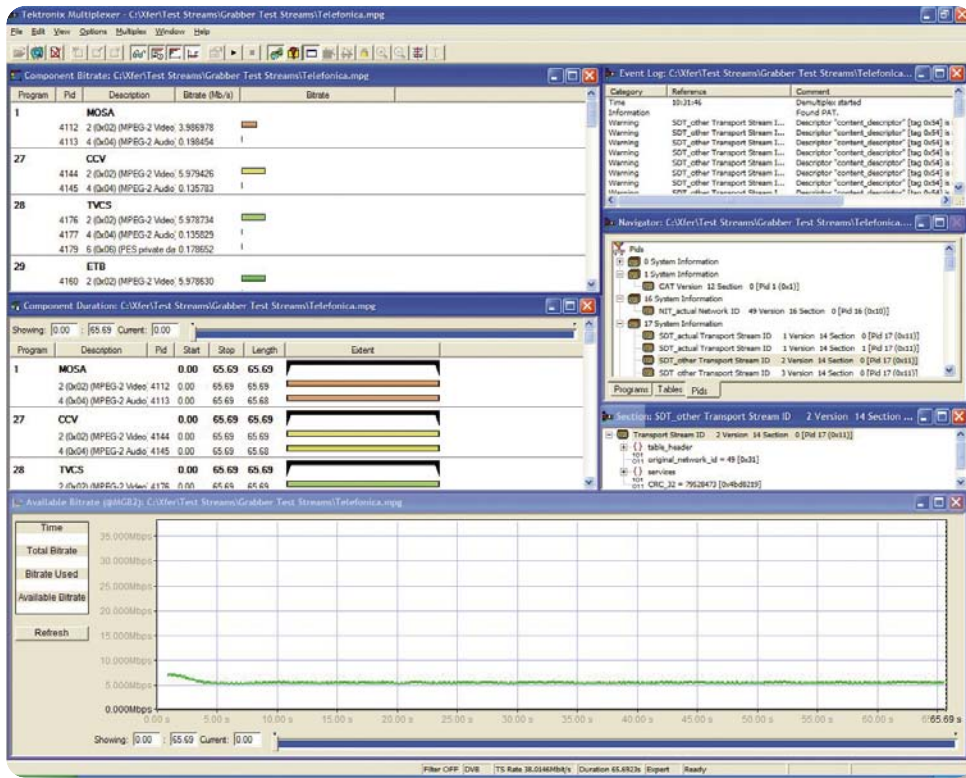


Multiplexer & SI Table Editor



► Figure 1. Multiplexer Application.

When testing network elements or set-top boxes, a transport stream of the representative type needed is often not available. Even if there is a similar one, vital components within it may be missing or suffer from a lack of SI (system information) or other tables, or are multiplexed to the incorrect transport stream rate for the application.

Use the Multiplexer/Re-multiplexer/De-multiplexer application to create multi-program Transport Streams with custom SI/PSI/PSIP information for DVB, ATSC, ISDB, and MPEG compliant Transport Streams. A new ISDB-T Single Segment mode is added in version 3.1.

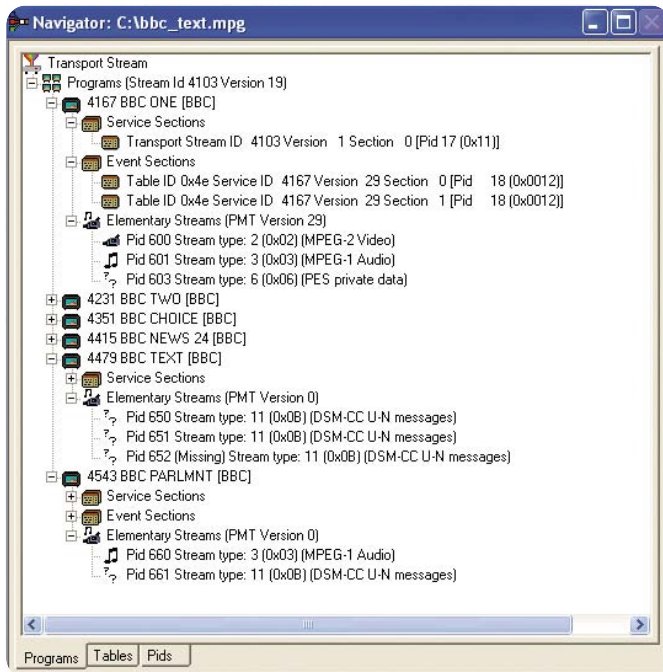
H.264 Elementary Streams may also be multiplexed into a Transport Stream. H.264 streams both with and without SEI timing messages are supported. The PTS and DTS generated for non-SEI streams are based upon the POC (Picture Order Count) information. PTS/DTS generation may be suppressed for SEI streams. Bitrate and framerate auto-detection features aid the import process. These may be overridden for non-SEI streams.

This enables the user to create their own test streams that they can use to validate and debug their designs more quickly, and also to create errored streams to perform parametric stress testing and ensure robustness and quality of their MPEG-2 or H.264 implementation.

The Tektronix Multiplexer/Re-multiplexer/De-multiplexer application supports:

- MPEG-1 Video
- MPEG-1 Audio
- MPEG-2 Video
- MPEG-2 Audio
- MPEG-2 AAC Audio
- AC-3 Audio
- H.264/AVC (both with and without optional SEI timing messages)
- All the above are supported in Elementary and PES (Packetized Elementary Stream) formats
- PIDs from other transport streams can be imported including any format including H.264 and VC-1
- Other data – the bit rate must be specified

Multiplexer & SI Table Editor



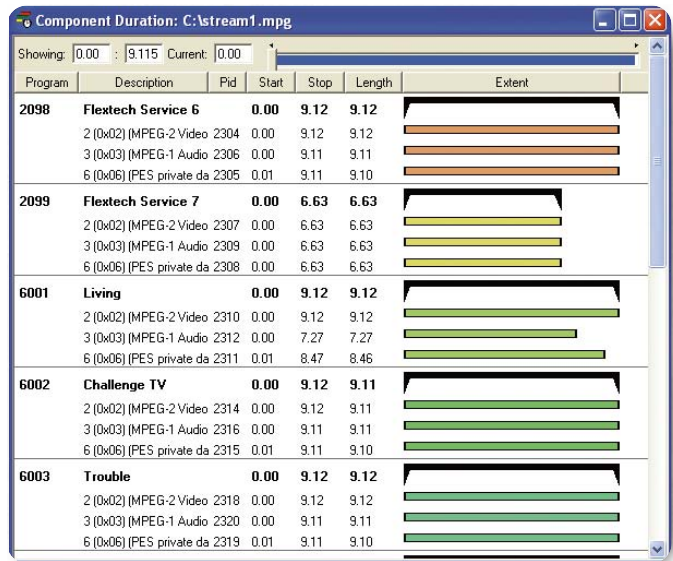
► Figure 2. Program De-Multiplex View.

The Solution

The multiplexer allows the user to collect together components from streams recorded off hard disk or CD/DVD-ROM, manipulate them in an unlimited manner, and then rebuild a fully compliant output stream. The software's built-in knowledge of table syntax and descriptors ensures compliance and high quality output of the final multiplexed transport stream.

De-multiplex Existing Streams

The multiplexer accepts any recorded Transport Stream as an input source. The user can then de-multiplex this transport stream into its component PES. The user can then save the resulting PES and ES streams onto disk. The de-multiplexer is elementary stream agnostic and can be used to extract H.264 and VC-1 Elementary Streams from a Transport Stream.



► Figure 3. Component Duration View.

Regroup Them with Stored Streams

These PES, or elementary video and audio streams, can be grouped together into logical groups – “Programs” of video, audio, and other associated data (such as Teletext/Closed Caption and MHP applications) with the original timing preserved. PIDs can be re-mapped as required.

Component Views and Available Bandwidth View

The Component Bit Durations View graphically displays the durations as well as start and stop times for each video or audio content PID. Duration and start and stop times can be changed by “drag and drop” or numerical entry. The available bandwidth view clearly shows the user how much content can be added into a transport stream so user can expand or optimize.

Multiplexer & SI Table Editor



► Figure 4. Available Bandwidth View.

Map, Check and Rebuild Your Own Multiplex

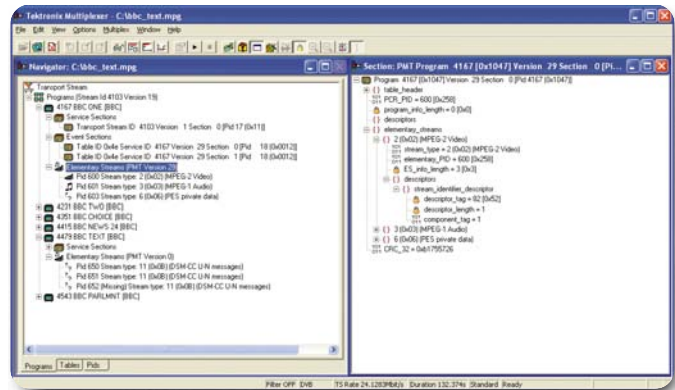
Streams can then be rebuilt into a larger multiplex stream and new SI/PSIP tables can be customized and added safely with in-built compliance checks.

Generate Compliant Timing and Output Bit Rates as Required

The multiplexer is able to insert PCRs at the correct repetition rate and also allows the user to specify the PCR repetition rate, if desired.

Create, Add, or Modify SI/PSIP Flexibility

The multiplexer allows all the standard ATSC/DVB/ISDB and MPEG PSIP/SI tables and descriptors to be added or edited. Scripting allows new or custom tables to be added. The user is permitted to generate illegal conditions that allow stress of decoder or transmission chain equipment to verify its robustness.



► Figure 5. SI View.

“Expert” and “Standard” Modes

Standard mode will calculate related fields and table pointers. Expert mode is also provided to allow the user to set these to illegal conditions for stress and robustness test of network elements and STB decoders.

Wizards for Common Tasks

- Create new transport streams
- Specify ATSC, DVB, ISDB, and MPEG standards
- Add programs
- Add events

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