Telephone Testing

Introduction

SoundCheck is a powerful and flexible system for testing all types of telephone, including smartphones, cellphones, VoIP phones, Skype phones, PCs used as phones, analog and digital phones. SoundCheck can be used to measure many aspects of the telephone including handset, headset, speakerphone, volume control, tone control etc., and a variety of transmission paths such as send, receive, sidetone and echo. In addition to testing these parts of assembled phones, it can also be used to test raw components (e.g. receivers, speakers, microphones, etc.).

Benefits

Interfaces to all types of phone

SoundCheck's open interface means that your type of device, whether analog, digital, USB, cell or VoIP, can be connected to the SoundCheck system. SoundCheck supports third-party interface accessories that may be required for some types of phones.

Interfaces to all types of test transducers

SoundCheck's built-in calibration tools completely support virtually all electroacoustic test platforms, such as mouth simulators, ear simulators, and Head and Torso Simulators

Listen offers a complete range of test accessories

Listen accessories include Microphones, AmpConnect,SoundConnect, and the Legato telephone test interface, which provides the electrical test circuits needed for analog telecommunications testing. Approved third-party test accessories can be bundled with your system These include microphones, acoustic calibrators, mouth simulators, ear simulators, and Head and Torso Simulators - with or without handset positioners,

Supports all Telephone Test Stimuli

Soundcheck accommodates virtually all telephone test stimuli, ranging from simple stimuli such as sine waves and noise to artificial, synthesized and real speech. SoundCheck can also accommodate composite source signals (e.g. consisting of a conditioning signal to trigger the voice activity detector, a measurement signal and a modulation segment). SoundCheck can meet current and likely future telephone test standards.

Test Flexibility

SoundCheck's simple point and click test development interface makes it easy to build complex telephone tests, and a variety of pre-programmed analyses enable you to be up and running with industry standard tests fast. Whether you are testing to a telephone industry standard using a pre-programmed test sequence, building a test from scratch, or developing your own custom telephone test by modifying standard SoundCheck test sequences, test development is powerful, flexible and fast.

Includes telephone-test specific features

SoundCheck can accommodate all known standard loudness rating tests. Narrowband loudness rating curves are included, and as it allows custom curves to be imported, it is flexible enough to accommodate any new loudness rating standards that may be developed. Measurement of active speech level (ASL) is also available.
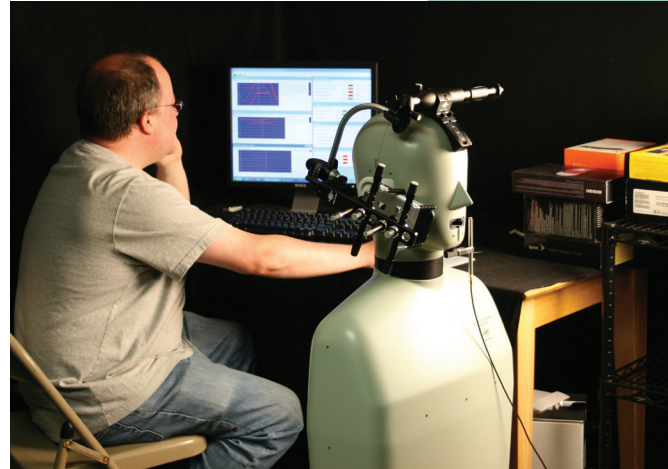
Testing Telephone Components and Accessories

Testing telephone receivers, speakers and microphones is essentially the same as testing loudspeakers and microphones. The main difference is in the specifications to which they are tested and the limits that are set. In addition, SoundCheck can also be used to test other smartphone components and accessories such as Bluetooth headsets, MP3 players, docking stations and headphones. Please refer to our other application notes for information on testing these smartphone components.

TIA Test Sequences

We offer test sequences written by a leading telecom test expert for testing to TIA470-C, TIA 820, TIA 920 and IEEE 1329 test standards. All major clauses of the standard are included in each package. Calibration, user prompts and the ability for the user to use the sequence as it stands or customize it make it simple to use and versatile for all telephone testing needs.

Telephone Measurements

SoundCheck is used for all standard telephone tests including:
- Frequency response
- Loudness rating
  - send loudness rating (SLR)
  - receive loudness rating (RLR)
  - sidetone masking rating (STMR)
  - weighted terminal coupling loss(TCLw)

- Distortion
- Linearity
- Noise
- Ear protection

SoundCheck® Application Note

Telephone Testing (cont.)
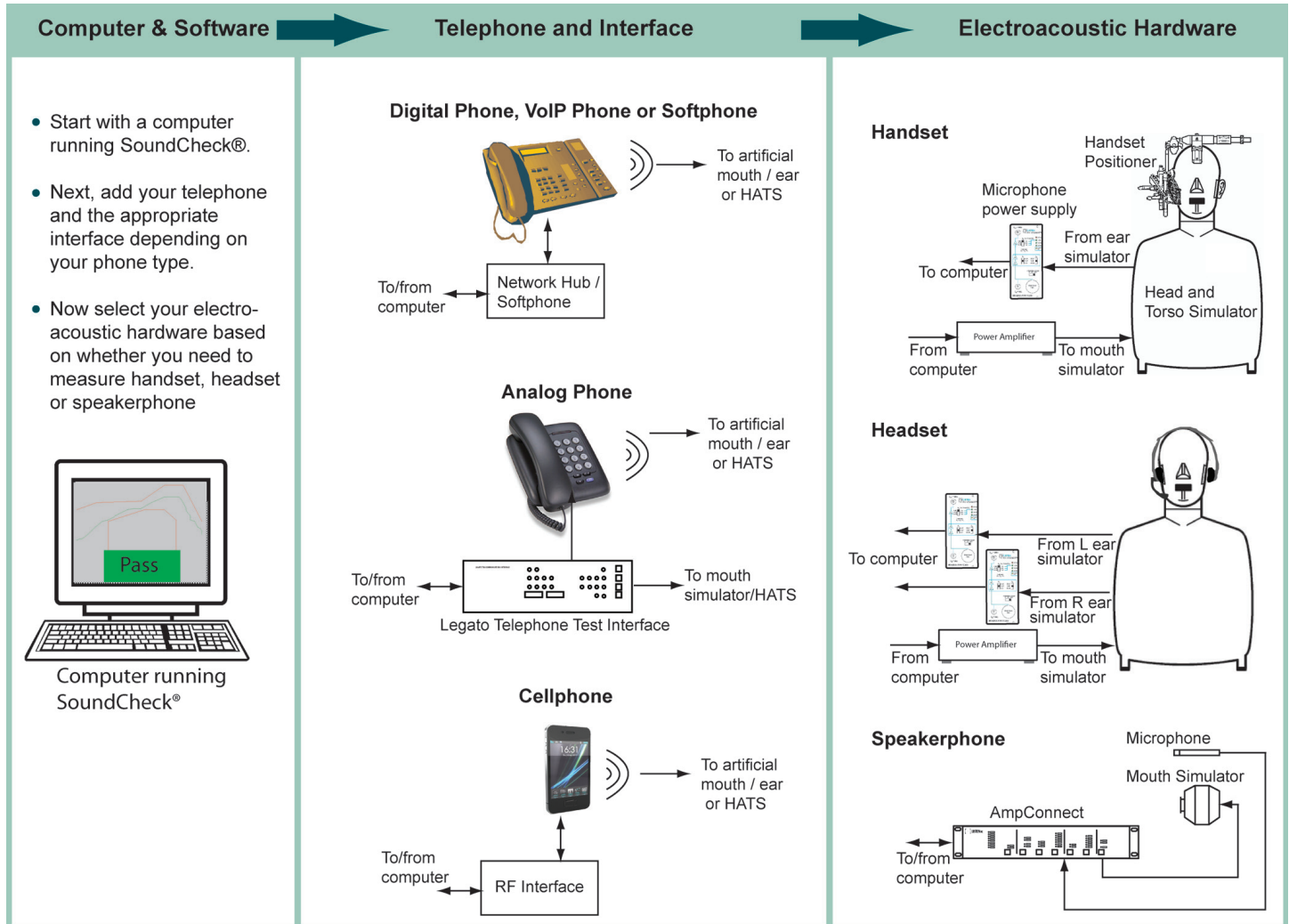
Benefits (cont.)

Testing Telephones with Background Noise
SoundCheck can be set up to test telephones in a noisy environment to simulate real life situations. In this configuration, Sound-Check controls a virtual environment in which multiple sound sources are simultaneously equalized and calibrated to simulate background noise.

System Configuration

Between the different types of phones and the characteristics we can test, there are many possible test set-ups. This diagram offers an overview that includes most types of phone and acoustic test. Please talk to a sales engineer about your exact requirements.

Computer & Software	Telephone and Interface	Electroacoustic Hardware

- Start with a computer running SoundCheck®.
- Next, add your telephone and the appropriate interface depending on your phone type.
- Now select your electro-acoustic hardware based on whether you need to measure handset, headset or speakerphone

Computer running SoundCheck®

Digital Phone, VoIP Phone or Softphone
To artificial mouth / ear or HATS
To/from computer — Network Hub / Softphone

Analog Phone
To artificial mouth / ear or HATS
To/from computer — Legato Telephone Test Interface — To mouth simulator/HATS

Cellphone
To artificial mouth / ear or HATS
To/from computer — RF Interface

Handset
Handset Positioner
Microphone power supply
From ear simulator
To computer
From computer — Power Amplifier — To mouth simulator
Head and Torso Simulator

Headset
To computer
From L ear simulator
From R ear simulator
From computer — Power Amplifier — To mouth simulator

Speakerphone
Microphone
Mouth Simulator
AmpConnect
To/from computer

Telephone Testing Software and Hardware

Software
SoundCheck Options
1102- Plus
1103 - Advanced

Hardware
Head and Torso Simulator
Handset positioner
Legato telephone test interface – provides network support for telephone including simulation of the line and also includes amplifier for mouth
Ear Simulator
Mouth Simulator

Recommended Software Modules (testing complete telephones)
2007: IEEE/ITU loudness ratings and sample send/receive sequences
2030: Active Speech
2005: RTA
2013: wav equalization
2031: Zwicker loudness rating (optional)

Test Sequences
3104: TIA 470C test sequences
3108: TIA 810 Test Sequences
3109: TIA 920 Test Sequences
3103: IEEE 1329-1999 Test Sequences