# Service Manual

Tektronix

# MPEG Test System
# Compaq Prosignia Platform

## 071-0152-01

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

CE

Printed in the U.S.A.

Tektronix, Inc., P.O. Box 1000, Wilsonville, OR 97070–1000

## WARRANTY

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

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; or c) 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.

**THIS WARRANTY IS GIVEN BY TEKTRONIX WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED. TEKTRONIX AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TEKTRONIX' RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. TEKTRONIX AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER TEKTRONIX OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.**

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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.

**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 servicing information for the Tektronix MPEG Test System products, serial numbers B040000 and above, using the Compaq Proliant (2500 or 1600) platform. The information in this manual pertains to the Data Store, Synchronous Serial Interface, and Real-Time Analyzer hardware that enable the capture, generation, and analysis capabilities of the Tektronix MTS 205, MTS 210, and MTS 215 MPEG Test Systems.

User information in this manual applies to version 3.0 of the MPEG Test System hardware and software components and version 2.0 of the Real-Time Analyzer software. If your test system has earlier software, please contact your Tektronix representative for information about MPEG Test System upgrade options.

## Related Documentation

For complete information about the Tektronix MPEG Test System software applications and their use, refer to the user manual(s) that accompanied your system. If your system has been upgraded, refer to the documentation that accompanied the most recent upgrade.

For the latest information about Tektronix MPEG Test System features and bugs, refer to the *Read This First* document that accompanied your test system or most recent upgrade.

For information about the Windows NT Workstation operating system, refer to the Microsoft documentation that accompanied your test system.

For information about the Compaq Proliant server, refer to the Compaq documentation that accompanied your test system.

## Manual Conventions

The following terms and conventions are used throughout this manual:

- The term *test system* is used interchangeably with the more formal term Tektronix MPEG Test System.
- The term *server* refers to the Compaq Proliant computer that hosts the test system.
- Signal names that have $\overline{\text{overbars}}$ represent active low signals.

## Contacting Tektronix

| | |
|---|---|
| Product Support | For questions about using Tektronix measurement products, call toll free in North America:<br>1-800-TEK-WIDE (1-800-835-9433 ext. 2400)<br>6:00 a.m. – 5:00 p.m. Pacific time<br><br>Or contact us by e-mail:<br>tm_app_supp@tek.com<br><br>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.<br><br>For a listing of worldwide service centers, visit our web site. |
| For other information | In North America:<br>1-800-TEK-WIDE (1-800-835-9433)<br>An operator will direct your call. |
| To write us | Tektronix, Inc.<br>P.O. Box 1000<br>Wilsonville, OR 97070-1000<br>USA |
| Website | Tektronix.com |

# Introduction

This short introduction emphasizes a few safety precautions that you need to keep in mind when servicing the MTS200 Series MPEG Test System, describes a service strategy for repairing the test system, and lists Tektronix service options available for this product.

## Before You Begin

To prevent injury to yourself or damage to the test system, fulfill the following requirements before you service your test system:

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

Be sure to heed all warnings, cautions, and notes in this manual when servicing your test system.

## Service Strategy

This manual contains the following service procedures:

- Performance verification procedures
- Adjustment procedures for the Data Store and synchronous serial interface boards
- Periodic maintenance
- Module removal and replacement
- Module-level fault diagnosis

Use the module-level fault diagnosis section (in the *Maintenance* section) to isolate problems to a specific module. 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. Use the remove and replacement procedures to remove and replace defective modules. Use the performance verification and adjustment procedures to verify the accuracy of your test system after installing a new module (or for periodic maintenance).

## Tektronix Service Offerings

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

Whether providing warranty repair service or any of the other services listed below, Tektronix service technicians, trained on Tektronix products, are best equipped to service your MTS 200 Series MPEG Test System. Tektronix technicians are informed of the latest improvements to the product as well as the latest product options.

### Warranty Repair Service

Tektronix warrants this product for one year from the date of purchase. Tektronix technicians provide warranty service at most Tektronix service locations worldwide. Your Tektronix product catalog lists all service locations; if necessary, contact your nearest Tektronix representative for more information or assistance.

### Repair Service

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

Of these services, the annual maintenance agreement offers a particularly cost-effective approach to service for many MTS 200 Series MPEG Test System owners.

### Self Service

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

## For More Information

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

# Specifications

# Specifications

The tables in this section list the electrical, physical, and environmental characteristics of the Tektronix 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 (✓) 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 1–23 on page 1–19.
- The test system has been adjusted at 25° C ±5° C.
- The test system has been operating a minimum of 20 minutes and has therefore reached normal operating temperature.

# Electrical Characteristics, Data Store System

The following tables pertain to the Tektronix 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 Mbytes/s ± 10 ppm | |
| Generation/Acquisition Test | Error free | Tested with a 10 Mbyte file (within the constraints of synchronization) |
| Input | | |
| Voltage Levels | | Standard level within 0 to 4 dB cable attenuation at 1/2 clock<br>Standard Levels:<br>Mark from 2.033 V to 2.607 V<br>Space from –0.237 to +0.237 V |
| Return Loss (75 Ω) | | 12 dB, 211 kHz to 422 kHz<br>18 dB, 422 kHz to 8.448 MHz<br>14 dB, 8.448 to 12.672 MHz |
| Connector | SMB | Male (shared with the 34.36 Mbit input) |
| Jitter Tolerance | | 177 ns peak-to-peak 20 Hz to 400 Hz<br>23.6 ns peak-to-peak 3 kHz to 400 kHz<br>Log prorated – 400 Hz to 3 kHz |
| Output | | |
| Pulse Width | | 59 ns, nominal |
| ✓ 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 Ω nominal | |
| Jitter | | 15 ns peak-to-peak with a 20 Hz lower cut-off and a 400 kHz upper cut-off filter<br>5 ns peak-to-peak with a 3 kHz lower cut-off and a 400 kHz upper cut-off filter<br>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 | SMB | Male |
| Return Loss | | 12 dB – 211 kHz to 422 kHz<br>18 dB – 422 kHz to 8.448 MHz<br>14 dB – 8.448 to 12.672 MHz |

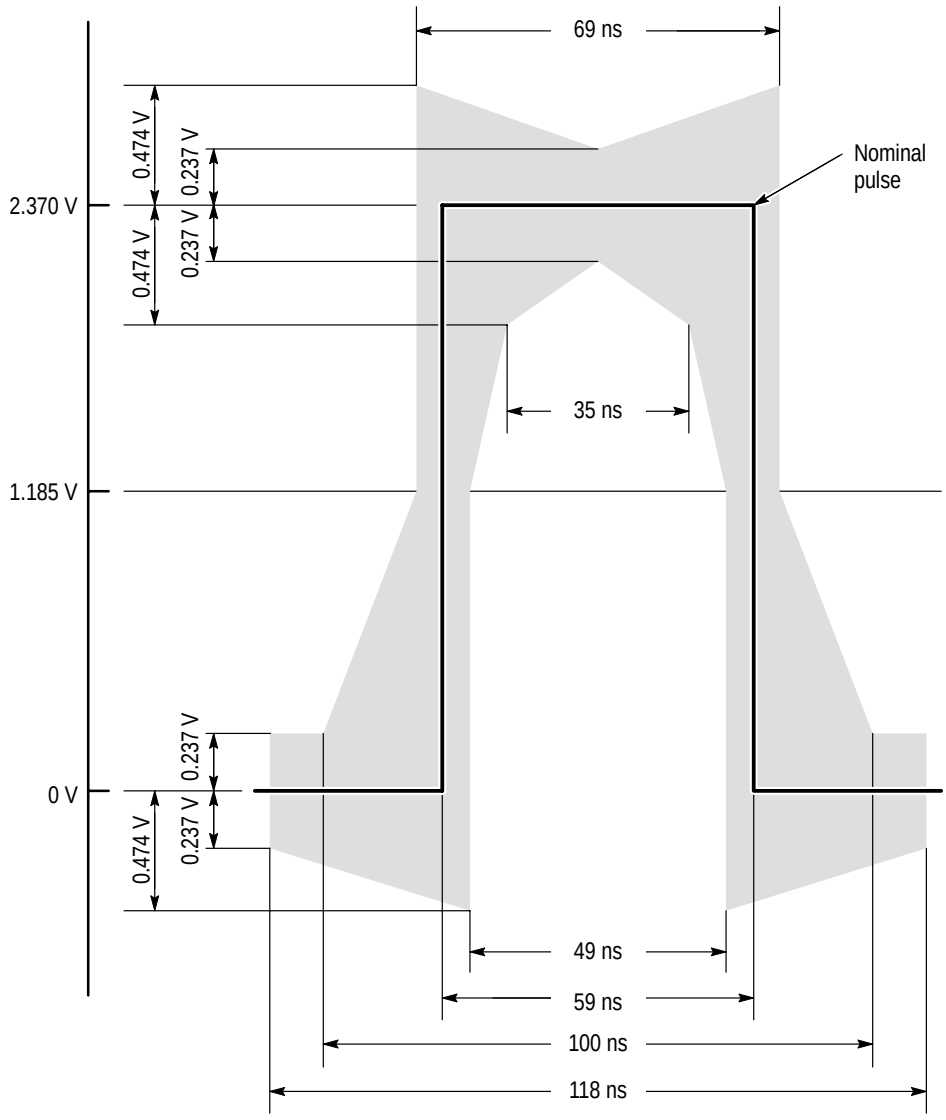



**Figure 1–1: Pulse specification for a G.703 8.448 MHz pulse**

**Table 1–2: G.703 — 34.368 MHz**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Standards Conformance | | ITU-CCITT G.703, G.823 |
| Connector | SMB | Male |
| Line Encoding | | HDB3 |
| ✓ Generation/Acquisition Test | Error free | Tested with a 10 Mbyte 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<br>Standard level:<br>Mark from 0.9 V to 1.1 V<br>Space from –0.1 V to +0.1 V |
| Return Loss (75 Ω) | | 12 dB 860 kHz to 1.72 MHz<br>18 dB 1.72 MHz to 34.368 MHz<br>14 dB 34.368 to 51.55 MHz |
| Connector | SMB | Male (shared with the 8 Mbit input) |
| Jitter Tolerance | | 43.7 ns peak-to-peak – 100 Hz to 1 kHz<br>4.37 ns peak-to-peak – 10 kHz to 800 kHz<br>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 Ω nominal resistive |
| Jitter | | 10 ns peak-to-peak with a 100 Hz lower cut-off and a 800 kHz upper cut-off filter<br>2.45 ns peak-to-peak with a 10 kHz lower cut-off and a 800 kHz upper cut-off filter<br>Allows a cascade of ten different regenerators before system limit is reached |
| Return Loss | | 12 dB – 860 kHz to 1.72 MHz<br>18 dB – 1.72 MHz to 34.368 MHz<br>14 dB – 34.368 MHz to 51.55 MHz |

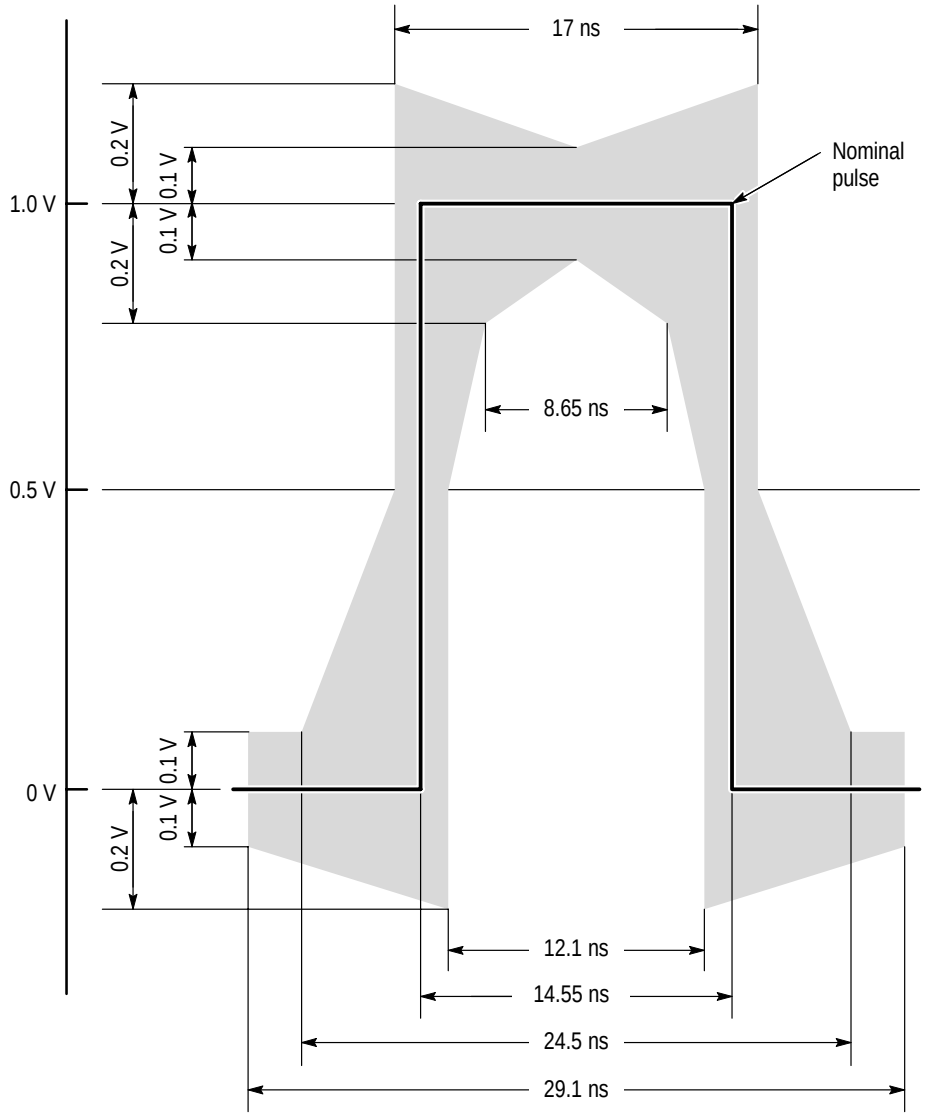
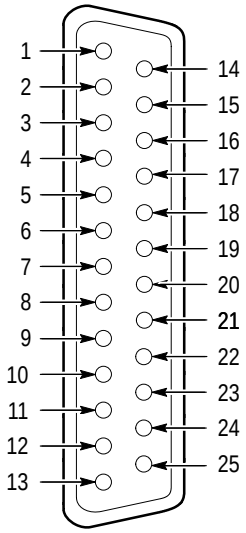



**Figure 1–2: Pulse specification for G.703 34.368 MHz**

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

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

**Table 1–4: ECL parallel data pinout**

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



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

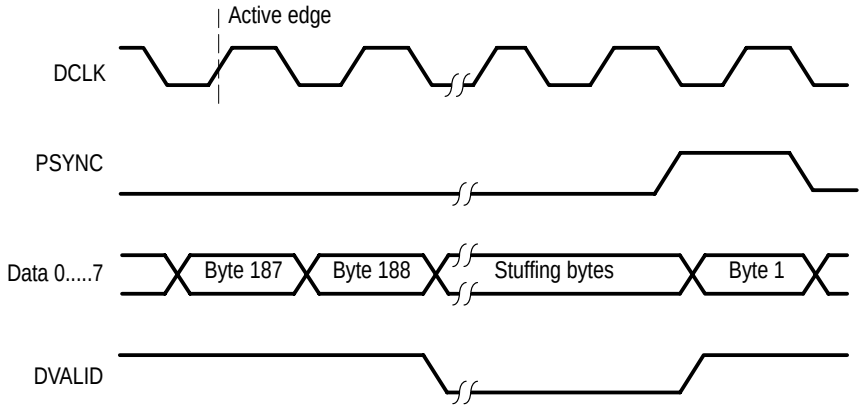



**Figure 1–3: Parallel data timing**

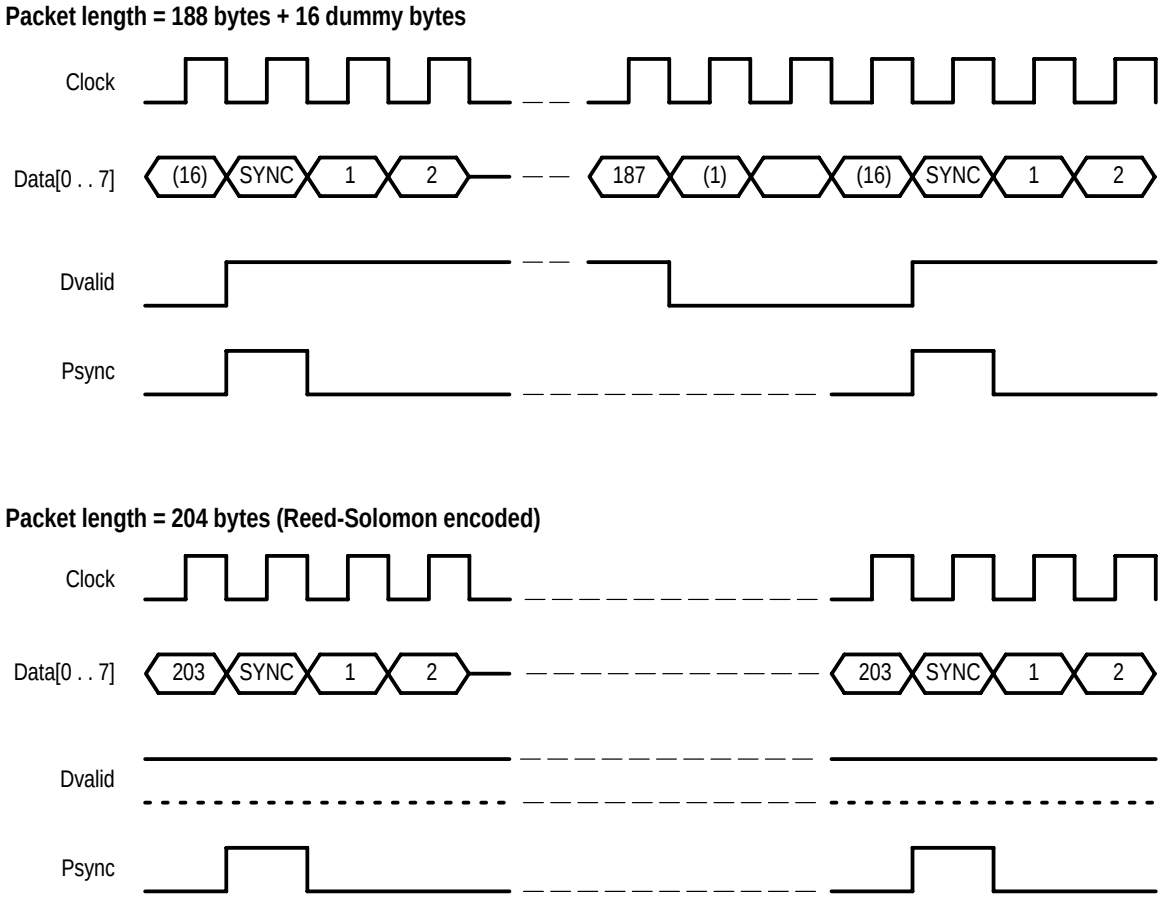
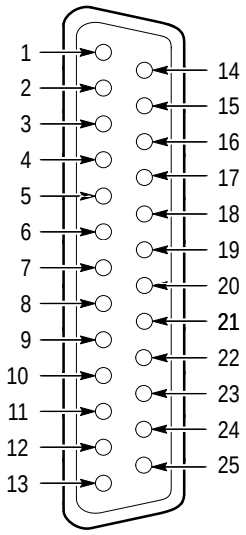



**Figure 1–4: Parallel data timing, 204-byte packets**

**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 | $\overline{\text{PSYNC}}$ |



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

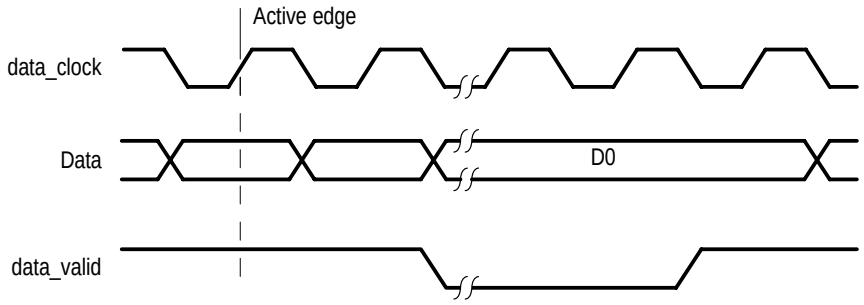
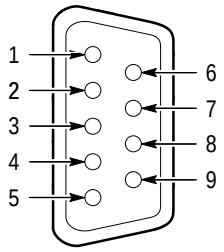



**Figure 1–5: Timing diagram for the ECL serial port**

**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) |



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

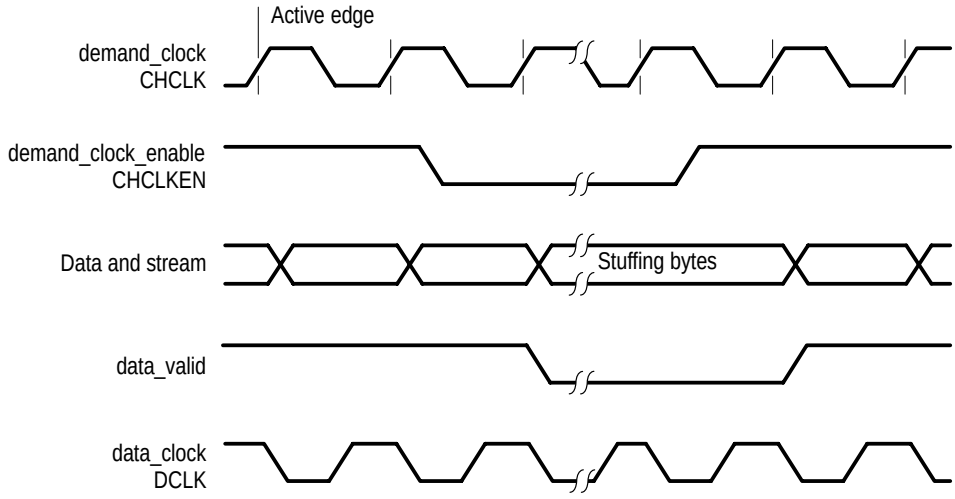



**Figure 1–6: ECL Timing diagram with control port**

**Table 1–7: 50 Ohm TTL I/O**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connectors | SMB | Male |
| Rise & Fall Times | | Between 2 ns and 6.5 ns |
| ⌐ Signal swing into 50 Ω (output) | Low < 0.3 V<br>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 Ω nominal resistive |
| Timing Diagram | | DATA signal is stable on the leading 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<br>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<br>TTL High: > 2.0 V |
| Termination | | 50 Ω, nominally resistive |
| Range | | 125 kHz to 45 MHz |

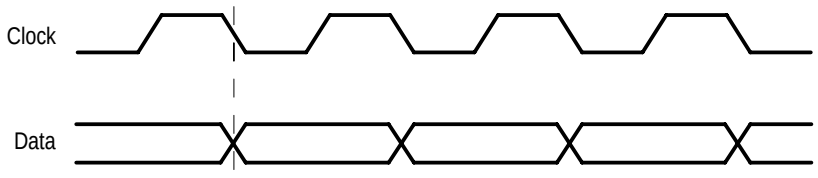
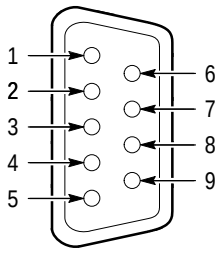



**Figure 1–7: Timing for the TTL port and the separate clock input**

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

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connector | 9-pin sub-miniature D-type | Female (pinout described in Table 1–10) |
| 10 Mbit Serial Voltage Levels | | Differential outputs measured single-ended |
| Output | | Low < 0.5 V<br>High > 2.5 V |
| Input | | Low < –0.5 V differential<br>High > 0.5 V differential |
| Common Mode Range | | ±5 Volts |
| 10 Mbit 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 Mbit serial port pinout**

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



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

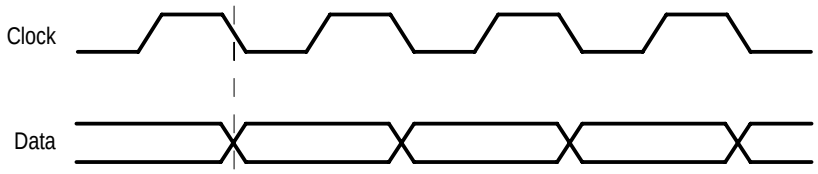



**Figure 1–8: Timing diagram for the 10 Mbit Serial port**

**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

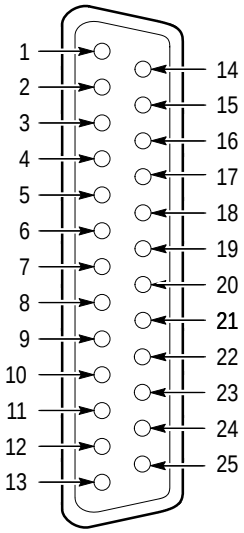
**Table 1–12: Parallel input port**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connector | D25 | Female (pinout described 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 | D25 | Female (pinout described 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 mVp-p |
| ✓ 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 minimum, +1.40 V maximum | |
| ✓ Modified ECL Output | −1.80 V maximum, −1.50 V minimum | |

**Table 1–14: LVDS/ECL/RS422 parallel data pinout**

| LVDS/ECL/RS422 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 | | |



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

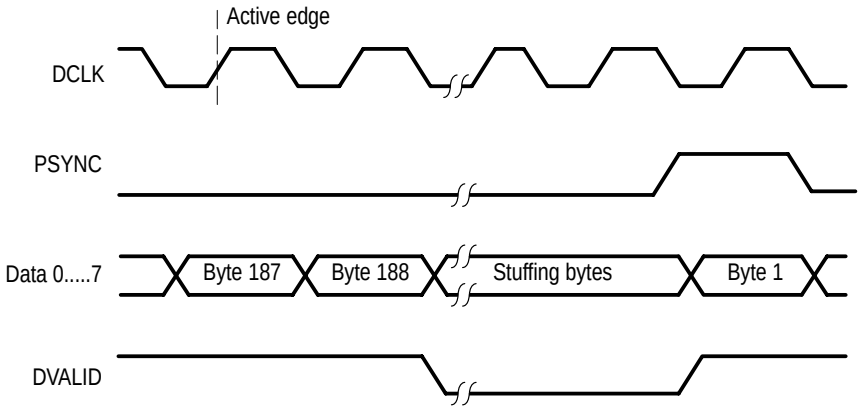



**Figure 1–9: Parallel data timing, 188-byte packets**

**Table 1–15: ASI input port**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connector | BNC | Female |
| Input Bit Rate | | 270 Mbps ± 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 ± 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% |

## Electrical Characteristics, Synchronous Serial Interface

Tables 1–17 through 1–19 list the electrical characteristics of the optional Synchronous Serial Interface I/O ports.

**Table 1–17: SSI input**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connector | BNC | Male |
| Bit rate | 10 Mbps to 50 Mbps | |
| Data format | | SMPTE 310M and DVB SSI compliant |
| Signal amplitude | Minimum: 250 $mV_{p-p}$<br>Maximum: 1100 $mV_{p-p}$ | |
| Signal DC offset | ±0.5 VDC, maximum | |
| Termination, nominal | 75 Ω | |
| Return loss, typical | 100 kHz to 77.6 MHz: –30 db, typical<br>100 kHz to 105 MHz: –15 db, minimum | |
| Synchronization | | Occurs under the following conditions:<br>1.) The sync byte is 47 hex and the packet length is 188 bytes.<br>2.) The sync byte is 47 hex and the packet length is 204 bytes; the condition when the 16 Reed Solomon (RS) bytes are dummies. The DVALID line in the SPI output will be low for the 16 RS bytes<br>3.) The packet length is 204 bytes and the following sequence occurs: for 7 packets the sync byte is 47 hex and for 1 packet the sync byte is B8 hex. This condition sometimes occurs when the 16 RS bytes are valid. In such a case, the DVALID line in the SPI output is high for the 16 RS bytes. |
| Packet length | 188 or 204 bytes | |

**Table 1–18: SSI output**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connector | BNC | Male |
| Data format | | SMPTE 310M and DVB SSI compliant |
| ✓Output Bit rate | SMPTE 310M (two settings):<br>19,392,658.5 ±54 bits/s for 8 VSB<br>38,785,316.9 ±108 bits/s for 16 VSB<br><br>DVB, adjustable:<br>10 Mbps to 50 Mbps | The SSI output bit rate is directly dependant on the parallel input bit rate being input. To achieve a more accurate SSI output bit rate, drive the Data Store board external clock input with a precision clock during generation. |
| Transport clock drift rate | 19,392,685.5 Hz: ±.54 Hz/s ⟨±0.028 ppm/s)<br>38,758,316.9 Hz: ±1.10 Hz/s | Measured below 1 Hz |
| Interface clock jitter | Peak to peak: 2 ns | Measured at 19,392,658 and 38,758,317 Hz |
| Signal | | |
| ✓ Amplitude | Minimum: Maximum: | Set by convertor board jumper |
| SMPTE 310M jumper | 720 $mV_{p-p}$ 880 $mV_{p-p}$ | |
| DVB jumper | 900 $mV_{p-p}$ 1100 $mV_{p-p}$ | |
| DC offset, maximum | ±0.5 VDC | |
| Rise and fall time[1] | Minimum: 0.4 ns<br>Maximum: 5.0 ns | Measured between 20% and 80% |
| Overshoot | 10% of signal amplitude maximum | |
| Output impedance, nominal | 75 Ω | |
| Return loss, typical | Minimum: –30 db 100 kHz to 77.6 MHz<br>–15 db 77.6 MHz to 105 MHz | |

1 **Rise and fall times shall not differ by more than 1.6 ns.**

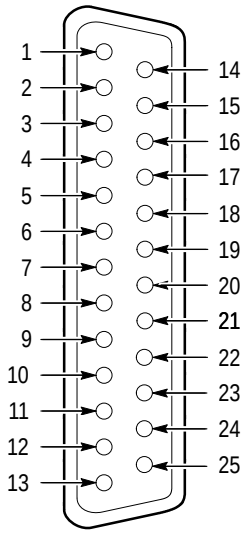
**Table 1–19: ECL Parallel I/O port**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Connector | D-25 | Female (pinout described in Table 1–20) |
| Input | | |
| Bit rate | 10 Mbps to 50 Mbps | |
| Data format | Synchronous parallel interface | ECL logic levels |
| Signal amplitude | Differential ECL | Compliant with ECL 100 K-Series levels. |
| Clock-to-data timing | | Data read on rising clock edge. Data should change within 10 ns of clock falling edge. |
| Termination, nominal | 100 Ω line to line | |

**Table 1–19: ECL Parallel I/O port (Cont.)**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Output | | |
| Input bit rate | 10 Mbps to 50 Mbps | |
| Data format | Synchronous parallel interface | ECL logic levels |
| Signal amplitude, typical | Logic high: –0.9 V<br>Logic low: –1.7 V | Differential ECL. Compliant with ECL 100 k levels. |
| Clock-to-data timing | | Data valid (stable) on rising clock edge. Data changes within 10 ns of clock falling edge. |
| Receiver termination, nominal | 100 Ω line to line | With –2 V pull down |

**Table 1–20: SSI parallel I/O data pinout**

| ECL parallel pinout | 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 | | |



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

## Test System Power Specifications

**Table 1–21: Power requirements**

| Characteristic | Description | Supplemental information |
|---|---|---|
| Line Voltage | | 100 to 240 VAC |
| Line Frequency | | 60 Hz / 50 Hz |
| Rated Input Current | | 3 A to 6 A |
| Power Consumption (without monitor) | | 160 W nominal |

## Mechanical (Physical) Characteristics

**Table 1–22: MPEG Test System mechanical characteristics**

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

## Environmental Characteristics

**Table 1–23: Environmental characteristics**

| Characteristic | Supplemental information |
|---|---|
| Temperature | |
| Nonoperating | –20° C (–4° F) to +60° C (140° F), maximum rate of change 20° C (36° F) per hour |
| Operating | +10° C (50° F) to +35° C (95° F), maximum rate of change 10° C (18° F) per hour |
| Altitude | |
| Nonoperating | 0 to 30,000 ft (9144 m) |
| Maximum operating | 0 to 6,562 ft (2000 m) |
| Humidity | |
| Maximum operating | 80% for temperatures up to +31° C (88° F), decreasing linearly to 66% at +35° C (95° F) |
| Nonoperating | 5% to 90% humidity, noncondensing |

**Table 1–24: Safety certification compliance**

| Category | Description |
|---|---|
| Temperature (operating) | +10° C (50° F) to +35° C (95° F) |
| Altitude (maximum operating) | 2000 Meters |
| Relative Humidity (maximum operating) | 80% for temperatures up to 31° C (88° F), decreasing linearly to 66% at +35° C (95° F) |
| Safety Class | Class I – grounded product |

**Table 1–25: 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.<br><br>Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:<br><br>EN 50081-1 Emissions:<br>EN 55011 Class A Radiated and Conducted Emissions<br><br>EN 50082-1 Immunity:<br>IEC 801-2 Electrostatic Discharge Immunity<br>IEC 801-3 Radiated RF Electromagnetic Field Immunity<br>IEC 801-4 Electrical Fast Transient/Burst Immunity<br><br>Conditional Statements:<br>1) Using high quality shielded cables, including those supplied as standard accessories.<br><br>Low Voltage directive 73/23/EEC, amended by 93/68/EEC:<br>EN 60950 Safety of Information Technology Equipment, Including Electrical Business Equipment |
| Australia Declaration of Conformity | Complies with electromagnetic compatibility standards as required under the Radio Communications Act.<br><br>Compliance to:<br>AS/NZS 2064.1/2 Industrial, Scientific, and Medical Equipment: 1992 (demonstrated with compliance to EN55011 class A) |

# Operating Information

# Operating Information

This section lists the location of installation instructions appropriate for your Tektronix MPEG Test System and gives a brief overview of how to operate the test system. For detailed operating information, refer to the user manual(s) provided with the instrument or software upgrade kit.

## Installation

To install your test system, select an installation site, install the server tower pedestal and door, and connect all the cabling. Once all items have been unpacked, the assembly of the individual items making up the system should require only a few minutes. Save the shipping carton and all inserts in case you need to ship the MPEG Test System server in the future. (See *Repackaging* beginning on page 6–24.)

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

MPEG Test System installation procedures depend on the hardware and software of your particular system. First determine the software version. If the version is not stated in the MPEG Test System Start menu title (for example, "Tektronix MTS100 V2.0"), open the MPEG Test System Readme (Mts100\Readme.txt or Mts200\Readme.txt) file to locate the version number. Then check the following table for the manual that contains the applicable instructions.

| Test System 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 | 070-9376-06 |
| 2.2 | MTS210 and MTS215 Deferred-Time Applications User Manual<br>or<br>MTS200 Series Real-Time Analyzer User Manual | 071-0078-XX<br><br>071-0076-XX |
| 2.5 and later | MTS200 Series, HW Installation and Specifications, Compaq Proliant 1600 Platform, Technical Reference | 071-0261-XX |

## Connecting the Data Store System Input and Outputs

The Data Store system is an integral part of all MPEG Test Systems but the MTS 205; it enables transport stream capture and output at up to 60 Mbps.

Figure 2–1 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.)

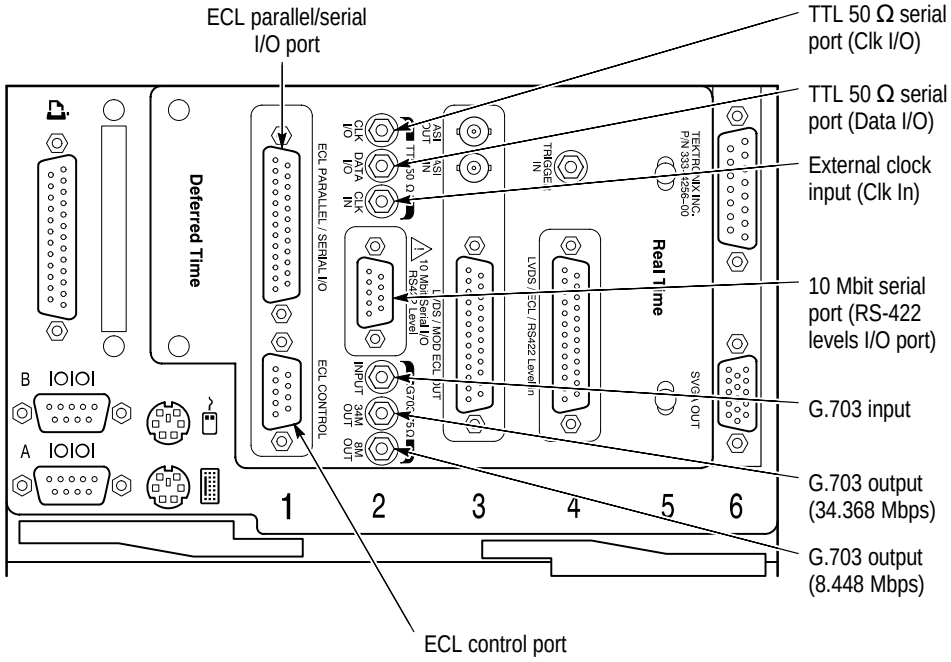



**Figure 2–1: Rear panel showing Data Store input and output ports (non-Option SS)**

### 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 above, 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 Mbps) 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 Mbps and 34.368 Mbps.

The G.703 port operates in the following modes:

- Acquisition mode. Locks to incoming the 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 Mbps output and the other for the 8.443 Mbps 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 Mbps. The port uses RS-422 voltage levels with a line-to-line input termination of 110 Ω. 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 Tektronix 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 Ω Serial Port (Data & Clock I/O)

The TTL 50 Ω 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 Mbps.

The TTL 50 Ω 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 Tektronix 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 others 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 Tektronix MPEG Test System includes six SMB-to-BNC adapter cables. Three of the adapter cables match the impedance of the G.703 75 Ω inputs and outputs. The other three match the impedance of the TTL 50 Ω 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

MTS 205 and MTS 215 test systems include the Real-Time Analyzer. Figure 2–2 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.

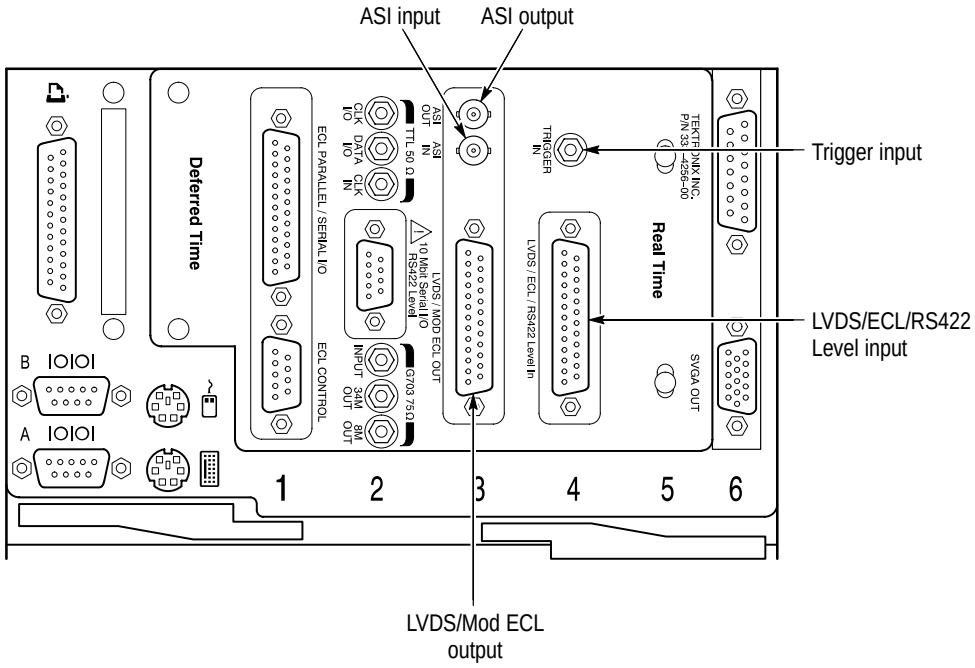



**Figure 2–2: Real-Time Analyzer input and output ports (computer rear)**

**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, refer to *Monitoring an Input Stream* in the *Operating Basics* section of the *MPEG Test System Real-Time Analyzer User Manual*.

### Output to the Data Store System (MTS 215 only)

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 2–3. 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 *Capturing Input Streams* in the *Operating Basics* section of the *MPEG Test System Real-Time Analyzer User Manual*.

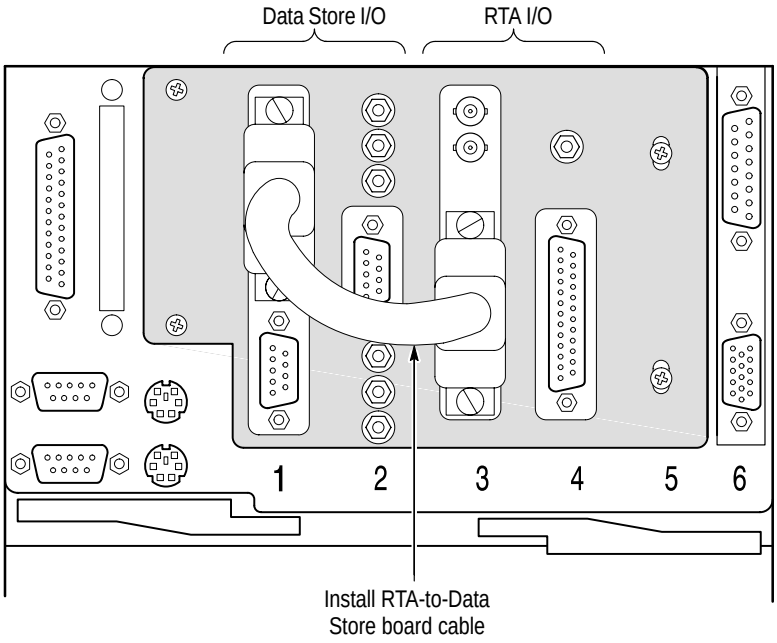



**Figure 2–3: RTA output to Data Store input connection**

### 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.** When ASI input is detected, 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.

## Connecting the Synchronous Serial Interface Input and Outputs

The Option SS synchronous serial interface (SSI) converts MPEG-2 SMPTE 310M compliant synchronous serial transport streams at 19.39 and 38.78 Mbps to synchronous parallel ECL output compatible with the the MPEG Test System Data Store and Real-Time Analyzer hardware. The interface also converts DVB-compatible serial data streams to parallel output. The SSI data conversion operates in both receiver and generator modes from 10 to 50 Mbps.

Figure 2–4 shows the SSI input and output connectors on the computer rear panel. A detailed description of each connector follows the illustration.

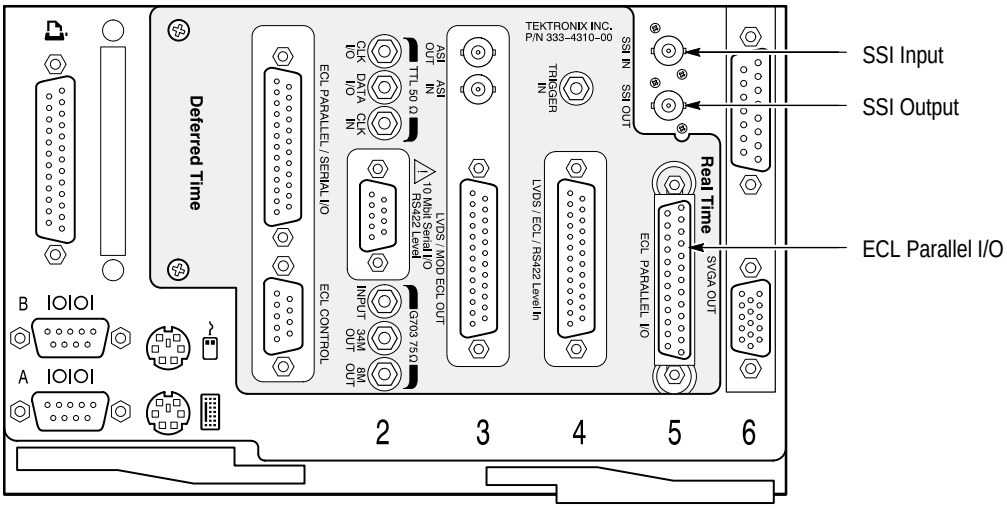



**Figure 2–4: SSI inputs and outputs, computer rear**

**SSI Input**

The SSI interface converts synchronous serial data from this input to synchronous parallel ECL output for the Data Store System or Real-Time Analyzer.

When an SSI signal is present at the SSI IN BNC connector, synchronous parallel data is output through the ECL PARALLEL I/O connector and available for input to Data Store System or Real-Time Analyzer ECL parallel inputs.

**SSI Output**

The SSI interface outputs synchronous serial data through the SSI OUT BNC connector when a synchronous serial signal is present at the SSI IN BNC connector (active loop-through). You must terminate this output into 75 ohms. When no SSI input is present, the SSI output will be converted from the ECL parallel input.

**ECL Parallel I/O**

Synchronous parallel signals input to the parallel I/O connector (from the Data Store System or Real-Time Analyzer ECL parallel outputs) are converted to synchronous serial data if there is no signal present at the SSI IN BNC connector. The output is available at the SSI OUT connector. The SSI output bit rate is identical to the parallel input bit rate. Synchronous parallel interface (SPI) output is ECL-level compatible.

***NOTE.*** *Use the SSI Parallel I/O connector as an ECL bi-directional interface to the Data Store System or Real-Time Analyzer.*

## Configuring the SSI Circuit Board

A jumper on the SSI circuit board configures the SSI output for SMPTE 310M (800 $mV_{p-p}$) or DVB (1 $V_{p-p}$) compatible levels; a ± 10% calibration adjustment is included.

SMPTE 310M specifies an SSI signal amplitude of 800 mV ± 10%, and this is the default amplitude setting. The DVB standard specifies a signal amplitude of 1.0 V ± 10%. To change the signal amplitude to 1.0 V, change the jumper on J5 to pins two and three. See Figure 2–5 for pin locations.

For SSI I/O port specifications, refer to the *Electrical Characteristics, Synchronous Serial Interface* beginning on page 1–16 of the *Specifications* section.

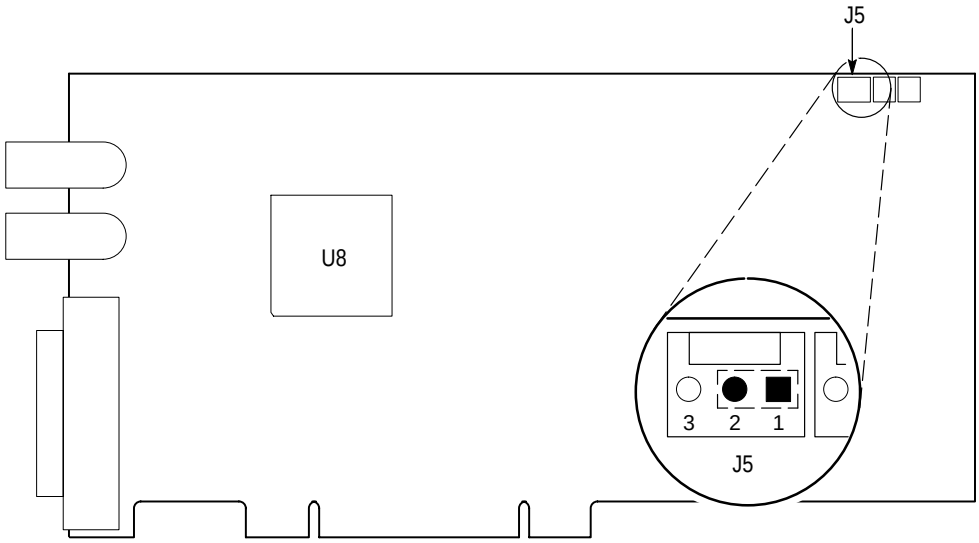



**Figure 2–5: SSI circuit board showing location J5**

# First Time Operation

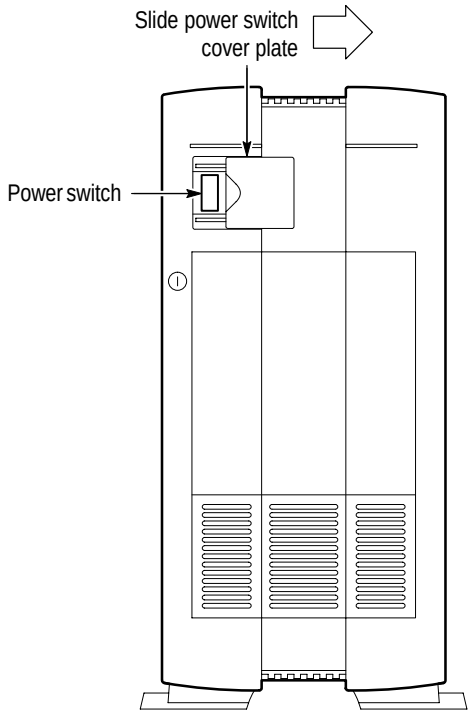
As noted in the headings of this section, some of the following procedures apply only if you are using the Tektronix MTS 200 Series MPEG Test System. See your computer user documentation for similar procedures if you are not using a personal computer/workstation.

This section describes the following procedures:

- Turning on the Tektronix MTS 200 Series MPEG Test System
- Logging on to the Tektronix MTS 200 Series MPEG Test System
- Starting the applications for which you have a license password
- Exiting the applications
- Shutting down the Tektronix MTS 200 Series MPEG Test System

## Turning on the MTS 200 Series MPEG Test System

To power on the MTS 200 Series computer, slide the power switch cover plate to the right and press the power switch.



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

## Logging On to the MTS 200 Series MPEG Test System

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 user name and password values set at the factory).

***NOTE.*** *If you are not using a Tektronix MTS 200 Series MPEG Test System, use the user name and password appropriate for your environment.*

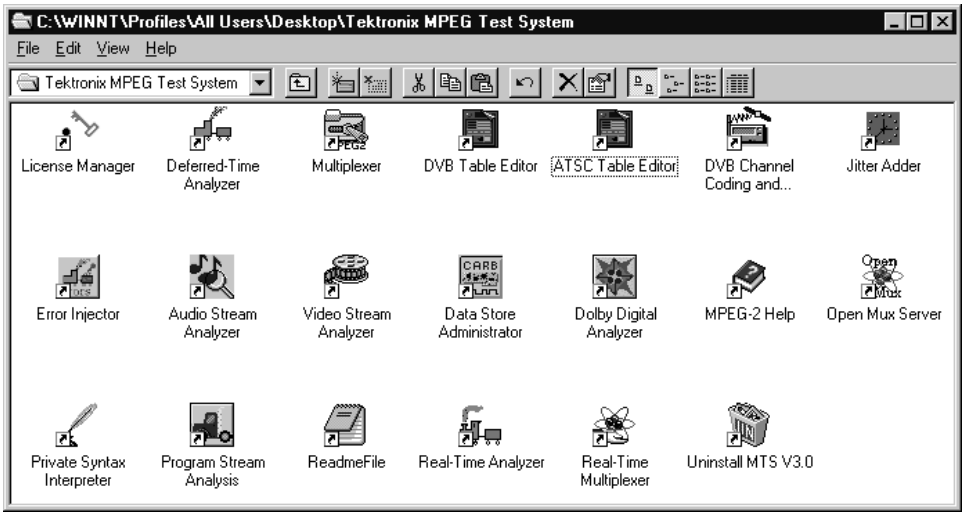
There are two other MTS 200 Series user name and passwords available. The first is *guest* with no password. This level has only limited access to files and applications. The second level is *administrator* with `MPEG2` as the password. This user has Tektronix MTS 200 Series MPEG Test System Administrator privileges. You must use this logon when installing software or performing upgrades.

***CAUTION.*** *The administrator user logon includes all privileges. If you are connected to a network, you may have special privileges within the network. Use this logon carefully.*

**Changing 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 *Appendix B: Software Repair* in the back of this manual.

## Starting Applications

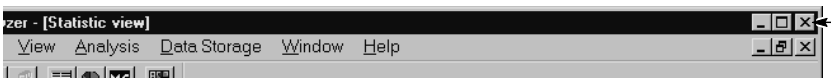
After you have logged on, the Tektronix MPEG Test System program group window appears as shown below. Start the applications by double-clicking the appropriate icon.




***NOTE.*** *Although Windows NT permits several applications to run simultaneously, hardware limitations prevent simultaneous use of the Deferred-Time Analyzer or Multiplexer with the Data Store Administrator.*

## Exiting Applications

To exit test system applications, select Exit from the File menu or click the close box in the upper-right corner of the application window. Typically, the current configuration is preserved and used the next time you start the application.




In the default configuration, application information and error messages (up to 2048 kbytes) are automatically saved in the Windows NT Event Viewer. No additional information is saved.

## 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 (see the illustration on page 2–11).

# Theory of Operation

# Theory of Operation

A Tektronix 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. 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 circuit boards, and the four added 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 test systems with serial number B059999 and earlier is 8 Gbytes; capacity of later test systems is 18 Gbytes.

The RTA circuit board decodes the input stream and enables instantaneous analysis, with the Real-Time Analyzer software, of many stream characteristics.

Option SS is a format converter circuit board that converts between SSI (Synchronous Serial Interface) and ECL parallel, in both directions.

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

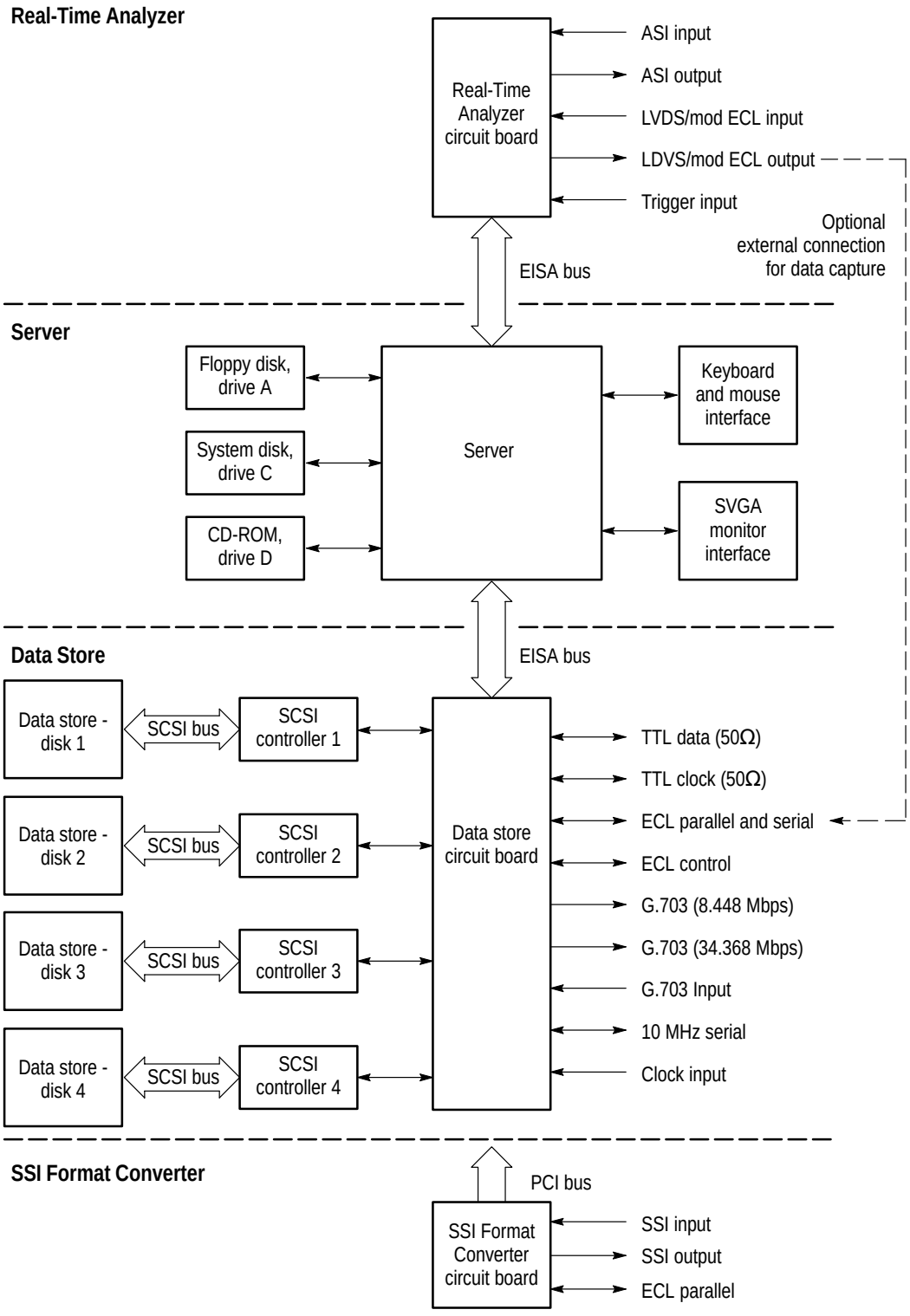



**Figure 3–1: Test System block diagram**

## 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 Mbps and 34.368 Mbps streams and operates in the unframed mode.

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

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

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

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

Serial data rates to 55 MBits/s are possible using the internal PLL. The maximum parallel data rate is 60 Mbps (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. The user 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. The user may specify, through 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.

## SSI Format Converter (MTS200 Option SS)

The Option SS format converter circuit board converts between SSI (Synchronous Serial Interface) and ECL parallel, in both directions. The circuit board is installed in slot 5 of the Proliant computer platform and it has a PCI connector and form factor. It draws power only from the PCI bus and does not require any software drivers or setup.

***NOTE.*** *Option SS is not supported on test systems using Prosignia platforms.*

### Format Conversion

An SSI format transport stream can be converted to ECL parallel for input to the Real-Time Analyzer or the Data Store circuit board for acquisition and in-depth analysis. Also a transport stream in the SSI format can be generated by driving the parallel port with the parallel output of the Data Store hardware.

The ECL parallel port of the SSI board is bi-directional, whereas the SSI input and output ports are dedicated BNC connectors. The mode of operation (input or output) is not controlled by software, but depends on whether there is a signal on the SSI input. If an input signal is present, the board will convert the SSI input to an ECL parallel output. If there is no SSI input, the board will switch to converting any signal on the parallel port to a SSI output.

### Transport Rate

The SSI Format converter board operates with transport rates between 10 and 50 Mbps. This includes the SMPTE 310M rates of 19,392,658 and 38,785,317 bps. When generating an SSI signal, the SSI transport rate is dependant on the rate of the Data Store circuit board.

### SSI Output Amplitude

Jumper J5 on the SSI format converter board sets the SSI output peak-to-peak amplitude to, nominally, 800mV (for SMPTE 310M environments) or 1.0 V (for DVB environments). The default factory setting is 800mV.

# Performance Verification

# Performance Verification, Data Store System

This section contains procedures for verifying that the Data Store system, an integral part of the MTS 210 and MTS 215, meets the performance requirements listed in the *Specifications* section.

It is common for Tektronix 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**

| Test System 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 | MTS 210 and MTS 215 Deferred-Time Applications | 071-0078-XX |

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

| Test System 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 1–23 on page 1–19, 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 | Used to test data transfer | Tektronix MTS 210 or 215 |
| MTS100 MPEG Test System 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 Ω SMB to BNC Adapter cables (4 required) | | Tektronix part number 174-3578-00 (shipped as a standard accessory) |
| 75 Ω SMB to BNC Adapter cables (4 required) | | Tektronix part number 174-3579-00 (shipped as a standard accessory) |
| 50 Ω BNC to BNC Cable (1 required) | | Tektronix part number 012-0057-01 |
| 50 Ω BNC Adapter (2 required) | Female-to-female connectors | Tektronix part number 103-0028-00 |

**Table 4–2: Required equipment (cont.)**

| Test equipment | Minimum requirements | Example |
|---|---|---|
| 50 Ω Feed-through Terminator (2 required) | | Tektronix part number 011-0049-01 |
| 75 Ω Feed-through Terminator | | Tektronix part number 011-0103-02 |
| Frequency counter | Accuracy and resolution to 8 decimal places, or used with an external reference (WWV, Loran C, or GPS) that will improve the accuracy to 8 decimal places. 1 MHz to 60 MHZ range. | Tektronix CDC250 Counter |
| 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 4–16, page 4–35) |
| 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 Tektronix 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 Mbps pulse mark voltage | +2.13 V to +2.60 V and<br>–2.13 V to –2.60 V | |
| 8 Mbps No-pulse space voltage | 0 V ±0.237 V | |
| 8 Mbps master generation | Error free transfer | |
| 34 Mbps pulse mark voltage | +0.9 V to +1.1 V and<br>–0.9 V to –1.1 V | |
| 34 Mbps No-pulse space voltage | 0 V ±0.1 V | |
| 34 Mbps master generation | Error free transfer | |
| TTL 50 Ω Port Tests | | |
| Clock pulse amplitude | <0.3 V and<br>>2.65 V | |
| Data I/O amplitude | <0.3 V and<br>>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 Mbps (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 the instrument warm up time, perform the *Internal Clock Test*, beginning 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 Ω Port Tests | page 4–23 |
| 10 Mbps (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 Tektronix 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 MPEG Test System Service Data Files disk, Tektronix part number 063-2578-00, 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 you must 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 (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 MPEG Test System 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 floppy 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 floppy disk copies and expands the compressed service data files into the TEMP directory on the local machine.
5. Eject the floppy disk from drive A.
6. Place the floppy 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.

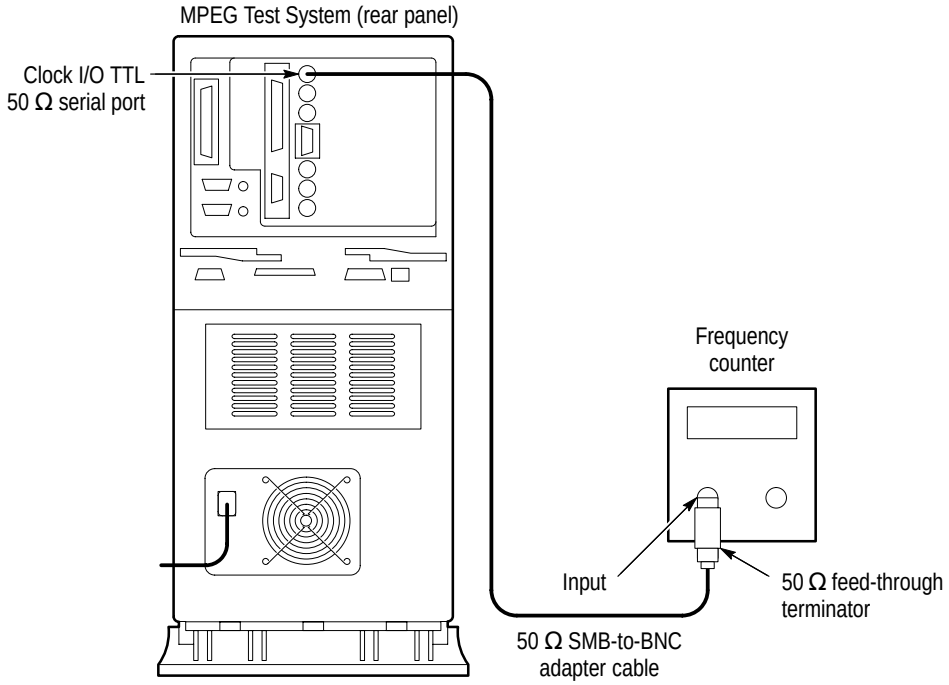



**Figure 4–1: Setup for measuring internal clock output accuracy**

**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 4 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 Mbps and 34 Mbps G.703 I/O port tests for pulse mark amplitude and no pulse space voltage, slave acquisition, and master generation.

### 8 Mbps Pulse Mark Amplitude and No-Pulse Space Voltage

This procedure verifies the following parameters:

- Pulse mark amplitude (+2.13 V to +2.60 V and –2.13 V to –2.60 V)
- No-pulse space voltage (0 V ± 0.237 V)

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

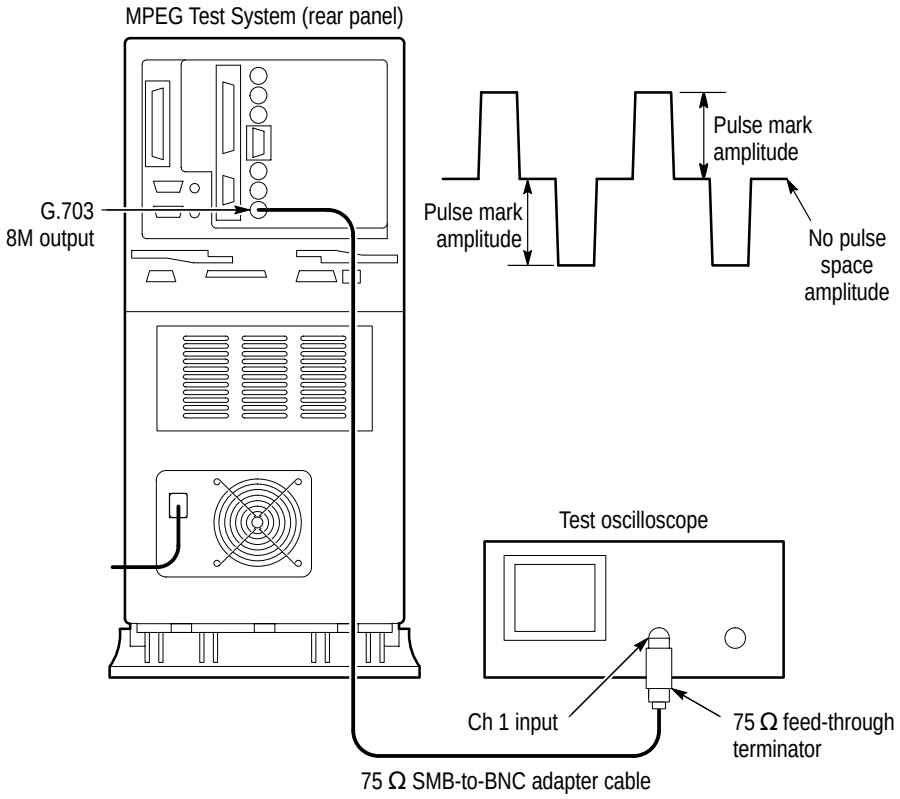



**Figure 4–2: Setup for measuring 8.448 Mbps signal parameters**

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

**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 |
|---|---|
| File name | Any file in the list |
| Protocol | Master |
| Port | G703 |
| Output Clock | 8.448 MHz |
| Loop | Selected |

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

6. Trigger the oscilloscope to obtain a stable display as shown in Figure 4–2.

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 ± 0.237 V.

### G.703 - 8 Mbps Slave Acquisition and Master Generation

This test requires a second Tektronix 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.

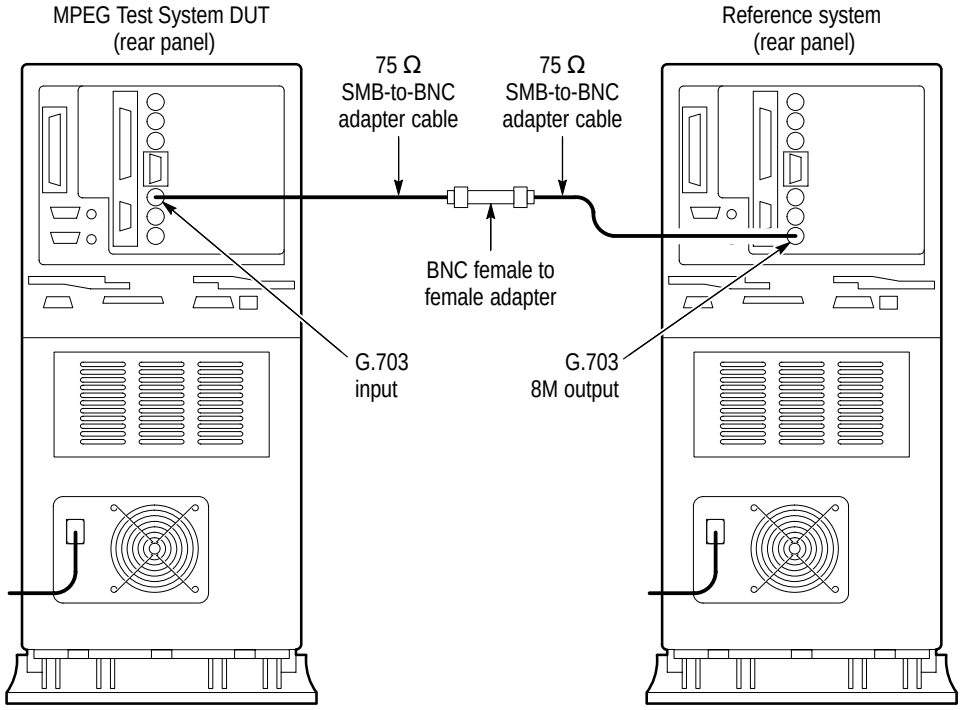



**Figure 4–3: Setup for testing G.703 8.448 Mbps slave acquisition**

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 |
| 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 Tektronix 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.


**Figure 4–4: Example file comparison results**

**13.** Reconnect the equipment as shown in Figure 4–5.

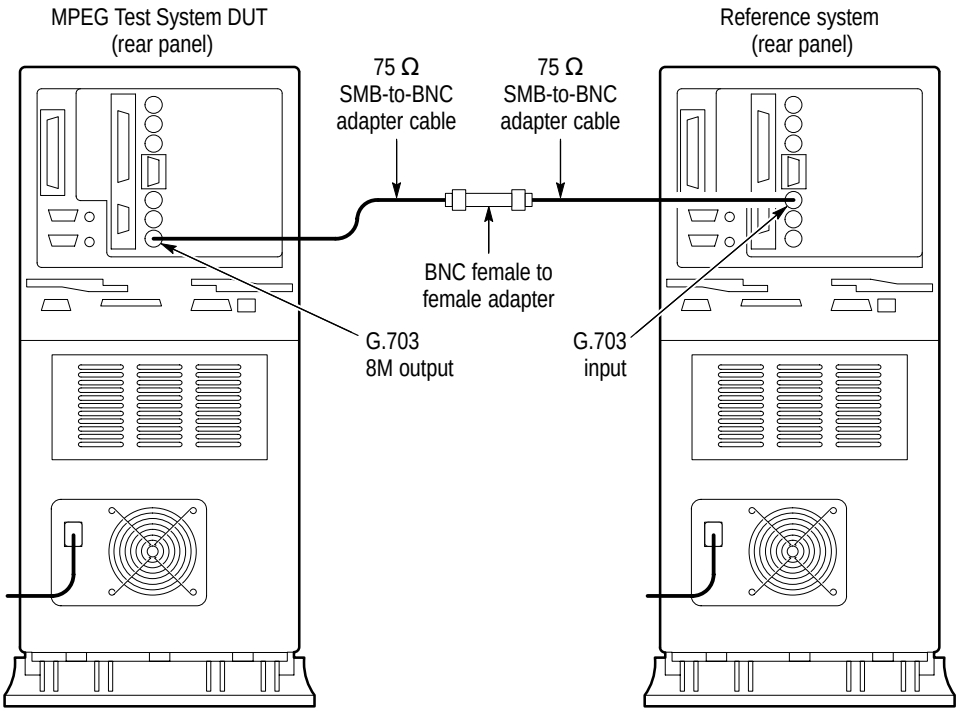



**Figure 4–5: Setup for testing G.703 8.448 Mbps master generation**

**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 b (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 (Figure 4–6).

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

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

where <filename> is the name you entered in step 15 (such as 8mbit2.tst).

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

**22.** Check the **Command Prompt** window for the comparison results (Figure 4–6). If no differences are encountered, error-free file transfer is verified.

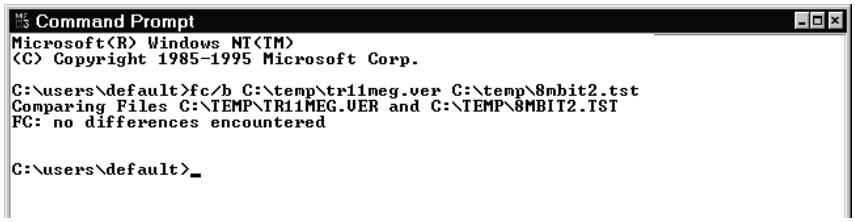



**Figure 4–6: Example file comparison results**

## 34 Mbps Pulse Mark Amplitude and No Pulse Space Voltage

This procedure verifies the following parameters:

- Pulse mark amplitude (+1 V ±0.1 V)
- No-pulse space voltage (0 V ±0.1 V)

**1.** Connect the equipment as shown in Figure 4–7.

**2.** Select (highlight) any 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.

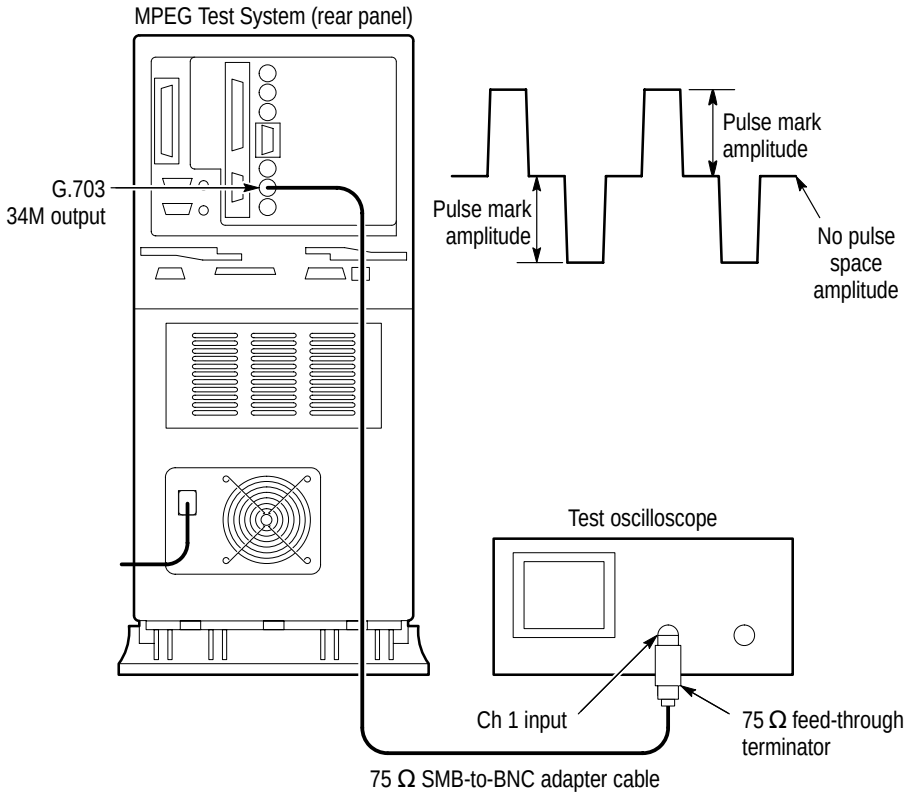



**Figure 4–7: Setup for measuring 34Mbps signal parameters**

**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 4–7.

**6.** Verify the pulse mark amplitude is +1 V ± 0.1 V and the no-pulse space voltage is 0 V ± 0.1 V.

### G.703 34 Mbps Slave Acquisition and Master Generation

This test requires a second Tektronix MPEG Test System that is designated 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 4–8.

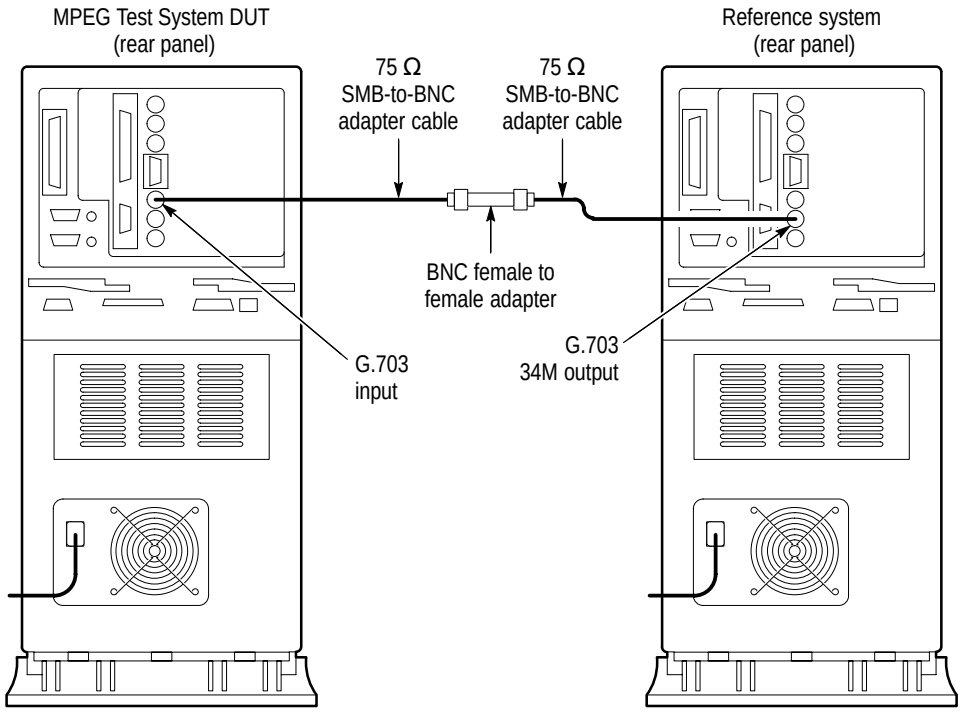



**Figure 4–8: Setup for testing G.703 34.368 Mbps slave acquisition**

**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 |

| Parameter | Setting |
|---|---|
| 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 b (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 (Figure 4–9).

    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 (Figure 4–9). If no differences are encountered, error-free file transfer is verified.

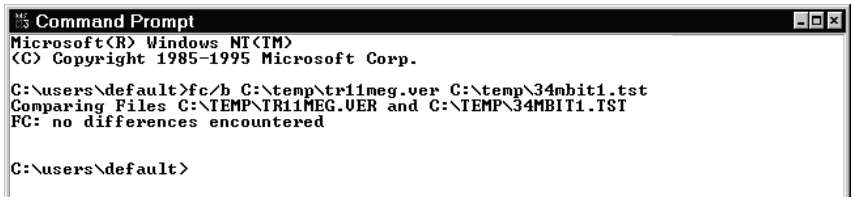



**Figure 4–9: Example results**

12. Reconnect the equipment as shown in Figure 4–10.

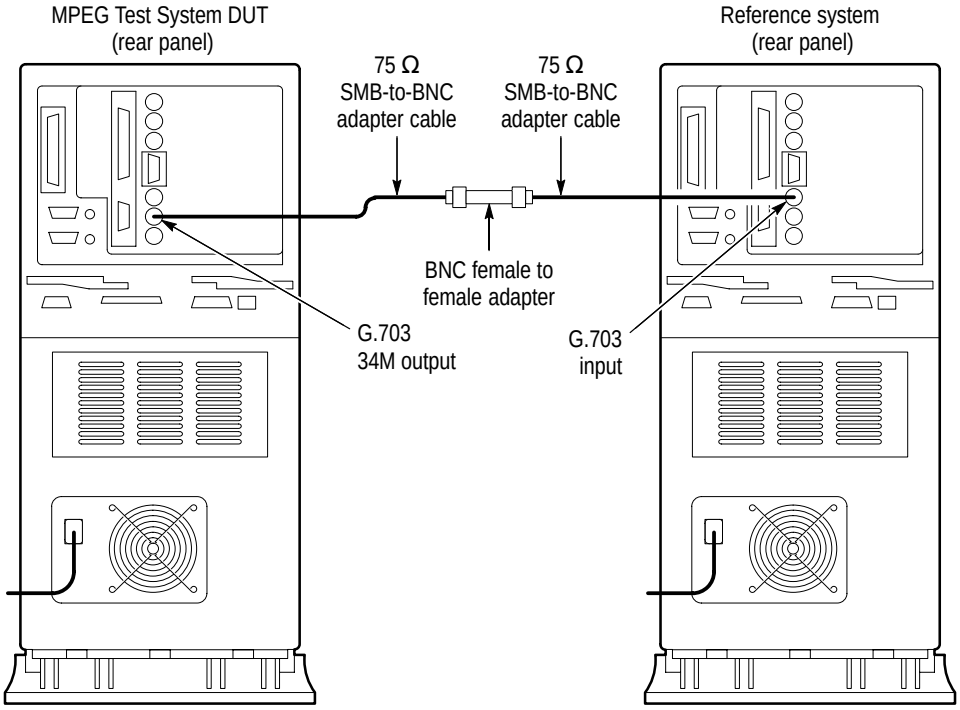



**Figure 4–10: Setup for testing G.703 34.368 Mbps master generation**

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

***NOTE.*** *The data order (LSB or MSB first) for the serial ports must match for both Tektronix 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 4–11.

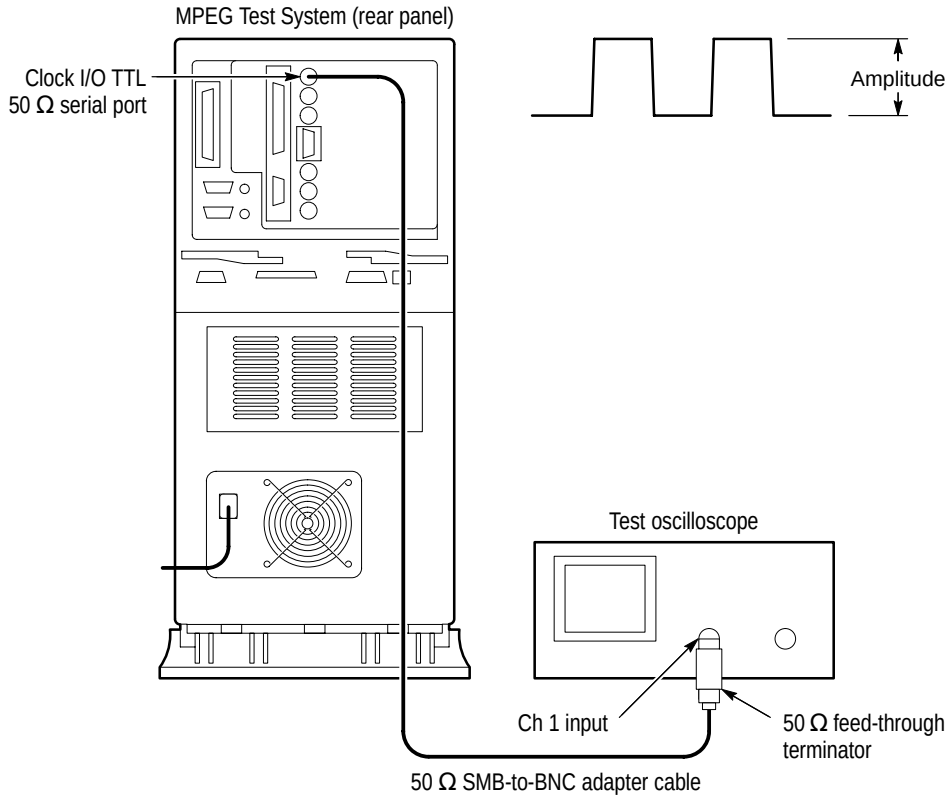



**Figure 4–11: Setup for measuring TTL 50 ohm clock pulse amplitude**

2. Start the Data Store Administrator application, if necessary.
   - Choose 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 4–11.
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 Tektronix MPEG Test System that is designated as the “reference system.” Within this procedure the Tektronix MPEG Test System you are testing is designated the “Device Under Test” (DUT).

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

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

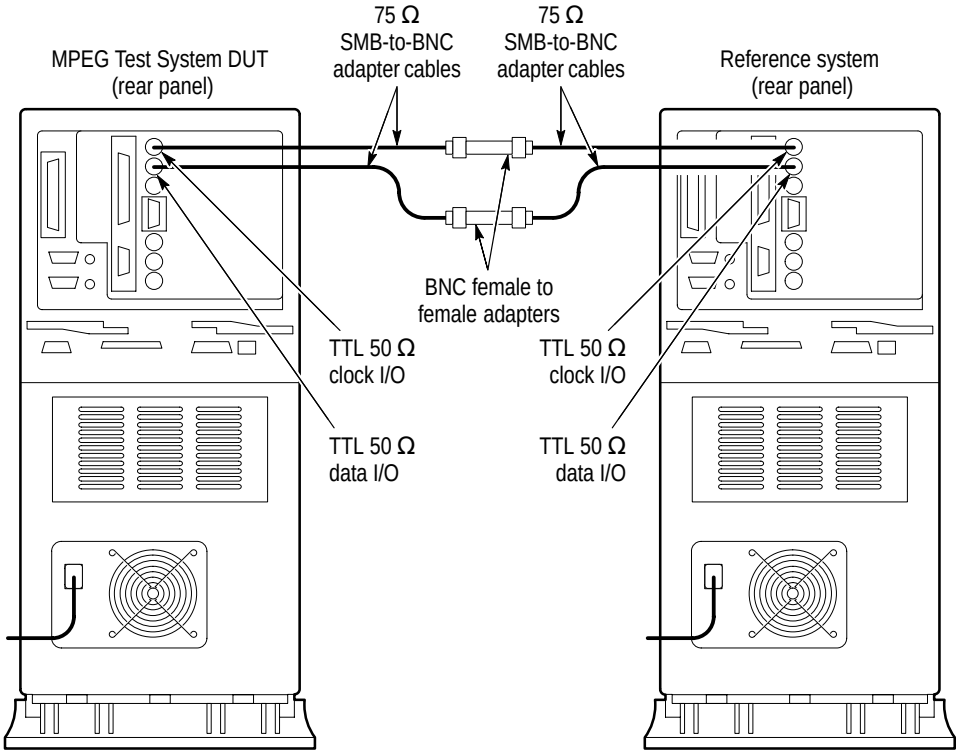



**Figure 4–12: TTL 50 ohm slave acquisition and master generation setup**

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 b (such as TTL1.tst).

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

10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:

    a. Start or switch to the Command Prompt application (Figure 4–9).

    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 Ω Serial Port Low Speed Clock Slave Acquisition and Master Generation

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

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

**1.** Connect the equipment as shown in Figure 4–12 (on page 4–25).

**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 b (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 b (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 (Figure 4–13).

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

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

where <filename> is the name you entered in step 13 (such as TTL4.tst).

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

**21.** Check the **Command Prompt** window for the comparison results (Figure 4–13). If no differences are encountered, error-free file transfer is verified.

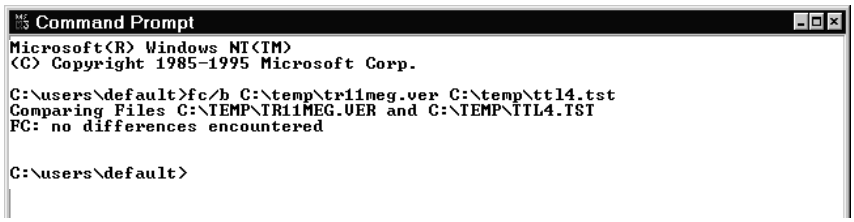



**Figure 4–13: Example Command Prompt comparison results**

## TTL 50 Ω Serial Port External Clock Generation

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

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

**1.** Connect the equipment as shown in Figure 4–14.

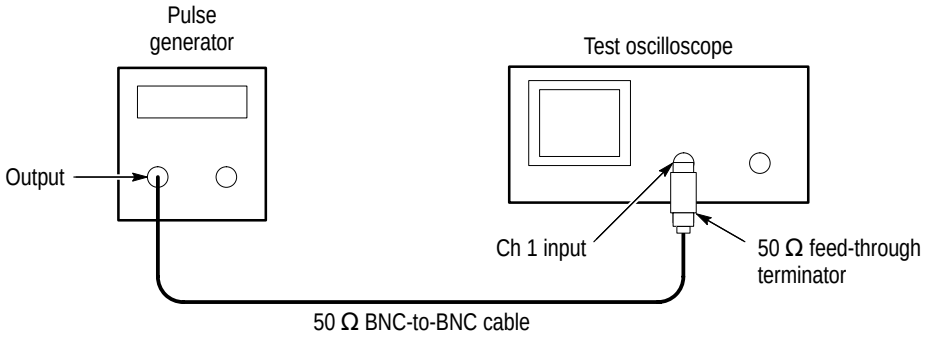



**Figure 4–14: Setup for measuring the pulse generator output**

**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 4–15.

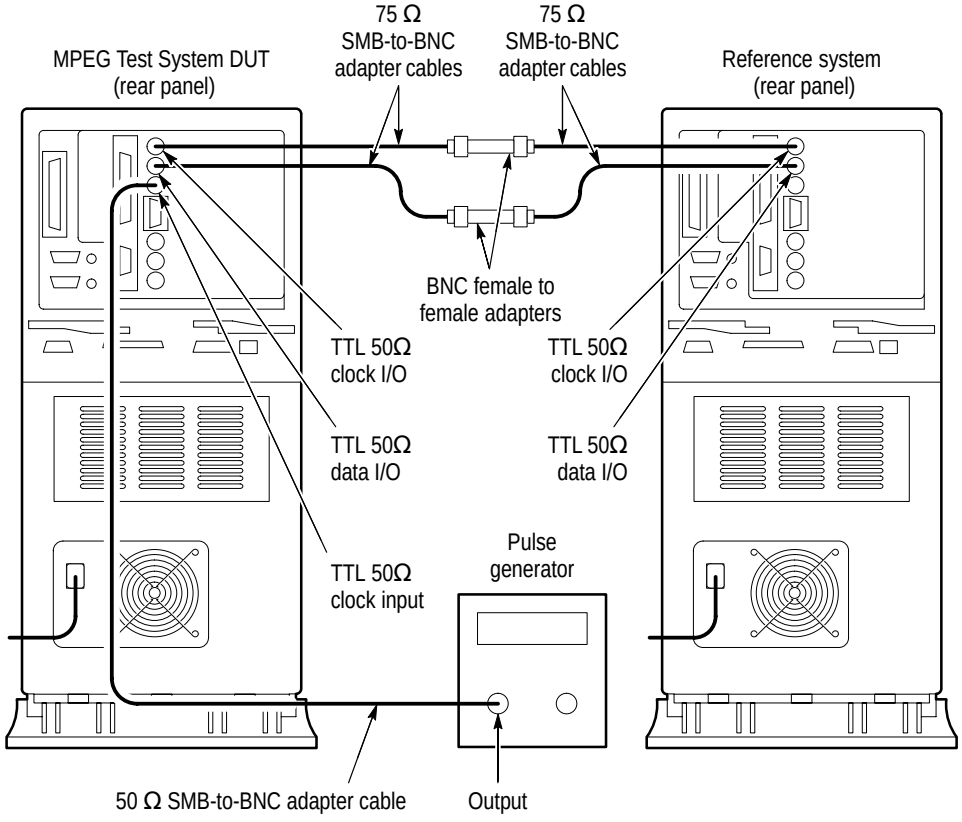



**Figure 4–15: Setup for checking 50 ohm external clock generation**

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 b (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 Mbps (RS-422) Port Tests

This section contains 10 Mbps (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.

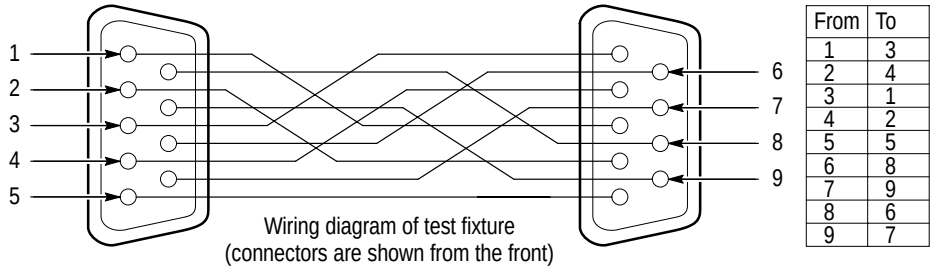
***NOTE**. The data order (LSB or MSB first) for the serial ports must match for both MTS100 MPEG Test Systems used during the Performance Verification procedure. Be sure to set the data order to the same setting for both systems. Systems with serial numbers between B010100 and B019999 always use the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

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

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

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

**1.** Construct the 10 MHz signal interconnect fixture as shown in Figure 4–16.




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

**Figure 4–16: 10 MHz signal interconnect fixture**

**2.** Connect the equipment as shown in Figure 4–17.

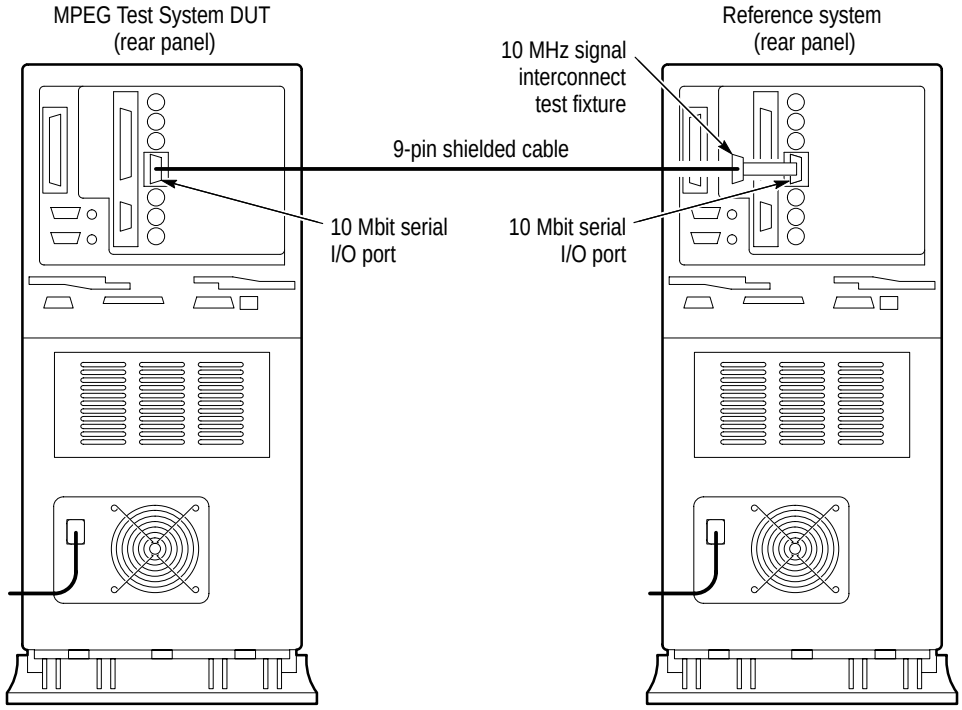



**Figure 4–17: Setup for checking 10 Mbit serial port high speed clock slave acquisition and master generation**

**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 b (such as RS4221.tst).

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

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

**a.** Start or switch to the Windows NT Command Prompt application.

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

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

where <filename> is the name you entered in step 5 (such as RS4221.tst).

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

**13.** Check the **Command Prompt** window for the comparison results. If no differences are 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 b (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 Tektronix MPEG Test System that is designated as the “reference system.” Within this procedure the Tektronix MPEG Test System you are testing is designated the “Device Under Test” (DUT).

The requirement is error-free file transfer between two Tektronix 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 b (such as RS4223.tst).

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

**9.** On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:

**a.** Switch to the Command Prompt application.

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

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

where <filename> is the name you entered in step 2 (such as RS4223.tst).

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

**10.** Check the **Command Prompt** window for the comparison results. If no differences are 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 b (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 Tektronix MPEG Test System that is designated as the “reference system.” Within this procedure the Tektronix MPEG Test System you are testing is designated the “Device Under Test” (DUT).

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

**1.** Connect the equipment as shown in Figure 4–18.

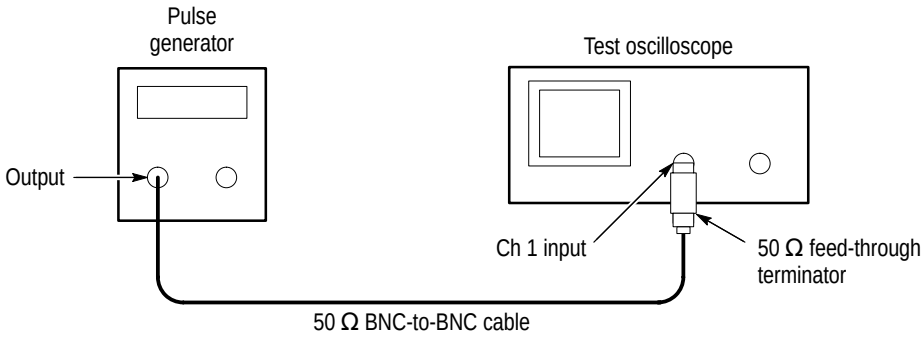



**Figure 4–18: Setup for measuring the pulse generator output**

**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.

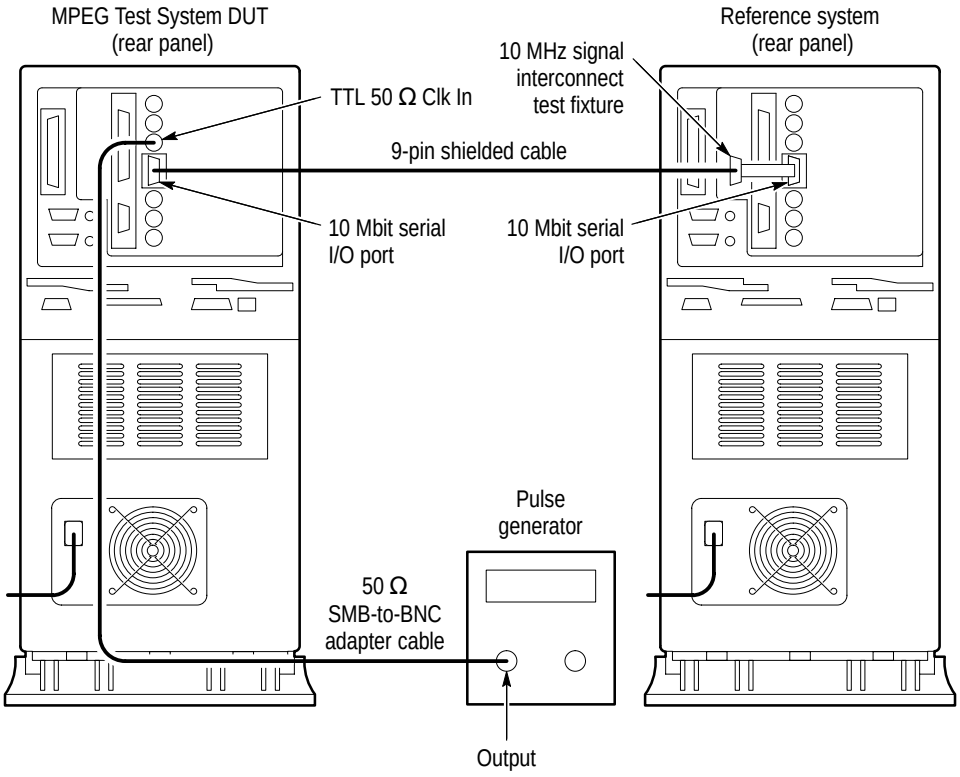



**Figure 4–19: Setup for checking 10 Mbit external clock generation**

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

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

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

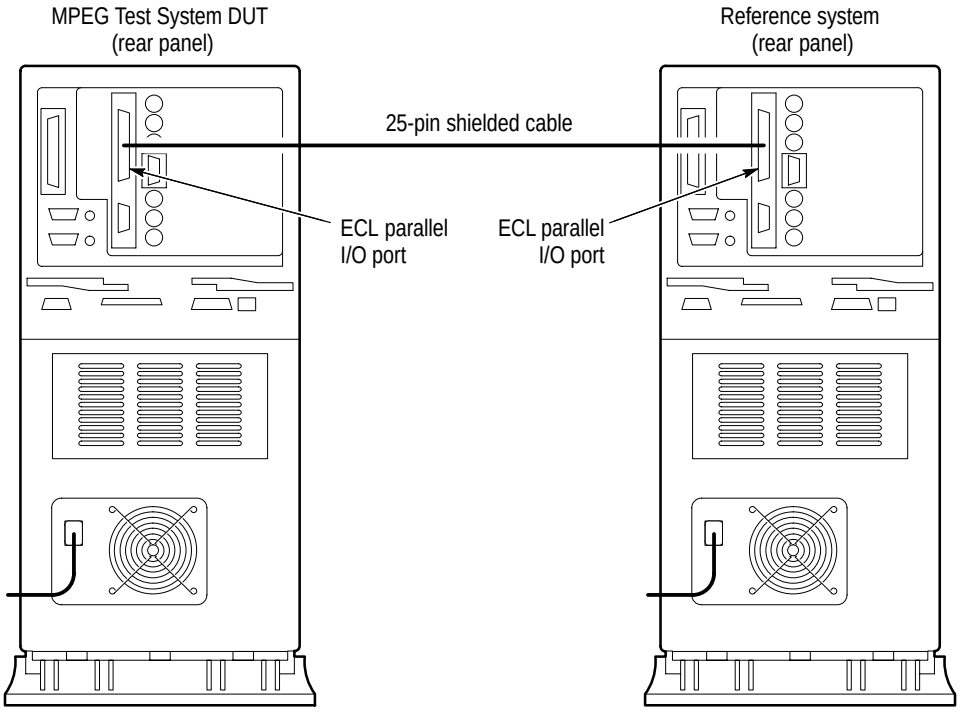



**Figure 4–20: Setup for checking ECL parallel port data transfer**

2. On the DUT, start the Data Store Administrator application (if necessary).

- Choose 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<br>(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 b (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 (Figure 4–21).

- 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 (Figure 4–21). If no differences are encountered, error-free file transfer is verified.

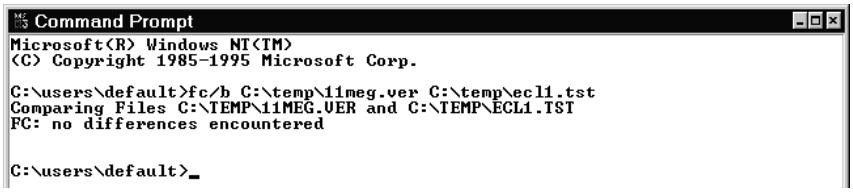



**Figure 4–21: Example file comparison results**

**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<br>(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 Tektronix MPEG Test System that is designated as the "reference system." Within this procedure the Tektronix MPEG Test System you are testing is designated the "Device Under Test" (DUT).

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

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

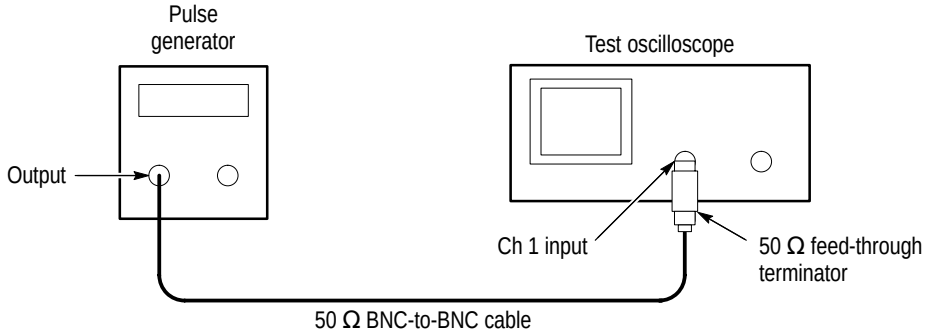



**Figure 4–22: Setup for measuring the pulse generator output**

**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.

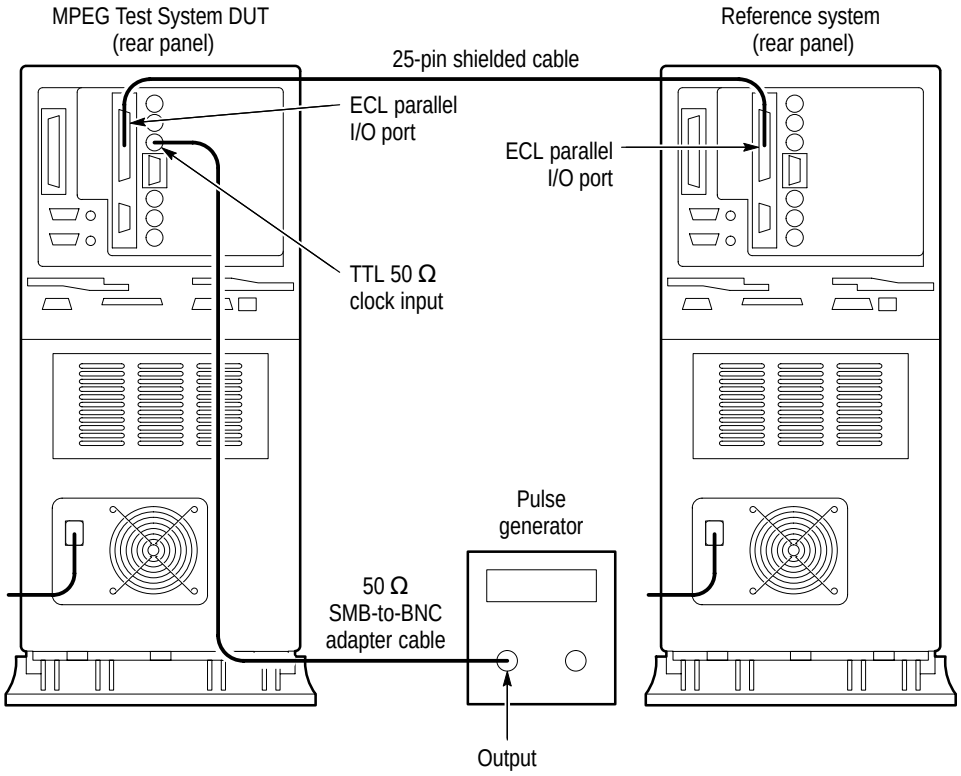



**Figure 4–23: Setup for checking ECL parallel port generation with an external clock**

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

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

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

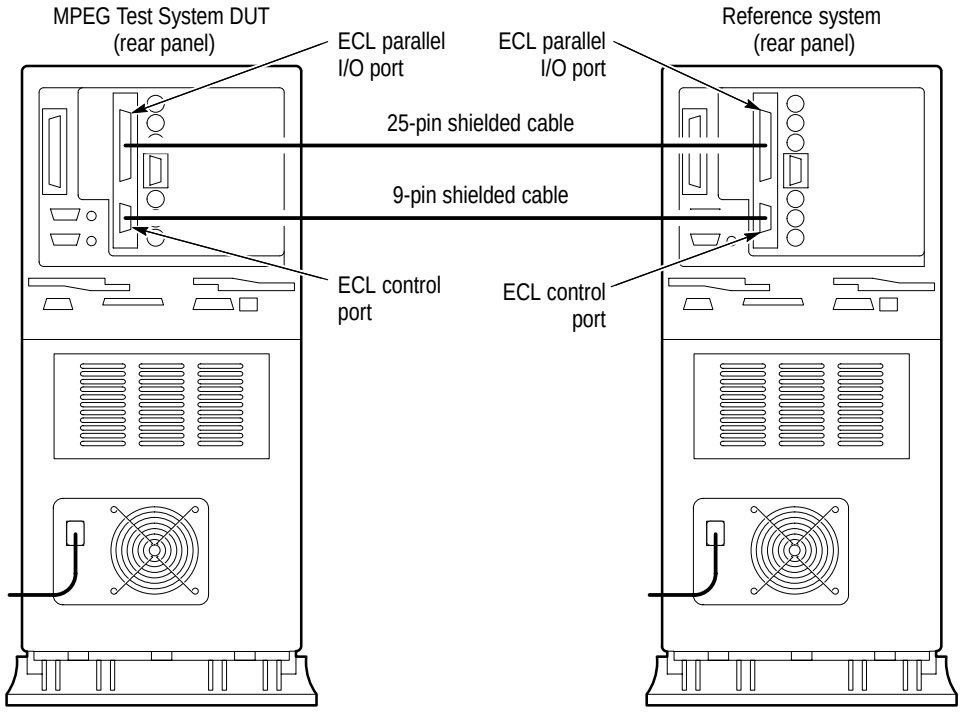



**Figure 4–24: Setup for checking ECL parallel port master acquisition and slave generation**

**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 |

| Parameter | Setting |
|---|---|
| Frequency | Maximum<br>(5.625 MB/s or 7.5 MB/s) |
| Synchronization | Psync |
| Control Port | Useful bytes: 188<br>Stuffing bytes: 16<br>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 b (such as ECL4.tst).
   d. Click **Start** to save the file to the hard disk.
10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:

**a.** Switch to the Command Prompt application.

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

```
fc/b C:\temp\11meg.ver C:\temp\<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<br>(5.625 MB/s or 7.5 MB/s) |
| Synchronization | Psync |
| Control Port | Useful bytes: 188<br>Stuffing bytes: 16<br>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 |

| Parameter | Setting |
|---|---|
| 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 b (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 Tektronix MPEG Test System that is designated as the "reference system." Within this procedure the Tektronix MPEG Test System you are testing is designated the "Device Under Test" (DUT).

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

**1.** Connect the equipment as shown in Figure 4–25.

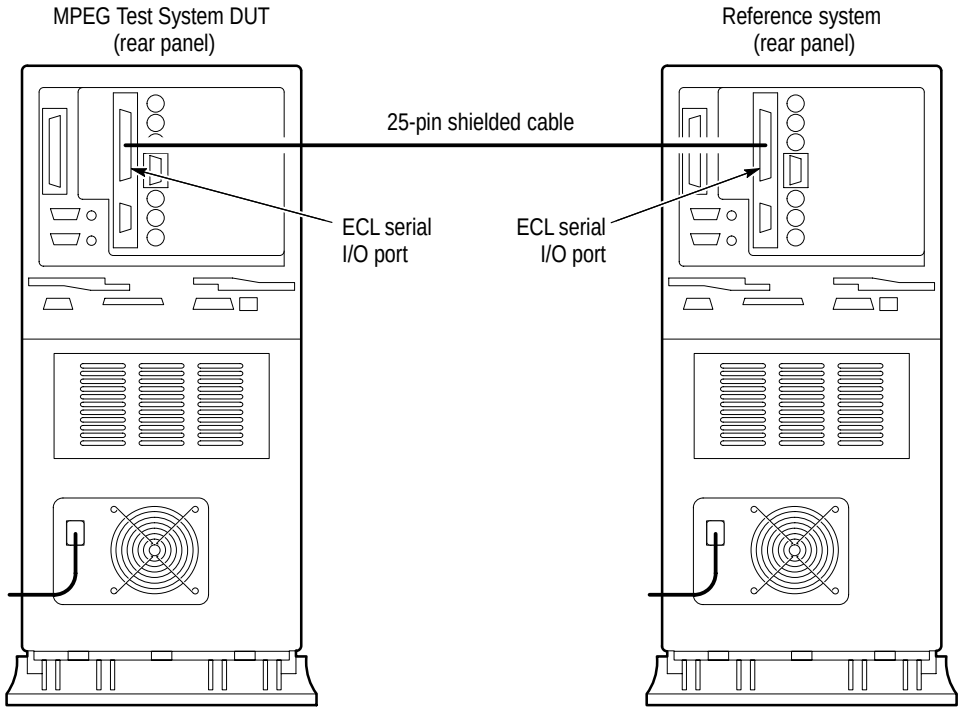



**Figure 4–25: Setup for checking ECL serial port slave acquisition and master generation**

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)<br>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 b (such as serial1.tst).

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

**11.** On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:

**a.** Start or switch to the Command Prompt application (Figure 4–26).

**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 (Figure 4–26). If no differences are encountered, error-free file transfer is verified.

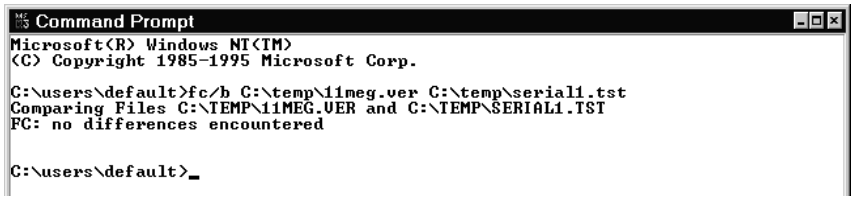



**Figure 4–26: Example file comparison results**

**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 |

| Parameter | Setting |
|---|---|
| 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)<br>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 b (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 Tektronix MPEG Test System that is designated as the "reference system." Within this procedure the Tektronix MPEG Test System you are testing is designated the "Device Under Test" (DUT).

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

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

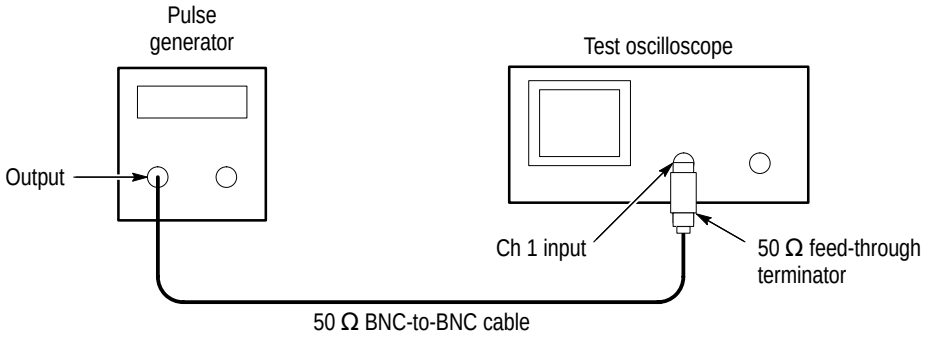



**Figure 4–27: Setup for measuring the pulse generator output**

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 4–28.

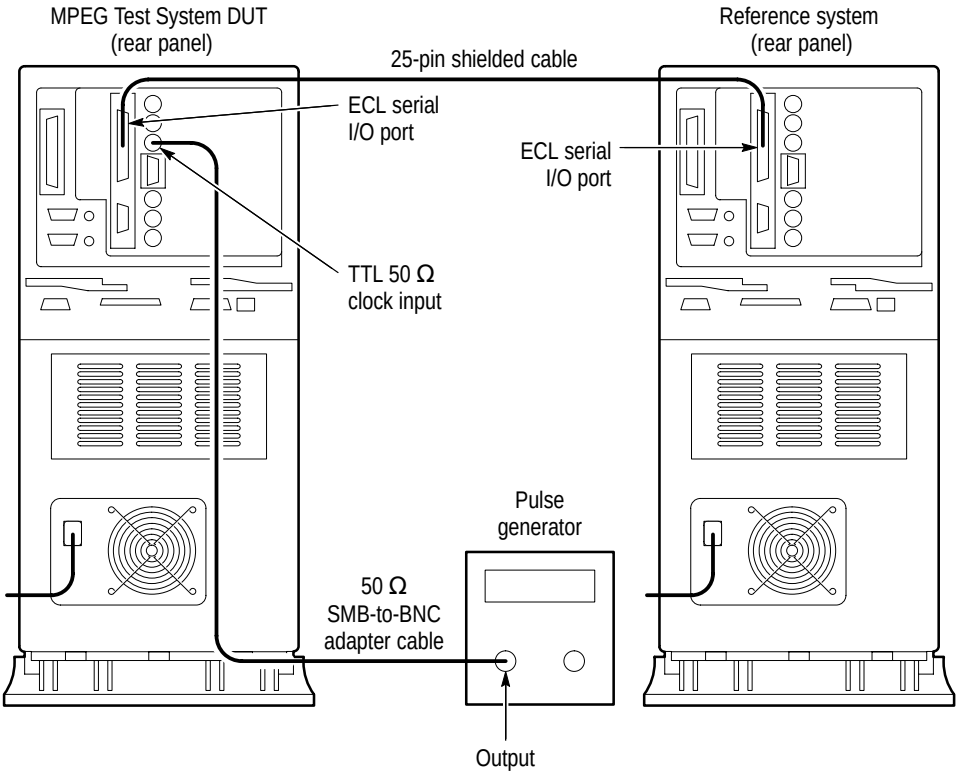



**Figure 4–28: Setup for checking ECL serial port generation with an external clock**

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

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

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

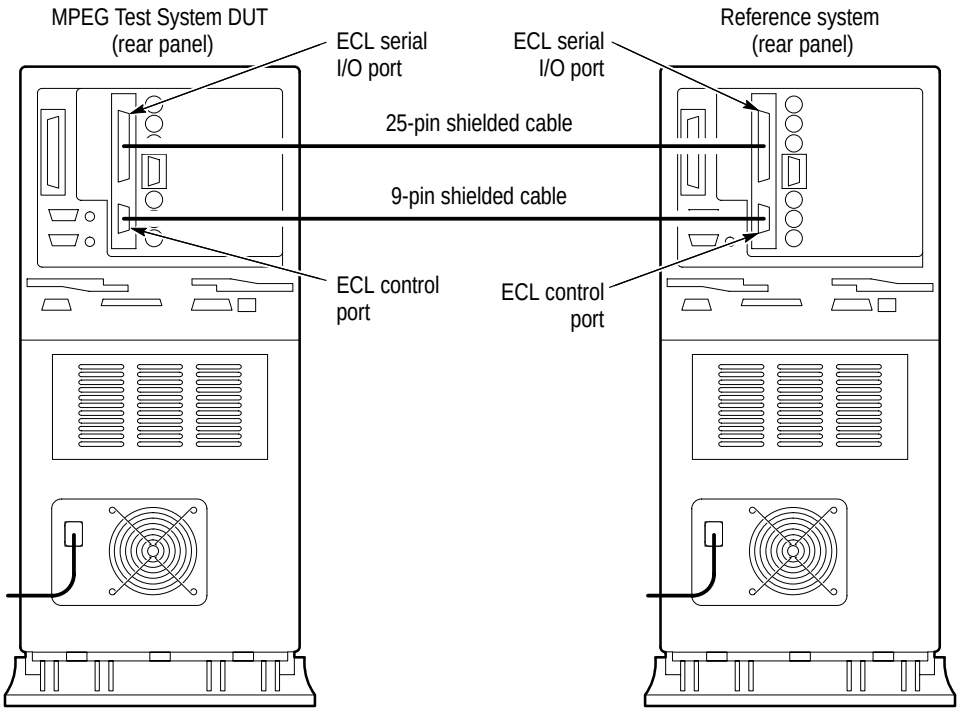



**Figure 4–29: Setup for checking ECL serial port slave generation**

**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 |

| Parameter | Setting |
|---|---|
| Frequency | 45 MB/s (to serial number B019999)<br>55 MB/s (all other instruments) |
| Synchronization | Psync |
| Control Port | Useful bytes: 188<br>Stuffing bytes: 16<br>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 b (such as serial4.tst).
   d. Click **Start** to save the file to the hard disk.

10. On the DUT, use the Windows NT Command Prompt to perform a file comparison as follows:

    a. Switch to the Command Prompt application.

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

    ```
    fc/b C:\temp\11meg.ver C:\temp\<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)<br>55 MB/s (all other instruments) |
| Synchronization | Psync |
| Control Port | Useful bytes: 188<br>Stuffing bytes: 16<br>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 b (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

***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 |
| MPEG Test System Real-Time Analyzer Verification Streams CD-ROM (2 Discs) | 2 | TRLONG.TRP<br>TR001.TRP<br>TR038.TRP<br>TR060.TRP | Supplied with this manual |
| Reference Instrument | 1 | Tektronix MPEG Test System containing Data Store and Real-Time Analyzer hardware and software | Tektronix MTS 215 or MTS100 with MTS1F05 |
| DVB-Physical Interface | 1 | ECL // input,<br>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 |

***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 $mV_{p-p}$<br>Common mode voltage + 0.70 V to + 1.40 V | |
| Modified ECL // Output Test | Differential output level 494 $mV_{p-p}$ to 908 $mV_{p-p}$<br>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<br>(DUTs with data store capability only) | Verified input stream capture | |

## Definitions

**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. Typically an MTS 215, the reference system 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 DVB-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**.
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.

---

***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 procedures described in this section are required for RTA version 1.0 only. If you are performing this verification procedure on a later version of the software (for instance, version 2.0), you can skip the steps that begin with* For version 1.0 of the RTA only.

---

   d. Select **Settings** from the Configuration menu; then select **Analysis** in the left-hand panel of the **Settings** window.
   e. Select DVB in the **Analysis Type** group of the right-hand panel.

**f.** Select **Hardware** in the left-hand 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 4–30. Refer to the Equipment Required List on Page 4–67 for cabling descriptions.

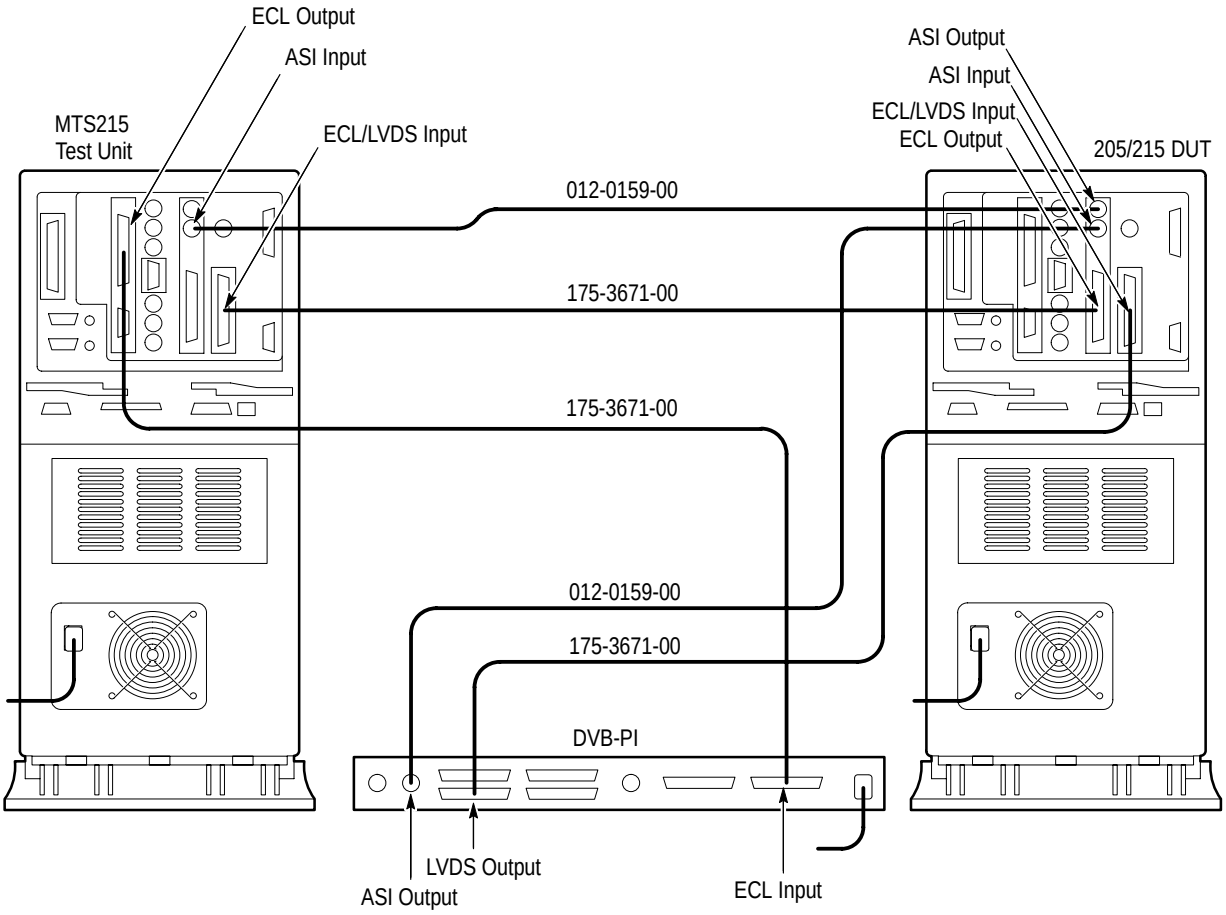



**Figure 4–30: Initial Real-Time Analyzer verification setup**

**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 4–94 to copy the 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 Ω Adapter to Channel 1 input of the oscilloscope.
   b. Connect a 75 Ω 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 4–91.
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 4–31.

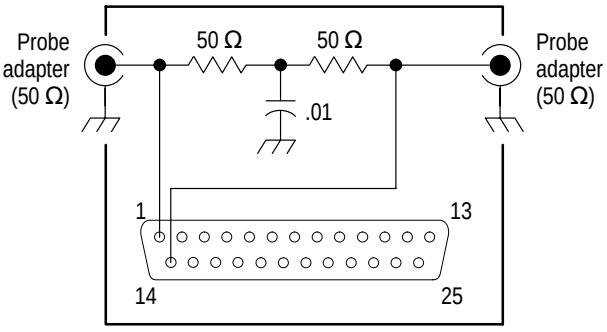



**Figure 4–31: Breakout box for LVDS port tests**

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 4–91.
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-hand 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 4–91.

**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-hand 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.

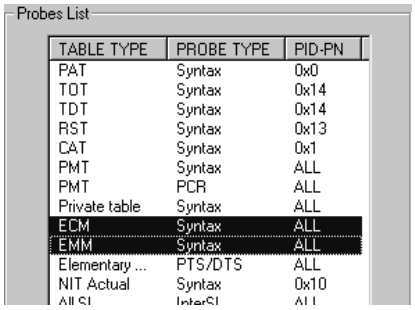
Reconfigure the DUT and reference system before performing any of the performance tests. Then perform the following procedures in order:

- 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-hand 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-hand panel, and then select **DVB** from the Analysis type group.
5. Expand the View structure in the left-hand 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-hand 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-hand 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 4–30 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 outputting 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

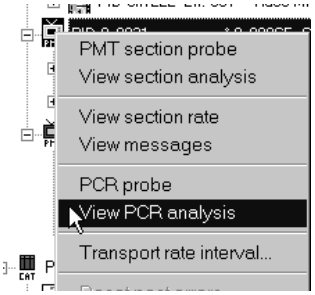
1. At the DUT, start the analysis (click the green traffic light command button).

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-hand 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 outputting 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-hand pane.
   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 4–32.

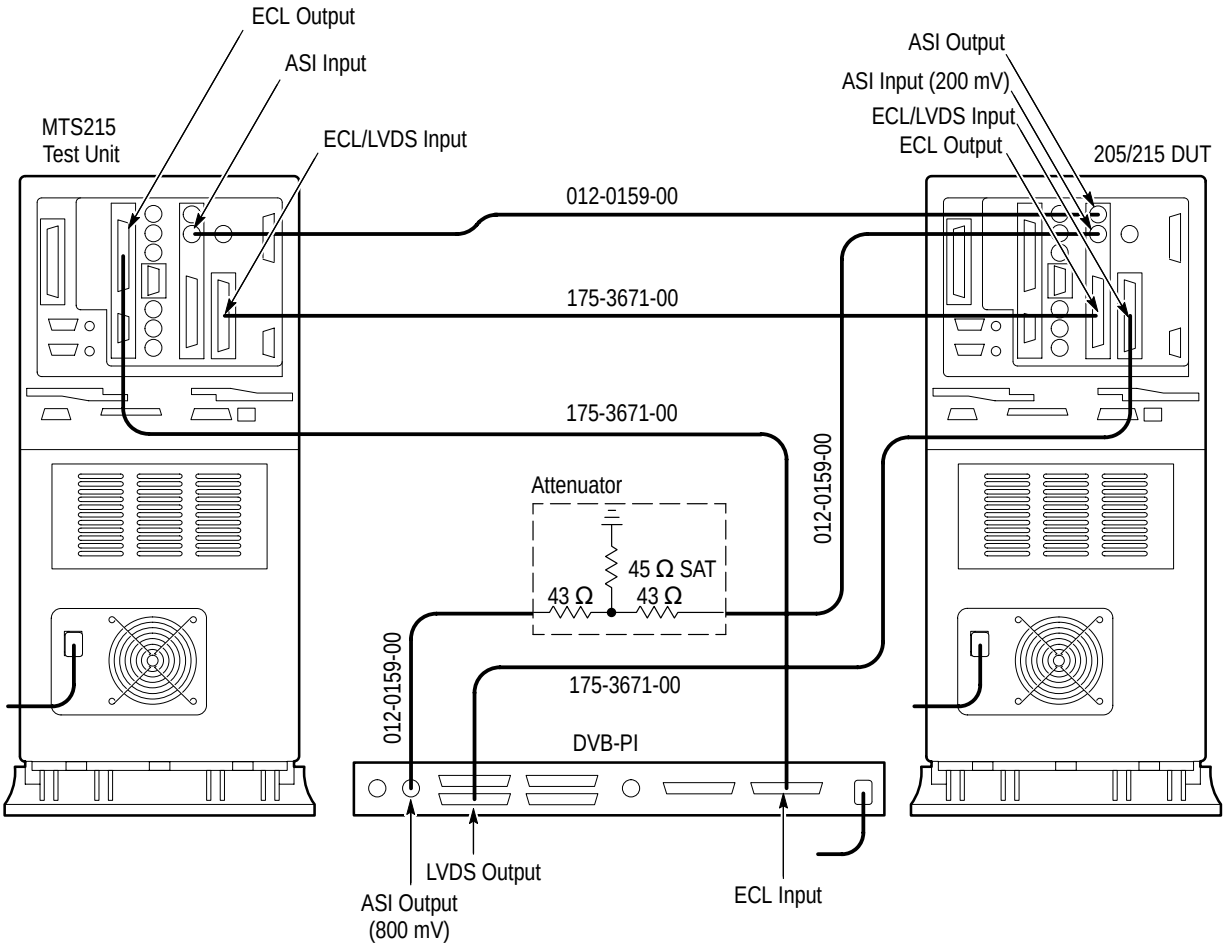



**Figure 4–32: Interconnections for verifying ASI Inputs**

**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-hand pane).

**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 acknowledge 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-hand pane 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 60 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 4–33. Refer to *Equipment Required* on Page 4–67 for cable descriptions.

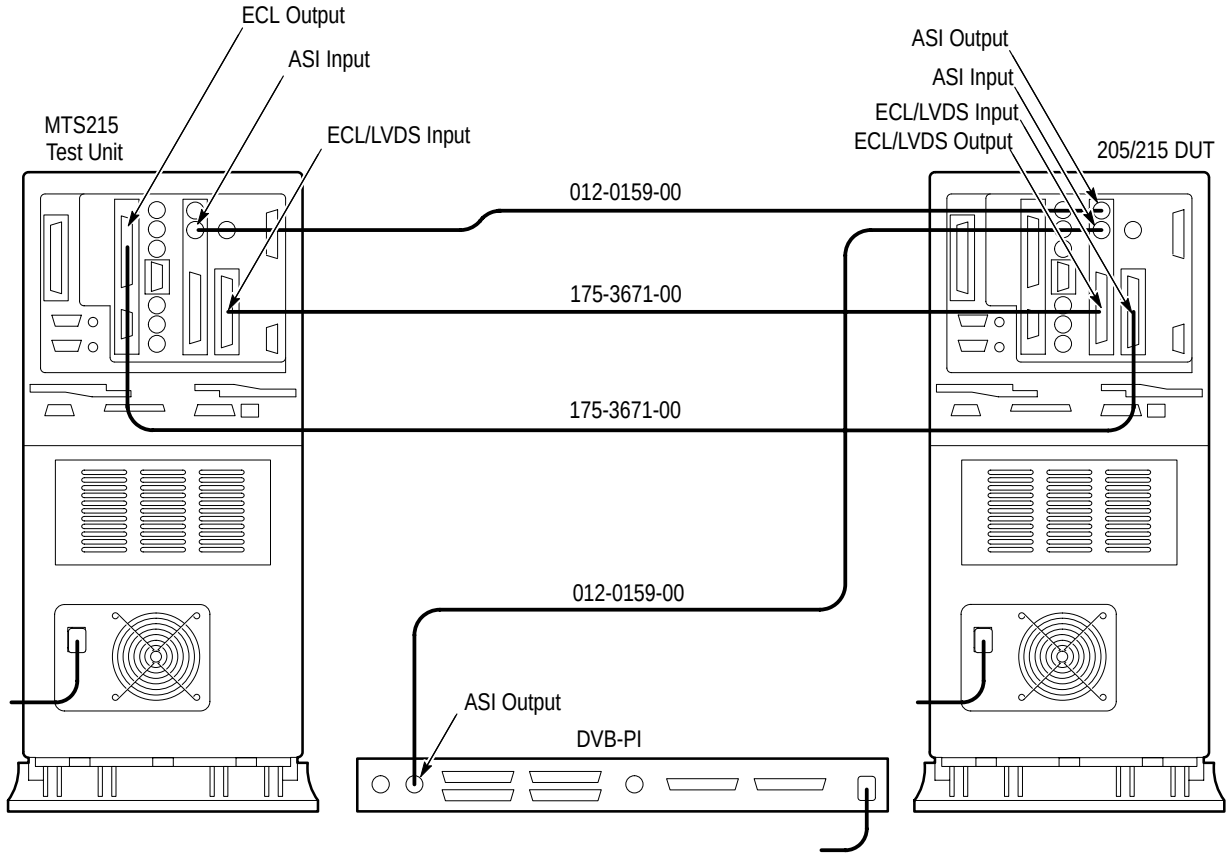



**Figure 4–33: Interconnections for verifying Modified ECL input**

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-hand 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-hand pane 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 4–87; 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 4–89.

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 4–89.

1. Connect the equipment as shown in Figure 4–34. Refer to *Equipment Required* on Page 4–67 for cable descriptions.

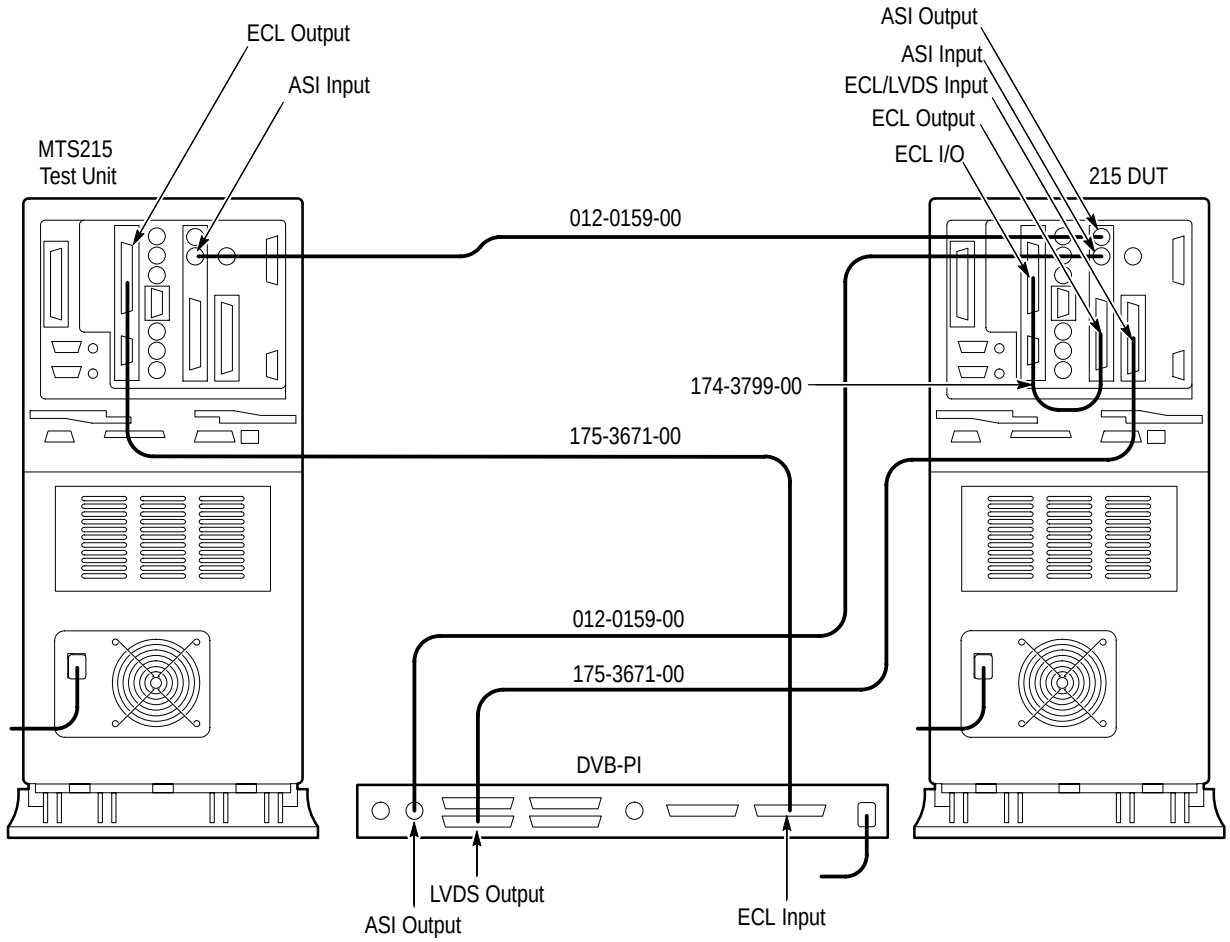



**Figure 4–34: Interconnections for verifying data capture**

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 resulting **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 4–87.

1. Connect the equipment as shown in Figure 4–34 on page 4–87.
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-hand pane.
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 oscilloscope 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 Ω
   - 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 MΩ
- 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 MΩ
- 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 the Verifications Streams Disc 1 of 2 (supplied with this 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 Verification Streams Disc 1.

7. Remove Verification Streams Disc 1 from the CD ROM drive and replace it with Verification Streams Disc 2 of 2.

8. Repeat steps **2**, **4**, and **5** for both files on Disc 2.

## Creating the the Reference System Configuration Profile “test1”

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.

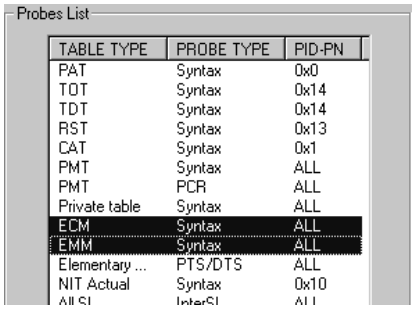
4. Click the General tab of the **Settings** window and then select **DVB**.

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**.

# Performance Verification, SSI System

This section contains procedures for verifying that the Synchronous Serial Interface system meets the performance requirements listed in the *Specifications* section.

***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.*

## Equipment Required

Table 4–6 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 4–6, the equipment must meet or exceed the tolerances.

**Table 4–6: Required equipment list**

| Test equipment | Minimum requirements | Example |
|---|---|---|
| MPEG test System | SSI capable | MTS215 Opt SS |
| Oscilloscope | Capable of measuring 6 V amplitude and 1.4 ns rise time | Tektronix TDS 784A |
| Shielded cable, 75 Ω | BNC-to-BNC, 72 in | Tektronix part number 012-0159-01 |
| Adapter cable, 50 Ω | SMB-to-BNC | Tektronix part number 174-3578-00 |
| Terminator, 50 Ω | BNC feedthrough | Tektronix part number 011–0049-01 |
| Terminator, 75 Ω | BNC feedthrough | Tektronix part number 011–0103-02 |
| Scope adjustment tool | Metal tip “tweaker” tool | Tektronix part number 020-0221-02 |

### Testing the SSI board as an SSI Receiver

1. Connect the test equipment as shown in Figure 4–35 and described in the following list:

   Reference machine

   - Connect a 25-conductor cable from the SSI board parallel port to the parallel port of the Data Store board.
   - Connect a cable from the SSI Output BNC of the SSI board to the SSI Input BNC of the SSI board in the DUT.

   Device under test (DUT)

   - Connect a 25-conductor cable from the parallel port of the SSI board to the parallel input of the Real Time Analyzer.

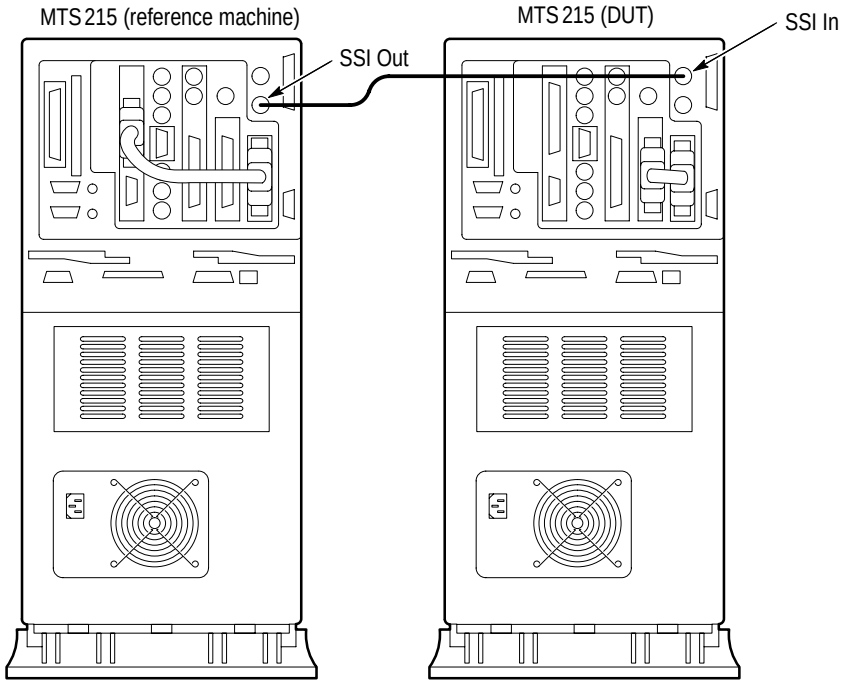



**Figure 4–35: Interconnections for testing an SSI board as an SSI generator**

2. Using the MTS215 reference machine, double-click the **Data Store Administrator** icon in the Tektronix MPEG Test System program group to start the Data Store Administrator application.

3. Select **Sample.trp** from the File Information selection box. (If *Sample.trp* is not present on your Data Store disk, write the file to the disk using the **PC to Board (Write)** File menu selection. See the *Data Store Administrator User Manual* for more information. The file is located in the C:\MTS200\CFG-TRP directory )
4. Select **Generation** from the Acq/Gen menu. The Generation dialog box is displayed.
5. Make the following selections and settings as necessary:
   - Board file = Sample.trp
   - Loop selected
   - Protocol = Master
   - Port = // ECL
   - Output clock = PLL
   - Frequency = 19 392 685 bits per second (bps), the bit rate specified in SMPTE310M for 8VSB
   - Control signals disabled
6. Click **Start**.
7. Using the MTS215 DUT, double-click the **Real-Time Analyzer** icon in the Tektronix MPEG Test System program group to start the RTA application.
8. Select **Settings** from the Configuration menu.
9. In the left-hand panel of the Settings dialog box, select **Analysis** (see Figure 4–36 on page 4–100).

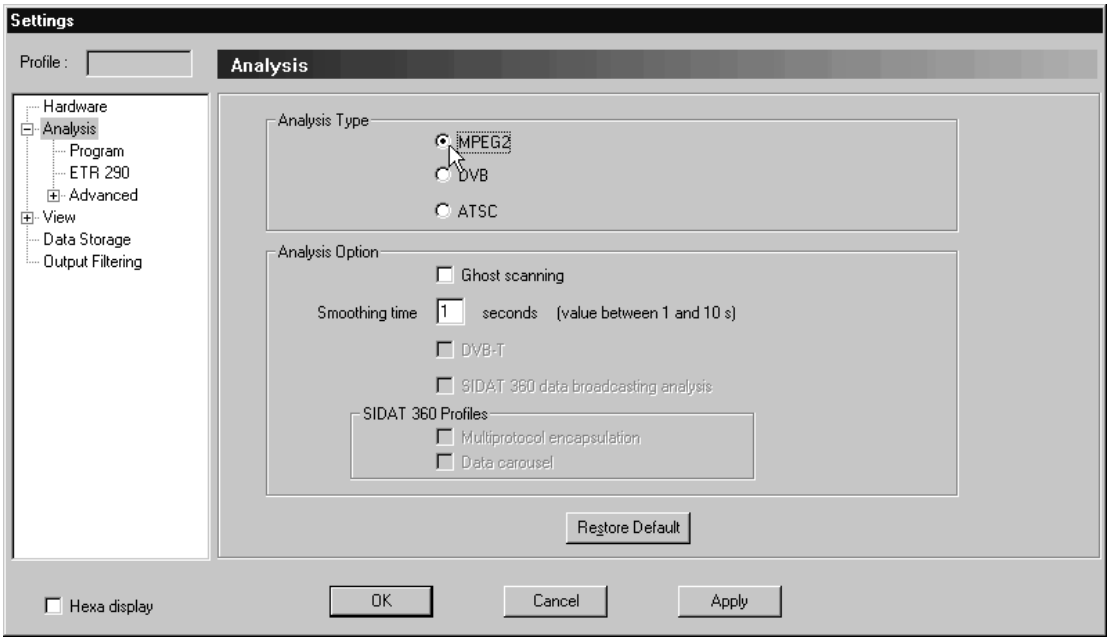



**Figure 4–36: Analysis panel of the Settings dialog box**

10. Select **MPEG** from the Analysis type group.
11. Select **Hardware** from the left-hand pane of the dialog box.
12. Select **DVB-PI (LVDS //) or ECL //** from the Input Type group, and then click **OK** to accept your changes and close the dialog box.
13. Select **Start** from the Analysis menu.
14. Verify that the transport stream is being accurately delivered through the format converter boards by noting the Transmission Rate value indicated in the middle panel of the Report View (see the Figure 4–37).

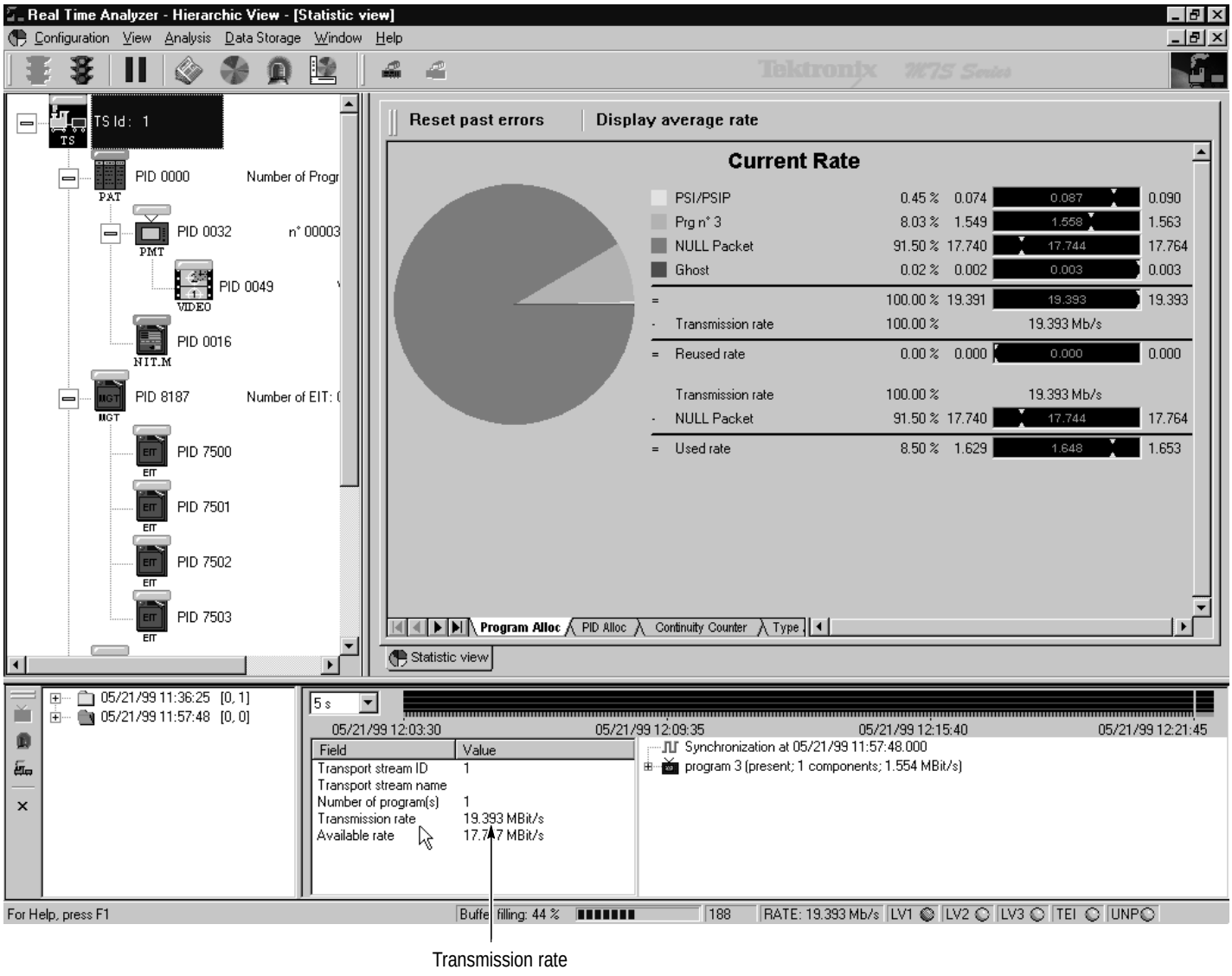



**Figure 4–37: Real-time analyzer showing the transmission rate**

If you need to confirm that the transport stream is being accurately transmitted through the format converter boards, connect the parallel output of the Data Store board (on the reference machine) directly to the parallel input of the RTA on the DUT, and then confirm that the transmission rate is the same.

15. After you are satisfied that the signal is being received accurately by the DUT, stop the real-time analyzer on the DUT (click the red stoplight button on the upper toolbar).
16. Display the Data Store Administrator on the MTS215 reference machine.
17. Select **Stop** from the Acq/Gen menu.
18. Repeat this procedure substituting the following values for the Frequency value listed in step 5:
    - 38 785 317 bps
    - 10 000 000 bps
    - 50 000 000 bps

### Testing the SSI board as an SSI Generator

An MTS205 or MTS215 with an SSI board (format converter board) will be used to receive, convert and analyze the SSI signal from the SSI board under test.

1. Connect the test equipment as shown in Figure 4–38 and described in the following list:

   Device under test (DUT)

   - Connect a 25-conductor cable from the SSI board parallel port to the parallel port of the Data Store board.
   - Connect a cable from the SSI Output BNC of the SSI board being tested to the SSI Input BNC of the SSI board in the receiving machine.

   Receiving machine

   - Connect a 25-conductor cable from the SSI receiver board to the parallel input of the Real Time Analyzer.

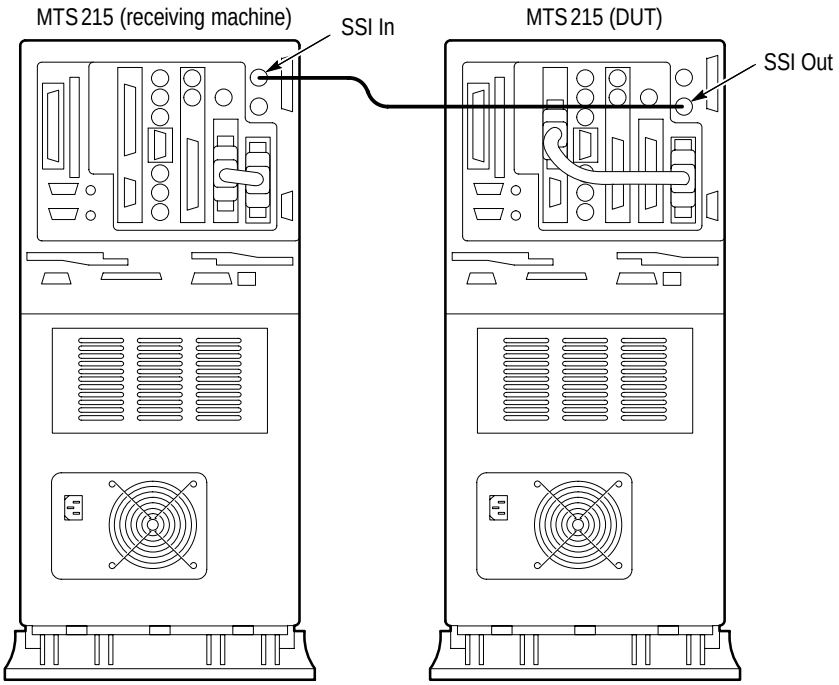



**Figure 4–38: Interconnections for testing an SSI board as an SSI generator**

2. Using the MTS215 DUT, double-click the **Data Store Administrator** icon in the Tektronix MPEG Test System program group to start the Data Store Administrator application.
3. Select **Sample.trp** from the File Information selection box.

4. Select **Generation** from the Acq/Gen menu. The Generation dialog box is displayed.
5. Make the following selections and settings as necessary:
   - Board file = Sample.trp
   - Loop selected
   - Protocol = Master
   - Port = // ECL
   - Output clock = PLL
   - Frequency = 19 392 685 bps
   - Control signals disabled
6. Click **Start**.
7. Using the MTS215 receiving machine, double-click the **Real-Time Analyzer** icon in the Tektronix MPEG Test System program group to start the RTA application.
8. Select **Settings** from the Configuration menu.
9. In the left-hand panel of the Settings dialog box, select **Analysis** (see Figure 4–36 on page 4–100).
10. Select **MPEG** from the Analysis type group.
11. Select **Hardware** from the left-hand pane of the dialog box.
12. Select **DVB-PI (LVDS //) or ECL //** from the Input Type group, and then click **OK** to accept your changes and close the dialog box.
13. Select **Start** from the Analysis menu.
14. Verify that the transport stream is being accurately delivered through the format converter boards by noting the Transmission Rate value indicated in the middle panel of the Report View (see the Figure 4–37 on page 4–101).

    If you need to confirm that the transport stream is being accurately transmitted through the format converter boards, connect the parallel output of the Data Store board (on the DUT) directly to the parallel input of the RTA on the receiving machine, and then confirm that the transmission rate is the same.

15. After you are satisfied that the signal is being generated accurately by the DUT, stop the real-time analyzer on the reference machine (click the red stoplight button on the upper toolbar).

16. Display the Data Store Administrator on the MTS215 DUT.

17. Select **Stop** from the Acq/Gen menu.

18. Repeat this procedure substituting the following values for the Frequency value listed in step 5:

    - 38 785 317 bps
    - 10 000 000 bps
    - 50 000 000 bps

### SSI Output Signal Amplitude Procedure

1. From the Data Store Administrator application on the DUT, select **Generation** from the Acq/Gen menu.
2. Make the following selections and settings as necessary:
   - Board file = Sample.trp
   - Loop selected
   - Protocol = Master
   - Port = // ECL
   - Output clock = PLL
   - Frequency = 10 000 000 bps
   - Control signals disabled
3. Click **Start**.
4. Remove the cable from the SSI Input BNC on the receiving machine (from the last procedure) and connect it to an oscilloscope using a 75Ω feed through terminator, as shown in Figure 4–39.

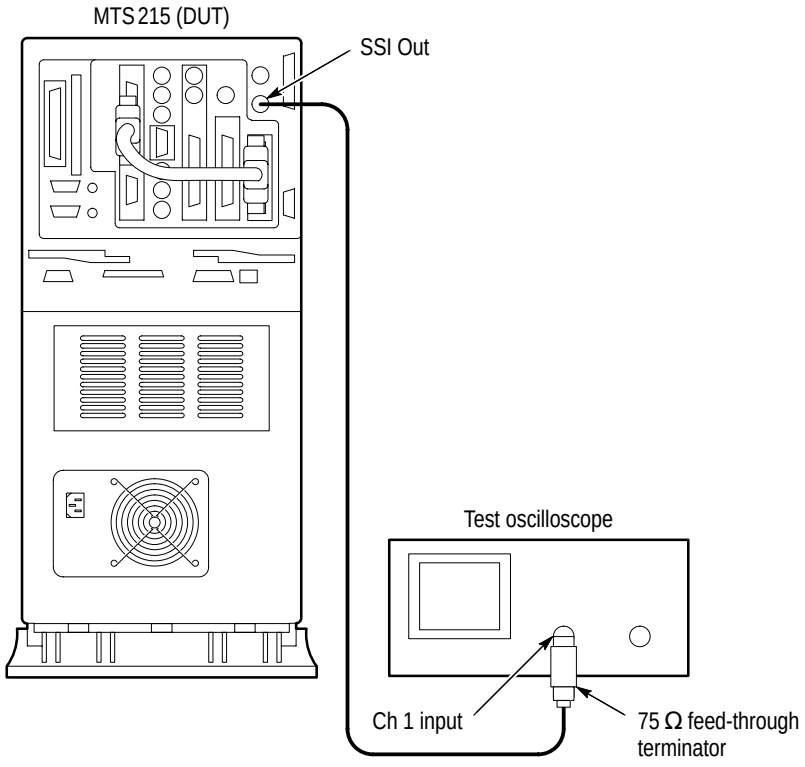



**Figure 4–39: Interconnections for measuring SSI output signal amplitude**

5. Set the time/per/div to 20 ns and adjust the triggering to obtain an eye pattern display.

6. Verify a signal amplitude:

   - For SMPTE 310M signals, 800 mV, ± 10% p/p (720 mV min, 880 mV max)

   - For DVB signals, 1.0 V, ± 10% p/p (900 mV min, 1100 mV max)

7. If the amplitude is not within specifications, adjust R168 on the SSI circuit board as necessary (see *SSI Output Signal Amplitude Adjustment* on page 5–15).

## Measuring the SSI Bit Rate Accuracy

The SSI bit rate specified by SMPTE310M for 8VSB is 19,392,658 bits/s +/- 54 bits/s (2.8ppm). In the following procedure the bit rate accuracy will be measured and adjusted, if necessary, at 20,000,00 bits/s.

***NOTE.*** *The bit rate from the SSI converter board is dependant on the bit rate of the parallel source (in this case, the Data Store board).*

1. Remove the 25-conductor cable installed between the parallel port of the Data Store board and the parallel port of the SSI board under test.
2. Connect a frequency counter to the TTL Clock output on the Data Store board using a 50Ω SMB to BNC adapter cable. See Figure 4–40.

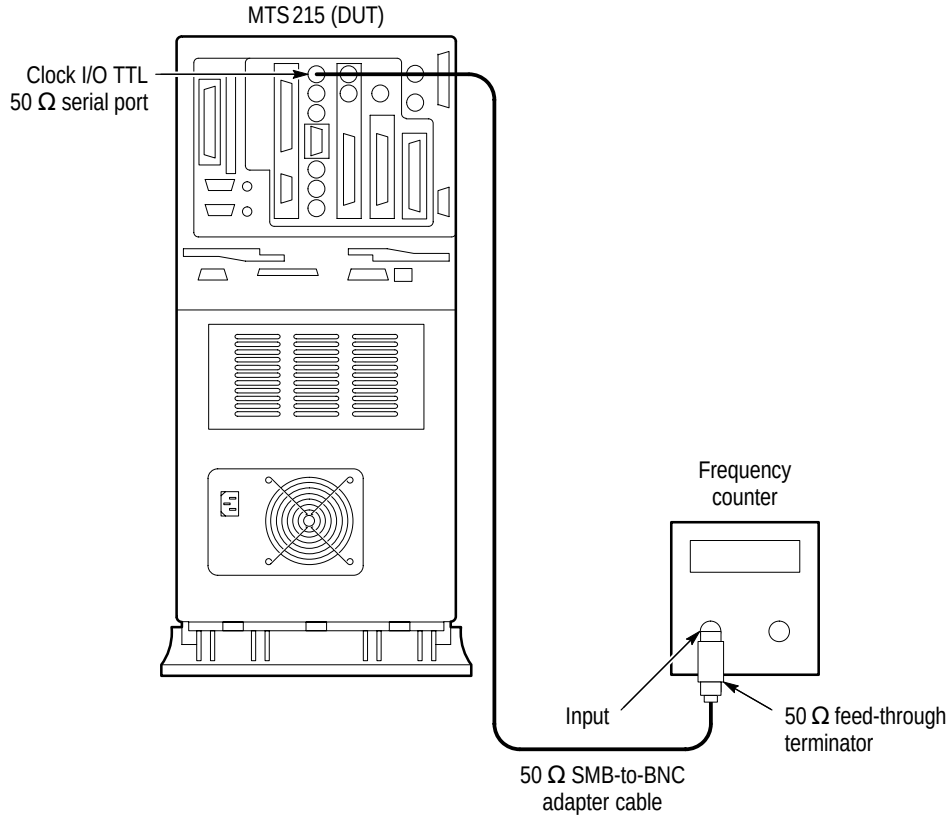



**Figure 4–40: Interconnection for measuring bit rate accuracy**

3. Using the Data Store Administrator on the MTS215/210 under test, select **Generation** from the Acq/Gen menu and output a transport stream using the following settings:
   - Board file = Sample.trp
   - Looping = enabled
   - Protocol = Master
   - Port = TTL, this setting is different from the other procedures
   - Output clock = PLL
   - Frequency = 20 000 000 bps
4. Check that the frequency counter readout shows 20,000,000 MHz +/- 56 Hz.

If the measurement is not within +/- 56 Hz of the center frequency of 20,000,000 Mhz, note the error in +/- number of Hz from the center frequency. Use the *Bit Rate Frequency (VCO) Adjustment* procedure beginning on page 5–10 to adjust the frequency.

# Adjustment Procedures

# Adjustment Procedures

This section contains the following procedures:

- *8.448 MHz Oscillator Frequency Adjustment*, beginning on page 5–2
- *Bit Rate Frequency (VCO) Adjustment*, beginning on page 5–10
- *SSI Output Signal Amplitude Adjustment*, beginning on page 5–15

The first two procedures show you how to remove and replace the Data Store and SCSI Controller circuit boards. You can access the adjustment on the SSI board from the top of the test system ( you do not need to remove the circuit board).

If these adjustments do not bring the test system into specifications, refer to the *Maintenance* section for circuit board replacement instructions.

***WARNING.*** *Review the general and service safety summaries provided at the beginning of this manual. Only qualified service personnel should perform these procedures.*

## Equipment Required

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

**Table 5–1: Required equipment list**

| Test Equipment | Characteristic | Example |
|---|---|---|
| 50 Ω SMB to BNC adapter cable | | Tektronix part number 174-3578-00 (shipped as a 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 |

**Table 5–1: Required equipment list (Cont.)**

| Test Equipment | Characteristic | Example |
|---|---|---|
| MPEG test System | SSI capable | MTS215 Opt SS |
| Shielded cable, 75 Ω | BNC-to-BNC, 72 in | Tektronix part number 012-0159-XX |

## 8.448 MHz 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. Therefore, 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. See the *Using the Data Store Administrator* section of the Deferred-Time Applications user manual for more information.

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

If the MPEG Test System is powered on, close all applications and log off of Windows NT before continuing.

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

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

## Remove the Data Store Circuit Board

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

***CAUTION.*** *You cannot remove the Data Store circuit board with the SCSI cables installed.*

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

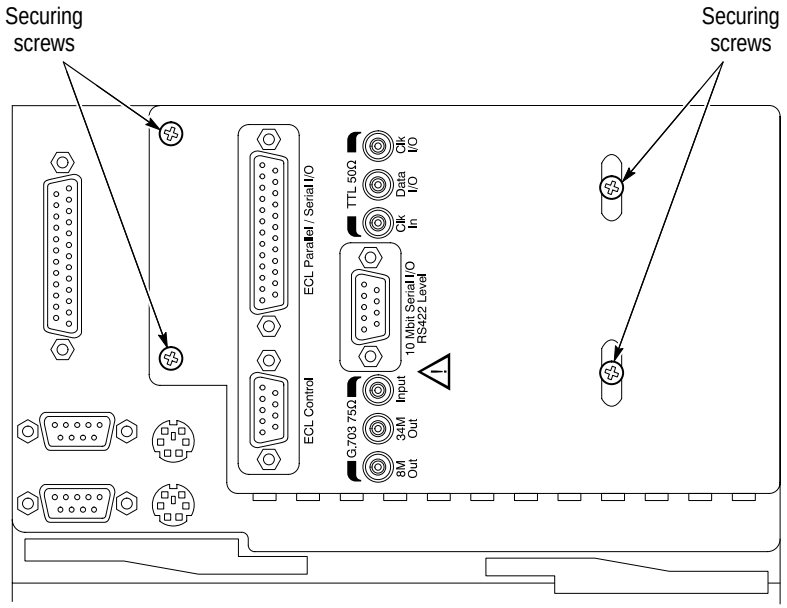



**Figure 5–1: Rear panel securing screws (MTS205 shown)**

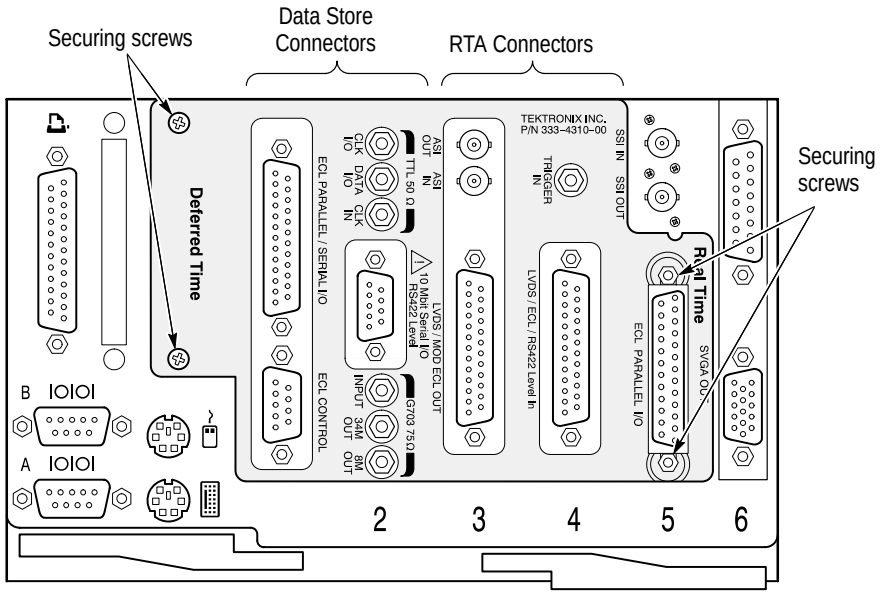



**Figure 5–2: MTS215 rear panel securing screws (SSI option installed)**

4. Use a screwdriver with a T-15 Torx tip to remove the securing screws that hold the Data Store and Filter circuit board mounting bracket to the server cage.

5. Unplug the four SCSI cables from the SCSI controller circuit boards. See Figure 5–3.

---

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

---

6. Grasp the circuit board near its front and back corners. Pull the circuit board straight up. It may be hard to disconnect the board from the EISA bus connector. You can pull on the front and rear of the board alternately to loosen the connector.

7. After the EISA bus connector is disengaged, carefully guide the SMB connectors past the rear edge of the server card cage as you lift the Data Store board out.

8. Place circuit board assembly on a static-free surface, such as a static grounding work station.

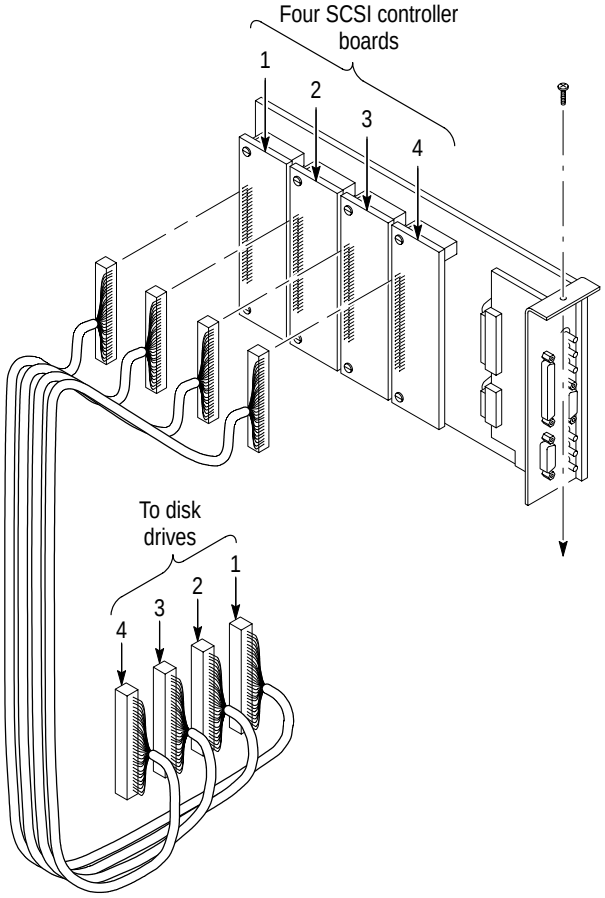



**Figure 5–3: Removing the Data Store circuit board**

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

### Remove the SCSI controller Board

The adjustment is located beneath the SCSI controller circuit board shown in Figure 5–4. Use the following procedure to remove the SCSI controller board:

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

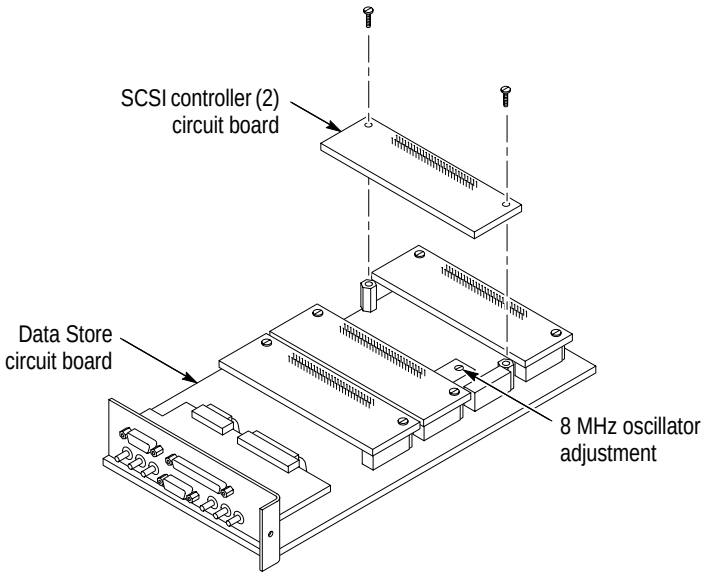



**Figure 5–4: Location of the 8.448 MHz oscillator adjustment**

### Reinstall the Data Store Circuit Board

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

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

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

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

## Power On Procedure

After the Data Store circuit board is temporarily installed, turn the Tektronix 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 5–5.

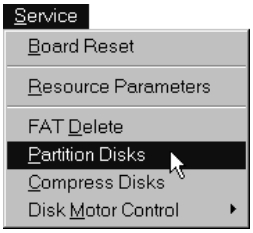



**Figure 5–5: The Service menu**

2. The **Partitioning** dialog box opens. Select Single shot from the **Partition type** list box.

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

## Adjust the Oscillator

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

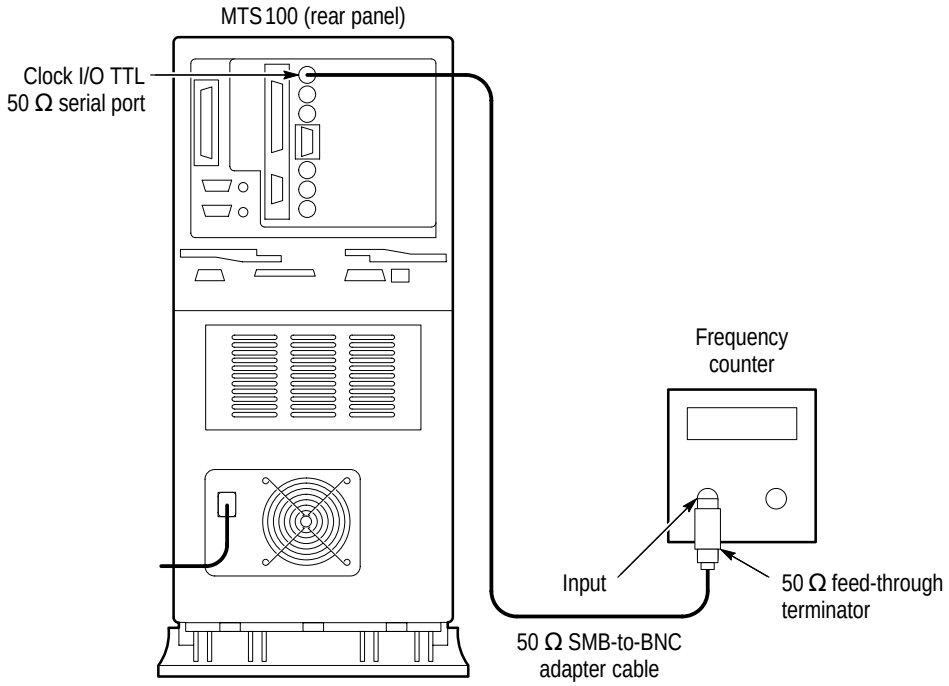



**Figure 5–6: Setup for adjusting the clock frequency**

2. In the 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.

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

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

## Reassemble the Test System

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

1. Exit the Data Store Administrator application.

2. Shut down Windows NT and then switch the Tektronix 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 MPEG Test System rear panel.

5. Replace the instrument top panel.

### Repartition the Data Store disks

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

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

This concludes the oscillator adjustment procedure.

## Bit Rate Frequency (VCO) 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. Therefore, 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. See the *Using the Data Store Administrator* section of the Deferred-Time Applications user manual for more information.

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

If the MPEG Test System is powered on, close all applications and log off of Windows NT before continuing.

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

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

## Remove the Data Store Circuit Board

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

***WARNING.*** *You cannot remove the Data Store circuit board with the SCSI cables installed.*

1. Be sure that you are wearing a static grounding wrist strap.
2. Unplug all rear-panel cables from the Data Store connectors. Also disconnect the AC power cord from the server receptacle.
3. Remove the four screws that secure the rear panel to the server cage frame (see Figure 5–7). Tilt the bottom of the rear panel out to clear the board slot screws and remove the rear panel.

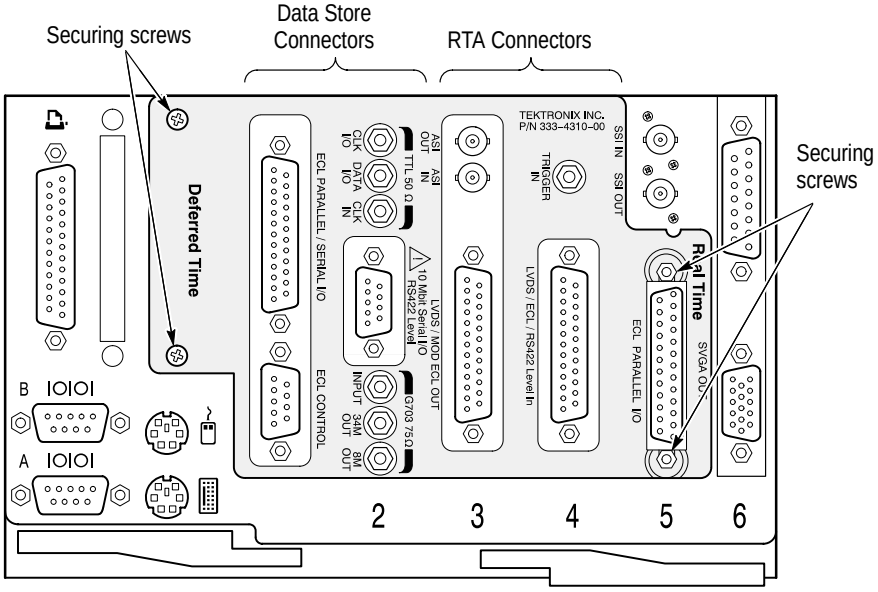



**Figure 5–7: MTS215 rear panel securing screws (SSI option installed)**

4. Use a screwdriver with a T-15 Torx tip to remove the securing screws that hold the Data Store and Filter circuit board mounting bracket to the server cage.

5. Unplug the four SCSI cables from the SCSI controller circuit boards. See Figure 5–8.

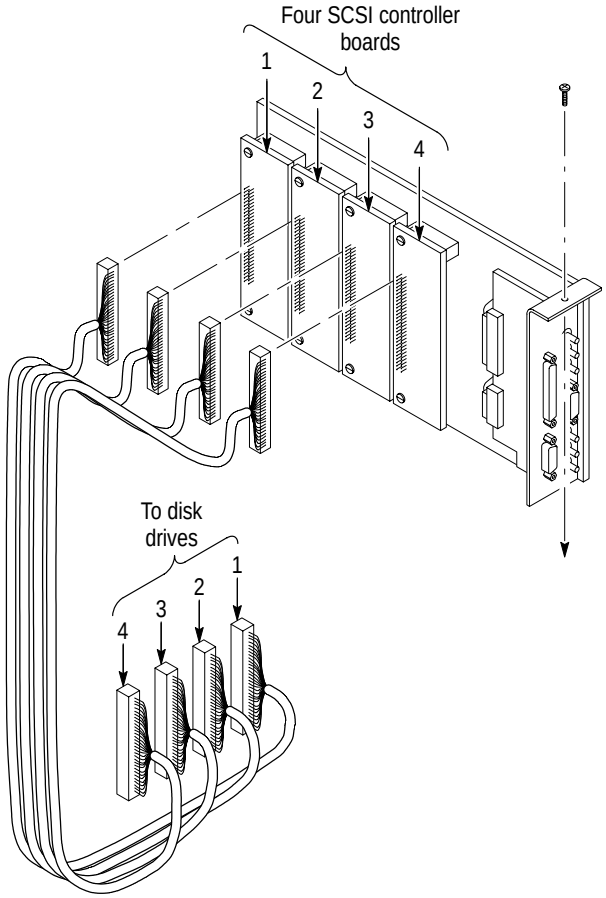



**Figure 5–8: Removing the Data Store circuit board**

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

6. Grasp the circuit board near its front and back corners. Pull the circuit board straight up. It may be hard to disconnect the board from the EISA bus

connector. You can pull on the front and rear of the board alternately to loosen the connector.

7. After the EISA bus connector is disengaged, carefully guide the SMB connectors past the rear edge of the server card cage as you lift the Data Store board out.

8. Place circuit board assembly on a static-free surface, such as a static grounding work station.

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

### Adjust the VCO

1. Remove the two screws that secure the SCSI Controller Daughter circuit board (2) to the Data Store circuit board. See Figure 5–9.

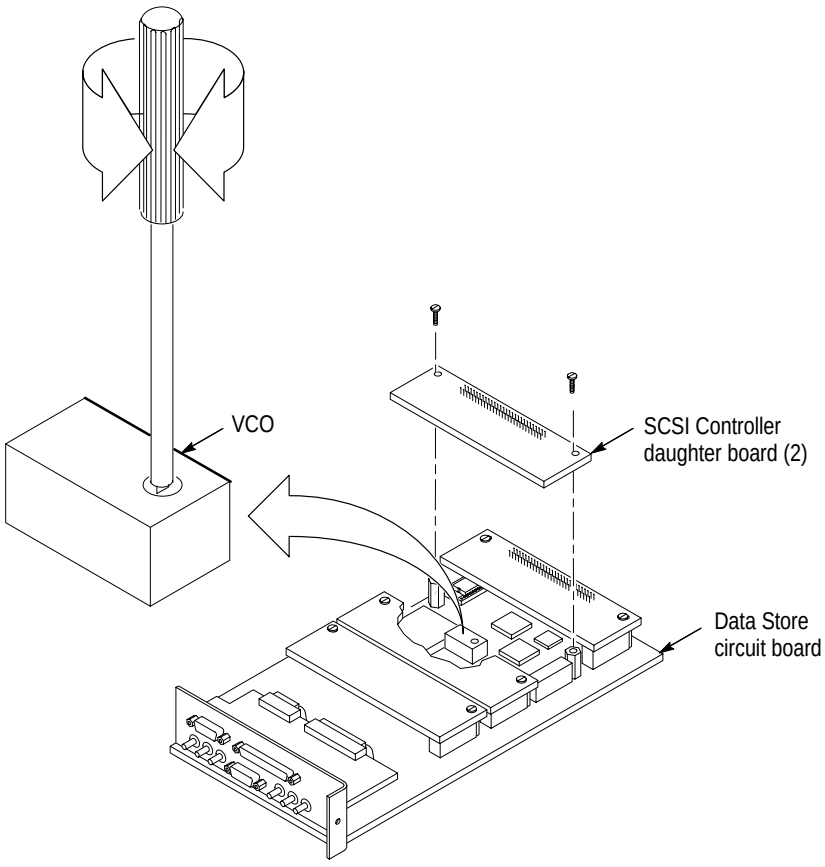



**Figure 5–9: Location of VCO on the Data Store circuit board with SCSI Controller Daughter circuit board removed**

2. Remove the SCSI Controller Daughter circuit board; gently lift the board while rocking it back and forth.
3. Locate the metal cased VCO. The cover has a frequency marking of 16.896 MHz.
4. With the aid of a light, look into the adjustment hole on the top of the metal case and note the position of the screwdriver adjustment slot.
5. Using a small diameter adjustment tool, rotate the adjustment approximately 30 degrees for each 40 Hz from center frequency (20,000,000 MHz). 30 degrees is equivalent to the hour increments on the face of an analog clock. Clockwise rotation will decrease the frequency and counter-clockwise will increase the frequency.
6. Reassemble the Data Store assembly, ensuring that the SCSI cables are installed correctly.

### Reinstall the Data Store Circuit Board

1. Move the four SCSI cables out of the way so that you can reinstall the Data Store/Filter circuit board assembly.
2. Align the circuit board with the cage guides for the second slot.
3. Carefully slide the circuit board into the slot. You will have to guide the SMB connectors around the edge of the computer circuit board cage as you lower the assembly. Do not plug the board into the EISA connector at this time.
4. Reconnect the SCSI cable (1) to the SCSI Controller (1) circuit board first. Align the connector with the receptacle and push in on the connector top and bottom to seat it.
5. Align the circuit board edge connector with the fixed connector in the circuit board cage.
6. Push the circuit board down firmly but carefully until the edge connector seats. You may have to alternately wiggle and press down on the front and rear of the circuit board to seat it completely.

7. Reattach the remaining SCSI cables to the SCSI Controller Daughter circuit board connectors.
8. Install the screw that secures the board assembly retaining bracket to the circuit board cage. Firmly tighten the screw.
9. Measure the bit rate accuracy again. If the reading is not within the tolerance, repeat the adjustment procedure.
10. When the bit rate accuracy is within tolerance, reattach the rear panel. Do not overtighten; over tightening will bend the rear panel.
11. Replace the top panel.

### Repartition the Data Store disks

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

This concludes the oscillator adjustment procedure.

## SSI Output Signal Amplitude Adjustment

SMPTE 310M specifies an SSI signal amplitude of 800 mV ± 10%, and this is the default amplitude setting. The DVB standard specifies a signal amplitude of 1.0 V ± 10%. This procedure adjusts the peak-to-peak amplitude for an 800 mV (SMPTE 310M) signal, but you can use the same procedure for a 1 V (DVB) signal.

To change the signal amplitude to 1.0 V, change the jumper on J5 to pins two and three. See to Figure 5–10 on page 5–16.

1. To make the following adjustment you need to expose the top of the SSI circuit board. See *Removing the server top panel* on page 6–4 for instructions.
2. Verify that S1 is in position zero and that the jumper on J5 (AMPL SEL) is installed on pins one and two. See Figure 5–10 for the location of the switch and jumper.

3. Verify a signal amplitude of 800 mV, $\pm 10\%_{p\text{-}p}$ (720 mV min, 880 mV max).
4. Adjust the potentiometer, R168, on the SSI circuit board as necessary (see Figure 5–10).
5. Replace the top panel after you have completed the adjustments.

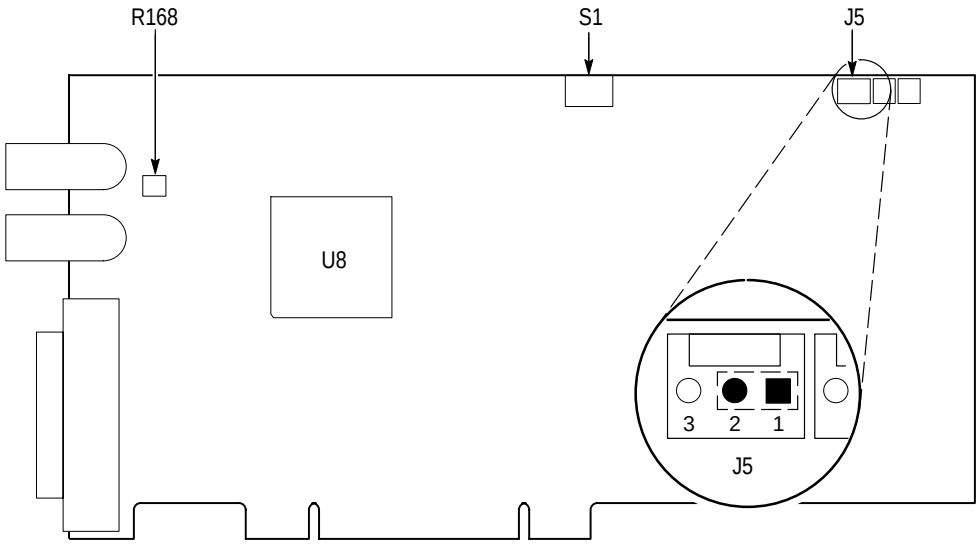



**Figure 5–10: SSI circuit board showing location of S1, J5, and R168**

This concludes the SSI output amplitude adjustment procedure.

# Maintenance

# Maintenance

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

## Preparation

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

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

## Handling Static-Sensitive Components

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

**Table 6–1: Static susceptibility**

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

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

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

## Cleaning and Inspection

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

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

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

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

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

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

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

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

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

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

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

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

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

## Removal and Replacement Instructions

The following procedures tell you how to remove and replace the Data Store circuit board, the Data Store disks, the Real-Time Analyzer circuit board assembly, and the video card. You can find part numbers for all these assemblies in the *Replaceable Parts List*. In compliance with the EISA standard, the Data Store circuit board and its associated SCSI Controller circuit boards are in the server card cage accessible with the top server cover removed. The Data Store hard disk drives are in the server front access drive bays.

### Recommended Tools

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

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

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

### Accessing the Top Card Cage

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

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

**Removing the server top panel.** One knurled thumbscrew holds the top panel in place. In most cases it is only finger-tight; if necessary, use a coin in the slot for added leverage. The panel thumbscrews for the top and left side panels are located in the front of the server behind the front door.

1. Open the front door of the server. It may be necessary to first unlock the door.
2. Completely loosen the knurled screw that holds the top panel in place.
3. Slide the top panel toward the rear of the instrument about 0.75 in (1.9 cm).
4. Disengage the top panel tabs from the top of the server by sliding the top panel out about 0.375 in (1 cm).
5. Lift up and remove the top panel to gain access to the server EISA/PCI card cage. See Figure 6–1.

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

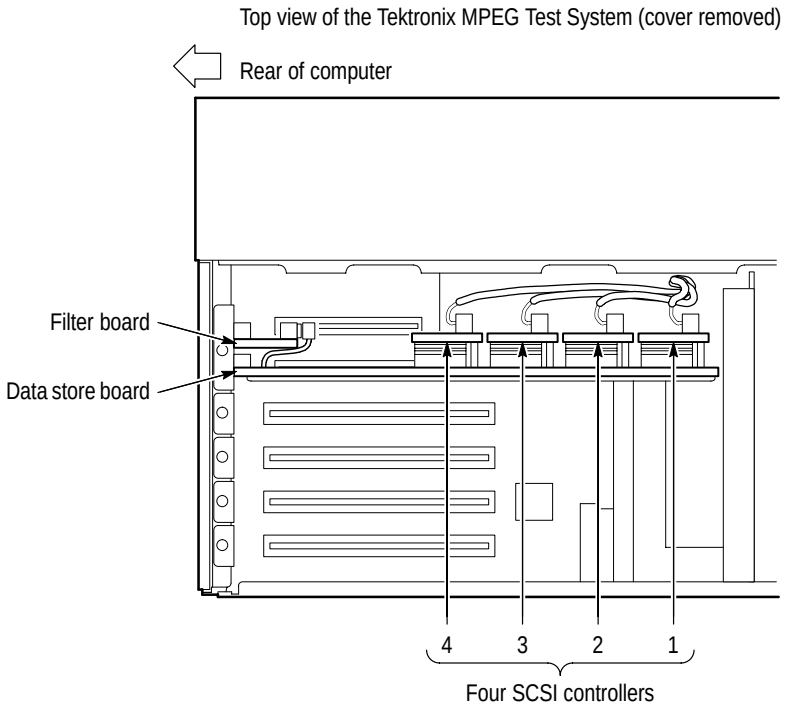



**Figure 6–1: Top view of the server**

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

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

## Removing the Data Store Circuit Board

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

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

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

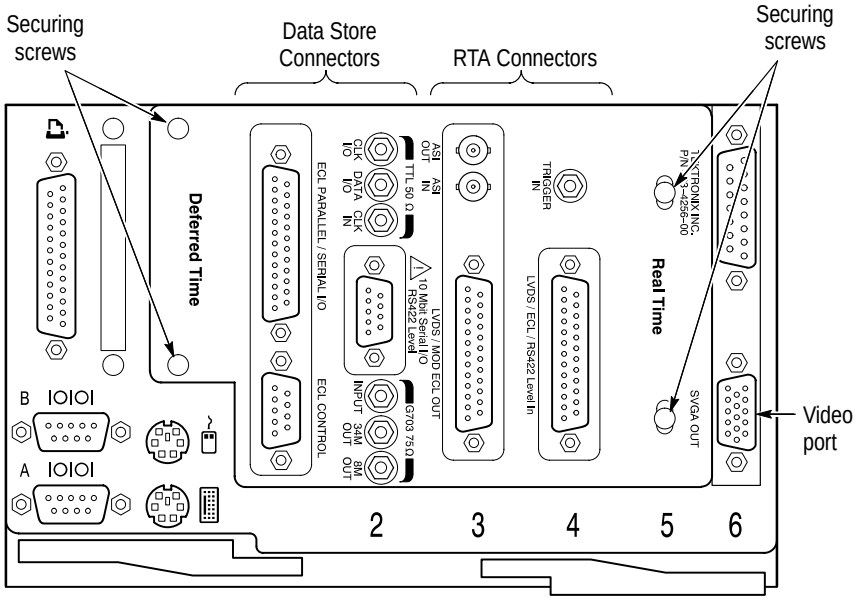



**Figure 6–2: MPEG Test System rear panel securing screws**

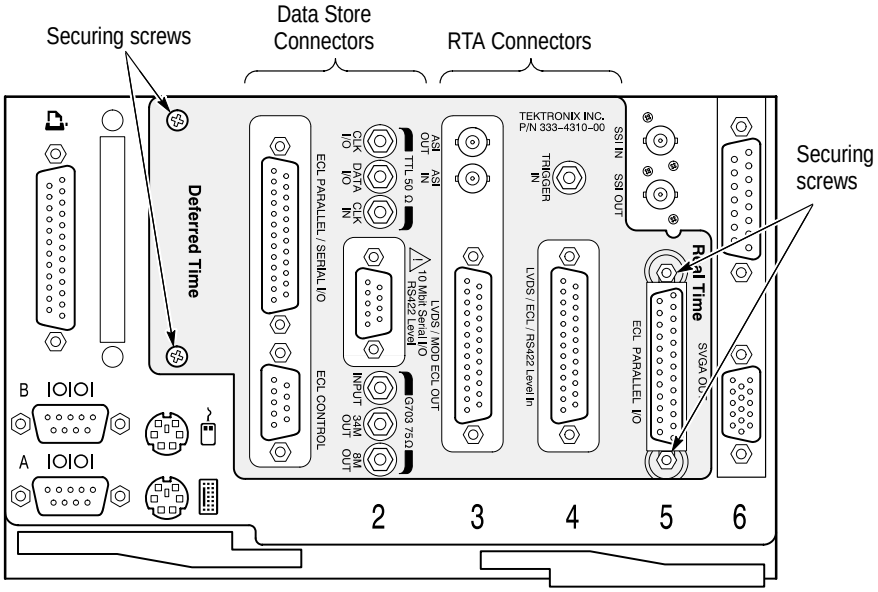



**Figure 6–3: MPEG Test System rear panel securing screws (SSI option installed)**

**4.** Use a screwdriver with a T-15 Torx tip to remove the securing screw that holds the Data Store and Filter circuit board mounting bracket to the server cage. There may be two screws used to secure the board in place.

5. Unplug the four SCSI cables from the SCSI Controller circuit boards. See Figure 6–4.

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

6. Grasp the circuit board near its front and back corners. Pull the circuit board straight up. It may be hard to disconnect the board from the EISA bus connector. You can pull on the front and rear of the board alternately to loosen the connector.

7. After the EISA bus connector is disengaged, carefully guide the SMB connectors past the rear edge of the server card cage as you lift the Data Store board out.

8. Place circuit board assembly on a static-free surface, such as a static grounding work station.

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

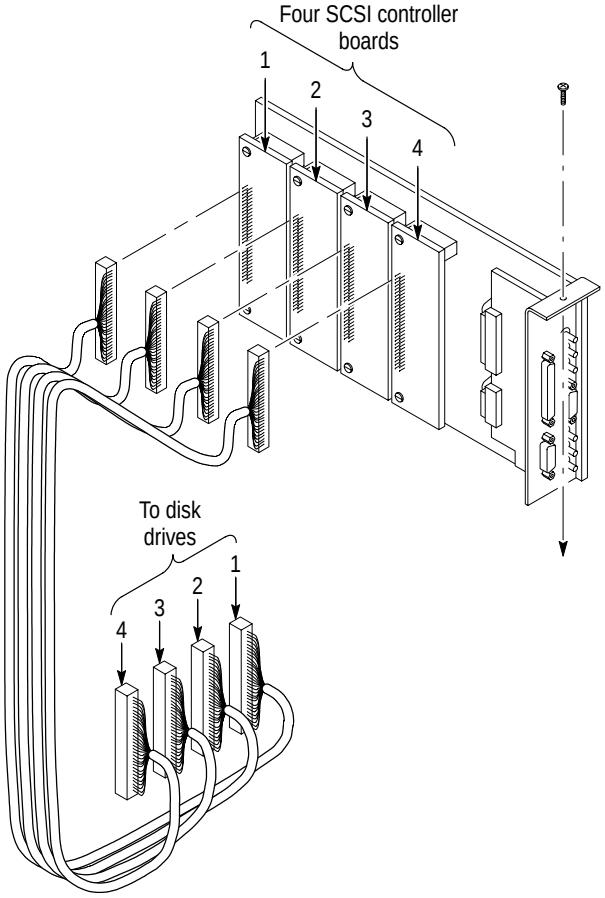



**Figure 6–4: Removing the Data Store circuit board**

## Reinstalling the Data Store Circuit Board

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

1. Wear a static grounding wrist strap when handling circuit boards; take special care not to touch IC leads.
2. Grasp the circuit board near the front and back corners.
3. Align the circuit boards with the cage guides for the second slot. See Figure 6–1 on page 6–5.
4. Carefully slide the circuit board into the slot. You will have to guide the SMB connectors on the circuit board around the edge of the server cage as the board is lowered into the slot. Do not plug the board into the EISA connector yet.

5. Reconnect the first SCSI (1) cable to the first SCSI Controller board (1). You can lift the Data Store board up part way to assist in reconnecting this connector.

6. Align the circuit board edge connector with the fixed connector in the cage.

7. Push the card in firmly but carefully until the edge connector is seated. You may have to wiggle the card some and alternately press down on the front and rear of the card to get it to seat completely.

8. Reattach the remaining SCSI cables to the SCSI Controller connectors. See Figure 6–4 for the correct order. Align the connectors with the receptacles and push in on the top and bottom of the SCSI connector to seat them.

9. Use a screwdriver with a T-15 Torx tip to install the screw(s) securing the circuit board mounting bracket to the server circuit board cage and firmly tighten.

10. Reattach the MPEG Test System rear panel. Tilt the top of the rear panel in to clear the screws holding in the slot panels and hold the panel in place to install the four screws to hold the rear panel on. Only slightly tighten these screws; over tightening them can bend the rear panel.

11. Reconnect the signal I/O cables to their rear panel connectors.

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

## Removing/Reinstalling the RTA Board

The Real-Time Analyzer board occupies slots 3 and 4 of test systems with real-time analysis capability.

1. Be sure that you are wearing a static grounding wrist strap and that test system power is switched off.
2. Remove the top panel of the server to access the expansion slots; see *Removing the server top panel* on page 6–4.
3. Remove any cables that are attached to the Data Store, SSI and RTA connectors and remove the four screws that hold the rear panel to the server; see Figure 6–2 and 6–3.
4. Tilt the bottom of the rear panel out to clear the board slot screws and remove the rear panel.
5. From the top of the computer, remove the T-15 Torx-head screws that hold the RTA circuit board (slot 4) and connector bracket (slot 3) to the back edge of the server card cage.
6. Carefully remove the RTA circuit board and connector bracket from the card cage. You will have to rock the board slightly (first lift the rear, then the front of the board) to disengage it from the EISA bus connector.
7. To reinstall the RTA board, reverse steps 2 through 6. Refer to *Reinstalling the server top panel* on page 6–5, if necessary, for detailed instructions.

## Removing/Reinstalling the SSI Board

The Synchronous Serial Interface (SSI) board occupies slot 5 of test systems with SSI capability.

1. Be sure that you are wearing a static grounding wrist strap and that test system power is switched off.
2. Remove the top panel of the server to access the expansion slots; see *Removing the server top panel* on page 6–4.
3. Remove any external cables that are attached to the Data Store, SSI and RTA connectors and remove the four screws that hold the rear panel to the server. See Figure 6–3 on page 6–7 for location of rear panel securing screws.
4. Tilt the bottom of the rear panel out to clear the board slot screws and remove the rear panel.
5. From the top of the computer, remove the T-15 Torx-head screw that holds the SSI circuit board (slot 5) to the back edge of the server card cage. See Figure 6–5.

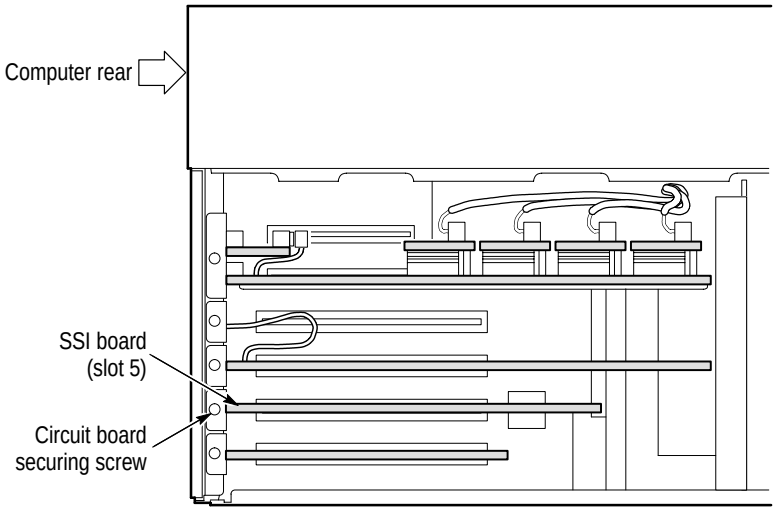



**Figure 6–5: Top view of the Proliant computer (MTS215 shown) showing SSI board location**

6. Carefully remove the SSI circuit board from the card cage. You will have to rock the board slightly (first lift the rear, then the front of the board) to disengage it from the EISA bus connector.

7. To reinstall the SSI board, reverse steps 2 through 6. Refer to *Reinstalling the server top panel* on page 6–5, if necessary, for detailed instructions.

## Removing/Reinstalling the Video Card

A video card is installed in slot 6 of newer test systems (serial number B070000 and above) and instruments that have received upgrade kits MTS1F01 or MTS1F03.

1. Be sure that you are wearing a static grounding wrist strap and that test system power is switched off.

2. Remove the top panel of the server to access the expansion slots; see *Removing the server top panel* on page 6–4.

3. Remove the video cable from the video port.

4. From the top of the computer, remove the T-15 Torx-head screw that secures the video card to the back edge of the server card cage.

5. 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.

6. To reinstall the video card, reverse steps 2 through 5. Refer to *Reinstalling the server top panel* on page 6–5, if necessary, for detailed instructions.

## Removing a Data Store Hard Disk

The Data Store disks reside in the server front access disk bay. The server side panel must be removed to access the power cable and the SCSI cables to the drives. Each of the drives has its own SCSI cable to the Data Store circuit board and a connection to the disk drive power cable. See Figure 6–7.

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

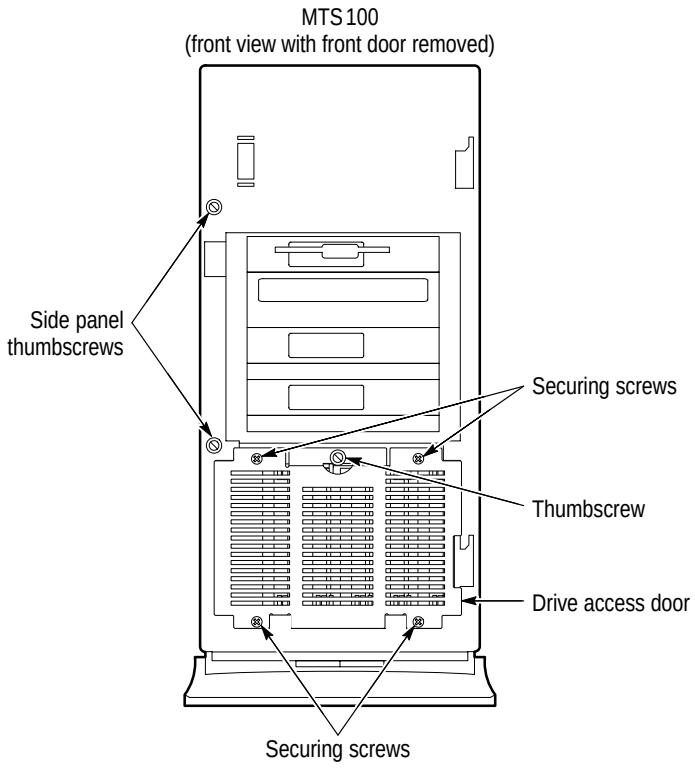



**Figure 6–6: Front of server shown disk drive access**

4. Loosen completely the two captive thumb screws securing the left side cover to the server chassis. In most cases they are only finger-tight; if necessary, use a coin in the slot for added leverage to loosen them.
5. Slide the side cover back about 1 inch to disengage the tabs on the side cover from the slots in the server chassis and remove the side cover.

**6.** Unplug the disk drive power plug of the drive or drives being removed. See Figure 6–7. More than one can be removed to gain better access to any connector being disconnected.

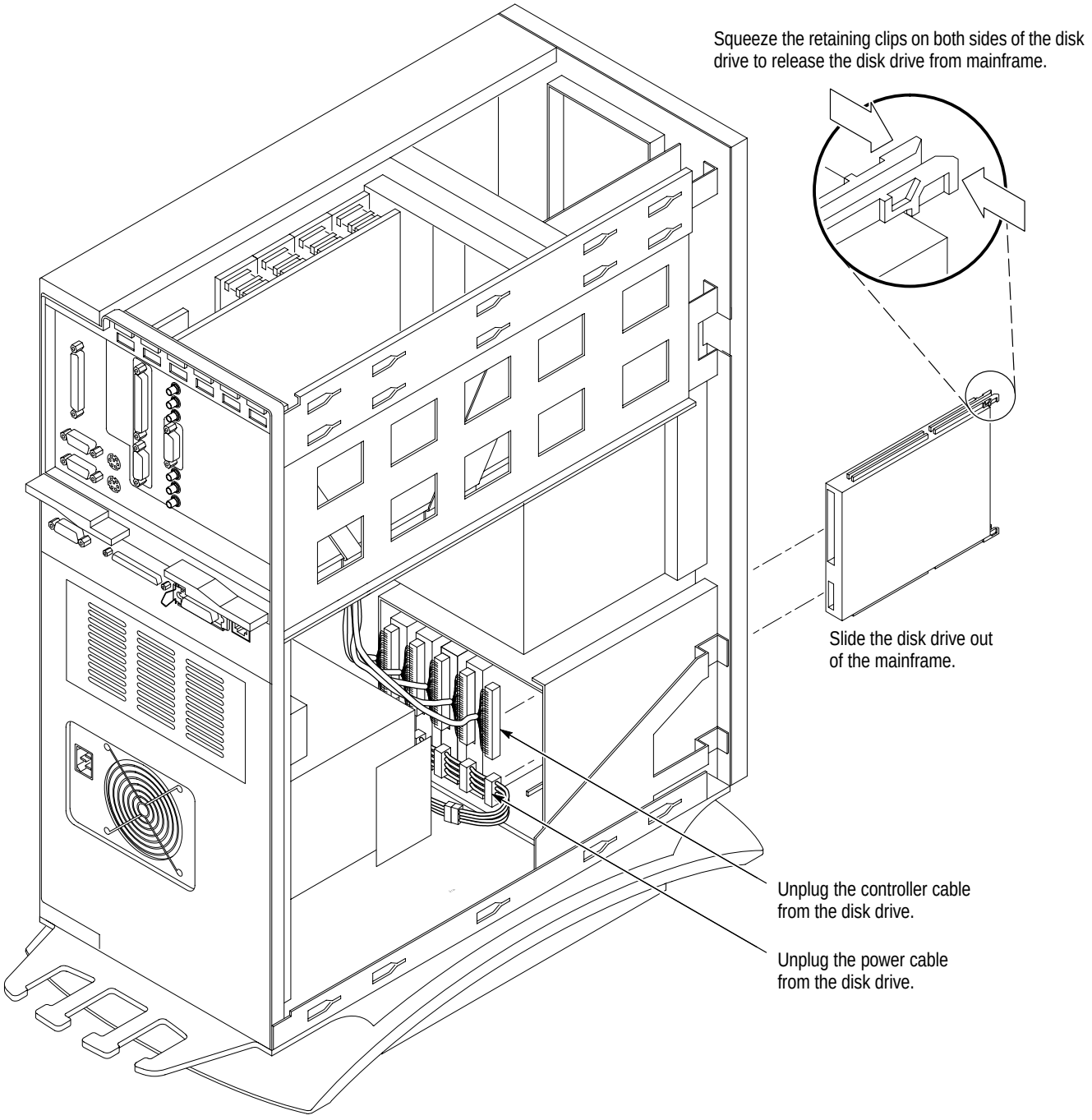



**Figure 6–7: Removing Data Store hard disk drives**

7. Unplug the SCSI cable of the drive or drives being removed.
8. Grasp the plastic retaining clips that secure the disk drive in the bay (see Figure 6–7). Squeeze the retaining clips and pull the drive straight out about half way.
9. When the disk drive is part way out, place one hand under the drive to support it and pull the drive out of the server.
10. Place the drive on a static free work area.

### Installing a Data Store Hard Disk

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

## Server Diagnostics

The Tektronix MPEG Test System consists of the server computer and the Data Store and/or Real-Time Analyzer hardware (and software) that are added to it. The server has built-in diagnostic routines that ignore the added MPEG Test System circuitry and deal only with the server. The diagnostics check to see that critical items are present and can be accessed.

There are two types of server diagnostics. One is a set of tests that are automatically performed each time that the power is turned on to determine that its hardware is operational. You can access a second, more complete set by pressing **F10** when prompted during system startup.

### Power-On Self-Tests (POST)

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

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

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

### "F10" Diagnostic Routines

To access these system diagnostics, restart the computer and press **F10** when prompted. Press any key to dismiss the first display and open the Main Menu, press the down-arrow key twice to highlight the **Diagnostics and Utilities** selection, and then press ENTER to open the menu. The following routines are called from the Diagnostics and Utilities menu:

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

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

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

## Data Store System Troubleshooting

Shutting down the Tektronix 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 6–20 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 resembles Figure 6–8.

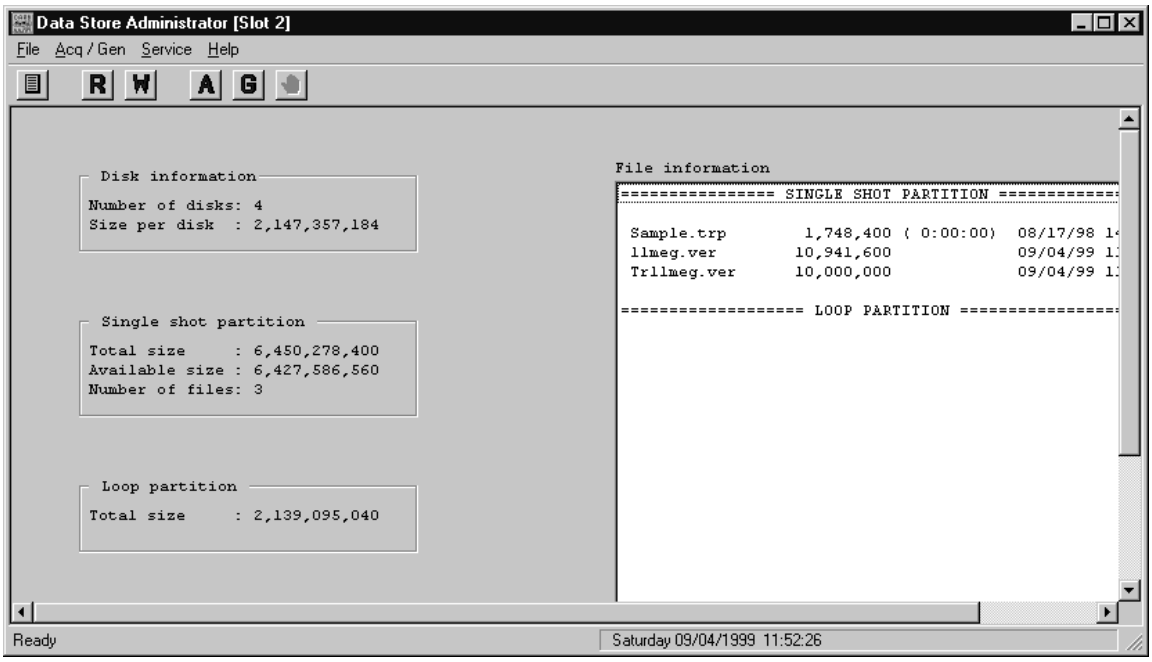



**Figure 6–8: The Data Store Administrator application window**

The following procedures use File and Service menu selections 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 6–9) or by pressing **F5**.

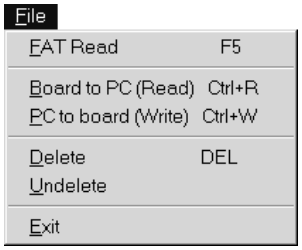



**Figure 6–9: The Data Store Administrator File menu**

The FAT information panels display information about the Data Store disks. See Figure 6–10.

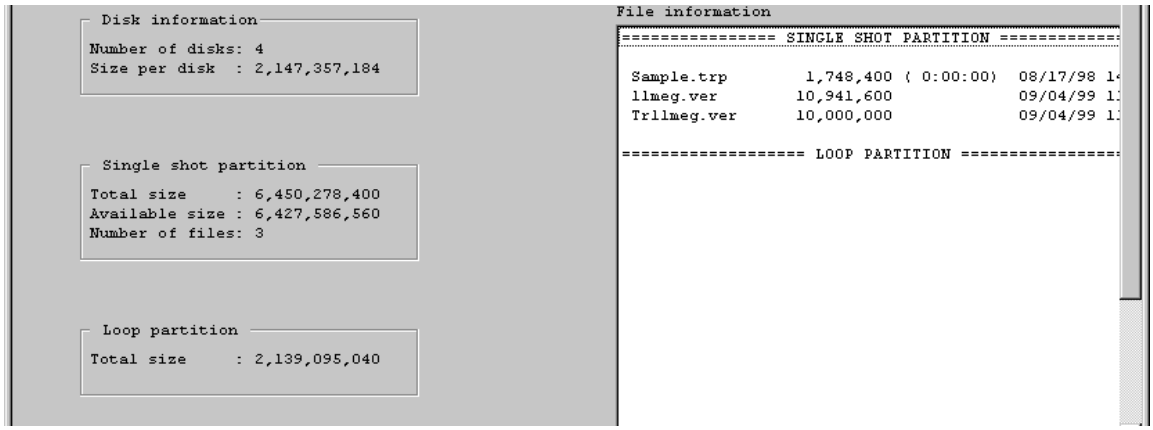



**Figure 6–10: FAT Information**

## 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 **Partitioning** 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 **Partitioning** window shown in Figure 6–11 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**.

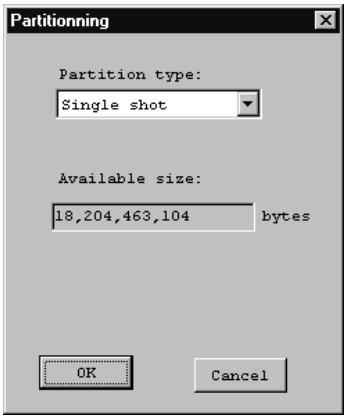



**Figure 6–11: The Partitioning dialog box**

***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 Tektronix 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.*

For the locations of these components, see the exploded diagram on page 8–8.

***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: 1, 2, 3, 4. See Figure 6–12 for the order of the installed disk drives.

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

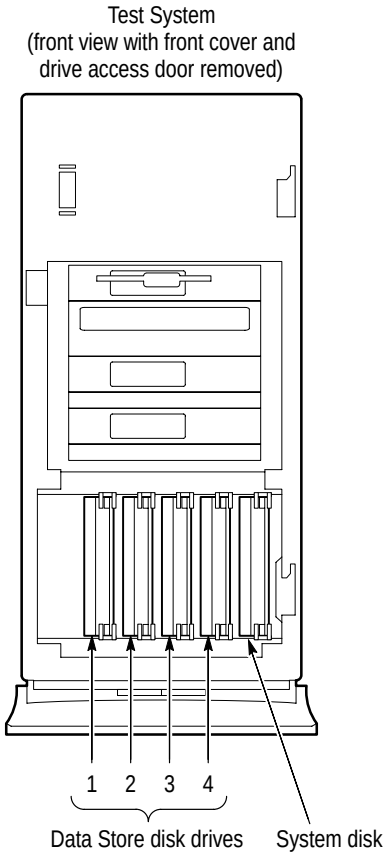



**Figure 6–12: Data Store disk drive order**

The **Disk Information** panel (see Figure 6–10 on page 6–19) 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 (18 Gbyte in instruments with serial numbers above B060000) between test systems. You can loop the output of the generating system to do so.

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

## 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. If the switch settings are correct, please contact Tektronix Customer Service for assistance.

### DIP Switch Settings

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**

| | DIP CA3 | | | | DIP CA2 | | | | DIP CA1 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Position** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** |
| ON | ● | | ● | ● | ● | ● | ● | | | | | |
| OFF | | ● | | | | | | ● | ● | ● | ● | ● |

## SSI Troubleshooting

There are no serviceable parts on the SSI circuit board. If the SSI does not pass the verification tests that begin on page 4–97, verify that S1 is in position 0 and that the jumper on J5 (AMPL SEL) is installed on pins one and two (for SMPTE 310M, 800 $mV_{p-p}$ input ) or pins two and three (for DVB, 1 $V_{p-p}$ input). See Figure 6–13. If you need to adjust the amplitude of the SSI output, refer to *SSI Output Signal Amplitude Adjustment* procedure beginning on page 5–15.

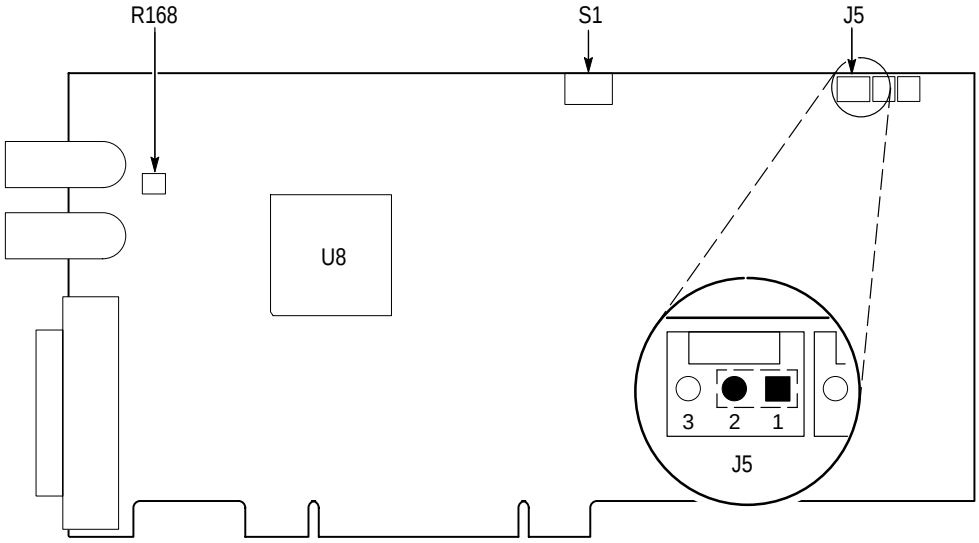



**Figure 6–13: SSI circuit board showing the location of S1 and J5**

If the switch setting and jumper position are correct, please contact Tektronix Customer Service for assistance.

# Repackaging

The MPEG Test System MPEG Test System is shipped in a carton designed to provide it with the maximum protection. If the instrument is subsequently shipped you will need to use this carton and the instrument support inserts to provide adequate protection.

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

## Obtaining Replacement Packaging

New packaging material is available from Tektronix. The part numbers are in Table 6–4. Packaging components are shown in Figure 6–14. Each component has an index number which also appears in Table 6–4. Contact your nearest Tektronix office or representative to obtain new packaging parts.

**Table 6–4: Packaging Material**

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

## Repackaging the Server

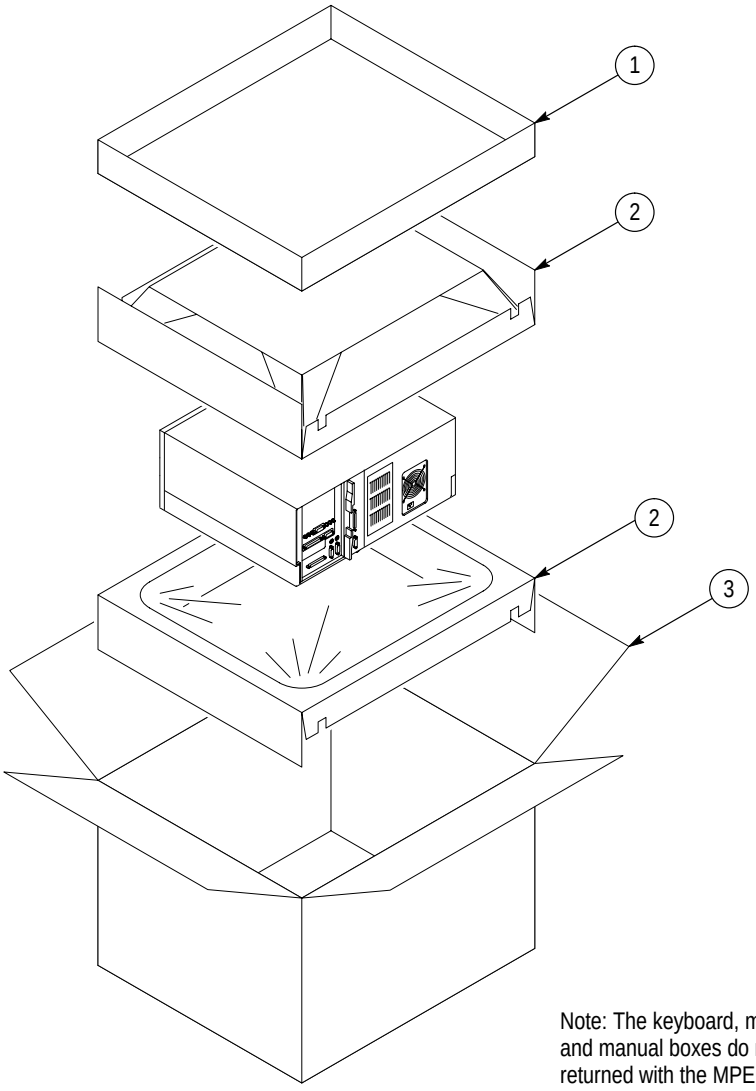
When the server is shipped, it is important to provide it with the maximum protection. Figure 6–14 shows how to repackage the server for shipment. As the figure shows, it is not necessary to have the keyboard, mouse, server front door, or server pedestal in the package for reshipment. However, the server pedestal and front door must be removed from the server for reshipment to prevent damage to the packaging or server parts.

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

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

Remove the server pedestal as follows:

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




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

**Figure 6–14: Repackaging the MPEG Test System server**

# Options

# Options

This section describes the options available for the MTS200 Series MPEG Test System.

**Option 1A** Option 1A includes the MPEG test system with the deferred-time analysis software. This option is available only with MTS210 systems.

**Option 1G** Option 1G includes the MPEG test system with the custom MPEG transport stream generator. This option is available only with MTS210 systems.

**Option AC** Option AC is an application for deferred-time analysis of Dolby Digital (AC-3) audio elementary streams.

**Option AG** Option AG includes the MPEG test system and the software included in options 1A and 1G. This option is available only with MTS210 systems.

**Option CA** Option CA enables the conditional access functionality of the MTS200 Series applications.

**Option ES** Option ES includes the audio and video stream analyzer software. With the Audio Stream Analyzer you can test MPEG-1 and MPEG-2 audio layer I and II specification streams. With the Video Stream Analyzer you can test MPEG-1 and MPEG-2 video elementary streams.

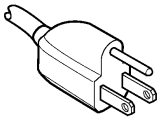
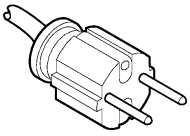
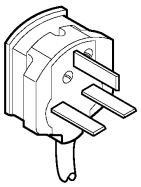
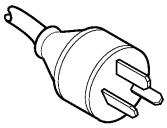
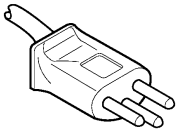
**Option OM** OpenMux is a real-time multiplexer/remultiplexer that can combine one or more elementary streams, program streams, and transport streams into a new multiplex. The application can save the new multiplex to a .trp file on the system disk or output the multiplex directly (without first creating a .trp file) through the Data Store (CARB) system.

**Option PS** Option PS provides the program stream analyzer software. With the MPEG Program Stream Analyzer you can analyze MPEG-2 program streams and MPEG-1 system streams at the pack and PES packet level.

**Option SS** Option SS, synchronous serial interface (SSI), converts MPEG-2 SMPTE 310M compliant synchronous serial transport streams at 19.39 and 38.78 Mbits/s to synchronous parallel ECL output compatible with the the MPEG Test System Data Store and Real-Time Analyzer hardware.

**Option A1, A2, A3, A5** The standard power cord and optional power cords are shown in Table 7–1

**Table 7–1: Power cord options**

| Plug configuration | Normal usage | Option number |
|---|---|---|
|  | North America<br>125 V/15A Plug<br>NEMA 5-15P | Standard |
|  | Europe<br>230 V | A1 |
|  | United Kingdom<br>230 V | A2 |
|  | Australia<br>230 V | A3 |
|  | Switzerland<br>230 V | A5 |

# Replaceable Parts

# Replaceable Parts

This section contains a list of replaceable modules for the various Tektronix MPEG Test Systems based on the Compaq Proliant 2500 and 1600 platforms. 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.

## Module Servicing

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

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

**Module Repair and Return** You may ship your module to us for repair, after which we will return it to you.

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

## Using the Replaceable Parts List

The following table describes each column in the parts list.

**Parts List Column Descriptions**

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

### Abbreviations

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

### Mfr. Code to Manufacturer Cross Index

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

## Manufacturers cross index

| Mfr. code | Manufacturer | Address | City, state, zip code |
|---|---|---|---|
| 060D9 | UNITREK CORPORATION | 3000 COLUMBIA HOUSE BLVD, SUITE 120 | VANCOUVER, WA 98661 |
| 0B445 | ELECTRI–CORD MFG CO INC | 312 EAST MAIN STREET | WESTFIELD, PA 16950 |
| 0J9P9 | GEROME MFG CO INC | PO BOX 737<br>403 NORTH MAIN | NEWBERG, OR 97132 |
| 0JZY4 | RAINBOW TECHNOLOGIES NORTH AMERICA INC | 50 TECHNOLOGY DR | IRVINE, CA 92718–2301 |
| 0KB05 | NORTH STAR NAMEPLATE INC | 5750 NE MOORE COURT | HILLSBORO, OR 97124–6474 |
| 18565 | CHOMERICS INC | 77 DRAGON COURT | WOBURN, MA 01880 |
| 2K262 | BOYD CORPORATION | 6136 NE 87TH AVENUE | PORTLAND, OR 97220 |
| 2W733 | BELDEN WIRE & CABLE COMPANY | 2200 US HWY 27 SOUTH<br>PO BOX 1980 | RICHMOND, IN 47374 |
| 30817 | INSTRUMENT SPECIALTIES CO INC | EXIT 53, RT 80<br>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<br>PO BOX 500 | BEAVERTON, OR 97077–0001 |
| 80126 | PACIFIC ELECTRICORD CO | 747 WEST REDONDO BEACH<br>PO BOX 10 | GARDENA, CA 90247–4203 |
| F7396 | THOMCAST | SUB OF THOMSON CSF GROUP<br>50 RUE DU PRESIDENT SADATE<br>29562 QUIMPOR | CEDEX 9, FR |
| F7396 | MATRA COMMUNICATION | 50 RUE DU PRESIDENT SADATE<br>29562 QUIMPOR | CEDEX 9, FR |
| TK0198 | AVNET INC | AVNET ELECTRONICS MKTG, AMERICA<br>15580 SW JAY STREET | BEAVERTON, OR 97006 |
| TK1547 | MOORE ELECTRONICS INC | 19500 SW 90TH CT<br>PO BOX 1030 | TUALATIN, OR 97062 |
| TK1943 | NEILSEN MANUFACTURING INC | 3501 PORTLAND RD NE | SALEM, OR 97303 |
| TK2383 | PANASONIC INDUSTRIAL CO | 1600 MCCANDLESS DR | MILPITAS, CA 95035 |
| TK2541 | AMERICOR ELECTRONICS LTD | UNIT–H<br>2682 W COYLE AVE | ELK GROVE VILLAGE, IL 60007 |
| TK2548 | XEROX CORPORATION | 14181 SW MILLIKAN WAY | BEAVERTON, OR 97005 |
| TK2607 | VANSTAR CORPORATION | OREGON CORP ACCOUNTS DIVISION<br>16280 SW UPPER BOONES FERRY RD | PORTLAND, OR 97224 |
| TK6075 | ALADDIN SOFTWARE SECURITY INC | 350 FIFTH AVE<br>SUITE 6614 | NEW YORK, NY 10118 |
| TK6108 | KENT H LANDSBERG CO | 27929 SW 95TH, SUITE 101 | WILSONVILLE, OR 97070 |
| 65685 | COMPAQ COMPUTER CORP | 20555 FM 149<br>DEPT M<br>PO BOX 69000 | HOUSTON, TX 77269–2025 |

## Replaceable parts list

| Fig. 8-1 index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name and description | Mfr. code | Mfr. part number |
|---|---|---|---|---|---|---|---|
| –1 | 174–3556–01 | | | 4 | CABLE ASSY, SP:SHLD RIBBON,SCSI,IDC,28 AWG,18L,2X25, 0.1 CTR,RCPT,CTR PLZ,W/FERRITE BOTH ENDS | 80009 | 174–3556–01 |
| –2 | 118–9285–03 | | B049999 | 1 | CKT BD ASSY:DATA STORE,MTS100 | 80009 | 118–9285–03 |
| –2 | 118–9285–04 | B050000 | B059999 | 1 | CKT BD ASSY:DATA STORE,MTS100 | 80009 | 118–9285–04 |
| –2 | 118–9285–05 | B060000 | B089999 | 1 | CKT BD ASSY:DATA STORE, MPEG TEST SYSTEM | F7396 | 118–9285–05 |
| -2 | 118–9285–06 | B090000 | | 1 | CKT BD ASSY:DATA STORE, MPEG TEST SYSTEM | F7396 | 118–9285–06 |
| -2 | 118–9285–07 | B101819 | | 1 | CKT BD ASSY:DATA STORE, MPEG TEST SYSTEM | F7396 | 118–9285–07 |
| | 386–6980–00 | | | 1 | BRACKET:CIRCUIT BD,CRS,4.782 X 1.700 | 80009 | 386–6980–00 |
| –3 | 118–9596–00 | | B089999 | 1 | CIRCUIT BD ASSY:REAL TIME ANALYZER FOR MPEG2; MTS205/MTS215, MTS1F05, MTS2F01, AND MTS2F04 | F7396 | HJ3925BA01 |
| –3 | 118–9596–01 | B090000 | | 1 | CIRCUIT BD ASSY:REAL TIME ANALYZER,MPEG2,EISA, | F7396 | HJ3925BA01 |
| –4 | 039–0040–00 | B070000 | | 1 | VGA CARD:64–BIT PCI GRAPHICS BOARD | TK2607 | MIL/2P/4N |
| –5 | 118–9284–03 | | B069999 | 1 | COMPUTER,PC:PENTIUM,200–MHZ,32MB RAM, CD–ROM, NT4.0,PROLIANT 2500 | TK2607 | 118–9284–03 |
| –5 | 118–9655–00 | B070000 | B079999 | 1 | COMPUTER,PC:PENTIUM,200–MHZ,32MB RAM, 4.55GB HD, CD–ROM,MILLENIUM II/4MBWRAM,NT 4.0,PROLIANT 2500 | TK2607 | 118–9655–00 |
| –5 | 118–9655–01 | B080000 | B090725 | 1 | COMPUTER,PC:PENTIUM II,266 MHZ,64 MB,4.55GB HD, CD–ROM,MILLENIUM II/4 MB WRAM,NT 4.0,PROLIANT 1600 | TK2607 | 118–9655–01 |
| –5 | 118–9655–02 | B090726 | | 1 | COMPUTER,PC:PENTIUM II,300 MHZ,64 MB,4.55 GB HD,CD–ROM,MILLENIUM II VIDEO CARD/4 MB WRAM,NT | TK2607 | 118–9655–02 |
| –6 | 386–7109–00 | B090000 | | 1 | SUPPORT:CIRCUIT BOARD,PORON,W/ADHESIVE,MTS205/MTS210/MTS215, | 2K262 | 386–7109–00 |
| –7 | 213–1094–00 | | | 12 | SCREW,TPG TF:6–32 X 0.250,STL,ZINC,T–15 TORX,TAPTITE | 80009 | 213–1094–00 |
| –8 | 407–4613–00 | B090000 | | 1 | BRACKET,SUPPORT:DRIVE CAGE,STL, | 5Y400 | 407–4613–00 |
| | 334–9691–00 | B080000 | | 1 | MARKER,IDENT:LABEL,MKD,MTS200,2.60 X 4.490,GE LEX-AN, W/ADHESIVE, | 0KB05 | 334–9691–00 |
| | 348–0274–00 | | | 1 | SHLD GSKT,ELEK:FINGER TYPE, 0.5 FT. | 30817 | 97–555–05 |
| | 348–1527–00 | | | 1 | GASKET, WIRE:WIRE MESH,EMI,0.125 H X 0.188 X 0.002 D, 2.5 FT. | 18565 | 6593 |
| –9 | 119–5173–01 | | B059999 | 4 | DISK DRIVE:WINCHESTER,3.5LP,2.15GB,SCSI,8MS | 80009 | 119–5173–01 |
| –9 | 119–5731–01 | B060000 | | 4 | DISK DRIVE:WINCHESTER,3.5 INCH,4.55GB,SCSI | 80009 | 119–5731–01 |
| | 386–6908–00 | | | 8 | BRACKET,SUPPORT:SIDE ACCESS DRIVE CLIPS KIT | 80009 | 386–6908–00 |
| | 211–0951–00 | | | 16 | SCREW:6–32 X 0.25,TORX,STL, DATA STORE DRIVE CLIP | 65685 | 143855–001 |
| –10 | 174–3578–00 | | | 3 | CABLE ASSY,RF:COAXIAL,RFD,50 OHM, 39.5L,SMB,PLUG,FEMALE,CONTACT X BNC, MALE | 80009 | 174–3578–00 |
| –11 | 174–3579–00 | | | 3 | CABLE ASSY, RF:COAX,RFD,75 OHM,39.5L,SMB,PLUG, FEMALE CONTACT X BNC,MALE | 80009 | 174–3579–00 |
| –12 | 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 |
| –13 | 174–3799–00 | | | 1 | CA,ASSY,ELEC:RTA // OUTPUT TO DATA STORE INPUT, MTS215, MTS1F05, MTS2F01, AND MTS2F04 | 060D9 | 174–3799–00 |

## Replaceable parts list (cont.)

| Fig. 8-1 index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name and description | Mfr. code | Mfr. part number |
|---|---|---|---|---|---|---|---|
| –14 | 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 |
| –15 | 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 |
| –16 | 333–4243–00 | | B069999 | 1 | PANEL,REAR:MTS100 | TK1943 | 333–4243–00 |
| –16 | 333–4254–00 | | B090818 | 1 | PANEL,REAR:MTS205 | 5Y400 | 333–4254–00 |
| –16 | 333–4255–00 | | | 1 | PANEL,REAR:MTS210 AND MTS1F03 | 5Y400 | 333–4255–00 |
| –16 | 333–4256–00 | | | 1 | PANEL,REAR:MTS215, MTS1F05, MTS2F01, AND MTS2F04 | 5Y400 | 333–4256–00 |
| –16 | 333–4310–00 | B100819 | | 1 | PANEL,REAR:20 GA CRS,ZINC PLATED | TK1943 | 333–4310–00 |
| –17 | 063–1938–00 | | B089999 | 1 | SOFTWARE ITEM:SOFTWARE PROTECTION DEVICE MEMOHASP–1 (Through MTS SW V2.2) | 80009 | 063–1938–00 |
| –17 | 119–5927–00 | B090000 | | 1 | DONGLE:SOFTWARE PROTECTION DEVICE, SENTINEL SUPERPRO (MTS SW V2.5) | 0JZY4 | SRB00054 |
| –18 | 386–6981–00 | | | 1 | PLATE:REAR PANEL NUTPLATE,CRS,2.7 X 1.375 | 0J9P9 | 386–6981–00 |
| –19 | 386–6974–01 | | | 1 | BRACKET:REAR PANEL MOUNT | 0J9P9 | 386–6974–00 |
| –20 | 213–1094–00 | | | 12 | SCREW,TPG TF:6–32 X 0.250,STL,ZINC,T–15 TORX,TAPTITE | 80009 | 213–1094–00 |
| | | | | | **STANDARD ACCESSORIES** | | |
| | 063–1888–03 | | B069999 | 1 | SOFTWARE PKG:BACKUP DISK,MTS100,VERSION2.1 | 80009 | 063–1888–02 |
| | 063–1912–01 | | | 1 | SOFTWARE PKG:WINDOWS NT 4.0,CDROM | 80009 | 063–1912–01 |
| | 063–1913–00 | | B069999 | 1 | EMERGENCY REPAIR DISK, BLANK,MTS100 | 80009 | 063–1913–00 |
| | 063–1914–00 | | | 1 | SOFTWARE PKG:CDROM STREAM DATA DISK | TK2548 | 063–1914–00 |
| | 063–2927–00 | B070000 | | 1 | SOFTWARE PKG:CD ROM ,STRM102 | TK2548 | 063–2927–00 |
| | 063–2944–00 | B070000 | B089999 | 1 | SOFTWARE PKG:BACKUP DISK,RTA V1.0, CD ROM,MTS205 | TK2548 | 063–2944–00 |
| | 063–2945–00 | B070000 | B089999 | 1 | SOFTWARE PKG:BACKUP DISK,V2.2,CD ROM,MTS210 1A | TK2548 | 063–2945–00 |
| | 063–2946–00 | B070000 | B089999 | 1 | SOFTWARE PKG:BACKUP DISK,V2.2,CD ROM,MTS210 1G | TK2548 | 063–2946–00 |
| | 063–2947–00 | B070000 | B089999 | 1 | SOFTWARE PKG:BACKUP DISK,V2.2/1.0,CD ROM, MTS210 AG/MTS215 | TK2548 | 063–2947–00 |
| | 063–2971–00 | B070000 | | 1 | WINDOWS NT EMERGENCY REPAIR DISK, BLANK | TK2548 | 063–2971–00 |
| | 063–3024–00 | | | 1 | SOFTWARE PKG:MTS200 SERIES,EISA CONFIGURATION,MTS2F01 | TK2548 | 063–3024–00 |
| | 063–3110–00 | B090000 | B090818 | 1 | SOFTWARE PKG:BACKUP DISK,V 2.5,CD ROM,MTS200 SERIES | TK2548 | 063–3110–00 |
| | 063–3110–01 | B100819 | | 1 | SOFTWARE PKG:BACKUP DISK,V 3.0,CD ROM,MTS200 SERIES | TK2548 | 063–3110–01 |
| | 063–3145–00 | | B090818 | 1 | SOFTWARE PKG:MPEG TEST SYSTEM UPGRADE WIZARD,MTS2WIZ | TK2548 | 063–3145–01 |
| | 063–3145–01 | B101819 | | 1 | SOFTWARE PKG:MPEG TEST SYSTEM UPGRADE WIZARD,MTS2WIZ | TK2548 | 063–3145–01 |
| | 063–3158–00 | | | 1 | DATA SHEET:SOFTWARE KEY INFORMATION,SNOWBALL UPGRADE KITS | 80009 | 063–3158–00 |
| | 063–3168–00 | B080671 | | 1 | SOFTWARE PKG:COMPAQ SMARTSTART & SUPPORT SOFTWARE,RELEASE 3.42A,CD ROM, MTS200 SERIES | TK2607 | 063–3168–00 |

## Replaceable parts list (cont.)

| Fig. 8-1 index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name and description | Mfr. code | Mfr. part number |
|---|---|---|---|---|---|---|---|
| | 063–3213–00 | | | 1 | SOFTWARE PKG:BACKUP DISK,V3.0,CD ROM,MTS200 SERIES | TK2548 | 063–3213–00 |
| | 070–9376–04 | B040000 | B049999 | 1 | MANUAL,TECH:USER,MTS100,SOFTWARE V2.0 | 80009 | 070–9376–04 |
| | 070–9376–05 | B050000 | B069999 | 1 | MANUAL,TECH:USER,MTS100,SOFTWARE V2.1 | 80009 | 070–9376–05 |
| | 070–9578–05 | B030000 | B049999 | 1 | MANUAL, TECH:READ THIS FIRST,MTS100, SOFTWARE V2.0 | 80009 | 070–9578–05 |
| | 070–9578–06 | | B069999 | 1 | MANUAL, TECH:READ THIS FIRST,MTS100, SOFTWARE V2.1 | 80009 | 070–9578–06 |
| | 070–9644–01 | B070000 | | 1 | MANUAL,TECH:USERS,STRM100 SERIES | TK2548 | 070–9644–01 |
| | 071–0076–00 | | B089999 | 1 | MANUAL,TECH:USERS,REAL–TIME ANALYZER, V1.0 | TK2548 | 071–0076–00 |
| | 071–0076–01 | B090000 | B090818 | 1 | MANUAL,TECH:USERS,REAL–TIME ANALYZER, V1.1 (MTS205 and MTS215) | TK2548 | 071–0076–01 |
| | 071–0076–02 | B100819 | | 1 | MANUAL,TECH:USERS,REAL–TIME ANALYZER, MTS205 | TK2548 | 071–0076–02 |
| | 071–0078–00 | B070000 | B089999 | 1 | MANUAL,TECH:USERS,MPEG TEST SYSTEM, V2.2 | TK2548 | 071–0078–00 |
| | 071–0078–01 | B090000 | B090818 | 1 | MANUAL,TECH:USERS,MPEG TEST SYSTEM, V2.5 (MTS210 and MTS215) | TK2548 | 071–0078–01 |
| | 071–0079–00 | B070000 | B089999 | 1 | MANUAL,TECH:READ THIS FIRST,MPEG TEST SYSTEM, SOFTWARE V2.2/1.0 | TK2548 | 071–0079–00 |
| | 071–0237–00 | B090000 | | 1 | MANUAL,TECH:READ THIS FIRST,MTS200 SERIES, SOFTWARE V2.5 | TK2548 | 071–0237–00 |
| | 071–0261–00 | B090000 | B090818 | 1 | MANUAL,TECH:MPEG TEST SYSTEM,HARDWARE INSTALLATION & SPECIFICATIONS,COMPAQ PROLIANT | TK2548 | 071–0261–00 |
| | 071–0261–01 | B100819 | | 1 | MANUAL,TECH:MPEG TEST SYSTEM,HARDWARE INSTALLATION & SPECIFICATIONS,COMPAQ PROLIANT | TK2548 | 071–0261–01 |
| | 071–0532–00 | B100819 | | 1 | MANUAL,TECH:USER,SERIES SYSTEM ANALYZER | TK2548 | 071–0532–00 |
| | 071–0534–00 | B100819 | | 1 | MANUAL,TECH:USER,SERIES STREAM CREATION APPLICATIONS | TK2548 | 071–0534–00 |
| | 071–0536–00 | B100819 | | 1 | MANUAL,TECH:USER,SERIES DATA STORE ADMINSTRATOR | TK2548 | 071–0536–00 |
| | 071–0537–00 | | | 1 | MANUAL,TECH:READ THIS FIRST,MPEG TEST SYSTEM SOFTWARE,V3.0 | TK2548 | 071–0537–00 |
| | 119–5696–00 | | | 1 | DISPLAY,MONITOR:17 IN MULTI–SCAN | TK2383 | TX–D7F35R |
| | 006–8148–00 | B090000 | | 1 | ENVELOPE:VINYL,ADHESIVE BACK VINYL,9.0 X 12.0,SHORT SIDE OPENING,CLEAR | TK6108 | Q9F489 |
| | | | | | **OPTIONAL ACCESSORIES** | | |
| | 161–0066–09 | | | 1 | CA ASSY,PWR:3,0.75MM SQ,250V/10A,99 INCH,STR,IEC320, RCPT,EUROPEAN (EUROPEAN OPTION A1 ONLY) | 2W733 | ORDER BY DESCR |
| | 161–0066–10 | | | 1 | CA ASSY,PWR:3,0.1MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT X 13A,FUSED UK PLUG(13A FUSE),UNIT (UNITED KINGDOM OPTION A2 ONLY) | TK2541 | ORDER BY DESCR |
| | 161–0066–11 | | | 1 | CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT,AUSTRALIA (AUSTRALIA OPTION A3 ONLY) | 80126 | ORDER BY DESCR |
| | 161–0154–00 | | | 1 | CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT,SWISS (SWISS OPTION A5 ONLY) | 5F520 | 86515030 |

## Replaceable parts list (cont.)

| Fig. 8-1 index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name and description | Mfr. code | Mfr. part number |
|---|---|---|---|---|---|---|---|
| | 644–0911–00 | | | 1 | RACKMOUNT KIT:CONVERSION KIT,PROLIANT 2500 SERVER,MTS2XX OPT 1R | 65685 | 264367–001 |
| | 071–0384–00 | | | 1 | MANUAL,TECH:USER,PROGRAM STREAM ANALYZER | TK2548 | 071–0384–00 |
| | 071–0151–00 | | | 1 | MANUAL,TECH:SERVICE,MPEG TEST SYSTEM,SERIAL B039999 & BELOW | TK2548 | 071–0151–00 |
| | 071–0152–00 | | B090818 | 1 | MANUAL,TECH:SERVICE,MPEG TEST SYSTEM,COMPAQ PROLIANT PLATFORM | TK2548 | 071–0152–00 |
| | 071–0152–01 | B100819 | | 1 | MANUAL,TECH:SERVICE,MPEG TEST SYSTEM,COMPAQ PROLIANT PLATFORM | TK2548 | 071–0152–00 |
| | 071–0192–00 | | | 1 | MANUAL,TECH:USER,AUDIO STREAM ANALYZER | TK2548 | 071–0192–00 |
| | 071–0249–00 | | | 1 | MANUAL,TECH:USER,VIDEO STREAM ANALYZER | TK2548 | 071–0249–00 |
| | | | | | **UPGRADE KIT INSTRUCTIONS** | | |
| | 075–0165–0X | | | 1 | INSTRUCTION,KIT:V2.0 TO V2.1, 040–1543–00 | TK2548 | 075–0165–0X |
| | 075–0225–0X | | | 1 | INSTRUCTION,KIT:UPGRADE,V2.1 TO V2.2,MTS1F03 | TK2548 | 075–0225–0X |
| | 075–0227–0X | | | 1 | INSTRUCTION,KIT:UPGRADE,V2.1 TO V2.2,MTS1F05 | TK2548 | 075–0227–0X |
| | 075–0329–0X | | | 1 | INSTRUCTION,KIT:UPGRADE,V2.2 TO V3.0,MTS2F25 | TK2548 | 075–0329–0X |
| | 075–0453–0X | | | 1 | INSTRUCTION, KIT:UPGRADE,V2.5 TO V3.O;MTS2F30 | TK2548 | 075–0453–0X |

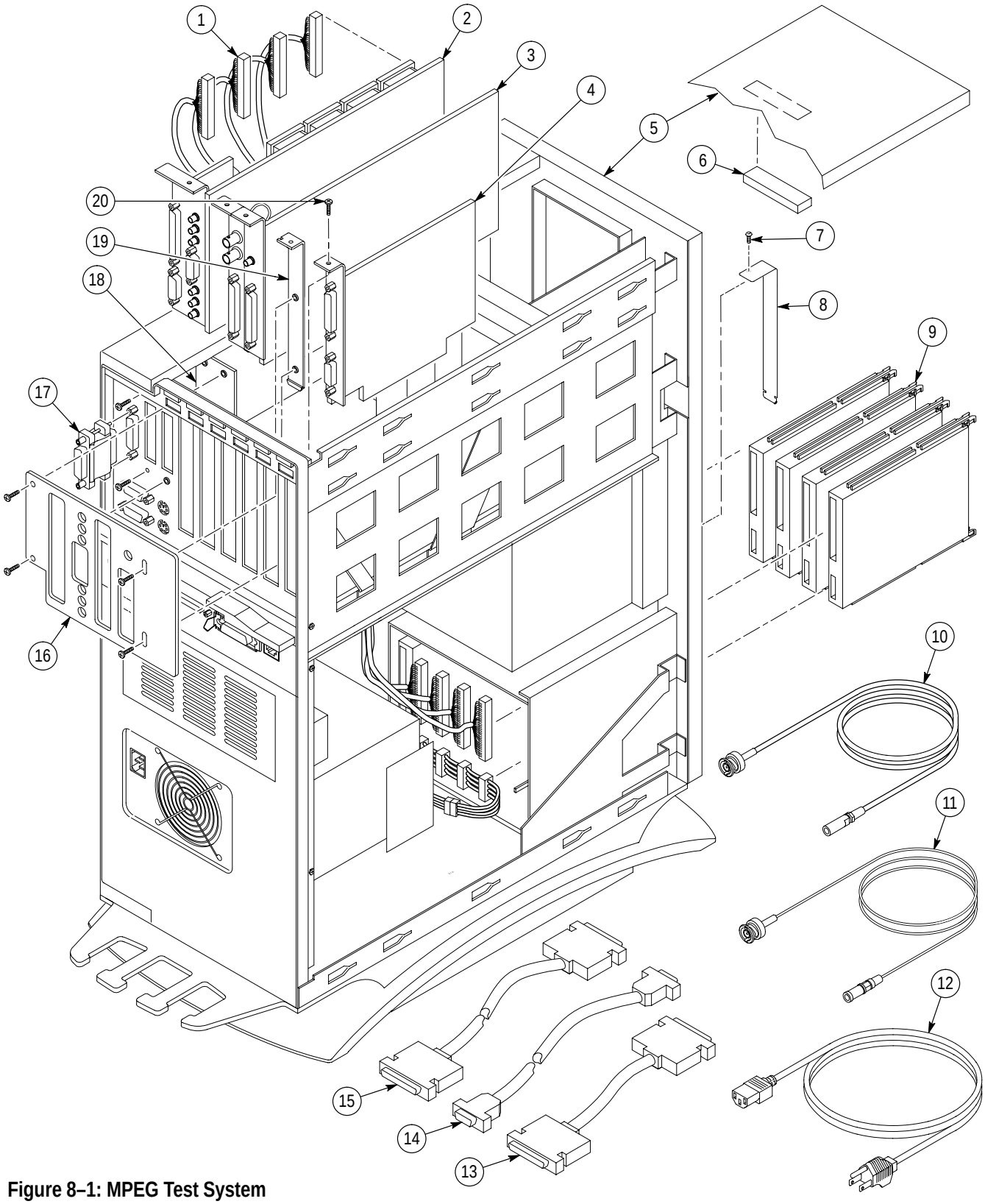



**Figure 8–1: MPEG Test System**

## Replaceable parts list for Option SS

| Fig. 8-2 index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name and description | Mfr. code | Mfr. part number |
|---|---|---|---|---|---|---|---|
| –1 | 671–4473–00 | | | 1 | CIRCUIT BD ASSY:SSI | 80009 | 671–4473–00 |
| –2 | 174–3799–00 | | | 1 | CA,ASSY,ELEC:RIBBON,CD AUDIO,IDC,25,28 AWG,12.0 L,(DSUB,MALE,STR,25 POS,3M 8225–6003) X (DSUB | 060D9 | 174–3799–00 |
| –3 | 333–4310–00 | | | 1 | PANEL,REAR:20 GA CRS,ZINC PLATED,NOVO | TK1943 | 333–4310–00 |

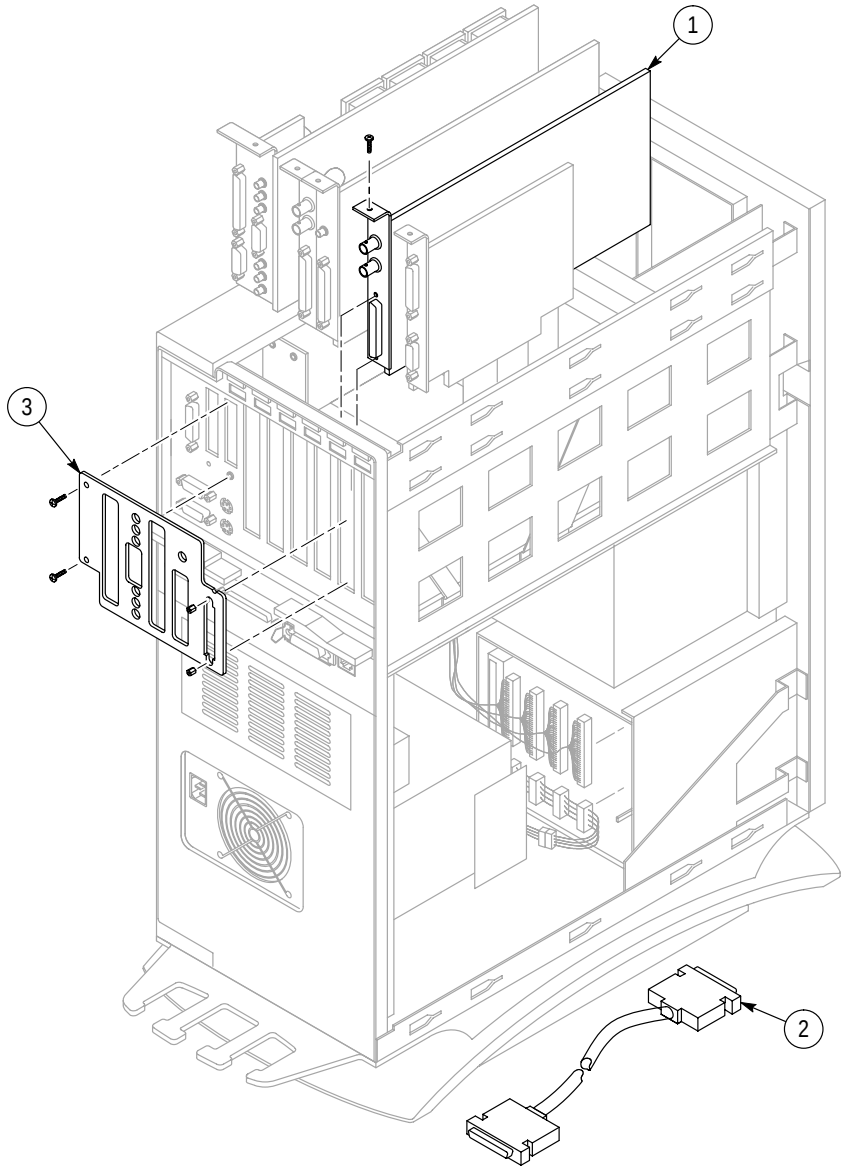



**Figure 8–2: Option SS**

## Replaceable parts list for packaging

| Fig. 8-3 index number | Tektronix part number | Serial no. effective | Serial no. discont'd | Qty | Name and description | Mfr. code | Mfr. part number |
|---|---|---|---|---|---|---|---|
| –1 | 004–4914–00 | | | 1 | BOX,SHIPPING | TK6108 | 472789 |
| –2 | 004–4913–00 | | | 1 | PAD,CUSHIONING:CORRUGATED,W/PLASTIC FILM CENTER,INSTRUMENT SUPPORT INSERTS | TK6108 | 472758 & 472797 |
| –3 | 004–4915–00 | | | 1 | PACKING,SLEEVE:CORRUGATED | TK6108 | 472792 |

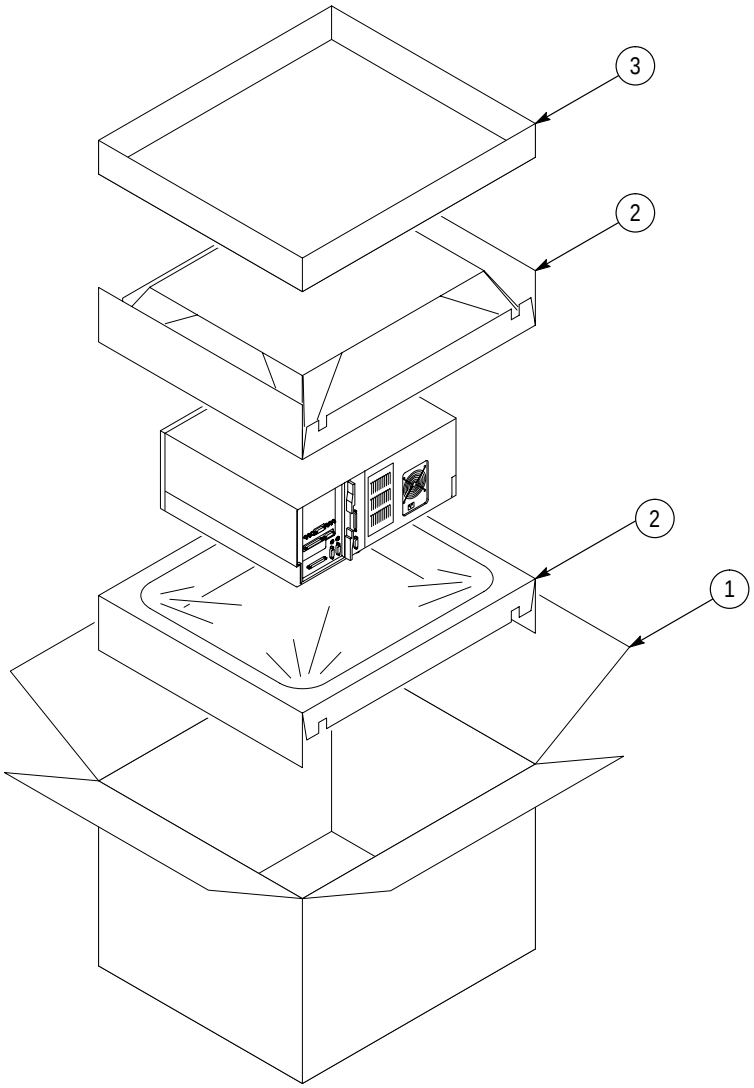



**Figure 8–3: Packing material**

# Appendices

# Appendix A: Software Repair

This appendix applies to instruments with serial numbers B040000 and above that use Windows NT 4.0 and MPEG Test System software version 2.2 and above. There are four parts to this appendix:

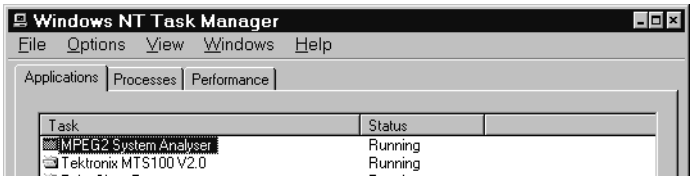
- *If an Application Locks* (page A–2) tells how to shut down an application that no longer responds to input.
- *Creating and Using an Emergency Repair Disk* (page A–3) explains how to create and use a system-specific repair disk.
- *Installing the Software on a New System Disk* (page A–5) explains the procedure for restoring both Windows NT and the MPEG Test System software in the unlikely event that you must replace the system disk.
- *Reinstalling the MPEG Test System Software* (page A–14) 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 A–22).
- *Installing Windows NT 4.0 Service Pack Five* tells you how to install Windows NT service pack five, which is required for running MTS200 Series version 3.0 software (page A–24).
- *Upgrading the Real-Time Analyzer Firmware* provides tells you how to upgrade the firmware, which is sometimes required to enable new features to the RTA software (page A–25).

## If an Application Locks

As with all software, Tektronix 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 Tektronix 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.

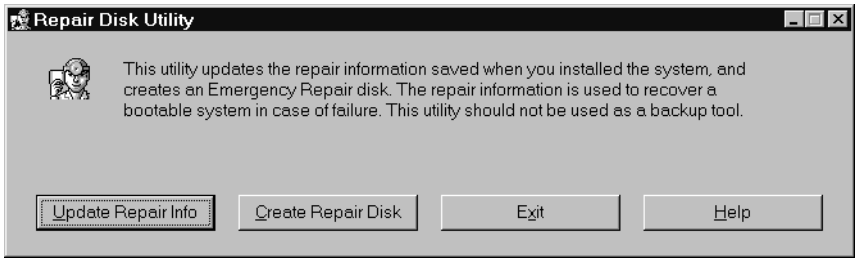
***CAUTION.*** *The files on the Emergency Repair Disk are MPEG Test System-specific; that is, the disk shipped with an MPEG Test System is the* **ONLY** *one that will work with that unit. Do not lose this disk. If you lose the Emergency Repair Disk provided with your MPEG Test System, create a new 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 B04*nnnn* and then perform the following steps.

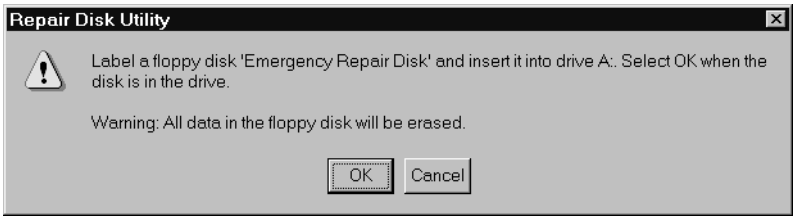
***NOTE****. The emergency repair disk is MPEG Test System-specific. Make sure that the emergency repair disk is clearly marked with its MPEG Test System serial number. The serial number of your Tektronix MPEG Test System appears on the original emergency repair disk and on the server rear panel, near 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 it becomes necessary to replace the MPEG Test System system disk, use one of the following two procedures to restore instrument function. The first procedure is for instruments using MPEG Test System software version 2.0 or 2.1. The procedure for instruments using software version 2.2, 2.5, and 3.0 begins on page A–8. To determine which procedure to follow, locate your latest MPEG Test System CD ROM. The software version is marked clearly on the case and on the disc. In either case, if you have any questions about Windows NT installation or setup, refer to the Windows NT Installation Guide for more information.

### MTS Software Versions 2.0 and 2.1

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 4.0 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 3993 MB 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.”
- 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. Make the MTS100 user a member of the Backup Operators group.

**9.** Continue following the on-screen instructions to set the following **Display Parameters**:

| | |
|---|---|
| Color Palette: | 256 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) and then perform the software installation procedure in the *Software Repair* appendix of the appropriate manual listed in the following table.

***NOTE.*** *You cannot reset the Data Store resource parameters or use the Data Store system before completing steps 13 through 15 of the current procedure.*

| 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 |

**13.** When MPEG Test System software installation is complete, but before you attempt to run any of the applications or reset the Data Store resource parameters, restart the computer and, when prompted during system start up, press the **F10** key to run the Compaq system partition utilities.

**14.** Select System Configuration from the system partition utilities MAIN MENU display; then select Configure Hardware from the System Configuration submenu.

**15.** Configure slot two for the Data Store (CARB) board.

- **a.** Highlight **Step 2: Add or remove boards** and then press **ENTER**.
- **b.** Highlight **Slot 2 (empty)** and then press **ENTER**.
- **c.** Press **F7** (as often as necessary) to change the directory and locate the c:\Mts100\Bin\!isa7000.cfg configuration file.
- **d.** Select **Slot 2**.
- **e.** Press **F10** to indicate that you are done.
- **f.** Highlight **Step 5: Save and exit** and then press **ENTER**.
- **g.** Finally, highlight **Save configuration and restart the the computer** and then press **ENTER**.

**16.** Log in as the administrator once again and then complete the MPEG Test System software installation procedure as necessary.

## MTS Software Versions 2.2, 2.5, and 3.0

Instruments using MPEG Test System software versions 2.2, 2.5, and 3.0 use different configuration files than earlier versions and also require the installation of a video driver.

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:**; 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:**; 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. 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.
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.

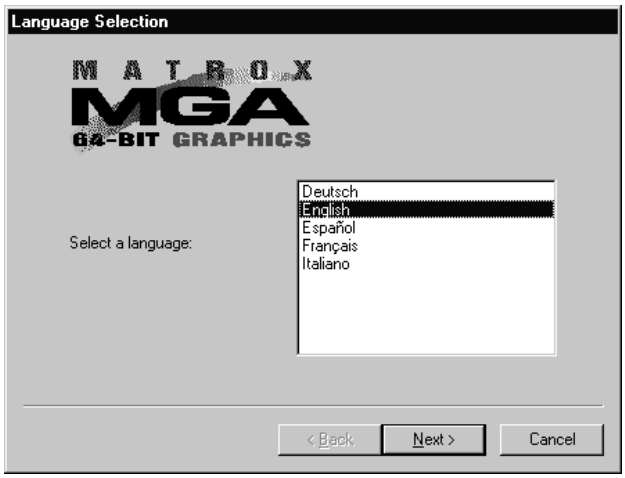
9. Log in as the administrator (the password is MPEG2).

**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.

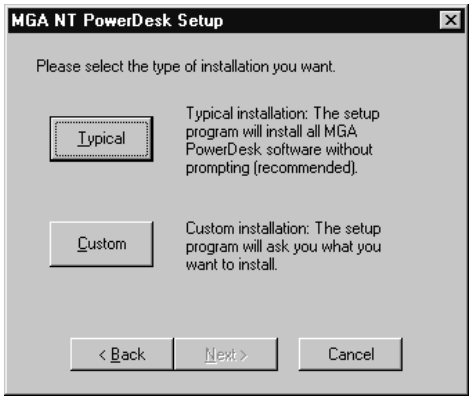



4. In the Language Selection window select the appropriate language; then click **Next**.

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.

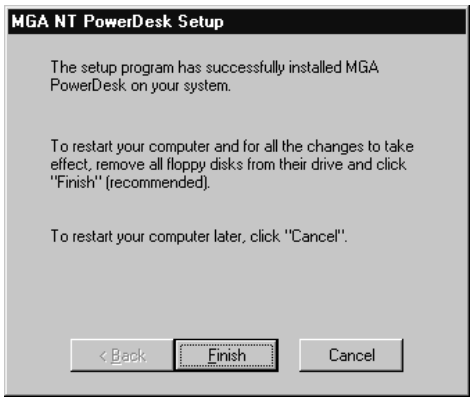



8. Click **Typical** for standard installation.

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* on page A–14. Note that while it is not necessary to uninstall old or corrupt application files, it is recommended.

# Reinstalling the MPEG Test System Software

The procedure that you must use to reinstall the Tektronix 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 A–1. Perform this procedure as the final step in updating your test system.

**Table A–1: Manuals for MTS200 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

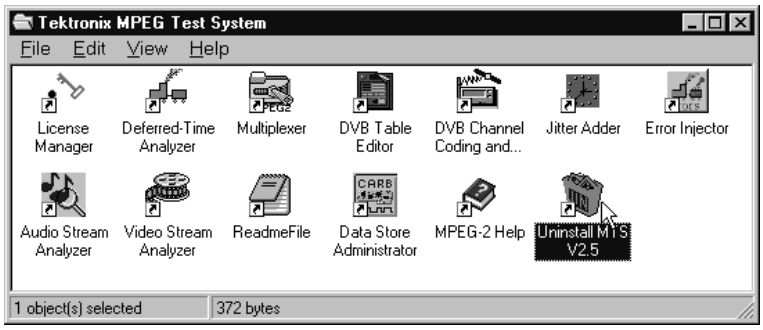
There are two easy ways to determine your MPEG Test System software version:

- From the Tektronix 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.

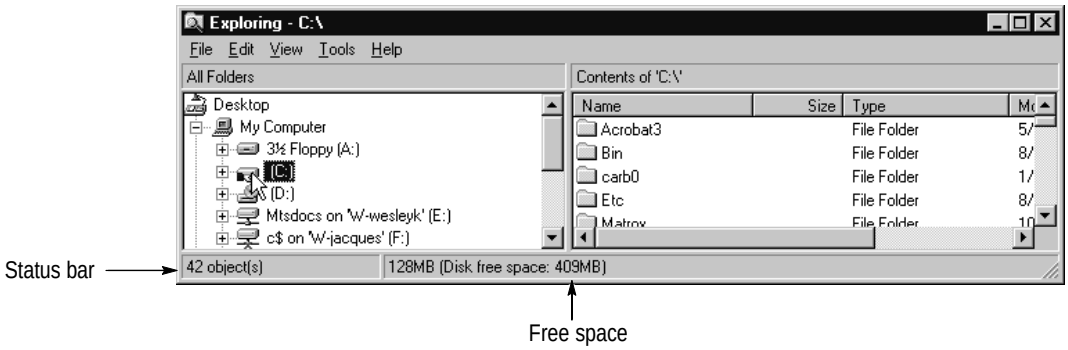



4. When the dialog box asks you to confirm the file deletion, click **Yes**.
5. When uninstall is complete, Click **OK** to close the Remove Programs From Your Computer window.

## 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:).

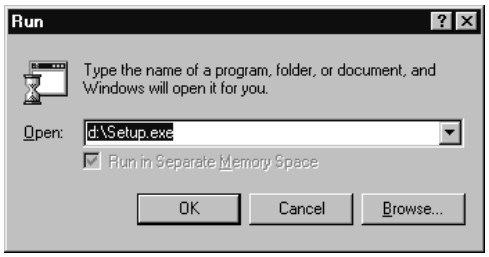
3. Check the status bar at the bottom of the Exploring window to verify that the target disk has at least 140 MB of free space. You cannot install the software on a disk that has less than 140 MB of free space.




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.

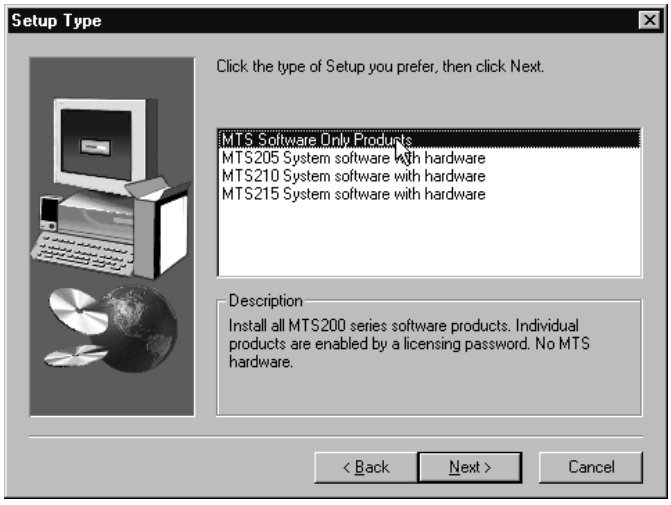
8. Read the Copyright and Setup text and then click **Next** to proceed to the Choose Destination Directory window.

***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 A–1 on page A–20, 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.

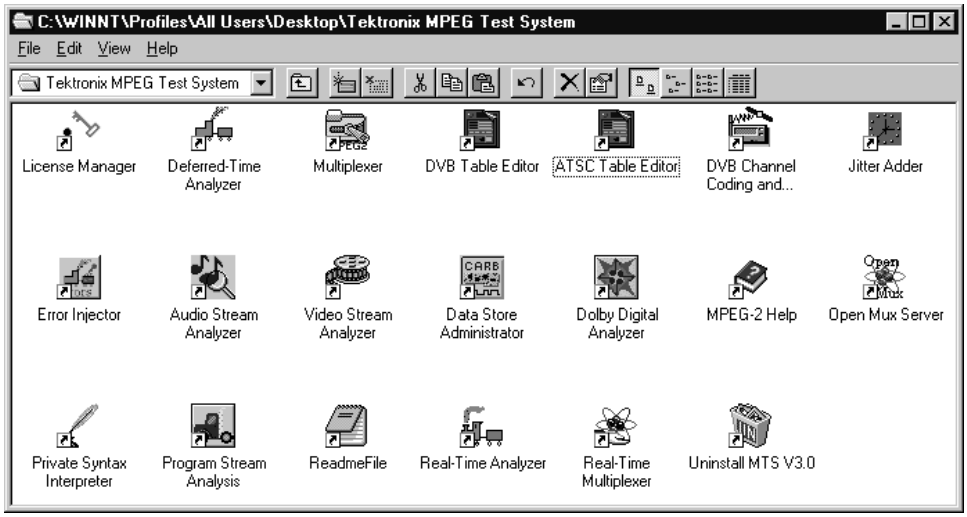
18. Another Setup Complete window opens. Accept the *Yes, I want to restart my computer now* option, remove the MPEG Test System disc from the CD ROM drive, and click **Finish** to complete setup and reboot the system.

***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 A–20.

## 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 MTS200 Series test system.

1. Ensure that the software key shipped with your test system or most recent upgrade is properly installed. Figure A–1 shows how and where the software protection key must be installed.

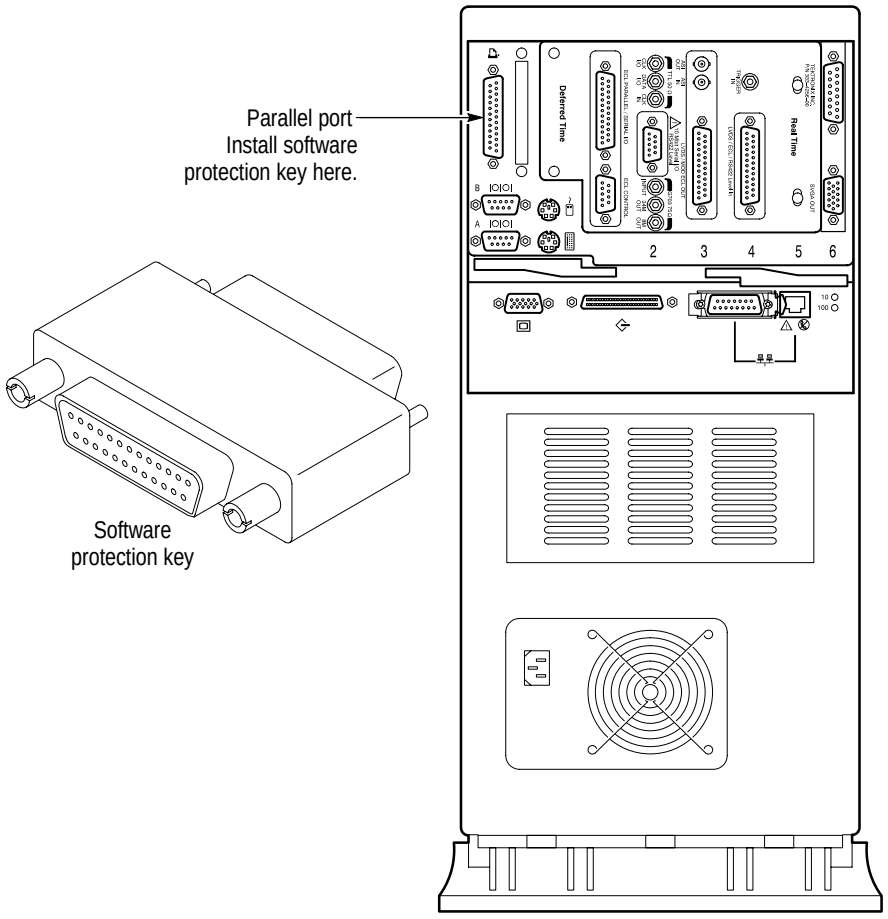
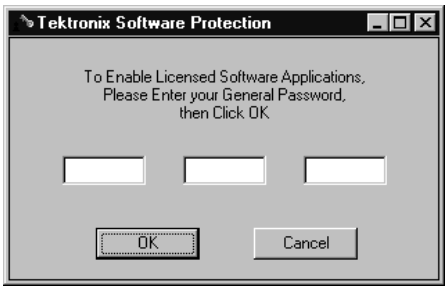



**Figure A–1: Rear Panel (MTS215 shown) showing parallel port and software protection key**


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).*

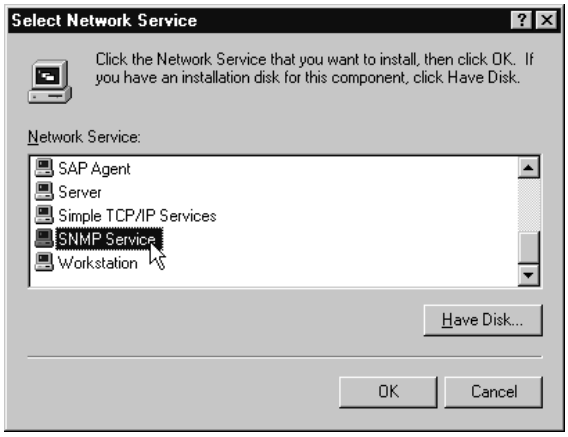
*The SNMP agent for the real-time analyzer can be automatically installed when you perform the procedure described in* Reinstalling the MPEG Test System Software*, beginning on page A–14, provided you have SNMP service installed and running during the software installation process. For more information 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.*

---

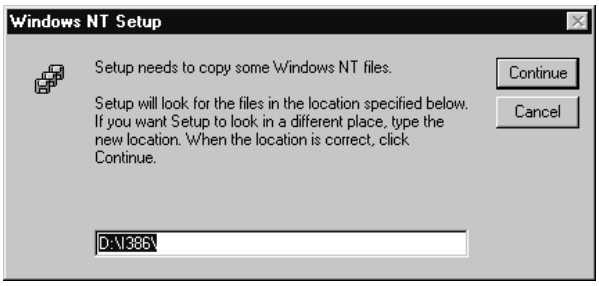
Use the following procedure to install the SNMP Service on an MTS 200 MPEG Test System:

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 MTS200 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 five (see *Installing Windows NT 4.0 Service Pack 5* beginning on page A–24).

## Installing Windows NT 4.0 Service Pack 5

The version 3.0 release of the MTS200 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 MTS200 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 A–22.*

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:


**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 B: MPEG Test System Application Software

This appendix lists the directories and files that make up the Tektronix 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 B–4; the lists of version 2.2 files begin on page B–7; the lists of version 2.5 files begin on page B–19, and the lists of version 3.0 files begin on page B–31.

## Software Version 2.0

The application software for the MTS100 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** 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**

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**

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**

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 Tektronix 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 the following page.
- The list of files provided with the MTS 210 option 1A begins on page B–10.
- The list of files provided with the MTS 210 option 1G begins on page B–13.
- The list of files for the MTS 205 Real-Time Analyzer begins on page B–17.

### Option AG, including Real-Time Analyzer

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
BYTEFLIP.EXE

**Option AG, including Real-Time Analyzer (Cont.)**

Path: C:\MTS100\Bin

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, including Real-Time Analyzer (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

### Option AG, including Real-Time Analyzer (Cont.)

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
- MUX.INI

### Option 1A

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

**Option 1A (Cont.)**

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
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

**Option 1A (Cont.)**

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

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

### Option 1A (Cont.)

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

Path: C:\MTS100

| | |
|---|---|
| Audio | <Dir> |
| Bin | <Dir> |
| Cfg-trp | <Dir> |
| Video | <Dir> |
| README.TXT | |

**Option 1G (Cont.)**

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 (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

**Option 1G (Cont.)**

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\

MUX.INI

Path: C:\Winnt\System32

CTL3D.DLL
CTL3DV2.DLL
DRVCARB.SYS
RHMMPLAY.DLL

### MTS 205

Path: C:\MTS100

| | |
|---|---|
| Bin | <Dir> |
| Cfg-trp | <Dir> |
| Service | <Dir> |
| README.TXT | |

Path: C:\MTS100\Bin

!PIA2500.CFG
D2HTLS32.DLL
DOC2HELP.INI
MFC30.DLL
MFC30D.DLL
MFC42.DLL
MPEG2NT.HLP
MSVCRT20.DLL
RTAMSG.DLL
RTA.CNT
RTA.HLP
SYNTAXV.DLL
RTA.EXE

Path: C:\MTS100\Cfg-trp

!!CFG.NDX

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

**MTS 205 (Cont.)**

Path: C:\Winnt\System32

CTL3D.DLL
CTL3DV2.DLL
DRVPIA.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 page B–19.
- The list of files installed on the MTS 210, all options, begins on page B–23.
- The list of files installed on the MTS 205 begins on page B–26.

### MTS 215, V2.5

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, V2.5 (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, V2.5 (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

**MTS 215, V2.5 (Cont.)**

Path: C:\MTS200\Service

!CAR2500.CFG
!PIA2500.CFG
FLASH.EXE
FX971120.HEX
README.TXT
RT980608.HEX

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 | |

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

**MTS 210, V 2.5 (Cont.)**

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
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

**MTS 210, V 2.5 (Cont.)**

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

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

### MTS 210, V 2.5 (Cont.)

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

### MTS 205, V2.5

Path: C:\MTS200

| | |
|---|---|
| Audio | <Dir> |
| Bin | <Dir> |
| Cfg-trp | <Dir> |
| Pstream | <Dir> |
| Service | <Dir> |
| Video | <Dir> |

README.TXT
UNINSTMTSV25.ISU

**MTS 205, V2.5 (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
CW3220MT.DLL
D2HTLS32.DLL
DOC2HELP.INI
DYNAMIC.AVI
EDITABLE.CNT
EDITABLE.EXE
EDITABLE.HLP
EINJWIN.CNT
EINJWIN.EXE
EINJWIN.HLP
GIGUE.CNT
GIGUE.EXE

**MTS 205, V2.5 (Cont.)**

Path: C:\MTS200\Bin

GIGUE.HLP
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
RTA.CNT
RTA.EXE
RTA.HLP
RTAMSG.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

**MTS 205, V2.5 (Cont.)**

Path: C:\MTS200\Cfg-trp

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

!PIA2500.CFG
FLASH.EXE
FX971120.HEX
README.TXT
RT980608.HEX

Path: C:\MTS200\Video\525

MOBL_015.MP2
MOBL_060.MP2

Path: C:\MTS200\Video\525\Testpat

100B_015.MP2
100B_060.MP2

**MTS 205, V2.5 (Cont.)**

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

SENTINEL.SYS
DRVPIA.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 B–36.
- The list of files installed on the MTS 205 begins on page B–40.
- The list of files installed with software only installations begins on page B–45.

**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

**MTS210, V 3.0 (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

**MTS205, 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 | |

**MTS205, V 3.0 (cont)** 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
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
Compiler.exe
Cw3215.dll
Cw3220.dll
Cw3220mt.dll
D2htls32.dll
delservice.dll
Doc2help.ini
Dynamic.avi
Editable.cnt
editable.exe
Editable.hlp
EditableATSC.exe
Einjwin.cnt

**MTS205, V 3.0 (cont)** Path: C:\MTS200\Bin

Einjwin.exe
Einjwin.hlp
Gigue.cnt
gigue.exe
Gigue.hlp
Inetwh32.dll
InitDr
InitLg
InitSt
mapi32.dll
Mfc42.dll
Mfc42d.dll
Mfco42d.dll
MFCXLib10d.dll
MFCXLib10r.dll
Mpeg2nt.hlp
Msvcrtd.dll
mtslm.dll
Mux_mpg2.cnt
mux_mpg2.exe
Mux_mpg2.hlp
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
Sx32w.dll
Synt300.dll
Syntaud.dll
Syntaxps.dll
Syntaxv.dll

**MTS205, V 3.0 (cont)**

Path: C:\MTS200\Bin

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
Default.trp
sample.emm
Sample.trp
sample1.efg
sample2.efg
test.ecm

Path: C:\MTS200\Pstream

sample.pck

**MTS205, V 3.0 (cont)**

Path: C:\MTS200\Service

!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

**MTS205, 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

**Software Only Installations, V 3.0**

Path: C:\MTS200

| | |
|---|---|
| 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
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
Mfc42.dll
Mpeg2nt.hlp
mtslm.dll
Mux_mpg2.cnt
mux_mpg2.exe
Mux_mpg2.hlp
Owl50f.dll
Owl50t.dll

**Software Only Installations, V 3.0 (cont)**

Path: C:\MTS200\Bin

protek.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
Default.trp
sample.emm
Sample.trp
sample1.efg
sample2.efg
test.ecm

**Software Only Installations, V 3.0 (cont)**

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