

TONAL AND SPEECH MATERIALS FOR AUDITORY PERCEPTUAL ASSESSMENT, DISC 2.0

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Reissued, 2011 (Blue Disc)

INTRODUCTION

The *Tonal and Speech Materials for Auditory Perceptual Assessment, Disc 2.0* compact audio disc, which is substantially a re-issue of Disc 1.0 of the same name issued in 1992, was produced to provide a collection of high-quality auditory materials for use in assessing auditory perceptual (central) abilities. The tonal and speech materials contained on the disc were selected based on the availability of the materials either through the public domain or through the generosity of the individuals responsible for the materials, including G. Donald Causey, Ph.D. (Northwestern University Auditory Test No. 6), Bob Brose (Technisonic Studios, Inc., St. Louis, Charles E. Harrison, producer of the CID W-1 lists), Kresge Hearing Research Laboratory of the South, New Orleans (dichotic CVs), and James Jerger, Ph.D. (Dichotic Sentence Identification).

The materials on Disc 2.0 of the *Tonal and Speech Materials for Auditory Perceptual Assessment* compact disc differ from the materials on its predecessor (Disc 1.0) in several ways. The following two tracks that were on Disc 1.0 were eliminated on Disc 2.0: (1) dichotic chords with simultaneous onsets, and (2) dichotic chords with a 90 ms lag in the left channel. The number of frequency and duration tone pattern stimuli were reduced from 60 (Disc 1.0) to 30 (Disc 2.0). Disc 2.0 contains the following six tracks that were not available on Disc 1.0: (1) two Tracks of 25, 2-pair dichotic digits, (2) two Tracks of 25, 3-pair dichotic digits, and (3) two Tracks of 54, randomized 1-, 2-, and 3-pair of dichotic digits. The remaining materials on Disc 1.0 were copied digitally onto Disc 2.0.

This compact disc project was sponsored by the Rehabilitation Research and Development Service, VA Headquarters. The Auditory Research Laboratory facilities at the James H. Quillen VA Medical Center, Mountain Home, Tennessee, used to produce the compact disc were provided both by the Medical Research Service and by Rehabilitation, Research and Development Service, VA Headquarters. The following individuals made contributions to the production of Disc 1.0, most of which are continued on Disc 2.0: Steven P. Bornstein, Ph.D., Nancy K. Cambron, M.S., Charles Martinez, M.A., Frank E. Musiek, Ph.D., Doug Noffsinger, Ph.D., and John P. Preece, Ph.D.

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TEST MATERIALS

The text that follows describes briefly the materials that are contained on each track of the compact disc. A detailed script of each track and references are provided. The inter-stimulus intervals (ISI) with the various materials are the times between successive stimulus onsets. Normative data for the majority of the materials on the disc are provided in a series of papers in the July, 1994, issue of the *Journal of the American Academy of Audiology* and in a paper by Humes, Coughlin, and Talley (1996).

Track 1. Both channels contain a 300-ms, 1000-Hz tone burst, followed by a 1-s silent interval and a 15-s, 1000-Hz calibration tone that reflects the peaks of the speech materials as monitored on a calibrated vu meter (Green, Williams, & Kryter, 1959; Lilly, 1967). The tone burst can be used to check the ballistic characteristics of a vu meter. The needle on a calibrated vu meter will swing from -20 vu to 0 vu with minimal overshoot when a 300-ms tone burst is placed across the meter. It should be noted that many meters used on audiometers are not "true" vu meters and/or are not properly calibrated (ANSI, 1954). The 1000-Hz calibration tone, therefore, may not reflect accurately the peaks of the speech materials on non-vu meters and on non-calibrated vu meters. For a variety of reasons, the materials on several tracks do not peak at 0 vu. These exceptions are noted in the text that follows.

Track 2. This 86-s stereo track contains 25, 1-pair dichotic digits (1, 2, 3, 4, 5, 6, 8, 9, and 10) with a 3-s interstimulus interval. The levels of the digits do not reach 0 vu because the duration of each digit is less than the integration time of a vu meter. The task of the subject is to repeat the dichotic digits. [See Broadbent, 1956; Kimura, 1961.]

Track 3. This 128-s stereo track contains 25, 2-pair dichotic digit stimuli, designated List 1. Because the durations of the digit stimuli are different, the interval between digits in a set ranges from 500 to 700 ms with an interstimulus interval of 4 s. [See Broadbent, 1956; Kimura, 1961; Wilson & Jaffe, 1996]

Track 4. This 127-s stereo track is the same as Track 2 but with different 25, 2-pair dichotic digits, designated as List 2.

Track 5. This 193-s stereo track contains 25, 3-pair dichotic digit stimuli, designated List 1. The interval between digits in a set ranges from 500 to 700 ms with an interstimulus interval of 5 s. [See Broadbent, 1956; Kimura, 1961; Wilson & Jaffe, 1996].

Track 6. This 193-s stereo track is the same as Track 4 but with different 25, 3-pair dichotic digits, designated as List 2.

Track 7. This 395-s stereo track contains 18, 1-pair, 18, 2-pair, and 18, 3-pair dichotic digit stimuli interleaved randomly. The interval between digits in a set ranges from 500 to 700 ms with interstimulus intervals of 5 s for the 1-pair and 6 s for the 2- and 3-pair [See Strouse & Wilson, 1999].

Track 8. This 395-s stereo track contains 18, 1-pair, 18, 2-pair, and 18, 3-pair dichotic digit stimuli interleaved randomly. The interval between digits in a set ranges from 500 to 700 ms with interstimulus intervals of 5 s for the 1-pair and 6 s for the 2- and 3-pair.

Track 9. This 155-s stereo track contains the 30 possible pairings of six nonsense (CV) syllables (BA, DA, GA, PA, TA, and KA) in a dichotic format (Berlin, Lowe-Bell, Cullen, Thompson, & Loovis, 1973; Wilson & Leigh, 1996). The syllables were digitized (from the right channel of an analog tape produced by Kresge Hearing Research Laboratory, New Orleans), edited, and aligned at the VA Medical Center, Long Beach. The levels of the syllables do not reach 0 vu because the duration of each syllable is less than the integration time of a vu meter. The task of the subject is to repeat the dichotic nonsense syllables.

Track 10. This 156-s stereo track is identical to Track 9, except the nonsense syllable in the left channel lags by 90 ms the nonsense syllable in the right channel.

Track 11. This 271-s stereo track contains the 30 possible pairings of six synthetic sentences (Fifer, Jerger, Berlin, Tobey, & Campbell, 1983; Noffsinger, Martinez, & Wilson, 1994) in a dichotic format. This version of the Dichotic Sentence Identification Test was produced (digitized, compressed and expanded as needed, and aligned) at the VA Medical Center, Long Beach. The task of the subject is to identify from a list of six sentences the dichotic sentences.

Track 12. This 235-s stereo track contains 50 CVC words that are segmented at the approximate phoneme boundaries and are alternated such that the carrier phrase (Show me) is in both channels, the initial consonant segment is in the left channel, the vowel segment is in the right channel, and the final consonant segment is in the left channel (Wilson, Arcos, & Jones, 1984; Wilson, 1994). Because the carrier phrases on the two channels are recorded 180° out-of-phase (to prevent the patient from experiencing a mid-line image with the carrier phrase), the materials will sound "rough" when both channels are monitored in a single loudspeaker. The task of the subject is to repeat the monosyllabic word. Minimal correct recognition of the words is obtained from either channel individually; maximum correct recognition of the words is obtained when both channels are presented simultaneously.

Track 13. This 236-s stereo track is identical to Track 12, except that the 50 CVC words are in a different randomization.

Track 14. This 241-s track contains monosyllabic words from List 3 of the Northwestern University Auditory Test No. 6 (N. U. No. 6) spoken by a female (Wilson, Zizz, Shanks, & Causey, 1990). The words on the left channel (1) are high-pass filtered (2100-Hz cutoff; 115 dB/octave rejection), whereas the words on the right channel (2) are low-pass filtered (1500-Hz cutoff; 115 dB/octave). The high-pass words on the left channel peak at -15 to -10 vu; the low-pass words on the right channel peak at -3 to 0 vu. The materials sound normal if both channels are fed to a single loudspeaker. Because the words are simultaneous on the two channels, a binaural fusion task can be created by presenting the words in the stereo mode. [See Bocca, Calearo, Cassinari, & Miglivacca, 1955; Matzker, 1957; Smith & Resnick, 1972; Bornstein, Wilson, & Cambron, 1994.]

Track 15. This 245-s track is identical to Track 14, except that the materials are List 4 of the N. U. No. 6.

Track 16. The left channel (1) contains 30 frequency-pattern sequences (six patterns by five randomizations). The low-frequency tone (L) is 880 Hz and the high-frequency tone (H) is 1122 Hz. Both tones are 150 ms with 10-ms rise-fall times (cosine squared). The frequency-pattern sequences have 200-ms interstimulus intervals and 6-s interpattern intervals. Because the frequency pattern tones are shorter than the integration time of a vu meter, the vu meter peaks at -2 to -3 vu with reference to the 1000-Hz calibration tone. [See Pinheiro & Ptacek, 1971; Ptacek & Pinheiro, 1971; Pinheiro & Musiek, 1985; Musiek & Pinheiro, 1987]. The right channel (B) contains 30 duration-pattern sequences (six patterns by five randomizations). The tones are 1000 Hz with 10-ms rise-fall times (cosine squared). The long tone (L) is 500 ms, the short tone (S) is 250 ms, the interstimulus interval is 300 ms, and the interpattern interval is 6 s. [See Pinheiro & Musiek, 1985; Musiek, Baran, & Pinheiro, 1990.] The task of the subject is to repeat (mimic) the tonal pattern. The track time is 198 s. The following are the various combinations of pattern sequences:

Frequency Patterns				Duration Patterns			
LLH	=	880 Hz	880 Hz 1122 Hz	LLS	=	500 ms	500 ms 250 ms
LHL	=	880 Hz	1122 Hz 880 Hz	LSL	=	500 ms	250 ms 500 ms
LHH	=	880 Hz	1122 Hz 1122 Hz	LSS	=	500 ms	250 ms 250 ms
HLH	=	1122 Hz	880 Hz 1122 Hz	SLS	=	250 ms	500 ms 250 ms
HLL	=	1122 Hz	880 Hz 880 Hz	SLL	=	250 ms	500 ms 500 ms
HHL	=	1122 Hz	1122 Hz 880 Hz	SSL	=	250 ms	250 ms 500 ms

Track 17. The right channel (2) contains 50 carrier phrase and word stimuli from the N.U. No. 6 pool of 200 words that are compressed 45%, i.e., 45% of the carrier phrase and word has been removed. This list is designated List 5 because it contains a composite of words from the original four N.U. No. 6 lists. The left channel (1) contains the same 50 carrier phrases and words that are compressed 45% and reverberated 0.3 s. The task of the subject is to repeat the word that follows the carrier phrase. The track time is 210 s. [See Fairbanks & Kodman, 1957; Beasley, Schwimmer, & Rintelmann, 1972; Kurdziel, Noffsinger, & Olsen, 1976; Wilson, Preece, Salamon, Sperry, & Bornstein, 1994; Stuart & Phillips, 1998.]

Track 18. This track is identical to Track 17, except that a different group of 50 words from the N.U. No. 6 pool of 200 words is used; hence, the designation is List 6. The track time is 210 s.

Track 19. The right channel (2) contains 50 carrier phrase and word stimuli from the N.U. No. 6 pool of 200 words that are compressed 65%, i.e., 65% of the carrier phrase and word has been removed. This list is designated List 7 because it contains a composite of words from the original four N.U. No. 6 lists. Because the words have been compressed so much, the words peak at less than 0 vu. The left channel (1) contains the same 50 carrier phrases and words that are compressed 65% and reverberated 0.3 s. The task of the subject is to repeat the word that follows the carrier phrase. The track time is 202 s. [See Wilson, Preece, Salamon, Sperry, & Bornstein, 1994; Stuart & Phillips, 1998.]

Track 20. This track is identical to Track 19, except that a different group of 50 words from the N.U. No. 6 pool of 200 words is used; hence, the List 8 designation. The track is 200 s.

NOTE: Tracks 17 and 18 contain 100 words; likewise, Tracks 19 and 20 contain 100 words. The two groups of 100 words contain 52 common words.

Track 21. This stereo track contains spondaic words embedded in bursts of broadband noise in the $S\pi N_0$ paradigm, i.e., the spondaic words (S) are 180° out-of-phase on the two channels and the bursts of broadband noise (N) in-phase on the two channels. The 10 spondaic words that are used repetitively are from the Technisonic Studio recording of the W-1 lists (Hirsh et al., 1952) and were selected based on earlier masking-level difference data (Wilson, Shanks, & Koebsell, 1982). The words start 500 ms into the 2000-ms noise bursts that have 200-ms rise-fall times. Four words are recorded at each of 16 signal-to-noise ratios in 2-dB decrements from 0 dB to -30 dB. To avoid "pegging" the vu meter on the noise/word composite signals at 0 dB S/N, the levels are calibrated to -1 vu with reference to the 1000-Hz calibration tone. Because the words are 180° out-of-phase, monitoring the words will be difficult if both channels are fed to one loudspeaker at the same levels. To avoid this problem, monitor only one channel. The interstimulus interval is 5 s (see Script) with a 318 s total time. For relative phase calibration purposes, *Track 22* contains 100-Hz tone bursts recorded 180° out-of-phase on the two channels. [See Durlach & Colburn, 1978; Noffsinger et al., 1972; Olsen, Noffsinger, & Carhart, 1976; Wilson, Zizz, & Sperry, 1994.]

Track 22. This 19-s stereo track contains 100-Hz tone bursts that are 50-ms on and 50-ms off recorded 180° out-of-phase on the two channels. These tone bursts are for the relative phase calibration of the two channels of audiometers. The procedure for phase calibration requires an NBS-9A, 6 cm³ coupler, a microphone, a microphone amplifier or sound-level meter, and an oscilloscope. The output of the amplifier or meter is fed to the oscilloscope. If the earphones are in-phase with each other, then the tone bursts will be out-of-phase at the oscilloscope, i.e., the onset of the waveform through one earphone will be positive whereas the onset of the waveform through the other earphone will be negative. If these results are not obtained, then reversing the leads to one earphone will produce the correct phase relation.

SCRIPT FOR EACH TRACK

Track 1 (0:17)**Track 2 (1-pair digits) (1:26)**

Left Channel and Right Channel	Time	Left Ch.	Right Ch.
1000-Hz Calibration Tone	1. 0:01	10	2
	2. 0:04	6	10
(300-ms tone burst; 1-s interval; 15-s tone)	3. 0:08	5	3
	4. 0:11	6	9
	5. 0:15	1	4
	6. 0:18	6	5
	7. 0:22	8	10
	8. 0:25	3	1
	9. 0:29	9	3
	10. 0:32	2	8
	11. 0:36	6	2
	12. 0:39	4	9
	13. 0:43	1	3
	14. 0:46	10	5
	15. 0:50	10	4
	16. 0:53	3	9
	17. 0:57	6	1
	18. 1:00	5	9
	19. 1:04	3	10
	20. 1:07	8	2
	21. 1:11	1	9
	22. 1:14	9	6
	23. 1:18	9	10
	24. 1:21	3	8
	25. 1:25	4	5

Track 3 (2-pair digits) (2:08)

	Time	Left Ch.	Right Ch.
1.	0:01	4,3	1,6
2.	0:05	3,1	9,10
3.	0:11	9,6	1,5
4.	0:16	2,10	6,8
5.	0:21	4,8	6,9
6.	0:26	9,1	10,2
7.	0:31	2,4	9,10
8.	0:36	1,9	8,6
9.	0:42	2,4	3,9
10.	0:47	1,4	10,5
11.	0:52	2,5	1,3
12.	0:57	4,5	2,6
13.	1:02	3,10	5,6
14.	1:08	4,1	9,5
15.	1:13	4,5	3,8
16.	1:18	9,5	4,1
17.	1:23	4,5	10,2
18.	1:28	9,8	3,4
19.	1:33	9,10	8,5
20.	1:39	8,6	4,1
21.	1:44	6,8	10,2
22.	1:49	9,1	2,8
23.	1:55	6,9	3,1
24.	2:00	1,2	3,9
25.	2:05	5,3	2,1

Track 4 (2-pair digits) (2:07)

	Time	Left Ch.	Right Ch.
1.	0:01	10,3	2,9
2.	0:05	10,6	3,8
3.	0:11	10,8	5,1
4.	0:16	6,9	5,8
5.	0:21	1,3	2,5
6.	0:26	5,2	10,1
7.	0:31	3,5	6,9
8.	0:36	8,10	9,1
9.	0:42	4,6	5,2
10.	0:47	10,8	4,5
11.	0:52	4,9	8,2
12.	0:57	5,10	9,2
13.	1:02	1,10	9,3
14.	1:08	5,2	3,8
15.	1:13	10,4	8,1
16.	1:18	6,2	8,10
17.	1:23	8,4	5,3
18.	1:28	3,4	1,2
19.	1:33	3,9	4,5
20.	1:39	9,3	5,4
21.	1:44	10,2	6,4
22.	1:49	8,6	10,4
23.	1:55	5,10	6,4
24.	2:00	3,2	10,6
25.	2:05	10,9	1,3

Track 5 (3-pair digits) (3:13)

	Time	Left Ch.	Right Ch.
1.	0:01	2,10,4	1,8,6
2.	0:08	8,3,6	10,4,9
3.	0:16	10,6,9	8,5,4
4.	0:24	1,3,8	4,9,5
5.	0:31	6,8,4	2,5,3
6.	0:39	6,9,8	4,5,10
7.	0:47	6,4,5	1,10,8
8.	0:55	6,8,2	10,1,4
9.	1:02	1,3,2	6,5,10
10.	1:10	5,2,4	10,3,8
11.	1:18	1,9,4	3,2,5
12.	1:26	4,5,9	3,2,1
13.	1:34	4,5,10	8,6,1
14.	1:41	3,9,1	8,4,2
15.	1:49	4,2,5	6,8,1
16.	1:57	5,9,6	1,3,10
17.	2:05	5,10,8	2,3,1
18.	2:13	9,4,6	5,1,8
19.	2:20	1,9,3	2,6,5
20.	2:28	4,9,5	10,1,6
21.	2:36	10,6,8	3,4,9
22.	2:44	10,3,6	9,8,2
23.	2:52	8,3,9	4,2,5
24.	3:00	3,1,9	6,5,10
25.	3:07	3,5,10	2,8,6

Track 6 (3-pair digits) (3:13)

	Time	Left Ch.	Right Ch.
1.	0:01	10,6,8	4,1,2
2.	0:08	9,5,10	2,4,8
3.	0:16	2,10,1	3,9,6
4.	0:24	6,2,4	8,5,9
5.	0:31	2,6,1	4,9,3
6.	0:39	9,4,1	6,3,10
7.	0:47	6,10,4	3,1,2
8.	0:55	8,2,1	5,10,9
9.	1:02	6,1,3	5,10,2
10.	1:10	9,3,2	8,10,6
11.	1:18	5,10,8	3,6,4
12.	1:26	9,4,6	3,2,5
13.	1:34	4,1,3	9,6,10
14.	1:41	2,6,1	5,10,8
15.	1:49	2,8,5	10,3,9
16.	1:57	9,10,8	4,5,3
17.	2:05	9,6,10	1,8,3
18.	2:13	1,6,5	8,3,4
19.	2:20	4,8,2	5,6,9
20.	2:28	1,5,8	10,9,6
21.	2:36	3,10,9	5,4,8
22.	2:44	5,9,2	8,10,3
23.	2:52	4,1,3	2,8,9
24.	3:00	2,1,10	6,3,9
25.	3:07	8,3,9	1,6,2

Track 7 (1-, 2-, & 3 -pair digits) (6:35)

	Time	Left Ch.	Right Ch.
1.	0:01	6,2,4	8,5,9
2.	0:09	2,10	3,9
3.	0:17	5	6
4.	0:23	10	6
5.	0:28	5,9,6	1,3,10
6.	0:37	6	4
7.	0:43	4,8	1,9
8.	0:50	4,8	5,6
9.	0:58	8,3,6	10,4,9
10.	1:07	10,3	9,8
11.	1:15	2,1,10	6,3,9
12.	1:23	5	2
13.	1:29	4,1,3	9,6,10
14.	1:38	1,6,5	8,3,4
15.	1:47	10,6,9	8,5,4
16.	1:56	9,10,8	4,5,3
17.	2:04	3,1,2	10,4,8
18.	2:13	4,5,9	3,2,1
19.	2:22	5	10
20.	2:28	3,4,10	9,8,5
21.	2:36	5	4
22.	2:42	2,8	9,10
23.	2:50	5,9	1,3
24.	2:57	3,9	8,4
25.	3:05	1	5
26.	3:11	4,1	9,6
27.	3:18	6,8,4	2,5,3

Track 7 (continued)

	Time	Left Ch.	Right Ch.
28.	3:27	10,4	6,9
29.	3:35	10,6	3,4
30.	3:42	6,4,5	1,10,8
31.	3:51	10,4,2	6,9,5
32.	4:00	1	2
33.	4:06	8	5
34.	4:11	6,10,4	3,1,2
35.	4:20	4,1,3	2,8,9
36.	4:29	1,2	9,4
37.	4:37	2,10	1,8
38.	4:44	10	9
39.	4:50	10	2
40.	4:55	10,6,8	4,1,2
41.	5:04	8	9
42.	5:10	10,6	4,1
43.	5:18	4	10
44.	5:23	3	10
45.	5:29	2,5,10	8,3,4
46.	5:38	1	3
47.	5:43	6	8
48.	5:49	8,4	9,6
49.	5:56	2	8
50.	6:02	1,9	3,2
51.	6:10	8,2	5,10
52.	6:17	9,10	4,5
53.	6:25	10	1
54.	6:31	8,3	4,2

Track 8 (1-, 2-, & 3-pair digits) (6:35)

	Time	Left Ch.	Right Ch.
1.	0:01	1,3	4,9
2.	0:08	8	6
3.	0:14	3	9
4.	0:20	6,1,3	5,10,2
5.	0:28	5,9,4	6,8,1
6.	0:37	2,8	10,3
7.	0:45	3	1
8.	0:50	2,6,1	5,10,8
9.	0:59	9,4,1	6,3,10
10.	1:08	4	1
11.	1:14	3,5	2,8
12.	1:21	1,3	6,5
13.	1:29	8,10,6	3,2,1
14.	1:38	6,1	5,10
15.	1:46	1,9,4	3,2,5
16.	1:54	9,4	6,3
17.	2:02	6,9,8	4,5,10
18.	2:11	8,3	10,4
19.	2:19	9,4,6	3,2,5
20.	2:27	8	4
21.	2:33	9,1	10,2
22.	2:41	5,9	8,10
23.	2:48	1,5,8	10,9,6
24.	2:57	4	9
25.	3:03	9	2
26.	3:08	9	5
27.	3:14	8,2,1	5,10,9

Track 8 (continued)

	Time	Left Ch.	Right Ch.
28.	3:23	9	6
29.	3:28	2,1	6,3
30.	3:36	4	8
31.	3:42	6	2
32.	3:47	2,5	8,3
33.	3:55	1,3,8	4,9,5
34.	4:04	10,2	1,9
35.	4:11	9	10
36.	4:17	3,1,9	6,5,10
37.	4:26	10	8
38.	4:31	5,2	10,3
39.	4:39	6,8,2	10,1,4
40.	4:48	9	3
41.	4:53	3,5	4,10
42.	5:01	10,6,8	3,4,9
43.	5:10	5	3
44.	5:16	1,9,3	2,6,5
45.	5:24	6,8	10,1
46.	5:32	6	9
47.	5:38	1	4
48.	5:43	10,2	5,1
49.	5:51	10,3,6	9,8,2
50.	6:00	8,1,5	6,9,2
51.	6:09	5,2	4,6
52.	6:16	8	1
53.	6:22	3,4	9,8
54.	6:30	2,10,1	3,9,6

Track 9 (2:35)

DICHOTIC (CV) SYLLABLES
Onsets Simultaneous

	Time	Left Ch.	Right Ch.
1.	0:00	TA	GA
2.	0:05	TA	DA
3.	0:11	DA	BA
4.	0:16	DA	PA
5.	0:21	KA	TA
6.	0:26	KA	BA
7.	0:31	GA	DA
8.	0:36	KA	GA
9.	0:42	TA	PA
10.	0:47	TA	KA
11.	0:52	GA	TA
12.	0:57	KA	PA
13.	1:03	BA	DA
14.	1:08	BA	PA
15.	1:13	DA	GA
16.	1:18	GA	KA
17.	1:23	GA	BA
18.	1:29	TA	BA
19.	1:34	PA	DA
20.	1:39	PA	TA
21.	1:44	DA	KA
22.	1:50	DA	TA
23.	1:55	PA	BA
24.	2:00	KA	DA
25.	2:05	PA	KA
26.	2:11	GA	PA
27.	2:16	BA	TA
28.	2:21	BA	KA
29.	2:26	PA	GA
30.	2:31	BA	GA

Track 10 (2:36)

DICHOTIC (CV) SYLLABLES
Onsets Separated 90 ms

	Time	Lag Left Ch.	Lead Right Ch.
1.	0:00	KA	PA
2.	0:05	KA	DA
3.	0:11	TA	KA
4.	0:16	BA	PA
5.	0:21	DA	KA
6.	0:26	KA	GA
7.	0:32	KA	TA
8.	0:37	GA	TA
9.	0:42	DA	BA
10.	0:47	TA	GA
11.	0:53	BA	TA
12.	0:58	BA	KA
13.	1:03	PA	GA
14.	1:09	BA	GA
15.	1:14	PA	DA
16.	1:19	GA	DA
17.	1:24	PA	KA
18.	1:30	TA	PA
19.	1:35	TA	DA
20.	1:40	PA	BA
21.	1:46	GA	BA
22.	1:51	BA	DA
23.	1:56	DA	GA
24.	2:01	DA	TA
25.	2:07	GA	KA
26.	2:12	TA	BA
27.	2:17	GA	PA
28.	2:22	DA	PA
29.	2:28	KA	BA
30.	2:33	PA	TA

Track 11 (4:31)**DICHOTIC SENTENCE IDENTIFICATION**

Left Channel

1. Agree with him only to find out.
2. Go change your car color is red.
3. Women view men with green paper should.
4. Small boat with a picture has become.
5. Small boat with a picture has become.
6. Built the government with the force almost.
7. Go change your car color is red.
8. Go change your car color is red.
9. Agree with him only to find out.
10. Agree with him only to find out.
11. Agree with him only to find out.
12. Built the government with the force almost.
13. Built the government with the force almost.
14. Women view men with green paper should.
15. Women view men with green paper should.
16. Go change your car color is red.
17. Women view men with green paper should.
18. Agree with him only to find out.
19. Down by the time is real enough.
20. Down by the time is real enough.
21. Built the government with the force almost.
22. Built the government with the force almost.
23. Down by the time is real enough.
24. Women view men with green paper should.
25. Down by the time is real enough.
26. Go change your car color is red.
27. Small boat with a picture has become.
28. Small boat with a picture has become.
29. Down by the time is real enough.
30. Small boat with a picture has become.

Right Channel

- Women view men with green paper should.
 Agree with him only to find out.
 Down by the time is real enough.
 Built the government with the force almost.
 Down by the time is real enough.
 Go change your car color is red.
 Women view men with green paper should.
 Small boat with a picture has become.
 Small boat with a picture has become.
 Go change your car color is red.
 Built the government with the force almost.
 Small boat with a picture has become.
 Down by the time is real enough.
 Agree with him only to find out.
 Small boat with a picture has become.
 Built the government with the force almost.
 Go change your car color is red.
 Down by the time is real enough.
 Built the government with the force almost.
 Agree with him only to find out.
 Women view men with green paper should.
 Agree with him only to find out.
 Small boat with a picture has become.
 Built the government with the force almost.
 Women view men with green paper should.
 Down by the time is real enough.
 Agree with him only to find out.
 Women view men with green paper should.
 Go change your car color is red.
 Go change your car color is red.

Track 12 (3:55), List 5A**Track 12, List 5A, continued****Vowels In One Ear Consonants In The Other (VIOECITO)**

Left Channel	Right Channel	Left Channel	Right Channel
Consonant Segments	Vowel Segments (Word)	Consonant Segments	Vowel Segments (Word)
1. Show me c_p	Show me _a_(cape)	26. Show me c_ch	Show me _oa_(coach)
2. Show me wr_t	Show me _i_(write)	27. Show me sh_n	Show me _i_(shine)
3. Show me s_l	Show me _o_(sole)	28. Show me s_t	Show me _ea_(seat)
4. Show me s_l	Show me _ea_(seal)	29. Show me b_s	Show me _ow_(bows)
5. Show me m_n	Show me _a_(mane)	30. Show me s_n	Show me _i_(sign)
6. Show me n_t	Show me _o_(note)	31. Show me n_t	Show me _e_(net)
7. Show me t_l	Show me _ai_(tail)	32. Show me g_n	Show me _ow_(gown)
8. Show me f_n	Show me _i_(fin)	33. Show me h_s	Show me _o_(hose)
9. Show me l_ck	Show me _o_(lock)	34. Show me s_ng	Show me _i_(sing)
10. Show me l_n	Show me _i_(line)	35. Show me m_l	Show me _ai_(mail)
11. Show me t_s	Show me _ie_(ties)	36. Show me sh_p	Show me _o_(shop)
12. Show me ch_f	Show me _e_(chef)	37. Show me s_l	Show me _ai_(sail)
13. Show me t_p	Show me _y_(type)	38. Show me l_d	Show me _oa_(load)
14. Show me ch_n	Show me _i_(chin)	39. Show me ch_lk	Show me _a_(chalk)
15. Show me m_d	Show me _ai_(maid)	40. Show me m_l	Show me _i_(mill)
16. Show me b_dg	Show me _a_(badge)	41. Show me l_k	Show me _ea_(leak)
17. Show me ch_k	Show me _e_(check)	42. Show me l_gh	Show me _au_(laugh)
18. Show me r_d	Show me _i_(ride)	43. Show me n_s	Show me _oo_(noose)
19. Show me l_c	Show me _a_(lace)	44. Show me sh_l	Show me _aw_(shawl)
20. Show me sh_ck	Show me _a_(shack)	45. Show me m_ch	Show me _a_(match)
21. Show me j_g	Show me _o_(jog)	46. Show me n_s	Show me _o_(nose)
22. Show me m_d	Show me _o_(mowed)	47. Show me ch_n	Show me _ai_(chain)
23. Show me ch_ck	Show me _i_(chick)	48. Show me w_v	Show me _a_(wave)
24. Show me p_l	Show me _ee_(peel)	49. Show me sh_p	Show me _i_(ship)
25. Show me m_t	Show me _i_(mitt)	50. Show me y_m	Show me _a_(yam)

Track 13 (3:56), List 5B**Track 13, List 5B, continued****Vowels In One Ear Consonants In The Other (VIOECITO)**

Left Channel	Right Channel	Left Channel	Right Channel
Consonant Segments	Vowel Segments (Word)	Consonant Segments	Vowel Segments (Word)
1. Show me s_ng	Show me _i_(sing)	26. Show me j_g	Show me _o_(jog)
2. Show me m_d	Show me _o_(mowed)	27. Show me sh_p	Show me _i_(ship)
3. Show me m_t	Show me _i_(mitt)	28. Show me s_n	Show me _i_(sign)
4. Show me f_n	Show me _i_(fin)	29. Show me t_l	Show me _ai_(tail)
5. Show me h_s	Show me _o_(hose)	30. Show me y_m	Show me _a_(yam)
6. Show me sh_p	Show me _o_(shop)	31. Show me n_s	Show me _oo_(noose)
7. Show me sh_n	Show me _i_(shine)	32. Show me r_d	Show me _i_(ride)
8. Show me m_l	Show me _i_(mill)	33. Show me ch_k	Show me _e_(check)
9. Show me b_s	Show me _ow_(bows)	34. Show me t_s	Show me _ie_(ties)
10. Show me s_t	Show me _ea_(seat)	35. Show me p_l	Show me _ee_(peel)
11. Show me t_p	Show me _y_(type)	36. Show me l_gh	Show me _au_(laugh)
12. Show me m_n	Show me _a_(mane)	37. Show me m_ch	Show me _a_(match)
13. Show me ch_n	Show me _ai_(chain)	38. Show me n_t	Show me _e_(net)
14. Show me sh_ck	Show me _a_(shack)	39. Show me n_t	Show me _o_(note)
15. Show me m_d	Show me _ai_(maid)	40. Show me ch_ck	Show me _i_(chick)
16. Show me l_d	Show me _oa_(load)	41. Show me wr_t	Show me _i_(write)
17. Show me s_l	Show me _ea_(seal)	42. Show me l_ck	Show me _o_(lock)
18. Show me s_l	Show me _ai_(sail)	43. Show me l_n	Show me _i_(line)
19. Show me ch_n	Show me _i_(chin)	44. Show me g_n	Show me _ow_(gown)
20. Show me s_l	Show me _o_(sole)	45. Show me sh_l	Show me _aw_(shawl)
21. Show me l_c	Show me _a_(lace)	46. Show me c_ch	Show me _oa_(coach)
22. Show me l_k	Show me _ea_(leak)	47. Show me ch_lk	Show me _a_(chalk)
23. Show me b_dg	Show me _a_(badge)	48. Show me ch_f	Show me _e_(chef)
24. Show me m_l	Show me _ai_(mail)	49. Show me c_p	Show me _a_(cape)
25. Show me n_s	Show me _o_(nose)	50. Show me w_v	Show me _a_(wave)

Track 14 (4:01)

NORTHWESTERN NO. 6, List 3C

Left Channel High-Pass at 2100 Hz
Right Channel Low-Pass at 1500 Hz

- | | |
|---------------|------------|
| 1. Youth | 26. Wire |
| 2. Mouse | 27. Cool |
| 3. Lid | 28. Ditch |
| 4. Pole | 29. Bar |
| 5. Beg | 30. Mess |
| 6. Hire | 31. Dodge |
| 7. Pearl | 32. Cheek |
| 8. When | 33. Five |
| 9. Soup | 34. Team |
| 10. Pain | 35. Search |
| 11. Shall | 36. Seize |
| 12. Cab | 37. Gun |
| 13. Tell | 38. Cause |
| 14. Note | 39. Good |
| 15. Germ | 40. Void |
| 16. Base | 41. Phone |
| 17. Talk | 42. Half |
| 18. Walk | 43. Date |
| 19. Luck | 44. Mop |
| 20. Road-Rode | 45. Jug |
| 21. Name | 46. Late |
| 22. Sheep | 47. Ring |
| 23. Rush | 48. Life |
| 24. Chat | 49. Rat |
| 25. Thin | 50. Hit |

Track 15 (4:05)

NORTHWESTERN NO. 6, List 4C

Left Channel High-Pass at 2100 Hz
Right Channel Low-Pass at 1500 Hz

- | | |
|---------------|---------------|
| 1. Vote | 26. Lease |
| 2. Long | 27. Dog |
| 3. Hole-Whole | 28. Rose |
| 4. Get | 29. Bone |
| 5. Make | 30. Should |
| 6. Food | 31. Perch |
| 7. Tape | 32. Gas |
| 8. Kick | 33. Mob |
| 9. Dip | 34. Sail-Sale |
| 10. Tire | 35. Kill |
| 11. Wife | 36. Near |
| 12. Wash | 37. Bath |
| 13. Hall | 38. Came |
| 14. Join | 39. Sour |
| 15. Neat | 40. Chain |
| 16. Have | 41. Doll |
| 17. Red | 42. Wheat |
| 18. Ripe | 43. Thumb |
| 19. Such | 44. Fit |
| 20. Back | 45. Shirt |
| 21. Check | 46. Lean |
| 22. Lose | 47. Rough |
| 23. Peg | 48. Yearn |
| 24. Judge | 49. Pass |
| 25. Time | 50. Mood |

Track 16 (3:18)

Left Channel (1)

Frequency Tone Patterns

L = 880 Hz, 150 ms
H = 1122 Hz, 150 ms

1.	0:00	LLH
2.	0:06	LHH
3.	0:13	HLL
4.	0:20	HHL
5.	0:26	HLH
6.	0:33	LHL
7.	0:40	LHH
8.	0:46	LLH
9.	0:53	HHL
10.	1:00	HLH
11.	1:06	LHL
12.	1:13	HLL
13.	1:20	HHL
14.	1:26	LHL
15.	1:33	HLH
16.	1:40	LHH
17.	1:46	HLL
18.	1:53	LLH
19.	2:00	HHL
20.	2:07	LLH
21.	2:13	LHL
22.	2:20	HLH
23.	2:27	LHH
24.	2:33	HLL
25.	2:40	LLH
26.	2:47	HLL
27.	2:54	LHL
28.	3:01	LHH
29.	3:07	HHL
30.	3:14	HLH

Track 16 (3:18)

Right Channel (2)

Duration Tone Patterns

L = 500 ms, 1000 Hz
S = 250 ms, 1000 Hz

1.	0:00	LLS
2.	0:06	LSS
3.	0:13	SLL
4.	0:20	SSL
5.	0:26	SLS
6.	0:33	LSL
7.	0:40	LSS
8.	0:46	LLS
9.	0:53	SSL
10.	1:00	SLS
11.	1:06	LSL
12.	1:13	SLL
13.	1:20	SSL
14.	1:26	LSL
15.	1:33	SLS
16.	1:40	LSS
17.	1:46	SLL
18.	1:53	LLS
19.	2:00	SSL
20.	2:07	LLS
21.	2:13	LSL
22.	2:20	SLS
23.	2:27	LSS
24.	2:33	SLL
25.	2:40	LLS
26.	2:47	SLL
27.	2:54	LSL
28.	3:01	LSS
29.	3:07	SSL
30.	3:14	SLS

Track 17 (3:30)

NORTHWESTERN NO. 6, List 5

Track 18 (3:30)

NORTHWESTERN NO. 6, List 6

Left Channel--45% Compressed and 0.3 s Reverberation
 Right Channel--45% Compressed

- | | | | |
|-----------|-------------|---------------|---------------|
| 1. Hall | 26. Match | 1. Time | 26. Base |
| 2. Shirt | 27. Chair | 2. Perch | 27. Learn |
| 3. Rough | 28. Bought | 3. Lose | 28. Haze |
| 4. Vote | 29. Thought | 4. Have | 29. Turn |
| 5. Dip | 30. Gaze | 5. Ripe | 30. Pad |
| 6. Join | 31. Voice | 6. Chain | 31. Live |
| 7. Peg | 32. Rot | 7. Mob | 32. Read-Reed |
| 8. Neat | 33. Shack | 8. Yearn | 33. Hush |
| 9. Wheat | 34. Pike | 9. Sail-Sale | 34. Tool |
| 10. Get | 35. Merge | 10. Cool | 35. Young |
| 11. Doll | 36. Numb | 11. Phone | 36. Rain |
| 12. Chat | 37. Keep | 12. Hit | 37. Juice |
| 13. Hire | 38. White | 13. Mouse | 38. Dead |
| 14. Bar | 39. Said | 14. Tell | 39. South |
| 15. When | 40. Room | 15. Wire | 40. Fail |
| 16. Rat | 41. Which | 16. Jug | 41. Pick |
| 17. Five | 42. Moon | 17. Gun | 42. Tip |
| 18. Team | 43. Hurl | 18. Late | 43. Bean |
| 19. Germ | 44. Raid | 19. Road-Rode | 44. Reach |
| 20. Ring | 45. Jar | 20. Life | 45. Lot |
| 21. Talk | 46. Met | 21. Ditch | 46. Hash |
| 22. Date | 47. Take | 22. Search | 47. Choice |
| 23. Youth | 48. Shout | 23. Pain | 48. Puff |
| 24. Far | 49. Pool | 24. Mop | 49. Dime |
| 25. Deep | 50. Boat | 25. Cause | 50. Vine |

Track 19 (3:22)**Track 20 (3:20)**

NORTHWESTERN NO. 6, List 7A

NORTHWESTERN NO. 6, List 8A

Left Channel--45% Compressed and 0.3 s Reverberation
 Right Channel--45% Compressed

- | | | | |
|-----------|---------------|----------------|------------|
| 1. Jug | 26. Week-Weak | 1. Pool | 26. Puff |
| 2. Chief | 27. Raise | 2. Knock | 27. Peg |
| 3. Reach | 28. Mop | 3. Ditch | 28. Bone |
| 4. Gap | 29. Room | 4. Road-Rode | 29. Thumb |
| 5. Hurl | 30. Far | 5. Chat | 30. Keg |
| 6. Pole | 31. Shout | 6. Page | 31. Yes |
| 7. Late | 32. Raid | 7. Wag | 32. Third |
| 8. Hall | 33. Voice | 8. Hole-Whole | 33. Long |
| 9. Yearn | 34. Sure | 9. Love | 34. Should |
| 10. Met | 35. Note | 10. Jar | 35. Gaze |
| 11. Kill | 36. Chain | 11. Chalk | 36. Check |
| 12. Bean | 37. Luck | 12. Nag | 37. Lid |
| 13. Pike | 38. Bought | 13. Red | 38. Beg |
| 14. Cheek | 39. Thin | 14. Ring | 39. Tough |
| 15. Goose | 40. Rain | 15. Sheep | 40. Wife |
| 16. Wire | 41. Shirt | 16. Pad | 41. Shawl |
| 17. Vine | 42. Dip | 17. Jail | 42. Rag |
| 18. Kite | 43. Doll | 18. Burn | 43. Fail |
| 19. Kick | 44. Limb | 19. Base | 44. Sell |
| 20. Have | 45. Haze | 20. Half | 45. King |
| 21. Pearl | 46. Lot | 21. Read--Reed | 46. Rot |
| 22. Get | 47. Gas | 22. Perch | 47. Hit |
| 23. Whip | 48. South | 23. Choice | 48. Boat |
| 24. Said | 49. Size | 24. Tip | 49. Tool |
| 25. Food | 50. Live | 25. Lose | 50. Keep |

Track 21 (5:18)

Spondaic Words In the S π No condition of the Masking-Level Difference paradigm

(To achieve the SoNo condition, simply split one of the two channels and present the split signal to both ears)

<i>0 dB S/N Ratio</i>	<i>-8 dB S/N Ratio</i>	<i>-16 dB S/N Ratio</i>	<i>-24 dB S/N Ratio</i>
1. 0:00 Horseshoe	17. 1:20 Headlight	33. 2:40 Armchair	49. 4:00 Horseshoe
2. 0:05 Mushroom	18. 1:25 Sidewalk	34. 2:45 Toothbrush	50. 4:05 Hotdog
3. 0:10 Northwest	19. 1:30 Hotdog	35. 2:50 Mushroom	51. 4:10 Oatmeal
4. 0:15 Toothbrush	20. 1:35 Inkwell	36. 2:55 Hotdog	52. 4:15 Armchair
<i>-2 dB S/N Ratio</i>	<i>-10 dB S/N Ratio</i>	<i>-18 dB S/N Ratio</i>	<i>-26 dB S/N Ratio</i>
5. 0:20 Sidewalk	21. 1:40 Sidewalk	37. 3:00 Sidewalk	53. 4:20 Mushroom
6. 0:25 Inkwell	22. 1:45 Hotdog	38. 3:05 Inkwell	54. 4:25 Horseshoe
7. 0:30 Oatmeal	23. 1:50 Mushroom	39. 3:10 Headlight	55. 4:30 Hotdog
8. 0:35 Hotdog	24. 1:55 Oatmeal	40. 3:15 Northwest	56. 4:35 Toothbrush
<i>-4 dB S/N Ratio</i>	<i>-12 dB S/N Ratio</i>	<i>-20 dB S/N Ratio</i>	<i>-28 dB S/N Ratio</i>
9. 0:40 Headlight	25. 2:00 Armchair	41. 3:20 Headlight	57. 4:40 Sidewalk
10. 0:45 Armchair	26. 2:05 Northwest	42. 3:25 Mushroom	58. 4:45 Headlight
11. 0:50 Oatmeal	27. 2:10 Inkwell	43. 3:30 Sidewalk	59. 4:50 Inkwell
12. 0:55 Toothbrush	28. 2:15 Horseshoe	44. 3:35 Inkwell	60. 4:55 Northwest
<i>-6 dB S/N Ratio</i>	<i>-14 dB S/N Ratio</i>	<i>-22 dB S/N Ratio</i>	<i>-30 dB S/N Ratio</i>
13. 1:00 Horseshoe	29. 2:20 Headlight	45. 3:40 Toothbrush	61. 5:00 Oatmeal
14. 1:05 Armchair	30. 2:25 Toothbrush	46. 3:45 Armchair	62. 5:05 Armchair
15. 1:10 Mushroom	31. 2:30 Oatmeal	47. 3:50 Oatmeal	63. 5:10 Sidewalk
16. 1:15 Northwest	32. 2:35 Horseshoe	48. 3:55 Northwest	64. 5:15 Mushroom

Track 22. This 19-s, stereo track contains 100-Hz tone bursts 50-ms on, 50-ms off that are recorded 180° out-of-phase on the two channels.

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TONAL AND SPEECH MATERIALS FOR AUDITORY PERCEPTUAL ASSESSMENT, DISC 2.0

Track	Left Channel	Right Channel	Time
1	1000-Hz Calibration Tone	1000-Hz Calibration Tone	0:17
2	25, 1-pair Dichotic Digits, List 1	25, 1-pair Dichotic Digits, List 1	1:26
3	25, 2-pair Dichotic Digits, List 1	25, 2-pair Dichotic Digits, List 1	2:08
4	25, 2-pair Dichotic Digits, List 2	25, 2-pair Dichotic Digits, List 2	2:07
5	25, 3-pair Dichotic Digits, List 1	25, 3-pair Dichotic Digits, List 1	3:13
6	25, 3-pair Dichotic Digits, List 2	25, 3-pair Dichotic Digits, List 2	3:13
7	54, 1-, 2-, & 3-pair Dichotic Digits	54, 1-, 2-, & 3-pair Dichotic Digits	6:35
8	54, 1-, 2-, & 3-pair Dichotic Digits	54, 1-, 2-, & 3-pair Dichotic Digits	6:35
9	30, Dichotic CVs, simultaneous onset ¹	30, Dichotic CVs, simultaneous onset	2:35
10	30, Dichotic CVs, 90 ms lag	30, Dichotic CVs, 90 ms lead	2:36
11	30, Dichotic Synthetic Sentences ²	30, Dichotic Synthetic Sentences	4:31
12	Consonant segments of 50 NU No. 6 words	Vowel segments of 50 NU No. 6 words	3:55
13	Consonant segments of 50 NU No. 6 words	Vowel segments of 50 NU No. 6 words	3:56
14	List 3, NU No. 6 words high-pass filter ³	List 3, NU No. 6 low-pass filter	4:01
15	List 4, NU No. 6 words high-pass filter	List 4, NU No. 6 low-pass filter	4:05
16	30 frequency patterns 880 Hz & 1122 Hz	30 duration patterns, 250 ms & 500 ms	3:18
17	NU No. 6, 45% comp + 0.3-s reverb (List 5) ³	NU No. 6, 45% compressed	3:30
18	NU No. 6, 45% comp + 0.3 s reverb (List 6)	NU No. 6, 45% compressed	3:30
19	NU No. 6, 65% comp + 0.3-s reverb (List 7) ³	NU No. 6, 65% compressed	3:22
20	NU No. 6, 65% comp + 0.3-s reverb (List 8)	NU No. 6, 65% compressed	3:20
21	Spondaic Words SπNo MLD ⁴	Spondaic Words SπNo MLD	5:18
22	100-Hz, Pulsed Phase Cal. Tone	100-Hz, Pulsed Phase Cal. Tone	0:19

73:52

¹Dichotic Nonsense Syllables (CVs) provided by Kresge Hearing Research Laboratory of the South, New Orleans, Louisiana.

²The Dichotic Synthetic Sentence Identification materials reproduced compliments of James Jerger, Ph.D., University of Texas, Dallas.

³The NU No. 6 recordings used for the degraded speech tasks were with the compliments of G. Donald Causey, Ph.D., Consultant in Audiology, VA Medical Center, Washington, D.C.

⁴The CID W-1 spondaic words used in the MLD paradigm were reproduced from the original recordings produced by Charles E. Harrison at Technisonic Studios, Inc., St. Louis, Missouri.

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