

## **Contents of this CDROM**

This CDROM contains installation files for APWIN version 1.60, Adobe Acrobat PDF files for all manuals, Addendum information, and several audio tracks containing test signals. Here is the organization of the disc.

Folder	Contents
APWIN	Installation files for APWIN version 1.60. Run SETUP.EXE to install this software
Adobe	Installation files for the Adobe Acrobat Reader that is necessary to view or print any of the manuals included on this disc in Adobe Acrobat PDF format. If you do not already have the Adobe Acrobat Reader installed on your system, run SETUP.EXE in this directory to install version 3.01.
Documentation	Adobe Acrobat PDF files of all user manuals. Using the supplied Adobe Acrobat Reader, any of the manuals may be viewed and/or printed. Also included in this folder are PDF files of various other forms and tables. See the more detailed list below for a complete list of all included files.

### List of included Adobe Acrobat PDF files (Manuals and documents)

Folder	Manual, form, or document	
Accessories		
ApplicationNotes	Copies of all AppNotes, associated test and procedure files	
APWBasic	APWIN BASIC User's Guide and Programming Reference (3 volumes)	
ATS-1		
AUDIOTST	Copies of selected AUDIO.TST issues	
Brochures	Brochures for cable kits, switchers, product specifications and an assortment of product brochures	
InstallationandGet tingStarted	Installation and Getting Started for System One and System Two	
Miscellaneous	New features in APWIN, table listing the 72 audio test signals on this CD, Register form for your copy of APWIN, detailed specifications for System Two hardware and a bug report form to submit observed samples to Technical Support	
PortableOne	Portable One Access and Portable One Dual Domain	
TechincalPapers		
TECHNOTES	Copies of all TechNotes, associated test and procedure files	
Tutorials	APWIN Simplified Tutorial, Multitone, and Procedures for System One and System Two	
UserManuals	APWIN User's Manual for System One and System Two	
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AP P/N 8211.0085

## **APWIN Version 1.60**

(Final Release March 1999)

## New features since version 1.52a

APWIN version 1.60 has been created to support the new hardware features provided with System Two Cascade. Much of the capability included in APWIN 1.60 draws on the legacy of earlier versions of APWIN that operate with System Two but updated for the new Cascade platform. This document will describe these new features added to APWIN to support the new capabilities of System Two Cascade. It is written from the perspective of a user familiar with System Two and previous versions of APWIN.

## Dual Reading Meters on DSP Audio Analyzer.

DSP Audio Analyzer now has dual Reading Meters that allow two simultaneous readings with the resultant speed gain. Thus it is possible to make stereo distortion, crosstalk, bandpass, and phase readings. When added to the two level readings, four simultaneous measurements may be made.



## Additional Inputs on DSP Audio Analyzer

The INPUT selection list for the DSP Audio Analyzer has been increased to now include the High Bandwidth A to D converter.



## Additional measurement functions added to DSP Audio Analyzer

Phase and SMPTE/DIN IM distortion have been added to the list of possible measurements for the digital audio analyzer.

Measurement Function :	
🔽 🔽 Ra	Amplitude 2 2-Ch Ratio
Decleare Thus	Crosstalk THD+N Ratio
BW: < 10 Hz 💌 Fs/2	THD+N Ampl
Fitr: None	Bandpass SMPTE/DIN
- Digital References	Phase

## New DC-Only coupling for DSP Audio Analyzer

A DC Only selection on the input coupling choice allows true DC Voltage measurements.

## Harmonic Weighting for DSP Audio Analyzer

A new selection in the Weighting Filter menu allows measurement of harmonics only in THD+N measurement function.

### Longer record lengths for INTERVU

INTERVU now acquires 1.5M samples allowing over 19 ms of data to be acquired for subsequent analysis. (System Two can acquire 256k samples). The sample rate of the A to D converter has also increased from 67MHz to 80 MHz.

## New Support for higher sample rates on System Two Cascade

System Two Cascade supports the new digital audio sample rates of 88.2kHz and 96kHz.



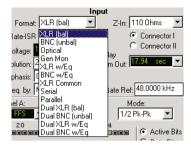


# Support for System Two Cascade Dual Connector Digital Audio Interface

A new D I/O panel now includes controls to select from among several digital audio formats. In addition to the classic single connector 44.1/48kHz AES/EBU format,

Outp		
Format:	XLR 👤	
ate-OSR	XLR BNC	p
/oltage:	Optical	
olution:	Serial Parallel	B
nphasis:	Dual XLR Dual BNC	e
Sim	Dual XLR 2xOSR Dual BNC 2xOSR	ale bi
	, cona myana	010

System Two Cascade hardware includes two balanced and two unbalanced connectors for AES/EBU/SPDIF input and output. In single connector modes, these two connectors interface to a 2 x 1 switch allowing programmable



selection of one of two digital audio bit streams. In the interleaved dual connector digital audio format, each connector carries one channel of the two-channel signal.

## Now four channels of signal monitoring

There are now four monitor connectors on the front panel allowing simultaneous monitoring of four channels of data. Additional selections have been added to the Headphone/Speaker panel to accommodate these additional channels.





## FASTTEST record length increased to 32k

The maximum record length in FASTTEST has been increased to 32k (from 16k). Also, the double-precision FFT gives improved noise floor.

#### Phase readings now possible on FFTs

Phase readings have been added to the magnitude readings available from FFT transforms. The browser available from the Sweep panel includes Phase as well as Amplitude. Additionally, changes to the DSP code improve the "move-to-bin-center" and "realign" operation of sync averaging.

Browser : Sweep.Data	1	×
Instrument: Fft None Gen Anir	Parameter: Ch.1 Phase Ch.1 Ampl Ch.1 Phase Ch.2 Ampl Ch.2 Phase	
Swr Dcx DGen Dio Sync/Ref	Cri 2 Priase	
Fft Time		
<u>o</u> k <u>c</u>	ancel 🔽 Show <u>R</u> ea	-

#### FFT acquisition and transform length increased

System Two Cascade FFT Acquisition buffer has been increased to 256k from the 24k size available on System Two. Additionally, the Transform buffer length adds 32k to the previous 16k maximum.

🔲 Digital Analyzer	_ 🗆 ×
Analyzer: FFT spectrum analyzer (fft)	•
Ch 1 Input: Digital @ ISR	▼ Ch 2
A 💌 Source B	•
0.000 FFS 💌 Peak Mon 0.0	00 FFS 💌
FFT: 1024 💌 Acquire: Tra	ck FFT 💌
	sk FFT
Avgs: Power (spectrum only) 1.5	< C
2.5k	< Contract of the second se
Wave Disnlay Interpolate 10k	
FFT Start Time: 0.000 sec 24k	
Trigger: 36k	
Delay: 0.000 sec 💌 72k	ь.
Source: Free Run Slope 256	

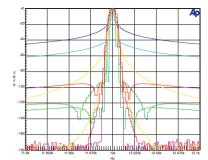
🔚 Digital Analyzer			
Analyzer	Analyzer: FFT spectrum analyzer (fft)		
Ch 1	nput: Dig	jital @ ISR	
A	•	Source B	
0.000	FFS 🔽	Peak Mon <mark>0.00</mark>	
FFT:	1024	<ul> <li>Acquire: Track</li> </ul>	
Window:	256	arris 💌 Sub 1	
Avgs:	1024	trum only) 🔄	
	2048 4096		
Wave		polate	
Wave FFT Sta	32768	0 sec 💌	

#### New Windows

Four new FFT window selections have been added: Hamming, Gaussian, Rife-Vincent 4 term, and Rife-

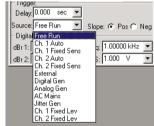
Vincent 5 term. The Equiripple window has also been improved with lower sidelobes.





### Enhanced FFT triggering

Additional choices have been added to the FFT hardware triggering menu to allow fixed level triggering (oscilloscope-style) in addition to the previous fixed sensitivity triggering.



#### Even Integer FFT Bin Centers now possible

The 65,536, 131,072, and 262,144 Hz sample rates provide FFT

bin centers that are even integer Hz values. For example, with 32k FFT Transform length and 65k A/D sample rate, the FFT bin centers are 2.0000 Hz, 4.0000 Hz, etc.

#### MLS sequence length increased

An extended sequence length of 128k has been added to the previous 32k size for the Maximum Length Sequence generation and measurement capability. This will allow an acquisition of 2.8 seconds (at 48kHz) thereby increasing the size of the acoustic environment that can be measured.



### D I/O now has Invert and Parity Error selection

Selections are now added to invert the digital audio output signal and to add a parity error to the data stream.

Browser : Reg.Target	×
Instrument:	Parameter:
DSP Audio Anlr	Ampl A
None Gen Anlr Swr DCx DGen Dio Sync/Ref <u>DSP Audio Anlr</u> Time	Ampl A Ampl B Freq A Freq B Freq B Level A Level A & Level B Level B
<u>O</u> K (	Gancel Show <u>R</u> eadings

## New Sync Ref panel

An enhanced Sync Ref panel adds Frame Lock to AES/EBU Reference as a signal choice. Controls also allow the sync output to be inverted and allow jitter to be added to the Master Clock output.

#### New test type added .AT2C extension

To simplify management of test files for the new System Two Cascade platform, a new test file type has been created with the

extension .at2c. Additionally, APWIN 1.60 includes the ability to import System Two .at2 test files (which could then be saved as System Two Cascade .at2c test files).

Output		
Format		•
Sample Rate-OSF	48.0000	kHz 🔻
Voltage: Resolution:	5.000 V	pp
Resolution:	24	Bits
PreEmphasis:	Off	•
☐ Invert	🔲 Parit	y Error

### Additional choices added to DSP Audio Analyzer Regulation

New choices of Level A & Level B and Freq A & Freq B have been added to the Regulation panel for the Digital Analyzer to allow simultaneous control to two parameters during the regulation process.

🖬 Sync/Ref Input/Output 💦 🔲 🗙				
Reference Input				
Source: AES Sync Rate				
🗖 Frame Lock C HiZ 📀 110 Ohms				
Frequency: 48.0000 kHz				
Input Frequency:Hz				
Delay, In from Ref In: <mark>29.80 nsec </mark> ▼				
Out of Range: 📼				
Sync Output				
Delay, Out from Ref Out: 0.0000 UI 🔽 orr				
📁 Invert Frame Sync				
Jitter Clock Outputs				

## Additional Instrument Selection at Startup

When APWIN 1.60 starts, the user can select from one of three platforms: System One, System Two, or System Two Cascade. Alternatively, if "Hardware Auto Detect" is selected, APWIN will make the platform selection automatically. In the "Prompt for Choice" mode, a System Two Compatibility mode is available if the hardware is System Two Cascade. This allows System Two (at2) test files to be loaded and run on System Two Cascade hardware.

Choo	ose Hardware	
(	APWIN is configured to prompt for hardware choice or no hardware was found. Please select your hardware.	
	System One	
	System Two	
	System Two Cascade	
	System Two Cascade (System Two Compatibility Mode)	



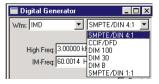
#### New Samples provided for System two Cascade

A new set of furnished samples have been generated to support the new capabilities of System Two Cascade and APWIN 1.60. The new folder branch adds to the previous S1 and S2 branches with their samples particular to System One and System Two. New samples provided for System two Cascade use long file names for better identification of their function.

#### New IMD Waveforms available on D/A source signals

Intermodulation (dual tone) test signals have been added to the list of choices available on DSP generated waveforms, that is IMD selections on the digital generator and D/A selections on the analog generator. Additionally, SMPTE IMD amplitude ratios have been fixed at 1:1 and 4:1.

🖬 Analog Generator	_ 🗆 ×
Wfm: IMD (D/A)	SMPTE/DIN 4:1
High Freq: 3.00000 k	SMPTE/DIN 4:1
IM-Freq: 60.0000 H	SMPTE/DIN 1:1
	DIM 30 DIM B
	DIM B DIM 100



## New Pass Through selection on Digital Generator and Analog D/A signals

A Pass Through selection is now available on the D/A waveform selection of the Analog Generator and the Special waveform selection of the Digital Generator that passes through the digital

🖬 Analog Generator	
Wfm: Special (D/A) 💌 F	
Frequency: 1.00000 ki	Polarity Pass Thru
Ľ	ass miu

signal present at the rear panel Digital Reference input connector.

🔲 Digital Generator	
Wfm: Special 💌	Monotonicity 🗾
Samples/Step: 1.00000	Monotonicity J-Test Polarity Walking Ones Walking Zeros Constant Value
CHA OUTPUT	Bittest Random

## Improved Performance of digitally generated IMD signals

The IMD (D/A) waveform generation in System Two Cascade has better performance than System Two or System One since one D/A generates one component, at full scale, while the other D/A generates the other component, at full scale, and are then resistively summed at 1:1 or 4:1 ratio. The combination of the individual signal components each operating at full scale on their respective converter and the better performance converters yield significantly lower IMD test signal distortion.

## Enhanced Converter Performance in System Two Cascade

Support has been added to APWIN for the improved converters present in System Two Cascade: the highresolution A to D converters, useable with signals up to approximately 50kHz, have improved from 20 bit to 24 bit. The high bandwidth 16 bit A to D converters, previously able to handle signals up to approximately 80kHz, can now handle signals up to approximately 120kHz. The D to A converters have improved from 18 bit to 24 bit.

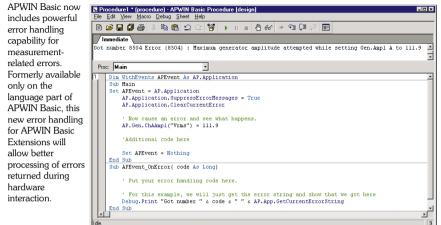
## Greatly increased A/D and D/A converter bandwidth extend sophisticated DSP-based testing techniques to much higher frequencies

A/D converter sample rates of 65k, 131k, and 262k provide bandwidths of 30 kHz, 60 kHz, and 120 kHz to most DSP-based analyzer programs. This means that the Fast RMS feature and simultaneous 2-channel THD+N, SMPTE IMD, and Bandpass meters of DSP Audio Analyzer are now extended to as high as 120 kHz. Multitone testing techniques are now available to bandwidths of 60 kHz with FASTTEST. Quasianechoic testing with MLS can now be accommodated to 60 kHz bandwidth.

## Extended upper frequency limits for D/A generated signals

D/A converter sample rates of 65k and 131k provide complex and sophisticated waveforms such as Stereo Sine, Variable Phase Sine, Shaped Burst, Dual Sine, MLS, and Arbitrary Waveforms to upper frequency limits of 30 kHz at best performance levels and 60 kHz at slightly reduced performance levels.

### New error handling in OLE



#### Sample Rate abbreviations added: OSR and ISR

There are several different Sample Rates used throughout the system: sample rate of digital audio signals entering and leaving the system and the sample rates of the various converters used in the system. D/A converter sample rate, A/D Converter Sample Rate, Digital Output Sample Rate, and Digital Input Sample

Rate are now independent and could be four separate values, or can be deliberately set to the same value when required. With limited space on many panels and drop down menus, the terms OSR for Output Sample Rate and ISR for Input Sample Rate have been developed.



📰 Digital A	nalyzer 📃
Analyzer: DSF	<sup>o</sup> Audio Analyzer (analyzer)
Ch A Inpui	t Digital @ ISR 📃 💌
AC Coupled	Digital @ ISR - HiRes A/D @65536
FFS	HiBW A/D @131072
Hz	HiBW A/D @262144 HiBes A/D @0SB
	HiBW A/D @2xOSR

Configuration	×	Waveform loading automatically sets Sample
General Hardware Configure Filters Log Graph		Rate
General Options Prompt to Save Test when a test is closed Load "LASTAT"" on startup Save "LASTAT"" on exit Lege all readings active during sweeps Display data in graph on test open		Sample rates are now automatically set when waveforms are loaded using information contained in the waveform file itself. The Configuration panel allows this feature to be enabled.
<u>Reprocess</u> FFT Data on Zoom     European Broadcast option installed	Set Sa	mple Rate when loading generator waveforms
Do not load panels on Open Test.     Auto-"Enter" for Numeric Fields      Set Sample Rate when loading generator waveforms      Company Name: Audio Precision		
OK Cancel	Help	

#### New MAKEWAVE utility

Several improvements have been added to the MAKEWAVE utility. Long file names are now supported. The upper frequency range has been slightly increased to .499 of sample rate, up from approximately .47. The low frequency range has been extended to include any values that particular sample rates and record lengths will support16k record length has been added. There is now more control of statistical data produced by the program.

#### System Two Cascade Multitone Creation

Adjust the following parameters to create the required waveform.

X

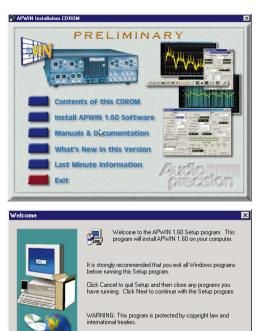
Waveform Name :	Multi-tone Waveform Length :
WAVEFORM       Sample Rate :     48000       Margin Headroom :     1.0	10582 ▲ 8132     This field defines the number of samples used to create one iteration of the multitone waveform.       1024     ►
<ul> <li>☐ Create Sweep <u>I</u> able (ADS) file.</li> <li>☐ Create MS <u>B</u>IFF (WAV) file.</li> <li>☐ Minimize <u>C</u>reat Factor</li> <li>☐ Create <u>S</u>tereo (AGS) Waveform</li> </ul>	Record Length : This field defines the number of samples created for one channel in the output file, that may contain multiple iterations of the multitone waveform.
Use Existing File Data OK	Cancel File Options

# Installing the software

The CDROM starts with an opening screen illustrated at the right. If your CDROM is set to AUTORUN, this screen will be automatically displayed within a minute or two after inserting the disc. If AUTORUN is not enabled, browse the CDROM and start the SETUP.EXE program located in the root folder.

> Not compatible with Windows 3.11 APWIN version 1.60 will operate on Windows 95, Windows 98, and Windows NT 4.0. It will not run under Windows 3.1 or 3.11 as did version 1.50.

From this point, you can browse the CDROM, install APWIN, view or print any of the manuals, or view last minute information. The installation program for APWIN is self explanatory and will guide you through the installation process. The APWIN installation program will automatically detect what operating system you are using (Windows 95 or Windows NT) and install the appropriate driver. It will give you a choice of what files to install and where to install them. The default installation will install all files and take approximately 37 MB of hard disk space.



Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.



After a successful installation, you will find a new Start Menu Folder such as shown at the right. Select the APWIN icon to start APWIN.

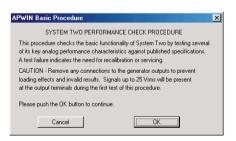
For a quick tour of the software, open one of the sample tests or procedures supplied. Select File Open, Test or Procedure, and navigate to the S1 or S2 folder (for System One and System Two). There are several sample tests you can browse for an introduction to some of the capabilities of System One and SystemTwo inside APWIN.

An interesting procedure to start with is the System Performance procedure S1-22CK.APB (or S2-22CK.APB) which runs a complete performance evaluation of the analog hardware of the System including comparison to specification limits and failure reporting. It will also illustrate automatic test loading and show several sweeps on graphs. To find this procedure, look in S1 (or S2) under the APWIN folder.

Then navigate to the PROCEDUR and then SYSCHECK folder and find a file called S1-22CK.APB (or S2-22CK.APB). Load this self check procedure and select RUN under the Procedure menu. This will test the hardware and illustrate an automatic sequence of tests, graphing, and comparison to limits.



Open						? ×	j
Look jn: 🔂	SysCheck	•	<b>E</b>	<u></u>	<b>e</b> ř	8-8- 8-8- 8-8-	
S2-22ck							
1					_		
File <u>n</u> ame:	S2-22ck					<u>O</u> pen	
Files of type:	APWIN Basic Procedure (*.APB	)		•		Cancel	
						1.	2



# Installing the hardware

APWIN requires an interface card to communicate with System One or System Two. Every purchased copy of APWIN includes either an ISA-WIN interface card for desktop PC installation or a PCM-WIN PCMCIA interface card for notebook computers. (Note that APWIN will not run with earlier Audio Precision APIB interface cards such as PCI-1, PCI-2 or PCI-3.)



With the computer turned off, remove the cover and install the ISA-WIN interface card that came with this APWIN package. Use caution handling the card to avoid static damage. The factory default address jumper setting should work for most installations. If not, see the Installation and Getting Started manual for details on how to set





If the computer to be used with APWIN is a notebook with a PCMCIA slot, use the PCM-WIN interface. Whether running Windows 95 or Windows NT, *install* **APWIN before plugging in the PCM-WIN interface card**. The APWIN installation process will install the correct driver for the PCM-WIN card. After completing the installation of APWIN, plug in the PCM-WIN card and Windows 95 should "find" the card and establish the correct link. (Windows NT requires a power cycle to "find" the card)

### Not compatible with Windows 3.11

APWIN version 1.60 will operate on Windows 95, Windows 98, and Windows NT 4.0. It will not run under Windows 3.1 or 3.11 as did version 1.50.

## Audio Precision APWIN CD-ROM Audio Test Signals

All waveforms are at the standard CD Audio 44.1 kHz sample rate.

Track	Description	Level	Duration	Dither	FILE NAME
1	Data track: APWIN software, Manuals in PDF format, Newsletters, and	TECHNOTES	Readable on a com		lrive only
Refer		TEORINOTEO.			inve only
2	997 Hz single tone level reference	0 dBFS	30 seconds	Triangular	
Noise		U UDI U	00 30001103	mangalai	
3	Quiet Track, "Infinity zero"	Zero	30 seconds	None	
4	Quiet Track	Zero	30 seconds	Triangular	
5	Quiet Track	Zero	30 seconds	Shaped	
	Jency Sweep	2010	00000000	enaped	
6	20 – 20 kHz High Resolution 120 frequencies	0 dBFS	1 sec each tone	Triangular	1
7	20 – 20 kHz High Resolution 31 frequencies	0 dBFS	1 sec each tone	Triangular	
8	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	0 dBFS	.5 sec each tone	Triangular	
9	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	0 dBFS	.5 sec each tone	Triangular	
10	20 – 20 kHz High Resolution 120 frequencies	0 dBFS	120 seconds, 1	Shaped	
			sec each tone		
11	20 – 20 kHz High Resolution 31 frequencies	0 dBFS	31 seconds, 1	Shaped	
			sec each tone		
12	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	0 dBFS	.5 seconds	Shaped	
13	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	0 dBFS	.5 seconds	Shaped	
14	Stepped sweep with 11 frequencies at ISO octave spacing	0 dBFS	1 sec each tone	Triangular	
15	Stepped sweep with 21 frequencies at ISO half-octave spacing	0 dBFS	1 sec each tone	Triangular	
16	Stepped sweep with 31 frequencies at ISO third-octave spacing	0 dBFS	1 sec each tone	Triangular	
17	Stepped sweep with 11 frequencies at ISO octave spacing	0 dBFS	3 sec each tone	Triangular	
18	Stepped sweep with 21 frequencies at ISO half-octave spacing	0 dBFS	3 sec each tone	Triangular	
19	Stepped sweep with 31 frequencies at ISO third-octave spacing	0 dBFS	3 sec each tone	Triangular	
20	20 – 20 kHz High Resolution 120 frequencies	-20 dBFS	1 sec each tone	Triangular	
21	20 – 20 kHz High Resolution 31 frequencies	-20 dBFS	1 sec each tone	Triangular	
22	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Triangular	
23	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Triangular	
24	20 – 20 kHz High Resolution 120 frequencies	-20 dBFS	1 sec each tone	Shaped	
25	20 – 20 kHz High Resolution 31 frequencies	-20 dBFS	1 sec each tone	Shaped	
26	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Shaped	
27	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Shaped	
28	Stepped sweep with 11 frequencies at ISO octave spacing	-20 dBFS	1 sec each tone	Triangular	
29	Stepped sweep with 21 frequencies at ISO half-octave spacing	-20 dBFS	1 sec each tone	Triangular	
30	Stepped sweep with 31 frequencies at ISO third-octave spacing	-20 dBFS	1 sec each tone	Triangular	
31	Stepped sweep with 11 frequencies at ISO octave spacing	-20 dBFS	3 sec each tone	Triangular	
32	Stepped sweep with 21 frequencies at ISO half-octave spacing	-20 dBFS	3 sec each tone	Triangular	
33	Stepped sweep with 31 frequencies at ISO third-octave spacing	-20 dBFS	3 sec each tone	Triangular	

Amplitude Sweep         34       400 Hz 0 dBFS to -110 dBFS       NA       5 sec each tone       Triangular tone         35       Left: Amplitude Linearity 400 Hz 0 dBFS to -110 dBFS       NA       5 sec each tone       Triangular tone         36       Right: Amplitude Linearity 400 Hz 0 dBFS to -110 dBFS       NA       5 sec each tone       Triangular tone         36       Right: Amplitude Linearity 400 Hz 0 dBFS to -110 dBFS       NA       5 sec each tone       Triangular         37       400 Hz single tone level reference       0 dBFS       30 seconds       Triangular         37       400 Hz single tone level reference       -6 dBFS       30 seconds       Triangular         38       400 Hz single tone level reference       -10 dBFS       30 seconds       Triangular         40       Hz single tone level reference       -20 dBFS       30 seconds       Triangular         41       400 Hz single tone level reference       -30 dBFS       30 seconds       Triangular         42       400 Hz single tone level reference       -30 dBFS       30 seconds       Triangular         43       400 Hz single tone level reference       -30 dBFS       30 seconds       Triangular         43       400 Hz single tone level reference       -40 dBFS       30 seconds       Tr							
International and the second secon							
Right: Frequency sweep 1000 to 890, 10 Hz steps synced with amplitude changes       Inne       Inne         36       Right: Amplitude Linearity 400 Hz 0 dBFS to -110 dBFS Left: Frequency sweep 1000 to 890, 10 Hz steps synced with amplitude changes.       NA       5 sec each tone       Triangular         38       400 Hz single tone level reference       0 dBFS       30 seconds       Triangular         39       400 Hz single tone level reference       -3 dBFS       30 seconds       Triangular         40       Hz single tone level reference       -10 dBFS       30 seconds       Triangular         41       400 Hz single tone level reference       -20 dBFS       30 seconds       Triangular         42       400 Hz single tone level reference       -40 dBFS       30 seconds       Triangular         43       400 Hz single tone level reference       -40 dBFS       30 seconds       Triangular         44       400 Hz single tone level reference       -50 dBFS       30 seconds       Triangular         44       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         45       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         46       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular		Triangular		NA	400 Hz 0 dBFS to -110 dBFS	34	
Left:       Frequency sweep 1000 to 890, 10 Hz steps synced with amplitude changes.       tone         37       400 Hz single tone level reference       0 dBFS       30 seconds       Triangular         38       400 Hz single tone level reference       -3 dBFS       30 seconds       Triangular         39       400 Hz single tone level reference       -4 dBFS       30 seconds       Triangular         40       400 Hz single tone level reference       -20 dBFS       30 seconds       Triangular         41       400 Hz single tone level reference       -20 dBFS       30 seconds       Triangular         41       400 Hz single tone level reference       -30 dBFS       30 seconds       Triangular         43       400 Hz single tone level reference       -40 dBFS       30 seconds       Triangular         44       400 Hz single tone level reference       -50 dBFS       30 seconds       Triangular         45       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         46       400 Hz single tone level reference       -80 dBFS       30 seconds       Triangular         47       400 Hz single tone level reference       -100 dBFS       30 seconds       Triangular         47       400 Hz single tone level reference       -100 dBFS<		Triangular		NA	Right: Frequency sweep 1000 to 890, 10 Hz steps synced with	35	
38         400 Hz single tone level reference         -3 dBFS         30 seconds         Triangular           39         400 Hz single tone level reference         -6 dBFS         30 seconds         Triangular           40         400 Hz single tone level reference         -10 dBFS         30 seconds         Triangular           41         400 Hz single tone level reference         -20 dBFS         30 seconds         Triangular           42         400 Hz single tone level reference         -30 dBFS         30 seconds         Triangular           43         400 Hz single tone level reference         -40 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -50 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           45         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           46         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -100 dBFS         30 seconds		Triangular		NA	Left: Frequency sweep 1000 to 890, 10 Hz steps synced with	36	
39         400 Hz single tone level reference         -6 dBFS         30 seconds         Triangular           40         400 Hz single tone level reference         -10 dBFS         30 seconds         Triangular           41         400 Hz single tone level reference         -20 dBFS         30 seconds         Triangular           42         400 Hz single tone level reference         -30 dBFS         30 seconds         Triangular           43         400 Hz single tone level reference         -40 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -50 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -60 dBFS         30 seconds         Triangular           45         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           46         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None		Triangular	30 seconds	0 dBFS	400 Hz single tone level reference		
40       400 Hz single tone level reference       -10 dBFS       30 seconds       Triangular         41       400 Hz single tone level reference       -20 dBFS       30 seconds       Triangular         42       400 Hz single tone level reference       -30 dBFS       30 seconds       Triangular         43       400 Hz single tone level reference       -40 dBFS       30 seconds       Triangular         44       400 Hz single tone level reference       -40 dBFS       30 seconds       Triangular         44       400 Hz single tone level reference       -60 dBFS       30 seconds       Triangular         45       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         46       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         47       400 Hz single tone level reference       -90 dBFS       30 seconds       Triangular         48       400 Hz single tone level reference       -100 dBFS       30 seconds       Triangular         50       400 Hz single tone level reference       -100 dBFS       30 seconds       Triangular         50       400 Hz single tone level reference       -100 dBFS       30 seconds       Triangular         51       MLS Sequence Pink #1       0		Triangular	30 seconds		400 Hz single tone level reference		
41         400 Hz single tone level reference         -20 dBFS         30 seconds         Triangular           42         400 Hz single tone level reference         -30 dBFS         30 seconds         Triangular           43         400 Hz single tone level reference         -40 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -50 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -50 dBFS         30 seconds         Triangular           45         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           46         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           47         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #2         0 dBFS         15 seconds         None		Triangular	30 seconds	-6 dBFS	400 Hz single tone level reference	39	
42         400 Hz single tone level reference         -30 dBFS         30 seconds         Triangular           43         400 Hz single tone level reference         -40 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -50 dBFS         30 seconds         Triangular           44         400 Hz single tone level reference         -60 dBFS         30 seconds         Triangular           45         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           46         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           47         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         15 seconds         None           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #3         0 dBFS         15 seconds         None		Triangular	30 seconds	-10 dBFS	400 Hz single tone level reference		
43       400 Hz single tone level reference       -40 dBFS       30 seconds       Triangular         44       400 Hz single tone level reference       -50 dBFS       30 seconds       Triangular         45       400 Hz single tone level reference       -60 dBFS       30 seconds       Triangular         46       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         47       400 Hz single tone level reference       -70 dBFS       30 seconds       Triangular         48       400 Hz single tone level reference       -90 dBFS       30 seconds       Triangular         48       400 Hz single tone level reference       -90 dBFS       30 seconds       Triangular         50       400 Hz single tone level reference       -100 dBFS       30 seconds       Triangular         50       400 Hz single tone level reference       -100 dBFS       30 seconds       Triangular         51       MLS Sequence Pink #1       0 dBFS       15 seconds       None       5         51       MLS Sequence Pink #3       0 dBFS       15 seconds       None       5         53       MLS Sequence Pink #4       0 dBFS       15 seconds       None       5         55       1 HL4 Sqquarewave       0 dBFS <td< td=""><td></td><td>Triangular</td><td>30 seconds</td><td>-20 dBFS</td><td>400 Hz single tone level reference</td><td>41</td></td<>		Triangular	30 seconds	-20 dBFS	400 Hz single tone level reference	41	
44         400 Hz single tone level reference         -50 dBFS         30 seconds         Triangular           45         400 Hz single tone level reference         -60 dBFS         30 seconds         Triangular           46         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           47         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         15 seconds         Triangular           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #2         0 dBFS         15 seconds         None           54         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54		Triangular	30 seconds	-30 dBFS	400 Hz single tone level reference		
45         400 Hz single tone level reference         -60 dBFS         30 seconds         Triangular           46         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           47         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         15 seconds         None           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           55         1 kHz Squarewave		Triangular	30 seconds	-40 dBFS	400 Hz single tone level reference	43	
46         400 Hz single tone level reference         -70 dBFS         30 seconds         Triangular           47         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         0 dBFS         15 seconds         None           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 KHz Squarewave         0 dBFS         15 seconds         None           55         1 KHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         1		Triangular	30 seconds	-50 dBFS	400 Hz single tone level reference	44	
47         400 Hz single tone level reference         -80 dBFS         30 seconds         Triangular           48         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #2         0 dBFS         15 seconds         None           53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None <t< td=""><td></td><td>Triangular</td><td>30 seconds</td><td>-60 dBFS</td><td>400 Hz single tone level reference</td><td>45</td></t<>		Triangular	30 seconds	-60 dBFS	400 Hz single tone level reference	45	
48         400 Hz single tone level reference         -90 dBFS         30 seconds         Triangular           49         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           51         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #2         0 dBFS         15 seconds         None           53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Squarewave         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None <tr< td=""><td></td><td>Triangular</td><td>30 seconds</td><td>-70 dBFS</td><td>400 Hz single tone level reference</td><td>46</td></tr<>		Triangular	30 seconds	-70 dBFS	400 Hz single tone level reference	46	
49         400 Hz single tone level reference         -100 dBFS         30 seconds         Triangular           50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           61         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #2         0 dBFS         15 seconds         None           53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None           58         Walking Ones 10 Samples / Step         NA         15 seconds         None           59         Walking Zeros 10 Samples / Step         NA         15 seconds         None           59         Walking Zeros 10 Samples / Step         NA         15 seconds         None           60         Monotonicity		Triangular	30 seconds	-80 dBFS	400 Hz single tone level reference	47	
50         400 Hz single tone level reference         -110 dBFS         30 seconds         Triangular           62         MLS Sequence Pink #1         0 dBFS         15 seconds         None           52         MLS Sequence Pink #2         0 dBFS         15 seconds         None           53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 KHz Squarewave         0 dBFS         15 seconds         None           55         1 KHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None           58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61 <td></td> <td>Triangular</td> <td>30 seconds</td> <td>-90 dBFS</td> <td>400 Hz single tone level reference</td> <td>48</td>		Triangular	30 seconds	-90 dBFS	400 Hz single tone level reference	48	
Acoustic         0<		Triangular	30 seconds	-100 dBFS	400 Hz single tone level reference	49	
Stimulus         OdBFS         15 seconds         None           51         MLS Sequence Pink #2         0 dBFS         15 seconds         None           53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         0 dBFS         15 seconds         None           58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60		Triangular	30 seconds	-110 dBFS	400 Hz single tone level reference	50	
52         MLS Sequence Pink #2         0 dBFS         15 seconds         None           53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         0 dBFS         15 seconds         None           58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         14Lz and 2kHz at –40 dB         0 dBFS         15 seconds         None           61         THD –60dB         1KHz and 2kHz at –60 dB         0 dBFS         15 seconds         None					stic	Acou	
53         MLS Sequence Pink #3         0 dBFS         15 seconds         None           54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           Miscellaneous         0 dBFS         15 seconds         None           55         1 KHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J Test         0 dBFS         15 seconds         None           58         Walking Ones 10 Samples / Step         NA         15 seconds         None           59         Walking Zeros 10 Samples / Step         NA         15 seconds         None           60         Monotonicity 10 Samples / Step         NA         15 seconds         None           61         THD –40dB 1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           61         THD –60dB 1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None		None	15 seconds	0 dBFS	MLS Sequence Pink #1	51	
54         MLS Sequence Pink #4         0 dBFS         15 seconds         None           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None           58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60dB         1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None		None	15 seconds	0 dBFS	MLS Sequence Pink #2	52	
Miscellaneous           55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         0 dBFS         15 seconds         None           58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60dB         1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None		None	15 seconds	0 dBFS	MLS Sequence Pink #3		
55         1 kHz Squarewave         0 dBFS         15 seconds         None           56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None           58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         14z and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60dB         1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None		None	15 seconds	0 dBFS	MLS Sequence Pink #4	54	
56         Polarity         0 dBFS         15 seconds         None           57         J-Test         NA         15 seconds         None           58         Walking Ones 10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60dB         1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None					ellaneous	Misce	
57         J-Test         NA         15 seconds         None           58         Walking Ones 10 Samples / Step         NA         15 seconds         None           59         Walking Zeros 10 Samples / Step         NA         15 seconds         None           60         Monotonicity 10 Samples / Step         NA         15 seconds         None           60         Monotonicity 10 Samples / Step         NA         15 seconds         None           61         THD –40dB         1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60dB         1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None		None	15 seconds	0 dBFS	1 kHz Squarewave	55	
58         Walking Ones         10 Samples / Step         NA         15 seconds         None           59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           61         THD –40dB         1kHz and 2kHz at –40 dB         0 dBFS         15 seconds         None           62         THD –60dB         1kHz and 2kHz at –60 dB         0 dBFS         15 seconds         None		None	15 seconds	0 dBFS	Polarity	56	
59         Walking Zeros         10 Samples / Step         NA         15 seconds         None           60         Monotonicity         10 Samples / Step         NA         15 seconds         None           Calibration         61         THD -40dB         1kHz and 2kHz at -40 dB         0 dBFS         15 seconds         None           61         THD -60dB         1kHz and 2kHz at -40 dB         0 dBFS         15 seconds         None		None	15 seconds	NA	J-Test	57	
60         Monotonicity         10 Samples / Step         NA         15 seconds         None           Calibration         End         THD -40dB         15 seconds         None           61         THD -40dB         15 seconds         None         62           62         THD -60dB         18Hz and 2kHz at -60 dB         0 dBFS         15 seconds         None		None	15 seconds	NA	Walking Ones 10 Samples / Step	58	
Calibration           61         THD -40dB         1kHz and 2kHz at -40 dB         0 dBFS         15 seconds         None           62         THD -60dB         1kHz and 2kHz at -60 dB         0 dBFS         15 seconds         None		None	15 seconds	NA	Walking Zeros 10 Samples / Step		
61         THD -40dB         1kHz and 2kHz at -40 dB         0 dBFS         15 seconds         None           62         THD -60dB         1kHz and 2kHz at -60 dB         0 dBFS         15 seconds         None		None	15 seconds	NA	Monotonicity 10 Samples / Step	60	
62 THD -60dB 1kHz and 2kHz at -60 dB 0 dBFS 15 seconds None	Calibration						
		None	15 seconds	0 dBFS	THD –40dB 1kHz and 2kHz at –40 dB	61	
		None	15 seconds	0 dBFS	THD –60dB 1kHz and 2kHz at –60 dB	62	
63 THD -80dB 1kHz and 2kHz at -80 dB 0 dBFS 15 seconds None		None	15 seconds	0 dBFS	THD –80dB 1kHz and 2kHz at –80 dB	63	

Level

Duration

Track

Description

FILE NAME

Dither

Track	Description	Level	Duration	Dither	FILE NAME
Twin 1	one (Intermodulation Distortion Test Signals)				
64	63 Hz & 7 kHz 4:1 Amplitude Ratio (SMPTE IMD Test Signal	-1 dBFS	30 seconds	Triangular	SMPTE-44.AGM
65	19 kHz & 20 kHz Twin Tone (CCIF IMD Test Signal)	-1 dBFS	30 seconds	Triangular	1920TT44.AGM
66	14 kHz & 15 kHz Twin Tone (CCIF IMD Test Signal)	-1 dBFS	30 seconds	Triangular	1415TT44.AGM
Multito	one				
67	Multitone with 31 frequencies at ISO 1/3 octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO3144.AGM
68	Multitone with 11 frequencies at ISO 1 octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO-1-44.AGM
69	Multitone with 21 frequencies at ISO half-octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO-2-44.AGM
70	Multitone with 31 frequencies at ISO third-octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO-3-44.AGM
71	Multitone with 31 frequencies at ISO 1/3 octave spacing, 3 frequencies near 200 Hz, 2 kHz, 20 kHz have been shifted up one bin to the next possible frequency in right channel for crosstalk measurements	-1 dBFS	10 seconds	Triangular	ISOXTALK.AGS
Codec					
72	Sinewaves in every other critical band from 40 Hz to 20 kHz excluding 1 kHz to 4 kHz	-1 dBFS	10 seconds	Triangular	ALTCRT44.AGM



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