User Manual

Tektronix

MTS 200 Series MPEG Test System Data Store Administrator

071-0536-00

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Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If a 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.

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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.

Preface

This document applies to the Tektronix MPEG Test System Data Store Administrator software and hardware. The Data Store system is an integral part of the Tektronix MTS 210 and MTS 215 MPEG Test Systems.

For the latest information about MTS 200 Series Software features and bugs, refer to the *MPEG Test System Software Version 3.0 Read This First* document, Tektronix part number 071-0537-XX, that accompanied your test system, software product, or upgrade.

Manual Structure

This manual is divided into the following sections:

Getting Started. The Getting Started section contains all the information you will need to get your Real-Time Analyzer up and running.

Operating Basics. The Operating Basics section contains a tutorial that new users should use to familiarize themselves with the Data Store Administrator. Experienced users can also consult the tutorial for detailed instructions for unfamiliar tasks.

Reference. The Reference section contains in-depth descriptions of the analyzer capabilities, the software interface, and configuration options.

Appendix A: Specifications. Appendix A contains hardware specifications for the Tektronix MTS 200 Series MPEG Test System Data Store system.

Appendix B: Functional Check. Appendix B outlines a procedure for confirming proper function of the Data Store system.

Glossary. Consult the glossary when you encounter an unfamiliar term.

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Terms

This manual uses two terms as defined below. Refer to the *Glossary* for additional definitions.

CARB (Carte d'Acquisition / Restitution Binaire)
French for Binary Acquisition/Restitution Board: The Data Store system, which can capture, store, and output MPEG-2 compliant transport streams.

The acronym CARB is used in this manual only where necessary to reflect usage in the user interface.

DSA
Data Store Administrator: the software application that controls the Data Store system.

Related Documents

The Tektronix MPEG Test System consists of several different hardware and software configurations, options, and stand-alone software products. Please refer to the following documents for additional information about other test system components.

The *MTS 200 Series Real-Time Analyzer User Manual*, Tektronix part number 071-0076-XX, contains information about using the Real-Time Analyzer and Private Syntax Interpreter applications.

The *MTS 200 Series MPEG-2 DVB/ATSC System Analyzer User Manual*, Tektronix part number 071-0532-XX, contains information about using the Deferred-Time Analyzer and DVB Channel Coding and Decoding applications.

The *MTS 200 Series Stream Creation Applications User Manual*, Tektronix part number 071-0534-XX, contains information about using the Multiplexer, DVB Table Editor, ATSC Table Editor, DVB Channel Coding and Decoding, Jitter Adder, Error Injector, and Open Mux Controller applications.

The *MTS 200 Series Program Stream Analyzer User Manual*, Tektronix part number 071-0384-XX, contains information about using the deferred-time Program Stream Analyzer application.

The *MPEG Test System Dolby Digital Audio Stream Analyzer User Manual*, Tektronix part number 071-0535-XX, contains information about using the deferred-time AC-3 Audio Stream Analyzer application.

The *MTS 200 Series MPEG Audio Stream Analyzer User Manual*, Tektronix part number 071-0192-XX, contains information about using the deferred-time MPEG Audio Stream Analyzer application.

The *MTS 200 Series Video Stream Analyzer User Manual*, Tektronix part number 071-0249-XX, contains information about using the deferred-time MPEG Video Stream Analyzer application.

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

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

Related Applications

The applications that appear in your version 3.0 Tektronix MPEG Test System program group and Start menu depend on the system configuration and its installed options. Table i summarizes all test system applications available in release 3.0.

For additional information about software options and licensing, see the version 3.0 *Read This First* document included with the test system.

Table i: MPEG Test System version 3.0 applications

Icon	Application title	Function	User Document
Real-Time Analyzer	Real-Time Analyzer	Continuously monitor an input bitstream for compliance with the MPEG-2, DVB SI, and ATSC PSIP digital television standards.	MTS 200 Real-Time Analyzer User Manual 071-0076-XX
Private Syntax Interpreter	Private Syntax Interpreter	Create table definitions used by the Real-Time Analyzer to interpret private syntax sections.	
Data Store Administrator	Data Store Administrator	Manage the data store (CARB) disks and control acquisition/generation of MPEG-2 transport streams.	MTS 200 MPEG Test System Data Store Administrator User Manual 071-0536-XX
Deferred-Time Analyzer	MPEG-2 DVB/ATSC System Analyzer	Analyze transport streams and packetized elementary streams saved to system disk or data store (CARB) files.	MTS 200 MPEG-2 DVB/ATSC System Analyzer User Manual 071-0532-XX
DVB Channel	DVB Channel Coding and Decoding	Code and decode transport stream files to DVB specifications.	MTS 200 Stream Creation Applications User Manual 071-0534-XX (Information repeated in both manuals)
Program Strea...	Program Stream Analyzer	Analyze MPEG program stream files.	MTS 200 Series Program Stream Analyzer User Manual 071-0384-XX
Video Stream Analyzer	MPEG Video Stream Analyzer	Analyze MPEG-1 and MPEG-2 video elementary streams files or streams extracted from the MPEG-2 System Analyzer or Program Stream Analyzer.	MPEG Test System Video Stream Analyzer User Manual 071-0249-XX
Audio Stream Analyzer	MPEG Audio Stream Analyzer	Analyze MPEG-1 and MPEG-2 audio elementary streams files or streams extracted from the MPEG-2 System Analyzer or Program Stream Analyzer.	MPEG Test System Audio Stream Analyzer User Manual 071-0192-XX

Table i: MPEG Test System version 3.0 applications (Cont.)

Icon	Application title	Function	User Document
Dolby Digital Analyzer	Dolby Digital Audio Stream Analyzer	Analyze Dolby Digital (AC-3) audio elementary stream files or streams extracted from the MPEG-2 DVB/ATSC System Analyzer.	MTS 200 Dolby Digital Audio Stream Analyzer User Manual 071-0535-XX
Multiplexer	MPEG-2 Transport Stream Multiplexer	Create transport stream files from PSI/SI/PSIP table files, elementary stream files, and data files.	MTS 200 Stream Creation Applications User Manual 071-0534-XX
DVB Table Editor	DVB Table Editor	Create and edit PSI and DVB SAI table files for use with the transport stream multiplexer.	
ATSC Table Editor	ATSC Table Editor	Create and edit PSI ad ATSC PSIP table files for use with the transport stream multiplexer.	
Jitter Adder	Jitter Adder	Add jitter to PCR data in MPEG-2 transport stream files.	
Error Injector	Error Injector	Insert or correct errors in transport stream packets.	
Real-Time Multiplexer	Real-Time Multiplexer	Configure the real-time multiplexing application to remultiplex system and or elementary streams for immediate output.	
Open Mux Server	Open Mux Server	Remultiplex various MPEG inputs (system, MPEG-2, DVB, ATSC, and elementary streams) into a valid transport stream for immediate output. The user interface for this application is the Real-Time Multiplexer.	
License Manager	Tektronix Software Protection	Enter or reenter the general password to enable licensed applications.	Read This First, MTS 200 Software V3.0 071-0537-XX
MPEG-2 Help	MPEG2_Part1 (ISO/IEC 13818-1)	The international MPEG-2 system standard in Windows Help format.	none
Uninstall MTS	Uninstall MTS	Remove MPEG Test System software from the system disk.	MTS 200 User Manuals

Software Version

Table ii lists the MTS 200 MPEG Test System application version numbers supported by this manual. To verify an application version number, select **Help** in the application menu bar; then select **About** from the Help menu.

Table ii: MTS 200 MPEG Test System (V3.0) supported applications

Application	Supported version	Applicable document(s)	Manual part number
Data Store Administrator	V2.0 and above	MTS 200 Series MPEG Test System Data Store Administrator User Manual	071-0536-XX

Contacting Tektronix

Product Support	For application-oriented questions about a Tektronix measurement product, call toll free in North America: 1-800-TEK-WIDE (1-800-835-9433 ext. 2400) 6:00 a.m. – 5:00 p.m. Pacific time
	Or contact us by e-mail: tm_app_supp@tektronix.com
	For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Contact your local Tektronix distributor or sales office. Or visit our web site for a listing of worldwide service locations.
	www.tektronix.com
For other information	In North America: 1-800-TEK-WIDE (1-800-835-9433) An operator will direct your call.
To write us	Tektronix, Inc. P.O. Box 1000 Wilsonville, OR 97070-1000

MTS 200 Series MPEG Test System Data Store Administrator

Getting Started

All Tektronix MTS 210 and MTS 215 MPEG Test Systems contain the Data Store system, which can acquire and output transport streams at rates from 1 Mbit/s to 60 Mbit/s (maximum) and store up to 18 Gbytes of data. At the highest data rate, the Data Store system can store over 40 minutes of transport stream data; you can also use end-to-start looping to continuously (and indefinitely) acquire or output transport stream data.

This section contains information to help you get started using the Data Store Administrator, the application that controls and manages the Data Store system. Refer to the following subsections as necessary:

- *Input and Output Connections*, page 2

- *First Time Operation*, page 9

- *Software Repair*, page 12

Refer to the *Operating Basics* section, beginning on page 13, for information about using the Data Store Administrator.

Input and Output Connections

Figure 1 shows the test system Data Store input and output (I/O) connectors on the Compaq Proliant rear panel. Figure 2 shows the same connectors on the Compaq Prosignia rear panel (MPEG Test Systems with serial numbers below B040000). A detailed description of each connector follows the illustrations. Use the I/O port(s) best suited to your signal sources and operating environment.

For I/O port specifications, refer to *Specifications* beginning on page 49.
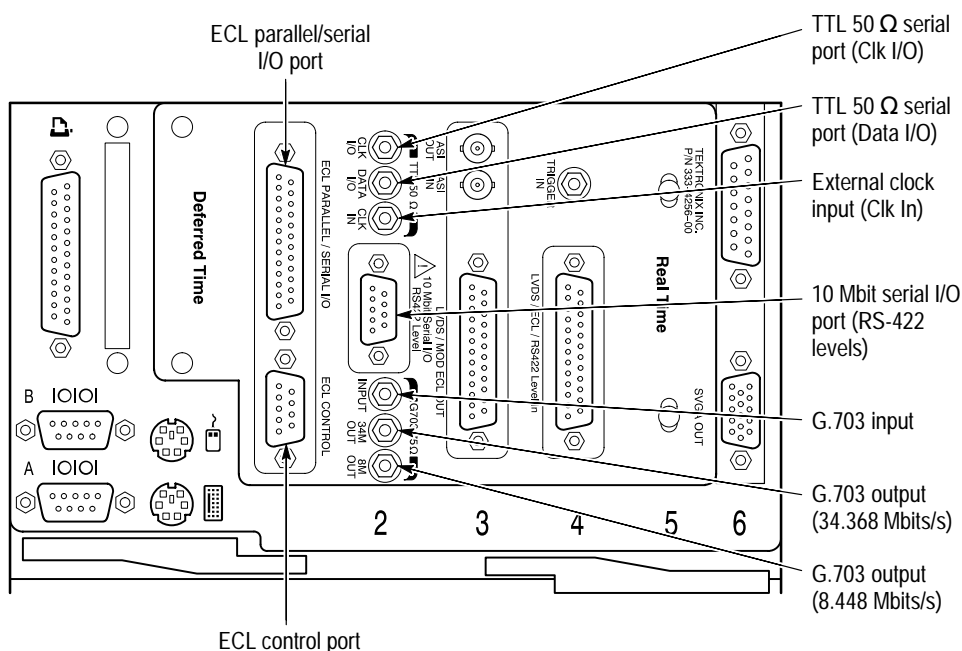
Figure 1: Data Store inputs and outputs (Compaq Proliant)

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.
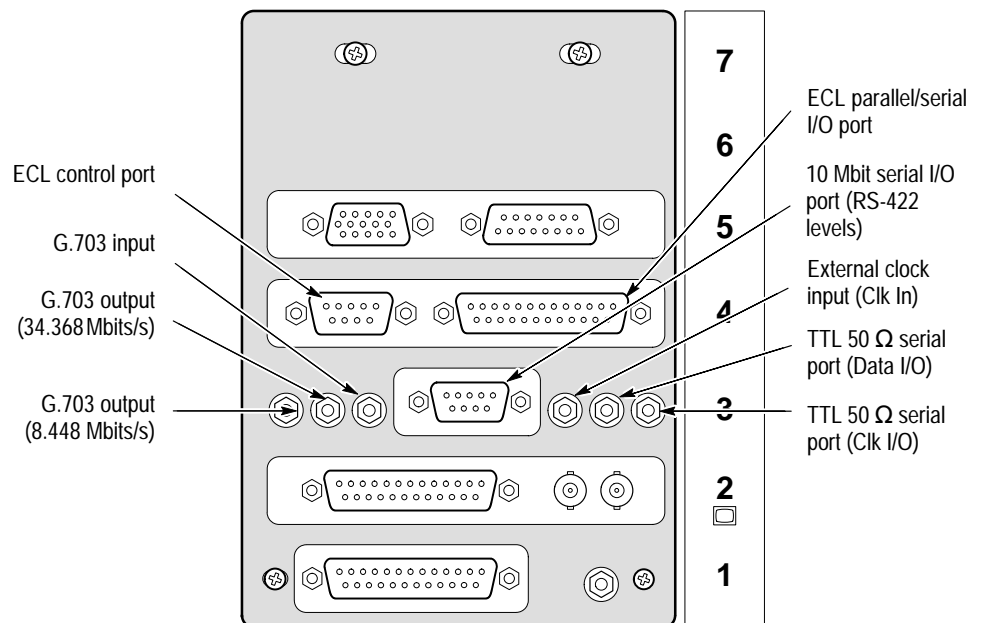
Figure 2: Data Store inputs and outputs (Compaq Prosignia)

Table 1: ECL Parallel 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.*

Table 2: ECL Serial data pinout
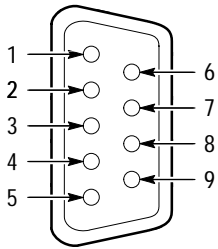
ECL serial pinout	Pin	Function
	1	DCLK
	2	Ground
	3 thru 9	Not managed
	10	DATA 0
	11	DVALID
	12	PSYNC
	13	Shield
	14	$\overline{\text{DCLK}}$
	15	Ground
	16 thru 22	Not managed
	23	$\overline{\text{DATA 0}}$
	24	$\overline{\text{DVALID}}$
	25	$\overline{\text{PSYNC}}$

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

ECL Control Port   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.

Table 3: ECL Control data pinout

ECL control pinout	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.*

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

The G.703 port operates in the following modes:

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

■   Generation (internal clock source) MODE. Uses an internal clock source.
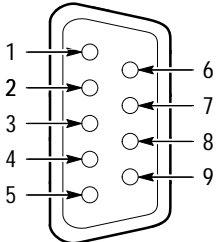
The G.703 serial interface uses three Data Store circuit-board mounted SMB connectors. One connector is a dedicated input for both bit rates. The other two connectors are dedicated outputs, one for the 34.368 Mbit/s output and the other for the 8.443 Mbit/s output. To reduce spurious emissions, connect only the output in use.

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

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

The 10 Mbit Serial port transmits and receives MPEG transport signals and includes bidirectional clocks and data pairs. The maximum operating frequency is 10 Mbit/s. The port uses RS-422 voltage levels with a line-to-line input termination of 110 Ω.

Table 4: 10 Mbit Serial data pinout

10 Mbit serial pinout	Pin	Function
	1	DATA IN
	2	CLK IN
	3	DATA OUT
	4	CLK OUT
	5	Ground
	6	DATA IN (Asserted Low)
	7	CLK IN (Asserted Low)
	8	DATA OUT (Asserted Low)
	9	CLK OUT (Asserted Low)

Asserted Low differential signal.

The 10 Mbit Serial port uses the following signals:

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

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

The 10 Mbit Serial port operates in the following modes:

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

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

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

Clock Input

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

For example, a 45 MHz clock input can generate a 45Mbit/s serial ECL signal. A 45 Mbit/s ECL output requires a 5.624 Mbit/s (byte-wide) clock input.

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 Mbits/s.

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 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 5. In general, low data rates tolerate longer cable lengths than do high data rates. Low-loss coaxial cable and low capacitance properly pair-twisted cable support longer transmission paths than do miniature coaxial cable or ribbon cable. Induced RF noise can further limit usable cable length.

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

Table 5: Estimated maximum cable lengths

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

Table 5: Estimated maximum cable lengths (cont.)

Port	Data Rate (Mbits/s)	Maximum length (meters)	Cable type	Comments
TTL	50	25	RG58 type	Calculated Value
ECL Parallel	1	50	Belden 8112	Calculated Value
ECL Serial	45	5	Belden 8112	Calculated Value

Adapters. The MPEG Test System includes six SMB-to-BNC adapter cables. Three of the adapter cables match the impedance of the G.703 75 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).

Software Key

The Rainbow Technologies software key, or Dongle, is not required to run the Data Store Administrator; however, it must be installed on the computer parallel port to start and run most other Tektronix MPEG Test System applications.

NOTE. The software key that matches your system must be installed on the parallel port to start and run most MTS 200 Series software applications. Do not remove or misplace the software key. Do not exchange the software key with the key from another Tektronix MPEG Test System.

First Time Operation

To power on the test system computer, slide the power switch cover plate to the right and press the power switch.

Slide power switch
cover plate

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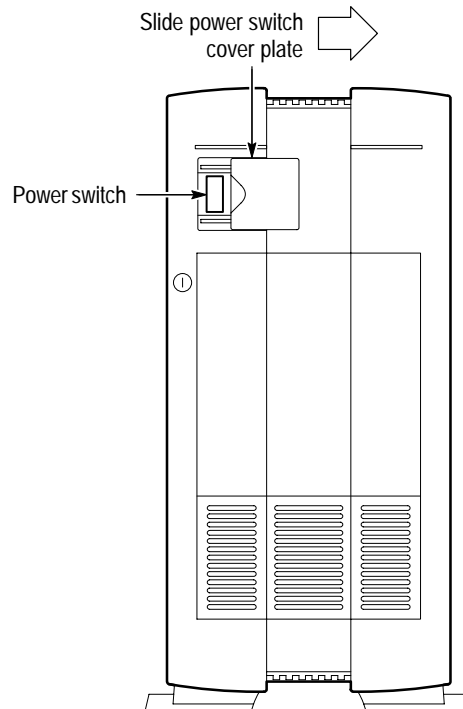
The Windows NT initialization process takes up to two minutes to complete. Under normal circumstances, no action is required. (For further information on the Windows NT initialization process, see the Windows NT documentation included with the test system.) When the Begin Logon window appears, simultaneously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

Logging On

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

There are two other logons and passwords available. The first is `guest` with no password. This level has only limited access to files and applications. The second level is `administrator` with `MPEG2` as the password. This user has

administrator privileges. You must use this logon when performing all software upgrades.

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

Changing 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. See page 12 for additional information.

Starting the Data Store Administrator

When logon is complete, the Tektronix MPEG Test System program group window appears as shown below. Double-click the Data Store Administrator icon to start the program. Refer to the *Operating Basics* section, beginning on page 13, for information about using the Data Store Administrator.

Refer to the appropriate User manual for information about other MPEG Test System applications. Refer to *Related Documents* and *Related Applications*, both in the *Preface* of this manual, for the correct manual title and part number.

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 the Data Store Administrator

To exit Data Store Administrator, select **Exit**/**Quit** from the application File menu or click the close button in the upper-right corner of the application window.

Close button
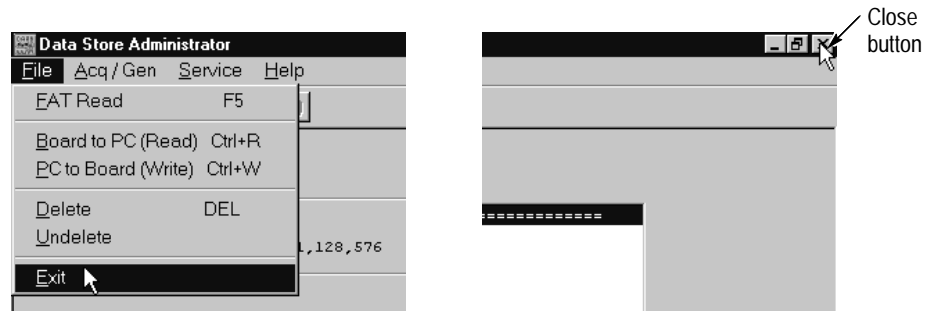
Shutting Down the Computer

To avoid loss of data and possible problems during subsequent Windows NT initialization, always shut down Windows NT before switching computer power off. To shut down Windows NT, select **Shut Down** from the Start menu.

In the Shut Down Windows dialog box, select **Shut down the computer?** and then click **Yes**. After a few seconds, the Shutdown Computer window appears with the message "It is now safe to turn off your computer." You can now power off the computer.

⚠ *CAUTION. Do not switch computer power off before the message "It is now safe to turn off your computer" appears. Doing so may result in lost data and difficulty in restarting Windows NT.*

Software Repair

If you experience operating problems and suspect that one or more MPEG Test System files have been corrupted, refer to the Software Repair appendix in either of the following manuals:

The *MTS 200 Series MPEG-2 DVB/ATSC System Analyzer User Manual*, Tektronix part number 071-0532-XX.

The *MTS 200 Series Stream Creation Applications User Manual*, Tektronix part number 071-0534-XX.

Operating Basics

The Data Store Administrator application manages the Data Store disks and MPEG-2 transport stream acquisition and generation to and from the disks. Because Windows NT cannot manage the Data Store disks, the Data Store Administrator performs all the low-level functions normally accomplished with the Windows NT Explorer application.

The Data Store Administrator, the SCSI drivers, and the EISA card are optimized to provide a continuous data acquisition or generation rate of up to 60 Mbits/s (ECL) for a minimum of 40 minutes (18 Gbyte data store disk capacity) without interruption or data loss. Looping acquisition and generation is also possible.

Terms

The terms *Data Store disk* and *system disk* are NOT interchangeable. *CARB* is a French acronym that is synonymous with Data Store.

Data Store Disk. The Data Store disks are four hard drives totalling 18 Gbytes that are physically connected to the Data Store circuit board. These disks are used by the Data Store Administrator when generating and acquiring transport streams. They can also be used by the following applications when dealing with files that are too large for the system disk: Multiplexer, DVB/ATSC System Analyzer, Audio stream Analyzer, Video stream Analyzer, Program Stream Analyzer, and Dolby Digital Audio analyzer.

System Disk. The system disk is the fixed disk drive (hard disk) that contains the Windows NT operating system files and the MTS 200 Series application software. You can access this disk using the Windows NT Explorer application. The system disk is configured during manufacture as the C drive.

CARB. The term CARB, a French acronym referring to the Data Store disks or the Data Store board, is used often in the Data Store Administrator user interface. CARB appears in this manual when necessary to reflect on-screen nomenclature and to avoid ambiguity.

Special Features of the Data Store Disks

In order to generate or acquire MPEG-2 transport streams, the Data Store disks have these special features required to accommodate constant, high bit rate input/output:

■ The data store disks can be divided into single shot and looping partitions.

■ The Single Shot partition can contain up to 255 files. File acquisition must stop when the partition is full.

■ The looping partition permits continuous capture of input, which is stored as a single file. If you create a six Gbyte looping partition, you can fill the partition and continue acquisition. The partition always contains the most recently acquired data. After you stop acquisition you can analyze or replay the last six Gbytes of input.

   Each new acquisition to the looping partition overwrites any previously-acquired data. You can store only one file on the looping partition.

■ You can output any file from either partition repeatedly in looping mode.

■ You can partition the Data Store disks as entirely single shot, entirely looping, or any combination between those two extremes (for example, 16 Gbytes single shot and 2 Gbytes looping).

■ You can change the relative sizes of the partitions at any time; however, repartitioning the Data Store disks erases all files on the disks. Refer to *Partitioning the Disks* on page 19 for more information.

■ In order to sustain extremely high rates of data transfer, the Single Shot partition uses a rigid file structure. Unlike a normal computer disk, on which file data can be fragmented and stored wherever there is free space, the Data Store disks must store each file as a single data block immediately "below" the last-acquired file. As a result, you cannot simply delete an arbitrary file to free up disk space. This is explained further under *Compress Disks* on page 40.

NOTE. Because of the rigid file structure, it is strongly advised that you use the Data Store disks only for acquiring, storing, and generating transport stream files. For best results, always transfer small files onto the MTS 200 Series system disk for long-term storage.

Starting the Application

There are two ways to start the application:

■ Double-click the **Data Store Administrator** icon in the Tektronix MPEG Test System program group window.

■ Select **Data Store Administrator** from the Programs/Tektronix MPEG Test System submenu of the Windows NT Start menu.

NOTE. You cannot start the Data Store Administrator application if either the Deferred-Time Analyzer or the Multiplexer applications are running.

Acquiring Data

Follow this outline procedure to receive and save data on the Data Store disks.

1. Connect the data source to the appropriate Data Store system input. For descriptions of the inputs, refer to *Appendix A: Data Store I/O Specifications* or *Getting Started* in the *MTS 200 Series Hardware Installation and Specifications Compaq Proliant 1600 Platform* Technical Reference, Tektronix part number 071-0261-XX.

2. Click the **A** (acquisition) command button to open the ACQUISITION settings window.
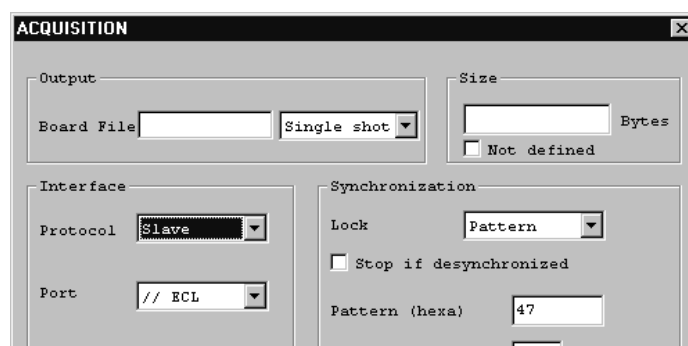
3. Enter a name for the file to be saved in the Board File text box. If you intend to analyze the file with the Deferred-Time Analyzer, use an appropriate file name extension (*.trp, for example).

4. If the Data Store disks have both a Single Shot and a Loop partition, select the target partition.

5. Enter a size to specify how much of the input stream to capture; select **Not defined** if you intend to stop acquisition manually (such as when capturing indefinitely to the Loop partition).

6. Select **Slave** protocol to use the source clock; select **Master** protocol to use the internal Data Store clock.

7. Select the input port. Choices depend on the following protocol selection:

   ■ Inputs available with Slave protocol: //ECL, Serial ECL, G703, TTL, and 10 Mbits.

   ■ Inputs available with Master protocol: **//ECL** and **Serial ECL**.

8. Depending on the port selection, you may have additional Interface choices. Refer to *Acquisition* on page 31 for further information.

9. Select the appropriate Synchronization settings. To acquire an MPEG-2 transport stream made up of 188 byte packets, use the settings (Pattern/47/188) shown in the example ACQUISITION window above. Refer to *Acquisition* on page 31 for further information.

10. Click **Start**. If the settings are correct for the input, the Acquisition in progress message appears in the application window.
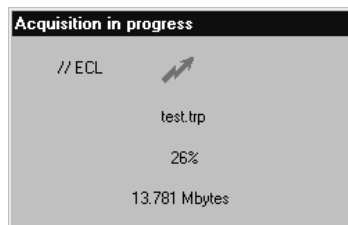
11. If you defined a file size, acquisition ends when the specified amount of data is received. Otherwise, select **Interrupt Transfer** from the Acq/Gen menu or click the corresponding (red hand) command button to stop acquisition.

   In the default configuration, the Data Store Administrator dialog box containing the message "Transfer is finished" appears after each acquisition of a specified size. Click **OK** to acknowledge the message. You can edit the Windows NT registry to prevent appearance of this message; refer to *Suppressing the "Transfer is Finished" message* on page 43 for instructions.

When acquisition ends, the new file is added to the File information list.

Generating (Outputting) Data

Follow this outline procedure to output data from the Data Store disks. You can refer to *Generation*, beginning on page 35, for additional information.

1. Select a file from the File information list and right-click to open the shortcut menu.
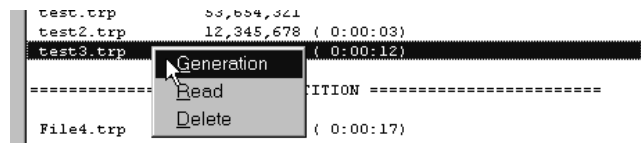
2. Click **Generation** to open the GENERATION settings window.
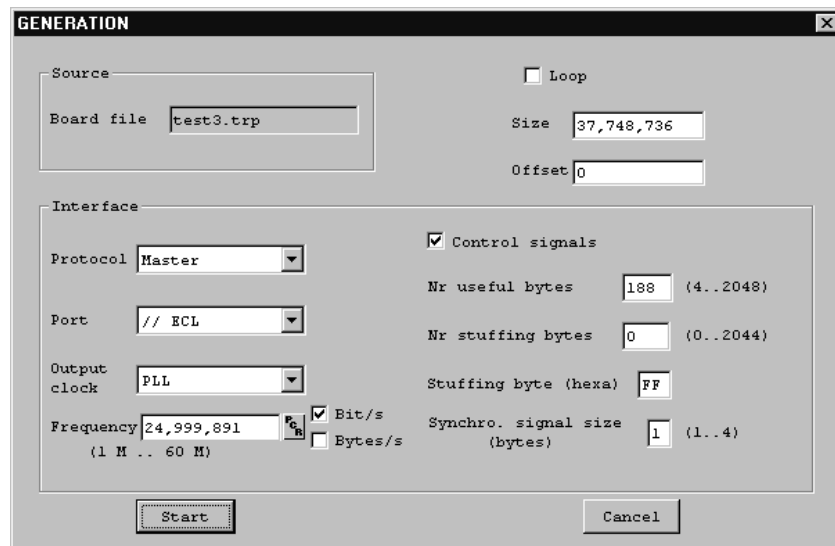
3. Make the following selections:

Table 6: Data Store generation settings

Settings parameter	Choices/explanation
Loop	Select to repeatedly output entire file
Size	Portion of the file to output once. Not available when loop is selected
Offset	Bytes at the beginning of file to ignore. Not available when loop is selected.
Protocol	Master or Slave
Port	//ECL, Serial ECL, G703, TTL, 10 Mbits

Table 6: Data Store generation settings (Cont.)

Settings parameter	Choices/explanation
Output clock	Depends on Port; see Table 12 on page 37.
Frequency	Depends on Port and clock; see Table 12 on page 37.
Msb first	Available with serial ports only and if Data Store system is configured; refer to *Msb first* on page 37 for additional information.
Control signals	Available with ECL ports only, forces burst mode output

4. Click **Start**. The Generation in progress message appears and remains on the Data Store Administrator application window as long as generation continues. You can minimize the application window during generation, but you cannot exit the Data Store Administrator.

```
Generation in progress

   // ECL            3,124,986 Hz

            test3.trp

              11%

          4.000 Mbytes
```
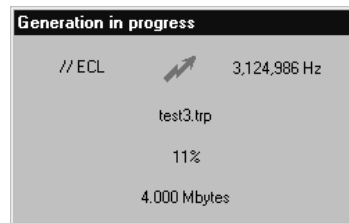
5. If you selected Loop generation, select **Interrupt Transfer** from the Acq/Gen menu or click the corresponding (red hand) command button to end generation. Otherwise, generation ends when the end of the source file is reached.

   In the default configuration, the Data Store Administrator dialog box containing the message "Transfer is finished" appears after each one-time (not looping) generation. Click **OK** to acknowledge the message. You can edit the Windows NT registry to prevent appearance of this message; refer to *Suppressing the "Transfer is Finished" message* on page 43 for instructions.

Disk Management

The Data Store system hardware and software is specially designed for unusually high rates of data transfer. As a result, you cannot use standard Windows NT file management practices to manage the Data Store disks. Although the Data Store system is visible as folder C:\Carb0 through the My Computer icon and the

Windows NT Explorer application, you can copy, output, and erase Data Store files only through the Data Store Administrator application.

Partitioning the Disks   The Data Store disks can have two types of partition:

- Single Shot, for acquisition and storage of up to 255 individual files. Acquisition can continue only until the partition is full.

- Looping, for continuous acquisition of a single file. When the partition is full, new input data overwrites the oldest data on the partition.

You can partition the Data Store disks as entirely Single Shot, entirely Looping, or any combination between the two extremes (for example, 16 Gbytes single shot and 2 Gbytes looping).You can change the relative sizes of the partitions whenever the Data Store system is not generating or acquiring; however, repartitioning the Data Store disks erases all files on the disks.

CAUTION. Partitioning the Data Store disks erases all file directory information and makes it impossible to read, retrieve, or use previously-stored data. Be sure to transfer irreplaceable and important files to the system disk or other storage media before partitioning the Data Store disks.

Use the following procedure to partition the Data Store disks:

1. Transfer all important Data Store files to the System Disk or to another MPEG Test System. Refer to *Copying Files to the Computer* on page 20 or *Data Store Transfers* on page 44 for instructions and additional information.

2. Select **Partition Disks** from the Service menu. The Partitionning window opens.
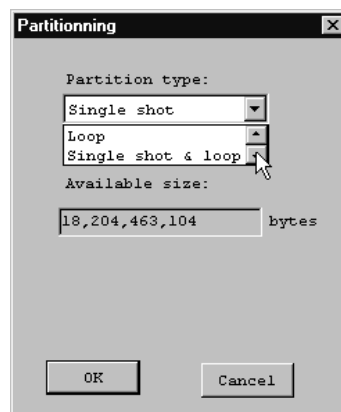
3. Select the appropriate Partition type from the list.

4. If you selected only Single shot or only Loop partition type, click **OK** to create the partition.

5. If you selected Single shot & loop, enter the desired size of the loop partition and click **OK** to create the partitions.

6. Click **Yes** in the resulting Are you sure? message window to confirm your choice (click **No** to abort partitioning).

   When partitioning is complete, the Disk information reflects your partitioning choices and the File information list is empty.

Copying Files from the Computer

You can copy files to the Single Shot partition from any drive that the computer has access to, such as the system disk, the CD ROM drive, and any network drives. Use the following procedure to copy files from MPEG Test System disks to the Data Store disks:

1. Check the Single Shot partition Disk information to verify that the Available size is large enough for the file.

```
 ┌─ Single shot partition ─┐
 │ Total size      : 10,182,852,608
 │ Available size : 10,131,816,448
 │ Number of files: 2
```

2. Select **PC to Board (Write)** from the File menu or click the **W** command button. The File Write to CARB window opens.

3. Click **Browse** to open a standard Windows Open dialog box.

4. Locate and select the appropriate file (double-click on the file name or click **OK** to dismiss the Open dialog box).

   By default, the PC file name is used as the name of the Data Store file. You can edit the name in the Name of the CARB File text box.

5. Click **Start** to begin writing the file onto the Single Shot partition. A message box appears to show the progress of the operation. Another box appears when the transfer is complete; click **OK** to acknowledge. The file name appears at the bottom of the Single Shot partition files list.

Copying Files to the Computer

You can copy files from either Data Store partition to any drive that the computer has access to, such as the system disk and network drives. Use the following procedure to copy files from the Data Store disks to MPEG Test System disks:

1. Verify that there is enough room on the target drive to accept the file. (To check disk free space, open the My Computer window and click on the target

drive icon; the disk free space is reported on the status bar at the bottom of the window.)

NOTE. Due limitations of the File Allocation Table (FAT) file system, you cannot copy files larger than four Gbytes onto the system disk.

---

2. Highlight the name of the source file on the Data Store Administrator File information list.

3. Right-click to open the shortcut menu; then click **Read**.
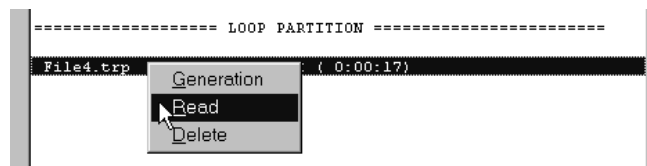
The File Read from CARB window opens.
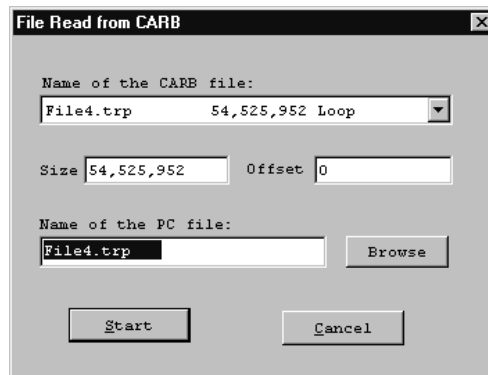
4. To copy the entire file under its original name in the C:\Mts200\Cfg-trp directory, click **Start**.

5. To copy the file to a different directory and file name, enter the path and name in the Name of the PC file text box or click **Browse** to access the appropriate drive and directory and enter the file name.

6. To copy only a portion of the file, enter the desired size in the Size box. If you enter 20000000 (or 20,000,000 or 20 000 000), for example, only the first 20 Mbytes of the file will be written to the PC disk. To copy only packets 11 through 110 from a stream of 188-byte packets, enter 1880 in the **Offset** box and enter 18800 in the size box.

Erasing All Files

To quickly erase all files from both partitions of the Data Store disks, choose **Fat Delete** from the service menu. The *"Are you sure?"* message appears. To delete all files from the Data Store disks, click **Yes**.

⚠ **CAUTION.** *The Fat Delete command is irreversible. You cannot recover deleted files. Never use the Fat Delete command before confirming that important Data Store files have been backed up on the system disk or on other media.*

Erasing Files to Increase Available Disk Space

In some circumstances, you may want to delete some files from the Data Store disks in order to make room for additional acquisitions while preserving other important files that may be too large to transfer to the system disk. Because Data Store files must occupy contiguous regions of the disks, you must first mark the unwanted files for deletion and then compress the disks to create the largest possible segment for new acquisitions.

1. Delete unwanted files as follows:

   a. Select the unwanted files on the File information list.

      To select several files in a row, hold the **SHIFT** key down while making your selections; to select several files that are not listed consecutively, hold the **CTRL** key down while making your selections.)

   b. Right-click to open the shortcut menu. If you have selected more than one file, Delete is the only command available.
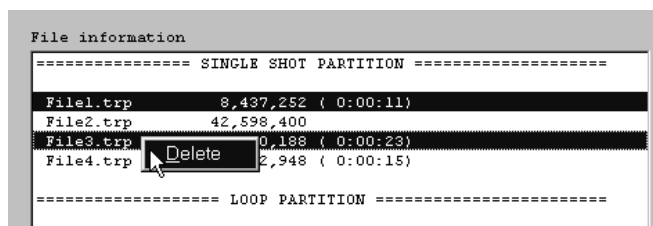
   c. Click **Delete**. Click **Yes** or **Yes to All** in the resulting confirmation window. Until you compress the disks, you can undelete all but the last file on the list.

d. If you decide not to erase a file that is marked deleted, highlight the file name and right-click; then click **Undelete** in the shortcut menu.


```
File2.trp        42,598,400
File3.trp    Undelete   88 ( 0:00:23)   (DELETED)
File4.trp             48 ( 0:00:15)
```
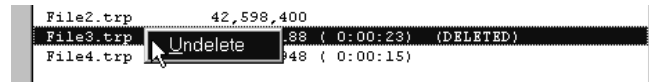
2. Compress the Data Store disks as follows:

a. To erase files that are marked deleted and to consolidate the remaining files in contiguous regions of the data store disks, select **Compress Disks** from the Service menu.

NOTE. *The last file and files marked* delete *cannot be recovered following disk compression.*

---

b. One again the *"Are you sure?"* message appears. Click **Yes** to proceed.

NOTE. *The Compress function requires approximately one second per megabyte of disk space to compress the Data Store disks.*

For example, 1 Gbyte = 1024 Mb; 1024 seconds is approximately 17 minutes.

---

c. When disk compression is complete, the File information list contains only the names of the remaining files.


```
File information
================ SINGLE SHOT PARTITION ====================

 File2.trp        42,598,400 ( 0:00:56)
 File4.trp        64,722,948

=================== LOOP PARTITION =======================
```

MTS 200 Series MPEG Test System Data Store Administrator
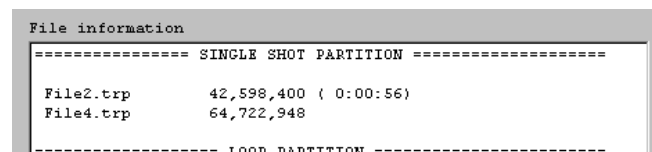
Reference

This section contains detailed information about the Data Store Administrator. The following subsections begin on the indicated pages:

The Application Window

When you open the Data Store Administrator, the application window shown below occupies the screen.
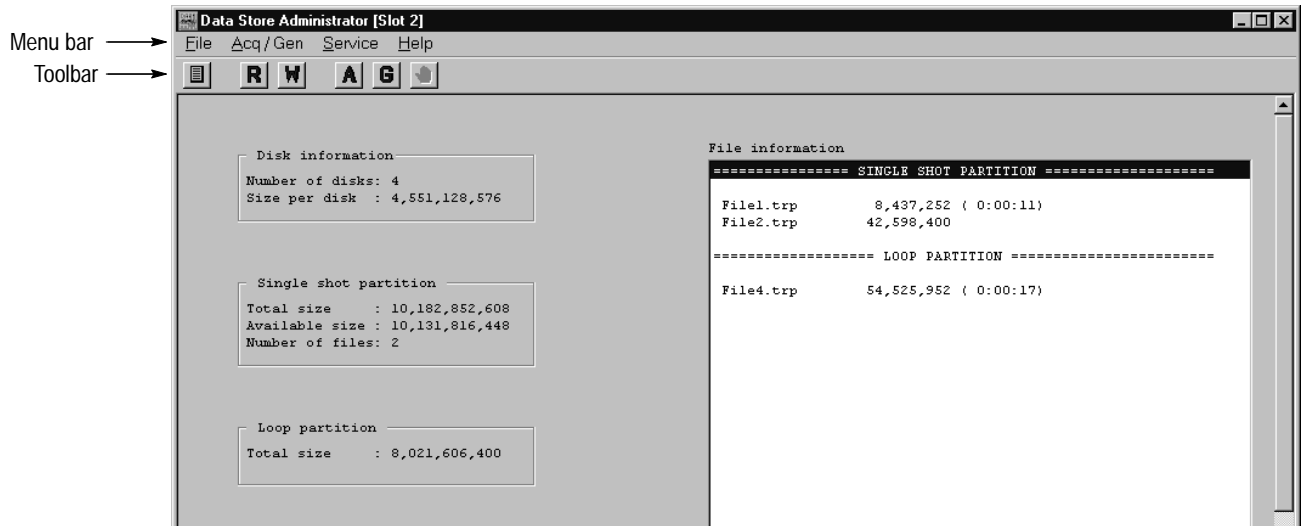
Toolbar Command Buttons

The toolbar contains command buttons for several frequently used menu commands. Click a button to select the corresponding menu command.

Table 7: Toolbar command buttons

Button	Corresponding menu command
▤	FAT Read (page 27)
R	Board to PC (Read) (page 28)
W	PC to Board (Write) (page 28)
A	Acquisition (page 31)
G	Generation (page 35)
🖑	Interrupt transfer (page 38)

File Menu Commands

The File menu contains file management commands.

```
 File
  FAT Read              F5

  Board to PC (Read)   Ctrl+R
  PC to board (Write)  Ctrl+W

  Delete                DEL
  Undelete

  Exit
```

Table 8: File menu commands

Use	To
FAT Read	List the files available on the Data Store disks
Board to PC (Read)	Copy a file from the Data Store disks to the system hard drive (or other disk)
PC to board (Write)	Copy a file from the system hard drive or other media to the Data Store disks
Delete	Mark a Data Store file to be deleted (unless the file is at the bottom of the list, it can be undeleted any time before disk compression)
Undelete	Remove the delete mark from a Data Store file
Exit	Quit the Data Store Administrator application

FAT Read   FAT stands for File Allocation Table. The FAT Read command lists the files available on the Data Store disks and shows their status. A FAT Read occurs automatically when the Data Store Administrator is started and after most file read and write operations.

```
  Disk  information
 Number of disks: 4
 Size per disk  : 4,551,128,576




  Single shot partition
 Total size    : 12,054,560,768
 Available size : 11,782,576,128
 Number of files: 5




  Loop partition
 Total size    : 6,149,898,240
```

```
 File  information
 =============== SINGLE SHOT PARTITION ==================

  File1.trp         8,437,252
  File2.trp        42,598,400
  File3.trp        94,000,188
  File4.trp       100,000,000
  File5.trp        26,944,160


 ================== LOOP PARTITION =====================

  RTA.trp       6,144,655,360
```

The FAT Information display occupies the application window and provides the following information:

- Number of Disks detected on the Data Store board. There should be four disks; any fewer indicates that you may have a malfunctioning disk. (The MTS 200 Series can operate with fewer than four disks if one or more fails and immediate replacements are not available.)

- Size of each disk (in bytes).

- Partition information.

- File name(s).

- File size(s) in bytes.

- Files marked as deleted (DEL). These files are deleted when the Compress Disks command is next selected from the Service menu.

Board to PC (Read)

Use the Board to PC (Read) command to copy a file from the Data Store system to the system disk (or another regular disk).

The most common reasons to copy a file to the system disk are as follows:

- To save an important file before repartitioning the Data Store disks.

- To save a file from the Loop partition before acquiring another file in looping mode.

After selecting the name of the file to copy from the File information list, you can invoke the read command in the following ways:

- Right-click in the File information box and then select **Read** from the resulting shortcut menu.

- Press **CTRL+R**.

- Click the **R** command button.

- Select **Board to PC (Read)** from the File menu.

Refer to *Copying Files to the Computer* on page 20 for step-by-step instructions.

PC to Board (Write)

The PC to board (Write) command copies a file from the system to the Data Store disks. Use this command to move transport stream files created with the Multiplexer application (or modified with the Packet Jitter or Coder/Decoder applications) to the Data Store disks. After you move the files, you can use them to generate transport streams.

NOTE. It is not always necessary to use the PC to board (Write) command to write files to the Data Store disks. You can write files directly to the Data Store disks from the Multiplexer application using the c:\carb0\mono directory.

---

1. Select the **PC to board (Write)** command from the File menu, press **CTRL**+**W**, or click the corresponding (W) toolbar button. The File Write to CARB dialog box opens.
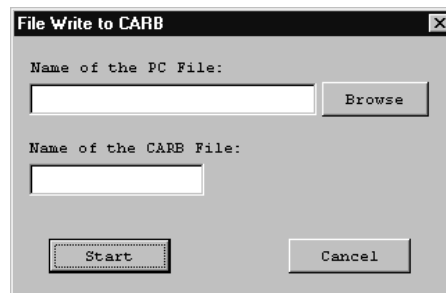
2. Enter the full path and file name or click **Browse** to select the file that you want to transfer to the Data Store disks.

3. Enter an appropriate file name in the Name of the CARB File text box.

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

Delete Use the Delete command to free up space on the Data Store disks.

To delete a file do the following:

1. Select the file(s) in the File information list.

2. Select **Delete** from the File menu or right-click to open the shortcut menu and click **Delete**.
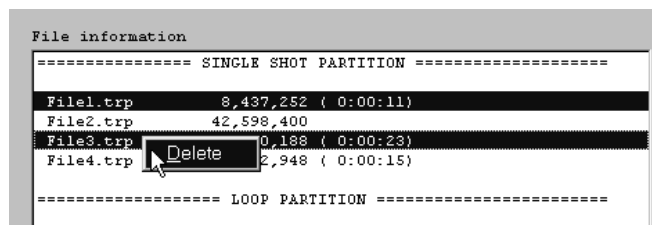
3. The Confirm delete file warning message opens.
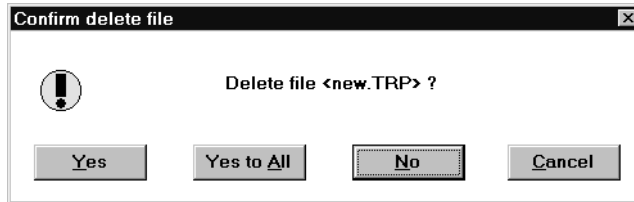
In most cases, you can undelete a file that is marked as deleted as long as you have not compressed the Data Store disks (see page 40). However, if you delete the last file (or files) in the FAT table, it (or they) will be removed immediately. In this case, you are given a special warning that the file is not recoverable.
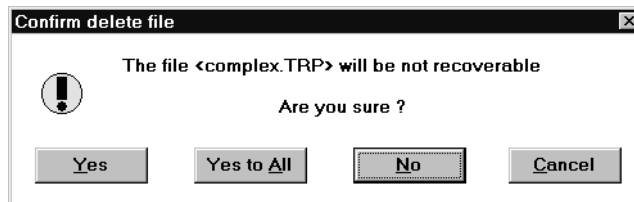
Use the Delete command to free up space on the Data Store disks. However, if you remove files listed anywhere except at the end of the FAT, you must also select the **Compress Disks** command from the Service menu (refer to *Compress Disks* on page 40 for more information).

Undelete   The Undelete command removes the (DELETED) mark from a file on the Data Store disks. If you decide not to erase a file, use this command to return it to normal status.

To undelete a file, highlight its name in the File information box. Select the Undelete command from the File menu or right-click to open the shortcut menu and click **Undelete**.
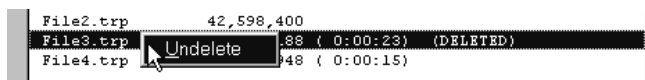
Acq/Gen Menu Commands

The Acq/Gen menu gives you access to commands to acquire or generate MPEG-2 transport streams.
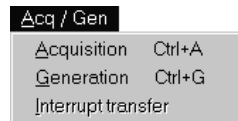
Table 9: Acq/Gen menu commands

Use	To
Acquisition	Acquire a transport stream from the selected input port and save it as a Data Store file
Generation	Generate a transport stream from a transport stream file stored on the Data Store disks and outputs it from the selected output port
Interrupt transfer	Stop the current Acquire or Generation process

Acquisition   Select the Acquisition command to open the ACQUISITION window. Use this window to configure the Data Store system to acquire a transport stream and to begin saving the stream to a file on the Data Store disks.
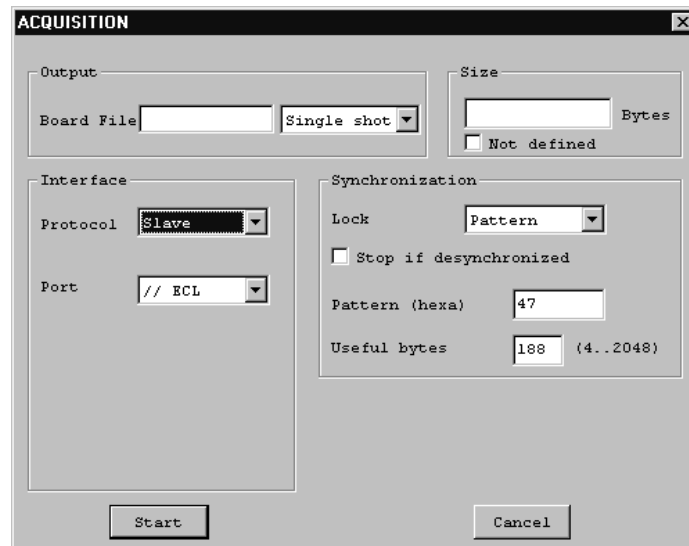
Some ACQUISITION window settings can affect the availability of other settings and the appearance of the window can also change in response to your choices.

This section explains the following acquisition settings groups: Output, Size, Interface, Synchronization, and Control Port (Master ECL Interface only).

Output. The Output group contains the Board File text box and a partition type selection box. Enter a name for the file in which you will save the incoming transport stream. If the Data Store disks have both a single shot and a loop partition, then select the target partition from the list box.

NOTE. *Use a Data Store File name that is not already in use or marked as deleted.*

Size. The Size group allows you to define the size of the file to be acquired. If you want to leave the file size undefined, select the Not Defined check box. This option allows the file to continue acquiring data until you select the Interrupt transfer command (see page 38). If you do not select this check box, you must enter a value in the text box. This number cannot be larger than the selected partition size. When the MTS 200 Series has collected a file the same size as defined in the text box, the acquisition process stops.

NOTE. *The File Size must be greater than 1024 bytes.*

Interface. The Interface group contains the Protocol, Port, Internal Clock, and Frequency parameters.
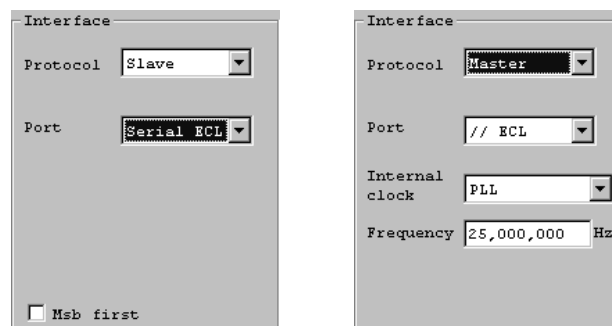
The acquisition Protocol can be Slave or Master. If it is Slave, the input signal supplies the clock; therefore, neither Internal Clock nor Frequency parameters are available. If the Port is set to G.703, the clock frequency must be specified however. If Protocol is set to Master, the Data Store board generates the clock. Only the Parallel ECL and Serial ECL ports can have Master Protocol.

The Port option selects the signal input port. The individual ports have their own specifications. The following ports are available: //ECL (Parallel ECL), Serial ECL, G.703, TTL (50 Ohm TTL), and 10 Mbit Serial Port (RS–422).

The Msb first option is available only when the Serial ECL port is selected. Select **Msb first** to output each byte of data "most-significant bit" first.

The Internal Clock option, available with Master protocol, selects which of the internal references is used as the clock. The following options are available: PLL, Osc. 34.368 MHz, Osc. 8.448 MHz, and External Clock. If you select PLL, the Frequency setting is available.

The Frequency setting should match the incoming signal rate. The available frequency range is port dependent as specified in Table 10.

NOTE. Data rates for G.703 ports must be exact. Since PLL is unavailable, the optional rates are 8.448 MHz or 34.368 MHz.

Table 10: Frequencies available for each port

Port	Minimum frequency	Maximum frequency
Parallel ECL	125 kHz	7.5 MHz
Serial ECL	1 MHz	60 MHz
G.703	8.448 MHz	34.368 MHz
TTL	1 MHz	45 MHz
10 Mbit Serial (RS422)	1 MHz	10 MHz

NOTE. Frequency step size is 1 Hz.

Synchronization. The Synchronization group determines how the incoming signal locks. The options include: none, PSYNC signal, and Pattern. None and Pattern are available to all ports. PSYNC is only available to the ECL ports.

If you are using a serial port and select **None**, synchronization is not guaranteed to start at the beginning of a byte or packet. In this case, it is better to select the pattern synchronization option. With Pattern synchronization, the first three packets are lost however.
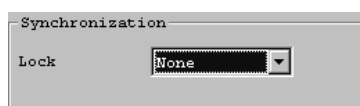
If Pattern is selected as the lock mode, you must enter three additional parameters: Stop if Desynchronized, Pattern (hex), and Useful Bytes. If the Stop if Desynchronized check box is selected, the acquisition stops with an error message box after 8 bad synchronization bytes.

```
┌─ Synchronization ─────────────────────────┐
│                                           │
│  Lock          [Pattern        ▼]         │
│                                           │
│  ☐ Stop if desynchronized                 │
│                                           │
│  Pattern (hexa)    [47    ]                │
│                                           │
│  Useful bytes      [188  ]  (4..2048)     │
│                                           │
└───────────────────────────────────────────┘
```
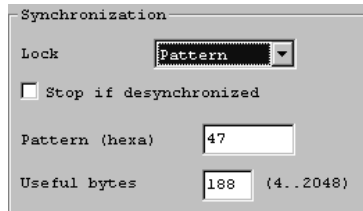
The Pattern is the actual synchronization signal in hexadecimal. For standard transport packets, the sync byte is 47.

The Useful Byte**s** parameter is the size of the transport packet. The standard size is 188.

The simultaneous presence of PSYNC and the synchronization pattern is not verified. The PSYNC signal is only used to trigger the start of acquisition (detection of the first leading edge). Thus no desynchronization criterion exists in this case. After the start of acquisition, the presence of the PSYNC signal is not verified.

```
┌─ Synchronization ─────────────────────────┐
│                                           │
│  Lock          [PSYNC Signal ▼]           │
│                                           │
└───────────────────────────────────────────┘
```
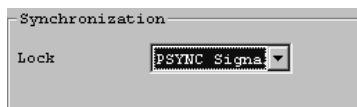
The mechanisms of synchronization and loss of synchronization vary according to the synchronization method used. See Table 11.

Table 11: How synchronization works

Synchronization method	Acquisition begins with	Loss of synchronization
None	1st clock received	Never
By PSYNC signal	1 recognition	Never
By pattern	3 exact recognitions	Absence of exact recognition during 8 cycles

Control Port. If either of the ECL ports are in Master mode, an additional group, Control Port, is presented. There are two or three parameters in this group, depending on the Synchronization Lock type.

```
┌─Control port────────────────────┐     ┌─Control port────────────────────┐
│ Useful bytes      [188]  (4..2048)│    │ Stuffing bytes    [0]    (0..2044)│
│                                  │     │                                  │
│                                  │     │ Synchro. byte size [1]   (1..4)  │
│ Stuffing bytes    [0]    (0..2044)│    └──────────────────────────────────┘
│ Synchro. byte size [1]   (1..4)  │
└──────────────────────────────────┘
```

The Useful Bytes parameter is the number of useful bytes as validated by a validation signal.

Stuffing Bytes is the number of bytes when the DEN (data enable) is off.

Synchro. Byte Size is the synchronization signal size, in bytes. It can range from 1 to 4 bytes.

NOTE. To prevent anomalous data, connect equipment only to those ports that are in use. For example, for G.703 output, both G.703 ports are active at the selected rate, but the voltage level is different on each port.

Generation   When a file name is selected in the File information list, the Generation command opens the GENERATION settings window. You can configure the Data Store system to generate a transport stream from the selected file and output the stream through the specified port.

Use any of the following methods to open the GENERATION window:

- Right-click in the File information list; then click **Generation** on the resulting shortcut menu.

- Click the **G** command button.

- Select **Generation** from the Data Store Administrator File menu.

NOTE. To open the GENERATION window, you must first select a Data Store file from the File information list.

```
GENERATION                                                           ☒

 ┌─ Source ──────────────────────────┐        ☐ Loop
 │                                    │
 │  Board file   test2.trp            │        Size  12,345,678
 │                                    │
 └────────────────────────────────────┘        Offset 0

 ┌─ Interface ────────────────────────────────────────────────────┐
 │                                        ☑ Control signals        │
 │  Protocol Master      ▼                                         │
 │                                        Nr useful bytes   188   (4..2048)
 │  Port     Serial ECL  ▼                                         │
 │                                        Nr stuffing bytes  0    (0..2044)
 │  Output                                                         │
 │  clock    PLL         ▼                Stuffing byte (hexa) FF  │
 │                                                                 │
 │  Frequency 25,000,102  PLL Bits/s     Synchro. signal size  1  (1..4)│
 │     (1 M .. 60 M)                          (bytes)              │
 │  ☐ Msb first                                                    │
 │         ┌─────────┐                        ┌─────────┐          │
 │         │  Start  │                        │ Cancel  │          │
 │         └─────────┘                        └─────────┘          │
 └─────────────────────────────────────────────────────────────────┘
```
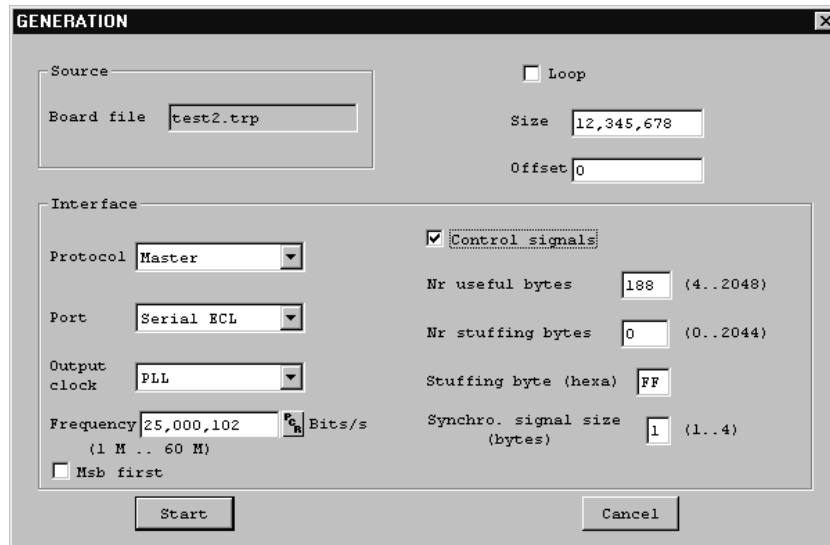
The GENERATION settings window is dynamic in that the window contents depend on some basic settings choices. The illustration above shows all possible settings parameters. The parameters are discussed in the following paragraphs.

Source. The Board file is the file that you selected/highlighted on the File information list before invoking the Generation command. If the correct file is not selected, close the window and try again.

Loop. If Loop is checked, the Data Store system outputs the entire file continuously until you perform a manual interrupt. If it is not checked, the file is sent only once. The Size and Offset settings are not available when Loop is selected.

NOTE. Minimum file size for looping generation is one Mbyte.

Size. Available only when Loop is not selected. By default, the Size text box contains the size of the selected file. To output only a portion of the file, enter the size in bytes. You can enter spaces or commas (example: 100 000 000 or 100,000,000) if desired. Unless you enter an Offset value, the Data Store system begins output with the first byte of data in the file.

Offset. Available only when Loop is not selected. Enter the number of data bytes to ignore at the beginning of the file. For example, to output the second 100 MB of a 200 MB file, enter an Offset of 104 857 620.

Protocol. The Protocol can be either Master (the Data Store board generates the reference clock) or Slave (the clock is generated by an external source). Only the ECL ports can use Slave protocol.

Port. Select the output port from the Port drop-down list. The choices are: //ECL (Parallel ECL), Serial ECL, G.703, TTL (the TTL 50 Ohm port), and 10 Mbit serial port (RS–422).

NOTE. Connect receiving equipment only to the selected output port. This will prevent unexpected results.

All of the other parameters are based on the selected port. Table 12 summarizes the availability of remaining settings parameters.

Table 12: Parameters available for each port selection

Port selection	Osc. 8.448 MHz	Osc. 34.368 MHz	PLL Min – Max	External clock	Control signals
Parallel ECL	N/A	N/A	125 kHz – 7.5 MHz	Available	Available
Serial ECL	Available	Available	1 MHz – 55 MHz	Available	Available
G.703	Available	Available	N/A	Available	N/A
TTL	Available	Available	1 MHz – 45 MHz	Available	N/A
10 Mbit Serial	Available	N/A	1 MHz – 10 MHz	Available	N/A

Output clock. Depending on the port selection, the Output clock can be one of the two internal oscillators (8.448 MHz or 34.368 MHz), the PLL, or an external clock signal. If you select the PLL, the Frequency setting is available.

NOTE. The data rates for the G.703 ports must be exact. Therefore only the two internal oscillators with the G.703 frequencies are available.

Frequency. Available only when PLL Output clock is selected. Enter the desired frequency to the nearest Bit/s or Byte/s (select the appropriate units) within the allowable range (see Table 12). Click the adjacent **PCR** button to have the Data Store Administrator calculate the frequency from data in the output file.

Msb first. This option is available when the Serial ECL port is selected. Select the **Msb first** option to output each byte of data "most-significant bit" first instead of least-significant bit first, which is the default.

Control signals. The Control signals option is available only with the ECL ports, which have a DEN (data enable) signal. Selecting **Control signals** causes burst mode output.

NOTE. If you select burst mode, be sure that the first byte(s) of the file are sync bytes (SB), typically 0x47, because the SB signal is on during the first byte(s) of the file.

The Nr useful bytes is the number of bytes when DEN is on.

The Nr stuffing bytes is the number of bytes when the DEN is off. All stuffing bytes have the value entered in the Stuffing byte (hexa) text box.

The Synchro. signal size is the number of bytes when the SB (Sync Byte) signal is on.

Interrupt Transfer   The Interrupt transfer command stops the current Acquisition or Generation process.

Service Menu Commands

The Service menu contains housekeeping commands for the Data Store disks and the Data Store board.

Service
 Board Reset
 Resource Parameters
 FAT Delete
 Partition Disks
 Compress Disks
 Disk Motor Control   ▶   Automatic Control Parameters
                              Start Disks Motor
                              Stop Disks Motor
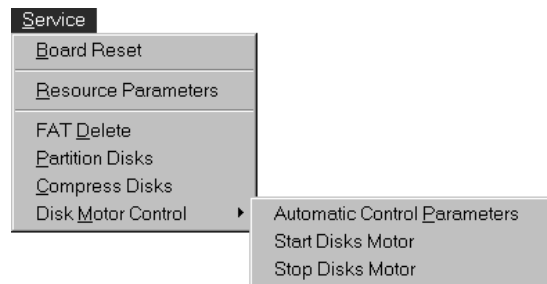
Table 13: Service menu commands

| Use	To
Board Reset	Perform a software reset on the Data Store board (use after an error)
Resource Parameters	View the Data Store resource parameters
FAT Delete	Initialize the Data Store disks. The partitions are preserved, but all files are lost
Partition Disks	Create disk partitions. Must be run each time Data Store disks are added, removed, or replaced

Table 13: Service menu commands (Cont.)

Use	To
Compress Disks	Free the disk space of all (DELETED) files
Disk Motor Control	Stop and restart the Data Store disk motors or specify automatic stop and set the delay (available to Administrator only)

Board Reset

The Board Reset command performs a software reset on the Data Store board. Use this command after an error occurs (such as locking the application) to reset the software.

Resource Parameters

The Resource Parameters command opens the Resources Parameters dialog box. You cannot change Data Store resource parameters, which are set for the computer platform (as shown in Table 14) during software installation.
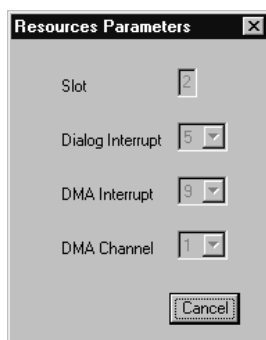
Table 14: Data Store resource parameters

Parameter	Proliant	Prosignia
Slot: the expansion slot occupied by the Data Store board	2	3
Dialog Interrupt: the interrupt used for the dialog between the PC and the Data Store board	5	15
DMA Interrupt: the interrupt used for DMA exchange	9	10
DMA Channel: the channel used for DMA exchange	1	1

FAT Delete   Refer to *Erasing All Files* on page 22 for information about using the FAT Delete command.

CAUTION. The Fat Delete command is irreversible. You cannot recover deleted files. Never use the Fat Delete command before confirming that important Data Store files have been backed up on the system disk or on other media.

Partition Disks   Refer to *Partitioning the Disks* on page 19 for information about using the Partition Disks command.

CAUTION. Partitioning erases all files from the Data Store disks; erased files cannot be recovered. Be sure to transfer important files to the system disk or another backup medium before partitioning the Data Store disks.

Compress Disks   The Compress Disks command frees the disk space of all files marked for deletion. This command performs the deletion and then optimizes the files on the Data Store disks for maximum efficiency. You are given a message box to confirm this operation.

NOTE. The Compress function requires approximately one second per megabyte of disk space to compress the Data Store disks.

For more information on why compression is necessary, see *Special Features of the Data Store disks* beginning on page 14. If you want to remove all files from the Data Store disks, use the FAT Delete command, described on page 40.

In order to sustain extremely high rates of data transfer, the Single Shot partition uses a rigid file structure. Unlike a normal computer disk, on which file data can be fragmented and stored wherever there is free space, the Data Store disks must store each file as a single data block immediately below the last-acquired file. As a result, you cannot simply delete an arbitrary file to free up disk space.

The following illustration and paragraphs explain data store file deletion and disk compression.

File 1	File 1	File 1
File 2	File 2	File 2
File 3	File 3 marked as deleted	File 4
File 4	File 4	File 5
File 5	File 5	
Empty	Empty	Empty
(A)	**(B)**	**(C)**

Column (A) of the figure represents the data structure after five files have been acquired. Any new file added to the Data Store disks is written to the top of the empty section, immediately below file 5.

Column (B) shows what happens when you delete file 3. Because file 3 is surrounded by other files it is only *marked* as deleted, but it is not actually deleted and cannot be overwritten. Thus, the disk space is not free for storing other files. To free the disk space, you must compress the Data Store disks. You can undelete it any time before you invoke the Compress command. However, you can delete the last file listed (File 5 in columns A and B) because it is adjacent to the empty disk space and you can add directly to that space.

Column (C) shows what happens after a Compress command. File 3 is removed, files 4 and 5 are moved so that they now follow file 2, and the space freed by moving files 4 and 5 is added to the empty space. This is the only way to free disk space after deleting a middle file (other than first deleting all files below it until the file is the last listed).
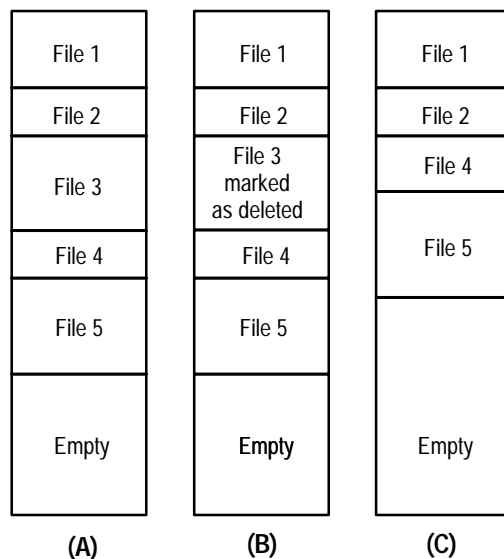

NOTE. *The Compress function requires approximately one second per megabyte of disk space to compress the Data Store disks. (For example, 8 Gbyte = 8192 MB; 8192 seconds is 136.5 minutes.)*

Disk Motor Control

The Disk Motor Control submenu contains three commands: Automatic Control Parameters, Start Disks Motor, and Stop Disks Motor. You must log on to Windows NT as the Administrator to use these commands; refer to *Logging On* on page 9 for instructions.

Disk Motor Control ▶	Automatic Control Parameters
	Start Disks Motor
	Stop Disks Motor

Select Stop Disks Motor to stop the Data Store disk motors when you intend to leave the test system running for an extended period but know that you will not be using the Data Store system for some time. Stopping the Data Store disk motors will extend their life. The motors restart automatically for generation or acquisition and when you copy a file either to or from the system disk. Restarting the motors takes approximately 20 seconds.

Select **Start Disks Motor** to manually restart the Data Store disk motors.

Select **Automatic Control Parameters** to set a motor automatic stop delay. Select **Automatic stop** in the resulting dialog box; the Motor delay entry box appears. Enter the delay time and click **Apply** to initiate the delay.

| Disks motor control para... ⊠	Disks motor control para... ⊠
☐ Automatic stop	☑ Automatic stop
	Motor delay [240] min
Apply Cancel	Apply Cancel

The disk motors automatically stop after the specified delay period has passed with no disk access. The default delay is 10 minutes; the recommended minimum delay period is 240 minutes (four hours).

*NOTE. The time required for disk startup can cause unexpected results during data storage with the MTS 215 Real-Time Analyzer (RTA) application. Do not stop the disk motors or select **Automatic stop** if you have an MTS 215 and intend to capture data through the RTA. Refer to the* Real-Time Analyzer User Manual *for information about RTA data storage.*

The Help Menu

The Help menu has a single command. No online help is available for the Data Store Administrator.

Help
About...
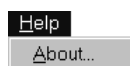
Select the About command to open the software version information window.

Suppressing the *Transfer is Finished* Message

In the default configuration, the Data Store Administrator dialog box containing the message *Transfer is finished* appears after each acquisition or generation. To turn off the display of the dialog box after every transfer, change the DefaultAlwaysDialog Box registry parameter. The possible settings for the DefaultAlwaysDialogBox are shown in Table 15.

Table 15: DefaultAlwaysdialogbox registry parameter values

Value	Description
0x1	A dialog box is displayed after all transfers (default)
0	A dialog box is not displayed after transfers

To change to value of the DefaultAlwaysDialogBox registry parameter, exit the Data Store Administrator and use the Registry Editor program, Regedt32.exe, located in the C:\WINNT\system32 directory.

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

Use the following path to access the DefaultAlwaysDialogBox registry parameter.

```
C:\HKEY_CURRENT_USER\SOFTWARE\CARB\CARB0
```

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

Data Store Transfers

The easiest way to check the operation of an MPEG Test System is with another MTS 200 Series system. The results of MTS-to-MTS transfers will vary depending on generation, acquisition, and synchronization mode.

In either acquisition or generation, files can be processed in loop-back mode. During read or write file loop back, the system must be configured to assure that the data flow is never interrupted. The file loop back does not cause the insertion of stuffing data. Refer to Table 16 for information on MTS-to-MTS data transfers.

Table 16: MTS to MTS transfer results

Interface	Generation mode	Acquisition mode		Expected result
ECL	Nonlooping	Size:	Generator's File size	Auto stop, files are identical
		Sync:	Sync Byte	
ECL	Nonlooping	Size:	Generator's file size minus three packets	Auto stop, first three packets lost
		Sync:	Pattern	
ECL	Nonlooping	Size:	Not defined	No auto stop, manual stop size is truncated in 1 Mbyte (1024 Bytes)
		Sync:	None, Pattern, or Sync Byte	
ECL	Nonlooping	Size:	> Generator's file size	No auto stop, manual stop size is not predictable because the algorithm for smoothing the size of each internal transferred block
		Sync:	None, Pattern, or Sync Byte	
G.703, TTL, or 10 Mbit/s serial	Nonlooping	Size:	Generator's file size	Auto stop, first three packets lost and last three packets are stuffed "FF"
		Sync:	Pattern	
G.703, TTL, or 10 Mbit/s serial	Nonlooping	Size:	Not defined	No Auto stop, manual stop is truncated in 1 Mbyte (1024 Bytes) increments
		Sync:	Pattern or None	
G.703, TTL, or 10 Mbit/s serial	Nonlooping	Size:	> Generator's file size	Auto stop, remaining packets to the end of the file are stuffed "FF"
		Sync:	No synchronization or synchronization on pattern with NO stop after desynchronization	

Table 16: MTS to MTS transfer results (cont.)

Interface	Generation mode	Acquisition mode		Expected result
G.703, TTL, or 10 Mbit/s serial	Nonlooping	Size:	> Generator's file size	Auto stop, the requested size is not reached. The size of the stored file is not user predictable because of the algorithm for smoothing the size of each internal transferred block
		Sync:	No synchronization and synchronization on pattern with AUTOMATIC stop after desynchronization	
Any	Looping	Size:	Acquisition file size, if defined	Auto stop
		Sync:	None, Pattern, or Sync Byte (ECL only)	
Any	Looping	Size:	Not defined	No auto stop, manual stop size is truncated in 1 Mbyte (1024 Bytes) increments
		Sync:	None, Pattern, or Sync Byte (ECL only)	

Problems and Troubleshooting

You may encounter problems while using the Data Store Administrator.

■ If the Data Store board does not respond to commands, but the application will respond to mouse or keyboard input, try selecting the Board Reset command on the Service menu.

■ Some problems result in on-screen error messages; refer to *Error Messages*, below, for a brief explanation of the Data Store error messages.

■ You may be able to clear an error condition by logging off and shutting down the test system (power off) for approximately five minutes; try doing so before proceeding to *When All Else Fails*, on page 47.

Error Messages   The following is a list of error messages and their meanings. CARB is a French acronym for the Data Store system.

CARB Time out Error (ERR_CARB_TIME_OUT)
    Time–out in TEST mode (such as SCSI access or EISA access).

CARB0 Error (Generation is too fast. Disk <N> too slow)
    Reduce the data rate. Refer to Tektronix Service Support for SCSI drive repair if a problem persists.

Desynchronization (ERR_CARB_DESYNCHRONIZATION)
    During an acquisition with stop on desynchronization option, the synchronization pattern has been lost.

Disk error (ERR_CARB_DISK_ERROR)
Indicates a disk error on a check condition SCSI request.

Disk Initialization Error (ERR_CARB_DISK_INIT)
The first disk does not respond to the initialization sequence.

End of disk Error (ERR_CARB_END_OF_DISK)
Caused by an attempt to access outside the end of the disk or partition.

End of file Error (ERR_CARB_END_OF_FILE)
Caused by an attempt to access outside the end of the file.

Error busy card (ERR_CARB_DRIVER_BUSY)
There is already a command in progress.

Error : file not found (ERR_CARB_FILE_NOT_FOUND)
The file is not listed on the Data Store disks FAT (file allocation table).

Error : no partition (ERR_CARB_NO_PARTITION)
No partition exists on the Data Store disks; you must create a partition before capturing or storing a file.

Error : unknown command code (ERR_CARB_CODE_UNKNOWN)
The CPU has received an unknown command.

FAT Error (ERR_CARB_FAT_ERROR)
No partition exists on the Data Store disks; you must create a partition before capturing or storing a file.

FAT Full Error (ERR_CARB_FAT_FULL)
255 files (32 files, on early instruments) are present on the Data Store disks, not able to create another one.

File already exist (ERR_CARB_FILE_ALREADY_EXIST)
Try to create a file that already exist.

Line Error (ERR_CARB_LIGNE_ERROR)
Overflow in acquisition mode (the line FIFO is full).

Parameter error (ERR_CARB_PARAM_ERROR)
A parameter of the command is incorrect (such as value out of range).

SCSI Error (ERR_CARB_SCSI_ERROR)
Disk error on non DMA operations.

SCSI Overflow Error (ERR_CARB_OVERFLOW_SCSI)
The SCSI memory bank is full, causing an overflow in acquisition mode.

SCSI Read Error (ERR_CARB_READ_SCSI)
Disk error on DMA read operations.

SCSI Write Error (ERR_CARB_WRITE_SCSI)
Disk error on DMA write operations.

System Error (ERR_CARB_SYST_ERROR)
SCSI memory bank underflow or SCSI disks not responding.

Time-out Error (Not detected by CPU) (ERR_CARB_DRIVER_TIME_OUT)
The Data Store board does not respond to the NT driver request (the CPU board has not received the NT driver request).

(Detected by CPU) (ERR_CARB_DRIVER_TIME_OUT_2)
The Data Store board does not respond to the NT driver request (the CPU board has received the NT driver request but does not respond to it).

When All Else Fails   If an error message does not explain the problem sufficiently, or if restarting your system does not clear the problem, contact your nearest Tektronix representative or service facility.

Appendix A: Data Store I/O Specifications

The tables in this appendix list the electrical characteristics of the MPEG Test System, Data Store I/O and control ports.

Table 17: 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 MB file (within the constraints of synchronization)
Input		
Voltage Levels		Standard level within 0 to 4 dB cable attenuation at 1/2 clock frequency Standard Levels: Mark from 2.033 V to 2.607 V Space from –0.237 to +0.237 V
Return Loss (75 Ω)		12 dB, 211 kHz to 422 kHz 18 dB, 422 kHz to 8.448 MHz 14 dB, 8.448 to 12.672 MHz
Connector		Male SMB (shared with the 34.36 Mbit input)
Jitter Tolerance		177 ns peak-to-peak 20 Hz to 400 Hz 23.6 ns peak-to-peak 3 kHz to 400 kHz Log prorated – 400 Hz to 3 kHz
Output		
Pulse Width, nominal	59 ns	
Pulse "Mark" Amplitude	2.37 V ± 0.237 V	
No-Pulse "Space" Voltage	0 ± 0.237 V	
Pulse Shape		Conforms to 8.448 MHz Pulse Mask, see Figure 3
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 5 ns peak-to-peak with a 3 kHz lower cut-off and a 400 kHz upper cut-off filter Allows a cascade of ten different regenerators before system limit is reached

Table 17: G.703 — 8.448 MHz (cont.)

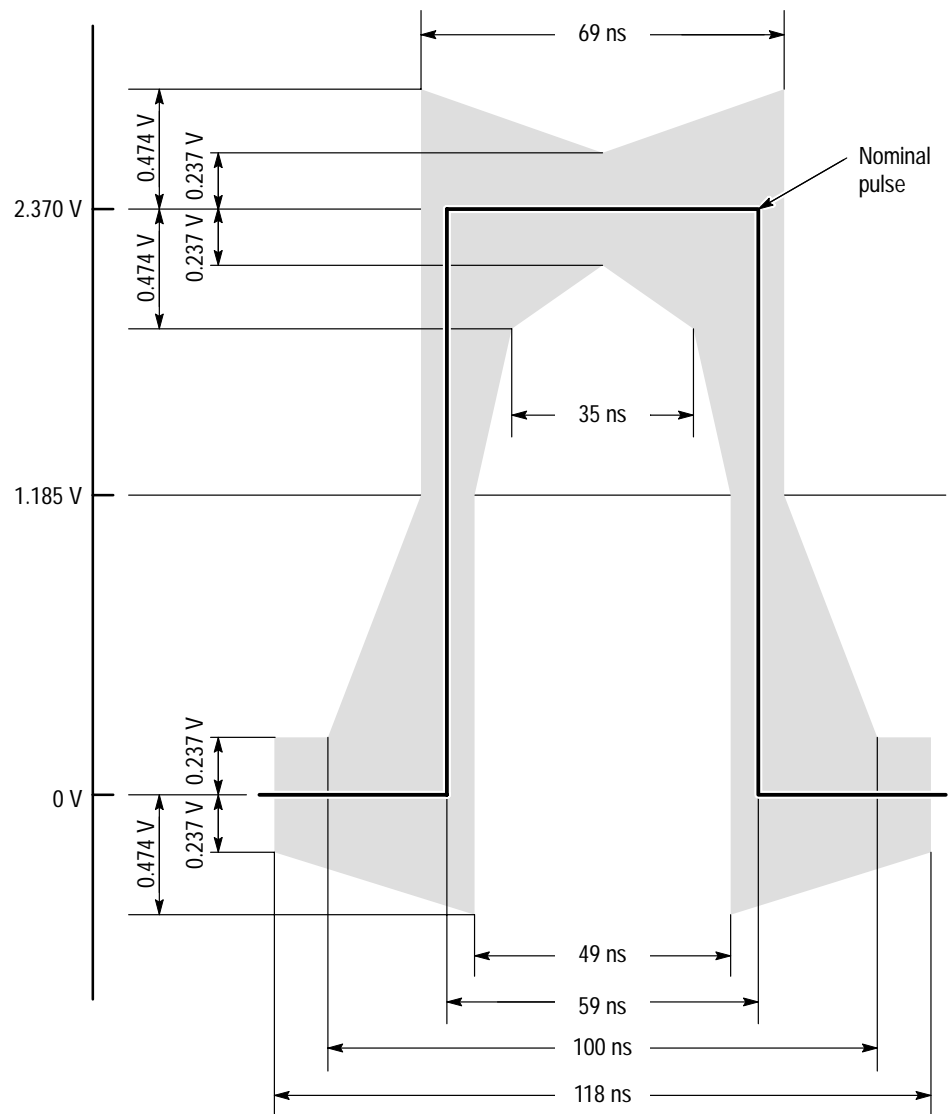| Characteristic	Description	Supplemental information
Connector		Male SMB
Return Loss		12 dB – 211 kHz to 422 kHz
		18 dB – 422 kHz to 8.448 MHz
		14 dB – 8.448 to 12.672 MHz

Figure 3: Pulse specification for a G.703 8.448 MHz pulse

Table 18: G.703 — 34.368 MHz

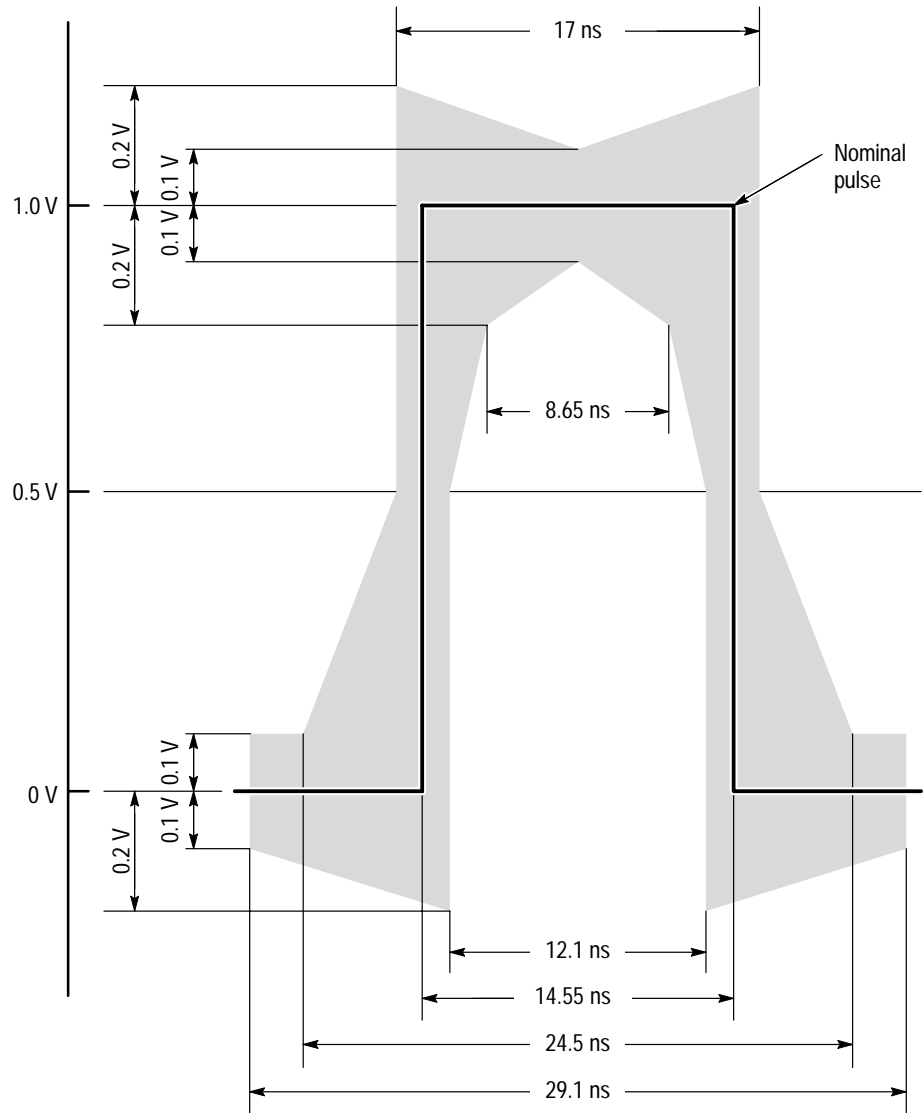| Characteristic	Description	Supplemental information
Standards Conformance		ITU-CCITT G.703, G.823
Connector		Male SMB
Line Encoding		HDB3
Generation/Acquisition Test	Error free	Tested with a 10 MB file (within the constraints of synchronization)
Serial Bit Rate	34.368 Mbits/s ± 20 ppm	
Input		
Voltage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

Figure 4: Pulse specification for G.703 34.368 MHz

Table 19: ECL parallel, serial, and control ports

Characteristic	Description	Supplemental information
Connector		Parallel Data: Female D25 (pinout described in Table 20) Serial Data: Female D25 (pinout described in Table 21) Flow Control: Female D9 (pinout described in Table 22)

Generation/Acquisition Test
 	
    Master/Slave
    Slave/Master (w/control)
		Tested with a 10 MB file at maximum data rates (within the constraints of synchronization)

Digital Format		Binary, positive logic
Input		
Maximum Data Rate		Serial: 55 Mbits/s Parallel: 60 Mbits/s (7.5 MB/s)
Minimum Data Rate		Clock Rate: 1 MHz Serial: 1 Mbits/s Parallel: 1 Mbits/s (125 KB/s)
Signal Level Amplitude		Differential ECL, Compliant with the ECL 100K levels
Time Reference		Rising edge of the clock
Output		
Maximum Data Rate		Serial: 55 Mbits/s Parallel: 60 Mbits/s (7.5 MB/s)
Minimum Data Rate		Clock rate: 1 MHz Serial: 1 Mbits/s Parallel: 1 Mbits/s (125 KB/s)
Clock to Data Timing		Data changes within 5 ns of falling clock edge
Signal Level Amplitude		Differential ECL,Compliant with the ECL 100K-Series levels
Required Receiver Termination		110 Ω, line-to-line

Table 20: 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 5: Parallel data timing, 188-byte packets

Packet length = 188 bytes + 16 dummy bytes

Clock

Data[0 . . 7] (16) SYNC 1 2 — — — 187 (1) (16) SYNC 1 2
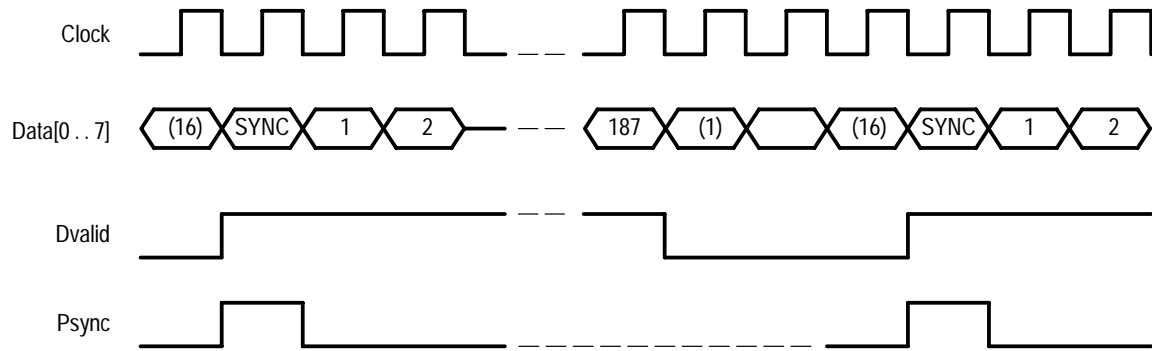
Dvalid

Psync

Packet length = 204 bytes (Reed-Solomon encoded)

Clock

Data[0 . . 7] 203 SYNC 1 2 — — — — — — 203 SYNC 1 2
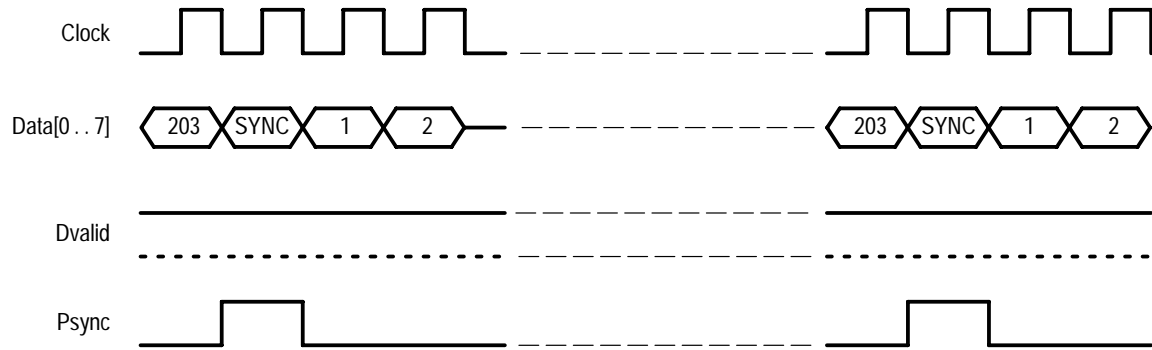
Dvalid

Psync

Figure 6: Parallel data timing, 204-byte packets

Table 21: 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.*
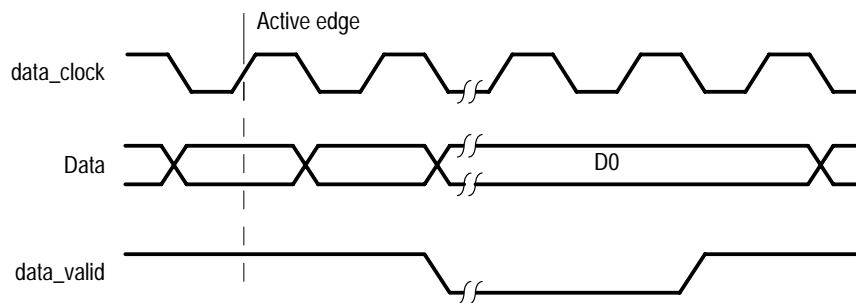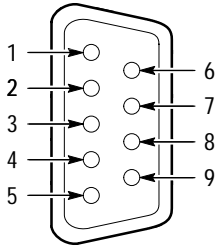
Figure 7: Timing diagram for the ECL serial port

Table 22: 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	$\overline{CHCLK}$ (Channel Clock)
	7	Ground
	8	$\overline{CHSYNC}$ (Channel Sync)
	9	$\overline{CHCLKEN}$ (Channel Clock Enable)

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

Figure 8: ECL Timing diagram with control port

Table 23: 50 Ω TTL I/O

Characteristic	Description	Supplemental information
Connectors		Male SMB
Rise & Fall Times		Between 2 ns and 6.5 ns
Signal swing into 50 Ω (output)	Low < 0.3 V High > 2.65 V	
Digital Format		Binary, positive logic
Maximum Data Rate		45 Mbits/s
Minimum Data Rate		1 Mbit/s
Generation/Acquisition Test	Error free	Tested with a 10 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 9)
Clock to Data Timing		Data changes within 5 ns of falling clock edge
Signal Level Amplitude (input)		TTL Low < 0.8 V High > 2.0 V

Table 24: TTL 50 Ω Clock In port

Characteristic	Description	Supplemental information
Clock port voltage levels		TTL Low: < 0.8 V TTL High: > 2.0 V
Termination		50 Ω, nominally resistive
Range		125 kHz to 45 MHz
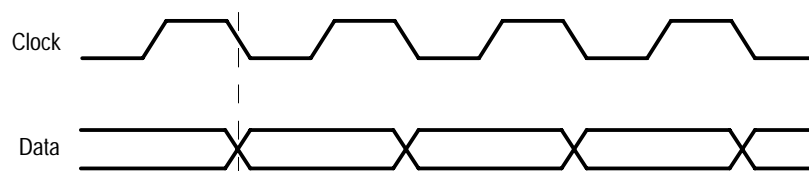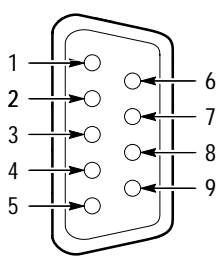
Figure 9: Timing for the TTL port and the separate clock input

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Table 25: 10 Mbit serial port (RS-422 levels I/O Port)

Characteristic	Description	Supplemental information
Connector		9-pin sub-miniature D-type connector (see Table 26)
10 Mbit Serial Voltage Levels		Differential outputs measured single-ended
Output		Low <0.5 V High >2.5 V
Input		Low <−0.5 V differential High >0.5 V differential
Common Mode Range		±5 Volts
10 Mbit Serial Rise and Fall Times		Between 2 ns and 12 ns
Maximum Data Rate		10 Mbit/s
Minimum Data Rate		1 Mbit/s
Clock to Data Timing		Data changes within 10 ns of falling clock edge
Generation/Acquisition Test		Tested with a 10 MB file at maximum data rates (within the constraints of the stop/start bits)

Table 26: 10 Mbit serial port pinout

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

Asserted Low differential signal.
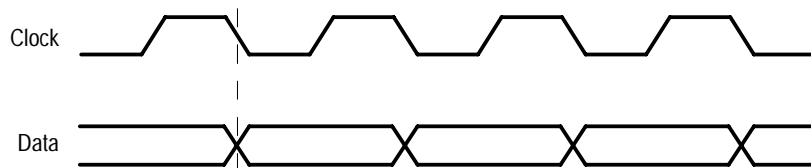
Figure 10: Timing diagram for the 10 Mbit Serial port

Table 27: 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

Appendix B: Functional Check

Use the procedure in this section to check Data Store system basic operation. The procedure checks instrument functionality only; see the optional Service Manual, Tekronix part number 071-0152-XX (Compaq Proliant platform) or 071-0151-0X (Compaq Prosignia platform), for the complete performance verification procedure.

Required Equipment

You need the following equipment to perform this check:

- Oscilloscope: capable of measuring 6 V amplitude and 1.4 ns rise time

- 50 Ω SMB to BNC adapter cable (Tektronix part number 174-3578-XX)

- 75 Ω SMB to BNC adapter cable (Tektronix part number 174-3579-XX)

- 50 Ω feed-through terminator (Tektronix part number 011-0049-XX)

- 75 Ω feed-through terminator (Tektronix part number 011-0103-XX)

The BNC terminators and adapter cables used to connect the test system to the oscilloscope are standard accessories of the test system.

Procedure

Perform the following steps to check Data Store system functionality.

1. Connect the equipment as shown in Figure 11.

G.703 output
(8.448 Mbits/s)

MTS rear panel

Test oscilloscope

Ch 1 input

75 Ω feed-through
terminator

75 Ω SMB-to-BNC
adapter cable
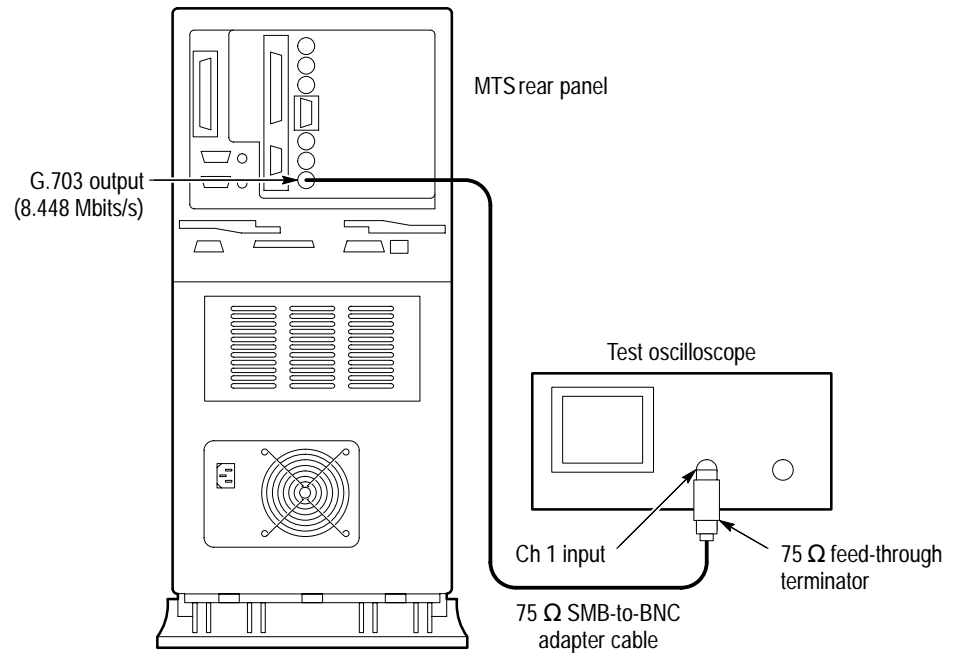
Figure 11: Initial test system connections for the functional check

2. Switch test system power on.

3. Allow the test system to complete the Windows NT initialization process. No user intervention is required until initialization is complete.

4. When Windows NT initialization is finished, press **CTRL** + **ALT** + **DELETE**, as instructed by the message box.

5. Type MTS100 for Username; do not enter a password. Click **OK**. If the default Username or Password have been changed, use the current valid Username and Password.

6. Double-click the **Data Store Administrator** icon in the Tektronix MPEG Test System program window.
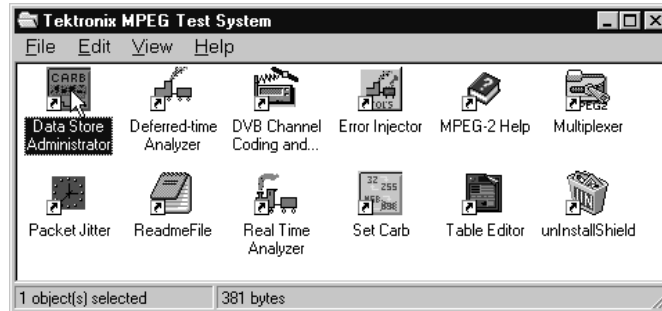
Figure 12: Starting the Data Store Administrator

7. Set up the Data Store Administrator as follows:

   a. Click the **G** (Generate) toolbar button.

   b. In the resulting GENERATION dialog box, select any valid Data Store file as the Source.

   c. Select the **Loop** option.

   d. In the dialog box Interface section, make the following selections:
   Protocol = Master.
   Port = G703
   Output clock = 8.448 Mbits.

   e. Click **Start**.

8. Trigger the oscilloscope.

9. Check for a frequency of approximately 4.224 MHz, amplitude of approximately 5 volts, and rise time of approximately 4 ns. See Figure 13 for the location of the measurement points on the waveform.

10. Move the output cable to the G703, 34 M output. See Figure 13.
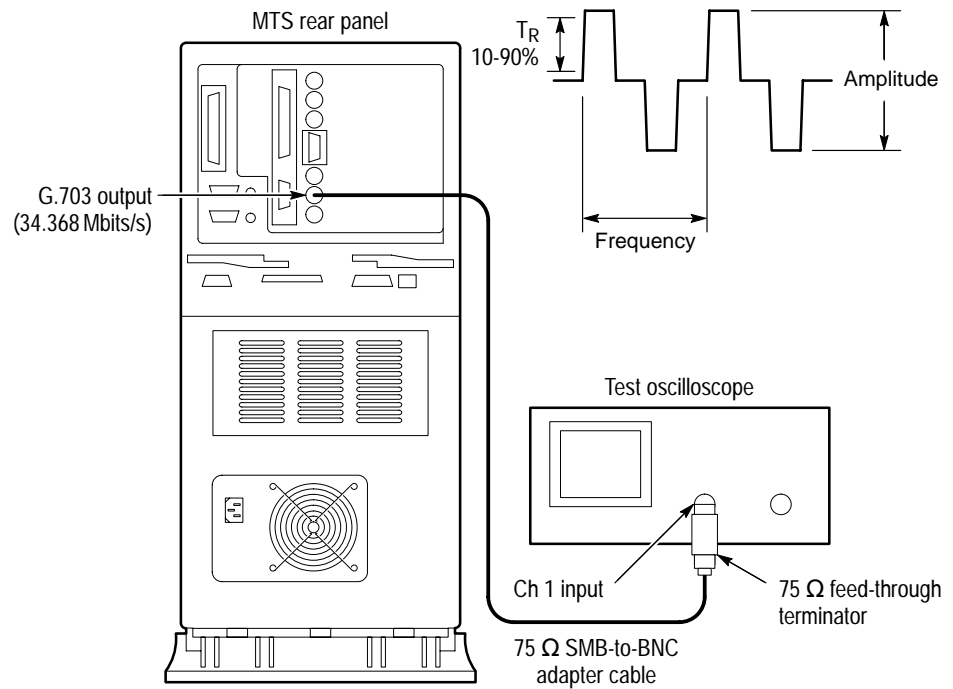
Figure 13: Setup for measuring the G.703 34.368 Mbit/s output

11. Set up the Data Store Administrator as follows:

   a. Click the **Stop** (red hand) toolbar button.

   b. Click the **G** (Generate) toolbar button.

   c. In the resulting GENERATION dialog box, select any valid Data Store file as the Source.

   d. Select the **Loop** option.

   e. In the Interface section of the dialog box, make the following selections:
   Protocol = Master.
   Port = G703
   Output clock = 34.368 Mbits

   f. Click **Start**.

12. Trigger the oscilloscope.

13. Check for a frequency of approximately 17.2 MHz, peak-to-peak amplitude of approximately 2.3 volts, and a rise time of approximately 3.8 ns. See Figure 13.

14. Remove the 75 Ω SMB-to-BNC adapter cable from the oscilloscope and the MTS 200 Series G703 34 M Out connector.

15. Connect a 50 Ω SMB-to-BNC adapter cable from the TTL 50 Ω Clock I/O Port, through a 50 Ω feed-through terminator, to the oscilloscope input. See Figure 14.
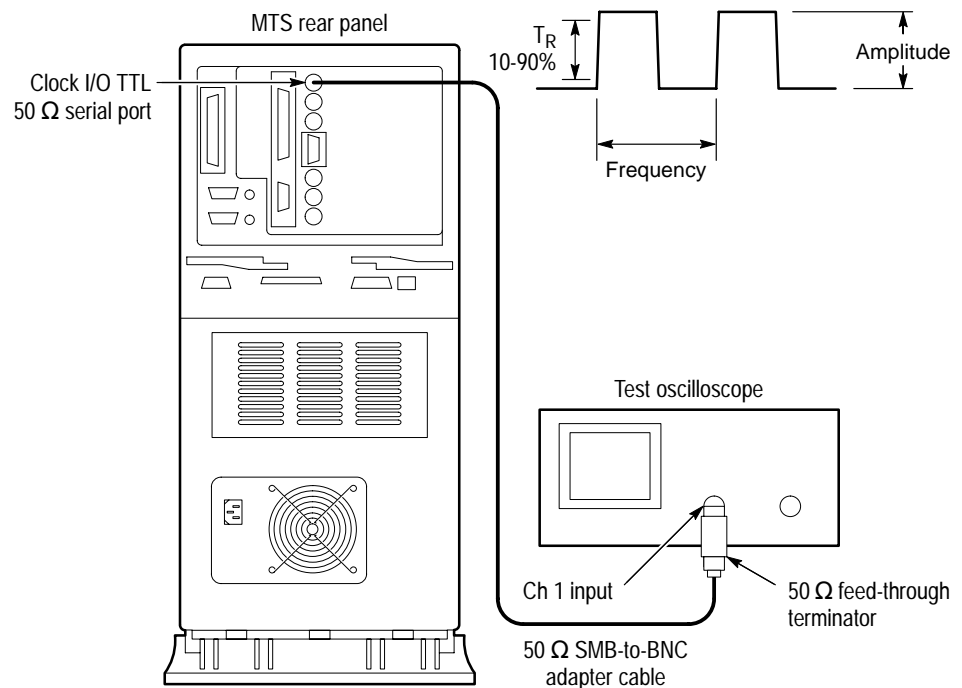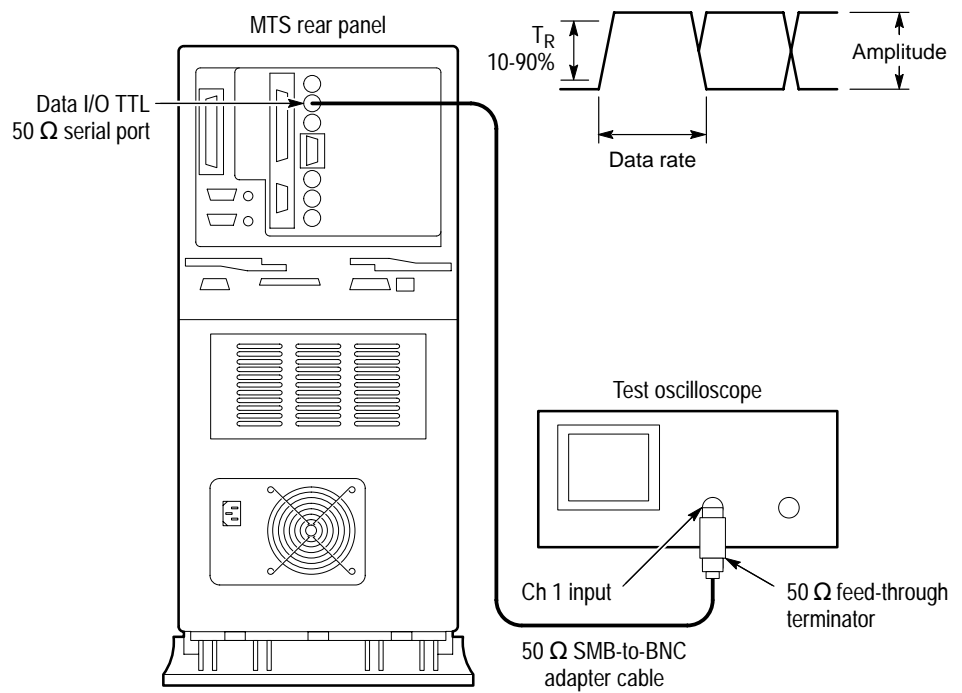

Figure 14: Setup for measuring the TTL 50 ohm clock I/O port

16. Set up the Test System as follows:

    a. Click the **Stop** (red hand) toolbar button.

    b. Click the **G** (Generate) toolbar button.

    c. In the resulting GENERATION dialog box, select any valid Data Store file as the Source.

    d. Select the **Loop** option.

    e. In the Interface section of the dialog box, make the following selections:
    Protocol = Master.
    Port = TTL
    Output clock = PLL
    Frequency = 1,000,000 Bits/s

      f.   Click **Start**.

17. Trigger the oscilloscope.

18. Check for a frequency of approximately 1 MHz, amplitude of approximately 3.0 volts and a rise time of approximately 2.0 ns. See Figure 14.

19. Move the Test System output cable to the TTL 50 Ω Data I/O Port. See Figure 15.

Figure 15: Setup for measuring the TTL 50 ohm data I/O port

20. Set up the Test System as follows:

    a. Click the **Stop** (red hand) toolbar button.

    b. Click the **G** (Generate) toolbar button.

    c. In the resulting GENERATION dialog box, select any valid Data Store file as the Source.

    d. Select the **Loop** option.

    e. In the Interface section of the dialog box, make the following selections:
Protocol = Master.
Port = TTL
Output clock = PLL
Frequency = 45,000,000 Bits/s

    f. Click **Start**.

21. Trigger the oscilloscope on the plus slope.

22. Check for an amplitude of approximately 3.0 volts, a data rate of 45 MHz and a rise time of approximately 2.0 ns. See Figure 15.

23. Move the Test System output cable to the TTL 50 Ω Clock I/O Port. See Figure 14.

24. Trigger the oscilloscope.

25. Check for an amplitude of approximately 3.0 volts, frequency of 45 MHz and a rise time of approximately 2.0 ns. See Figure 14.

26. In the Data Store Administrator, click the Stop (red hand) toolbar button.

This completes the functional check.

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