MPEG2 measurement generators and decoders

Let's go west: ATSC ready for takeoff

A special standard complying with national requirements is used in the US for terrestrial broadcasting of digital TV signals: ATSC (Advanced Television Systems Committee). Same as the European DVB standard, ATSC is based on MPEG2 coding but it differs in some essential features. Several countries in South America and Asia are about to adopt this standard. So Rohde & Schwarz has integrated the ATSC standard in all its measuring instruments concerned.

Photo 42 499/3

FIG 1
MPEG2 Measurement Generator DVG and MPEG2 Measurement Decoder DVMD with optional software now also support the North American ATSC standard

For the last three years Rohde & Schwarz has been accompanying the worldwide introduction of digital TV with its "dream team" made up of MPEG2 Measurement Generator DVG, MPEG2 Measurement Decoder DVMD [1] and the optional software packages Stream Combiner™ and Stream Explorer™ [2]. The instruments are now multistandard units and support the North American ATSC standard which differs from the European standard in some essential features:

- High-resolution formats (480, 720, 1080 lines)
- Progressive scanning (60 Hz)
- 6-channel Dolby surround AC-3-coded audio
- Other tables
- Data-compressed table contents

MPEG2 Measurement Generator DVG is a versatile transport stream signal source especially suited for continuous operation. It is able to provide a comprehensive range of test patterns (bounce, sweep, colorbars, etc), test tones (CCITT.033) and moving picture sequences in a seamless loop. This makes it an ideal instrument for production testing of set-top boxes and for testing modulators and transmission links. The generator has been revised and upgraded and the following enhancements have been added:

- ATSC sequences with HDTV video and audio elementary streams (Dolby AC-3)
- Faster hardware
- Larger memory
- Expansion of SPI and ASI interfaces to 208 bytes/packet

With the aid of the optional software **Stream Combiner™ DVG-B1**, other external elementary streams can also be integrated and multiplexed to a continuous seamless transport stream for DVG (FIG 2). This function was enhanced particularly for the use of Dolby AC-3-coded audio and 4:2:2 or HDTV video sequences of up to 25 Mbit/s. An ATSC setup ensures that the program paradigm is adhered to and that all required ATSC tables and descriptors are added. The comprehensive editor enables modification of ATSC tables (STT, MGT, TVCT, CVCT, RRT, EIT, ETT, PIT) and their extension by other descriptors. The editor also uses Huffman coding for information in plain text within the tables. Also new is the possibility of including com-

prehensive or non-standardized tables and descriptors from files.

MPEG2 Measurement Decoder DVMD serves for monitoring DVB-conformal transport streams at nodes in transmission links and distribution centers. It monitors the transport stream for errors to ETR 290 (DVB Measurement Guidelines), eg data rates used, whether all time stamps are correct and whether all necessary tables are included at the specified repetition rates. This monitoring task can now also be performed on ATSC transport streams.

The software package **Stream Explorer™ DVMD-B1** available as an option for DVMD is now ATSC-compatible too. In addition to performing MPEG2-specific measurements it determines the data rate of ATSC elementary streams and tables and offers an ATSC table interpreter with Huffman decoding for compressed information texts. Thus the complete table content of ATSC transport streams can be detected, displayed and easily monitored (FIG 3).

All products mentioned come from now on as multistandard models, ie DVG and DVMD as well as Stream Combiner™ and Stream Explorer™ comply with the European DVB and the North American ATSC standard. Older instruments can be upgraded.

Thanks to these new characteristics, customers in North America will be well-equipped for ensuring the reliability of digital TV. The instruments will also support European manufacturers producing for the North American market and enable them to guarantee the required high quality of their products in development and production.

Harald Weigold

Reader service card 164/06 for information on DVG, DVMD and optional software

REFERENCES

[1] Fischbacher, M.; Weigold, H.: MPEG2 Generator DVG and MPEG2 Measurement Decoder DVMD – Test equipment for digital TV in line with MPEG2. News from Rohde & Schwarz (1996) No. 152, pp 20 – 23

[2] Fischbacher, M.; Rohde, W.: PC software for MPEG2 dream team DVG/DVMD. News from Rohde & Schwarz (1997) No. 154, p 29

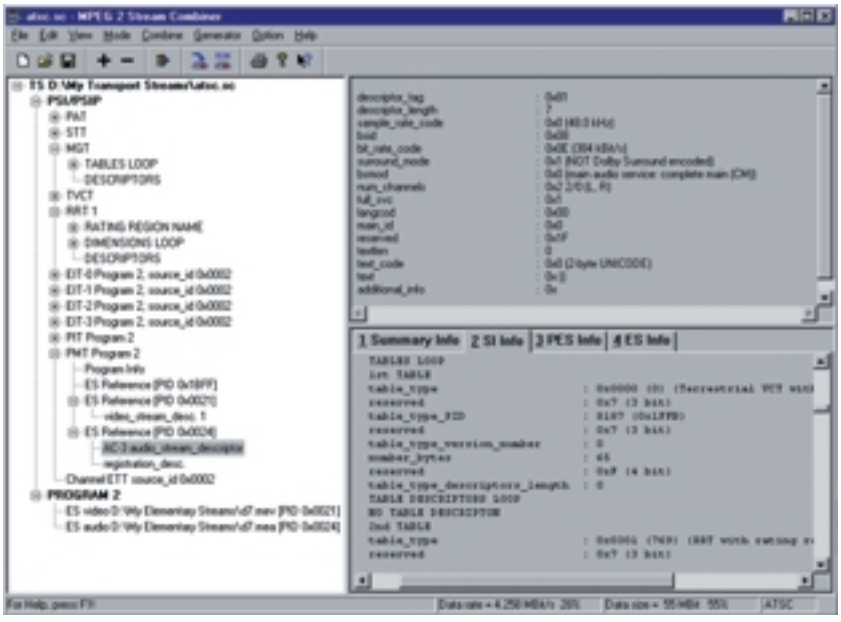

FIG 2 Configuring an ATSC transport stream for MPEG2 Measurement Generator DVG with Stream Combiner™ software

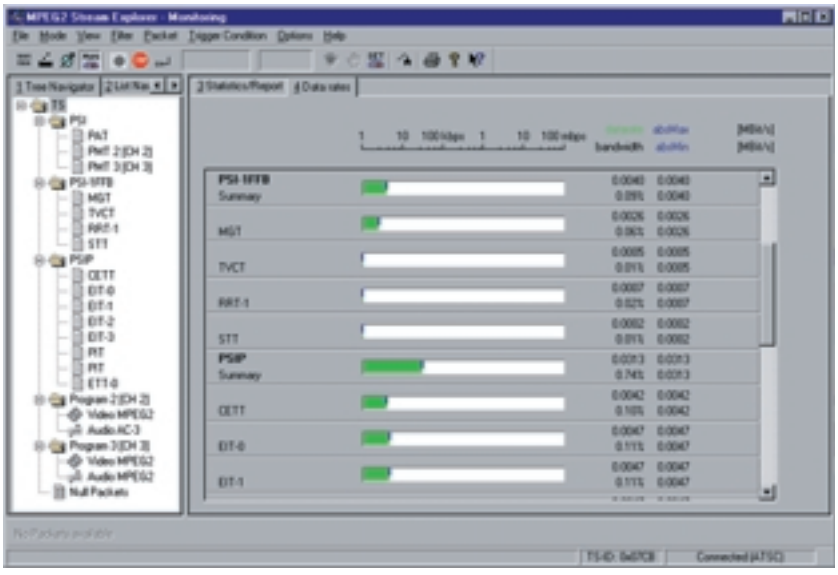

FIG 3 Data rate monitoring of ATSC tables (PSIP) with MPEG2 Measurement Decoder DVMD and Stream Explorer™ software