NRSC REPORT

NATIONAL RADIO SYSTEMS COMMITTEE

NRSC-R58
Digital Audio Radio IBOC Laboratory Tests
Transmission Quality Failure Characterization and Analog Compatibility
August 11, 1995

Part VI – Appendices AH through AL

NAB: 1771 N Street, N.W.
Washington, DC 20036
Tel: (202) 429-5356 Fax: (202) 775-4981

CEA: 1919 South Eads Street
Arlington, VA 22202
Tel: (703) 907-7660 Fax: (703) 907-8113

Co-sponsored by the Consumer Electronics Association and the National Association of Broadcasters
http://www.nrscstandards.org

NOTICE

NRSC Standards, Guidelines, Reports and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards, Guidelines, Reports and other technical publications shall not in any respect preclude any member or nonmember of the Consumer Electronics Association (CEA) or the National Association of Broadcasters (NAB) from manufacturing or selling products not conforming to such Standards, Guidelines, Reports and other technical publications, nor shall the existence of such Standards, Guidelines, Reports and other technical publications preclude their voluntary use by those other than CEA or NAB members, whether to be used either domestically or internationally.

Standards, Guidelines, Reports and other technical publications are adopted by the NRSC in accordance with the NRSC patent policy. By such action, CEA and NAB do not assume any liability to any patent owner, nor do they assume any obligation whatever to parties adopting the Standard, Guideline, Report or other technical publication.

This Report does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this Report to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

Published by
CONSUMER ELECTRONICS ASSOCIATION
Technology & Standards Department
1919 S. Eads St.
Arlington, VA 22202

NATIONAL ASSOCIATION OF BROADCASTERS
Science and Technology Department
1771 N Street, NW
Washington, DC 20036

FOREWORD

NRSC-R58, *Digital Audio Radio IBOC Laboratory Tests – Transmission Quality Failure Characterization and Analog Compatibility*, documents the first comprehensive testing of in-band/on-channel digital radio systems. This report was prepared for Working Group B and the Combined EIA DAR and NRSC DAB Subcommittees.

The NRSC is jointly sponsored by the Consumer Electronics Association and the National Association of Broadcasters. It serves as an industry-wide standards-setting body for technical aspects of terrestrial over-the-air radio broadcasting systems in the United States.

Contents

APPENDIX AH

Digital Test Results USA Digital Radio FM 1

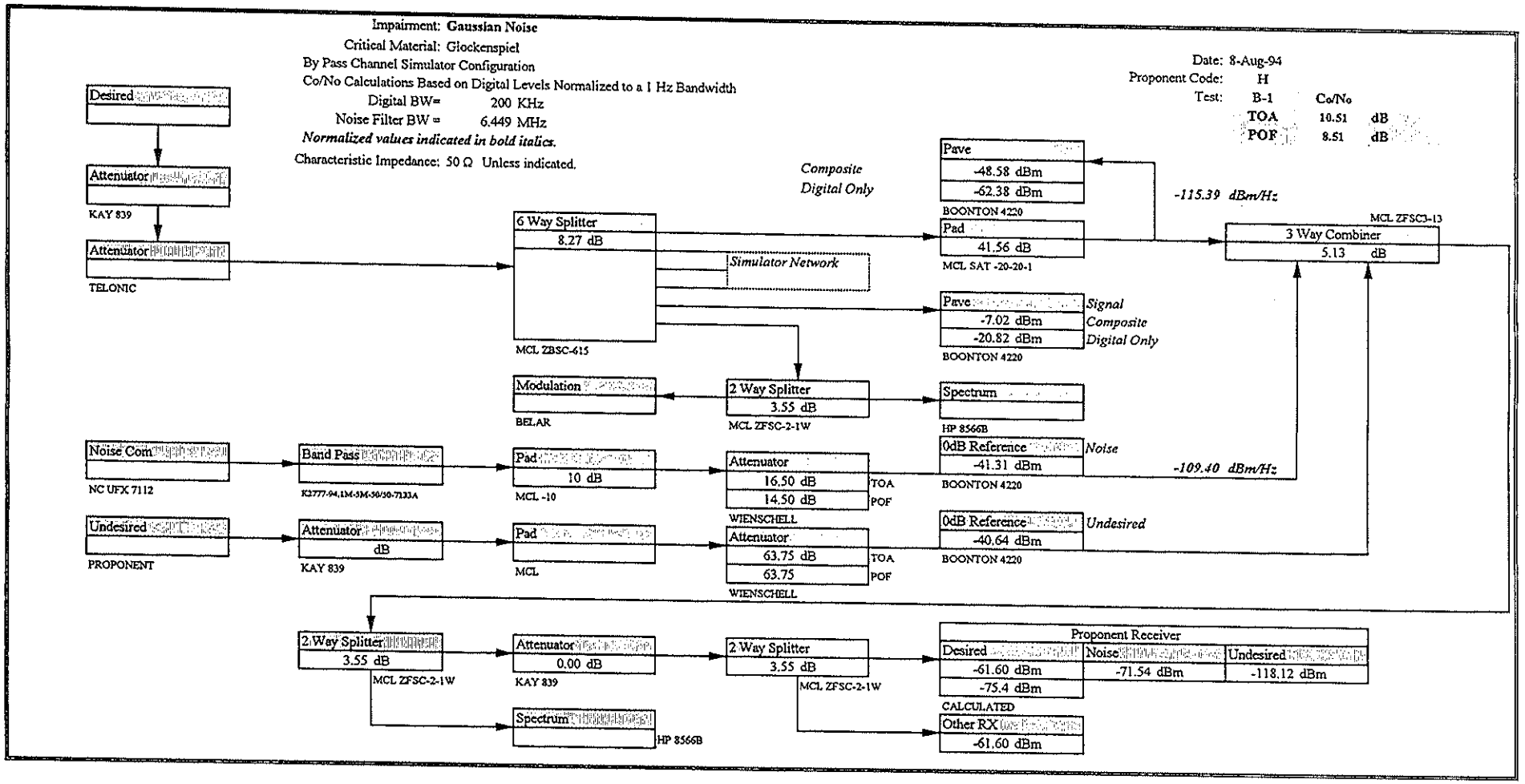
EIA Digital Audio Radio Test Laboratory

Proponent:	USADR FM1 Rev A.
Code:	H
Digital Band Width:	2.00E+05 Hz
Composite Band Width:	4.50E+05 Hz
Peak/Average Composite:	3.51 dB
Peak/Average Digital:	8.58 dB

EIA Digital Audio Radio Test Laboratory

Test	B-1	Gaussian Noise		Units
Proponent Code:	H			
Glockenspiel		TOA	POF	
	Attenuator	16.50	14.50	dB
	Co/No	10.51	8.51	dB
	TOA	Small pops and some high cut.		
EO&C				
	POF	Severe high cut and warbles.		
Soprano		TOA	POF	
	Attenuator	16.00	14.50	dB
	Co/No	10.01	8.51	dB
	TOA	Small pops.		
EO&C				
	POF	Excessive noise and high cut.		
Clarinet		TOA	POF	
	Attenuator	16.50	14.50	dB
	Co/No	10.51	8.51	dB
	TOA	Small pop or click.		
EO&C				
	POF	Severe high cut and warbles.		

Notes:		
	Recording Reference:	DAR30218.DAT
	Testers:	DML,DS,EB
	Date:	8-Aug-94


Impairment: Gaussian Noise
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Co/No Calculations Based on Digital Levels Normalized to a 1 Hz Bandwidth
Digital BW= 200 KHz
Noise Filter BW = 6.449 MHz
Normalized values indicated in bold italics.
Characteristic Impedance: 50 Ω Unless indicated.
Date: 8-Aug-94
Proponent Code: H
Test: B-1
Co/No
TOA 10.51 dB
POF 8.51 dB
Composite
Digital Only
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Pave
-48.58 dBm
-62.38 dBm
BOONTON 4220
-115.39 dBm/Hz
Pad
41.56 dB
MCL SAT -20-20-1
MCL ZFSC3-13
3 Way Combiner
5.13 dB
Pave
-7.02 dBm
-20.82 dBm
BOONTON 4220
Signal
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
K2777-94,1M-5M-50/50-7133A
Pad
10 dB
MCL -10
Attenuator
16.50 dB TOA
14.50 dB POF
WIENSCHELL
0dB Reference
-41.31 dBm
BOONTON 4220
Noise
-109.40 dBm/Hz
Undesired
PROPONENT
Attenuator
dB
KAY 839
Pad
MCL
Attenuator
63.75 dB TOA
63.75 POF
WIENSCHELL
0dB Reference
-40.64 dBm
BOONTON 4220
Undesired
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Proponent Receiver
Desired
-61.60 dBm
-75.4 dBm
CALCULATED
Noise
-71.54 dBm
Undesired
-118.12 dBm
Spectrum
HP 8566B
Other RX
-61.60 dBm

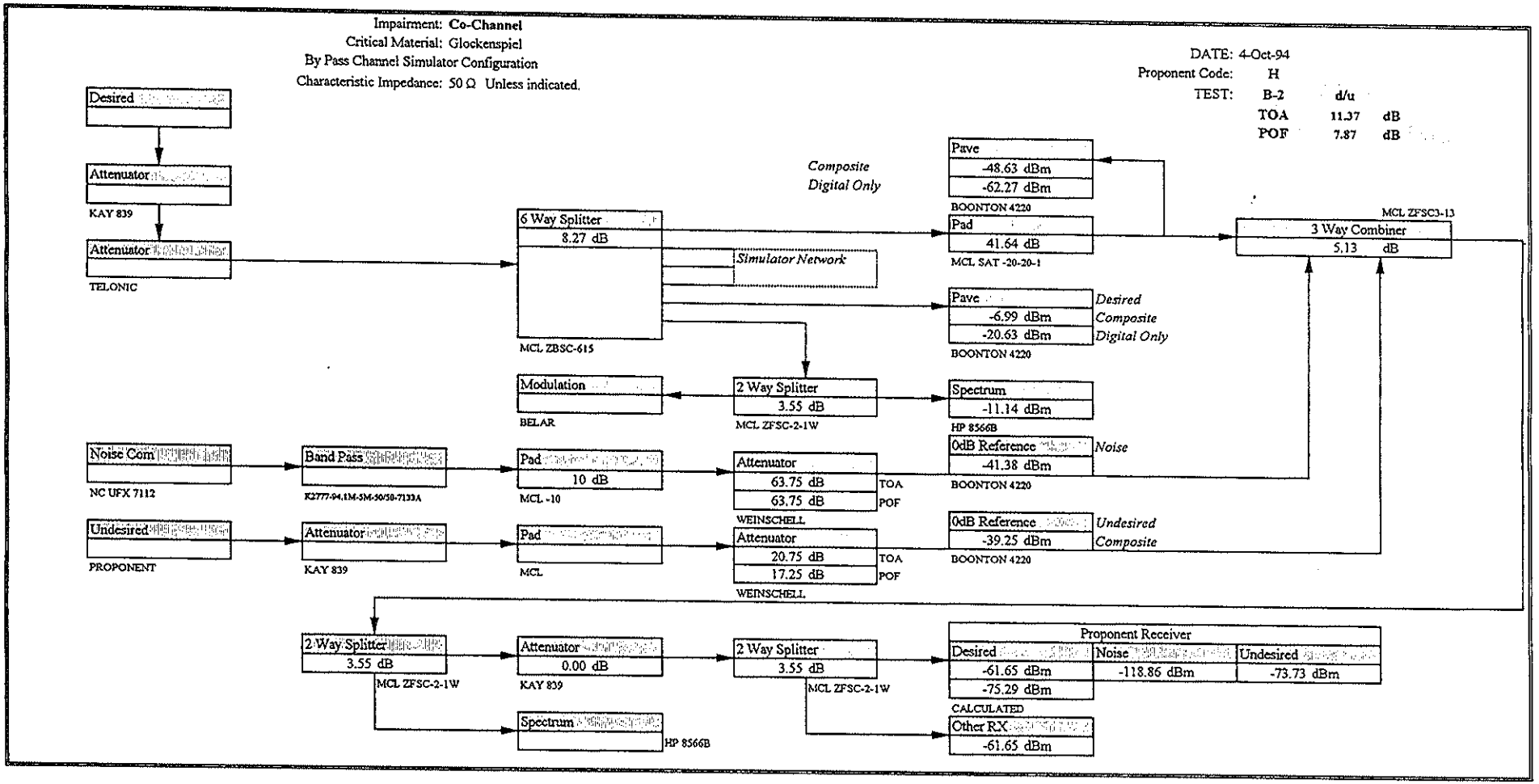
EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30218.DAT			1	2				Glockenspiel Clear Channel	63.75
8-Aug-94			3	4					18.00
			5	6					17.50
			7	8					17.00
			9	10	11			TOA lab	16.50
			12	13					16.00
			14	15					15.50
			16	17					15.00
			18	19	20			POF lab	14.50
			21	22				Sync	63.75
			23	24					14.00
			25	26				Soprano Clear Channel	63.75
			27	28					17.50
			29	30					17.00
			31	32					16.50
			33	34				TOA lab	16.00
			35	36					15.50
			37	38					15.00
			39	40				POF lab	14.50
			41	42				Sync	63.75
			43	44					14.00
			45	46				Clarinet Clear Channel	63.75
			47	48					18.00
			49	50					17.50
			51	52					17.00
			53	54	55	56		TOA lab	16.50
			57	58					16.00
			59	60					15.50
			61	62					15.00
			63	64				POF lab	14.50
			65	66				Sync	63.75
			67	68					14.00

Code: H
Impairment: Gaussian Noise

EIA Digital Audio Radio Test Laboratory

Test	B-2	Co-Channel		Units
Proponent Code:	H			
Glockenspiel		TOA	POF	
	Attenuator	20.75	17.25	dB
	d/u	11.37	7.87	dB
EO&C	TOA	Small pops in left ear.		
	POF	High cut, warbles and some muting.		
Soprano		TOA	POF	
	Attenuator	20.25	16.75	dB
	d/u	10.87	7.37	dB
EO&C	TOA	Small pops.		
	POF	Excessive noise, high cut and some muting..		
Clarinet		TOA	POF	
	Attenuator	20.25	16.25	dB
	d/u	10.87	6.87	dB
EO&C	TOA	Small background pops and clicks.		
	POF	Excessive noise and high cut.		
Notes:	Recording Reference:	DAR30238.DAT		
	Testers:	DML,RMc		
	Date:	4-Oct-94		


Impairment: Co-Channel
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Characteristic Impedance: 50 Ω Unless indicated.
DATE: 4-Oct-94
Proponent Code: H
TEST: B-2 d/u
TOA 11.37 dB
POF 7.87 dB
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.63 dBm
-62.27 dBm
BOONTON 4220
Pad
41.64 dB
MCL SAT -20-20-1
MCL ZFSC3-13
3 Way Combiner
5.13 dB
Pave
-6.99 dBm
-20.63 dBm
BOONTON 4220
Desired
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
-11.14 dBm
HP 8566B
Noise Com
NC UFX 7112
Band Pass
K2777-94,1M-5M-50/50-7133A
Pad
10 dB
MCL -10
Attenuator
63.75 dB
63.75 dB
TOA
POF
WEINSCHELL
0dB Reference
-41.38 dBm
BOONTON 4220
Noise
Undesired
PROPONENT
Attenuator
KAY 839
Pad
MCL
Attenuator
20.75 dB
17.25 dB
TOA
POF
WEINSCHELL
0dB Reference
-39.25 dBm
BOONTON 4220
Undesired
Composite
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Proponent Receiver
Desired
Noise
Undesired
-61.65 dBm
-75.29 dBm
-118.86 dBm
-73.73 dBm
CALCULATED
Spectrum
HP 8566B
Other RX
-61.65 dBm

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30238.DAT			1	2				Glockenspiel Clear Channel	63.75
4-Oct-94			3	4					22.25
			5	6					21.75
			7	8					21.25
			9	10	11	12		TOA lab	20.75
			13	14					20.25
			15	16					19.75
			17	18					19.25
			19	20					18.75
			21	22					18.25
			23	24					17.75
			25	26				POF lab	17.25
			27	28					16.75
			29	30				Soprano Clear Channel	63.75
			31	32					21.75
			33	34					21.25
			35	36					20.75
			37	38	39	40	41	TOA lab	20.25
			42	43					19.75
			44	45					19.25
			46	47					18.75
			48	49					18.25
			50	51					17.75
			52	53					17.25
			54	55				POF lab	16.75
			56	57					16.25

Code: H
Impairment: Co-Channel

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30238.DAT			58	49				Clarinet Clear Channel	63.75
4-Oct-94			60	61					21.75
			62	63					21.25
			64	65					20.75
			66	67	68			TOA lab	20.25
			69	70					19.75
			71	72					19.25
			73	74					18.75
			75	76					18.25
			77	78					17.75
			79	80					17.25
			81	82					16.75
			83	84				POF lab	16.25
			85	86					15.75

Code: H
Impairment: Co-Channel

Test	B-3	Urban Slow Rayleigh					
Proponent Code:	H	Impairment Level					Units
Glockenspiel			TOA		POF		
	Attenuator		63.75		63.75		dB
	Co/No		58.44		58.44		dB
	TOA	Small burst of noise, high cut and small pop in left ear.					
EO&C							
	POF						
Soprano			TOA		POF		
	Attenuator		63.75				dB
	Co/No		58.44				dB
	TOA	High frequency roll off.					
EO&C							
	POF						
Clarinet			TOA		POF		
	Attenuator		63.75				dB
	Co/No		58.44				dB
	TOA	High frequency roll off.					
EO&C							
	POF						

Notes:
Recording Reference: DAR30277.DAT
Testers: DML,RMc
Test Date: 27-Oct-94

Test	B-3	Urban Fast Rayleigh				
Proponent Code:	H	Impairment Level				Units
Glockenspiel			TOA		POF	
	Attenuator		63.75		63.75	dB
	Co/No		58.44		58.44	dB
	TOA	99.5% Mute, virtually no recovered audio.				
EO&C						
	POF					
Soprano			TOA		POF	
	Attenuator		63.75			dB
	Co/No		58.44			dB
	TOA	Due to performance as indicated above this test was not necessary.				
EO&C						
	POF					
Clarinet			TOA		POF	
	Attenuator		63.75			dB
	Co/No		58.44			dB
	TOA	Due to performance as indicated above this test was not necessary.				
EO&C						
	POF					

Notes:
Recording Reference: DAR30277.DAT
Testers: DML,RMc
Test Date: 27-Oct-94

Test	B-3	Rural Fast Rayleigh				
Proponent Code:	H	Impairment Level				Units
Glockenspiel			TOA		POF	
	Attenuator		63.75		63.75	dB
	Co/No		58.44		58.44	dB
	TOA	No recovered audio. System software had to be re-loaded for re-acquisition to occur in a clear channel.				
EO&C						
	POF					
Soprano			TOA		POF	
	Attenuator		63.75			dB
	Co/No		58.44			dB
	TOA	Due to performance as indicated above this test was not necessary.				
EO&C						
	POF					
Clarinet			TOA		POF	
	Attenuator		63.75			dB
	Co/No		58.44			dB
	TOA	Due to performance as indicated above this test was not necessary.				
EO&C						
	POF					

Notes:
Recording Reference: DAR30277.DAT
Testers: DML,RMc
Test Date: 27-Oct-94

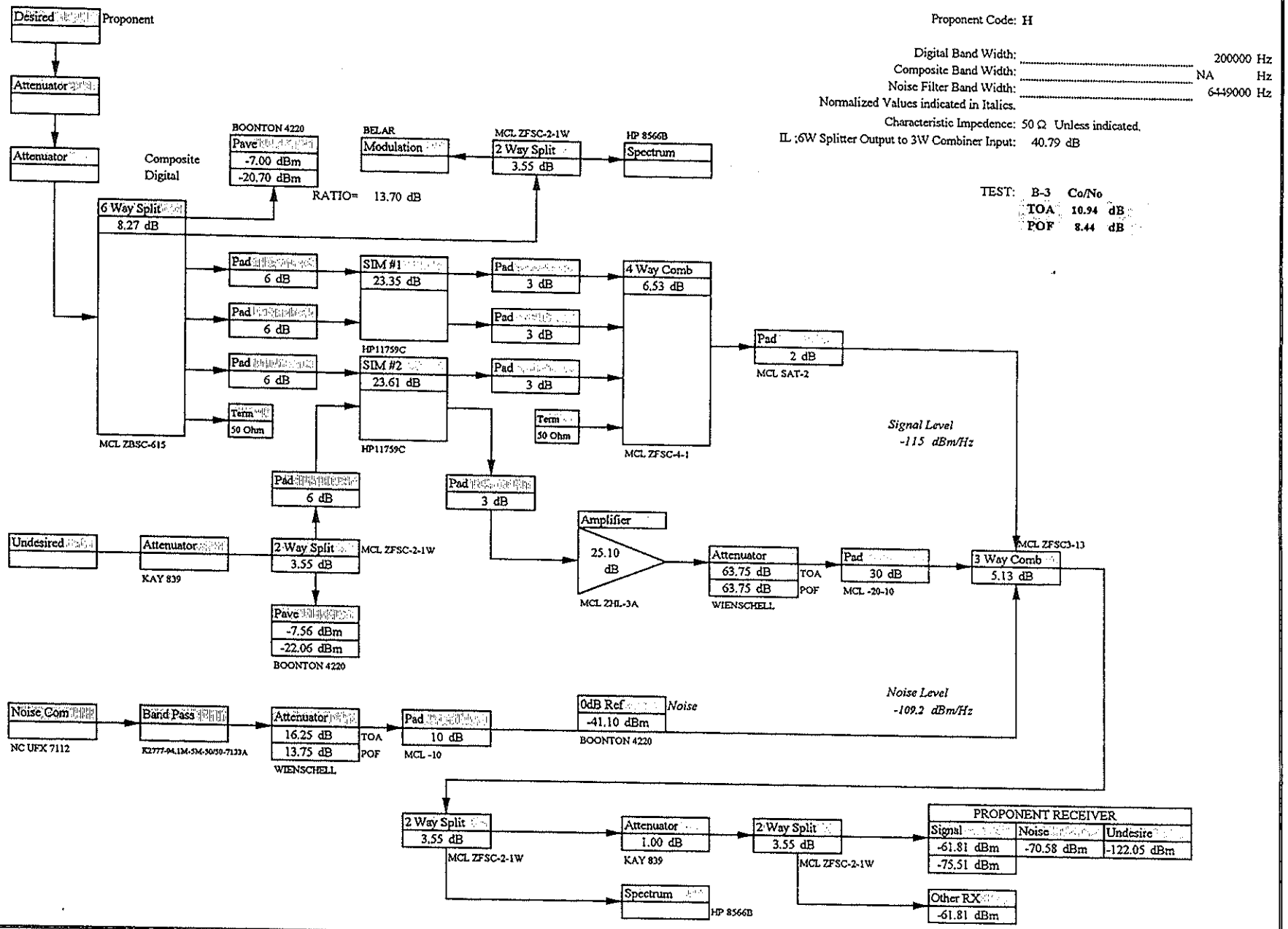
Test	B-3	Terrain Obstructed Rayleigh				
Proponent Code:	H	Impairment Level				Units
Glockenspiel		TOA		POF		
	Attenuator	63.75		63.75		dB
	Co/No	58.44		58.44		dB
	TOA	Virtually no recovered audio. Small burst of heavilly distorted audio.				
EO&C						
	POF					
Soprano		TOA		POF		
	Attenuator	63.75				dB
	Co/No	58.44				dB
	TOA	Due to performance as indicated above this test was not necessary.				
EO&C						
	POF					
Clarinet		TOA		POF		
	Attenuator	63.75				dB
	Co/No	58.44				dB
	TOA	Due to performance as indicated above this test was not necessary.				
EO&C						
	POF					

Notes:
Recording Reference: DAR30277.DAT
Testers: DML,RMc
Test Date: 27-Oct-94

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30277.DAT			1	2	3	4	5	Glockenspiel Urban Slow	63.75
27-Oct-94									
			6					Disregard	
			7	8	9	10	11	Soprano Urban Slow	63.75
			12	13	14	15	16	Clarinet Urban Slow	63.75
			17	18				Disregard	
			19	20	21	22	23	Glockenspiel Urban Fast	63.75
			24	25	26	27	28	Glockenspiel Rural Fast	63.75
			29	30	31	32	33	Glockenspiel Terrain Obstructed	63.75

Proponent Code: H
Impairment: Urban Slow Rayleigh


Desired
Proponent
Attenuator
Attenuator
Composite
Digital
BOONTON 4220
Pave
-7.00 dBm
-20.70 dBm
RATIO= 13.70 dB
BELAR
Modulation
MCL ZFSC-2-1W
2 Way Split
3.55 dB
HP 8566B
Spectrum
Proponent Code: H
Digital Band Width: 200000 Hz
Composite Band Width: NA Hz
Noise Filter Band Width: 64-49000 Hz
Normalized Values indicated in Italics.
Characteristic Impedence: 50 Ω Unless indicated.
IL ;6W Splitter Output to 3W Combiner Input: 40.79 dB
TEST: B-3 Co/No
TOA 10.94 dB
POF 8.44 dB
6 Way Split
8.27 dB
MCL ZBSC-615
Pad
6 dB
Pad
6 dB
Pad
6 dB
Term
50 Ohm
SIM #1
23.35 dB
SIM #2
23.61 dB
HP11759C
HP11759C
Pad
3 dB
Pad
3 dB
Pad
3 dB
Term
50 Ohm
4 Way Comb
6.53 dB
MCL ZFSC-4-1
Pad
2 dB
MCL SAT-2
Signal Level
-115 dBm/Hz
Pad
6 dB
Pad
3 dB
Undesired
Attenuator
KAY 839
2 Way Split
3.55 dB
MCL ZFSC-2-1W
Pave
-7.56 dBm
-22.06 dBm
BOONTON 4220
Amplifier
25.10
dB
MCL ZHL-3A
Attenuator
63.75 dB
63.75 dB
TOA
POF
WIENSCHELL
Pad
30 dB
MCL -20-10
MCL ZFSC3-13
3 Way Comb
5.13 dB
Noise Com
NC UFX 7112
Band Pass
K2777-94.1M-5M-50/50-7132A
Attenuator
16.25 dB
13.75 dB
TOA
POF
WIENSCHELL
Pad
10 dB
MCL -10
0dB Ref
-41.10 dBm
Noise
BOONTON 4220
Noise Level
-109.2 dBm/Hz
2 Way Split
3.55 dB
MCL ZFSC-2-1W
Attenuator
1.00 dB
KAY 839
2 Way Split
3.55 dB
MCL ZFSC-2-1W
PROPONENT RECEIVER
Signal
Noise
Undesire
-61.81 dBm
-70.58 dBm
-122.05 dBm
-75.51 dBm
Spectrum
HP 8566B
Other RX
-61.81 dBm

Test C-1	Impulse Response				
USADR FM1 Rev A.					
Program Material	Glockenspiel		1.00 Vp-p at attenuator input. 10.00 ns wide pulse		
Pulse Repetition (Hz)	Attn at TOA	(Vp-p)	Attn at POF	(Vp-p)	EO&C
100	0.00	1.00	0.00	1.00	Could not achieve TOA or POF with this configuration.
200	1.75	0.82	0.00	1.00	TOA small pop, click / high cut, POF could not attain.
333	0.75	0.92	0.00	1.00	TOA small pop, click / high cut, POF could not attain.
666	5.25	0.55	1.75	0.82	TOA small pop, click / high cut, POF excessive noise with muting.
1000	8.25	0.39	4.50	0.60	TOA small pop, click / high cut, POF excessive noise with muting.
Additional Comments:					
Test Date: 25-Jul-94					
Testers: TK, DS					

Test	C-2	CW Response							
USADR FM1 Rev A.									
Program Material		Mozart (track 67 SQAM Disk)							
Test Point	Frequency MHz	LEV 1 POF	LEV 2 POF+6	LEV 3 POF+12	Test Point	Frequency MHz	LEV 1 POF	LEV 2 POF+6	LEV 3 POF+12
1	93.85	0	0	0	27	94.11	0	0	0
2	93.86	0	0	0	28	94.12	0	0	0
3	93.87	2	2	2	29	94.13	0	0	0
4	93.88	2	2	2	30	94.14	0	0	0
5	93.89	2	2	2	31	94.15	0	0	0
6	93.90	2	2	2	32	94.16	0	0	0
7	93.91	2	2	2	33	94.17	0	0	0
8	93.92	2	2	2	34	94.18	0	0	0
9	93.93	2	2	2	35	94.19	0	0	0
10	93.94	1	2	2	36	94.20	0	0	1
11	93.95	2	2	2	37	94.21	0	2	2
12	93.96	2	2	2	38	94.22	0	0	0
13	93.97	2	2	2	39	94.23	2	2	2
14	93.98	0	0	2	40	94.24	2	2	2
15	93.99	0	0	2	41	94.25	2	2	2
16	94.00	0	0	2	42	94.26	1	1	2
17	94.01	0	0	2	43	94.27	2	2	2
18	94.02	0	0	2	44	94.28	2	2	2
19	94.03	0	0	2	45	94.29	2	2	2
20	94.04	0	0	2	46	94.30	1	1	1
21	94.05	0	0	2	47	94.31	2	2	2
22	94.06	0	0	0	48	94.32	2	2	2
23	94.07	0	0	0	49	94.33	2	2	2
24	94.08	0	0	0	50	94.34	0	0	0
25	94.09	0	0	0	51	94.35	0	1	0
26	94.10	0	0	0					

Test Date: 17-Oct-94 0 dB Attenuator Reference: -32.86 dBm

Testers: DML, RMc 0=CLEAN AUDIO 1=APPROXIMATE TOA 2 ≥ POF

POF Attn=29.75dB POF d/u= 14.13 dB

Test C-3 Airplane Flutter USADR FM1 Rev A. Program Material Glockenspiel		
Scenario	Reflected Path	EO&C
#1	400 Km/h Doppler 27.5 µs Delay TOA 8.00 dB 8.00 dB	Excessive noise and high cut. Level of impairment approaching POF. DAR30500.DAT PI # 16,17 and 18
#2	200 Km/h Doppler 13.7 µs Delay TOA 6.00 dB 6.00 dB	Virtually no recovered audio. Beyond POF level of impairment. Small drop out or flutter. Not recorded.
#3	100 Km/h Doppler 6.8 µs Delay TOA 4.00 dB 4.00 dB	Virtually no recovered audio. Had to reload receiver software after this simulation . Not recorded.
Test Date: 27-Oct-94 Testers: DML, RMc		

Test	C-4	Weak Signal Sensitivity
USADR FM1 Rev A.		
Program Material		Glockenspiel

TOA (dBm)	POF (dBm)
-86 ≤ TOA < -85	-89 < POF ≤ -88

Test Date: 27-Oct-94
Testers: DML,RMc

Test Code:	C-5 H	**Delay Spread / Doppler** Bad Urban 1
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-40		2		2		2		2		2	
0-36	2		2		2		2		2		2
0-32		2		2		2		2		2	
0-28	1		2		1		2		2		2
0-24		2		1		2		2		2	
0-20	1		1		1		2		2		2
0-16		1		1		1		2		2	
0-12	0		1		1		2		2		2
0-8		0		1		2		2		2	
0-4	0		0		1		2		2		2

Doppler (km/h)

EO&C	30 sec minimum listening time.	
	0 = Unimpaired	Small Impairments consisted of
	1 = Small Impairment	occational, brief (short duration) dropouts.
	2 ≥ POF Level of Impairment	

Test Date: 27-Oct-94
Testers: DML, RMc

Test	C-5	**Delay Spread / Doppler**
Code:	H	Bad Urban 2
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-80		2		2		2		2		2	
0-76	2		2		2		2		2		2
0-72		2		2		2		2		2	
0-68	2		2		2		2		2		2
0-64		2		2		2		2		2	
0-60	2		2		2		2		2		2
0-56		2		2		2		2		2	
0-52	2		2		2		2		2		2
0-48		2		2		2		2		2	
0-44	2		2		2		2		2		2

Doppler (km/h)

EO&C

30 sec minimum listening time.

0 = Unimpaired

1 = Small Impairment

2 ≥ POF Level of Impairment

Small Impairments consisted of occational, brief (short duration) dropouts.

Test Date: 27-Oct-94

Testers: DML, RMc

Test	**C-5**	**Delay Spread / Doppler**
Code:	**H**	Typical Urban
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-10		1		1		2		2		2	
0-9	0		1		1		2		2		2
0-8		1		1		2		2		2	
0-7	0		1		1		2		2		2
0-6		0		1		2		2		2	
0-5	0		1		1		2		2		2
0-4		0		1		2		2		2	
0-3	0		1		1		2		2		2
0-2		1		1		2		2		2	
0-1	0		1		1		2		2		2

Doppler (km/h)

EO&C	30 sec minimum listening time.	
	0 = Unimpaired	Small Impairments consisted of
	1 = Small Impairment	occational, brief (short duration) dropouts.
	2 ≥ POF Level of Impairment	

Test Date: 27-Oct-94
Testers: DML, RMc

Test	**C-5**	**Delay Spread / Doppler**
Code:	**H**	Hilly Terrain
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-50	1		1		2		2		2		2
0-48		2		1		2		2		2	
0-44	1		1		1		2		2		2
0-40		2		1		2		2		2	
0-36	2		1		2		2		2		2
0-32		2		1		1		2		2	
0-28	0		2		2		2		2		2
0-24		2		2		2		2		2	
0-20	0		1		1		2		2		2

Doppler (km/h)

EO&C 30 sec minimum listening time.

0 = Unimpaired
1 = Small Impairment
2 ≥ POF Level of Impairment

Small Impairments consisted of occational, brief (short duration) dropouts and periodic flutters.

Test Date: 27-Oct-94
Testers: DML, RMc

Test	**C-5**	**Delay Spread / Doppler**
Code:	**H**	Rural Area
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-1.0		1		1		2		2		2	
0-0.9	0		1		2		2		2		2
0-0.8		1		1		2		2		2	
0-0.7	0		1		1		2		2		2
0-0.6		1		1		2		2		2	
0-0.5	0		1		1		2		2		2
0-0.4		0		1		2		2		2	
0-0.3	0		1		1		2		2		2
0-0.2		1		1		2		2		2	
0-0.1	1		0		1		2		2		2

Doppler (km/h)

EO&C	30 sec minimum listening time.	
	0 = Unimpaired	Small Impairments consisted of
	1 = Small Impairment	occational, brief (short duration) dropouts.
	2 ≥ POF Level of Impairment	

Test Date: 27-Oct-94
Testers: DML, RMc

Test	C-6	Additional Multipath Doppler Simulations			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario					
	Level	Attn	Co/No	Units	EO&C
#1 Urban Slow	TOA	32.50	27.31	dB	High cut and other pops and clicks.
	POF	22.50	17.31	dB	Excessive noise and muting.
#2 Urban Fast	TOA	63.75	58.56	dB	Background noise and high cut.
	POF	21.50	16.31	dB	Excessive noise.
#3 Rural Fast	TOA	63.75	58.56	dB	System never re-acquires. Total mute.
	POF	63.75	58.56	dB	
#4 Terrain Obstructed Fast	TOA	63.75	58.56	dB	High cut and other pops and clicks some muting POF level.
	POF	63.75	58.56	dB	

		Desired		Noise	
Test Date:	26-Oct-94				
Testers:	DML, RMc	Signal	-7.00 dBm		
DAT Reference:	DAR30552.DAT	IL	40.79 dB	BW	6.45E+06 Hz
		3WIN	-47.79 dBm	0dB Ref	-41.38 dBm

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30552.DAT			1	2	3			Urban Slow	63.75
26-Oct-94			4	5	6			Urban Slow	63.75
			7	8	9			Urban Slow with noise	32.50
			10	11	12			Disregard	63.75
			13	14	15			Urban Fast	63.75
			16	17	18			Rural Fast	63.75
			19	20	21			Obstructed Fast	63.75

Additional Multipath Doppler Simulations

Code: H

Test C-6

Test	D-Series Co-Channel, 1st and 2nd Adjacent				
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
	Level	Attn	D/U	Units	EO&C
D-1 Co-Channel	TOA	30.50	11.96	dB	Small pop.
	POF	26.00	7.46	dB	Excessive noise and high cut.
D-2 Lower 1st Adjacent	TOA	50.00	31.46	dB	Small drop outs or flutters.
	POF	38.00	19.46	dB	Excessive Muting.
Upper 1st Adjacent	TOA	49.75	31.21	dB	Small pop.
	POF	37.75	19.21	dB	Excessive noise, high cut and crackling.
D-3 Lower 2nd Adjacent	TOA	28.00	9.46	dB	Small pop.
	POF	19.75	1.21	dB	Excessive noise, high cut and mute.
	TOA				Not necessary due to symmetry.
	POF				

DAT Reference: DAR30405.DAT
By Pass Simulator Configuration.

Test Date: 17-Oct-94		Desired	Undesired
Testers: DML, RMc	6WOUT	-6.99 dBm	
	IL	41.49 dB	
	3WIN	-48.48 dBm	-29.94 dBm

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30405.DAT			0	1	2			USADR FM1 Co-Channel TOA	30.50
17-Oct-94									
			3	4	5			Upper 1st Adjacent, TOA	49.75
			6	7	8			Lower 2nd Adjacent TOA	28.00

Code: H
D-Series Recordings

Test	E-1	Co-Channel with Multipath (Rayleigh)			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	63.75	67.38	dB	High cut and small pop.
	POF	27.25	30.88	dB	Excessive noise and muting.
#2 Urban Fast	TOA	63.75	67.38	dB	Never re-acquires.
#3 Rural Fast	TOA	63.75	67.38	dB	Never re-acquires.
#4 Terrain Obstructed	TOA	63.75	67.38	dB	Never re-acquires.

Test Date: 27-Oct-94		Desired	Undesired
Testers: DML, RMc	Signal	-7.00 dBm	
	IL	40.79 dB	
	3WIN	-47.79 dBm	-51.42 dBm

Test	E-2	Lower 1st Adjacent with Multipath (Rayleigh)			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	63.75	67.38	dB	Small pop.
	POF	41.25	44.88	dB	Excessive noise and high cut.
#2 Urban Fast	TOA	63.75	67.38	dB	Never re-acquires.
#3 Rural Fast	TOA	63.75	67.38	dB	Never re-acquires.
#4 Terrain Obstructed	TOA	63.75	67.38	dB	Never re-acquires.

Test Date: 27-Oct-94		Desired	Undesired
Testers: DML, RMc	Signal	-7.00 dBm	
	IL	40.79 dB	
	3WIN	-47.79 dBm	-51.42 dBm

Test	E-3	Lower 2nd Adjacent with Multipath (Rayleigh)			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	63.75	67.38	dB	Small pop.
	POF	19.75	23.38	dB	Excessive noise and small mute.
#2 Urban Fast	TOA	63.75	67.38	dB	Never re-acquires.
#3 Rural Fast	TOA	63.75	67.38	dB	Never re-acquires.
#4 Terrain Obstructed	TOA	63.75	67.38	dB	Never re-acquires.

Test Date: 27-Oct-94		Desired	Undesired
Testers: DML, RMc	Signal	-7.00 dBm	
	IL	40.79 dB	
	3WIN	-47.79 dBm	-51.42 dBm

Test	E-1	Co-Channel with Multipath (Doppler)			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	32.00	35.81	dB	Small pop. DAR30552.DAT #23
	POF	18.00	21.81	dB	Excessive noise and high cut.
#2 Urban Fast	TOA	63.75	67.56	dB	Background noise and high cut.
	POF	21.50	25.31	dB	Excessive noise.
#3 Rural Fast	TOA	63.75	67.56	dB	Never re-acquires.
#4 Terrain Obstructed	TOA	63.75	67.56	dB	Excessive noise and high cut. POF level of impairment .

Test Date: 26-Oct-94		Desired	Undesired
Testers: DML, RMc	Signal	-7.00 dBm	
	IL	40.65 dB	
	3WIN	-47.65 dBm	-51.46 dBm

Test	E-2	Lower 1st Adjacent with Multipath (Doppler)			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	63.75	67.42	dB	High cut with small pops and clicks.
	POF	31.00	34.67	dB	Excessive noise, high cut and mutes.
#2 Urban Fast					Background noise and high cut.
#3 Rural Fast					Never re-acquires.
#4 Terrain Obstructed Fast					Excessive noise and high cut. POF level of impairment .

Test Date: 21-Oct-94		Desired	Undesired
Testers: DML, RM, ST	Signal	-7.00 dBm	
	IL	40.79 dB	
	3WIN	-47.79 dBm	-51.46 dBm

Test	E-3	Lower 2nd Adjacent with Multipath (Doppler)			
USADR FM1 Rev A.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	20.50	24.17	dB	Small click.
	POF	10.50	14.17	dB	Excessive noise and mutes.
#2 Urban Fast					Background noise and high cut.
#3 Rural Fast					Never re-acquires.
#4 Terrain Obstructed Fast					Excessive noise and high cut. POF level of impairment .

Test Date: 26-Oct-94		Desired	Undesired
Testers: DML, RMc	Signal	-7.00 dBm	
	IL	40.79 dB	
	3WIN	-47.79 dBm	-51.46 dBm

Test	J-1	Re-Acquisition
USADR FM1 Rev A.		
Program Material	Mozart (Track 67 on SQAM disk)	

Toff (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
30	5	5	8
	7	6	5
	8	5	4
	6	5	6
	3	7	4
Average	5.8	5.6	5.4

POF Attenuator Setting	:	12.00 dB
Desired Signal Level	:	-48.48 dBm
Noise 0 dB Reference	:	-41.41 dBm

Additional Comments:

Re-Acquisition time is the value listed ± 0.5 seconds.

Test Date: 17-Oct-94

Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev A.		Urban Slow Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	8	6	3
10	6	3	3
15	6	7	7
20	12	6	6
25	6	6	2
Average	7.6	5.6	4.2

POF Attenuator Setting : 26.75dB
Desired Signal Level : -48.48 dBm
Noise 0 dB Reference : -41.15 dBm

Additional Comments:

Re-Acquisition time is the value listed ± 1 second.
Rayleigh Urban Slow is the only Rayleigh simulation where re-acquisition occurs. Other environments not tested for this reason.

Test Date: 27-Sep-94
Testers: DML, ST

Test	**J-2**	**Re-Acquisition with Multipath**
USADR FM1 Rev A.		Urban Slow Doppler
Program Material		Mozart (Track 67 on SQAM disk)

	Re-Acquisition Time (s)		
Tsim (s)	POF-2	POF-4	POF-6
5	8	3	7
10	8	6	4
15	7	6	5
20	6	10	5
25	3	10	7
Average	6.4	7	5.6

POF Attenuator Setting : 22.5 dB
Desired Signal Level : -47.65 dBm
Noise 0 dB Reference : -41.15 dBm

Additional Comments:

Re-Acquisition time is the value listed ± 1 second.

Test Date: 26-Oct-94
Testers: DML, ST

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev A.		Urban Fast Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	3	4	9
10	4	7	7
15	5	6	6
20	3	4	2
25	5	10	10
Average	4	6.2	6.8

POF Attenuator Setting	:	21.50 dB
Desired Signal Level	:	-47.65 dBm
Noise 0 dB Reference	:	-41.15 dBm

Additional Comments:

Re-Acquisition time is the value listed ± 1 second.

Test Date: 21-Oct-94
Testers: DML, ST

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev A.		Terrain Obstructed Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF
5	14
10	4
15	5
20	7
25	5
Average	7

POF Attenuator Setting	:	63.75 dB
Desired Signal Level	:	-47.65 dBm
Noise 0 dB Reference	:	-41.15 dBm

Additional Comments:

Re-Acquisition time is the value listed ± 1 second.

Test Date: 21-Oct-94

Testers: DML, ST

Test	B-1	Ancillary Data Channel Demonstration Gaussian Noise BER				
Proponent Code:	H					Units
			TOA		POF	
	Attenuator	16.25	15.75	14.75	13.75	dB
	Co/No	11.10	10.60	9.60	8.60	dB
	Log(BER)	-∞	-3.895	-2.517	-1.472	
	BER	0.00E+00	1.27E-04	3.04E-03	3.37E-02	
Test	B-2	Ancillary Data Channel Demonstration Co-Channel BER				
						Units
			TOA		POF	
	Attenuator		15.00		11.50	dB
	d/u		11.02		7.52	dB
	Log(BER)		-∞		-1.231	
	BER		0.00E+00		5.88E-02	

Testers: DML, RMc
Date: 12-Dec-94

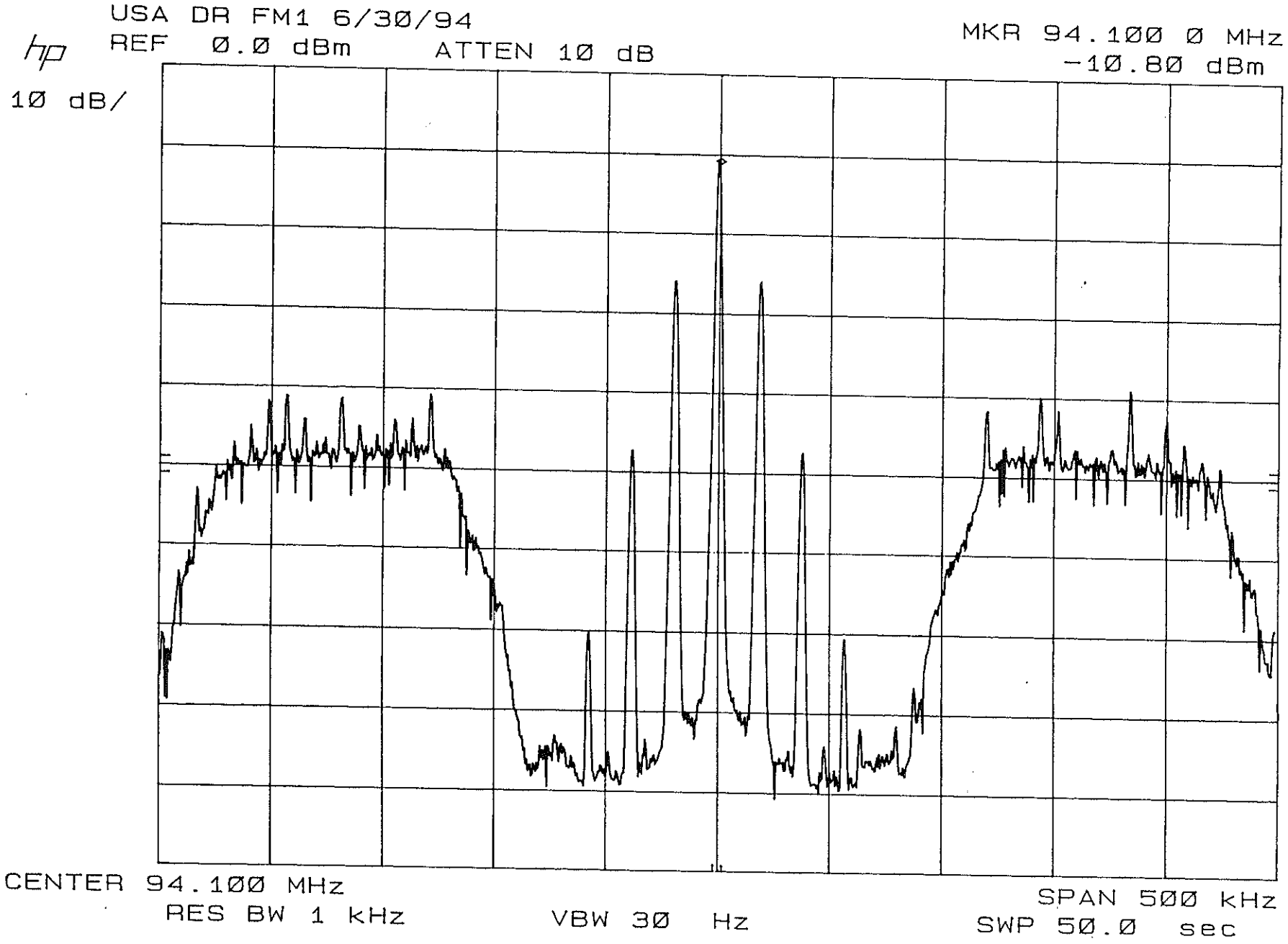
TOA and POF levels have been approximated for this demonstration.

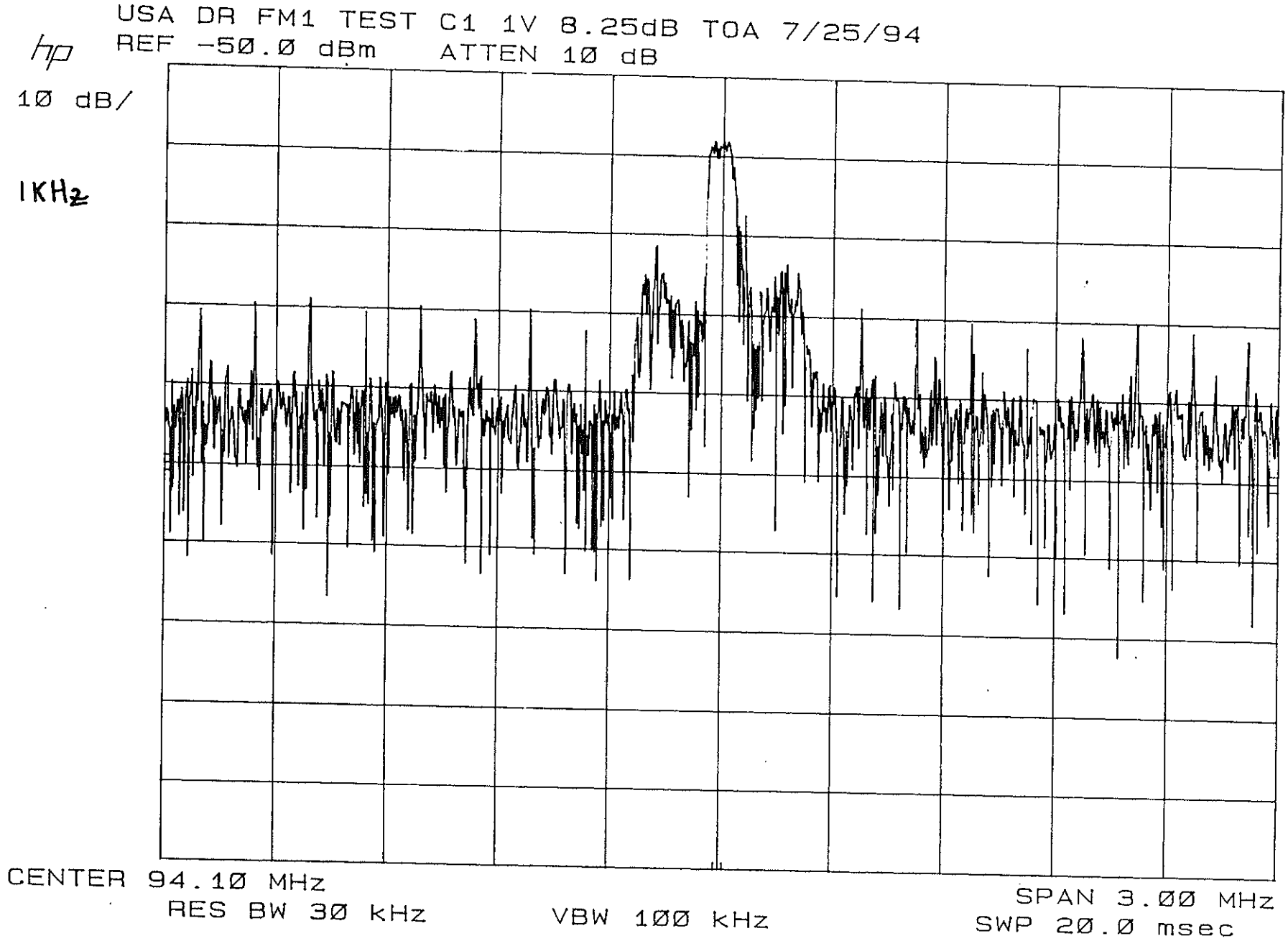
Test	B-3	Ancillary Data Channel Demonstration Multipath BER Doppler	Units
Proponent Code:	H		
Urban Slow		No Added Noise	
	Attenuator	63.75	dB
	Co/No	58.60	dB
	Log(BER)	-1.785	
	BER	1.64E-02	
Urban Fast		No Added Noise	
	Attenuator	63.75	dB
	Co/No	58.60	dB
	Log(BER)	-1.186	
	BER	6.51E-02	
Rural Fast		No Added Noise	
	Attenuator	63.75	dB
	Co/No	58.60	dB
	Log(BER)		
	BER	No Valid data received.	
Terrain Obstructed		No Added Noise	
	Attenuator	63.75	dB
	Co/No	58.60	dB
	Log(BER)	-0.918	
	BER	1.21E-01	

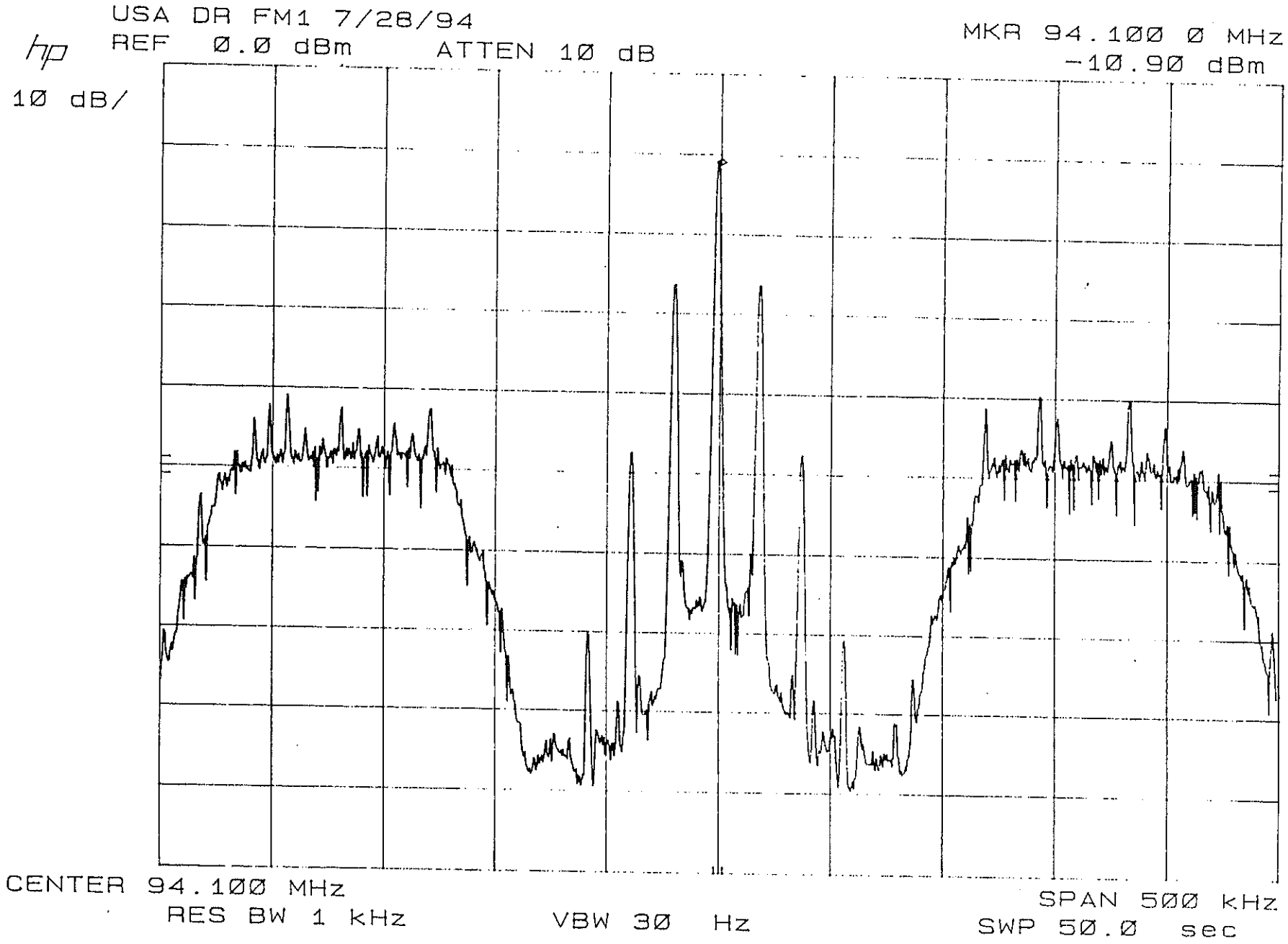
Testers: DML, RMc
Date: 12-Dec-94

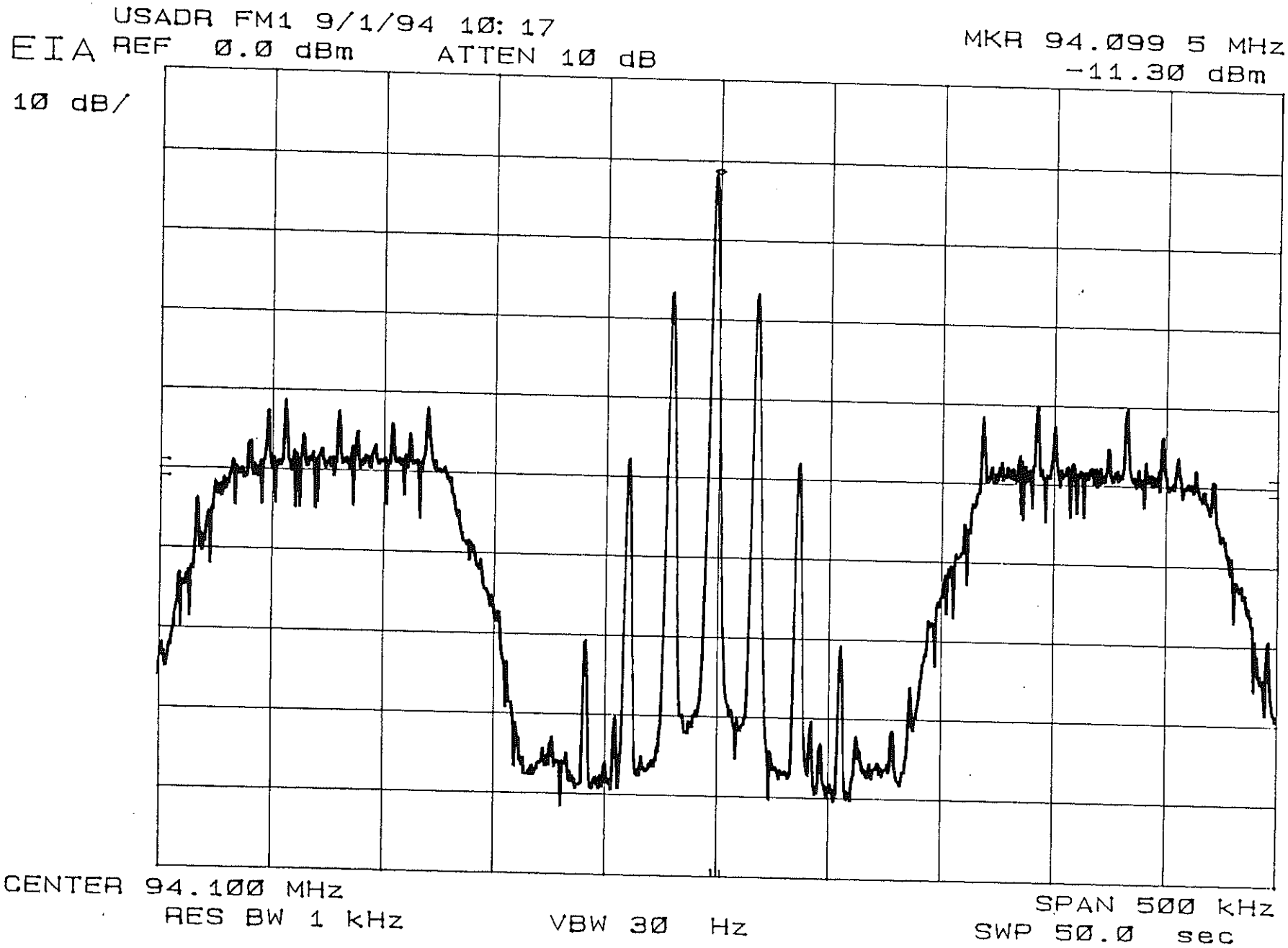
TOA and POF levels have been approximated for this demonstration.

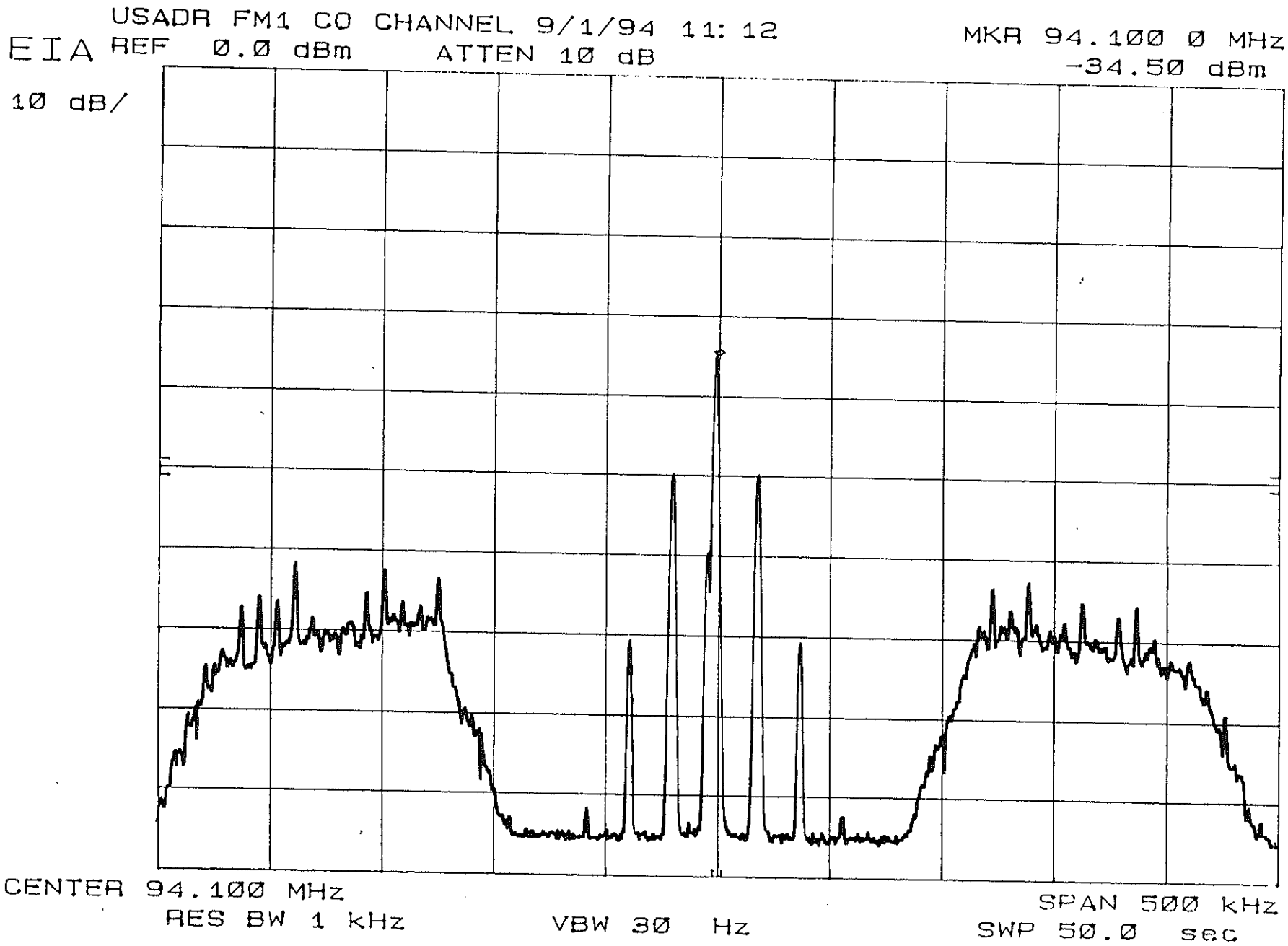
Test	B-3	Ancillary Data Channel Demonstration Multipath BER Special			Units
Proponent Code:	H				
Obstructed Path		No Added Noise		(San Fran 4)	
	Attenuator	63.75			dB
	Co/No	58.60			dB
	Log(BER)	-5.759			
	BER	1.74E-06			
Rural Highway		TOA	POF	(SLC)	
	Attenuator	16.75	14.25		dB
	Co/No	11.60	9.10		dB
	Log(BER)	-3.557	-1.446		
	BER	2.77E-04	3.58E-02		
Suburban		No Added Noise		(WSHW9)	
	Attenuator	63.75			dB
	Co/No	58.60			dB
	Log(BER)	-1.188			
	BER	6.49E-02			
Terrain Obstructed		No Added Noise	POF	(NOVA 4)	
	Attenuator	63.75	28.75		dB
	Co/No	58.60	23.60		dB
	Log(BER)	-1.026	-1.725		
	BER	9.43E-02	1.88E-02		
Testers:	DML, RMc	TOA and POF levels have been approximated for this demonstration.			
Date:	12-Dec-94				

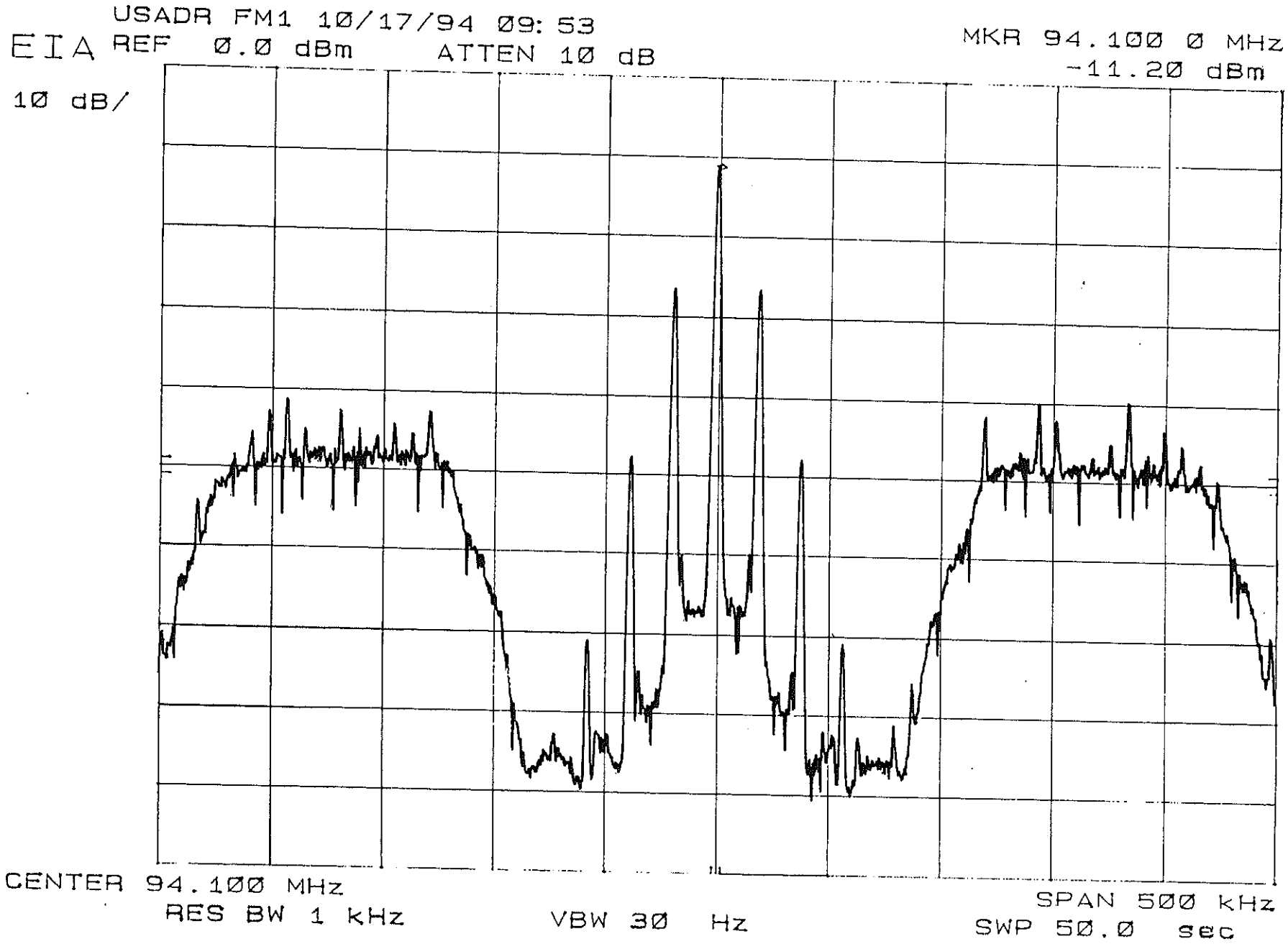

USA DR FM1 6/30/94
REF 0.0 dBm
ATTEN 10 dB
MKR 94.100 0 MHz
-10.80 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

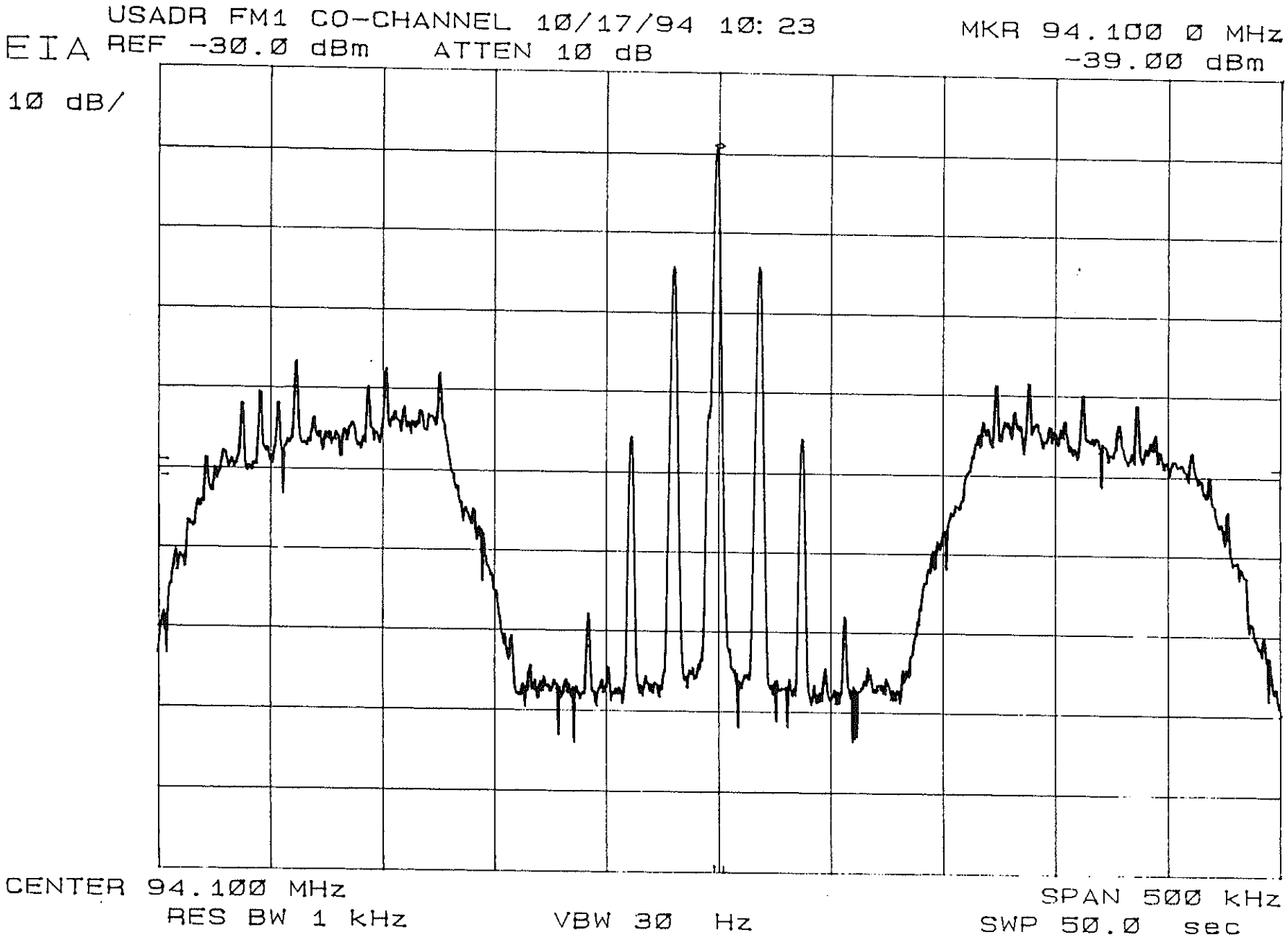

USA DR FM1 TEST C1 1V 8.25dB TOA 7/25/94
hp
REF -50.0 dBm
ATTEN 10 dB
10 dB/
1KHz
CENTER 94.10 MHz
RES BW 30 kHz
VBW 100 kHz
SPAN 3.00 MHz
SWP 20.0 msec

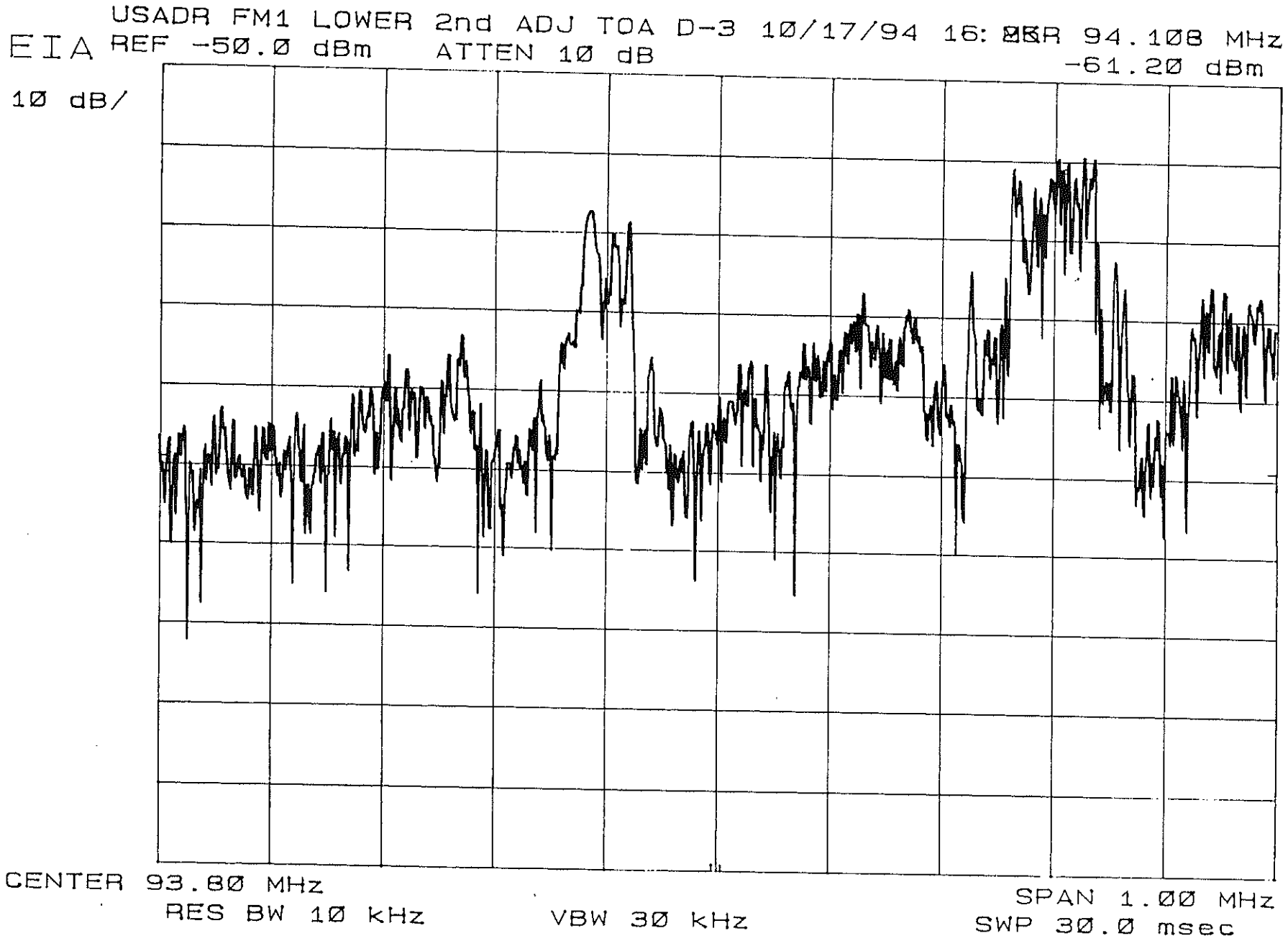

USA DR FM1 7/28/94
REF 0.0 dBm
ATTEN 10 dB
MKR 94.100 0 MHz
-10.90 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

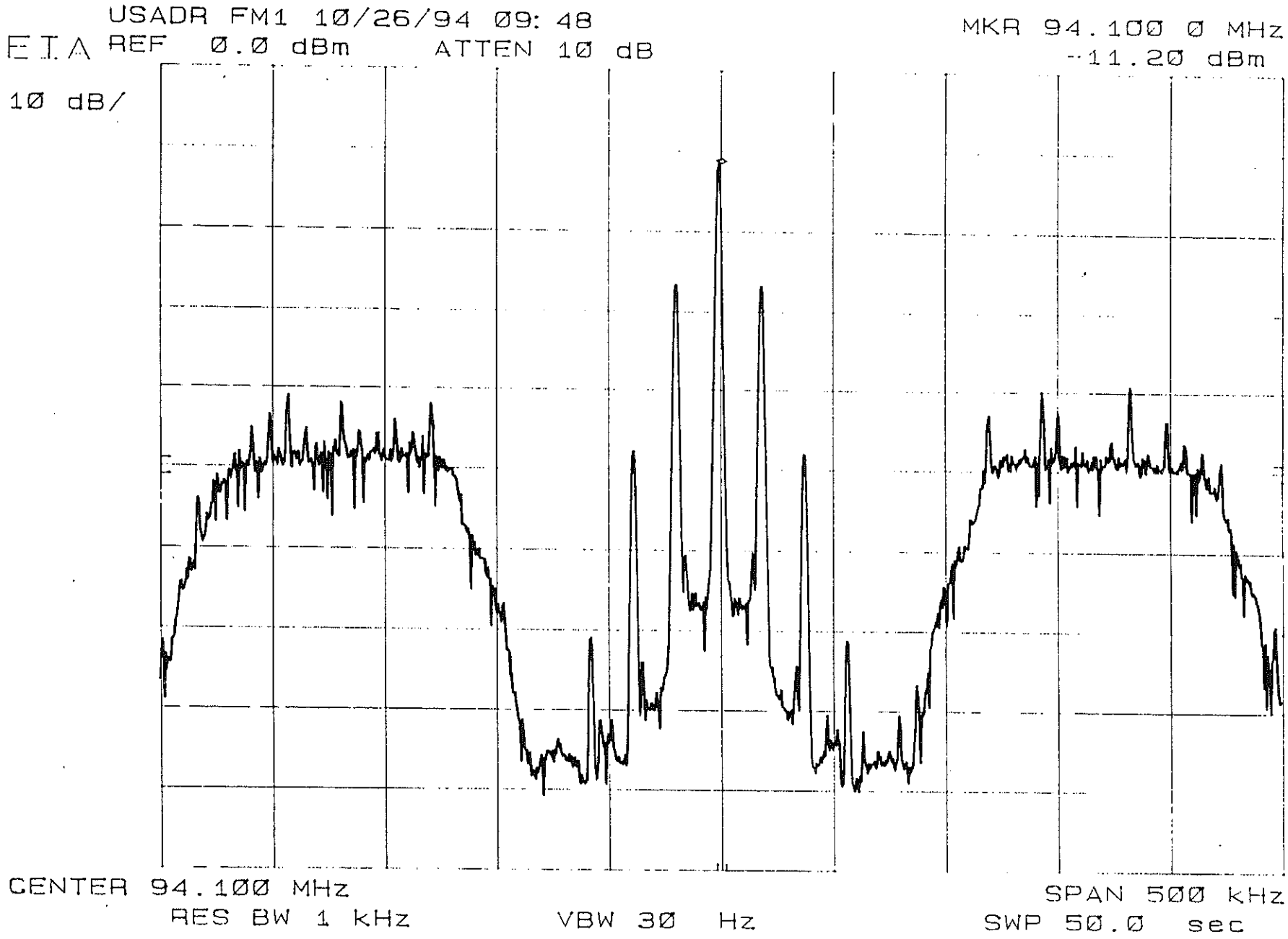

USADR FM1 9/1/94 10: 17
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.099 5 MHz
-11.30 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

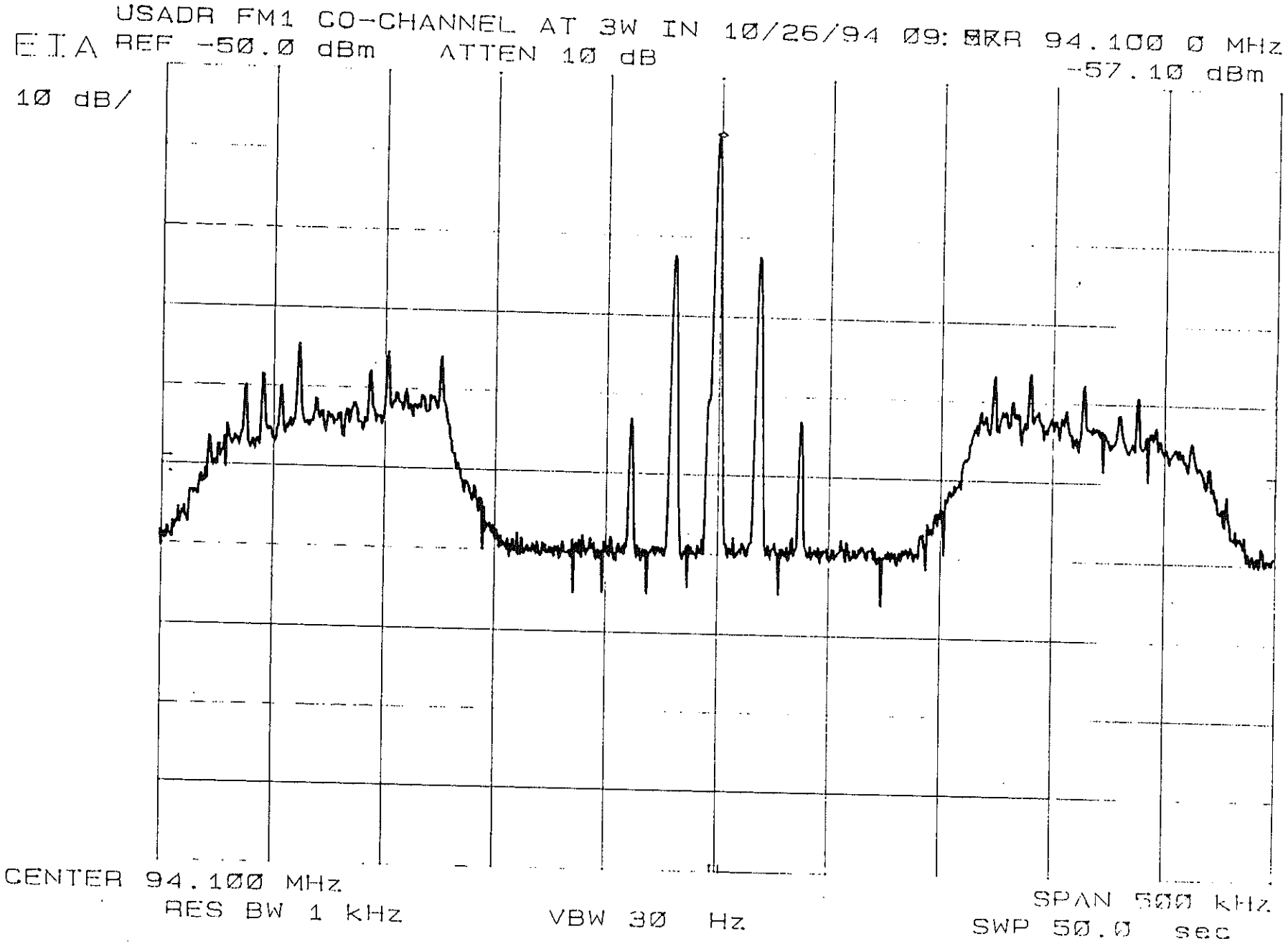

USADR FM1 CO CHANNEL 9/1/94 11: 12
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.100 0 MHz
-34.50 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

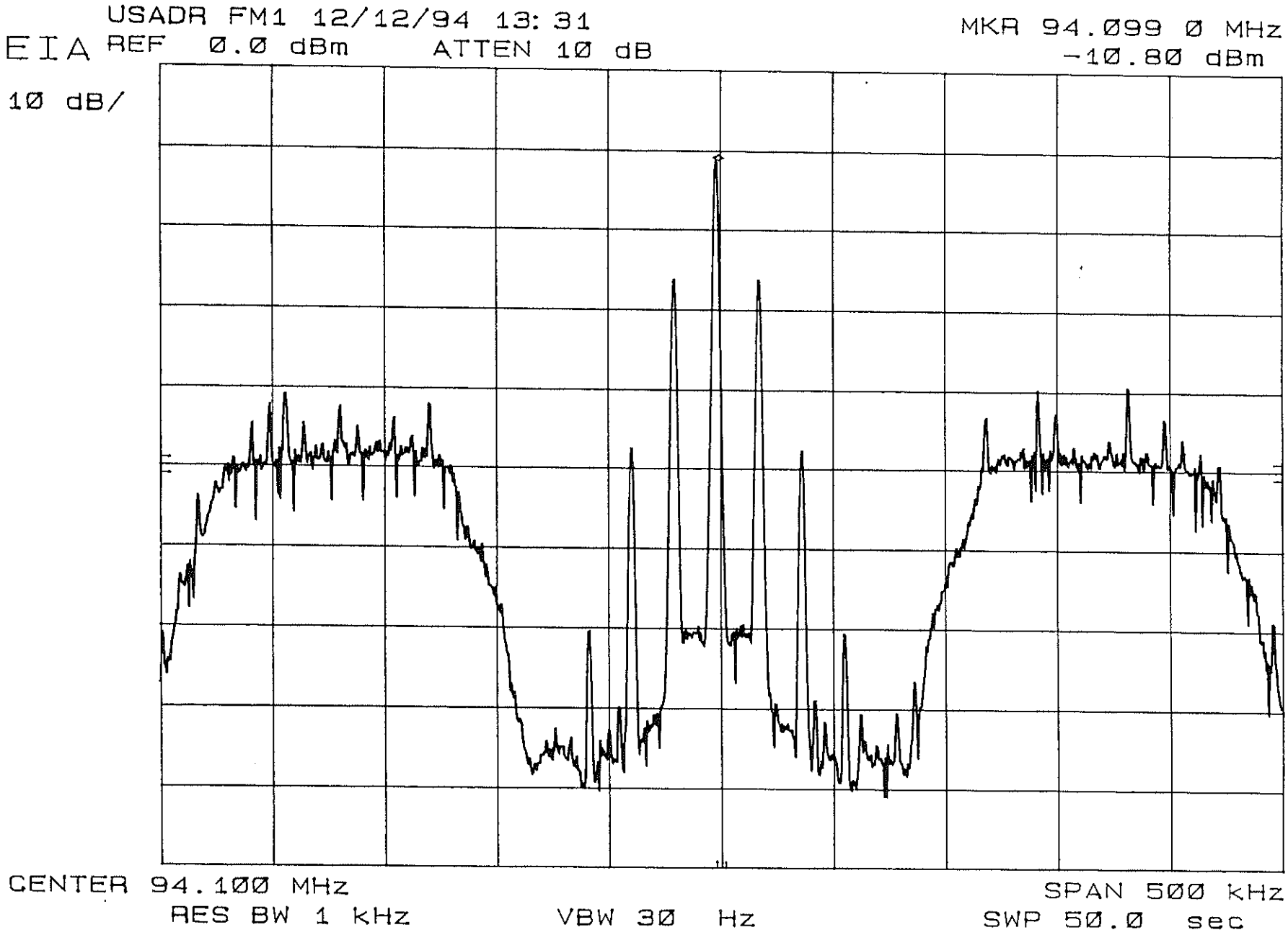

USADR FM1 10/17/94 09:53
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.100 0 MHz
-11.20 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec


USADR FM1 CO-CHANNEL 10/17/94 10:23
EIA REF -30.0 dBm ATTEN 10 dB
MKR 94.100 0 MHz
-39.00 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec


USADR FM1 LOWER 2nd ADJ TOA D-3 10/17/94 16: 08
EIA REF -50.0 dBm ATTEN 10 dB
MKR 94.108 MHz
-61.20 dBm
10 dB/
CENTER 93.80 MHz
RES BW 10 kHz
VBW 30 kHz
SPAN 1.00 MHz
SWP 30.0 msec


USADR FM1 10/26/94 09: 48
E.T.A
REF 0.0 dBm
ATTEN 10 dB
MKR 94.100 0 MHz
-11.20 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec


USADR FM1 CO-CHANNEL AT 3W IN 10/26/94 09:
E.I.A
REF -50.0 dBm
ATTEN 10 dB
MKR 94.100 0 MHz
-57.10 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec


USADR FM1 12/12/94 13:31
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.099 0 MHz
-10.80 dBm
10 dB/
CENTER 94.100 MHz
SPAN 500 kHz
RES BW 1 kHz
VBW 30 Hz
SWP 50.0 sec

APPENDIX AI

Digital Test Results USA Digital Radio AM

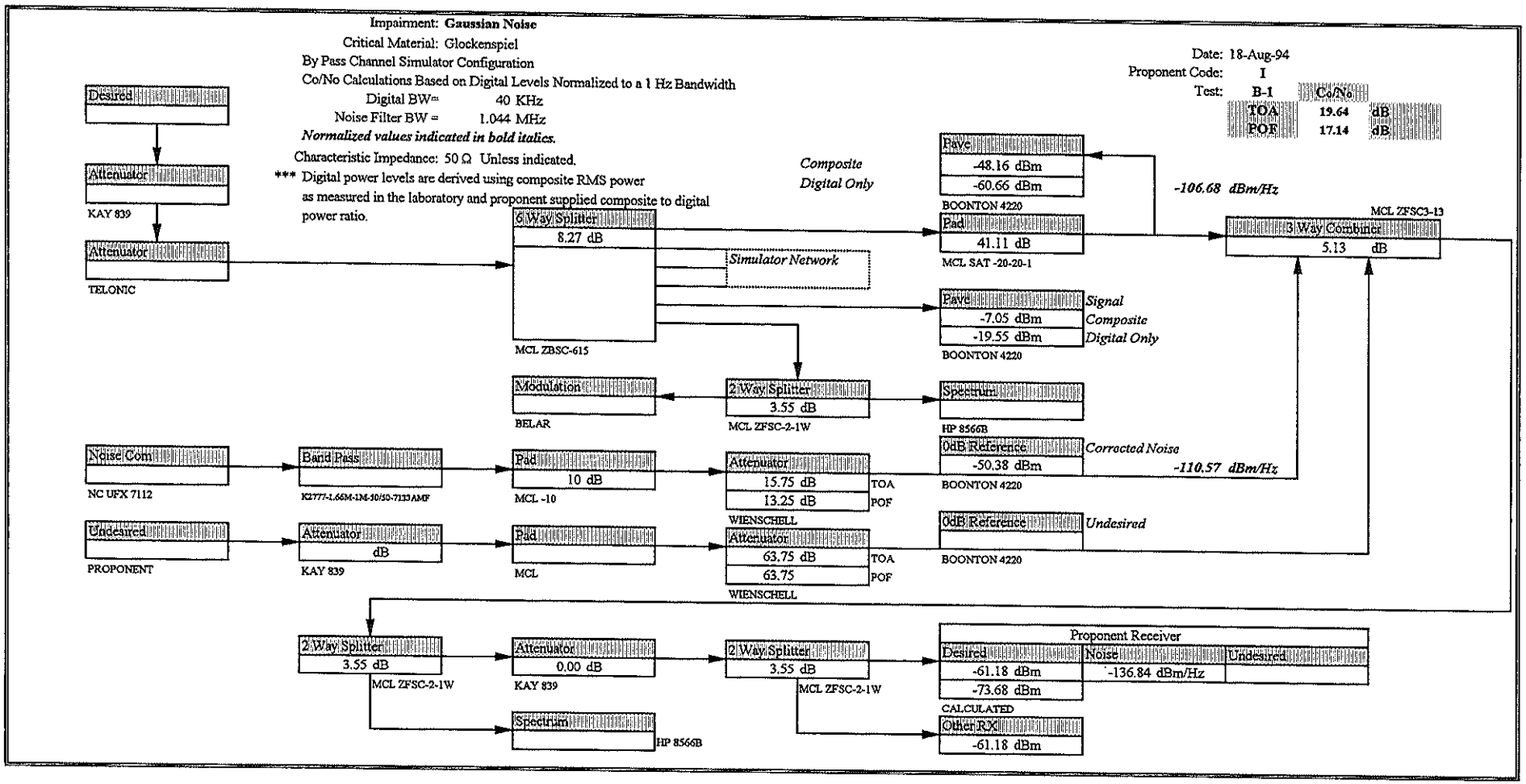
EIA Digital Audio Radio Test Laboratory

Proponent:	**USADR AM**
Code:	I
Digital Band Width:	4.00E+04 Hz
Composite Band Width:	4.00E+04 Hz

EIA Digital Audio Radio Test Laboratory

Test	B-1	Gaussian Noise		Units
Proponent Code:	I			
Glockenspiel		TOA	POF	
	Attenuator	15.75	13.25	dB
	Co/No	19.64	17.14	dB
	TOA	Small pops and clicks.		
EO&C				
	POF	Muting as well as large pops and clicks.		
Soprano		TOA	POF	
	Attenuator	15.75	13.75	dB
	Co/No	19.64	17.64	dB
	TOA	Small pop or click.		
EO&C				
	POF	Muting as well as large pops and clicks.		
Clarinet		TOA	POF	
	Attenuator	16.00	14.00	dB
	Co/No	19.89	17.89	dB
	TOA	Small pop.		
EO&C				
	POF	Muting as well as large pops and clicks.		
Notes:	Recording Reference:	DAR30222.DAT		
	Testers:	DML,DS,EB		
	Date:	18-Aug-94		

EIA Digital Audio Radio Test Laboratory



EIA Digital Audio Radio DAT Recording Log

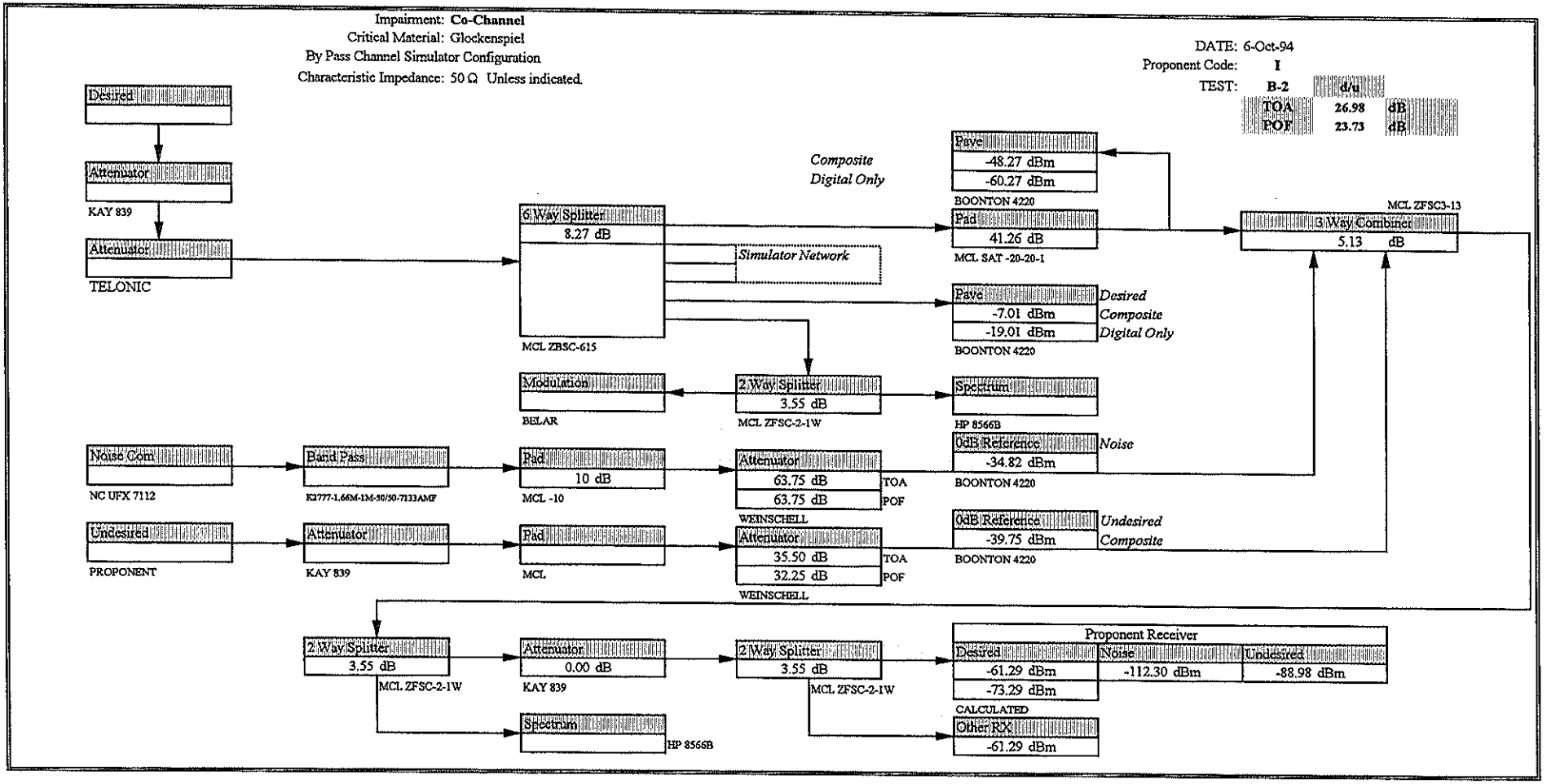
DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30222.DAT			1	2				Glockenspiel Clear Channel	63.75
18-Aug-94			3	4					17.25
			5	6					16.75
			7	8					16.25
			9	10				TOA lab	15.75
			11	12					15.25
			13	14					14.75
			15	16					14.25
			17	18					13.75
			19	20				POF lab	13.25
			21	22				Sync	63.75
			23	24					12.75
			25	26				Soprano Clear Channel	63.75
			27	28					17.25
			29	30					16.75
			31	32					16.25
			33	34				TOA lab	15.75
			35	36					15.25
			37	38					14.75
			39	40					14.25
			41	42				POF lab	13.75
			43	44				Sync	63.75
			45	46					13.25
			47	48				Clarinet Clear Channel	63.75
			49	50					17.50
			51	52					17.00
			53	54					16.50
			55	56				TOA lab	16.00
			57	58					15.50
			59	60					15.00
			61	62					14.50
			63	64				POF lab	14.00
			65	66				Sync	63.75
			67	68					13.50

Code: I
Impairment: Gaussian Noise

EIA Digital Audio Radio Test Laboratory

Test	B-2	Co-Channel		Units
Proponent Code:	I			
Glockenspiel		TOA	POF	
	Attenuator	34.50	32.25	dB
	d/u	25.98	23.73	dB
EO&C	TOA	Small pops in left ear.		
	POF	High cut, warbles and some muting.		
Soprano		TOA	POF	
	Attenuator	34.75	32.25	dB
	d/u	26.23	23.73	dB
EO&C	TOA	Small pops.		
	POF	High cut, warbles and some muting.		
Clarinet		TOA	POF	
	Attenuator	35.25	32.75	dB
	d/u	26.73	24.23	dB
EO&C	TOA	Small background pops and clicks.		
	POF	High cut and warbles.		

Notes:		
	Recording Reference:	DAR30240.DAT
	Testers:	DML,RMc
	Date:	6-Oct-94

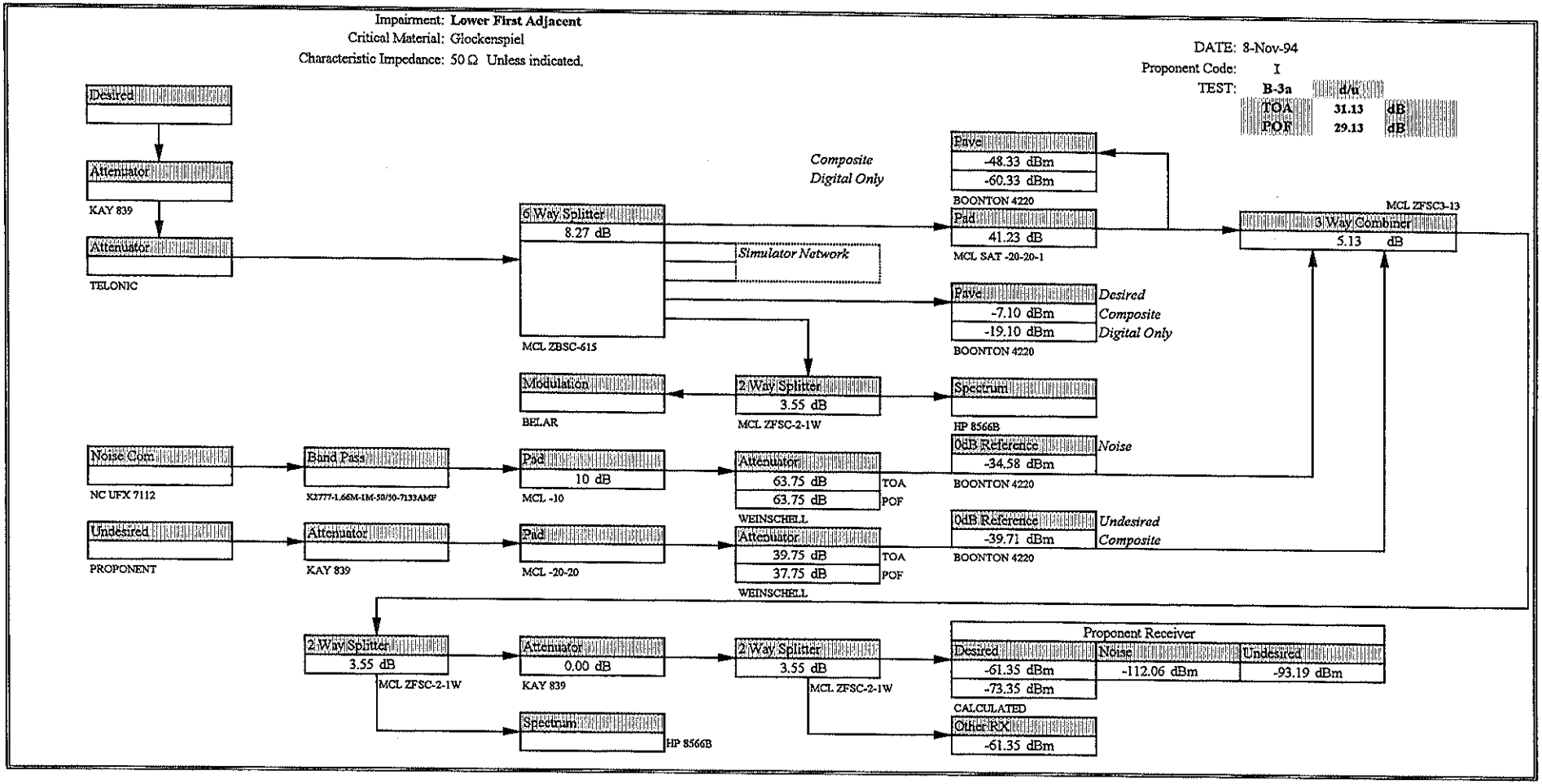

Impairment: Co-Channel
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Characteristic Impedance: 50 Ω Unless indicated.
DATE: 6-Oct-94
Proponent Code: I
TEST: B-2
d/u
TOA 26.98 dB
POF 23.73 dB
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.27 dBm
-60.27 dBm
BOONTON 4220
Pad
41.26 dB
MCL SAT -20-20-1
MCL ZFSC3-13
3 Way Combiner
5.13 dB
Pave
-7.01 dBm
-19.01 dBm
BOONTON 4220
Desired
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
K2777-1.66M-1M-50/50-7133AMF
Pad
10 dB
MCL -10
Attenuator
63.75 dB
63.75 dB
TOA
POF
WEINSCHELL
0dB Reference
-34.82 dBm
BOONTON 4220
Noise
Undesired
PROPONENT
Attenuator
KAY 839
Pad
MCL
Attenuator
35.50 dB
32.25 dB
TOA
POF
WEINSCHELL
0dB Reference
-39.75 dBm
BOONTON 4220
Undesired
Composite
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Proponent Receiver
Desired
-61.29 dBm
-73.29 dBm
CALCULATED
Noise
-112.30 dBm
Undesired
-88.98 dBm
Spectrum
HP 8566B
Other RX
-61.29 dBm

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30240.DAT			1	2				Glockenspiel Clear Channel	63.75
6-Oct-94			3	4					36.00
			5	6					35.50
			7	8					35.00
			9	10				TOA lab	34.50
			11	12					34.00
			13	14					33.50
			15	16					33.00
			17	18					32.50
			19	20				POF lab	32.25
			21	22					31.75
			23	24				Soprano Clear Channel	63.75
			25	26					36.25
			27	28					35.75
			29	30					35.25
			31	32	33	34		TOA lab	34.75
			35	36					34.25
			37	38					33.75
			39	40					33.25
			41	42					32.75
			43	44				POF lab	32.25
			45	46					31.75
			47	48				Clarinet Clear Channel	63.75
			49	50					36.75
			51	52					36.25
			53	54					35.75
			55	56	57	58		TOA lab	35.25
			59	60					34.75
			61	62					34.25
			63	64					33.75
			65	66					33.25
			67	68				POF lab	32.75
			69	70					32.25

Code: I
Impairment: Co-Channel

Test	B-3a	Lower First Adjacent		Units
Proponent Code:	I			
Glockenspiel		TOA	POF	
	Attenuator	39.75	37.75	dB
	d/u	31.13	29.13	dB
EO&C	TOA	Small chirp / burst of pops or clicks.		
	POF	Excessive background noise and muting.		
Soprano		TOA	POF	
	Attenuator	39.75	36.75	dB
	d/u	31.13	28.13	dB
EO&C	TOA	Small burst of pops.		
	POF	Excessive background noise and muting.		
Clarinet		TOA	POF	
	Attenuator	39.75	38.25	dB
	d/u	31.13	29.63	dB
EO&C	TOA	Drop out or mute.		
	POF	Excessive muting and background noise.		
Notes:	Recording Reference:	DAR30278.DAT	DAR30279.DAT	
	Testers:	DML,RMc		
	Date:	8-Nov-94		


Impairment: Lower First Adjacent
Critical Material: Glockenspiel
Characteristic Impedance: 50 Ω Unless indicated.
DATE: 8-Nov-94
Proponent Code: I
TEST: B-3a d/u
TOA 31.13 dB
POR 29.13 dB
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.33 dBm
-60.33 dBm
BOONTON 4220
Pad
41.23 dB
MCL SAT -20-20-1
MCL ZFSC3-13
3 Way Combiner
5.13 dB
Pave
-7.10 dBm
-19.10 dBm
BOONTON 4220
Desired
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
X2777-1.66M-1M-50/50-7133AMP
Pad
10 dB
MCL -10
Attenuator
63.75 dB TOA
63.75 dB POR
WEINSCHELL
0dB Reference
-34.58 dBm
BOONTON 4220
Noise
Undesired
PROPONENT
Attenuator
KAY 839
Pad
MCL -20-20
Attenuator
39.75 dB TOA
37.75 dB POR
WEINSCHELL
0dB Reference
-39.71 dBm
BOONTON 4220
Undesired
Composite
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Proponent Receiver
Desired
-61.35 dBm
-73.35 dBm
CALCULATED
Noise
-112.06 dBm
Undesired
-93.19 dBm
Other RX
-61.35 dBm

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30278.DAT			1	2	3			Glockenspiel Clear Channel	63.75
8-Nov-94			4	5	6				41.25
			7	8	9				40.75
			10	11	12				40.25
			13	14	15	16	17	TOA lab	39.75
			18	19	20				39.25
			21	22	23				38.75
			24	25	26				38.25
			27	28	29				37.75
			30	31	32			POF lab	37.25
			33	34	35				36.75
			36	37	38			Glockenspiel Clear Channel	63.75
			39	40	41				42.25
			42	43	44				41.75
			45	46	47				41.25
			48	49	50				40.75
			51	52	53				40.25
			54	55	56	57	58	TOA lab	39.75
			59	60	61				39.25
			62	63	64				38.75
			65	66	67				38.25
			68	69	70			POF lab	37.75
			71	72	73				37.25

Code: I
Impairment: Lower First Adjacent

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30279.DAT			1	2	3	4		Soprano Clear Channel, Disregard #3	63.75
8-Nov-94			5	6	7				42.25
			8	9	10				41.75
			11	12	13				41.25
			14	15	16				40.75
			17	18	19	20			40.25
			21	22	23	24	25	TOA lab	39.75
			26	27	28				39.25
			29	30	31				38.75
			32	33	34				38.25
			35	36	37				37.75
			38	39	40				37.25
			41	42	43			POF lab	36.75
			44	45	46				36.25
			47	48	49			Clarinet Clear Channel	63.75
			50	51	52				42.25
			53	54	55				41.75
			56	57	58				41.25
			59	60	61				40.75
			62	63	64				40.25
			65	66	67	68	69	TOA lab	39.75
			70	71	72				39.25
			73	74	75				38.75
			76	77	78			POF lab	38.25
			79	80	81				37.75

Code: I
Impairment: Lower First Adjacent

Test	C-1	Impulse Response				
USADR AM				1 Vp-p at attenuator input.		
Program Material		Glockenspiel		10.00 ns wide pulse		
Pulse Repetition (Hz)		Attn at TOA (dB)	(Vp-p)	Attn at POF (dB)	(Vp-p)	EO&C
100		3.25	0.69	1.75	0.82	TOA small pop or click, POF Excessive noise with some muting.
200		4.50	0.60	3.25	0.69	TOA small pop or click, POF Excessive noise with some muting.
333		5.50	0.53	4.25	0.61	TOA small pop or click, POF Excessive noise with some muting.
666		9.25	0.34	8.25	0.39	TOA small pop or click, POF Excessive noise with some muting.
1000		11.50	0.27	10.25	0.31	TOA small pop or click, POF Excessive noise with some muting.

Additional Comments:

Test Date: 26-Jul-94
Testers: DML, TK, DS

Signal Level at Receiver: -70.00 dBm

Test C-2 CW Response
USADR AM
Program Material Mozart (track 67 SQAM Disk)

Test Point	Frequency MHz	LEV 1 POF	LEV 2 POF+6	LEV 3 POF+12	Test Point	Frequency MHz	LEV 1 POF	LEV 2 POF+6	LEV 3 POF + 12
1	1.630	0	0	0	17	1.662	0	0	1
2	1.632	0	0	0	18	1.664	0	0	1
3	1.634	0	0	0	19	1.666	0	1	2
4	1.636	0	0	0	20	1.668	0	1	2
5	1.638	0	0	0	21	1.670	0	0	0
6	1.640	0	0	0	22	1.672	0	2	2
7	1.642	2	2	2	23	1.674	1	2	2
8	1.644	2	2	2	24	1.676	1	2	2
9	1.646	2	2	2	25	1.678	1	2	2
10	1.648	2	2	2	26	1.680	0	0	0
11	1.650	0	0	0	27	1.682	0	0	0
12	1.652	0	0	2	28	1.684	0	0	0
13	1.654	0	1	2	29	1.686	0	0	0
14	1.656	0	0	2	30	1.688	0	0	0
15	1.658	0	0	1	31	1.690	0	0	0
16	1.660	0	0	0					

Test Date: 7-Oct-94 0 dB Attenuator Reference: -39.5 dBm
Testers: DML, ST, EB 0=CLEAN AUDIO 1=APPROXIMATE TOA 2 ≥ POF
POF Attn=55.75 dB POF d/u= 46.95 dB

Test	C-4	Weak Signal Sensitivity
USADR AM		
Program Material		Glockenspiel

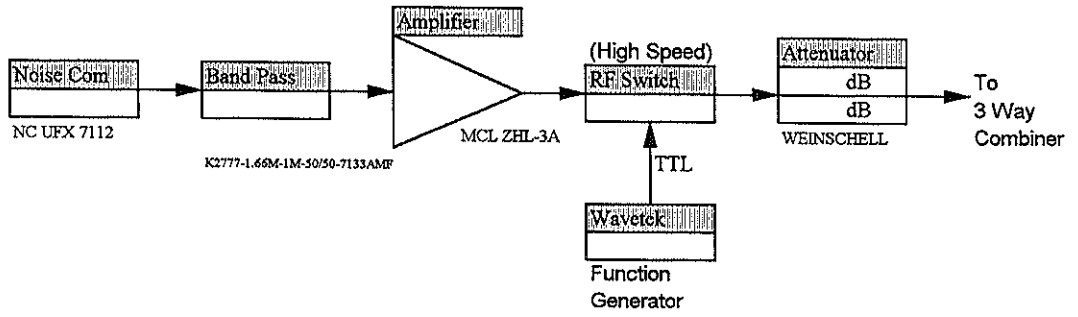
TOA (dBm)	POF (dBm)
-89 ≤ TOA < -88	-91 < POF ≤ -90

Test Date: 7-Oct-94
Testers: DML, ST, EB

Test	C-7	Environmental Noise			
USADR AM					
Program Material		Glockenspiel			
	Pulse Width	Period	Digital	EO&C	Analog
1	500 us	1.33 s	No effect		
2	1 ms	128 ms	No effect		
3	1.8 ms	68.5 ms	Pops and clicks. Level of impairment between TOA and POF.		Spark gap noise.
4	3.3 ms	1.33 s	Occasional mutes, pops and clicks. Level of impairment between TOA and POF.		Record Scatches

Test Date:	6-Dec-94					
Testers:	DML, RMc	Noise	Desired		TOA	POF
		-38.86 dBm	-48.50 dBm	ATTN	27.50	25.00

Test C-7 Environmental Noise
USADR AM



Test	D-Series Co-Channel, 1st and 2nd Adjacent				
USADR AM					
Program Material:	Glockenspiel				
	Level	Attn	D/U	Units	EO&C
D-1 Co-Channel	TOA	35.25	26.75	dB	Small pop or click.
	POF	32.25	23.75	dB	Excessive noise some muting.
D-2 Lower 1st Adjacent	TOA	41.25	32.75	dB	Small pop or click.
	POF	37.50	29.00	dB	Excessive noise some muting.
Upper 1st Adjacent	TOA	40.25	31.75	dB	Small pop or click.
	POF	36.50	28.00	dB	Excessive noise some muting.
D-3 Lower 2nd Adjacent	TOA	39.75	31.25	dB	Small drop out.
	POF	36.75	28.25	dB	Excessive noise some muting.
Upper 2nd Adjacent	TOA				Symmetry exists.
	POF				

Additional Comments:

DAT Reference: None
By Pass Simulator Configuration.

Test Date: 7-Oct-94		Desired	Undesired
Testers: DML, ST, EB	6WOUT	-6.78 dBm	
	IL	41.52 dB	
	3WIN	-48.30 dBm	-39.8 dBm

Test	E-1	Co-Channel with Fading Simulator			
USADR AM					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
With out Fader	TOA	37.25	27.75	dB	Small warble or burst of pops.
RX RF Level -61.0 dBm	POF	33.00	23.50	dB	Excessive noise with some muting.
With Fader	TOA	40.25	30.75	dB	Small warble or burst of pops.
	POF	36.00	26.50	dB	Excessive noise with some muting.

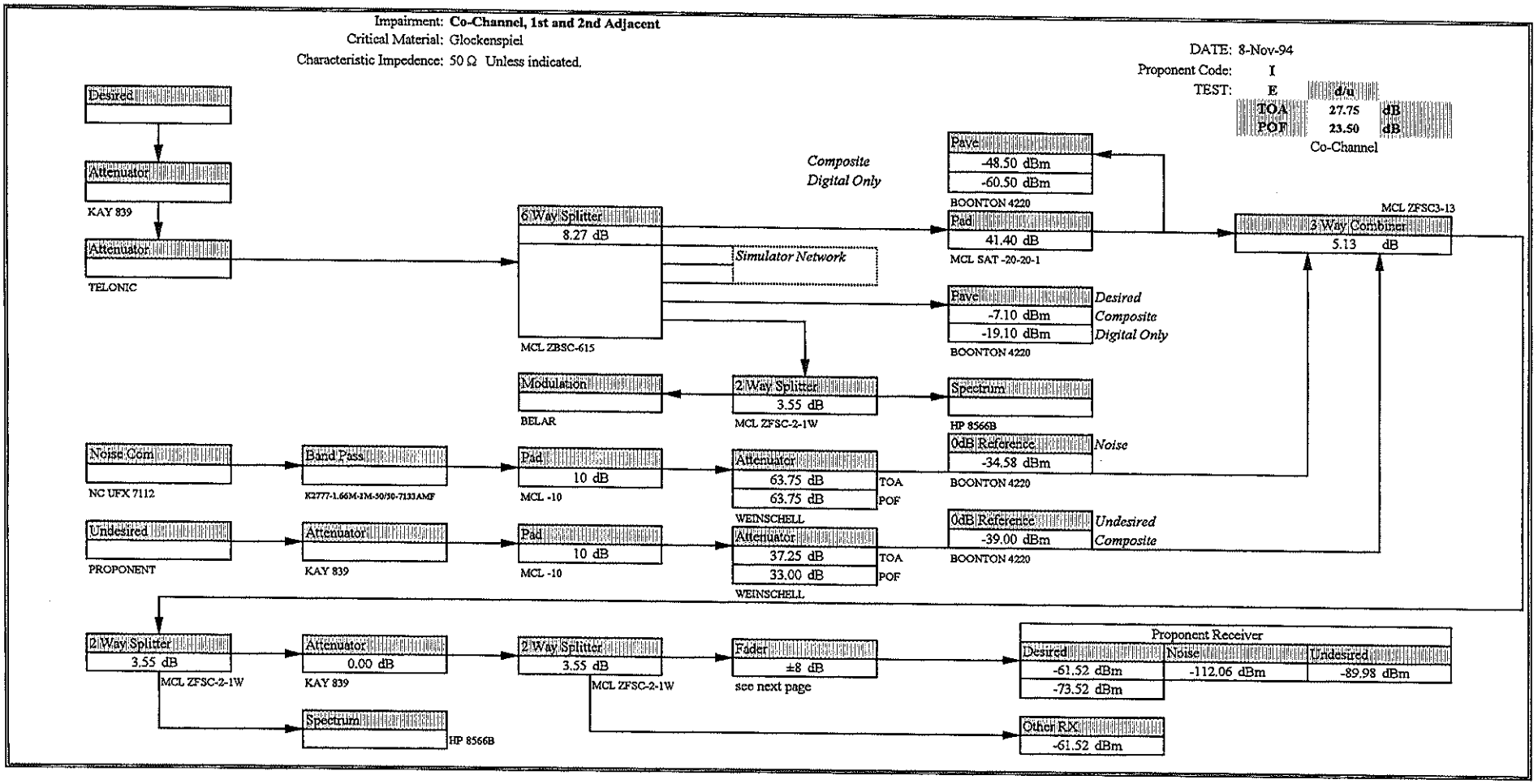
		Desired	Undesired
Test Date: 7-Dec-94			
Testers: DML, RMc	Signal	-7.10 dBm	
	IL	41.40 dB	
	3WIN	-48.50 dBm	-39.0 dBm

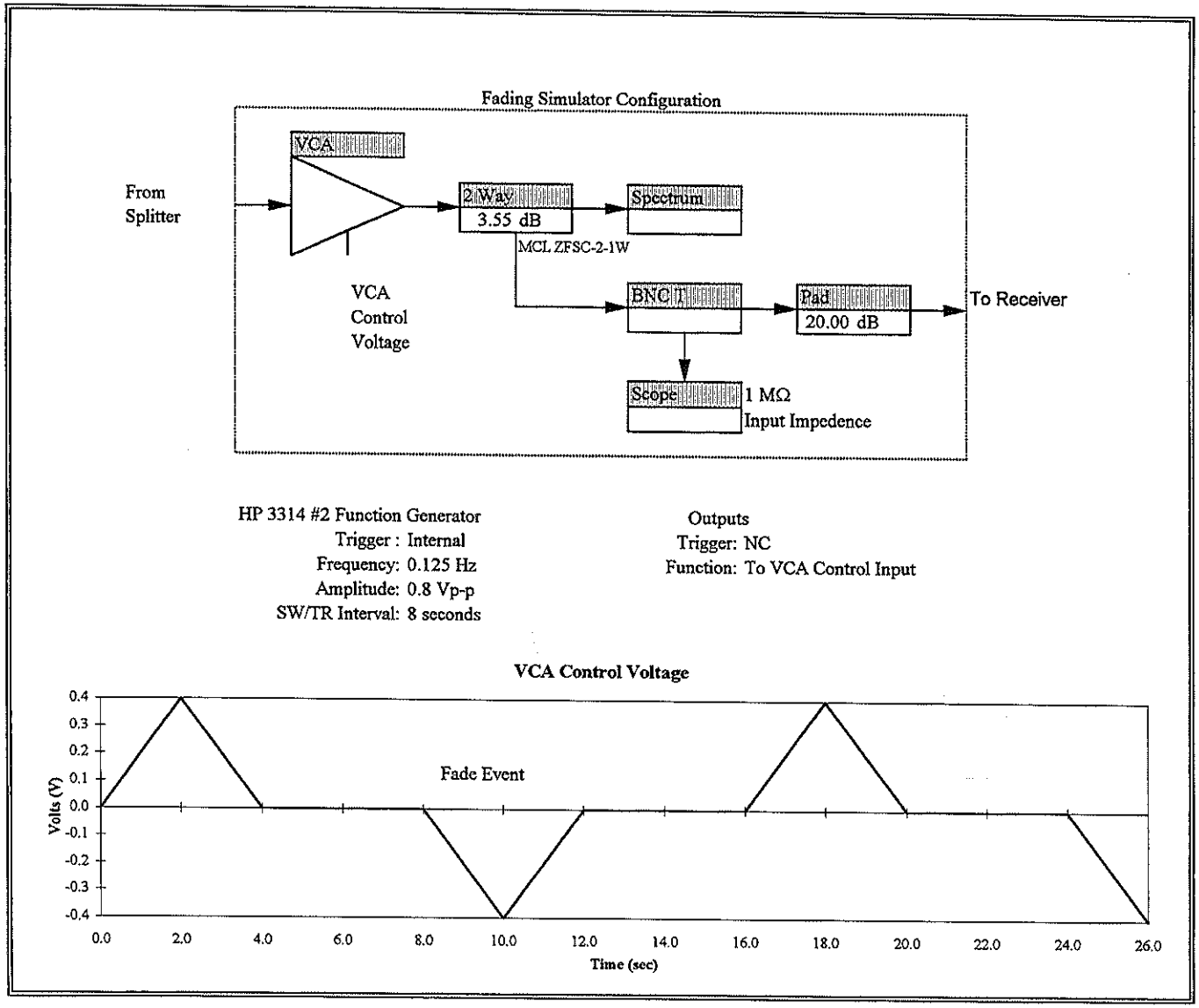
Test	E-2	Lower 1st Adjacent with Fading Simulator			
USADR AM					
Program Material:	Glockenspiel				
Scenario					
	Level	Attn	D/U	Units	EO&C
With out Fader	TOA	44.50	35.00	dB	Small burst of pops.
RX RF Level -61.0 dBm	POF	39.50	30.00	dB	Excessive noise with some muting.
With Fader	TOA	44.50	35.00	dB	Small burst of pops.
	POF	39.50	30.00	dB	Excessive noise with some muting.

		Desired	Undesired
Test Date: 7-Dec-94			
Testers: DML, RMc	Signal	-7.10 dBm	
	IL	41.40 dB	
	3WIN	-48.50 dBm	-39.0 dBm

Test	E-3	Lower 2nd Adjacent with Fading Simulator			
USADR AM					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
With out Fader	TOA	40.50	31.00	dB	Small burst of pops.
RX RF Level -61.0 dBm	POF	35.50	26.00	dB	Excessive noise with some muting.
With Fader	TOA	42.50	33.00	dB	Small burst of pops.
RX RF Level ± 8 dB	POF	37.50	28.00	dB	Excessive noise with some muting.

		Desired	Undesired
Test Date: 7-Dec-94			
Testers: DML, RMc	Signal	-7.10 dBm	
	IL	41.40 dB	
	3WIN	-48.50 dBm	-39.0 dBm


Impairment: Co-Channel, 1st and 2nd Adjacent
Critical Material: Glockenspiel
Characteristic Impedence: 50 Ω Unless indicated.
DATE: 8-Nov-94
Proponent Code: I
TEST: E
d/u
TOA 27.75 dB
POF 23.50 dB
Co-Channel
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.50 dBm
-60.50 dBm
BOONTON 4220
Pad
41.40 dB
MCL SAT-20-20-1
3 Way Combiner
5.13 dB
MCL ZFSC3-13
Pave
-7.10 dBm
-19.10 dBm
BOONTON 4220
Desired
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
K2777-1.66M-1M-50/50-7133AMF
Pad
10 dB
MCL -10
Attenuator
63.75 dB TOA
63.75 dB POF
WEINSCHELL
0dB Reference
-34.58 dBm
BOONTON 4220
Noise
Undesired
PROPONENT
Attenuator
KAY 839
Pad
10 dB
MCL -10
Attenuator
37.25 dB TOA
33.00 dB POF
WEINSCHELL
0dB Reference
-39.00 dBm
BOONTON 4220
Undesired
Composite
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Fader
±8 dB
see next page
Proponent Receiver
Desired
-61.52 dBm
-73.52 dBm
Noise
-112.06 dBm
Undesired
-89.98 dBm
Spectrum
HP 8566B
Other RX
-61.52 dBm


Fading Simulator Configuration
From Splitter
VCA
VCA Control Voltage
2 Way 3.55 dB
MCL ZFSC-2-1W
Spectrum
BNC T
Pad 20.00 dB
To Receiver
Scope
1 MΩ Input Impedence
HP 3314 #2 Function Generator
Trigger : Internal
Frequency: 0.125 Hz
Amplitude: 0.8 Vp-p
SW/TR Interval: 8 seconds
Outputs
Trigger: NC
Function: To VCA Control Input
VCA Control Voltage
Fade Event
Volts (V)
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
Time (sec)

Test J-1 Re-Acquisition
USADR AM
Program Material Mozart (Track 67 on SQAM disk)

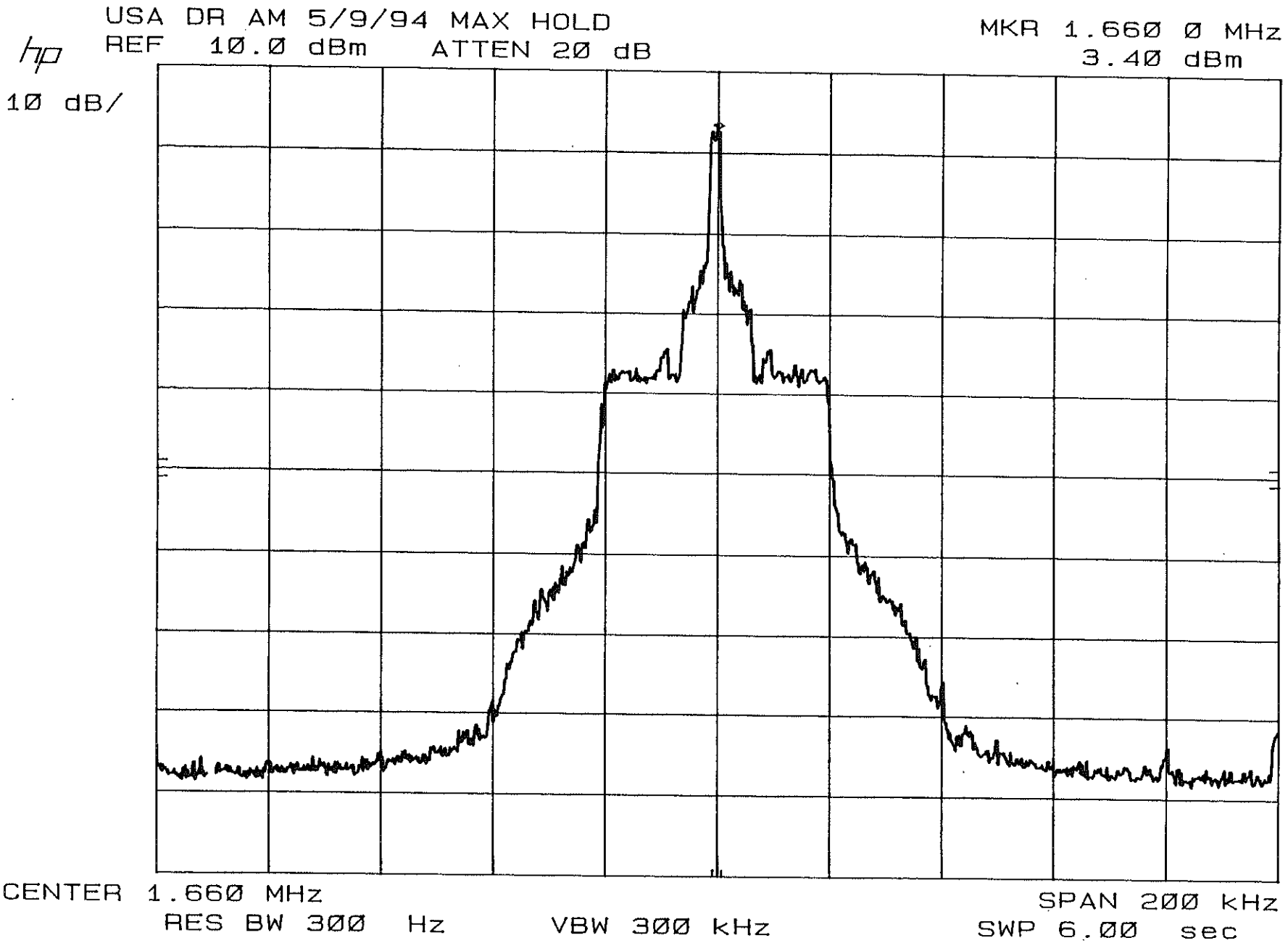
Toff (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
30	3	3	4
	6	3	3
	4	5	3
	3	3	4
	6	3	4
Average	4.4	3.4	3.6

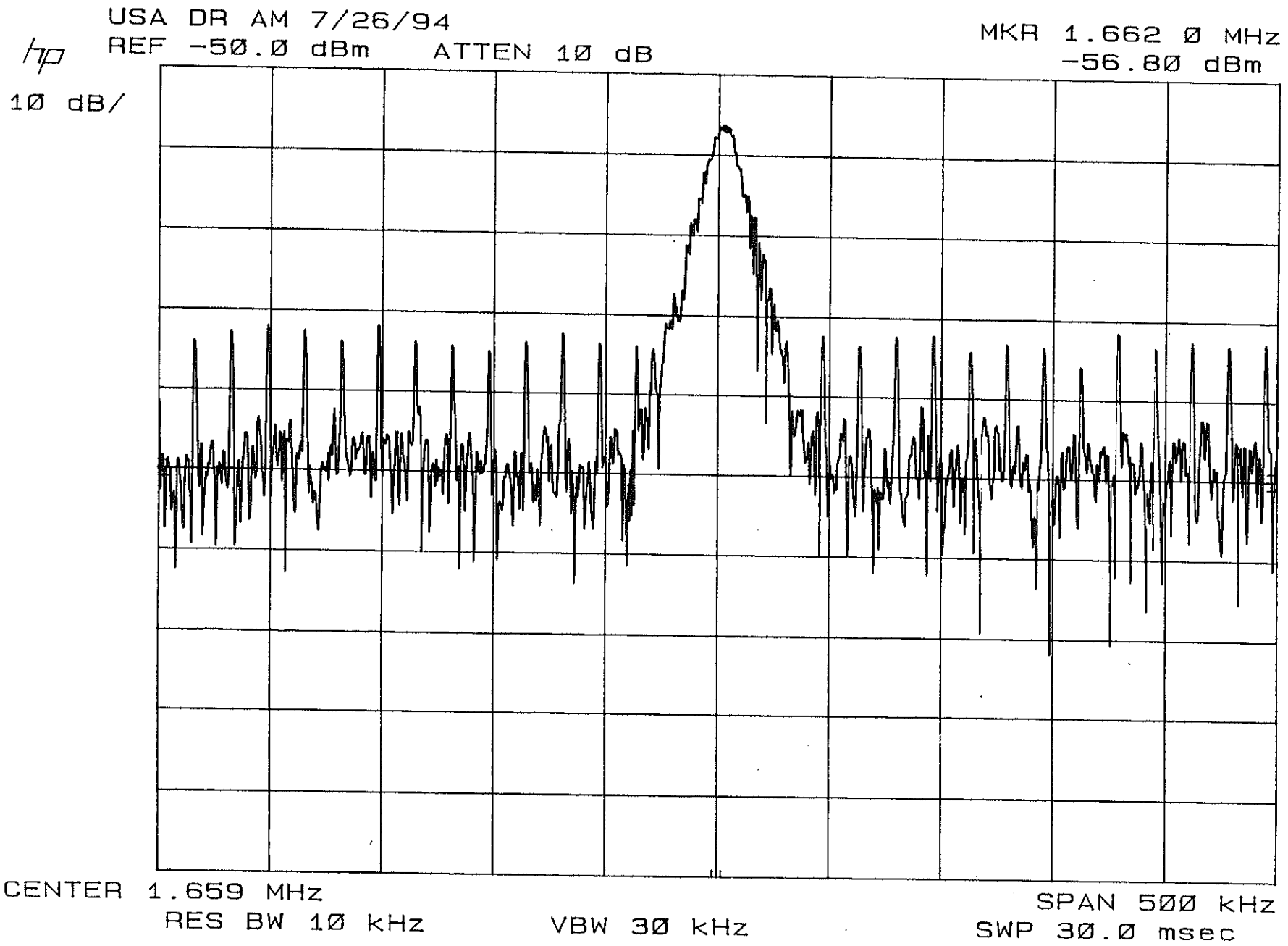
POF Attenuator Setting : 13.25 dB
Desired Signal Level : -48.30 dBm
Noise 0 dB Reference : -34.78 dBm

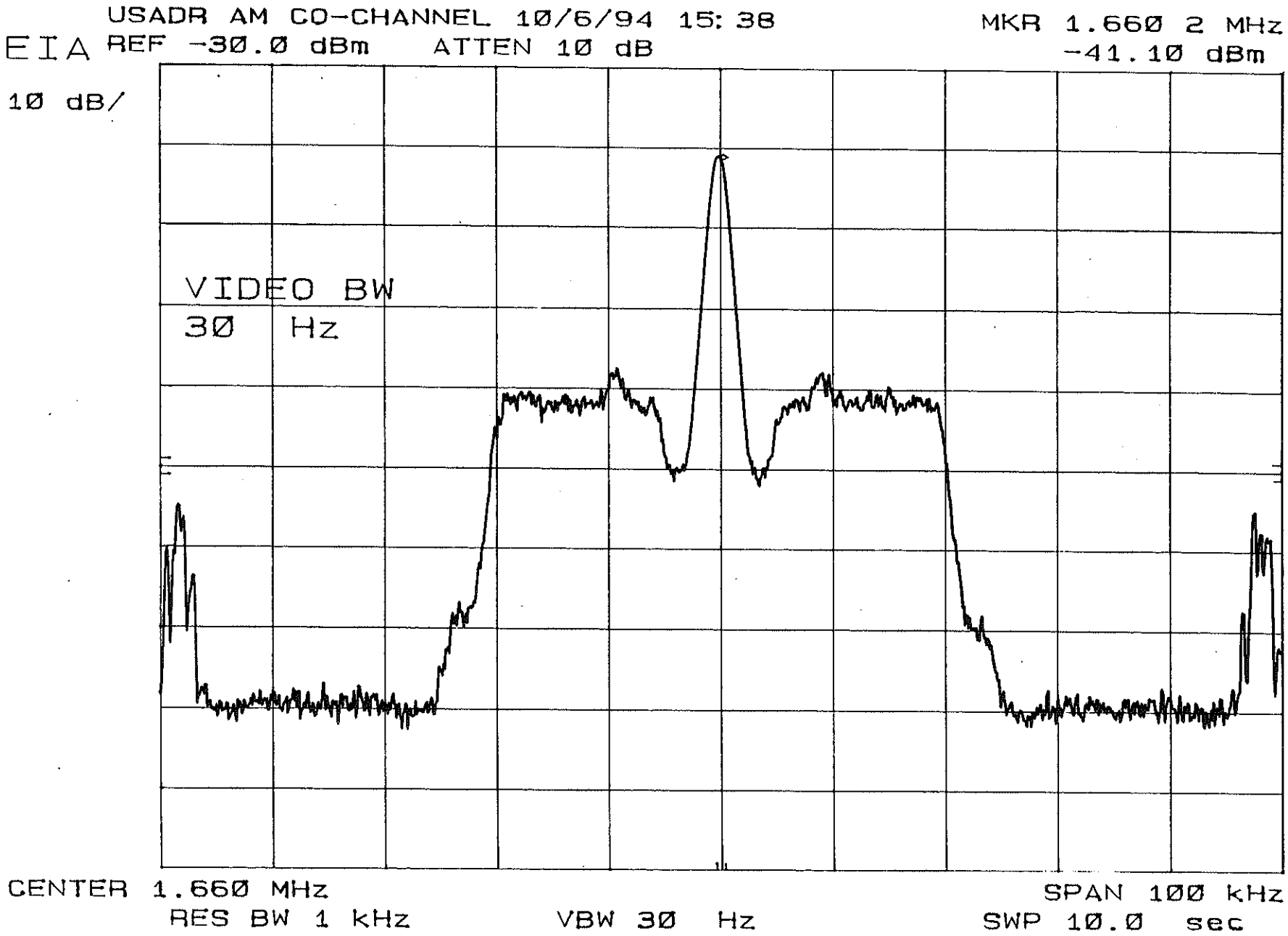
Additional Comments:

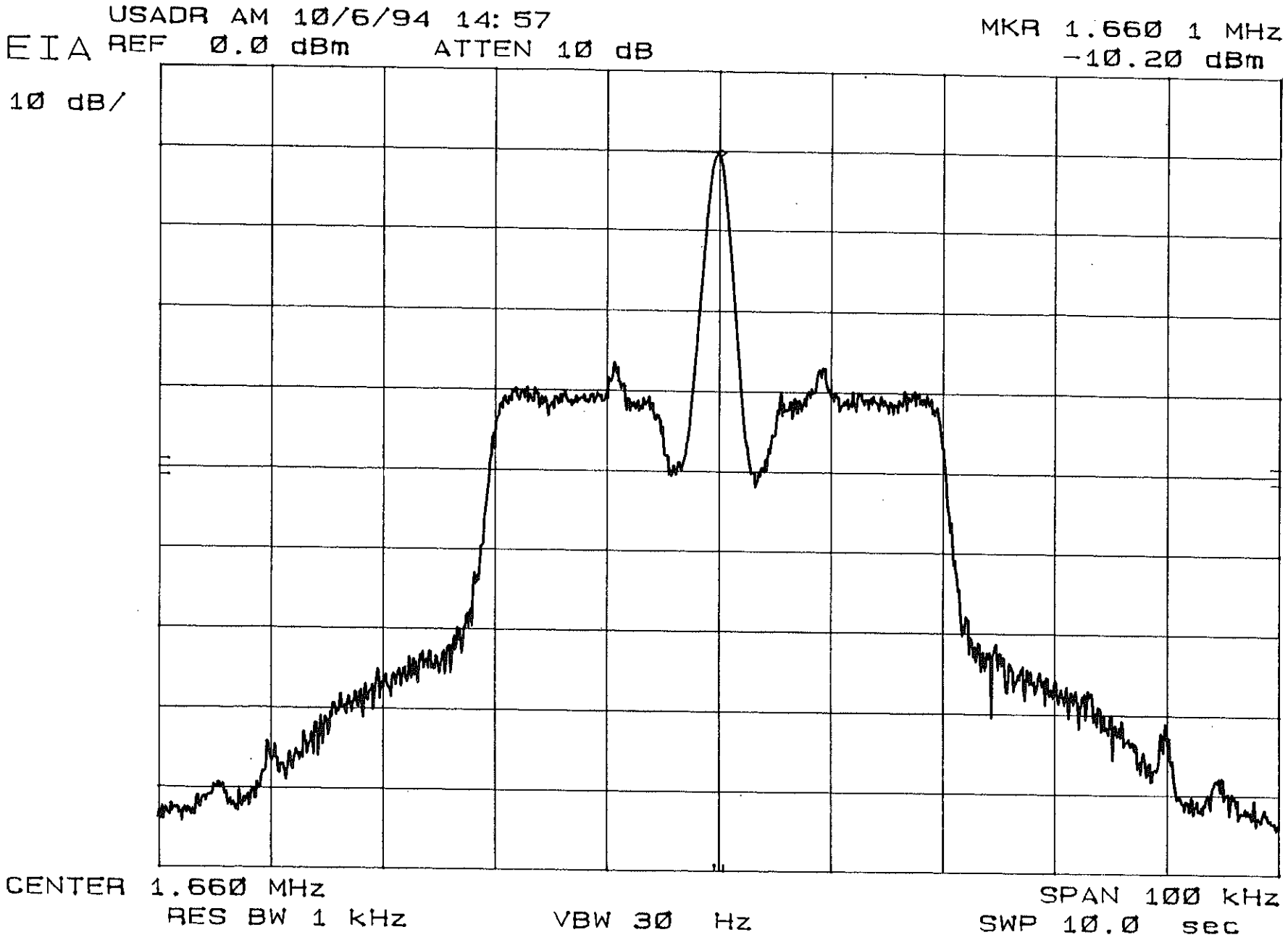
Re-Acquisition time is the value listed ± 0.5 seconds.

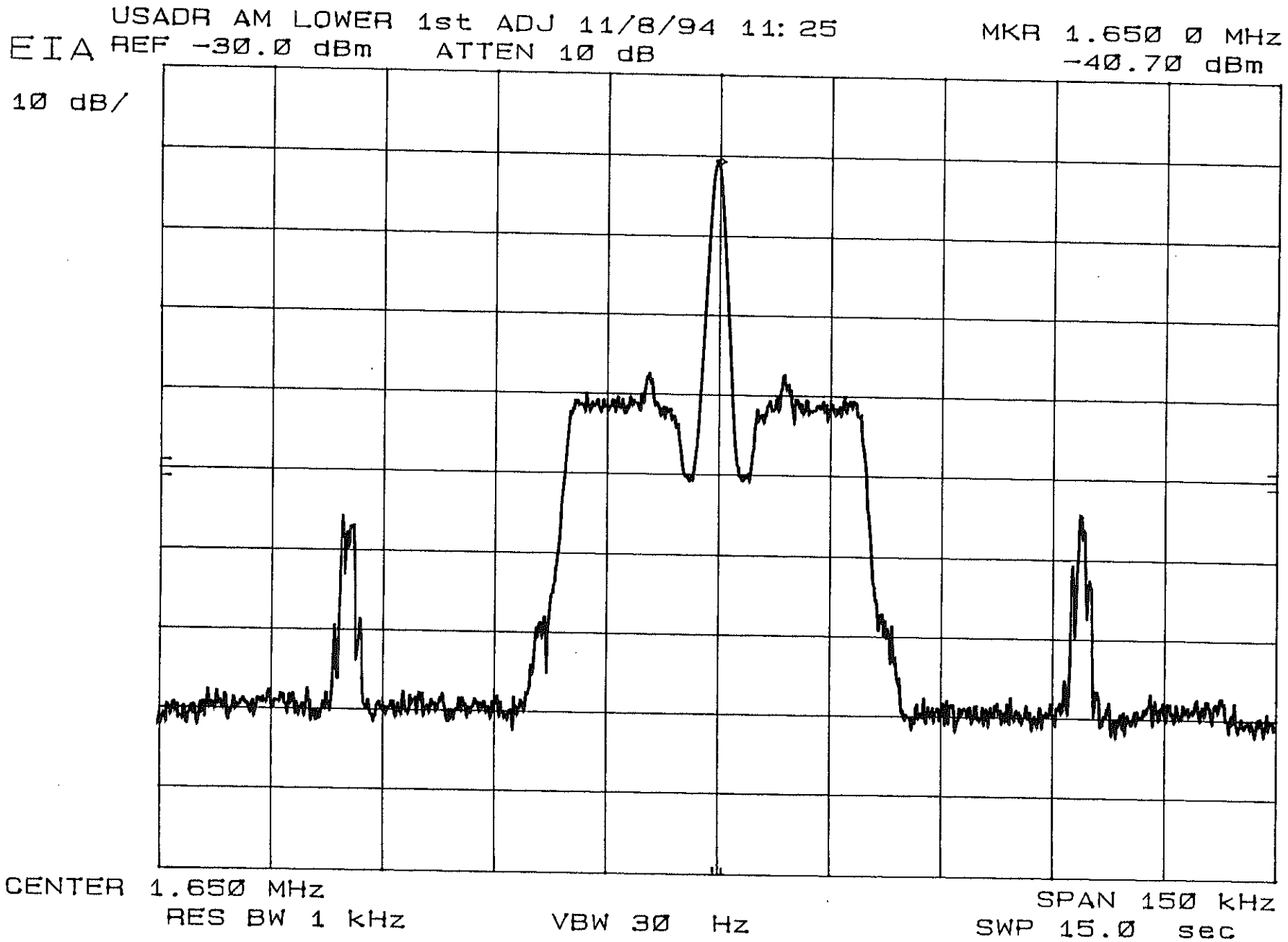
Test Date: 7-Oct-94
Testers: DML, ST, EB

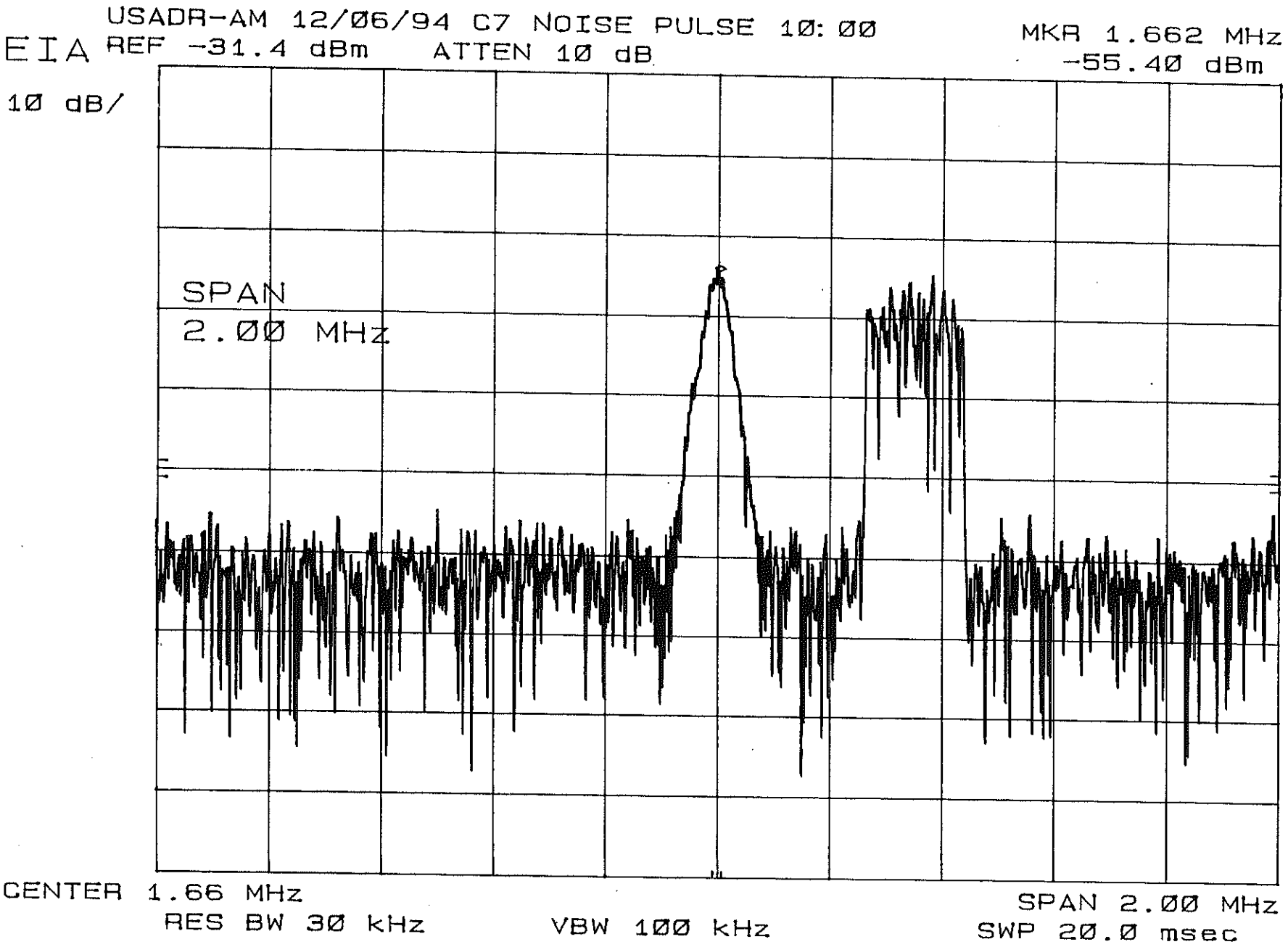

USA DR AM 5/9/94 MAX HOLD
REF 10.0 dBm ATTEN 20 dB
MKR 1.660 0 MHz
3.40 dBm
10 dB/
CENTER 1.660 MHz
RES BW 300 Hz
VBW 300 kHz
SPAN 200 kHz
SWP 6.00 sec

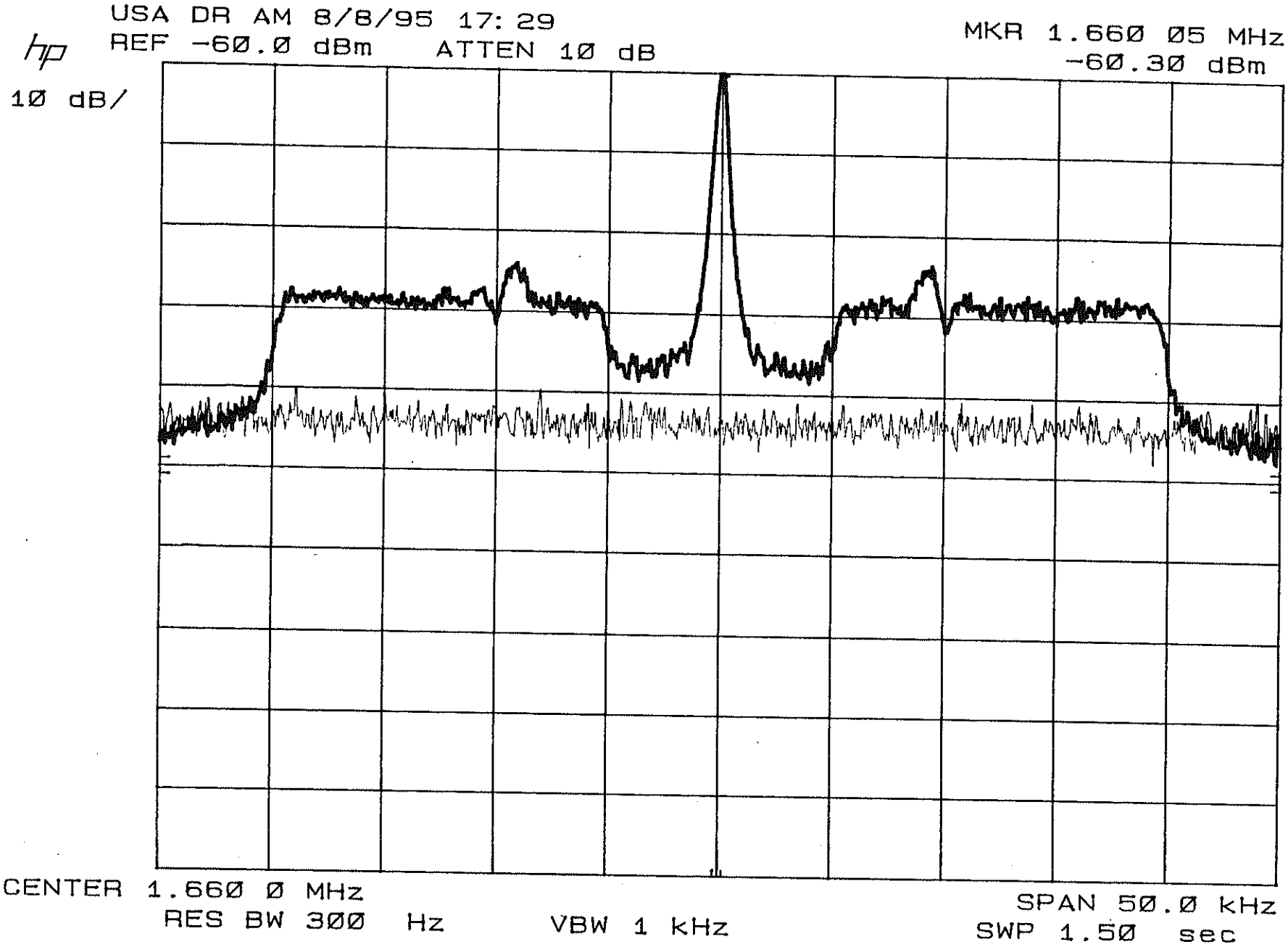

USA DR AM 7/26/94
REF -50.0 dBm
ATTEN 10 dB
MKR 1.662 0 MHz
-56.80 dBm
10 dB/
CENTER 1.659 MHz
RES BW 10 kHz
VBW 30 kHz
SPAN 500 kHz
SWP 30.0 msec

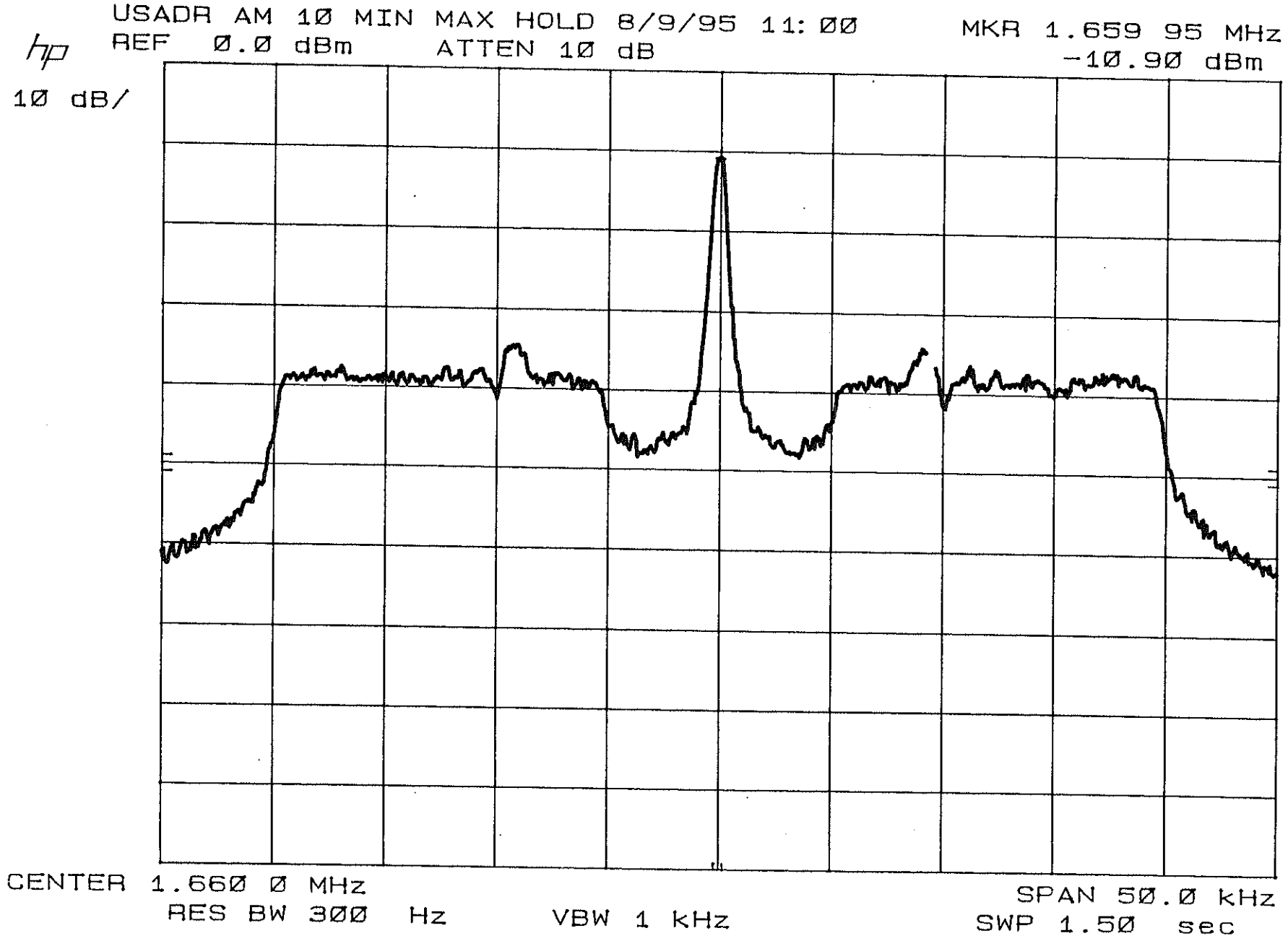

USADR AM CO-CHANNEL 10/6/94 15:38
EIA REF -30.0 dBm ATTEN 10 dB
MKR 1.660 2 MHz
-41.10 dBm
10 dB/
VIDEO BW
30 Hz
CENTER 1.660 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 100 kHz
SWP 10.0 sec

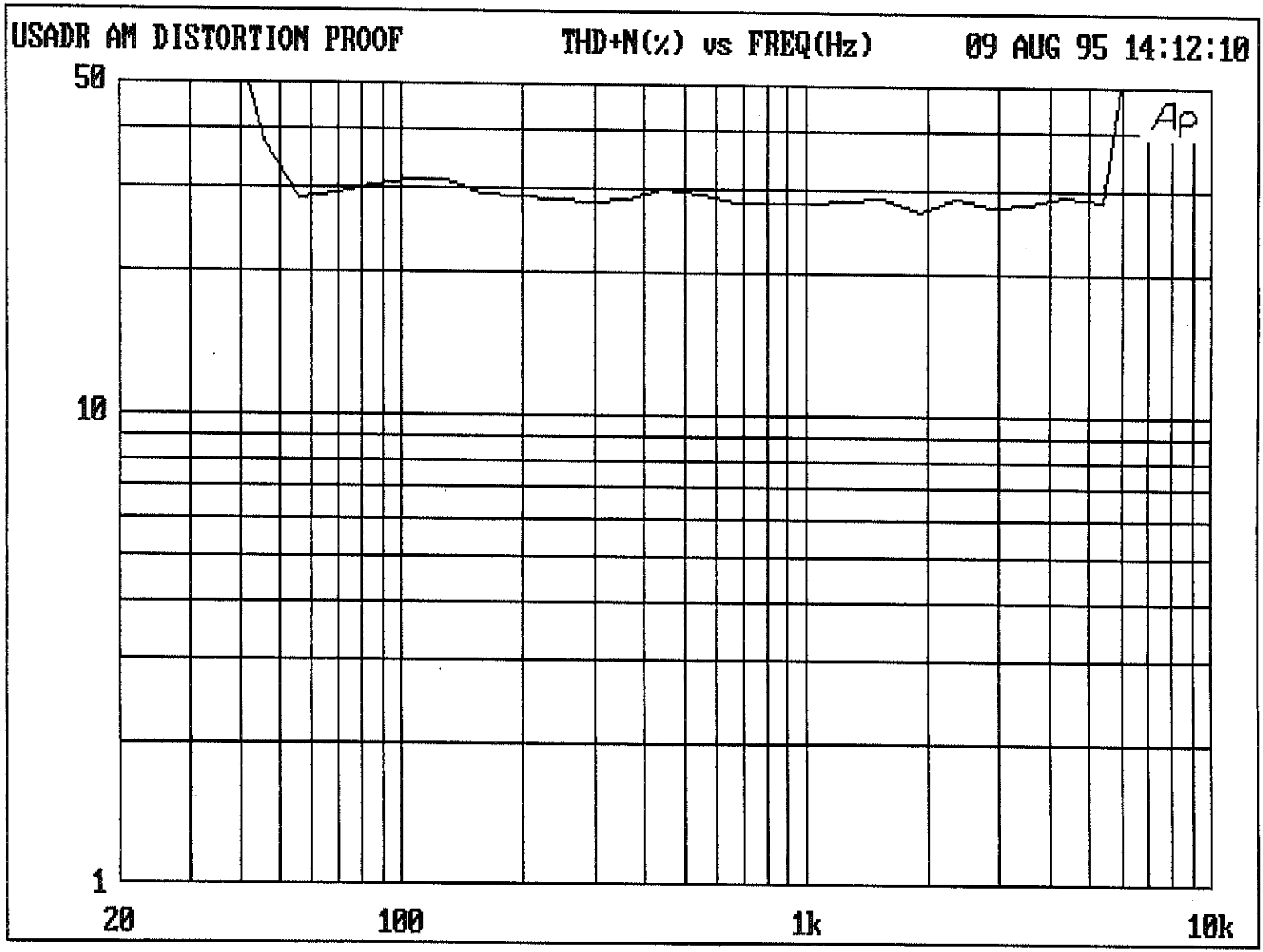

USADR AM 10/6/94 14:57
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 1.660 1 MHz
-10.20 dBm
10 dB/
CENTER 1.660 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 100 kHz
SWP 10.0 sec

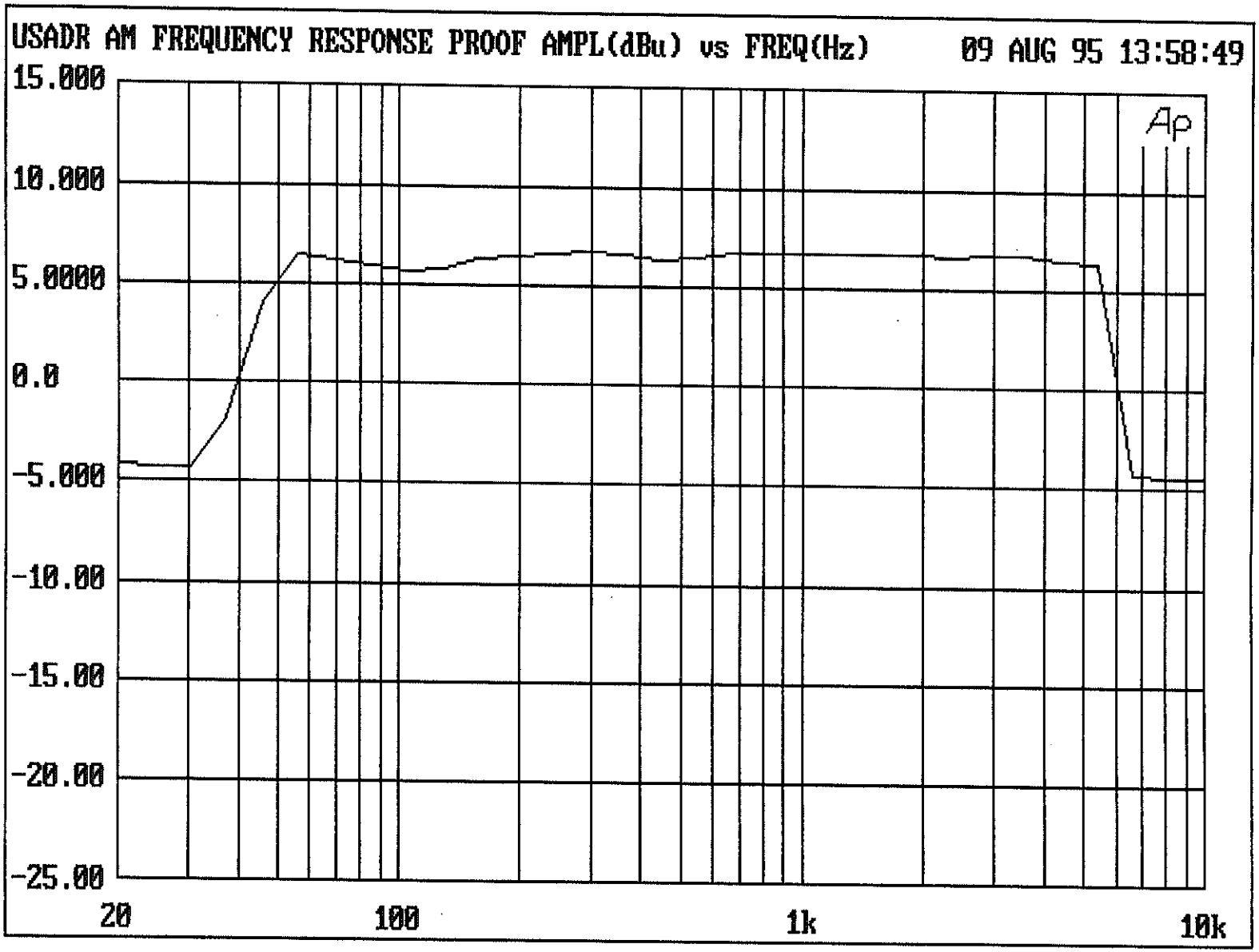

USADR AM LOWER 1st ADJ 11/8/94 11:25
EIA REF -30.0 dBm ATTEN 10 dB
MKR 1.650 0 MHz
-40.70 dBm
10 dB/
CENTER 1.650 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 150 kHz
SWP 15.0 sec


USADR-AM 12/06/94 C7 NOISE PULSE 10:00
EIA REF -31.4 dBm ATTEN 10 dB
MKR 1.662 MHz
-55.40 dBm
10 dB/
SPAN
2.00 MHz
CENTER 1.66 MHz
RES BW 30 kHz
VBW 100 kHz
SPAN 2.00 MHz
SWP 20.0 msec


USA DR AM 8/8/95 17:29
REF -60.0 dBm ATTEN 10 dB
MKR 1.660 05 MHz
-60.30 dBm
10 dB/
CENTER 1.660 0 MHz
RES BW 300 Hz
VBW 1 kHz
SPAN 50.0 kHz
SWP 1.50 sec


USADR AM 10 MIN MAX HOLD 8/9/95 11:00
REF 0.0 dBm
ATTEN 10 dB
MKR 1.659 95 MHz
-10.90 dBm
10 dB/
CENTER 1.660 0 MHz
RES BW 300 Hz
VBW 1 kHz
SPAN 50.0 kHz
SWP 1.50 sec


USADR AM DISTORTION PROOF
THD+N(%) vs FREQ(Hz)
09 AUG 95 14:12:10
50
10
1
20
100
1k
10k
Ap


USADR AM FREQUENCY RESPONSE PROOF AMPL(dBu) vs FREQ(Hz)
09 AUG 95 13:58:49
15.000
10.000
5.0000
0.0
-5.000
-10.00
-15.00
-20.00
-25.00
20
100
1k
10k
Ap

APPENDIX AK

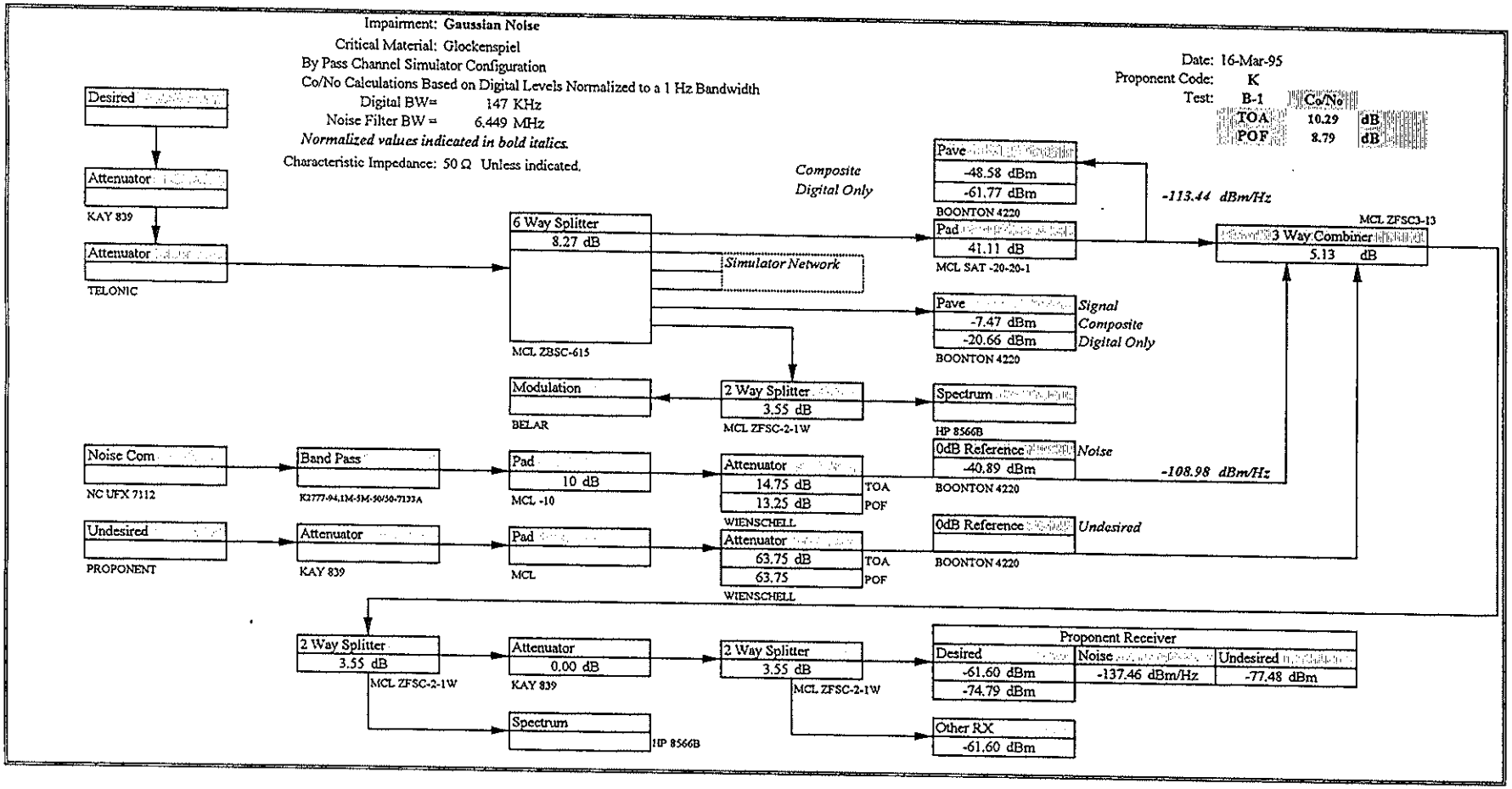
Digital Test Results AT&T/Amati IBOC DSB Revision B

EIA Digital Audio Radio Test Laboratory

Proponent:	**AT&T Amati DSB Rev B.**
Code:	K
Digital Band Width:	1.47E+05 Hz
Composite Band Width:	4.00E+05 Hz
Peak/Average Composite:	3.09 dB
Peak/Average Digital:	11.76 dB

Test	B-1	Gaussian Noise		Units
Propnent Code:	K			
Material				
Glockenspiel		TOA	POF	
	Attenuator	14.75	13.25	dB
	Co/No	10.29	8.79	dB
EO&C	TOA	Small drop out.		
	POF	Many small and medium duration drop outs.		
Soprano				
	Attenuator	14.50	13.25	dB
	Co/No	10.04	8.79	dB
EO&C	TOA	Small drop out.		
	POF	Many small and medium duration drop outs.		
Clarinet				
	Attenuator	14.50	13.25	dB
	Co/No	10.04	8.79	dB
EO&C	TOA	Small drop out.		
	POF	Many small and medium duration drop outs.		

Notes:		
	Recording Reference:	DAR30223.DAT
	Testers:	DML,RMC
	Date:	16-Mar-95


Impairment: Gaussian Noise
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Co/No Calculations Based on Digital Levels Normalized to a 1 Hz Bandwidth
Digital BW= 147 KHz
Noise Filter BW = 6.449 MHz
Normalized values indicated in bold italics.
Characteristic Impedance: 50 Ω Unless indicated.
Date: 16-Mar-95
Proponent Code: K
Test: B-1
Co/No
TOA 10.29 dB
POF 8.79 dB
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.58 dBm
-61.77 dBm
BOONTON 4220
-113.44 dBm/Hz
Pad
41.11 dB
MCL SAT -20-20-1
MCL ZFSC3-13
3 Way Combiner
5.13 dB
Pave
-7.47 dBm
-20.66 dBm
BOONTON 4220
Signal
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
K2777-94,1M-5M-50/50-7133A
Pad
10 dB
MCL -10
Attenuator
14.75 dB
13.25 dB
WIENSCHELL
TOA
POF
0dB Reference
-40.89 dBm
BOONTON 4220
Noise
-108.98 dBm/Hz
Undesired
PROPONENT
Attenuator
KAY 839
Pad
MCL
Attenuator
63.75 dB
63.75
WIENSCHELL
TOA
POF
0dB Reference
BOONTON 4220
Undesired
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Proponent Receiver
Desired
-61.60 dBm
-74.79 dBm
Noise
-137.46 dBm/Hz
Undesired
-77.48 dBm
Spectrum
HP 8566B
Other RX
-61.60 dBm

EIA Digital Audio Radio Test Laboratory

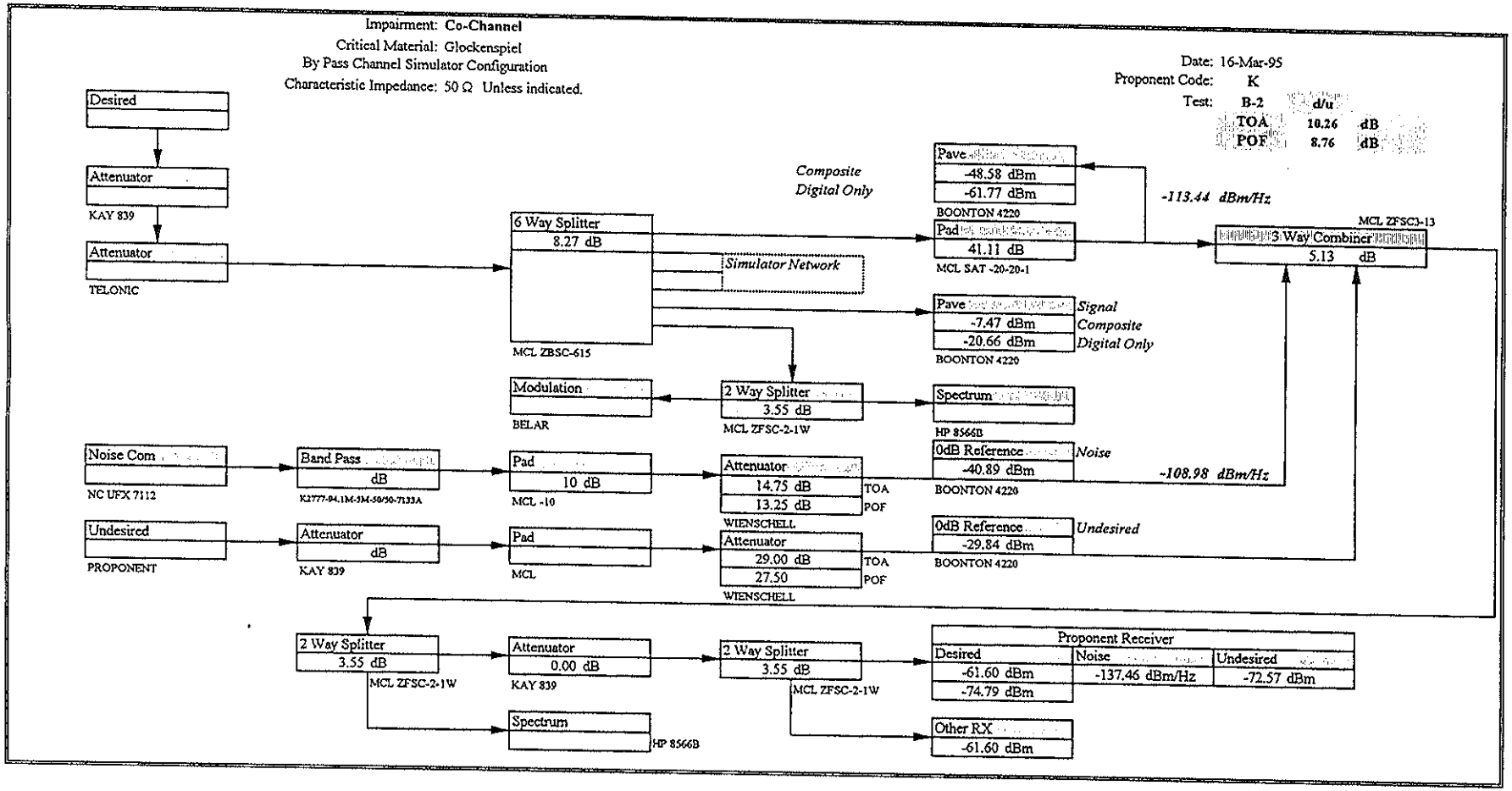
DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30223.DAT			1	2	3			Glockenspiel Clear Channel	63.75
16-Mar-95			4	5	6				16.25
			7	8	9				15.75
			10	11	12				15.25
			13	14	15	16	17	TOA lab	14.75
			18	19	20				14.25
			21	22	23				13.75
			24	25	26			POF lab	13.25
			27	28	29				12.75
			30	31	32			Soprano Clear Channel	63.75
			33	34	35				16.00
			36	37	38				15.50
			39	40	41				15.00
			42	43	44			TOA lab	14.50
			45	46	47				14.00
			48	49	50				13.50
			51	52	53			POF lab	13.25
			54	55	56				12.75
			57	58	59			Clarinet Clear Channel	63.75
			60	61	62				16.00
			63	64	65				15.50
			66	67	68				15.00
			69	70	71			TOA lab	14.50
			72	73	74				14.00
			75	76	77				13.50
			78	79	80			POF lab	13.25
			81	82	83				12.75

Proponent Code: K

Impairment: Gaussian Noise

EIA Digital Audio Radio Test Laboratory

Test	B-2	Co-Channel		
Propnent Code:	K			
Material				Units
Glockenspiel		TOA	POF	
	Attenuator	29.00	27.50	dB
	d/u	10.26	8.76	dB
EO&C	TOA	Small flutter or drop out.		
	POF	Many small to medium duration drop outs.		
Soprano		TOA	POF	
	Attenuator	28.50	27.75	dB
	d/u	9.76	9.01	dB
EO&C	TOA	Flutter or small drop outs.		
	POF	Many small to medium duration drop outs.		
Clarinet		TOA	POF	
	Attenuator	28.75	27.75	dB
	d/u	10.01	9.01	dB
EO&C	TOA	Small drop outs.		
	POF	Many small to medium duration drop outs.		
Notes:	Recording Reference:	DAR30245.DAT		
	Testers:	DML,RMC		
	Date:	16-Mar-95		


Impairment: Co-Channel
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Characteristic Impedance: 50 Ω Unless indicated.
Date: 16-Mar-95
Proponent Code: K
Test: B-2 d/u
TOA 10.26 dB
POF 8.76 dB
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.58 dBm
-61.77 dBm
BOONTON 4220
-113.44 dBm/Hz
Pad
41.11 dB
MCL SAT -20-20-1
3 Way Combiner
5.13 dB
MCL ZFSC-3-13
Pave
-7.47 dBm
-20.66 dBm
BOONTON 4220
Signal
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
dB
K2777-94.1M-5M-50/50-7133A
Pad
10 dB
MCL -10
Attenuator
14.75 dB
13.25 dB
TOA
POF
WIENSCHELL
0dB Reference
-40.89 dBm
BOONTON 4220
Noise
-108.98 dBm/Hz
Undesired
PROPONENT
Attenuator
dB
KAY 839
Pad
MCL
Attenuator
29.00 dB
27.50
TOA
POF
WIENSCHELL
0dB Reference
-29.84 dBm
BOONTON 4220
Undesired
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Proponent Receiver
Desired
-61.60 dBm
-74.79 dBm
Noise
-137.46 dBm/Hz
Undesired
-72.57 dBm
Spectrum
HP 8566B
Other RX
-61.60 dBm

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30245.DAT			1	2	3			Glockenspiel Clear Channel	63.75
16-Mar-95			4	5	6				30.50
			7	8	9				30.00
			10	11	12				29.50
			13	14	15			TOA lab	29.00
			16	17	18				28.50
			19	20	21				28.00
			22	23	24			POF lab	27.50
			25	26	27				27.00
			28	29	30			Soprano Clear Channel	63.75
			31	32	33				30.00
			34	35	36				29.50
			37	38	39				29.00
			40	41	42			TOA lab	28.50
			43	44	45				28.25
			46	47	48				28.00
			49	50	51			POF lab	27.75
			52	53	54				27.50
			55	56	57			Clarinet Clear Channel	63.75
			58	59	60				30.25
			61	62	63				29.75
			64	65	66				29.25
			67	68	69			TOA lab	28.75
			70	71	72				28.25
			73	74	75				28.00
			76	77	78			POF lab	27.75
			79	80	81				27.50

Proponent Code: K

Impairment: Co-Channel

Test	B-3	Urban Slow Rayleigh		Units
Propnent Code:	K			
Glockenspiel		TOA	POF	
	Attenuator	38.00	28.00	dB
	Co/No	33.94	23.94	dB
EO&C	TOA	Small drop out.		
	POF	Excessive Muting		
Soprano		TOA	POF	
	Attenuator	37.00	28.00	dB
	Co/No	32.94	23.94	dB
EO&C	TOA	#36 Unconfirmed flutter on "do", #39 obvious drop out.		
	POF	Excessive Muting		
Clarinet		TOA	POF	
	Attenuator	37.00	28.00	dB
	Co/No	32.94	23.94	dB
EO&C	TOA	Small drop out.		
	POF	Excessive Muting		

Notes:
Recording Reference: DAR30305.DAT
Impairment: Multipath with Gaussian Noise
Testers: DML,RMC
Test Date: 21-Apr-95

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30305.DAT			1	2	3	4	5	Glockenspiel No Added Noise	63.75
21-Apr-95			6	7	8				39.00
			9	10	11			TOA lab	38.00
			12	13	14				37.00
			15	16	17				34.00
			18	19	20				31.00
			21	22	23			POF lab	28.00
			24	25	26	27	28	Soprano No Added Noise	63.75
			29	30	31				39.00
			32	33	34				38.00
			35	36	37	38	39	TOA lab	37.00
			40	41	42				34.00
			43	44	45				31.00
			46	47	48			POF lab	28.00
			49	50	51			Clarinet No Added Noise	63.75
			52	53	54				39.00
			55	56	57				38.00
			58	59				DISREGARD 49-59	
			60	61	62	63	64	Clarinet No Added Noise	63.75
			65	66	67				39.00
			68	69	70			TOA lab	38.00
			71	72	73				37.00
			74	75	76				34.00
			77	78	79				31.00
			80	81	82			POF lab	28.00

Proponent Code: K
Impairment: Urban Slow Rayleigh

Test	B-3	Urban Fast Rayleigh		Units
Propnent Code:	K			
Glockenspiel		TOA	POF	
	Attenuator	27.00	23.00	dB
	Co/No	22.94	18.94	dB
EO&C	TOA	Small Flutter		
	POF	Excessive Muting		
Soprano		TOA	POF	
	Attenuator	27.00	23.00	dB
	Co/No	22.94	18.94	dB
EO&C	TOA	Small Break or Flutter		
	POF	Excessive Muting		
Clarinet		TOA	POF	
	Attenuator	27.00	23.00	dB
	Co/No	22.94	18.94	dB
EO&C	TOA	Small Drop Out		
	POF	Excessive Muting		

Notes:
Recording Reference: DAR30306.DAT
Impairment: Multipath with Gaussian Noise
Testers: DML,RMC
Test Date: 21-Apr-95

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30306.DAT			1	2	3	4	5	Glockenspiel No Added Noise	63.75
21-Apr-95			6	7	8				29.00
			9	10	11				28.00
			12	13	14			TOA lab	27.00
			15	16	17				26.00
			18	19	20				24.00
			21	22	23			POF lab	23.00
			24	25	26	27	28	Soprano No Added Noise	63.75
			29	30	31				29.00
			32	33	34				28.00
			35	36	37			TOA lab	27.00
			38	39	40				26.00
			41	42	43				24.00
			44	45	46			POF lab	23.00
			47	48	49	50	51	Clarinet No Added Noise	63.75
			52	53	54				29.00
			55	56	57				28.00
			58	59	60			TOA lab	27.00
			61	62	63				26.00
			64	65	66				24.00
			67	68	69			POF lab	23.00

Proponent Code: K
Impairment: Urban Fast Rayleigh

Test	B-3	Rural Fast Rayleigh		Units
Propnent Code:	K			
Glockenspiel		TOA	POF	
	Attenuator	32.00	27.00	dB
	Co/No	27.94	22.94	dB
EO&C	TOA	Small Drop Out		
	POF	Excessive Muting		
Soprano		TOA	POF	
	Attenuator	31.00	27.00	dB
	Co/No	26.94	22.94	dB
EO&C	TOA	Small Drop Out		
	POF	Excessive Muting and Overloads.		
Clarinet		TOA	POF	
	Attenuator	31.00	27.00	dB
	Co/No	26.94	22.94	dB
EO&C	TOA	Small Drop Out		
	POF	Excessive Muting and Overloads.		

Notes:
Recording Reference: DAR30307.DAT
Impairment: Multipath with Gaussian Noise
Testers: DML,RMC
Test Date: 21-Apr-95

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30307.DAT			1	2	3	4	5	Glockenspiel No Added Noise	63.75
21-Apr-95			6	7	8				34.00
			9	10	11				33.00
			12	13	14			TOA lab	32.00
			15	16	17				31.00
			18	19	20				30.00
			21	22	23				29.00
			24	25	26				28.00
			27	28	29			POF lab	27.00
			30	31	32	33	34	Soprano No Added Noise	63.75
			35	36	37				34.00
			38	39	40				33.00
			41	42	43				32.00
			44	45	46			TOA lab	31.00
			47	48	49				30.00
			50	51	52				29.00
			53	54	55				28.00
			56	57	58			POF lab	27.00
			59	60	61	62	63	Clarinet No Added Noise	63.75
			64	65	66				34.00
			67	68	69				33.00
			70	71	72				32.00
			73	74	75			TOA lab	31.00
			76	77	78				30.00
			79	80	81				29.00
			82	83	84				28.00
			85	86	87			POF lab	27.00

Proponent Code: K
Impairment: Rural Fast Rayleigh

Test	B-3	Terrain Obstructed Rayleigh		Units
Propnent Code:	K			
Material				
Glockenspiel		TOA	POF	
	Attenuator	30.00	26.00	dB
	Co/No	25.94	21.94	dB
EO&C	TOA	Small Flutter		
	POF	Excessive Muting, Overloads		
Soprano		TOA	POF	
	Attenuator	29.00	25.00	dB
	Co/No	24.94	20.94	dB
EO&C	TOA	Drop Out		
	POF	Excessive muting.		
Clarinet		TOA	POF	
	Attenuator	30.00	25.00	dB
	Co/No	25.94	20.94	dB
EO&C	TOA	Small Drop Out		
	POF	Many Drop Outs		

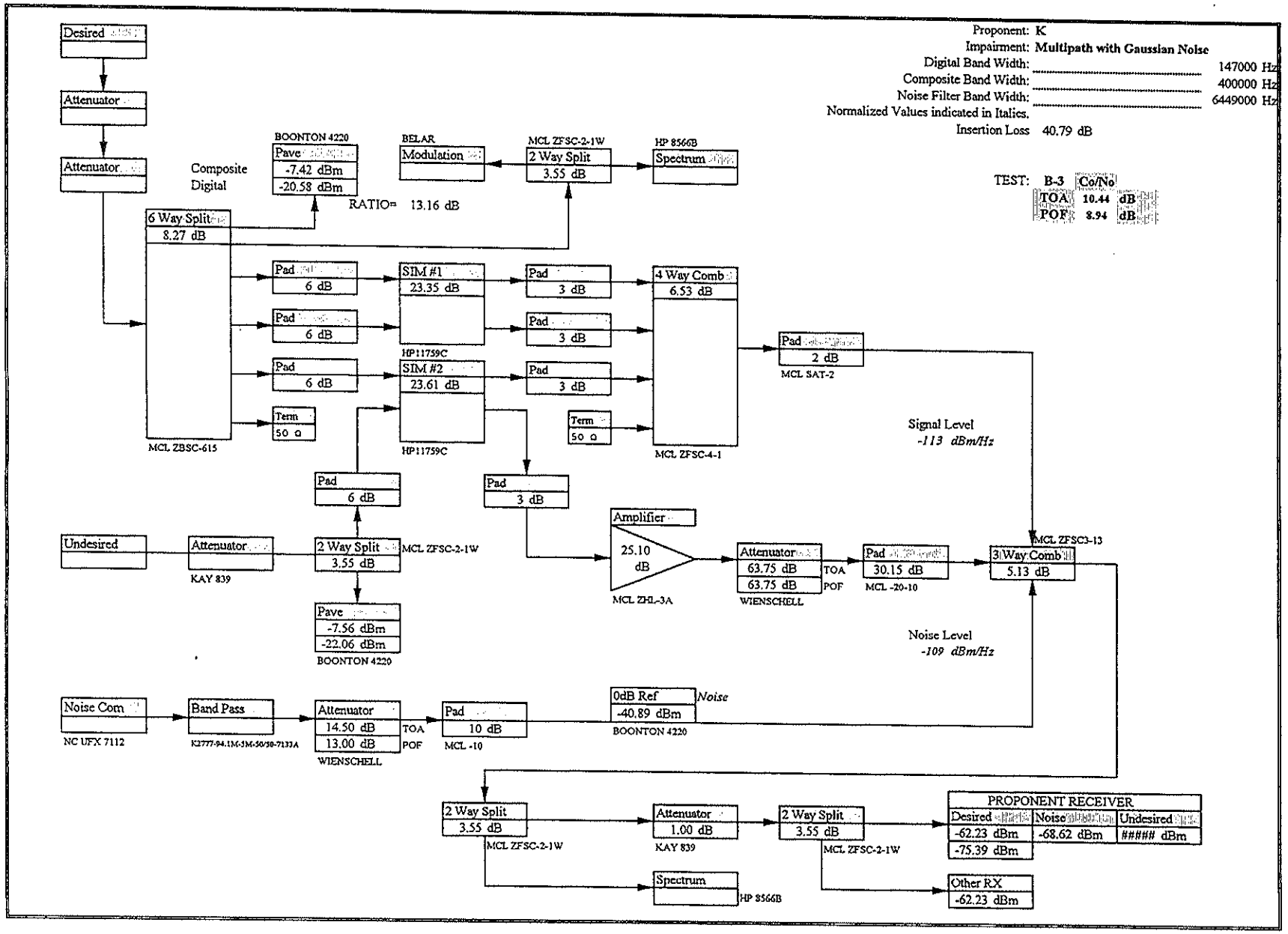
Notes:
Recording Reference: DAR30308.DAT
Impairment: Multipath with Gaussian Noise
Testers: DML,RMC
Test Date: 21-Apr-95

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30308.DAT			1	2	3	4	5	Glockenspiel No Added Noise	63.75
21-Apr-95			6	7	8				34.00
			9	10	11				33.00
			12	13	14				32.00
			15	16	17				31.00
			18	19	20			TOA lab	30.00
			21	22	23				29.00
			24	25	26				28.00
			27	28	29				27.00
			30	31	32			POF lab	26.00
			33	34	35	36	37	Soprano No Added Noise	63.75
			38	39	40				33.00
			41	42	43				32.00
			44	45	46				31.00
			47	48	49				30.00
			50	51	52			TOA lab	29.00
			53	54	55				28.00
			56	57	58				27.00
			59	60	61				26.00
			62	63	64			POF lab	25.00
			65	66	67	68	69	Clarinet No Added Noise	63.75
			70	71	72				31.00
			73	74	75			TOA lab	30.00
			76	77	78				29.00
			79	80	81				28.00
			82	83	84				27.00
			85	86	87				26.00
			88	89	90			POF lab	25.00

Proponent Code: K
Impairment: Terrain Obstructed Rayleigh

EIA Digital Audio Radio Test Laboratory



Test C-1 **Impulse Response**
AT&T Amati DSB Rev B. 5 Vp-p at attenuator input.
Program Material Glockenspiel

Pulse Repetition (Hz)	Attn at TOA	(Vp-p)	Attn at POF	(Vp-p)	EO&C
100	0.00	5.00	0.00	5.00	Could not achieve TOA or POF with this repetition rate.
200	0.00	5.00	0.00	5.00	TOA level of impairment. Small drop outs or flutters.
333	6.25	2.43	0.00	5.00	TOA occasional drop outs. POF many drop outs.
666	6.75	2.30	6.00	2.51	TOA occasional drop out. POF many drop outs.
1000	6.75	2.30	6.50	2.37	TOA occasional drop out. POF many drop outs.

Test Date: 8-May-95
Testers: DML,RMc

Test C-2 CW Response
AT&T Amati DSB Rev B.
Program Material Mozart (track 67 SQAM Disk)

Test Point	Frequency MHz	LEV 1 POF	LEV 2 POF+6	LEV 3 POF+12	Test Point	Frequency MHz	LEV 1 POF	LEV 2 POF+6	LEV 3 POF+12
1	93.85	0	0	0	27	94.11	0	0	0
2	93.86	0	0	0	28	94.12	0	0	0
3	93.87	0	0	0	29	94.13	0	0	0
4	93.88	0	0	0	30	94.14	0	0	0
5	93.89	0	0	0	31	94.15	0	0	0
6	93.90	0	0	2	32	94.16	0	0	0
7	93.91	0	1	2	33	94.17	0	0	0
8	93.92	0	2	2	34	94.18	0	0	0
9	93.93	1	2	2	35	94.19	0	0	0
10	93.94	0	2	2	36	94.20	0	0	0
11	93.95	0	2	2	37	94.21	0	0	0
12	93.96	2	2	2	38	94.22	0	0	0
13	93.97	0	0	0	39	94.23	0	0	0
14	93.98	0	0	0	40	94.24	2	2	2
15	93.99	0	0	0	41	94.25	0	2	2
16	94.00	0	0	0	42	94.26	0	0	2
17	94.01	0	0	0	43	94.27	1	2	2
18	94.02	0	0	0	44	94.28	1	2	2
19	94.03	0	0	0	45	94.29	0	0	2
20	94.04	0	0	0	46	94.30	0	0	2
21	94.05	0	0	0	47	94.31	0	0	0
22	94.06	0	0	0	48	94.32	0	0	0
23	94.07	0	0	0	49	94.33	0	0	0
24	94.08	0	0	0	50	94.34	0	0	0
25	94.09	0	0	0	51	94.35	0	0	0
26	94.10	0	0	0					

Test Date: 8-May-95 0 dB Attenuator Reference: -33.32 dBm
0=CLEAN AUDIO 1=APPROXIMATE TOA 2 ≥ POF
POF at 93.96 MHz Attn=29.75dB POF d/u= 14.57 dB
Composite

Test C-3 Airplane Flutter AT&T Amati DSB Rev B. Program Material Glockenspiel		
Scenario	Reflected Path	EO&C
#1	400 Km/h Doppler 27.5 µs Delay 8.00 dB TOA 3.20	Scenario as programmed has no defects in the recovered audio. TOA small flutter or drop out # 36. 19:30 - 21:12 Recorded TOA PI #'s 34,35,36 DAR30500.DAT
#2	200 Km/h Doppler 13.7 µs Delay 6.00 dB TOA 0.00	With the reflected path level maximized recorded for the record PI #'s 37,38 and 39. No defects in the recovered audio. 21:17 - 23:01
#3	100 Km/h Doppler 6.8 µs Delay 4.00 dB TOA 0.00	With the reflected path level maximized recorded for the record PI #'s 40,41 and 42. No defects in the recovered audio. 23:05 - 24:46
Test Date: 26-Apr-95 Testers: DML, RMc		

Test	C-4	Weak Signal Sensitivity
AT&T Amati DSB Rev B.		
Program Material	Glockenspiel	

TOA (dBm)	POF (dBm)
-90 ≤ TOA < -89	-92 < POF ≤ -91

Test Date: 21-Apr-95
Testers: DML,RMc

Test	**C-5**	**Delay Spread / Doppler**
Code:	**K**	Bad Urban 1
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-40		1		2		1		0		0	
0-36	0		0		1		0		0		0
0-32		2		1		0		0		0	
0-28	0		1		1		0		0		0
0-24		0		0		0		0		0	
0-20	0		0		0		0		0		0
0-16		0		0		0		0		0	
0-12	0		0		0		0		0		0
0-8		0		0		0		0		0	
0-4	0		0		0		0		0		0

Doppler (km/h)

EO&C	30 sec minimum listening time.
	0 = Unimpaired
	1 = Small Impairment — Small Impairments consisted of occational, brief (short duration) dropouts.
	2 ≥ POF Level of Impairment
Test Date:	25-Apr-95
Testers:	DML, RMc

did not fill in pattern due to time limitations.

DATA CONTINUED ON PG 22 →

Test	**C-5**	**Delay Spread / Doppler**
Code:	**K**	Bad Urban 2
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-80		2		2		2		2		2	
0-76	2		2		2		2		2		2
0-72		2		2		2		2		2	
0-68	2		2		2		2		2		2
0-64		2		2		2		2		2	
0-60	2		2		2		2		2		2
0-56		2		2		2		2		1	
0-52	0		2		2		2		1		1
0-48		2		2		2		1		0	
0-44	2		2		2		1		1		0

Doppler (km/h)

EO&C	30 sec minimum listening time.
	0 = Unimpaired — Small Impairments consisted of
	1 = Small Impairment — occational, brief (short duration) dropouts.
	2 ≥ POF Level of Impairment

Test Date: 25-Apr-95
Testers: DML, RMc

← DATA CONTINUED FROM PG 21

Test	C-5	**Delay Spread / Doppler**
Code:	K	Typical Urban
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-10		0		0		0		0		0	
0-9	0		0		0		0		0		0
0-8		1		0		0		0		0	
0-7	0		0		0		0		0		0
0-6		1		0		0		0		0	
0-5	0		0		0		0		0		0
0-4		0		0		0		0		0	
0-3	0		0		0		0		0		0
0-2		0		0		0		0		0	
0-1	0		0		0		0		0		0

Doppler (km/h)

EO&C

30 sec minimum listening time.

0 = Unimpaired

1 = Small Impairment

2 ≥ POF Level of Impairment

Small Impairments consisted of occational, brief (short duration) dropouts.

Test Date: 25-Apr-95

Testers: DML, RMc

Test	C-5	**Delay Spread / Doppler**
Code:	K	Hilly Terrain
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-50	0		2		0		0		0		0
0-48		1		2		1		0		0	
0-44	0		0		0		0		0		0
0-40		0		1		0		0		0	
0-36	2		1		1		0		0		0
0-32		0		0		0		0		0	
0-28	0		0		0		0		0		0
0-24		0		0		0		0		0	
0-20	0		0		0		0		0		0

Doppler (km/h)

EO&C

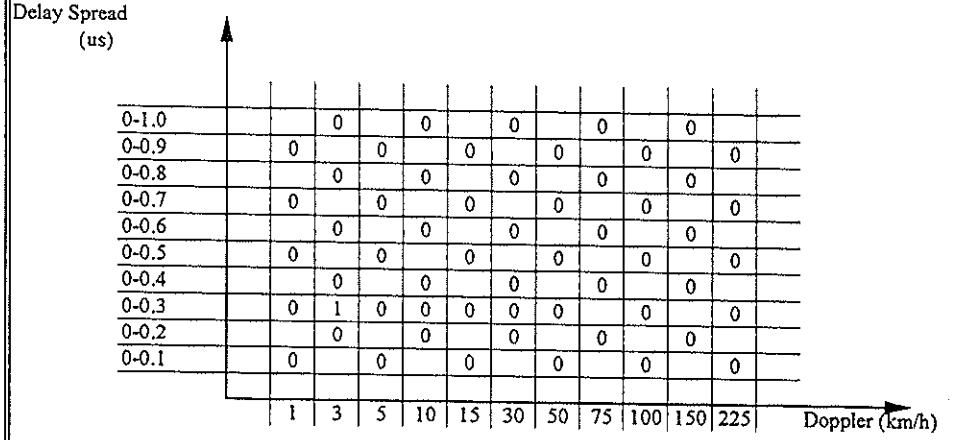
30 sec minimum listening time.

0 = Unimpaired
1 = Small Impairment
2 ≥ POF Level of Impairment

Small Impairments consisted of occational, brief (short duration) dropouts and periodic flutters.

Test Date: 25-Apr-95
Testers: DML, RMc

Test	C-5	**Delay Spread / Doppler**
Code:	K	Rural Area
Program Material		Mozart (Track 67 on SQAM disk)



EO&C	30 sec minimum listening time.	
	0 = Unimpaired	Small Impairments consisted of
	1 = Small Impairment	occational, brief (short duration) dropouts.
	2 ≥ POF Level of Impairment	

Test Date: 25-Apr-95
Testers: DML, RMc

Test C-6 **Additional Multipath Doppler Simulations**				
AT&T Amati DSB Rev B.				
Program Material: Glockenspiel				
Scenario	Level	Attn	Co/No Units	EO&C
#1 Urban Slow				Recorded for the record No Added Noise #2 Static Pops. #4 Small drop out #5 Medium duration mute.
#2 Urban Fast	TOA	21.00	16.80 dB	Small drop out or flutter.
	POF	17.00	12.80 dB	Excessive flutter / muting.
#3 Rural Fast	TOA	18.00	13.80 dB	Small drop out or flutter.
	POF	15.00	10.80 dB	Excessive flutter / muting.
#4 Terrain Obstructed Fast	TOA	24.00	19.80 dB	Small drop out or flutter.
	POF	19.00	14.80 dB	Excessive flutter / muting.

		Desired		Noise	
Test Date:	26-Apr-95				
Testers:	DML, RMc	6WOUT	-7.44 dBm		
DAT Reference:	DAR30561.DAT	IL	40.79 dB	BW	6.45E+06 Hz
		3WIN	-48.23 dBm	0dB Ref	-40.77 dBm

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30561.DAT	0:12	3:02	1	2	3	4	5	Urban Slow Doppler No Added Noise	63.75
26-Apr-95									
	3:10	6:02	6	7	8	9	10	Urban Fast Doppler No Added Noise	63.75
			11	12	13				23.00
			14	15	16			Unconfirmed TOA # 15	22.00
			17	18	19			TOA #18 Small Flutter or drop out.	21.00
			20	21	22				20.00
			23	24	25				19.00
			26	27	28				18.00
		18:20	29	30	31			POF, Excessive Muting	17.00
	18:28	21:19	32	33	34	35	36	Rural Fast Doppler No Added Noise	63.75
			37	38	39				19.00
			40	41	42			#42 TOA Small Flutter or drop out	18.00
			43	44	45				17.00
			46	47	48				16.00
		30:06	49	50	51			POF, many flutters and drop outs or mutes.	15.00
	30:14	37:25	52	53	54	55	56	Obstructed Path Doppler No Added Noise	63.75
			57	58	59				26.00
			60	61	62				25.00
			63	64	65			TOA, #64 Flutter and Drop outs.	24.00
			66	67	68				23.00
			69	70	71				22.00
			72	73	74				21.00
			75	76	77				20.00
			78	79	80			POF, excessive muting.	19.00

Additional Multipath Doppler Simulations
Code: K
Test: C-6

Test **D-Series Co-Channel, 1st and 2nd Adjacent**
AT&T Amati DSB Rev B.
Program Material: Glockenspiel

	Level	Attn	D/U	Units	EO&C
D-1 Co-Channel	TOA	33.25	10.46	dB	Small drop out.
	POF	31.75	8.96	dB	Excessive muting.
D-2 Lower 1st Adjacent	TOA	26.75	23.96	dB	Small drop outs or flutters.
	POF	23.25	20.46	dB	Excessive Muting.
Upper 1st Adjacent	TOA	27.00	24.21	dB	Small drop outs or flutters.
	POF	23.00	20.21	dB	Excessive Muting.
D-3 Lower 2nd Adjacent	TOA	6.00	-16.79	dB	Small drop out or flutter.
	POF	2.25	-20.54	dB	Muting and flutter.
Upper 2nd Adjacent	TOA	4.75	-18.04	dB	Small drop out or flutter.
	POF	1.00	-21.79	dB	Excessive muting.

Additional Comments: Tests conducted through the multipath simulators with one path on the desired and one path on the undesired channels.

DAT Reference: DAR30410.DAT

Test Date: 1-May-95
Testers: DML, RMc

	Desired	Undesired
Signal	-7.44 dBm	-7.76 dBm
IL	40.79 dB	37.68 dB
3WIN	-48.23 dBm	-45.44 dBm

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30410.DAT									
1-May-95	0:06	2:58	1	2	3	4	5	Lower 1st Adjacent TOA	26.75
	3:04		6	7	8	9	10	Lower 2nd Adjacent TOA, # 10 at very end small drop out.	6.00
		7:42	11	12	13				5.75
	7:46		14	15	16	17	18	Upper 2nd Adjacent TOA Nothing apparent	4.75
			19	20	21	22	23		4.50
		16:30	24	25	26	27	28	#27 Small drop out.	4.25
	16:33	19:26	29	30	31	32	33	Co-Channel TOA, #30 small flutter	33.25

Code: K
D-Series Recordings

Test E-1 **Co-Channel with Multipath (Rayleigh)**
AT&T Amati DSB Rev B.
Program Material: Glockenspiel

Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	43.00	39.06	dB	Small drop out or flutter.
	POF	30.00	26.06	dB	Excessive Muting.
#2 Urban Fast	TOA	29.00	25.06	dB	Small drop out.
	POF	26.00	22.06	dB	Excessive muting.
#3 Rural Fast	TOA	35.00	31.06	dB	Small Drop Out
	POF	31.00	27.06	dB	Excessive muting
#4 Terrain Obstructed	TOA	35.00	31.06	dB	Small drop out or flutter.
	POF	30.00	26.06	dB	Excessive muting.

Test Date: 27-Apr-95
Testers: DML, RMc

	Desired	Undesired
Signal	-7.44 dBm	-6.61 dBm
IL	40.79 dB	37.68 dB
3WIN	-48.23 dBm	-44.29 dBm

Test	E-2	Lower 1st Adjacent with Multipath (Rayleigh)			
AT&T Amati DSB Rev B.					
Program Material:	Glockenspiel				
Scenario					
	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	55.00	52.21	dB	Small flutter.
	POF	38.00	35.21	dB	Excessive muting.
#2 Urban Fast	TOA	41.00	38.21	dB	Small flutter.
	POF	34.00	31.21	dB	Excessive muting.
#3 Rural Fast	TOA	45.00	42.21	dB	Small drop out or flutter.
	POF	37.00	34.21	dB	Excessive muting
#4 Terrain Obstructed Fast	TOA	45.00	42.21	dB	Small drop outs.
	POF	35.00	32.21	dB	Excessive muting.

Test Date: 1-May-95		Desired	Undesired
Testers: DML, RMc	Signal	-7.44 dBm	-7.76 dBm
	IL	40.79 dB	37.68 dB
	3WIN	-48.23 dBm	-45.44 dBm

Test	E-3	Lower 2nd Adjacent with Multipath (Rayleigh)			
AT&T Amati DSB Rev B.					
Program Material:	Glockenspiel				
Scenario					
	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA	38.00	15.21	dB	1 medium duration drop out and a small flutter.
	POF	21.00	-1.79	dB	Excessive muting.
#2 Urban Fast	TOA	22.00	-0.79	dB	Slight flutter or drop out.
	POF	14.00	-8.79	dB	Excessive muting.
#3 Rural Fast	TOA	26.00	3.21	dB	Small drop out or flutter.
	POF	17.00	-5.79	dB	Excessive muting
#4 Terrain Obstructed Fast	TOA	30.00	7.21	dB	Small drop outs.
	POF	17.00	-5.79	dB	Excessive drop outs and an overload.

Test Date: 1-May-95		Desired	Undesired
Testers: DML, RMc	Signal	-7.44 dBm	-7.76 dBm
	IL	40.79 dB	17.68 dB
	3WIN	-48.23 dBm	-25.44 dBm

Test E-1 Co-Channel with Multipath (Doppler)					
AT&T Amati DSB Rev B.					
Program Material: Glockenspiel					
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA				Scenario with No Co-Channel creates defects in the recovered audio. Defects consist of occasional mutes and flutters. The level of impairment is between TOA and POF closer to TOA.
	POF				
#2 Urban Fast	TOA	27.00	24.06	dB	Small drop out.
	POF	19.00	16.06	dB	Excessive muting.
#3 Rural Fast	TOA	20.00	17.06	dB	Small drop out or flutter.
	POF	17.00	14.06	dB	Excessive muting
#4 Terrain Obstructed Fast	TOA	26.00	23.06	dB	Small drop outs.
	POF	22.00	19.06	dB	Excessive muting.

Test Date: 28-Apr-95		Desired	Undesired
Testers: DML, RMc	Signal	-7.44 dBm	-7.61 dBm
	IL	40.79 dB	37.68 dB
	3WIN	-48.23 dBm	-45.29 dBm

Test E-2 **Lower 1st Adjacent with Multipath (Doppler)**					
AT&T Amati DSB Rev B.					
Program Material: Glockenspiel					
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA				Scenario with no 1st Adjacent creates defects in the recovered audio. Defects consist of occasional mutes and flutters. The level of impairment is between TOA and POF closer to TOA.
	POF				
#2 Urban Fast	TOA	33.00	30.06	dB	Small drop out.
	POF	26.00	23.06	dB	Excessive muting.
#3 Rural Fast	TOA	32.00	29.06	dB	Small drop out or flutter.
	POF	26.00	23.06	dB	Excessive muting
#4 Terrain Obstructed Fast	TOA	41.00	38.06	dB	Small drop outs.
	POF	30.00	27.06	dB	Excessive muting.

Test Date: 28-Apr-95		Desired	Undesired
Testers: DML, RMc	Signal	-7.44 dBm	-7.61 dBm
	IL	40.79 dB	37.68 dB
	3WIN	-48.23 dBm	-45.29 dBm

Test E-3 **2nd Adjacent with Multipath (Doppler)**
AT&T Amati DSB Rev B.
Program Material: Glockenspiel

Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow	TOA				Scenario with no 2nd Adjacent creates defects in the recovered audio. Defects consist of occasional mutes and flutters. The level of impairment is between TOA and POF closer to TOA.
	POF				
#2 Urban Fast	TOA	12.00	-10.79	dB	Small flutter or drop out.
	POF	5.00	-17.79	dB	Excessive muting.
#3 Rural Fast	TOA	12.00	-10.79	dB	Small drop out or flutter.
	POF	6.00	-16.79	dB	Excessive muting
#4 Terrain Obstructed Fast	TOA	20.00	-2.79	dB	Small drop outs.
	POF	9.00	-13.79	dB	Excessive muting.

Test Date: 1-May-95
Testers: DML, RMc

	Desired	Undesired
Signal	-7.44 dBm	-7.76 dBm
IL	40.79 dB	17.68 dB
3WIN	-48.23 dBm	-25.44 dBm

Test J-1 Re-Acquisition
AT&T Amati DSB Rev B.
Program Material Mozart (Track 67 on SQAM disk)

Toff (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
30	4	2	2
	2	3	5
	5	2	6
	2	3	2
	5	3	4
Average	3.6	2.6	3.8

POF Attenuator Setting : 13.25 dB
Desired Signal Level : -48.24 dBm
Noise 0 dB Reference : -40.84 dBm

EO&C

Re-Acquisition time is the value listed ± 0.5 seconds.

Test Date: 8-May-95
Testers: DML, RMc

Test	J-2	**Re-Acquisition with Multipath**
AT&T Amati DSB Rev		Urban Slow Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	3	2	6
10	6	4	7
15	7	2	3
20	3	2	2
25	4	4	4
Average	4.6	2.8	4.4

POF Attenuator Setting : 28.00 dB
Desired Signal Level : -48.26 dBm
Noise 0 dB Reference : -40.77 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 26-Apr-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
AT&T Amati DSB Rev		Urban Fast Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

	Re-Acquisition Time (s)		
Tsim (s)	POF-2	POF-4	POF-6
5	2	6	3
10	3	2	5
15	4	3	7
20	5	5	2
25	2	5	3
Average	3.2	4.2	4.0

POF Attenuator Setting	:	23.00 dB
Desired Signal Level	:	-48.23 dBm
Noise 0 dB Reference	:	-40.78 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 27-Apr-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
AT&T Amati DSB Rev		Rural Fast Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	2	4	2
10	8	6	3
15	2	3	4
20	6	5	2
25	4	3	5
Average	4.4	4.2	3.2

POF Attenuator Setting	:	27.00 dB
Desired Signal Level	:	-48.23 dBm
Noise 0 dB Reference	:	-40.78 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 27-Apr-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
AT&T Amati DSB Rev		Terrain Obstructed Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	2	5	4
10	3	2	2
15	2	7	4
20	6	5	3
25	4	2	5
Average	3.4	4.2	3.6

POF Attenuator Setting : 25.00 dB
Desired Signal Level : -48.23 dBm
Noise 0 dB Reference : -40.78 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 27-Apr-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
AT&T Amati DSB Rev		Urban Slow Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF
5	5
10	5
15	5
20	5
25	3
Average	4.6

POF Attenuator Setting	:	Defects without added noise
Desired Signal Level	:	-48.26 dBm
Noise 0 dB Reference	:	-40.77 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 26-Apr-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
AT&T Amati DSB Rev		Urban Fast Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	6	5	6
10	5	3	2
15	4	7	6
20	2	2	6
25	3	2	3
Average	4.0	3.8	4.6

POF Attenuator Setting : 17.00 dB
Desired Signal Level : -48.26 dBm
Noise 0 dB Reference : -40.77 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 26-Apr-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
AT&T Amati DSB Rev		Rural Fast Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	3	2	2
10	5	3	5
15	2	4	2
20	6	2	6
25	2	2	3
Average	3.6	2.6	3.6

POF Attenuator Setting : 15.00 dB
Desired Signal Level : -48.26 dBm
Noise 0 dB Reference : -40.77 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 26-Apr-95
Testers: DML, RMc

Test	J-2	**Re-Acquisition with Multipath**
AT&T Amati DSB Rev		Terrain Obstructed Doppler
Program Material		Mozart (Track 67 on SQAM disk)

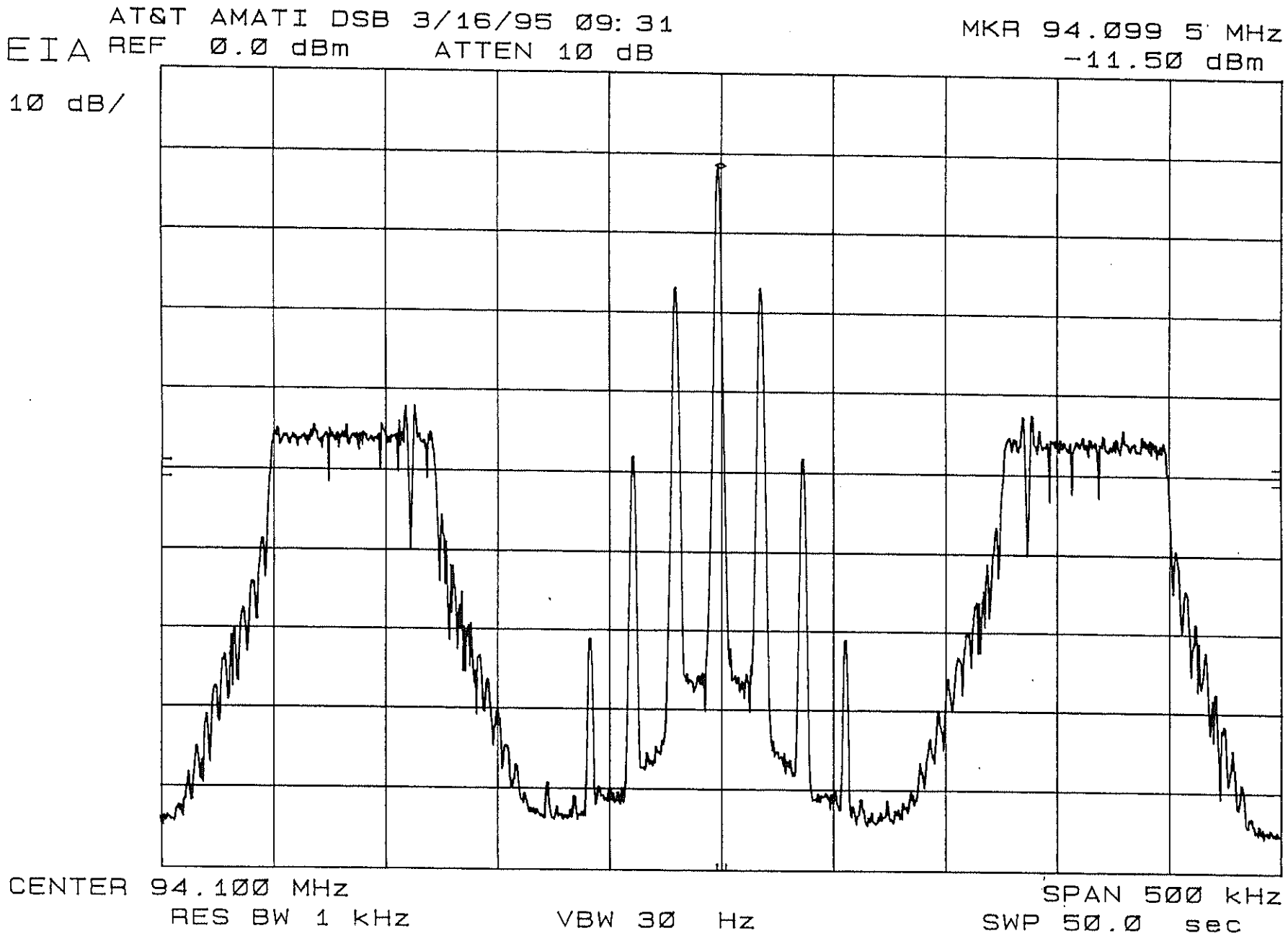
Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	8	2	6
10	5	3	2
15	3	3	4
20	4	5	7
25	5	3	3
Average	5.0	3.2	4.4

POF Attenuator Setting : 19.00 dBm
Desired Signal Level : -48.26 dBm
Noise 0 dB Reference : -40.77 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 26-Apr-95
Testers: DML, RMc

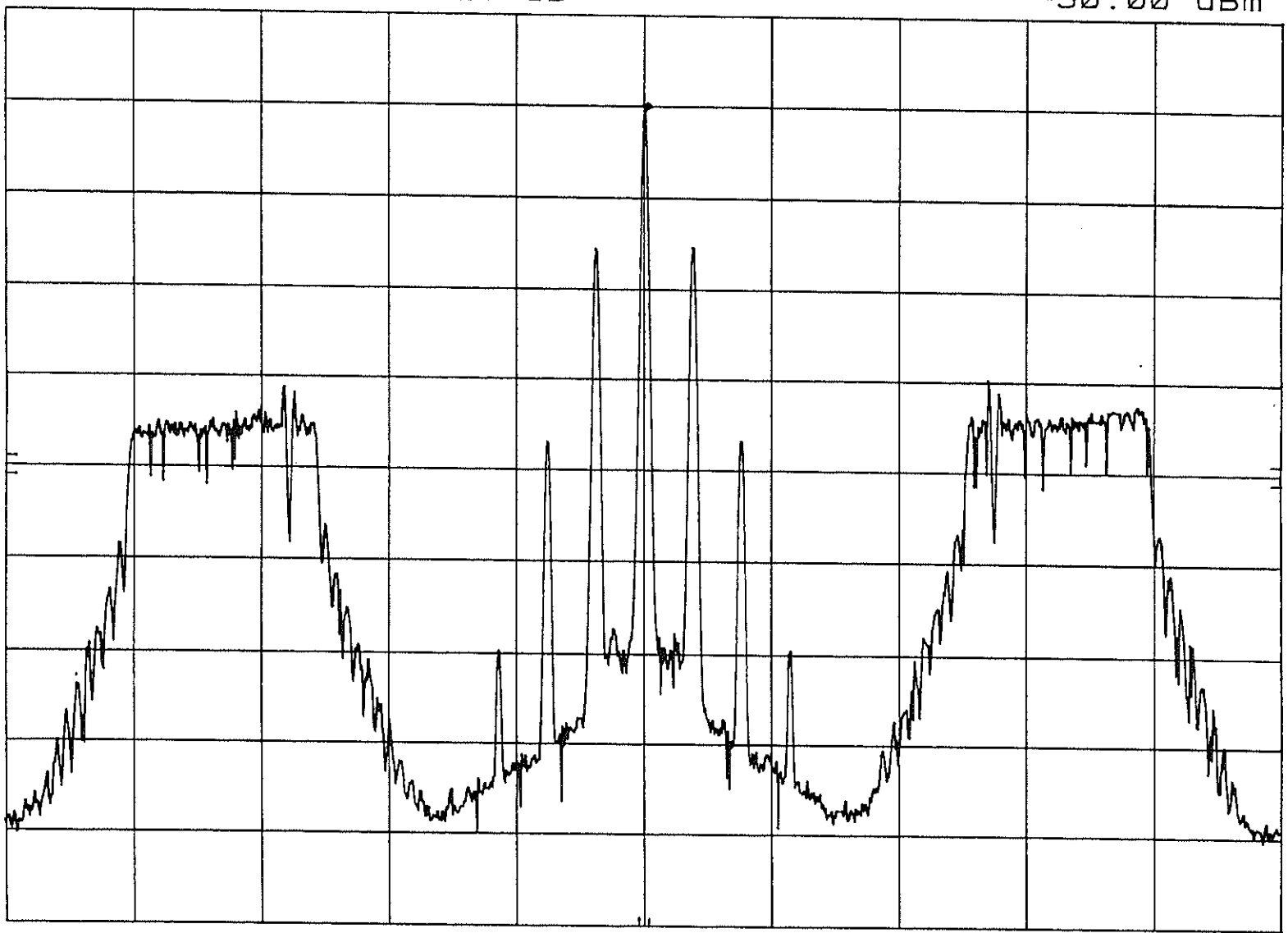

AT&T AMATI DSB 3/16/95 09:31
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.099 5 MHz
-11.50 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

AT&T AMATI DSB CO-CHANNEL 3/16/95 10: 17

EIA REF −20.0 dBm ATTEN 10 dB

MKR 94.101 0 MHz
−30.00 dBm

10 dB/



CENTER 94.100 MHz

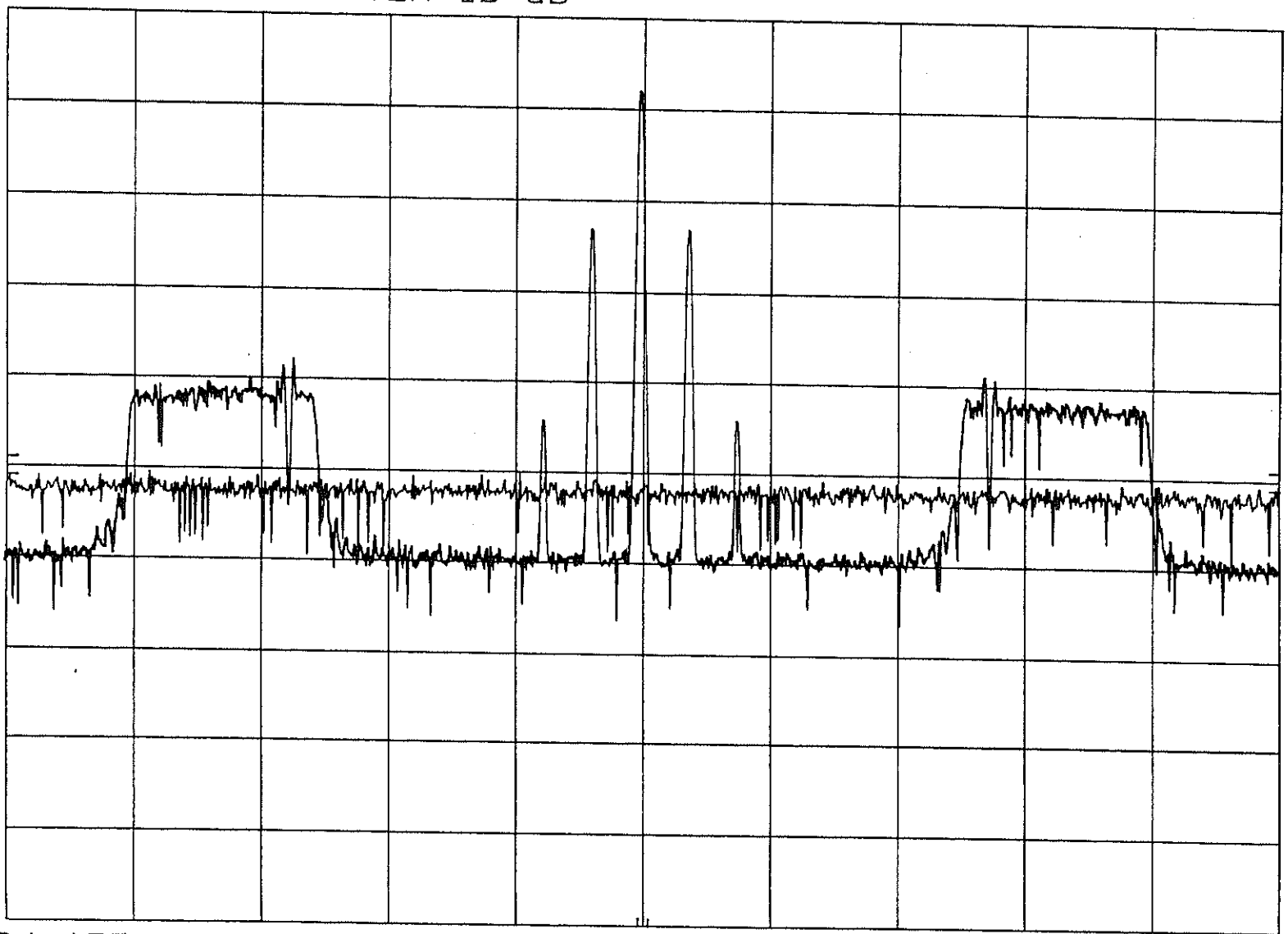
SPAN 500 kHz

RES BW 1 kHz VBW 30 Hz SWP 50.0 sec

AT&T AMATI DSB GAUSSIAN NOISE Co/No AT ATTN=14.5 3/16/95 1

EIA REF -50.0 dBm ATTEN 10 dB

10 dB/



CENTER 94.100 MHz

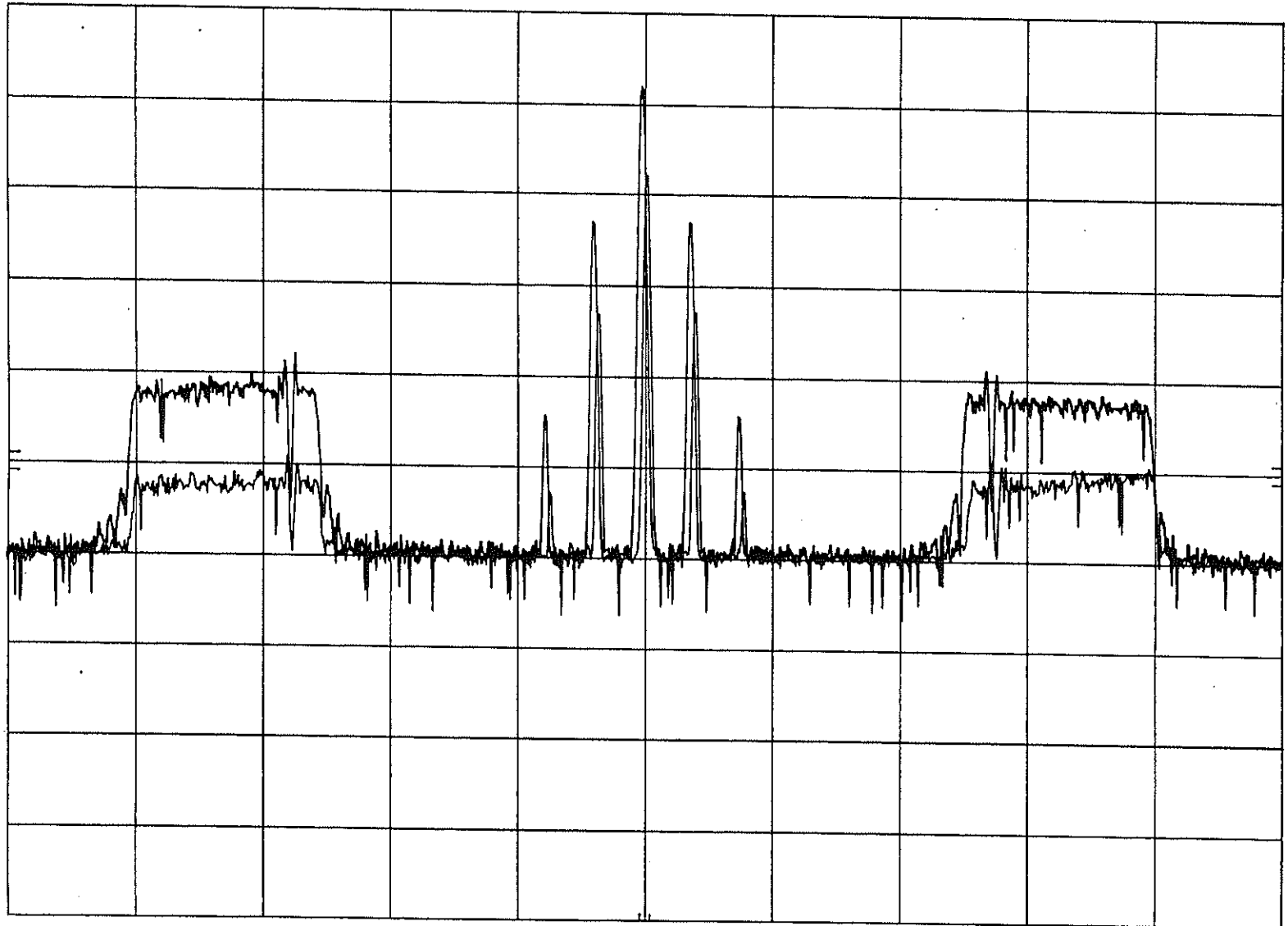
SPAN 500 kHz

RES BW 1 kHz VBW 30 Hz SWP 50.0 sec

AT&T AMATI CO-CHANNEL d/u AT ATTN = 28.75 3/16/95 18:44

EIA REF -50.0 dBm ATTEN 10 dB

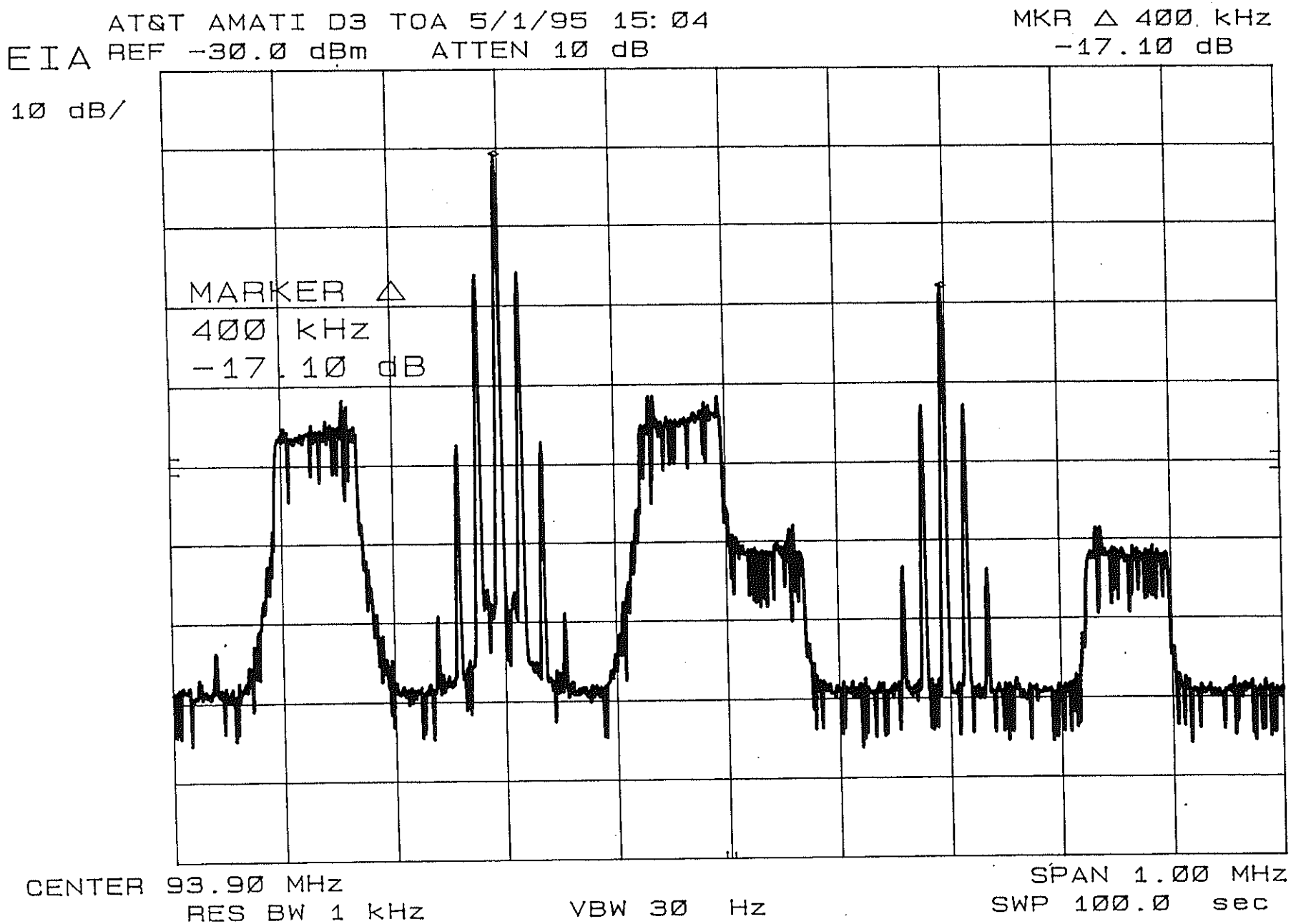
10 dB/

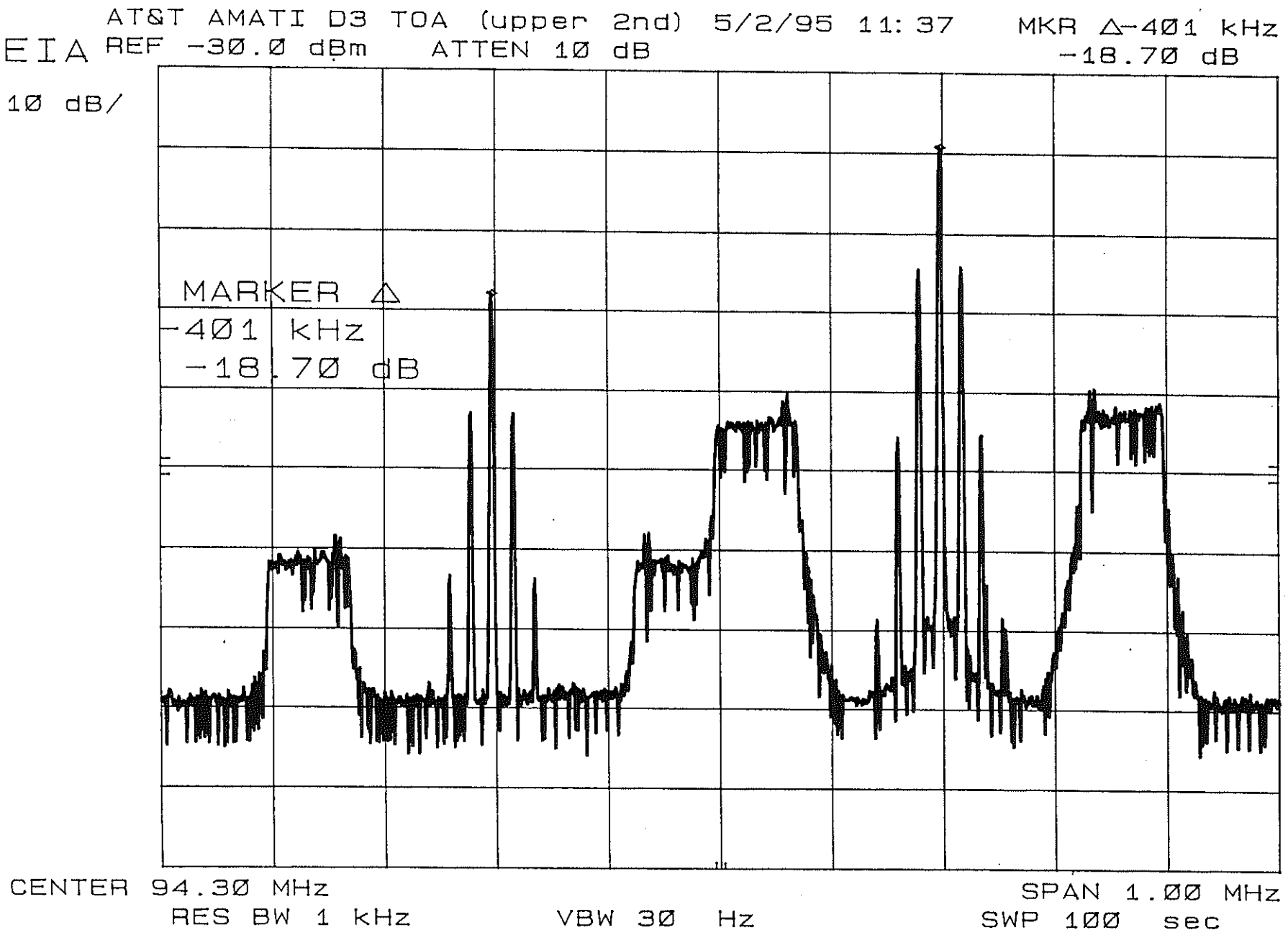


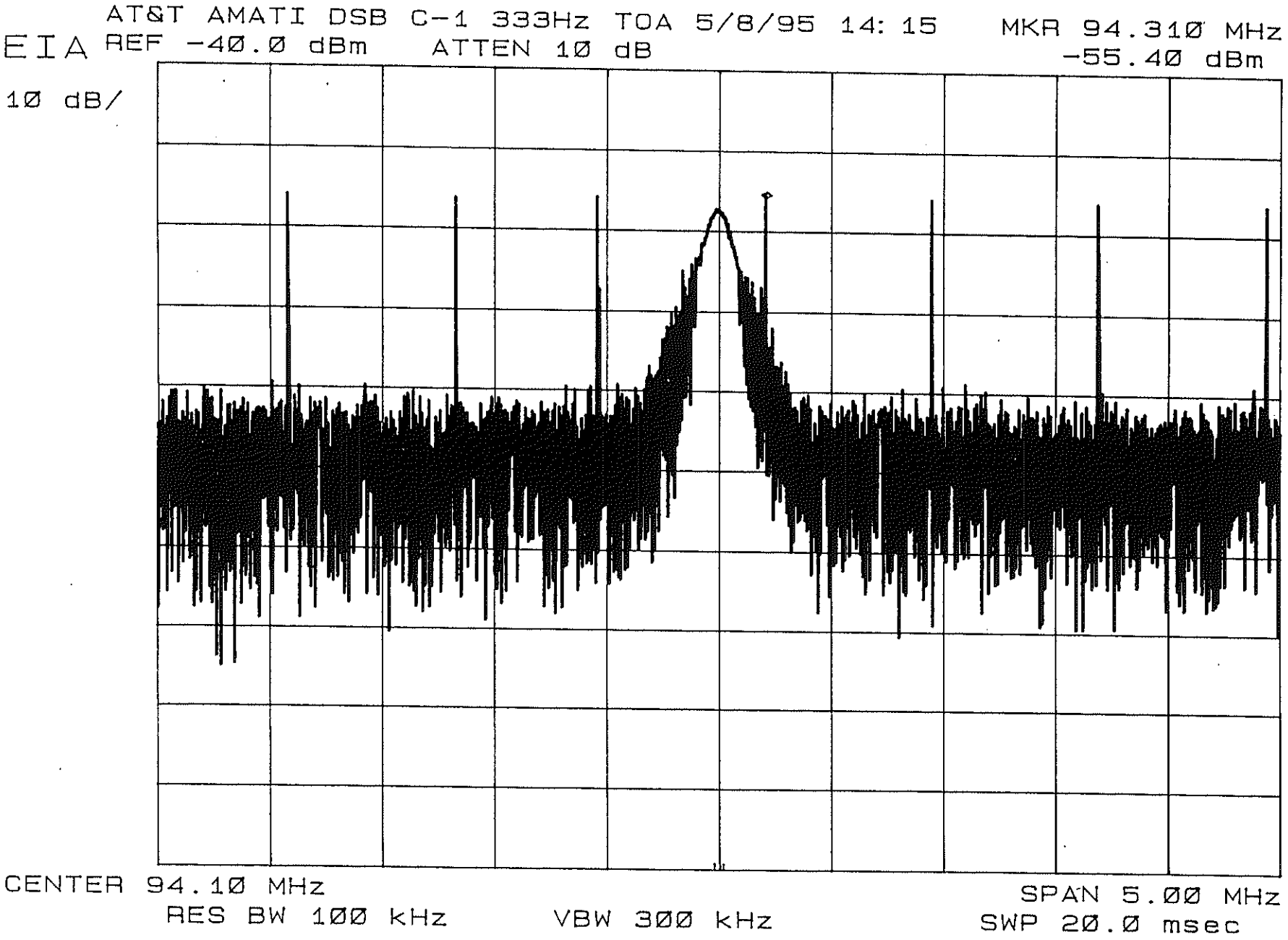
CENTER 94.100 MHz

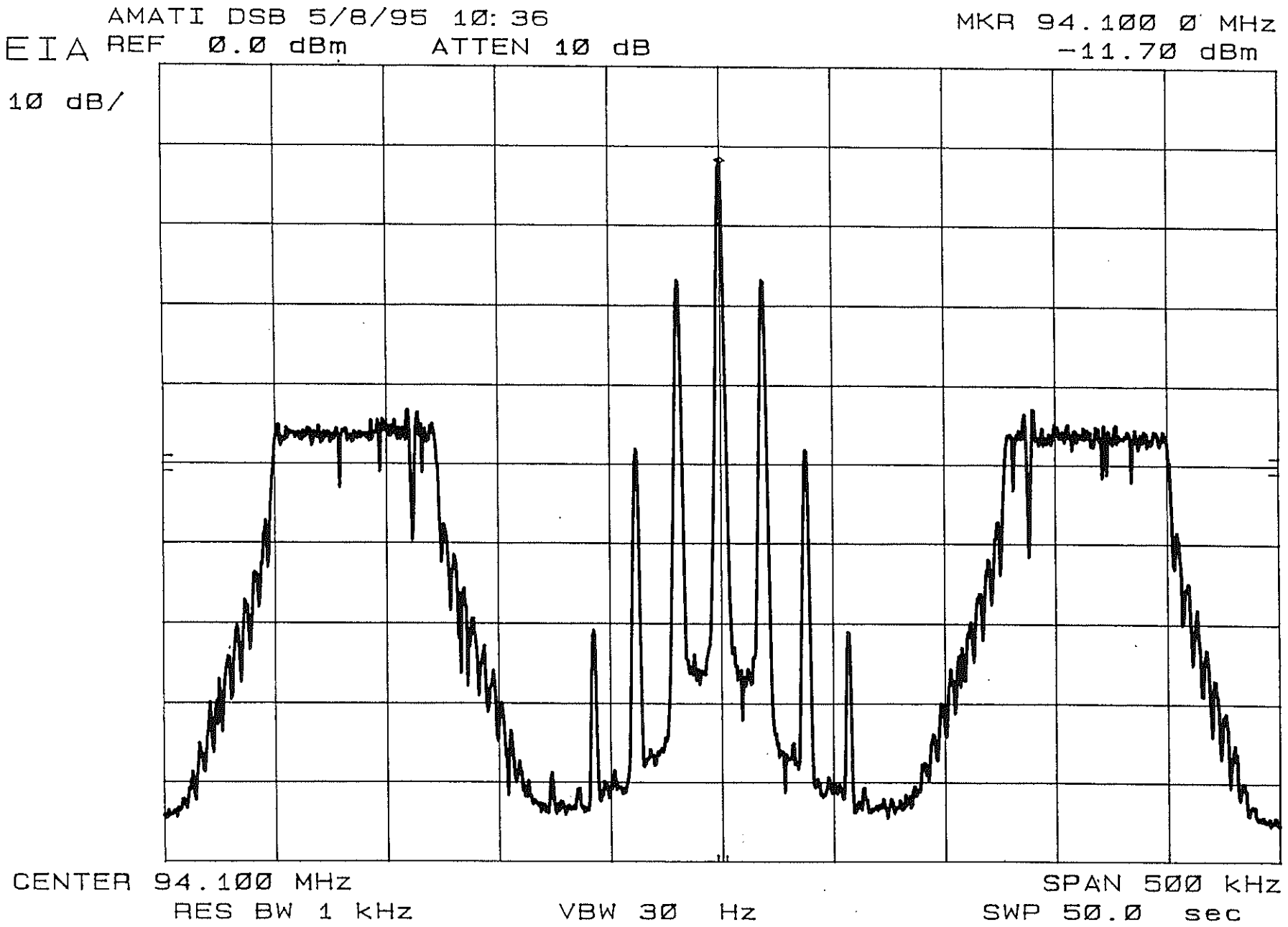
SPAN 500 kHz

RES BW 1 kHz VBW 30 Hz SWP 50.0 sec


AT&T AMATI D3 TOA 5/1/95 15:04
MKR Δ 400. kHz
EIA REF -30.0 dBm ATTEN 10 dB
-17.10 dB
10 dB/
MARKER Δ
400 kHz
-17.10 dB
CENTER 93.90 MHz
SPAN 1.00 MHz
RES BW 1 kHz
VBW 30 Hz
SWP 100.0 sec


AT&T AMATI D3 TOA (upper 2nd) 5/2/95 11:37
MKR Δ-401 kHz
-18.70 dB
EIA
REF -30.0 dBm
ATTEN 10 dB
10 dB/
MARKER Δ
-401 kHz
-18.70 dB
CENTER 94.30 MHz
SPAN 1.00 MHz
RES BW 1 kHz
VBW 30 Hz
SWP 100 sec


AT&T AMATI DSB C-1 333Hz TOA 5/8/95 14: 15
MKR 94.310 MHz
EIA REF -40.0 dBm
ATTEN 10 dB
-55.40 dBm
10 dB/
CENTER 94.10 MHz
SPAN 5.00 MHz
RES BW 100 kHz
VBW 300 kHz
SWP 20.0 msec


AMATI DSB 5/8/95 10:36
MKR 94.100 0 MHz
EIA REF 0.0 dBm
ATTEN 10 dB
-11.70 dBm
10 dB/
CENTER 94.100 MHz
SPAN 500 kHz
RES BW 1 kHz
VBW 30 Hz
SWP 50.0 sec

APPENDIX AL

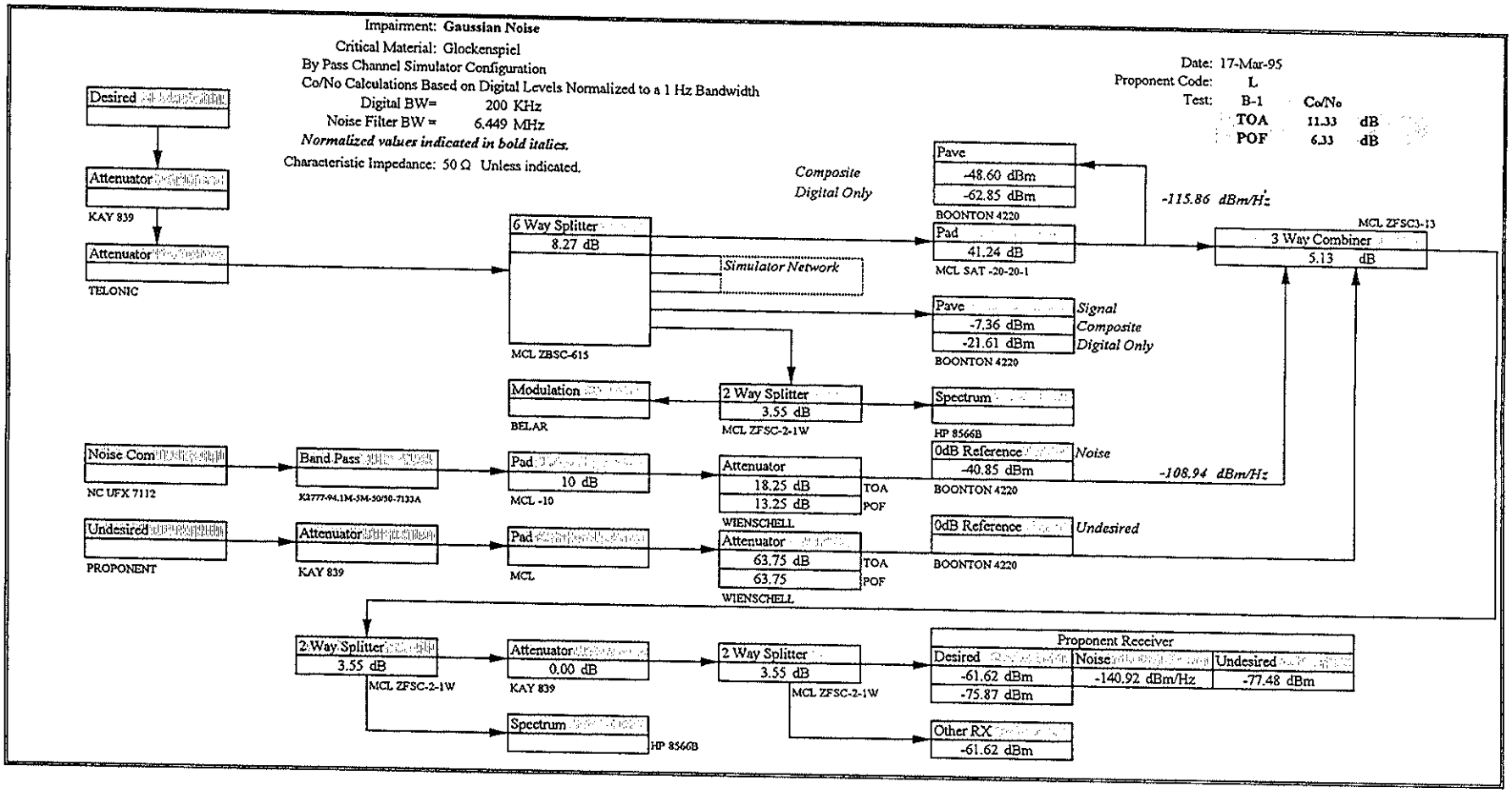
Digital Test Results USA Digital Radio FM 1 Revision B

EIA Digital Audio Radio Test Laboratory

Proponent:	USADR FM1 Rev B.
Code:	L
Digital Band Width:	2.00E+05 Hz
Composite Band Width:	4.50E+05 Hz
Peak / Average Composite:	3.57 dB
Peak / Average Digital:	8.58 dB

Test	B-1	Gaussian Noise		Units
Proponent Code:	L			
Glockenspiel		TOA	POF	
	Attenuator	18.25	13.25	dB
	Co/No	11.33	6.33	dB
EO&C	TOA	Small burst of pops at end of first arpeggio. Small warble.		
	POF	High Frequency roll off, many pops and clicks, some muting.		
Soprano		TOA	POF	
	Attenuator	17.75	13.75	dB
	Co/No	10.83	6.83	dB
EO&C	TOA	Small burst of pops.		
	POF	High Frequency Roll off, many pops and clicks and some muting.		
Clarinet		TOA	POF	
	Attenuator	18.00	13.50	dB
	Co/No	11.08	6.58	dB
EO&C	TOA	Small bursts of pops or clicks.		
	POF	High Frequency roll off, many pops and clicks, some muting.		

Notes:		
	Recording Reference:	DAR30224.DAT
	Testers:	DML,RMC
	Date:	17-Mar-95


Impairment: Gaussian Noise
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Co/No Calculations Based on Digital Levels Normalized to a 1 Hz Bandwidth
Digital BW= 200 KHz
Noise Filter BW = 6.449 MHz
Normalized values indicated in bold italics.
Characteristic Impedance: 50 Ω Unless indicated.
Date: 17-Mar-95
Proponent Code: L
Test: B-1 Co/No
TOA 11.33 dB
POF 6.33 dB
Composite
Digital Only
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Pave
-48.60 dBm
-62.85 dBm
BOONTON 4220
-115.86 dBm/Hz
Pad
41.24 dB
MCL SAT -20-20-1
MCL ZFSC)-13
3 Way Combiner
5.13 dB
Pave
-7.36 dBm
-21.61 dBm
BOONTON 4220
Signal
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
X3777-94.1M-5M-50/50-7133A
Pad
10 dB
MCL -10
Attenuator
18.25 dB
13.25 dB
TOA
POF
WIENSCHELL
0dB Reference
-40.85 dBm
BOONTON 4220
Noise
-108.94 dBm/Hz
Undesired
PROPONENT
Attenuator
KAY 839
Pad
MCL
Attenuator
63.75 dB
63.75
TOA
POF
WIENSCHELL
0dB Reference
BOONTON 4220
Undesired
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Proponent Receiver
Desired
-61.62 dBm
-75.87 dBm
Noise
-140.92 dBm/Hz
Undesired
-77.48 dBm
Spectrum
HP 8566B
Other RX
-61.62 dBm

EIA Digital Audio Radio DAT Recording Log

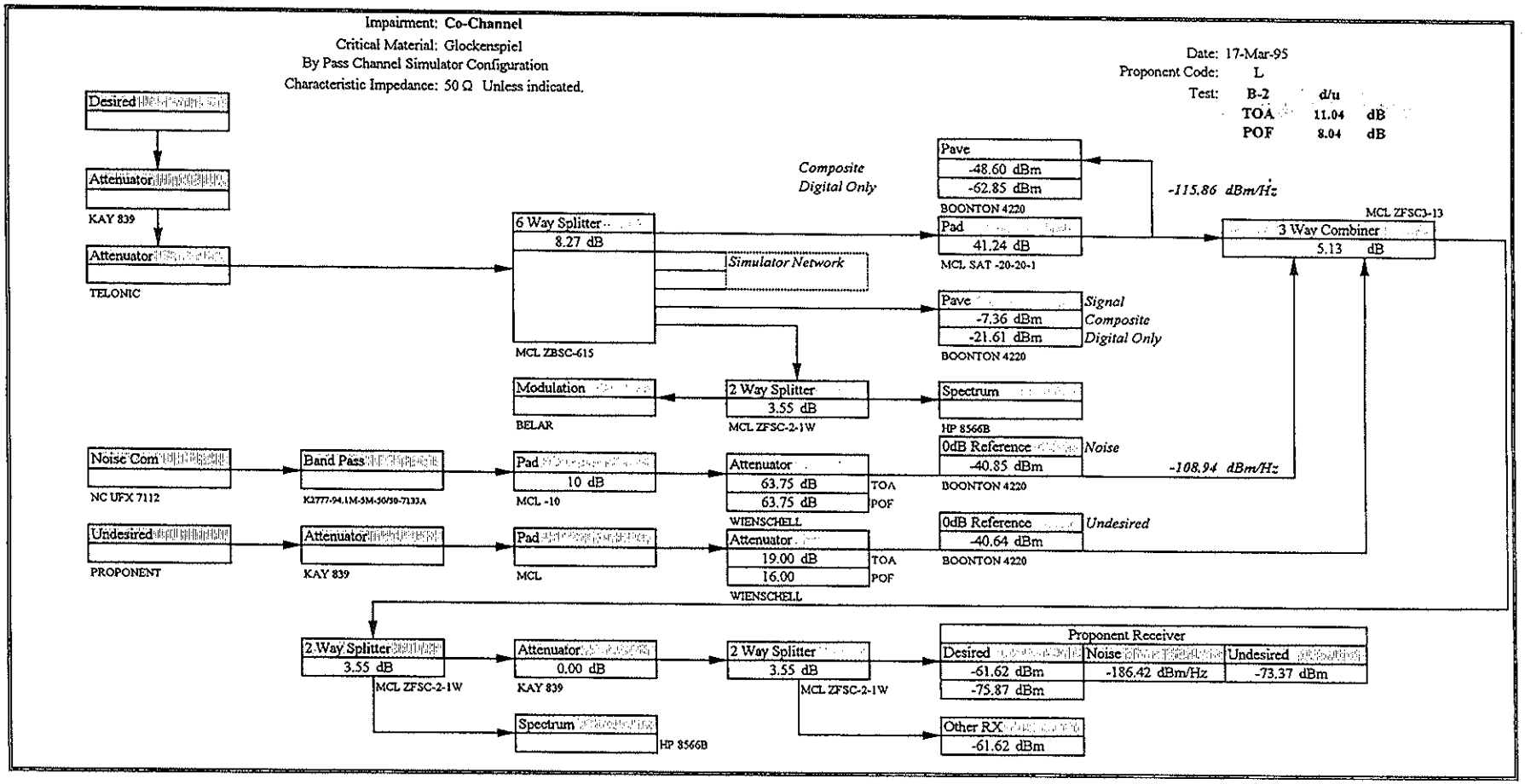
DAT File Number	Time Code Start	Time Code Stop	Program ID #					Description	Attn
DAR30224.DAT			1	2	3			Glockenspiel Clear Channel	63.75
17-Mar-95			4	5	6				19.75
			7	8	9				19.25
			10	11	12				18.75
			13	14	15			TOA lab	18.25
			16	17	18				17.25
			19	20	21				16.25
			22	23	24				15.25
			25	26	27				14.25
			28	29	30			POF lab	13.25
			31	32	33				12.75
			34	35	36			Soprano Clear Channel	63.75
			37	38	39				19.25
			40	41	42				18.75
			43	44	45				18.25
			46	47	48			TOA lab	17.75
			49	50	51				16.75
			52	53	54				15.75
			55	56	57				14.75
			58	59	60			POF lab	13.75
			61	62	63				13.25
			64	65	66			Clarinet Clear Channel	63.75
			67	68	69				19.50
			70	71	72				19.00
			73	74	75			TOA-0.5 #75 Unconfirmed TOA	18.50
			76	77	78			TOA lab	18.00
			79	80	81				17.00
			82	83	84				16.00
			85	86	87				15.00
			88	89	90				14.00
			91	92	93			POF lab	13.50
			94	95	96				13.00

Code: L
Impairment: Gaussian Noise

EIA Digital Audio Radio Test Laboratory

Test	B-2	Co-Channel		Units
Proponent Code:	L			
Glockenspiel		TOA	POF	
	Attenuator	19.00	14.00	dB
	d/u	11.04	6.04	dB
EO&C	TOA	Small burst of pops. Warble or chirp 1st arpeggio 1st note.		
	POF	Many pops and clicks with high cut and some muting.		
Soprano		TOA	POF	
	Attenuator	18.50	14.00	dB
	d/u	10.54	6.04	dB
EO&C	TOA	High Cut and small burst of pops.		
	POF	Many pops and clicks with high cut and some muting.		
Clarinet		TOA	POF	
	Attenuator	19.00	14.75	dB
	d/u	11.04	6.79	dB
EO&C	TOA	Small burst of pops.		
	POF	Many pops and clicks with high cut and some muting.		

Notes:		
	Recording Reference:	DAR30246.DAT
	Testers:	DML,RMC
	Date:	17-Mar-95


Impairment: Co-Channel
Critical Material: Glockenspiel
By Pass Channel Simulator Configuration
Characteristic Impedance: 50 Ω Unless indicated.
Date: 17-Mar-95
Proponent Code: L
Test: B-2 d/u
TOA 11.04 dB
POF 8.04 dB
Desired
Attenuator
KAY 839
Attenuator
TELONIC
6 Way Splitter
8.27 dB
MCL ZBSC-615
Simulator Network
Composite
Digital Only
Pave
-48.60 dBm
-62.85 dBm
BOONTON 4220
-115.86 dBm/Hz
Pad
41.24 dB
MCL SAT -20-20-1
MCL ZFSC3-13
3 Way Combiner
5.13 dB
Pave
-7.36 dBm
-21.61 dBm
BOONTON 4220
Signal
Composite
Digital Only
Modulation
BELAR
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Noise Com
NC UFX 7112
Band Pass
K2777-94.1M-5M-50/50-7133A
Pad
10 dB
MCL -10
Attenuator
63.75 dB
63.75 dB
TOA
POF
WIENSCHELL
0dB Reference
-40.85 dBm
BOONTON 4220
Noise
-108.94 dBm/Hz
Undesired
PROPONENT
Attenuator
KAY 839
Pad
MCL
Attenuator
19.00 dB
16.00
TOA
POF
WIENSCHELL
0dB Reference
-40.64 dBm
BOONTON 4220
Undesired
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Attenuator
0.00 dB
KAY 839
2 Way Splitter
3.55 dB
MCL ZFSC-2-1W
Spectrum
HP 8566B
Proponent Receiver
Desired
Noise
Undesired
-61.62 dBm
-75.87 dBm
-186.42 dBm/Hz
-73.37 dBm
Other RX
-61.62 dBm

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30246.DAT	0:05		1	2	3			Glockenspiel Clear Channel	63.75
17-Mar-95			4	5	6				20.50
			7	8	9				20.00
			10	11	12				19.50
			13	14	15	16	17	TOA lab	19.00
			18	19	20				18.00
			21	22	23				17.00
			24	25	26				16.00
			27	28	29				15.00
			30	31	32			POF lab	14.00
		20:27	33	34	35				13.50
	20:30		36	37	38			Soprano Clear Channel	63.75
			39	40	41				20.00
			42	43	44				19.50
			45	46	47				19.00
			48	49	50	51	52	TOA lab	18.50
			53	54	55				18.00
			56	57	58				17.00
			59	60	61				16.00
			62	63	64			POF lab	15.00
		37:48	65	66	67				14.50
	38:05		68	69	70			Clarinet Clear Channel	63.75
			71	72	73				20.50
			74	75	76				20.00
			77	78	79				19.50
			80	81	82	83	84	TOA lab	19.00
			85	86	87				18.50
			88	89	90				17.50
			91	92	93				16.50
			94	95	96				15.50
			97	98	99			POF lab	14.75
		57:15	100	101	102				14.25

Code: L
Impairment: Co-Channel

Test B-3 Proponent Code: L	Urban Slow Rayleigh	
Material		Units
Glockenspiel	TOA POF	
Attenuator		dB
C/N		dB
TOA	Defects in recovered audio apparent without any added noise.	
EO&C	Small bursts of pops and clicks and some High Frequency roll off.	
	Level of impairment between TOA and POF.	
POF		
Soprano	TOA POF	
Attenuator		dB
C/N		dB
TOA	Defects in recovered audio apparent without any added noise.	
EO&C	Small bursts of pops and clicks and some High Frequency roll off.	
	Level of impairment between TOA and POF.	
POF	Not as preceptible as with glockenspiel.	
Clarinet	TOA POF	
Attenuator		dB
C/N		dB
TOA	Defects in recovered audio apparent without any added noise.	
EO&C	Small bursts of pops and clicks and some High Frequency roll off.	
	Level of impairment between TOA and POF.	
POF	Not as preceptible as with glockenspiel.	
	More perceptible than Soprano.	

Notes:
Recording Reference: DAR30301.DAT
Impairment: Multipath with Gaussian Noise
Testers: DML,RMC
Test Date: 13-Apr-95

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30301.DAT	0:12	3:05	1	2	3	4	5	Glockenspiel	63.75
13-Apr-95									
	3:08	5:49	6	7	8	9	10	Soprano	63.75
	5:53	8:36	11	12	13	14	15	Clarinet	63.75

Proponent Code: L
Impairment: Urban Slow Rayleigh

Test	B-3	Urban Fast Rayleigh Impairment Level		
Proponent Code:	L			
Material				Units
Glockenspiel		TOA	POF	
	Attenuator	38.00	24.00	dB
	C/N	31.17	17.17	dB
	TOA	Click.		
EO&C				
	POF	High Cut , pops, clicks and occasional mutes.		
Soprano		TOA	POF	
	Attenuator	35.00	24.00	dB
	C/N	28.17	17.17	dB
	TOA	Small burst of pops.		
EO&C				
	POF	High Frequency Roll off, many pops and clicks and some muting.		
Clarinet		TOA	POF	
	Attenuator	38.00	24.00	dB
	C/N	31.17	17.17	dB
	TOA	Small warble or burst of pops or clicks.		
EO&C				
	POF	Many small duration mutes with background noise.		

Notes:
Recording Reference: DAR30302.DAT
Impairment: Multipath with Gaussian Noise
Testers: DML,RMC
Test Date: 13-Apr-95

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30302.DAT			1	2	3			Glockenspiel No Added Noise	63.75
13-Apr-95			4	5	6				40.00
			7	8	9	10	11	TOA Unconfirmed	39.00
			12	13	14	15	16	TOA lab	38.00
			17	18	19				34.00
			20	21	22				29.00
			23	24	25			POF lab	24.00
			26	27	28			Soprano No Added Noise	63.75
			29	30	31				39.00
			32	33	34				38.00
			35	36	37				37.00
			38	39	40				36.00
			41	42	43			TOA lab	35.00
			44	45	46				32.00
			47	48	49				28.00
			50	51	52				26.00
			53	54	55			POF lab	24.00
			56	57	58			Clarinet No Added Noise	63.75
			59	60	61			TOA Unconfirmed	39.00
			62	63	64			TOA lab	38.00
			65	66	67			TOA+4	34.00
			68	69	70			TOA+9	28.00
			71	72	73			POF lab	24.00

Proponent Code: L
Impairment: Urban Fast Rayleigh

Test / Proponent Code: / Material	B-3 / L	Rural Fast Rayleigh Impairment Level	Units
Glockenspiel	Attenuator C/N		
	TOA EO&C POF	Defects in recovered audio apparent without any added noise. Small bursts of pops and clicks and some High Frequency roll off. Level of impairment approximately TOA.	
Soprano	Attenuator C/N		
	TOA EO&C POF	On "You" small burst of clicks. Other defects include high cut and various pops.	
Clarinet	Attenuator C/N		
	TOA EO&C POF	1st arpeggio high cut, pops and clicks (warbles)	
Notes:	Recording Reference: DAR30303.DAT Impairment: Multipath with Gaussian Noise Testers: DML,RMC Test Date: 14-Apr-95		

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30303.DAT			1	2	3	4	5	Glockenspiel No Added Noise	63.75
14-Apr-95									
			6	7	8	9	10	Soprano No Added Noise	63.75
			11	12	13	14	15	Clarinet No Added Noise	63.75

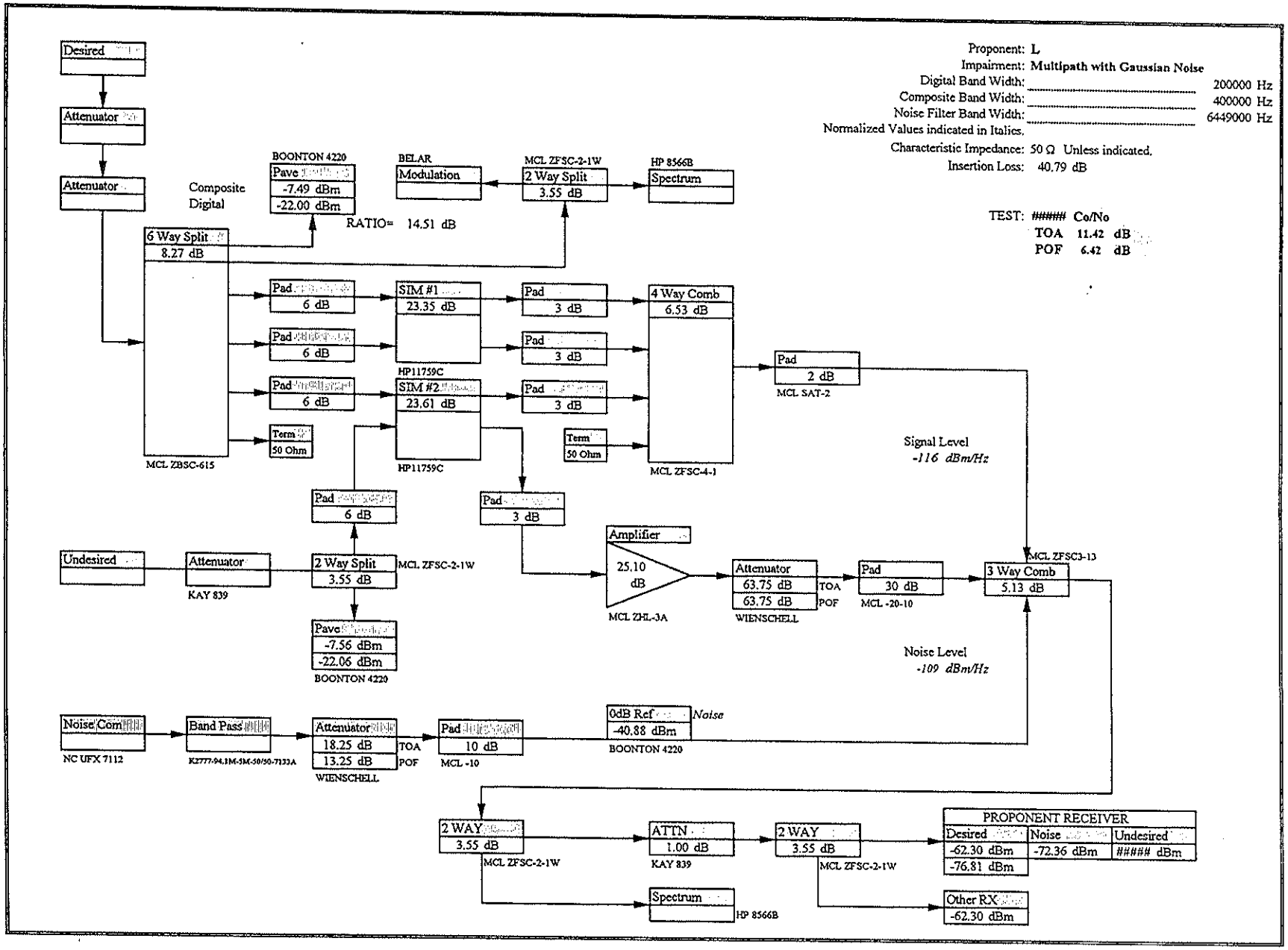
Proponent Code: L
Impairment: Rural Fast Rayleigh

Test B-3 Proponent Code: L Material	Terrain Obstructed Rayleigh	Units
Glockenspiel Attenuator C/N TOA EO&C POF	Level of impairment detected between TOA and POF, closer to POF.	
Soprano Attenuator C/N TOA EO&C POF	POF level of impairment.	
Clarinet Attenuator C/N TOA EO&C POF	POF level of impairment.	
Notes: Recording Reference: DAR30304.DAT Impairment: Multipath with Gaussian Noise Testers: DML,RMC Test Date: 14-Apr-95		

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code Start	Time Code Stop	Program IDs					Description	Attn
DAR30304.DAT	0:07	3:00	1	2	3	4	5	Glockenspiel No Added Noise	63.75
14-Apr-95									
	3:06	5:45	6	7	8	9	10	Soprano No Added Noise	63.75
	5:47	8:30	11	12	13	14	15	Clarinet No Added Noise	63.75

Proponent Code: L
Impairment: Terrain Obstructed Rayleigh


Proponent: L
Impairment: Multipath with Gaussian Noise
Digital Band Width: 200000 Hz
Composite Band Width: 400000 Hz
Noise Filter Band Width: 6449000 Hz
Normalized Values indicated in Italics.
Characteristic Impedance: 50 Ω Unless indicated.
Insertion Loss: 40.79 dB
TEST: ###### Co/No
TOA 11.42 dB
POF 6.42 dB
Desired
Attenuator
Attenuator
Composite Digital
BOONTON 4220
Pave
-7.49 dBm
-22.00 dBm
RATIO= 14.51 dB
BELAR
Modulation
MCL ZFSC-2-1W
2 Way Split
3.55 dB
HP 8566B
Spectrum
6 Way Split
8.27 dB
MCL ZBSC-615
Pad
6 dB
Pad
6 dB
Pad
6 dB
Term
50 Ohm
SIM #1
23.35 dB
HP11759C
SIM #2
23.61 dB
HP11759C
Pad
3 dB
Pad
3 dB
Pad
3 dB
Term
50 Ohm
4 Way Comb
6.53 dB
MCL ZFSC-4-1
Pad
2 dB
MCL SAT-2
Signal Level
-116 dBm/Hz
Pad
6 dB
Pad
3 dB
Undesired
Attenuator
KAY 839
2 Way Split
3.55 dB
MCL ZFSC-2-1W
Pave
-7.56 dBm
-22.06 dBm
BOONTON 4220
Amplifier
25.10 dB
MCL ZHL-3A
Attenuator
63.75 dB
63.75 dB
TOA
POF
WIENSCHELL
Pad
30 dB
MCL -20-10
MCL ZFSC3-13
3 Way Comb
5.13 dB
Noise Level
-109 dBm/Hz
Noise Com
NC UFX 7112
Band Pass
KZ777-94.1M-5M-50/50-7133A
Attenuator
18.25 dB
13.25 dB
TOA
POF
WIENSCHELL
Pad
10 dB
MCL -10
0dB Ref
-40.88 dBm
Noise
BOONTON 4220
2 WAY
3.55 dB
MCL ZFSC-2-1W
ATTN
1.00 dB
KAY 839
2 WAY
3.55 dB
MCL ZFSC-2-1W
PROPONENT RECEIVER
Desired
Noise
Undesired
-62.30 dBm
-72.36 dBm
dBm
-76.81 dBm
Spectrum
HP 8566B
Other RX
-62.30 dBm

Test C-1 Impulse Response					
USADR FM1 Rev B.			5 Vp-p at attenuator input.		
Program Material	Glockenspiel				
Pulse Repetition (Hz)	Attn at TOA dB	(Vp-p)	Attn at POF dB	(Vp-p)	EO&C
100	17.50	0.59	0.00	4.46	TOA, small warble. POF, not attainable.
200	20.50	0.42	15.00	0.79	TOA, small warble. POF,numerous warbles,high cut and mutes.
333	14.00	0.89	0.00	4.46	TOA, small warble. POF not attainable.
666	16.00	0.71	0.00	4.46	TOA, Buzz mute. POF, not attainable.
1000	21.00	0.40	17.50	0.59	

Test Date: 9-May-95
Testers: DML,RMc

Test	C-2	CW Response							
USADR FM1 Rev B.									
Program Material		Mozart (track 67 SQAM Disk)							
Test Point	Frequency MHz	POF	POF+6	POF+12	Test Point	Frequency MHz	POF	POF+6	POF+12
1	93.85	0	0	0	27	94.11	0	0	0
2	93.86	0	0	0	28	94.12	0	0	0
3	93.87	0	0	1	29	94.13	0	0	0
4	93.88	2	2	2	30	94.14	0	0	0
5	93.89	2	2	2	31	94.15	0	0	0
6	93.90	1	2	2	32	94.16	0	0	0
7	93.91	2	2	2	33	94.17	0	0	0
8	93.92	1	2	2	34	94.18	0	0	0
9	93.93	2	2	2	35	94.19	0	0	0
10	93.94	1	1	2	36	94.20	0	0	0
11	93.95	1	2	2	37	94.21	0	0	0
12	93.96	1	2	2	38	94.22	0	0	0
13	93.97	1	2	2	39	94.23	1	2	2
14	93.98	0	0	0	40	94.24	2	2	2
15	93.99	0	0	0	41	94.25	1	2	2
16	94.00	0	0	0	42	94.26	1	2	2
17	94.01	0	0	0	43	94.27	2	2	2
18	94.02	0	0	0	44	94.28	1	2	2
19	94.03	0	0	0	45	94.29	2	2	2
20	94.04	0	0	0	46	94.30	2	2	2
21	94.05	0	0	0	47	94.31	2	2	2
22	94.06	0	0	0	48	94.32	2	2	2
23	94.07	0	0	0	49	94.33	0	0	1
24	94.08	0	0	0	50	94.34	0	0	0
25	94.09	0	0	0	51	94.35	0	0	0
26	94.10	0	0	0					

Test Date: 9-May-95 0 dB Attenuator Reference: -33.38 dBm

0=CLEAN AUDIO 1=APPROXIMATE TOA 2 ≥ POF

POF at 93.96 MHz Attn=38.50dB

POF = High Cut, warbles and occasional buzz mutes.

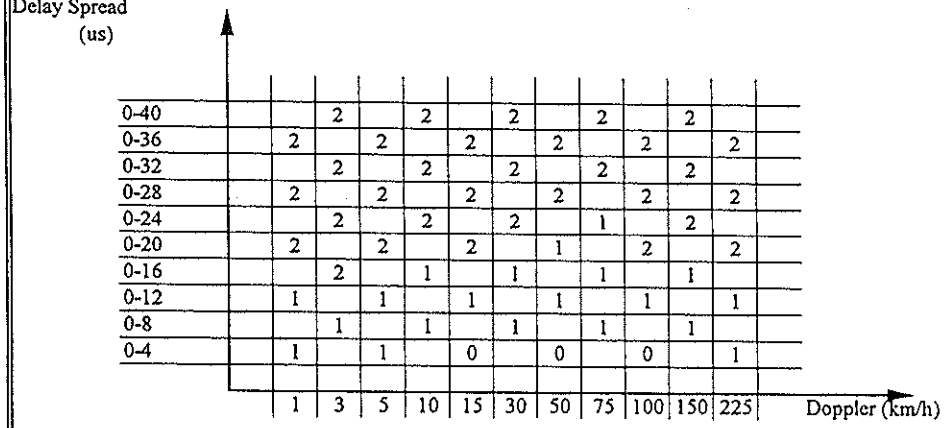
Test C-3 **Airplane Flutter** **USADR FM1 Rev B.** Program Material Glockenspiel		
Scenario	Reflected Path	EO&C
#1	400 Km/h Doppler 27.5 µs Delay 8.00 dB	High Frequency roll off with background noise. Level of impairment approacing POF. No clear audio segmants. Recorded for the Record. DAR30500.DAT PI #s 19, 20, 21, 22 and 23
#2	200 Km/h Doppler 13.7 µs Delay 6.00 dB	High Frequency roll off with background noise. Level of impairment equal to POF. No clear audio segmants. Recorded for the Record. DAR30500.DAT PI #s 24, 25,26, 27 and 28
#3	100 Km/h Doppler 6.8 µs Delay 4.00 dB	High Frequency roll off with background noise. Level of impairment equal to POF. No clear audio segmants. Recorded for the Record. DAR30500.DAT PI #s 29, 30, 31, 32 and 33
Test Date: 14-Apr-95 Testers: DML, RMc		

Test	C-4	Weak Signal Sensitivity
USADR FM1 Rev B.		
Program Material	Glockenspiel	

TOA (dBm)	POF (dBm)
-87 ≤ TOA < -86	-92 < POF ≤ -91

Test Date: 4-May-95
Testers: DML, RMc

Test	C-5	Delay Spread / Doppler
Code:	L	Bad Urban 1
Program Material		Mozart (Track 67 on SQAM disk)



EO&C

Test Date: 18-Apr-95
Testers: DML, RMc

0= Unimpaired
1= Small Impairment
2= POF Level of Impairment

30 sec minimum listening time.

Test Code:	C-5	Delay Spread / Doppler
	L	Bad Urban 2
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-80											
0-76	2		2		2		2		2		2
0-72											
0-68		2		2		2		2		2	
0-64											
0-60	2		2		2		2		2		2
0-56											
0-52		2		2		2		2		2	
0-48											
0-44	2		2		2		2		2		2

Doppler (km/h)

EO&C

System locked up and receiver software had to be reloaded once during this series of tests.

Test Date: 18-Apr-95
Testers: DML, RMc

0= Unimpaired
1= Small Impairment
2= POF Level of Impairment

30 sec minimum listening time.

Test	C-5	Delay Spread / Doppler
Code:	L	Typical Urban
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-10		2		1		1		1		1	
0-9	1		1		1		1		0		1
0-8		1		0		1		0		1	
0-7	1		1		0		1		1		1
0-6		1		1		0		0		0	
0-5	1		1		1		0		0		1
0-4		1		0		0		0		0	
0-3	0		0		0		0		0		1
0-2		1		0		0		0		0	
0-1	0		1		1		1		1		1

Doppler (km/h)

EO&C

Test Date: 18-Apr-95
Testers: DML, RMc

0= Unimpaired
1= Small Impairment
2= POF Level of Impairment

30 sec minimum listening time.

Test	C-5	Delay Spread / Doppler
Code:	L	Hilly Terrain
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

Delay Spread (us)	1	3	5	10	15	30	50	75	100	150	225
0-50	2		2		2		2		2		2
0-48		2		2		2		2		2	
0-44	1		2		2		2		2		2
0-40		2		1		1		1		1	
0-36	2		2		1		2		1		1
0-32		2		2		1		1		2	
0-28	1		2		2		1		2		2
0-24		2		2		2		2		2	
0-20	1		2		2		2		2		2

Doppler (km/h)

EO&C

System locked up and receiver software had to be reloaded once during this series of tests.

Test Date: 18-Apr-95

Testers: DML, RMc

0= Unimpaired
1= Small Impairment
2= POF Level of Impairment

30 sec minimum listening time.

Test	C-5	Delay Spread / Doppler
Code:	L	Rural Area
Program Material		Mozart (Track 67 on SQAM disk)

Delay Spread (us)

	1	3	5	10	15	30	50	75	100	150	225
0-1.0	0		0		0		0		0		1
0-0.9		0		0		0		0		0	
0-0.8											
0-0.7	0		1		0		0		0		0
0-0.6											
0-0.5		0		0		0		0		0	
0-0.4											
0-0.3	0		0		0		0		0		0
0-0.2		0		0		0		0		0	
0-0.1	1		0		0		0		0		0

Doppler (km/h)

EO&C

System locked up and receiver software had to be reloaded once during this series of tests.

Test Date: 18-Apr-95
Testers: DML, RMc

0= Unimpaired
1= Small Impairment
2= POF Level of Impairment

30 sec minimum listening time.

Test C-6 Additional Multipath Doppler Simulations USADR FM1 Rev B. Program Material: Glockenspiel				
Scenario		Attn	Co/No Units	EO&C
#1 Urban Slow	No Added Noise			Mutes on severe fades. High Frequency roll off and warbleing. Level of impairment between TOA and POF closer to TOA.
#2 Urban Fast	TOA	29.00	22.21 dB	TOA Small Static pop on ID # 19
	POF	16.00	9.21 dB	POF Many warbles, High Cut and a mute.
#3 Rural Fast	TOA	24.00	17.21 dB	TOA Small Static pop on ID # 49
	POF	14.00	7.21 dB	POF Many warbles, High Cut and a mute.
#4 Terrain Obstructed Fast	No Added Noise			Mutes on severe fades. High Frequency roll off and warbleing. POF level of impairment.

Test Date: 19-Apr-95
Testers: DML, RMc
DAT Reference: DAR30560.DAT

EIA Digital Audio Radio Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30560.DAT	0:20	3:13	1	2	3	4	5	Urban Slow Doppler No Added Noise	63.75
19-Apr-95									
	3:17	6:11	6	7	8	9	10	Urban Fast Doppler No Added Noise	63.75
			11	12	13				31.00
			14	15	16				30.00
			17	18	19			TOA	29.00
			20	21	22				25.00
			23	24	25				21.00
			26	27	28			POF	17.00
			33	34	35	36	37	Rural Fast Doppler No Added Noise	63.75
			38	39	40				26.00
			41	42	43	44	45	TOA unconfirmed	25.00
			46	47	48	49	50	TOA confirmed	24.00
			51	52	53				21.00
			54	55	56				18.00
			57	58	59			POF	14.00
		37:25	60	61	62	63	64	Obstructed Path Doppler No Added Noise	63.75

Propnent Code: L

Additional Multi Path

Test **D-Series Co-Channel, 1st and 2nd Adjacent**
USADR FM1 Rev B.
Program Material: Glockenspiel

	Level	Attn	D/U	Units	EO&C
D-1 Co-Channel	TOA	13.75	10.78	dB	Small warble.
	POF	10.25	7.28	dB	Many pops, clicks and some muting.
D-2 Lower 1st Adjacent	TOA	30.25	27.28	dB	Small chirp.
	POF	25.75	22.78	dB	Many pops, clicks and some muting.
Upper 1st Adjacent	TOA	29.75	26.78	dB	High Cut and warble.
	POF	25.75	22.78	dB	Many pops, clicks and some muting.
D-3 Lower 2nd Adjacent	TOA	26.75	3.78	dB	Small warble or chirp.
	POF	18.25	-4.72	dB	Many pops and clicks high cut and slight mute.
Upper 2nd Adjacent	TOA	28.25	5.28	dB	Small chirp.
	POF	21.50	-1.47	dB	Pops, clicks, high cut and mute.

Additional Comments: Tests conducted through the multipath simulators with one path on the desired and one path on the undesired channels.

DAT Reference: DAR30411.DAT

Test Date: 2-May-95
Testers: DML, RMc

	Desired	Undesired
Signal	-7.40 dBm	-7.54
IL	40.79 dB	37.68 dB
3WIN	-48.19 dBm	-45.22 dBm

EIA Digital Audio Radio Laboratory

DAT File Number	Time Code Start	Time Code Stop	Start IDs					Description	Attn
DAR30411.DAT									
2-May-95	0:05	2:58	1	2	3	4	5	Co-Channel, #	14.25
			6	7	8	9	10	Various defects in 7 and 10 unconfirmed.	14.00
		8:11	11	12	13	14		Confirmed TOA	13.75
	8:20		15	16	17	18	19	Lower 2nd Adjacent, #19 very end slight warble.	26.75
		14:05	20	21	22	23	24	#23 2nd arpeggio at the end.	
	14:10	17:04	25	26	27	28	29	Lower 1st Adjacent,TOA #28 very end	30.25
	17:08	20:01	30	31	32	33	34	Upper 2nd Adjacent #33 TOA	28.25
	20:04	22:57	35	36	37	38	39	Upper 1st Adjacent TOA #39 warble	29.75

Proponent Code: L

D-Series Recordings Co,1st and 2nd Adjacent

Test E-1 Co-Channel with Multipath (Rayleigh) USADR FM1 Rev B. Program Material: Glockenspiel					
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow					Scenario with No Co-Channel creates defects in the recovered audio. Defects consist of high cut and warbles. The level of impairment is between TOA and POF closer to TOA.
#2 Urban Fast	TOA	37.00	34.03	dB	Small drop out.
	POF	24.00	21.03	dB	Excessive muting.
#3 Rural Fast					Scenario with No Co-Channel creates defects in the recovered audio. Defects consist of broken glass, hich cut and pops. The level of impairment is between TOA and POF closer to TOA.
#4 Terrain Obstructed					Scenario with No Co-Channel creates defects in the recovered audio. Defects consist of mutes, pops and high cut. The level of impairment is between TOA and POF closer to POF.

Test Date: 2-May-95		Desired	Undesired
Testers: DML, RMc	Signal	-7.40 dBm	-7.54 dBm
	Insertion Loss	40.79 dB	37.68 dB
	Level at 3 way combiner	-48.19 dBm	-45.22 dBm

Test	E-2	Lower 1st Adjacent with Multipath (Rayleigh)			
USADR FM1 Rev B.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow					Scenario with no 1st Adjacent creates defects in the recovered audio. Defects consist of high cut and warbles. The level of impairment is between TOA and POF closer to TOA.
#2 Urban Fast	TOA	55.00	52.02	dB	Burst of pops.
	POF	40.00	37.02	dB	High Cut, pops, clicks and buzz mute.
#3 Rural Fast					Scenario with no 1st Adjacent creates defects in the recovered audio. Defects consist of broken glass, hich cut and pops. The level of impairment is between TOA and POF closer to TOA.
#4 Terrain Obstructed					Scenario with no 1st Adjacent creates defects in the recovered audio. Defects consist of mutes, pops and high cut. The level of impairment is between TOA and POF closer to POF.

		Desired	Undesired
Test Date: 4-May-95			
Testers: DML, RMc	Signal	-7.46 dBm	-7.59 dBm
	Insertion Loss	40.79 dB	37.68 dB
	Level at 3 way combiner	-48.25 dBm	-45.27 dBm

Test	E-3	Lower 2nd Adjacent with Multipath (Rayleigh)			
USADR FM1 Rev B.					
Program Material:	Glockenspiel				
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow					Scenario with no 2nd Adjacent creates defects in the recovered audio. Defects consist of high cut and warbles. The level of impairment is between TOA and POF closer to TOA.
#2 Urban Fast	TOA	53.00	29.99	dB	Shattering.
	POF	35.00	11.99	dB	Pops, clicks, high cut and muting.
#3 Rural Fast					Scenario with no 2nd Adjacent creates defects in the recovered audio. Defects consist of broken glass, hich cut and pops. The level of impairment is between TOA and POF closer to TOA.
#4 Terrain Obstructed					Scenario with no 2nd Adjacent creates defects in the recovered audio. Defects consist of mutes, pops and high cut. The level of impairment is between TOA and POF closer to POF.

		Desired	Undesired
Test Date: 3-May-95			
Testers: DML, RMc	Signal	-7.44 dBm	-7.54 dBm
	Insertion Loss	40.79 dB	37.68 dB
	Level at 3 way combiner	-48.23 dBm	-45.22 dBm

Test E-1 Co-Channel with Multipath (Doppler) USADR FM1 Rev B. Program Material: Glockenspiel					
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow					Scenario with No Co-Channel creates defects in the recovered audio. Defects consist of high cut, warbles and mutes. The level of impairment is between TOA and POF closer to TOA.
#2 Urban Fast	TOA	26.00	23.03	dB	High cut, broken glass and warbleing.
	POF	17.00	14.03	dB	Excessive high cut, muting and some background noise.
#3 Rural Fast	TOA	23.00	20.03	dB	High cut, broken glass and warbleing.
	POF	18.00	15.03	dB	Excessive high cut, muting and background noise.
#4 Terrain Obstructed					Scenario with No Co-Channel creates defects in the recovered audio. Defects consist of high cut and warbles. The level of impairment is between TOA and POF.

Test Date: 2-May-95 Testers: DML, RMc		Desired	Undesired
	Signal	-7.40 dBm	-7.54 dBm
	Insertion Loss	40.79 dB	37.68 dB
	Level at 3 way combiner	-48.19 dBm	-45.22 dBm

Test E-2 Lower 1st Adjacent with Multipath (Doppler) USADR FM1 Rev B. Program Material: Glockenspiel					
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow					Scenario with no 1st Adjacent creates defects in the recovered audio. Defects consist of high cut, warbles and mutes. The level of impairment is between TOA and POF closer to TOA.
#2 Urban Fast	TOA	46.00	43.02	dB	Static Pop and warble.
	POF	31.00	28.02	dB	Warbles, shatters, pops, clicks, high cuts and mutes.
#3 Rural Fast	TOA	39.00	36.02	dB	Static Pop and warble.
	POF	30.00	27.02	dB	Warbles, shatters, pops, clicks, high cuts and mutes.
#4 Terrain Obstructed					Scenario with no 1st Adjacent creates defects in the recovered audio. Defects consist of high cut and warbles. The level of impairment is between TOA and POF.

Test Date: 4-May-95		Desired	Undesired
Testers: DML, RMc	Signal	-7.46 dBm	-7.59 dBm
	Insertion Loss	40.79 dB	37.68 dB
	Level at 3 way combiner	-48.25 dBm	-45.27 dBm

Test E-3 2nd Adjacent with Multipath (Doppler) USADR FM1 Rev B. Program Material: Glockenspiel					
Scenario	Level	Attn	D/U	Units	EO&C
#1 Urban Slow					Scenario with No 2nd Adjacent creates defects in the recovered audio. Defects consist of high cut, warbles and mutes. The level of impairment is between TOA and POF closer to TOA.
#2 Urban Fast	TOA	39.00	15.99	dB	Static Pop and warble.
	POF	24.00	0.99	dB	Warbles, shatters, pops, clicks, high cuts and buzz mutes.
#3 Rural Fast	TOA	36.00	12.99	dB	Static Pop and warble.
	POF	24.00	0.99	dB	Warbles, shatters, pops, clicks, high cuts and mutes.
#4 Terrain Obstructed					Scenario with No 2nd Adjacent creates defects in the recovered audio. Defects consist of high cut and warbles. The level of impairment is between TOA and POF.

Test Date: 3-May-95 Testers: DML, RMc		Desired	Undesired
	Signal	-7.44 dBm	-7.54 dBm
	Insertion Loss	40.79 dB	37.68 dB
	Level at 3 way combiner	-48.23 dBm	-45.22 dBm

Test J-1 Re-Acguisition
USADR FM1 Rev B.
Program Material Mozart (Track 67 on SQAM disk)

Toff (s)	Re-Acquisition Time (s) POF-2dB	POF-4dB	POF-62dB
30	7	9	10
	5	6	3
	14	2	3
	11	10	7
	10	9	5
Average	9.4	7.2	5.6

POF Attenuator Setting : 13.00 dB
Desired Signal Level : -48.27 dBm
Noise 0 dB Reference : -40.87 dBm

EO&C

Re-Acquisition time is the value listed ± 0.5 seconds.

Test Date: 8-May-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Urban Slow Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	10	6	6
10	6	10	5
15	5	6	8
20	8	6	38
25	11 *	10	10
Average	8.0	7.6	13.4

POF Attenuator Setting	:	28.00 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C The recovered audio exhibits high cut and warbleing while running the simulation by itself. Approximately a TOA level of impairment.

Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95
Testers: DML, RMc

* Indicates receiver software was reloaded after a one minute period with signal and with out recovered audio.

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Urban Fast Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	6	6	7
10	9	11	9
15	8	8	7
20	5	11	5
25	11	11	11
Average	7.8	9.4	7.8

POF Attenuator Setting	:	22.00 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Rural Fast Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	11	5	7
10	6	15	12
15	31	8	7
20	11	6	7
25	9	11	10
Average	13.6	9.0	8.6

POF Attenuator Setting	:	28.00 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C Recovered Audio is approximately at a TOA level of impairment with the simulation running with no added noise.
Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Terrain Obstructed Rayleigh
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF
5	8
10	10
15	5
20	4
25	4
Average	6.2

POF Attenuator Setting	:	63.75 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C The recovered audio exhibits high cut and warbleing while running the simulation by itself. Static and mutes (buzzing) also occur. Approximately a POF level of impairment.

Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Urban Slow Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	4	4	34
10	11	4	10
15	9	5	10
20	5	5	17
25	9	7	11
Average	7.6	5.0	16.4

POF Attenuator Setting	:	23.00 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C Recovered audio exhibits defects which are consistent with a level of impairment between TOA and POF, closer to TOA.

Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Urban Fast Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	8	5	11
10	11	6	14
15	5	10	4
20	8	7	37
25	10	8	16
Average	8.4	7.2	16.4

POF Attenuator Setting	:	16.00 dBm
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95
Testers: DML, RMc

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Rural Fast Doppler
Program Material		Mozart (Track 67 on SQAM disk)

Tsim (s)	Re-Acquisition Time (s) POF-2	POF-4	POF-6
5	7	9	11
10	7	6	5
15	5	8	33
20	9 *	6	10
25	7	10	8
Average	7.0	7.8	13.4

POF Attenuator Setting	:	14.00 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

EO&C

Re-Acquisition time is the value listed ± 1 second.

Test Date: 5-May-95

Testers: DML, RMc

* Indicates receiver software was reloaded after a one minute period with signal and with out recovered audio.

Test	J-2	Re-Acquisition with Multipath
USADR FM1 Rev B.		Terrain Obstructed Doppler
Program Material		Mozart (Track 67 on SQAM disk)

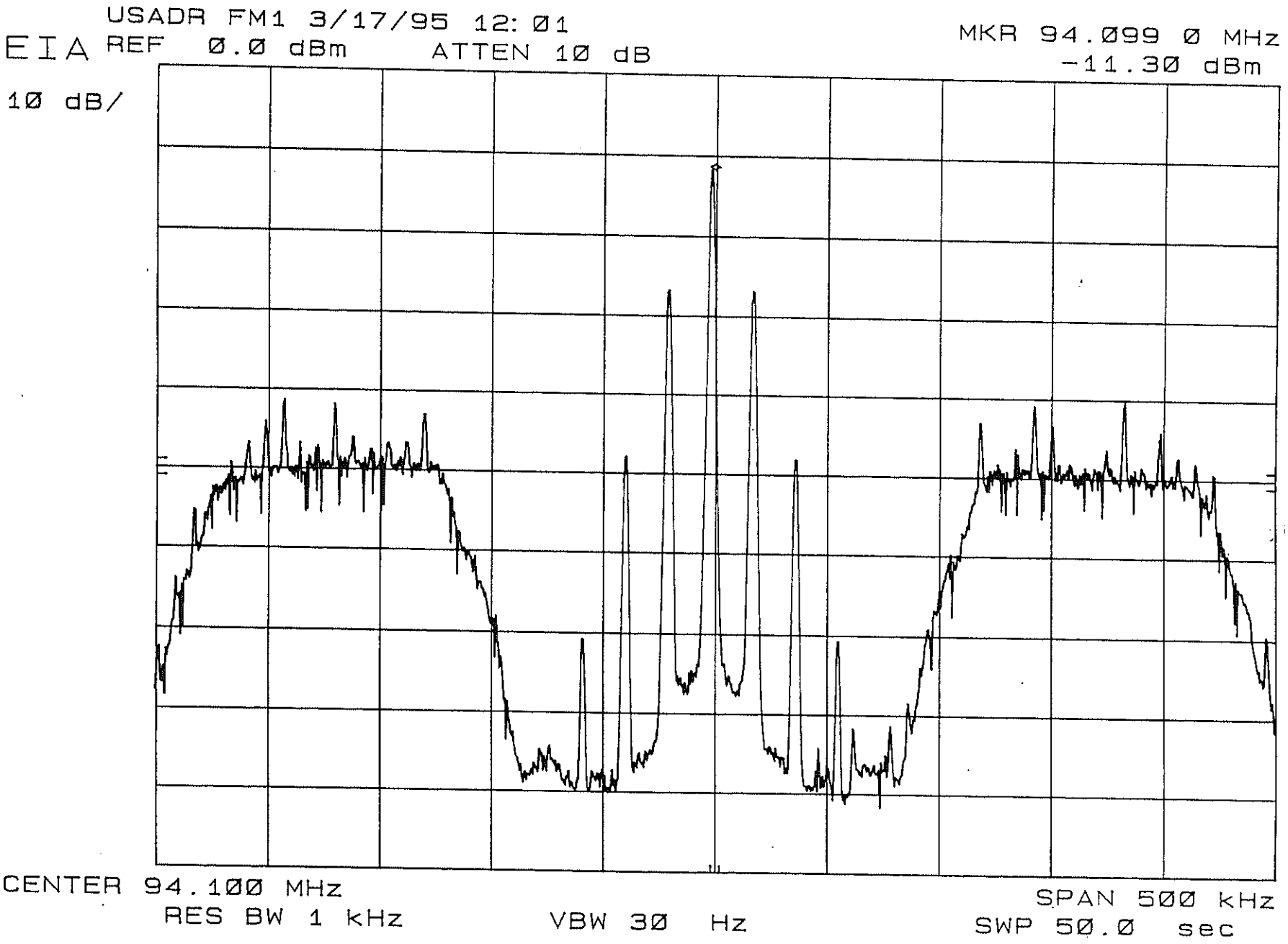
Tsim (s)	Re-Acquisition Time (s) POF
5	5
10	5
15	2
20	4
25	3
Average	3.8

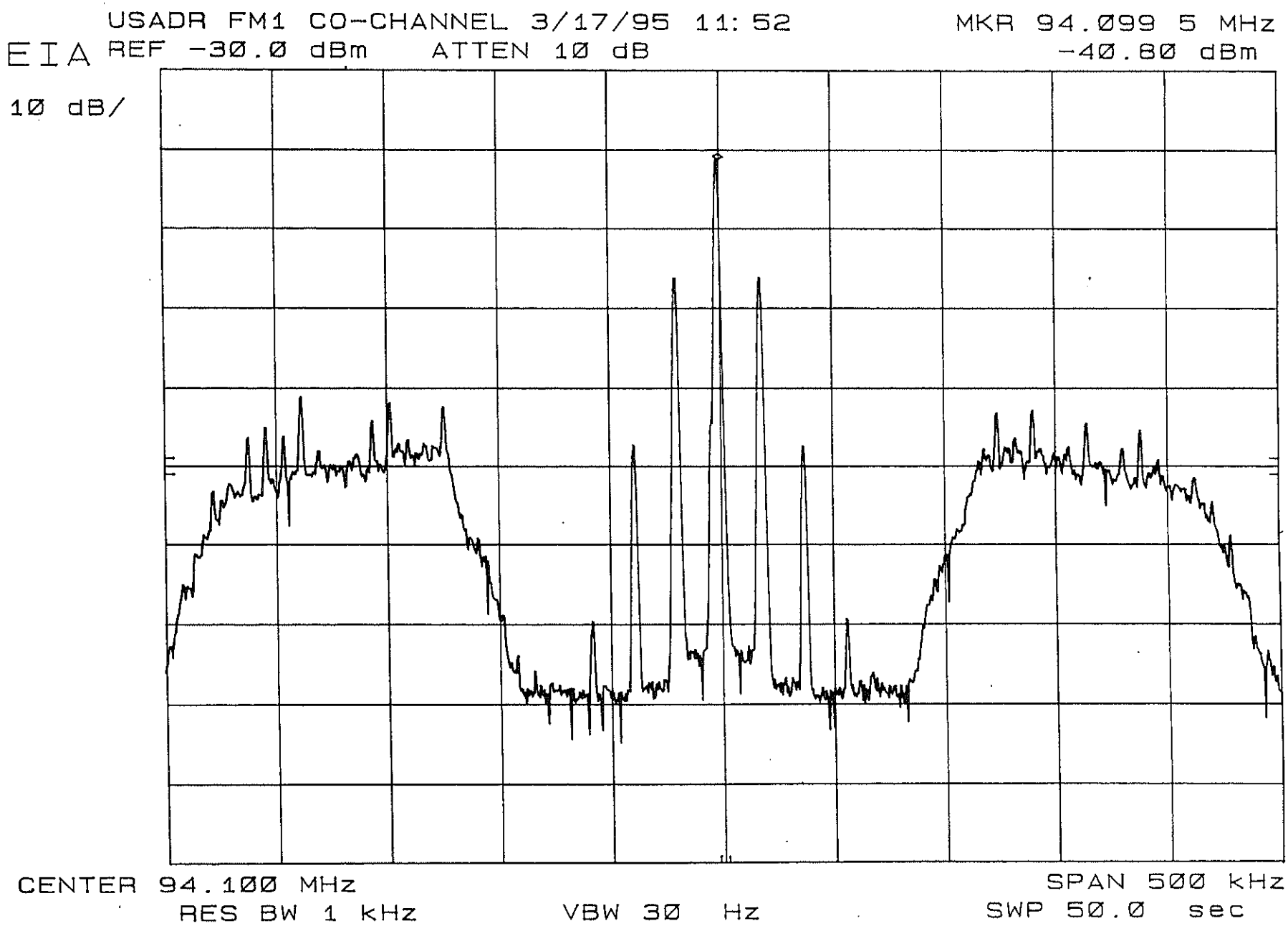
POF Attenuator Setting	:	63.75 dB
Desired Signal Level	:	-48.25 dBm
Noise 0 dB Reference	:	-40.87 dBm

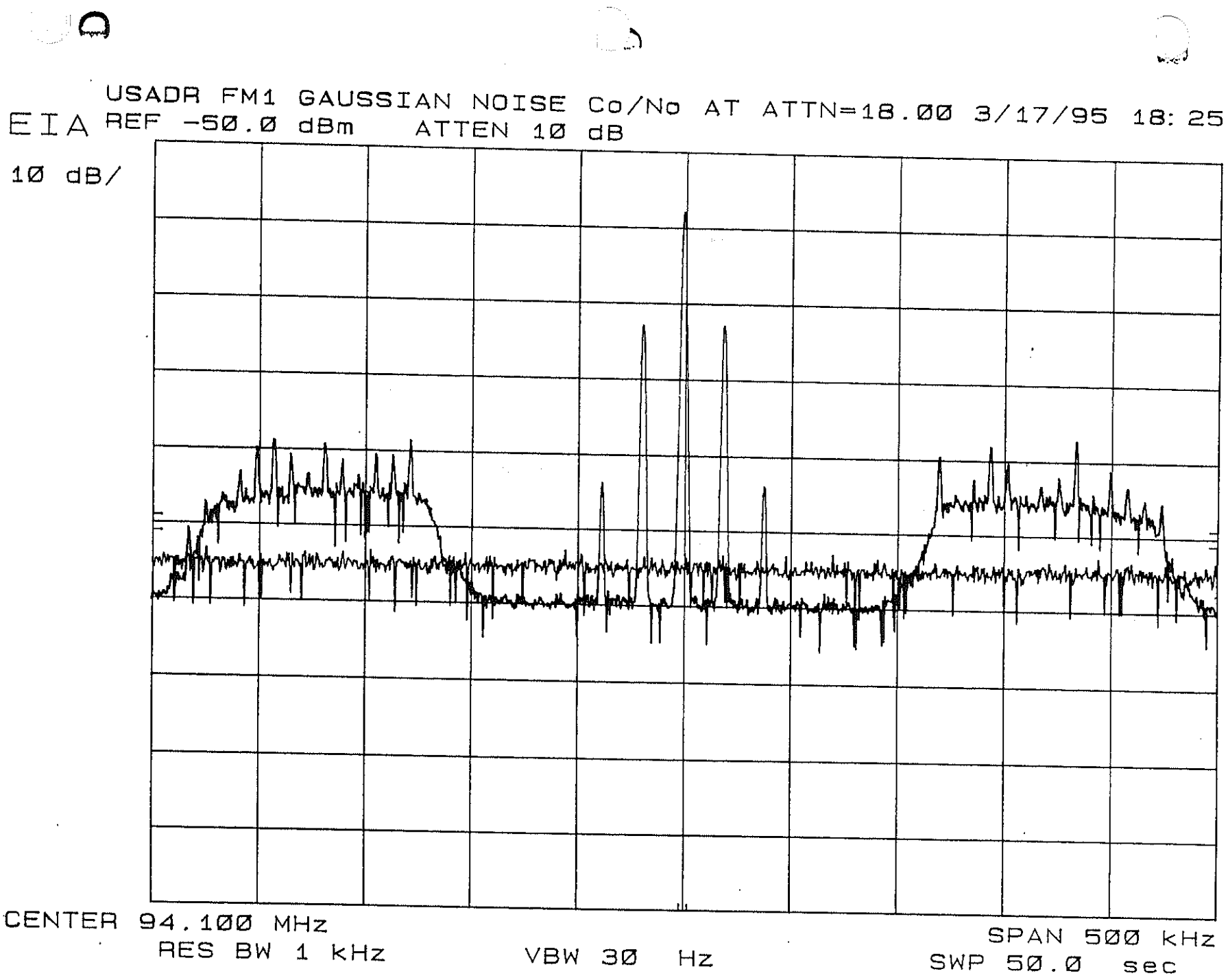
EO&C The recovered audio exhibits high cut and warbleing while running the simulation by itself. Static and mutes also occur. Approximately a POF level of impairment.

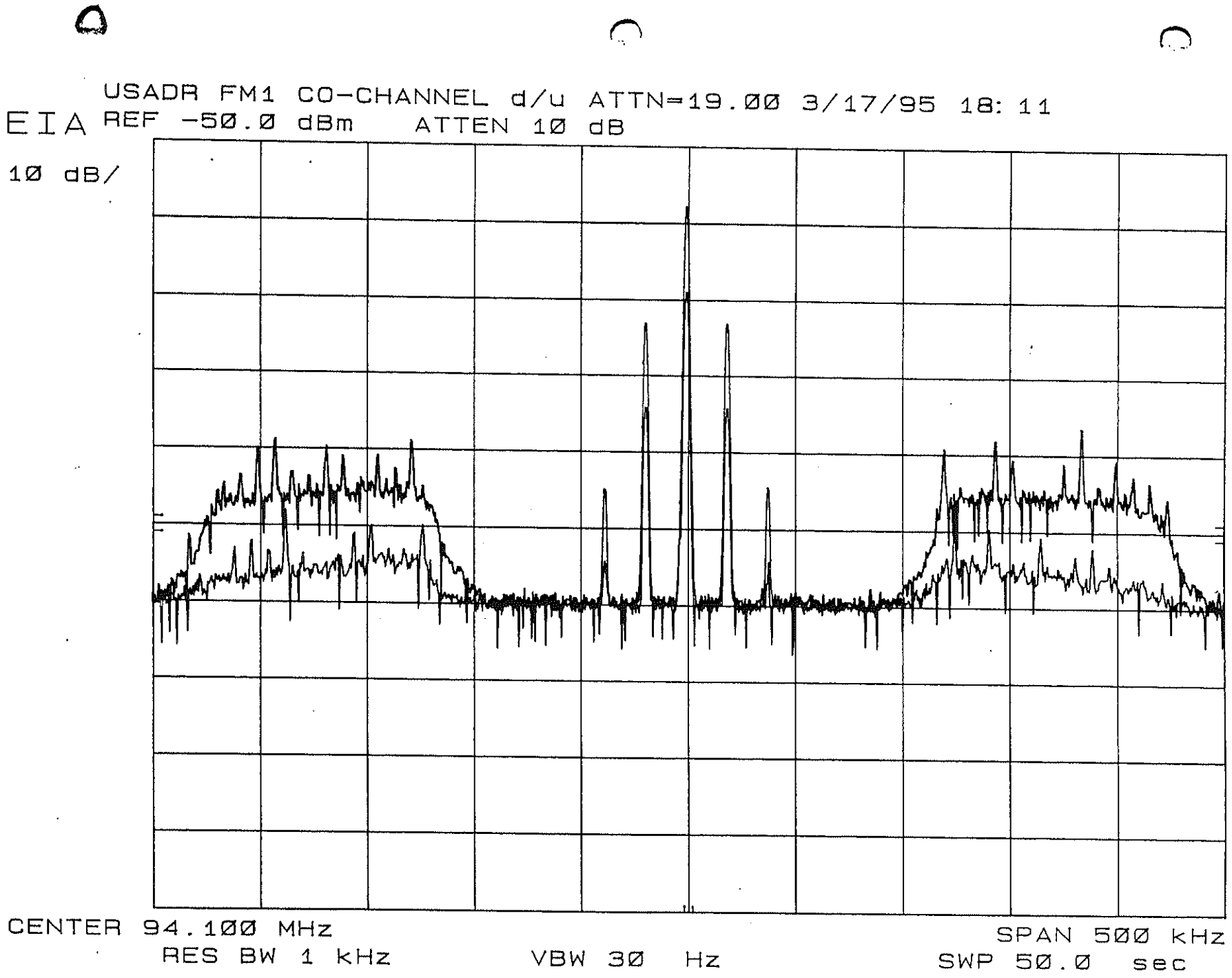
Re-Acquisition time is the value listed ± 1 second.

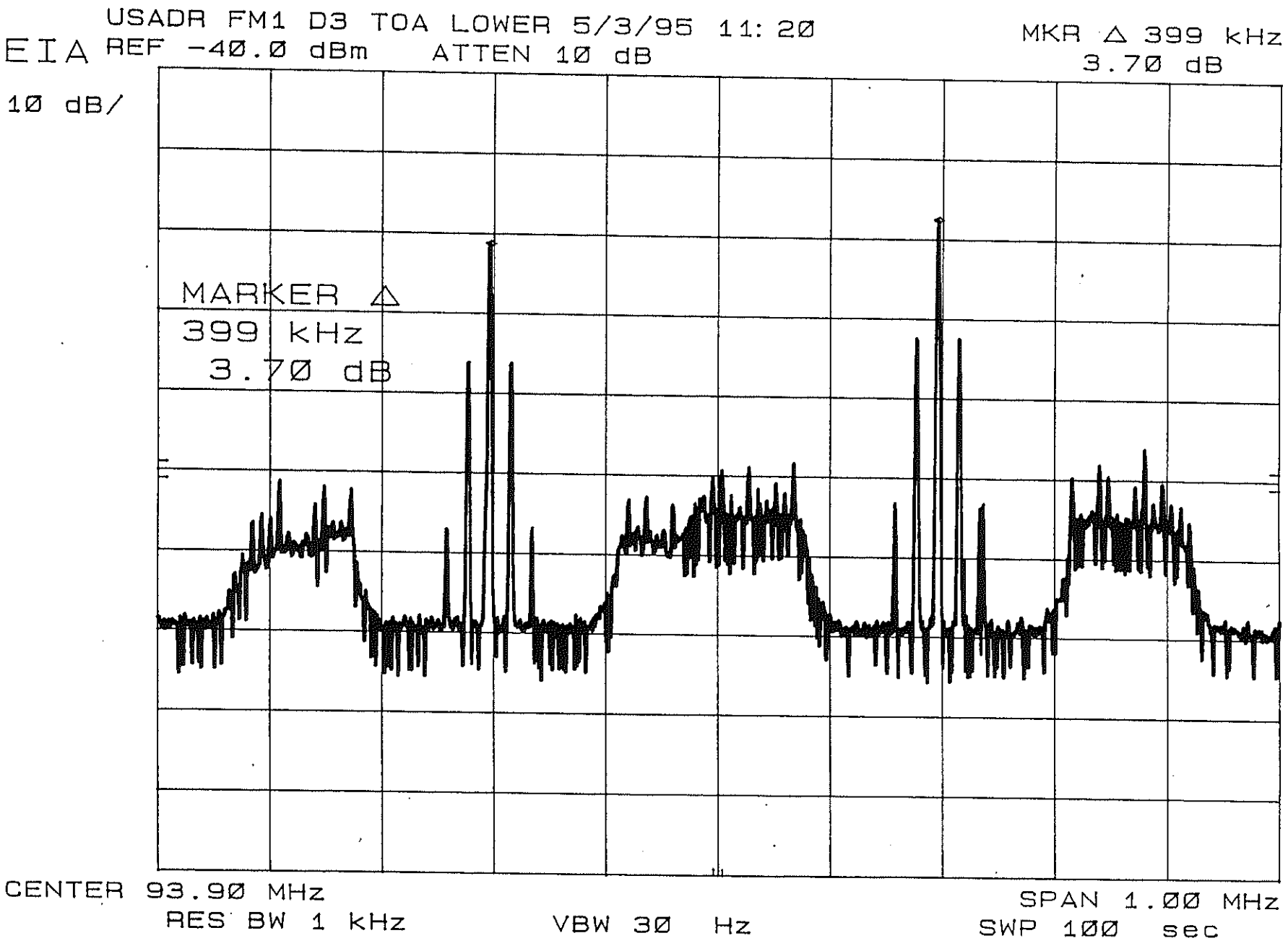
Test Date: 5-May-95
Testers: DML, RMc

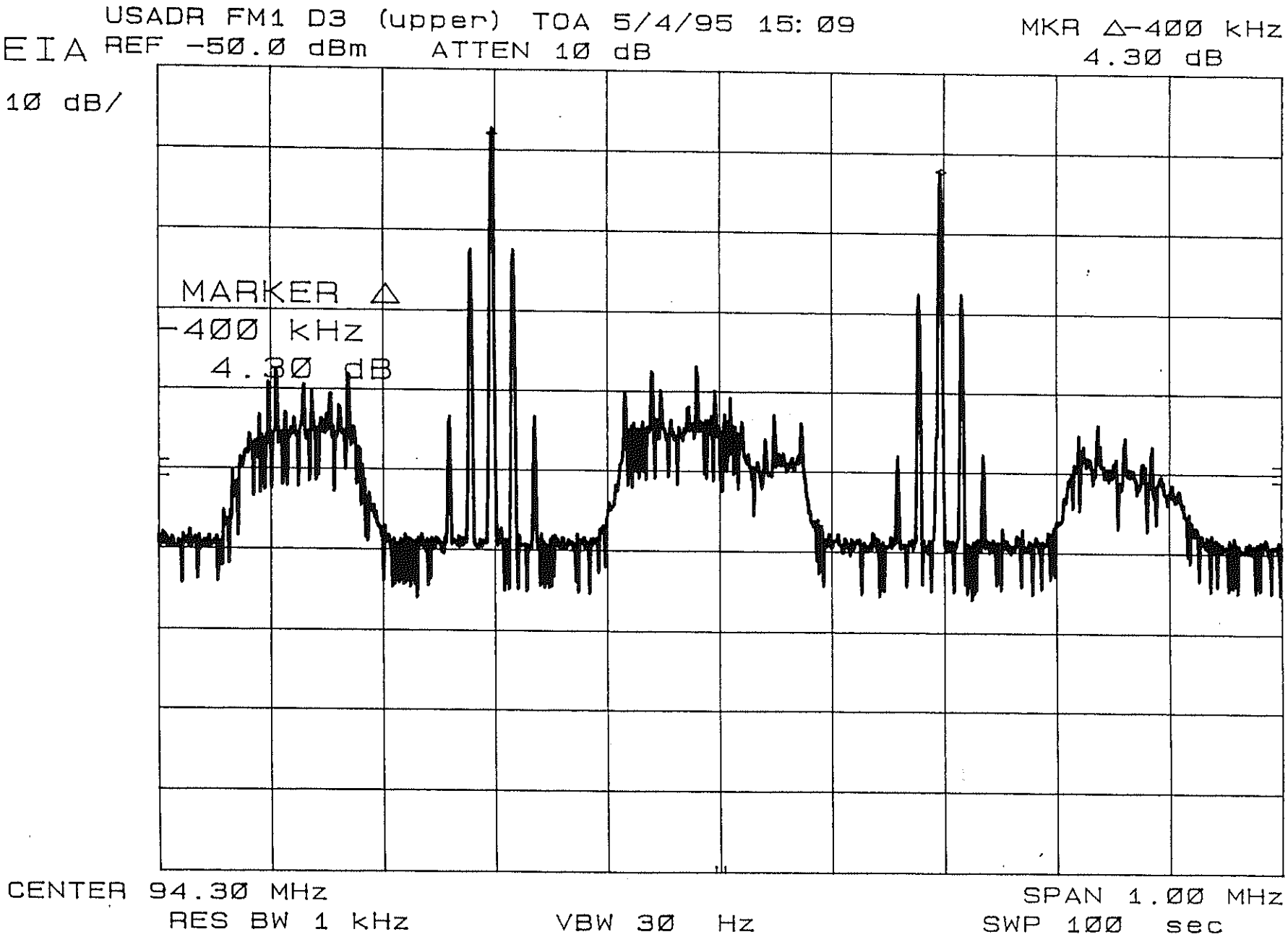

USADR FM1 3/17/95 12:01
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.099 0 MHz
-11.30 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

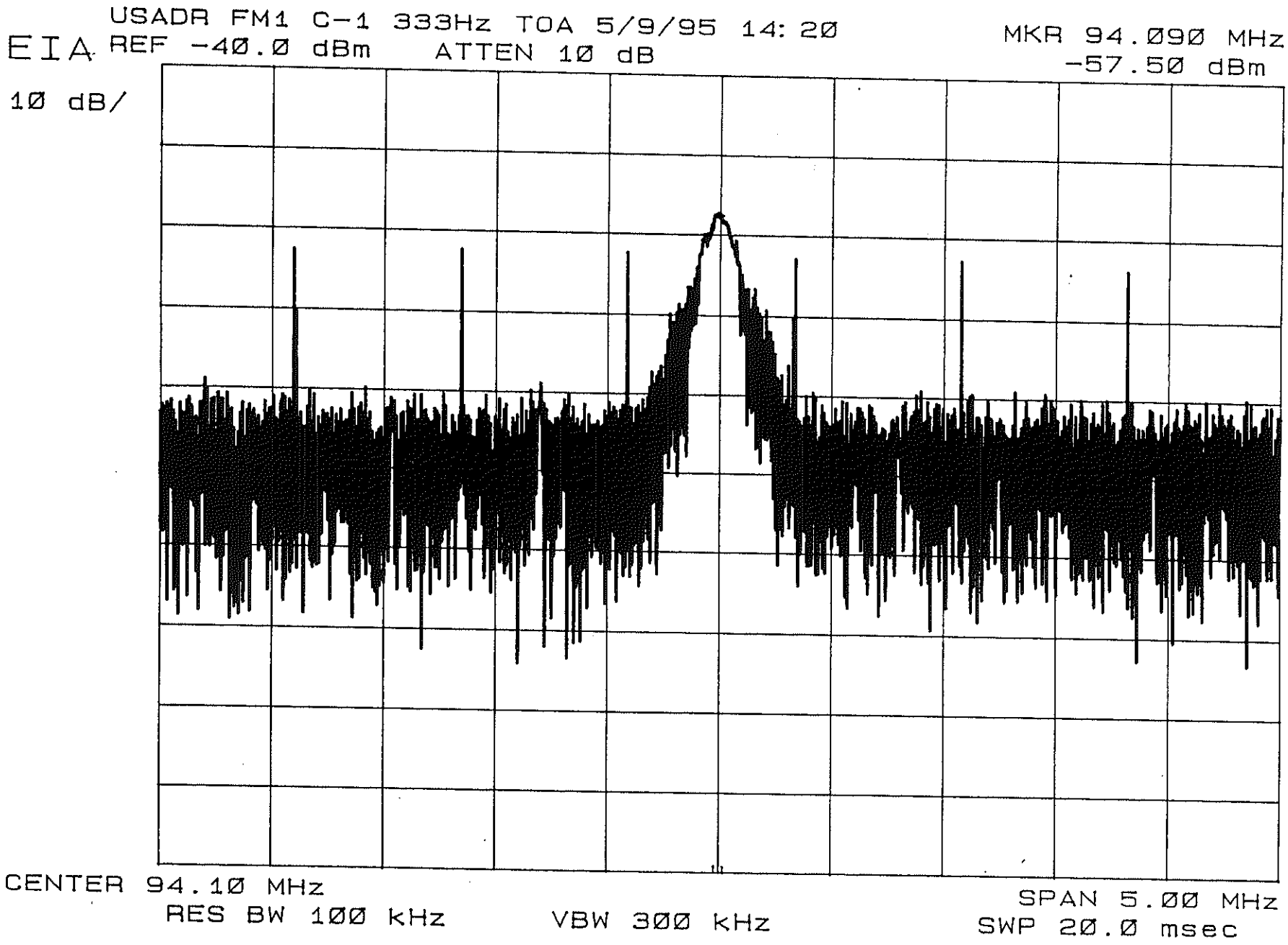

USADR FM1 CO-CHANNEL 3/17/95 11:52
MKR 94.099 5 MHz
EIA REF -30.0 dBm
ATTEN 10 dB
-40.80 dBm
10 dB/
CENTER 94.100 MHz
SPAN 500 kHz
RES BW 1 kHz
VBW 30 Hz
SWP 50.0 sec

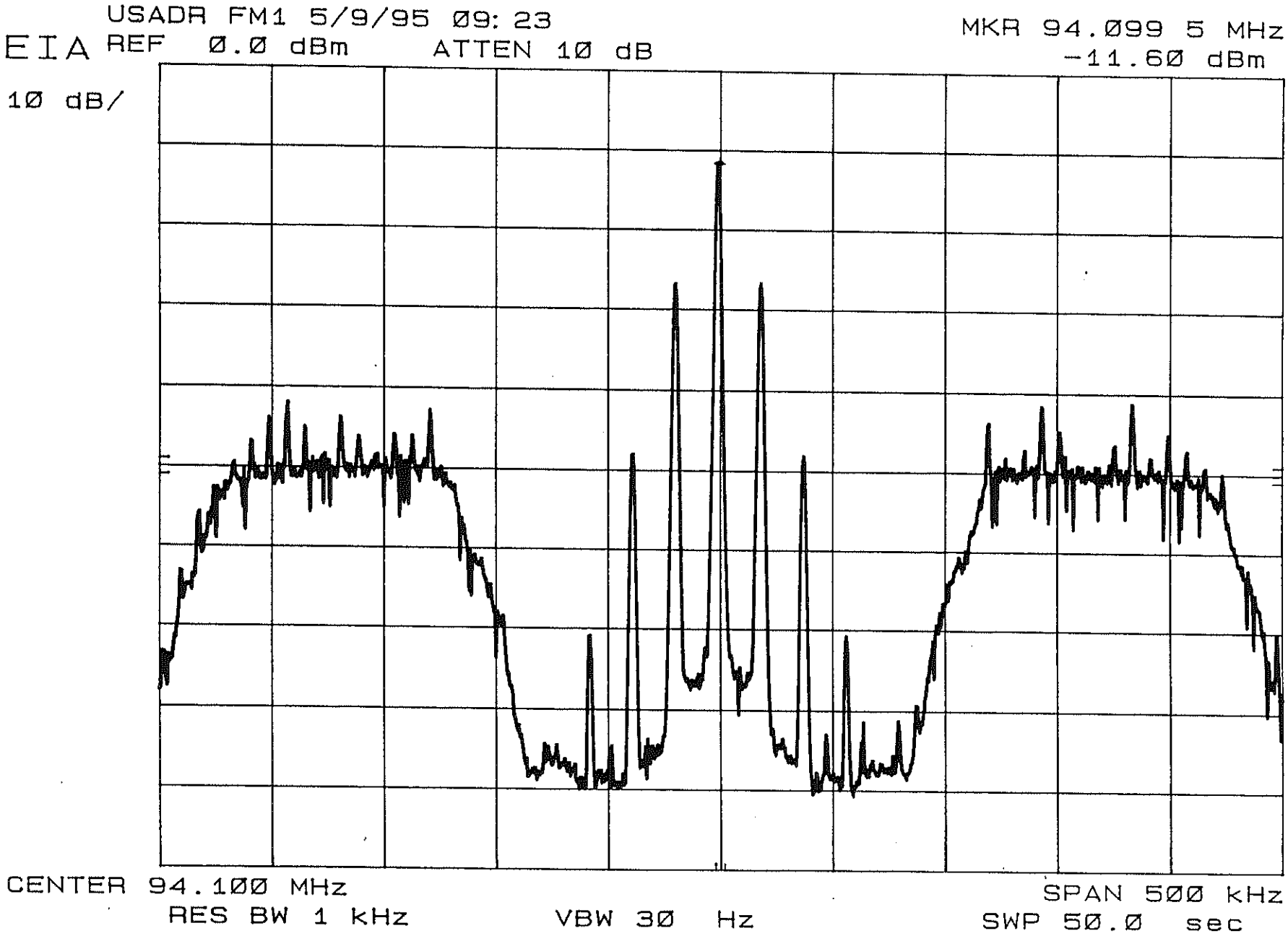

USADR FM1 GAUSSIAN NOISE Co/No AT ATTN=18.00 3/17/95 18:25
EIA REF -50.0 dBm ATTEN 10 dB
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec


USADR FM1 CO-CHANNEL d/u ATTN=19.00 3/17/95 18: 11
EIA REF -50.0 dBm ATTEN 10 dB
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec


USADR FM1 D3 TOA LOWER 5/3/95 11:20
EIA REF -40.0 dBm ATTEN 10 dB
MKR Δ 399 kHz
3.70 dB
10 dB/
MARKER Δ
399 kHz
3.70 dB
CENTER 93.90 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 1.00 MHz
SWP 100 sec


USADR FM1 D3 (upper) TOA 5/4/95 15:09
EIA REF -50.0 dBm ATTEN 10 dB
MKR Δ-400 kHz
4.30 dB
10 dB/
MARKER Δ
-400 kHz
4.30 dB
CENTER 94.30 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 1.00 MHz
SWP 100 sec


USADR FM1 C-1 333Hz TOA 5/9/95 14:20
EIA REF -40.0 dBm ATTEN 10 dB
MKR 94.090 MHz
-57.50 dBm
10 dB/
CENTER 94.10 MHz
RES BW 100 kHz
VBW 300 kHz
SPAN 5.00 MHz
SWP 20.0 msec


USADR FM1 5/9/95 09: 23
EIA REF 0.0 dBm
ATTEN 10 dB
MKR 94.099 5 MHz
-11.60 dBm
10 dB/
CENTER 94.100 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

NRSC-R58

NRSC Document Improvement Proposal

If in the review or use of this document a potential change appears needed for safety, health or technical reasons, please fill in the appropriate information below and email, mail or fax to:

National Radio Systems Committee

c/o Consumer Electronics Association

Technology & Standards Department

1919 S. Eads St.

Arlington, VA 22202

FAX: 703-907-4190

Email: standards@ce.org

DOCUMENT NO.	DOCUMENT TITLE:
SUBMITTER'S NAME: COMPANY:	TEL: FAX: EMAIL:
ADDRESS:	
URGENCY OF CHANGE: _____ Immediate _____ At next revision	
PROBLEM AREA (ATTACH ADDITIONAL SHEETS IF NECESSARY):	

a. Clause Number and/or Drawing:

b. Recommended Changes:

c. Reason/Rationale for Recommendation:

ADDITIONAL REMARKS:

SIGNATURE:	DATE:

FOR NRSC USE ONLY

Date forwarded to NAB Technology: _____

Responsible Committee: _____

Co-chairmen: _____

Date forwarded to co-chairmen: _____


CEA
Consumer Electronics Association


NAB
NATIONAL ASSOCIATION OF BROADCASTERS