

«Stream Labs» Closed Joint -Stock Company

**TPG-8 test image oscillator**

Operation Manual

2004

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# 1 OSCILLATOR DESCRIPTION AND PRINCIPLES OF OPERATION

## 1.1 Application of the oscillator

This test oscillator must be used for controlling of:

1. video-frequency band;
2. video monitor linearity and gamma correction, its effective contrast ratio and light intensity ;
3. adjustment of the characteristic wave impedance or there are far-and-echoes and long cable quality ;
4. video recorder reproduction quality and other facilities of analog transmission or reproduction.

it is as well irreplaceable for estimation of:

5. vertical and horizontal image resolution, a dynamic range, color rendering after image reading under various standards (JPEG, MPEG-2, MPEG-4, Wavelet, JPEG 2000 etc.) and compression levels;
6. Geometric distortions after image reading.
7. a dynamic range of video signal level.

For example, in order to measure the image resolution, evaluate a dynamic range, color rendering in video recorders and network video servers, one has not at all use a TV camera, it is even contraindicated as it is initially assumes a positioning error of a test chart, light intensity and all the path of image processing from on objective up to the signal transformations. The test oscillator with standard test-pattern signals and different kinds of real scenes- it makes a great difference.

## 1.2 Specifications

Operation in PAL and NTSC standards.

Video signal meets with the requirements of GOST 7845-92 and ITU-R BT.470-4 "Television Systems" (former CCIR Report 624).

Video signal outputs are analog S-Video, composite and component (YUV).

There is possibility of changing of output signal voltage from the oscillator's keyboard within the range of 0.2V – 1.5V. Default voltage value is 1V.

Test images are loaded through USB port.

Maximum number of oscillator's test images is – 8.

Power supplies:

- internal rechargeable batteries;
- external network adapter;
- PC's USB port.

The network adapter for internal rechargeable batteries charging and oscillator power supply:

- output voltage of  $5\pm 0.2V$ ;
- power 5W minimum.

3 NiMH AA type batteries are used for autonomous power supply of the oscillator.

Maximum power consumption:

- 1W - from a battery;
- 3W- from network adapter and charging of internal batteries.

Duration of continuous operation with internal batteries is 5 hours.  
Approximate charge time of dead batteries is 16 hours.

Operational conditions:

- ambient temperature 10°C to 35°C;
- maximum relative humidity 80%;
- air pressure 84 kPa to 107 kPa (630 to 800 MmHg).

Generator dimensions: 190mm×77mm×26mm.

Weight: 300 g.

TPG-8+SDI, the version of test image oscillator has following features, besides before mentioned ones:

- differential output signal (SDI) level comes to 800±80mV;
- maximum length of coaxial cable for SDI signal transmission (Belden 1694A) is 300m;
- test sine-wave audio signal frequency (1 kHz) integrated into digital stream;
- integrated EDH packages for error recognition and handling.
- supports SMPTE 125M, ITU-R BT.601, SMPTE 259M, SMPTE 272M, ITU-R BT.1305, SMPTE RP-165, and ITU-R BT.1034 standards.

### 1.3 Completeness of the set

Completeness of the oscillator's set:

Description	Qty	Notes
TPG-8/TPG-8+SDI test image oscillator	1	
Nil-Mn AA type battery	3	
Network adapter	1	
"TPG-8 Navigator" software	1	on a single CD
USB cable	1	
Package	1	
Operation manual	1	

### 1.4 Oscillator operation

The oscillator switching on is made by "On" button pressing on the keyboard and switching off by "Off" key pressing. When the power supply is on, the green light is flashing up on the LED front panel.

Pressing of "P1"... "P8" keys displays the corresponding image previously stored in oscillator's flash memory. "PAL" and "NTSC" keys are used for changing of the image standard.

Output signal level can be modified by "↑" and "↓" buttons. Initial 1V level of video signal would be set by "1.0V" key pressing.

Switching to component output mode and back (to VBS, CVBS, and S-Video output modes) would be made by simultaneous pressing of "↑" and "↓" keys. Connection must be made according to

Fig.4. In addition, the cable adapter from S-Video contact socket to BNC socket is necessary in order to use the component output. Schematic diagram of the adapter is shown in Fig.1.

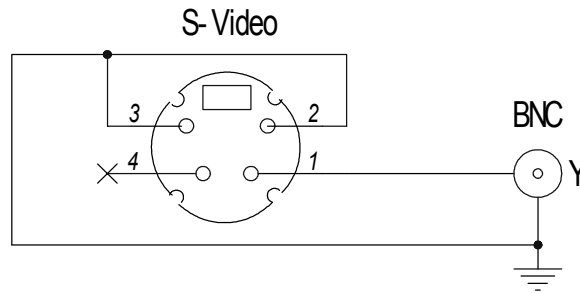


Fig.1 Schematic diagram of the adapter

The adapter connection to S-Video output (Fig.2) would be applied for use of TPG-8+SDI version test image oscillator in component video output mode.

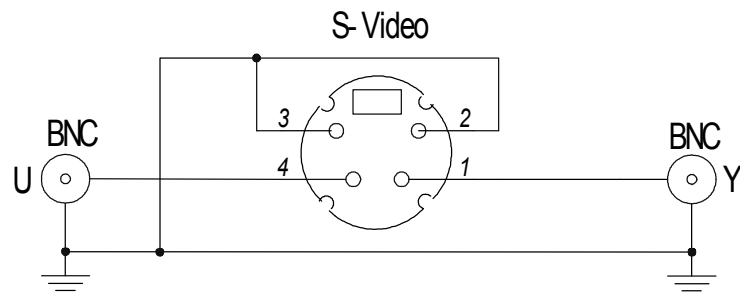


Fig.2 Schematic diagram of the adapter for TPG-8+SDI generator

When the batteries are significantly discharged (if there remains approximately 10 - 30 minutes before absolute discharge and closedown), the power supply green LED illuminates in red. At this moment you should charge the batteries.

Power supply should be on while charging the internal batteries.

Oscillator appearance is shown in the Fig.3. Keys description and layout are shown in the Fig.4.



Fig.3. Test image generator

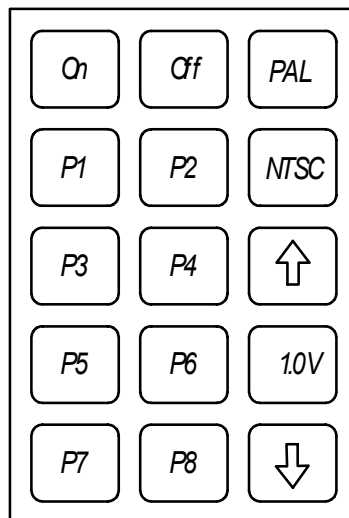


Fig.4. Generator keyboard layout

**Advanced version of the oscillator** is able to display a frame sequence in addition to a static image. For displaying a frame sequence it necessary to record 100x100 dot image sequences into any oscillator cell (50 images for PAL and 60 images for NTSC standard) as follows. The file of the first frame would be specified; other frames would be recorded by the program automatically.

Recorded frame sequence would be displayed:

- on the black background: you would press the key corresponding to the number of the memory cell which contains the necessary frame sequence;

- on the background of a static image: press simultaneously two keys one of which corresponds to the number of a static image and other to the number of a memory cell containing the necessary frame sequence.

**TPG-8+SDI** version is able generate PAL and NTSC 4:2:2 test images (13.5 MHz, SMPTE 125M, ITU-R BT.601) digitalized for transmission on basis of SDI standard (SMPTE 259M-C-1997). In accordance with SMPTE 272M and ITU-R BT.1305 standards, the test sine-wave 1 kHz audio signal frequency is integrated into ANC data segment. Besides, EDH data are integrated into SDI data stream used for error recognition and handling on receiving side (SMPTE RP-165, ITU-R BT.1034).

### 1.5 Description of oscillator's external connectors

Oscillator's top panel appearance is shown in Fig.5. This panel contains VBS, CVBS, S-Video, and YUV video output connectors.

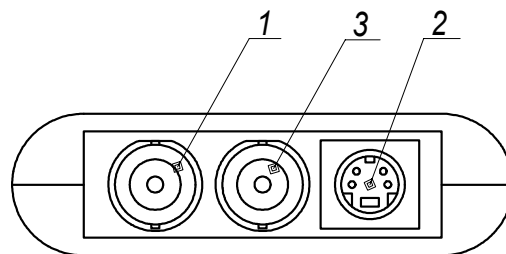


Fig.5 Generator's top panel

- 1 – VBS/U output connectors
- 2 – S-Video/Y output connectors
- 3 – CVBS/V output connectors

TPG-8+SDI oscillator's version top panel's connectors layout are as follows (Fig.5): 1 – SDI output connectors; 2 – S-Video/Y, U output connectors; 3 - CVBS/V output connectors.

Oscillator's bottom panel appearance is shown in Fig.6. It contains:

- a socket for network adapter connection (1);
- USB data exchange LED indicator (2);
- a socket for USB cable for PC connection (3).

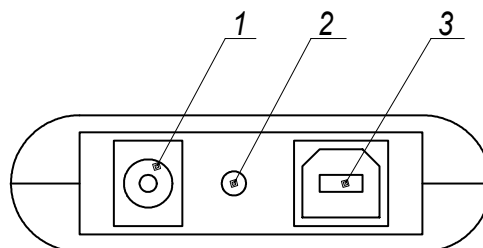


Fig.6 Oscillator's bottom panel

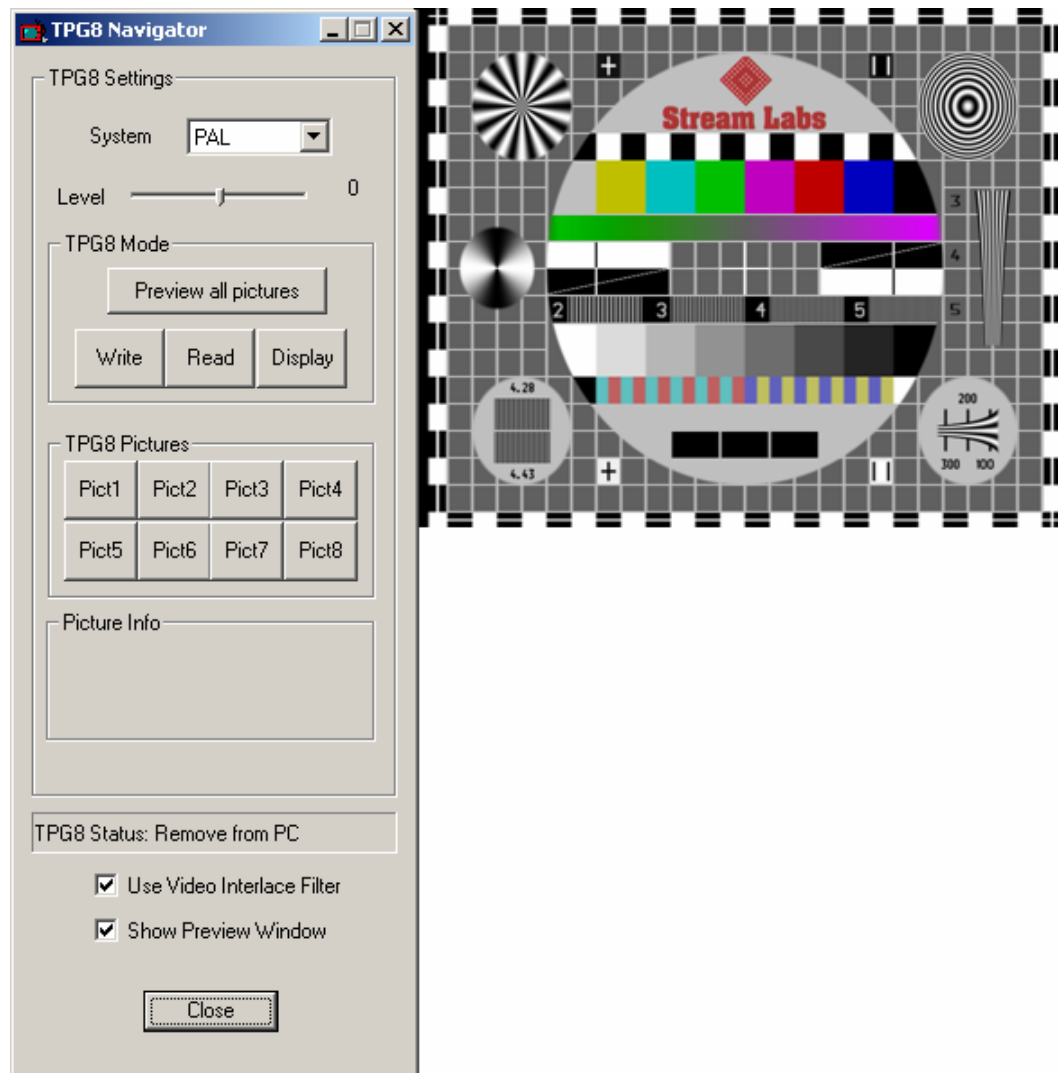
### 1.6 "TPG-8 Navigator" software

Functionality:

- Test tables recording (supported file formats are: .bmp, .tga, .jpg, .tif, and .d1 (special format)).
- Previously recorded test tables read/preview.

- Device settings adjustment: system selection, change of output signal level.

TPG-8 Navigator program interface screenshot.



### TPG-8 Settings

**System** - PAL/NTSC system selection.

**Level** - Change of output signal level.

### TPG-8 Mode

**Preview all pictures** - Preview of all previously recorded test charts images in reduced scale.

**Write** - Test chart writing into device active memory area (Pict1-Pict8).

**Read** - Test chart reading from device active memory area (Pict1-Pict8).

**Display** – Displaying of test chart written into device active memory area (Pict1-Pict8).

### TPG-8 Pictures

Device active memory area selection (Pict1-Pict8).

### Picture Info

Information field containing parameters of a test chart stored in device active memory area (Pict1-Pict8).

### TPG-8 Status



Device current status + indication of operation flow with test charts.

**Use Video Interlace Filter** - Enabling/Disabling of the interface filter for test chart leveling.

**Show Preview Window** - Show/Hide test chart preview window.

Work with test charts.

1. Select device active memory area (Pict1 - Pict8 keys). The information field displays parameters of the test chart currently stored in this area.
2. Once having selected the active memory area you can do with the following actions:
  - Write any new test chart into it (Write key);
  - Read test chart stored in it (test chart will be displayed in Preview Window) (Read key).
  - Display test chart on the monitor connected to Video Out connector (Display key).

### **1.7 Safety measures**



Never use non-rechargeable dry cells instead of batteries.

Always use the oscillator only with standard network adapter

## 2 POTENTIAL FAULTS AND REMEDIAL ACTIONS

There is a list of potential faults, their origin and remedial actions in the table below.

<b>Fault</b>	<b>Possible origin</b>	<b>Remedial action</b>
"Power Supply" LED does not light when On button is pressed	1. Batteries are not installed 2. Batteries are installed improperly 3. Batteries are absolutely discharged	Install batteries according to installation diagram on a casing. Install batteries according to installation diagram on a casing. Connect the network adapter and press "On" key
The image displayed does not correspond to the required	Video signal output standard does not correspond to the standard of the stored image	Select other video signal output standard by pressing "PAL" or "NTSC" key.