

DTV Channel 6 Interference to FM Band Reception

Laboratory Test Report

Denon TU-680 NAB Noise Floor Plot and Additional Certification Tests

Engr(s): DML
Date: 5/26/98
Printed: 10/12/98

Project: RECEIVER CHARACTERIZATION

Radio Mfg.: Denon **RX #** 9
Model No.: TU-680NAB
Serial No.: 2092400103

FM TESTS (TEST FREQUENCY 88.5 MHz)

TEST SET-UP

Ant. Net: 50 Ohm to 75 Ohm Transformer **Inertion Loss:** 0.35 dB
Audio Ref: 559 mVrms **Load Impedance:** NA
Controls: NA

Test bed: Test Bed, W/Orban Stereo Gen & Harris Exciter as Signal Source
Meas.: Audio measurements made with Audio Precision as rms with 15kHz low pass filter.

S/N RATIO - 1 kHz, 100% MOD (-50 dBm)

MAX 71.5 dB (mono with 15 kHz low pass filter)

THD - 1kHz, 100% MOD (-50dBm)

MONO 0.15 %
 STEREO 0.15 % Adjusted audio level for 0 dB.

LIMITING THRESHOLD (Audio -1dB)

-96 dBm Audio level drops 72 dB in a 1 dB RF level step.

HIGH CUT THRESHOLD

Audio: 10 kHz, L+R, 100% Mod, Pilot off
 -3dB = -95 dBm Audio level drops 65 dB in a 1 dB RF level step.

L/R Balance

	Left	Right	
Mono:	0	-0.09	dB
Stereo:	0	-0.09	dB

SEPARATION @ -65dBm

Freq.	L->R	R->L	
1 kHz	48.5	45	dB (W/O Pre-Emph)
10 kHz	41.5	39.9	dB (W/O Pre-Emph)

SIGNAL, NOISE & SEPARATION VS RF LEVEL

- * Left channel used as the measurement channel for Signal and Noise data
- * Left channel driven (L only) for separation data
- * Audio test frequency = 1 kHz
- * RF levels represent power into the receiver.
- * Filt. Noise figures represent noise measurements made with a 15 kHz low pass filter to reject the pilot

CURVE DATA

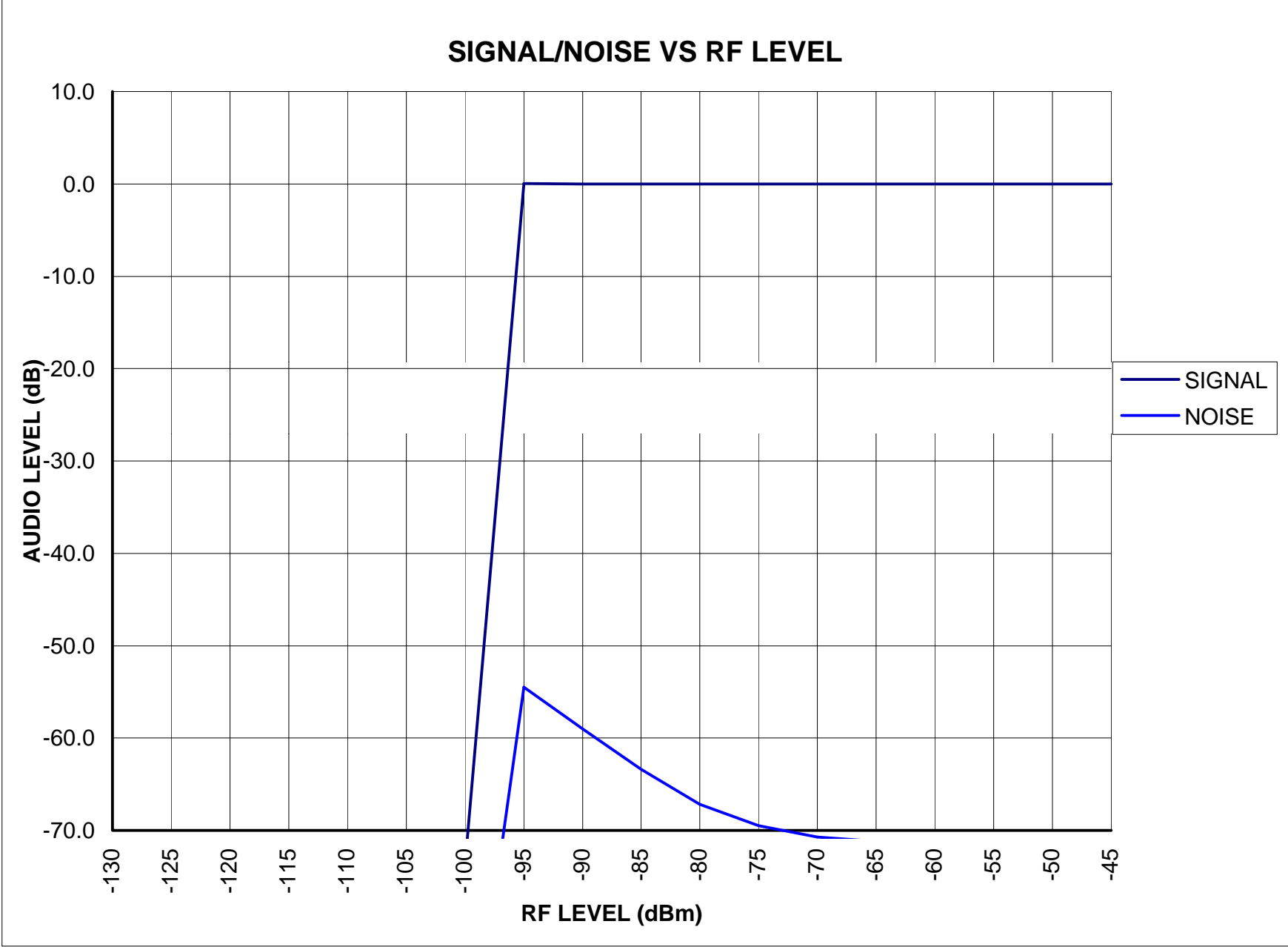
SIGNAL, NOISE & SEPARATION VS RF LEVEL

RF Level dBm	mono (L)		Stereo (L)			RF Level dBm	Separation L->R	
	Signal dB	Noise dB	Signal dB	Filt. Noise dB	Noise dB		Left dB	Right dB
-130	-82.0	-90.5	-81.5	-80.0	-89.8	-130	-79.0	-78.5
-125	-81.4	-91.0	-81.4	-77.0	-90.0	-125	-78.0	-78.5
-120	-80.4	-91.5	-80.7	-77.0	-90.6	-120	-78.0	-78.5
-115	-79.0	-92.7	-79.0	-77.0	-92.0	-115	-78.0	-78.0
-110	-77.0	-95.0	-76.7	-77.0	-94.0	-110	-77.0	-77.5
-105	-75.0	-99.2	-74.6	-77.0	-98.5	-105	-77.0	-77.0
-100	-73.6	-100.0	-73.5	-79.0	-99.9	-100	-76.5	-76.4
-95	0.0	-54.5	0.0	-32.7	-32.4	-95	-0.2	-32.0
-90	0.0	-59.0	0.0	-37.3	-37.0	-90	0.0	-37.4
-85	0.0	-63.4	0.0	-42.0	-41.8	-85	0.0	-42.0
-80	0.0	-67.2	0.0	-47.0	-46.7	-80	0.0	-46.3
-75	0.0	-69.5	0.0	-51.9	-51.6	-75	0.0	-48.8
-70	0.0	-70.7	0.0	-56.7	-56.3	-70	0.0	-49.6
-65	0.0	-71.2	0.0	-61.2	-61.0	-65	0.0	-49.7
-60	0.0	-71.3	0.0	-65.2	-65.0	-60	0.0	-49.5
-55	0.0	-71.5	0.0	-68.0	-67.9	-55	0.0	-49.4
-50	0.0	-71.5	0.0	-69.4	-69.5	-50	0.0	-50.0
-45	0.0	-71.5	0.0	-70.0	-70.0	-45	0.0	-52.8

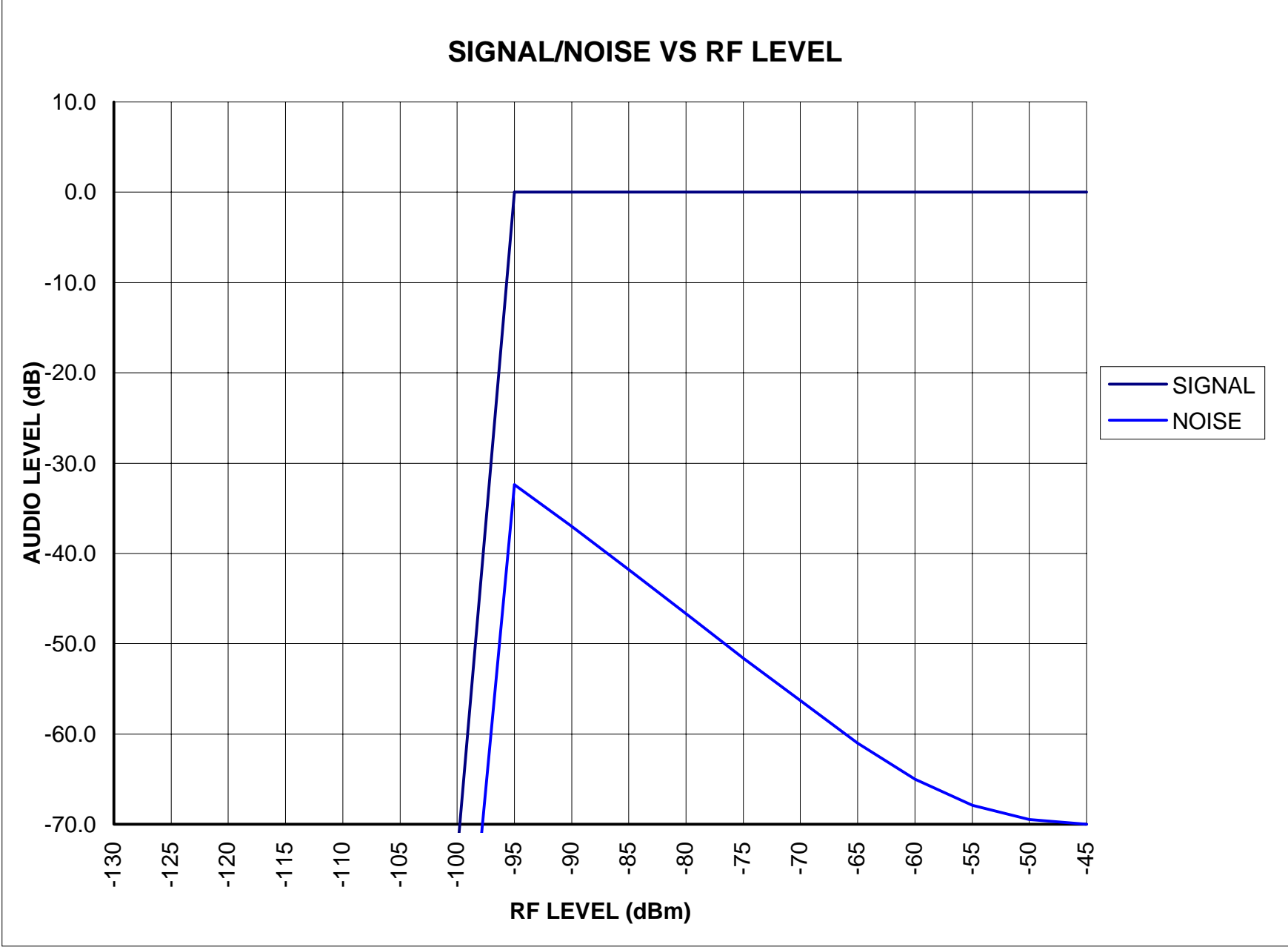
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NPR

DTV-FM



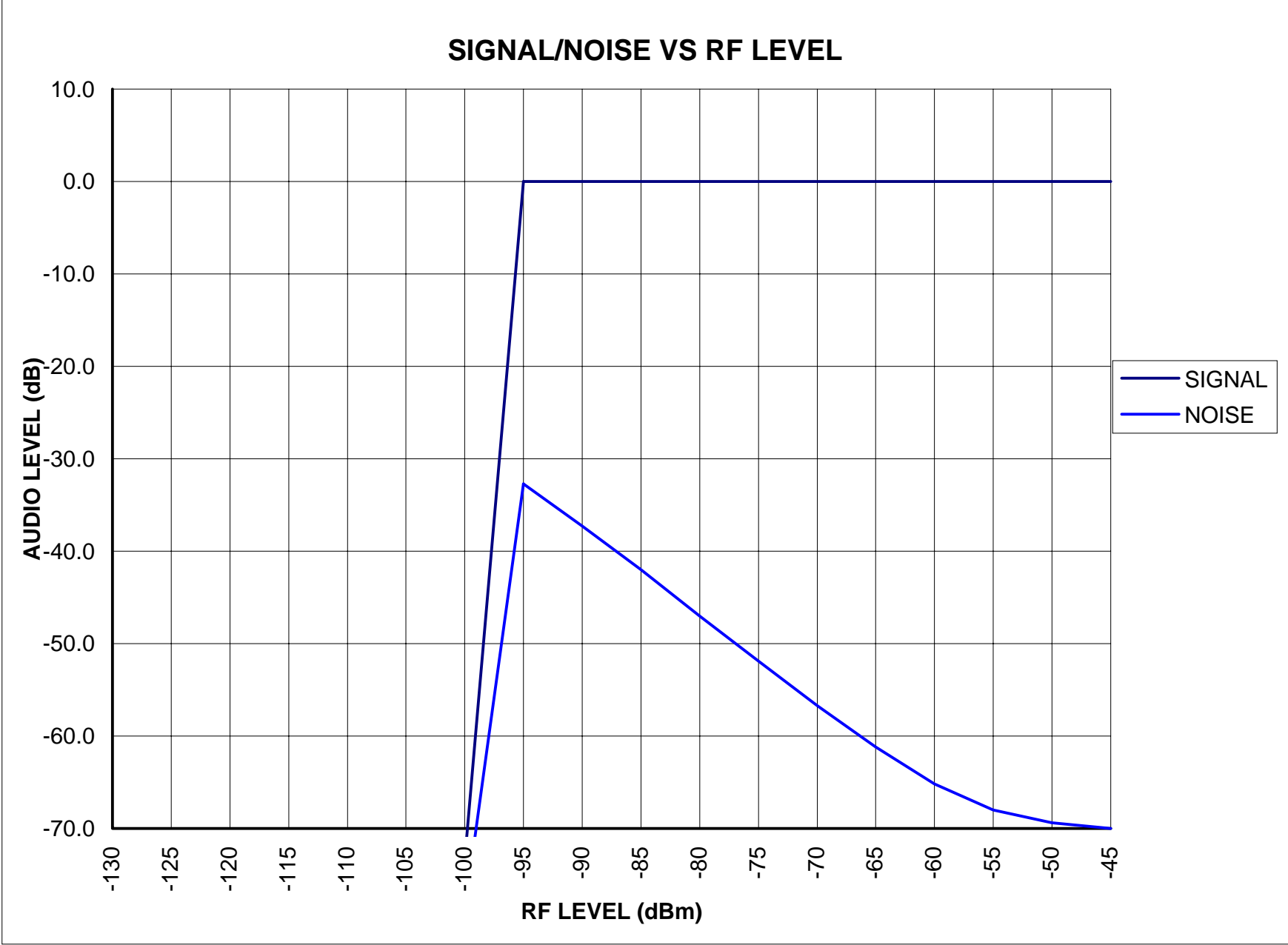
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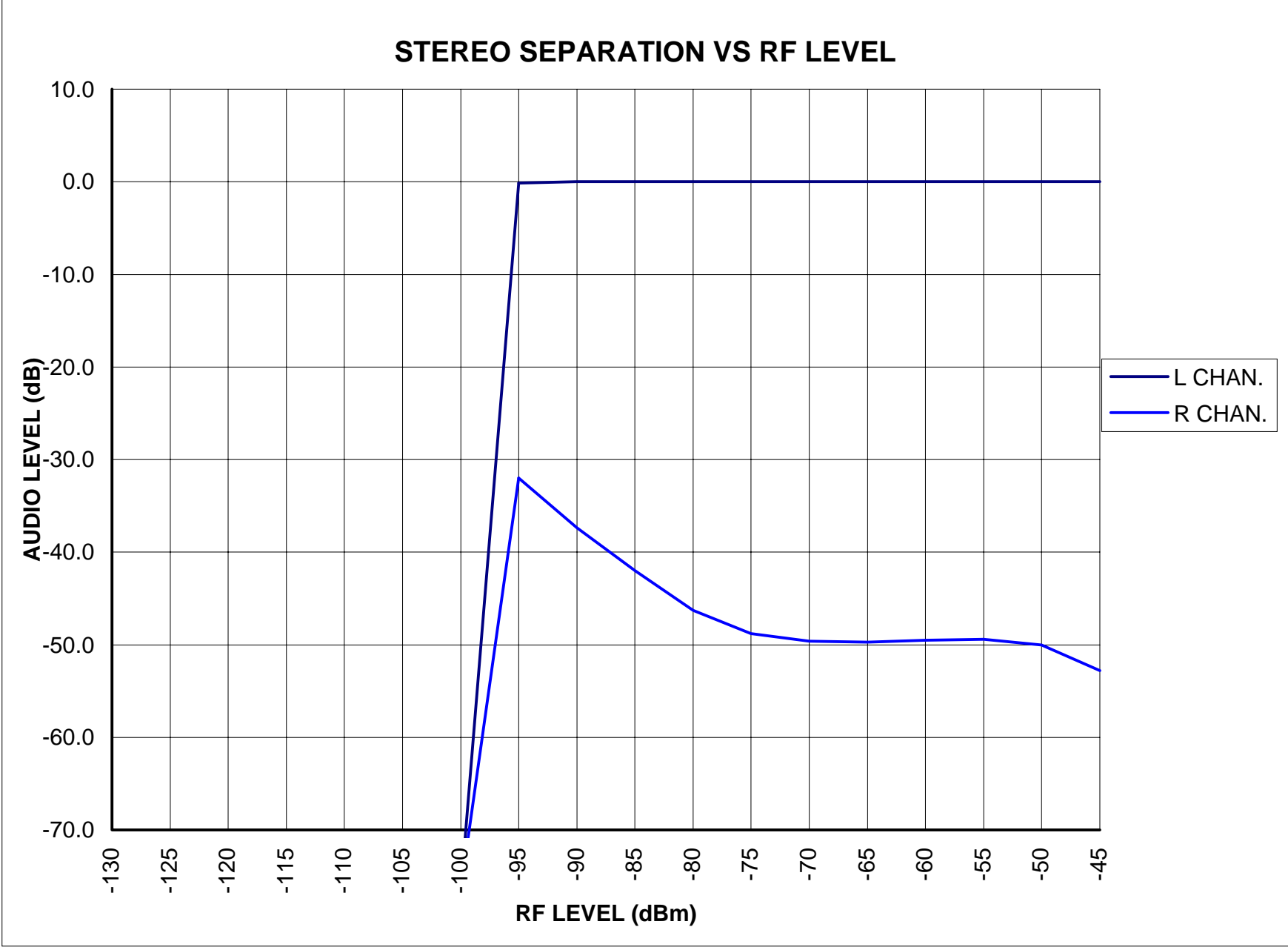
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NPR

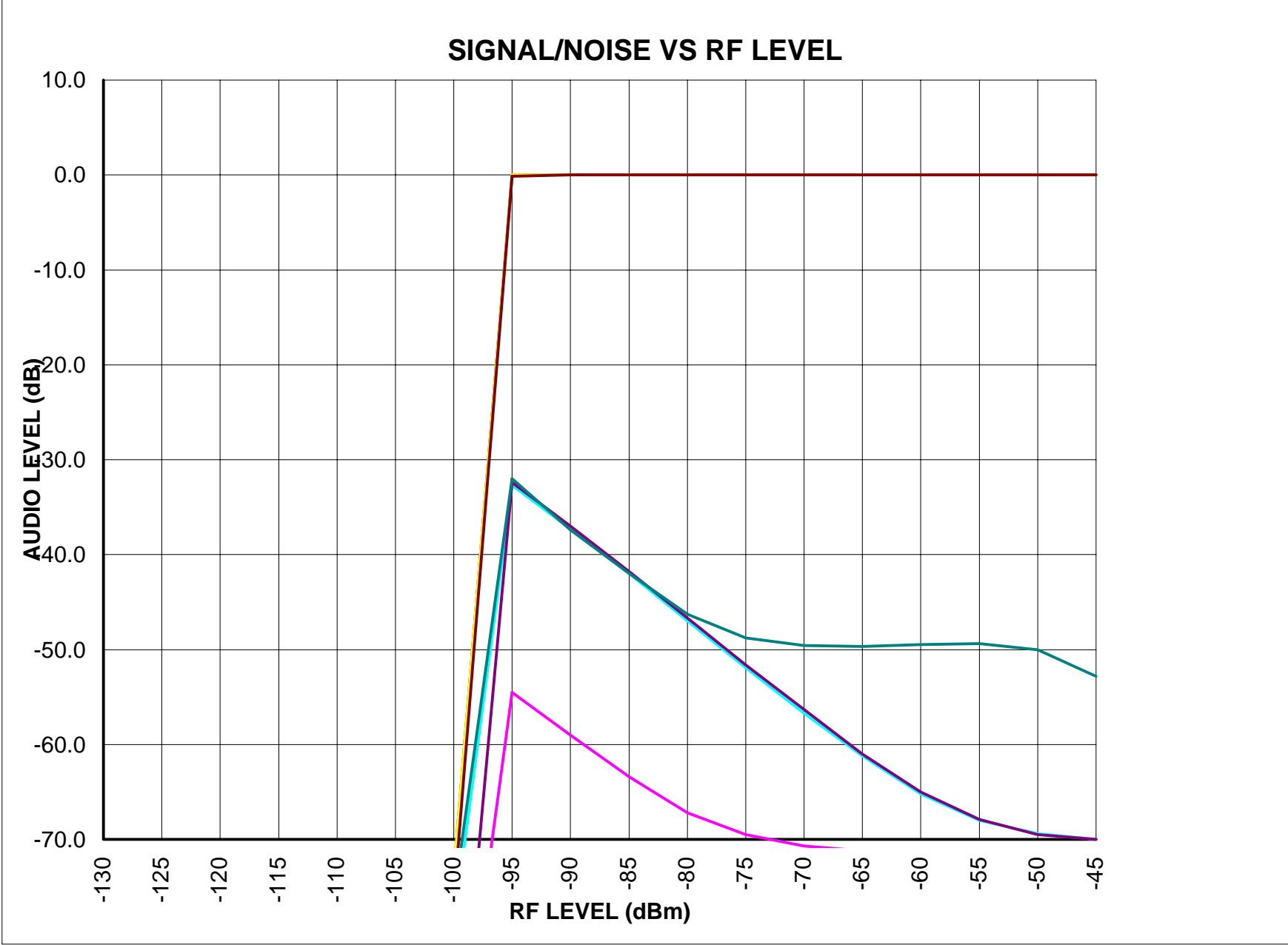
DTV-FM

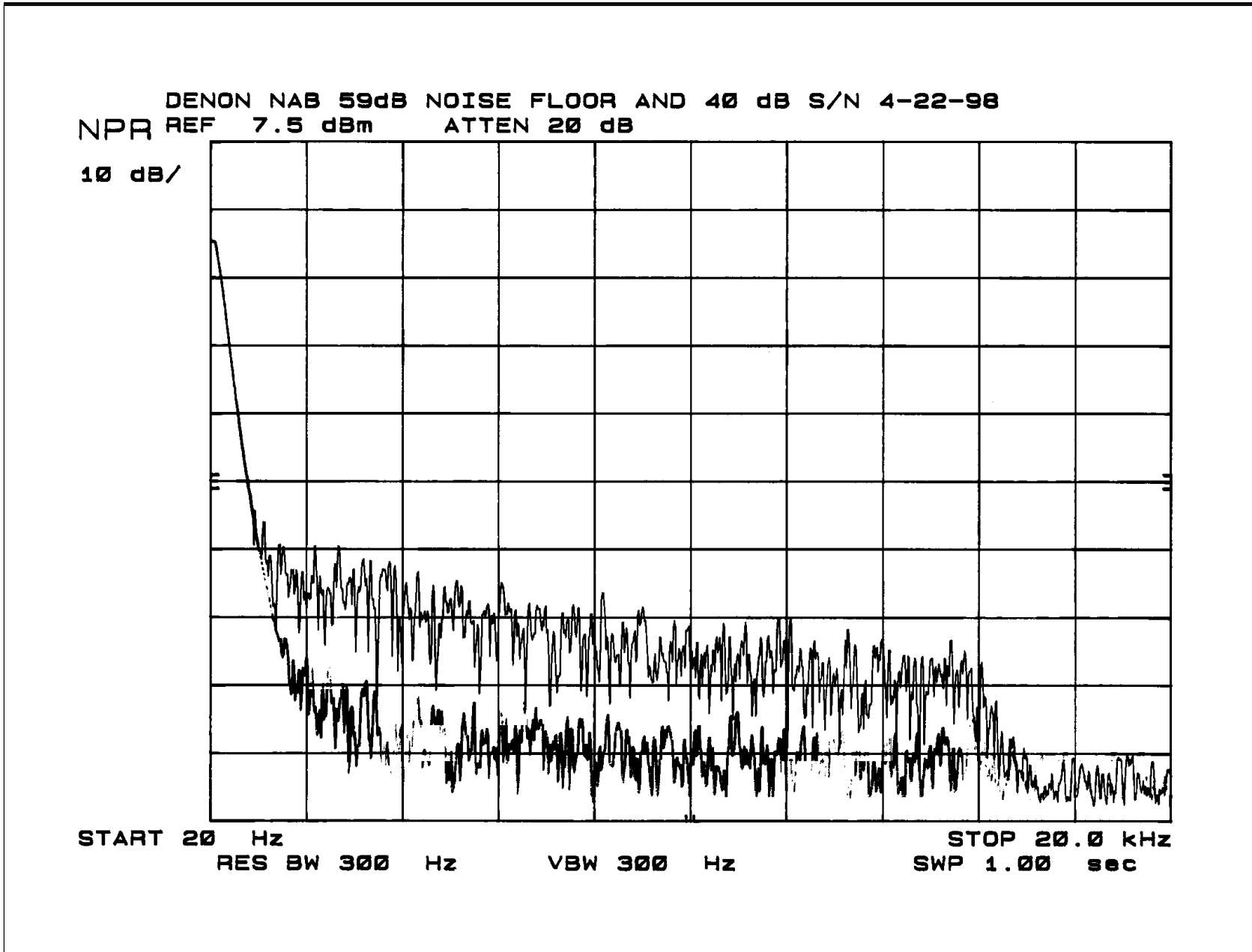


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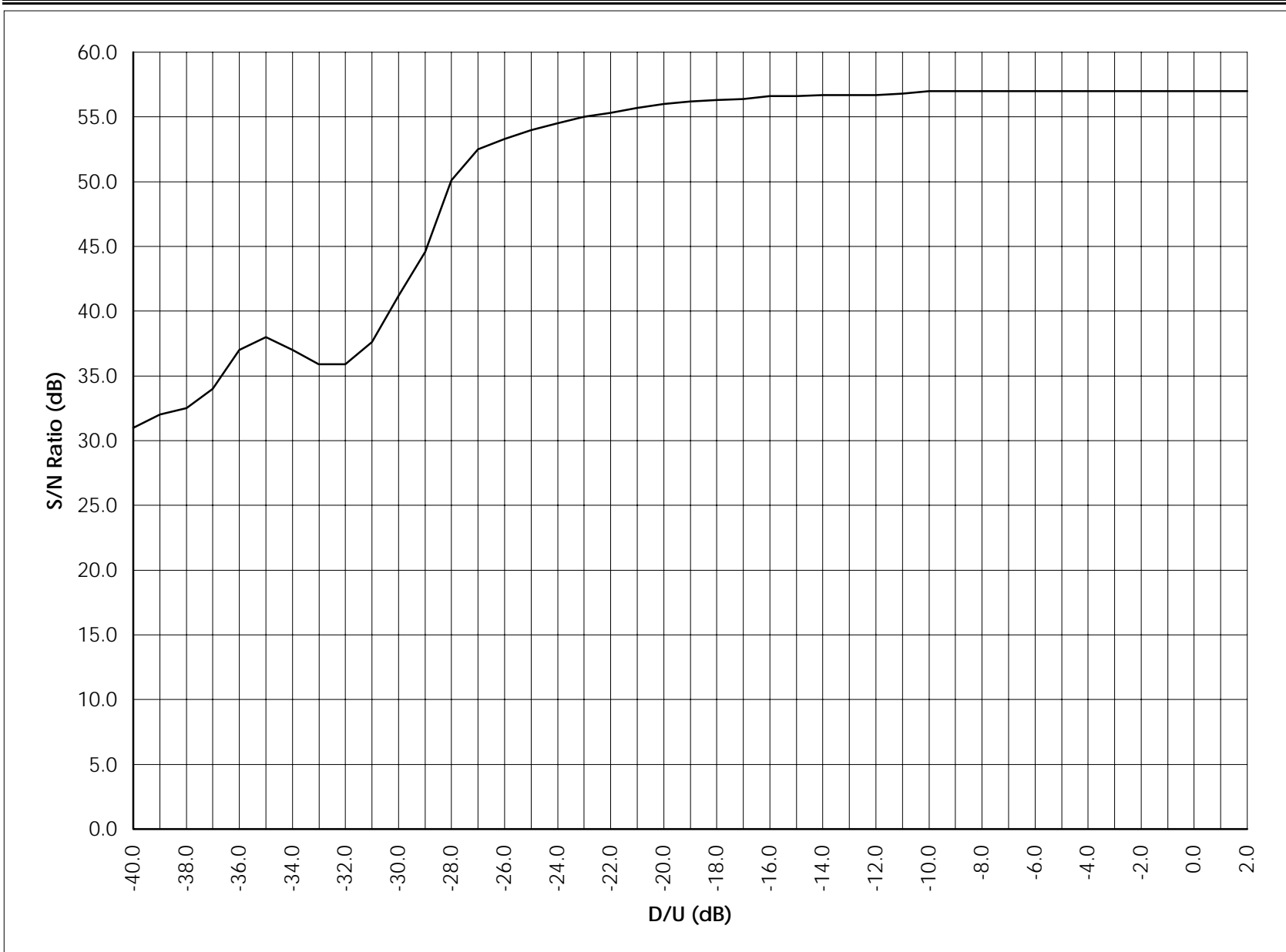




Undesired Attenuator	D/U (dB)	RADIO S/N (dB)
42	2.0	57.0
41	1.0	57.0
40	0.0	57.0
39	-1.0	57.0
38	-2.0	57.0
37	-3.0	57.0
36	-4.0	57.0
35	-5.0	57.0
34	-6.0	57.0
33	-7.0	57.0
32	-8.0	57.0
31	-9.0	57.0
30	-10.0	57.0
29	-11.0	56.8
28	-12.0	56.7
27	-13.0	56.7
26	-14.0	56.7
25	-15.0	56.6
24	-16.0	56.6
23	-17.0	56.4
22	-18.0	56.3
21	-19.0	56.2
20	-20.0	56.0
19	-21.0	55.7
18	-22.0	55.3
17	-23.0	55.0
16	-24.0	54.5
15	-25.0	54.0
14	-26.0	53.3
13	-27.0	52.5
12	-28.0	50.1
11	-29.0	44.6
10	-30.0	41.2
9	-31.0	37.6
8	-32.0	35.9
7	-33.0	35.9
6	-34.0	37.0
5	-35.0	38.0
4	-36.0	37.0
3	-37.0	34.0
2	-38.0	32.5
1	-39.0	32.0
0	-40.0	31.0

2/12/98
 DML
 Desired Frequency: 88.5 MHz
 Undesired Frequency: 88.1 MHz
 Desired Level at RX: -55.0 dBm
 Desired at Combiner: -32.81 dBm
 Undesired at Combiner: 7.15 dBm 0 dB Reference

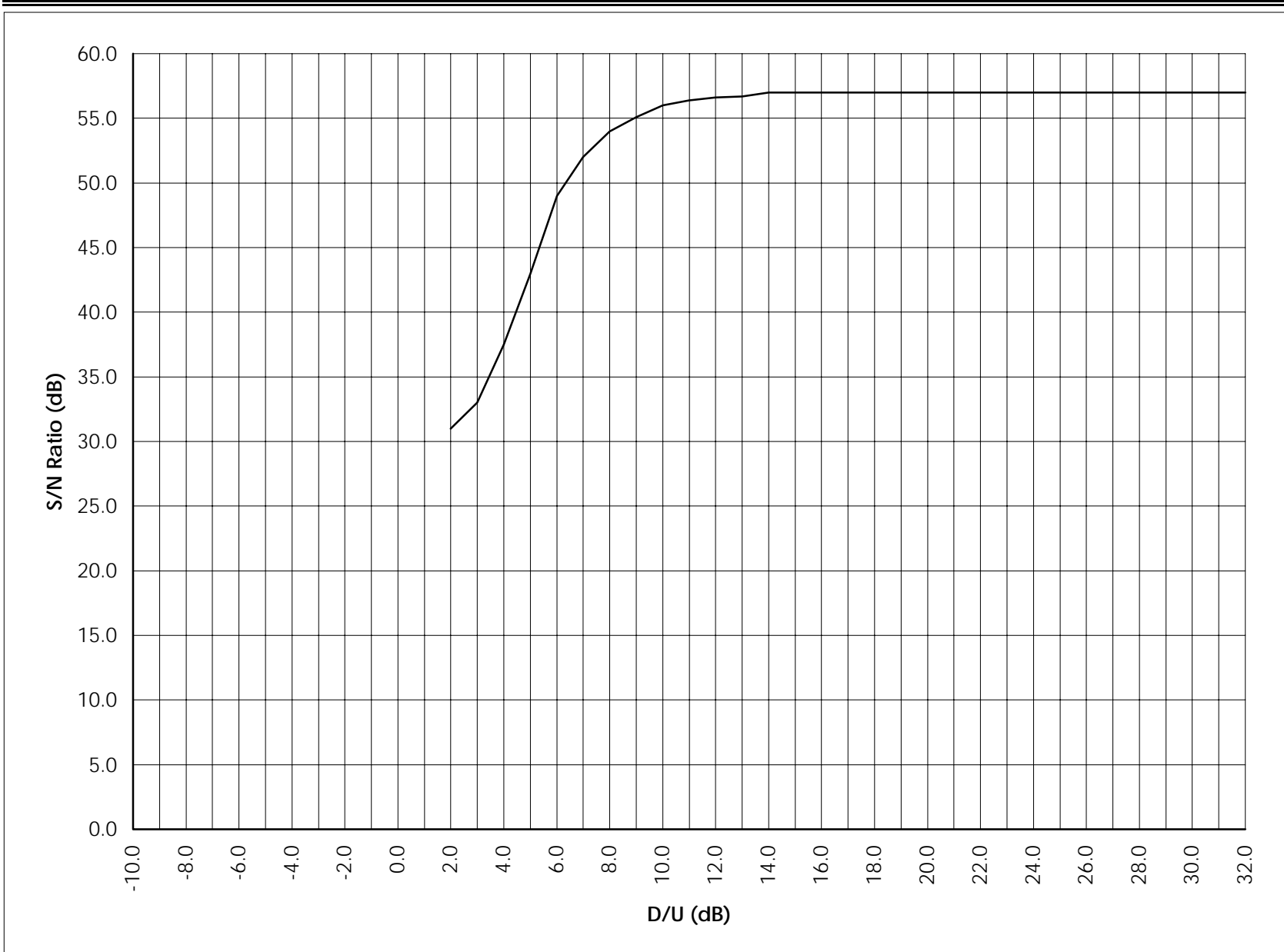
- Note(s):
- 1) The results here represent a characteristic receiver input signature based on ramping the undesired signal up in 1dB increments and recording the signal to noise ratio.
 - 2) The interfering signal is modulated with clipped pink noise at 100% modulation (no pilot).
 - 3) The measurements are made using 15 kHz low pass and CCIR filters with quasi-peak detection.



Undesired Attenuator	D/U (dB)	RADIO S/N (dB)
72	32.0	57.0
71	31.0	57.0
70	30.0	57.0
69	29.0	57.0
68	28.0	57.0
67	27.0	57.0
66	26.0	57.0
65	25.0	57.0
64	24.0	57.0
63	23.0	57.0
62	22.0	57.0
61	21.0	57.0
60	20.0	57.0
59	19.0	57.0
58	18.0	57.0
57	17.0	57.0
56	16.0	57.0
55	15.0	57.0
54	14.0	57.0
53	13.0	56.7
52	12.0	56.6
51	11.0	56.4
50	10.0	56.0
49	9.0	55.1
48	8.0	54.0
47	7.0	52.0
46	6.0	49.0
45	5.0	43.0
44	4.0	37.5
43	3.0	33.0
42	2.0	31.0
41	1.0	
40	0.0	
39	-1.0	
38	-2.0	
37	-3.0	
36	-4.0	
35	-5.0	
34	-6.0	
33	-7.0	
32	-8.0	
31	-9.0	
30	-10.0	

2/12/98
 DML
 Desired Frequency: 88.5 MHz
 Undesired Frequency: 88.3 MHz
 Desired Level at RX: -55.0 dBm
 Desired at Combiner: -32.81 dBm
 Undesired at Combiner: 7.15 dBm 0 dB Reference

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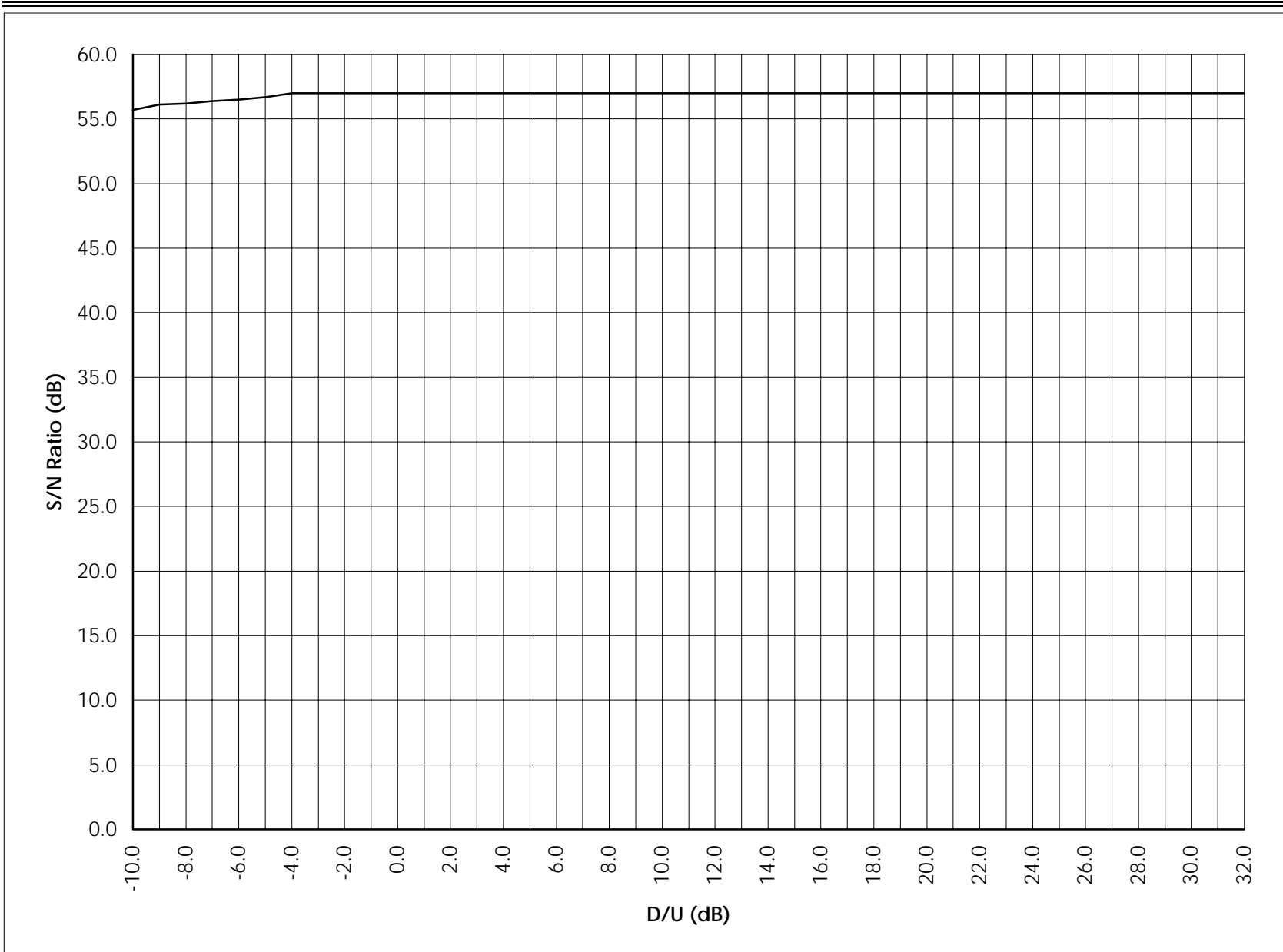


Undesired Attenuator	D/U (dB)	RADIO S/N (dB)
72	32.0	57.0
71	31.0	57.0
70	30.0	57.0
69	29.0	57.0
68	28.0	57.0
67	27.0	57.0
66	26.0	57.0
65	25.0	57.0
64	24.0	57.0
63	23.0	57.0
62	22.0	57.0
61	21.0	57.0
60	20.0	57.0
59	19.0	57.0
58	18.0	57.0
57	17.0	57.0
56	16.0	57.0
55	15.0	57.0
54	14.0	57.0
53	13.0	57.0
52	12.0	57.0
51	11.0	57.0
50	10.0	57.0
49	9.0	57.0
48	8.0	57.0
47	7.0	57.0
46	6.0	57.0
45	5.0	57.0
44	4.0	57.0
43	3.0	57.0
42	2.0	57.0
41	1.0	57.0
40	0.0	57.0
39	-1.0	57.0
38	-2.0	57.0
37	-3.0	57.0
36	-4.0	57.0
35	-5.0	56.7
34	-6.0	56.5
33	-7.0	56.4
32	-8.0	56.2
31	-9.0	56.1
30	-10.0	55.7

Unstable

2/12/98
 DML
 Desired Frequency: 88.5 MHz
 Undesired Frequency: 88.7 MHz
 Desired Level at RX: -55.0 dBm
 Desired at Combiner: -32.81 dBm
 Undesired at Combiner: 7.15 dBm 0 dB Reference

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42	2.0	57.3
41	1.0	57.3
40	0.0	57.3
39	-1.0	57.2
38	-2.0	57.2
37	-3.0	57.2
36	-4.0	57.1
35	-5.0	57.0
34	-6.0	57.0
33	-7.0	57.0
32	-8.0	57.0
31	-9.0	57.0
30	-10.0	57.0
29	-11.0	57.0
28	-12.0	57.0
27	-13.0	56.8
26	-14.0	56.7
25	-15.0	56.7
24	-16.0	56.5
23	-17.0	56.4
22	-18.0	56.3
21	-19.0	56.2
20	-20.0	56.0
19	-21.0	55.7
18	-22.0	55.4
17	-23.0	55.1
16	-24.0	54.7
15	-25.0	54.3
14	-26.0	53.9
13	-27.0	53.2
12	-28.0	52.6
11	-29.0	52.0
10	-30.0	51.2
9	-31.0	50.4
8	-32.0	49.6
7	-33.0	48.5
6	-34.0	47.6
5	-35.0	46.4
4	-36.0	45.2
3	-37.0	44.0
2	-38.0	42.5
1	-39.0	41.0
0	-40.0	39.5

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