

Read This First

Tektronix

**MTS300 MPEG Test System
Software Version 6.1**

071-0666-05

www.tektronix.com



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Read This First

Read This First contains release information about the Tektronix MTS300 MPEG Test System software version 6.1 and associated components. This document is organized as follows:

- *CD-ROM Directories* page 2
- *Demonstration License* page 3
- *Standard and Optional Applications* page 4
- *Hardware Upgrades* page 5
- *Software Version Numbers* page 6
- *New Applications and Features* page 6
- *Performance and Release Issues* page 10

Version 6.1 of the MTS300 MPEG Test System now supports various configurations of the optional input formats. These changes are documented in the *MTS300 MPEG Test System Hardware and Software Installation Technical Reference* that is included with each MTS300 MPEG Test System and with each hardware upgrade kit.



CAUTION. *If it is necessary to reinstall the MTS300 Application software or operating system, use only the CD that was shipped with your MTS300 system. Applying the software on the CD to an instrument with a different controller board may damage the software on that instrument. (Tektronix part number 063-3650-XX has been created to support the DTI LBC8926A controller. The previous controller, LBC8525, was supported by Tektronix disc part number 063-3325-XX.) To find out which controller is installed in your instrument, observe the display as the system boots; the BIOS displays the version of controller board installed.*

CD-ROM Directories

The following directories are provided on the *MTS300 MPEG Test System Application Software Recovery* CD-ROM supplied with your MTS300 system:

AVDelay This directory contains audio and video elementary streams and configuration files so that you can create transport streams that can be used to measure audio/video delay using the Tektronix VM700 or VM700A instruments.

Manuals This directory contains user manuals for all of the MTS300 MPEG Test System applications in Adobe Acrobat (.pdf) format. You can read and print the manuals using Acrobat Reader, which is also supplied in this directory.

The PDF files on the CD-ROM apply to the 6.1 release of the MTS300 MPEG Test System. To order new printed manuals, see your Tektronix representative.

PerformanceVerification This directory contains a transport stream file and utility that can be used to verify the rate specifications of the MTS300 system, and to verify the accuracy of transport stream recording and play back. The Readme.txt file in this directory provides instructions for using the verification stream and utility.

Sp6a This directory contains the Windows NT Service Pack 6a upgrade installation file (sp61386.exe). Service Pack 6a is standard on all MTS300 systems. Refer to the *MTS300 MPEG Test System Hardware and Software Installation Technical Reference* (Tektronix part number 071-0667-XX) for installation instructions.

UpgradeWizard This directory contains the MTS300 upgrade program file (mts3wiz.exe).

NOTE. *You must use the Upgrade Wizard program to order upgrades for your MTS300 system.*

JRE The Java Run-Time Environment (version 1.3) is required to use the Java clients that are included with this V6.1 release. This directory (JRE) contains the executable file you use to install this run-time environment. The upgrade kit includes installation instructions.

Tools This directory contains an automated logon configuration program, which can be used to enable, disable, or change the auto logon configuration.

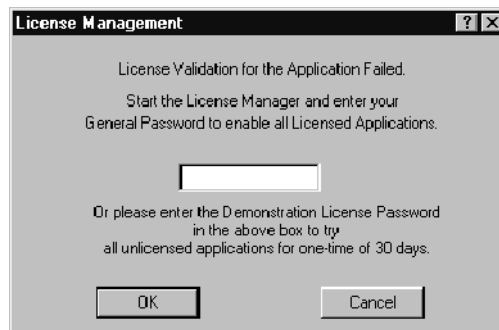
Demonstration License

MTS300 MPEG Test Systems are manufactured with files, icons, and menu items for all MTS300 applications that work with the installed hardware, even though some applications may not be licensed for use with your test system.

NOTE. *The Demonstration License applies to all unlicensed applications concurrently and cannot be renewed. Be sure to try all applications of interest within thirty days of activating the license.*

To try optional applications, use the following procedure to activate the Demonstration License, which enables all unlicensed applications for thirty days:

1. Consult the password document supplied with your MPEG Test System product and identify the eight-digit Demonstration Password.
2. Start any unlicensed application. The License Management dialog box opens.



3. Enter the password in the License Management dialog box and then click **OK**. After you have correctly entered the password, all unlicensed or optional applications are available for the following thirty days.

Standard and Optional Applications

Table 1 lists the standard and optional applications available with the MTS300 system. You can upgrade your existing MTS300 system with the optional applications listed below.

Table 1: MTS300 standard and optional applications

Instrument	Licensed applications
MTS300 (standard)	Master Client Expert Client Configuration Client Stream Recorder Stream Player Private Syntax Interpreter Error Injector TMCC Expert Client TMCC Configuration Client
MTS300 Option DT	MPEG-2 DVB/ATSC/ISDB System Analyzer (deferred time) ATSC Table Editor ISDB/ARIB Table Editor DVB Channel Coder/Decoder DVB Table Editor Jitter Adder Multiplexer (deferred-time) TMCC Analyzer (deferred time)
MTS300 Option ES	MPEG Audio Stream Analyzer MPEG Video Stream Analyzer
MTS300 Option OC	None
MTS300 Option OM	OpenMux
MTS300 Option PS	Program Stream Analyzer
MTS300 Option AC-3	Dolby Digital Audio Stream Analyzer
MTS300 Option TM	TMCC Combiner

Hardware Upgrades

You can add one of the following upgrade kits to your MTS300 system for an additional signal-format, I/O interface:

- MTS3FLV. This kit adds two I/O ports using the SPI (LVDS parallel) interface.
- MTS3FDE. This kit adds two I/O ports using the DHEI (GI Digicipher II) interface.
- MTS3FSS. This kit adds two I/O ports using the SMPTE310M interface.
- MTS3FAC. This kit adds two I/O ports using the ASI/M2S interface.

NOTE. *Certain interface combinations are not supported. Refer to the MTS300 MPEG Test System Hardware and Software Installation Technical Reference for information about which interface combinations are supported.*

Software Version Numbers

The version numbers for the MTS300 system applications supported by this manual are listed in a Readme.txt file located in the following two locations:

- In the root directory of the MTS300 application CD-ROM (063-3650-XX)
- In the C:\MTS300 directory on the hard drive of the MTS300 system

To verify an application version number, select **About** from the Help menu of the application.

New Applications and Features

This section describes the new application and features that were added for the version 6.1 release of the MTS300 MPEG Test System.

One major improvement with this version 6.1 release of the MTS300 MPEG Test System is support for ISDB-S/ARIB transport streams in addition to existing support for MPEG-2, DVB, and ATSC standards. ARIB stands for the Association of Radio Industries and Business. The ISDB-S/ARIB standard defines elements (carried in table structures) for managing ARIB-compliant transport streams. These are the ARIB structures analyzed by the MTS300 system:

- Broadcaster Information Table (BIT)
- Download Control Table (DCT)
- Download Table (DLT)
- Software Download Trigger Table (SDTT)

ISDB-S/ARIB transport streams are MPEG-2 compliant streams that conform to the ITU-R standard for ISDB-S (Integrated Service Digital Broadcasting, Satellite) multiplexing. An ISDB stream uses TMCC (Transmission and Multiplexing Configuration Control) data multiplexed in the first eight bytes of the 16 Reed-Solomon bytes of 204 byte MPEG-2 transport streams. TMCC information is used to manage the modulation parameters of the transponders in digital broadcast environments that include multiple broadcasters and types of services with different transmission requirements.

MTS300 version 6.1 software adds a new Data Logging function for real-time analysis. This new function allows you to specify which transport stream events will be recorded into tab-delimited text files for further analysis.

- Master Client** You will start the new TMCC Expert and TMCC Configuration Clients from the Port Manager Panel of the Master Client.
- Expert Client** When analyzing in ISDB transport stream, the Expert Client will display the ISDB specific tables BIT, DCT, DLT, and SDTT in addition to other tables common with the MPEG-2/DVB/ATSC standards. Section analysis, rate errors, and reports are displayed for the ISDB transport stream as with other DVB tables.
- Configuration Client** The Configuration Client allows you to specify to which standard you are testing an input: MPEG-2, DVB, ATSC, or ISDB.
- A new Data Logging configuration panel allows you to enable or disable the function, select the types of events that will be logged, and set the size and time-period of the data files.
- TMCC Expert Client** The new TMCC (Transmission and Multiplexing Configuration Control) Expert Client is a new application included with version 6.1 of the Tektronix MTS300 MPEG Test System. This client allows you to analyze the TMCC data of an ARIB-compliant transport stream input real time. You can also analyze an ARIB-compliant transport stream file stored on your local disk using the TMCC Deferred-Time Client.
- The TMCC Expert client has the following characteristics:
- Indicates the presence of sync bytes (0x47 for TMCC basic streams and W1, W2, or W3 sync bytes for TMCC data streams)
 - Displays the syntax of TMCC data
 - Displays Slot, TSID, TS Name, and Modulation mode information
 - Displays information, warning, and error messages
 - Indicates the presence of TMCC alarm and update flags in the transport stream
 - Displays the overall stream rate
 - Provides access to the Stream Recorder client, enabling you to capture all or part of a TMCC transport stream input
- When you use the TMCC client to analyze local transport stream files, the TMCC Configuration Client is automatically started, allowing you to specify the file you need to analyze. The toolbar for the Deferred-Time Client provides buttons with which you can navigate transitions in the TMCC data. Finally, the stream capture buttons are replaced with buttons that you can use to save all or a specific part of the transport stream file to a disk.

TMCC Configuration Client

The new TMCC (Transmission Multiplexing Configuration Control) Configuration client is a new application included with this version of the Tektronix MTS300 MPEG Test System. This client allows you to set the monitoring, analysis, and reporting parameters of the TMCC Analysis Servers.

The TMCC Configuration client has the following characteristics:

- Configures the TMCC Analysis Servers to operate in either TMCC basic or TMCC data stream modes
- Enables you to specify a transport stream ID to analyze using the MPEG-2 Analysis Server (only in the TMCC data stream mode)
- Sets parameters for the following TMCC probes:
 - Frame size
 - Super frame size
 - Modulation mode and slot consistency
 - TMCC syntax
 - TMCC update counter (only in TMCC data stream mode)

Using these real-time applications, you can continuously monitor an input bitstream for compliance with the MPEG-2, DVB, ATSC, and ISDB-S/ARIB digital television standards. You can monitor an array of stream parameters to ensure decodability, or you can concentrate on just a few parameters for closer examination.

TMCC Combiner

The new TMCC Combiner is a wizard-like application that helps you configure TMCC information that you want added to the Reed-Solomon area of 204 byte transport stream packets. Once you specify this information, the TMCC Combiner re-multiplexes your transport stream file with the added information, creating a valid TMCC stream.

ARIB Table Editor

The MTS300 ARIB Table Editor allows you to create and change PSI and ARIB table structures and parameters.

ARIB tables that you can edit using the ARIB Table Editor include the following:

- **Broadcaster Information Table (BIT)**

The BIT provides name and ID parameters and descriptions of the services encoded in the transport stream for each broadcaster.

- **Download Control Table (DCT)**

The DCT provides a list of modules available in the transport stream for download.

- **Download Table (DLT)**

The DLT is used to download code to set top boxes.

- **Software Download Trigger Table (SDTT)**

The SDTT is used to define the service, group, and schedule for items encoded in the transport stream that can be downloaded.

Deferred-Time System Analyzer

The Deferred-Time System Analyzer supports ISDB-S/ARIB transport streams. The ISDB specific tables BIT, DCT, DLT, and SDTT are handled in the same manner as other tables common with the MPEG-2/DVB/ATSC standards.

Deferred-Time TMCC Analyzer

The TMCC (Transmission and Multiplexing Configuration Control) Deferred-Time Analyzer application allows you analyze the TMCC data of an ISDB-S/ARIB-compliant transport stream stored on your local disk. The TMCC Deferred-Time Analyzer has the following characteristics:

- Indicates the presence of sync bytes (0x47 for TMCC basic streams and W1, W2, or W3 sync bytes for TMCC data streams)
- Displays the syntax of TMCC data
- Displays Slot, TSID, TS Name, and Modulation mode information
- Displays information, warning, and error messages
- Indicates the presence of TMCC alarm and update flags in the transport stream
- Displays the overall stream rate

Performance and Release Issues

This section describes known issues at the time of the MTS300 MPEG Test System release.

Thomcast Name Change

Thomcast, Inc. has changed its name to Thales, Inc. The software was completed before the name change was announced. Some of the opening screens for the different applications still refer to Thomcast, Inc.

Real-Time Analysis

Configuration Profiles (Reference CSEdb19930). To save, load (restore), or delete Real-Time Analysis configuration profiles, you must be logged in to Windows NT as a user that is a member of either the Administrators user group or the Backup Operators user group. To restore or delete a profile, you must be logged in as the user who saved the profile.

The default user in the standard MTS300 system configuration, *MTS300*, is a member of the Backup Operators group. To add a user or change the group memberships of a user, log in as the *administrator* (password = *MPEG2*) and select the User Manager application from the Windows NT Start/Programs/Administrative Tools (common) subdirectory. Refer to the Windows NT documentation for additional information about the User Manager application.

PID Bit Rate Limitation. Each PID of the stream is limited to a bit rate of 98 566 144 bits/s. The bit rates of any PID with bit rates over this limit will be reported by subtracting 98 566 144 bits/s from the actual value. Therefore, a Null packet rate of 150 Mbps is reported in the Expert client as 51 433 856 bits/s.

Deferred-Time System Analyzer

Analysis of Large Files (Reference N/A). While analyzing large transport stream files, the analyzer can appear to be busy with no indication of progress; in addition, the message window can obscure the “Press Escape to abort” reminder. Analysis of large transport stream files can take many minutes; press ESC to suspend or abort most MPEG-2 System Analyzer operations.

Fonts (Reference CSEdb03373). When displaying a large font, some characters are displayed badly (or not at all) in the packet views. Use a smaller font.

Buffer Overflow using Dynamic Analysis (Reference CSEdb17277). Streams generated with the MPEG Test System Multiplexer application can cause buffer overflow during Dynamic Analysis with the MPEG-2 System Analyzer. This can occur because the Dynamic Analysis algorithm uses the “Leak method” to transfer video elementary stream data from the main buffer (*MBn*) to the elementary stream buffer (*EBn*); therefore, buffer overflow can occur when analyzing streams, such as those created with the Multiplexer application, that require “VBV delay method” data transfer.

Refer to ISO/IEC 13818-1 for additional information about leak method and VBV delay method buffering.

Timing Analysis using the System Analyzer (Reference N/A). When using the System Analyzer to examine a partial, filtered transport stream captured with the Expert and/or Configuration Clients, timing analysis is not advised for the following reasons:

- The System Analyzer cannot compute the bit rate if the first PMT declared in the PAT has no PCR information, which occurs when the corresponding PID has been filtered by the Expert Client.
- Even if you input the correct overall bit rate, all information related to timing (PCR, PTS/DTS, section rates, and dynamic analyses) can be incorrect because the time distribution of the packets repartition is lost when filtered data is captured. PCRs, for example, will be incorrect because they are computed at the source on the complete stream, not on a filtered part of it.

If you intend to perform in-depth timing analysis of a captured stream, always select **No PID filtered** on the Data Storage Configuration tab of the Configuration Client **Settings** window.

M-TMCC Transport Streams. For M-TMCC transport streams compliant with the ISDB-S/ARIB standard, the Deferred-Time System Analyzer is not able to determine the rate of the transport stream. Use the Deferred-Time TMCC Analyzer to determine the rate of the transport stream, and then enter the observed rate in the Analysis/Multiplex Characteristics/Rate dialog before performing other timing-related analysis.

AC-3 Audio in ATSC Mode. In ATSC analysis mode, if the first AC-3 audio packet appears more than 3000 packets from the beginning of a transport stream file, the Deferred-Time System Analyzer is not able to recognize the AC-3 elementary stream correctly. The reason is that the PMT itself cannot determine the elementary stream type from the ATSC standard. The Deferred-Time System Analyzer must look into the actual packets containing the AC-3 audio to recognize the AC-3 audio, but the searching is limited to only the first 3000 packets.

Analysis Server

Some MPEG2 and ATSC compliant transport streams use packets with PID 16 to carry video elementary streams. Do not try to analyze transport streams with video in packets with PID 16 while in the DVB mode. In the DVB mode, the analysis server expects packets with PID 16 to be NIT sections, complying with the DVB standard.

Open Mux Server In ATSC mode, when the configuration is one PSI/ATSC input and one ES video only input, the video descriptor and smoothing descriptor may be missing.

Stream Player The Stream Player is not able to determine the rate of M-TMCC transport streams. To work around this problem, you can use the Deferred-Time TMCC Analyzer to determine the rate of the transport stream, and then enter the observed rate into the Stream Player before you play back the transport stream.

SPI (LVDS) Interface Input The SPI (LVDS) input (Option LV or MTS3FLV) does not support the use of the Data Valid signal. If you need to use this signal, the Data Valid signal can be enabled by performing the work-around procedure described in the DValid.doc file on the MTS300 Application Software CD-ROM in the Tools directory. However, this work-around setup will be lost when the instrument is rebooted. You will have to perform the work-around procedure each time you reboot the instrument.

Rackmount Installation Kit The kit instructions included with the rackmount kit for the MTS300 system indicates that the kit is for RFA300 instruments. The rackmount kit is correct for all instruments using the mainframe common to a number of Tektronix instruments, including the MTM300, RFA300, and PQM300.

ATSC Corrigendum The MTS300 system is compliant to the *Corrigendum for Program and System Information Protocol for Terrestrial Broadcast and Cable (A65)*. The corrigendum is an amendment to the A65 standard that replaces the 2-bit zero field taking the value 00 with the reserved field taking the value 11 in all PSIP tables. Disregard syntax errors reported in the Expert client related to this field because the transport stream being analyzed may not be compliant to the corrigendum.