



Beacon Tester BT-611M

GENERAL DESCRIPTION

BT-611M Beacon Tester is designed for high accuracy and resolution measurements of the full set of ELT signal parameters to check its compliance with the ones, specified in C/S doc. T.001, T.007.

The BT-611M Beacon Tester is professional specified test equipment for beacon manufacturers or test laboratories, service centers.

BT-611M Tester provides visual testing of frequency and phase behavior inside the burst during CW preamble and when it is modulated, statistical frequency stability parameters and, as a useful option to COSPAS/SARSAT requirements - rms frequency variations between the bursts. All specified burst and modulation time intervals are displayed.

The Tester provides high stability results when used by laboratories, manufacturers or during field beacon tests.

The Tester integrates two independent amplitude and frequency measurement channels for 406.025 MHz and 121.5 MHz beacon transmitters. Any PC or laptop could be connected to the Tester's USB port. Measurement functions and displayed results formats (graphics or tables) are available by means of special software.

Tester covers wide frequency range 406.00 – 406.1 MHz exceeding all reserved Cospas-Sarsat frequencies.

The Tester provides continuous testing and recording of all ELT parameters which allows to analyze the real-time beacon (ELT) operation during up to 48 hours.

The Tester was completely modernized in 2011.

BT-611M can be controlled directly from RS-232 port by remote terminal for programming of automatic tests. The feature allows to integrate BT-611M to complex test system.

OPERATION / FEATURES

The BT-611M Tester is required for annual or issue inspections of beacon (ELT) after or during receiving of type approval. The precision beacon signal parameters are complicated, and could not be measured with the simplified handheld testers. The most complex task is measuring of frequency stability and phase modulation parameters important for reliable communication with satellite and accurate position calculation.

BT-611M Tester provides real time testing of distress beacons, such as ELT. The ELT Testing procedure is simple.

Simple steps are required: connect the Tester to PC, connect the beacon to tester, run the software, turn on the beacon and start the testing. All data will be displayed on PC.

BT-611 Tester provides:

1. **Real time chart of the power and frequency values;**
2. **Real time Phase characteristic of the 406 MHz signal;**
3. **Real time charts with the frequency instability;**
4. **Real time charts with the phase deviation, phase asymmetry;**
5. **Complete table of the beacon (ELT) signal parameters;**
6. **All decoded data of the beacon (ELT);**



The tester is desktop professional solution, user-friendly.

The tester can be used for testing of any COSPAS-SARSAT distress beacons such as ELT, PLB or marine EPIRBs.

CONNECTION TO PC or Laptop

The BT-611 Tester requires to be connected to any PC or laptop for proper operation. The connection is carried out by means of standard USB A-B cable and special software. The minimal requirements are Microsoft OS, such as Windows XP, Windows Vista or Windows 7, at least 1 USB port and Internet Explorer 6.0 or higher (or any other browser). No special hardware configuration is required.

Also the special FTDI driver should be installed for proper connection. It can be downloaded at our web-site as well.

It is very simple to connect the tester to PC. Connect one side of the cable to tester and other to PC. Then install the drivers following the standard Windows wizard. After the driver is installed run the software. No installation is required. Just run the software and start testing. All measuring data will be displayed in tables and charts.



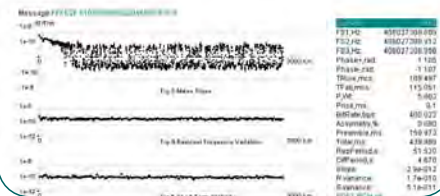
406 MHz Decode Program (Version 4.02)



Parameter	Value	Description
Current burst number since the test started		
F51 Hz	40027410.108	Frequency value sampled on 12...112 ms interval
F52 Hz	40027410.186	Frequency value sampled on 217...317 ms interval
F53 Hz	40027410.125	Frequency value sampled on 317...417 ms interval
Phase-J&K	1.107	Phase modulation index (averaged)
Phase-J&K	-1.094	Phase modulation index (averaged)
TRise,ms	114.164	Deviation time rise
TFall,ms	116.152	Deviation time fall
PR,db	8.858	Burst power (averaged) interval from 70 ms to the burst end
PR,ms	9.0	Power rise time (0.1-0.9 level)
BitRate,bit/s	399.993	Bit rate
Asymmetry,%	0.000	Half bit asymmetry
Preamble,ms	153.978	CW preamble
Total,ms	440.994	Total burst duration
Repetition,ms	50.700	Burst repetition period
Diff,ms	1.890	Maximum period difference (over 18 bursts)
Slope	3.9e-012	Frequency slope relative to carrier (18 F52 counts window)
Residual	2.5e-010	Residual variations (18 F52 counts window)
Stability	5.9e-011	Short term stability (Allan variance, corresponds to F52, F53 counts)
BCCH check result		BCCH check result

Short-term frequency stability corresponds to the Allan variance; horizontal solid line marks the limit 2E-9;

Figure 15 shows the example of results of the transmitted frequency long-term test.



TECHNICAL DESCRIPTION

BT-611 Tester provides:

Measured Parameter	Measure d Value	Accuracy		
		C-ST.008	BT-611 M	
Frequency	406 MHz	406000...406100 kHz	±100 Hz	$\Delta_{406} = \pm 20.3 \text{ Hz}$
	121.5 MHz	121495...121505 kHz	-	$\Delta_{121} = \pm 2.6 \text{ Hz}$
Frequency stability measuring resolution	$< 1 \times 10^{-9}$	1×10^{-10}		$\delta_{FS} = +3,88 \times 10^{-11}$
Phase deviation	$\pm(63 \pm 6.3)^\circ$	$\pm 2.3^\circ$		$\Delta_{\theta} = \pm 0.8^\circ$
Deviation Trise/Tfall time	$150 \pm 100 \mu\text{s}$	$\pm 25 \mu\text{s}$		$\Delta T = \pm 10 \mu\text{s}$
Asymmetry	$< 5\%$	$\pm 1\%$		$\delta_{AS} = \pm 0.8\%$
Bit rate	$400 \pm 4 \text{ bit/s}$	$\pm 0.6 \text{ bit/s}$		$\Delta = \pm 0.18 \text{ BR bit/s}$
Burst duration	$(440 \pm 4,4) \text{ ms}$ $(520 \pm 5,2) \text{ ms}$	$\pm 1 \text{ ms}$		$\Delta = - 80 \text{ BD } \mu\text{s}$
Preamble duration limiting error	$(160 \pm 1,6) \text{ ms}$	$\pm 1 \text{ ms}$		$\Delta = - 60 \text{ PD } \mu\text{s}$
Burst repetition period	$47.5...54.5 \text{ s}$	$\pm 10 \text{ ms}$		$\Delta_{RP} = \pm 10 \text{ ms}$
Input power 406 MHz	$3.1...8 \text{ W}$	$\pm 10\%$		$\delta_{P406} = \pm 10\%$
406 MHz power rise time	5 ms	$\pm 0.5 \text{ ms}$		$\Delta_{PR} = \pm 0.5 \text{ ms}$
Input power 121.5 MHz	$20 \text{ mW}...150 \text{ mW}$	-		$\delta_{M121} = \pm 10\%$

Operating environment

Operating temperature + 10°C...40°C;
Relative humidity up to 95% at 25°C.

Storage conditions

Temperature - 40°C... 50°C;
Humidity up to 90% at 25°C (non condensing)

Weight

Net 2.8 kg; (measuring unit)
Gross 3.6 kg (antenna included)

Dimensions

Measuring unit 252 x 260 x 69 mm
Antenna (when assembled): Height 280 mm
Diameter 260 mm



Complete set of the 406MHz SARSAT BEACON Tester

- BT-611M measuring unit
- Antenna, consisting of: Antenna rod, The trivet with cable, Supporting legs, Strip
- RF calibrated cable
- USB cable A/B
- Three prong AC power cord
- Technical description and operation manual (English)
- Device packing
- Software and software user's manual (available at our website)

