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User Manual

Tektronix

MTG100 & MTG300
MPEG Generator

071-0615-50

This document supports firmware version 2.0 and above.

www.tektronix.com

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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. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect and Disconnect Properly. 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.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

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

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

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.*

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

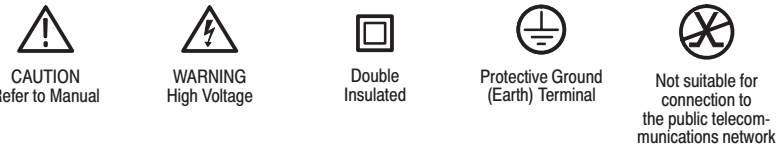
Terms on the Product. These terms may appear on the product:

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:



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Preface

The user manual for the MTG100 and MTG300 MPEG Generator contains the following sections:

Getting Started briefly describes the MTG100 and MTG300 MPEG Generator and provides installation instructions, options listing, accessories listing, repacking instructions, and power on and off instructions.

Operating Basics provides an overview of the front panel controls and rear panel connections, operating principles, basic operating procedures, and numeric input methods. This section also provides examples of basic data outputting.

Reference provides detailed information about the functions and use of the MTG100 and MTG300 MPEG Generator's main menus.

Appendices provides product specifications, instructions for operating the MTG Comm$^+$ file transfer application and ReMux application, performance verification procedures, and instructions for inspecting and cleaning the MPEG generator.

Terms

This manual uses the following terms:

- **Stream**: Generic term for transport streams and data streams of Non TS format (i.e.,data format other than transport stream format).
- **S-TMCC** (Single TMCC): Transport stream to which TMCC (Transmission and Multiplexing Configuration Control) information is inserted into the 8 bytes in its Reed-Solomon code area (16 bytes). It is defined in the ISDB-S (Integrated Services Digital Broadcasting-Satellite) system.
- **M-TMCC** (Multi TMCC): Transport stream to which TMCC information is inserted into the sync byte area, and having super frame structure. It is defined in the ISDB-S system.

Related Manuals

The following related documentation for the instrument is available:

- The *MTG100 & MTG300 MPEG Generator Service Manual* (Tektronix part number 071-0616-XX) describes how to maintain and service the MTG100 and MTG300 MPEG Generators and provides a complete module-level

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description of the operation of the instrument. This manual is an optional accessory.

Contacting Tektronix

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Sales support	1-800-833-9200, select option 1*
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Technical support	Email: techsupport@tektronix.com 1-800-833-9200, select option 3* 6:00 a.m. – 5:00 p.m. Pacific time

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Getting Started

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Getting Started

This section provides the following information:

- Product description
- List of standard and optional accessories
- List of instrument options
- Initial product inspection procedure
- Installation instructions
- Instructions for repackaging the instrument for shipment
- Functional check procedure

Product Description

The MTG100 and MTG300 MPEG Generators store and playback MPEG-2 transport streams that are compliant with ATSC, DVB, and ARIB standards. The MPEG generators can automatically update the time stamp values of the transport stream in real time to support long term playout. Table 1-1 lists the main features of the MPEG generators.

You can output transport streams stored in the MPEG generators to perform the following tasks:

- Evaluate IRD/STB designs and manufacturing processes
- Evaluate performance of MPEG-2 equipment
- Perform conformance testing of MPEG-2 systems
- Provide substitute signal generation for digital television transmitters

The MTG300 MPEG Generator facilitates complete stress testing by providing comprehensive capabilities to customize stored transport streams. In addition, the MTG300 MPEG Generator allows you to effectively monitor receiver operation by inserting PSI/SI/PSIP tables into the transport stream.

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CAUTION. *The MPEG generator comes from the factory with sample transport stream files loaded on the hard drives. To prevent the loss of these files, it is recommended that you use the MTG Comm+ application to save copies of these files. Refer to* Appendix B: Using MTG Comm+ for File Transfers.

Table 1-1: Main product features

Feature	MTG100	MTG300
Storage and output of streams up to 36 GB in size	●	●
Real-time updating of transport stream time stamps and time tables (PCR, PTS/DTS, and continuity_counter values)	●	●
188, 204, and 208 byte packet-length, S-TMCC, M-TMCC, and Non TS output formats	●	●
Output interfaces: Serial: ASI (burst and packet), SSI, ECL, LVDS, and TTL Parallel: ECL, LVDS, and TTL	●	●
Data rate: 80 Mbps maximum; 0.5 Mbps minimum	●	●
Sample transport streams provided for DVB and ATSC	●	●
Remote control via Ethernet interface	●	●
Downloading of transport stream files via an Ethernet interface	●	●
Hierarchy display of the stored transport stream	●	●
PSI/SI/PSIP editor		●
Real-time dynamic insertion of PSI/SI/PSIP tables		●
PCR jitter insertion		●

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Accessories

Table 1-2 lists the standard and optional accessories provided with the MTG100 and MTG300 MPEG Generators.

Table 1-2: Standard and optional accessories

Accessory	Std.	Opt.	Tektronix part number
MTG100 & MTG300 MPEG Generator User Manual	●		071-0615-XX
MTG Comm+ File Transfer Application Software Disk, 3.5-inch	●		063-3276-XX
Interface Cable, D-Sub 25-pin, twisted pair	●		174-3882-01
Power cord 125 V/6A	●		161-0230-01
MTG100 & MTG300 MPEG Generator Service Manual		●	071-0616-XX
Rackmounting kit		●	040-1665-XX

Options

Table 1-3 lists the instrument options that can be ordered with the MPEG generators. Table 1-4 lists the available power cord options.

Table 1-3: Instrument options

Option number	Description
D1 (Calibration Test Data Report)	When you order Option D1, a report with the calibration test data for the instrument will be provided with your MPEG generator.
1R (Rackmounting)	When you order Option 1R, the MPEG generator is shipped configured for mounting in a 19-inch rack. You can install a rackmounting kit (optional accessory) if you need to configure a standard MPEG generator for mounting in a 19-inch rack. Refer to Table 1-2 for the Tektronix part number of the rackmounting kit.

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Initial Product Inspection

Perform the following product inspection procedure when you initially receive your instrument:

1. Inspect the MPEG generator shipping carton for external damage, which indicates possible damage to the instrument.
2. Remove the MPEG generator from the shipping carton, and then check that the instrument has not been damaged in transit. Prior to shipment the instrument is thoroughly inspected for mechanical defects. The exterior should not have any scratches or impact marks.

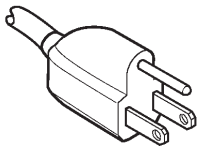
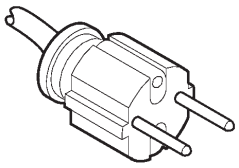
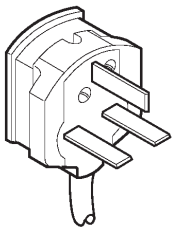
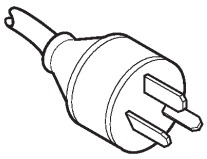
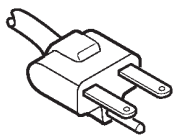
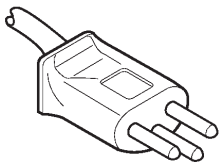
NOTE. *Save the shipping carton and packaging materials for instrument repackaging in case shipment becomes necessary.*

3. Verify that the shipping carton contains the basic instrument, the standard accessories listed in Table 1-2, and any optional accessories that you ordered.
4. After you install the MPEG generator (refer to *Installation* on page 1-6), you can perform the performance verification procedure in *Appendix D: Performance Verification* if you want to verify that the instrument performs to the specifications listed in *Appendix A: Specifications*.

Contact your local Tektronix Field Office or representative if there is a problem with your instrument or if your shipment is incomplete.

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Table 1-4: Power cord options

Option number	Normal usage	Plug configuration	Tektronix part number
Standard	North America 115 V		161-0230-01
A1	Europe 230 V		161-0104-06
A2	United Kingdom 230 V		161-0104-07
A3	Australia 230 V		161-0104-05
A4	North America 230 V		161-0104-08
A5	Switzerland 230 V		161-0167-00

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Installation

Before you install the instrument, refer to the *General Safety Summary* at the front of this manual for power source, grounding, and other safety information.

Environmental Operating Requirements

Verify that the location of your installation has the proper operating environment.



CAUTION. *Damage to the instrument can occur if this instrument is powered on at temperatures outside the specified temperature range.*

The MPEG generators operate correctly in ambient temperatures from +5° C to +40° C and in relative humidity from 20% to 80%. For complete operating environment information, refer to *Appendix A: Specifications*.

Verify that there is at least 5.0 cm (2 inches) of clearance on top and bottom, 15.0 cm (6 inches) on the left and right sides, and 7.5 cm (3 inches) at the rear of the instrument to allow for heat dissipation. Verify that the air intake holes on the sides and bottom of the cabinet are not obstructed.

NOTE*. If you are installing the instrument in a dedicated rack, refer to the instruction sheet that comes with the rackmounting kit for proper installation procedures.*

When the generator is mounted in a 19-inch rack, verify that there is at least one unit of clearance above the MPEG generator.

AC Line Voltage Requirements

Check that your location provides the proper electrical power requirements as listed in Table 1-5.

Table 1-5: AC line power requirements

Parameter	Description
Line Voltage Range	90 V – 250 V
Line frequency	48 Hz – 63 Hz
Maximum power	200 W

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Power Cord Requirements

Refer to Table 1-4 on page 1-5 to verify that you are using the proper power cord for your location. Connect the power cord from the rear-panel power connector to the power system.



CAUTION. *The instrument is shipped with a power cord appropriate for use with your power systems (normal 115 V power system or 230 V power system). If the instrument is to be used with a power system other than what the order specified, the power cord must be replaced with one appropriate for the power source used. Refer to Table 1-4 for a listing of available power cords.*

Applying Power to the Instrument

After you have verified the environment, AC line, and power cord requirements, apply power to the instrument by plugging the power cord into the power connector on the rear panel (see Figure 1-1), and then plugging the power cord into the local power source.

Power Switches. The MPEG generator uses two power switches: the Principle Power Switch (located on the rear panel) and the ON/STBY switch (located on the front panel).

When the Principle Power Switch is in the on position (see Figure 1-1), power is applied to the power supply standby circuit of the instrument. After the Principle Power Switch is on, use the front-panel ON/STBY switch (see Figure 1-2) to apply power to the rest of the instrument.

NOTE*. After the instrument is installed, it is recommended that you leave the Principal Power Switch in the on position and use the ON/STBY switch as the power switch.*

Power On. After you power on the instrument, verify that the fan is operating.



CAUTION. *Do not operate the instrument if the cooling fan does not operate when you turn the instrument on. Serious damage to your instrument can occur from overheating if the cooling fan is not operating.*

NOTE*. Allow the instrument to warm up for 20 minutes prior to calibrating the clock or making precision measurements. The instrument must be completely warmed up to operate at its optimum precision.*

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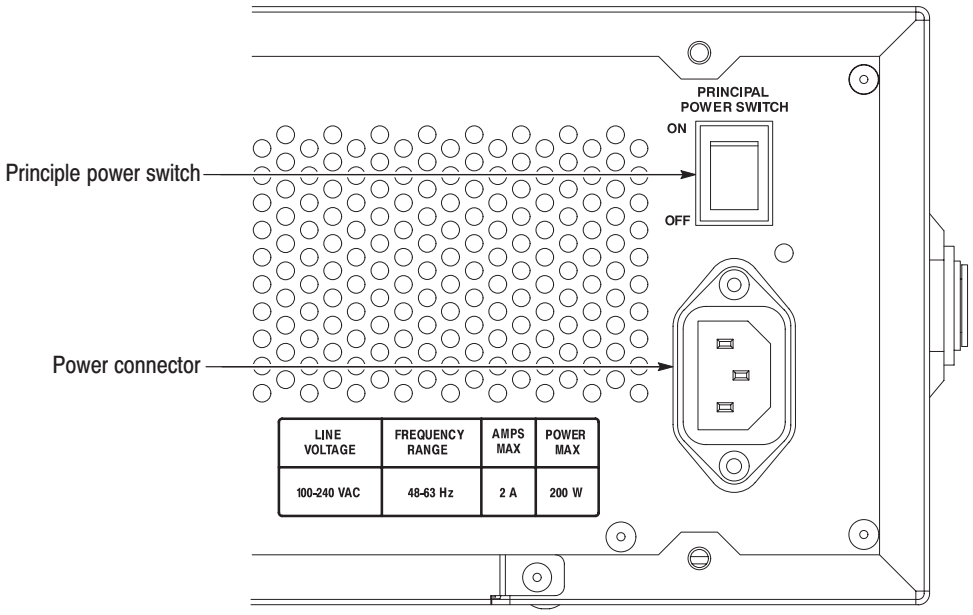


Figure 1-1: Rear panel power connector and power switch

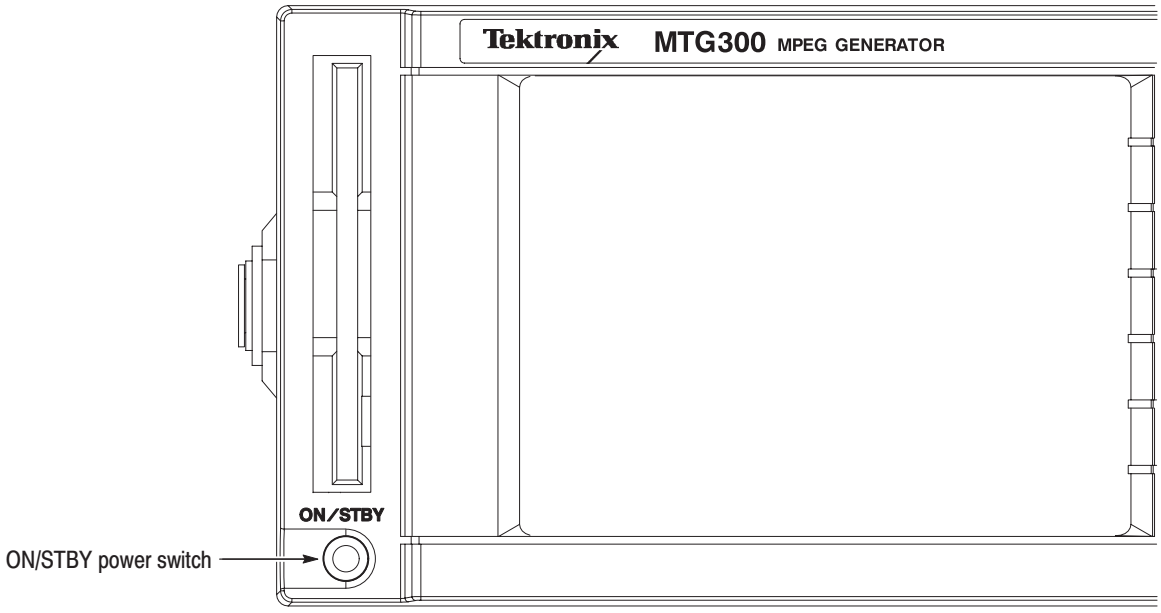


Figure 1-2: Front panel power switch

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Start-Up Diagnostics

The MPEG generator automatically runs diagnostics when the instrument is powered on using the ON/STBY switch. These diagnostics check that the instrument is performing within its defined operating characteristics. If all of the diagnostic checks are completed without any errors, the instrument displays the menu bar and status bar.

***NOTE**. If the instrument chassis temperature is outside the specified operating range, an error will occur during the power-up diagnostics. If this happens, power off the instrument, wait until the chassis temperature is within normal operating range, and then power on the instrument again.*

If a diagnostic error is displayed during instrument start up, contact your local Tektronix Field Office or representative.

Repackaging for Shipment

When you ship this instrument, use the original packaging material if possible. If the original packaging is unfit for use or is not available, repackage the instrument using the following procedure:

1. Obtain a corrugated cardboard shipping carton having inside dimensions at least six inches greater than the instrument dimensions and having a carton test strength of at least 125 kg (275 pounds).
2. If the instrument is being shipped to a Tektronix Service Center for repair or calibration, attach a tag to the instrument showing the following information:
   - The owner of the instrument (with address).
   - The name of a person at your firm who may be contacted if additional information is needed.
   - The complete instrument type and serial number.
   - A description of the service required.
3. Wrap the instrument with polyethylene sheeting or equivalent to protect the outside finish and prevent entry of packing materials into the instrument.
4. Cushion the instrument on all sides by tightly packing dunnage or urethane foam between the carton and the instrument, allowing for three inches (7.62 cm) of padding on each side (including top and bottom).
5. Seal the carton with shipping tape or with an industrial stapler.
6. Mark the address of the Tektronix Service Center and your return address on the carton in one or more prominent locations.

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Functional Check Procedure

Perform the following procedure if you are operating the instrument for the first time (to verify that the instrument shipped without damage) or you suspect that the instrument is not working properly:

***NOTE**. Before you perform this procedure, install the MPEG generator following the instructions listed in* Installation *starting on page 1-6.*

1. Connect the MPEG generator to a power source, and then turn the instrument on using the power switches.
2. Press the front-panel **MENU** button to enable the pull-down menu display. When the pull-down menus are enabled, the name of the selected pull-down menu is highlighted.
3. Use the left and right arrow buttons to select the **FILE** pull-down menu.
4. Use the rotary knob or the arrow buttons to select **Open TS File...** from the menu, and then press the **OK** bezel button to open the dialog box shown in Figure 1-3.
5. Use the rotary knob or the arrow buttons to select the **test64.trp** file, and then press the **OK** bezel button. The hierarchy view of the transport stream file will be displayed on the screen.

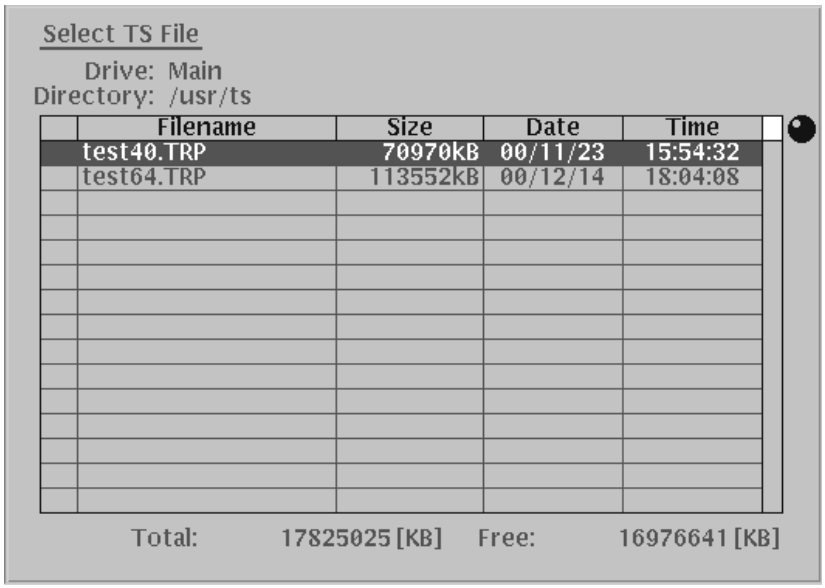


Figure 1-3: Select TS File dialog box

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6. Connect a 75 Ω cable between the **ASI OUT** connector on the MPEG generator rear panel to the **ASI IN** connector on an MPEG decoder. See Figure 1-4.

7. Connect the decoder to a picture monitor.

8. Press the MPEG generator **START/STOP** button to start the transport stream output. When transport stream output is started, the Output Status indicator in the status bar changes from **Stopped** to **Running**.

***NOTE**. You can select the test40.trp file in step 5 of this procedure if you need to decrease the bit rate of the transport stream due to performance restrictions in your decoder.*

9. Check that the picture from the transport stream is displayed correctly on the picture monitor.

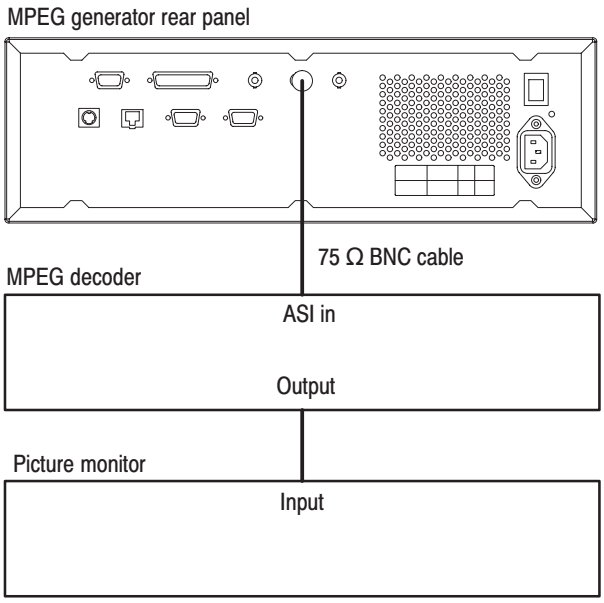


Figure 1-4: Equipment connection for the functional check

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Operating Basics

This section introduces you to the basics of operating the MTG100 and MTG300 MPEG Generators. The information is divided into the following subsections:

- *Functional Overview* contains descriptions of the front-panel controls, the rear-panel connectors and power switch, and elements of the display.
- *Using the Menu System* provides the basic concepts of how to operate the MPEG generator using the menus and front-panel controls, and how to enter numeric or text input into dialog boxes.
- *Output Loop Modes* describes the loop modes that control the types of changes the MTG100 and MTG300 MPEG Generators can make to transport streams.
- *Tutorials* contains procedures that show you how to output and edit transport stream data.

Functional Overview

This subsection contains descriptions of the front-panel controls, LCD display, and the rear-panel connectors and power switch.

Front Panel Controls

Figure 2-1 shows the locations of the front panel controls. Descriptions of the front-panel controls appear on the following pages.

ON/STBY Power Switch. Use the ON/STBY power switch as the standard power switch during normal instrument operation instead of the rear-panel Principle Power Switch. The Principal Power Switch must be in the On position before the ON/STBY power switch will operate.

Floppy Disk Drive. Use the floppy disk drive to save and load a insertion file or preset file. This drive accepts preformatted 2HD 3.5 inch floppy disks.

***NOTE**. If you power on the instrument with a floppy disk inserted into the disk drive, the system can not boot and no information appears on the screen. If this happens, eject the floppy disk from the disk drive, and turn off the instrument and then turn it on again.*

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LCD Display. The LCD display uses its 640 x 480 pixel resolution to display transport stream components and the menu systems. Refer to *LCD Display Elements* on page 2-6 for more information about the display.

Bezel Buttons. Use the bezel buttons to access various functions in conjunction with the menu system on the LCD display.

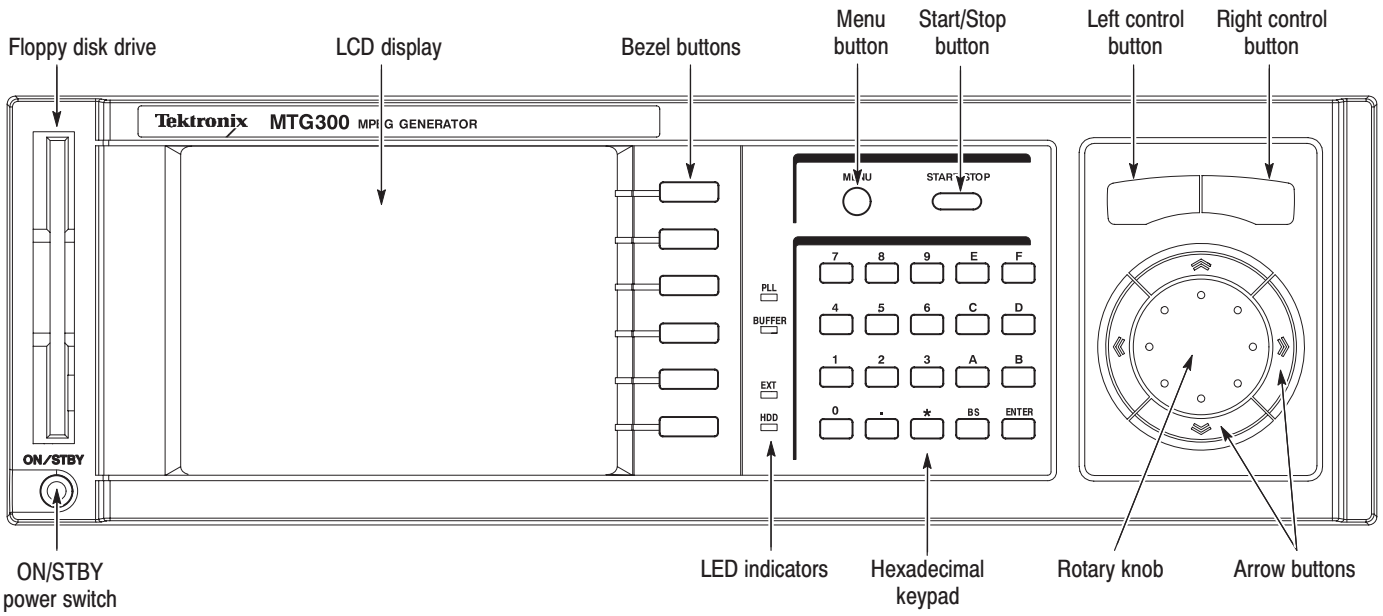


Figure 2-1: MTG300 front panel

Menu Button. This button works in conjunction with the menu system on the LCD display. Press the MENU button to toggle the display between the pull-down menus and the Icon cursor. When the pull-down menus are enabled, the Icon cursor is disabled. When the Icon cursor is enabled, the pull-down menus are disabled.

Start/Stop Button. Press this button to start or stop transport stream output. The Output Status indicator in the Status bar displays Running or Stopped to indicate the current status of the output. The Buffer indicator in the Status bar lights when data is being output.

LED Indicators. The four LEDs indicate the following instrument conditions:

- The PLL indicator lights when the internal phase-lock loop is locked, which indicates a correctly timed transport stream output. The indicator will turn

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off if the reference clock frequency shifts outside of the ranges listed in Table 2-1.

- The BUFFER indicator lights when output data is being transferred from the hard disk to the buffer.
- The EXT indicator lights when an external reference clock signal is input to the rear-panel EXT 27MHz REFERENCE IN connector.
- The HDD indicator lights when the hard disk drive is in operation.

Table 2-1: PLL indicator reference clock frequency range

Output clock frequency	Reference clock frequency range
64.000000 Mbps	18 MHz to 32 MHz
45.000000 Mbps	25 MHz to 45 MHz
44.999995 Mbps	19 MHz to 28 MHz
32.000005 Mbps	26 MHz to 40 MHz

Hexadecimal Keypad. Use the hexadecimal keypad to enter values in numeric or character input modes. The characters A to F are primarily used for hexadecimal input; instructions are displayed when these keys are used for other operations. The BS (back space) key deletes previously input digits during numeric input or deletes the character directly in front of the cursor during character input. The Enter key confirms numeric and character input.

Left Control Button. The left control button performs the following functions on the LCD display:

- When the Icon cursor is displayed in the hierarchy display, use this button to toggle the display of any hierarchy items under the currently selected hierarchy item on and off (expand or collapse the hierarchy).
- When a pull-down menu is displayed, use this button to select the high-lighted menu item or to toggle the setting of the highlighted menu item on and off.

Right Control Button. The right control button performs the following functions on the LCD display:

- When the Icon cursor is displayed in the hierarchy display, use this button to toggle the display of any hierarchy items under the currently selected hierarchy item on and off (expand or collapse the hierarchy).

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- When the pull-down menus are enabled, press this button to quit the menu operation.

Rotary Knob. When the knob icon appears on the display next to an item, the rotary knob controls that item. Use the rotary knob to control the following functions on the LCD display:

- In the hierarchy display, use this knob to move the Icon cursor between hierarchy items.
- When a pull-down menu is displayed, use this knob to move between the menu items.
- When a dialog box appears, use this knob to adjust numeric values.

Arrow Buttons. Use the arrow buttons around the rotary knob to maneuver on the LCD display. For example, you can use these buttons to move the Icon cursor or to move among the pull-down menu selections.

Rear Panel Connectors and Power Switch

Figure 2-2 shows the locations of the MPEG generator rear-panel connectors and the power switch.

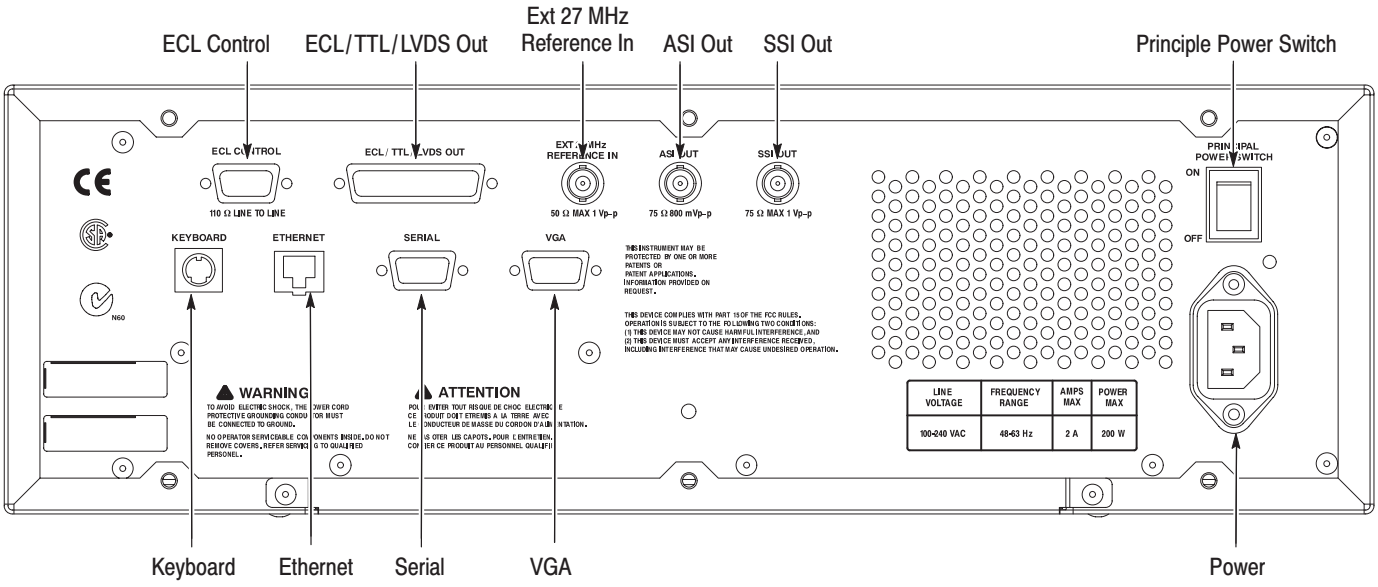


Figure 2-2: MPEG generator rear panel

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ECL Control. Use this 9-pin D-sub connector to input external ECL control signals to the MPEG generator.

ECL/TTL/LVDS Out. Use this 25-pin D-sub connector to output an ECL, TTL, or LVDS signal in parallel or serial formats.

EXT 27MHz Reference In. Use this BNC connector to input an external 27 MHz reference clock signal to the MPEG generator.



CAUTION. *External clock signals with voltages in excess of 1 V_{p-p} can damage the instrument. Only apply signals with voltages less than 1 V_{p-p} to the* ***EXT 27MHz REFERENCE IN*** *connector.*

ASI Out. Use this BNC connector to output an ASI signal.

SSI Out. Use this BNC connector to output an SSI signal.

Keyboard. Use this connector to attach a standard 101-key PC keyboard only when service is being performed on the instrument.

Ethernet. Use this connector to connect to your local Ethernet network.

NOTE*. Be sure to connect the MPEG generator to your local Ethernet network before you power on the instrument. If not so, the instrument cannot connect to the network.*

Serial. This 9-pin D-sub connector provides a serial interface for instrument calibration.

VGA. Use this 9-pin D-sub connector to output the instrument display to a VGA monitor, projector, or video printer (to make a screen hardcopy).

Principle Power Switch. Use this switch to apply power to the instrument standby circuit. This switch must be in the On position before you can use the front-panel ON/STBY switch to apply power to the rest of the instrument.

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Power. Use this power connector to apply power to the instrument using the supplied power cord.

Display Elements

Figure 2-3 shows the location of the LCD display elements. These elements are described starting below.

Menu Bar. The Menu bar displays the names of the four pull-down menus: FILE, OUTPUT, CONFIG, and UTILITY. Press the Menu button to enable or disable the pull-down menus. When the pull-down menus are enabled, the currently selected menu name is highlighted. Use the Arrow buttons to select the desired menu.

Hierarchy Display. Each icon in the hierarchy display represents an element of the stream. The hierarchy text contains a description of the associated icon.

Refer to *Hierarchy Display* on page 3-25 for detailed information about the hierarchy icons and their associated Bezel menu selections.

Icon Cursor. The Icon cursor appears as a red box around an icon in the hierarchy to indicate the currently selected icon. In most instances, generator functions selected through the menus are applied to the selected hierarchy icon (representing a particular transport stream element).

Use the rotary knob or the arrow buttons to move the Icon cursor between icons. When the Icon cursor is at the top or bottom of the hierarchy display, the hierarchy scrolls to show additional elements of the stream when applicable.

Elapsed Time or TDT/TOT/STT Time Display. This box displays the elapsed time of the current stream data output. When a TDT (Time and Data Table), TOT (Time Offset Table), or STT (System Time Table) is contained in the transport stream, the elapsed time since the initial time described in the table is displayed in this box.

Bezel Menu. The Bezel menu contains commands and functions that apply to the hierarchy icon selected by the Icon cursor. The commands and functions available in the Bezel menu depend on the type of transport stream element that is selected.

Scroll Bar. The scroll bar appears when there is a hierarchy display to show your relative position in the hierarchy of the transport stream.

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Pull-down Menu. Press the Menu button to toggle the pull-down menu display for the selected menu on and off. The contents of the menu depends on the type of the selected hierarchy icon.

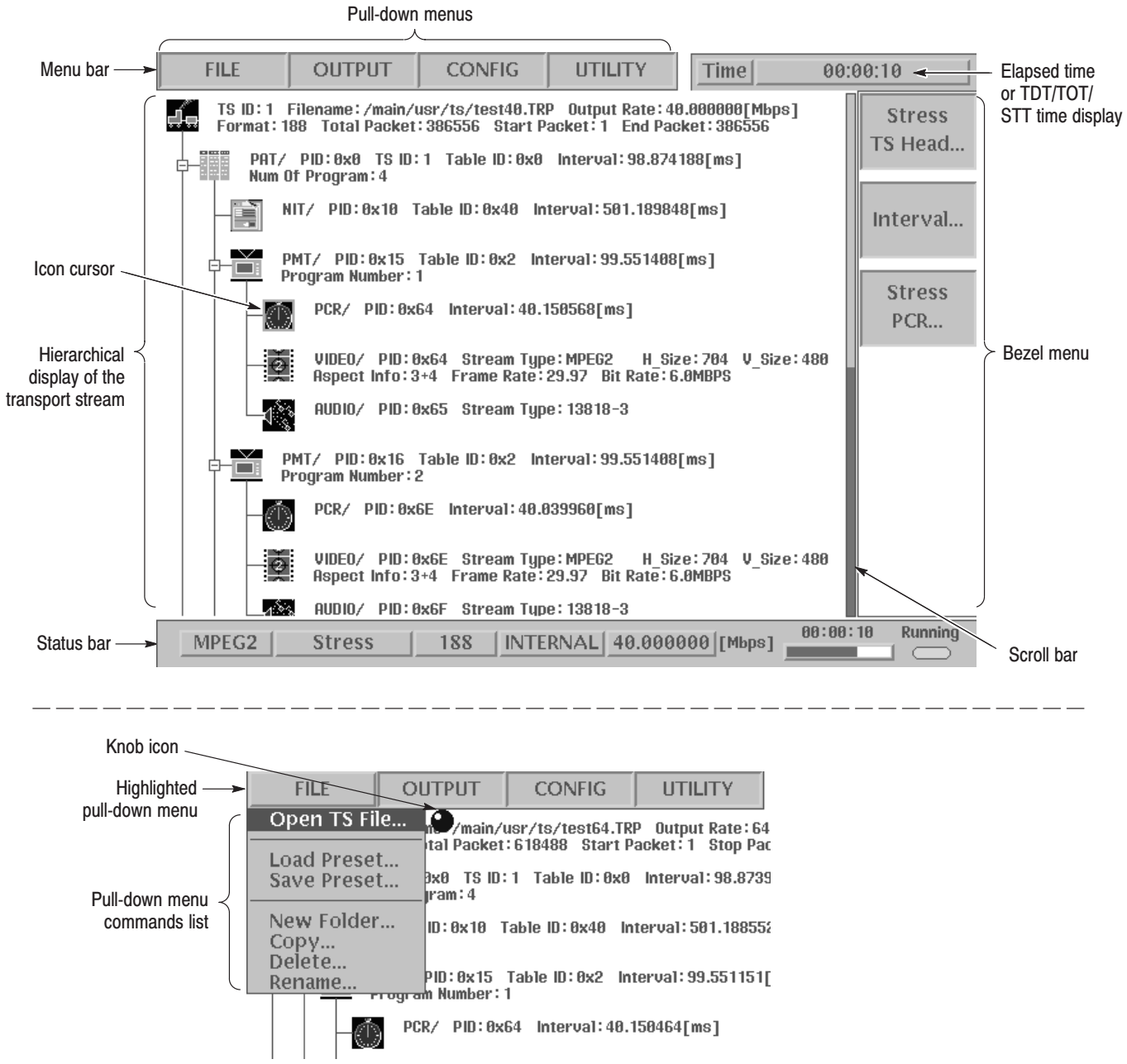


Figure 2-3: Elements of the LCD display

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Knob Icon. The knob icon appears adjacent to items on the display to indicate that the rotary knob controls that item. For example, when the knob icon appears next to a menu (as shown in Figure 2-3), you can use the knob to move through the menu items. When the knob icon appears in a dialog box adjacent to a highlighted parameter value, you can use the knob to adjust that value.

Status Bar. The Status bar (see Figure 2-4) contains several indicators that display general information about the transport stream output status.

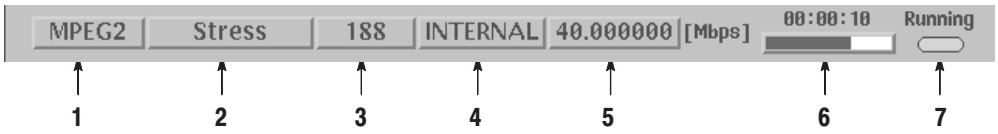


Figure 2-4: Status bar

The Status bar shows the following information:

1. Standard. This indicator displays the standard of the selected stream. (MPEG2, ARIB, DVB, ATSC, S-TMCC, M-TMCC, or Non TS).
2. Loop Mode. This indicator displays which loop mode is being used for the stream output (No Update, Auto Update, or Stress). Refer to *Output Loop Modes* on page 2-15 for more information.
3. Packet Size. This indicator displays the packet length in bytes (188, 204, 208, or Non TS) of the stream output.
4. Clock Source. This indicator displays the source of the reference clock (internal or external) used for the stream output.
5. Bit Rate. This indicator displays the bit-rate (in Mbps) of the stream output.
6. Position. This indicator displays the status of the stream output using time and a duration gauge. The time indicates the stream time elapsed since the beginning of the stream. The value is reset every time after the stream file generation is complete. The duration gauge shows the progress of stream generation.

   The duration gauge is updated every 1 second. If you output the stream with repetition rate of 3 seconds, the gauge may not be displayed correctly.
7. Output Status. This indicator displays the current status (Running or Stopped) of the stream output.

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Using the Menu System

This section describes the basics of using the MPEG generator's menu system and the methods for entering numeric and text input in the various dialog boxes.

The menu system on the MPEG generator provides access to instrument settings and to operational functions such as the selection of transport stream output parameters. The menu system is comprised of two types of menus: the four pull-down menus displayed in the Menu bar and the Bezel menu which is displayed at the right side of the screen (see Figure 2-3 on page 2-7).

Pull-down Menus

The pull-down menus are displayed in the Menu bar at the top of the screen. You can operate these menus using the front panel MENU button, the right and left control buttons, the arrow buttons, and the rotary knob (see Figure 2-5).

Accessing Pull-down Menu Commands. The MENU button toggles display control between the Icon cursor (used to select icons in the hierarchy display) and the pull-down menus. When the Icon cursor is enabled (displayed), press the MENU button to enable the pull-down menus. When the pull-down menus are enabled or displayed, press the MENU button to close any open pull-down menu and to enable (display) the Icon cursor.

When the pull-down menus are enabled, the Icon cursor is not displayed and the currently selected pull-down menu name is highlighted in the Menu bar. Use the left and right arrow buttons to select (highlight) the desired pull-down menu (see Figure 2-6).

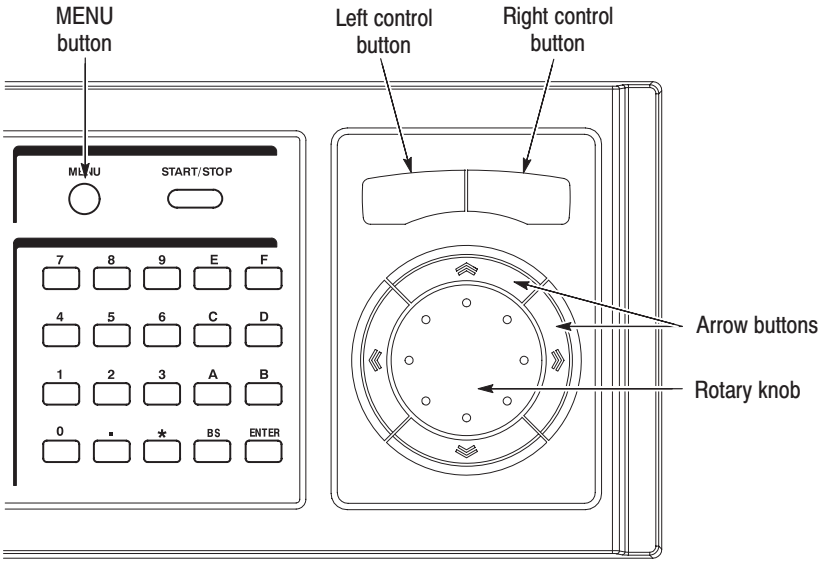


Figure 2-5: Front panel showing the pull-down menu controls

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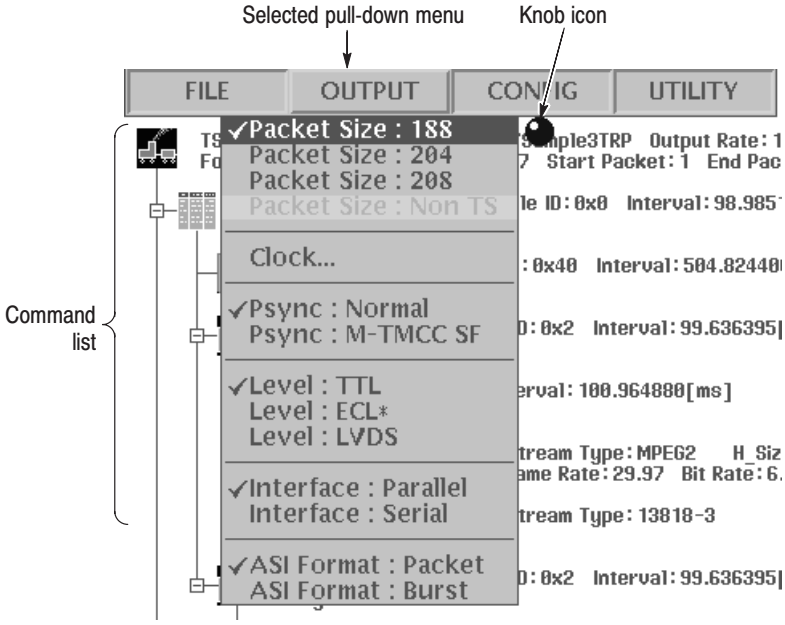


Figure 2-6: Example of a displayed pull-down menu

When a pull-down menu is displayed, the knob icon is displayed at the upper-right side of the command list. The knob icon represents the capability of the rotary knob to move the highlighting (selecting) bar through the command list. You can also move through the command list using the up and down arrow buttons. Press the left control button or the OK bezel button to execute the highlighted command.

Display States of the Pull-down Menu Commands. The pull-down menu commands can have the following two display states as shown in Figure 2-7:

- A command followed by "..." represents that a corresponding dialog box will open after you execute the command.
- A command preceded by a check mark (✓) represents the selected command in a command list subsection. You can select only one command at a time in a subsection, which is represented by a separation line in the command list.

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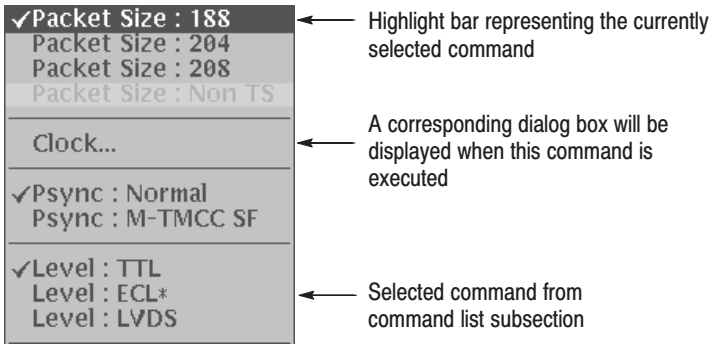


Figure 2-7: Display states of the pull-down menu commands

Bezel Menu

The Bezel menu displays a variety of commands. The commands change to correspond to the transport stream item selected by the Icon cursor in the hierarchy display, or to correspond to functions in a displayed dialog box.

Accessing Bezel Menu Commands. The Bezel menu appears at the right side of the screen. When you move the Icon cursor through the hierarchy items in the display, the Bezel menu commands change to correspond with the selected transport stream item. Select the desired Bezel menu command by pressing the associated bezel button (see Figure 2-8).

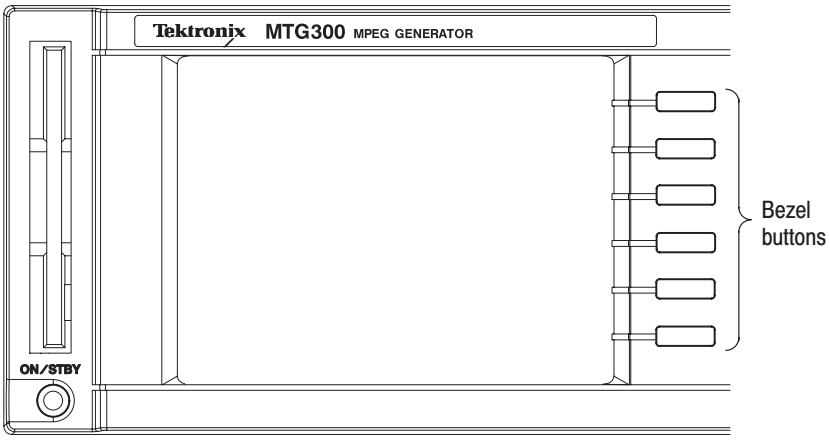
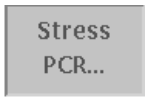


Figure 2-8: Front panel showing the Bezel menu controls

Display States of the Bezel Menu Commands. The Bezel menu commands can have the following three display states as shown in Table 2-2:

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Table 2-2: Display states of the Bezel menu commands

Menu command	Description
	Pressing the associated bezel button will execute the displayed function immediately.
	Pressing the associated bezel button will display the corresponding dialog box. A menu command followed by "..." represents that a corresponding dialog box will open after you execute the command.
	Pressing the associated bezel button will toggle the selected state of the function. In this example, the highlight bar represents that the Delete Packet function is set to Inactive. The function will toggle to Active if you press the associated bezel button.

Numeric Input

You can enter numeric values in displayed dialog boxes by using the hexadecimal keypad or by using the rotary knob.

Numeric Input Using the Hexadecimal Keypad. Perform the following procedure to input numeric values. Figure 2-9 shows the hexadecimal keypad.

1. Select the numeric parameter you want to change in an open dialog box.
2. Input the desired parameter value using the numeric keys on the keypad, and then press the keypad **ENTER** key.
3. Press the **Apply** or **OK** bezel button associated with the dialog box for your value changes to take effect.

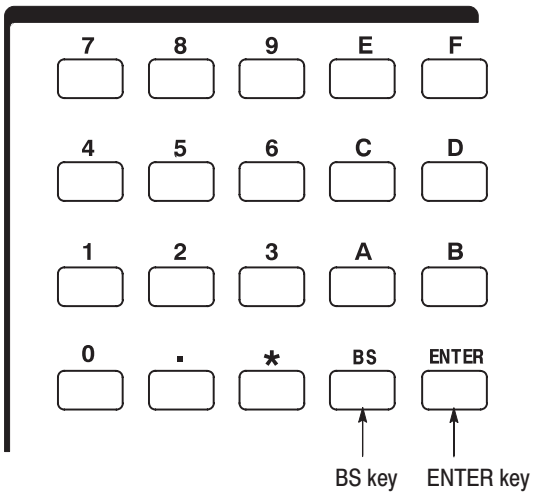


Figure 2-9: Hexadecimal keypad

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Numeric Input Using the Rotary Knob. The knob icon is displayed next to a selected dialog box parameter when you can use the rotary knob to change the parameter value. Figure 2-10 shows a dialog box that can use the rotary knob to enter numeric values.

You can use the rotary knob to change the value of the numeric digit indicated by the underscore character. Use the arrow buttons to select any digit value to change with the knob. Rotating the knob to the left decreases the value and rotating it to the right increases the value.

You do not need to use the front panel ENTER key to confirm a value when using the rotary knob to change a value. The input value is confirmed automatically without pressing the ENTER key.

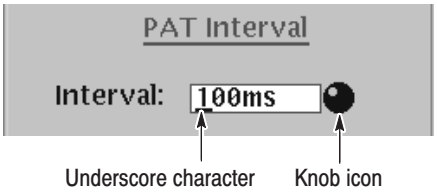


Figure 2-10: Dialog box showing knob icon and underscore character

Perform the following procedure to change a value using the rotary knob:

1. Select the numeric parameter you want to change in an open dialog box.
2. Use the left and right arrow buttons to move the underscore character to the digit value you want to modify.
3. Change the value by turning the rotary knob.

Text Input

Text input is required to enter the names for new folders and for entering text for other dialog box parameters. When text input is required, the MPEG generator automatically brings up a dialog box such as the one shown in Figure 2-11.

Perform the following procedure to enter text input:

1. Use the rotary knob to highlight the desired character in the letter/digit matrix, and then press the front-panel **ENTER** button enter the character in the text box.
2. Continue as in step 1 until the name is entered in the text box. Use the front-panel **BS** (back space) key to erase incorrect input. The position where the character will be inserted is indicated with an input cursor (|). Use the left and right arrow buttons to change the position of the input cursor.

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3. Enter all of the desired characters then press the **OK** bezel button to complete the text entering process. Press the **Cancel** bezel button to cancel text input and return to the previous display.

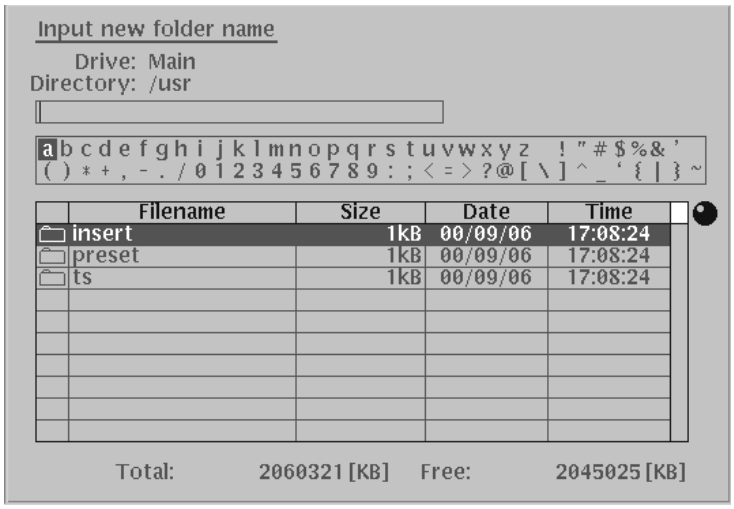


Figure 2-11: Dialog box for text input

You can also use any file name listed in the Filename box instead of entering all of the characters for a new file name.

Perform the following procedure to use the file name for entering a new file name:

1. Press the down arrow button to highlight the Filename box. The knob icon appears at the upper-right side of the box.
2. Use the rotary knob to select the file name that you want to use for entering a new file name, and then press the front-panel **ENTER** button. The selected file name appears in the text box.
3. Press the up arrow button to highlight the text box and letter/digit matrix. The knob icon appears above the upper-right corner of the letter/digit matrix.
4. Edit the file name.

Pop-up Message Box

The MPEG generator displays a pop-up message box that prompts you to confirm operations that will be difficult to recover from. An example of a pop-up message box is shown in Figure 2-12, which shows the message box for confirming that you want to defragment the TS drive. Press the **OK** bezel button to execute the operation displayed in the box. Press the **Cancel** bezel button to cancel the operation and return to the state prior to selecting the menu command that displayed the message box.

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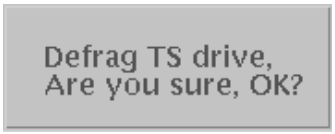


Figure 2-12: Pop-up message box

Output Loop Modes

The MPEG generator continuously outputs a transport stream using one of three user-selected looping methods: No Update, Auto Update, or Stress (MTG300 only). You can set the output loop mode using the Configure pull-down menu.

***NOTE**. For the transport stream packet with the transport_scrambling_control value of 0, the PTS and DTS values are not updated even if the output loop mode is set to Auto Update or Stress. When you playout the transport stream scrambled by a decoder, be sure to use the No Update loop mode.*

When the TDT/TOT/STT Update command from the Configure pull-down menu is set to OFF, the timing values of the TDT/TOT/STT are not updated even if the output loop mode is set to Auto Update or Stress. In this case, the elapsed time of the current transport stream data output is displayed in the Elapsed Time or TDT/TOT/STT Time Display box.

When the TOT is not held in one transport stream packet, the CRC (Cyclic redundancy Check) value in the table is not updated.

When the PTS/DTS information is not held in one transport stream packet with the payload_unit_start_indicator value of 1, they are not updated correctly.

For the file downloaded in M-TMCC or Non TS format, you cannot select the loop modes other than No Update. In addition, for the file downloaded in S-TMCC format, you cannot select the Stress loop mode.

No Update Mode

In the No Update loop mode, the MPEG generator outputs the stream with no changes allowed (except setting the start packet and stop packet of the transport stream). Time information values are not updated. You cannot make any changes to the transport stream items and the Bezel menu functions are disabled except for the TS Item menu where you set the start and stop packets for the transport stream.

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Auto Update Mode

In the Auto Update loop mode, you can change the following timing values: PCR (Program Clock Reference), continuity_counter, PTS (Presentation Time Stamp) / DTS (Decoding Time Stamp), TDT (Time and Data Table) /TOT (Time Offset Table), and STT (System Time Table).

Stress Mode (MTG300 Only)

The Stress loop mode is only available with the MTG300 MPEG Generator. In the Stress loop mode, all of the real-time transport stream stress functions are available.

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Tutorials

This section provides the following tutorials to familiarize you with the basic functions of the MPEG generator:

- Outputting a transport stream
- Changing the PCR interval (MTG300 only)
- Inserting an EIT (MTG300 only)

***NOTE**. These tutorials do not cover all the features and functions of the MPEG generator. The tutorials are intended to introduce you to the operations required to execute the instrument's basic functions.*

Refer to the Reference *section for detailed descriptions of the menus and functions used in these procedures.*

Before you perform these tutorials, make sure that the MPEG generator is properly installed. Refer to Installation *on page 1-6.*

Required Equipment

Table 2-3 lists the equipment required to perform the tutorials. Accuracy of alternate equipment should equal or exceed that of the example instruments and accessories. Using inadequate equipment may result in inaccurate measurements.

Table 2-3: Tutorial recommended test equipment and accessories

Item	No.	Requirements	Example
MPEG test system	1		Tektronix MTS200 Series Real Time Analyzer or equivalent
75 Ω BNC coax cable	1		Tektronix p/n 012-0074-00

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Outputting a Transport Stream

The hard disk drive of the MPEG generator is shipped with files containing factory-supplied samples of transport streams. This tutorial opens one of these sample files and outputs the transport stream.

Perform the following steps to select and output a stored transport stream:

1. Press the front-panel **MENU** button to enable the pull-down menu display. When the pull-down menus are enabled, the name of the selected pull-down menu is highlighted.
2. Use the left and right arrow buttons to select the **FILE** pull-down menu.
3. Use the rotary knob or the up and down arrow buttons to select **Open TS File...** from the menu, and then press the **OK** bezel button to open the dialog box shown in Figure 2-13.

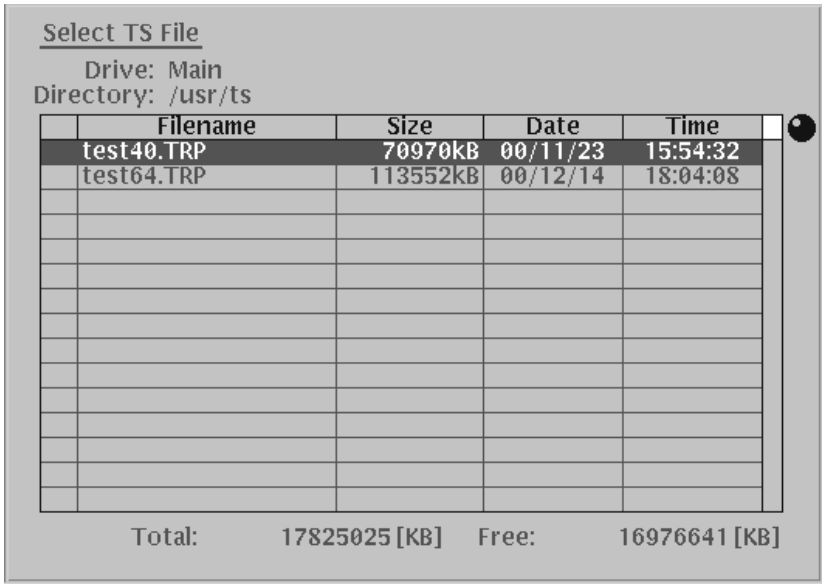


Figure 2-13: Select TS File dialog box

4. Use the rotary knob or the arrow buttons to select the **test64.trp** file, and then press the **OK** bezel button. This displays the hierarchy view of the transport stream file shown in Figure 2-14.

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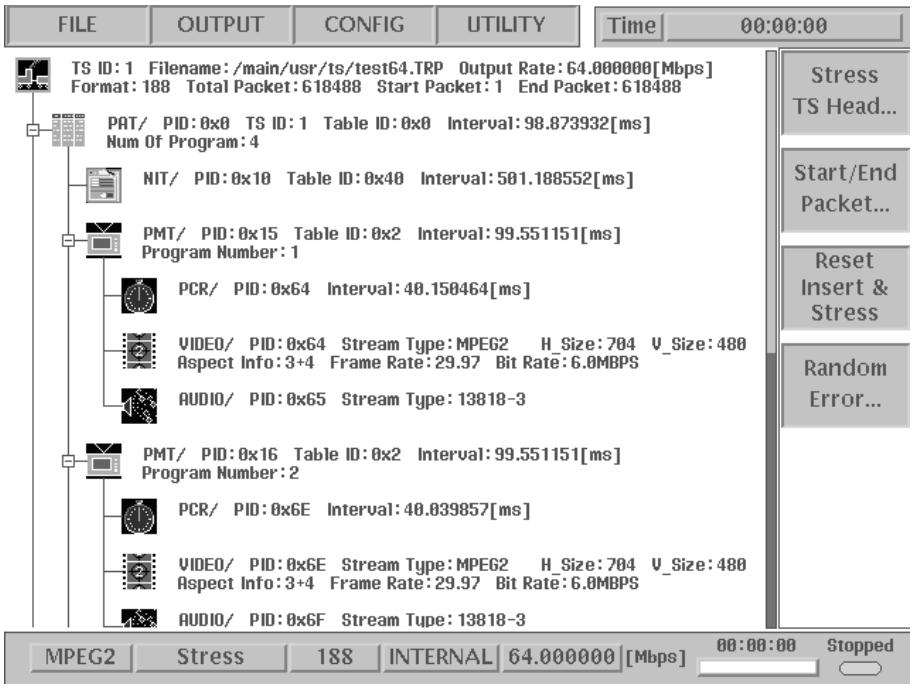


Figure 2-14: Hierarchy view of the transport stream file

5. Connect a 75 Ω cable between the **ASI OUT** connector on the MPEG generator rear panel to the **ASI IN** connector of the MPEG test system.

6. Press the MPEG generator **START/STOP** button to start the transport stream output. When transport stream output is started, the Output Status indicator in the status bar changes from **Stopped** to **Running**.

7. Set up the MPEG test system to monitor the transport stream output from the MPEG generator. Figure 2-15 shows the transport stream data displayed on a Tektronix MTS200 Series Real Time Analyzer.

8. Press the **START/STOP** button on the MPEG generator to stop the transport stream output. Observe that the Output Status indicator in the status bar changed from **Running** to **Stopped**.

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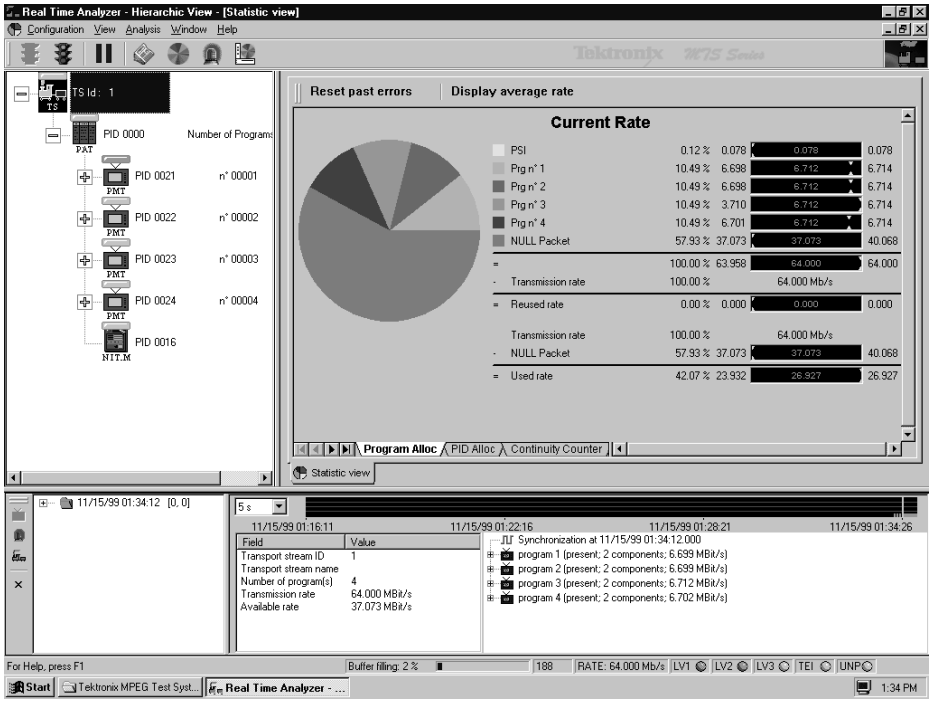


Figure 2-15: Transport stream display from a Tektronix MTS200 Series Real Time Analyzer

Changing the PCR Interval (MTG300 Only)

This tutorial changes the PCR (Program Clock Reference) interval of the transport stream data. The PCR is a time stamp in the transport stream from which decoder timing is derived.

Perform the following steps to change the PCR interval (if your equipment is still set up from the previous tutorial, proceed to step 6):

1. Press the front-panel **MENU** button to enable the pull-down menu display. When the pull-down menus are enabled, the name of the selected pull-down menu is highlighted.

2. Use the left and right arrow buttons to select the **FILE** pull-down menu.

3. Use the rotary knob or the up and down arrow buttons to select **Open TS File...** from the menu, and then press the **OK** bezel button to open the dialog box shown in Figure 2-13.

4. Use the rotary knob or the arrow buttons to select the **test64.trp** file, and then press the **OK** bezel button. This displays the hierarchy view of the transport stream file shown in Figure 2-14.

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5. Connect a 75 Ω cable between the **ASI OUT** connector on the MPEG generator rear panel to the **ASI IN** connector of the MPEG test system.

6. Press the MPEG generator **START/STOP** button to start the transport stream output. When transport stream output is started, the Output Status indicator in the status bar changes from **Stopped** to **Running**.

7. Set up the MPEG test system to monitor the PCR interval in the transport stream output from the MPEG generator (for example the PCR Analysis mode in the Tektronix MTS215 or MTS205). Observe that the PCR interval is 40 ms as measured on the MPEG test system.

8. Move the Icon cursor to a PCR icon in the hierarchy using the rotary knob. Figure 2-16 shows the Icon cursor selecting a PCR icon.

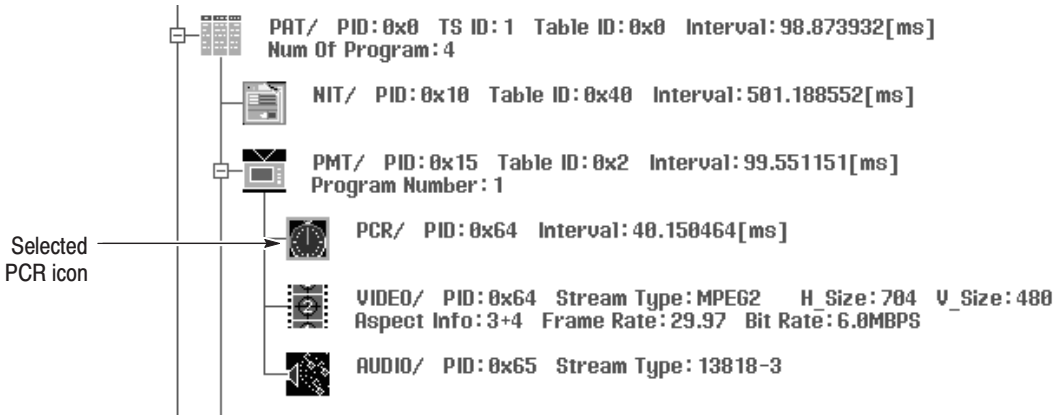


Figure 2-16: Using the Icon cursor to select a PCR icon

9. Press the **Interval...** bezel button, which opens the **PCR Interval** dialog box shown in Figure 2-17.

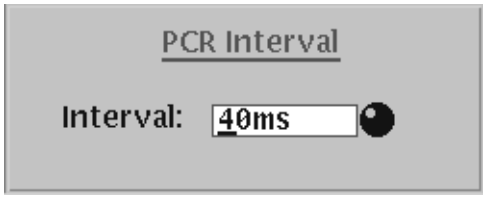


Figure 2-17: PCR Interval dialog box

10. Set the PCR interval to 100 ms using either the rotary knob or the hexadecimal keys. To use the hexadecimal keys, press the numbers you want for the value, and then press the **Enter** key.

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11. Press the **Keep Stress** bezel button to accept the value change and close the PCR Interval dialog box. Observe that when you changed the PCR interval value, the color of the PCR interval value displayed to the right of the PCR icon changed to orange to indicate a user-defined value.

12. Observe that the PCR interval is 100 ms as measured on the MPEG test system. Figure 2-18 shows the PCR interval monitored by the Tektronix MTS200 Series MPEG test system.

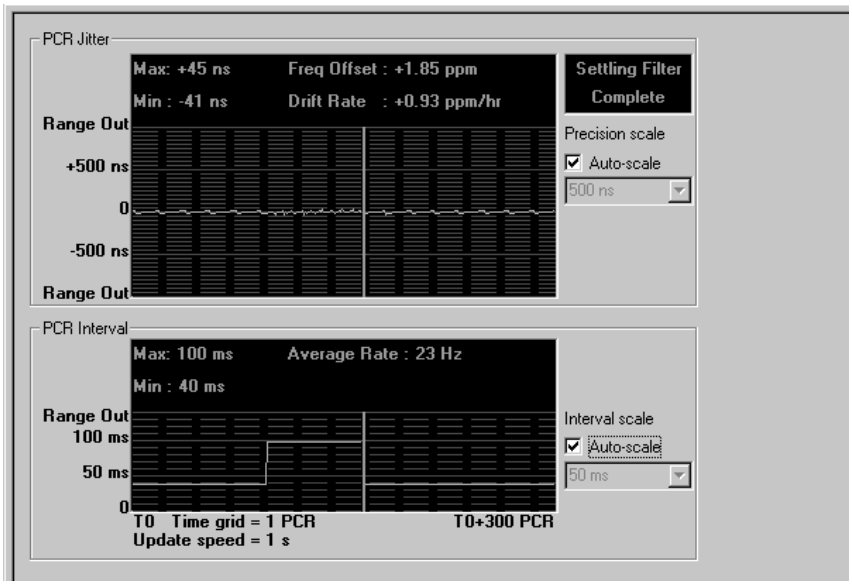


Figure 2-18: PCR interval monitored by the MPEG test system

13. Press the **START/STOP** button on the MPEG generator to stop the transport stream output. Observe that the Output Status indicator in the status bar changed from **Running** to **Stopped**.

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Inserting an EIT (MTG300 Only)

This tutorial inserts an EIT (Event Information Table) into the transport stream. This EIT data is contained on the hard disk of the instrument as a file (*.eit).

Perform the following steps to insert an EIT:

1. Press the front-panel **MENU** button to enable the pull-down menu display. When the pull-down menus are enabled, the name of the selected pull-down menu is highlighted.
2. Use the left and right arrow buttons to select the **CONFIG** pull-down menu.
3. Use the rotary knob or the up and down arrow buttons to select **Insert Section/TS...** from the menu, and then press the **OK** bezel button to open the Select Insert File dialog box shown in Figure 2-19.

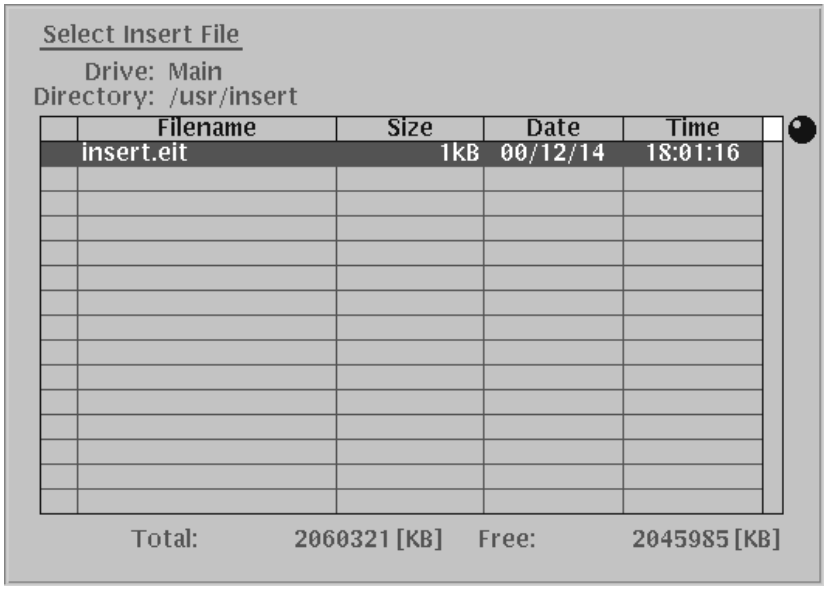


Figure 2-19: Select Insert File dialog box

4. Use the rotary knob or the arrow buttons to select the **Insert.eit** file, and then press the **OK** bezel button. This displays the Insertion Setup dialog box shown in Figure 2-20.

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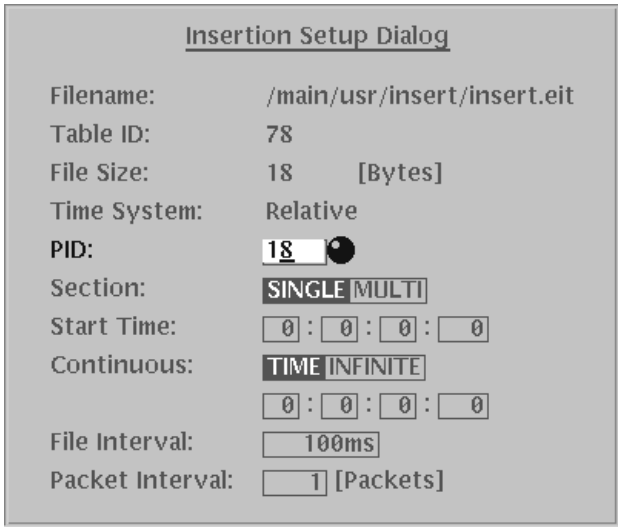


Figure 2-20: Insertion Setup dialog box

5. Use the arrow buttons to highlight the PID parameter in the Insertion Setup dialog box as shown in Figure 2-20.
6. Use the rotary knob to set the PID value to 18 (0x12), and then press the **Apply** bezel button to accept the settings and close the dialog box.
7. Press the **START/STOP** button to start transport stream output. When transport stream output is started, the Output Status indicator in the status bar changes from **Stopped** to **Running**.
8. Press the **MENU** button to enable the Icon cursor in the hierarchy display.
9. Use the rotary knob to move the Icon cursor to the bottom of the hierarchy display.

   Observe that an INS_SI icon is added at the end of the hierarchy as shown in Figure 2-21. The icon's background is colored blue to indicate it has been added by the user.
10. Connect a 75 Ω cable between the **ASI OUT** connector on the MPEG generator rear panel to the **ASI IN** connector of the MPEG test system.
11. Set up the MPEG test system to monitor the transport stream output from the MPEG generator. Figure 2-22 shows the transport stream data displayed on a Tektronix MTS200 Series Real Time Analyzer with the GHOST icon shown. In this case, the inserted EIT appears as a GHOST, since it is not referenced in an appropriate table in the transport stream.

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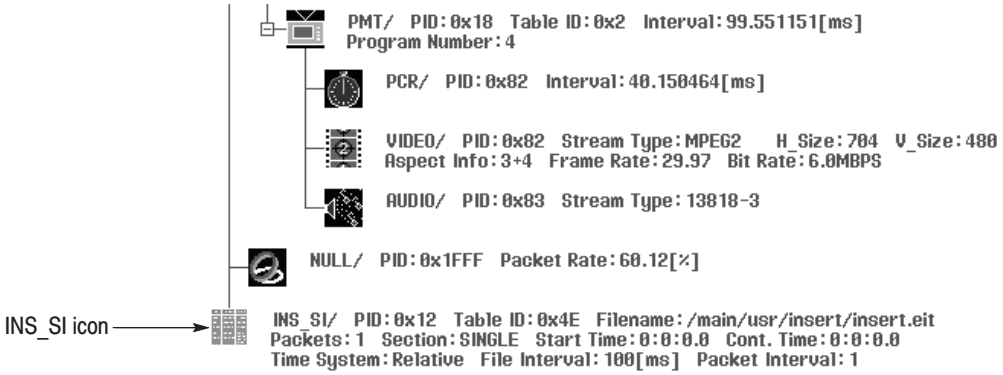


Figure 2-21: INS_SI icon

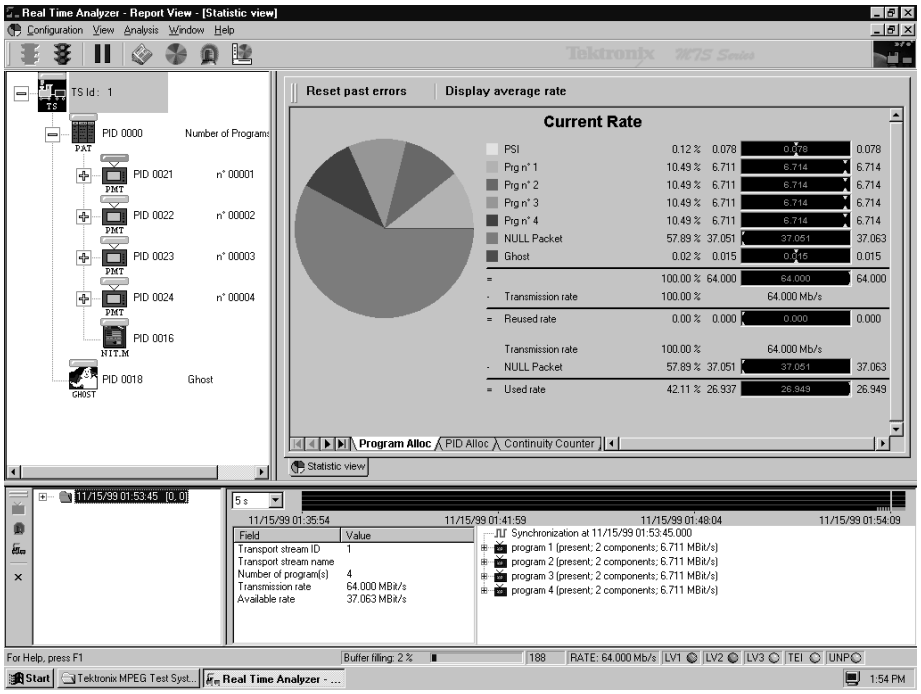


Figure 2-22: GHOST icon shown on the Tektronix MTS200 Series MPEG test system

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Reference

The *Reference* section is divided into the following subsections:

- *Bezel Menu* describes how the bezel menu functions vary with the current mode of the instrument.
- *Pull-down Menus* describes the function of each selection available in the pull-down menus.
- *Hierarchy Display* describes the icons used by the MPEG generator to represent transport stream elements, and lists the Bezel menu functions available with each icon type.
- *Replacing and Inserting Section Data (MTG300 Only)* provides instructions and procedures on how to replace and insert section data.
- *Adding Jitter to PCRs (MTG300 Only)* provides instructions and procedures on how to add jitter to PCRs.
- *Preset File* provides information about the preset file and procedures on how to save and load a preset file.
- *File Operations* provides procedures on how to create a new folder, copy a file, delete a file or folder, and rename a file name or folder name.

Bezel Menu

The Bezel menu is the command menu that appears on the right side of the screen next to the bezel buttons (see Figure 2-3 on page 2-7). Press the bezel button associated with the displayed menu selection to make selections in the Bezel menu. Which commands are displayed in the Bezel menu depends on the following factors:

- The model of the instrument. The MTG300 MPEG Generator has more functions available than the MTG100 MPEG Generator.
- When the Icon cursor is enabled, the Bezel menu functions change to match the selected transport stream icon. When the Pull-down menus are enabled, the Bezel menu functions change to interact with the selections you make in the Pull-down menus.
- The current output loop mode. The Bezel menu selections change to match which output loop mode is selected. Refer to *Output Loop Modes* on page 2-15 for more information.

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The following subsection, *Pull-down Menus*, contains descriptions of the Bezel menu commands that interact with the pull-down menus. Refer to *Hierarchy Display* on page 3-25 for descriptions of the Bezel menu commands associated with each type of transport stream element.

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Pull-down Menus

This subsection describes the function of each selection available in the pull-down menus and their associated Bezel menu selections. The four pull-down menus listed in the Menu bar provide the following general functions:

- The FILE menu contains commands for managing various file operations.
- The OUTPUT menu contains commands for defining output parameters.
- The CONFIG menu contains commands for setting the output loop mode and the initial PCR values, and inserting an insertion file and a TDT/TOT/STT.
- The UTILITY menu contains commands for managing data storage operations and network settings.

Refer to *Basic Menu Operation* on page 2-9 for information about how to operate the menu system.

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FILE Pull-down Menu

The FILE pull-down menu contains commands for managing various file operations. Table 3-1 describes the commands in the FILE pull-down menu.

Table 3-1: FILE pull-down menu commands

Command	Description
Open TS File...	Opens a stream file stored in the /main/usr/ts directory of the MPEG generator. When you open a new transport stream file, the currently set insertion functions are all canceled. When you select this command, the Select TS File dialog box appears. Refer to *Select TS Dialog Box* on page 3-5 for more information.
Load Preset...	Loads the specified preset file (*set). When a preset file is loaded, the current instrument settings are changed by the file's content. Refer to *Preset File* beginning on page 3-95, for more information about the preset file.
Save Preset...	Saves the current instrument settings as a preset file. Refer to *Preset File* beginning on page 3-95, for more information about the preset file.
New Folder...	Creates a new folder (subdirectory) under one of the following factory-supplied directories on the hard disk drive: /main/usr/preset, /main/usr/ts, or /main/usr/insert. Refer to *File Operations* beginning on page 3-99, for more information about how to create a new folder.
Copy...	Copies the specified file. You can copy the files only in the insert or preset directory. Refer to *File Operations* beginning on page 3-99, for more information about how to copy a file.
Delete...	Deletes the specified file or folder. Before the file or folder is deleted, a confirmation dialog box appears to confirm the delete operation. You cannot delete the /main/usr/ts, /main/usr/insert, or /main/usr/preset directories because these directories are required by the MPEG generator. Refer to *File Operations* beginning on page 3-99, for more information about how to delete a file or a holder.
Rename...	Renames the specified file or folder. Refer to *File Operations* beginning on page 3-99, for more information about how to rename a file name or a holder name.

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Select TS File Dialog Box

When you select the Open TS File... command from the FILE pull-down menu, the Select TS File dialog box appears as shown in Figure 3-1. Use the rotary knob or the arrow buttons to highlight the desired file. Press the OK bezel button or the left control button to load the highlighted file.

Table 3-2 describes the Select TS File dialog box parameters and Table 3-3 describes the Bezel menu commands associated with the dialog box.

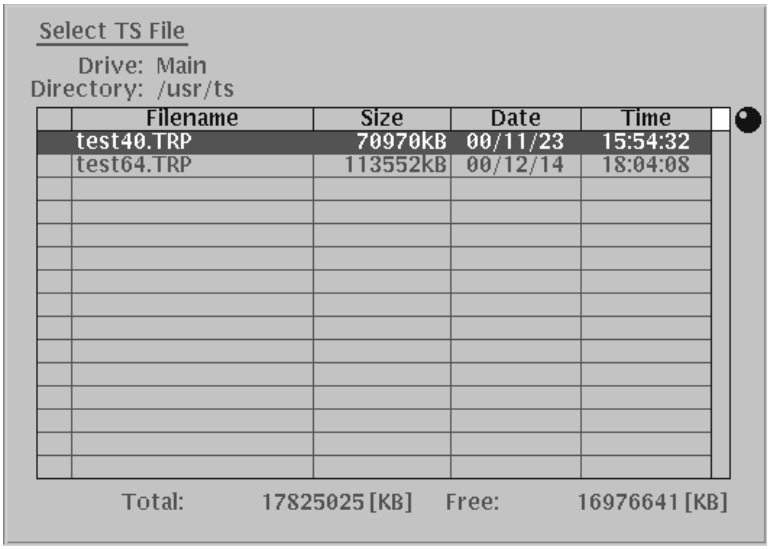


Figure 3-1: Select TS File dialog box

Table 3-2: Select TS File dialog box parameters

Parameter	Description
Drive	Shows the disk drive containing the transport stream files.
Directory	Shows the directory path of the files listed under Filename. The default directory is /main/usr/ts.
Filename	Lists the files in the current directory path.

Table 3-3: Bezel menu commands for the Select TS File dialog box

Command	Description
Up Level	Moves from the current directory to the directory one level higher.
Down Level	Moves from the current directory to the selected lower-level directory.
Update	Updates the list of files under Filename for the selected directory.
Cancel	Cancels the Select TS File operation and closes the dialog box.
OK	Executes the Select TS File operation and closes the dialog box.

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OUTPUT Pull-down Menu

The OUTPUT pull-down menu contains commands for defining output parameters. Table 3-4 describes the commands available in the OUTPUT pull-down menu.

Table 3-4: OUTPUT pull-down menu commands

Command	Description
Packet Size	Sets the packet size (in bytes) for the stream. You can set the packet size to 188 (188 + 0), 204 (188 + 16), 208 (188 + 20) bytes, or Non TS. A file downloaded in Non TS standard is always output in Non TS standard. If you change the packet size setting, the MPEG generator prompts you to change the clock-rate setting. If you select Yes, the Clock dialog box appears to have you confirm or change the clock-rate setting. Refer to *Clock Dialog Box* on page 3-6 for more information.
Clock...	Sets the clock rate of the transport stream output. When you select this menu item, the Clock dialog box appears. Refer to *Clock Dialog Box* on page 3-6 for more information.
Psync	Sets the format of the PSYNC signal output from the ECL/TTL/LVDS OUT connector. You can select Normal or M-TMCC. For Normal, a single pulse signal is output at the start point of each packet. For M-TMCC, a single pulse is output at the start point of the SF appearing every 204 X 48 X8 bytes. You cannot set this parameter for the Non TS standard file.
Level	Sets the signal level for the ECL/TTL/LVDS OUT connector on the rear panel. You can select TTL, ECL*, or LVDS. Note: For ECL*, the signal level is less than the typical ECL signal level. Refer to *ECL/TTL/LVDS output* in Table A-2 on page 0-5.
Interface	Use this command to set the output format for the ECL/TTL/LVDS OUT connector on the rear panel. You can select Parallel or Serial formats.
ASI Format	Sets the insertion mode for the ASI OUT connector on the rear panel. You can select Packet or Burst insertion modes. For the Packet mode, valid data is output per transport stream packet. For Burst mode, the valid data is output in burst.

Clock Dialog Box

When you select the Clock... command from the OUTPUT pull-down menu, the Clock dialog box appears as shown in Figure 3-2. Use the arrow buttons to highlight the desired parameter, and then use the rotary knob or hexadecimal keypad to set values. Press the OK bezel button to apply changes.

Table 3-5 describes the Clock dialog box parameters and Table 3-6 describes the Bezel menu commands associated with the dialog box.

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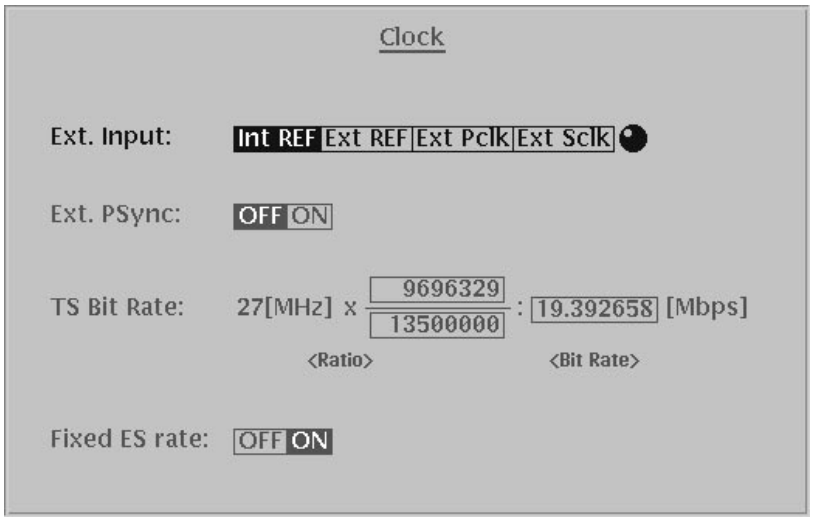


Figure 3-2: Clock dialog box

Table 3-5: Clock dialog box parameters

Parameter	Description
Ext. Input	Sets which clock will be used as the reference for the stream output. You can select from the following settings: INT REF (internal reference) uses the internal clock of the MPEG generator as the clock reference. EXT REF (external reference) allows you to input a sine wave on the EXT 27MHz REFERENCE IN connector for use as the clock reference. EXT Pclk (external parallel clock) allows you to input a clock signal on the ECL CONTROL connector for use as the parallel clock. EXT Sclk (external serial clock) allows you to input a clock signal on the ECL CONTROL connector for use as the serial clock.
Ext. Psync	Sets whether or not the data is synchronously output with the PSYNC signal input to the ECL CONTROL connector.

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Table 3-5: Clock dialog box parameters (Cont.)

Parameter	Description
TS Bit Rate	Sets the clock rate for the transport stream output. You can enter the clock rate using one of the following methods (the first method provides greater clock-rate precision): ● Enter values into the numerator and denominator fields, and then press the Ratio Bezel button. The MPEG generator will then calculate the clock rate based on the ratio of the numerator and denominator values. ● Enter a value into the clock rate field, and then press the Immediate Bezel button. The MPEG generator will then calculate the numerator and denominator fields based on the clock rate. When you use the Ext Pclk or Ext Sclk mode, set the clock rate to the same value as the input clock signal. If you do not set the value properly, the PCR and PTS/DTS values are not updated correctly. Also, the PLL may not lock at the worst.
Fixed ES rate	Sets whether elementary stream rate is fixed or not. When you set it to ON, the elementary stream rate becomes constant regardless of the clock rate setting. If you set it to ON, You cannnot set the output clock rate (TS Bit Rate) more than the data rate set when the file was downloaded.

Table 3-6: Bezel menu commands for the Clock dialog box

Command	Description
Ratio	Sets the MPEG generator to calculate the output clock rate based on the divided ratio entered in the numerator and denominator fields of the Clock dialog box.
Bit Rate	Sets the MPEG generator to calculate the divided-ratio numerator and denominator values based on the output clock rate. In this mode, numeric rounding may occur depending on the calculated value.
Default	Resets all of the dialog box settings back to the factory default settings. The default clock-rate value is calculated based on the Packet Size setting in the OUTPUT menu.
Cancel	Cancels any setting changes and closes the dialog box.
OK	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

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CONFIG Pull-down Menu

The CONFIG pull-down menu contains commands for setting the output loop mode and the initial PCR values, and inserting an insertion file and a TOT/STT. Table 3-7 describes the commands available in the CONFIG pull-down menu.

Table 3-7: CONFIG pull-down menu commands

Command	Description
Loop Mode	Sets the loop mode used to output a transport stream. You can select No Update, Auto Update, or Stress (MTG300 only). Refer to *Output Loop Modes* on page 2-15 for more information.
Start/End Packet...	Changes the start and end packet of the transport stream. When you select this menu item, the Start/End Packet dialog box appears. Refer to *Start/End Packet Dialog Box* on page 3-10 for more information.
PCR Initial Value...	Sets the initial value of the program_clock_reference_base and program_clock_reference_extension parameters when the transport stream is output. When you select this menu item, the PCR Start Value dialog box appears. Refer to *PCR Start Value Dialog Box* on page 3-11 for more information.
Insert Section/TS... (MTG300 only)	Opens an insertion file, which can be either a section file or a transport stream file. Opening a new file creates a corresponding icon in the hierarchy display. When you select this command, the Select Insert File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Insert File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1. After you select a file to insert, the Insertion Setup dialog box appears. Refer to *Insertion Setup Dialog Box* on page 3-12 for more information.
Insert TDT/TOT... (MTG300 only)	Inserts a TOT into the selected transport stream. This command is only available when the selected transport stream file is in ARIB or DVB formats and a TDT (Time and Data Table) or TOT (Time and Offset Table) does not already exist in the stream. When you select this command, the TOT Item dialog box appears. Refer to *TOT Item Dialog Box* on page 3-14 for more information.
Insert STT... (MTG300 only)	Inserts an STT into the selected transport stream. This command is only available when you select a transport stream file in ATSC format and an STT (System Time Table) does not already exist in the stream. When you select this command, the STT Item dialog box appears. Refer to *STT Item Dialog Box* on page 3-15 for more information.

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Table 3-7: CONFIG pull-down menu commands (Cont.)

Command	Description
TDT/TOT/STT Update	Sets whether or not the timing values of the TDT/TOT/STT are updated in the Auto Update and Stress output loop mode. You can select ON or OFF. When you set it to OFF, the TDT..., TOT..., and STT... bezel menus are disabled.
Auto play on power up	Sets whether or not the transport stream is automatically output using the last power-down settings when you turn the MPEG generator on. You can select ON or OFF. If you set it to ON, take care of the output level setting used when the he MPEG generator was last turned off and the input level of the instrument (device) currently connected to the MPEG generator.

Start/End Packet Dialog Box. When you select the Start/End Packet... command from the Bezel menu on your MTG300 MPEG generator, the Start/End Packet dialog box appears as shown in Figure 3-14. Use the arrow buttons to highlight the desired parameter, and the use the rotary knob or hexadecimal keypad to set the value. Press the Apply bezel button to apply changes.

Table 3-8 describes the Start/End Packet dialog box parameters and Table 3-9 describes the Bezel menu commands associated with the dialog box.

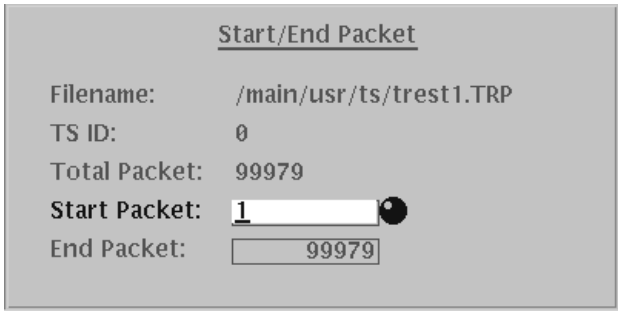


Figure 3-3: Start/End Packet dialog box

Table 3-8: Start/End Packet dialog box parameters

Parameter	Description
Finename	Shows the directory path and file name of the transport stream.
TS ID	Shows the TS ID of the transport stream.
Total Packet	Shows the total number of packets in the transport stream.

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Table 3-8: Start/End Packet dialog box parameters (Cont.)

Parameter	Description
Start Packet	Sets the number of the start packet in the transport stream.
End Packet	Sets the number of the end packet in the transport stream. The number of (End Packet–Start Packet) is need to be more than 5000 packets.

Table 3-9: Bezel menu commands for the Start/End Packet dialog box

Command	Description
Default	Resets all of the dialog box settings back to the factory default settings.
Cancel	Cancels any setting changes and closes the dialog box.
Apply	Applies the settings to the transport stream output.

PCR Start Value Dialog Box

When you select the PCR Initial Value... command from the CONFIG pull-down menu, the PCR Start Value dialog box appears as shown in Figure 3-4. Use the arrow buttons to highlight the desired parameter, and then use the rotary knob or hexadecimal keypad to set values. Press the OK bezel button to apply changes.

Table 3-10 describes the PCR Start Value dialog box parameters and Table 3-11 describes the Bezel menu commands associated with the dialog box.

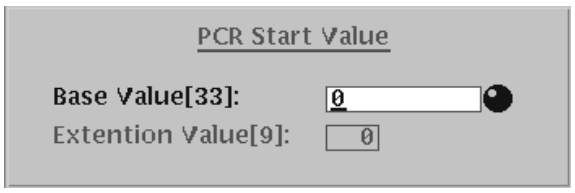


Figure 3-4: PCR Start Value dialog box

Table 3-10: PCR Start Value dialog box parameters

Parameter	Description
Base Value	Sets the initial value for the program_clock_reference_base value. You can set the value from 0 to 8589934591. The bracketed number represents the number of bits for the program_clock_reference_base field.
Extension Value	Sets the initial value for the program_clock_reference_extension value. You can set the value from 0 to 299. The bracketed number represents the number of bits for the program_clock_reference_extension field.

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Table 3-11: Bezel menu commands for the PCR Start Value dialog box

Command	Description
Default	Resets all of the dialog box settings back to the factory default settings.
Cancel	Cancels any setting changes and closes the dialog box.
OK	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

Insertion Setup Dialog Box (MTG300 Only)

When you select the Insert Section/TS... command from the CONFIG pull-down menu, or you select INS_SI... from the Bezel menu of a selected INS_SI icon in the hierarchy display, or you select INS_TS... from the Bezel menu of a selected INS_TS icon in the hierarchy display, the Insertion Setup dialog box appears as shown in Figure 3-5. Use the arrow buttons to highlight a parameter, and then use the rotary knob or hexadecimal keypad to set the value. Press the Apply bezel button to apply changes.

Table 3-12 describes the Insertion Setup dialog box parameters and Table 3-13 describes the Bezel menu commands associated with the dialog box.

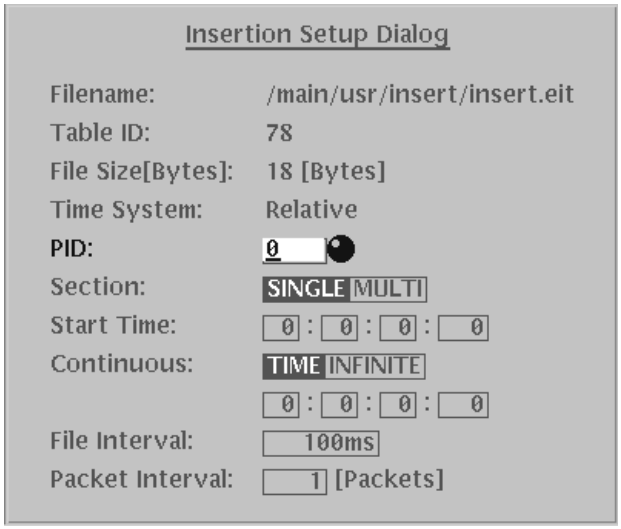


Figure 3-5: Insertion Setup dialog box

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Table 3-12: Insertion Setup dialog box parameters

Parameter	Description
Filename	Shows the directory path and name of the section or transport stream file selected in the Select Insert File dialog box. The default directory path is /main/usr/insert.
Table ID	Shows the table_id value of the table corresponding to the section file. The value is automatically defined by the selected file. This parameter appears only when the selected insertion file is a section file.
File Size	Shows the size of the selected section or transport stream file.
Time System	Shows the reference time used by the Start Time parameter to start the file insertion: Relative, TDT, TOT, or STT. Relative is displayed when a TDT, TOT, or STT is not present in the transport stream. TDT, TOT, or STT is displayed when a TDT, TOT, or STT is present in the transport stream.
PID	When the insertion file is a section file, this parameter sets the PID value when the section file is packetized. You can set the value from 0 to 8191 (0x0000 to 0x1FFF). When the insertion file is a transport stream, this parameter sets the PID value of the transport stream packet (file). You can set the value from 0 to 8191 (0x0000 to 0x1FFF). When you access the Insertion Setup dialog box from an INS_SI or INS_TS icon in the hierarchy display, this parameter is automatically set by the stream item and cannot be changed.
Section	Sets the mode for how section data will be contained in the transport stream packets. You can select SINGLE or MULTI. Refer to *Section Modes* on page 3-83 for more information. This parameter appears only when the selected insertion file is a section file.
Start Time	Sets the time when file insertion is started. You can set the time value from 00:00:00:000 to 24:59:59:999 (hours : minutes : seconds : milliseconds). How this Start Time parameter works depends on the setting of the Time System parameter in this dialog box. When the Time System parameter is Relative, file insertion starts when the period of time set in this Start Time parameter has elapsed after the start of the transport stream output. When the Time System parameter is TDT, TOT, or STT, file insertion starts when the time described in the TDT, TOT, or STT of the transport stream corresponds to the time set in this Start Time parameter. For user-inserted TDTs, TOTs, and STTs, the TDT Item, TOT item, and STT Item dialog boxes contain a parameter to set the start time. When the start time setting in this dialog box matches the start time setting in the TDT Item, TOT item, or STT Item dialog box, file insertion is started.
Continuous	Sets the duration for the file insertion. When you select TIME, you can set the time value from 00:00:00:000 to 24:59:59:999 (hours : minutes : seconds : milliseconds). When you select INFINITE or set the time value to 00:00:00:000, the file insertion duration is set to infinite.

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Table 3-12: Insertion Setup dialog box parameters (Cont.)

Parameter	Description
File Interval	Sets the time interval between file insertions. The insertion file will be repeatedly inserted into the transport stream output at the specified time interval. You can set the interval from 100 ms to 3000 ms in 10 ms steps.
Packet Interval	Data in the insertion file is packetized by the MPEG generator prior to being inserted in the transport stream output. Use this parameter to set the time interval between the packets of the insertion file. You can set the packet interval from 1 to 1000 packets in 1 packet steps.

Table 3-13: Bezel menu commands for the Insertion Setup dialog box

Command	Description
Default	Resets all of the dialog box settings back to the factory default settings.
Cancel	Cancels any setting changes and closes the dialog box.
Apply	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

TOT Item Dialog Box (MTG300 Only)

When you select the Insert TOT/TDT... command from the CONFIG pull-down menu or you select TDT... or TOT... from the Bezel menu of a selected TDT or TOT icon in the hierarchy display, the TOT Item or TDT Item dialog box appears. Figure 3-6 shows the TOT Item dialog box. Use the arrow buttons to highlight the desired parameter, and then use the rotary knob or hexadecimal keypad to set values. Press the Keep Stress bezel button to apply changes.

***NOTE**. The TDT Item or TOT Item dialog box is available from the CONFIG pull-down menu only when the selected transport stream file is in ARIB or DVB formats and a TDT (Time and Data Table) or TOT (Time Offset Table) does not already exist in the transport stream.*

Table 3-14 describes the TOT Item dialog box parameters and Table 3-15 describes the Bezel menu commands associated with the dialog box.

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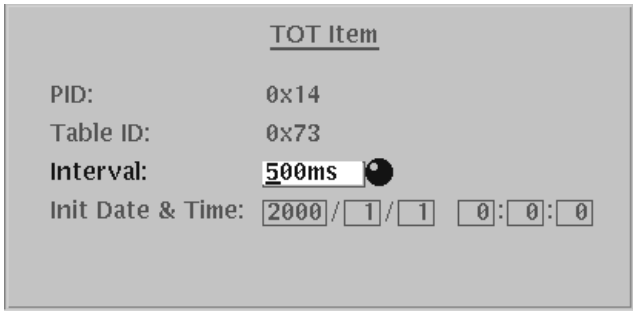


Figure 3-6: TOT Item dialog box

Table 3-14: TOT Item dialog box parameters

Parameter	Description
PID	Shows the PID value of the TOT you are inserting.
Table ID	Shows the table_id value of the TOT you are inserting.
Interval	Sets the period between occurrences of the TOT in the transport stream. You can set the value from 0.5 s to 120 s in 0.1 s steps.
Init Date & Time	Sets the initial date and time (year / month / day hour : minute : second) of the TOT.

Table 3-15: Bezel menu commands for the TOT Item dialog box

Command	Description
Undo Stress	Cancels any setting changes and closes the dialog box.
Keep Stress	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

STT Item Dialog Box (MTG300 Only)

When you select the Insert STT... command from the CONFIG pull-down menu or you select STT... from the Bezel menu of a selected STT icon in the hierarchy display, the STT Item dialog box appears as shown in Figure 3-7. Use the arrow buttons to highlight the desired parameter, and then use the rotary knob or hexadecimal keypad to set values. Press the OK bezel button to apply changes.

***NOTE**. The STT Item dialog box is available from the CONFIG pull-down menu only when the selected transport stream file is in ATSC format and an STT (System Time Table) does not already exist in the stream.*

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The STT Item dialog box allows you to set and control Daylight Savings time parameters. Refer to *Controlling Daylight Savings Time* on page 3-17 for more information.

Table 3-16 describes the STT Item dialog box parameters and Table 3-17 describes the Bezel menu commands associated with the dialog box.

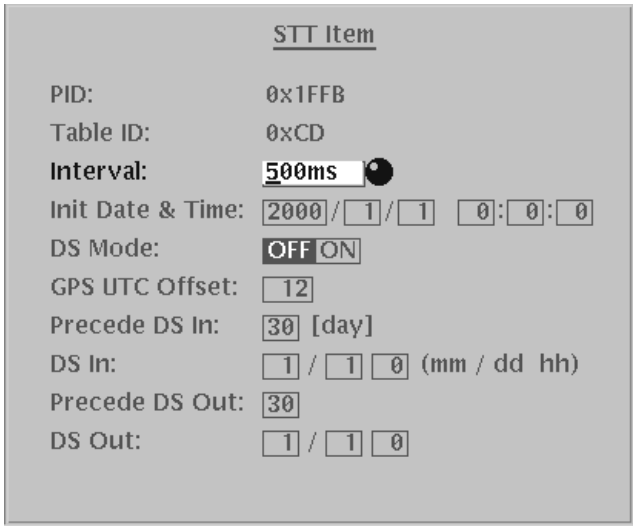


Figure 3-7: STT Item dialog box

Table 3-16: STT Item dialog box parameters

Parameter	Description
PID	Shows the PID value of the STT you are inserting.
Table ID	Shows the table_id value of the STT you are inserting.
Interval	Sets how often the STT appears in the transport stream. You can set the value from 0.5 s to 120 s in 0.1 s steps.
Init Date & Time	Sets the initial date and time (year / month / day hour : minute : second) of the STT.
DS Mode	Sets the DayLight Savings Time mode either ON or OFF. Refer to *Controlling Daylight Savings Time* on page 3-17 for more information.
GPS UTC Offset	Sets the offset value between the GPS and UTC time standards. When converting from GPS to UTC time, this offset is subtracted from GPS time. The International Bureau of Weights and Measures determines the appropriate value for this parameter. You can set the offset value from 0 s to 255 s.

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Table 3-16: STT Item dialog box parameters (Cont.)

Parameter	Description
Precede DS In	Sets the number of days until the start of the Daylight Savings time. Refer to *Controlling Daylight Savings Time* on page 3-17 for more information.
DS In	Sets the date and time when Daylight Savings time starts. Refer to *Controlling Daylight Savings Time* on page 3-17 for more information.
Precede DS Out	Sets the number of days until the end of Daylight Savings time. Refer to *Controlling Daylight Savings Time* on page 3-17 for more information.
DS Out	Sets the date and time when Daylight Savings time ends. Refer to *Controlling Daylight Savings Time* on page 3-17 for more information.

Table 3-17: Bezel menu commands for the STT Item dialog box

Command	Description
Undo Stress	Cancels any setting changes and closes the dialog box.
Keep Stress	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

Controlling Daylight Savings Time (MTG300 Only)

The MTG300 MPEG generator provides the capability to change the status of the three fields in the STT that control daylight savings time: the DS_status, DS_day_of month, and DS_hour. Using this feature, you can test that the receiver can switch into or out of daylight savings time at the appropriate local time. This subsection explains the relationship between the daylight savings time parameter settings in the STT Item dialog box and the status of the three fields in the STT.

Table 3-16 describes the DS Mode, Precede DS In, DS In, Precede DS Out, and DS Out parameters, which control the daylight savings time fields in the STT Item dialog box. The MPEG generator converts the entered daylight savings time parameters to seconds when performing calculations. Figure 3-8 shows the relationship between the daylight savings time parameters.

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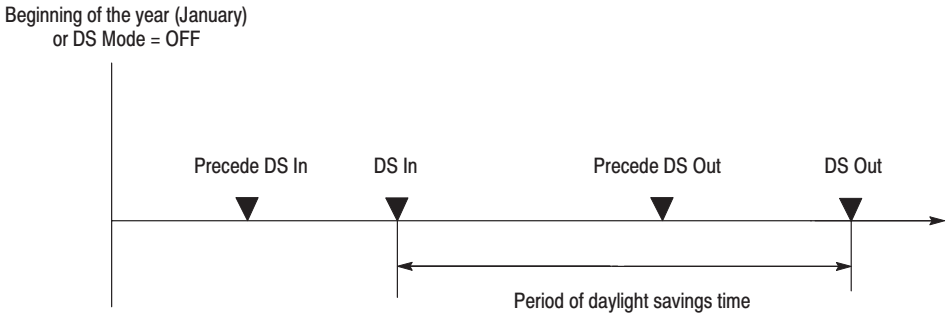


Figure 3-8: Relationship between the daylight savings time parameters in the STT Item dialog box

Table 3-18 shows the relationship between the parameters in the STT Item dialog box and the status of the daylight savings fields (DS_status, DS_day_of_month, and DS_hour) in the STT.

Table 3-18: Relationship of DS parameters in the STT Item dialog box to the status of the daylight savings time fields

Conditions	DS_status	DS_day_of_month	DS_hour
At the beginning of the year (January) or when DS Mode is set to OFF, daylight savings time is off.	0	0	0
When the transition into daylight savings time is DS In minus the day setting of Precede DS In, the DS_day_of_month field takes the value of the day setting of DS In, and the DS_hour field takes the value of the hour setting of DS In.	0	Day setting of DS In	Hour setting of DS In
When the date and time set in DS In arrives, daylight savings time is on.	1	0	0
When the transition out of daylight savings time is DS Out minus the day setting of Precede DS Out, the DS_day_of_month field takes the value of the day setting of DS Out, and the DS_hour field takes the value of the hour setting of DS Out.	1	Day setting of DS Out	Hour setting of DS Out
When the date and time set in DS Out arrives, daylight savings time is off.	0	0	0

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UTILITY Pull-down Menu

The UTILITY pull-down menu contains commands for setting the network configuration, defragmenting the hard disk, or setting system parameters. This menu is also used to perform the instrument self test or reset the instrument settings to the factory defaults. Table 3-19 describes the commands available in the UTILITY pull-down menu.

Table 3-19: UTILITY pull-down menu commands

Command	Description
Network...	Sets network parameters when the MPEG generator is connected to a remote computer (PC) using the Ethernet port. You must set network parameters when you want to transfer files using the MTG Comm application. Refer to *Appendix B: Using MTG Comm for File Transfers* for more information. When you select this menu item, the Network dialog box appears. Refer to *Network Dialog Box* on page 3-19 for more information.
Drive...	Optimizes the files on the internal hard-disk drives for maximum operating efficiency. When you select this menu item, the Drive dialog box appears. Refer to *Drive Dialog Box* on page 3-22 for more information.
Service...	This command is not for users of the MPEG generator. The command is used by factory personnel only to test the internal hardware of the instrument.
System...	Sets the internal date and time for the MPEG generator and displays general system information including the software and hardware versions installed in the instrument and the standards supported by the instrument. When you select this menu item, the System dialog box appears. Refer to *System Dialog Box* on page 3-23 for more information.

Network Dialog Box

Use the Network dialog box to set network parameters for the Ethernet port on the MPEG generator. These parameters will be used when you connect the MPEG generator to a remote computer (PC) so that you can transfer stream files between the MPEG generator and the PC. Refer to *Appendix B: Using MTG Comm+ for File Transfers* for information about connecting the MPEG generator to a PC.

When you select the Network... command from the UTILITY pull-down menu, the Network dialog box appears as shown in Figure 3-9. Use the arrow buttons to highlight the desired parameter, and then press the Edit... bezel button to open a dialog box for inputting the address. Use the hexadecimal keypad to set the address. Press the OK bezel button to apply changes.

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Table 3-20 describes the Network dialog box parameters and Table 3-21 describes the Bezel menu commands associated with the dialog box.



Figure 3-9: Network dialog box

The settings you enter in the Network dialog box depend on how you connect the MPEG generator to the remote PC. You can connect the MPEG generator directly to a single PC or you can connect it to your local Ethernet network where the MPEG generator can be accessed by network PCs running the MTG Comm^{+} application.

If you connect the MPEG generator directly to a single PC, use the following procedure to set the Network dialog box parameters:

***NOTE**. You must exit the Network dialog box before your setting changes will take effect.*

1. Set the DHCP Client parameter to Disable.
2. Set the IP Address parameter to be the same IP address as the PC's address except for the last number. The last number must be different than the last number in the PC's IP address.
3. Set the Subnet Mask parameter to be the same subnet mask used by the PC. Do not enter a number if the PC does not have a subnet mask.
4. You do not need to enter a Routing Destination or Routing Gateway if you are directly connected to a single PC.

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If you connect the MPEG generator to your local Ethernet network, you can access the MPEG generator using any PC on the network running the MTG Comm+ application.



CAUTION. *To prevent communication conflicts on your network, ask your local network administrator for the correct numbers to enter in the Network dialog box if you connect the MPEG generator to your local Ethernet network.*

Table 3-20: Network dialog box parameters

Parameter	Description
DHCP Client	Sets valid or invalid IP address settings by DHCP (Dynamic Host Configuration Protocol). You can select Disable or Enable. If you set it to Enable, the MPEG generator functions as a DHCP client. In this case, you can register the addresses such as the IP address and subnet mask used by the MPEG generator. This way, the MPEG generator accesses the DHCP server and gets the addresses automatically when connected to the network. If you set it to Disable, you will need to set address values in each of the menu items described below. NOTE: Under some network environments, the MPEG generator may not be able to get the IP adress automatically from a DHCP server. In this case, you need set the following parameters.
IP Address	Sets the IP address of the MPEG generator. If the DHCP Client parameter is set to Enable, the IP address automatically obtained from the DHCP server is used.
Subnet Mask	Sets the subnet address for the MPEG generator. If the DHCP Client parameter is set to Enable, the subnet address automatically obtained from the DHCP server is used.
Routing Destination	Sets a routing destination address for the MPEG generator on your Ethernet network. If the DHCP Client parameter is set to Enable, the destination address automatically obtained from the DHCP server is used.
Routing Gateway	Sets the gateway address to be used by the MPEG generator on your Ethernet network. Enter the address of a gateway when the remote computer is connecting to the MPEG generator through another network that is connected to your Ethernet network through a gateway.
MAC address	Displays the Media Access Control adress of the MPEG generator.

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Table 3-21: Bezel menu commands for the Network dialog box

Command	Description
Edit...	Inputs the address of the selected Network dialog box parameter. After you input the address in the displayed dialog box, press the OK bezel button to set the address.
Execute Ping...	Sends the ping command to the remote computer to verify that the MPEG generator can communicate with the network. Enter the IP address of the remote computer in the displayed dialog box using the hexadecimal keypad, and then press the OK bezel button to execute the ping command. The MPEG generator will respond with a message to indicate the status of network communication.
Cancel	Cancels any setting changes and closes the dialog box.
OK	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

Drive Dialog Box

When you select the Drive... command from the UTILITY pull-down menu, the Drive dialog box appears as shown in Figure 3-10. The dialog box displays the identification of the TS drives, the status of the clusters, and the percentage of fragmentation.

Table 3-22 describes the Bezel menu commands associated with the dialog box.



CAUTION. *To prevent the loss of your TS data, consider the following operating conditions before you select the Defrag TS drive command:*

- *You cannot interrupt the file defragmenting function after it has started except by turning the instrument off using the power switch. Power loss during the defragmenting function may result in the loss of all TS data.*
- *The period of time the MPEG generator takes to defragment the TS files depends on the amount of data stored on them. If the disk storage is near full capacity, it may take 2–3 hours to complete the operation. No data output is possible while the files are being degramented.*

Table 3-22: Bezel menu commands for the Drive dialog box

Command	Description
Defrag TS drive	Defragments the two 9 GB SCSI hard drives where your TS data resides. Defragmenting your TS data files will increase the instrument's operating efficiency. A dialog box appears before the operation begins to confirm the defragmenting function. Refer to the *Caution* note above before you select this command.
Exit	Closes the dialog box.

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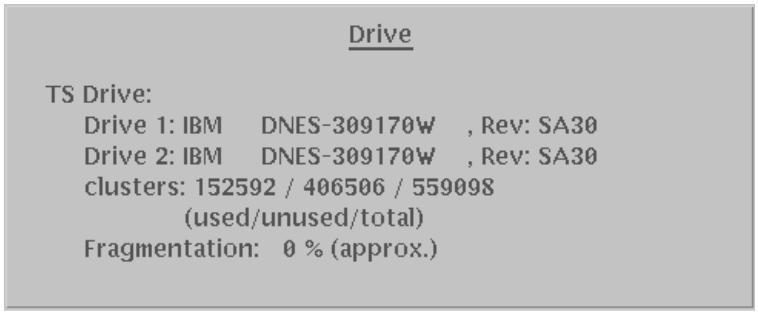


Figure 3-10: Drive dialog box

System Dialog Box

When you select the System... command from the UTILITY pull-down menu, the System dialog box appears as shown in Figure 3-11. The dialog box displays the internal date and time of the MPEG generator and displays general system information including the software and hardware versions installed in the instrument and the compression standards supported by the instrument. Use the arrow buttons to highlight the desired parameter, and then use the rotary knob or hexadecimal keypad to set values.

Table 3-23 describes the System dialog box parameters and Table 3-24 describes the Bezel menu commands associated with the dialog box.

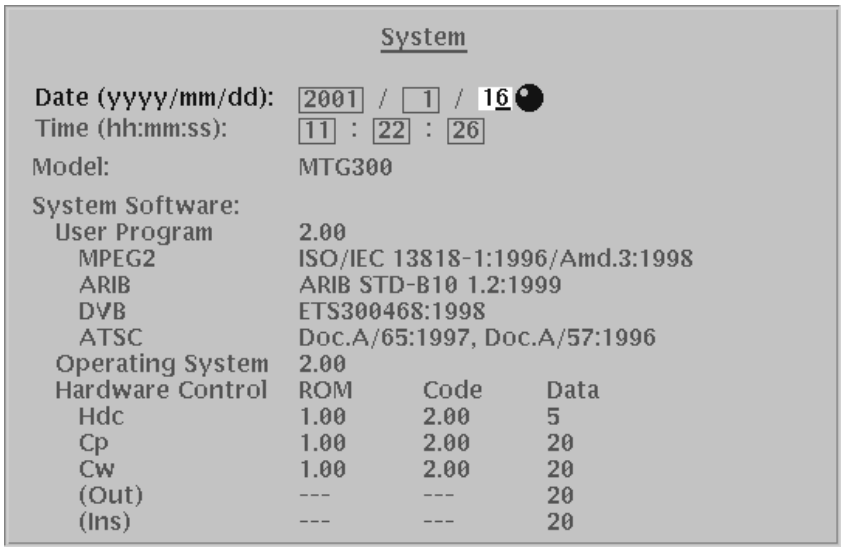


Figure 3-11: System dialog box

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Table 3-23: System dialog box parameters

Parameter	Description
Date (yyyy/mm/dd)	Sets the internal calendar date used by the MPEG generator. Any date changes are immediately valid.
Time (hh:mm:ss)	Sets the internal time used by the MPEG generator. Enter the hours parameter using numbers 1 through 24. Any time changes are immediately valid.

Table 3-24: Bezel menu commands for the System dialog box

Command	Description
Exit	Use this command to close the dialog box.

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Hierarchy Display

The MPEG generator displays the selected transport stream using a hierarchy structure. This section describes the hierarchy display, defines each icon you may encounter in the display, and describes the Bezel menu functions associated with each type of hierarchy icon.

Overview of the Hierarchy Display

The MPEG generator uses icons displayed in a hierarchical structure to show the interrelationship of transport stream components (see Figure 3-12). Additional information about each stream component such as PID and Table ID numbers is displayed next to each icon. Icons that represent data inserted by the user using the MPEG generator are displayed with a blue background to distinguish them from the standard transport stream icons.

The "+" symbol displayed to the left of some icons indicates that the item includes lower-level transport stream components that are not displayed. The symbol changes to "–" when the lower level components are displayed. To expand or collapse the hierarchy, select the desired upper-level icon and press the left control button.

When a transport stream contains more items than will display on the screen at one time, a scroll bar appears at the right of the screen.



CAUTION. *All PSI or PSIP information must be placed within the first 8 Mbytes of a transport stream file downloaded using the MTG Comm application. If the PSI or PSIP information is not in the first 8 Mbytes, the hierarchy icons for the PSI or PSIP information may not be displayed correctly. Refer to* Appendix B:Using MTG Comm for File Transfers *for more information about the MTG Comm application.*

The Icon cursor is used to select individual transport stream components as represented by the icons. The Icon cursor is displayed as a red square (border) surrounding a hierarchy icon (see Figure 3-12). Use the rotary knob or the arrow buttons to move the Icon cursor through the hierarchy. The hierarchy display scrolls (if applicable) when the Icon cursor reaches the top or bottom of the displayed portion of the hierarchy.

When the pull-down menus are enabled, the Icon cursor is not displayed. Press the front-panel MENU button to toggle control between the Icon cursor and the pull-down menus.

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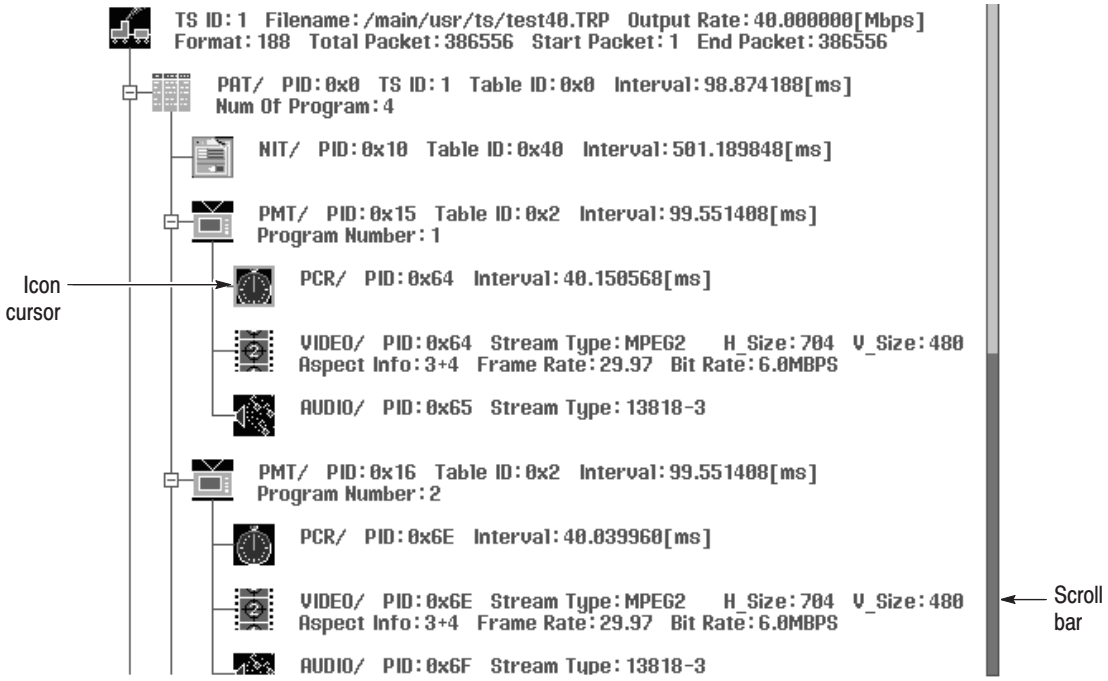


Figure 3-12: Example of the hierarchy display

Hierarchy Display Icons

Table 3-25 describes the icons you may encounter in the hierarchy display of the MPEG generator for transport streams using the MPEG-2, ARIB, DVB, and ATSC formats.

Table 3-26 on page 3-29 describes icons that are specific to transport streams using DVB format.

Table 3-27 on page 3-30 describes icons that are specific to transport streams using ARIB format.

Table 3-28 on page 3-32 describes icons that are specific to transport streams using the ATSC format.

Table 3-29 on page 3-33 describes icons that are specific to transport streams using the S-TMCC or M-TMCC format and to streams using the Non TS format.

Table 3-30 on page 3-33 describes icons that represent the user-inserted data inserted by the MPEG generator.

Refer to *Icon Text and Bezel Menu Commands* on page 3-34 for descriptions of the icon text and Bezel menu commands associated with each hierarchy icon.

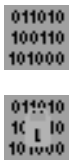
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Table 3-25: Icons used for MPEG-2, ARIB, DVB, and ATSC formats

Icon	Element type
	Transport Stream (TS) This icon represents all transport stream packets that make up the stream.
	Program Allocation Table (PAT) One or more transport packets with a PID value and table_id value of 0x00.
	Transport Stream Description Table (TSDT) One or more transport packets with a PID value of 0x02 and a table_id value of 0x03.
	Network Information Table (NIT) One or more transport packets with a PID value specified by the network_PID in the PAT.
	Conditional Access Table (CAT) One or more transport packets with a PID value of 0x01 and a table_id value of 0x0001.
	Program Map Table (PMT) One or more transport packets with a PID value specified by the program_map_PID in the PAT and a table_id value of 0x02.
	Program Clock Reference (PCR) One or more transport packets with a PID value specified by the PCR_PID in the PMT and a PCR_flag value of 1.
	Video elementary stream One or more transport packets with a PID value specified by the elementary_PID in the PMT and a stream_type value of 0x01 or 0x02. A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.
	Audio elementary stream One or more transport packets with a PID value specified by the elementary_PID in the PMT and a stream_type value of 0x03 or 0x04. A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.
	Audio AAC, Audio AC3 (ATSC format) One or more transport packets with a PID value specified by the elementary_PID in the PMT and a stream_type value of 0x0F or 0x81 (ATSC format). A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.

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Table 3-25: Icons used for MPEG-2, ARIB, DVB, and ATSC formats (Cont.)

Icon	Element type
	Data stream One or more transport packets with a PID value specified by the elementary_PID in the PMT and a stream_type value of other than 0x01–0x05, 0x08, and 0x0F (in ATSC format, 0x81). A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.
	Private Section One or more transport packets with a PID value specified by the elementary_PID in the PMT and a stream_type value of 0x05. A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.
	Digital Storage Media Command and Control (DSM-CC) One or more transport packets with a PID value specified by the elementary_PID in the PMT and a stream_type value of 0x08. A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.
	Entitlement Control Message (ECM) One or more transport packets with a PID value specified by the CA_PID of the CA_descriptor in the PMT, a payload_start_unit_indicator value of 1, and the payload does not start 000001 (section) or the payload starts 000001 (PES).
	Entitlement Management Message (EMM) One or more transport packets with a PID value specified by the CA_PID of the CA_descriptor in the CAT, a payload_start_unit_indicator value of 1, and the payload does not start 000001 (section) or the payload starts 000001 (PES).
	GHOST One or more transport packets with a PID value not specified in the PSI or Private Section PID file when the transport stream is downloaded.
	NULL One or more transport packets with a PID value of 0x1FFF.
	GARBAGE One or more transport packets where the section-data structure at the beginning of the section is not complete.
	Private Information (PRI) One or more transport packets with a PID value specified in the Private Section PID file when the transport stream is downloaded.
	Adaptation Field Error (ADFERR) One or more transport packets with an adaptation_field_control value of 0x00.

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Table 3-26: Icons specific to DVB format

Icon	Element type
	Service Description Table (SDT) One or more transport packets with a PID value of 0x0011 and a table_id value of 0x42.
	Bouquet Association Table (BAT) One or more transport packets with a PID value of 0x0011 and a table_id value of 0x4A.
	Event Information Table (EIT) One or more transport packets with a PID value of 0x0012 and a table_id value of 0x4E–0x6F.
	Running Status Table (RST) One or more transport packets with a PID value of 0x0013 and a table_id value of 0x4E–0x71.
	Stuffing Table (ST) One or more transport packets with a PID value of 0x0010–0x0013 and a table_id value of 0x72.
	Discontinuity Information Table (DIT) One or more transport packets with a PID value of 0x1E and a table_id value of 0x7E.
	Selection Information Table (SIT) One or more transport packets with a PID value of 0x1F and a table_id value of 0x7F.
	Time and Data Table (TDT) One or more transport packets with a PID value of 0x0014 and a table_id value of 0x72.
	Time Offset Table (TOT) One or more transport packets with a PID value of 0x0014 and a table_id value of 0x73.

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Table 3-27: Icons specific to ARIB format

Icon	Element type
 	Service Description Table (SDT) One or more transport packets with a PID value of 0x0011 and a table_id value of 0x42.
	Bouquet Association Table (BAT) One or more transport packets with a PID value of 0x0011 and a table_id value of 0x4A.
	Event Information Table (EIT) One or more transport packets with a PID value of 0x0012 and a table_id value of 0x4E–0x6F.
	Running Status Table (RST) One or more transport packets with a PID value of 0x0013 and a table_id value of 0x4E–0x71.
	Stuffing Table (ST) One or more transport packets with a PID value of 0x0010–0x0013 and a table_id value of 0x72.
	Discontinuity Information Table (DIT) One or more transport packets with a PID value of 0x1E and a table_id value of 0x7E.
	Selection Information Table (SIT) One or more transport packets with a PID value of 0x1F and a table_id value of 0x7F.
	Local event Information Table (LIT) One or more transport packets with a PID value of 0x0020 and a table_id value of 0xD0. One or more transport packets with a PID value specified by the elementary_PID in the PMT and a table_id value of 0xD0 when a stream type value is 0x05.
	Event Relation Table (ERT) One or more transport packets with a PID value of 0x0021 and a table_id value of 0xD1. One or more transport packets with a PID value specified by the elementary_PID in the PMT and a table_id value of 0xD1 when a stream type value is 0x05.
	Index Transmission Table (ITT) One or more transport packets with a PID value specified by the elementary_PID in the PMT and a table_id value of 0xD2.

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Table 3-27: Icons specific to ARIB format (Cont.)

Icon	Element type
	Partial Content Announcement Table (PCAT) One or more transport packets with a PID value of 0x22 and a table_id value of 0xC2.
	Software Download Trigger Table (SDTT) One or more transport packets with a PID value of 0x23 and a table_id value of 0xC3.
	Download Control Table (DCT) One or more transport packets with a PID value of 0x17 and a table_id value of 0xC0.
	DownLoad Table (DLT) One or more transport packets with a PID value specified by the DL_PID in the DCT and a stream_type value of 0xC1. A lock symbol appears in the icon when the transport_scrambling_control value is set to 01.
	Time and Data Table (TDT) One or more transport packets with a PID value of 0x0014 and a table_id value of 0x72.
	Time Offset Table (TOT) One or more transport packets with a PID value of 0x0014 and a table_id value of 0x73.

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Table 3-28: Icons specific to ATSC format

Icon	Element type
	Master Guide Table (MGT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xC7.
	Terrestrial Virtual Channel Table (TVCT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xC8.
	Cable Virtual Channel Table (CVCT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xC9.
	Rating Region Table (RRT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xCA.
	Event Information Table (EIT) One or more transport packets with a PID value specified by the table_type_PID in the MGT and a table_id value of 0xCB.
	Channel Extended Text Table (CETT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xC8.
	Event Extended Text Table (EETT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xC9.
	Program Identifier Table (PIT) One or more transport packets with a PID value specified by the elementary_PID in the PMT and a table_id value of 0xD0 when a stream_type value is 0x85.
	System Time Table (STT) One or more transport packets with a PID value of 0x1FFB and a table_id value of 0xCD.

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Table 3-29: Icons specific to ISDB-S and Non TS format

Icon	Element type
	S–TMCC Transport stream to which TMCC information is inserted into 8 bytes in its Reed-Solomon area (16 bytes).
	M-TMCC Transport stream to which TMCC information is inserted into its sync byte area, and having super frame structure.
	Transport Stream (TS) Transport stream composing the S-TMCC or M-TMCC.
	Non TS Data stream other than transport stream format, which is downloaded in Non TS format.

Table 3-30: Icons specific to user-inserted data[1]

Icon	Element type
	INS_SI The service information insertion file inserted by the MPEG generator into the transport stream.
	INS_TS A transport stream insertion file inserted by the MPEG generator into the transport stream.
	INS_TDT or INS_TOT A TDT or TOT inserted by the MPEG generator into the transport stream.
	INS_STT An STT inserted by the MPEG generator into the transport stream.

1 These Icons's background are colored blue.

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Icon Text and Bezel Menu Commands

To the right of each icon, the MPEG generator displays text that describes each transport stream component. The text associated with an icon will change color to indicate the following conditions:

- Red text indicates that the selected transport stream is not suited for outputting with the Auto Update loop mode. The No Update loop mode is recommended for outputting it.
- Orange text indicates that the parameters of the component have been changed from its default value.
- Green text indicates that the component has been replaced with the specified section file.

When you use the Icon cursor to select a transport stream component, the Bezel menu displays commands that apply only to the selected component (MTG300 only). This subsection describes the text information and available Bezel menu commands for each icon type.

***NOTE**. Only the MTG300 MPEG generator can access the Bezel menu commands for the selected transport stream icon. The output loop mode must be set to Stress for all of the available Bezel menu commands to appear. Refer to* Output Loop Modes *on page 2-15 for more information.*

Transport Stream (TS) Icon

Table 3-31 describes the text information and Table 3-32 describes the Bezel menu commands for the Transport Stream (TS) icon.

Table 3-31: Transport stream icon text descriptions

Parameter	Description
TS ID	Shows the ID number for the transport stream.
Filename	Shows the file name and path of the transport stream.
Output Rate	Shows the output rate of the transport stream.
Format	Shows the packet-size format of the transport stream in bytes (188, 204, or 208).
Total Packet	Shows the total number of packets in the transport stream.
Start Packet	Shows the number of the start packet in the transport stream.
End Packet	Shows the number of the end packet in the transport stream.

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Table 3-31: Transport stream icon text descriptions (Cont.)

Parameter	Description
Consistency error included	This message is displayed in red when the PID in the PSI or table_id has no consistency. For ARIB, DVB, or ATSC formats, this error is displayed when PIDs reserved by the standards are not used properly.
Multi PSI version included	This message is displayed in red when more than one version of the PAT or PMT resides in the transport stream.

Table 3-32: Transport stream icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status in all of the packet headers of the transport stream. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Start/End Packet...	Changes the start and end packet of the transport stream. When you select this menu item, the Start/End Packet dialog box appears. Refer to *Start/End Packet Dialog Box* on page 3-38 for more information.
Random Error...	Inserts random errors into the transport stream. When you select this menu item, the Random Error Stress dialog box appears. Refer to *Random Error Stress Dialog Box* on page 3-39 for more information.
Reset Insert & Stress	Cancels all of the insertion and stress functions for the transport stream. When you press this bezel button, a confirmation message box appears for you to confirm the operation. Press the OK bezel button to execute the operation or press the Cancel bezel button to cancel the operation and return to the state prior to selecting this menu item.

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TS Head Stress Dialog Box. When you select the Stress TS Head... command from the Bezel menu on your MTG300 MPEG generator, the TS Head Stress dialog box appears as shown in Figure 3-13. The stress tests activated from this dialog box are momentary and can only be applied when this dialog box is displayed. Any transport stream setting changes applied by a test revert to their prior state when the test is completed.

Use the arrow buttons to highlight the test you want to execute, and then press the Effect Check bezel button to enable the test. A check mark (✓) appears by the enabled test. Only one test can be executed at a time. Press the Apply bezel button to execute the enabled test. If you set to 0 in the Count box, the selected test is repeated infinitely.

Table 3-33 describes the TS Head Stress dialog box parameters and Table 3-34 describes the Bezel menu commands associated with the dialog box.

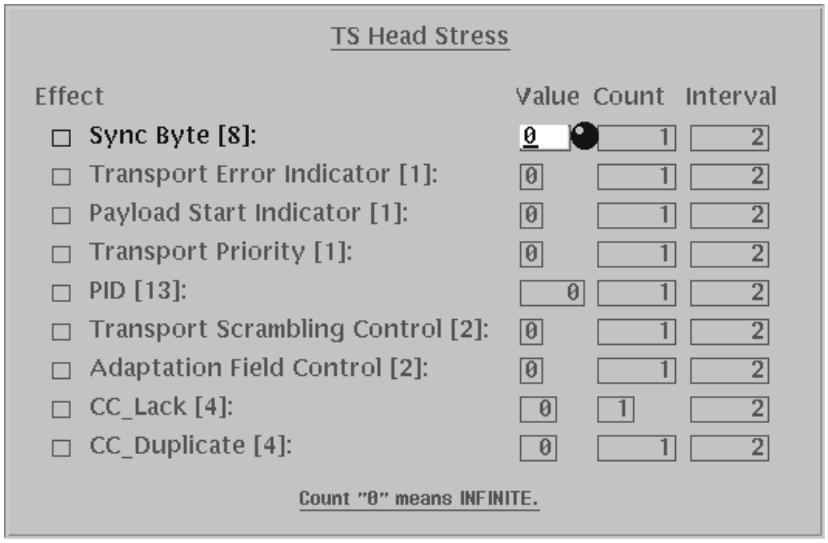


Figure 3-13: TS Head Stress dialog box

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Table 3-33: TS Head Stress dialog box parameters

Parameter	Description
Sync Byte	The set-up sync_byte value (0 to 255) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
Transport Error Indicator	The set-up transport_error_indicator value (0 or 1) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
Payload Start Indicator	The set-up payload_unit_start_indicator value (0 or 1) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
Transport Priority	The set-up transport_priority value (0 or 1) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
PID	The set-up PID value (0 to 8191) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
Transport Scrambling Control	The set-up transport_scrambling_control value (0 to 3) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
Adaptation Field Control	The set-up adaptation_field_control value (0 to 3) is replaced at every set-up packet interval (0 to 65535) by the set-up number of packets (1 to 65535).
CC_Lack	The continuity_counter value is deleted from the set-up value (0 to 15) at every set-up interval (0 to 65535) by the set-up number of packets (1 to 15).
CC_Duplicate	Out of the set-up value (0 to 15), continuity_counter value is copied at every set-up interval (0 to 65535) by the set-up number of packets.

Table 3-34: Bezel menu commands for the TS Head Stress dialog box

Command	Description
Effect Check	Enables the selected test. A check mark (✓) appears by the enabled test.
Abort	When the Count box of the selected test is set to 0, abort the execution of the test.
Default	Resets all of the dialog box settings back to the factory default settings.
Exit Menu	Cancels any setting changes and closes the dialog box.
Apply	Applies the selected test to the transport stream. The stress tests activated from this dialog box are momentary. Any transport stream setting changes applied by a test revert to their prior state when the test is completed.

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Start/End Packet Dialog Box. When you select the Start/End Packet... command from the Bezel menu on your MTG300 MPEG generator, the Start/End Packet dialog box appears as shown in Figure 3-14. Use the arrow buttons to highlight the desired parameter, and the use the rotary knob or hexadecimal keypad to set the value. Press the Apply bezel button to apply changes.

Table 3-35 describes the Start/End Packet dialog box parameters and Table 3-36 describes the Bezel menu commands associated with the dialog box.

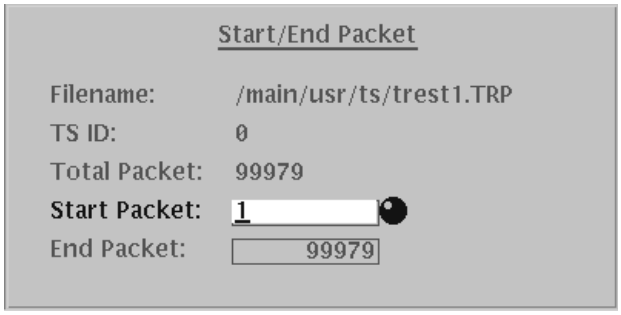


Figure 3-14: Start/End Packet dialog box

Table 3-35: Start/End Packet dialog box parameters

Parameter	Description
Finename	Shows the directory path and file name of the transport stream.
TS ID	Shows the TS ID of the transport stream.
Total Packet	Shows the total number of packets in the transport stream.
Start Packet	Sets the number of the start packet in the transport stream.
End Packet	Sets the number of the end packet in the transport stream. The number of (End Packet–Start Packet) is need to be more than 5000 packets.

Table 3-36: Bezel menu commands for the Start/End Packet dialog box

Command	Description
Default	Resets all of the dialog box settings back to the factory default settings.
Cancel	Cancels any setting changes and closes the dialog box.
Apply	Applies the settings to the transport stream output.

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Random Error Stress Dialog Box. When you select the Random Error... command from the Bezel menu on your MTG300 MPEG generator, the Random Error Stress dialog box appears as shown in Figure 3-15. Use the rotary knob or hexadecimal keypad to set the interval. Press the Apply bezel button to apply the random error stress to the transport stream output.

Table 3-37 describes the Random Error Stress dialog box parameters and Table 3-38 describes the Bezel menu commands associated with the dialog box.

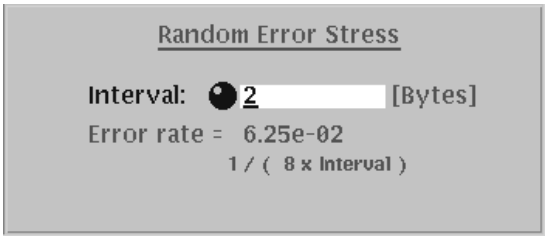


Figure 3-15: Random Error Stress dialog box

Table 3-37: Random Error Stress dialog box parameters

Parameter	Description
Interval	Sets the interval that the random error is inserted into the transport stream output. You can set the value from 2 to 4294967295 byte in 1 byte steps.
Error rate	Shows the error rate (error/sec).

Table 3-38: Bezel menu commands for the Error Rate Stress dialog box

Command	Description
Apply	Enables the insertion of the random error.
Undo Stress	Disables the insertion of the random error.
Exit	Cancels any setting changes and closes the dialog box.

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Program Allocation Table (PAT) Icon

Table 3-39 describes the text information and Table 3-40 describes the Bezel menu commands for the Program Allocation Table (PAT) icon.

Table 3-39: PAT icon text descriptions

Parameter	Description
PID	Shows the PID value of the PAT.
TS ID	Shows the transport_stream_id value of the PAT.
Table ID	Shows the table_id value of the PAT.
Interval	Shows the period of the PAT.
Num of Program	Shows the number of programs contained in the transport stream.

Table 3-40: PAT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the PAT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Interval...	Changes the period of the PAT. When you select this menu item, the PAT Interval dialog box appears. Refer to *PAT Interval Dialog Box* on page 3-41 for more information. Note: If the pointer_field value of the transport stream is not 0, this command is not available.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.

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Table 3-40: PAT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Replace Section...	Replaces the current PAT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

PAT Interval Dialog Box. When you select the Interval... command from the Bezel menu on your MTG300 MPEG generator, the PAT Interval dialog box appears as shown in Figure 3-16.

The PAT interval parameter sets the time between occurrences of the PAT in the transport stream. Use the rotary knob or hexadecimal keypad to change the interval. You can set the value from 50 ms to 30000 ms in 1 ms steps.

Table 3-41 describes the Bezel menu commands associated with the dialog box.

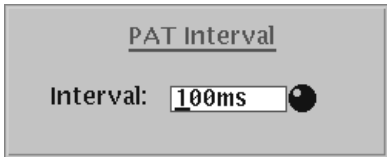


Figure 3-16: PAT Interval dialog box

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Table 3-41: Bezel menu commands for the PAT Interval dialog box

Command	Description
Undo Stress	Returns the PAT interval to the default value and closes the dialog box.
Keep Stress	Enables the PAT interval. When you change the PAT interval, the new interval value is displayed in orange after the PAT icon.

Replace Setup Dialog Box. When you select the Replace Section... command from the Bezel menu on your MTG300 MPEG generator, the Replace Setup dialog box appears as shown in Figure 3-17. Use the arrow buttons to highlight the desired parameter, and then use the rotary knob or hexadecimal keypad to set values. Press the Apply bezel button to apply changes.

Table 3-42 describes the Replace Setup dialog box parameters and Table 3-43 describes the Bezel menu commands associated with the dialog box.

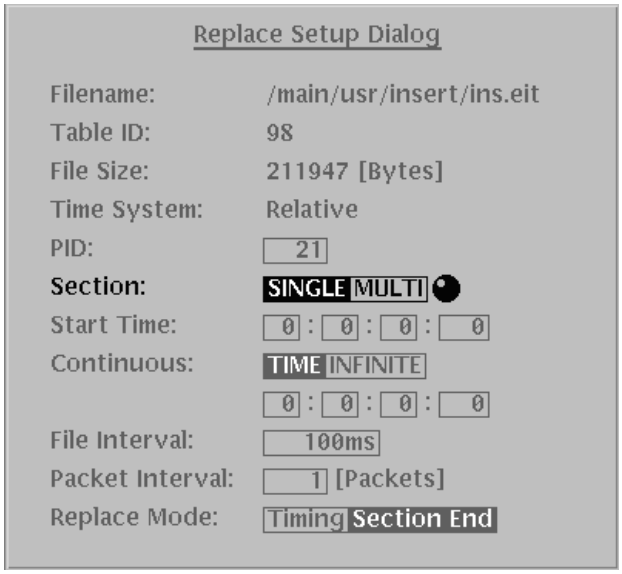


Figure 3-17: Replace Setup dialog box

Table 3-42: Replace Setup dialog box parameters

Parameter	Description
Filename	Shows the directory path and name of the section file selected in the Select Replace File dialog box. The default directory path is /main/usr/insert.
Table ID	Shows the table_id value of the PAT. This value is automatically defined by the selected file.

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Table 3-42: Replace Setup dialog box parameters (Cont.)

Parameter	Description
File Size	Shows the size of the selected section file.
Time System	Shows the reference time used by the Start Time parameter to start the file replacement: Relative, TDT, TOT, or STT. Relative is displayed when a TDT, TOT, or STT is not present in the transport stream. TDT, TOT, or STT is displayed when a TDT, TOT, or STT is present in the section file. For the Relative mode, data replacement starts when the period of time set in the Start Time parameter has elapsed after the start of transport stream output. For the TDT, TOT, and STT modes, data replacement starts when the time described in the TDT, TOT, or STT corresponds to the time set in the Start Time parameter.
PID	Shows the PID value of the table corresponding to the section data.
Section	Sets the mode for how section data will be contained in the transport stream packets. You can select SINGLE or MULTI. Refer to *Section Modes* on page 3-83 for more information.
Start Time	Sets the time when data replacement is started. You can set the time value from 00:00:00:000 to 24:59:59:999 (hours : minutes : seconds : milliseconds). How this Start Time parameter works depends on the setting of the Time System parameter in this dialog box. When the Time System parameter is Relative, data replacement starts when the period of time set in this Start Time parameter has elapsed after the start of the transport stream output. When the Time System parameter is TDT, TOT, or STT, data replacement starts when the time described in the TDT, TOT, or STT of the transport stream corresponds to the time set in this Start Time parameter. For user-inserted TDTs, TOTs, and STTs, the TDT Item, TOT item, and STT Item dialog boxes contain a parameter to set the start time. When the start time setting in this dialog box matches the start time setting in the TDT Item, TOT item, or STT Item dialog box, data replacement is started.
Continuous	Sets the duration for data replacement. When you select TIME, you can set the time value from 00:00:00:000 to 24:59:59:999 (hours : minutes : seconds : milliseconds). When you select INFINITE or set the time value to 00:00:00:000, the data replacement duration is set to infinite.
File Interval	Sets the time interval between data replacements. The replacement file will be repeatedly inserted into the transport stream output at the specified time interval. You can set the interval period from 100 ms to 3000 ms in 10 ms steps.
Packet Interval	Data in the replacement file is packetized by the MPEG generator prior to being inserted in the transport stream output. Use this parameter to set the time interval between the packets of the replacement file. You can set the packet interval period from 1 to 1000 packets in 1 packet steps.
Replace Mode	Sets how the selected section data are replaced with the original data. You can select Section End or Timing. Refer to *Replacement Modes* on page 3-84 for more information.

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Table 3-43: Bezel menu commands for the Replace Setup dialog box

Command	Description
Default	Resets all of the dialog box settings back to the factory default settings.
Cancel	Cancels any setting changes and closes the dialog box.
Apply	Enables all setting changes. When you apply setting changes, data output from the MPEG generator is stopped. You must restart the MPEG generator output for the setting changes to appear.

Transport Stream Description Table (TSDT) Icon

Table 3-44 describes the text information and Table 3-45 describes the Bezel menu commands for the Transport Stream Description Table (TSDT) icon.

Table 3-44: TSDT icon text descriptions

Parameter	Description
PID	Shows the PID value of the TSDT.
Table ID	Shows the table_id value of the TSDT.
Interval	Shows the period of the TSDT.

Table 3-45: TSDT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the TDST. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.

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Table 3-45: TSDT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Replace Section...	Replaces the current TDST with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

Network Information Table (NIT) Icon

Table 3-46 describes the text information and Table 3-47 describes the Bezel menu commands for the Network Information Table (NIT) icon.

Table 3-46: NIT icon text descriptions

Parameter	Description
PID	Shows the PID value of the NIT.
Table ID	Shows the table_id value of the NIT.
Interval	Shows the period of the NIT.

Table 3-47: NIT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the NIT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI...	Changes the status of the section header in the NIT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.

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Table 3-47: NIT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section...	Replaces the current NIT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

Conditional Access Table (CAT) Icon

Table 3-48 describes the text information and Table 3-49 describes the Bezel menu commands for the Conditional Access Table (CAT) icon.

Table 3-48: CAT icon text descriptions

Parameter	Description
PID	Shows the PID value of the CAT.
Table ID	Shows the table_id value of the CAT.
Interval	Shows the period of the CAT.

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Table 3-49: CAT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the CAT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI...	Changes the status of the section header in the CAT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section...	Replaces the current CAT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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Program Map Table (PMT) Icon

Table 3-50 describes the text information and Table 3-51 describes the Bezel menu commands for the Program Map Table (PMT) icon.

Table 3-50: PMT icon text descriptions

Parameter	Description
PID	Shows the PID value of the PMT.
Table ID	Shows the table_id value of the PMT.
Interval	Shows the period of the PMT.
Program Number	Shows the program number associated with the PMT.

Table 3-51: PMT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the PMT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Interval...	Changes the period of the PMT. When you select this menu item, the PMT Interval dialog box appears. Refer to *PMT Interval Dialog Box* on page 3-49 for more information. Note: If the pointer_field value of the transport stream is not 0, this command is not available.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section...	Replaces the current PMT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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PMT Interval Dialog Box. When you select the Interval... command from the Bezel menu on your MTG300 MPEG generator, the PMT Interval dialog box appears as shown in Figure 3-18.

The PMT interval parameter sets the time between occurrences of the PMT in the transport stream. Use the rotary knob or hexadecimal keypad to change the interval. You can set the value from 50 ms to 30000 ms in 1 ms steps.

Table 3-52 describes the Bezel menu commands associated with the dialog box.

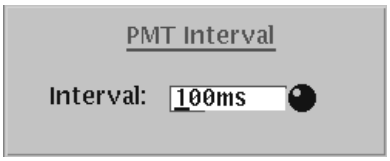


Figure 3-18: PMT Interval dialog box

Table 3-52: Bezel menu commands for the PMT Interval dialog box

Command	Description
Undo Stress	Returns the PMT interval to the default value and closes the dialog box.
Keep Stress	Enables the PMT interval. When you change the PMT interval, the new interval value is displayed in orange after the PMT icon.

Program Clock Reference (PCR) Icon

Table 3-53 describes the text information and Table 3-54 describes the Bezel menu commands for the Program Clock Reference (PCR) icon.

Table 3-53: PCR icon text descriptions

Parameter	Description
PID	Shows the PID value of the PCR.
Interval	Shows the period of the PCR.

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Table 3-54: PCR icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the PCR. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Interval...	Changes the period of the PCR. When you select this menu item, the PCR Interval dialog box appears. Refer to *PCR Interval Dialog Box* on page 3-50 for more information.
Stress PCR...	Sets the jitter parameters inserted into the PCRs. This function allows you to create a transport stream with known multiplex errors. When you select this menu item, the PCR Stress dialog box appears. Refer to *PCR Stress Dialog Box* on page 3-51 for more information. Also refer to *Adding Jitter to PCRs* on page 3-89.

PCR Interval Dialog Box. When you select the Interval... command from the Bezel menu on your MTG300 MPEG generator, the PCR Interval dialog box appears as shown in Figure 3-19.

The PCR interval parameter sets the time between occurrences of the PCR in the transport stream. Use the rotary knob or hexadecimal keypad to change the interval. You can set the value from 20 ms to 10000 ms in 1 ms steps.

Table 3-55 describes the Bezel menu commands associated with the dialog box.

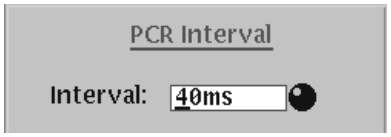


Figure 3-19: PCR Interval dialog box

Table 3-55: Bezel menu commands for the PCR Interval dialog box

Command	Description
Undo Stress	Returns the PCR interval to the default value and closes the dialog box.
Keep Stress	Enables the PCR interval. When you change the PCR interval, the new interval value is displayed in orange after the PCR icon.

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PCR Stress Dialog Box. When you select the Stress PCR... command from the Bezel menu on your MTG300 MPEG generator, the PCR Stress dialog box appears as shown in Figure 3-20. The stress tests activated from this dialog box can only be applied when the dialog box is displayed. Any transport stream setting changes applied by a test revert to their prior state when you exit the dialog box.

The PCR Stress dialog box allows you to run two tests: Interval Jitter and Value Jitter. Use the arrow buttons and hexadecimal keypad or rotary knob to set test parameters, and then press the Interval or Value bezel buttons so that Apply is highlighted to enable the desired test. Both jitter tests can be executing at the same time.

Refer to *Adding Jitter to PCRs* on page 3-89 for more information.

Table 3-56 describes the PCR Stress dialog box parameters and Table 3-57 describes the Bezel menu commands associated with the dialog box.

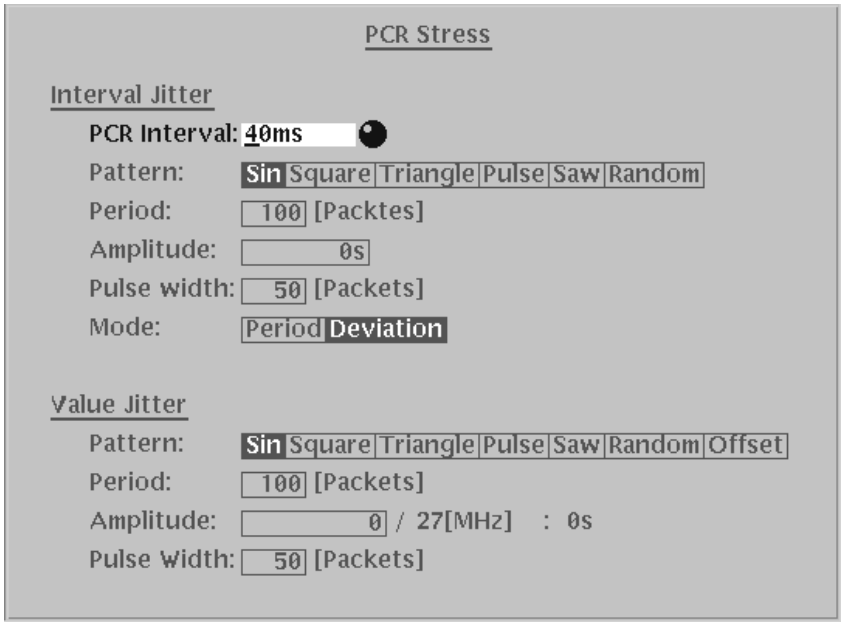


Figure 3-20: PCR Stress dialog box

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Table 3-56: PCR Stress dialog box parameters

Parameter	Description
Interval Jitter	The Interval Jitter test adds jitter to the period of the packets containing a PCR.
PCR Interval	Sets the frequency of PCRs used as the reference in the program stream. You can set the value from 20 ms to 10000 ms in 1 ms steps.
Pattern	Selects the waveform type of the waveform used to add jitter. You can select Sine, Square, Triangle, Pulse, Sawtooth, or Random.
Period	Sets the period of the waveform used to add jitter. You can set the value from 5 to 3000 packets in 1 packet steps.
Amplitude	Sets the amplitude of the waveform used to add jitter. You can set the value from 10 ms to 10000 ms in 10 ms steps.
Pulse Width	Sets the pulse width of the waveform used to add jitter. You can set the value from 1 to (period – 1) packet(s) in 1 packet steps. This Pulse Width parameter is available only when the Interval Jitter Pattern parameter is set to Pulse.
Mode	Sets the function mode of the Interval Jitter test. You can set Period or Deviation. In the Period mode, amplitude variation of the waveform selected in Pattern item is added to PCR interval currently set. In Deviation mode, PCR interval varies by the amplitude variation of the waveform selected in the Pattern item with reference to standard PCR interval.
Value Jitter	The Value Jitter test adds jitter to the program_clock_reference_base value and the program_clock_reference_extension value in the adaptation field.
Pattern	Selects the waveform type of the waveform used to add jitter. You can select Sine, Square, Triangle, Pulse, Sawtooth, Random, or Offset.
Period	Sets the period of the waveform used to add jitter. You can set the value from 5 to 3000 packets in 1 packet steps.
Amplitude	Sets the amplitude of the waveform used to add jitter. You can set the value from 0/27 MHz to 270000000/27 MHz (0 s to 10 s).
Pulse Width	Sets the pulse width of the waveform used to add jitter. You can set the value from 1 to (period – 1) packet(s) in 1 packet steps. This Pulse Width parameter is available only when the Interval Jitter Pattern parameter is set to Pulse.

Table 3-57: Bezel menu commands for the PCR Stress dialog box

Command	Description
Interval Apply	Applies the Interval Jitter test to the transport stream output.
Interval Undo	Disables the Interval Jitter test from the transport stream output.
Value Apply	Applies the value Jitter test to the transport stream output.
Value Undo	Disables the value Jitter test from the transport stream output.

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Table 3-57: Bezel menu commands for the PCR Stress dialog box (Cont.)

Command	Description
Exit Menu	Cancels any setting changes and closes the dialog box. The transport stream output will revert to its prior state.

Video Elementary Stream (VIDEO) Icon

Table 3-58 describes the text information and Table 3-59 describes the Bezel menu commands for the video elementary stream (VIDEO) icon.

Table 3-58: VIDEO icon text descriptions

Parameter	Description
PID	Shows the PID value of the video elementary stream.
Stream Type	Shows the type of the video elementary stream (MPEG-1 or MPEG-2).
ES Rate	Shows the rate of the elementary stream. This value is displayed when the ES_rate_flag value in the PES packet header is set to 1.
H_Size	Shows the horizontal_size_value of the sequence header.
V_Size	Shows the vertical_size_value of the sequence header.
Aspect Info	Shows the aspect_ratio_information of the sequence header.
Frame Rate	Shows the frame_rate_code of the sequence header.
Bit Rate	Shows the bit_rate_value of the sequence header.

Table 3-59: VIDEO icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the video elementary stream. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress DTS...	Changes the delay time of the Decoding Time Stamp (DTS). When you select this menu item, the DTS Stress dialog box appears. Refer to *DTS Stress Dialog Box* on page 3-54 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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DTS Stress Dialog Box. When you select the DTS Stress... command from the Bezel menu on your MTG300 MPEG generator, the DTS Stress dialog box appears as shown in Figure 3-21. This function is available only when the dialog box is displayed.

The Delay parameter sets the delay time for the DTS. You can set the delay from 0/90 kHz to 4500/90 kHz (0 ms to 50 ms). The transport stream output is varied as the value is changed. Use the rotary knob or hexadecimal keypad to change the delay.

Table 3-60 describes the Bezel menu commands associated with the dialog box.



Figure 3-21: DTS Stress dialog box

Table 3-60: Bezel menu commands for the DTS Stress dialog box

Command	Description
Default	Returns the DTS delay to the default value.
Exit Menu	Cancels any setting changes and closes the dialog box.

Audio Elementary Stream (AUDIO) Icon

Table 3-61 describes the text information and Table 3-62 describes the Bezel menu commands for the audio elementary stream (AUDIO) icon.

Table 3-61: AUDIO icon text descriptions

Parameter	Description
PID	Shows the PID value of the audio elementary stream.
Stream Type	Shows the type of the audio elementary stream (13818–3 or 11172–3).
ES Rate	Shows the rate of the elementary stream. This value is displayed when the ES_rate_flag value in the PES packet header is set to 1.

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Table 3-62: AUDIO icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the audio elementary stream. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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AUDIO_AAC and AUDIO_AC3 Icons

Table 3-63 describes the text information and Table 3-64 describes the Bezel menu commands for the AUDIO_AAC and AUDIO_AC3 (ATSC only) icons.

Table 3-63: AUDIO_AAC and AUDIO_AC-3 (ATSC only) icon text descriptions

Parameter	Description
PID	Shows the PID value of the audio elementary stream.
Stream Type	Shows the type of the audio elementary stream (AAC or AC3 (ATSC only)).
ES Rate	Shows the rate of the elementary stream. This value is displayed when the ES_rate_flag value in the PES packet header is set to 1.

Table 3-64: AUDIO_AAC and AUDIO_AC-3 (ATSC only) icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the audio elementary stream. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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Data Stream (DATA) Icon

Table 3-65 describes the text information and Table 3-66 describes the Bezel menu commands for the data stream (DATA) icon.

Table 3-65: DATA icon text descriptions

Parameter	Description
PID	Shows the PID value of the data stream.
Stream Type	Shows the type of the data stream (DATA).
ES Rate	Shows the rate of the stream. This value is displayed when the ES_rate_flag value in the PES packet header is set to 1.

Table 3-66: DATA icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the data elementary stream. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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Private Section (DATA_SECT) Icon

Table 3-67 describes the text information and Table 3-68 describes the Bezel menu commands for the private section (DATA_SECT) icon.

Table 3-67: DATA_SECT icon text descriptions

Parameter	Description
PID	Shows the PID value of the private section.
Table ID	Shows the table_id value of the private section.
Stream Type	Shows the type of the private section.

Table 3-68: DATA_SECT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the private section. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section...	Replaces the current private section with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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DSM_CC Icon

Table 3-69 describes the text information and Table 3-70 describes the Bezel menu commands for the digital storage media command and control (DSM_CC) icon.

Table 3-69: DSM_CC icon text descriptions

Parameter	Description
PID	Shows the PID value of the data DSM-CC.
Stream Type	Shows the type of the DSM-CC.

Table 3-70: DSM_CC icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the DSM-CC. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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Entitlement Control Message (ECM) Icon

Table 3-71 describes the text information and Table 3-72 describes the Bezel menu commands for the Entitlement Control Message (ECM) icon. The items labeled “Section data only” do not appear when the ECM is a PES (Packetized Elementary Stream) packet.

Table 3-71: ECM icon text descriptions

Parameter	Description
PID	Shows the PID value of the ECM.
Table ID (Section data only)	Shows the table_id value of the ECM.
Interval (Section data only)	Shows the period of the ECM.

Table 3-72: ECM icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the data elementary stream. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Reset Replace (Section data only)	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section... (Section data only)	Replaces the current ECM with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.

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Table 3-72: ECM icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Stress SI... (Section data only)	Changes the status of the section header in the ECM. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

Stress SI Dialog Box. When you select the Stress SI... command from the Bezel menu on your MTG300 MPEG generator, the Stress SI dialog box appears as shown in Figure 3-22. This function is available only when the dialog box is displayed.

The Reserved parameter selects whether the value 00 or 11 (binary) is written in the reserved bits.

Table 3-73 describes the Bezel menu commands associated with the dialog box.

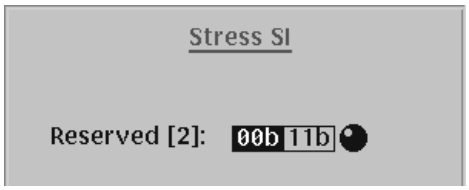


Figure 3-22: Stress SI dialog box

Table 3-73: Bezel menu commands for the Stress SI dialog box

Command	Description
Default	Resets the setting to the factory default setting.
Exit Menu	Cancels the setting and closes the dialog box.
Apply	Applies the setting to the transport stream output.

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Entitlement Management Message (EMM) Icon

Table 3-74 describes the text information and Table 3-75 describes the Bezel menu commands for the Entitlement Management Message (EMM) icon. The items labeled “Section data only” do not appear when the EMM is a PES (Packetized Elementary Stream) packet.

Table 3-74: EMM icon text descriptions

Parameter	Description
PID	Shows the PID value of the EMM.
Table ID	Shows the table_id value of the EMM.
Interval	Shows the period of the EMM.

Table 3-75: EMM icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the EMM. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI... (Section data only)	Changes the status of the section header in the EMM. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace (Section data only)	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section... (Section data only)	Replaces the current EMM with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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GHOST Icon

Table 3-76 describes the text information and Table 3-77 describes the Bezel menu commands for the GHOST icon.

Table 3-76: GHOST icon text descriptions

Parameter	Description
PID	Shows the PID value of the GHOST.
Packet Rate	Shows the average output rate of the packet.

Table 3-77: GHOST icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the GHOST. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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Private Information (PRI) Icon

Table 3-78 describes the text information and Table 3-79 describes the Bezel menu commands for the Private Information (PRI) icon.

Table 3-78: PRI icon text descriptions

Parameter	Description
PID	Shows the PID value of the PRI.
Table ID	Shows the table_id value of the PRI.
Interval	Shows the period of the PRI.

Table 3-79: PRI icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the PRI. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI...	Changes the status of the section header in the PRI. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section...	Replaces the current PRI with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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Adaptation Field Error (ADFERR) Icon

Table 3-80 describes the text information and Table 3-81 describes the Bezel menu commands for the Adaptation Field Error (ADFERR) icon.

Table 3-80: ADFERR icon text descriptions

Parameter	Description
PID	Shows the PID value of the ADFERR.
Packet Rate	Shows the average output rate of the packet.

Table 3-81: ADFERR icon Bezel menu commands (MTG300 only)

Command	Description
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

NULL Icon

Table 3-82 describes the text information and Table 3-83 describes the Bezel menu commands for the NULL icon.

Table 3-82: NULL icon text descriptions

Parameter	Description
PID	Shows the PID value of the NULL.
Packet Rate	Shows the average output rate of the NULL packet reference to the output rate of the transport stream.

Table 3-83: NULL icon Bezel menu command (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the NULL. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.

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GARBAGE Icon

Table 3-84 describes the text information and Table 3-85 describes the Bezel menu commands for the GARBAGE icon.

Table 3-84: GARBAGE icon text descriptions

Parameter	Description
PID	Shows the PID value of the GARBAGE.
Packet Rate	Shows the average output rate of the packet.

Table 3-85: GARBAGE icon Bezel menu commands (MTG300 only)

Command	Description
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, and DLT Icons

Table 3-86 describes the text information and Table 3-87 describes the Bezel menu commands for the Service Description Table (SDT), Bouquet Association Table (BAT), Event Information Table (EIT), Running Status Table (SRT), Stuffing Table (ST), Discontinuity Information Table (DIT), Selection Information Table (SIT), Local event Information Table (LIT), Event Relation Table (ERT), Index Transmission Table (ITT), Partial Content Announcement Table (PCAT), Software Download Trigger Table (SDTT), Download Control Table (DCT), and DownLoad Table (DLT) icons.

Table 3-86: SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, and DLT icon text descriptions

Parameter	Description
PID	Shows the PID value of the SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, or DLT.
Table ID	Shows the table_id value of the SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, or DLT.
Interval	Shows the period of the SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, or DLT.

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Table 3-87: SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, and DLT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, or DLT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI...	Changes the status of the section header in the SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, or DLT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.
Replace Section...	Replaces the current SDT, BAT, EIT, RST, ST, DIT, SIT, LIT, ERT, ITT, PCAT, SDTT, DCT, or DLT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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TDT and TOT Icon

Table 3-88 describes the text information and Table 3-89 describes the Bezel menu commands for the Time and Data Table (TDT) and Time Offset Table (TOT) icons.

Table 3-88: TDT and TOT icon text descriptions

Parameter	Description
PID	Shows the PID value of the TDT or TOT.
Table ID	Shows the table_id value of the TDT or TOT.
Interval	Shows the period of the TDT or TOT.

Table 3-89: TDT and TOT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the TDT or TOT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
TDT... or TOT...	Changes the period and initial time of the TDT or TOT. When you select this command, the TDT Item or TOT Item dialog box appears. Refer to *TOT Item Dialog Box* on page 3-14 for more information.
Stress SI...	Changes the status of the section header in the TDT or TOT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.

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Table 3-89: TDT and TOT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Replace Section...	Replaces the current TDT or TOT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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MGT and PIT Icons

Table 3-90 describes the text information and Table 3-91 describes the Bezel menu commands for the Master Guide Table (MGT) and Program Identifier Table (PIT) icons.

Table 3-90: MGT and PIT icon text descriptions

Parameter	Description
PID	Shows the PID value of the MGT or PIT.
Table ID	Shows the table_id value of the MGT or PIT.
Interval	Shows the period of the MGT or PIT.
Multi MGT Version (MGT only)	This message is displayed in red when more than one version of the MGT resides in the transport stream.

Table 3-91: MGT and PIT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the MGT or PIT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI...	Changes the status of the section header in the MGT or PIT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.

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Table 3-91: MGT and PIT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Replace Section...	Replaces the current MGT or PIT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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TVCT, CVCT, RRT, EIT, CETT, and EETT Icons

Table 3-92 describes the text information and Table 3-93 describes the Bezel menu commands for the Terrestrial Virtual Channel Table (TVCT), Cable Virtual Channel Table (CVCT), Rating Region Table (RRT), Event Information Table (EIT), Channel Extended Text Table (CETT), and Event Extended Text Table (EETT) icons.

Table 3-92: TVCT, CVCT, RRT, EIT, CETT, and EETT icon text descriptions

Parameter	Description
PID	Shows the PID value of the TVCT, CVCT, RRT, EIT, CETT, or EETT.
Table ID	Shows the table_id value of the TVCT, CVCT, RRT, EIT, CETT, or EETT.
Table Type	Shows the table_type value of the TVCT, CVCT, RRT, EIT, CETT, or EETT.
Interval	Shows the average period of the packets when the payload_unit_start_indicator value is set to 1.

Table 3-93: TVCT, CVCT, RRT, EIT, CETT, and EETT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the TVCT, CVCT, RRT, EIT, CETT, or EETT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
Stress SI...	Changes the status of the section header in the TVCT, CVCT, RRT, EIT, CETT, or EETT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.

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Table 3-93: TVCT, CVCT, RRT, EIT, CETT, and EETT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Replace Section...	Replaces the current TVCT, CVCT, RRT, EIT, CETT, or EETT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

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System Time Table (STT) Icon

Table 3-94 describes the text information and Table 3-95 describes the Bezel menu commands for the System Time Table (STT) icon.

Table 3-94: STT icon text descriptions

Parameter	Description
PID	Shows the PID value of the STT.
Table ID	Shows the table_id value of the STT.
System Time	Shows the system type of the STT.
Initial Time	Shows the initial data and time (year / month / day hour : minute : second) of the STT.
Interval	Shows the period of the STT.
GPS UTC Offset	Shows the GPS_UTC_offset value.
DS Mode	Shows the Daylight Savings Time mode setting.
DS In	Shows the date and time when Daylight Savings time starts.
DS Out	Shows the date and time when Daylight Savings time ends.

Table 3-95: STT icon Bezel menu commands (MTG300 only)

Command	Description
Stress TS Head...	Changes the status of the packet header in the packet containing the STT. When you select this menu item, the TS Head Stress dialog box appears. Refer to *TS Head Stress Dialog Box* on page 3-36 for more information.
STT...	Changes the period and initial time of the STT. When you select this command, the STT Item dialog box appears. Refer to *STT Item Dialog Box* on page 3-15 for more information.
Stress SI...	Changes the status of the section header in the STT. When you select this menu item, the Stress SI dialog box appears. Refer to *Stress SI Dialog Box* on page 3-61 for more information.
Reset Replace	Cancels the data replacement activated by the Replace Section... command and restores the original data.

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Table 3-95: STT icon Bezel menu commands (MTG300 only) (Cont.)

Command	Description
Replace Section...	Replaces the current STT with the specified section data (section file). When you select this command, the Select Replace File dialog box opens listing the files in the /main/usr/insert directory on the hard drive. The Select Replace File dialog box functions similar to the Select TS File dialog box shown in Figure 3-1 on page 3-5. After you select a replacement file, the Replace Setup dialog box appears. Refer to *Replace Setup Dialog Box* on page 3-42 for more information. Refer to *Replacing and Inserting Section Data (MTG300 Only)* on page 3-81 for detailed information about section replacement.
Del Packet	Toggles the Delete Packet function between Inactive and Active. Inactive: Cancels the delete packet operation. Active: Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR). When the item is deleted, the item information is shaded in the hierarchy display.

S-TMCC and M-TMCC Icons

Table 3-96 describes the text information for the S-TMCC and M-TMCC icons.

Table 3-96: S-TMCC and M-TMCC icon text descriptions

Parameter	Description
Filename	File name and path of the stream.
Total SF	Shows the number of super frames.
Total TS	Shows the number of transport streams. For the S-TMCC, this value is always 1.
Change Info	Shows the change information.
Emerge Info	Shows the start control signal in hexadecimal format.
T/R Count Info	Shows the transmission/receiving control information in hexadecimal format.
Ext Info (M-TMCC only)	Shows the extension information in hexadecimal format.

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Transport Stream (TS) Icon

Table 3-97 describes the text information for the Transport Stream (TS) icon used with the S-TMCC and M-TMCC icons.

Table 3-97: Transport stream icon text descriptions

Parameter	Description
Relative TS	Shows the relative transport stream number.
TS_ID	Shows the ID number for the transport stream.
Contract Slot	Shows the number of contract slots.
Modulate/Slot(1)	Shows the number of slots (includes the number of invalid slots)

Non TS Icon

Table 3-98 describes the text information for the Non Transport Stream (Non TS) icon.

Table 3-98: Non TS icon text descriptions

Parameter	Description
Filename	Shows the file name and path of the Non TS data.
Output Rate	Shows the output rate of the Non TS data.
File Length	Shows the file length of the Non TS data.

INS_SI Icon

Table 3-99 describes the text information and Table 3-100 describes the Bezel menu commands for the Service Information insertion file (INS_SI) icon.

Table 3-99: INS_SI icon text descriptions

Parameter	Description
PID	Shows the PID value of the packet.
Filename	Shows the name of the insertion file.
Table ID	Shows the table_id value of the table.
Packets	Shows the total number of packets in the section.
Section	Shows the current section mode: SINGLE or MULTI.
Start Time	Shows the start time when the data insertion is started.
Cont. Time	Shows the duration for the insertion.
Time System	Shows the standard time used to start the data insertion: Relative, TDT, TOT, or STT.
File Interval	Shows the time interval between file insertions.
Packet Interval	Shows the interval between the packets when the inserted section file is packetized.

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Table 3-100: INS_SI icon Bezel menu commands (MTG300 only)

Command	Description
INS_SI...	Changes the parameters for the insertion file (section file). When you select this menu item, the Insertion Setup dialog box appears. Refer to *Insertion Setup Dialog Box* on page 3-12 for more information.
Reject	Deletes the INS_SI icon and cancels all of the settings.

INS_TS Icon

Table 3-101 describes the text information and Table 3-102 describes the Bezel menu commands for the INS_TS (TS insertion file) icon.

Table 3-101: INS_TS icon text descriptions

Parameter	Description
PID	Shows the PID value of the packet.
Filename	Shows the name of the insertion file.
Packets	Shows the total number of packets in the TS (transport stream) file.
Start Time	Shows the start time when the data insertion is started.
Cont. Time	Shows the duration for the insertion.
Time System	Shows the standard time used to start the data insertion.
File Interval	Shows the time interval between file insertions.
Packet Interval	Shows the interval between the packets when the inserted TS file is packetized.

Table 3-102: INS_TS icon Bezel menu commands (MTG300 only)

Command	Description
INS_TS...	Changes the parameters for the TS (transport stream) insertion file. When you select this menu item, the Insertion Setup dialog box appears. Refer to *Insertion Setup Dialog Box* on page 3-12 for more information.
Reject	Deletes the INS_TS icon and cancels all of the settings.

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INS_TDT and INS_TOT Icons

Table 3-103 describes the text information and Table 3-104 describes the Bezel menu commands for the INS_TDT (TDT inserted by the MPEG generator) and INS_TOT (TOT inserted by the MPEG generator) icons.

Table 3-103: INS_TDT and INS_TOT icons text descriptions

Parameter	Description
PID	Shows the PID value of the TDT or TOT.
Table ID	Shows the table_id value for the TDT or TOT.
Packets	Shows the total number of packets in the TDT or TOT.
Initial Time	Shows the initial date and time of the TDT or TOT.
Interval	Shows the time interval between TDT or TOT.

Table 3-104: INS_TDT and INS_TOT icons Bezel menu commands (MTG300 only)

Command	Description
TDT... or TOT...	Changes the period and initial time of the TDT or TOT. This command is only available when the selected transport stream file is in ARIB or DVB formats and a TDT or TOT does not already exist in the stream. When you select this command, the TDT Item or TOT Item dialog box appears. Refer to *TOT Item Dialog Box* on page 3-14 for more information.
Reject	Deletes the INS_TDT or INS_TOT icon and cancels all of the settings.

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INS_STT Icon

Table 3-105 describes the text information and Table 3-106 describes the Bezel menu commands for the INS_STT (STT inserted by the MPEG generator) icon.

Table 3-105: INS_STT icon text descriptions

Parameter	Description
PID	Shows the PID value (0x1FFB) of the STT.
Table ID	Shows the table_id value (0xCD) for the STT.
Packets	Shows the total number of packets in the STT.
Initial Time	Shows the initial date and time of the STT.
Interval	Shows the period of the STT.
GPS UTC Offset	Shows the offset value between the GPS and UTC time standards.
DS Mode	Shows the Daylight Savings Time mode setting.
Precede DS In	Shows the number of days until the start of the Daylight Saving time.
DS In	Shows the date and time when Daylight Savings time starts.
Precede DS Out	Shows the number of days until the end of the Daylight Saving time.
DS Out	Shows the date and time when Daylight Savings time ends.

Table 3-106: INS_STT icon Bezel menu commands (MTG300 only)

Command	Description
STT...	Changes the period and initial time of the STT. This command is only available when the selected transport stream file is in ATSC format and an STT does not already exist in the stream. When you select this command, the STT Item dialog box appears. Refer to *STT Item Dialog Box* on page 3-15 for more information.
Reject	Deletes the INS_STT icon and cancels all of the settings.

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Replacing and Inserting Section Data (MTG300 Only)

The MTG300 MPEG Generator provides the capability to replace section data such as CATs, NITs, PATs, and PMTs in a transport stream with user-specified data. The MPEG generator also allows you to insert user-specified section data into a transport stream.

These features allow you to change the status of SI or PSI tables to check if a receiver is operating correctly when the table information is updated.

***NOTE**. The MPEG generator uses files stored in the /main/usr/insert directory on the hard disk to replace or insert user-specified section data. Therefore, before you can replace or insert section data, an appropriate section file must be stored on the hard disk.*

*For example, if you want to replace the PMT in a transport stream, you must first store a *.pmt file in the /main/usr/insert directory on the hard disk.*

This subsection provides instructions on how to replace or insert section data into the transport stream.

Replacing Section Data

Perform the following procedure to replace section data in the transport stream:

1. Use the Icon cursor to select the transport stream item in the hierarchy display that you want to replace. If the Icon cursor is not displayed, press the **MENU** button to enable the Icon cursor.
2. Press the **Replace Section...** bezel button. This opens the **Select Replace File** dialog box shown in Figure 3-23.
3. In the Select Replace File dialog box, select the section file that you want to use as the replacement file.
4. After you select the desired replacement file, press the **OK** bezel button. This closes the Select Replace File dialog box and opens the **Replace Setup** dialog box shown in Figure 3-24.

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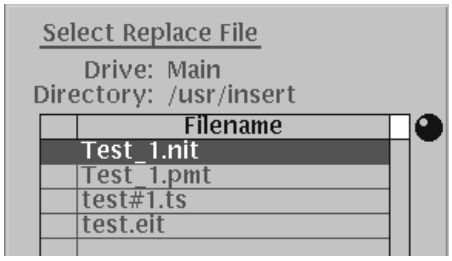


Figure 3-23: Select Replace File dialog box

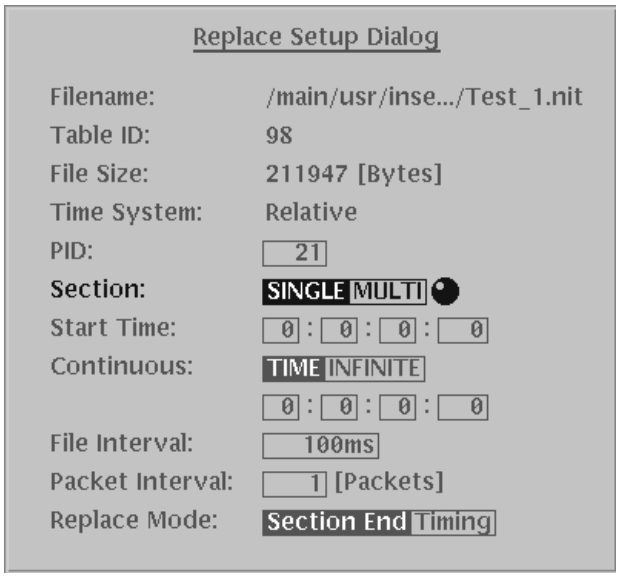


Figure 3-24: Replace Setup dialog box

5. The Replace Setup dialog box lets you set the parameters for how the section data will be replaced and packetized. Refer to *Replace Setup Dialog Box* on page 3-42 for information about the dialog box parameters.

   Refer to *Section Modes* on page 3-83 for detailed information about the Section parameter, and refer to *Replacement Modes* on page 3-84 for detailed information about the Replace Mode parameter.

6. After you set the Replace Setup dialog box parameters, press the **Apply** bezel button to confirm the settings, close the dialog box, and start the section data replacement.

   When section data replacement starts, the text information for the new file is displayed in yellow-green after the text information displayed for the transport stream item you are replacing.

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Section Modes

The replacement section data (section data file) is packetized by the MPEG generator to produce transport stream packets when you replace section data in a transport stream. The MPEG generator provides two section modes, Single and Multi, to let you set whether one (Single), or more than one (Multi) section data is contained in a transport stream packet. This subsection describes the difference between these two section modes.

Single Section Mode. In the Single section mode, only one section data is contained in one transport stream packet. Figure 3-25 shows how section data are transformed into transport stream packets for the Single section mode. In this example, two section data are divided into four transport stream packets.

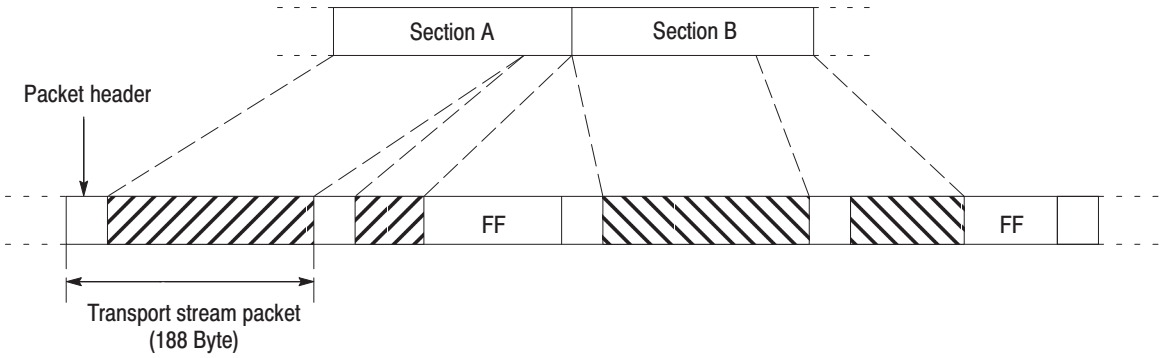


Figure 3-25: Single section mode

Multi Section Mode. In the Multi section mode, two or more section data are contained in one transport stream packet. Figure 3-26 shows how section data are transformed into transport stream packets for the Multi section mode. In this example, two section data are divided into three transport stream packets. The Multi section mode minimizes the length of the transport stream data.

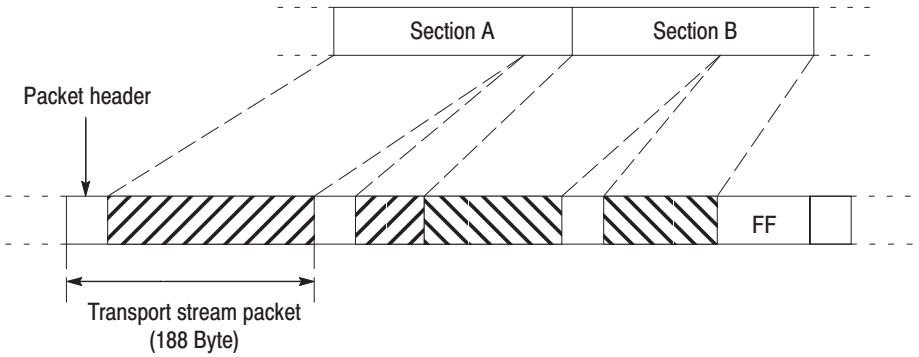


Figure 3-26: Multi section mode

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Replacement Modes

The MPEG generator provides two replacement modes in the Replace Setup dialog box for replacing the selected section data: Section End and Timing. This subsection describes the differences between these two modes.

Section End Replacement Mode. In the Section End replacement mode (see Figure 3-27), data replacement starts when the following conditions occur:

- The time set in the Start Time parameter of the Replace Setup dialog box arrives
- The packet with payload_unit_start_indicator value 0x0001 is detected

After the time set in the Continuous Time parameter of the Replace Setup dialog box arrives, data replacement is ended.

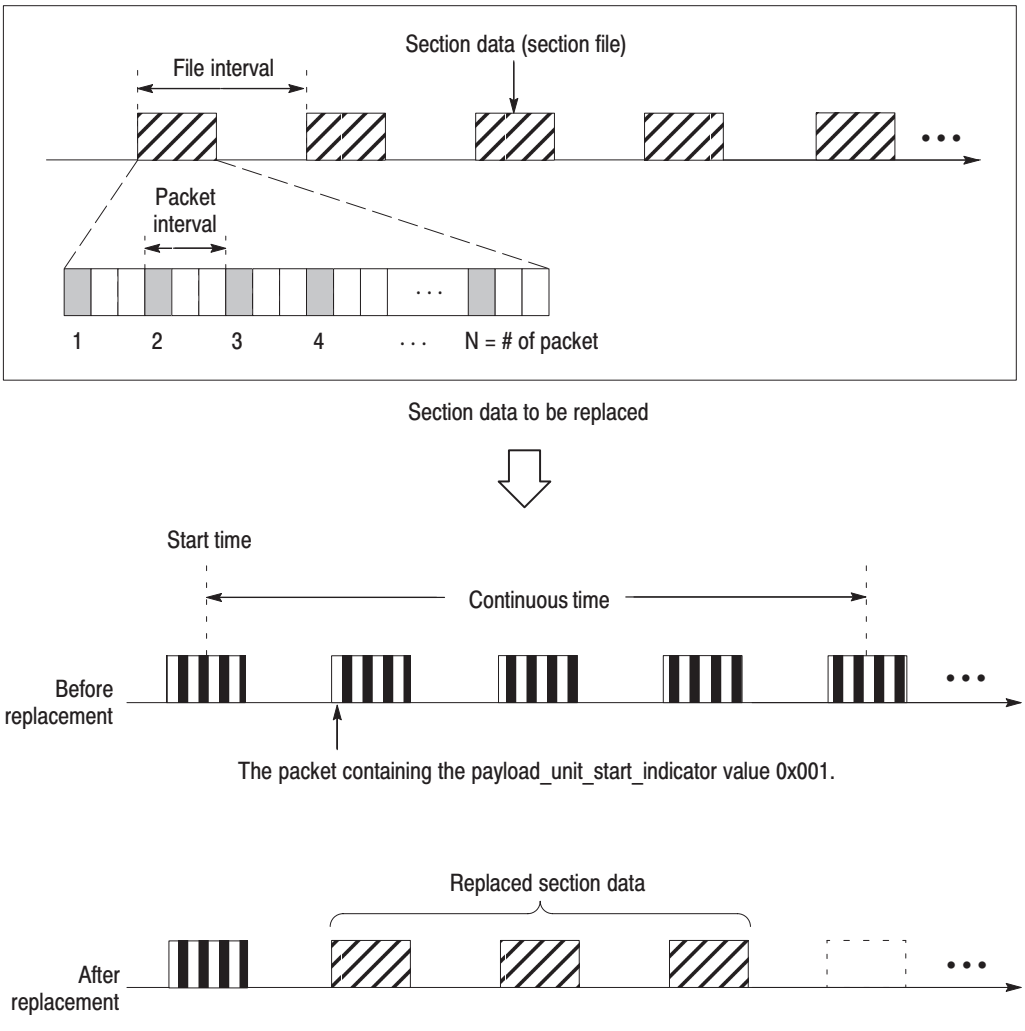


Figure 3-27: Section End replacement mode

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Timing Replacement Mode. In the Timing replacement mode (see Figure 3-28), data replacement starts immediately when the time set in the Start Time parameter of the Setup Replace dialog box arrives.

After the time set in the Continuous Time parameter of the Setup Replace dialog box arrives, the data replacement is ended.

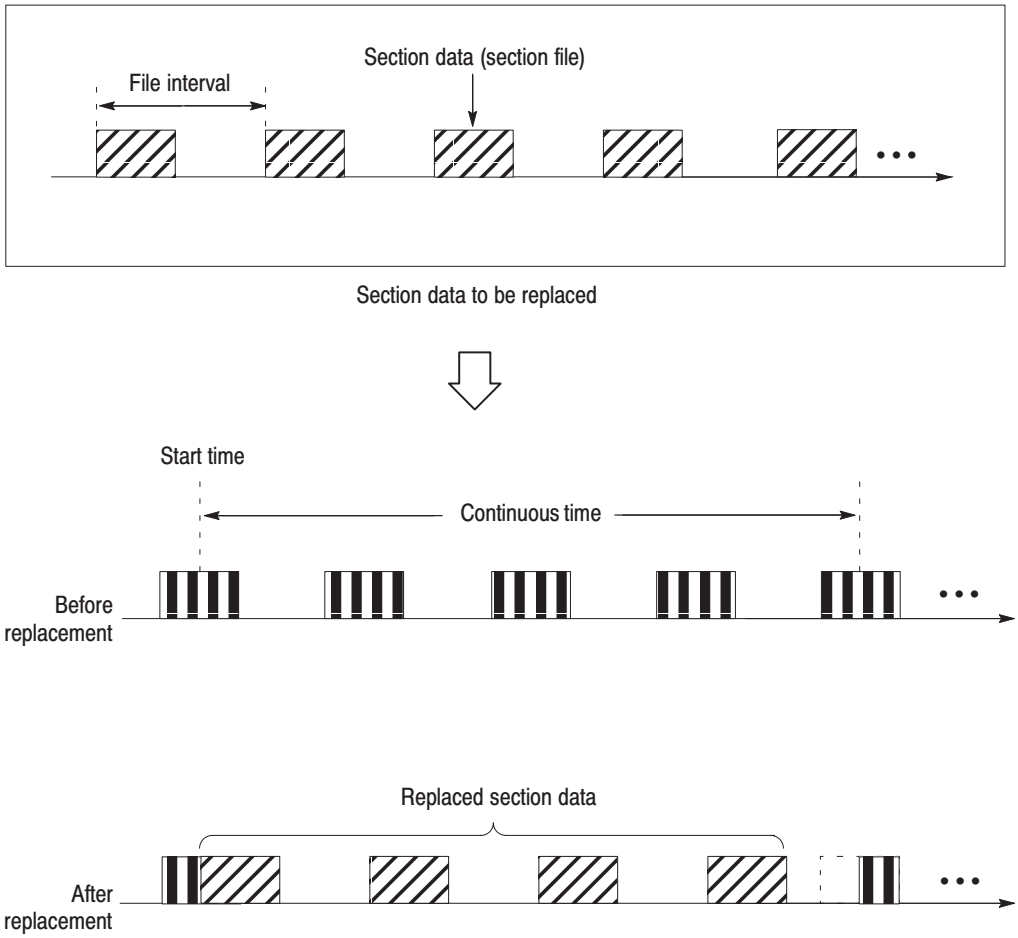


Figure 3-28: Timing replacement mode

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Inserting Section Data

Perform the following procedure to insert section data into the transport stream:

1. Open the **CONFIG** pull-down menu. If the pull-down menus are not enabled (the Icon cursor is displayed), press the **MENU** button to enable the pull-down menus.
2. Select the **Insert Section/TS...** command, and then press the **OK** bezel button. This opens the **Select Insert File** dialog box shown in Figure 3-29.

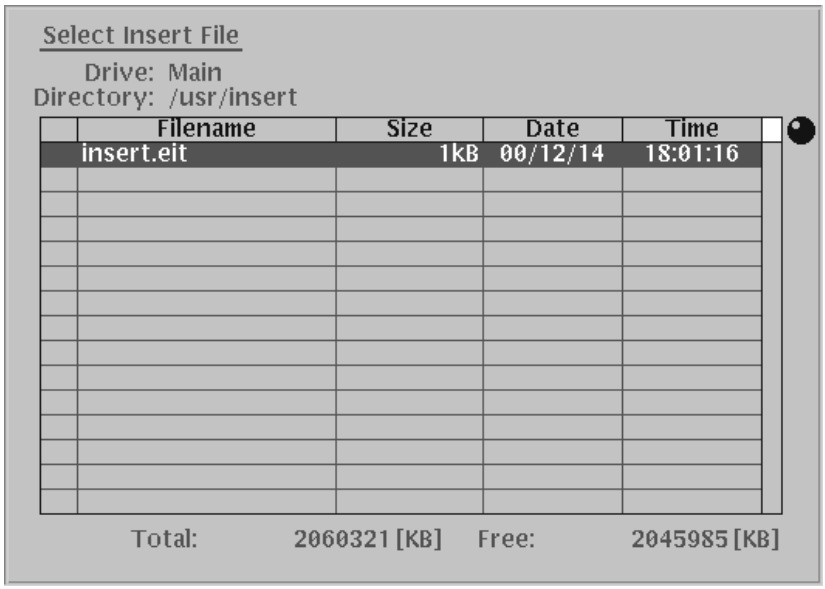


Figure 3-29: Select Insert File dialog box

3. In the Select Insert File dialog box, select the section file that you want to insert into the transport stream.
4. After you select the desired insert file, press the **OK** bezel button. This closes the Select Insert File dialog box and opens the **Insertion Setup** dialog box shown in Figure 3-30.
5. The Insertion Setup dialog box lets you set the parameters for how the section data will be inserted into the transport stream. Refer to *Insertion Setup Dialog Box* on page 3-12 for information about the parameters.

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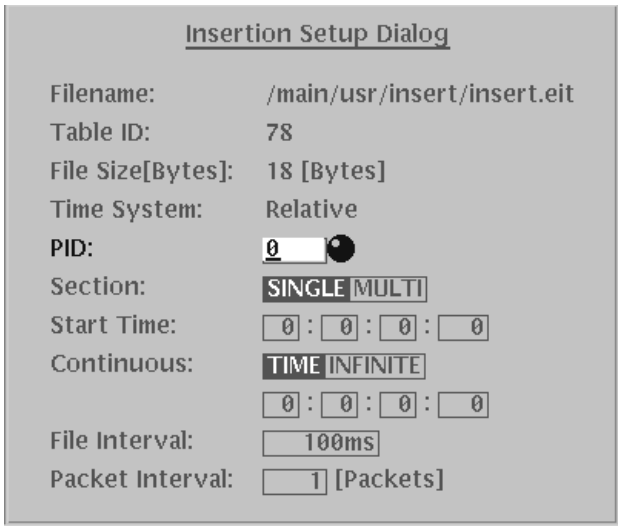


Figure 3-30: Insertion Setup dialog box

6. After you set the Insertion Setup dialog box parameters, press the **Apply** bezel button to confirm the settings, close the dialog box, and start the section data insertion.

   When section data insertion starts, the icon representing the inserted data appears at the end of the hierarchy display. The inserted-data icon is displayed with a blue background.

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Adding Jitter to PCRs (MTG300 Only)

The MTG300 MPEG generator provides the capability to add jitter to PCRs (Program Clock References). Adding jitter to PCRs allows you to simulate transmission delay variations and to test the robustness of decoders under various conditions.

The MPEG generator provides two types of jitter functions: Interval Jitter and Value Jitter. Refer to *Interval Jitter Function* on page 3-90 and to *Value Jitter Function* on page 3-92 for detailed information about the two jitter functions.

Adding Jitter

Perform the following procedure to add jitter to PCRs:

1. Use the Icon cursor to select the PCR item in the hierarchy display that you want to replace. If the Icon cursor is not displayed, press the **MENU** button to enable the Icon cursor.
2. Press the **Stress PCR...** bezel button. This opens the **PCR Stress** dialog box shown in Figure 3-31.

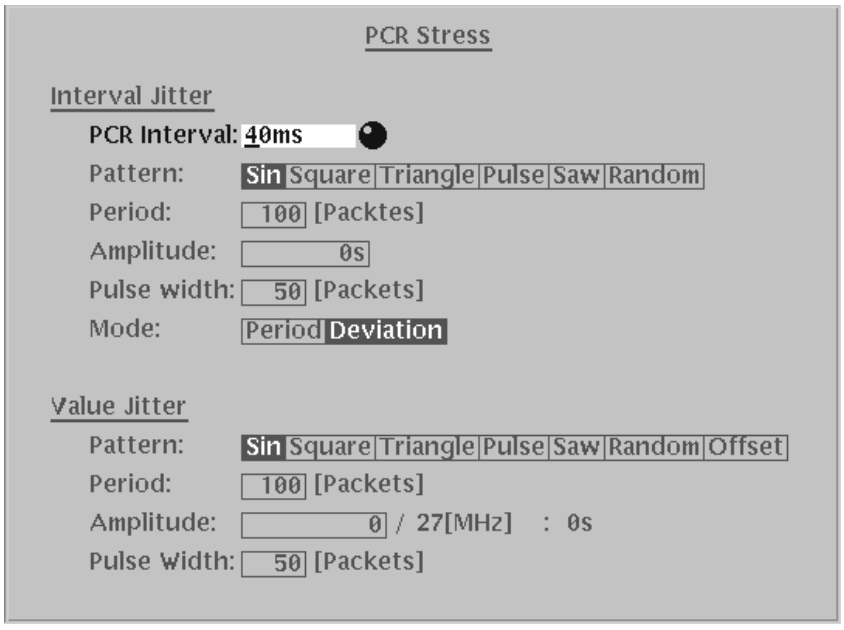


Figure 3-31: PCR Stress dialog box

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3. The PCR Stress dialog box lets you set how the parameters for how jitter will be added to the PCR. The PCR Stress dialog box is divided into the following two fields:

   - Interval Jitter. Use this field to add jitter to the period of the transport stream packets containing a PCR.
   - Value Jitter. Use this field to add jitter to the program_clock_reference_base value and the program_clock_reference_extension value in the adaptation field.

   Refer to *PCR Stress Dialog Box* on page 3-51 for information about the dialog box parameters. For detailed information about the two jitter functions, refer to *Interval Jitter Function* on page 3-90 and *Value Jitter Function* on page 3-92.

4. After you have set the parameters, press the **Interval Apply** bezel button and/or the **Value Apply** bezel button to enable one or both of the jitter functions.

Interval Jitter Function

The Interval Jitter function, accessed through the PCR Stress dialog box (see Figure 3-31), allows you to add jitter to the period of packets containing a PCR. Refer to *PCR Stress Dialog Box* on page 3-51 for information about the dialog box parameters.

Period Mode and Deviation Mode

The Interval Jitter function provides two function modes: Period and Deviation. This subsection describes the differences between the two modes.

Period Mode. In this mode, amplitude variation of the waveform selected in Pattern item is added to PCR interval currently set.

Figure 3-32 shows the variation of PCR interval in Period mode with following settings:

PCR Interval: 30 ms, Pattern: Square, Period: 8 [Packets], Amplitude: 10 ms

In this mode, PCR interval after jitter insertion can be defined by the following equation:

$$PCR(n) = PCR_Reference + \int Square(t)$$

Where: PCR_Reference is the PCR interval set in the PCR Interval item, and Square(t) is the square waveform defined by the Amplitude and Period items.

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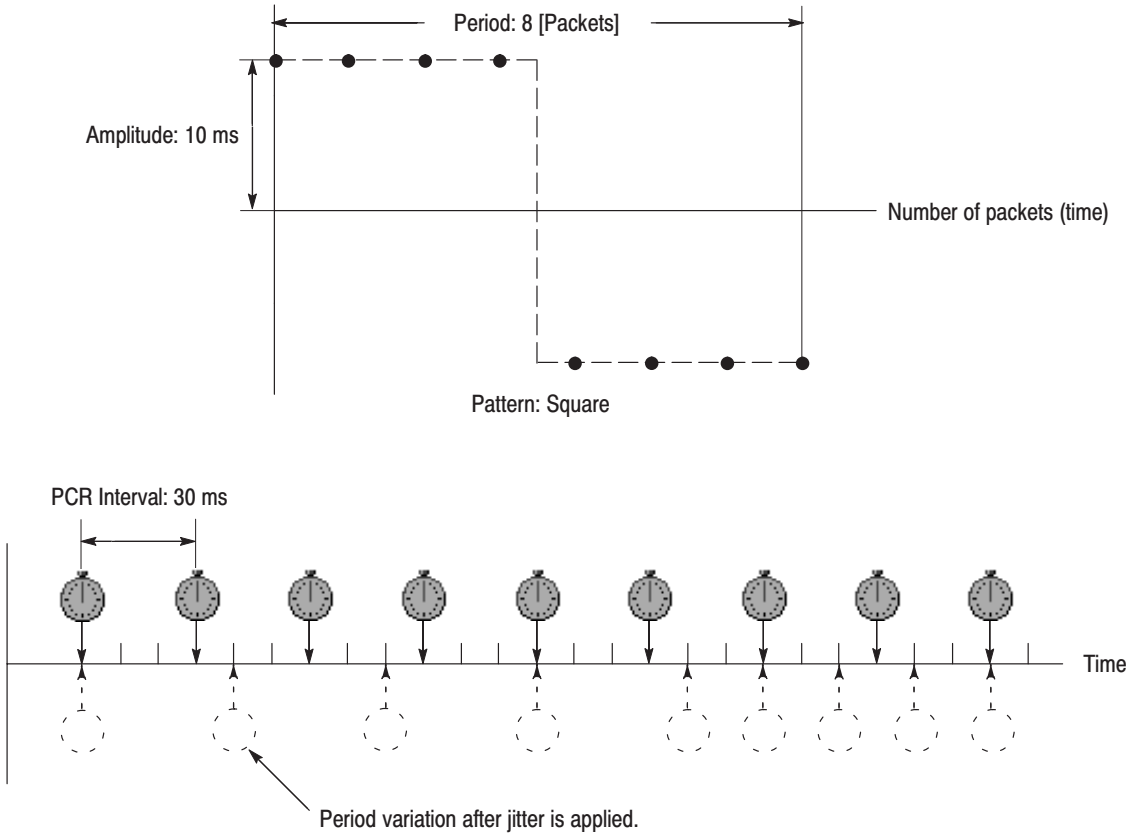


Figure 3-32: Changing the PCR interval in the Period mode

Deviation Mode. In this mode, PCR interval varies by the amplitude variation of the waveform selected in the Pattern item with reference to standard PCR interval.

Figure 3-33 shows the variation of PCR interval in Deviation mode with following settings:

PCR Interval: 30 ms, Pattern: Square, Period: 8 [Packets], Amplitude: 10 ms

In this mode, PCR interval after jitter insertion can be defined by the following equation:

PCR(n) =PCR_Reference + Square(t)

Where: PCR_Reference is the PCR interval set in the PCR Interval item, and Square(t) is the square waveform defined by the Amplitude and Period items.

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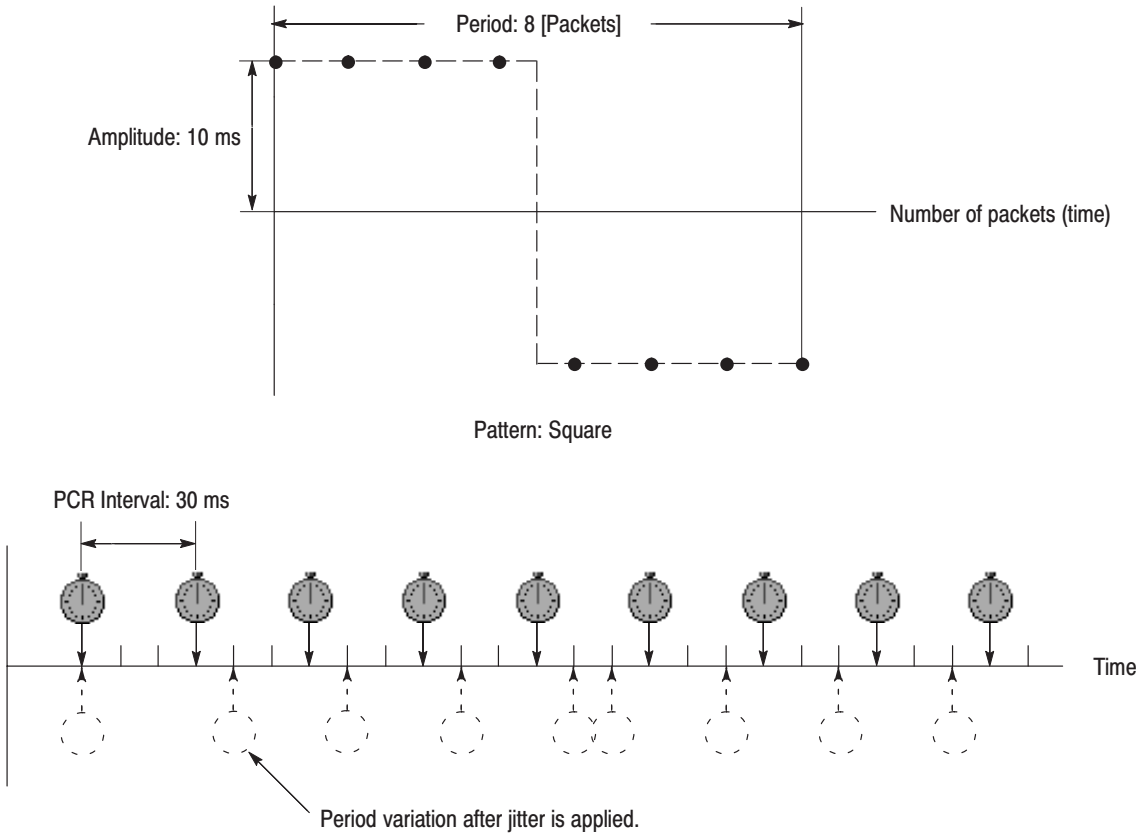


Figure 3-33: Changing the PCR interval in the Deviation mode

Value Jitter Function

The Value Jitter function, accessed through the PCR Stress dialog box (see Figure 3-31), allows you to add jitter to the program_clock_reference_base value and the program_clock_reference_extension value in the adaptation field of transport stream packets. You can use this function to modulate the data values of the PCRs away from their correct values. Refer to *PCR Stress Dialog Box* on page 3-51 for information about the dialog box parameters.

Figure 3-34 shows the relationship among these parameters and how the PCR values (program_clock_reference_base value and program_clock_reference_extension) change when Sine is selected as a jitter-pattern waveform. The PCR values varies by the value of sine waveform defined by the amplitude and period. The PCR period does not change.

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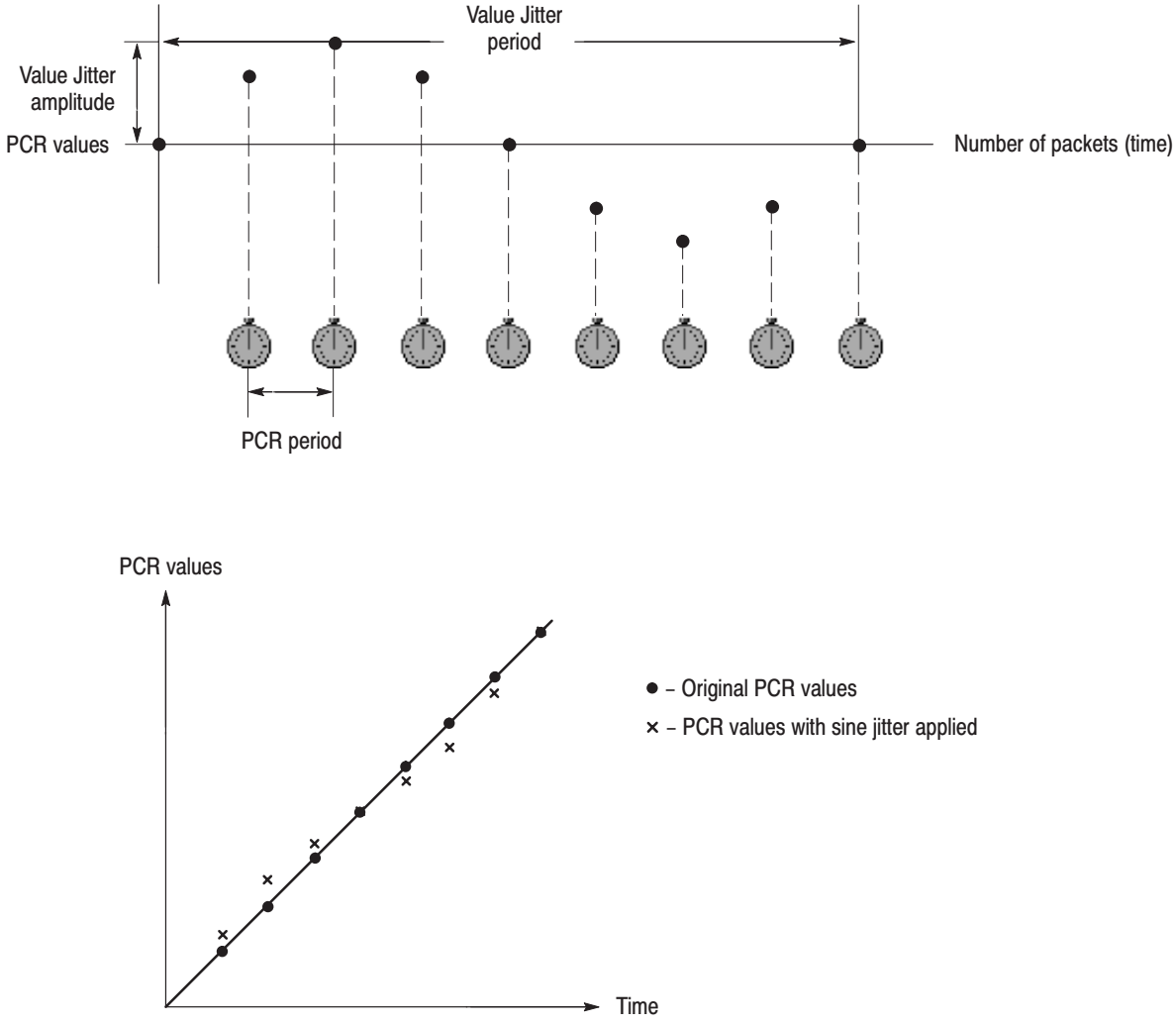


Figure 3-34: Value Jitter function with a sine jitter pattern applied

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Preset File

The MPEG generator provides the capability to save the user-defined instrument settings on the hard disk as a preset file and load the instrument settings saved as a preset file. This section describes the contents of the instrument settings saved as a preset file and how to save and load a preset file.

The preset file has the extension of .set and save the /usr/preset directory on the hard disk.

***NOTE**. The preset file cannot be saved on a floppy disk directory. Also, it cannot br loaded into the instrument's memory from a floppy disk directory. If you want to save a preset file to a floppy disk, first save the file to the hard disk, and then copy it from the hard disk to the floppy disk by the Copy... command in the FILE pull-down menu. Also, If you want to load a preset file stored in a floppy disk, copy the file from the floppy disk to the hard disk by the Copy... command in the FILE pull-down menu.*

Contents of the Preset File

The preset file contains the following instrument settings:

- File name and parameter settings of the insertion file(s) and replace file(s).
- Packet size, clock mode, clock rate, output level, parallel/serial output format, and ASI output format.
- Output loop mode, initial value of the PCR, TDT/TOT/STT update mode, and auto play on power up mode.
- Information of the deleted transport stream item (packet), start/end packet of the transport stream.
- Network parameters.

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Saving a Preset File

This subsection provides the procedures to save the current instrument settings on the hard disk as a preset file.

Perform the following steps to save a preset file:

1. Set the instrument settings that you want to save.
2. Select **Save Preset...** from FILE pull-down menu, and then press the **OK** bezel button. This opens the **Input Preset Filename** dialog box shown in Figure 3-35.

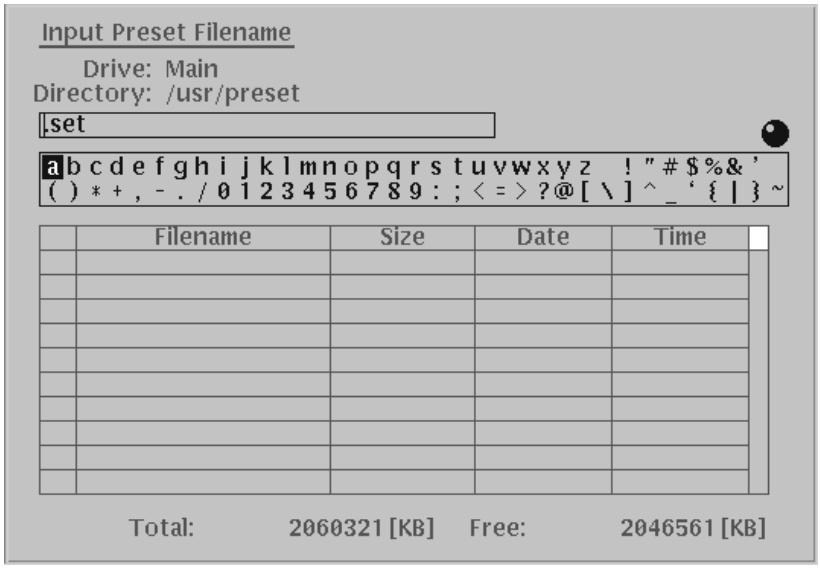


Figure 3-35: Input Preset Filename dialog box

3. In the dialog box, enter the file name that you want to use as the preset file. The *.set extension is added automatically.
4. After you have completed the text input, press the **OK** bezel button.

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Loading a Preset File

This subsection provides the procedures to load an instrument settings saved as a preset file.

***NOTE**. When you load the preset file contained the information of the insertion file(s) and replace file(s), the appropriate file(s) must be resided on the hard disk of the MPEG generator. If the appropriate file(s) is(are) not resided on the hard disk, the settings of the preset file are not reproduced exactly.*

Perform the following steps to load a preset file:

1. Select **Load Preset...** from FILE pull-down menu, and then press the **OK** bezel button. This opens the **Select Preset File** dialog box shown in Figure 3-36.

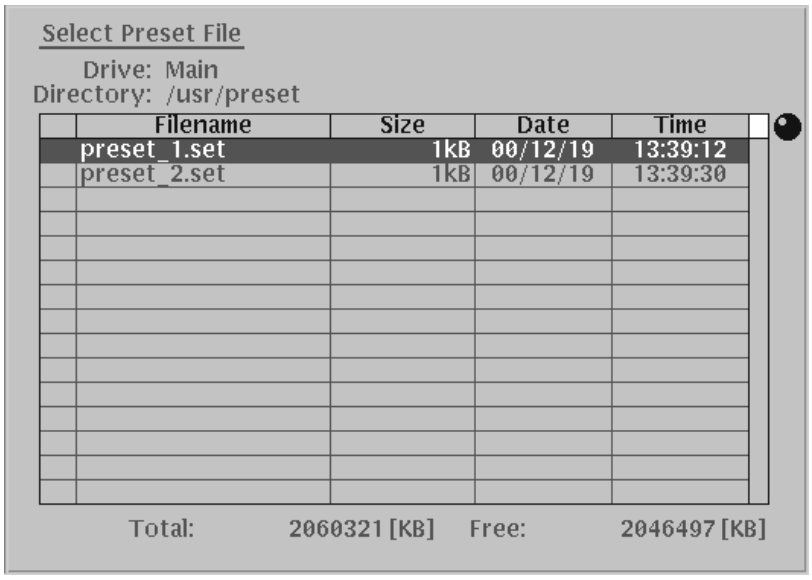


Figure 3-36: Select Preset File dialog box

2. In the dialog box, select the preset file that you want to load, and then press the **OK** bezel button.

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An Example Preset File

You can view (and edit) a preset file with a text editing application such as Notepad. An example of a preset file is shown below.

```
MAGIC 4000
Version 3
Instrument 300
PacketSize 188
ExternalInput InternalRef
Level ECL
ASIFormat Word
LoopMode Stress
TsStandard MPEG2
InsertTdtSttState NONE
Interface Parallel
NumberBase Hex
ClockFrequency 6.4000000000e+01
PcrStartBaseCount 0.0000000000e+00
PcrStartExtentionCount 0.0000000000e+00
IpAddress 172.17.43.14
SubnetMask 255.255.0.0
GatewayAddress
DestinationNetwork
UpdateTimeTable ON
_TSFILE /main/usr/ts/test64.TRP
```


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File Operations

This section explains the following file operations used in the MPEG generator:

- Creating a new folder
- Copying a file
- Deleting a file or folder
- Renaming a file name or folder name

Refer to *Preset File* beginning on page 3-95, how to save and load a preset file.

Creating a new folder

***NOTE**. You cannot create a new folder (subdirectory) in the same hierarchy as that of the insert, preset, and ts folders (directories) on the main drive (hard disk drive).*

Perform the following procedures to create a new folder (subdirectory):

1. Select **New folder...** from FILE pull-down menu, and then press the **OK** bezel button. This opens the **Input new folder name** dialog box shown in Figure 3-37.

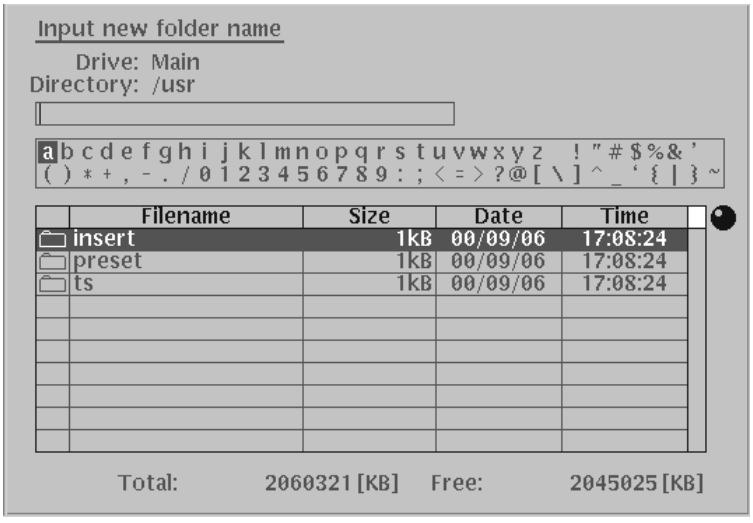


Figure 3-37: Input new folder name dialog box

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2. Press the **Drive...** bezel button to open the **Select Drive** dialog box shown in Figure 3-38.

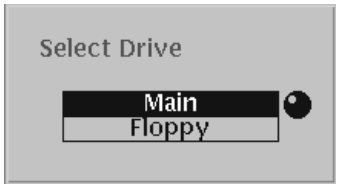


Figure 3-38: Select Drive dialog box

3. Select the drive (Main or Floppy) in which you want to create a new folder, and press the **OK** bezel button.
4. Use the down arrow button to highlight the **Filename** column in the Input new folder name dialog box, .
5. Use the rotary knob and the **Down Level** bezel button to select the directory under which you want to create a new folder.
6. Use the up arrow button to highlight the text input field in the Input new folder name dialog box.
7. Enter the new folder name in the text input field, and then press the **OK** bezel button,

Copying a file

NOTE. *You cannot copy a stream file.*

Perform the following procedures to copy a file:

1. Select **Copy...** from FILE pull-down menu, and then press the **OK** bezel button. This opens the **File copy** dialog box shown in Figure 3-39.

   When you access the dialog box first, the Source field and Destination field are empty.

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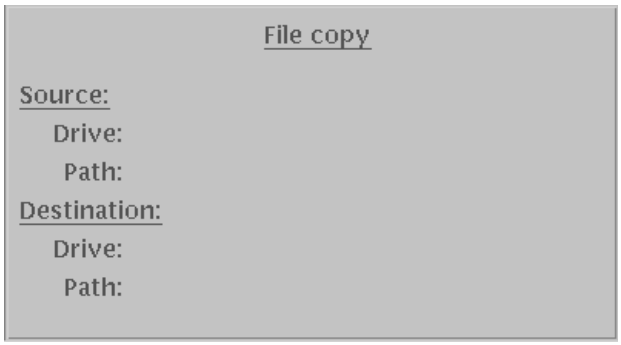


Figure 3-39: File copy dialog box

2. Press the **Source...** bezel button to open the **Select source file** dialog box.
3. Press the **Drive...** bezel button to open the **Select Drive** dialog box.
4. In the dialog box, select the source drive (Main or Floppy), and press the **OK** bezel button.
5. Use the rotary knob and the **Down Level** bezel button to select the source file, and then press the **OK** bezel button.
6. Press the **Destination...** bezel button to open the **Input destination file name** dialog box.
7. If the destination drive is different from the source drive, press the **Drive...** bezel button to open the **Select Drive** dialog box.
8. In the dialog box, select the destination drive (Main or Floppy), and press the **OK** bezel button.
9. In the **Input destination file name** dialog box, enter the destination file name. In the text input field, the source file name appears. After you have completed the text input, press the **OK** bezel button.
10. Confirm the drive name and path name in the Source and Destination fields, and then press the **Execute** button.

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Deleting a file or folder

***NOTE**. You cannot delete the insert, preset, or ts folder on the main drive (hard disk drive). Also, you cannot delete the folder which contains some files.*

Perform the following procedures to delete a file or folder:

1. Select **Delete...** from FILE pull-down menu, and then press the **OK** bezel button. This opens the **Select file** dialog box.
2. Press the **Drive...** bezel button to open the **Select Drive** dialog box.
3. In the dialog box, select the drive (Main or Floppy) which contains the file or folder that you want to delete, and press the **OK** bezel button.
4. Use the rotary knob and the **Down Level** bezel button, select the file or folder that you want to delete, and then press the **OK** bezel button.

   This displays a pop-up message box to confirm the delete operation.
5. Press the **OK** bezel button to execute the operation.

Renaming a file name or folder name

***NOTE**. You cannot rename the insert, preset, or ts folder name on the main drive (hard disk drive).*

Perform the following procedures to rename a file name or folder name:

1. Select **Rename...** from FILE pull-down menu, and then press the **OK** bezel button. This opens the **Rename file** dialog box shown in Figure 3-40.

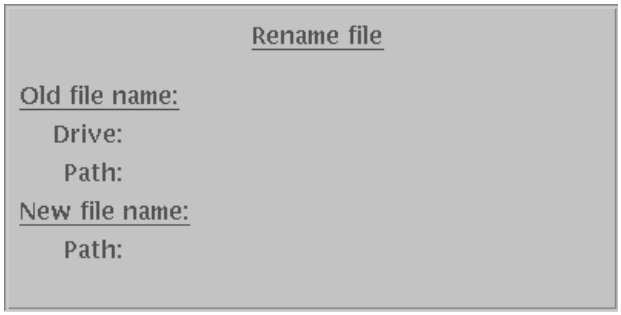


Figure 3-40: Rename file dialog box

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2. Press the **Old file name...** bezel button to open the **Select file** dialog box.
3. Press the **Drive...** bezel button to open the **Select Drive** dialog box.
4. In the dialog box, select the drive (Main or Floppy) which contains the file or folder that you want to rename, and press the **OK** bezel button.
5. Use the rotary knob and the **Down Level** bezel button, select the file or folder that you want to rename, and then press the **OK** bezel button.
6. Press the **New file name...** bezel button to open the **Input new file name** dialog box.
7. In the dialog box, enter the new file name or folder name, and then press the **OK** bezel button.
8. Confirm the old file name and new file name in the Rename file dialog box, and then press the **Execute** bezel button.

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Appendix A: Specifications

This section is divided into two subsections. *General Characteristics* lists the functional, electrical, mechanical, and environmental characteristics of the MPEG generator. *Certifications and Compliances* lists the national and international standards to which the MPEG generator complies.

General Characteristics

This section lists the functional, electrical, mechanical, and environmental characteristics of the MPEG generator.

All listed specifications are guaranteed unless labeled with “typical”. Typical specifications are provided for your convenience but are not guaranteed.

Performance Conditions

The electrical characteristics listed on the following pages are valid under the following conditions:

- The MPEG generator must be in an environment where the temperature, altitude, humidity, and vibration conditions are within the operating limits described in Table A-4 on page A-8.
- The MPEG generator must have a warm-up period of at least 20 minutes.
- The MPEG generator must have been calibrated and adjusted at an ambient temperature between +20° C and +30° C.
- The MPEG generator must be operating at an ambient temperature between +5° C to +40° C, unless otherwise noted.

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Table A-1: Functional characteristics

Characteristics	Description
General	
Analyzed TS standard	MPEG-2, DVB, ARIB, ATSC
Supported Packet format	188, 204, 208 bytes, Non TS
Loop mode	
No Update	Stream is output with no editing functions available.
Auto Update	Transport stream is output with the following timing information updated: PCR, PTS/DTS, Continuity_counter, UTC_time (TDT/TOT) / system_time, DS_status, DS_day_of_month,DS_hour (STT)
Stress (MTG300 only)	Transport stream is output with all editing functions available.
TDT/STT Insertion	MTG300 only
Section Interval	0.5 s to 120.0 s (100 ms resolution)
External SI file insertion	MTG300 only
Start time	0 s to 24:59:59:999 hr (1 ms resolution) TDT, TOT, or STT is used as a reference (DVB, ARIB, and ATSC mode only).
Continuous time	50 ms to 24:59:59:999 hr (1 ms resolution) or Infinite TDT, TOT, or STT is used as a reference (DVB, ARIB, and ATSC mode only).
Section interval	100 ms to 30.00 s (10 ms resolution)
Packet interval	0 to 1000 packets
Packetized mode	Single, Multi
External TS file insertion	MTG300 only
Start time	0 s to 24:59:59:999 hr (1 ms resolution) TDT, TOT, or STT is reference (DVB, ARIB, and ATSC mode only).
Continuous time	50 ms to 24:59:59:999 hr (1 ms resolution) or Infinite TDT, TOT, or STT is used as a reference (DVB, ARIB, and ATSC mode only).
File interval	100 ms to 30.00 s (10 ms resolution)
Packet interval	0 to 1000 packets
External SI file replacement	MTG300 only
Start time	0 s to 24:59:59:999 hr (1 ms resolution) TDT, TOT, or STT is used as a reference (DVB, ARIB, and ATSC mode only).
Continuous time	50 ms to 24:59:59:999 hr (1 ms resolution) or Infinite TDT, TOT, or STT is used as a reference (DVB, ARIB, and ATSC mode only).
Section interval	100 ms to 30.00 s (10 ms resolution)
Packet interval	0 to 1000 packets
Packetized mode	Single, Multi

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Table A-1: Functional characteristics (Cont.)

Characteristics	Description
Delete packet	MTG300 only
Target packet	Deletes the selected item from the transport stream. If other items with the same PID value as the selected item exist in the transport stream and they are contained in one packet, they are also deleted from the transport stream (except for the PCR).
PCR interval setting	MTG300 only
PCR interval	20 ms to 10.000 s (1 ms resolution)
PCR interval jitter adder	MTG300 only
Target PCR	Selected one PCR
Reference period	20 ms to 10.000 s (1 ms resolution)
Jitter Pattern	sine, rectangle, triangle, pulse, ramp, and random
Jitter Duty	1 to (period–1) packet(s) (available for pulse)
Jitter Period	5 to 3000 packets
Jitter Amplitude	100 to 10 ms (10 ms resolution)
PCR value jitter adder	MTG300 only
Target PCR	Selected one PCR.
Jitter Pattern	sine, rectangle, triangle, pulse, ramp, random, and offset
Jitter Duty	1 to (period–1) packet(s) (only available for pulse jitter pattern)
Jitter Period	5 to 3000 packets (except for the offset mode)
Jitter Amplitude	1 to 60 s (resolution of 37 ns, 27 MHz clock)
TS header change	MTG300 only
Number of packets	1 to 65535 packets (on every manual operation) 0 value means that the selected operation is executed infinitely.
Target of change word operation	Sync_Byte (8) Transport_error_indicator (1) payload_unit_start_indicator (1) transport_priority (1) PID (13) transport_scrambling_control (2) adaptation_field_control (2) Target packet is all the items or one selected item.
Target of Lack/Duplicate operation	continuity_counter (4) Target packet is one selected item.

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Table A-1: Functional characteristics (Cont.)

Characteristics	Description
SI header change	MTG300 only
Target packets	One selected item. If two or more sections are contained in one packet, all of the sections are changed by the operation.
Number of packets	1 to 65535 packets (on every manual operation)
Target of change word operation	reserved (2)
DTS value change	MTG300 only
Target packet	One selected PID including Video PES (except for the scrambled PES)
Number of packets	Continuous
Add time	0 ms to 50 ms (90 kHz resolution)

Table A-2: Electrical characteristics

Characteristics	Description
Clock	
Reference clock	For Output_clock, PCR/PTS/DTS, Packet operation timing, and TDT/STT time.
Internal	27 MHz ± 1 ppm
External	27 MHz
Output clock	
Frequency	0.5 MHz to 80 MHz, Locked to Reference clock.
PLL divide ratioFYID	Output Clock = (X / (Y * Z)) * 27 MHz
(Internal and External Reference)	1024 < X < 65536 4500 < Y < 9000 Z = 4 (32 MHz < Output clock ≤ 80 MHz) Z = 8 (16 MHz < Output clock ≤ 32 MHz) Z = 16 (8 MHz < Output clock ≤ 16 MHz) Z = 32 (4 MHz < Output clock ≤ 6 MHz) Z = 64 (2 MHz < Output clock ≤ 4 MHz) Z = 128 (1 MHz < Output clock ≤ 2 MHz)
(External clock) (Output clock < 24 MHz)	Output Clock = (Y / X) * 216 MHz 1024 < X < 65536 8 < Y < 16383 Output clock / 6000 < Y < Output clock / 3000
(External clock) (Output clock ≥ 24 MHz)	Output Clock = (Y / X) * 432 MHz 1024 < X < 65536 8 < Y < 16383 Output clock / 12000 < Y < Output clock / 6000
P/N and Jitter	< –104 dBc/Hz at 20 kHz (< 32 MHz) < –97 dBc/Hz at 20 kHz (< 64 MHz)

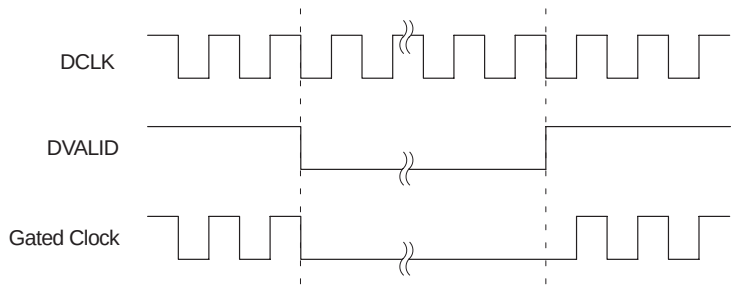
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Table A-2: Electrical characteristics (Cont.)

Characteristics	Description
External reference input	
Connector type	BNC
Frequency	27 MHz, 1 ppm recommended.
Input level, typical	800 mV ± 200 mV (p-p)
Input impedance, typical	50 Ω (at 27 MHz)
ECL control input	
Connector type	D-sub, 9 pin
Frequency	62.5 kHz to 10 MHz, select parallel output. 0.5 MHz to 64 MHz, select serial output.
Input level, typical	Differential ECL
Termination, typical	110 Ω, line to line.
Pin assignment	1 DCLK 2 GND 3 PSYNC 4 CHCLKEN 5 Shield 6 $\overline{\text{DCLK}}$ 7 $\overline{\text{GND}}$ 8 $\overline{\text{PSYNC}}$ 9 $\overline{\text{CHCLKEN}}$
ECL/TTL/LVDS output (parallel)	
Connector type	D-sub, 25 pin (the same connector as Serial output)
Output level (Output on) (J310101 and above)	Note: Do not connect the $\overline{\text{Asserted Low}}$ pins for single-end use.
TTL	0 V to 2.8 V (without termination)
LVDS	0.8 V to 1.60 V (without termination)
ECL*	–1.8 V to –0.9 V (without termination)
Output resistance, typical (Output off)	350 Ω at 5 V to GND pin (When the output is off, the power of the buffer amplifier is cut off.)
Data rate	62.5 kBps to 10 MBps
Pin assignment	1 DCLK 2 GND 3 to 10 DATA 7 to DATA 0 11 DVALID 12 PSYNC 13 Shield 14 $\overline{\text{DCLK}}$ 15 $\overline{\text{GND}}$ 16 to 23 $\overline{\text{DATA 7}}$ to $\overline{\text{DATA 0}}$ 24 $\overline{\text{DVALID}}$ 25 $\overline{\text{PSYNC}}$

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Table A-2: Electrical characteristics (Cont.)

Characteristics	Description
ECL/TTL/LVDS output (serial)	
Connector type	D-sub, 25 pin (the same connector as Parallel output)
Output level (Output on) (J310101 and above)	Note: Do not connect the Asserted Low pins for single-end use. Do not connect the "Not Managed" pins to GND pins.
TTL	0 V to 2.8 V (without termination)
LVDS	0.8 V to 1.60 V (without termination)
ECL*	–1.8 V to –0.9 V (without termination)
Output resistance, typical (Output off)	350 Ω at 5 V to GND pin (When the output is off, the power of the buffer amplifier is cut off.)
Data rate	0.5 Mbps to 64 Mbps
Pin Assignment	1 DCLK 2 GND 3 to 8 Not managed 9 Gated Clock 10 DATA 0 11 DVALID 12 PSYNC 13 Shield 14 DCLK 15 GND 16 to 21 Not managed 22 Gated Clock 23 DATA 0 24 DVALID 25 PSYNC
	Timing relationship between DCLK and Gated Clock 
ASI output	Complies with EN50083-9 Annex B.
Connector type	BNC
Impedance, typical	75 Ω
Output voltage	800 mV ± 10%
Deterministic Jitter	10% (p-p)
Random Jitter	8% (p-p)

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Table A-2: Electrical characteristics (Cont.)

Characteristics	Description
Rise/fall time (20% to 80%)	< 1.2 ns
Transmission format	Data packets (Insert Packet unit), Data Bursts (Insert Word unit)
SSI output	Complies with SMPTE 310M.
Connector type	BNC
Impedance	75 Ω
Data rate	1 Mbps to 40 Mbps (Not managed when the data frequency is more than 40 Mbps.)
Output voltage	800 mV ± 10 %
Return loss	> 30 dB , 100 kHz to 80 MHz
Drift and wander	< 0.028 ppm/s, < 1 kHz
Jitter	< 2 ns, 1 kHz to 800 kHz
Rise/fall time (20 % to 80%)	0.4 ns to 5.0 ns < 1.6 ns (difference between rise and fall time)
Condition	This output cannot be used with the external clock input.
Display	
Display area	Width: 13.2 cm (5.2 inches) Height: 9.9 cm (3.9 inches)
Resolution	Horizontal: 640 pixels Vertical: 480 pixels
AC line power	
Rating Voltage	100 to 240 VAC
Voltage Range	90 to 250 VAC
Frequency Range	48 to 63 Hz
Maximum power	200 W
Maximum current	2 A
Installation Category	CAT II

Table A-3: Mechanical characteristics

Characteristics	Description
Net weight	
Standard	Approximately 14 kg
Dimensions	
Height	132 mm (without front feet extended)
Width	430 mm
Length	560 mm

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Table A-4: Environmental characteristics

Characteristics	Description
Temperature	
Operating	+5° C to +40° C
Non-operating	–20° C to +60° C
Relative humidity	
Operating	20% to 80% (No condensation) Maximum wet-bulb temperature 29.4° C
Non-operating	5% to 90% (No condensation) Maximum wet-bulb temperature 40.0° C
Altitude	
Operating	To 4.5 km (15,000 feet). Maximum operating temperature decreases 1° C each 300 m above 1.5 km.
Non-operating	To 15 km (50,000 feet).
Dynamics	
Vibration	
Operating	0.27 g_{rms}, 5 to 500 Hz, 10 min, three axes
Non-operating	2.28 g_{rms}, 5 to 500 Hz, 10 min, three axes
Shock	
Non-operating	294 m/s^2 (30 G), half-sine, 11 ms duration.
Installation requirements	
Power consumption	200 W maximum. Maximum line current is 2 A_{rms} at 50 Hz.
Dissipation (fully loaded)	90 V line, with 5% clipping
Surge current	≦ 30 A peak for less than 5 line cycles at 25°C after product has been off for at least 30 s.
Cooling clearance	
Top clearance	5.0 cm
Side clearance	15 cm
Rear clearance	7.5 cm

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Certifications and Compliances

This subsection lists the national and international standards to which the MPEG generator complies.

Table A-5: Certifications and compliances

Category	Standards or description
EC Declaration of Conformity – EMC	Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities: EMC Directive 89/336/EEC: EN 61000-3-2 — AC Power Line Harmonic Emissions EN 61000-3-3 — Voltage Fluctuations and Flicker Emissions EN 61326-1 — EMC requirement for Class A electrical equipment for measurement, control and laboratory use. IEC 61000-4-2 — Electrostatic Discharge Immunity (Performance Criterion B) IEC 61000-4-3 — RF Electromagnetic Field Immunity (Performance Criterion A) IEC 61000-4-4 — Electrical Fast Transient / Burst Immunity (Performance Criterion B) IEC 61000-4-5 — Power Line Surge Immunity (Performance Criterion B) IEC 61000-4-6 — Conducted RF Immunity (Performance Criterion A) IEC 61000-4-8 — Power Frequency Electromagnetic Field Immunity (Performance Criterion A) IEC 61000-4-11 — Voltage Dips and Interruptions Immunity (Performance Criterion B)
Australia/New Zealand Declaration of Conformity – EMC	Complies with EMC provision of Radio Communications Act per the following standard(s): AS/NZS 2064.1/2 — Industrial, Scientific, and Medical Equipment: 1992
FCC Compliance	Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A Limits.
Safety	Complies with the following safety standards/regulations: UL 3111-1, First Edition[1] — Standard for electrical measuring and test equipment. CAN/CSA C22.2 No.1010.1-92[1] — Safety requirements for electrical equipment for measurement, control, and laboratory use. IEC 61010-1/A2:1995[1] — Safety requirements for electrical equipment for measurement, control,and laboratory use. Low Voltage Directive 73/23/EEC: Amended by 93/68/EEC: EN 61010-1/A2 — Safety requirements for electrical equipment for measurement, control,and laboratory use.

1 **UL3111-1 First Edition, CSA C22.2 No.1010.1-92, and IEC61010-1/A2:1995 Safety Certification Compliance Altitude (maximum operating): 2000 meters**

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Table A-5: Certifications and compliances (Cont.)

Category	Standards or description
Installation (Overvoltage) Category	Terminals on this product may have different installation (overvoltage) category designations. The installation categories are: CAT III — Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location. CAT II — Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected. CAT I — Secondary (signal level) or battery operated circuits of electronic equipment.
Pollution Degree	A measure of the contaminates that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated. Pollution Degree 2 — Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.

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Appendix B: Using MTG Comm+ for File Transfers

MTG Comm+, a standard accessory with the MPEG generator, is a software application for a PC using the Microsoft Windows 95/98/2000/NT operating system. MTG Comm+ provides the capability to transfer stream, insertion, or preset files between a PC and the MPEG generator using the Ethernet interface.

This section provides the following information:

- Minimum system requirements for your PC
- Instructions for installing MTG Comm+ on your PC(s) and connecting the MPEG generator to your Ethernet network
- Instructions for operating the MTG Comm+ application including the requirements for transferred files
- Tutorials for transferring files between a PC and the MPEG generator

PC System Requirements

Your PC requires the following minimum system requirements to load and operate the MTG Comm+ application:

- Microsoft Windows 95/98/2000/NT operating system
- Ethernet interface

Installation Instructions and Ethernet Setup

This subsection provides the following instructions: installing the MTG Comm+ application on your PC, creating a desktop shortcut icon on the PC to run MTG Comm+, connecting your PC(s) to the MPEG generator using the Ethernet port, and setting the required Ethernet parameters.

***NOTE**. Before you install the MTG Comm+ application on your PC, create a back-up copy of the original MTG Comm+ software disk supplied with the application. Store the original disk in a safe location and use the copy disk to perform the installation procedure. After you complete the MTG Comm+ installation procedure, store the back-up disk in a safe location for future use.*

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Installing MTG Comm+

The following installation instructions assume that you are familiar with the basics of using the Windows operating system. If necessary, read your Windows user documentation before installing MTG Comm+.

Perform the following procedure to install MTG Comm+:

1. Be sure that your PC meets the requirements listed under *PC System Requirements* on page B-1 before proceeding with the installation.
2. Insert the MTG Comm+ installation disk into a 3.5 inch floppy disk drive on your PC, and then double-click the **My Computer** icon on your PC.
3. Click on the **3.5 inch floppy drive** icon that you are using for the installation. The PC will display the contents of the MTG Comm+ installation disk.



CAUTION. *To prevent data loss, it is strongly recommended than you exit any open applications on your PC before you run the MTG Comm+ Setup.exe file.*

4. Double-click **Setup.exe** in the list. The MTG Comm+ installation program will display a series of setup windows as listed below. Click the **Next>** button to accept the default parameters or change the parameters in the setup windows to suit your needs. Click the **<Back** button in a setup window to return to the previous setup window.
   a. Welcome window. Read the displayed information, and then click the **Next>** button to proceed with the installation.
   b. Choose Destination Location window. The default directory location for the application is displayed. If you want to install MTG Comm+ in a custom location, click the **Browse...** button, and then select or create a custom directory location. Click the **Next>** button to proceed.
   c. Select Program Folder window. The default name for the program folder is displayed. If you want to change the name, type in a new name or select a name from the Existing Folders list. Click the **Next>** button to proceed.
   d. Start Copying Files window. Review the displayed information, and then click the **Next>** button to start the installation.
   e. Setup Complete window. If the installation is successful, you will see a message that Setup has finished installing the MTG Comm+ application onto your PC. If you want to run MTG Comm+ immediately, select **Yes, Launch the program file**, and then click the **Finish** button. To exit the installation program without running MTG Comm+, click the **Finish** button.
5. Remove the MTG Comm+ installation disk from your PC, and then store the disk in a safe location.

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Creating a Desktop Shortcut Icon

Perform the following procedure to create an icon on your PC desktop that you can use to run the MTG Comm+ application:

1. On your PC display, move the mouse cursor to any unoccupied desktop area, and then click the right mouse button to open the desktop menu.
2. From the desktop menu select **New**, and then select **Shortcut** to open the Create Shortcut dialog box.
3. Click the **Browse...** button in the Create Shortcut dialog box.
4. Use the Browse dialog box to locate the MTG Comm+ directory.
   a. If you installed the MTG Comm+ application using the default directory location and the default folder name in the installation procedure, select the following directory folders in order: **Program Files**, **Sonytek**, and **MTG Comm+ 2.0**.
   b. If you installed the MTG Comm+ application to a custom location or gave the application folder a custom name, you will need to select your custom directory path.
   c. You should now be at a location in the PC directory structure where the browse list box shows the MTG Comm+ **Sample** folder and the **MtgComm+.exe** file.
5. Select the **MtgComm+.exe** file (MtgComm+.exe will be displayed in the file name box), and then click the **Open** button. The directory path to the MtgComm+.exe file will now be displayed in the Comm and Line box of the Create Shortcut dialog box.
6. Click the **Next>** button in the Create Shortcut dialog box. The default name of the shortcut icon is now displayed in the dialog box. You can edit the icon name to suit your needs or accept the default name.
7. Click the **Finish** button to finish creating the desktop shortcut icon. The Mtgcomm+.exe shortcut icon will now appear on the PC desktop. You can start the MTG Comm+ application by double-clicking the **MtgComm+.exe** (or your custom name) shortcut icon.

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Connecting Your PC(s) to the MPEG Generator

MTG Comm+ uses the rear-panel Ethernet port on the MPEG generator to communicate with a PC (see Figure 2-2 on page 2-4) using 100BASE-T. Use one of the following two methods to connect your PC(s) to the MPEG generator:

- If you are connecting the MPEG generator directly to a single PC, use a 100BASE-T crossover Ethernet cable to connect between the Ethernet port on the MPEG generator and the Ethernet port on the PC. If you need to construct your own crossover cable, Figure B-1 shows the pin connections to change on a straight cable to produce a crossover cable.
- If you are connecting the MPEG generator to your local Ethernet network, use a straight Ethernet cable to connect between the Ethernet port on the MPEG generator and the Ethernet hub port of your local network. By connecting to an Ethernet network, you can access the MPEG generator using any PC on the network running the MTG Comm+ application.

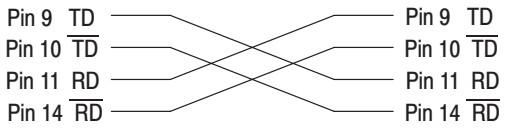


Figure B-1: Pin connections for a 100BASE-T crossover Ethernet cable

Setting Ethernet Network Parameters

Before you can use MTG Comm+ to transfer files between the MPEG generator and your PC(s), you must set the Ethernet network parameters for both the MPEG generator and the MTG Comm+ application.

***NOTE**. Use the ping command from the PC and the Ping command from the MPEG generator (available when the Network dialog box is displayed) to verify network communications after you set the Ethernet network parameters for the MPEG generator and for the MTG Comm+ application.*

You must exit the Network dialog box before your network setting changes will take effect.

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Ethernet Parameters for the MPEG Generator. Perform the following procedure to set the Ethernet network parameters for the MPEG generator:

1. Select **Network...** from the **Utility** pull-down menu on the MPEG generator. This will open the Network dialog box shown in Figure B-2.

   The settings you enter in the Network dialog box depend on how you connect the MPEG generator to the remote PC. You can connect the MPEG generator directly to a single PC or you can connect it to your local Ethernet network.



Figure B-2: Network dialog box for the MPEG generator

2. If you connect the MPEG generator directly to a single PC, perform the following steps to set the Network dialog box parameters:

   a. Set the **DHCP Client** parameter to Disable.

   b. Set the **IP Address** parameter to be the same IP address as the PC's address except for the last number. The last number must be different than the last number in the PC's IP address.

   c. Set the **Subnet Mask** parameter to be the same subnet mask used by the PC. Do not enter a number if the PC does not have a subnet mask.

   d. You do not need to enter a **Routing Destination** or **Routing Gateway** if you are directly connected to a single PC.

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3. If you connect the MPEG generator to your local Ethernet network, perform the following steps to set the Network dialog box parameters:

   - When a DHCP server is in the network.

     If the DHCP server is in the network, when you select **Enable** in the DHCP Client item, the MPEG generator functions as a DHCP client. In this case, you can register the addresses such as the IP address and subnet mask used by the MPEG generator. This way, the MPEG generator accesses the DHCP server and gets the addresses automatically when connected to the network.

***NOTE**. Under some network environments, the MPEG generator may not be able to get the IP address automatically from a DHCP server. In this case, you need to enter the appropriate address value in each item.*

   - When a DHCP server is not in the network, see the *Caution* note below.



***CAUTION.** To prevent communication conflicts on your Ethernet network, ask your local network administrator for the correct numbers to enter in the Network dialog box if you connect the MPEG generator to your local Ethernet network.*

4. Verify that the Ethernet connections using the ping command from the PC and the Ping command from the Bezel menu of the Network dialog box.

Ethernet Parameters for MTG Comm+. Perform the following procedure to set the Ethernet network parameters for the MTG Comm+ application:

1. Select **Network** from the **Utility** menu of the MTG Comm+ application. This will open the Set MTG Host Name dialog box shown in Figure B-3.
2. Use the **Host Name** field in the dialog box to enter the IP address that you assigned to your MPEG generator.
3. Click the **OK** button to accept the settings and close the dialog box.

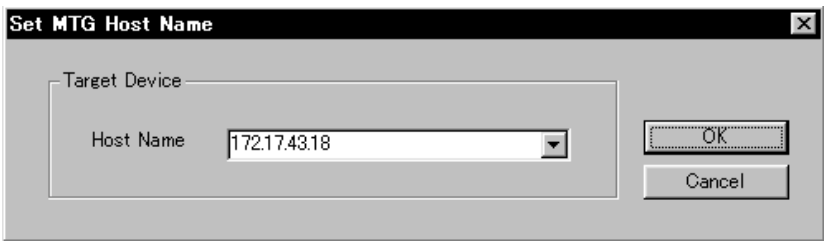


Figure B-3: Set MTG Host Name dialog box for MTG Comm+

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MTG Comm+ Operating Basics

This section describes the basics of operating the MTG Comm+ application. The following information is located in this section:

- Requirements for transport stream files
- Instructions on how to start and exit the MTG Comm+ application
- Descriptions of the elements in the application window
- Descriptions of the functions available through the pull-down menus
- Tutorials containing procedures that show you how to transfer files between your PC and the MPEG generator



CAUTION. *The MPEG generator comes from the factory with sample files loaded on the hard drives. To prevent the loss of these files, it is recommended that you use MTG Comm+ to save copies of these files.*

Transport Stream File Requirements

MTG Comm+ can transfer three types of files: stream files, insertion files, and preset files (must have file extensions of .set).

When you download a file from the PC to the MPEG generator, you must transfer the file to the correct folder in the MPEG generator, depending on the type of file. Stream files must be transferred to the /main/usr/ts directory, insertion files must be transferred to the /main/usr/insert directory, and preset files must be transferred to the /main/usr/preset.

Refer to the *Caution* note on the following page before you transfer files using MTG Comm+.

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CAUTION. *To prevent the transfer of bad data to the MPEG generator, be sure to select and enter the correct parameters in the User Check dialog box. Entering incorrect parameters, such as an incorrect format standard, will result in files that cannot be transferred or will not be able to be properly played out from the MPEG generator. Observe the following operating conditions:*

Do not press the keyboard Enter key when you are entering values in the Data Rate portion of the User Check dialog box. MTG Comm+ calculates the Data Rate fields from your entered values after you leave an edited Data Rate parameter. (You can see the Data Rate values change when you click on another parameter.) If you press the Enter key before you exit an edited Data Rate parameter, MTG Comm+ will download the transport stream file using an incorrect data rate value.

Starting and Exiting MTG Comm+

When you complete the installation procedure, you can use any of the following methods to start the MTG Comm+ application:

- Double-click the MtgComm+ shortcut icon on the PC desktop that you created during the installation procedure.
- Double-click the MtgComm+.exe file name in the Program Manager window.
- Select MtgComm+ from the Start – Programs menu.

To exit (quit) the MTG Comm+ application, select **Exit** from the **File** menu command list of the application.

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Elements of the MTG Comm+ Window

Figure B-4 shows the MTG Comm+ application window. Table B-1 provides a description of the elements in the application window.

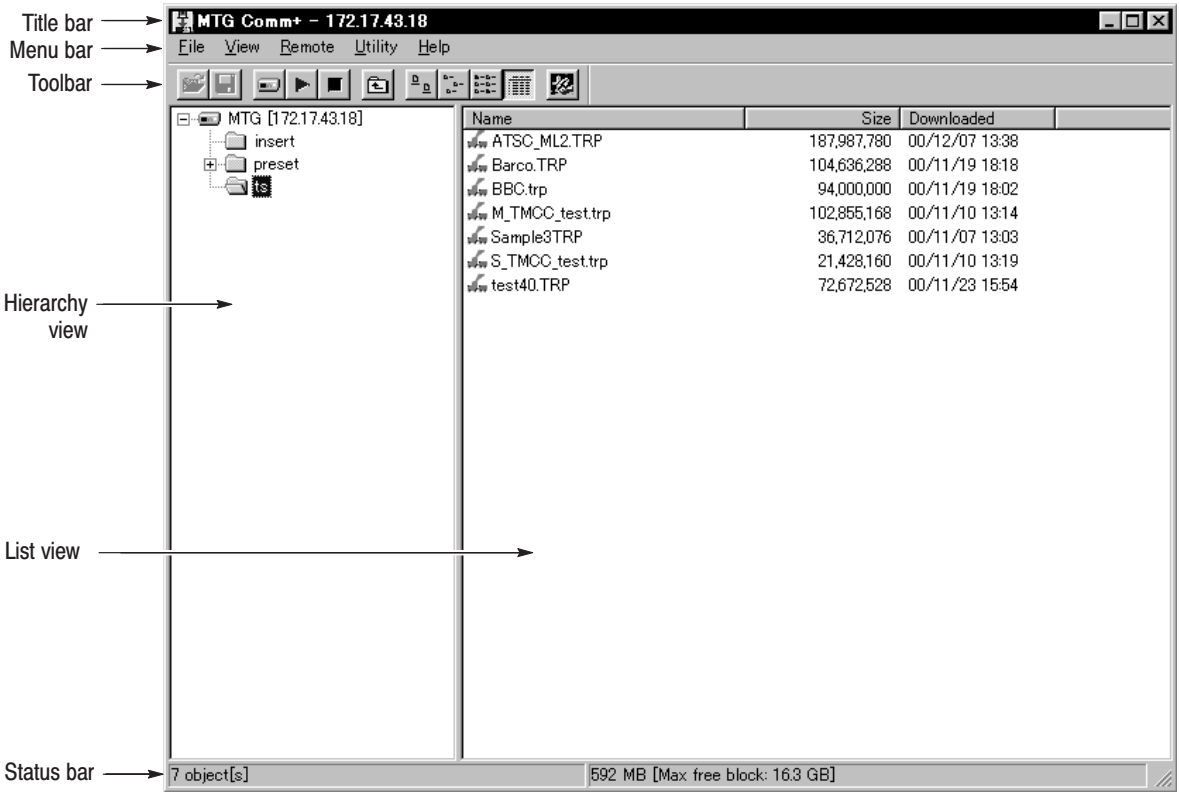


Figure B-4: MTG Comm+ application window

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Table B-1: Elements of the MTG Comm+ window

Element	Description
Title bar	The Title bar displays the name of the application and contains the standard window-sizing boxes for Windows.
Menu bar	The Menu bar displays the names of the five pull-down menus. Refer to *Using the MTG Comm+ Menus* on page B-12 for detailed information about the functions available in the menus.
Toolbar	The toolbar provides shortcut buttons for many of the most often used menu commands. Click a toolbar button to select the corresponding command. You can toggle the toolbar display on and off using the Toolbar command in the View pull-down menu. Table B-2 describes the function of each toolbar button.
Hierarchy view	The Hierarchy view displays the file structure on the MPEG generator. The contents of the selected directory is displayed in the List view. The IP address of the selected MPEG generator is displayed at the top of the Hierarchy.
List view	The List view displays the contents of the selected directory in the Hierarchy view. You can use the View pull-down menu to alter the display in the List view.
Status bar	The status bar displays the number of files (objects) stored in the selected directory, the total file size of the selected directory, and the amount of free disk space (when the insert or preset directory is displayed) or the continuous area in the free disk space (when the ts directory is displayed) on the MPEG generator's hard drive.

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Table B-2: Toolbar button descriptions

Icon	Name	Function
	PC to MTG	Displays the Open File dialog box where you can select the file you want to transfer from your PC to the directory on the MPEG generator selected in the Hierarchy view. Equivalent to the PC to MTG command in the File menu.
	MTG to PC	Equivalent to the **MTG to PC** command in the File menu.
	Load	Equivalent to the **Load** command in the Remote menu.
	Run	Equivalent to the **Run** command in the Remote menu.
	Stop	Equivalent to the **Stop** command in the Remote menu.
	Up One Level	Moves from the current folder to the upper level folder.
	Large Icons	Equivalent to the **Large Icons** command in the View menu.
	Small Icons	Equivalent to the **Small Icons** command in the View menu.
	List	Equivalent to the **List** command in the View menu.
	Details	Equivalent to the **Details** command in the View menu.
	ReMux	Starts the ReMux application. Refer to *Appendix C: Using ReMux Application* for detailed information about the ReMux application.

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Using the MTG Comm+ Menus

The Menu bar displays the names of the five pull-down menus: File, View, Remote, Utility, and Help. This section describes the function of each selection in these menus.

File Menu

The File menu contains commands for managing file operations and for exiting the MTG Comm+ application. Table B-3 describes each of the File menu commands.

Table B-3: MTG Comm+ File menu commands

Command	Function
PC to MTG...	Displays the PC to MTG Download dialog box where you can select the file you want to transfer from your PC to the directory on the MPEG generator selected in the Hierarchy view. Refer to the *Caution* note on page B-8 before you select this command. When you have selected a file to transfer, click the Download button to open the User Check dialog box. Make the appropriate selections in the User Check dialog box, and then click OK to begin the file transfer. Refer to *User Check Dialog Box* on page B-13 for detailed information about the dialog box parameters.
MTG to PC...	When you select this command after you highlight a file in the List view of the MTG Comm application, the MTG to PC Upload dialog box appears where you can select a destination path and file name for the file you want to transfer to your PC.
New	Creates a new folder in the currently selected directory of the MPEG generator.
Delete	Deletes the file or empty folder currently selected on the MPEG generator.
Rename	Renames the file name or folder name currently selected on the MPEG generator.
Exit	Exits the MTG Comm+ application.

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User Check Dialog Box. The User Check dialog box (see Figure B-5) appears after you click the Open button in the Open File dialog box when you are transferring a file from the PC to the MPEG generator. Table B-4 describes the User Check dialog box parameters.

CAUTION. *Refer to* Transport Stream File Requirements *on page B-7 for important information about the requirements of the transport stream files downloaded using this dialog box. Be sure to read the Caution note on page B-8 before you operate the User Check dialog box.*

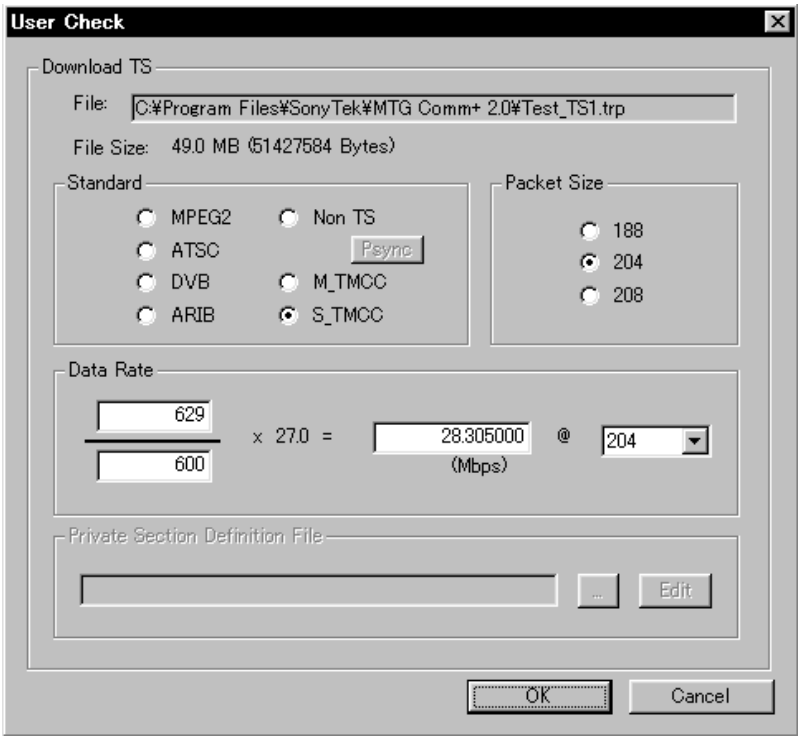


Figure B-5: User Check dialog box

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Table B-4: User Check dialog box parameters

Parameter	Description
File	Displays the directory path and file name of the stream file you selected to transfer to the MPEG generator.
File Size	Displays the file size of the stream file you selected to transfer to the MPEG generator.
Standard	Sets the format to be used by the MPEG generator to playback the stream file you are transferring to the generator. You must set this parameter to correctly match the format of the selected transport stream file or else the MPEG generator will not be able to correctly playback the file. Refer to the *Caution* note on page B-8. For a Non TS, S-TMCC, or M-TMCC file, the standard is determined automatically by the application depending on the file content. For a transport stream file (MPEG2, ATSC, DVB, or ARIB), the standard is set to the previous setting as a default. If the Non TS standard is selected, the Psync button becomes valid. When you press this button, the Set Psync dialog box appears. Use the dialog box to enable the PSYNC and DVALID signal for data output. Refer to *Set Psync Dialog Box* on page B-16 for detailed information about the dialog box parameters. Refer to *Automatic Determination of Standard* on page B-23 about how the MTG Comm+ application determines the standard of the selected stream file.
Packet Size	Sets the packet size of the selected transport stream. The MTG Comm+ application automatically sets this parameter to match the selected transport stream file. The application counts the number of bytes between the 0x47 (sync byte) values in the stream.

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Table B-4: User Check dialog box parameters (Cont.)

Parameter	Description
Data Rate	Sets the default clock rate used by the MPEG generator to playback the stream. The MTG Comm+ application analyzes the selected stream and automatically approximates the data rate. You can enter values in the fraction fields to provide greater clock accuracy. You can use the packet size box to have the MPEG generator playback the transport stream file with a specified packet size that is different than the original file. After you enter values in the Data Rate fields, do not press the keyboard Enter key. Refer to the *Caution* note on page B-8.

Private Section Definition File	Specifies the file describing the PID and table_id values of the private_section. If the selected transport stream file contains the transport stream packet with the PID and table_id value described in the private section definition file, the packet appears in the hierarchy display as a PRI icon.
	
	Use the following format to describe the private section definition file:
	
	`PID, table_id <Return>`
	
	The following is an example of the private section definition file in the hexadecimal value:
	
	`0x1000,0x80`
	`0xaa,0x55`
	`.`
	`.`
	
	You can directly describe the file name in the text box. When you click the Edit button, you can edit the file using the text editor specified by the Options command of the Utility pull-down menu. When you click the "..." button, the Open File dialog box opens where you can select another private section definition file.

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Set Psync Dialog Box. The Set Psync dialog box (see Figure B-6) appears after you click the Psync button in the User Check dialog box. Table B-5 describes the Set Psync dialog box parameters.

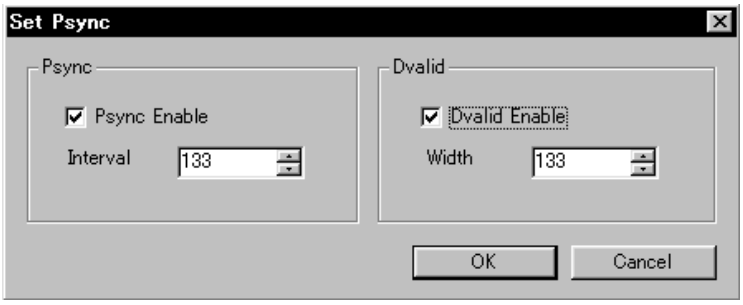


Figure B-6: Set Psync dialog box

Table B-5: Set Psync dialog box parameters

Parameter	Description
Psync	Sets the status of the PSYNC signal output from the ECL/TTL/LVDS connector. In the Interval box, you can set the output period of the PSYNC signal in the range of 16 to 256 bytes. In addition, this value need to be set equal to or greater than the Width value in the Dvalid field.
Dvalid	Sets the status of the DVALID signal output from the ECL/TTL/LVDS connector. In the Width box, you can set the data width of the DVALID signal in the range of 16 to 256 bytes.

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View Menu

The View menu contains commands that control the appearance of the MTG Comm+ application window. Table B-6 describes each of the View menu commands.

Table B-6: MTG Comm+ View menu commands

Command	Function
Toolbar	Toggles the display of the Toolbar on and off in the application window. A check mark precedes the command in the menu when the Toolbar is selected for display.
Status Bar	Toggles the display of the Status bar on and off in the application window. A check mark precedes the command in the menu when the Status bar is selected for display.
Large Icons	Causes the application to display files or folders in the List view using large icons. A check mark precedes the command in the menu when Large Icons is selected.
Small Icons	Causes the application to display files or folders in the List view using small icons. A check mark precedes the command in the menu when Small Icons is selected.
List	Causes the application to display files or folders in the List view in a vertical list form. A check mark precedes the command in the menu when List is selected.
Details	Causes the application to display files or folders in the List view in a detailed column format which includes the file size and last modified date of each file. A check mark precedes the command in the menu when Details is selected. When you select Details, you can click on the column names in the List view to reorder the contents of the directory by file name, by file size, or by file date.
Arrange Icons	Sets the display order for the folders and files in the List view. You can arrange the List view display by Name, Size, or Date.
Refresh	Refreshes the file display in the List view.

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Remote Menu

The Remote menu contains commands that load the transport stream file or preset file and control the data output of the MPEG generator. Table B-6 describes each of the Remote menu commands.

Table B-7: MTG Comm+ Remote menu commands

Command	Function
Load	Loads the selected stream file or preset file.
Run	Starts the stream output on the MPEG generator.
Stop	Stops the stream output on the MPEG generator.

Utility Menu

The Utility menu contains commands for setting the network parameters.

Table B-8: MTG Comm+ Utility menu commands

Command	Function
Network	Opens the Ethernet dialog box where you can set the host name (IP address) and port number of the target MPEG generator. Refer to *Ethernet Parameters for MTG Comm+* on page B-6 for more information.
Check Error	Opens the MTG Error dialog box which lists the error(s) detected in the MPEG generator.
Options	Opens the Set Options dialog box where you can specify whether or not the ISDB_S files (S-TMCC file and M-TMCC file) are checked in the standard detemination procedures and which text editor application you will use to describe a private section definition file in the User Check dialog box. Refer to *Set Options Dialog Box* on page B-19 for detailed information about the dialog box parameters.

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Set Options Dialog Box. The Set Options dialog box (See Figure B-7) appears after you select Options command in the Utility menu. Table B-9 describes the Set Option dialog box parameters.

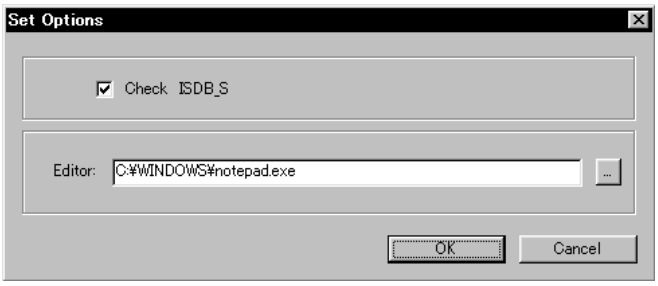


Figure B-7: Set Options dialog box

Table B-9: Set Options dialog box parameters

Parameter	Description
Check ISDB_S	Sets whether or not the S-TMCC and M-TMCC files are checked in the standard determination procedures. Refer to *Automatic Determination of Standard* on page B-23 for detailed information.
Editor	Specifies which text editor application you will use to describe a private section definition file in the User Check dialog box. Refer to *User Check Dialog Box* on page B-13 for more information.

Help Menu

The Help menu About... command displays information including the MTG Comm+ software version number and copyright information.

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MTG Comm+ Tutorials

After you have connected the MPEG generator to the PC using an Ethernet cable and set the required network parameters, you can use MTG Comm+ to transfer files between the PC and the MPEG generator.

***NOTE**. The convention used by the MTG Comm+ application is to call file transfers from the PC to the MPEG generator a "download," and to call file transfers from the MPEG generator to the PC an "upload."*

Downloading a File to the MPEG Generator

This subsection provides the procedures to download a stream file, an insertion file, or a preset file from the PC to the MPEG generator.

Stream File. Perform the following steps to download a stream file from the PC to the MPEG generator:

1. Select **PC to MTG...** from the **File** pull-down menu to open the PC to MTG Download dialog box.
2. In the PC to MTG Download dialog box, highlight the stream file on the PC that you want to download, and then click the **Download** button to open the **User Check** dialog box shown in Figure B-5 on page B-13.



***CAUTION.** Refer to* Transport Stream File Requirements *on page B-7 for important information about the requirements for transport stream files you may want to transfer. Be sure to read the Caution note on page B-8 before you operate the User Check dialog box.*

3. Select the desired parameters in the User Check dialog box, and then click the **OK** button to download the file. Refer to *User Check Dialog Box* on page B-13 for more information.

***NOTE**. You can download more than one stream file from the PC to the MPEG generator using drag-and-drop operation.*

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Insertion file. Perform the following steps to download an insertion file from the PC to the MPEG generator:

1. Select **PC to MTG...** from the **File** pull-down menu to open the PC to MTG Download dialog box.
2. In the PC to MTG Download dialog box, highlight the insertion file on the PC that you want to download, and then click the **Download** button to open the **Insert File** dialog box shown in Figure B-8.

CAUTION. *Refer to* Transport Stream File Requirements *on page B-7 for important information about the requirements for transport stream files you may want to transfer.*

3. In the Insert File dialog box, confirm the insertion file than you want to download to the MPEG generator by clicking the **OK** button to download the file.



Figure B-8: MTG Comm+ Insert File dialog box

Preset file. Perform the following steps to download a preset file from the PC to the MPEG generator:

1. Select **PC to MTG...** from the **File** pull-down menu to open the PC to MTG Download dialog box.
2. In the PC to MTG Download dialog box, highlight the preset file on the PC that you want to download, and then click the **Download** button to open the **Insert File** dialog box shown in Figure B-9.

CAUTION. *Refer to* Transport Stream File Requirements *on page B-7 for important information about the requirements for transport stream files you may want to transfer.*

3. In the Preset File dialog box, confirm the preset file that you want to download.

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4. When you click the **Edit** button, you can view the content of the preset file and edit it.

5. Click the **OK** button to download the file.

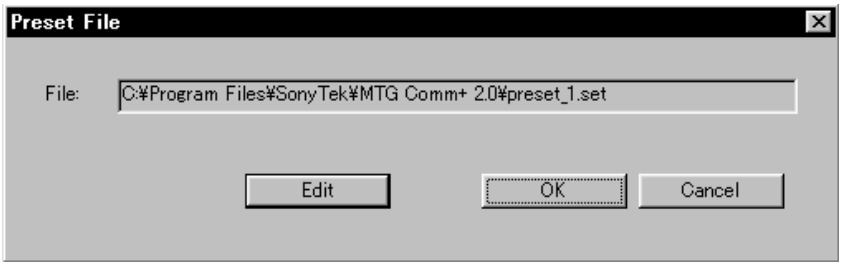


Figure B-9: MTG Comm+ Preset File dialog box

Uploading a File to the PC

The procedure for uploading a file from the MPEG generator to the PC is the same for a stream file, an insertion file, and a preset file.

Perform the following steps to upload a stream file, an insertion file, or a preset file from the MPEG generator to the PC:

1. In the List view of the MTG Comm+ application, select the file you want to upload to the PC.

2. Select **MTG to PC...** from the **File** pull-down menu to open the MTG to PC Upload dialog box.

3. In the MTG to PC Upload dialog box, specify the destination folder for the file you are going to upload to your PC.

4. Click the **Upload** button to upload the file from the MPEG generator to your PC.

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Automatic Determination of Standard

MTG Comm+ automatically determines the standard of the selected stream file using the procedures shown in Figures B-10 and B-11.

In general, it is recommended to use the standard selected as the result of the automatic determination. If you change the standard as shown below, the stream file may not be analyzed correctly.

- From Non TS to a standard other Non TS
- From MPEG2, ATSC, DVB, or ARIB to S-TMCC or M-TMCC
- From M-TMCC to MPEG2, ATSC, DVB, or ARIB

If more than 650 stream items (icons) ware recognized in the stream file, no further icon may be created.

When you click the **Check ISDB_S** option in the Set Option dialog box (See Figure B-7 on page B-19) to off, you can skip the file check procedure for the M-TMCC and S-TMCC files.

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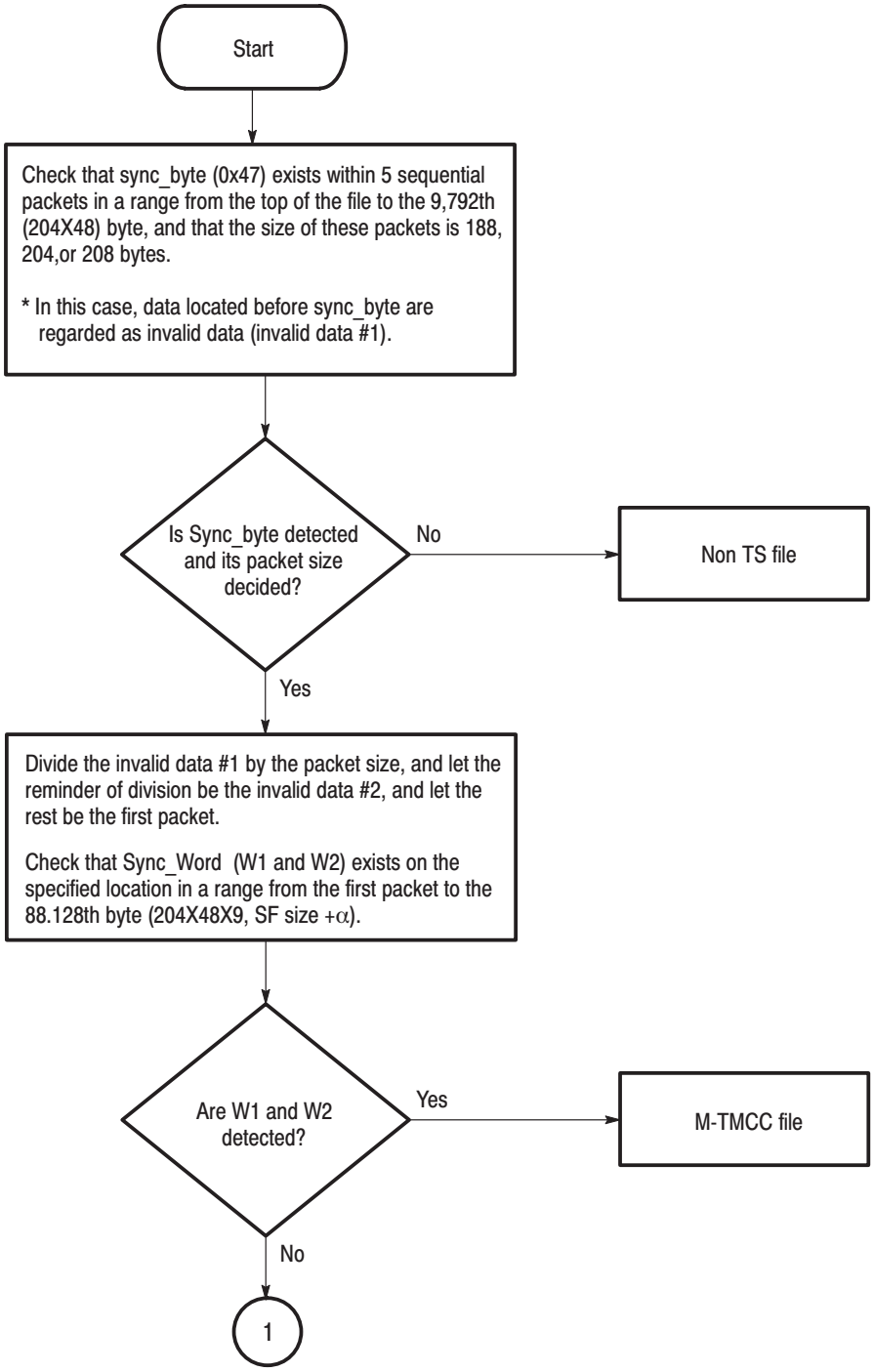


Figure B-10: Automatic recognition of standard (1)

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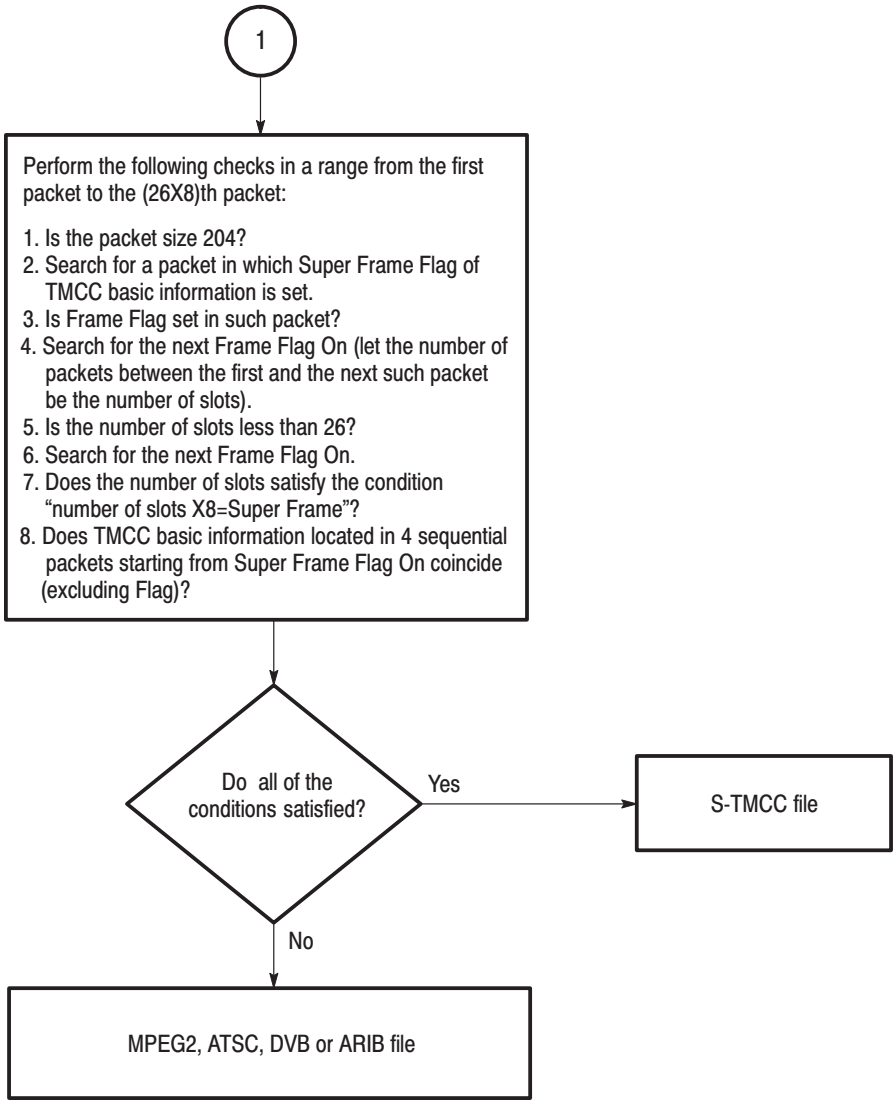


Figure B-11: Automatic recognition of standard (2)

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Appendix C: Using the ReMux Application

ReMux is the application software that can be accessed from the toolbar of the MTG Comm+ application. ReMux provides the capability to create a transport stream of super frame structure defined in the ISDB-S system from a MPEG2 transport stream.

This section describes the functions of the ReMux application and how to create a transport stream of super frame structure.

Refer to *Appendix B: Using MTG Comm+ for File Transfers* for detailed information about the MTG Comm+ application.

***NOTE**. The ReMux application cannot handle files larger than 2 GB.*

Starting the ReMux Application

Click the ReMux icon in the toolbar of the MTG Comm+ application window to start the application.



Figure C-1: Location of the Remux icon

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Elements of the ReMux Window

Figure C-2 shows the ReMux application window. Table C-2 provides a description of the elements in the application window.

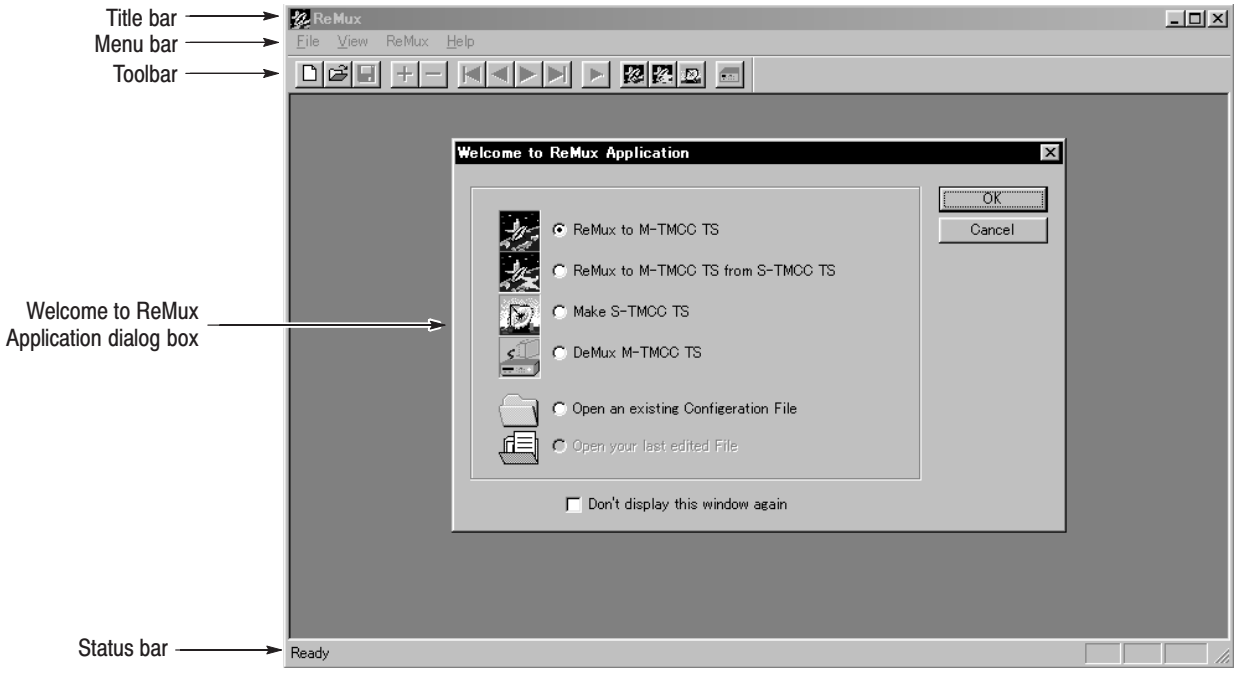


Figure C-2: ReMux application window

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Table C-1: Elements of the ReMux window

Element	Description
Title bar	The Title bar displays the name of the application and contains the standard window-sizing boxes for Windows.
Menu bar	The Menu bar displays the names of the six pull-down menus. Refer to *Using the ReMux Menus* on page C-5 for detailed information about the functions available in the menus.
Toolbar	The toolbar provides shortcut buttons for many of the most often used menu commands. Click a toolbar button to select the corresponding command. You can toggle the toolbar display on and off using the Toolbar command in the View pull-down menu. Table C-2 describes the function of each toolbar button.
Welcome to Re-Mux Application dialog box	Use this dialog box to select the operation mode. ● ReMux to M-TMCC TS: Create a transport stream of M-TMCC structure from a transport stream. ● ReMux to M-TMCC TS from S-TMCC TS: Create a transport stream of M-TMCC structure from a transport stream of S-TMCC structure. ● Make S-TMCC TS: Creates a transport stream of S-TMCC structure from a transport stream. ● DeMux M-TMCC TS: De-multiplexes (i.e., separates) the original transport stream from a transport stream of M-TMCC structure. ● Open an existing Configuration File: Opens a stored configuration file (.cfg). ● Open your last edited File: Opens the file used last (configuration file or transport stream file). You can toggle the dialog box display on or off using the OPTION dialog box. Refer to *OPTION Dialog Box* on page C-7 for detailed information about the dialog box.
Status bar	The status bar displays the short explanation of the currently selected command and information related to the operation. You can toggle the status bar display on and off using the Status Bar command in the View pull-down menu.

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Table C-2: Toolbar button descriptions

Icon	Name	Function
	New	Equivalent to the **New** command in the File menu.
	Open	Equivalent to the **Open** command in the File menu.
	Save	Equivalent to the **Save** command in the File menu.
	Add	Equivalent to the **Add** command in the Edit menu.
	Delete	Equivalent to the **Delete** command in the Edit menu.
	First	Equivalent to the **First** command in the Edit menu.
	Previous	Equivalent to the **Previous** command in the Edit menu.
	Next	Equivalent to the **Next** command in the Edit menu.
	Last	Equivalent to the **Last** command in the Edit menu.
	Execute	Equivalent to the **Execute** command in the ReMux menu.
	ReMux to M-TMCC TS	Equivalent to the **Mode: ReMux to M-TMCC TS** command in the ReMux menu.
	ReMux to M-TMCC TS from S-TMCC TS	Equivalent to the **Mode: ReMux to M-TMCC TS from S-TMCC TS** command in the ReMux menu.
	Make S-TMCC TS	Equivalent to the **Mode: Make S-TMCC TS** command in the ReMux menu.
	DeMux to M-TMCC TS	Equivalent to the **Mode: DeMux to M-TMCC TS** command in the ReMux menu.

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Using the ReMux Menus

The Menu bar displays the name of the six pull-down menus: File, Edit, View, ReMux, Window, and Help. This section describes the function of each selection in these menus.

File Menu

The File menu contains commands for managing file operations and for exiting the ReMux application. Table C-3 describes each of the File menu commands.

Table C-3: ReMux File menu commands

Command	Function
New	Opens the Select Remux Mode dialog box where you can select the mode to execute. Refer to *Select Remux Mode Dialog Box* on page C-5 for detailed information about the dialog box parameters.
Open...	Opens a saved configuration file or a transport stream file of M-TMCC structure. If you try to open the other files, an error message appears.
Close	Closes the active window.
Save	Saves the active window settings to a configuration file.
Save As...	Saves the active window settings to the specified configuration file.
Exit	Exits the ReMux application.

Select Remux Mode Dialog Box. The Select Remux Mode dialog box (see Figure C-3) appears after you select the New command in the File menu. Select one of the ReMux mode, and then click the **OK** button. Table C-4 describes the Select Remux Mode dialog box parameters.

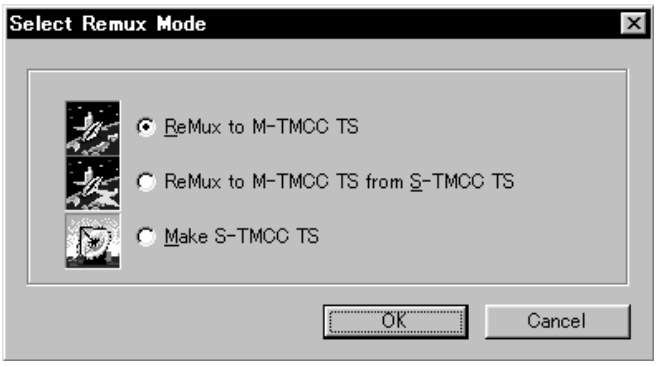


Figure C-3: Select Remux Mode dialog box

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Table C-4: Select Remux Mode dialog box parameters

Parameter	Description
ReMux to M-TMCC TS	Creates a transport stream of M-TMCC structure from a transport stream.
ReMux to M-TMCC TS from S-TMCC TS	Creates a transport stream of M-TMCC structure from a transport stream of S-TMCC structure.
Make S-TMCC TS	Creates a transport stream of S-TMCC structure from a transport stream.

Edit Menu

The Edit menu contains commands that control TMCC information display and add/delete TMCC information and transport stream. Table C-5 describes each of the Edit menu commands.

Table C-5: ReMux File menu commands

Command	Function
Previous	Displays the previous TMCC information.
Next	Displays the next TMCC information.
First	Displays the first TMCC information.
Last	Displays the last TMCC information.
Add	Adds TMCC information or a transport stream.
Delete	Deletes TMCC information or a transport stream.

ReMux Menu

The ReMux menu contains commands that execute the selected operation, select a ReMux mode, and select option settings. Table C-6 describes each of the ReMux menu commands.

Table C-6: ReMux ReMux menu commands

Command	Function
Execute	Executes the ReMux or DeMux operation.
Mode	Selects a ReMux mode. This command has the same function as the New command in the File menu.
Option	Opens the OPTION dialog box where you can set the TS ID of the transport stream(s) inserted as a dummy and toggle the Welcome dialog box display on or off. Refer to *OPTION Dialog Box* on page C-7 for detailed information about the dialog box parameters.

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OPTION Dialog Box. The OPTION dialog box (see Figure C-4) appears after you select the Option command in the ReMux menu. Table C-4 describes the Select Remux Mode dialog box parameters.



Figure C-4: OPTION dialog box

Table C-7: OPTION dialog box parameters

Parameter	Description
Dummy TSID	In ReMux to M-TMCC TS or ReMux to M-TMCC TS from S-TMCC mode, if the number of slots of the transport stream of M-TMCC structure are less than 48, dummy transport stream(s) is(are) inserted automatically so that the number of slots are equal to 48. This parameter sets the transport stream ID of them.
Show "Welcome" Window	Sets whether or not the Welcome to ReMux Application dialog box appeared when you start the ReMux application is displayed.

Window Menu

The Window menu contains commands that control the appearance of the editing windows and open the new window. Table C-8 describes each of the Window menu commands.

Table C-8: ReMux Window menu commands

Command	Function
New Window	Opens the new window with settings same with those of the active window.
Cascade	Arranges the editing windows so that they overlap one another.
Tile	Arranges the editing windows so that they do not overlap each other.
Arrange Icons	When the editing windows are minimize, arranges their title bars.

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View Menu

The View menu contains commands that control the appearance of the ReMux application window. Table C-9 describes each of the View menu commands.

Table C-9: ReMux View menu commands

Command	Function
Toolbar	Toggles the display of the Toolbar on and off in the application window. A check mark precedes the command in the menu when the Toolbar is selected for display.
Status Bar	Toggles the display of the Status bar on and off in the application window. A check mark precedes the command in the menu when the Status bar is selected for display.

Help Menu

The Help menu About ReMux... command displays information including the ReMux software version number and copyright information.

ReMux Tutorials

This subsection describes the basics of operating the ReMux application.

Make S-TMCC TS Mode

This mode allows you to create a transport stream of S-TMCC structure from a transport stream.

This subsection describes the procedure to create a transport stream of S-TMCC structure from a transport stream.

1. Select **New** from the **File** pull-down menu or click the **New** button on the toolbar to open the **Select Remux Mode** dialog box shown in Figure C-3 on page C-5.
2. Select **Make S-TMCC TS** in the dialog box, and then click the **OK** button to open the editing window for the Make S-TMCC TS mode shown in Figure C-5.

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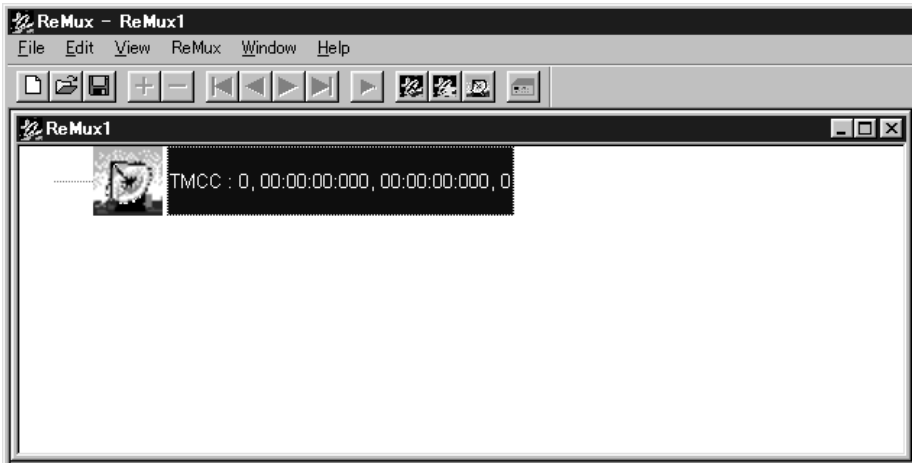
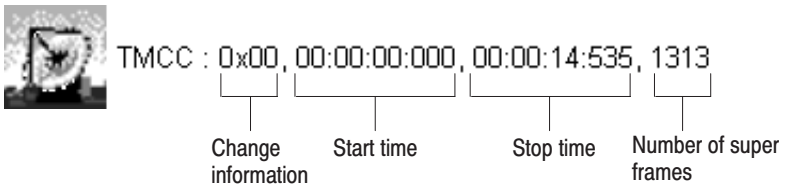


Figure C-5: Editing window for the Make S-TMCC TS mode

The information displayed at the right side of the TMCC icon has following meaning:



Selecting a Transport Stream File.

3. Select **Add** from the **Edit** pull-down menu or clock the + (Add) button on the toolbar to open the **Open** dialog box.

4. In the dialog box, select a transport stream file, and then click the **Open** button to open the **Edit TS Information** dialog box shown in Figure C-6.

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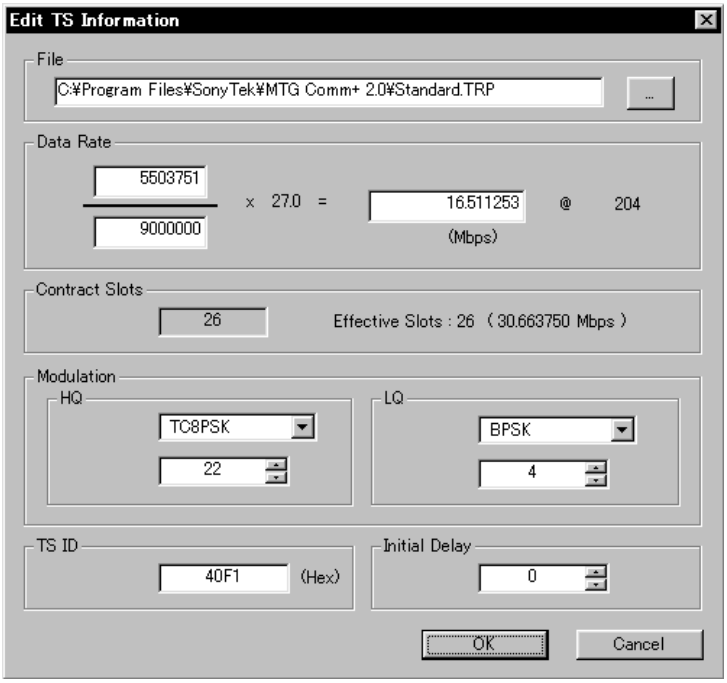


Figure C-6: Edit TS Information dialog box

In this dialog box, you can set the following parameters:

- **File**: Specifies the transport stream file to be converted to a transport stream file of S-TMCC structure.
- **Data Rate**: Specifies the data rate of the transport stream. You cannot set the value exceed the data rate of the effective slots. If this value is less than the data rate of the effective slot, in addition, conversion of the data rate is done with the insertion of null packets.
- **Contract Slots**: Shows the number of contract slots. This value depends on the number of slots set in the Modulation item.
- **Modulation**: Specifies the modulation system and the number of slots to be assigned to HQ and LQ when performed hierarchical data transfer.
  - **HQ**: Specifies the modulation system and the number of slots to be assigned to HQ level.
  - **LQ**: Specifies the modulation system and the number of slots to be assigned to LQ level. This field is enabled only when the hierarchical control descriptor exists in PMT.
- **TS ID**: Specifies the transport stream ID. This value is used to change the ID value in TMCC, and the ID value in PAT is not changed.

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- **Initial Delay**: Specifies the number of delay packets (i.e., null packets) to be inserted at the start of re-multiplex. You can set the value in the range of 0 to 65535.

5. After you change the parameters, click the **OK** button to confirm the changes and close the dialog box.

   This displays a transport stream icon under the TMCC icon (See Figure C-7).

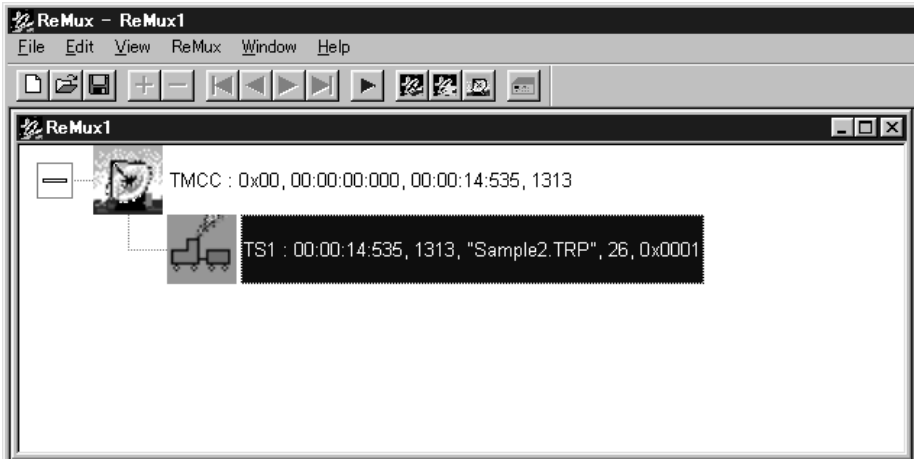
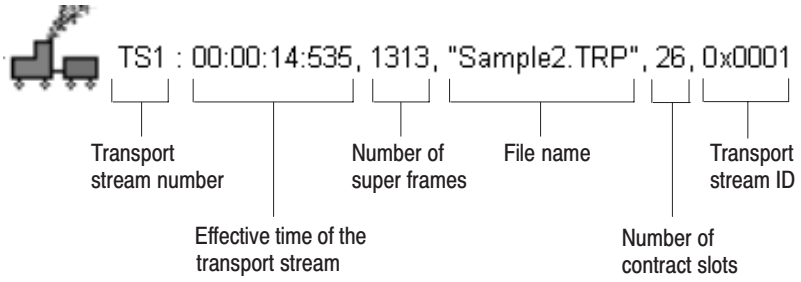


Figure C-7: Window displaying a transport stream icon

The information displayed at the right side of the transport stream icon has following meaning:



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Editing the TMCC Information for the Transport Stream.

6. Double-click the TMCC icon to open the **Edit TMCC Information** dialog box to edit the TMCC information for the transport stream (See Figure C-8).

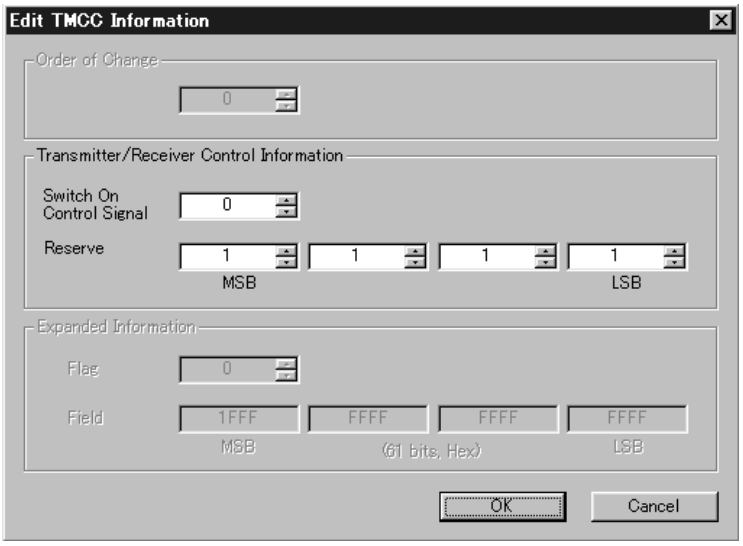


Figure C-8: Edit TMCC Information dialog box (S-TMCC)

In this dialog box, you can set the following parameters:

- **Transmitter/Receiver Control Information**: Sets the transmission/receiving control information.
  - **Switch On Control Signal**: Sets the start control signal to on (1) or off (0).
  - **Reserve**: Sets the reserve bit.

7. After you change the parameters, click the **OK** button to confirm the changes and close the dialog box.

Creating a Transport Stream of S-TMCC Structure.

8. Select **Execute** in the **ReMux** pull-down menu or click the ▶ (Execute) button to open the **Save As...** dialog box.

9. In the dialog box, specify a file name, and then click the **Save** button.

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ReMux to M-TMCC TS from S-TMCC TS Mode

This mode allows you to create a transport stream of M-TMCC structure from a transport stream of S-TMCC structure.

This subsection describes the procedure to create a transport stream of M-TMCC structure from a transport stream of S-TMCC structure.

1. Select **New** from the **File** pull-down menu or click the **New** button on the toolbar to open the **Select Remux Mode** dialog box shown in Figure C-3 on page C-5.
2. Select **ReMux to M-TMCC TS from S-TMCC TS** in the dialog box, and then click the **OK** button to open the editing window for the ReMux to M-TMCC TS from S-TMCC TS mode shown in Figure C-9.

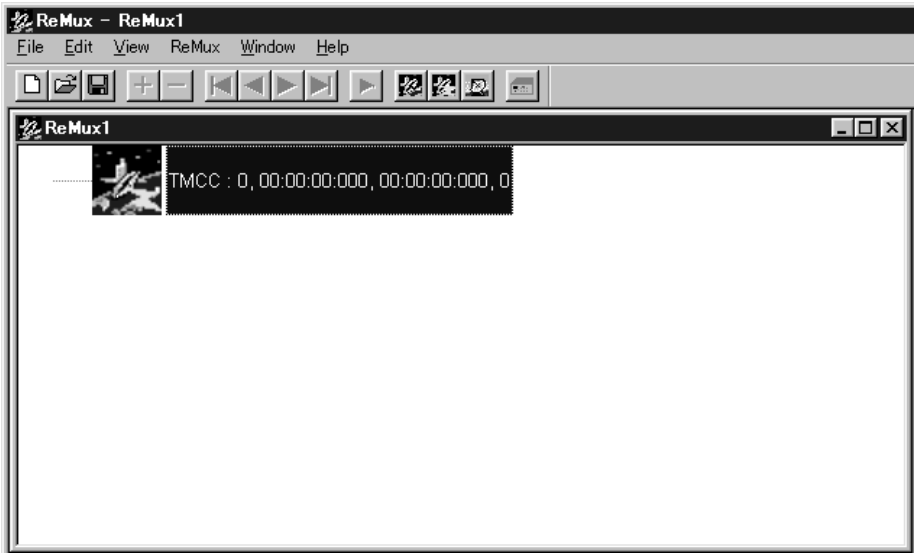


Figure C-9: Editing window for the ReMux to M-TMCC TS from S-TMCC TS mode

Selecting a Transport Stream File.

3. Select **Add** from the **Edit** pull-down menu or click the + (Add) button on the toolbar to open the **Open** dialog box.
4. In the dialog box, select a transport stream file having S-TMCC structure, and then click the **Open** button to open the **Edit TS Information** dialog box shown in Figure C-6 on page C-10.

***NOTE**. If you select a transport stream file having no S-TMCC structure, an error message appears.*

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5. In the dialog box, set the parameters, and then click the **OK** button. This displays a transport stream icon in the window.

Multiplexing Transport Streams.

In the ReMux to M-TMCC TS from S-TMCC TS mode, you can multiplex transport streams of S-TMCC structure until the total number of slots reached to 48.

6. Select **Add** from the **Edit** pull-down menu or click the **+** (Add) button on the toolbar to open the **Open** dialog box.

7. In the dialog box, select a transport stream file having S-TMCC structure, and then click the **Open** button to open the **Edit TS Information** dialog box shown in Figure C-6 on page C-10.

8. In the dialog box, set the parameters, and then click the **OK** button.

   This multiplexes the newly selected transport stream and the transport stream icon is added in the window (See Figure C-10).

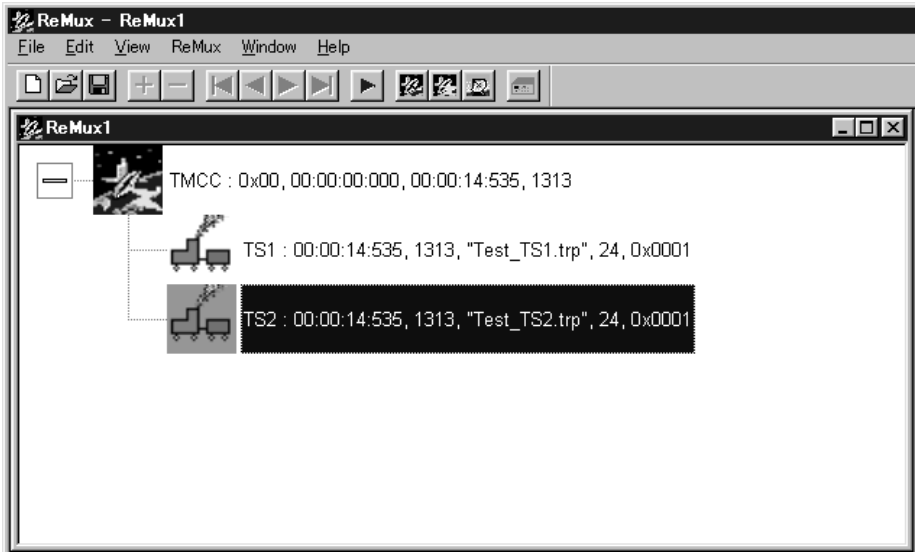


Figure C-10: Transport stream is multiplexed

9. If you want to multiplex more transport streams, repeat steps 6 through 8.

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Editing the TMCC Information for the Transport Stream.

10. Double-click the TMCC icon to open the **Edit TMCC Information** dialog box for editing the TMCC information for the transport stream (See Figure C-11).

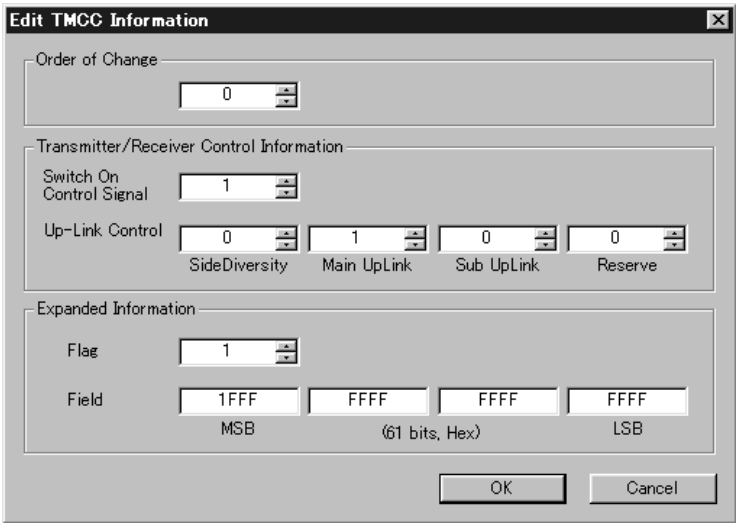


Figure C-11: Edit TMCC Information dialog box (M-TMCC)

In this dialog box, you can set the following parameters:

- **Order of Change**: Sets the TMCC change instruction. You can set the value in the range of 0 to 31.
- **Transmitter/Receiver Control Information**: Sets the transmission/receiving control information.
  - **Switch On Control Signal**: Sets the control signal on (1) or off (0).
  - **Up-Link Control**: Controls the up-link switching.
- **Extended Information**: Sets the extended information. When you set the Flag (extension flag) item to 1, the Field item becomes active.

11. After you change the parameters, click the **OK** button to confirm the changes and close the dialog box.

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Creating a Transport Stream of M-TMCC Structure.

12. Select **Execute** in the **ReMux** pull-down menu or click the ▶ (Execute) button to open the **Save As...** dialog box.

13. In the dialog box, specify a file name, and then click the **Save** button.

    If the number of slots of the transport stream of M-TMCC structure you are going to create is less than 48, a dummy transport stream(s) is(are) inserted so that the number of slots reached to 48. The transport stream thus inserted has the ID value set in the OPTION dialog box (See Figure C-4 on page C-7) and TS8PSK is used as the modulation system.

Multiplexing Transport Streams of M-TMCC Structure with Different TMCC Information.

In the ReMux to M-TMCC TS from S-TMCC TS mode, you can multiplex a transport stream of M-TMCC structure with a transport stream of M-TMCC structure having different TMCC information.

14. Click the TMCC icon.

15. Select the **Add** command from the **Edit** pull-down menu or click the **+** (Add) button on the toolbar to open the **Add TMCC** dialog box as shown in Figure C-12.

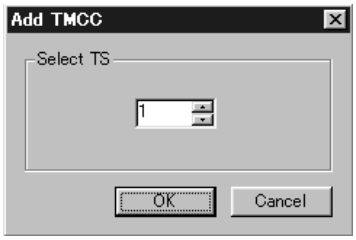
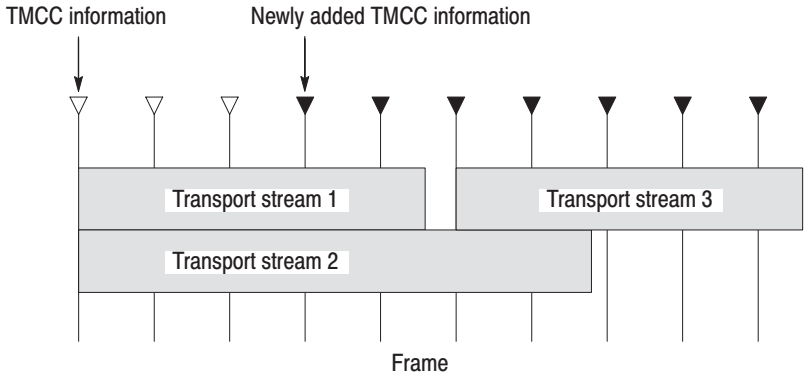


Figure C-12: Add TMCC dialog box

In this dialog box, you can specify the transport stream to which the new TMCC information is inserted if more than one transport stream is multiplexed.

The following illustration shows the positional relationship of TMCC information and the transport stream to be inserted to the transport streams already multiplexed.

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This illustration shows the positional relationship when inserted TMCC information and the transport stream 3 after the transport stream 1 while two transport streams have been multiplexed. The new TMCC information is inserted to the position two frames before the location to which the transport stream to be newly multiplexed is inserted.

16. In the Add TMCC dialog box, select a transport stream number, and then click the **OK** button to open the **Edit TMCC Information** dialog box for editing the TMCC information (See Figure C-11).

17. After you change the parameters, click the **OK** button to confirm the changes and close the dialog box.

    This opens a new editing window with a TMCC icon displayed. In this case, note the increase of the value indicating change instruction at the right side of the TMCC icon. In addition, the **First** and **Previous** buttons on the toolbar change their color to green indicating that a TMCC exists before this TMCC.

18. Repeat steps 3 through 5 to select a transport stream file.

19. Repeat steps 6 through 8 to multiplex the transport stream file.

20. If you want to further multiplex a transport stream(s) of M-TMCC structure having different TMCC information, repeat steps 14 through 19.

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Creating a Transport Stream of M-TMCC Structure.

21. Select **Execute** in the **ReMux** pull-down menu or click the ▶ (Execute) button to open the **Save As...** dialog box.

22. In the dialog box, specify a file name, and then click the **Save** button.

    If the number of slots of the transport stream of M-TMCC structure you are going to create is less than 48, a dummy transport stream(s) is(are) inserted so that the number of slots reached to 48. The transport stream thus inserted has the ID value set in the OPTION dialog box (See Figure C-4 on page C-7) and TS8PSK is used as the modulation system.

ReMux to M-TMCC TS Mode

This mode allows you to create a transport stream of M-TMCC structure from a transport stream. In this mode, two Remux functions are simultaneously executed: the Make S-TMCC TS and the ReMux to M-TMCC TS from S-TMCC TS mode.

This subsection describes the procedure to create a transport stream of M-TMCC structure from a transport stream.

1. Select **New** from the **File** pull-down menu or click the **New** button on the toolbar to open the **Select Remux Mode** dialog box shown in Figure C-3 on page C-5.

2. Select **ReMux to M-TMCC** in the dialog box, and then click the **OK** button to open the edit window for the ReMux to M-TMCC TS mode shown in Figure C-13.

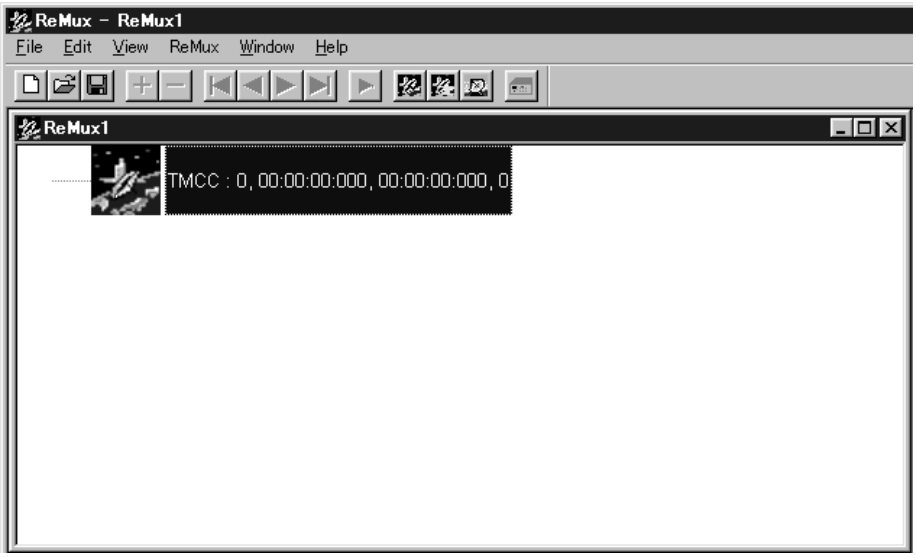


Figure C-13: Editing window for the ReMux to M-TMCC TS mode

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Selecting a Transport Stream File.

3. Select **Add** from the **Edit** pull-down menu or clock the + (Add) button on the toolbar to open the **Open** dialog box.

4. In the dialog box, select a transport stream file, and then click the **Open** button to open the **Edit TS Information** dialog box shown in Figure C-6 on page C-10.

5. In the dialog box, set the parameters, and then click the **OK** button. This will display a transport stream icon in the window.

Multiplexing Transport Streams.

6. With steps 6 through 9 on page C-14, multiplex the transport streams.

Editing the TMCC Information for M-TMCC.

7. With step 10 on page C-15, edit the TMCC information for M-TMCC.

Multiplexing Transport Streams of M-TMCC Structure with Different TMCC Information.

8. With steps 14 through 20 on page C-16 and C-17, multiplex the transport stream of M-TMCC structure having different TMCC information.

Creating a Transport Stream of M-TMCC Structure..

9. With steps 21 and 22 on page C-18, create a transport stream of M-TMCC structure.

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DeMux M-TMCC TS Mode

This mode allows you to de-multiplex (separate) the original transport stream from a transport stream of M-TMCC structure. The transport stream thus de-multiplexed, in addition, is bit-rate converted to a packet form of 204 bytes.

This subsection describes the procedure to de-multiplex the original transport stream from a transport stream of M-TMCC structure.

1. Select **DeMux** from the **ReMux** pull-down menu or click the **DeMux M-TMCC TS** button on the toolbar to open the **Open** dialog box.
2. In the dialog box, select a transport stream file of M-TMCC structure, and then click the **Open** button to open the editing window for the DeMux M-TMCC TS mode shown in Figure C-14.

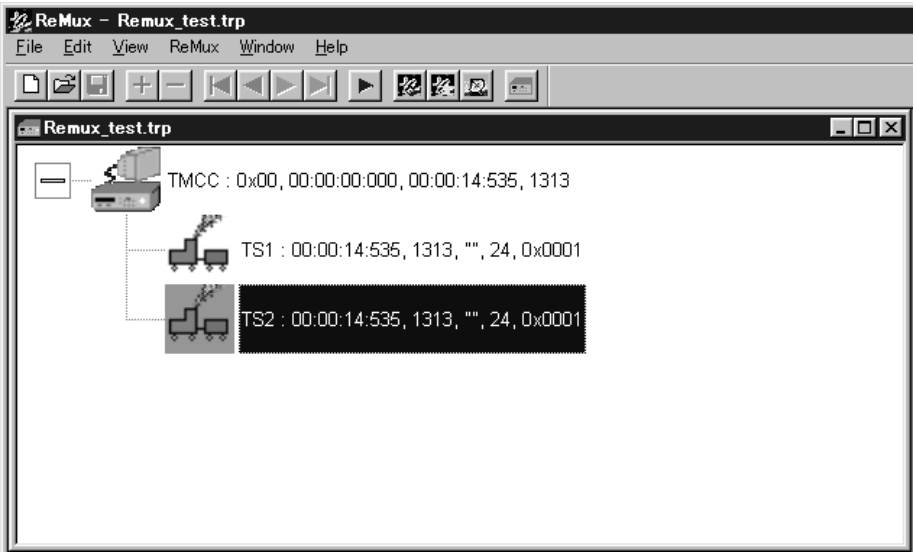


Figure C-14: Editing window for the DeMux M-TMCC TS mode

***NOTE**. If you select a transport stream file having no M-TMCC structure, an error message appears.*

3. Select **Execute** in the **ReMux** pull-down menu or click the ▶ (Execute) button to open the **DEMUX** dialog box shown in Figure C-15.

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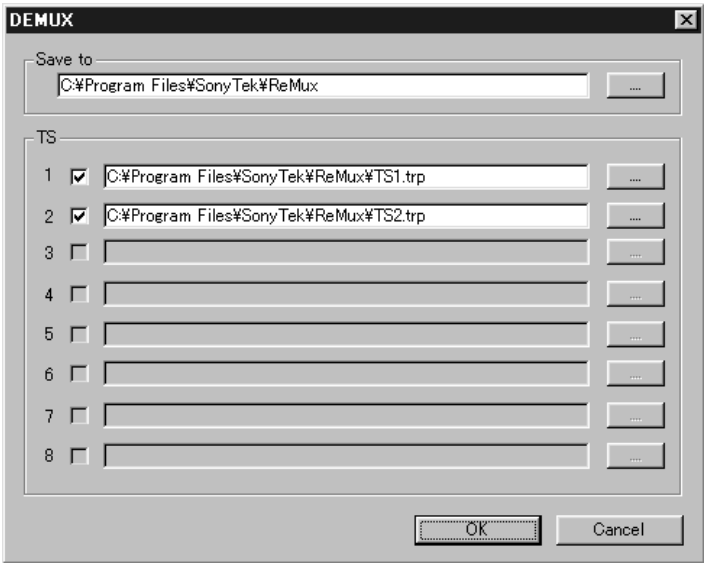


Figure C-15: DEMUX dialog box

In this dialog box, you can set the following parameters:

- **Save to**: Specifies the directory to which the de-multiplexed transport stream to be saved.
- **TS**: Selects the transport stream(s) to be de-multiplexed. Click the check box at the front of the file name to select the file to be de-multiplexed. When you click the **...** button at the right side of file name, the Save As... dialog box appears, and you can specify a file name and save the file.

4. After you select the directory and transport stream(s), click the **OK** button. The transport stream(s) is(are) de-multiplexed and saved to the directory.

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Appendix D: Performance Verification

This appendix provides procedures which verify the performance of the MPEG generator. These tests comprise a valid confirmation of performance and functionality when the following conditions are met:

- The MPEG generator must be operating in an environment that is within the operating limits described in Table A-4 on page A-8.
- The MPEG generator and test equipment must have had a warm-up period of at least 20 minutes.

Equipment and Test Signals Required

Table D-1 lists the test equipment required to perform all of the performance verification procedures. The table identifies examples of recommended equipment and lists the required precision where applicable. If you substitute other test equipment for the examples listed, the equipment must meet or exceed the listed tolerances.

Table D-1: Equipment required for performance verification

Item	No.	Minimum requirements	Recommended equipment
Frequency counter	1	Frequency range: 0.1 Hz to 1250 MHz Precision: 7 digits or higher	ANRITSU MF 1603A
Signal generator	1	Frequency: 27 MHz ±1 ppm Amplitude: 0.0 dBm	HP 8648
Oscilloscope	1	Bandwidth: 1 GHz or higher	Tektronix TDS784D
MPEG analyzer	1	Real Time Analyzer, Deferred Time Analyzer, and Data Store Administrator applications	Tektronix MTS205 or MTS215 option SS
75 Ω to 50 Ω minimum loss attenuator	1	Bandwidth: 1 GHz Amplitude precision: –3 dB	Tektronix AMT75
Probe	1	X 1	Tektronix P6101B
BNC cable	1	Impedance: 50 Ω Length: 42 inches	Tektronix part no. 012-0057-01
BNC cable	1	Impedance: 75 Ω Length: 42 inches	Tektronix part no. 012-0074-00
N-to-BNC adapter	1		Tektronix part no. 103-0045-00
Custom interface cable	1	Type: 9-pin, D-type (male) – to – 25-pin, D-type (male), see Figure D-1 Length: 1 m to 2 m (as needed)	Custom interface cable, see Figure D-1.
Parallel interface cable	1	25-pin, D-type, twisted pair	Tektronix part no. 174-3882-01, (supplied with the MPEG generator)

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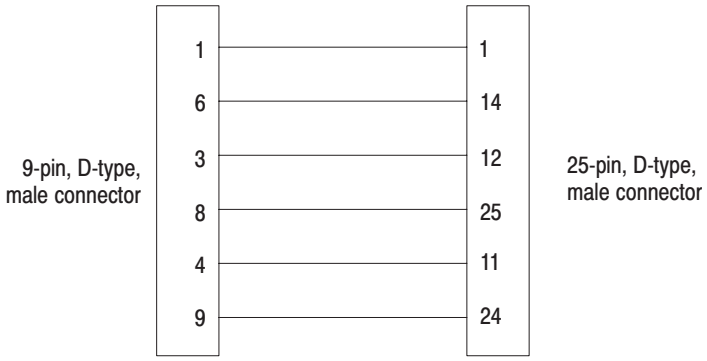


Figure D-1: Custom cable with 9-pin and 25-pin, D-type connectors

The MPEG generator is shipped from the factory with sample MPEG test files loaded on the hard disk. Two of these files are required to perform the performance verification procedures. Table D-2 lists the required test files and the performance verification tests that require these files.

Table D-2: MPEG test files required for performance verification

File name	Performance verification tests
test40.trp	SSI Output and External Clock Input
test64.trp	Internal Clock Frequency, ASI Output, Parallel Output, Serial Output, and External Reference Input

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Procedures

The following conventions are used in the performance verification procedures:

- Each test lists the characteristic that is being tested and the equipment required to perform the test.
- Each test contains complete setup instructions, which allows you to perform each test individually or in order.
- The equipment connection illustrations are specific to the recommended equipment (equipment nomenclature is labeled). If you are using substitute equipment, the location of your signal connections may vary from those in the illustrations.

***NOTE**. Before you perform the performance verification procedures, be sure that the MPEG generator is operating in an environment that is within the operating limits described in Table A-4 on page A-8.*

In addition, the MPEG generator and the test equipment must be warmed up for at least 20 minutes to ensure accurate test results.

The performance verification procedures appear in the following order:

1. Internal clock frequency
2. ASI output
3. SSI output
4. Parallel output
5. Serial output
6. External clock input
7. External reference input

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Internal Clock Frequency

This test verifies the frequency of the MPEG generator's internal clock. The following equipment and MPEG test signal is required for this test:

- Frequency counter
- Probe
- test64.trp MPEG test signal

Perform the following procedure to verify the internal clock frequency of the MPEG generator:

1. Connect the probe to the input of the frequency counter, and then attach the probe tip to **pin 1** of the ECL/TTL/LVDS OUT connector on the MPEG generator as shown in Figure D-2.
2. Set the frequency counter to the frequency measurement mode (if necessary). and then set the Gate Time to > 0.2 s.

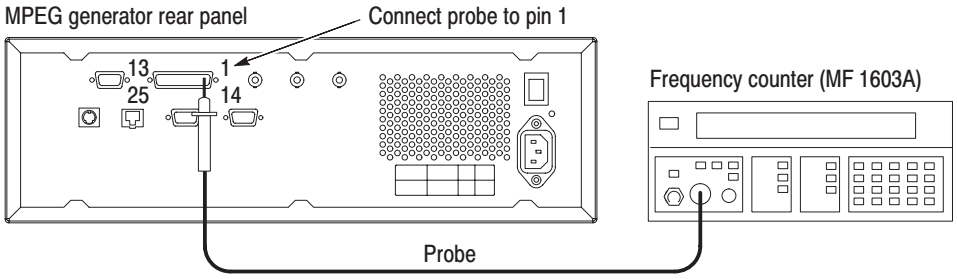


Figure D-2: Equipment connection for verifying the internal clock frequency

3. Open the test64.trp file on the MPEG generator.
   a. Select **Open TS File...** from the **FILE** pull-down menu.
   b. In the resulting **Select TS File** dialog box, select the **test64.trp** file, and then press the **OK** bezel button.
4. Press the **START/STOP** button on the MPEG generator to start the signal output of the test64.trp file.
5. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, and HDD.
6. Set the frequency counter to trigger on the input, and then confirm that the displayed frequency is within the range of 7.999992 MHz to 8.000008 MHz.
7. Press the **START/STOP** button on the MPEG generator to stop the signal output, and then remove the probe tip from the ECL/TTL/LVDS OUT connector.

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ASI Output

This test verifies that transport stream data is output correctly from the ASI OUT connector on the MPEG generator. The following equipment and MPEG test signal is required for this test:

- Oscilloscope
- MPEG test system
- 75 Ω BNC cable
- 75 Ω to 50 Ω minimum loss attenuator
- test64.trp MPEG test signal

Perform the following procedure to verify that transport stream data is output correctly from the ASI OUT connector on the MPEG generator:

1. Connect the ASI OUT connector on the MPEG generator to the oscilloscope CH1 input using a 75 Ω BNC cable and the 75 Ω to 50 Ω minimum loss attenuator as shown in Figure D-3.
2. Set the oscilloscope controls as indicated below:

   Displayed channel CH1
   Vertical axis . . . . . 200 mV/div
   Horizontal axis . . . . . 5 ns/div
   Horizontal position . . . . Center
   Record length 500
   Acquire mode . . . . . Sample
   Acquire sequence . . . . . RUN/STOP button only
   Trigger mode . . . . . Auto
   Trigger level . . . . . 0 V
   Trigger source CH1
   Trigger position . . . . . 50 %
   Trigger slope . . . . . Rising Edge
   Trigger coupling . . . . . DC
   Display style . . . . . Dots
   Input coupling . . . . . DC
   Input impedance . . . . . 50 Ω
   Measure . . . . . Amplitude

3. Open the test64.trp file on the MPEG generator.
   a. Select **Open TS File...** from the **FILE** pull-down menu.
   b. In the resulting **Select TS File** dialog box, select the **test64.trp** file, and then press the **OK** bezel button.
4. Press the **START/STOP** button on the MPEG generator to start the signal output of the test64.trp file.

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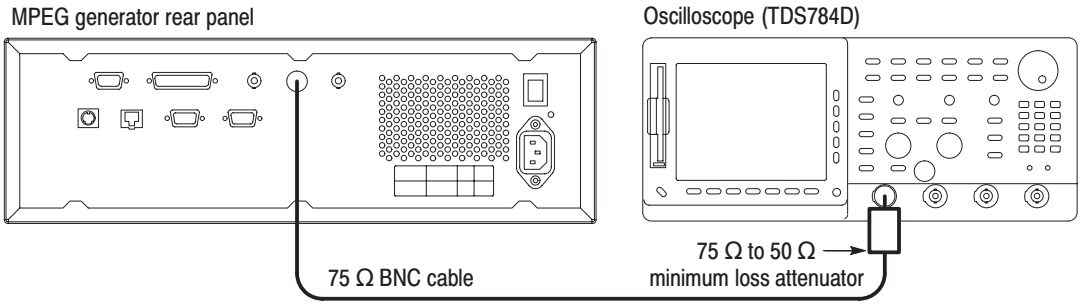


Figure D-3: Initial equipment connection for verifying the ASI output

5. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, and HDD.
6. Use the oscilloscope to measure that the signal amplitude is within the range of 720 mV to 880 mV.
7. Disconnect the BNC cable from the 75 Ω to 50 Ω minimum loss attenuator on the oscilloscope's input, and then connect the BNC cable to the ASI IN connector on the MPEG test system's Real Time Analyzer as shown in Figure D-4.
8. Double-click the **Real Time Analyzer** icon in the MPEG test system's Program Group window to start the application.
9. In the Real Time Analyzer window on the MPEG test system, select **Settings...** from the **Configuration** menu to open the Settings window.
10. In the Settings window, select **Hardware Configuration** to open the Hardware Configuration window.
11. In the Hardware Configuration window, click the **Restore Defaults** button, click the **Apply** button, and then select **DVB-PI ASI** as the Input Type.
12. In the Settings window, select **ETR290** to open the ETR290 configuration window.
13. In the ETR290 window, click the **Restore Defaults** button, click the **Apply** button, and then click **OK** to close the Settings window.

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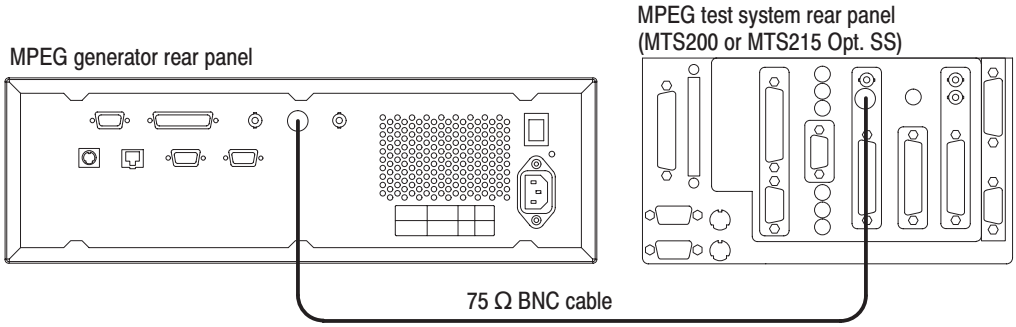


Figure D-4: Second equipment connection for verifying the ASI output

14. In the Real Time Analyzer window, click the **Start Analysis** toolbar button.
15. Verify that the Hierarchic view is displayed on the screen and that no error messages appear. In addition, verify that the transmission rate is 64 Mbps and that the transport stream packet size is 188 bytes.
16. In the Real Time Analyzer window, click the **Stop Analysis** toolbar button to stop analysis.
17. Press the **START/STOP** button on the MPEG generator to stop the signal output, and then remove the BNC cable from the ASI OUT connector.

SSI Output

This test verifies that transport stream data is output correctly from the SSI OUT connector on the MPEG generator. The following equipment and MPEG test signal is required for this test:

- Oscilloscope
- MPEG test system
- 75 Ω BNC cable
- Parallel interface cable
- 75 Ω to 50 Ω minimum loss attenuator
- test40.trp MPEG test signal

Perform the following procedure to verify that transport stream data is output correctly from the SSI OUT connector on the MPEG generator:

1. Connect the SSI OUT connector on the MPEG generator to the oscilloscope CH1 input using a 75 Ω BNC cable and the 75 Ω to 50 Ω minimum loss attenuator as shown in Figure D-5.

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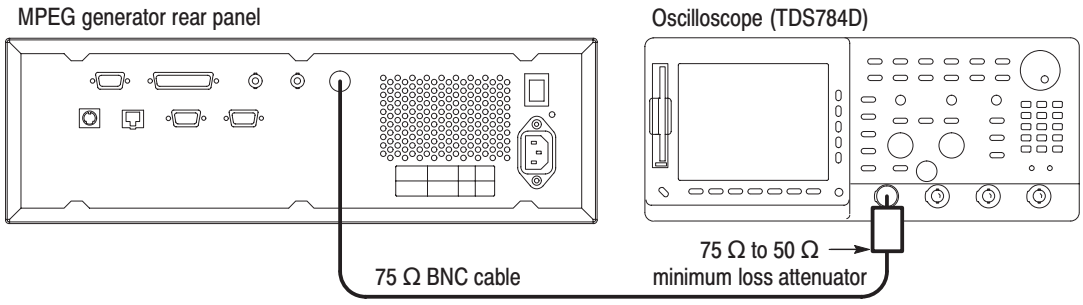


Figure D-5: Initial equipment connection for verifying the SSI output

2. Set the oscilloscope controls as indicated below (only the horizontal axis setting is different from the setup in the ASI Output test):

Displayed channel CH1
Vertical axis . . . . . 200 mV/div
Horizontal axis . . . . . 10 ns/div
Horizontal position . . . . Center
Record length 500
Acquire mode . . . . . Sample
Acquire sequence . . . . . RUN/STOP button only
Trigger mode . . . . . Auto
Trigger level . . . . . 0 V
Trigger source CH1
Trigger position . . . . . 50 %
Trigger slope . . . . . Rising Edge
Trigger coupling . . . . . DC
Display style . . . . . Dots
Input coupling . . . . . DC
Input impedance . . . . . 50 Ω
Measure . . . . . Amplitude

3. Open the test40.trp file on the MPEG generator.

a. Select **Open TS File...** from the **FILE** pull-down menu.

b. In the resulting **Select TS File** dialog box, select the **test40.trp** file, and then press the **OK** bezel button.

4. Press the **START/STOP** button on the MPEG generator to start the signal output of the test40.trp file.

5. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, and HDD.

6. Use the oscilloscope to measure that the signal amplitude is within the range of 720 mV to 880 mV.

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7. Disconnect the BNC cable from the 75 Ω to 50 Ω minimum loss attenuator on the oscilloscope's input, and then connect the BNC cable to the SSI IN connector on the MPEG test system's Real Time Analyzer as shown in Figure D-6.

8. Use the parallel interface cable to connect the SSI parallel output to the Real Time Analyzer parallel input on the MPEG test system rear panel as shown in Figure D-6.

9. Double-click the **Real Time Analyzer** icon in the MPEG test system's Program Group window to start the application.

10. In the Real Time Analyzer window on the MPEG test system, select **Settings...** from the **Configuration** menu to open the Settings window.

11. In the Settings window, select **Hardware Configuration** to open the Hardware Configuration window.

12. In the Hardware Configuration window, click the **Restore Defaults** button, click the **Apply** button, and then select **DVB-PI SPI (LVDS//) or ECL/** as the Input Type.

13. In the Settings window, select **ETR290** to open the ETR290 configuration window.

14. In the ETR290 window, click the **Restore Defaults** button, click the **Apply** button, and then click **OK** to close the Settings window.

15. In the Real Time Analyzer window, click the **Start Analysis** toolbar button.

16. Verify that the Hierarchic view is displayed on the screen and that no error messages appear. In addition, verify that the transmission rate is 40 Mbps and that the transport stream packet size is 188 bytes.

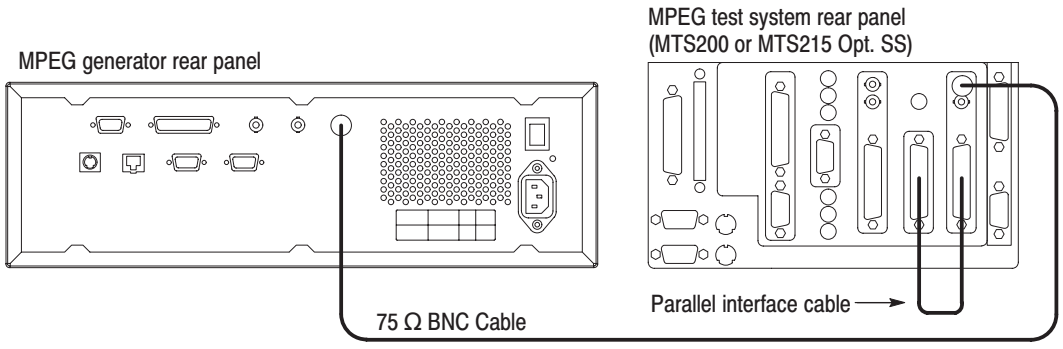


Figure D-6: Second equipment connections for verifying the SSI output

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17. In the Real Time Analyzer window, click the **Stop Analysis** toolbar button to stop analysis.

18. Press the **START/STOP** button on the MPEG generator to stop the signal output, and then remove the BNC cable from the SSI OUT connector.

Parallel Output

This test confirms that transport stream data is output correctly in parallel format from the ECL/TTL/LVDS OUT connector on the MPEG generator. The following equipment and MPEG test signal is required for this test:

- MPEG test system
- Parallel interface cable
- test64.trp MPEG test signal

Perform the following procedure to verify that transport stream data in parallel format is output correctly from the ECL/TTL/LVDS OUT connector on the MPEG generator:

1. Use the parallel interface cable to connect the ECL/TTL/LVDS OUT connector on the MPEG generator to the LVDS/ECL/RS422 Level In connector on the MPEG test system rear panel as shown in Figure D-7.

2. Open the test64.trp file on the MPEG generator.

   a. Select **Open TS File...** from the **FILE** pull-down menu.

   b. In the resulting **Select TS File** dialog box, select the **test64.trp** file, and then press the **OK** bezel button.

3. Select **Level : ECL** from the **OUTPUT** menu on the MPEG generator, and then press the **OK** bezel button.

4. Select **Interface : Parallel** from the **OUTPUT** menu on the MPEG generator, and then press the **OK** bezel button.

5. Press the **START/STOP** button on the MPEG generator to start the signal output of the test64.trp file.

6. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, and HDD.

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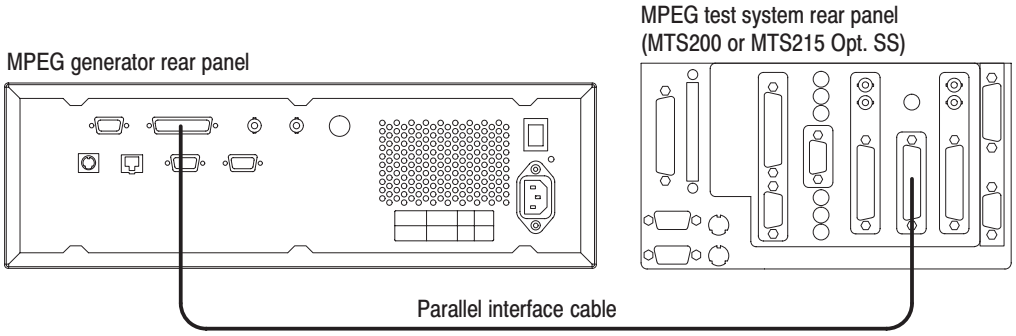


Figure D-7: Equipment connection for verifying the parallel output

7. Double-click the **Real Time Analyzer** icon in the MPEG test system's Program Group window to start the application.
8. In the Real Time Analyzer window on the MPEG test system, select **Settings...** from the **Configuration** menu to open the Settings window.
9. In the Settings window, select **Hardware Configuration** to open the Hardware Configuration window.
10. In the Hardware Configuration window, click the **Restore Defaults** button, click the **Apply** button, and then select **DVB-PI SPI (LVDS//) or ECL//** as the Input Type.
11. In the Settings window, select **ETR290** to open the ETR290 configuration window.
12. In the ETR290 window, click the **Restore Defaults** button, click the **Apply** button, and then click **OK** to close the Settings window.
13. In the Real Time Analyzer window, click the **Start Analysis** toolbar button.
14. Verify that the Hierarchic view is displayed on the screen and that no error messages appear. In addition, verify that the transmission rate is 64 Mbps and that the transport stream packet size is 188 bytes.
15. In the Real Time Analyzer window, click the **Stop Analysis** toolbar button to stop analysis.
16. Press the **START/STOP** button on the MPEG generator to stop the signal output.

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Serial Output

This test confirms that transport stream data is output correctly in serial format from the ECL/TTL/LVDS OUT connector on the MPEG generator. The following equipment and MPEG test signal is required for this test:

- MPEG test system
- Parallel interface cable
- test64.trp MPEG test signal

Perform the following procedure to verify that transport stream data in parallel format is output correctly from the ECL/TTL/LVDS OUT connector on the MPEG generator:

1. Use the parallel interface cable to connect the ECL/TTL/LVDS OUT connector on the MPEG generator to the ECL PARALLEL/SERIAL I/O connector on the MPEG test system rear panel as shown in Figure D-8.
2. Open the test64.trp file on the MPEG generator.
   a. Select **Open TS File...** from the **FILE** pull-down menu.
   b. In the resulting **Select TS File** dialog box, select the **test64.trp** file, and then press the **OK** bezel button.
3. Select **Level : ECL** from the **OUTPUT** menu on the MPEG generator, and then press the **OK** bezel button.
4. Select **Interface : Serial** from the **OUTPUT** menu on the MPEG generator, and then press the **OK** bezel button.
5. Press the **START/STOP** button on the MPEG generator to start the signal output of the test64.trp file.
6. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, and HDD.

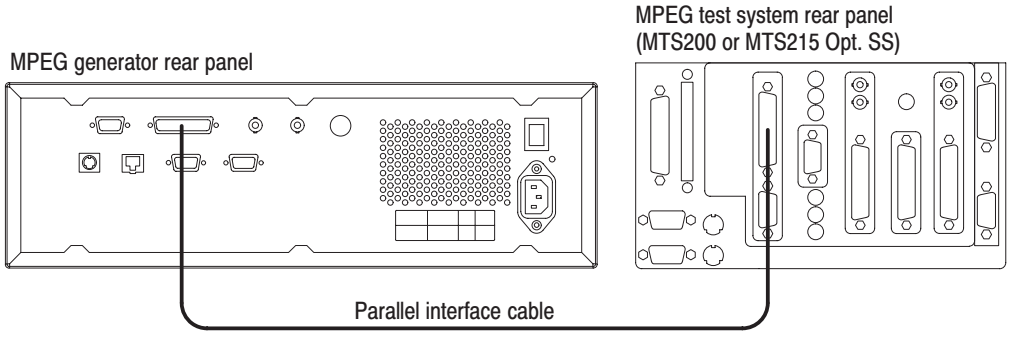


Figure D-8: Equipment connection for verifying the serial output

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7. Double-click the **Data Store Administrator** icon in the MPEG test system's Program Group window to start the application.

8. In the Data Store Administrator window, click the **A** (acquisition) command button to open the Acquisition settings window.

9. In the Acquisition settings window, enter the following selections:

   Board File . . . . . test.trp (or unique file name)
   Partition . . . . . Single shot (this selection appears if the hard drive of the MPEG test system is partitioned)
   Size . . . . . 10,000,000 (bytes)
   Synchronization Lock . . . . Psync
   Port . . . . . Serial ECL
   MSB First box . . . . . Check (this selection appears after the port is set to Serial ECL)

10. In the Acquisition settings window, click **Start** to start the acquisition.

11. Click **OK** after the "Transfer is finished" message appears.

12. Select **Exit/Quit** from File menu or click the close box in the upper-right corner of the application window to exit the Data Store Administrator application.

13. Double-click the **Deferred Time Analyzer** icon in the MPEG test system's Program Group window to start the application.

14. In the Deferred Time Analyzer window, select **Open** from the **File** menu or click the **Open** command button in the upper toolbar to open the Open dialog box.

15. Select the **C:\Carb0\mono\test.trp** (or your unique file name) file in the Open dialog box, and then click **Open** to open the test.trp file.

16. In the Deferred Time Analyzer window, select **Consistency Check** from the **Analysis** menu to check for consistency within the stream file.

17. Verify that the **No Error Found** dialog box appears after the stream file is checked by the Deferred Time Analyzer application.

18. Press the **START/STOP** button on the MPEG generator to stop the signal output, and then remove the parallel interface cable from the rear panel.

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External Clock Input

This test confirms that the external clock input (ECL CONTROL input) on the MPEG generator is functioning correctly. The following equipment and MPEG test signal is required for this test:

- MPEG test system
- 75 Ω BNC cable
- Custom 9-pin to 25-pin, D-type interface cable
- test40.trp MPEG test signal

Perform the following procedure to verify that the external clock input (ECL CONTROL input) on the MPEG generator is functioning correctly:

1. Use the 75 Ω BNC cable to connect the ASI OUT connector on the MPEG generator to the ASI IN connector on the rear panel of the MPEG test system as shown in Figure D-9.
2. Use the custom interface cable (see Figure D-1 on page D-2) to connect the ECL CONTROL connector on the MPEG generator to the ECL PARALLEL/SERIAL I/O connector on the MPEG test system rear panel as shown in Figure D-9.
3. Open the test40.trp file on the MPEG generator.
   a. Select **Open TS File...** from the **FILE** pull-down menu.
   b. In the resulting **Select TS File** dialog box, select the **test40.trp** file, and then press the **OK** bezel button.

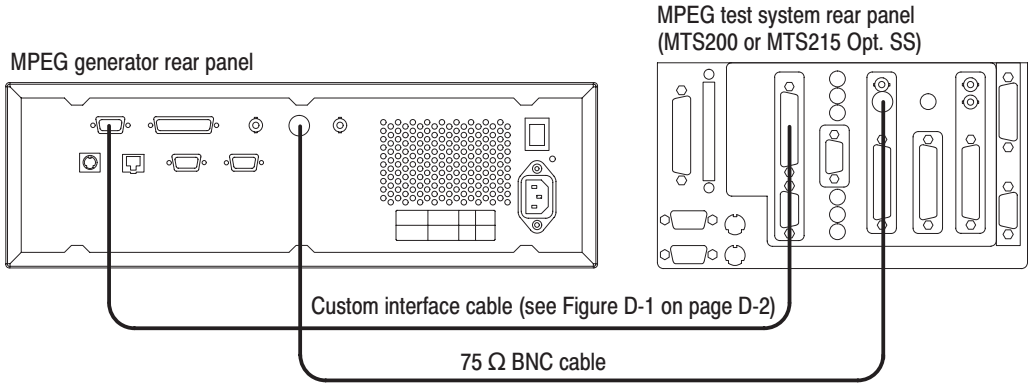


Figure D-9: Equipment connections for verifying the external clock input

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4. Select **Clock...** from the **OUTPUT** menu on the MPEG generator to open the Clock dialog box.

5. Select **EXT CLOCK** in the Clock dialog box, and then press the **OK** bezel button.

6. Select **Interface : Serial** from the **OUTPUT** menu on the MPEG generator, and then press the **OK** bezel button.

7. Double-click the **Data Store Administrator** icon in the MPEG test system's Program Group window to start the application.

8. In the Data Store Administrator window, select any file from the File information list, and then right-click to open the shortcut menu.

9. Click **Generation** to open the Generation settings window.

10. In the Generation settings window, make the following selections:

    Port . . . . . Serial ECL
    Frequency 40,000,000
    Loop . . . . . Check (select)

11. In the Generation settings window, click **Start** to begin signal generation.

12. Press the **START/STOP** button on the MPEG generator to start the signal output of the test40.trp file.

13. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, EXT, and HDD.

14. Double-click the **Real Time Analyzer** icon in the MPEG test system's Program Group window to start the application.

15. In the Real Time Analyzer window on the MPEG test system, select **Settings...** from the **Configuration** menu to open the Settings window.

16. In the Settings window, select **Hardware Configuration** to open the Hardware Configuration window.

17. In the Hardware Configuration window, click the **Restore Defaults** button, click the **Apply** button, and then select **DVB-PI ASI** as the Input Type.

18. In the Settings window, select **ETR290** to open the ETR290 configuration window.

19. In the ETR290 window, click the **Restore Defaults** button, click the **Apply** button, and then click **OK** to close the Settings window.

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20. In the Real Time Analyzer window, click the **Start Analysis** toolbar button.
21. Verify that the Hierarchic view is displayed on the screen and that no error messages appear. In addition, verify that the transmission rate is 40 Mbps and that the transport stream packet size is 188 bytes.
22. Select **Interrupt transfer** from the **Acq/Gen** menu in the Data Store Administrator window stop the signal generation.
23. In the Real Time Analyzer window, click the **Stop Analysis** toolbar button to stop analysis.
24. Press the **START/STOP** button on the MPEG generator to stop the signal output.

External Reference Input

This test confirms that the EXT 27 MHz REFERENCE IN input on the MPEG generator is functioning correctly. The following equipment and MPEG test signal is required for this test:

- MPEG test system
- Signal generator
- 75 Ω BNC cable
- 50 Ω BNC cable
- N-to-BNC adapter
- test64.trp MPEG test signal

Perform the following procedure to verify that the EXT 27 MHz REFERENCE IN input on the MPEG generator is functioning correctly:

1. Use the 75 Ω BNC cable to connect the ASI OUT connector on the MPEG generator to the ASI IN connector on the rear panel of the MPEG test system as shown in Figure D-10.
2. Use the 50 Ω BNC cable and the N-to-BNC adapter to connect the EXT 27 MHz REFERENCE IN connector on the MPEG generator to the OUTPUT connector on the signal generator as shown in Figure D-10.
3. Set the signal generator output for a 27.0000 MHz, 0.0 dBm signal.
4. Open the test64.trp file on the MPEG generator.
   a. Select **Open TS File...** from the **FILE** pull-down menu.
   b. In the resulting **Select TS File** dialog box, select the **test64.trp** file, and then press the **OK** bezel button.

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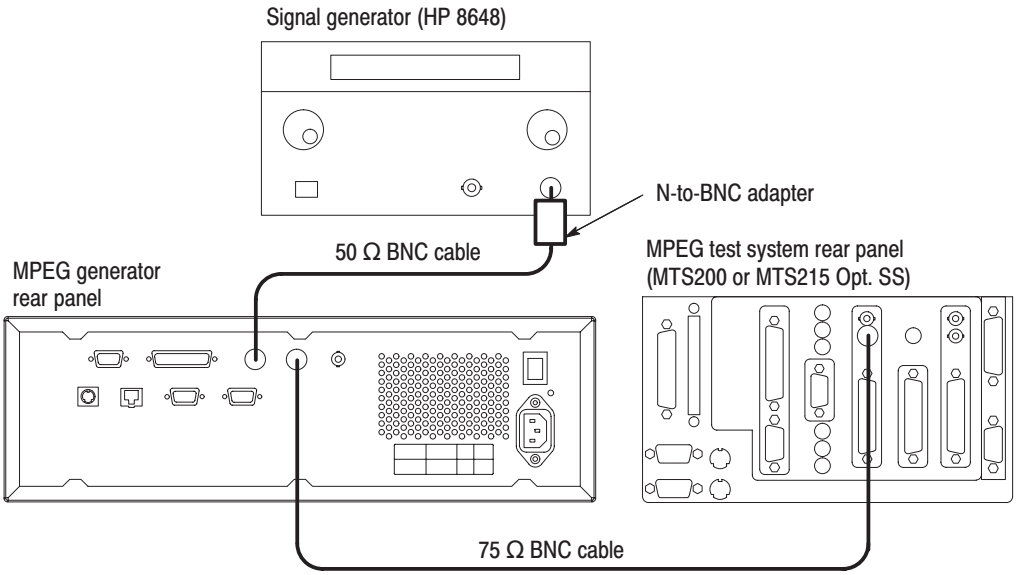


Figure D-10: Equipment connections for verifying the external reference input

5. Select **Clock...** from the **OUTPUT** menu on the MPEG generator to open the Clock dialog box.
6. Select **EXT REF** in the Clock dialog box, and then press the **OK** bezel button.
7. Press the **START/STOP** button on the MPEG generator to start the signal output of the test64.trp file.
8. Verify that the following LEDs on the MPEG generator's front panel are illuminated: PLL, BUFFER, EXT, and HDD.
9. Double-click the **Real Time Analyzer** icon in the MPEG test system's Program Group window to start the application.
10. In the Real Time Analyzer window on the MPEG test system, select **Settings...** from the **Configuration** menu to open the Settings window.
11. In the Settings window, select **Hardware Configuration** to open the Hardware Configuration window.
12. In the Hardware Configuration window, click the **Restore Defaults** button, click the **Apply** button, and then select **DVB-PI ASI** as the Input Type.
13. In the Settings window, select **ETR290** to open the ETR290 configuration window.
14. In the ETR290 window, click the **Restore Defaults** button, click the **Apply** button, and then click **OK** to close the Settings window.

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15. In the Real Time Analyzer window, click the **Start Analysis** toolbar button.
16. Verify that the Hierarchic view is displayed on the screen and that no error messages appear. In addition, verify that the transmission rate is 64 Mbps and that the transport stream packet size is 188 bytes.
17. In the Real Time Analyzer window, click the **Stop Analysis** toolbar button to stop analysis.
18. Press the **START/STOP** button on the MPEG generator to stop the signal output.

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Appendix E: Inspection and Cleaning

Inspect and clean the instrument as often as your operating conditions require. The collection of dirt can cause instrument overheating and operational failure. Dirt acts as an insulating blanket, preventing efficient heat dissipation. Dirt also provides an electrical conduction path that can cause an instrument failure, especially under high-humidity conditions.



CAUTION. *Avoid the use of chemical cleaning agents that might damage the plastics used in this instrument. Use only deionized water when cleaning the front-panel controls. Use a 75% ethyl alcohol solution as a cleaner and rinse with deionized water.*

Avoid the use of high-pressure compressed air when cleaning dust from the interior of this instrument. High-pressure air can cause Electro Static Discharge (ESD). Instead, use low-pressure compressed air (about 9 psi).

Exterior Inspection

Using Table E-1 as a guide, inspect the outside of the instrument for damage, wear, and missing parts. You should thoroughly check instruments that appear to have been dropped or otherwise abused to verify correct operation and performance. Immediately repair defects that could cause personal injury or lead to further damage to the instrument.

Table E-1: External inspection check list

Item	Inspect for	Repair action
Cabinet and front panel	Cracks, scratches, deformations, damaged hardware or gaskets	Replace defective module
Front-panel knobs	Missing, damaged, or loose knobs	Repair or replace missing or defective knobs
Connectors	Broken shells, cracked insulation, deformed contacts, and dirt in connectors	Replace defective modules; clear or wash out dirt
Accessories	Missing items or parts of items, bent pins, broken or frayed cables, and damaged connectors	Replace damaged or missing items, frayed cables, and defective modules

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Exterior Cleaning

Perform the following steps when you clean the exterior of the instrument:



WARNING. *To avoid injury or death, unplug the power cord from line voltage before cleaning the instrument. Avoid getting moisture inside the instrument during external cleaning. Use only enough liquid to dampen the cleaning cloth.*

1. Remove loose dust on the outside of the instrument with a lint-free cloth.
2. Remove remaining dirt with a lint-free cloth dampened with a general purpose detergent-and-water solution. Do not use abrasive cleaners.
3. Clean the monitor screen with a lint-free cloth dampened with a gentle, general purpose detergent-and-water solution.

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Glossary

ACTS (Advanced Communications Technologies and Services)
A set of telecommunication research projects financed by the European Union.

ARIB
Association of Radio Industries and Businesses.

ATSC
Advanced Television Systems Committee.

BAT (Bouquet Association Table)
One of the tables defined by DVB-SI. The BAT provides information regarding bouquets (collections of services marketed as a single entity). DVB only.

CAT (Conditional Access Table)
One of the PSI tables described by the MPEG-2 standard. The CAT provides the association between one or more CA systems, their EMM (Entitlement Management Message) streams, and any special parameters associated with them.

CRC (Cyclic Redundancy Check)
One of the fields described in the MPEG-2 standard. CRC is used to verify the correctness of data in PSI and SI tables.

Defragmentation
The process of rewriting parts of a file to contiguous sectors on a hard disk to increase the speed of access and retrieval. When files are updated, the computer tends to save these updates on the largest continuous space on the hard disk, which is often on a different sector than the other parts of the file. When files are thus "fragmented," the computer must search the hard disk each time the file is accessed to find all of the file's parts, which slows down response time.

DVB (Digital Video Broadcast)
A project group of the European Broadcasting Union (EBU).

DVB-MG
Digital Video Broadcasting - Measurement Guidelines.

DVB-SI (Digital Video Broadcast Service Information)
The DVB-SI adds the information that enables DVB IRDs to automatically tune to particular services and allows services to be grouped into categories with relevant schedule information. It has several tables, including: NIT, SDT, BAT, and EIT. (NIT is also required for MPEG-2.)

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DTS (Decoding Time-Stamp)
One of the fields described in the MPEG-2 standard. The DTS may be present in a PES packet header that indicates the time that an access unit is decoded in the T-STD.

ECM (Entitlement Control Message)
Private conditional access information that specifies control words and possibly other, typically stream-specific, scrambling and/or control parameters.

EISA (Extended Industry Standard Architecture)
The PC bus used to communicate with the CARB and PIA boards.

EIT (Event Information Table)
One of the tables defined by DVB-SI. The EIT contains data concerning events (a grouping of elementary broadcast data streams with a defined start and end time belonging to a common service) and programs (a concatenation of one or more events under the control of a broadcaster, such as event name, start time, and duration).

EMM (Entitlement Management Message)
Private conditional access information that identifies the authorization levels or the services of specific decoders.

ETS (European Telecommunication Standard)
One of the types of documents released by ETSI.

ETSI
European Telecommunications Standards Institute.

ETR (ETSI Technical Report)
One of the types of documents released by ETSI.

IRD (Integrated Receiver / Decoder)
A receiving decoder that can automatically configure itself using the MPEG-2 Program Specific Information (PSI).

ISO (International Standard Organization)
Organization responsible for establishing standards at the world-wide level.

MPEG-2
A standard developed by MPEG (Moving Picture Experts Group) for the compression of digital video.

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NIT (Network Information Table)
One of the PSI tables described by the MPEG-2 standard and also one of the tables defined by DVB-SI. The NIT conveys information relating to the physical organization of the multiplex; that is, transport streams carried via a given network and the characteristics of the network itself. Transport streams are identified by the combination of an original network ID and a transport stream ID in the NIT.

PAT (Program Association Table)
One of the PSI tables described in the MPEG-2 standard. The PAT provides information about the structure of a transport stream.

PCR (Program Clock Reference)
One of the fields defined in the MPEG-2 standard. A time stamp in the transport stream from which decoder timing is derived.

PES (Packetized Elementary Stream)
A structure defined in the MPEG-2 standard used to carry elementary stream data.

PID (Packet IDentifier)
One of the fields described in the MPEG-2 standard. A unique integer value used to identify elementary streams of a program in a single or multiprogram TS.

PMT (Program Map Table)
One of the PSI tables described by the MPEG-2 standard. The PMT identifies and indicates the locations of the streams that make up each service and the location of the Program Clock Reference (PCR) fields for a service. This table is transmitted in sections.

PSI (Program Specific Information)
A set of tables described by the MPEG-2 standard. The PSI contains all of the tables that define the MPEG-2 transport stream. It consists of the PAT, PMT, CAT, and NIT tables. (NIT is also used for DVB-SI.)

PSIP
Program and System Information Protocol.

PTS (Presentation Time Stamp)
One of the fields described in the MPEG-2 standard. The PTS may be present in a PES packet header that indicates the time that a presentation unit is presented in the T-STD.

RST (Running Status Table)
One of the tables defined by DVB-SI. The RST gives a quick updating mechanism for the status information carried in the EIT.

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SDT (Service Description Table)
One of the tables defined by DVB-SI. The SDT contains data describing the services in the system. Examples include: names of services and the service provider.

SI (Service Information)
Set of tables defined by DVB-SI. The SI provides information on services and events carried by different Multiplexes, and even other networks. SI is structured as six tables (PAT, NIT, CAT, SDT, EIT, and BAT). The applications are only concerned with NIT, BAT, SDT, and EIT.

ST (Stuffing Table)
One of the tables defined by DVB-SI. The ST provides stuffing sections.

TDT (Time & Date Table)
One of the tables defined by DVB-SI. The TDT carries the current time and date information.

TOT (Time Offset Table)
One of the tables defined by DVB-SI. The TOT gives information about a local time offset in a given area.

TS (Transport Stream)
A bit stream that contains 0 or more elementary streams combined in a manner that conforms to the MPEG-2 standard.

T-STD (Transport Stream System Target Decoder)
Described by the MPEG-2 standard, the T-STD is a hypothetical reference model of a decoding process used to define the semantics of a TS.

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