



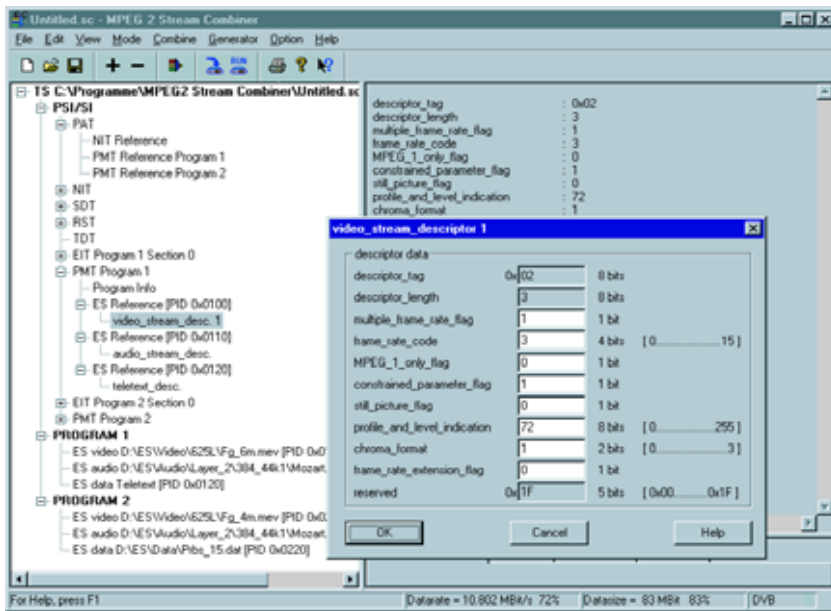
Stream Combiner™ DVG-B1

Generating user-specific MPEG-2 transport streams with the PC

- ◆ Generation of user-specific transport streams
- ◆ Elementary stream library
- ◆ Insertion of external elementary stream files
- ◆ Optional HDTV streams **NEW**
- ◆ Automatic generation of all necessary PSI, SI or PSIP tables, depending on the selected standard
- ◆ Editing PSI, SI and PSIP tables as required
- ◆ Setting of defined nonconformal states
- ◆ Windows 95/98 or Windows NT operating system
- ◆ Full remote control of DVG



ROHDE & SCHWARZ



Display of transport stream structure with information on individual elements (DVB mode)

Defining user-specific transport streams

A new transport stream can be defined very easily step by step with the Stream Combiner™. In the lefthand part of the program window (see above), all elements of the transport stream that have already been defined are represented as a tree structure. In the righthand part of the window, detailed information on the individual elements is displayed. The elements can be selected by means of a mouseclick.

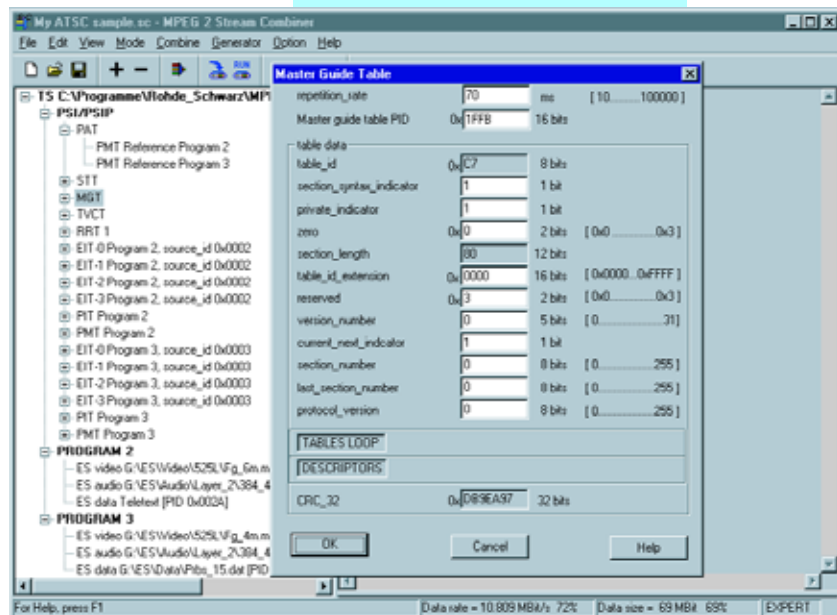
First of all, the standard (ATSC or DVB) to be used for transport stream generation has to be defined. In the dialog box opened next the transmission method (cable, satellite or terrestrial) has to be entered. Depending on the selected method, further transmission parameters have to be entered and the required tables (CVCT or TVCT for ATSC) and descriptors (of "delivery" type for DVB) are generated automatically.

Adding programs

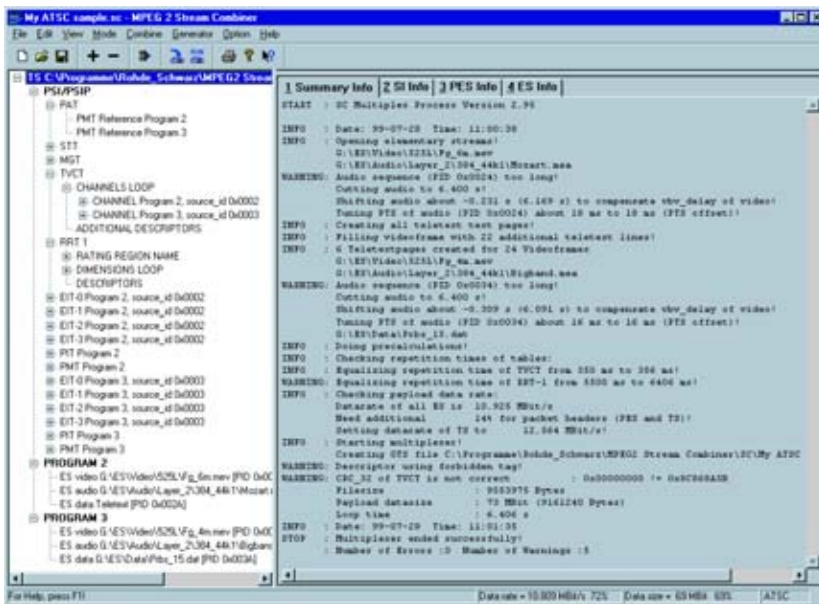


In the first step, the user adds the desired number of programs (up to 6) to the transport stream. Stream Combiner™ automatically generates the required PSI tables, eg PAT and PMT, and represents these tables immediately in the tree structure. The tables contain predefined default settings which can be changed as required.

With Stream Combiner™ Software DVG-B1, users of the MPEG-2 Generator DVG can generate their own specific transport streams. The software runs under Windows 95/98 or Windows NT on any PC or laptop. The data are loaded into the DVG via a parallel interface or a PC card hard disk. The user-friendly operating concept and the integrated help function ensure fast and efficient working right from the start without any special knowledge of MPEG-2, ATSC or DVB being required.



Editing individual tables, in this example Master Guide Table (MGT) in Expert mode



Comprehensive result display of multiplexing elementary streams to form a new transport stream (ATSC Mode)

Adding elementary streams


+ In the second step the desired elementary streams such as video, audio or data are added to the programs. Each program may contain up to 6 elementary streams. The software is supplied with a comprehensive elementary stream library from which the user can configure his specific transport stream. Stream Combiner™ automatically updates the relevant PSI tables every time a new elementary stream is added.

Adding service information


+ In the third step, further SI and PSI tables can be added to the transport stream : both standards: CAT, EIT, PAT, PMT, PT. Only ATSC: CVCT, ETT, MGT, PIT, RRT, STT, TVCT. Only DVB: BAT, DIT, NIT, RST, SDT, SIT, ST, TDT, TOT. The tables NIT, BAT, SDT and EIT that are relevant for a DVB network have an "actual" version (for the current transport stream) and an "other" version (for other transport streams of the same network). The EIT table is furthermore available in the versions "present" (for the current program) as well as "following" and "schedule" (for the future program). Types 0 and

1 are available for the private table (PT). All tables can be fully edited, the repetition rates being individually selectable for each table.


Generating the transport stream file

 After configuration of all elementary streams, these are multiplexed in the next step and a transport stream file in GTS format is generated for the MPEG-2 Generator DVG. This process is recorded in full detail and clearly displayed (see illustration above). Alternatively, a purely binary file in TRP format may be generated for use in other systems and generators.

Transferring the transport stream file to the generator

 The generated file can quickly and efficiently be transferred to the DVG via the special cable supplied. Alternatively, a PC card hard disk can be used. This is expedient if the generated transport stream is to be installed in several generators. DVG generates the new transport stream in the same way as the stored signals as an endless MPEG-2 sequence with all time stamps being continuously updated.

Cutting transport stream files

 In some cases it may be desirable to cut out specific parts from the available elementary streams and to use only those parts for generating a new transport stream file. That is where the separate program ES2Loop supplied with the software comes in handy. With this program the length of an audio sequence can be matched exactly to the length of the associated video sequence. The individual parts processed in this way are then combined in a new transport stream by Stream Combiner™.

Inserting external elementary stream files Besides the elementary streams from the library supplied, Stream Combiner™ allows external elementary streams (binary files to ISO/IEC 13818) to be inserted. Such files are offered by various suppliers on the Internet or on CD-ROMs (MPG, VID, M2V, MP2, AUD, M2A file extensions). ES2Loop first checks whether the external file is suitable for integration, and then processes the file for insertion into the new transport stream. Thus it is always ensured that the DVG can play back the new transport stream as an endless MPEG-2 loop.



Editing a user-specific transport stream



All generated transport streams can be subsequently modified with the Stream Combiner™. This is possible for the elementary streams and for all tables of a transport stream. Editing is performed after the respective file has been opened. The Stream Combiner™ operates in the same mode as for generating a new transport stream, i.e. the tree structure and the contents of the tables are displayed. Any desired element can be modified, deleted from or added to the transport stream.

At first, the modification of table entries is limited to conformity of the originally chosen standard (ATSC or DVB). For full editing of all table entries the "Expert" mode is however available which offers full modification capabilities. In this mode table entries can be edited and any descriptor inserted in the tables. In this way transport stream errors can be generated for in-depth testing of generator and decoder.

The DV-HDTV option additionally contains an extensive library of transport and elementary streams with several streams for high-resolution TV. This includes both complete transport and elementary streams for further processing with the

Stream Combiner®. The elementary streams have been edited to allow easy multiplexing with audiostreams and continuous and unbroken reproduction by the DVG und DVRG units. The streams contain live sequences and specially designed test patterns. The relevant data sheet (PD 0757.6979) gives a detailed description of the complete HDTV transport and elementary stream composition.

Generating defined nonconformal states

Stream Combiner™ offers various possibilities of integrating nonconformal states into a transport stream:

- ◆ Insertion of descriptors into tables for which they are not intended
- ◆ Insertion of wrong information into tables and descriptors
- ◆ Changing the repetition rate of tables
- ◆ Removing specific tables
- ◆ Introducing an offset between elementary stream clock (PTS, DTS) and PCR
- ◆ Switching off PCR, PTS and DTS updating at the end of a video/audio sequence

Remote control of MPEG-2 Generator DVG

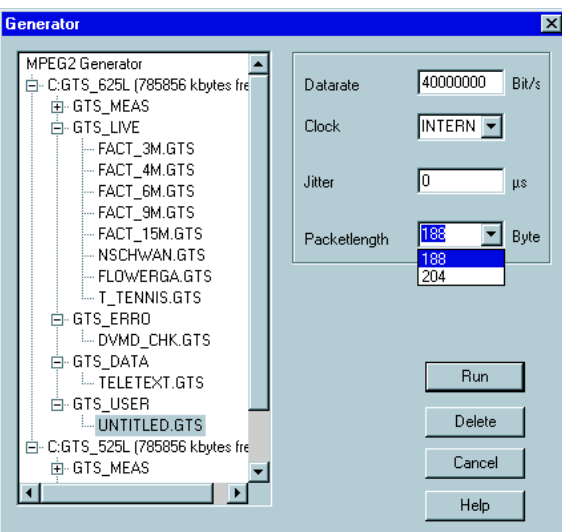


All operating parameters of the generator, such as data rate, packet length, PCR jitter, can conveniently be set with the Stream Combiner™ via the serial interface. All transport stream files stored in DVG are clearly displayed so that the desired file can be selected and started

(see illustration below). Files that are no longer required can be erased to save memory on the hard disk. PC and DVG communicate via the serial interface. This allows simple and convenient full remote control of a DVG which is for instance integrated in a system or accommodated in another room.

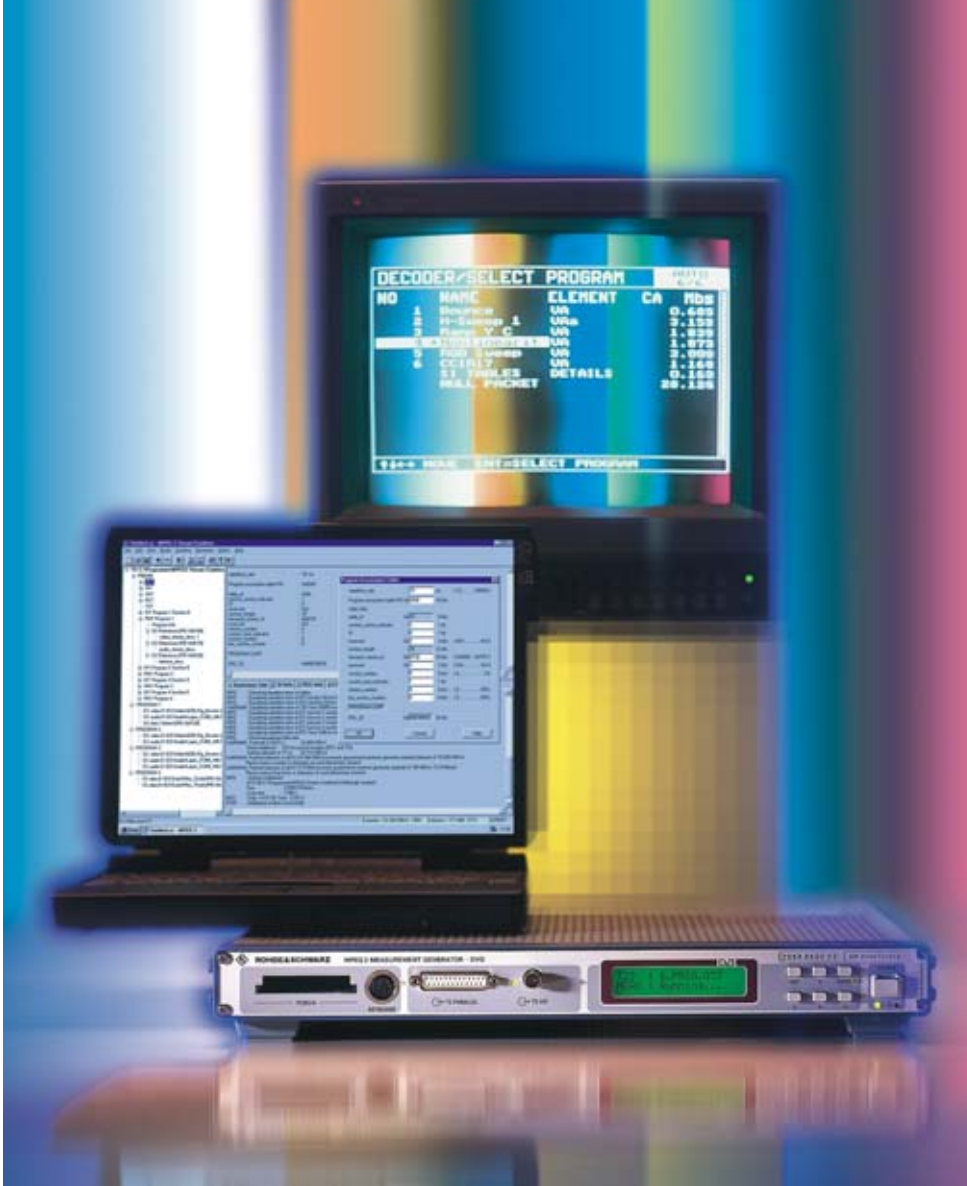
Abbreviations

ATSC	Advanced Television Systems Committee
BAT	Bouquet Association Table
CAT	Conditional Access Table
CETT	Channel Extended Text Table
CVCT	Cable Virtual Channel Table
DIT	Discontinuity Information Table
DTS	Decoding Time Stamp
DVB	Digital Video Broadcast
EIT	Event Information Table
EPG	Electronic Program Guide
ETT	Extended Text Table
MGT	Master Guide Table
MPEG	Motion Picture Experts Group
NIT	Network Information Table
PAT	Program Association Table
PCR	Program Clock Reference
PES	Packetized Elementary Stream
PID	Packet Identification
PIT	Program Identification Table
PMT	Program Map Table
PSI	Program Specific Information
PSIP	Program and System Information Protocol
PT	Private Table
PTS	Presentation Time Stamp
RRT	Rating Region Table
RST	Running Status Table
SDT	Service Description Table
SI	Service Information
SIT	Selection Information Table
ST	Stuffing Table
STT	System Time Table
TDT	Time and Date Table
TOT	Time Offset Table
TS	Transport Stream
TVCT	Terrestrial Virtual Channel Table



Full remote control of DVG

MPEG-2 Generator DVG and PC software Stream Combiner™, an ideal pair for synthetic generation of MPEG-2 transport streams



Specifications

Contents of elementary stream library

- all video and audio sequences contained in the preconfigured transport streams of DVG
- further moving picture sequences (ie under water sequences, "Table Tennis" and "Flower Garden" in 2/4/6 Mbit/s)
- additional audio sequences of different data rates and sampling frequencies
- audio sequences in Dolby® AC-3
- teletext sequences
- PRBS sequences
- other sequences on request

Transport stream

Sum of elementary stream data rates	max. 18 Mbit/s *)
Total data volume of all elementary streams	max. 228 Mbit *)
Output data rate at DVG (attained by adding null packets)	max. 160 Mbit/s
Number of programs	max. 6
Number of elementary streams per program	max. 6
Repetition length	max. 228 Mbit/sum of elementary stream data rates *)
MPEG-2 sequence length	endless

System requirements

PC or laptop with Pentium processor (recommended clock frequency: min. 100 MHz), Windows 95/98 or Windows NT operating system, min. 16 Mbyte RAM (Windows NT: 32 Mbyte), required memory on hard disk: approx. 20 Mbyte, 1 free parallel printer interface, CD-ROM drive, 1 free serial interface

Ordering information

Stream Combiner™	DVG-B1	2068.9835.02
------------------	--------	--------------

Equipment supplied

CD-ROM with setup program; serial connecting cable for connecting the DVG to the PC, manual and dongle for connection to the parallel printer output of the PC, special cable for parallel transfer of transport streams

Recommended extras

Expansion of the elementary stream library by a large number of different high-resolution elementary and transport streams	DV-HDTV	2085.7650.02
--	---------	--------------

*) only for DVGs manufactured as of October 98



ROHDE & SCHWARZ

ROHDE & SCHWARZ GmbH & Co. KG · Mühlendorfstraße 15 · D-81671 München · Germany · P.O.B. 80 14 69 · D-81614 München · Germany · Telephone +49 89 41 29-0
www.rohde-schwarz.com · CustomerSupport: Tel. +49 180 512 42 42, Fax +49 89 41 29-137 77, E-mail: CustomerSupport@rsd.rohde-schwarz.com