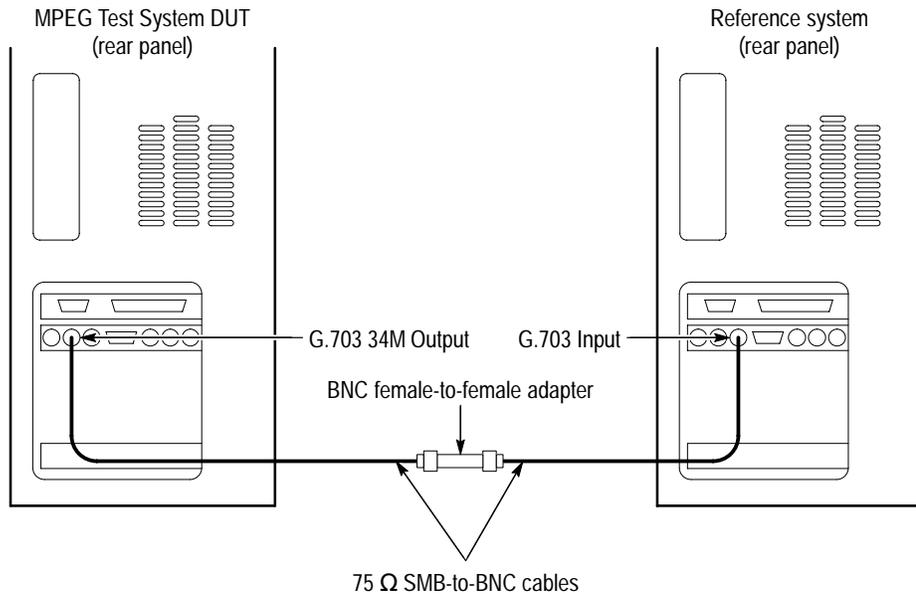
Figure 4–8: Setup for testing G.703 34.368 Mbits/s master generation

13. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (34mbit2.tst, for example)
Protocol	Slave
File Size	10,000,000
Port	G703
Internal Clock	34.368 MHz
Synchronization	Pattern

15. Click **Start** to begin the reference system acquisition.

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

17. In the DUT Data Store Administrator window, select 11meg.ver in the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	G703
Output Clock	34.368 MHz
Loop	Not selected

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

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

    a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 14 (such as 34mbit2.tst).

    c. Enter the following in the **Name of the PC file** text box:

      `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 reference 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 encountered, error-free file transfer is verified.

TTL 50 Ohm Port Tests

This section contains 50 ohm 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 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Reference systems with serial numbers between B010100 and B019999 that have not been upgraded to SW V2.1 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 4–9.
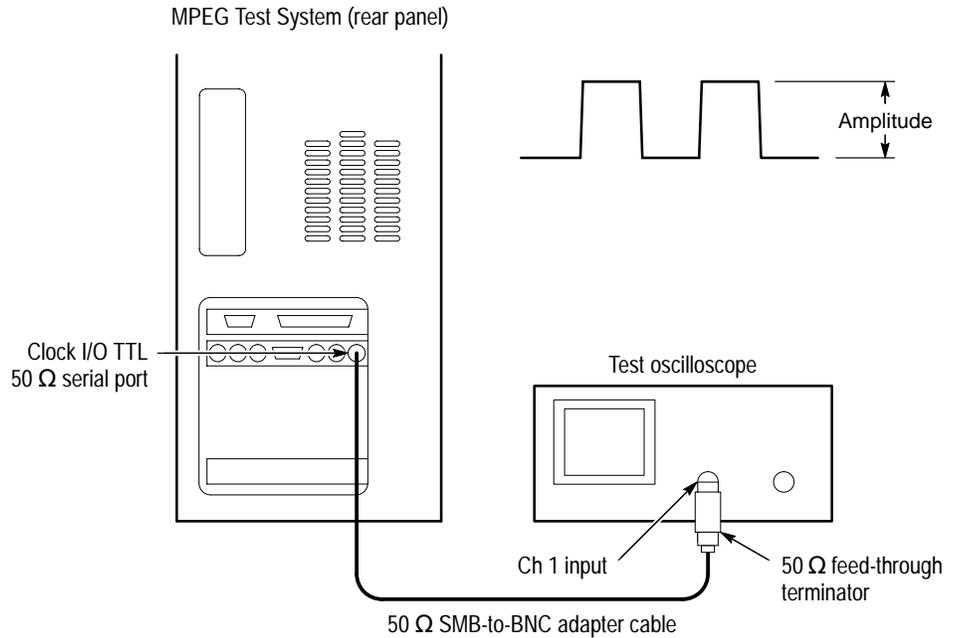
Figure 4–9: Setup for measuring TTL 50 ohm clock pulse amplitude

2. Start the Data Store Administrator application, if necessary, by choosing Data Store Administrator from the Tektronix MPEG Test System program group.

3. In the Data Store Administrator window, select any file name in the **File information** list and then click the **G** command button.

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

Parameter	Setting
Board file	Any file in the list
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	1,000,000 Hz
Loop	Selected

5. Click **Start** and wait 5 seconds.

6. Trigger the oscilloscope to obtain a stable display as shown in Figure 4–9.

7. Verify the positive peak is >2.65 V and the negative peak is <0.3 V.

8. Click the Stop command button (the red hand on the toolbar).

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

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

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

1. Connect the equipment as shown in Figure 4–10.
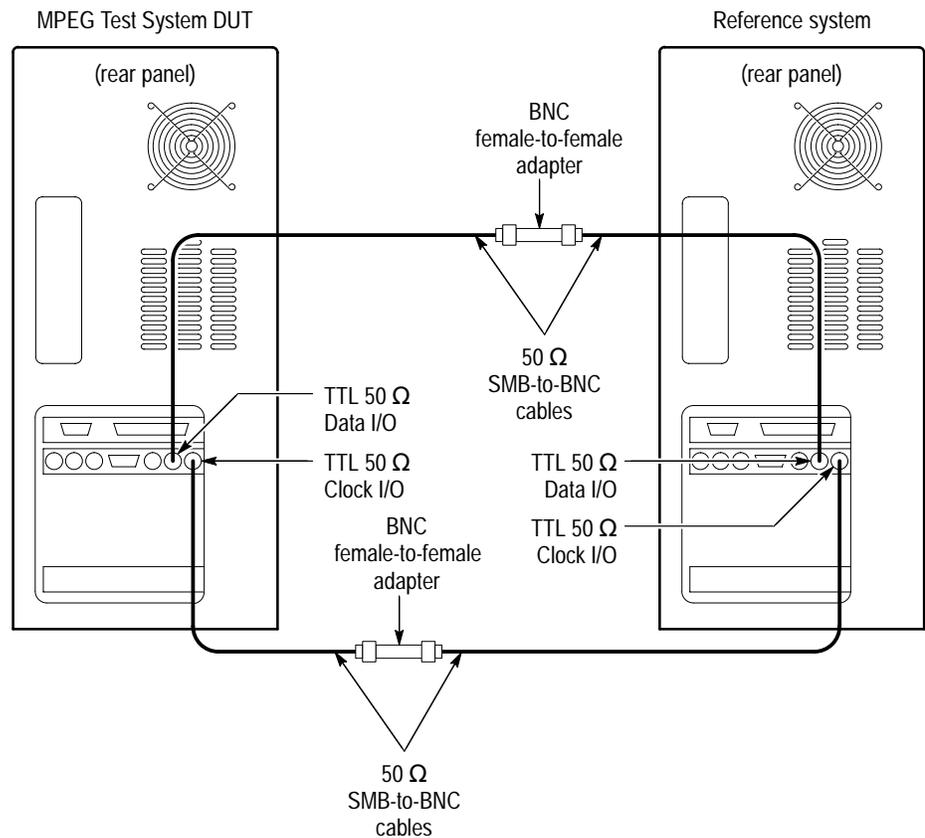
Figure 4–10: TTL 50 ohm slave acquisition and master generation setup

2. Click the **A** 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
Board 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 reference system, start or switch to the Data Store Administrator application, if necessary.

6. Select 11meg.ver on the **File information** list and then click the **G** command button in the Data Store Administrator window to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	45 MBit/s
Loop	Not selected

8. Click **Start** to begin reference system generation.

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

   a. On the DUT, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 3 (such as TTL1.tst).

    c. Enter the following in the **Name of the PC file** text box:

       `C:\temp\<filename>`

    where <filename> is the name you entered in step 9b (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.

    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. If no differences are encountered, error-free file transfer is verified.

12. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

13. Enter the following parameters in the **ACQUISITION** dialog box:

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

14. Click **Start** to begin reference system acquisition.

15. On the DUT, switch to the Data Store Administrator application.

16. Select 11meg.ver on the **File information** list and then click the **G** 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
Board file	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	45 MBit/s
Loop	Not selected

18. Click **Start** to begin DUT generation; wait for the transfer to complete.

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

   a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 13 (such as TTL2.tst).

   c. Enter the following in the **Name of the PC file** text box:

   ```
   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 reference 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\<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 encountered, error-free file transfer is verified.

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

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

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

1. Connect the equipment as shown in Figure 4–10 (on page 4–24).

2. In the DUT Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board 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 reference system, switch to the Data Store Administrator application.

6. In the reference system Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	1 MBit/s
Loop	Not selected

8. Click **Start** to begin reference system generation.

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

   a. On the DUT, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 3 (such as TTL3.tst).

   c. Enter the following in the **Name of the PC file** text box:

      C:\temp\<filename>

      where <filename> is the name you entered in step 9b (such as TTL3.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\tr11meg.ver C:\temp\<file name>

       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 encountered, error-free file transfer is verified.

12. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

13. Enter the following parameters in the **ACQUISITION** dialog box:

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

14. Click **Start** to begin reference system acquisition.

15. On the DUT, switch to the Data Store Administrator application.

16. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

17. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	TTL
Output Clock	PLL
Frequency	1 MBit/s
Loop	Not selected

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

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

   a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (Board to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 13 (such as TTL4.tst).

   c. Enter the following in the **Name of the PC file** text box:

      `C:\temp\<filename>`

   where <filename> is the name you entered in step 19b (such as TTL4.tst).

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

20. On the reference 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 13 (such as TTL4.tst).

   c. Press ENTER to begin the file comparison.

21. Check the **Command Prompt** window for the comparison results (see Figure 4–4 on page 4–14). If no differences are encountered, error-free file transfer is verified.

TTL 50 Ohm Serial Port External Clock Generation

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

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

1. Connect the equipment as shown in Figure 4–11.
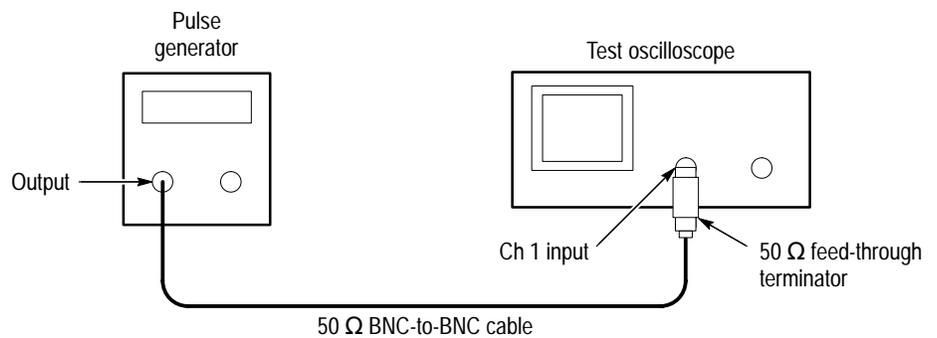
Figure 4–11: Setup for measuring the pulse generator output

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 4–12 on page 4–32.
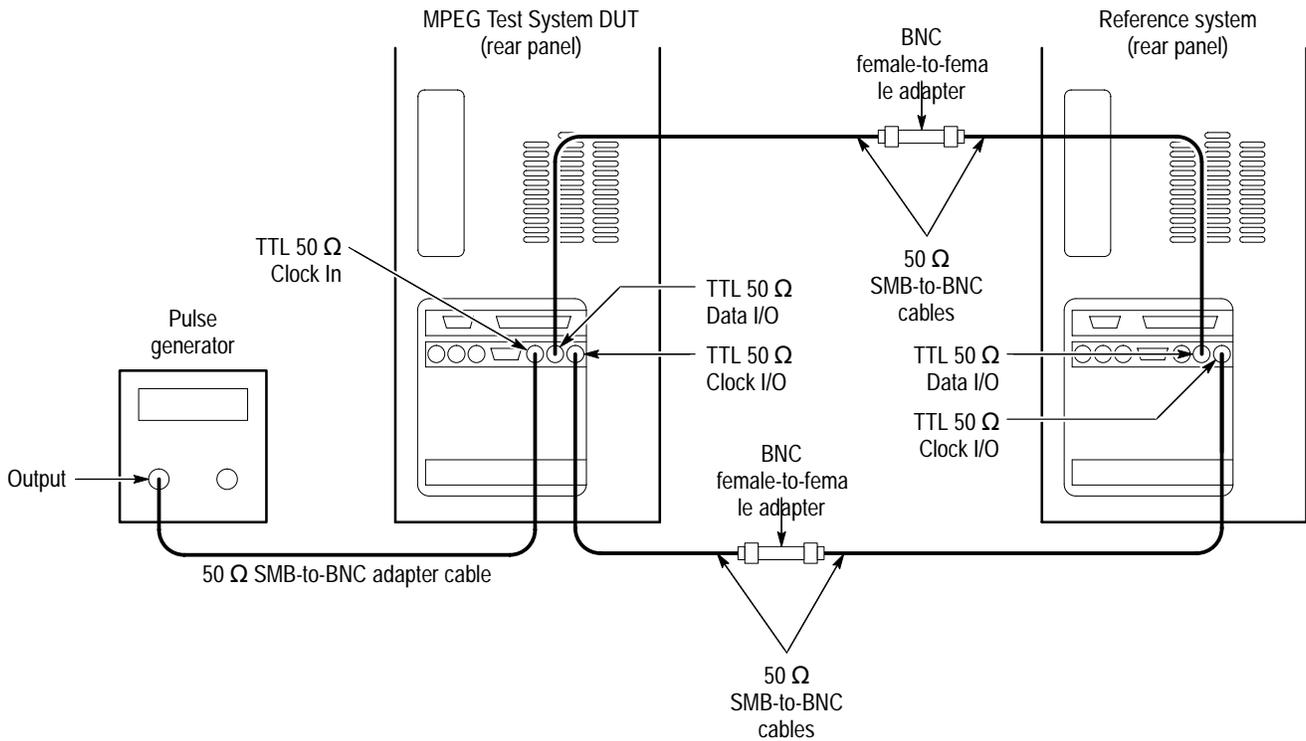
Figure 4–12: Setup for checking 50 ohm external clock generation

4. On the reference system, switch to the Data Store Administrator application.

5. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

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

7. Click **Start** to begin reference system acquisition.

8. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Port	TTL
Output Clock	External Clock
Loop	Not selected
Protocol	Master

10. Click **Start** to begin DUT generation.

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

    a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 6 (such as TTL5.tst).

    c. Enter the following in the **Name of the PC file** text box:

        `C:\temp\<filename>`

    where <filename> is the name you entered in step 11b (such as TTL5.tst).

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

12. On the reference 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 TTL5.tst).

    c. Press ENTER to begin the file comparison.

13. Check the **Command Prompt** window for the comparison results. If no differences are encountered, error-free file transfer is verified.

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 MPEG Test System that is designated as the reference system. Within this procedure the MPEG Test System you are testing is designated the Device Under Test (DUT).

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

1. Construct the 10 MHz signal interconnect fixture as shown in Figure 4–13.

From	To
1	3
2	4
3	1
4	2
5	5
6	8
7	9
8	6
9	7

Wiring diagram of test fixture
(connectors are shown from the front)
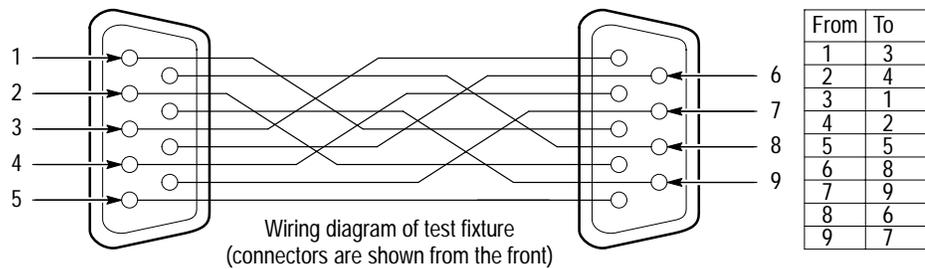
Figure 4–13: 10 MHz signal interconnect fixture

2. Connect the equipment as shown in Figure 4–14.
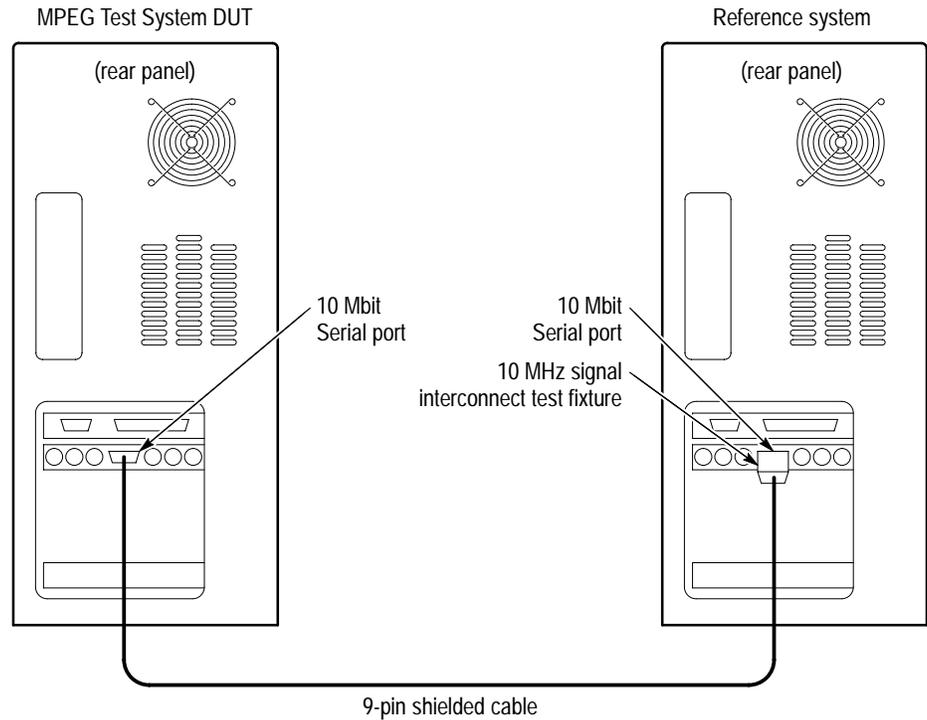
Figure 4–14: Setup for checking 10 Mbit serial port high speed clock slave acquisition and master generation

3. On the DUT, start or switch to the Data Store Administrator application, if necessary.

4. In the DUT Data Store Administrator window, Click the **A** command button to display the **ACQUISITION** dialog box.

5. Enter the following parameters in the **ACQUISITION** dialog box:

Parameter	Setting
Board 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 reference system, start or switch to the Data Store Administrator application, if necessary.

8. In the Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	10 MBits
Output Clock	PLL
Frequency	10 Mbps
Loop	Not selected

10. Click **Start** to begin reference system generation.

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

   a. On the DUT, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 5 (such as RS4221.tst).

   c. Enter the following in the **Name of the PC file** text box:

```
C:\temp\<filename>
```

   where <filename> is the name you entered in step 11b (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 encountered, error-free file transfer is verified.

14. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

15. Enter the following parameters in the **ACQUISITION** dialog box:

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

16. Click **Start** to begin acquisition.

17. On the DUT, double-click the Data Store Administrator icon to open the application.

18. On the DUT, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

19. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	10 MBits
Output Clock	PLL
Frequency	10 Mbps
Loop	Not selected

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

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

    a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select \<filename\>, where \<filename\> is the name you entered in step 15 (such as RS4222.tst).

    c. Enter the following in the **Name of the PC file** text box:

        `C:\temp\<filename>`

    where \<filename\> is the name you entered in step 21b (such as RS4222.tst).

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

22. On the reference 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\<file name>`

    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 encountered, error-free file transfer is verified.

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

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

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

1. In the DUT Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

2. Enter the following parameters in the **ACQUISITION** dialog box:

Parameter	Setting
Board 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 reference system, switch to the Data Store Administrator application.

5. In the reference system Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

6. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	10 MBits
Output Clock	PLL
Frequency	1 Mbps
Loop	Not selected

7. Click **Start** to begin 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, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 2 (such as RS4223.tst).

    c. Enter the following in the **Name of the PC file** text box:

       `C:\temp\<filename>`

    where <filename> is the name you entered in step 8b (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 encountered, error-free file transfer is verified.

11. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

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

13. Click **Start** to begin acquisition.

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

15. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	10 MBits
Output Clock	PLL
Frequency	1 Mbps
Loop	Not selected

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

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

    a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select \<filename\>, where \<filename\> is the name you entered in step 12 (such as RS4224.tst).

    c. Enter the following in the **Name of the PC file** text box:

    `C:\temp\<filename>`

    where \<filename\> is the name you entered in step 18b (such as RS4224.tst).

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

19. On the reference 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\<file name>
```

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 encountered, error-free file transfer is verified.

10 Mbit Serial Port External Clock Generation

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

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

1. Connect the equipment as shown in Figure 4–15.
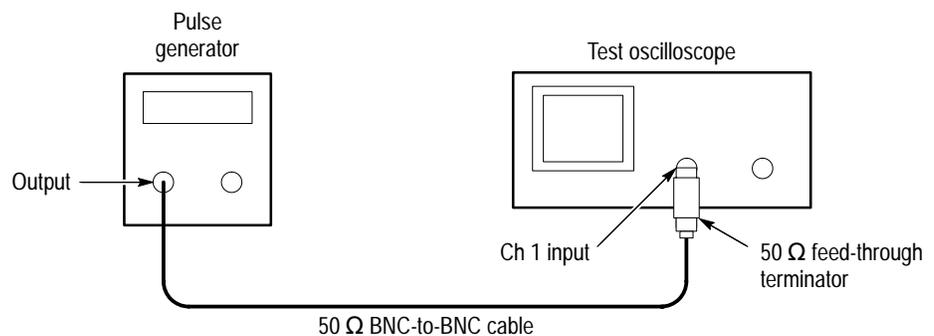
Figure 4–15: Setup for measuring the pulse generator output

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 4–16.
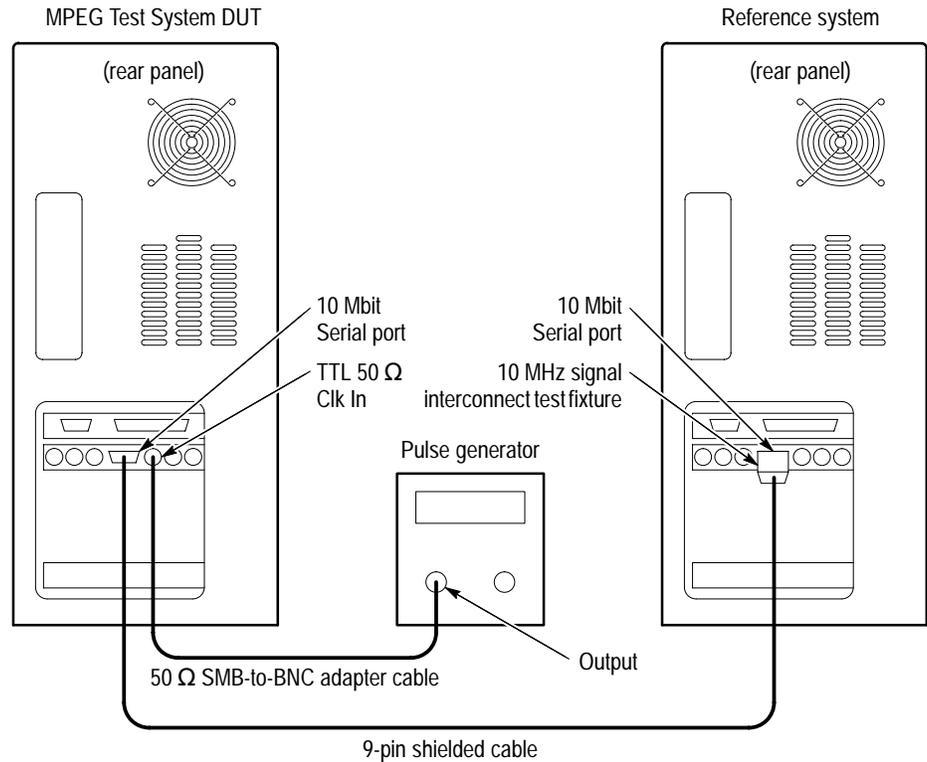
Figure 4–16: Setup for checking 10 Mbit external clock generation

4. On the reference system, switch to the Data Store Administrator application.

5. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

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

7. Click **Start** to begin acquisition.

8. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	10 MBits
Output Clock	External Clock
Loop	Not selected

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

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

    a. On the reference system, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 6 (such as RS4225.tst).

    c. Enter the following in the **Name of the PC file** text box:

        `C:\temp\<filename>`

        where <filename> is the name you entered in step 11b (such as RS4225.tst).

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

12. On the reference 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 encountered, error-free file transfer is verified.

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 MPEG Test System that is designated as the reference system. Within this procedure the MPEG Test System you are testing is designated the Device Under Test (DUT).

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

1. Connect the equipment as shown in Figure 4–17.

MPEG Test System DUT

(rear panel)

Reference system

(rear panel)

ECL Parallel/ Serial I/O port

ECL Parallel/ Serial I/O port

25-pin shielded cable
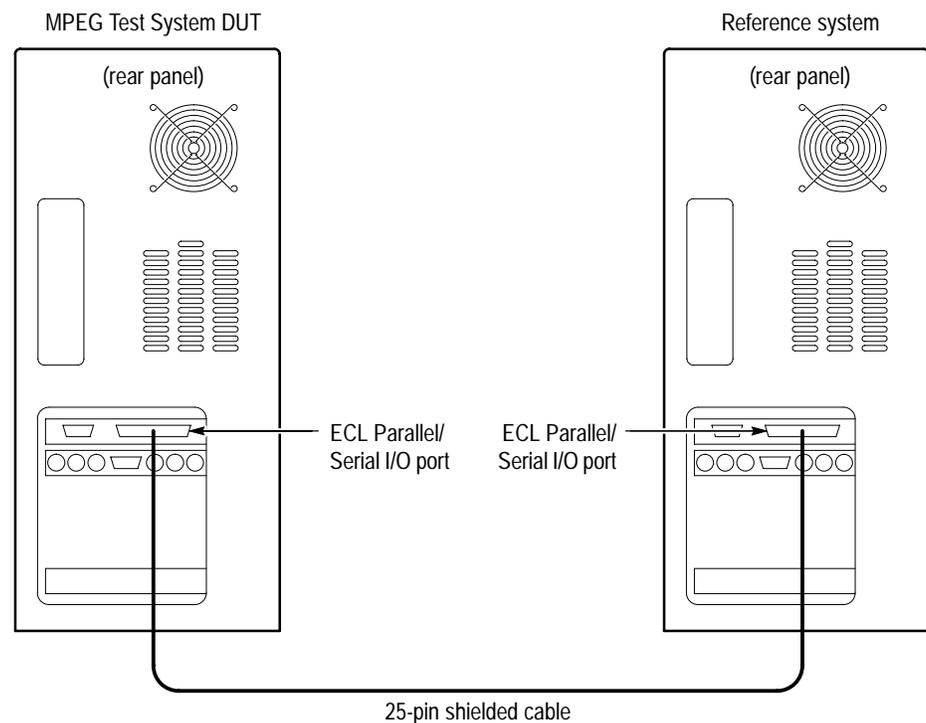
Figure 4–17: Setup for checking ECL parallel port data transfer

2. On the DUT, start the Data Store Administrator application, if necessary, by choosing Data Store Administrator from the Tektronix MPEG Test System program group.

3. In the DUT Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (ECL1.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	// ECL
Synchronization	Psync

5. Click **Start** to begin DUT acquisition.

6. On the reference system, start or switch to the Data Store Administrator application, if necessary.

7. In the reference system Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

8. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	// ECL
Output Clock	PLL
Frequency	Maximum (5.625 MB/s or 7.5 MB/s)
Loop	Not selected

9. Click **Start** to begin generation.

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

    a. On the DUT, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 4 (such as ECL1.tst).

c. Enter the following in the **Name of the PC file** text box:

`C:\temp\<filename>`

where <filename> is the name you entered in step 10b (such as ECL1.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.

- To start the application in Windows NT 3.51, double-click the Command Prompt icon in the Main program group.

- In Windows NT 4.0, select Command Prompt from the Programs submenu (of the Start menu).

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 ECL1.tst).

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

12. Check the **Command Prompt** window for the comparison results (see Figure 4–4 on page 4–14). If no differences are encountered, error-free file transfer is verified.

13. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (ECL2.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	// ECL
Synchronization	Psync

15. Click **Start** to begin acquisition.

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

17. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	// ECL
Output Clock	PLL
Frequency	Maximum (5.625 MB/s or 7.5 MB/s)
Loop	Not selected

19. Click **Start** to begin DUT generation.

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

   a. In the reference system Data Store Administrator window, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 14 (such as ECL2.tst).

   c. Enter the following in the **Name of the PC file** text box:

   `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 reference 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 ECL2.tst).

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

22. Check the **Command Prompt** window for the comparison results. If no differences are encountered, error-free file transfer is verified.

ECL Parallel Port External Clock Generation

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

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

1. Connect the equipment as shown in Figure 4–18.
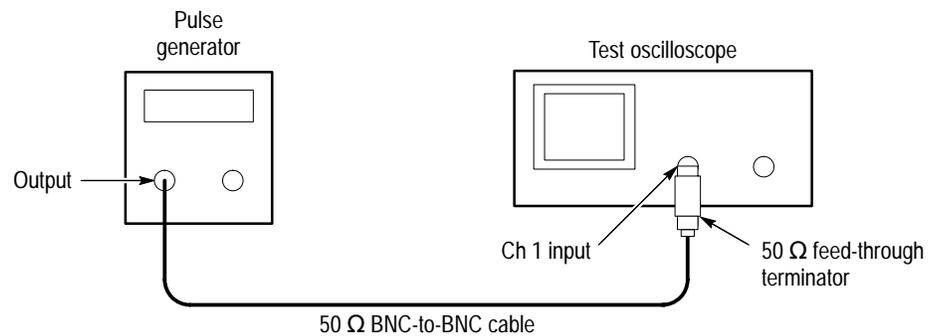
Figure 4–18: Setup for measuring the pulse generator output

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 4–19 on page 4–50.
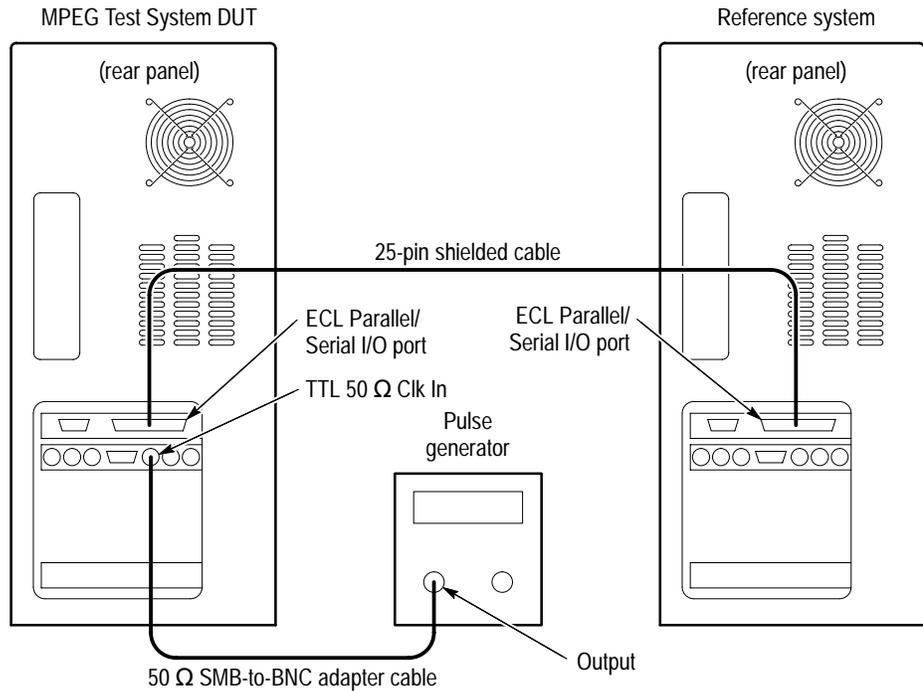
Figure 4–19: Setup for checking ECL parallel port generation with an external clock

4. On the reference system, switch to the Data Store Administrator application.

5. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board 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 acquisition.

8. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	// ECL
Output Clock	External Clock
Loop	Not selected

10. Click **Start** to begin DUT generation.

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

    a. In the test system Data Store Administrator window, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

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

    c. Enter the following in the **Name of the PC file** text box:

      `C:\temp\<filename>`

    where <filename> is the name you entered in step 11b (such as ECL3.tst).

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

12. 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 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 encountered, error-free file transfer is verified.

ECL Parallel Port Master Acquisition and Slave Generation

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

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

1. Connect the equipment as shown in Figure 4–20.
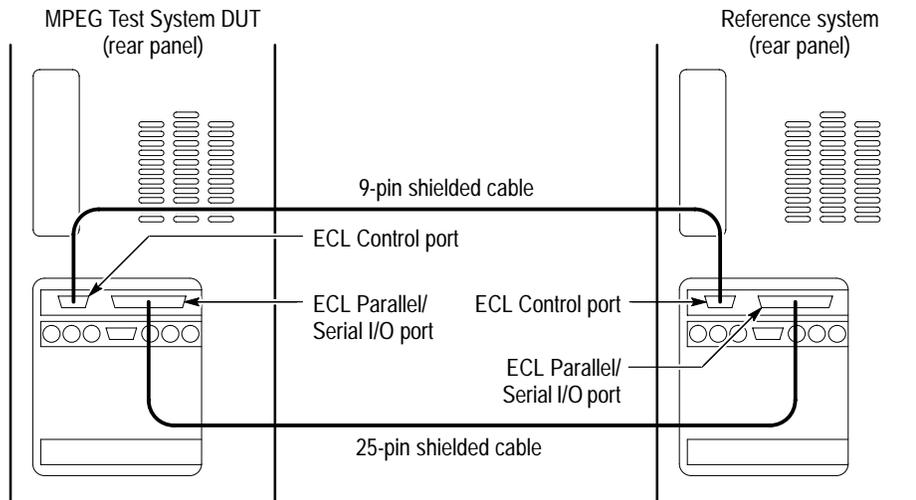
Figure 4–20: Setup for checking ECL parallel port master acquisition and slave generation

2. In the DUT Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (ECL4.tst, for example)
Protocol	Master
File Size	10,941,600
Port	ECL Parallel Port Input
Output Clock	PLL
Frequency	Maximum (5.625 MB/s or 7.5 MB/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 reference system, switch to the Data Store Administrator application.

6. In the Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Slave
Port	// ECL
Loop	Not selected

8. Click **Start** to begin 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, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 3 (such as ECL4.tst).

   c. Enter the following in the **Name of the PC file** text box:

   C:\temp\<filename>

   where <filename> is the name you entered in step 9b (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\<file name>

    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 encountered, error-free file transfer is verified.

12. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

13. Enter the following parameters in the **ACQUISITION** dialog box:

Parameter	Setting
Board 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 MB/s or 7.5 MB/s)
Synchronization	Psync
Control Port	Useful bytes: 188 Stuffing bytes: 16 Syncro. byte size: 1

14. Click **Start** to begin acquisition.

15. On the DUT, switch to the Data Store Administrator application.

16. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

17. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Slave
Port	// ECL
Loop	Not selected

18. Click **Start** to begin DUT generation.

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

    a. In the reference system Data Store Administrator window, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 13 (such as ECL5.tst).

    c. Enter the following in the **Name of the PC file** text box:

       `C:\temp\<filename>`

    where <filename> is the name you entered in step 19b (such as ECL5.tst).

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

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

    a. On the reference 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 encountered, error-free file transfer is verified.

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 MPEG Test System that is designated as the reference system. Within this procedure the MPEG Test System you are testing is designated the Device Under Test (DUT).

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

1. Connect the equipment as shown in Figure 4–21.
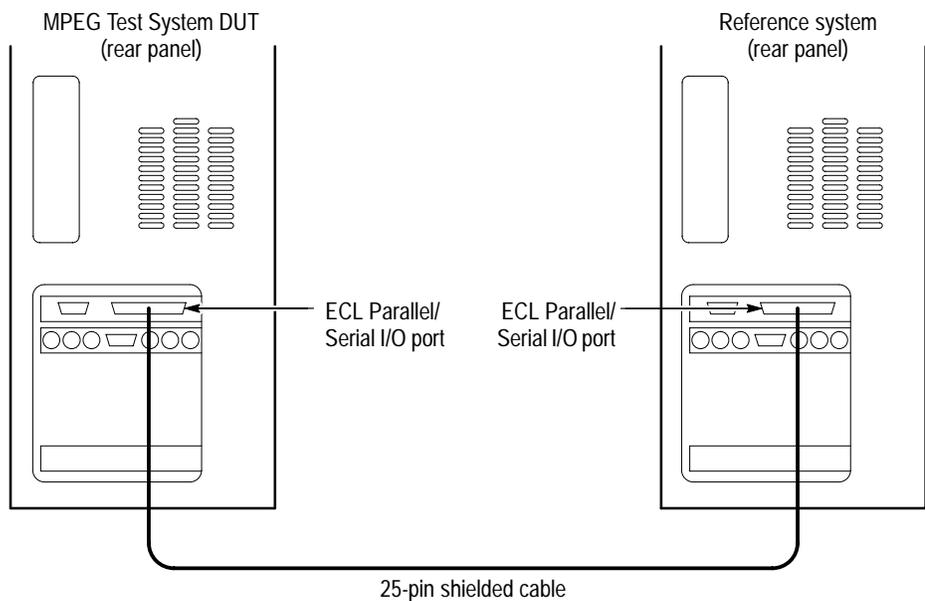
Figure 4–21: Setup for checking ECL serial port slave acquisition and master generation

2. On the DUT, start or switch to the Data Store Administrator application, as necessary.

3. In the DUT Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (serial1.tst, for example)
Protocol	Slave
File Size	10,941,600
Port	Serial ECL
Synchronization	Psync

5. Click **Start** to begin DUT acquisition.

6. On the reference system, start or switch to the Data Store Administrator application, as necessary.

7. In the reference system Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

8. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	Serial ECL
Output Clock	PLL
Frequency	45 MB/s (to serial number B019999) 55 MB/s (all other instruments)
Loop	Not selected

9. Click **Start** to begin 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, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 4 (such as serial1.tst).

    c. Enter the following in the **Name of the PC file** text box:

       `C:\temp\<filename>`

    where <filename> is the name you entered in step 10b (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.

    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 4 (such as serial1.tst).

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

12. Check the **Command Prompt** window for the comparison results (see Figure 4–4 on page 4–14). If no differences are encountered, error-free file transfer is verified.

13. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

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

15. Click **Start** to begin acquisition.

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

17. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	Serial ECL
Output Clock	PLL
Frequency	45 MB/s (to serial number B019999) 55 MB/s (all other instruments)
Loop	Not selected

19. Click **Start** to begin DUT generation.

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

    a. In the reference system Data Store Administrator window, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 14 (such as serial2.tst).

    c. Enter the following in the **Name of the PC file** text box:

       `C:\temp\<filename>`

    where <filename> is the name you entered in step 20b (such as serial2.tst).

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

21. 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 encountered, error-free file transfer is verified.

ECL Serial Port External Clock Generation

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

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

1. Connect the equipment as shown in Figure 4–22.
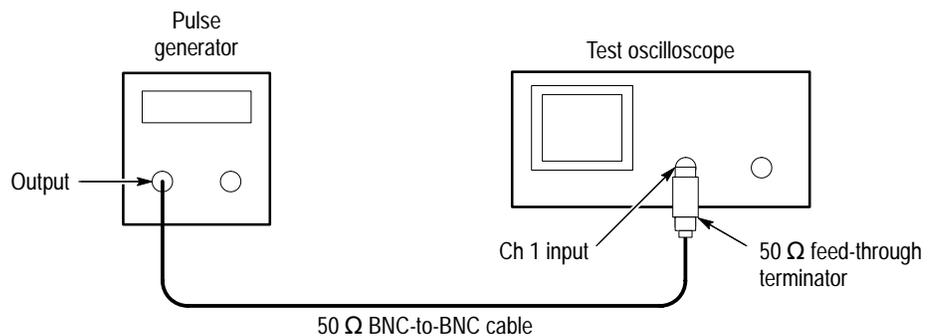
Figure 4–22: Setup for measuring the pulse generator output

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 4–23.
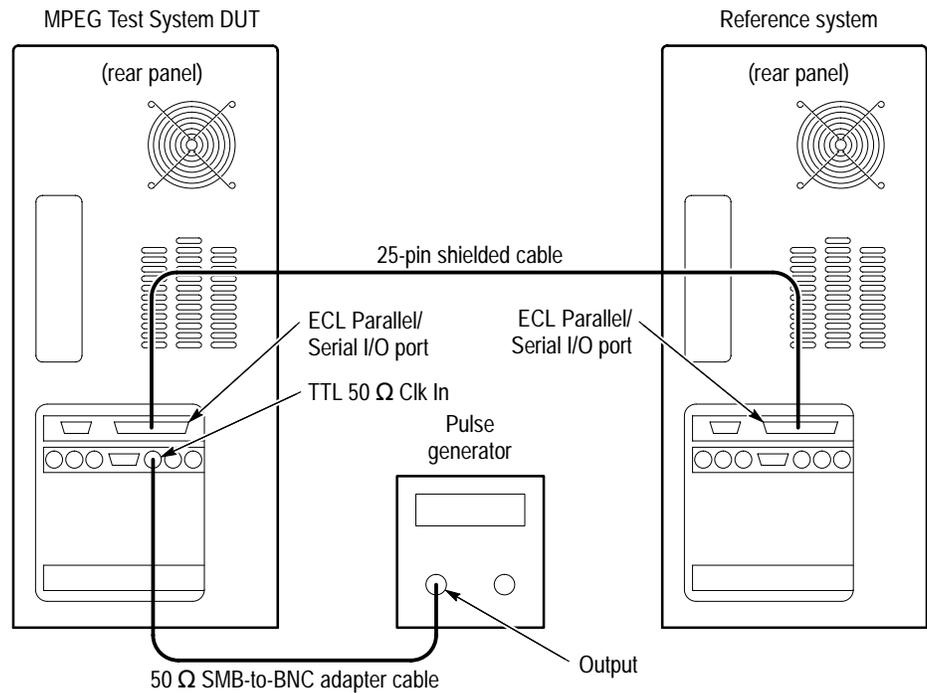
Figure 4–23: Setup for checking ECL serial port generation with an external clock

4. On the reference system, switch to the Data Store Administrator application.

5. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

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

7. Click **Start** to begin acquisition.

8. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Master
Port	Serial ECL
Output Clock	External Clock
Loop	Not selected

10. Click **Start** to begin DUT generation.

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

    a. In the reference system Data Store Administrator window, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

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

    c. Enter the following in the **Name of the PC file** text box:

       `C:\temp\<filename>`

       where <filename> is the name you entered in step 11b (such as serial3.tst).

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

12. On the reference 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 encountered, error-free file transfer is verified.

ECL Serial Port Master Acquisition and Slave Generation

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

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

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

MPEG Test System DUT   Reference system
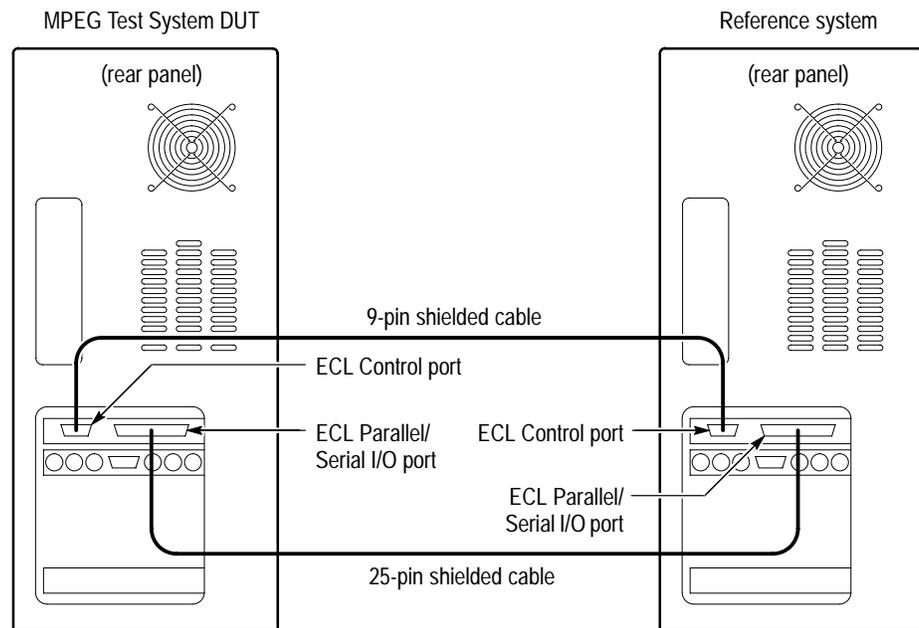
Figure 4–24: Setup for checking ECL serial port slave generation

2. In the DUT Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

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

Parameter	Setting
Board file	Any (serial4.tst, for example)
Protocol	Master
File Size	10,941,600
Port	Serial ECL
Output Clock	PLL
Frequency	45 MB/s (to serial number B019999) 55 MB/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 reference system, switch to the Data Store Administrator application.

6. In the reference system Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

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

Parameter	Setting
Board file	11meg.ver
Protocol	Slave
Port	Serial ECL
Loop	Not selected

8. Click **Start** to begin generation.

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

   a. On the DUT, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

   b. From the **Name of the CARB file** drop-down selection box, select <filename>, where <filename> is the name you entered in step 3 (such as serial4.tst).

   c. Enter the following in the **Name of the PC file** text box:

   `C:\temp\<filename>`

   where <filename> is the name you entered in step 9b (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\<file name>
```

    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 encountered, error-free file transfer is verified.

12. In the reference system Data Store Administrator window, click the **A** command button to display the **ACQUISITION** dialog box.

13. Enter the following parameters in the **ACQUISITION** dialog box:

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

14. Click **Start** to begin reference system acquisition.

15. On the DUT, switch to the Data Store Administrator application.

16. In the DUT Data Store Administrator window, select 11meg.ver on the **File information** list and then click the **G** command button to display the **GENERATION** dialog box.

17. Enter the following parameters in the **GENERATION** dialog box:

Parameter	Setting
Board file	11meg.ver
Protocol	Slave
Port	Serial ECL
Loop	Not selected

18. Click **Start** to begin DUT generation.

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

    a. In the reference system Data Store Administrator window, select the file you just acquired in the **File information** list and then click the **R** (CARB file read to PC) command button.

    b. From the **Name of the CARB file** drop-down selection box, 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 19b (such as serial5.tst).

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

20. On the reference 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 encountered, error-free file transfer is verified.

This concludes the Data Store System verification procedures.

Performance Verification, Real-Time Analyzer

This section contains procedures for verifying correct operation of the MPEG Test System Real-Time Analyzer hardware and software.

NOTE. To perform the procedures in this section, you must have a basic understanding of the Windows NT operating system and the MPEG Test System Real-Time Analyzer and Data Store Administrator applications. For detailed operating instructions, refer to the Windows NT documentation and the appropriate MPEG Test System User manual.

Equipment Required

Table 4–5: Required equipment list

Test equipment	Qty.	Minimum requirements	Example
Oscilloscope	1	500 MHz bandwidth	Tektronix TDS724D
X10 Oscilloscope Probes	2		Tektronix P6139A 10X Oscilloscope Probes
75/50 Ω Oscilloscope Adapter	1		AMT75
Digital Multimeter	1	0.5% DC voltage accuracy	Tektronix TX1 DMM
Reference Instrument	1	Tektronix MPEG Test System containing Data Store and Real-Time Analyzer hardware and software	Tektronix MTS 215 or MTS 100 with MTS1F05
DVB-Physical Interface	1	ECL // input, ASI and LVDS output	Matracom Model D 6002
BNC cables	4	75 Ω	Tektronix part number 012-0159–00
RTA-to-Data Store cable	1	25 conductors "straight through," shielded.	Tektronix part number 174-3799-00
DB25 Twisted Pair cables	3		Tektronix part number 175-3671-00
MTS RTA Verification Streams	2	Two CD-ROM discs with the following streams: TRLONG.TRP TR001.TRP TR038.TRP TR060.TRP	Tektronix part number 063-3203-00 (shipped with service manual)

> *NOTE*. *Verify that both oscilloscope probes are calibrated by using the Cal Probe Initialized softkey in the Vertical Menu of the TDS724D Oscilloscope. Also check both probes for compensation.*

Test Record

Use this table to record Real-Time Analyzer Performance Verification results.

Serial number	Procedure performed by	Date
Performance verification step	**Requirement**	**Test result**
Port Tests		
ASI Output Port Test	Output Level between 500 and 880 mV$_{p-p}$	
LVDS // Output Port Test	Differential output level 494 mV$_{p-p}$ to 908 mV$_{p-p}$ Common mode voltage $+0.70$ V to $+1.40$ V	
Modified ECL // Output Test	Differential output level 494 mV$_{p-p}$ to 908 mV$_{p-p}$ Common mode voltage -1.30 V to -2.0 V	
Performance Tests		
LVDS Input and ECL Output at 1.000 Mbit/s	Verified analysis and output	
ASI Input and ECL Output at 1.000 Mbit/s	Verified analysis and output	
ASI Input and ECL Output at 38.0 Mbit/s	Verified analysis and output	
LVDS Input and Output at 38.0 Mbit/s	Verified analysis and output	
LVDS and ASI Input at 60.0 Mbit/s	Verified analysis	
LVDS and ASI Output 60.0 Mbit/s	Verified output	
Minimum ASI Input Sensitivity	Correctly receive attenuated input	
ASI Input at 27.647 Mbit/s	Verified analysis	
Modified ECL Input	Verified analysis	
Data Capture (DUTs with data store capability only)	Verified input stream capture	

Definitions

The following terms are used throughout this section:

DUT (Device Under Test)
The MPEG Test System that contains the Real-Time Analyzer that you are checking for proper operation.

Reference System
The MPEG Test System that is used to verify DUT performance. The reference system, typically an MTS 215, must contain both a Data Store System and a Real-Time Analyzer.

RTA Verification Procedures

The Real-Time Analyzer verification procedures fall into two categories: port tests that require an oscilloscope and performance tests that require a reference system. Step-by-step instructions for the port tests begin on page 4–71; the performance tests begin on page 4–74.

Preparation and Equipment Setup

Before performing any of the tests, you must switch DUT power on, start Windows NT, start the Real-Time Analyzer, restore standard settings, select the DVP-PI ASI (serial) input, and check oscilloscope probe compensation.

1. Switch Real-Time Analyzer (DUT) power on and log on to Windows NT.

   a. Switch the DUT power on.

   b. Wait approximately two minutes while the computer boots up.

   c. Press **CRTL** + **ALT** + **DEL** when instructed to Log On.

   d. Log on as the administrator (enter **Administrator** as the Username) with the password **MPEG2**.

NOTE. These procedures were developed using the MTS200 Series Test System version 3.0 running the 2.0 version of the real-time analyzer application. Specific menu selections for older test systems running older versions of the RTA may vary. See the appropriate user manuals for operating instructions specific to the test system you are using.

Some steps in the following procedure are required for RTA version 1.0 only. If you are performing this procedure on a later version of the software, you can skip the steps that begin "For version 1.0 of the RTA only."

---

2.   Configure the DUT.

   a.   Double-click the **Real Time Analyzer** icon in the **Tektronix MPEG Test System** program group window to start the RTA application.

   b.   Select **About RTA** from the Help menu, make a note of the RTA version and then click **OK** to close the **About RTA** window.

   c.   Select **Restore standard** from the RTA Configuration menu and confirm the choice.

   d.   Select **Settings** from the Configuration menu; then select **Analysis** in the left panel of the **Settings** window.

   e.   Select DVB in the **Analysis Type** group of the right-hand panel.

   f.   Select **Hardware** in the left panel and, in the right-hand panel, change the **Input type** selection to DVB-PI ASI. Click **OK** to confirm the selections and close the **Settings** window.

   g.   Start analysis by clicking the green traffic light command button on the left end of the toolbar.

3.   Connect the equipment as shown in Figure 4–25.
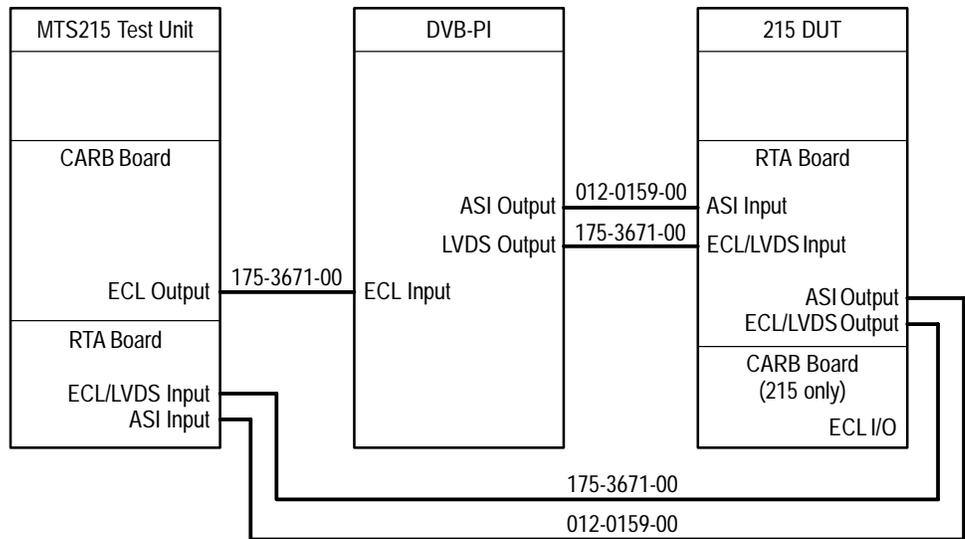
Figure 4–25: Initial Real-Time Analyzer verification setup

4.   Configure the reference system.

   a.   Switch the reference system power on.

   b.   Wait approximately two minutes while the computer boots up.

c. Press **CRTL** + **ALT** + **DEL** when instructed to Log On.

d. Log on as the administrator (enter **Administrator** as the Username) with the password **MPEG2**.

e. Open **Tektronix MPEG Test System** program group window, if necessary.

f. Double click the **Data Store Administrator** icon to start the application.

g. Confirm that the following verification stream files appear in the **File information** list:

> TRLong.trp
> Tr001.trp
> Tr038.trp
> Tr060.trp

If these files are not listed, follow the instructions under *Loading the Test Files Onto the Reference System* on page 4–93 to copy the verification stream files from the CD-ROM supplied with this manual to the Data Store disks.

h. Select (highlight) **Tr060.trp** in the **File information** list.

i. In the Data Store Administrator application window, click the G (Generator) toolbar button to open the **GENERATION** window.

j. Select the **Loop** check box.

k. Make the following generation settings:

Board file = Tr060.trp (if necessary)

Protocol = Master

Port = // ECL

Output clock = PLL

Frequency = 7,500,000 (Bytes/s)

5. Check oscilloscope probe LF compensation and adjust if necessary.

Port Tests   The following port tests require an oscilloscope and a method of probing the signals on individual output conductors:

■ ASI Output Port Test

■ LVDS // Output Port Test

■ Modified ECL // Output Test

ASI Output Port Test.

1. Set up the hardware.

   a. Connect AMT75 75/50 ohm Adapter to Channel 1 input of the oscillo-scope.

   b. Connect a 75 ohm BNC cable between the AMT75 Adapter and the ASI output of the DUT Real-Time Analyzer board.

2. Recall SETUP14 from TDS724D floppy disk. If you are using another oscilloscope or do not have this setup saved to disk, see *Oscilloscope Setups* on page 4–90.

3. With the oscilloscope, check for an ASI Output Level between 500 and 880 mV$_{p-p}$.

4. Disconnect the cables to the oscilloscope.

LVDS // Output Port Test.

1. Click **Start** in the reference system **GENERATION** window to begin generating the test file.

2. Check to confirm that the DUT Real-Time Analyzer is synchronized and updating information.

3. Disconnect the DB25 Twisted Pair cable from the DUT parallel (ECL/LVDS) output. Connect X10 probes to oscilloscope channels 1 and 2 and to pins 1 and 14 of the DUT parallel output connector. Use a breakout box as described in Figure 4–26.
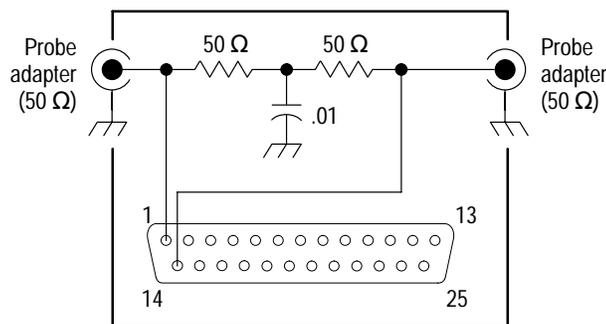
Figure 4–26: Breakout box for LVDS port tests

4. Recall SETUP15 from TDS724D floppy disk. If you are using another oscilloscope or do not have this setup saved to disk, see *Oscilloscope Setups* on page 4–90.

5. Reconfigure the Real-Time Analyzer (DUT) input and output.

   a. Stop analysis (click the red traffic light command button).

   b. Open the **Settings** window (through the Configuration menu) and, from the Hardware panel (select **Hardware** in the left panel), select **DVB-PI SPI (LVDS //) or ECL //** input type and **LVDS** output level.

   c. Click **OK** to confirm your choices and close the **Settings** window.

   d. Click **OK** in the **RTA** warning box to acknowledge that you have changed the output level.

6. Start analysis (click the green traffic light).

7. For version 1.0 of the RTA only, select **Start** from the Data Storage menu.

8. Use the oscilloscope to check for an LVDS output level between 494 mV$_{p-p}$ and 908 mV$_{p-p}$ (differential).

9. Check for an LVDS common mode voltage between +0.70 and +1.40 Volts.

   a. Disconnect the breakout box from the DUT Real-Time Analyzer parallel connector.

   b. Connect the DMM between the RTA parallel port D-connector pin 1 and the computer chassis.

   c. Measure the common mode voltage.

   d. Reconnect the breakout box.

10. Verify the Real-Time Analyzer DUT is synchronized and updating information.

Modified ECL // Output Test.

1. Leave the oscilloscope probes and twisted pair cable connected to the I/O Breakout Box as in the previous test.

2. Recall SETUP16 from TDS724D floppy disk. If you are using another oscilloscope or do not have this setup saved to disk, see *Oscilloscope Setups* on page 4–90.

3. Reconfigure the Real-Time Analyzer DUT output.

    a. Stop analysis (click the red traffic light command button).

*NOTE. If the DUT contains a Data Store system, click **Yes** to acknowledge the warning message.*

    b. Open the **Settings** window through the Configuration menu, and then select **Hardware** in the left panel.

    c. Change to **Modified ECL** output level and then click **OK** to confirm the change and close the **Settings** window.

4. Start analysis.

5. For version 1.0 of the RTA only, start Data Storage.

*NOTE. If the DUT does not contain a Data Store system, click **OK** to acknowledge the warning message.*

6. Verify that the MTS 205/215 DUT Real Time Analyzer is synchronized and updating information.

7. Use the oscilloscope to check for Modified ECL output level between 494 mV_{p-p} and 908 mV_{p-p} (differential).

8. Check for a Modified ECL common mode voltage between –1.50 and -1.80 Volts.

    a. Disconnect the breakout box from the DUT Real-Time Analyzer parallel connector.

    b. Connect the DMM between the RTA parallel port D-connector pin 1 and the computer chassis.

    c. Measure the common mode voltage.

9. For version 1.0 of the RTA only, stop Data Storage.

10. Stop Analysis.

Real-Time Analyzer Performance Tests

The remaining verification procedures use the system reference unit to both originate the test stream and receive the output of the Real-Time Analyzer DUT.

Reconfigure the DUT and reference system before performing any of the performance tests. Then perform the following procedures in order:

■ Verify LVDS Input and ECL Output at 1.000 Mbit/s

- Verify ASI Input and ECL Output at 1.000 Mbit/s

- Verify ASI Input and ECL Output at 38.0 Mbit/s

- Verify LVDS Input and Output at 38.0 Mbit/s

- Verify LVDS and ASI Input at 60.0 Mbit/s

- Verify LVDS and ASI Output 60.0 Mbit/s

- Verify Minimum ASI Input Sensitivity

- Verify ASI Input at 27.647 Mbit/s

- Verify Modified ECL Input

- Verify Data Capture (DUTs with data store capability only)

Real-Time Analyzer (DUT) Configuration

1. On the DUT, select **Restore standard** from the RTA Configuration menu; then click **OK** to confirm your selection.

2. Select **Settings** from the Configuration menu, and then click **Hardware** in the left panel.

3. Select **DVB-PI SPI (LVDS //) or ECL //** from the Input Type group, and then select **Modified ECL** from the Output Level group if necessary.

4. Click **Analysis** in the left panel, and then select **DVB** from the Analysis type group.

5. Expand the View structure in the left panel and select Hierarchical. Make the following changes:

   a. Clear the **Big icons** selection.

   b. Select **More information**.

6. Expand the Analysis structure in the left panel if necessary, and then expand the Advanced structure.

7. Select **Multiplex** and then add all table probes except ECM and EMM tables by making the following changes in the right-hand panel.

   a. Click **Add All**.

   b. Highlight the ECM and EMM entries on the Probes List and then click **Remove** (or double-click first the ECM entry and then the EMM entry).
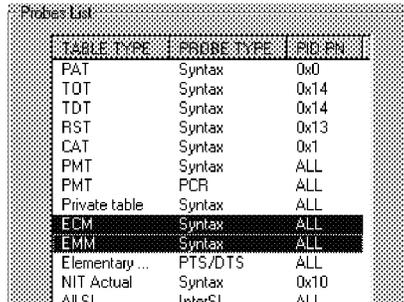
8. If you are using MPEG Test System Software version 2.5 and above, change the PCR Interval:

    a. Expand the Analysis | Advanced | Timing structure in the left panel if necessary and select **PCR**.

    b. Change the PCR Interval for the DVB mode to **60** ms in the right-hand panel.

9. Click **OK** to confirm all your changes and close the window.

10. Click **OK** to restart the RTA and enable small Hierarchic view icons.

Reference System Configuration

1. Connect the equipment as shown in Figure 4–25 on page 4–70.

2. On the reference system, click the red hand command button in the toolbar of the Data Store Administrator to end generation of the **Tr060.trp** transport stream.

3. Configure the generator to output the **Tr001.trp** transport stream.

    a. Click the **G** toolbar button to open the **GENERATION** window.

    b. Select the Board file **Tr001.trp** as the Source.

    c. Confirm that the **Loop** check box is selected.

    d. Make the following generation settings:

    Protocol = Master

    Port = // ECL

    Output clock = PLL

    Frequency = 125,000 (Bytes/s)

4. Click **Start** to begin generating the stream.

5. Minimize the Data Store Administrator application window.

6. Still on the reference system, double-click the **Real Time Analyzer** icon (in the **MPEG Test System** program group window) to start the RTA application.

7. Select the **Load** command on the Configuration menu, highlight **test1** in the Profiles list, and then click **Load** to restore the settings of the test1 profile. If the test1 profile does not exist on your reference system, create it with the procedure that begins on page 4–95.

Verify LVDS Input and ECL Output at 1.000 Mbit/s

1. At the DUT, start the analysis (click the green traffic light command button).

2. Check the Statistic view Program Alloc tab and verify a transmission rate of 1.000 Mbps.

3. Press **F7**, **F8**, and **F9** in turn to display all levels of the hierarchy; verify that three levels are displayed.

4. Select the PMT icon for PID 0x0015, right-click to display the shortcut menu, and then select View PCR analysis.

5. If you are using MPEG Test System version 2.5 and above, change the PCR Interval for DVB to 60 ms.
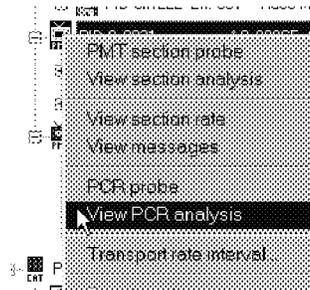
6. Select **OK** in the displayed dialog box, and then wait for the PCR Analysis displays to settle (about a minute).

7. Verify that the Max PCR Jitter is between +500 ns and –500 ns.

8. Verify that the Max PCR Interval does not exceed 50 ms.

9. For version 1.0 of the RTA only, select **Start** from the DUT Data Storage menu. If the DUT does not contain a Data Store system, click **OK** to acknowledge the resulting warning message.

NOTE. Errors may occur if the transport stream has looped more than once on the reference system. To clear errors, press F4 (reset past errors) on the DUT.

---

10. On the reference system, start real-time analysis (click the green traffic light button on the RTA toolbar).

11. Check for Transmission rate of 1.000 Mbps in the Program Allocation panel of the Statistic view. This verifies the DUT Modified ECL parallel output.

12. Stop analysis (red traffic light).

Verify ASI Input and ECL Output at 1.000 Mbit/s

1. At the DUT, stop analysis (red traffic light).

---

*NOTE. If the DUT contains a Data Store system, click **Yes** to acknowledge the warning message.*

---

2. Change the DUT input type to DVB-PI ASI.

    a. Select **Settings** from the Configuration menu, and then click **Hardware**.

    b. Select **DVB-PI ASI** input type.

    c. Click **OK** to confirm the change and close the window.

3. Start analysis (green traffic light).

4. In the Program Alloc panel of the Statistic view, verify a Transmission rate of 1.000 Mbps.

5. Press **F10** to ensure that the DUT Hierarchic view shows all levels of the input multiplex and verify that all levels are visible.

6. Open a PCR Analysis view of the PMT with PID 0x0015.

    a. Locate PMT PID 0x0015 icon in the DUT Hierarchic view.

    b. Select the icon and right-click to open the Shortcut menu.

    c. Select **View PCR Analysis** from the Shortcut menu.

7. Select **OK** in the displayed dialog box, and then wait for the PCR analysis display to settle (about a minute).

8. Verify that the Max PCR Jitter is between +500 ns and –500 ns.

9. Verify that the Max PCR Interval does not exceed 50 ms.

10. For version 1.0 of the RTA only, start Data Storage (select **Start** from the Data Storage menu).

---

*NOTE. If the DUT does not contain a Data Store system, click **OK** to acknowledge the warning message.*

---

11. Start analysis on the reference system and verify that the DUT is able to output ASI (serial) input as modified ECL (parallel) data.

   a. Click the green traffic light button on the RTA toolbar.

   b. In Program Allocation panel of the Statistic view, verify a Transmission rate of 1.000 Mbps.

Verify ASI Input and ECL Output at 38.0 Mbit/s

1. Configure the reference system to output a 38.0 Mbit/s transport stream.

   a. Switch from the RTA application to the Data Store Administrator.

   b. Stop Generation and open the **GENERATION** window (click the red hand toolbar button; then click the **G** button).

   c. Select the Board file **Tr038.trp** as the Source.

   d. Confirm that the **Loop** check box is selected.

   e. Confirm the following generation settings:

      Protocol = Master

      Port = // ECL

      Output clock = PLL

   f. Change the output frequency to 4,750,000 (Bytes/s).

   g. Click **Start**.

2. On the Program Allocation panel of the DUT Statistic view, verify a Transmission rate of 38.000 Mbps.

3. Verify, with the reference system, that the DUT is able to output ASI input as modified ECL data.

   a. On the reference system, switch from the Data Store Administrator to the RTA application.

   b. Verify, in the Statistic view Program Allocation panel, a transmission rate of 38.000 Mbps.

Verify LVDS Input and Output at 38.0 Mbit/s

1. Stop DUT analysis (click the red traffic light command button).

---

*NOTE. If the DUT contains a Data Store system, click **Yes** to acknowledge the warning message.*

---

2. Reconfigure the DUT to receive parallel input and to output at LVDS levels.

   a. Open the **Settings** window (select **Settings** from the Configuration menu), and then click **Hardware** (in the left pane).

   b. Select **DVB-PI SPI (LVDS //) or ECL //** from Input Type.

   c. Select **LVDS** from Output Level.

   d. Click **OK** to confirm the changes and close the **Settings** window.

   e. Click **OK** in the **RTA** warning box to acknowledge that you have changed the output level.

3. Start DUT analysis (click the green traffic light command button).

4. Check for Transmission rate of 38.000 Mbps in the DUT Program Allocation panel.

5. For version 1.0 of the RTA only, select **Start** from the DUT Data Storage menu to begin generating the data.

---

*NOTE. If the DUT does not contain a Data Store system, click **OK** to acknowledge the warning message.*

---

6. On the reference system Program Allocation panel, verify a Transmission rate of 38.000 Mbps.

Verify LVDS and ASI Input at 60.0 Mbit/s

1. Configure the reference system to output a 60 Mbit/s transport stream.

   a. Switch from the RTA application to the Data Store Administrator.

   b. Stop Generation and open the **GENERATION** window (click the red hand toolbar button; then click the **G** button).

   c. Select Board file **Tr060.trp** as the Source.

   d. Change the output frequency to 7,500,000 (Bytes/s).

   e. Click **Start**.

2. Verify on the DUT Program Allocation panel that the measured Transmission rate changes to 60.000 Mbps (this step verifies LVDS // input).

3. Click the red traffic light command button to stop DUT analysis

   For MPEG Test System versions earlier than version 2.5, click **Yes** in the resulting warning window to "...stop analysis anyway."

4. Reconfigure the DUT to accept serial input.

   a. Select **Settings** from the Configuration menu and select Hardware in the left panel.

   b. Select **DVB-PI ASI** from Input Type.

   c. Click **OK** to confirm the input change and close the **Settings** window.

5. Restart DUT analysis (click the green traffic light button).

6. For MPEG Test System versions earlier than version 2.5, select **Start** from the DUT Data Storage menu.

7. Verify on the DUT Program Allocation panel that the measured Transmission rate changes to 60.000 Mbps (this step verifies ASI input).

Verify LVDS and ASI Output 60.0 Mbit/s

1. Switch the reference system from the Data Store Administrator to the RTA application.

2. Check the reference system Program Allocation panel and verify that the Transmission rate is 60.000 Mbps. This verifies proper LVDS output from the DUT.

3. Change the reference system input type to ASI.

   a. Open the **Settings** window and select the Hardware Configuration tab.

   b. Select **DVB-PI ASI** from Input Type.

   c. Click **OK** to confirm the input change and close the **Settings** window.

---

*NOTE. Click **OK** in the Restart Analysis warning window, if necessary.*

---

4. Stop and restart reference system analysis (first click the red traffic light and then click the green traffic light).

5. Check the reference system Program Allocation panel and verify that the measured Transmission rate remains 60.000 Mbps. This verifies the DUT serial output.

Verify Minimum ASI Input Sensitivity

1. Change the hardware interconnections as shown in Figure 4–27.
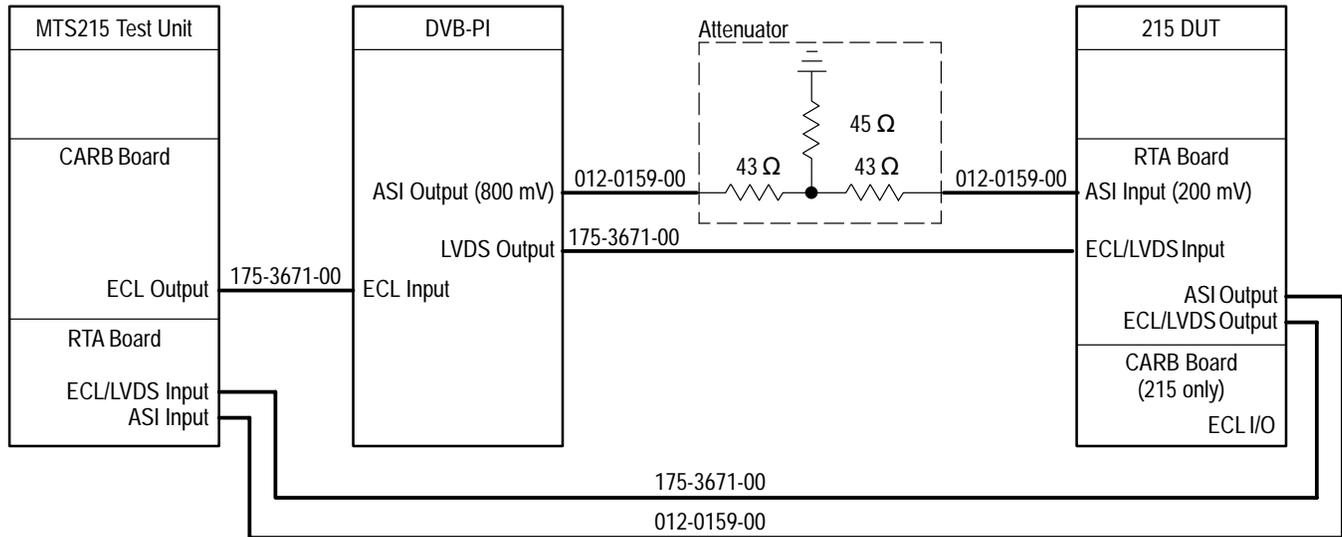
Figure 4–27: Reconfigure the hardware connections

2. Change the DUT output level back to Modified ECL (to enable data capture).

    a. Stop analysis (click the red traffic light and then click **Yes** in the resulting warning window).

    b. Open the Settings window and select **Hardware** (in the left panel).

    c. Select **Modified ECL** from Output Level, and then click **OK** to confirm and close the window.

    d. Click **OK** in the **RTA** warning box to acknowledge that you have changed the output level.

    e. Start the analyzer (green traffic light).

3. On the DUT Program Allocation panel, verify that the measured Transmission rate is 60.000 Mbps.

4. For version 1.0 of the RTA only, select **Start** from the DUT Data Storage menu to resume output.

NOTE. *If the DUT does not contain a Data Store system, click* **OK** *to acknowl-edge the warning message.*

---

5. At the reference system, verify that the Transmission rate displayed on the Program Allocation panel is 60.000 Mbps.

Verify ASI Input at 27.647 Mbit/s

1. Configure the reference system to generate **TRLong.trp** at 27.647 Mbps.

    a. On the reference system, switch from the RTA application to the Data Store Administrator.

    b. Stop Generation and open the **GENERATION** window (click the red hand toolbar button; then click the **G** button).

    c. Select Board file **TRLong.trp** as the Source.

    d. Change the output frequency to 3,455,893 (Bytes/s).

    e. Click **Start**.

2. Switch the reference system back to the RTA application and verify that the Transmission rate displayed on the Program Allocation panel changes to 27.647 Mbps.

3. Also verify that the Transmission rate displayed on the DUT Program Allocation panel is 27.647 Mbps.

4. Continuing at the DUT, check for all Channel Designators correctly displayed in the Program Allocation Display. The top hierarchy item in the left panel should be "Tektronix MTS200 27.647146 Mbps."

5. Check each of the following DUT Statistic view panels correct functionality:

    ■ Program Allocation. Double-click a slice of the Program Allocation pie chart to open the PID Allocation panel; then click **Reset past errors**.

    ■ Continuity Counter. Click the Continuity Counter tab on the bottom of the Statistic view and then click **Reset past errors**.

    ■ Transport Error Indicator. Check that it displays properly.

    ■ Unsynchronized Packet Indicator. Check that it displays properly.

6. Check the DUT PCR analysis view.

    a. In the DUT Hierarchic view, click the PID 0x0017 PMT icon.

    b. Right-click to open the shortcut menu.

c. Select **View PCR analysis** and click **OK** in the displayed dialog box.

d. If you are using MPEG Test System version 2.5 and above, change the PCR Interval for DVB to 50 ms.

e. In the PCR analysis view, verify PCR Jitter within ± 500 ns and PCR interval less than 50 ms.

Verify Modified ECL Input

1. Connect the equipment as shown in Figure 4–28.
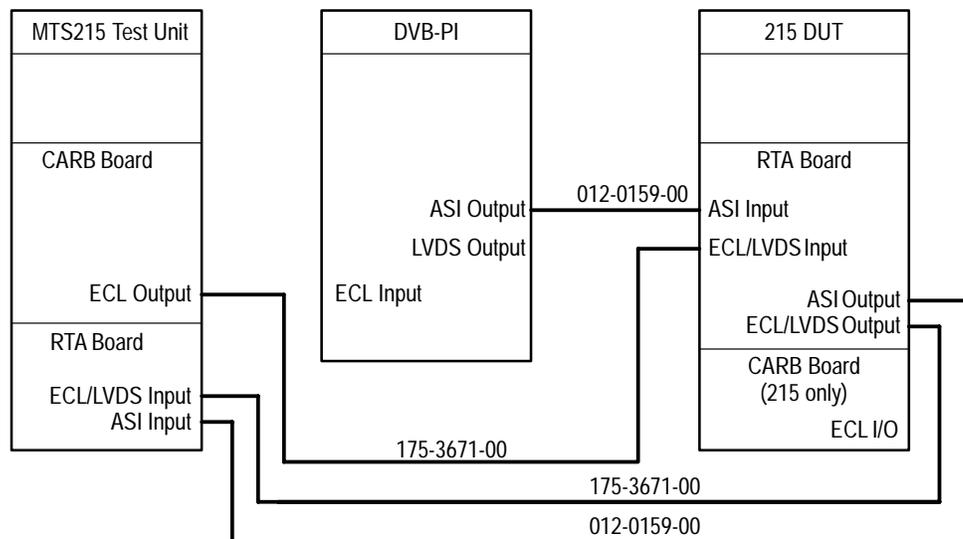
Figure 4–28: Hardware connections for verifying Modified ECL input

2. Stop DUT analysis (click the red traffic light button on the RTA toolbar).

*NOTE. If the DUT contains a Data Store system, click **Yes** to acknowledge the warning message.*

3. Change the DUT input type to parallel.

a. Select **Settings** from the Configuration menu and click Hardware in the left panel.

b. Select **DVB-PI // (LVDS) ECL //** from the Input Type group.

c. Click **OK** to confirm the change and close the window.

4. Restart DUT analysis (click the green traffic light toolbar button).

5. Click the the ETR 290 view button on the DUT RTA toolbar to open the ETR 290 View.

6. Click **Reset past errors**.

7. Verify, on the DUT, that the ETR 290 view indicates no errors (red lights) in the Priority 1 column (ignore any 1.2 , 1.4, 1.5.1 and 1.5.2 errors that may occur during the second transport stream loop after the error reset).

8. Select the PID 0x0017 PMT icon in the DUT hierarchic view, open a PCR Analysis view, and verify PCR jitter within ± 500 ns and PCR interval less than 50 ms.

   a. Click the PID icon.

   b. Right-click to open the shortcut menu.

   c. Select **View PCR analysis**.

   d. Check the PCR jitter and interval in the resulting PCR analysis view are operating normally (sweeping).

9. Verify that the Transmission rate displayed on the DUT Program Allocation panel remains 27.647 Mbps.

10. Continuing at the DUT, check that all Channel Designators correctly displayed in the Program Allocation Display. The top hierarchy item in the left panel should be "Tektronix MTS200 27.647146 Mbps."

If the DUT is an MTS 205, performance verification is now complete. If the DUT contains the data store system, you should also verify its ability to capture and store RTA input data.

The data capture verification procedure depends on the MPEG Test System software version: If the DUT is running RTA software version 1.0, proceed to *Verify Data Capture (RTA V1.0 DUTs with data store capability only)* on page 4–86; if the DUT is running RTA version 1.1 or later, proceed to *Verify Data Capture (RTA V1.1 DUTs with data store capability only)* on page 4–88.

To quickly determine the DUT software version, select **About RTA** from the Real-Time Analyzer Help menu.

Verify Data Capture (RTA V1.0 DUTs with data store capability only)

Do not use this procedure if the DUT MPEG Test System software is version 1.1; instead, refer to *Verify Data Capture (RTA V1.1 DUTs with data store capability only)* on page 4–88.

1. Connect the equipment as shown in Figure 4–29.
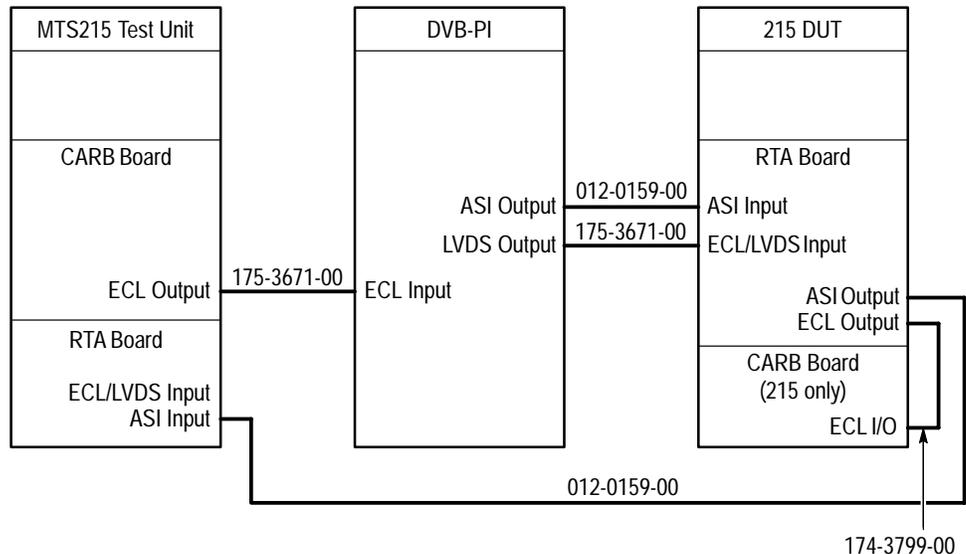
Figure 4–29: Equipment setup for verifying data capture

2. Stop reference system generation.

    a. Switch from the RTA application to the Data Store administrator.

    b. Click the red hand toolbar button to stop generation.

3. On the DUT, minimize (but do not exit) the RTA application; then start the Data Store Administrator.

4. If necessary, repartition the DUT data store disks to create a loop partition of at least 1,000,000,000 bytes.

    a. Select **Partition Disks** from the Service menu.

    b. Select **Single shot & loop** from the list of partition types.

    c. Enter an appropriate **Loop partition size** (at least 1,000,000,000 bytes).

    d. Click **OK** and then click **Yes** to confirm.

5. When the DUT Data Store Administrator finishes partitioning the disks, exit the Data Store Administrator. Then switch back to the RTA application.

6. Select **Start** from the DUT Data Storage menu.

7. If necessary, configure the reference system to generate **TRLong.trp** at 27.647 Mbps.

   a. Select Board file **TRLong.trp** as the Source.

   b. Confirm or change to the following settings:

   Loop selected

   Port = //ECL

   Output Clock = PLL

   Frequency = 3,455,893 Bytes/s.

   c. Click **Start**.

8. Wait approximately 1 minute and then select **Stop** from the DUT Data Storage menu.

9. On the DUT, minimize the RTA application and start the Deferred-time Analyzer application.

10. In the DUT MPEG2 DVB/ATSC System Analyzer, open the file that contains the data just captured by the RTA:

    `C:\Carb0\Mono\MNStop00.trp` for version 3.0 test systems

    `C:\Carb0\Multi\RTA.trp` for test systems version 2.5 and below

    a. Select **Open** from the File menu.

    b. Change to the c:\carb0\Mono (or Multi) directory in the **Open** window.

    c. Double-click MNStop00.trp (or RTA.trp) in the **File name** list box.

11. Press **CTRL** + **R** on the DUT keyboard to perform a multiplex rate analysis of the captured data.

12. Verify that the mux rate reported in the resulting window is between 27,647,100 and 27,647,200 bits/s and that the **Number of programs** is 7.

13. Close all applications on the DUT.

14. Stop the generation on the reference system.

15. Close all applications on the reference system.

Version 1.0 Real-Time Analyzer performance verification is now complete.

Verify Data Capture (RTA V1.1 DUTs with data store capability only)

Do not use this procedure if the DUT MPEG Test System software is version 1.0; instead, refer to *Verify Data Capture (RTA V1.0 DUTs with data store capability only)* on page 4–86.

1. Connect the equipment as shown in Figure 4–29 on page 4–86.

2. Stop reference system generation.

   a. Switch from the RTA application to the Data Store administrator.

   b. Click the red hand toolbar button to stop generation.

3. On the DUT, minimize (but do not exit) the RTA application; then start the Data Store Administrator.

4. If necessary use the following procedure to repartition the DUT data store disks to create a Single Shot partition of at least 1,000,000,000 bytes:

   a. Select **Partition Disks** from the Service menu.

   b. Select either **Single Shot** or **Single shot & loop** from the list of partition types.

   c. If necessary, enter an appropriate loop partition size (at least 1,000,000,000 bytes less than the Available size).

   d. Click **OK** and then click **Yes** to confirm.

5. When the DUT Data Store Administrator finishes partitioning the disks, exit the Data Store Administrator. Then switch back to the RTA application.

6. Select **Settings** from the Configuration menu.

7. In the **Settings** window, select **Data Storage** in the left panel.

8. Click **Reset All** and then click **OK** to close the **Settings** window and confirm the reset.

9. Select **Start** from the DUT Data Storage menu.

10. If necessary, configure the reference system to generate **TRLong.trp** at 27.647 Mbps.

    a. Select Board file **TRLong.trp** as the Source.

    b. Confirm or change to the following settings:

    Loop selected

    Port = //ECL

    Output Clock = PLL

Frequency = 3,455,893 Bytes/s

   c. Click **Start**.

11. Wait approximately five seconds and then select **Stop** from the DUT Data Storage menu.

12. On the DUT, minimize the RTA application and start the MPEG2 DVB/ ATSC System Analyzer application (the deferred-time analyzer).

13. In the DUT deferred-time analyzer, open the file that contains the data just captured by the RTA.

   a. Select **DVB** from the Options menu.

   b. Select **Open** from the File menu.

   c. Change to the c:\carb0\Mono directory in the **Open** window.

   d. Double-click the latest MnStop*nn*.trp name (highest number *nn*) in the **File name** list box.

14. Press **CTRL** + **R** on the DUT keyboard to perform a multiplex rate analysis of the captured data.

15. Verify that the **Mux Rate** reported in the resulting window is between 27,647,100 and 27,647,200 bits/s and that the **Number of programs** is 7.

16. Close all applications on the DUT.

17. Stop the generation on the reference system.

18. Close all applications on the reference system.

Version 1.1 Real-Time Analyzer performance verification is now complete.

Oscilloscope Setups

Use the following TDS724D setups as a guide when configuring your oscillo-scope for the three Real-Time Analyzer port tests. Save the configurations if your oscilloscope has the ability to store setups and you intend to verify RTA performance again.

TDS724D Setups for the ASI Port Test (SETUP14)

1. Vertical Menu Setups:

   ■ Channel 1 selected

   ■ Input Impedance = 50 ohm

   ■ Coupling = DC

   ■ Bandwidth = Full

   ■ Fine Scale = 100mV/division

2. Horizontal Menu Setups:

   ■ Time Base = Main

   ■ Trigger Position = 50%

   ■ Record Length = 500

   ■ Horiz Scale = 500ps/division

   ■ Time Base = Main Only

3. Trigger Menu Setups:

   ■ Trigger = Edge Triggered

   ■ Source = Channel 1

   ■ Slope = Positive

   ■ Level = 50%

   ■ Mode & Holdoff = Auto

4. Measure Setups:

   ■ Pk to Pk Measurement

   ■ Rise Time Measurement (20% to 80% level)

TDS724D Setups for the LVDS // Port Test (SETUP15)

1. Vertical Menu Setups:

   - Channel 1 & 2 selected

   - Input Impedance = 1 Megaohm

   - Coupling = DC

   - Bandwidth = Full

   - Fine Scale = 50mV/division

   - Vertical Offset = 1.2500 Volts (Channels 1 & 2)

   - Select Math Ref and Math 1 (Ch 1 – Ch 2) Average 2

2. Horizontal Menu Setups

   - Time Base = Main.

   - Trigger Position = 50%

   - Record Length = 500

   - Horiz Scale = 25ns/division

   - Time Base = Main Only

3. Trigger Menu Setups:

   - Trigger = Edge Triggered

   - Source = Channel 1

   - Coupling = AC

   - Slope = Positive

   - Level = 50%

   - Mode & Holdoff = Auto

4. Measure Setups:

   - Pk to Pk Measurement

TSD724D Setups for the Modified ECL // Output Test (SETUP16)

1. Vertical Menu Setups:

   - Channel 1 & 2 selected

   - Input Impedance = 1 Megaohm

   - Coupling = DC

   - Bandwidth = Full

   - Fine Scale = 500mV/division.

   - Vertical Offset = –1.6500 Volts (Channels 1 & 2)

   - Select Math Ref and Math 1 (Ch 1 – Ch 2) Average 2

2. Horizontal Menu Setups:

   - Time Base = Main

   - Trigger Position = 50%

   - Record Length = 500

   - Horiz Scale = 25ns/division

   - Time Base = Main Only

3. Trigger Menu Setups:

   - Trigger = Edge Triggered

   - Source = Channel 1

   - Coupling = AC

   - Slope = Positive

   - Level = 50%

   - Mode & Holdoff = Auto

4. Measure Setups:

   - Pk to Pk Measurement

Loading the Test Files Onto the Reference System

Use the following procedure to load the test files from the Service Stream discs to the data store (CARB) system of the reference MPEG Test System. Three of the files are very large. The complete procedure can take 45 minutes.

1. Confirm that there is at least 1.8 Gbytes of free space on the reference system disk. If necessary, delete enough files to free up the required disk space.

2. Extract a Stream to the Cfg-trp Directory.

   a. Put Service Stream Disc 1 (supplied with the service manual) into the CD ROM drive.

   b. Open an **Explorer** window to the CD ROM drive (D: in most cases) and then double-click the name of one of the two self-extracting test stream files, Tr001.exe or Tr038.exe.

   c. In the resulting **WinZip Self-Extractor** window, enter **C:\Mts100\Cfg-trp** (on a machine running MTS software version 2.2) or **C:\Mts200\Cfg-trp** (on later-version machines) in the **Unzip to folder** field.

   d. Click **Unzip**. Wait. Extracting Tr038.trp can take up to 15 minutes. When extraction is complete, click **OK** to dismiss the resulting message window and then close the **Winzip Self-Extractor** window.

3. If necessary, make room on the Single Shot Data Store partition.

   a. Start the Data Store Administrator application.

   b. Confirm that there is at least 4.0 Gbytes of free space on the Single Shot data store partition. If necessary, delete files or repartition the disks to free up or create the required space.

4. Write the stream to the Data Store Disks.

   a. Click the **W** button on the Data Store Administrator toolbar.

   b. Click **Browse** in the resulting **File Write to CARB** window.

   c. In the resulting **Open** dialog box, locate and select the transport stream (.trp) file extracted from the CD ROM (for example, Tr038.exe extracts to Tr038.trp).

    d. When you select the file, the **Open** dialog box closes to again reveal the **File Write to CARB** window. The appropriate name is already entered in the **Name of the CARB File:** field. Click **Start** to begin copying the file from the system disk to the data store system.

    e. Wait. Copying Tr038.trp can take more than eight minutes. When copying is complete, click **OK** to dismiss the resulting message window.

5. Delete the .trp file from the Cfg-trp folder. Doing so frees system disk space for the next extraction from the CD ROM.

    a. Open (or switch back to) an **Exploring** window and open the Cfg-trp folder (C:\Mts100\Cfg-trp in a MPEG Test System software version 2.2 machine; C:\Mts200\Cfg-trp in a version 2.5 machine).

    b. Highlight the .trp file name and hold down **SHIFT** while pressing **DEL** to immediately delete the file. Click **Yes** in the resulting **Confirm File Delete** window.

6. Repeat steps **2**, **4**, and **5** for the second file on Service Stream disc 1.

7. Remove Service Stream disc 1 from the CD ROM drive and replace it with disc 2. Repeat steps **2**, **4**, and **5** for both files on Service Stream disc 2.

Creating the the Reference System Configuration Profile

If you intend to use the reference system to perform RTA verification more than once, you will find it convenient to save the required settings as a named configuration profile. Use the following procedure to configure the system and to save the profile.

1. Select **Restore standard** from the RTA Configuration menu; then click **OK** to confirm your selection.

2. Select **Settings** from the Configuration menu and then click the Hardware Configuration tab in the resulting window.

3. Select **Modified ECL** output level if necessary.

4. Click the General tab of the Settings window and then select **DVB**.

5. Click the Hierarchic View tab and select **More information**.

6. Select the Probes List tab and add all but the ECM and EMM table probes.

    a. Click **Add All** and then press **ENTER** to acknowledge the resulting warning.

    b. Highlight the ECM and EMM entries on the Probes List and then click **Remove** (or double-click first the ECM entry and then the EMM entry).

7. Select the PCR Analysis tab and change the DVB mode Interval to **60** ms.

8. Click **OK** on the bottom of the **Settings** window to confirm all your changes and close the window.

9. Save the current configuration as "test1."

    a. Select **Save as** from the RTA Configuration menu.

    b. Enter **test1** as the Profile name.

    c. Click **Save**.

Adjustment Procedures

Adjustment Procedures

This section contains the procedure for adjusting the Data Store System 8.448 MHz oscillator.

NOTE. You should perform this adjustment only if the oscillator frequency fails to meet specification when checked with 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 ohm 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

Definition

CARB (Carte d'Acquisition / Restitution Binaire)
(French for Binary Acquisition/Restitution Board) The MTS 215 Data Store system, which can capture, store, and output MPEG-2 compliant transport streams. The term is used in this section where necessary for consistency with the Data Store Administrator user interface.

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 MPEG Test System.*

You must remove SCSI controller board 2 to access the oscillator frequency adjustment. Removing the SCSI controller board 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 previously stored files when all Data Store disk drives are restored to operation. If you have important files stored on the Data Store disks, save those files to the system disk, another MPEG Test System, or a network drive before proceeding with this procedure. See the *Using the Data Store Administrator* section of the Deferred-Time Applications user manual for more information.

Remove the Data Store Circuit Board

Use the following procedure to remove the Data Store circuit board (see the exploded diagram on page 6–5 for the location of the Data Store circuit board):

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

1. If the MPEG Test System is powered on, close all applications and log off of Windows NT before continuing.

    Wait until the message "It is now safe to turn off your computer" appears on the MPEG Test System screen before turning off the server.

2. With power to the computer turned off, remove the side panel from the left side of the server. To disengage the side panel, remove the three thumb-screws and then slide the panel approximately 0.5 inch (1.25 cm) towards the rear of the instrument. Next, pull the top of the side panel away from the server and then lift the panel up and away from the server chassis.

3. Remove the six screws that secure the I/O connector subpanel to the rear of the instrument.

4. Remove two screws that secure the bracket that holds the Data Store Circuit board in place.

5. Remove two screws that secure the back of the Data Store circuit board to the server, and remove the circuit board from the server.

Remove the SCSI Controller Board

The adjustment is located beneath the SCSI Controller circuit board shown in Figure 5–1. Use the following procedure to remove the SCSI Controller board:

1. Unplug the SCSI cable from the SCSI Controller circuit board shown in Figure 5–1.

2. Remove the two screws that secure the the SCSI Controller circuit board to the Data Store circuit board.

3. Remove the SCSI Controller circuit board and carefully place it on a static-free surface.
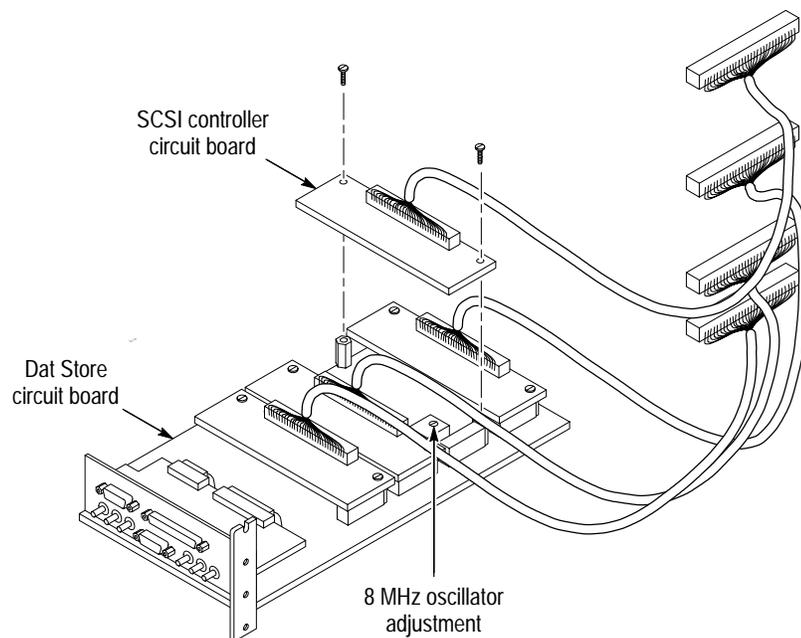
Figure 5–1: Location of the 8.448 MHz oscillator adjustment

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. Carefully dress the four SCSI cables so that you can reinstall the Data Store circuit board into the server.

2. Slide the Data Store circuit board into the third slot in the server. Press firmly to seat the board in the connector.

Power On Procedure After the Data Store circuit board is temporarily installed, turn the 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. Start the Data Store Administrator application. To do so, double-click the Data Store icon in the **Tektronix MPEG Test System** program group window.

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 **Partition Disks** from the Data Store Administrator Service menu shown in Figure 5–2.

Figure 5–2: The 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 5–3.
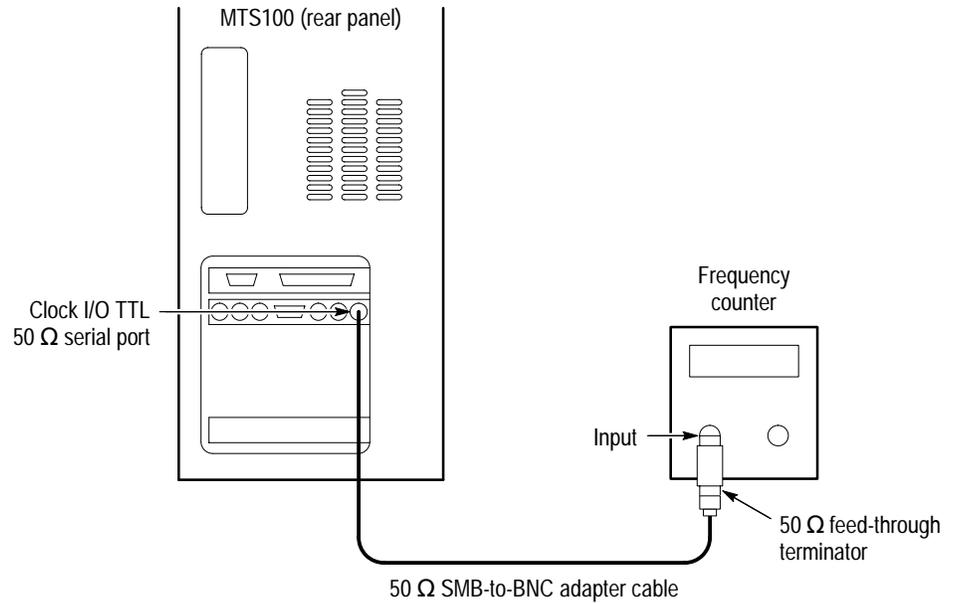
Figure 5–3: Setup for adjusting the clock frequency

2. In the MPEG Test System Data Store Administrator window, select (highlight) name of the file that you just downloaded and then click the **G** (generation) command button.

3. Select the following parameters to output a clock signal:

Parameter	Setting
File name	The file transferred after partitioning (example: Sample.trp)
Loop	Selected
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. See Figure 5–1 on page 5–3.

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

Reassemble the Test System

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

1. Exit the Data Store Control application.

2. Shut down Windows NT and then switch the 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 I/O connector subpanel.

5. Replace the instrument side panel.

Repartition the Data Store Disks

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.

This concludes the oscillator adjustment procedure.

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. (Service assemblies containing static-sensitive components at static-free work stations.)

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 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 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 ball cavity.

6. Replace the mouse 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, the optional Real-Time Analyzer circuit board (upgrade MTS1F05), the optional Video board (upgrade MTS1F03 or MTS1F05), and the Data Store Disk hard drives. Part numbers for the circuit boards 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. The Data Store hard disk drives are in the server side access drive bays.

Recommended Tools
The following tools are recommended for MTS100 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

Accessing the Card Cage and Side Access Bays
All of the replaceable modules (circuit boards, cables, and the hard disk drives) are in the left side of the server. Before removing the side cover, unplug the power cord.

Removing the Server Side Panel. Three knurled thumbscrews hold the left side panel in place. In most cases they are only finger-tight; if necessary, use a coin in the slot for added leverage. In addition to the screws, there may be a lock at the upper front corner of the panel to add to server security.

1. If present, remove the lock from the upper left corner.

2. Loosen and remove the three knurled screws on the rear panel that hold the side panel in place.

3. Slide the side panel toward the rear of the instrument about 0.5 in (1.25 cm).

4. Disengage the side panel tabs from the top of the server by tilting the panel out about 0.375 in (1 cm).

5. Lift up and remove the panel to gain access to the server side access bays and EISA card cage. See Figure 6–1.
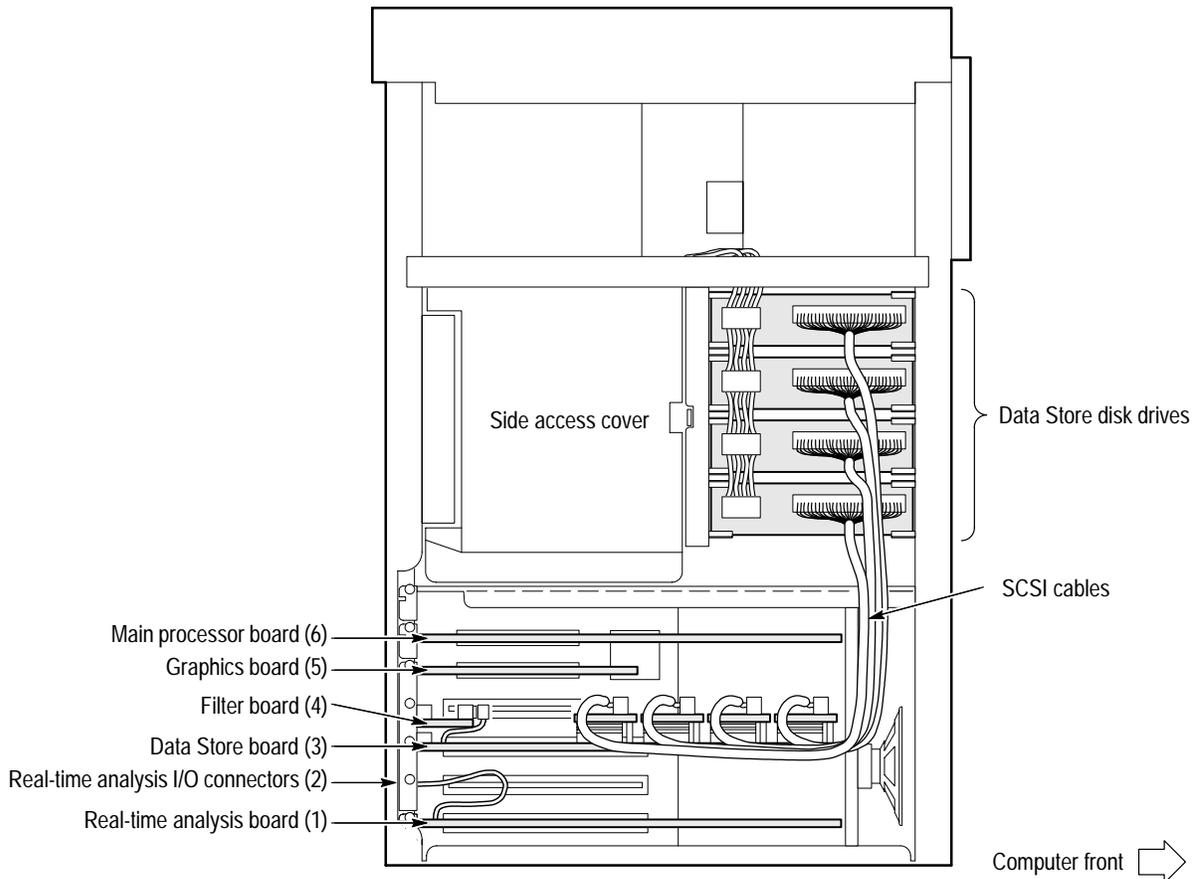
Figure 6–1: Side view of the server (left cover removed)

⚠️ *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 the cover removed; the cover is an integral part of the cooling system.*

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

1. Set the side panel lip over the bottom server chassis rail.

2. Push the tabs on the top of the side panel into the slots at the top of the server chassis.

3. Slide the side panel toward the front of the computer until the lip at the back contacts the rear panel surface.

4. Reinstall the thumbscrews that hold the side panel in place.

5. Replace the side-panel lock if applicable.

Removing the Data Store Circuit Board

The Data Store circuit board and disks are on the left side 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.

1. Be sure that you are wearing a static grounding wrist strap.

2. Unplug all rear-panel cables from the Data Store connectors.

3. Unplug the four SCSI cables from the Data Store disk drives. See Figure 6–2.
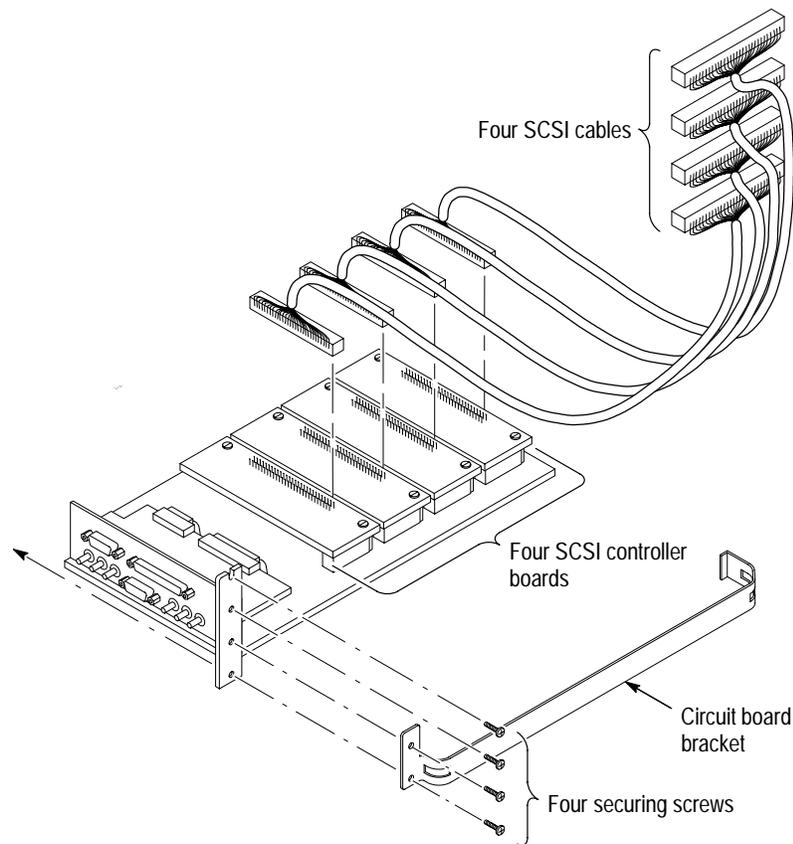

Figure 6–2: Removing the Data Store circuit board

4. Remove the six screws that secure the rear panel.

5. 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.

6. Grasp the circuit board near its front and back corners. Pull the circuit board straight out. (This removes the Data Store assembly from the server cage.) The circuit board cage has guides at the front and the back.

7. Place circuit board assembly on a static-free surface, such as a static grounding work station.

8. Remove the four SCSI cables from the SCSI Controller circuit boards.

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.

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. Wear a static grounding wrist strap when handling circuit boards; take special care not to touch IC leads.

1. Reattach the SCSI cables to the SCSI Controller connectors. See Figure 6–2 for the correct order.

2. Grasp the circuit board near the front and back corners.

3. Align the circuit boards with the cage guides for the third slot. See Figure 6–1 on page 6–5.

4. Carefully slide the circuit board into the slot. Align the circuit board edge connector with the fixed connector in the cage.

5. Push the card in firmly but carefully until the edge connector is seated.

6. Use a screwdriver with a T-15 Torx tip to install the two screws securing the circuit board bracket to the circuit board cage and the two screws holding down the module.

7. Plug the SCSI cables back into the Data Store disk drives.

8. Reattach the rear subpanel.

9. Reconnect the signal I/O cables to their rear panel connectors.

If you are finished, replace the server side cover.

Removing a Data Store Hard Disk

The Data Store disks reside in the server side access disk bays. 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 6–3. It may be necessary to remove more than one of the power or SCSI connectors to remove a particular disk drive.

1. Be sure that you are wearing a static grounding wrist strap.

2. The power cable runs across the disk drives. Pull off the disk drive power plug. Remove any other power plugs necessary to take out the disk drive. See Figure 6–3.

3. Unplug the SCSI cables necessary to remove the disk drive.

4. Grasp the plastic retaining clips that secure the disk drive in the bay. Squeeze the retaining clips and pull straight out.

5. When the disk drive is part way out, place your hand under the drive and pull the drive straight out.

6. Place the drive on a static free work area.

Installing a Data Store Hard Disk

When installing a disk drive, take care not to touch the components on top of the drive. Dress all cables away from the disk bay so that they do not interfere with installing the disk drive.

1. Wear a static grounding wrist strap when handling a disk drive.

2. Check to be sure that there is no obstruction in the disk bay where the drive is going to be installed.

3. Holding the disk drive from the bottom, start the guides into the tracks.

4. Once the drive has started in, push in on the front of the drive until the retaining clips lock into place.

5. Connect the cables to the drive(s).

Slide the disk drive out of the mainframe.

Unplug controller cable from the disk drive.

Unplug power cable from all four of the disk drives.

Squeeze the retaining clips on both sides of the disk drive to release the disk drive from mainframe.
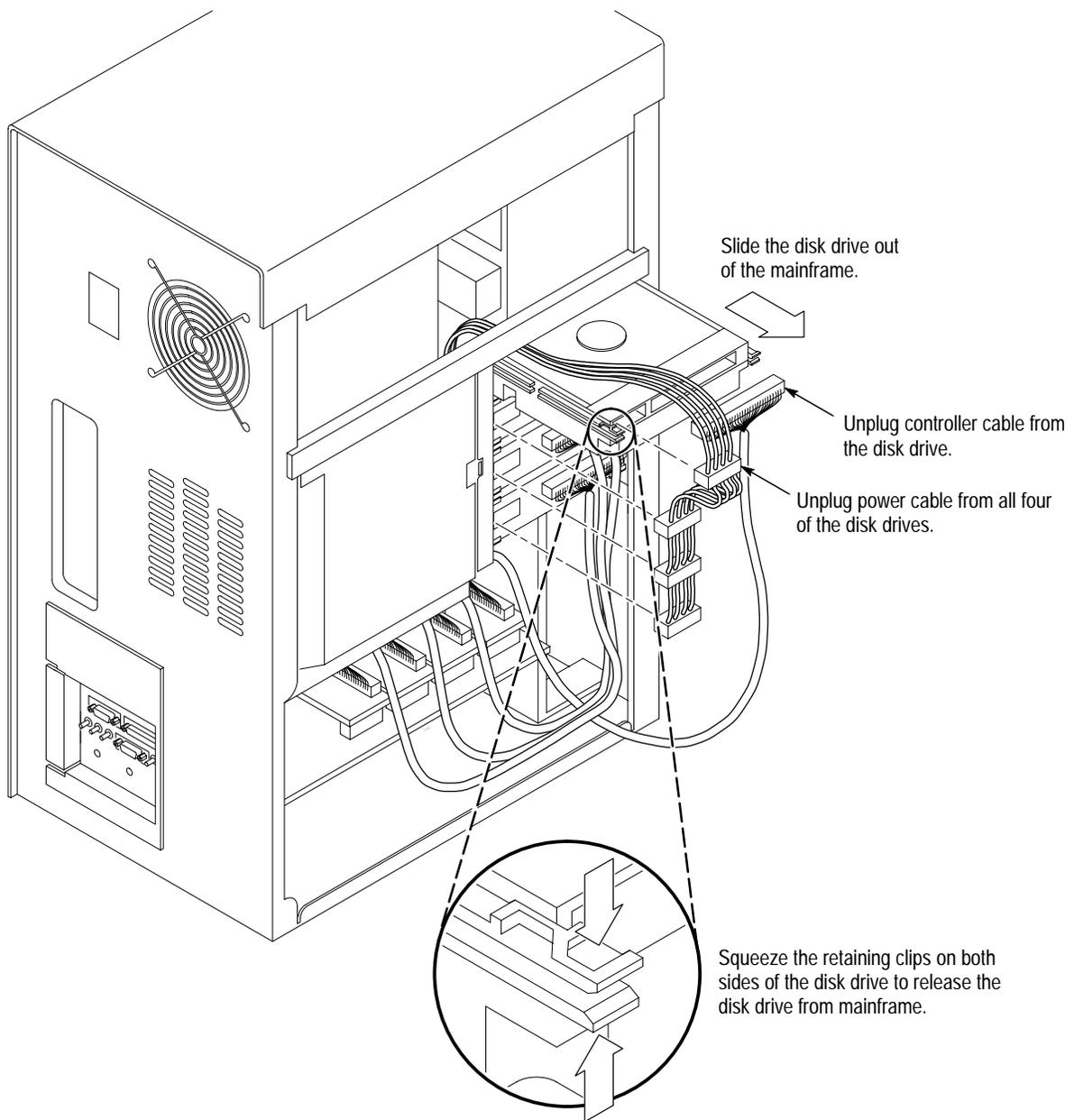
Figure 6–3: Removing Data Store hard disk drives

Removing/Reinstalling the RTA Board

The Real-Time Analyzer board occupies slots 1 and 2 of test systems with upgrade kit MTS1F05 installed. Use the following procedure to remove and replace the RTA board in the Proliant chassis.

1. Be sure that you are wearing a static grounding wrist strap and that test system power is switched off.

2. Remove the server side panel to access the expansion slots; see *Removing the Server Side Panel* on page 6–4.

3. Remove any cables that are attached to the Data Store, RTA, and video connectors.

4. Remove the four screws that hold the rear panel to the server (see Figure 6–4) and then remove the panel.
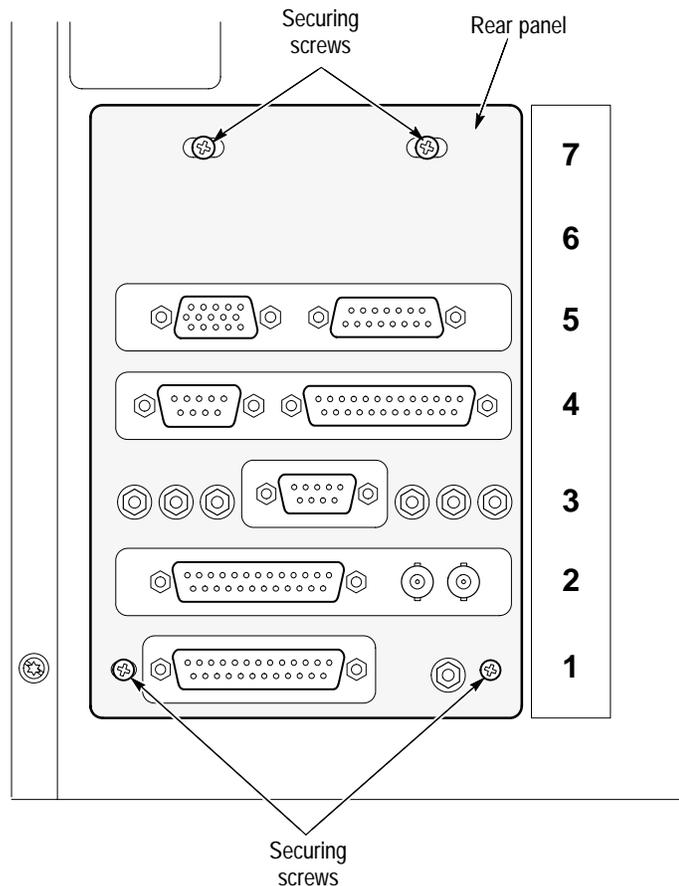
Figure 6–4: Proliant rear panel securing screws (shown with video card installed)

5. Remove the screws securing the RTA board bracket and I/O connector bracket to the computer card cage. Use a screwdriver with T-15 TORX tip.

6. Carefully remove the RTA board from the card cage. You may have to rock the board slightly (first lift the rear, then the front of the board) to disengage it from the EISA bus connector. Be sure that the I/O connector bracket is free of the computer chassis and accompanies the RTA board as you lift it away from the computer.

7. To reinstall the RTA board, reverse steps 2 through 6. Refer to *Reinstalling the Server Side Panel* on page 6–5 if necessary.

Removing/Reinstalling the Video Card

A video card is installed in slot 5 of instruments that have received upgrade kits MTS1F03 or MTS1F05. Use the following procedure to remove and reinstall the video card.

1. Be sure that you are wearing a static grounding wrist strap and that test system power is switched off.

2. Remove the server side panel to access the expansion slots; see *Removing the Server Side Panel* on page 6–4.

3. Remove any cables that are attached to the Data Store, RTA, and video connectors.

4. Remove the four screws that hold the rear panel to the server (see Figure 6–4) and then remove the panel.

5. Remove the T-15 Torx-head screw that secures the video card mounting bracket to the computer card cage.

6. Carefully remove the video card from the card cage. You may have to rock the board slightly (first lift the rear, then the front of the board) to disengage it from the PCI bus connector.

7. To reinstall the video card, reverse steps 2 through 6. Refer to *Reinstalling the Server Side Panel* on page 6–5 if necessary.

Server Diagnostics and Data Store Troubleshooting

Shutting down the 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 6–14 for fault isolation instructions for the Data Store disk system.

Starting the Application   Double-click the Data Store Administrator icon in the Tektronix MPEG Test System program group window to start the application. The Data Store Administrator application window will look similar to Figure 6–5.
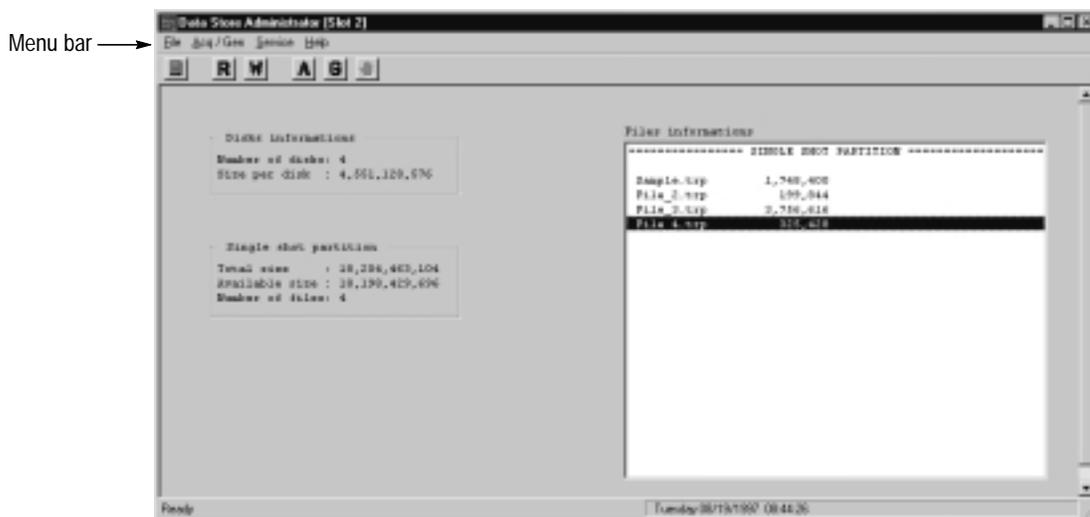
Figure 6–5: The Data Store Administrator application window

The menu bar in this window contains the names of the currently available menus. The following procedures use File and Service menu commands 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. To do so, refresh the FAT information either by selecting **FAT Read** from the File menu (see Figure 6–6) or by pressing **F5**.

Figure 6–6: The Data Store Administrator File menu

The FAT information panels display information about the Data Store disks. See Figure 6–7.

Figure 6–7: FAT Information

Repartitioning the Disks   The Data Store system can run with fewer than four disk drives, but the group of disks must be repartitioned to do so. To repartition the disks, select **Partition-ning** from the Service menu.

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

The **Partitionning** window shown in Figure 6–8 appears. Select the desired partition type (single shot, loop, or single shot and loop) from the **Partition type** list box. If you specify both single shot and loop partitions, also enter the size of the loop partition in the resulting box. Then click **OK**.
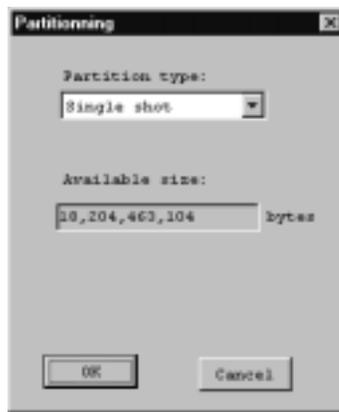
Figure 6–8: The Partitioning dialog box

NOTE. If the first-read disk drive has failed, you will not be able to repartition. If the Data Store Administrator cannot repartition the disks, refer to the following Troubleshooting Procedure *for instructions.*

Troubleshooting Procedure   The 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.

Figure 6–9 shows the replaceable components in the Data Store system.

⚠️ **CAUTION.** *You can damage the server or disk drives by disconnecting them when server power is turned on. Always shut down Windows NT and switch server power off before removing or connecting disk drive power or SCSI cables.*

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: 0, 1, 2, 3. See Figure 6–9 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.*
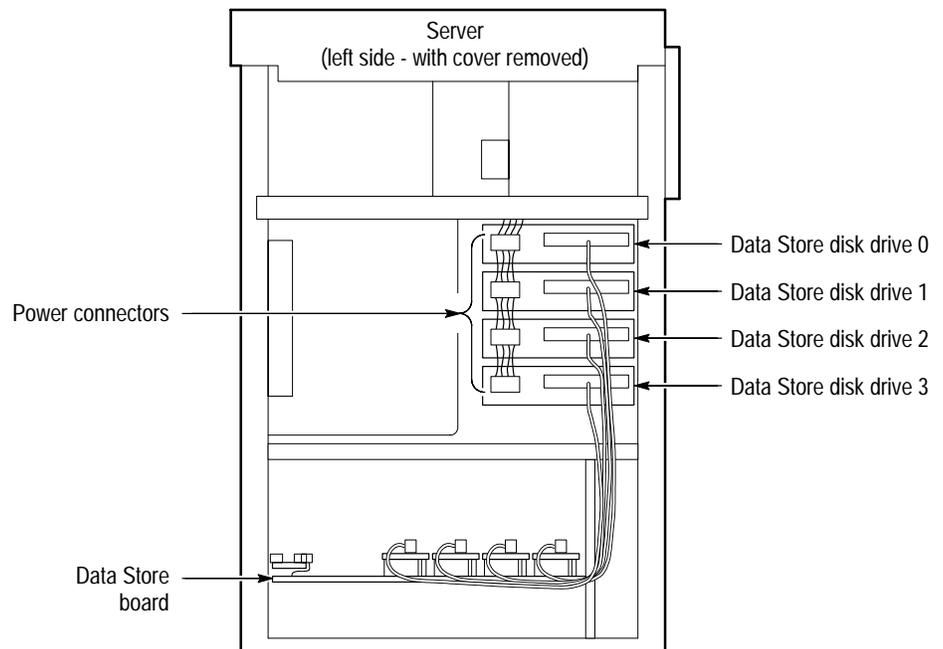
Figure 6–9: Location of replaceable components in the Data Store system

⚠️ **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 **Disk Information** panel (see Figure 6–7 on page 6–13) displays the number of Data Store disks that are recognized by the server. Table 6–2 shows how to interpret the "Number of disks" readout to identify a missing or 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 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.*

Real-Time Analyzer Troubleshooting

There are no serviceable parts on the Real-Time Analyzer circuit board. If the RTA does not pass the verification tests that begin on page 4–67, check the DIP Switch settings to be sure that they have not been changed.

The RTA circuit board has three DIP switches in the corner farthest away from the EISA-bus and D25 connectors. These switches are configured at manufacture and should not be reconfigured for any reason. If the RTA circuit board has been removed or replaced and you are experiencing incorrect operation, check the switches to confirm that they are configured as shown in Table 6–3.

Table 6–3: Correct RTA DIP switch configuration

Position	DIP CA3				DIP CA2				DIP CA1			
	1	2	3	4	1	2	3	4	1	2	3	4
ON	●		●	●	●	●	●					
OFF		●						●	●	●	●	●

If the switch settings are correct, please contact Tektronix Customer Service for assistance.

Repackaging

The MTS100 MPEG Test System is shipped in a carton designed to provide it with the maximum protection. If you need to ship the instrument, use this carton and cushioning to provide adequate protection.

NOTE. The MTS100 MPEG Test System shipping carton should be used to return the instrument to Tektronix service centers.

Obtaining Replacement Packaging

New packaging material is available from Tektronix. The part numbers are in Table 6–4. Packaging components are shown in Figure 6–10. To obtain these items contact your nearest Tektronix office or representative.

Table 6–4: Packaging Material

Item	Tektronix Part Number	Index Number
Top Cushion (Cardboard Insert)	004-4912-00	1
Foam Inserts	004-4913-00	2
Shipping Box	004-4914-00	3
Sleeve	004-4915-00	Not shown
Plastic Shipping Bag	006-2022-00	Not shown

Repackaging the server

When the server is shipped, it is important to provide it with the maximum protection. Figure 6–10 shows how to repackage the server for shipment. It is not necessary to have the keyboard and mouse boxes in the package for shipment. If you do not have the original plastic shipping bag, the server should be protected against dust and abrasion by using a plastic bag or wrap.

NOTE. When returning the MTS100 MPEG Test System for service, always include the software key (or HASP) that is installed on the parallel printer port of your test system. Without your software key, service personnel cannot operate your system.

Repackaging the Monitor

If the monitor is being shipped, it should be packaged in accordance with the instructions contained in its documentation.

Note: The keyboard, mouse, pedestal and manual boxes do not need to be returned with the MPEG Test System for servicing.
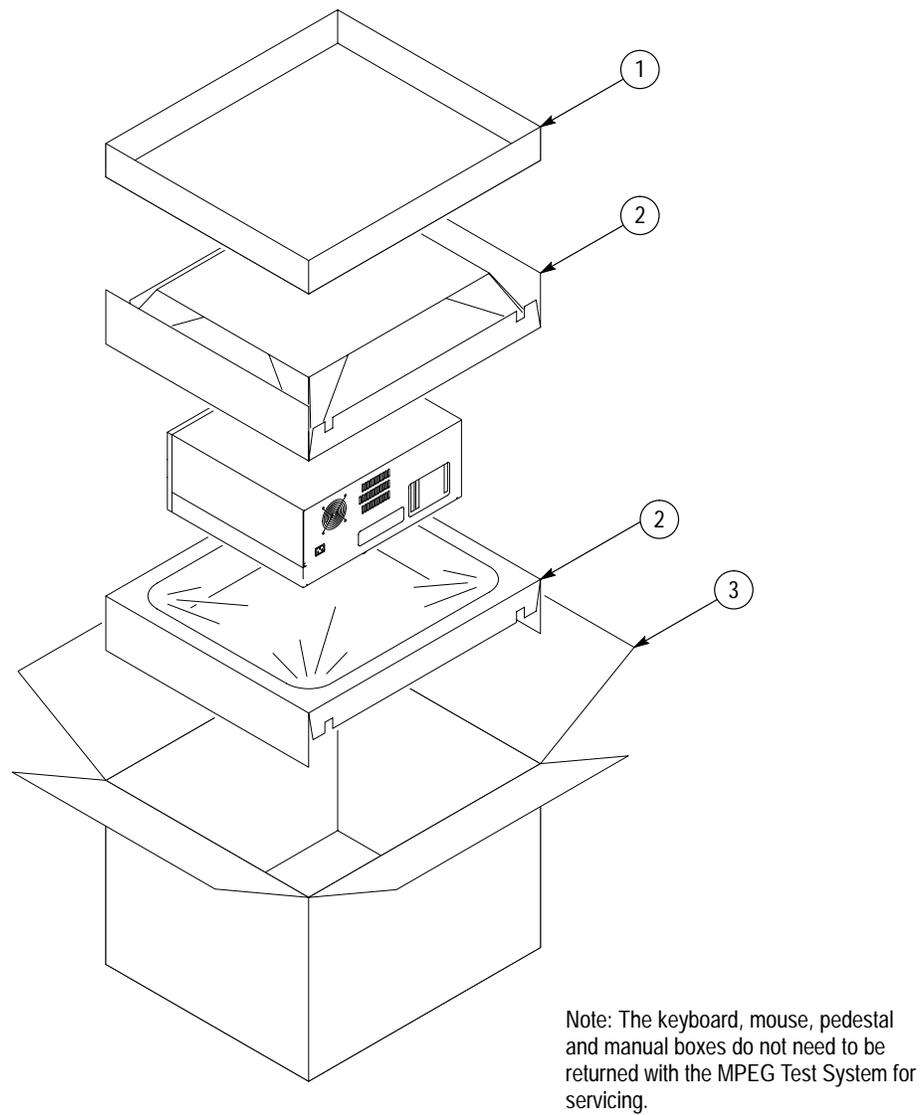
Figure 6–10: Packing illustration

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
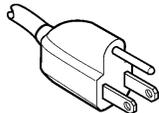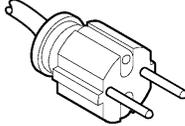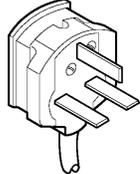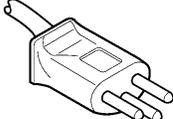
Replaceable Parts

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 1-800-833–9200.

Module Repair and Return

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

New Module

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.[1]
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.

[1] **Some of the parts listed in the Replaceable Parts List are not shown in the exploded view on page 8–8.**
Refer to the appropriate parts of the *Maintenance* **section of this manual for more information about the proper alignment and orientation of the parts not shown in the illustration.**

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
00779	AMP INC.	CUSTOMER SERVICE DEPT PO BOX 3608	HARRISBURG, PA 17105–3608
06383	PANDUIT CORP	17303 RIDGELAND AVE	TINLEY PARK, IL 60477–3048
18565	CHOMERICS INC	77 DRAGON COURT	WOBURN, MA 01880
74594	COMPONENT RESOURCES INC	BUSSMAN PARTS C/O CASEY LAKEY 14525 SW WALKER ROAD	BEAVERTON, OR 97006
0B445	ELECTRI–CORD MFG CO INC	312 EAST MAIN STREET	WESTFIELD, PA 16950
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214–4657
0J9P9	GEROME MFG CO INC	PO BOX 737 403 NORTH MAIN	NEWBERG, OR 97132
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
5Y400	TRIAX METAL PRODUCTS INC	1880 SW MERLO DRIVE	BEAVERTON, OR 97006
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
85480	BRADY USA	NAMEPLATE DIVISION P O BOX 571 346 ELIZABETH BRADY RD	HILLSBOROUGH, NC 27278
F7396	THOMCAST	SUB OF THOMSON CSF GROUP 50 RUE DU PRESIDENT SADATE 29562 QUIMPOR	CEDEX 9, FR
TK2541	AMERICOR ELECTRONICS LTD	UNIT–H 2682 W COYLE AVE	ELK GROVE VILLAGE, IL 60007
TK2548	XEROX CORPORATION	DIV OF XEROX CORPORATION 14181 SW MILLIKAN WAY	BEAVERTON, OR 97005

Replaceable parts list

Fig. & index number	Tektronix part number	Serial No, kit, or SW effective	Serial No. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
8–1	118-9284-00	B010100	B010156	1	COMPUTER,PC:PENTIUM,PC,PROSIGNIA 500 5/120, MOD 1, 16MB, NO HD, NET FLEX-L, CD-ROM	80009	118-9284-00
	118-9284-01	B010157	B029999	1	COMPUTER,PC:PENTIUM,PC,PROSIGNIA 500 5/150, 32MB, NO HD, NET FLEX-L, CD-ROM	80009	118-9284-01
	118-9284-02	B030307	B039999	1	COMPUTER,PC:PENTIUM,PC,PROSIGNIA 500 5/150, 32MB, NO HD, NET FLEX-L, CD-ROM	80009	118-9284-02
	253-0225-00			1	TAPE,PRESS SENS:ELCTLT AL FOIL,0.75 X 0.0055,18 YDS PER RL	80009	253-0225-00
	348-0274-00	B020251		1	SHLD GSKT,ELEK:FINGER TYPE	30817	97-555-05
	348-1524-00	B020251		1	GASKET, WIRE:WIRE MESH,EMI,0.250 H X 0.250 X 0.002 D	18565	6589
–2	119-5173-01		B039999	4	DISK DRIVE:WINCHESTER,3.5LP,2.15GB,SCSI,8MS	80009	119-5173-02
–2	119–5731–00	MTS1F03 or MTS1F05		4	DISK DRIVE:WINCHESTER,3.5 INCH,4.55GB,SCSI,TESTED	80009	119–5731–01
–2	119–5731–00	MTS2F30		4	DISK DRIVE:WINCHESTER,3.5 INCH,4GB,SCSI,W/OPTI-MIZED MODE PAGE SETTINGS	80009	119–5731–01
	386-6908-00	MTS1F03 or MTS1F05		8	BRACKET,SUPPORT:SIDE ACCESS DRIVE CLIPS KIT	80009	386-6908-00
	211-0951-00	MTS1F03 or MTS1F05		16	SCREW:6-32 X 0.25,TORX,STL, DATA STORE DRIVE CLIP	65685	143855-001
-3	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
	346-0128-00			1	STRAP,TIEDOWN,E:8.0 L X 0.1 W,NYLON	06383	PLT2M
-4	118-9285-00	B010100	B010170	1	CKT BD ASSY:STOR BD ASSY,SUPPORTING MPEG2 TRANSPORT MUX GEN. SOFTWARE	80009	118-9285-00
–4	118-9285-01	B010171	B010182	1	CKT BD ASSY:STOR BD ASSY,SUPPORTING MPEG2 TRANSPORT MUX GEN. SOFTWARE	80009	118-9285-01
–4	118-9285-02	B020183		1	CKT BD ASSY:STOR BD ASSY,SUPPORTING MPEG2 TRANSPORT MUX GEN. SOFTWARE	80009	118-9285-02
–4	118-9285-07	MTS2F30		1	CIRCUIT BD ASSY:STORAGE,SUPPORTING MPEG2 TRANSPORT MULTIPLEX GEN SOFTWARE	F7396	118-9285-07
-5	407-4433-00			1	BRACKET,SUPPORT:SUPPORT BRACKET,STEEL	80009	407-4433-00
–5	386-7070-00	MTS1F05		1	BRACKET:CARB BOARD BRACKET-NARROW 2 SLOT	F7396	386-7070-00
	118-9596-00	MTS1F05		1	CIRCUIT BD ASSY:REAL TIME ANALYZER FOR MPEG2; MTS1F05	F7396	HJ3925BA01
	118-9596-01	MTS2F30		1	CIRCUIT BD ASSY:REAL TIME ANALYZER,MPEG2,EISA	F7396	HJ3925BA01
	386-7061-00	MTS1F05		1	BRACKET:STEEL,REAL TIME ANALYZER CKT BD; MTS1F05	5Y400	386-7061-00
	039-0040-00	MTS1F03 or MTS1F05		1	VGA CARD:64-BIT PCI GRAPHICS BOARD	TK2607	MIL/2P/4N
-6	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
-7	174-3578-00			3	CABLE ASSY,RF:COAXIAL,RFD,50 OHM, 39.5L,SMB,PLUG,FEMALE,CONTACT X BNC, MALE	80009	174-3578-00

Replaceable parts list (cont.)

Fig. & index number	Tektronix part number	Serial No, kit, or SW effective	Serial No. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
-8	174-3579-00			3	CABLE ASSY, RF:COAX,RFD,75 OHM,39.5L,SMB,PLUG, FEMALE CONTACT X BNC,MALE	80009	174-3579-00
-9	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
-10	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
−15	174-3799-00	MTS1F05		1	CA,ASSY,ELEC:RTA // OUTPUT TO DATA STORE INPUT, MTS1F05	060D9	174-3799-00
-11	211-0721-00			6	SCREW,MACHINE:6-32 X 0.375,PNH,STL,CDPL,T-15 TORX	0KB01	ORDER BY DESCR
-12	333-4190-00			1	PANEL,REAR:STEEL,MTS100	80009	333-4190-00
−12	333-4272-00	MTS1F05		1	PANEL,REAR:STEEL,MTS1F05	5Y400	333-4272-00
−12	333-4283-00	MTS1F03		1	PANEL,REAR:STEEL,MTS1F03	5Y400	333-4283-00
	213-1094-00	MTS1F03 or MTS1F05		4	SCREW,TPG TF:6-32 X 0.250,PNH,STL,ZINC,T-15 TORX,TAPTITE	74594	213-1094-00
	386-6974-01	MTS1F03 or MTS1F05		1	BRACKET:REAR PANEL MOUNT,0.035THK COLD ROLL STL,PHOSPHATE WASH,TT-C4908B, TYPE II, MTS20	0J9P9	386-6974-01
-13	011-0168-00			1	TERMINATOR:BNC,MALE,STR,50 OHM,1 WATT,1.5 L,GY	00779	413364-2
	119-5133-10	B010100	B020209	1	MONITOR,COLOR:17 INCH,30-82 KHZ MULTI SCAN,TCO, 0.27MM DOT PITCH,FLAT CRT,PWR SAVING,ON SCREEN	80009	119-5133-10
	119-5426-00	B020210		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
					STANDARD ACCESSORIES		
-14	063-1938-00	SW V2.2		1	SOFTWARE ITEM:SOFTWARE PROTECTION DEVICE MEMOHASP-1 (MTS SW V1.0 through V2.2)	80009	063-1938-00
−14	119-5927-00	MTS2F25		1	DONGLE:SOFTWARE PROTECTION DEVICE, SENTINEL SUPERPRO (MTS SW V2.5 and later)	0JZY4	SRB00054
	063-1888-02	SW V2.0		1	SOFTWARE PKG:BACKUP DISK,MTS100,VERSION2.0	80009	063-1888-02
	063-1888-03	SW V2.1		1	SOFTWARE PKG:BACKUP DISK,MTS100,VERSION2.1	80009	063-1888-02
	063-2947-00	MTS1F03 or MTS1F05		1	SOFTWARE PKG:BACKUP DISK,V2.2/1.0	TK2548	063-2947-00
	063-3110-00	MTS2F25		1	SOFTWARE PKG:BACKUP DISK,V 2.5	TK2548	063-3110-00
	063–3213–00	MTS2F30		1	SOFTWARE PKG:BACKUP DISK,V 3.0	TK2548	063–3213–00
	063-1912-00		B029999	1	SOFTWARE PKG:WINDOWS NT 3.51,CDROM	80009	063-1912-00
	063-1912–01	B030000		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
					DOCUMENTATION, SOFTWARE V2.0		
	070-9578-04		B029999	1	MANUAL, TECH:READ ME FIRST MANUAL,MTS100	80009	070-9578-04
	070-9578-05	B030000		1	MANUAL, TECH:READ ME FIRST MANUAL,MTS100	80009	070-9578-05
	070-9376-02		B029999	1	MANUAL,TECH:USER,MTS100	80009	070-9376-02
	070-9376-03	B030000		1	MANUAL,TECH:USER,MTS100	80009	070-9376-03

Replaceable parts list (cont.)

Fig. & index number	Tektronix part number	Serial No, kit, or SW effective	Serial No. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
					DOCUMENTATION, SOFTWARE V2.1		
	075-0166-00		B010156	1	INSTRUCTION,KIT:V2.1 and DATA STORE BD UPGRADE, 040-1544-00	TK2548	075-0166-00
	075-0163-00	B010157	B010170	1	INSTRUCTION,KIT:V2.1 and DATA STORE BD UPGRADE, 040-1541-00	TK2548	075-0163-00
	075-0164-00	B020171	B020306	1	INSTRUCTION,KIT:V2.1 and DATA STORE BD UPGRADE, 040-1542-00	TK2548	075-0164-00
	075-0165-00	B030307	B039999	1	INSTRUCTION,KIT:V2.1 and DATA STORE BD UPGRADE, 040-1543-00	TK2548	075-0165-00
	070-9578-06	SW V2.1		1	MANUAL, TECH:READ THIS FIRST,MTS100, SOFTWARE V2.1	80009	070-9578-06
	070-9376-05	SW V2.1		1	MANUAL,TECH:USER,MTS100,SOFTWARE V2.1	80009	070-9376-05
					DOCUMENTATION, SOFTWARE V2.2		
	075-0225-00	MTS1F03		1	INSTRUCTION,KIT:UPGRADE MTS100 TO MTS210,MTS1F03	TK2548	075-0225-00
	075-0227-00	MTS1F05		1	INSTRUCTION,KIT:UPGRADE MTS100 TO MTS215,MTS1F05	TK2548	075-0227-00
	071-0079-00	MTS1F03 & MTS1F05		1	MANUAL,TECH:READ THIS FIRST,MPEG TEST SYSTEM, SOFTWARE V2.2/1.0	TK2548	071-0079-00
	071-0078-00	MTS1F03 & MTS1F05		1	MANUAL,TECH:USERS,MPEG TEST SYSTEM, V2.2	TK2548	071-0078-00
	071-0076-00	MTS1F05		1	MANUAL,TECH:USERS,REAL-TIME ANALYZER, V1.0	TK2548	071-0076-00
					DOCUMENTATION, SOFTWARE V2.5		
	075-0329-00	MTS2F25		1	INSTRUCTION,KIT:UPGRADE,VER 2.2 TO 2.5,MTS2F25	TK2548	075-0329-00
	071-0237-00	MTS2F25		1	MANUAL,TECH:READ THIS FIRST,MTS200 SERIES, SOFTWARE V2.5	TK2548	071-0237-00
	071-0078-01	MTS2F25		1	MANUAL,TECH:USERS,MPEG TEST SYSTEM, V2.5 (MTS210 and MTS215)	TK2548	071-0078-01
	071-0076-01	MTS2F25		1	MANUAL,TECH:USERS,REAL-TIME ANALYZER, V1.1 (MTS205 and MTS215)	TK2548	071-0076-01
					DOCUMENTATION, SOFTWARE V3.0		
	075–0453–00	MTS2F30		1	KIT INSTRUCTION; SOFTWARE UPGRADE, V2.5 TO V3.O	TK2548	075–0453–00
	071-0537-00	MTS2F30		1	MANUAL, TECH; READ THIS FIRST, MPEG TEST SYSTEM SOFTWARE, V3.0	TK2548	071-0237-00
	071-0076-02	MTS2F30		1	MANUAL,TECH:USERS,REAL-TIME ANALYZER, V1.1 (MTS205 and MTS215)	TK2548	071-0076-01
	071–0532–00	MTS2F30		1	MANUAL, TECH; USER, SYSTEM ANALYZER	TK2548	071–0532–00
	071–0534–00	MTS2F30		1	MANUAL, TECH; USER, STREAM CREATION APPLICATIONS	TK2548	071–0534–00
	071–0536–00	MTS2F30		1	MANUAL, TECH; USER, DATA STORE ADMINSTRATOR	TK2548	071–0536–00
					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

Replaceable parts list (cont.)

| Fig. & index number	Tektronix part number	Serial No, kit, or SW effective	Serial No. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
	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
	071-0151-00		B039999	1	MANUAL,TECH:SERVICE,MPEG TEST SYSTEM,SERIAL B039999 & BELOW	TK2548	071-0151-00

Figure 8–1: MTS100 MPEG Test System

Appendices

Appendix A:
Software Repair (Serial Number B029999 and Below)

This appendix applies to instruments, with serial number B029999 and below, that use Windows NT 3.51. 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.

- *Reloading the MTS 100 MPEG Test System Application Software* (page A–4) tells what to do if one or more of the MPEG Test System application files are corrupted.

- *Installing the Software on a New System Disk* (page A–13) explains the procedure for restoring the MPEG Test System software in the unlikely event that you must replace the system disk.

If an Application Locks

As with all software, the 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 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. Choose the Task List command button to bring up the Task List dialog box.

3. Click the locked application.

4. Click the End Task command button. This should close the locked application.

If this 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 the Shutdown command button to bring up the Shutdown 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

Whenever you upgrade the software or change your password, you should create a new emergency repair disk. This will minimize the chances that you will need to completely reload the operating software to resolve a minor problem.

An Emergency Repair Disk that contains the original factory data is shipped with each instrument. This disk can be updated or a new disk can be created. If you do choose to make a new emergency repair disk, you need one 3.5 in. disk. Mark it clearly that this is the Emergency Repair Disk for MPEG Test System serial number xxxxxxx. (It is not necessary that this disk already be formatted.)

NOTE. The Emergency Repair Disk is MTS100 MPEG Test System specific. Make sure that the Emergency Repair Disk is clearly marked with the serial number of the system it was created on.

Creating or Updating an Emergency Repair Disk

If you are making a new or updated Emergency Repair Disk use the following procedure.

1. With the Test System running and the Windows NT Program Manager displayed, go to the Applications (Common) menu and select RDISK.

2. This displays the Repair Disk Utility dialog box shown in Figure A–1.
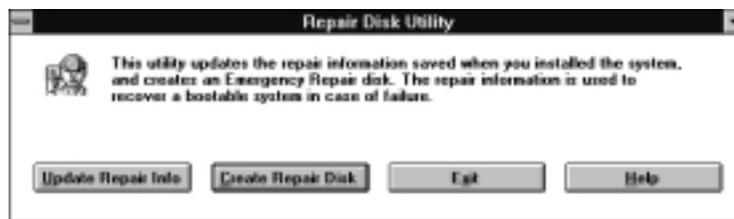
Figure A–1: The Repair Disk Utility dialog box

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–2 appears.

Figure A–2: Repair disk warning message

5. Insert a floppy disk in the a: drive. Use a new disk to create a brand new Emergency Repair Disk or the existing Emergency Repair Disk if you want to update.

6. Choose OK. The utility then formats the disk and saves the information.

7. When the operation is complete, the Repair Disk Utility main menu returns. See Figure A–1. Choose the Exit command button to end the Repair Disk Utility.

8. Remove the Emergency Repair Disk from the a: drive, label it with the Test System serial number, and keep it in a safe place.

Using the Emergency Repair Disk

If your system files are corrupt and you are unable to recover the previous startup configuration (Last Known Good – the Windows NT startup screen option), you use the Emergency Repair Disk to restore your system to its initial setup state. If you do not have the Emergency Repair Disk, you will have to reinstall Windows NT. See the *Windows NT manual*, provided with your back-up copy of Windows NT, for instructions to restore your operating system.

You may need to use the Emergency Repair Disk to restore user passwords. Make sure that you update the emergency repair disk each time you add a user or change a password.

The short procedure below is intended for those who are familiar with Windows NT. If you need more information, see the *Windows NT manual*.

NOTE. The Emergency Repair Disk is MTS100 MPEG Test System specific. The disk shipped with a Test System, or a new disk created on this Test System is the only one that contains the correct user information and passwords.

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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 MPEG Test System.

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 processes:

   - 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.).

Reloading the MTS100 MPEG Test System Application Software

Use the procedures below to reinstall your MPEG Test System software if it is accidently deleted or becomes corrupted. Software has been supplied on CD-ROM.


⚠ *CAUTION. To avoid an unintended loss of data, before you reinstall the software, be sure to backup any files you have created that are located in the c:\MTS100 directory.*

This is not necessarily the procedure used to upgrade the software. Use the directions provided with the software upgrade to perform upgrades.

1. Verify that the system disk on the MTS 100 workstation has 80 MB of free space. The program will not install if the system disk has less than 80 MB of free space.

2. If you are reinstalling the software because the MPEG Test System software has become corrupted, you should uninstall the software using unInstallMTS100, located in the Tektronix MPEG Test System V2.0 group.

a. To remove the existing MPEG Test System software, double-click the unInstallMTS100 icon (see Figure A–3).

Figure A–3: The Tektronix MPEG Test System V2.0 window

b. When the dialog box asks you to confirm the file deletion, click Yes.

3. Place the MPEG Test System Installation Software CD-ROM into the CD-ROM drive (usually D:\).

4. Restart Windows NT.

⚠ *CAUTION. To prevent incorrect installation of the MPEG Test System software, be certain to log into Windows NT as administrator before you install the MPEG Test System software.*

5. Log into Windows NT as administrator (Username = administrator and password = MPEG2). You must log in as "administrator" in order to install applications.

6. Close any applications that are running. Nothing should be running except the Program Manager.

7. Display the Program Manager.

8. Choose Run from the File menu. This displays the Run dialog box shown in Figure A–4.
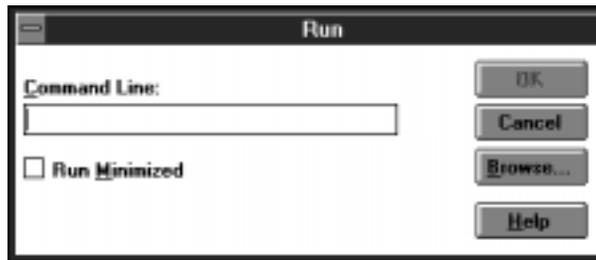
Figure A–4: The Run dialog box

9. Type "d:\setup" in the Command Line text box. Click OK to continue.

This starts the MPEG Test System Software Installation and brings up the dialog box shown in Figure A–5.

Figure A–5: The MPEG Test System Software Installation dialog box

10. After reading the text in the dialog box, click Next.

This brings up the dialog box shown in Figure A–6.

Figure A–6: Specifying the destination directory

11. Specify the directory into which the MPEG Test System software should be installed. The default directory name is MTS100. If you wish to use a different directory name, click Browse. To accept the default directory name, click Next.

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

After clicking on Next, the dialog box shown in Figure A–7 appears.

Figure A–7: The Select Program Folder dialog box

12. Select the program folder into which the program icons will be added. The default is "Tektronix MTS 100 V2.0". Follow the instructions in the dialog box to select a different program folder. Click Next to continue.

The setup program will begin installing the MPEG Test System software. A progress dialog box will appear as shown in Figure A–8.

Figure A–8: The progress dialog box

13. After the setup program has copied all the files to the hard drive, an information dialog box will appear. Read the dialog box and click OK to continue.

14. An information dialog box will appear asking you to verify that the HASP is installed. (See Figure A–9.) Once you have verified that the HASP is installed, click OK to continue.
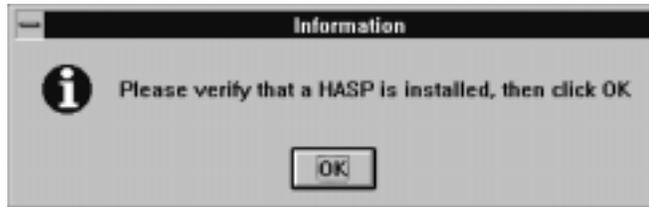
Figure A–9: Information dialog box

15. After the HASP Device Driver is installed, the dialog box in Figure A–10 appears. Click OK to continue.

Figure A–10: Notice to reboot your system

NOTE. The system does not automatically reboot when you choose the OK button. Do not reboot the computer at this time.

An information dialog box will appear stating that the installation is complete.

16. Next, an information dialog will appear asking you to reboot the system (see Figure A–11). Click OK to continue.

NOTE. The system does not automatically reboot when you choose the OK button. Do not reboot the computer at this time.
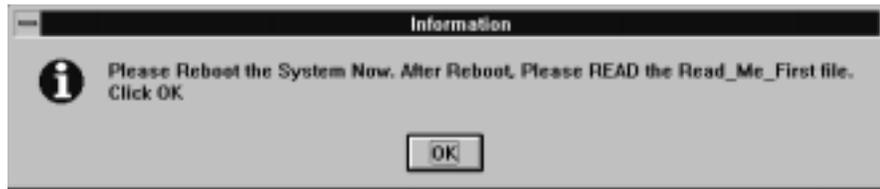
Figure A–11: The Information dialog box

17. The Restart Windows NT dialog box will appear as shown in Figure A–12. Accept the default selection of "Yes, I want to restart my computer now" by clicking on OK.

Figure A–12: The Restart Windows NT dialog box

18. After the MPEG Test System server reboots, login as the administrator (Username = administrator and password = MPEG2).

19. From the **Tektronix MTS100 V2.0** window, double-click the Data Store Control icon. See Figure A–13.

Figure A–13: The Tektronix MPEG Test System V2.0 window

20. Select Resources Parameter from the Service menu. The Resource Parameters dialog box will be displayed.

21. Do not change anything in the Resource Parameters dialog box, just click OK.

22. A dialog box will appear stating that you must restart the computer to take the changes into account. Click OK to continue.

23. Quit the Data Store Control program.

24. Double-click the Main icon in the **Program Manager** window.

25. Double-click the Control Panel icon.

26. Double-click the System icon.

27. Click Path in the **System** window.

28. If it is not already present, add the following to the end of the path:

    ;C:\MTS100\bin

If you used a different directory name in your installation, use that name instead of MTS100.

29. Click Set. Exit the **System** window.

30. Reboot the system.

If your system has a serial number of B020000 or above, you can now use the MPEG Test System applications. Your installation of the Version 2.0 software is complete.

⚠ **CAUTION.** *If your system has a serial number between B010100 and B019999, you must perform the following steps before you can use the MPEG Test System applications or your system files can become corrupted.*

31. Run the File Manager.

32. From the File menu, select Run.

33. Type:

    c:\MTS100\BIN\SETCARB.EXE

If you did not install the MPEG Test System software in the MTS100 directory, use the name of the directory in which you installed the MPEG Test System software.

34. Click OK.

35. In the window that appears, turn off the "MSB and LSB possibility" selection (it should not be checked).

36. Select 32 files. See Figure A–14.
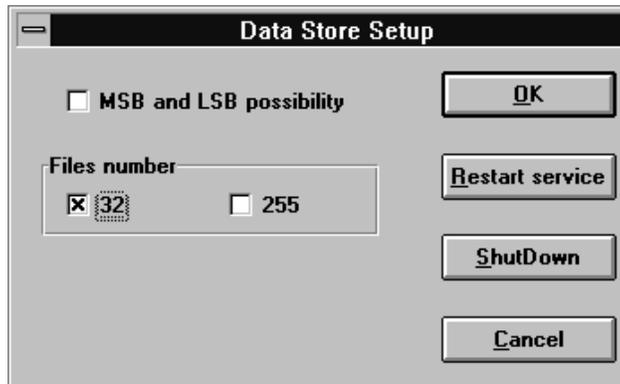
Figure A–14: Settings for MPEG Test System systems with serial numbers below B020000

37. Select Restart Service.

NOTE. *MPEG Test System systems with serial numbers between B010100 and B019999 cannot use 255 files or the MSB/LSB option.*

Your installation of the Version 2.0 software is complete.

Installing the Software on a New System Disk

If it becomes necessary to replace the MPEG Test System system disk, use this procedure to restore instrument function. If you have any questions about Windows NT installation or setup, refer to the Windows NT Installation Guide for more information.

1. After installation of a new system disk, switch the computer on and place the Compaq SmartStart CD-ROM into drive D. Restart the computer to force it to boot from the CD-ROM.

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 MPEG Test System software has been installed.

4. Select the appropriate language, country, and keyboard.

5. At the next Compaq SmartStart display, remove the CD-ROM from drive D and place the Windows NT setup boot disk 1 into drive A and the Windows NT 3.51 CD-ROM into drive D. Then press CTRL+ALT+DELETE twice to exit the SmartStart utilities and begin Windows NT setup.

6. Follow the on-screen instructions to install and configure Windows NT.

   ■ Select Express Install.

   ■ Choose to install from the CD-ROM.

   ■ 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.

   ■ When asked for the product ID, enter the number from the adhesive label on the inside rear cover of the Installation Guide.

   ■ Give the computer any appropriate name. As manufactured, the computer name is "MTS100" and the workgroup name is "MTS_100."

   ■ If no printer is attached, choose Cancel at the **Set Up Local Printer** step; you may use the Print Manager to add a printer later.

   ■ Select the Network options that apply to your installation; ask your system administrator for TCP/IP configuration parameters and other assistance, if required.

7. When the setup routine reaches the **Administrator Account Setup** window, enter MPEG2 (all uppercase) as the administrator password.

8. In the **Local Account Setup** window, set up an account for username MTS100; do not enter a password for this user.

9. Continue following the on-screen instructions.

   ■ Accept the virtual drive defaults.

   ■ Click Cancel in the **Set Up Applications** window. You will install the MPEG Test System software after Windows NT setup is complete.

   ■ Set the following **Display Parameters**:

Color Palette:	16 Colors
Desktop Area:	1024 by 768 pixels
Font Size:	Small Fonts
Refresh Frequency:	72 Hertz

10. 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 MPEG Test System serial number on the emergency repair disk.

11. When prompted to restart the computer, remove the disks from both drive A and drive D and then click Restart.

12. Log in as the administrator (the password is MPEG2).

13. Place the MPEG Test System Installation Software CD-ROM (part number 063-1888-02) into drive D.

14. Follow steps 7 through 17 (pages A–5 to A–10) of the MPEG Test System software installation procedure.

15. Step 17 of the MPEG Test System software installation procedure 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 three for the Data Store (CARB) board.

   a. Highlight **Step 2: Add or remove boards** and then press ENTER.

   b. Highlight **Slot 3 (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 3**.

     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 as the administrator once again and then return to page A–10, step 18 to complete the MPEG Test System software installation procedure.

NOTE. If the serial number of your instrument is below B020000, be sure to run Setcarb as explained in steps 32 through 37 (on page A–12) before using the Data Store Control application. Failure to do so may result in lost data.

When you finish MPEG Test System software installation, your instrument will be ready for use.

Appendix B:
Software Repair (Serial Number B030000 to B039999)

This appendix applies to instruments with serial numbers B030000 to B039999 using Windows NT 4.0 and MTS Series Software Versions 2.0 and 2.1. There are four parts to this appendix:

- *If an Application Locks* (below) tells you 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.

- *Reloading the MTS 100 MPEG Test System Software* (page B–5) tells you what to do if one or more of the MPEG Test System application files are corrupted.

- *Installing the Software on a New System Disk* (page B–5) explains the procedure for restoring the MPEG Test System software in the unlikely event that you must replace the system disk.

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 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 MPEG Test System-specific; that is, the disk shipped with an MPEG Test System 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 MPEG Test System, create a new one as described in* Creating an Emergency Repair Disk.

**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 MPEG Test System serial number B0xxxxx and then perform the following steps.

NOTE. *The emergency repair disk is MPEG Test System-specific. Make sure that the emergency repair disk is clearly marked with its MPEG Test System serial number. The serial number of your 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.
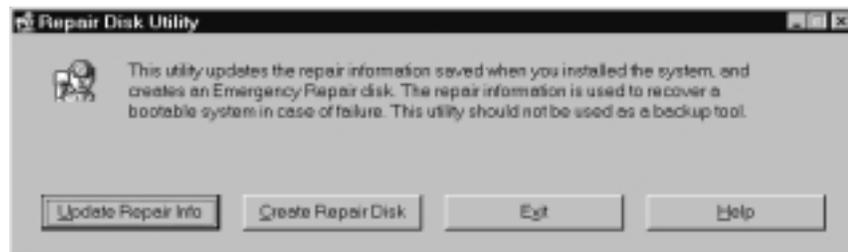
Figure B–2: The Repair Disk dialog box

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.
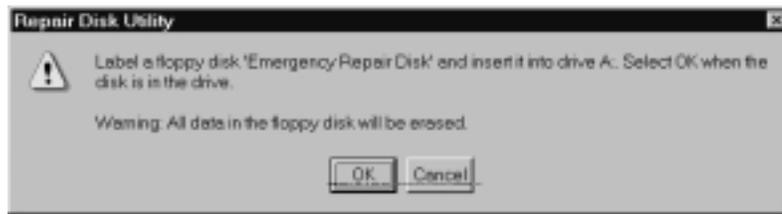
Figure B–3: All data on the disk will be erased

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 MPEG Test System.

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 MPEG Test System Software

It may become necessary to reinstall your MPEG Test System software if it is accidently deleted or becomes corrupted. Reinstallation procedures depend on your software version; please consult the following table for the manual that applies to your software version. Then refer to the *Software Repair* appendix in that manual for complete reinstallation instructions. If you do not know the software version installed on your particular machine, consult the MPEG Test System readme file, C:\Mts100\Readme.txt.

Software version	Manual title	Tektronix part number
2.0	MTS100 MPEG Test System User Manual	070-9376-04
2.1	MTS100 MPEG Test System Software V2.1 User Manual	070-9376-05

Installing the Software on a New System Disk

If it becomes necessary to replace the MPEG Test System 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 MPEG Test System 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 MPEG Test System 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 MPEG Test System operation.

- Select the Network options that apply to your installation. The MPEG Test System 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:	16 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–4.
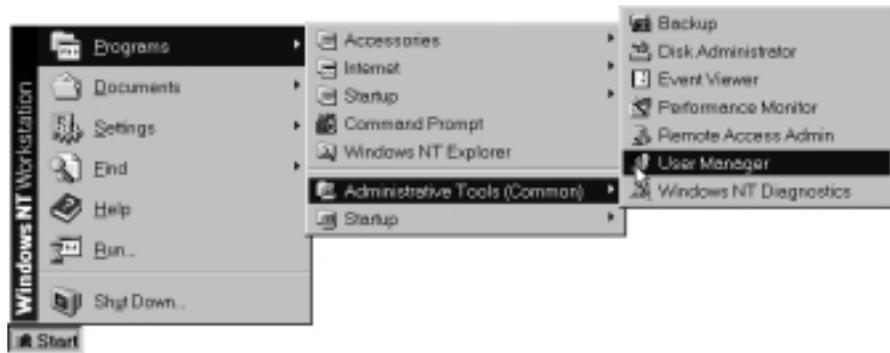
Figure B–4: Start the User Manager

9. Select New User from the User menu of **User Manager** window to open the **New User** dialog box shown in Figure B–5 on page B–7.

- Enter **MTS100** in the **Username:** text box

- Clear the **User Must Change Password at Next Login** option

- Select the **Password Never Expires** option.
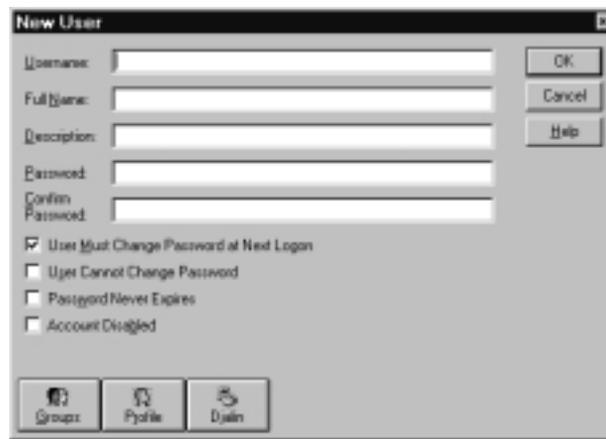
Figure B–5: The New User window

10. Click **Groups** in the lower-left corner of the **New User** window to open the **Group Memberships** window.

11. Select (highlight) the Backup Operators selection in the **Not member of** list on the right side of the window.

12. Click **Add** to place Backup Operators into the **Member of** list.

13. Click **OK** to confirm the change and close the **Group Memberships** window.

14. Click **OK** to confirm the MTS100 user settings and dismiss the **New User** window.

15. Close the **User Manager** window (select **Exit** from the User menu or simply click the close box in the upper-right corner of the window).

16. Select Settings > Control Panel from the Start menu; then double-click the **System** icon. Click the **Startup/Shutdown** tab in the resulting window to reveal the system startup and recovery settings as shown in Figure B–6 on page B–8.

17. 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–6: The system startup and recovery options

18. Click **OK**. Click **YES** in the resulting message window that asks if you want to restart your computer.

Reload Video Driver and EISA Configuration Files (MTS1F05 Installed)

If the MTS1F05 upgrade kit is installed in your system, you must reload the video driver and the Real-Time Analyzer and Data Store system configuration files. If you are using MPEG Test System software 2.0 or 2.1, you must first load the MTS software and then reload the Data Store configuration file; refer to *Reload Software and Configuration Files (SW Version 2.1 and Earlier)* on page B–10.

1. Power on and boot up (or restart) the computer.

2. When the message

   ```
   Press "F10" key for System Partition Utilities
   ```

   appears at the top of the display, press the **F10** key.

3. From the **Compaq System Configuration** window press any key to continue.

4. With the up/down arrow keys, select **System Configuration** from the MAIN MENU; then press **ENTER**.

5. Select **Configure Hardware**; then press **ENTER**.

6. From the Configuration Complete menu, select **Review or modify hardware settings**; then press **ENTER**.

7. Select **Add or Remove Boards**; then press **ENTER**.

8. Select **Slot 3 (CARB)** and press **Delete**; then press **OK**.

9. Select **Slot 1 (Empty)** (you installed the Real-Time Analysis board in Slot 1); then press **Insert**.

10. Locate the *MTS 200 Series EISA Configuration* disk, Tektronix part number 063-3024-00, provided with the MTS1F05 upgrade kit.

11. Insert the configuration disk into drive A; then press **F7**.

12. Select **A:** and then press **ENTER**.

13. Locate and select the file **!pia2500.cfg**; press **ENTER** to load the file.

14. In the **Add Confirmation** window press **ENTER**.

15. In the **Add** window verify that slot 1 is selected; then press **ENTER**.

16. Verify that the RTA board is listed for slot 1; slot 1 should read:

    ```
    PIA — For Proliant 2500
    ```

17. Select **Slot 3**; then press **Insert**.

18. Press **F7**.

19. Select **A:** and then press **ENTER**.

20. Locate and select the file **!car2500.cfg**; press **ENTER** to load the file.

21. In the **Add Confirmation** window, press **ENTER**.

22. In the **Add** window verify that slot 3 is selected; then press **ENTER**.

23. Verify that the CARB board is listed for slot 3; slot 3 should read:

    ```
    CARB — For Proliant 2500
    ```

24. Remove the configuration disk from the A drive.

25. Press **F10**.

26. Select **Save and Exit**; then press **ENTER**.

27. Select **Save Settings and Restart the Computer**; then press **ENTER**. Click **ENTER** again at the reboot window and wait for the computer to reboot.

28. Now reinstall the MPEG Test System software. Refer to your software user manual for instructions; refer to *Reinstalling the MPEG Test System Software* on page B–5 for a list of appropriate manuals.

When you finish software installation, your MPEG Test System is ready for use. For normal test system operations, always log on as the MTS100 user.

Reload Software and Configuration Files (SW Version 2.1 and earlier)

If you are using MPEG Test System software version 2.1 or earlier, you must install the MPEG Test System software before loading the Data Store configuration file.

1. Reinstall the MPEG Test System software. Refer to your software user manual for instructions; refer to *Reinstalling the MPEG Test System Software* on page B–5 for a list of appropriate manuals.

2. After installing the software onto the Prosignia system disk but before attempting to use any MPEG Test System software, restart the computer. When prompted during system start up, press the F10 key to run the Compaq system partition utilities.

3. Select System Configuration from the system partition utilities MAIN MENU display; then select Configure Hardware from the System Configuration submenu.

4. Configure slot three for the Data Store (CARB) board.

    a. Highlight **Step 2: Add or remove boards** and then press ENTER.

    b. Highlight **Slot 3 (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 3**.

    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.

Your MPEG Test System is ready for use. For normal test system operations, always log on as the MTS100 user.

Upgrading Real-Time Analyzer Firmware

If your MPEG Test System contains Real-Time Analyzer hardware, it may become necessary to update the firmware for the latest software version. Follow the directions included with the software update. The general procedure is as follows:

1. Start the RTA firmware update application, C:\MTS200\Service\Flash.exe, either through an exploring window (double click the Flash.exe icon) or through **Run...** command on the Windows NT Start menu.

2. Load the DSP file.

    a. Select **Load Dsp File** from the Flash application File menu.

    b. In the resulting **Open** dialog box, double-click the DSP filename, Rt*nnnnnn*.hex (if there is more than one DSP file in the Service directory, select the most recent file). A message, similar to the following, appears in the application window:

```
Opening C:\Mts200\SERVICE\rt980608.hex
Date: 06/08/1998 11:14:58
@Start of code: 00000000
Code size:    0000E740 bytes
```

3. Select **DownLoad Dsp software** from the Flash application PIA menu. The **Dialog** window appears in a few seconds.

4. Click **OK** to accept the version number.

5. In a moment the message "You must shutdown the PC before Use PIA" appears in the Flash application window. Click **OK** to acknowledge the message.

6. Load the Flex file.

   a. Select **Load Flex File** from the Flash application File menu.

   b. In the resulting **Open** dialog box, double-click the Flex filename, Fx*nnnnnn*.hex. A message, similar to the following, appears in the application window:

```
Opening C:\Mts200\SERVICE\Fx971120.hex
Date: 11/20/1997 19:20:32
@Start of code: 00000000
Code size:   0000B73F bytes
```

7. Select **DownLoad Flex software** from the Pia menu.

8. When the **Dialog** window appears, click **OK** to accept the version number.

9. The "You must shutdown the PC..." message appears again. Click **OK** to acknowledge the message and close the message window.

10. Select **Exit** from the Flash File menu to exit the application. Shut down Windows NT and briefly power-down the computer before attempting to use the Real-Time Analyzer.

Appendix C:
Software Repair (Software Version 2.2 and Above)

This appendix applies to instruments with MPEG Test System software version 2.2 and above. There are seven parts to this appendix:

■ *If an Application Locks* (page C–2) describes how to shut down an application that no longer responds to input.

■ *Creating and Using an Emergency Repair Disk* (page C–3) explains how to create and use a system-specific repair disk.

■ *Installing the Software on a New System Disk* (page A–13) explains the procedure for restoring both Windows NT and the MPEG Test System software if you must replace the system disk.

■ *Reinstalling the MPEG Test System Software* (page C–12) tells you how to reinstall the application(s) software when necessary.

■ *Installing SNMP Service* tells you how to install the SNMP service that allows you to use the real-time analyzer SNMP agent enabled with the MTS200 Series software version 3.0 (page C–20).

■ *Installing Windows NT 4.0 Service Pack 5* tells you how to install Windows NT service pack five, which is required for running MTS200 Series version 3.0 software (page C–22).

■ *Upgrading Real-Time Analyzer Firmware* tells you how to upgrade the firmware, which is sometimes required to enable new or upgraded features of the RTA software (page C–23).

If an Application Locks

As with all software, MPEG Test System applications can, on occasion, "freeze" or "lock up." In most cases the easiest way to recover 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.

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 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 MPEG Test System-specific; that is, the disk shipped with an MPEG Test System 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 MPEG Test System, 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 MPEG Test System serial number B0*nnnnn* and then perform the following steps.

NOTE. The emergency repair disk is MPEG Test System-specific. Make sure that the emergency repair disk is clearly marked with its MPEG Test System serial number. The serial number of your 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 opens.
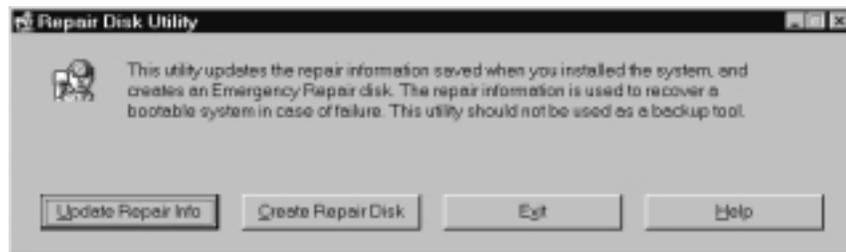
3. Click **Update Repair Info** to save your current configuration. A message appears to remind you that earlier repair information is overwritten. Click **Yes** to continue.

4. When the process is complete, a message appears to ask if you wish to create an Emergency Repair Disk. Click **Yes**. A new message appears.

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 MPEG Test System.

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 tasks:

   ■ 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 archives in the registry.

   ■ Reinstalls the Boot Loader (the boot sector, BOOT.INI, etc.).

Installing the Software on a New System Disk

If you need to replace the MPEG Test System system disk, use the following procedure to restore instrument function for instruments using MTS 200 Series Software, Versions 2.2, 2.5, and 3.0. This procedure describes how to perform the following steps:

■ Update the system partition

■ Update MPEG Test System configuration files

■ Complete the Windows NT installation

■ Install necessary drivers

■ Specify hardware settings

If you have any questions about Windows NT installation or setup, refer to the Windows NT Installation Guide for more information.

After completing the procedures described in this section, install the MTS 200 Series software using the procedure described in *Reinstalling the MPEG Test System Software* beginning on page C–12.

Update the System Partition

1. After installation of a new system disk, switch the computer on and place the Compaq SmartStart CD-ROM into drive D. Restart the computer to force it to boot from the CD-ROM.

2. Follow the on-screen instructions to update the system partition.

Update Configuration files

1. From the Compaq System Configuration window press any key to continue.

2. With the up/down arrow keys, select **System Configuration** from the MAIN MENU; then press **ENTER**.

3. Select **Configure Hardware**; then press **ENTER**.

4. From the Configuration Complete menu, select **Review or modify hardware settings**; then press **ENTER**.

5. Select **Add or Remove Boards**; then press **ENTER**.

6. Select **Slot 2 (CARB)** and press **Delete**; then press **OK**.

7. Select **Slot 4 (Empty)** (you installed the Real-Time Analysis board in Slot 4); then press **Insert**.

8. Locate the *MTS 200 Series EISA Configuration* disk provided with the test system.

9. Insert the configuration disk into drive A; then press **F7**.

10. Select **A:** and then press **ENTER**.

11. Locate and select the file **!pia2500.cfg**; press **ENTER** to load the file.

12. In the **Add Confirmation** window press **ENTER**.

13. In the **Add** window verify that slot 4 is selected; then press **ENTER**.

14. Verify that the that RTA board is listed for slot 4; slot 4 should read:

```
PIA - For Proliant 2500
```

15. Select **Slot 2**; then press **Insert**.

16. Press **F7**.

17. Select **A:** and then press **ENTER**.

18. Locate and select the file **!car2500.cfg**; press **ENTER** to load the file.

19. n the **Add Confirmation** window press **ENTER**.

20. In the **Add** window verify that slot 2 is selected; then press **ENTER**.

21. Verify the that CARB board is listed for slot 2; slot 2 should read:

CARB — For Proliant 2500

22. Remove the configuration disk from the A drive.

23. Press **F10**.

24. Select **Save and Exit**; then press **ENTER**.

Complete the Windows NT Installation

1. Select the appropriate language, country, and keyboard.

2. At the next Compaq SmartStart display, remove the CD-ROM from drive D and place the Windows NT setup boot disk 1 into drive A and the Windows NT 4.0 CD-ROM into drive D. Then press CTRL+ALT+DELETE twice to exit the SmartStart utilities and begin Windows NT setup.

3. Follow the on-screen instructions to install and configure Windows NT.

■ Select Express Install.

■ Choose to install from the CD-ROM.

■ 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.

■ When asked for the product ID, enter the number from the adhesive label on the inside rear cover of the Installation Guide.

■ Give the computer any appropriate name. The computer name MTS100 and workgroup name MTS_100 are values provided when the system is configured at the factory.

■ If no printer is attached, choose Cancel at the **Set Up Local Printer** step; you may use the Print Manager to add a printer later.

■ Select the Network options that apply to your installation; ask your system administrator for TCP/IP configuration parameters and other assistance, if required.

4. When the setup routine reaches the **Administrator Account Setup** window, enter MPEG2 (all uppercase) as the administrator password.

5. In the **Local Account Setup** window, set up an account for username MTS100; do not enter a password for this user. Make the MTS100 user a member of the Backup Operators group.

6. Continue following the on-screen instructions.

   - Accept the virtual drive defaults.

   - Click Cancel in the **Set Up Applications** window. You will install the MPEG Test System software after Windows NT setup is complete.

   - Set the following **Display Parameters**:

Color Palette:	256 Colors
Desktop Area:	1024 by 768 pixels
Font Size:	Small Fonts
Refresh Frequency:	72 Hertz

7. 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 MPEG Test System serial number on the emergency repair disk.

8. When prompted to restart the computer, remove the disks from both drive A and drive D and then click Restart.

9. Log in as the administrator (the password is MPEG2).

Install Video Driver   Use the following procedure to install video driver software. The CD ROM containing the software is supplied with the version 2.2 upgrade kits, MTS1F03 and MTS1F05, as well as all version 2.2, 2.5, or 3.0 test systems.

1. Override any "invalid display" messages that may occur and continue with the next step.

2. Locate the Matrox CD ROM and place it into the CD drive.

3. The set up application starts automatically and in a few seconds displays the **Language Selection** window.
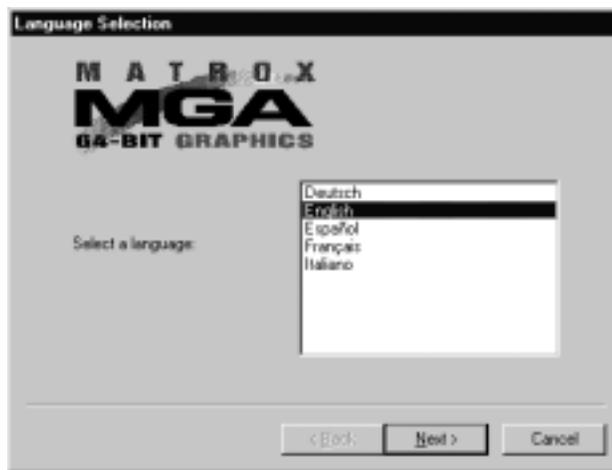
4. In the Language Selection window select the appropriate language; then click **Next**.

5. The **Welcome** window opens. Click **Next**.

6. The **First Time Installation** window opens. Read the instructions; then click **Install**.

7. The setup window opens to allow selection of the installation type.

8. Click **Typical** for standard installation.

9. The Setup program installs the driver software on the system then summarizes the installation.

10. Click **Next** to continue.

11. The setup window updates.

12. Remove the CD ROM disk from the CD drive.

13. Read the instructions; then click **Finish** to reboot the computer and finalize the installation.

Set Display Resolution

You must set the monitor display resolution before continuing.

NOTE. For first-time set up, use a monitor with a minimum resolution of 1024 by 768 pixels.

1. Access the Windows Control Panel and open the Display/Settings/Display Properties window.

2. Set the Color Palette to **16,777,216** colors.

3. Set the Desktop Area to **1024 x 768** pixels.

4. Set the Font Size to **Small Fonts**.

5. Set the Refresh Frequency to **70 Hertz**.

6. Click **Apply**.

Cirrus Disable   Use the following procedure to disable the standard PC video driver.

1. Open the Control Panel and select **Devices**.

2. In the Devices window scroll and select **Cirrus**; then click **Startup**.

3. The Device window reappears. Select **Disabled**; then click **OK**.

4. Override any warning messages by clicking **Yes** to continue.

5. Restart the computer.

6. Press **F10** for System Partition Utilities.

7. From the **Compaq System Configuration** window press any key to continue.

8. With the up/down arrow keys, select **System Configuration** from the MAIN MENU; then press **ENTER**.

9. Select **Configure Hardware;** then press **ENTER**.

10. Select **Review or modify hardware settings**; then press **ENTER**.

11. Select **Save and Exit**; then press **ENTER**.

12. Select **Save Settings and Restart the Computer**. Click **ENTER** and wait for the computer to reboot.

Install the MPEG Test System Software   Refer to *Reinstalling the MPEG Test System Software* beginning on page C–12.

Reinstalling the MPEG Test System Software

The procedure that you must use to reinstall the MPEG Test System software if it is accidently deleted or becomes corrupted depends on the software version. If you have MTS200 Series Test System software version 2.5 or version 3.0, follow the procedure below. If you have an earlier version (versions 2.0, 2.1, or 2.2), use the procedure in the *Software Repair* appendix of the appropriate manual listed in Table C–1. Perform this procedure as the final step in updating your test system.

Table C–1: Manuals for MTS100 Series version 2.x software

Software version	Manual title	Tektronix part number
2.0	MTS100 MPEG Test System User Manual	070-9376-04
2.1	MTS100 MPEG Test System Software V2.1 User Manual	070-9376-05
2.2	MTS 210 and MTS 215 Deferred-Time Applications User Manual	071-0078-XX
	(or) MTS 200 Series Real-Time Analyzer User Manual	071-0076-XX

NOTE. The following instructions are for reinstalling MPEG Test System software on a machine running Windows NT Workstation 4.0 only; procedures for upgrading your software could be different. If you are installing a software upgrade, follow the instructions provided with the upgrade kit.

Reinstalling the software involves three procedures:

- Uninstalling the current software

- Installing the software

- Entering passwords for licensed applications

Determining the Installed Software Version

There are two easy ways to determine your MPEG Test System software version:

- From the MPEG Test System Readme file. In versions 2.0, 2.1, and 2.2, the *Readme.txt* file is in the C:\Mts100 directory (folder); in versions 2.5 and 3.0, the file is located in the C:\Mts200 directory.

- Locate the CD ROM for your software. The version number is clearly marked on the disc label, the booklet cover, and the jewel case insert.

Uninstalling Software   For best results remove the existing software using the unInstallShield application.

1. Restart Windows NT and log on as the administrator (Username = administrator; password = MPEG2). You must log on as the administrator to install MPEG Test System applications.

2. Quit any applications that automatically started at login.

3. Double-click the **Uninstall MTS V2.5** icon in the Tektronix MPEG Test System program group window.

4. When the dialog box asks you to confirm the file deletion, click **Yes**.

5. When uninstall is complete, Click **OK** to close the Remove Programs From Your Computer window.

Installing Software   1. If you are not already logged on, log onto your NT workstation as Administrator.

2. Right-click the **My Computer** icon on your Windows NT desktop, and then select **Explore** from the submenu. In the Exploring window, select the icon that represents the disk drive onto which you will install the software (usually drive C:).

3. Check the status bar at the bottom of the Exploring window to verify that the target disk has at least 140 MB of free space. You cannot install the software on a disk that has less than 140 MB of free space.

Status bar → Free space
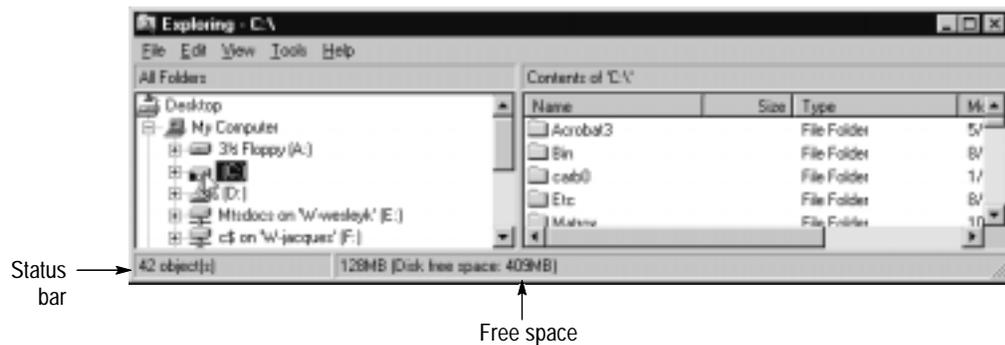
4. Place the MPEG Test System Version 3.0 Installation Software CD ROM into the CD ROM drive.

5. Click the Windows NT Start button, and then select **Run**.

6. Enter `d:\Setup.exe` in the resulting Run window as depicted in the following illustration (in this example, *d* is the drive letter for the CD ROM drive; use the drive letter that is correct for your computer), and then click **OK**.
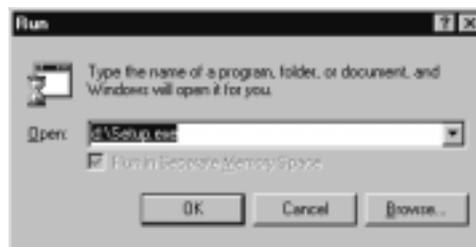
7. In a few seconds, the Tektronix MTS200 Series window appears on the computer screen.

8. Read the Copyright and Setup text and then click **Next** to proceed to the Choose Destination Directory window.

NOTE. It is strongly recommended that you use the default destination folder.

---

9. The default destination folder is C:\Mts200. Click **Next** to accept the default folder.

10. The Setup Type window opens.

■ If you are installing the software on a machine that has no MPEG Test System hardware, select **Software Only**. (If you make this selection, click **Next** and proceed directly to step 13.)

■ If your system contains only real-time analysis hardware and the Real-Time Analyzer software (that is, no Data Store (CARB) system), select **MTS205**.

■ If your system contains a Data Store (CARB) system but does not have Real-Time Analyzer hardware, select **MTS210**.

■ If your system contains both a Data Store (CARB) system and Real-Time Analyzer hardware, select **MTS215**.
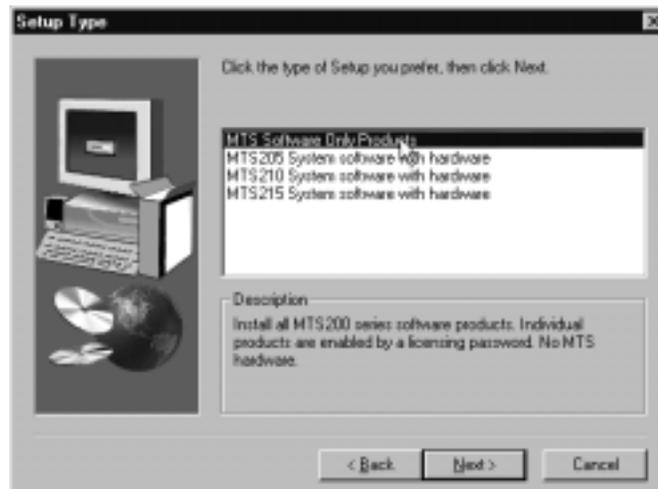
11. Click **Next**. The Select MTS2nn Platform window opens.
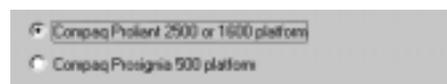
12. Select the option that applies to your test system, and then click **Next**.

⚠ **CAUTION.** *Selecting the wrong platform deactivates the Data Store system and Real-Time Analyzer, if installed. Identify your computer platform and select the appropriate option.*

13. Click **Next** in the Select Program Folder window to accept the default folder name (Tektronix MPEG Test System) and continue.

14. Review the Destination Directory, Selection, and Start Menu Folder selections in the Selection Summary window. If the selections are incorrect, click **Back** and change the information as needed. Once the information is correct, click **Next** to proceed with installation.

    The setup program begins installing the software and related sample files. The activity and progress gauges appear at first to show that installation is progressing.
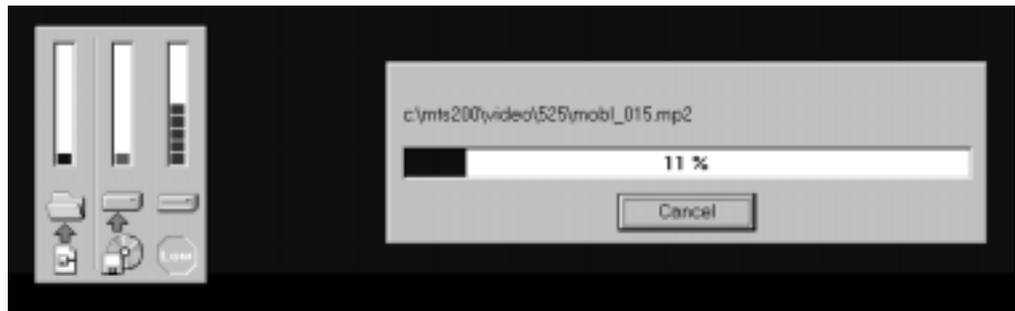
    Installation proceeds without your input (and sometimes with no apparent activity) for approximately two minutes, depending on your computer platform.

    During a normal setup, two empty program group windows are displayed after the program files have been copied to your disk drive. Shortly after these windows appear, a message reminds you to verify that the Dongle (Software Key) is installed.

15. Ensure that the Software Key is installed on the parallel printer port as shown in Figure C–1 on page C–18, and then click **OK**.

16. The Setup Complete window opens; click **Finish** to continue.

17. A Notepad window opens to display the Readme file. Read this file for important information, and then exit Notepad.

18. Another Setup Complete window opens. Accept the *Yes, I want to restart my computer now* option, remove the MPEG Test System disc from the CD ROM drive, and click **Finish** to complete setup and reboot the system.

NOTE. *You need to restart your computer before you enter the license password in the next procedure.*

---

19. When prompted, log on as any user.

20. If not already displayed, open the Tektronix MPEG Test System program group window by double-clicking the folder icon on the desktop.

The program group window resembles the following illustration.

Your software is now installed. To enable the software, enter your general license password using the procedure beginning on page C–18.

**Entering the General
License Password**

Perform the remaining steps to enter the general password that corresponds to the attached Software Key. The general password enables the applications that are included with your MTS 200 Series test system.

1. Ensure that the software key shipped with your test system or most recent upgrade is properly installed. Figure C–1 shows how and where the software protection key must be installed.

Parallel port
Install software
protection key here.

Software
protection key
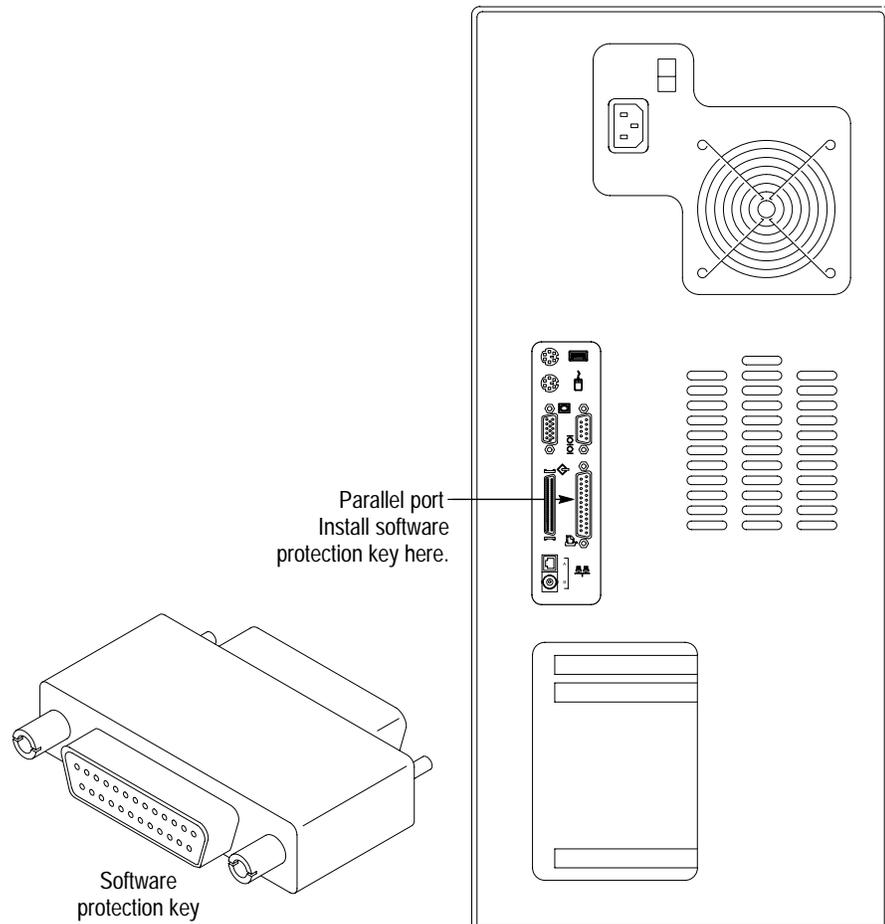
Figure C–1: Rear Panel (MTS215 shown) showing parallel port and software protection key

License Manager

2. Double-click the **License Manager** icon in the Tektronix MPEG Test System program group window to start the Tektronix Software Protection application.

The Tektronix Software Protection window appears.

3. Consult the password document supplied with your software and identify the general password.

4. Enter the three 6-character hexadecimal numbers of the password in the corresponding Tektronix Software Protection window entry fields (lowercase characters are acceptable).

5. Click **OK**. A License message window appears.

6. If the password is correct, click **OK** to acknowledge the message. If you made an error entering the password, click **OK** and return to step 3.

When you enter the correct password, software installation is complete. You will need to restart the computer before you can start any of the stream creation applications.

Installing SNMP Service

SNMP control of the Real Time Analyzer is available with the version 3.0 release of the MTS 200 Series Test System software. The SNMP Service and SNMP Agent is required in order to enable the SNMP capabilities of the real-time analyzer.

*NOTE. If you already have an SNMP service installed on your system, you do not need to perform this procedure. To determine whether you already have an SNMP service installed, select the **Services** icon in the Control Panel and scroll down the list of services. If the SNMP service is installed, it will be listed in this box (entries are in alphabetical order).*

The SNMP agent for the real-time analyzer can be automatically installed when you perform the procedure described in Reinstalling the MPEG Test System Software, *beginning on page C–12, provided you have SNMP service installed and running during the software installation process. For more information about installing the SNMP service, see your network administrator.*

Finally, Windows NT 4.0 Service Pack 5 must be installed (or re-installed if it already exists on your system) after the SNMP service is installed.

Use the following procedure to install the SNMP Service on an MTS 200 MPEG Test System:

1. Locate the Windows NT Workstation Installation CD-ROM that was supplied with your MTS 200 test system.

2. Click **Start** on the Windows NT Taskbar.

3. Point to **Settings**, and then select **Control Panel**. The Control Panel program group window is displayed.

4. Double-click the **Network** icon and select the **Services** panel in the Network dialog box.

5. Click **Add** to display the select Network Service dialog box, and then select **SNMP Service** as shown in the following illustration.
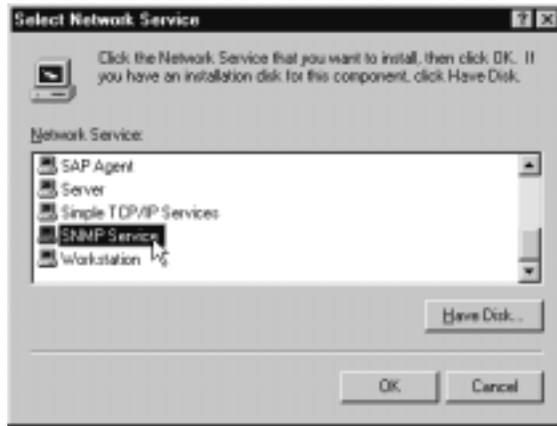
6. Insert the Windows NT Workstation Installation CD-ROM that was supplied with your MTS 200 test system, and then click **OK**. The Windows NT Setup dialog box is displayed.

7. Type `D:\I386\` in the Windows NT Setup dialog box as shown in the following illustration and click **Continue**.
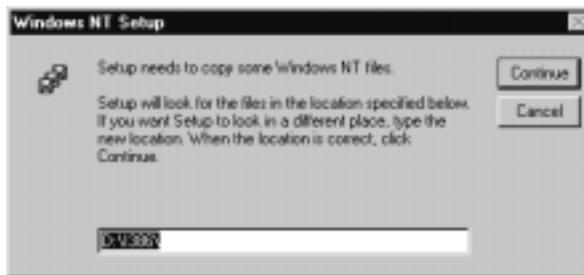
Some needed files are copied from the CD-ROM to your hard disk, and the Microsoft SNMP Properties dialog box is displayed.

8. In the Microsoft SNMP Properties dialog box, leave all the options, text boxes, and selections set to the default values.

9. Click **OK** to close all of the open dialog boxes and accept the SNMP service installation.

10. Remove the Windows NT Installation disc from the CD-ROM drive and restart the computer.

11. Install Service Pack 5 (see *Installing Windows NT 4.0 Service Pack 5* beginning on page C–22).

Installing Windows NT 4.0 Service Pack 5

The version 3.0 release of the MTS100 Series Test System applications requires Windows NT 4.0, with Service Pack 5 installed. If not already installed, use the procedure described in this section to install Windows NT Service Pack 5.

NOTE. If you want to use the SNMP capabilities enabled by the version of the real-time analyzer included with the MTS100 Series version 3.0 test system, you must have the SNMP service already installed. Also, you must install SNMP service before you install Service Pack 5. See Installing SNMP Service *on page C–20.*

1. Close all applications and windows.

2. Read the file *Readme.txt* located in the C:\MTS200 directory for more details about this procedure.

3. Insert the MPEG Test System Version 3.0 Installation Software disc into the CD-ROM drive.

4. Using Windows NT Explorer, display the contents of the disc in the CD-ROM drive (usually D:).

5. Display the contents of the **I386** directory.

6. Double-click the **SP5I386.EXE** file. The Service Pack Setup Welcome window is displayed.

7. Click **Next** to start the setup. The Extracting File progress window is displayed.

NOTE. In order to uninstall Window NT 4.0 Service Pack 5 at a later date, you must create an Uninstall directory when the service pack is installed.

8. When the License Agreement window is displayed, make sure that the check boxes to accept the license agreement and to create an Uninstall directory are both selected.

9. Click Install to start installing Service Pack 5.

10. During the installation process, you will be prompted to overwrite existing files. Select **No**, with the following exception:

    When you are asked about the *NETFLX3.SYS* file, click **Yes** in the message box to overwrite the existing file.

11. When the Installation Complete message is displayed, click **Restart**, to complete the Service Pack 5 installation procedure.

Upgrading Real-Time Analyzer Firmware

If your MPEG Test System contains Real-Time Analyzer hardware, it may become necessary to update the firmware for the latest software version. Follow the directions included with the software update. The general procedure is as follows:

1. Start the RTA firmware update application, C:\MTS200\Service\Flash.exe, either through an exploring window (double click the Flash.exe icon) or through **Run...** command on the Windows NT Start menu.

2. Load the DSP file.

   a. Select **Load Dsp File** from the Flash application File menu.

   b. In the resulting **Open** dialog box, double-click the DSP filename, Rt*nnnnnn*.hex (if there is more than one DSP file in the Service directory, select the most recent file). A message, similar to the following, appears in the application window:

   ```
   Opening C:\Mts200\SERVICE\rt980608.hex
   Date: 06/08/1998 11:14:58
   @Start of code: 00000000
   Code size:    0000E740 bytes
   ```

3. Select **DownLoad Dsp software** from the Flash application PIA menu. The **Dialog** window appears in a few seconds.

4. Click **OK** to accept the version number.

5. In a moment the message "You must shutdown the PC before Use PIA" appears in the Flash application window. Click **OK** to acknowledge the message.

6. Load the Flex file.

    a. Select **Load Flex File** from the Flash application File menu.

    b. In the resulting **Open** dialog box, double-click the Flex filename, Fx*nnnnnn*.hex. A message, similar to the following, appears in the application window:

```
Opening C:\Mts200\SERVICE\Fx971120.hex
Date: 11/20/1997 19:20:32
@Start of code: 00000000
Code size:    0000B73F bytes
```

7. Select **DownLoad Flex software** from the Pia menu.

8. When the **Dialog** window appears, click **OK** to accept the version number.

9. The "You must shutdown the PC..." message appears again. Click **OK** to acknowledge the message and close the message window.

10. Select **Exit** from the Flash File menu to exit the application. Shut down Windows NT and briefly power-down the computer before attempting to use the Real-Time Analyzer.

Appendix D: MPEG Test System Application Software

This appendix lists the directories and files that make up the MPEG Test System software. There are slight differences between versions 2.0, 2.1 and 2.2. The list of version 2.1 directories and files begins on page D–4; the lists of version 2.2 files begin on page D–7; the lists of version 2.5 files begin on page D–16, and the lists of version 3.0 files begin on page D–23.

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

Version 2.0 (cont.)   Path: C:\MTS100\BIN

Editable.hlp
Gigue.exe
Gigue.hlp
Matracom.exe
Mfc30.dll
Mfc30d.dll
Mpeg2nt.gid
Mpeg2nt.hlp
Msvcrt20.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

Version 2.0 (cont.) 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

Version 2.1 (cont.)   Path: C:\MTS100\BIN

Matracom.exe
Mfc30.dll
Mfc30d.dll
Mpeg2nt.hlp
Msvcrt20.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

Version 2.1 (cont.)   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

Software Version 2.2

The version 2.2 application files that are installed on a MPEG Test System differ slightly by product and option.

- The list of files provided with the MTS 210 option AG, the MTS 215, and several upgrade kits (including the MTS1F03, and MTS1F05) begins on this page.

- The list of files provided with the MTS 210 option 1A begins on page D–10.

- The list of files provided with the MTS 210 option 1G begins on page D–13.

Option AG, V 2.2

Path: C:\MTS100

Audio	\<Dir>
Bin	\<Dir>
Cfg-trp	\<Dir>
Service	\<Dir>
Video	\<Dir>
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

!CAR2500.CFG
!PIA2500.CFG
ADN_CARB.EXE
ADONUM.CNT
ADONUM.HLP
BC453RTL.DLL
BDS501F.DLL
BIDS47F.DLL
BIDS50F.DLL

Option AG, V 2.2 (cont.)   Path: C:\MTS100\Bin

BYTEFLIP.EXE
CANAL.CNT
CANAL.EXE
CANAL.HLP
CARBFILE.DLL
CW3215.DLL
CW3220.DLL
D2HTLS32.DLL
DOC2HELP.INI
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
MFC42.DLL
MPEG2NT.HLP
MSVCRT20.DLL
MUX_CARB.EXE
MUX_MPG2.CNT
MUX_MPG2.HLP
OWL253F.DLL
OWL50F.DLL
RTAMSG.DLL
RTA.CNT
RTA.HLP
SETCARB.EXE
SYNT207.DLL
SyntaxV.dll
Rta.EXE

Option AG, V 2.2 (cont.)   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\Service

        FLASH.EXE
        FLEX1310.HEX
        PIADMIN.EXE
        PIA0.CFG
        README.TXT

Path: C:|MTS100\Service\new_eisa

        RTAD2810.HEX

Path: C:|MTS100\Service\old_eisa

        RTAD2708.HEX

Path: C:\MTS100\Video\525

        MOBL_015.MP2
        MOBL_060.MP2

Path: C:\MTS100\Video\525\Testpat

        100B_015.MP2
        100B_060.MP2

Path: C:\MTS100\Video\625

        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

Option AG, V 2.2 (cont.) Path: C:Temp

       LOOP32.VER
       MFC30D.DLL
       MSVCRT20.DLL
       PKUNZIP.EXE
       PKZIP.EXE
       RPCNS4.DLL
       RPCRT4.DLL
       RPCSERV.EXE
       RPCSUPER.DLL

     Path: C:\Winnt

       MUX.INI

Option 1A, V 2.2 Path: C:\MTS100

       Audio   <Dir>
       Bin   <Dir>
       Cfg-trp   <Dir>
       Video   <Dir>
       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

       !CAR2500.CFG
       ADN_CARB.EXE
       ADONUM.CNT
       ADONUM.HLP
       BC453RTL.DLL
       BDS501F.DLL
       BIDS47F.DLL
       BIDS50F.DLL
       BYTEFLIP.EXE
       CANAL.CNT
       CANAL.EXE
       CANAL.HLP
       CARBFILE.DLL
       CW3215.DLL

Option 1A, V 2.2 (cont.)

CW3220.DLL
D2HTLS32.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
MFC42.DLL
MPEG2NT.HLP
MSVCRT20.DLL
OWL253F.DLL
OWL50F.DLL

Path: C:\MTS100\Bin

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

MOBL_015.MP2
MOBL_060.MP2

Option 1A, V 2.2 (cont.)   Path: C:\MTS100\Video\525\Testpat

        100B_015.MP2
        100B_060.MP2

Path: C:\MTS100\Video\625

        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:\Temp

        LOOP32.VER
        MFC30D.DLL
        MSVCRT20.DLL
        PKUNZIP.EXE
        PKZIP.EXE
        RPCNS4.DLL
        RPCRT4.DLL
        RPCSERV.EXE
        RPCSUPER.DLL

Path: C:\Winnt\System32

        CTL3D.DLL
        CTL3DV2.DLL
        DRVCARB.SYS
        MUX.INI
        RHMMPLAY.DLL

Option 1G, V 2.2   Path: C:\MTS100

Audio   <Dir>
Bin   <Dir>
Cfg-trp   <Dir>
Video   <Dir>
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

!CAR2500.CFG
BC453RTL.DLL
BDS501F.DLL
BIDS47F.DLL
BIDS50F.DLL
BYTEFLIP.EXE
CANAL.CNT
CANAL.EXE
CANAL.HLP
CARBFILE.DLL
CW3215.DLL
CW3220.DLL
D2HTLS32.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

Option 1G, V 2.2 (cont.)   Path: C:\MTS100\Bin

        MFC42.DLL
        MPEG2NT.HLP
        MSVCRT20.DLL
        MUX_CARB.EXE
        MUX_MPG2.CNT
        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

        MOBL_015.MP2
        MOBL_060.MP2

Path: C:\MTS100\Video\525\Testpat

        100B_015.MP2
        100B_060.MP2

Path: C:\MTS100\Video\625

        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

Option 1G, V 2.2 (cont.)   Path: C:\Temp

        LOOP32.VER
        MFC30D.DLL
        MSVCRT20.DLL
        PKUNZIP.EXE
        PKZIP.EXE
        RPCNS4.DLL
        RPCRT4.DLL
        RPCSERV.EXE
        RPCSUPER.DLL

Path: C:\Winnt\

        MUX.INI

Path: C:\Winnt\System32

        CTL3D.DLL
        CTL3DV2.DLL
        DRVCARB.SYS
        RHMMPLAY.DLL

Software Version 2.5

The installed version 2.5 application files differ slightly by product.

- The list of files installed on the MTS 215 begins on this page.

- The list of files installed on the MTS 210, all options, begins on page D–19.

MTS 215, V 2.5   Path: C:\MTS200

    Audio   <Dir>
    Bin   <Dir>
    Cfg-trp   <Dir>
    Pstream   <Dir>
    Service   <Dir>
    Video   <Dir>
    README.TXT
    UNINSTMTSV25.ISU

Path: C:\MTS200\Audio

    10KHZ.MP2
    15KZ_064.MP2
    15KZ_128.MP2
    15KZ_192.MP2
    15KZ_256.MP2
    1KHZ.MP2

Path: C:\MTS200\Bin

    ADN_CARB.EXE
    ADONUM.CNT
    ADONUM.HLP
    AUSTRAL.CNT
    AUSTRAL.EXE
    AUSTRAL.HLP
    BIDS47F.DLL
    BIDS50F.DLL
    BIDS50T.DLL
    BYTEFLIP.EXE

MTS 215, V 2.5 (cont.)   Path: C:\MTS200\Bin

CANAL.CNT
CANAL.EXE
CANAL.HLP
CARBFILE.DLL
CW3215.DLL
CW3220.DLL
CW3220MT.DLL
D2HTLS32.DLL
DOC2HELP.INI
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
MFC42.DLL
MPEG2NT.HLP
MSVCRT20.DLL
MTSLM.DLL
MUX_CARB.EXE
MUX_MPG2.CNT
MUX_MPG2.HLP
OWL253F.DLL
OWL50F.DLL
OWL50T.DLL
PROTEK.EXE
PULSAR.CNT
PULSAR.EXE
PULSAR.HLP

MTS 215, V 2.5 (cont.)   Path: C:\MTS200\Bin

RTA.CNT
RTA.EXE
RTA.HLP
RTAMSG.DLL
SETCARB.EXE
STRINFOCARB.DLL
SX32W.DLL
SYNT207.DLL
SYNT300.DLL
SYNTAUD.DLL
SYNTAXPS.DLL
SYNTAXV.DLL
SYNTVID.DLL
VISTAL.CNT
VISTAL.EXE
VISTAL.HLP

Path: C:\MTS200\Cfg-trp

!!CFG.NDX
DEFAULT.BAT
DEFAULT.CFG
DEFAULT.EIT
DEFAULT.NIT
DEFAULT.PMT
DEFAULT.SDT
DEFAULT.TRP
SAMPLE.EMM
SAMPLE.TRP
SAMPLE1.EFG
SAMPLE2.EFG
TEST.ECM

Path: C:\MTS200\Pstream

SAMPLE.PCK

Path: C:\MTS200\Service

!CAR2500.CFG
!PIA2500.CFG
FLASH.EXE
FX971120.HEX
README.TXT
RT980608.HEX

MTS 215, V 2.5 (cont.)   Path: C:\MTS200\Video\525

 MOBL_015.MP2
 MOBL_060.MP2

Path: C:\MTS200\Video\525\Testpat

 100B_015.MP2
 100B_060.MP2

Path: C:\MTS200\Video\625

 BARS_015.MP2
 BARS_060.MP2
 DEMO_015.MP2
 DEMO_060.MP2
 MOBL_015.MP2
 MOBL_060.MP2

Path: C:\MTS200\Video\625\Testpat

 100B_015.MP2
 100B_060.MP2

Path: C:\Winnt

 MUX.INI

Path: C:\Winnt\:System32\Drivers

 DRVCARB.SYS
 DRVPIA.SYS
 SENTINEL.SYS

MTS 210, V 2.5   Path: C:\MTS200

Audio	\<Dir\>
Bin	\<Dir\>
Cfg-trp	\<Dir\>
Pstream	\<Dir\>
Service	\<Dir\>
Video	\<Dir\>
README.TXT	
UNINSTMTSV25.ISU	

MTS 210, V 2.5 (cont.)   Path: C:\MTS200\Audio

10KHZ.MP2
15KZ_064.MP2
15KZ_128.MP2
15KZ_192.MP2
15KZ_256.MP2
1KHZ.MP2

Path: C:\MTS200\Bin

ADN_CARB.EXE
ADONUM.CNT
ADONUM.HLP
AUSTRAL.CNT
AUSTRAL.EXE
AUSTRAL.HLP
BIDS47F.DLL
BIDS50F.DLL
BIDS50T.DLL
BYTEFLIP.EXE
CANAL.CNT
CANAL.EXE
CANAL.HLP
CARBFILE.DLL
CW3215.DLL
CW3220.DLL

Path: C:\MTS200\Bin

CW3220MT.DLL
D2HTLS32.DLL
DOC2HELP.INI
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
MFC42.DLL
MPEG2NT.HLP

MTS 210, V 2.5 (cont.)

MSVCRT20.DLL
MTSLM.DLL
MUX_CARB.EXE
MUX_MPG2.CNT
MUX_MPG2.HLP
OWL253F.DLL
OWL50F.DLL
OWL50T.DLL
PROTEK.EXE
PULSAR.CNT
PULSAR.EXE
PULSAR.HLP
SETCARB.EXE
STRINFOCARB.DLL
SX32W.DLL
SYNT207.DLL
SYNT300.DLL
SYNTAUD.DLL

Path: C:\MTS200\Bin

SYNTAXPS.DLL
SYNTVID.DLL
VISTAL.CNT
VISTAL.EXE
VISTAL.HLP

Path: C:\MTS200\Cfg-trp

!!CFG.NDX
DEFAULT.BAT
DEFAULT.CFG
DEFAULT.EIT
DEFAULT.NIT
DEFAULT.PMT
DEFAULT.SDT
DEFAULT.TRP
SAMPLE.EMM
SAMPLE.TRP
SAMPLE1.EFG
SAMPLE2.EFG
TEST.ECM

Path: C:\MTS200\Pstream

SAMPLE.PCK

MTS 210, V 2.5 (cont.)   Path: C:\MTS200\Service

   !CAR2500.CFG

Path: C:\MTS200\Video\525

   MOBL_015.MP2
   MOBL_060.MP2

Path: C:\MTS200\Video\525\Testpat

   100B_015.MP2
   100B_060.MP2

Path: C:\MTS200\Video\625

   BARS_015.MP2
   BARS_060.MP2
   DEMO_015.MP2
   DEMO_060.MP2
   MOBL_015.MP2
   MOBL_060.MP2

Path: C:\MTS200\Video\625\Testpat

   100B_015.MP2
   100B_060.MP2

Path: C:\Winnt

   MUX.INI

Path: C:\Winnt\:System32\Drivers

   DRVCARB.SYS
   SENTINEL.SYS

Software Version 3.0

The installed version 3.0 application files differ by product:

- The list of files installed on the MTS 215 begins on this page.

- The list of files installed on the MTS 210, all options, begins on page D–28.

- The list of files installed with software only installations begins on page D–32.

MTS215, V 3.0 Path: C:\MTS200

AUDIO   <Dir>
BIN   <Dir>
CFG–TRP   <Dir>
DATA   <Dir>
Private_Syntax <Dir>
PStream   <Dir>
SERVICE   <Dir>
Video   <Dir>
Readme.txt
UninstMTSV30.isu

Path: C:\MTS200\Audio

10khz.mp2
15kz_064.mp2
15kz_128.mp2
15kz_192.mp2
15kz_256.mp2
1khz.mp2
acmod2_0.ac3
acmod3_0.ac3
acmod3_2.ac3

Path: C:\MTS200\Bin

ac3decp.dll
ac3syntax.dll
adn_carb.exe
Adonum.cnt
Adonum.hlp
audace.cnt

MTS215, V 3.0 (cont.) Path: C:\MTS200\Bin

Audace.exe
audace.hlp
austral.CNT
Austral.exe
Austral.hlp
Bids47f.dll
Bids50f.dll
Bids50t.dll
BrowserClientR.dll
BrowserServer.exe
BrowserService.exe
Byteflip.exe
Canal.cnt
Canal.exe
Canal.hlp
Carbfile.dll
Compiler.exe
Config.cnt
Config.exe
Config.hlp
Cw3215.dll
Cw3220.dll
Cw3220mt.dll
D2htls32.dll
delservice.dll
Doc2help.ini
Dynamic.avi
Editable.cnt
editable.exe
Editable.hlp
EditableATSC.exe
Einjwin.cnt
Einjwin.exe
Einjwin.hlp
Gigue.cnt
gigue.exe
Gigue.hlp
Inetwh32.dll
InitDr
InitLg
InitSt
InstBrowser.bat
INSTSRV.exe
mapi32.dll
matracom.exe

MTS215, V 3.0 (cont.)   Path: C:\MTS200\Bin

Mfc30.dll
Mfc30d.dll
Mfc42.dll
Mfc42d.dll
Mfco42d.dll
MFCXLib10d.dll
MFCXLib10r.dll
Mpeg2nt.hlp
Msvcrtd.dll
mtslm.dll
mtslmv.dll
Mux_mpg2.cnt
mux_mpg2.exe
Mux_mpg2.hlp
OpenMux.exe
openmux.nit
OpenTable.cnt
OpenTable.exe
OPENTABLE.HLP
Owl50f.dll
Owl50t.dll
protek.exe
PsipEditor.cnt
PSIPEDITOR.HLP
pulsar.CNT
PulSAR.exe
Pulsar.hlp
Rta.cnt
Rta.exe
Rta.hlp
Rtamsg.dll
Setcarb.exe
strinfo.dll
STRINFOCARB.DLL
Sx32w.dll
Synt300.dll
Syntaud.dll
Syntaxps.dll
Syntaxv.dll
Syntvid.dll
syntvidV4.dll

MTS215, V 3.0 (cont.)   Path: C:\MTS200\Bin

SYNT_ATSC_DVB.dll
Vistal.cnt
Vistal.exe
Vistal.hlp
W32N20.dll

Path: C:\MTS200\Cfg-trp

!!cfg.ndx
Atsc.CFG
Atsc.Mgt
Atsc.PMT
Atsc.Rrt
Atsc.Stt
Atsc.Vct
Atsc_000.Eit
Atsc_001.Eit
Atsc_001.Ett
Atsc_002.Eit
Atsc_003.Eit
Atsc_128.Ett
Default.bat
Default.cfg
Default.eit
Default.nit
Default.pmt
Default.sdt
Default.trp
sample.emm
Sample.trp
sample1.efg
sample2.efg
test.ecm

Path: C:\MTS200\Pstream

sample.pck

MTS215, V 3.0 (cont.)   Path: C:\MTS200\Service

> !car2500.cfg
> !pia2500.cfg
> 40Comupd.exe
> Flash.exe
> Fx990505.hex
> Readme.txt
> rt990505.hex
> rta_setup.reg

Path: C:\MTS200\Video\525

> Mobl_015.mp2
> Mobl_060.mp2

Path: C:\MTS200\Video\525\Testpat

> 100b_015.mp2
> 100b_060.mp2

Path: C:\MTS200\Video\625

> Bars_015.mp2
> Bars_060.mp2
> Demo_015.mp2
> Demo_060.mp2
> Mobl_015.mp2
> Mobl_060.mp2

Path: C:\MTS200\Video\625\Testpat

> 100b_015.mp2
> 100b_060.mp2

Path: C:\snmp\emanate\sadk\w32.bin

> msnsaagt.exe
> snmpdm.exe

MTS215, V 3.0 (cont.)   Path: C:\mib

        rta.html
        rta_v1.mib
        rta_v2.mib

Path: C:\Etc\Srconf\agt

        snmpd.bak
        snmpd.cnf
        snmpd.jnk

Path: C:\Etc\Srconf\mgr

        mgr.cnf
        snmpinfo.dat
        snmpinfo.dat.org

MTS210, V 3.0   Path: C:\MTS200

        AUDIO   \<Dir>
        BIN   \<Dir>
        CFG–TRP   \<Dir>
        DATA   \<Dir>
        PStream   \<Dir>
        SERVICE   \<Dir>
        Video   \<Dir>
        Readme.txt
        UninstMTSV30.isu

Path: C:\MTS200\Audio

        10khz.mp2
        15kz_064.mp2
        15kz_128.mp2
        15kz_192.mp2
        15kz_256.mp2
        1khz.mp2
        acmod2_0.ac3
        acmod3_0.ac3
        acmod3_2.ac3

MTS210, V 3.0 (cont.)   Path: C:\MTS200\Bin

ac3decp.dll
ac3syntax.dll
adn_carb.exe
Adonum.cnt
Adonum.hlp
audace.cnt
Audace.exe
audace.hlp
austral.CNT
Austral.exe
Austral.hlp
Bids47f.dll
Bids50f.dll
Bids50t.dll
BrowserClientR.dll
BrowserServer.exe
BrowserService.exe
Byteflip.exe
Canal.cnt
Canal.exe
Canal.hlp
Carbfile.dll
Config.cnt
Config.exe
Config.hlp
Cw3215.dll
Cw3220.dll
Cw3220mt.dll
D2htls32.dll
delservice.dll
Doc2help.ini
Dynamic.avi
Editable.cnt
editable.exe
Editable.hlp
EditableATSC.exe
Einjwin.cnt
Einjwin.exe
Einjwin.hlp
Gigue.cnt
gigue.exe
Gigue.hlp
Inetwh32.dll
InitDr

MTS210, V 3.0 (cont.)   Path: C:\MTS200\Bin

InitLg
InitSt
InstBrowser.bat
INSTSRV.exe
matracom.exe
Mfc30.dll
Mfc30d.dll
Mfc42.dll
Mpeg2nt.hlp
mtslm.dll
mtslmv.dll
Mux_mpg2.cnt
mux_mpg2.exe
Mux_mpg2.hlp
OpenMux.exe
openmux.nit
Owl50f.dll
Owl50t.dll
protek.exe
PsipEditor.cnt
PSIPEDITOR.HLP
pulsar.CNT
PulSAR.exe
Pulsar.hlp
Setcarb.exe
strinfo.dll
STRINFOCARB.DLL
Sx32w.dll
Synt300.dll
Syntaud.dll
Syntaxps.dll
Syntvid.dll
syntvidV4.dll
SYNT_ATSC_DVB.dll
Vistal.cnt
Vistal.exe
Vistal.hlp
W32N20.dll
bytes

MTS210, V 3.0 (cont.)   Path: C:\MTS200\Cfg-trp

!!cfg.ndx
Atsc.CFG
Atsc.Mgt
Atsc.PMT
Atsc.Rrt
Atsc.Stt
Atsc.Vct
Atsc_000.Eit
Atsc_001.Eit
Atsc_001.Ett
Atsc_002.Eit
Atsc_003.Eit
Atsc_128.Ett
Default.bat
Default.cfg
Default.eit
Default.nit
Default.pmt
Default.sdt
Default.trp
sample.emm
Sample.trp
sample1.efg
sample2.efg
test.ecm

Path: C:\MTS200\Pstream

sample.pck

Path: C:\MTS200\Service

!car2500.cfg
40Comupd.exe
Flash.exe
Fx990505.hex
Readme.txt
rt990505.hex
rta_setup.reg

Path: C:\MTS200\Video\525

Mobl_015.mp2
Mobl_060.mp2

MTS210, V 3.0 (cont.)   Path: C:\MTS200\Video\525\Testpat

> 100b_015.mp2
> 100b_060.mp2

Path: C:\MTS200\Video\625

> Bars_015.mp2
> Bars_060.mp2
> Demo_015.mp2
> Demo_060.mp2
> Mobl_015.mp2
> Mobl_060.mp2

Path: C:\MTS200\Video\625\Testpat

> 100b_015.mp2
> 100b_060.mp2

Software Only   Path: C:\MTS200
Installations, V 3.0

AUDIO	\<Dir\>
BIN	\<Dir\>
CFG–TRP	\<Dir\>
DATA	\<Dir\>
PStream	\<Dir\>
VIDEO	\<Dir\>

> Readme.txt
> UninstMTSV30.isu

Path: C:\MTS200\Audio

> 10khz.mp2
> 15kz_064.mp2
> 15kz_128.mp2
> 15kz_192.mp2
> Path: C:\MTS200\Audio
> 15kz_256.mp2
> 1khz.mp2
> acmod2_0.ac3
> acmod3_0.ac3
> acmod3_2.ac3

Software Only Installations, V 3.0 (cont.)

Path: C:\MTS200\Bin

ac3decp.dll
ac3syntax.dll
adn_carb.exe
Adonum.cnt
Adonum.hlp
audace.cnt
Audace.exe
audace.hlp
austral.CNT
Austral.exe
Austral.hlp
Bids47f.dll
Bids50f.dll
Bids50t.dll
Byteflip.exe
Canal.cnt
Canal.exe
Canal.hlp
Carbfile.dll
Cw3215.dll
Cw3220.dll
Cw3220mt.dll
D2htls32.dll
delservice.dll
Doc2help.ini
Dynamic.avi
Editable.cnt
editable.exe
Editable.hlp
EditableATSC.exe
Einjwin.cnt
Einjwin.exe
Einjwin.hlp
Gigue.cnt
gigue.exe
Gigue.hlp
Inetwh32.dll

Software Only Installations, V 3.0 (cont.)

Path: C:\MTS200\Bin

Mfc42.dll
Mpeg2nt.hlp
mtslm.dll
Mux_mpg2.cnt
mux_mpg2.exe
Mux_mpg2.hlp
Owl50f.dll
Owl50t.dllprotek.exe
PsipEditor.cnt
PSIPEDITOR.HLP
pulsar.CNT
PulSAR.exe
Pulsar.hlp
Sx32w.dll
Synt300.dll
Syntaud.dll
Syntaxps.dll
Syntvid.dll
SYNT_ATSC_DVB.dll
Vistal.cnt
Vistal.exe
Vistal.hlp

Path: C:\MTS200\Cfg-trp

!!cfg.ndx
Atsc.CFG
Atsc.Mgt
Atsc.PMT
Atsc.Rrt
Atsc.Stt
Atsc.Vct
Atsc_000.Eit
Atsc_001.Eit
Atsc_001.Ett
Atsc_002.Eit
Atsc_003.Eit
Atsc_128.Ett
Default.bat
Default.cfg
Default.eit
Default.nit
Default.pmt
Default.sdt

Software Only Installations, V 3.0 (cont.)

Path: C:\MTS200\Cfg-trp

    Default.trp
    sample.emm
    Sample.trp
    sample1.efg
    sample2.efg
    test.ecm

Path: C:\MTS200\Pstream

    sample.pck

Path: C:\MTS200\Video\525

    Mobl_015.mp2
    Mobl_060.mp2

Path: C:\MTS200\Video\525\Testpat

    100b_015.mp2
    100b_060.mp2

Path: C:\MTS200\Video\625

    Bars_015.mp2
    Bars_060.mp2
    Demo_015.mp2
    Demo_060.mp2
    Mobl_015.mp2
    Mobl_060.mp2

Path: C:\MTS200\Video\625\Testpat

    100b_015.mp2
    100b_060.mp2