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Application Notes
AN-3

Using DC FIVE or DC LIVE/Forensics To Create 3 Audio Test CD's

Diamond Cuts DC FIVE and DC LIVE/Forensics offers a broad suite of real time audio tools including noise reduction, audio enhancement, audio measurement and signal generation. This application note describes the use of these programs to create Audio Test CD's containing signals useful for audio system electrical and acoustical evaluation.

This document assumes that the software is installed and working in your system. For help with installation or to get started with the software, refer to the product manual.

Basic Requirments:
DC FIVE or LIVE/Forensics Software
Win 98SE, Win ME, Win 2000 or Win XP
200 MHz or faster PC with Pentium or AMD processor

Other Requirements:

CD ROM Burner
3 Blank CD ROMS
Microphone (Optional)
Soundcard (Optional)
CD Player

Overview:
Described here are the parameters required to make three separate audio test CD's. CD #1 is optimized for Stereo System Testing, CD #2 is for testing and calibrating your Real Time Acoustical Analyzer, while CD #3 is optimized for Audio System Acoustical Calibration utilizing any of a number of measurement techniques.

You will be using the Make Waves generator found under the Edit menu to make the signals for your Audio Test CD(s). You must set up the Make Waves generator for the following parameters:

Sample Rate:	44.1 KHz
File Type:	Stereo
Resolution:	16 Bits

These will not change for any of the signals that you will be creating. These parameters are global for creating Wave Files, which will be compatible with conversion to Red Book Audio when you burn your test CD ROMs:
None of the 3 CD's contains more than 50 tracks. Since CD's allow for up to 100 tracks, each signal track can be announced via a microphone and separate .wav file explaining the properties of the signal track that follows. Specific applications examples involving the use of these CD's is beyond the purview of this document. So specific applications will be covered in future Application Notes.

Applications:

1. Sound Card Performance Testing
2. CD and DVD Player Performance Testing
3. Stereo Amplifier and Pre-Amplifier Testing
4. Loudspeaker Testing
5. Real Time Analyzer Calibration
6. Equalizer Calibration
7. Sound System Room Acoustical Balancing.
8. etc.

Measurements Capabilities with the Test CD's:

1. Frequency Response

2. Frequency Accuracy
3. Signal to Noise Ratio
4. Total Harmonic Distortion vs Frequency
5. Intermodulation Distortion
6. Acoustical Room Response and Resonance

CD Making Procedure:

1. Choose which CD you want to make
2. Set up a sub directory under the name of the CD to be made
3. Launch the Diamond Cut Software program
4. Bring up the Make Waves Generator found under the Edit Menu.
5. Choose Track 01
6. Set the Make Waves Generator to all of the parameters found in the CD parameter matrix for the CD you desire to make
7. Click "OK"
8. The resulting Wave file will appear in the Source Window after some processing time.
9. If there are no Special Processing Notes, name the Source File the same as that which is shown in the Column called "Track Name" in the CD parameter matrix.
10. If there are Special Processing Notes, perform those procedures on the Wave file.
11. After the Special Processing procedures have been performed, name the final resultant Wave file the same name as that which is shown in the column called "Track Name" in the CD parameter matrix.
12. Choose the next track.
13. Go to step 6
14. Repeat till all tracks in the matrix have been created.
15. *Optional Steps to Annunciate Each Track:*
    a. *Connect a Microphone to the Mic Input of your sound card*
    b. *In a quiet room (like a clothing closet), record a descriptive for each Signal Track for the Test CD of Interest. (i.e. Track 01 follows and is a 1 KHz, 0 dB Reference Sine Wave). It is also recommended that the first track be reserved to identify the Title of the CD.*
    c. *Name each Wave file with an appropriate descriptive (i.e., Announce in this manner: "* Track One is a 1 Kilo Hertz Sine Wave at a 0 dB Reference Level") *Use the table of descriptions as your script.*
16. Exit the Diamond Cut Software Program and Launch your CD ROM burning Audio Software.
17. Create the appropriate playlist as per the CD matrix that you are making.
18. Burn the CD ROM.
19. Label the CD Appropriately,
20. Done

DANGER! When playing the first track on the Test CD's, keep the volume on your sound system all the way down. Slowly rotate the volume control upwards until the volume is at the desired level. The reason for this DANGER warning is that the first signal is always at 1 Kilo Hertz 0 dB (Maximum Output) Reference Level and can damage your ears and/or sound system.

Stereo System Test CD (CD # 1) Parameters						
Track #	**Track Name (.wav)**	**Waveshape**	**Frequency (Hz)**	**Amplitude (dB)**	**Length (Sec)**	**Special Processing Notes**
01	1 KHz 0 dB Reference1.wav	Sine Wave	1000	0	120	None
02	Silence1.wav	Sine Wave	0.01	-97	120	Note 1 (Mute)
03	10 Hz –3 dB Sine.wav	Sine Wave	10	-3	30	None
04	20 Hz – 3 dB Sine.wav	Sine Wave	20	-3	30	None
05	30 Hz – 3 dB Sine.wav	Sine Wave	30	-3	30	None
06	40Hz – 3 dB Sine.wav	Sine Wave	40	-3	30	None
07	50 Hz – 3 dB Sine.wav	Sine Wave	50	-3	30	None
08	60 Hz – 3 dB Sine.wav	Sine Wave	60	-3	30	None
09	80 Hz – 3 dB Sine.wav	Sine Wave	80	-3	30	None
10	100 Hz – 3 dB Sine.wav	Sine Wave	100	-3	30	None

11	125 Hz – 3 dB Sine.wav	Sine Wave	125	-3	30	None
12	250 Hz – 3 dB Sine.wav	Sine Wave	250	-3	30	None
13	400 Hz – 3 dB Sine.wav	Sine Wave	400	-3	30	None
14	800 Hz – 3 dB Sine.wav	Sine Wave	800	-3	30	None
15	1 KHz – 3 dB Sine.wav	Sine Wave	1000	-3	30	None
16	2 KHz – 3 dB Sine.wav	Sine Wave	2000	-3	30	None
17	3 KHz – 3 dB Sine.wav	Sine Wave	3000	-3	30	None
18	4 KHz – 3 dB Sine.wav	Sine Wave	4000	-3	30	None
19	5 KHz – 3 dB Sine.wav	Sine Wave	5000	-3	30	None
20	6 KHz – 3 dB Sine.wav	Sine Wave	6000	-3	30	None
21	7 KHz – 3 dB Sine.wav	Sine Wave	7000	-3	30	None
22	8 KHz – 3 dB Sine.wav	Sine Wave	8000	-3	30	None
23	9 KHz – 3 dB Sine.wav	Sine Wave	9000	-3	30	None
24	10 KHz – 3 dB Sine.wav	Sine Wave	10000	-3	30	None
25	11KHz – 3 dB Sine.wav	Sine Wave	11000	-3	30	None
26	12 KHz – 3 dB Sine.wav	Sine Wave	12000	-3	30	None
27	13 KHz – 3 dB Sine.wav	Sine Wave	13000	-3	30	None
28	14 KHz – 3 dB Sine.wav	Sine Wave	14000	-3	30	None
29	15 KHz – 3 dB Sine.wav	Sine Wave	15000	-3	30	None
30	16 KHz – 3 dB Sine.wav	Sine Wave	16000	-3	30	None
31	17 KHz – 3 dB Sine.wav	Sine Wave	17000	-3	30	None
32	18 KHz – 3 dB Sine.wav	Sine Wave	18000	-3	30	None
33	19 KHz – 3 dB Sine.wav	Sine Wave	19000	-3	30	None
34	20 KHz – 3 dB Sine.wav	Sine Wave	20000	-3	30	None
35	21 KHz – 3 dB Sine.wav	Sine Wave	21000	-3	30	None
36	440 Hz – 10 dB ASine.wav	Sine Wave	440	-10	30	None
37	1 KHz – 10 dB Sine.wav	Sine Wave	1000	-10	30	None
38	1 KHz – 10 dB Right Sine.wav	Sine Wave	1000	-10	30	Note 2 (Right Channel Only)
39	1 KHz – 10 dB Left Sine.wav	Sine Wave	1000	-10	30	Note 3 (Left Channel Only)
40	200Hz –10 dB Sine.wav	Sine Wave	200	-10	30	None
41	200 Hz – 10 dB Invert Sine.wav	Sine Wave	200	-10	30	None
42	20 Hz – 20 KHz Sweep.wav	Sine Wave	20 - 20000	-10	60	Note 4
43	Whitenoise.wav	White	N/a	-10	600	None
44	Pinknoise1.wav	White	N/a	-10	600	Note 5
45	PinknoiseRight.wav	White	N/a	-10	120	Note 6
46	PinknoiseLeft.wav	White	N/a	-10	120	Note 7
47	PinknoiseInvert.wav	White	N/a	-10	120	Note 8
48	1 KHz – 10 dB Square.wav	Square	1000	-10	120	None
49	1 KHz – 10 dB Triangle.wav	Triangle	1000	-10	120	None
50	50 Hz & 7 KHz 4-1 Intermodulation.wav	Sine	60 and 7000	-10	60	Note 14
Total Time = 55.5 Minutes						

Stereo System Test CD (CD # 1) Descriptions	
Track #	**Description of Track**
01	1 Kilo Hertz Sine Wave at a 0 dB Reference Level
02	Silence
03	10 Hertz Sine Wave at a – 3 dB Level
04	20 Hertz Sine Wave at a – 3 dB Level
05	30 Hertz Sine Wave at a – 3 dB Level

06	40 Hertz Sine Wave at a – 3 dB Level
07	50 Hertz Sine Wave at a – 3 dB Level
08	60 Hertz Sine Wave at a – 3 dB Level
09	80 Hertz Sine Wave at a – 3 dB Level
10	100 Hertz Sine Wave at a – 3 dB Level
11	125 Hertz Sine Wave at a – 3 dB Level
12	250 Hertz Sine Wave at a – 3 dB Level
13	400 Hertz Sine Wave at a – 3 dB Level
14	800 Hertz Sine Wave at a – 3 dB Level
15	1 Kilo Hertz Sine Wave at a – 3 dB Level
16	2 Kilo Hertz Sine Wave at a – 3 dB Level
17	3 Kilo Hertz Sine Wave at a – 3 dB Level
18	4 Kilo Hertz Sine Wave at a – 3 dB Level
19	5 Kilo Hertz Sine Wave at a – 3 dB Level
20	6 Kilo Hertz Sine Wave at a – 3 dB Level
21	7 Kilo Hertz Sine Wave at a – 3 dB Level
22	8 Kilo Hertz Sine Wave at a – 3 dB Level
23	9 Kilo Hertz Sine Wave at a – 3 dB Level
24	10 Kilo Hertz Sine Wave at a – 3 dB Level
25	11 Kilo Hertz Sine Wave at a – 3 dB Level
26	12 Kilo Hertz Sine Wave at a – 3 dB Level
27	13 Kilo Hertz Sine Wave at a – 3 dB Level
28	14 Kilo Hertz Sine Wave at a – 3 dB Level
29	15 Kilo Hertz Sine Wave at a – 3 dB Level
30	16 Kilo Hertz Sine Wave at a – 3 dB Level
31	17 Kilo Hertz Sine Wave at a – 3 dB Level
32	18 Kilo Hertz Sine Wave at a – 3 dB Level
33	19 Kilo Hertz Sine Wave at a – 3 dB Level
34	20 Kilo Hertz Sine Wave at a – 3 dB Level
35	21 Kilo Hertz Sine Wave at a – 3 dB Level
36	440 Hz A above Middle C Sine Wave at a – 3 dB Level
37	1 Kilo Hertz Sine Wave at a – 10 dB Level
38	1 Kilo Hertz Sine Wave at a – 10 dB Level Right Channel Only
39	1 Kilo Hertz Sine Wave at a – 10 dB Level Left Channel Only
40	200 Hertz Sine Wave at a – 10 dB Level
41	200 Hertz Sine Wave at a – 10 dB Level with One Channel Phase Inverted
42	20 Hertz to 20 Kilo Hertz Swept Sine Wave at – 10 dB
43	White Noise at a – 10 dB Level
44	Pink Noise at a – 10 dB Level
45	Pink Noise at a – 10 dB Level Right Channel Only
46	Pink Noise at a – 10 dB Level Left Channel Only
47	Pink Noise at a – 10 dB Level with One Channel Phase Inverted
48	1 Kilo Hertz Square Wave at a – 10 dB Level
49	1 Kilo Hertz Triangle Wave at a – 10 dB Level
50	Dual tones of 60 Hertz & 7 Kilo Hertz with a 4:1 amplitude ratio for Intermodulation Distortion Testing
Total Time = (approximately) 10 minutes	

Audio Real Time Acoustical Analyzer Test CD (CD # 2) Parameters						
Track #	**Track Name (.wav)**	**Waveshape**	**Frequency (Hz)**	**Amplitude (dB)**	**Length (Sec)**	**Processing Notes**
01	1 KHz 0 dB Reference2.wav	Sine Wave	1000	0	120	None
02	Silence2.wav	Sine Wave	0.01	-97	120	None
03	20 Hz – 6 dB Sine.wav	Sine Wave	20	-6	30	None
04	25 Hz – 6 dB Sine.wav	Sine Wave	25	-6	30	None
05	31.5Hz – 6 dB Sine.wav	Sine Wave	31.5	-6	30	None
06	40 Hz - 6 dB Sine.wav	Sine Wave	40	-6	30	None
07	50 Hz - 6 dB Sine.wav	Sine Wave	50	-6	30	None
08	63 Hz – 6 dB Sine.wav	Sine Wave	63	-6	30	None
09	80 Hz – 6 dB Sine.wav	Sine Wave	80	-6	30	None
10	100 Hz – 6 dB Sine.wav	Sine Wave	100	-6	30	None
11	125 Hz – 6 dB Sine.wav	Sine Wave	125	-6	30	None
12	160 Hz – 6 dB Sine.wav	Sine Wave	160	-6	30	None
13	200 Hz – 6 dB Sine.wav	Sine Wave	200	-6	30	None
14	250 Hz – 6 dB Sine.wav	Sine Wave	250	-6	30	None
15	315 Hz – 6 dB Sine.wav	Sine Wave	315	-6	30	None
16	400 Hz – 6 dB Sine.wav	Sine Wave	400	-6	30	None
17	500 Hz – 6 dB Sine.wav	Sine Wave	500	-6	30	None
18	630 Hz – 6 dB Sine.wav	Sine Wave	630	-6	30	None
19	800 Hz – 6 dB Sine.wav	Sine Wave	800	-6	30	None
20	1.0 KHz – 6 dB Sine.wav	Sine Wave	1000	-6	30	None
21	1.25 KHz – 6 dB Sine.wav	Sine Wave	1250	-6	30	None
22	1.6 KHz – 6 dB Sine.wav	Sine Wave	1600	-6	30	None
23	2.0 KHz – 6 dB Sine.wav	Sine Wave	2000	-6	30	None
24	2.5 KHz – 6 dB Sine.wav	Sine Wave	2500	-6	30	None
25	3.15 KHz – 6 dB Sine.wav	Sine Wave	3150	-6	30	None
26	4.0 KHz – 6 dB Sine.wav	Sine Wave	4000	-6	30	None
27	5.0 KHz – 6 dB Sine.wav	Sine Wave	5000	-6	30	None
28	6.3 KHz – 6 dB Sine.wav	Sine Wave	6300	-6	30	None
29	8.0 KHz – 6 dB Sine.wav	Sine Wave	8000	-6	30	None
30	10 KHz – 6 dB Sine.wav	Sine Wave	10000	-6	30	None
31	12.5 KHz – 6 dB Sine.wav	Sine Wave	12500	-6	30	None
32	16.0 KHz – 6 dB Sine.wav	Sine Wave	16000	-6	30	None
33	20.0 KHz – 6 dB Sine.wav	Sine Wave	20000	-6	30	None
34	20 Hz – 20 KHz Sweep2.wav	Sine Wave	20 - 20000	-6	60	Note 4
35	20 Hz – 20 KHz Sweepsquare.wav	Square Wave	20 - 20000	-6	60	Note 4
36	20 Hz – 20 KHz Sweeptriangle.wav	Triantle Wave	20 - 20000	-6	60	Note 4
37	Silence3.wav	Sine Wave	0.01	-97	30	Note 1 (Mute)
38	1.0 KHz 0 dB Cal.wav	Sine Wave	1000	0	30	None
39	1.0 KHz – 1 dB Cal.wav	Sine Wave	1000	-1	30	None
40	1.0 KHz – 2 dB Cal.wav	Sine Wave	1000	-2	30	None
41	1.0 KHz – 3 dB Cal.wav	Sine Wave	1000	-3	30	None
42	1.0 KHz – 4 dB Cal.wav	Sine Wave	1000	-4	30	None
43	1.0 KHz – 5 dB Cal.wav	Sine Wave	1000	-5	30	None
44	1.0 KHz – 6 dB Cal.wav	Sine Wave	1000	-6	30	None
45	1.0 KHz – 7 dB Cal.wav	Sine Wave	1000	-7	30	None
46	1.0 KHz – 8 dB Cal.wav	Sine Wave	1000	-8	30	None
47	1.0 KHz – 9 dB Cal.wav	Sine Wave	1000	-9	30	None
48	1.0 KHz – 10 dB Cal.wav	Sine Wave	1000	-10	30	None
49	Pinknoise2.wav	White	N/a	-10	600	Note 5

50	262 Hz & 2 KHz 4-1 Intermodulation.wav	Sine	262 and 2000	-10	60	Note 14
Total Time = 39.5 Minutes						

Audio Real Time Acoustical Analyzer Test CD (CD # 2) Descriptions	
Track #	**Description of Track**
01	1 Kilo Hertz Sine Wave at a 0 dB Reference Level
02	Silence
03	20 Hertz Sine Wave at a – 6 dB Level
04	25 Hertz Sine Wave at a – 6 dB Level
05	31.5 Hertz Sine Wave at a – 6 dB Level
06	40 Hertz Sine Wave at a – 6 dB Level
07	50 Hertz Sine Wave at a – 6 dB Level
08	63 Hertz Sine Wave at a – 6 dB Level
09	80 Hertz Sine Wave at a – 6 dB Level
10	100 Hertz Sine Wave at a – 6 dB Level
11	125 Hertz Sine Wave at a – 6 dB Level
12	160 Hertz Sine Wave at a – 6 dB Level
13	200 Hertz Sine Wave at a – 6 dB Level
14	250 Hertz Sine Wave at a – 6 dB Level
15	315 Hertz Sine Wave at a – 6 dB Level
16	400 Hertz Sine Wave at a – 6 dB Level
17	500 Hertz Sine Wave at a – 6 dB Level
18	630 Hertz Sine Wave at a – 6 dB Level
19	800 Hertz Sine Wave at a – 6 dB Level
20	1 Kilo Hertz Sine Wave at a – 6 dB Level
21	1.25 Kilo Hertz Sine Wave at a – 6 dB Level
22	1.6 Kilo Hertz Sine Wave at a – 6 dB Level
23	2 Kilo Hertz Sine Wave at a – 6 dB Level
24	2.5 Kilo Hertz Sine Wave at a – 6 dB Level
25	3.15 Kilo Hertz Sine Wave at a – 6 dB Level
26	4 Kilo Hertz Sine Wave at a – 6 dB Level
27	5 Kilo Hertz Sine Wave at a – 6 dB Level
28	6.3 Kilo Hertz Sine Wave at a – 6 dB Level
29	8 Kilo Hertz Sine Wave at a – 6 dB Level
30	10 Kilo Hertz Sine Wave at a – 6 dB Level
31	12.5 Kilo Hertz Sine Wave at a – 6 dB Level
32	16 Kilo Hertz Sine Wave at a – 6 dB Level
33	20 Kilo Hertz Sine Wave at a – 6 dB Level
34	20 Hertz to 20 Kilo Hertz Swept Sine Wave at – 6 dB
35	20 Hertz to 20 Kilo Hertz Swept Square Wave at – 6 dB
36	20 Hertz to 20 Kilo Hertz Swept Triangle Wave at – 6 dB
37	Silence
38	1 Kilo Hertz Sine Wave at a 0 dB Level
39	1 Kilo Hertz Sine Wave at a –1 dB Level
40	1 Kilo Hertz Sine Wave at a –2 dB Level
41	1 Kilo Hertz Sine Wave at a –3 dB Level
42	1 Kilo Hertz Sine Wave at a –4 dB Level
43	1 Kilo Hertz Sine Wave at a –5 dB Level
44	1 Kilo Hertz Sine Wave at a –6 dB Level
45	1 Kilo Hertz Sine Wave at a –7 dB Level
46	1 Kilo Hertz Sine Wave at a –8 dB Level
47	1 Kilo Hertz Sine Wave at a –9 dB Level
48	1 Kilo Hertz Sine Wave at a –10 dB Level
49	Pink Noise at a – 10 dB Level

49	Dual tones of 262 Hertz & 2 Kilo Hertz with a 4:1 amplitude ratio for Intermodulation Distortion Testing
Total Time = (approximately) 10 minutes	

Audio System Acoustical Testing CD (CD # 3) Parameters						
Track #	**Track Name (.wav)**	**Waveshape**	**Frequency (Hz)**	**Amplitude (dB)**	**Length (Sec)**	**Processing Notes**
01	1 KHz 0 dB Reference3.wav	Sine Wave	1000	0	120	None
02	Silence3.wav	Sine Wave	0.01	-97	120	None
03	20 Hz – 6 dB Random.wav	White	20	-6	30	Note 9
04	25 Hz – 6 dB Random.wav	White	25	-6	30	Note 9
05	31.5Hz – 6 dB Random.wav	White	31.5	-6	30	Note 9
06	40 Hz - 6 dB Random.wav	White	40	-6	30	Note 9
07	50 Hz - 6 dB Random.wav	White	50	-6	30	Note 9
08	63 Hz – 6 dB Random.wav	White	63	-6	30	Note 9
09	80 Hz – 6 dB Random.wav	White	80	-6	30	Note 9
10	100 Hz – 6 dB Random.wav	White	100	-6	30	Note 9
11	125 Hz – 6 dB Random.wav	White	125	-6	30	Note 9
12	160 Hz – 6 dB Random.wav	White	160	-6	30	Note 9
13	200 Hz – 6 dB Random.wav	White	200	-6	30	Note 9
14	250 Hz – 6 dB Random.wav	White	250	-6	30	Note 9
15	315 Hz – 6 dB Random.wav	White	315	-6	30	Note 9
16	400 Hz – 6 dB Random.wav	White	400	-6	30	Note 9
17	500 Hz – 6 dB Random.wav	White	500	-6	30	Note 9
18	630 Hz – 6 dB Random.wav	White	630	-6	30	Note 9
19	800 Hz – 6 dB Random.wav	White	800	-6	30	Note 9
20	1.0 KHz – 6 dB Random.wav	White	1000	-6	30	Note 9
21	1.25 KHz – 6 dB Random.wav	White	1250	-6	30	Note 9
22	1.6 KHz – 6 dB Random.wav	White	1600	-6	30	Note 9
23	2.0 KHz – 6 dB Random.wav	White	2000	-6	30	Note 9
24	2.5 KHz – 6 dB Random.wav	White	2500	-6	30	Note 9
25	3.15 KHz – 6 dB Random.wav	White	3150	-6	30	Note 9
26	4.0 KHz – 6 dB Random.wav	White	4000	-6	30	Note 9
27	5.0 KHz – 6 dB Random.wav	White	5000	-6	30	Note 9
28	6.3 KHz – 6 dB Random.wav	White	6300	-6	30	Note 9
29	8.0 KHz – 6 dB Random.wav	White	8000	-6	30	Note 9
30	10 KHz – 6 dB Random.wav	White	10000	-6	30	Note 9
31	12.5 KHz – 6 dB Random.wav	White	12500	-6	30	Note 9
32	16.0 KHz – 6 dB Random.wav	White	16000	-6	30	Note 9
33	19.0 KHz – 6 dB Random.wav	White	19000	-6	30	Note 9
34	20 Hz – 20 KHz	Sine Wave	20 - 20000	-6	60	Note 9

	Sweep3.wav					
35	1 KHz Quadrature.wav	Sine Wave	1000	-6	30	Note 13
36	1.0 KHz – 6 dB Cal	Sine Wave	1000	-6	30	None
37	1.0 KHz – 5 dB Cal	Sine Wave	1000	-5	30	None
38	1.0 KHz – 4 dB Cal	Sine Wave	1000	-4	30	None
39	1.0 KHz – 3 dB Cal	Sine Wave	1000	-3	30	None
40	1.0 KHz – 2 dB Cal	Sine Wave	1000	-2	30	None
41	1.0 KHz – 1 dB Cal	Sine Wave	1000	-1	30	None
42	1.0 KHz 0 dB Cal	Sine Wave	1000	0	30	None
43	Pinknoise3.wav	White	N/a	-10	600	Note 5
44	PinknoiseRight3.wav	White	N/a	-10	120	Note 6
45	PinknoiseLeft3.wav	White	N/a	-10	120	Note 7
46	Whitenoise3.wav	White	N/a	-10	600	None
47	Brownnoise.wav	White	N/a	-10	120	Note 10
48	Seismicnoise.wav	White	N/a	-10	120	Note 11
49	Subsonicseismicnoise.wav	White	N/a	-10	120	Note 12
50	15 Hz & 16 KHz 1-1 Intermodulation.wav	Sine	1500 and 1600	-10	60	Note 15
Total Time = 55.5 Minutes						

Audio System Acoustical Testing CD (CD # 3) Descriptions	
Track #	**Description of Track**
01	1 Kilo Hertz Sine Wave at a 0 dB Reference Level
02	Silence
03	20 Hz Centered Narrowband Random Noise at a – 6 dB Average Level
04	25 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
05	31.5 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
06	40 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
07	50 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
08	63 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
09	80 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
10	100 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
11	125 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
12	160 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
13	200 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
14	250 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
15	315 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
16	400 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
17	500 Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
18	630 Hz Centered Narrowband Random Noise at a – 6 dB Average Level
19	800 Hz Centered Narrowband Random Noise at a – 6 dB Average Level
20	1 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
21	1.25 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
22	1.6 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
23	2 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
24	2.5 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
25	3.15 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
26	4 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
27	5 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
28	6.3 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
29	8 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
30	10 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
31	12.5 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
32	16 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level

33	19 Kilo Hertz Centered Narrowband Random Noise at a – 6 dB Average Level
34	20 Hertz to 20 Kilo Hertz Swept Sine Wave at a – 6 dB
35	1 Kilo Hertz Sine Waves in Quadrature at a– 6 dB
36	1 Kilo Hertz Sine Wave Reference at a – 6 dB
37	1 Kilo Hertz Sine Wave Reference at a– 5 dB
38	1 Kilo Hertz Sine Wave Reference at a – 4 dB
39	1 Kilo Hertz Sine Wave Reference at a – 3 dB
40	1 Kilo Hertz Sine Wave Reference at a – 2 dB
41	1 Kilo Hertz Sine Wave Reference at a – 1 dB
42	1 Kilo Hertz Sine Wave Reference at a 0 dB
43	Pink Noise at a – 10 dB Average Level
44	Pink Noise Right Channel Only at a – 10 dB Average Level
45	Pink Noise Left Channel Only at a – 10 dB Average Level
46	White Noise at a – 10 dB Average Level
47	Brown Noise at a – 10 dB Average Level
48	Seismic Noise at a – 10 dB Average Level
49	Sub-Sonic Noise at a – 10 dB Average Level
50	Dual tones of 15 Kilo Hertz & 16 Kilo Hertz with a 1:1 amplitude ratio for Intermodulation Distortion Testing
Total Time = (approximately) 10 minutes	

Special Processing Notes:

Note 1: Highlight the entire Wave file and apply the Mute function found under the Edit menu.

Note 2: Highlight the entire Wave file and apply the File conversion Filter found under the Filter Menu. Set the File Conversion filter as follows:

From Stereo to Stereo
Left Channel Amplitude set to – 96 dB
Run the Filter and assign the resultant file to its sources name.

Note 3: Highlight the entire Wave file and apply the File conversion Filter found under the Filter Menu. Set the File Conversion filter as follows:

From Stereo to Stereo
Right Channel Amplitude set to – 96 dB
Run the Filter and assign the resultant file to its sources name.

Note 4: In the Make Waves Generator, set up the following additional parameters:

Check the Linear Sweep Checkbox
Set the Frequency for 20 Hz
Set the Stop Frequency for 20000 Hz

Note 5: Bring up the Multi filter. Find the "White to Pink Noise Converter, 20 KHz" preset. Click on it. Run the Filter and assign the resultant filter to its sources name.

Note 6: Bring up the Multi filter. Find the "White to Pink Noise Converter, 20 KHz" preset. Click on it. Make the Destination the Source. Next, bring up the File Conversion Filter and set it as follows:

From Stereo to Stereo
Left Channel Amplitude set to – 96 dB
Run the Filter and assign the resultant file to its sources name.

Note 7: Bring up the Multi filter. Find the "White to Pink Noise Converter, 20 KHz" preset. Click on it. Make the Destination the Source. Next, bring up the File Conversion Filter and set it as follows:

From Stereo to Stereo
Right Channel Amplitude set to – 96 dB
Run the Filter and assign the resultant file to its sources name.

*** See Warning Below**

Note 8: Bring up the Multi filter. Find the "White to Pink Noise Converter, 20 KHz" preset. Click on it. Make the Destination the Source. Next, bring up the File Conversion Filter and set it as follows:

Find preset called "Stereo Phase Inversion."
Click on it
Run the Filter and assign the resultant file to its sources name

*** See Warning Below!**

Note 9: Bring up the Multi filter found under the Filter menu. Find the "White Noise to 1-3rd Octave Bucket Converter. Click on the Notch Filter on the Multi filter signal line. Adjust the Center Frequency to the Frequency in Hz as shown on the Track Matrix. Close the Notch Filter. Run the Multi filter and assign the resultant file to its sources name.

*** See Warning Below!**

Note 10: Bring up the Multi filter found under the Filter menu. Find the "White (Random) to Brown Noise Converter." Run the Multi filter and assign the resultant file to its sources name.

***See Warning Below!**

Note 11: Bring up the Multi filter found under the Filter menu. Find the "White to Seismic Noise Converter 50 Hz." Run the Multi filter and assign the resultant file to its sources name.

***See Warning Below!**

Note 12: Bring up the Multi filter found under the Filter menu. Find the "White to Seismic Noise Converter 20 Hz." Run the Multi filter and assign the resultant file to its sources name.

***See Warning Below!**

Note 13: Bring up the File conversion Filter. Find and set up the Preset called "1000 Hz, = 90 degree phase shift converter" (This is nothing more than a setting of 0.25 on the Time Offset parameter). Run the Filter and assign the resultant file to its sources name.

Note 14: Paste Mix the two signals with 4:1 Amplitude Ratio (12 dB difference)

Note 15: Paste Mix the two signals with 1:1 Amplitude Ratio (0 dB difference)

***Warning: Do not change any of the parameters on any of the filters in the "White Noise to 1-3rd Octave Bucket Converter"! Doing so will destroy the accuracy of the resultant Test Wave files that you will be creating!**