ECT1

DSPGenie – Echo Canceller Tester

Features

- G.168 tests of all commercially available Echo Cancellers at a click of a mouse.
- Includes customised drivers for each Echo Canceller to automate the testing process
- Flexible DSP based hardware allows upgrades up to full Network Emulation
- Allows standard subjective tests
- Stores graphical and audible output of tests
- Output of tests can be viewed on any computer using Viewer software
- Generates Pass/Fail test report
- Continual updates of tests and drivers via Internet
- Automated Perceptual Analysis Measurements, "Objectively subjective"
- Automated G.164/165 tone disable testing
- Records Send & Receive channels of live network traffic
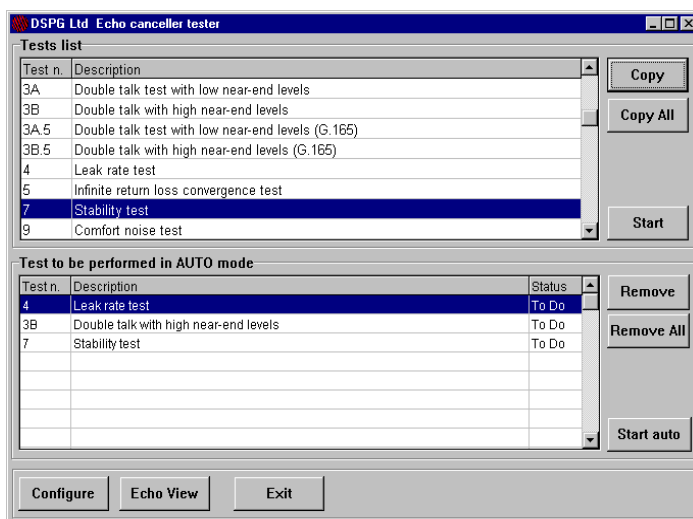- Stand-alone/remote controlled via laptop

ECT Concept

One of the key factors for improving the quality and performance of PSTN networks are Echo Cancellers. However, with so many models on the market there is inevitably a varying degree of performance There is now an obvious need for purpose designed instruments such as the ECT1 that allow an easy and automated range of tests including G.168 2000. Due to the differences in the individual cancellers operations, special drivers agreed with manufactures should be used to provide the most optimal test conditions.

ECT1 G.168/2000 Test Selection

Description

Based on DSP technology, the tester achieves accurate and repeatable results by implementing all G.168 test procedures digitally. Signal injection and monitor points are provided, allowing analogue measurements to be made if desired.

The software is a Windows 9X-based software package designed to perform real-time subjective and objective tests for all commercially available Echo Cancellers. Below to the left is an example of the G.168 test selection menu.

Objective G.168 2000 Test Mode

All the tests are implemented by the software, which is divided into several separate modules, such as, an echo path generator with three independent branches, two signal generators able to generate Composite Source Signal (CSS), tones, fax sequences or noise and a measurement instrument.

G.168 2000 Testing

After a simple configuration procedure, the *ECT1* is able to perform the G.168 tests without any user interaction. The *ECT1* controls the echo canceller parameters (Convergence, H register, NLP), generates all of the test signals, measures the output and

processes the results. At the end of the test session, the user can check the results using either the graphic viewer or by printing out a detailed report. To the right is an example of the G.168 graphic viewer of test results of dBm0 of Lres vs. time. All software may be continuously upgraded following any new versions of the G.168 specification including G.168 2000.

PAMS & Noise Reduction Testing

The Perceptual Analysis Measurement System is a new addition to the ECT1 test suite. Originally designed by BT Laboratories, this algorithm analyses the quality of a signal for degradation and gives a subjective MOS or Percentage of Toll Quality score as related to the human ear. Percentage of Toll Quality is a result that shows how good a call is compared to optimal network conditions. Effectively making subjective testing, objective.

This can also be used for testing of Noise Reduction algorithms. This operates by inserting noise just before the echo canceller and analysing the effectiveness to return to the original reference file.

G.165/G.164 Tone Disabler Testing

In a package similar to G.168 or PAMS, this tests the tone disabling ability according to G.165 and G.164. The tolerance limits for many different parameters are tested, for example, frequency range, angle of phase reversal, period of tone, signal/noise ratios and many others. This will give an accurate description of the tone disabling capability of echo cancellers.

G.169 Automatic Level Control

Following our standard software design, this tests the automatic level control ability of echo cancellers. Many different tests are implemented including ALC in the presence of echo or noise, DTMF tests and standard ALC stability tests. Testing ALC devices will give you confidence that you will not see a pumping effect in the network and that the device is working.

G.168 Test Results
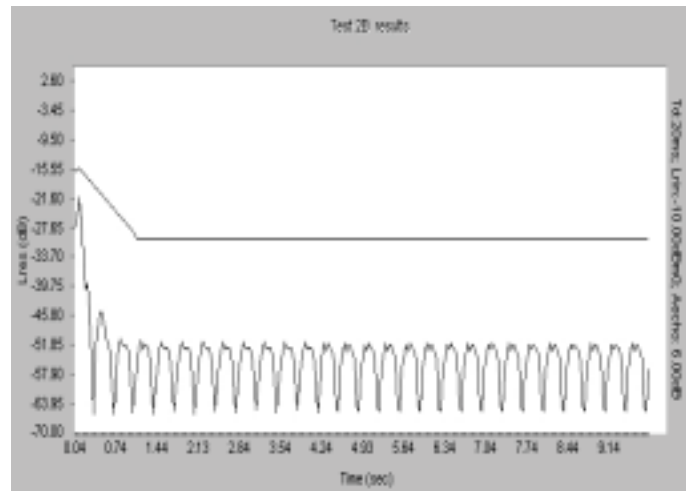
Subjective Testing Mode

Using the dialogue boxes the user can manipulate the echo path generator with its three independent branches and listen to the effects using the four-wire *TEL-4* telephones or a microphone and loudspeakers. A central office card can also be connected which will allow you to test standard two-wire telephones or fax machines. You are able to setup line conditions and analyse the effect in real world situations. The echo canceller parameters can be set up manually via a plug-in keypad or from the *ECT-1* software via a V.24 serial port. Optionally, the echo canceller can be controlled directly via a parallel port of the PC. The tests used within G.168 are objective and are not intended to replace or eliminate the use of subjective tests when measuring the perceived quality of echo cancellers. The *ECT-1* allows the user to continue testing using the subjective method.

Non-Intrusive Monitoring

When put into a non-intrusive monitoring mode the ECT can record data in wave files. These wave files can then be used in conjunction with Analysis software to measure SV6 levels, psofometric noise, delay and ERL of a network. The advantage of this is being able to prove that an echo canceller has improved the voice quality of your network.

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Central Office Emulation

With our new Central Office Emulator card, we complete our Network Emulator with 2-wire to 4-wire and back to 2-wire connectivity. You are able to set-up call impairments and perform all of the standard operations you would expect.

Network Connectivity

The ECT can be used in either a terminate or bridge mode when connecting to switches or similar devices. This allows testing and analysing of many devices in the network. In the bridge mode you can also use the ECT to insert delay into the system.

Future Development

The ECT is constantly being upgraded and new features added to it. All additional modifications will only be software that can be downloaded from the Internet or sent via email.

We are currently working on a four point recording system for enhanced non-intrusive recording.

We also make custom designed software for individual customers needs and desires.

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Standard Specifications / Ordering Details

Part No.	Description
ECT-1R T1 or E1	19" rack mountable system with full expansion capability. Includes: Two PCM interface cards (either E1 or T1), Echo canceller serial RS232 and TTL controls, Ethernet interface, built-in PC with HDD, two four-wire telephones, three floating point DSP cards implementing testing procedures and complex hybrid module, Objective G.168/2000 Software and Subjective test software suites.
ECT-1P T1 or E1	Portable unit with limited expansion capability. Includes the same features as ECT-1R.
ECT-1 Mini Genie E1 or T1	Ultra compact unit with only basic G.168/2000 testing capability, either E1 or T1 only. No expansion capability available.
	Note: ECT-1R and ECT-1P can be ordered with both E1 & T1 installed.

Hardware Options / Ordering Details

Part No.	Description
DS-PCM1T	Additional T1 PCM interface board (incl. software)
DS-PCM1E	Additional E1 PCM interface board (incl. software)
DSAD2	High Quality A/D and D/A converter for precise subjective tests
DSHYB-1	Additional Complex Hybrid Module for subjective tests
DS-SLIC	Central Office Card
DS-TEL 4	One pair of 4-wire telephones
FR GSM	Full rate GSM codec (incl. two boards & software)
EFR GSM	Enhanced Full Rate GSM codec (incl. two boards & software)
ADPCM	ADPCM G.726 codec (incl. two boards & software)
IS-54	IS-54 VSELP codec (incl. two boards & software)
Inmarsat B	Inmarsat standard B codec (incl. two boards & software)
Inmarsat Aero H	Inmarsat Aero H codec (incl. two boards & software)
Inmarsat Mini M	Inmarsat standard Mini M codec (incl. two boards & software)
Inmarsat Aero I	Inmarsat standard Aero I codec (incl. two boards & software)
G-728	LD CELP G.728 codec (incl. two boards & software)
G-729	LD CELP G.729 codec (incl. two boards & software)
IS-95A	CDMA codec (incl. two boards & software)
OST	One-day on site ECT-1/G.168 training

Software Options / Ordering Details

Part No.	Description
PAMS	Perceptual Analysis Measurement System (PAMS) Tester
SRC	E1 or T1 Synchronised Subjective Recording
MMR	E1 or T1 Monitoring Mode Recorder
TD	G.164/165 Tone Disabler Tester
ALC	G.169 Automatic Level Control Tester
ECHO	Echo delay, ERL, Noise and Level analysis from wave
ECT Viewer	Distributable viewing software for objective G.168 test results

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