

*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 VII – Appendices AM through AS



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NRSC-R58

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NRSC-R58

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

Description

Appendix

Tests F-1, F-4 and G-1 Co-channel DAR to Analog	AM
Tests F-2, F-5 and G-2 First-adjacent DAR to Analog	AN
Tests F-3, F-6 and G-3 Second-adjacent DAR to Analog	AO
Tests H and I Analog to DAR	AP
Test L	AQ
Test M	AR
Test O	AS

APPENDIX AM

Tests F-1, F-4 and G-1 Co-channel DAR to Analog

EIA Digital Audio Radio Test Laboratory

Tests F1, F4 and G1

Receiver

Rx No.: #1
Mfg.: DELCO
Model: 16192463
Serial: 1000499

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio with the Digital Proponent on the desired frequency (Co-channel)
3	DAR -> Analog interference at a 35dB signal to noise ratio with the Digital Proponent on the desired frequency
4	Digital Audio Tape recording log of the Co-channel results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA DAR Test Lab DAT Recording Log

Refer to...

Test F-1, F-4 and G-1 45 dB S/N Receiver #1 DELCO 16192463	Measurements	F-1 d/u in dB	F-4 Co-Channel DAR to Analog EO&C	G-1 Urban Slow Rayleigh Co-Channel DAR to Analog with Multipath EO&C	G-1 Urban Fast Rayleigh Co-Channel DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.80 Loss 40.71 undesired -41.43	36.17	Interfering Audio detectable and tracks with ABBA beat		
RX Level -62.00 dBm	Loss 21.75 Attn 22.50				
AT&T IBAC	desired -8.80 Loss 40.71 undesired -15.61				
RX Level -62.00 dBm	Loss 47.68 Attn 22.25	36.03	Audible background noise increases DAR->FM Less Annoying than FM->FM	DAR->FM Less Annoying than No detectable modulation with digital	FM-> FM same as DAR-> FM
AT&T Amati DSB IBOC	desired -8.80 Loss 40.71 undesired -7.00	36.67	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 31.50				
AT&T Amati LSB IBOC	desired -8.80 Loss 40.71 undesired -7.11				
RX Level -62.00 dBm	Loss 47.68 Attn 31.50	36.78	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
USADR FM1 IBOC	desired -8.80 Loss 40.71 undesired -9.73	35.40	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 27.50				
USADR FM2 IBOC	desired -8.80 Loss 40.71 undesired -6.05				
RX Level -62.00 dBm	Loss 47.68 Attn 31.25	35.47	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM

Notes: Subcarrier Group B on interferers and desired analog
Clipped Pink Noise as Main Ch. modulation on interferers
Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to 6 dB
Tests conducted February 17, 1995

DAT REF No. DAR40110.DAT

Best case S/N ratio: 49dB

EIA DAR Test Lab DAT Recording Log

Test F-1 35 dB S/N Receiver #1 DELCO 16192463	Measurements	F-1 d/u in dB	Test F-1 (Weak) 35 dB S/N Receiver #1 DELCO 16192463	Measurements	F-1 d/u in dB	Test F-1 (Weak) 45 dB S/N Receiver #1 DELCO 16192463	Measurements	F-1 d/u in dB
Analog to Analog Reference	desired -8.80 Loss 40.71 undesired -41.43	23.67	Analog to Analog Reference	desired -8.80 Loss 40.71 undesired -41.42	22.91	Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.45	NA
Desired Signal Level -62.00 dBm	Loss 21.75 Attn 10.00		RX Level -77.00 dBm	Loss 21.75 Attn 9.25		RX Level -77.00 dBm	Loss 21.75 Attn 9.25	
AT&T IBAC	desired -8.80 Loss 40.71 undesired -15.61	24.03	AT&T IBAC	desired -8.80 Loss 40.71 undesired -15.65	22.07	AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.49	NA
RX Level -62.00 dBm	Loss 47.68 Attn 10.25		RX Level -77.00 dBm	Loss 47.68 Attn 8.25		RX Level -77.00 dBm	Loss 47.68 Attn 8.00	
AT&T Amati DSB IBOC	desired -8.80 Loss 40.71 undesired -8.01	24.43	AT&T Amati DSB IBOC	desired -8.80 Loss 40.71 undesired -8.00	23.67	AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84	NA
RX Level -62.00 dBm	Loss 47.68 Attn 18.25		RX Level -77.00	Loss 47.68 Attn 17.50		RX Level -77.00 dBm	Loss 47.68 Attn 17.00	
AT&T Amati LSB IBOC	desired -8.80 Loss 40.71 undesired -8.13	24.80	AT&T Amati LSB IBOC	desired -8.80 Loss 40.71 undesired -8.10	24.02	AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00	NA
RX Level -62.00 dBm	Loss 47.68 Attn 18.50		RX Level -77.00 dBm	Loss 47.68 Attn 17.75		RX Level -77.00 dBm	Loss 47.68 Attn 16.75	
USADR FM1 IBOC	desired -8.80 Loss 40.71 undesired -9.49	23.91	USADR FM1 IBOC	desired -8.80 Loss 40.71 undesired -9.50	21.67	USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.49	NA
RX Level -62.00 dBm	Loss 47.68 Attn 16.25		RX Level -77.00 dBm	Loss 47.68 Attn 14.00		RX Level -77.00 dBm	Loss 47.68 Attn 15.00	
USADR FM2 IBOC	desired -8.80 Loss 40.71 undesired -6.05	23.97	USADR FM2 IBOC	desired -8.80 Loss 40.71 undesired -6.09	22.26	USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07	NA
RX Level -62.00 dBm	Loss 47.68 Attn 19.75		RX Level -77.00 dBm	Loss 47.68 Attn 18.00		RX Level -77.00 dBm	Loss 47.68 Attn 18.50	
						Notes: Best Case S/N = -43.5 dB		

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40110.DAT									
2/15/95									
			1				AT&T Co-Channel		
Disregard			2						
Disregard			3						
			4				FM1 Co-Channel		
			5				FM2 Co-Channel		
			6				Amati DSB Co-Channel		
			7				Amati LSB Co-Channel		
Disregard			8						
Disregard			9						
Disregard			10						
			11				Amati DSB Urban Slow with Co-Channel		
			12				Amati LSB Urban Slow with Co-Channel		
			13				AT&T Urban Slow with Co-Channel		
			14				FM1 Urban Slow with Co-Channel		
			15				FM2 Urban Slow with Co-Channel		
			16				FM2 Urban Fast with Co-Channel		
			17				FM1 Urban Fast with Co-Channel		
			18				Amati LSB Urban Fast with Co-Channel		
			19				Amati DSB Urban Fast with Co-Channel		
Disregard			20						
			21				AT&T Urban Fast with Co-Channel		

EIA Digital Audio Radio Test Laboratory

Tests F1, F4 and G1

Receiver

Rx No.: #2
Mfg.: DENON
Model: TU-380RD
Serial: 4056301149

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio with the Digital Proponent on the desired frequency (Co-channel)
3	DAR -> Analog interference at a 35dB signal to noise ratio with the Digital Proponent on the desired frequency
4	Digital Audio Tape recording log of the Co-channel results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-1, F-4 and G-1 45 dB S/N Receiver #2 DENON TU-380RD	Measurements	F-1 d/u in dB	F-4 Co-Channel DAR to Analog EO&C	G-1 Urban Slow Rayleigh Co-Channel DAR to Analog with Multipath EO&C	G-1 Urban Fast Rayleigh Co-Channel DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.37	43.39	Interfering Audio detectable and tracks with ABBA beat		
RX Level -62.00 dBm	Loss 21.75 Attn 29.75				
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.58	42.53	Audible background noise increases DAR->FM Less Annoying than FM->FM FM->FM d/u attn= 29.61 dB	DAR->FM Less Annoying than FM->FM No detectable modulation with digital	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 28.75				
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84	42.79	Same as Analog Reference d/u attn= 37.35 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 36.75				
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00	42.95	Same as Analog Reference d/u attn= 37.19 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 36.75				
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.44	42.89	Same as Analog Reference d/u attn= 35.75 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 35.25				
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -5.99	42.94	Same as Analog Reference d/u attn= 39.20 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 38.75				
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to 6 dB Tests conducted February 17, 1995					DAT REF No. DAR40112.DAT

EIA Digital Audio Radio Test Laboratory

Test F-1 35 dB S/N Receiver #2 DENON TU-380RD	Measurements	F-1 d/u in dB	Test F-1 (Weak) 35 dB S/N Receiver #2 DENON TU-380RD	Measurements	F-1 d/u in dB	Test F-1 (Weak) 45 dB S/N Receiver #2 DENON TU-380RD	Measurements	F-1 d/u in dB
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.37 Loss 21.75 Attn 18.50	32.14	Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.37 Loss 21.75 Attn 21.50	35.14	Analog to Analog Reference	desired Loss undesired Loss Attn	NA
RX Level -62.00 dBm			RX Level -77.00 dBm			RX Level -77.00 dBm		
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.58 Loss 47.68 Attn 17.75	31.53	AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.58 Loss 47.68 Attn 21.25	35.03	AT&T IBAC	desired Loss undesired Loss Attn	NA
RX Level -62.00 dBm			RX Level -77.00 dBm			RX Level -77.00 dBm		
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84 Loss 47.68 Attn 25.50	31.54	AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84 Loss 47.68 Attn 29.00	35.04	AT&T Amati DSB IBOC	desired Loss undesired Loss Attn	NA
RX Level -62.00 dBm			RX Level -77.00 dBm			RX Level -77.00 dBm		
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00 Loss 47.68 Attn 25.50	31.70	AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00 Loss 47.68 Attn 29.25	35.45	AT&T Amati LSB IBOC	desired Loss undesired Loss Attn	NA
RX Level -62.00 dBm			RX Level -77.00 dBm			RX Level -77.00 dBm		
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.44 Loss 47.68 Attn 24.00	31.64	USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.44 Loss 47.68 Attn 27.75	35.39	USADR FM1 IBOC	desired Loss undesired Loss Attn	NA
RX Level -62.00 dBm			RX Level -77.00 dBm			RX Level -77.00 dBm		
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -5.99 Loss 47.68 Attn 27.75	31.94	USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -5.99 Loss 47.68 Attn 31.25	35.44	USADR FM2 IBOC	desired Loss undesired Loss Attn	NA
RX Level -62.00 dBm			RX Level -77.00 dBm			RX Level -77.00 dBm		

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40112.DAT 2/17/95									
Disregard			1						
			2			AT&T Co-Channel			
			3			Amati LSB Co-Channel			
Disregard			4						
			5			Amati DSB Co-Channel			
			6			FM1 Co-Channel			
			7			FM2 Co-Channel			
			8			FM2 Urban Slow with Co-Channel			
			9			FM1 Urban Slow with Co-Channel			
			10			Amati DSB Urban Slow with Co-Channel			
			11			Amati LSB Urban Slow with Co-Channel			
			12			AT&T Urban Slow with Co-Channel			
			13			AT&T Urban Fast with Co-Channel			
			14			Amati LSB Urban Fast with Co-Channel			
			15			Amati DSB Urban Fast with Co-Channel			
Disregard			16						
			17			FM1 Urban Fast with Co-Channel			
			18			FM2 Urban Fast with Co-Channel			

EIA Digital Audio Radio Test Laboratory

Tests F1, F4 and G1

Receiver

Rx No.: #3
Mfg.: PANASONIC
Model: RX-FS430
Serial: GR3J01184

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio with the Digital Proponent on the desired frequency (Co-channel)
3	DAR -> Analog interference at a 35dB signal to noise ratio with the Digital Proponent on the desired frequency
4	Digital Audio Tape recording log of the Co-channel results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR wieghting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-1, F-4 and G-1 45 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-1 d/u in dB	F-4 Co-Channel DAR to Analog EO&C	G-1 Urban Slow Rayleigh Co-Channel DAR to Analog with Multipath EO&C	G-1 Urban Fast Rayleigh Co-Channel DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.81 Loss 40.71 undesired -41.46	40.94	Interfering Audio detectable and tracks with ABBA beat		
RX Level	Loss 21.75 Attn 27.25				
-62.00 dBm					
AT&T IBAC	desired -8.81 Loss 40.71 undesired -15.60	41.01	Audible background noise increases DAR->FM Less Annoying than FM->FM FM->FM d/u attn= 27.18 dB	DAR->FM Less Annoying than FM->FM No detectable modulation with digital	FM-> FM same as DAR-> FM
RX Level	Loss 47.68 Attn 27.25				
-62.00 dBm					
AT&T Amati DSB IBOC	desired -8.81 Loss 40.71 undesired -8.00	40.91	Same as Analog Reference d/u attn= 34.78 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level	Loss 47.68 Attn 34.75				
-62.00 dBm					
AT&T Amati LSB IBOC	desired -8.81 Loss 40.71 undesired -8.12	41.03	Same as Analog Reference d/u attn= 34.66 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level	Loss 47.68 Attn 34.75				
-62.00 dBm					
USADR FM1 IBOC	desired -8.81 Loss 40.71 undesired -9.48	41.14	Same as Analog Reference d/u attn= 33.30 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level	Loss 47.68 Attn 33.50				
-62.00 dBm					
USADR FM2 IBOC	desired -8.81 Loss 40.71 undesired -6.07	40.98	Same as Analog Reference d/u attn= 36.71 dB	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level	Loss 47.68 Attn 36.75				
-62.00 dBm					
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -3.5dB Tests conducted February 22, 1995				DAT REF No. DAR40114.DAT Best Case S/N =51dB	

EIA Digital Audio Radio Test Laboratory

Test F-1 35 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-1 d/u in dB	Test F-1 (Weak) 35 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-1 d/u in dB	Test F-1 (Weak) 45 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-1 d/u in dB
Analog to Analog Reference	desired -8.81 Loss 40.71 undesired -41.46	29.94	Analog to Analog Reference	desired -8.81 Loss 40.71 undesired -41.46	32.69	Analog to Analog Reference	desired -8.81 Loss 40.71 undesired -41.44	NA
Desired Signal Level -62.00 dBm	Loss 21.75 Attn 16.25		RX Level -77.00 dBm	Loss 21.75 Attn 19.00		RX Level -77.00 dBm	Loss 21.75 Attn 11.25	
AT&T IBAC	desired -8.81 Loss 40.71 undesired -15.60		29.51	AT&T IBAC		desired -8.81 Loss 40.71 undesired -15.60	32.26	
RX Level -62.00 dBm	Loss 47.68 Attn 15.75		RX Level -77.00 dBm	Loss 47.68 Attn 18.50		RX Level -77.00 dBm	Loss 47.68 Attn 30.00	
AT&T Amati DSB IBOC	desired -8.81 Loss 40.71 undesired -8.00	29.66	AT&T Amati DSB IBOC	desired -8.81 Loss 40.71 undesired -8.00	32.16	AT&T Amati DSB IBOC	desired -8.81 Loss 40.71 undesired -8.00	NA
RX Level -62.00 dBm	Loss 47.68 Attn 23.50		RX Level -77.00 dBm	Loss 47.68 Attn 26.00		RX Level -77.00 dBm	Loss 47.68 Attn 37.50	
AT&T Amati LSB IBOC	desired -8.81 Loss 40.71 undesired -8.12		29.78	AT&T Amati LSB IBOC		desired -8.81 Loss 40.71 undesired -8.12	32.28	
RX Level -62.00 dBm	Loss 47.68 Attn 23.50		RX Level -77.00 dBm	Loss 47.68 Attn 26.00		RX Level -77.00 dBm	Loss 47.68 Attn 37.75	
USADR FM1 IBOC	desired -8.81 Loss 40.71 undesired -9.48	29.89	USADR FM1 IBOC	desired -8.81 Loss 40.71 undesired -9.48	32.39	USADR FM1 IBOC	desired -8.81 Loss 40.71 undesired -9.48	NA
RX Level -62.00 dBm	Loss 47.68 Attn 22.25		RX Level -77.00 dBm	Loss 47.68 Attn 24.75		RX Level -77.00 dBm	Loss 47.68 Attn 36.00	
USADR FM2 IBOC	desired -8.81 Loss 40.71 undesired -6.07		29.73	USADR FM2 IBOC		desired -8.81 Loss 40.71 undesired -6.07	32.48	
RX Level -62.00 dBm	Loss 47.68 Attn 25.50		RX Level -77.00 dBm	Loss 47.68 Attn 28.25		RX Level -77.00 dBm	Loss 47.68 Attn 39.50	
						Notes: Best Case S/N = 38.5 dB		

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40114.DAT									
2/22/95									
Disregard			1						
Disregard			2						
			3						
			4				AT&T Co-Channel		
			5				Amati DSB Co-Channel		
			6				FM1 Co-Channel		
			7				FM2 Co-Channel		
Disregard			8						
			9				Amati LSB Co-Channel		
			10				Amati LSB Urban Slow with Co-Channel		
			11				Amati DSB Urban Slow with Co-Channel		
			12				AT&T Urban Slow with Co-Channel		
			13				FM1 Urban Slow with Co-Channel		
			14				FM2 Urban Slow with Co-Channel		
			15				FM2 Urban Fast with Co-Channel		
			16				FM1 Urban Fast with Co-Channel		
			17				Amati DSB Urban Fast with Co-Channel		
			18				AT&T Urban Fast with Co-Channel		
							Amati LSB Urban Fast with Co-Channel		

EIA Digital Audio Radio Test Laboratory

Tests F1, F4 and G1

Receiver

Rx No.: #4
Mfg.: PIONEER
Model: SX-201
Serial: OA3965843C

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio with the Digital Proponent on the desired frequency (Co-channel)
3	DAR -> Analog interference at a 35dB signal to noise ratio with the Digital Proponent on the desired frequency
4	Digital Audio Tape recording log of the Co-channel results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-1, F-4 and G-1 45 dB S/N Receiver #4 PIONEER SX-201		F-1	F-4	G-1	G-1
			Co-Channel DAR to Analog	Urban Slow Rayleigh Co-Channel DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Co-Channel DAR to Analog with Multipath EO&C
	Measurements	d/u in dB	EO&C		
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired -41.42	44.18	Interfering Audio detectable and tracks with ABBA beat		
RX Level -62.00 dBm	Loss 21.75 Attn 30.50				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.72	43.91	Audible background noise increases DAR->FM Less Annoying than FM->FM	DAR->FM Less Annoying than FM->FM No detectable modulation with digital	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 30.00		FM->FM d/u attn= 30.27 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.00	43.69	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 37.50		d/u attn= 37.99 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.04	43.98	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 37.75		d/u attn= 37.95 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.51	43.70	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 36.00		d/u attn= 36.48 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.01	43.70	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 39.50		d/u attn= 39.98 dB		
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to 6 dB Tests conducted February 16, 1995				DAT REF No. DAR40111.DAT

EIA Digital Audio Radio Test Laboratory

Test F-1 35 dB S/N Receiver #4 PIONEER SX-201	Measurements	F-1 d/u in dB	Test F-1 (Weak) 35 dB S/N Receiver #4 PIONEER SX-201	Measurements	F-1 d/u in dB	Test F-1 (Weak) 45 dB S/N Receiver #4 PIONEER SX-201	Measurements	F-1 d/u in dB
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired -41.42	32.68	Analog to Analog Reference	desired -8.78 Loss 40.71 undesired -41.42	34.18	Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.45	NA
Desired Signal Level -62.00 dBm	Loss 21.75 Attn 19.00		RX Level -77.00 dBm	Loss 21.75 Attn 20.50		RX Level -77.00 dBm	Loss 21.75 Attn 9.25	
AT&T IBAC	desired -8.80 Loss 40.71 undesired -15.72	32.14	AT&T IBAC	desired -8.80 Loss 40.71 undesired -15.72	33.64	AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.49	NA
RX Level -62.00 dBm	Loss 47.68 Attn 18.25		RX Level -77.00 dBm	Loss 47.68 Attn 19.75		RX Level -77.00 dBm	Loss 47.68 Attn 8.00	
AT&T Amati DSB IBOC	desired -8.80 Loss 40.71 undesired -8.00	32.17	AT&T Amati DSB IBOC	desired -8.80 Loss 40.71 undesired -8.00	33.67	AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84	NA
RX Level -62.00 dBm	Loss 47.68 Attn 26.00		RX Level -77.00 dBm	Loss 47.68 Attn 27.50		RX Level -77.00 dBm	Loss 47.68 Attn 17.00	
AT&T Amati LSB IBOC	desired -8.80 Loss 40.71 undesired -8.04	32.21	AT&T Amati LSB IBOC	desired -8.80 Loss 40.71 undesired -8.04	33.96	AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00	NA
RX Level -62.00 dBm	Loss 47.68 Attn 26.00		RX Level -77.00 dBm	Loss 47.68 Attn 27.75		RX Level -77.00 dBm	Loss 47.68 Attn 16.75	
USADR FM1 IBOC	desired -8.80 Loss 40.71 undesired -9.51	32.18	USADR FM1 IBOC	desired -8.80 Loss 40.71 undesired -9.51	33.68	USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.49	NA
RX Level -62.00 dBm	Loss 47.68 Attn 24.50		RX Level -77.00 dBm	Loss 47.68 Attn 26.00		RX Level -77.00 dBm	Loss 47.68 Attn 15.00	
USADR FM2 IBOC	desired -8.80 Loss 40.71 undesired -6.01	32.18	USADR FM2 IBOC	desired -8.80 Loss 40.71 undesired -6.01	33.68	USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07	NA
RX Level -62.00 dBm	Loss 47.68 Attn 28.00		RX Level -77.00 dBm	Loss 47.68 Attn 29.50		RX Level -77.00 dBm	Loss 47.68 Attn 18.50	
Notes:								

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40111.DAT									
2/16/95									
Disregard			1						
			2						
			3			Amati LSB Co-Channel			
			4			Amati DSB Co-Channel			
Disregard			5			AT&T Co-Channel			
			6						
Disregard			7			FM1 Co-Channel			
			8						
			9			FM2 Co-Channel			
			10			FM2 Urban Slow with Co-Channel			
			11			FM1 Urban Slow with Co-Channel			
			12			Amati DSB Urban Slow with Co-Channel			
			13			Amati LSB Urban Slow with Co-Channel			
			14			AT&T Urban Slow with Co-Channel			
			15			AT&T Urban Fast with Co-Channel			
			16			Amati LSB Urban Fast with Co-Channel			
			17			Amati DSB Urban Fast with Co-Channel			
			18			FM1 Urban Fast with Co-Channel			
						FM2 Urban Fast with Co-Channel			

EIA Digital Audio Radio Test Laboratory

Tests F1, F4 and G1

Receiver

Rx No.: #5

Mfg.: FORD

Model: F4XF-19B132-CB

Serial: 281150B010

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio with the Digital Proponent on the desired frequency (Co-channel)
3	DAR -> Analog interference at a 35dB signal to noise ratio with the Digital Proponent on the desired frequency
4	Digital Audio Tape recording log of the Co-channel results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-1, F-4 and G-1 45 dB S/N Receiver #5 FORD F4XF	Measurements	F-1 d/u in dB	F-4 Co-Channel DAR to Analog EO&C	G-1 Urban Slow Rayleigh Co-Channel DAR to Analog with Multipath EO&C	G-1 Urban Fast Rayleigh Co-Channel DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.45	35.22	Interfering Audio detectable and tracks with ABBA beat		
RX Level -62.00 dBm	Loss 21.75 Attn 21.50				
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.49	34.94	Audible background noise increases DAR->FM Less Annoying than FM->FM	DAR->FM Less Annoying than FM->FM No detectable modulation with digital	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 21.25		FM->FM d/u attn= 21.53 dB		
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -8.00	35.20	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 29.00		d/u attn= 29.02 dB		
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.11	35.31	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 29.00		d/u attn= 28.91 dB		
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.49	35.19	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 27.50		d/u attn= 27.53 dB		
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07	35.27	Same as Analog Reference	FM-> FM same as DAR-> FM	FM-> FM same as DAR-> FM
RX Level -62.00 dBm	Loss 47.68 Attn 31.00		d/u attn= 30.95 dB		
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to 2.3 dB					DAT REF No. DAR40113.DAT

EIA Digital Audio Radio Test Laboratory

Test F-1 35 dB S/N Receiver #5 FORD F4XF	Measurements	F-1 d/u in dB	Test F-1 (Weak) 35 dB S/N Receiver #5 FORD F4XF	Measurements	F-1 d/u in dB	Test F-1 (Weak) 45 dB S/N Receiver #5 FORD F4XF	Measurements	F-1 d/u in dB			
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.45	24.22	Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -31.45	11.97	Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -41.45	22.97			
Desired Signal Level -62.00 dBm	Loss 21.75 Attn 10.50		RX Level -77.00 dBm	Loss 21.75 Attn 8.25		RX Level -77.00 dBm	Loss 21.75 Attn 9.25				
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.49		23.69	AT&T IBAC		desired -8.77 Loss 40.71 undesired -15.49	10.44		AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.49	21.69
RX Level -62.00 dBm	Loss 47.68 Attn 10.00			RX Level -77.00 dBm		Loss 27.68 Attn 16.75			RX Level -77.00 dBm	Loss 47.68 Attn 8.00	
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -8.00	23.95		AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84	11.54		AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.84	23.04	
RX Level -62.00 dBm	Loss 47.68 Attn 17.75			RX Level -77.00 dBm	Loss 47.68 Attn 5.50			RX Level -77.00 dBm	Loss 47.68 Attn 17.00		
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00		24.20	AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00		11.70	AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.00		22.95
RX Level -62.00 dBm	Loss 47.68 Attn 18.00			RX Level -77.00 dBm	Loss 47.68 Attn 5.50			RX Level -77.00 dBm	Loss 47.68 Attn 16.75		
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.49	23.94		USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.49	11.69		USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.49	22.69	
RX Level -62.00 dBm	Loss 47.68 Attn 16.25			RX Level -77.00 dBm	Loss 47.68 Attn 4.00			RX Level -77.00 dBm	Loss 47.68 Attn 15.00		
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07		24.02	USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07		11.77	USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07		22.77
RX Level -62.00 dBm	Loss 47.68 Attn 19.75			RX Level -77.00 dBm	Loss 47.68 Attn 7.50			RX Level -77.00 dBm	Loss 47.68 Attn 18.50		

EIA DAR Test Lab DAT Recording Log

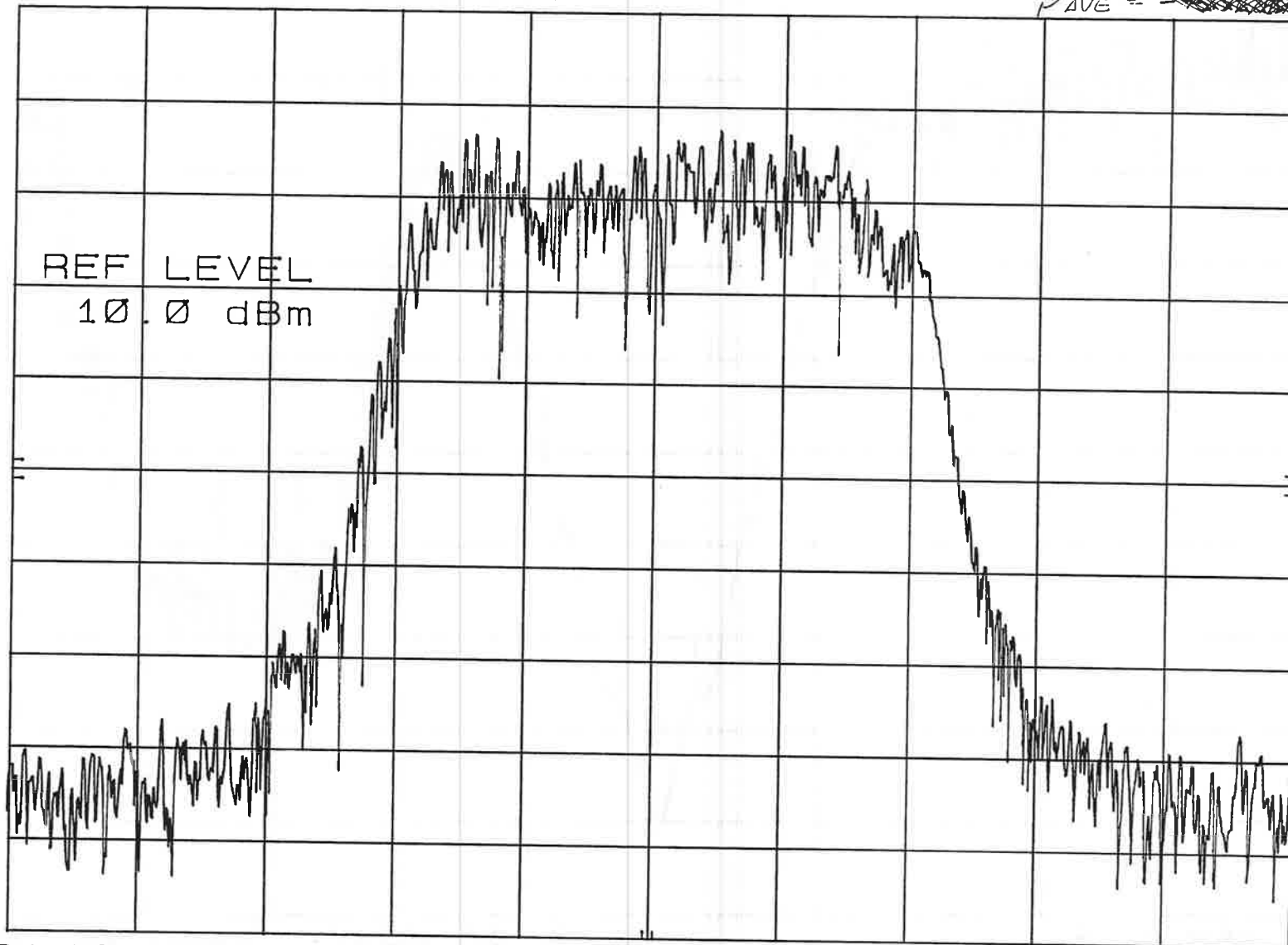
DAT File Number	Time Code		Start IDs			Description	Grade	
	Start	Stop					1	2
DAR40113.DAT 2/17/95								
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			2					
			3					
			4					
			5					
Disregard			6					
			7					
			8					
			9					
			10					
			11					
			12					
			13					
			14					
			15					
			16					

2/22/95 AT&T 14: 11

hp REF 10.0 dBm ATTEN 20 dB

PAVE = ~~XXXXXXXXXX~~

10 dB/



CENTER 94.100 MHz

RES BW 10 kHz

VBW 30 kHz

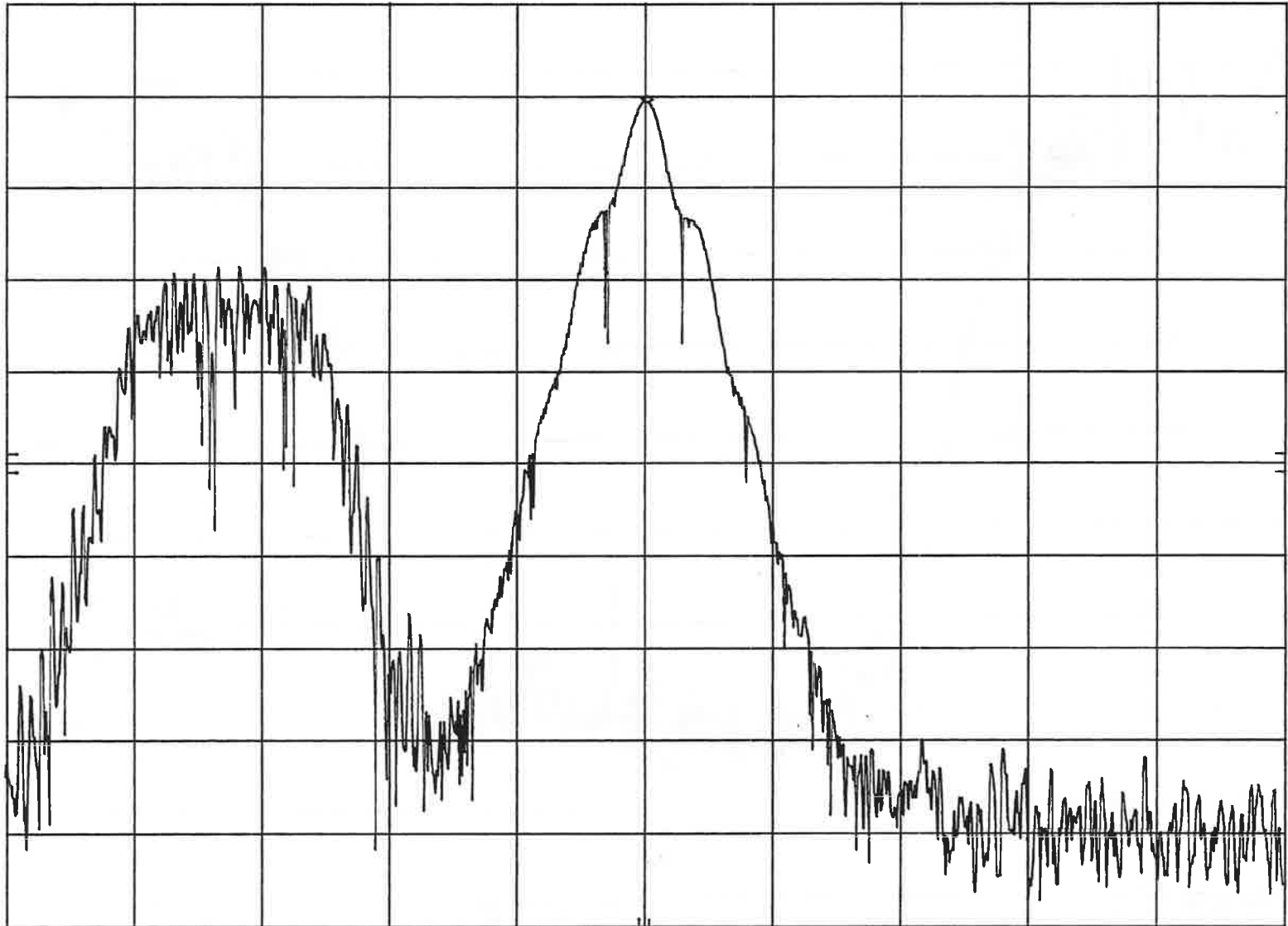
SPAN 500 kHz
SWP 30.0 msec

P AVE = - ~~XXXXXX~~

2/22/95 AMATI LSB 14:26
REF 20.0 dBm ATTEN 30 dB

MKR 94.100 5 MHz
9.70 dBm

hp
10 dB/



CENTER 94.100 MHz
RES BW 10 kHz

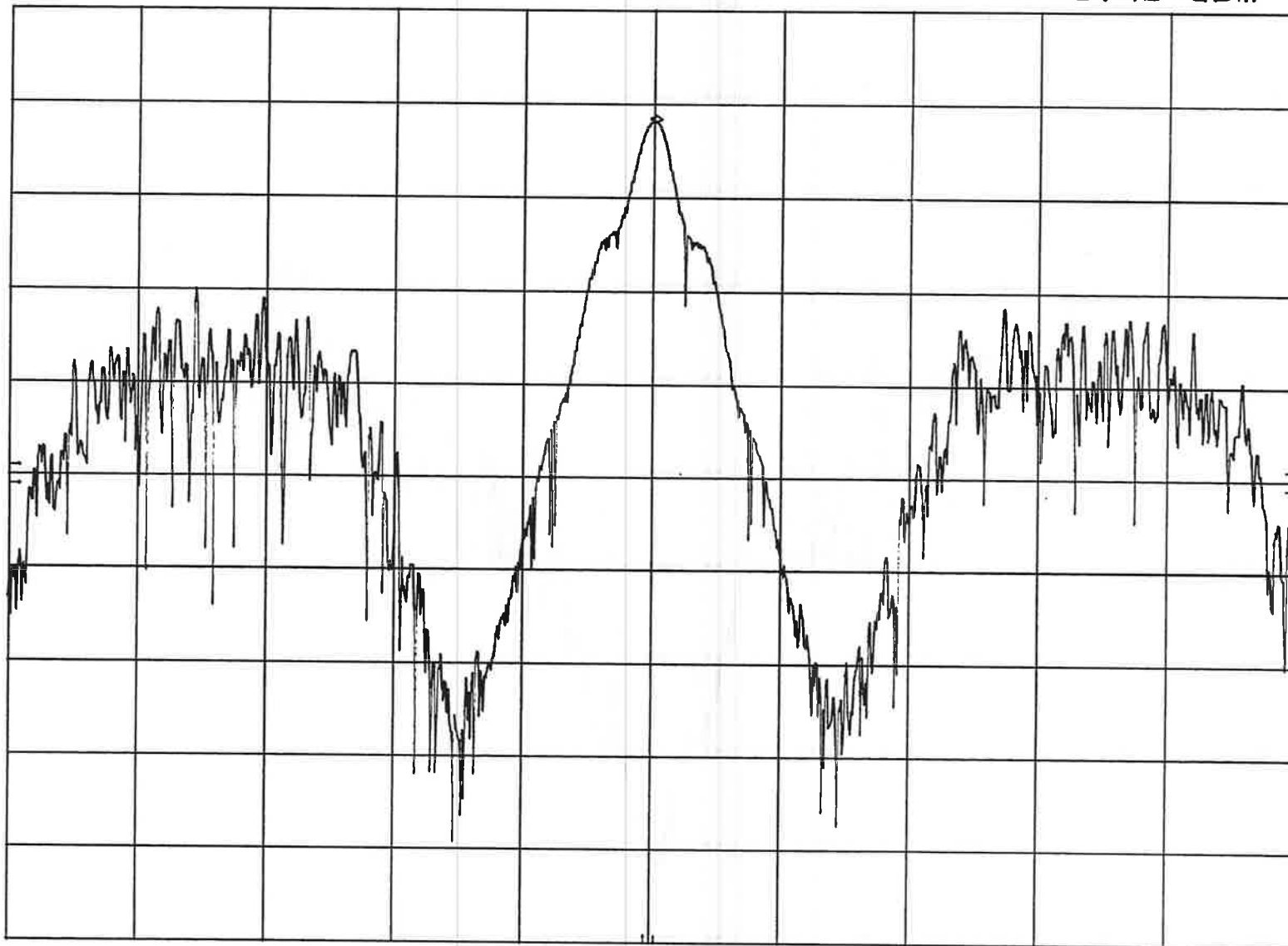
VBW 30 kHz

SPAN 500 kHz
SWP 30.0 msec

2/22/95 USADR FM-1 14:47
REF 20.0 dBm ATTEN 30 dB

PAUC = ~~XXXXXXXXXX~~
MKR 94.100 5 MHz
8.40 dBm

hp
10 dB/



CENTER 94.100 MHz
RES BW 10 kHz

VBW 30 kHz

SPAN 500 kHz
SWP 30.0 msec

PAVE = ~~XXXXXXXXXX~~

2/22/95 USADR FM-2 14:40

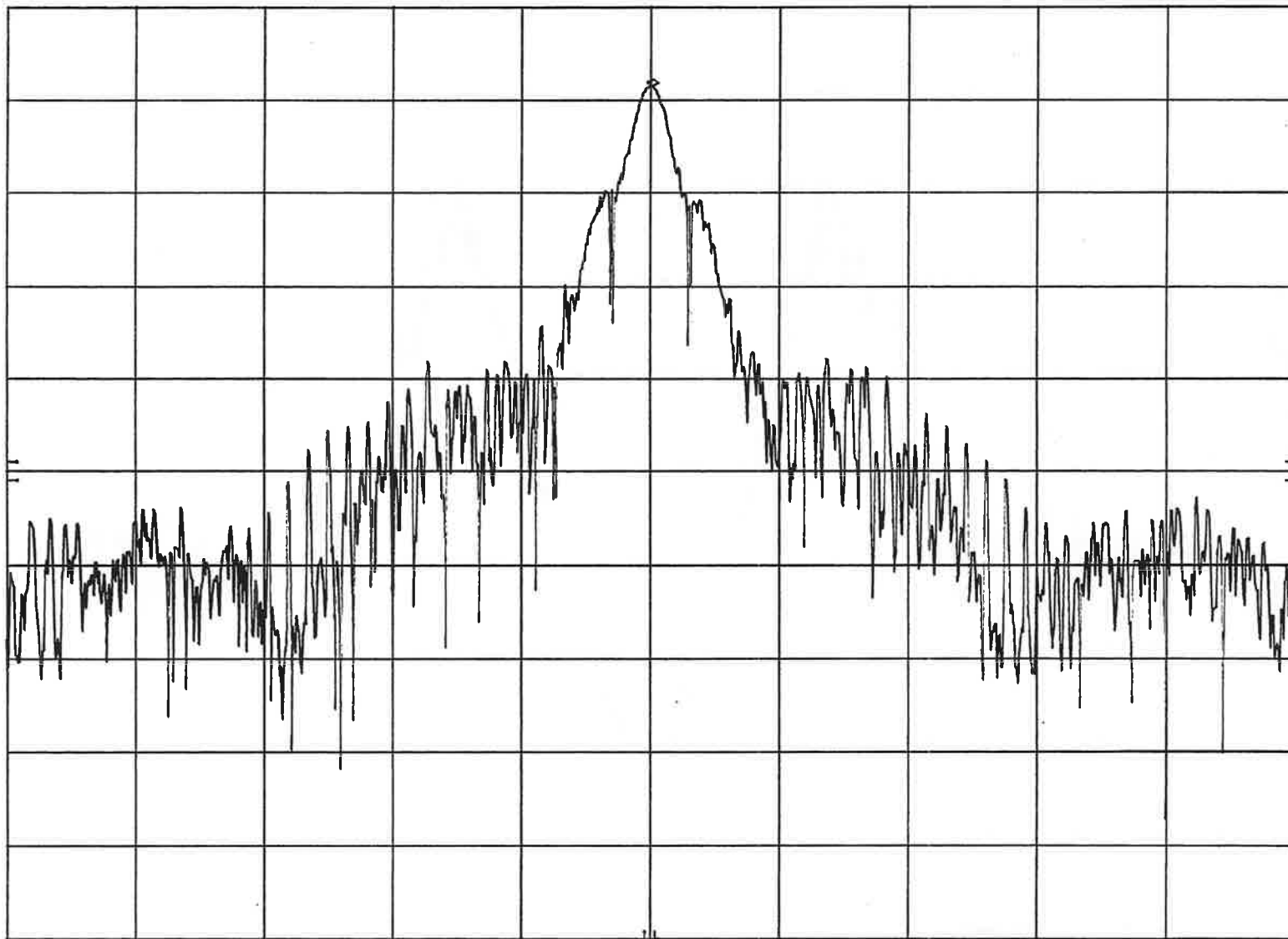
MKR 94.100 5 MHz

hp

REF 20.0 dBm ATTEN 30 dB

11.90 dBm

10 dB/



CENTER 94.100 MHz

RES BW 10 kHz

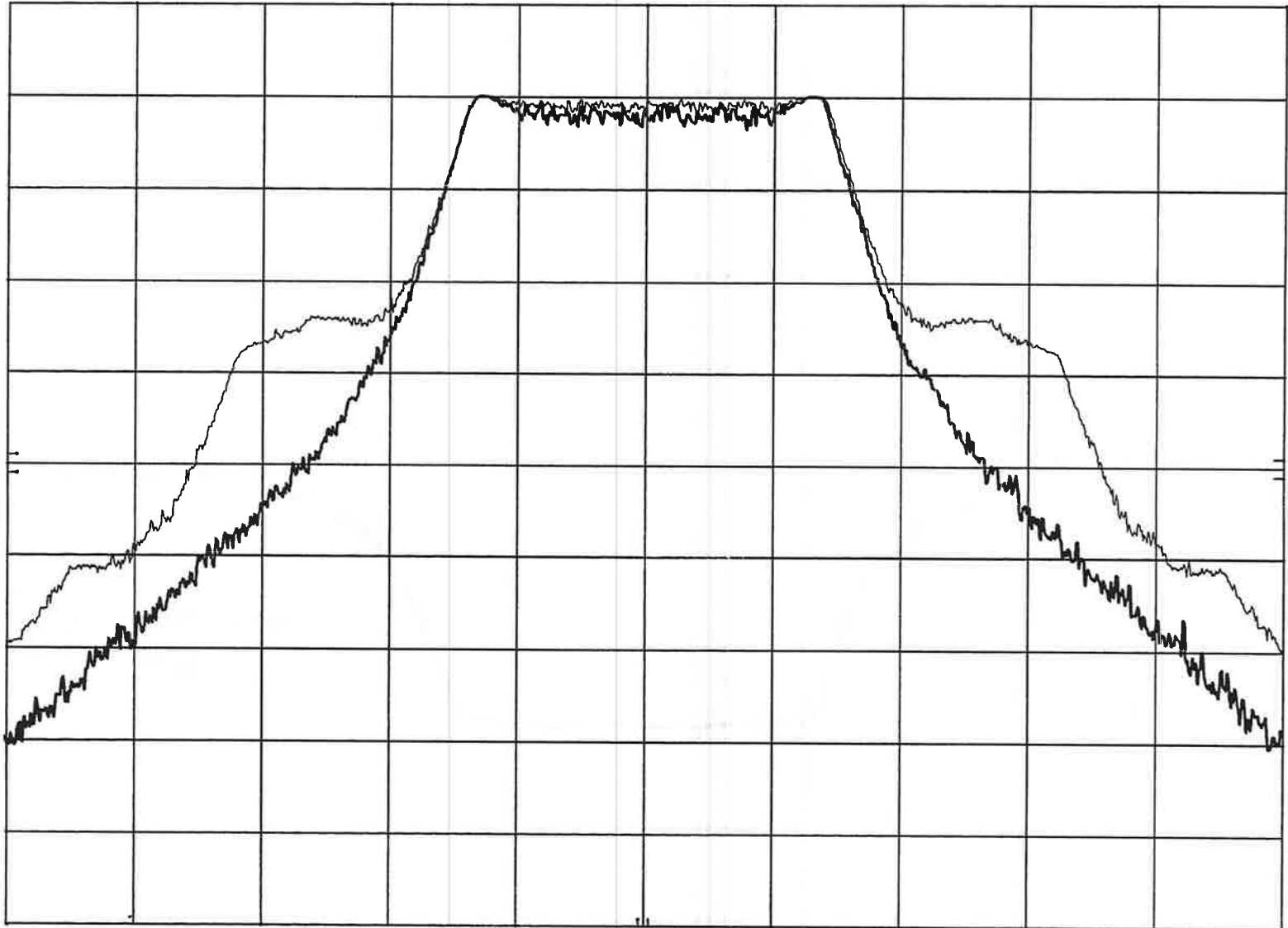
VBW 30 kHz

SPAN 500 kHz

SWP 30.0 msec

CLIPPED PINK NOISE MODULATED W AND W/O SCA INPUTS 1/17/95
EIA REF 2.1 dBm ATTEN 20 dB

10 dB/



CENTER 94.100 MHz

RES BW 10 KHz

VBW 30 KHz

SPAN 500 KHz
SWP 30.0 msec

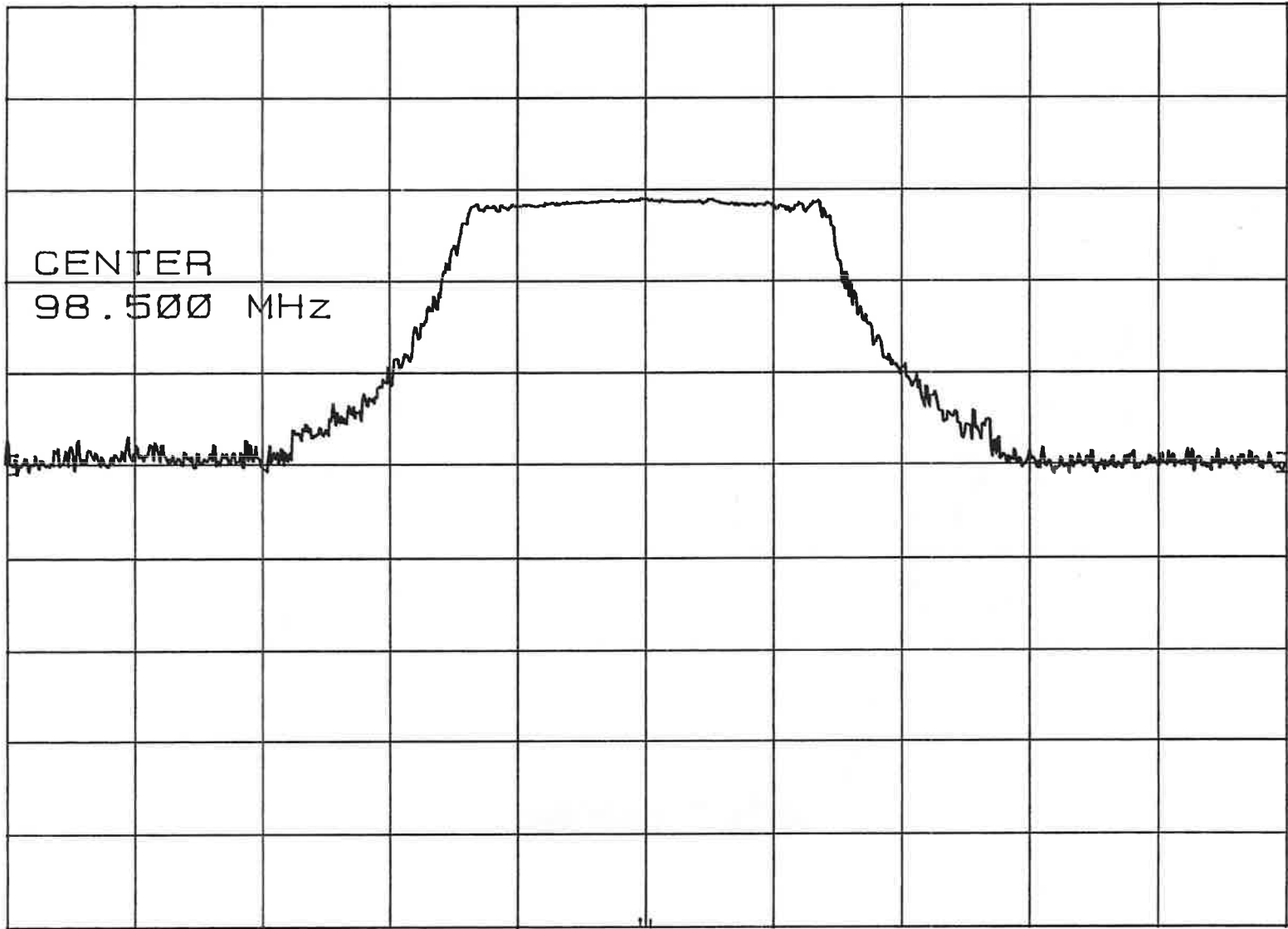
SCA'S : 67 KHz @ 10%

92 KHz @ 10%

LOCAL RADIO STATION 16:21

EIA REF -30.0 dBm ATTEN 20 dB

10 dB/



CENTER 98.500 MHz

RES BW 10 kHz

VBW 30 kHz

SPAN 500 kHz

SWP 30.0 msec

APPENDIX AN

Tests F-2, F-5 and G-2 First-adjacent DAR to Analog

EIA Digital Audio Radio Test Laboratory

Tests F2, F5 and G2

Receiver

Rx No.: #1

Mfg.: DELCO

Model: 16192463

Serial: 1000499

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
4	Digital Audio Tape recording log of the Lower First Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
7	Digital Audio Tape recording log of the Upper First Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

*d/u to give
45 dB
SNR
in receiver.*

Test F-2, F-5 and G-2		F-2	F-5	G-2	Urban Slow Rayleigh	Urban Fast Rayleigh
45 dB S/N			Lower First Adjacent	Lower First Adjacent		
Receiver #1			DAR to Analog	DAR to Analog		
DELCO				with Multipath		
16192463	Measurements	d/u in dB	EO&C	EO&C		
Analog to Analog Reference	desired -8.86 Loss 40.71 undesired -21.41	4.09	Interferer Mod peaks detected			
RX Level -62.00 dBm	Loss 21.75 Attn 10.50					
AT&T IBAC	desired -8.86 Loss 40.71 undesired -15.66	6.77	DAR-> FM more annoying Intense constant static			
RX Level -62.00 dBm	Loss 27.68 Attn 13.00		S/N eq d/u 29.5 dB d/u attn= 10.32 dB			
AT&T Amati DSB IBOC	desired -8.86 Loss 40.71 undesired -8.01	18.37	DAR-> FM more annoying Hiss with interer modulation peaks detected			
RX Level -62.00 dBm	Loss 27.68 Attn 32.25		S/N eq d/u 31.5 dB d/u attn= 17.97 dB			
AT&T Amati LSB IBOC	desired -8.86 Loss 40.71 undesired -8.14	4.25	DAR->FM same as FM->FM			
RX Level -62.00 dBm	Loss 27.68 Attn 18.00		S/N eq d/u 43 dB d/u attn= 17.84 dB			
USADR FM1 IBOC	desired -8.86 Loss 40.71 undesired -9.51	16.12				
RX Level -62.00 dBm	Loss 27.68 Attn 28.50		S/N eq d/u 33 dB d/u attn= 16.47 dB			
USADR FM2 IBOC	desired -8.86 Loss 40.71 undesired -6.10	4.71				
RX Level -62.00 dBm	Loss 27.68 Attn 20.50		S/N eq d/u 43.5 dB d/u attn= 19.88 dB			
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted February 23, 1995					DAT Ref.: DAR40120.DAT Best Case S/N = 49 dB	

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #1 DELCO 16192463	Measurements	F-2 d/u in dB	Effects without Digital Modulation				
			d/u in dB @ S/N=45dB		d/u in dB @ S/N=35dB		
			Silence	Silence	Silence	Silence	
Analog to Analog Reference	desired Loss undesired	-8.86 40.71 -21.41	3.34	NA			
Desired Signal Level -62.00 dBm	Loss Attn	21.75 9.75					
AT&T IBAC	desired Loss undesired	-8.86 40.71 -15.61	4.97	-8.87 40.71 -15.38	3.23	-8.87 40.71 -15.38	1.73
RX Level -62.00 dBm	Loss Attn	27.68 11.25		27.68 9.75		27.68 8.25	
AT&T Amati DSB IBOC	desired Loss undesired	-8.86 40.71 -8.01	6.87	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 20.75					
AT&T Amati LSB IBOC	desired Loss undesired	-8.86 40.71 -8.14	3.50	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 17.25					
USADR FM1 IBOC	desired Loss undesired	-8.86 40.71 -9.51	5.62	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 18.00					
USADR FM2 IBOC	desired Loss undesired	-8.86 40.71 -6.10	3.96	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 19.75					
Notes: Same as "Lower 45dB"							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40120.DAT 2/23/95									
							LOWER FIRST ADJACENT		
Disregard			1						
Disregard			2						
			3				AT&T Lower 1st Adjacent		
			4				Amati DSB Lower 1st Adjacent		
			5				Amati LSB Lower 1st Adjacent		
			6				FM1 Lower 1st Adjacent		
			7				FM2 Lower 1st Adjacent		
							WITH MULTIPATH (URBAN SLOW)		
			8				FM2 Urban Slow with Lower 1st Adjacent		
			9				FM1 Urban Slow with Lower 1st Adjacent		
Disregard			10						
			11				Amati LSB Urban Slow with Lower 1st Adjacent		
			12				AT&T Urban Slow with Lower 1st Adjacent		
			13				Amati DSB Urban Slow with Lower 1st Adjacent		
							WITH MULTIPATH (URBAN FAST)		
			14				Amati DSB Urban Fast with Lower 1st Adjacent		
			15				AT&T Urban Fast with Lower 1st Adjacent		
			16				FM1 Urban Fast with Lower 1st Adjacent		
			17				FM2 Urban Fast with Lower 1st Adjacent		
			18				Amati LSB Urban Fast with Lower 1st Adjacent		

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #1 DELCO 16192463	Measurements	F-2 d/u in dB	F-5 Upper First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.82 Loss 40.71 undesired -21.44 Loss 21.75 Attn 11.75	5.41	Measurement varies between 43 - 47 dB		
RX Level -62.00 dBm					
AT&T IBAC	desired -8.82 Loss 40.71 undesired -15.66 Loss 27.68 Attn 14.50	8.31	S/N eq d/u 27.5 dB d/u attn= 11.60 dB		
RX Level -62.00 dBm					
AT&T Amati DSB IBOC	desired -8.82 Loss 40.71 undesired -7.97 Loss 27.68 Attn 35.25	21.37	S/N eq d/u 29.5 dB d/u attn= 19.29 dB		
RX Level -62.00 dBm					
AT&T Amati LSB IBOC	desired -8.82 Loss 40.71 undesired -8.09 Loss 27.68 Attn 35.00	21.24	S/N eq d/u 31.5 dB d/u attn= 19.17 dB		
RX Level -62.00 dBm					
USADR FM1 IBOC	desired -8.82 Loss 40.71 undesired -9.47 Loss 27.68 Attn 31.25	18.87	S/N eq d/u 31.75 dB d/u attn= 17.79 dB		
RX Level -62.00 dBm					
USADR FM2 IBOC	desired -8.82 Loss 40.71 undesired -6.06 Loss 27.68 Attn 21.75	5.96	S/N eq d/u 40.5 dB d/u attn= 21.20 dB		
RX Level -62.00 dBm					
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 8, 1995			DAT Ref.: DAR40140.DAT Best Case S/N = 49 dB	

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #1 DELCO 16192463	Measurements	F-2		Effects with out Digital Modulation	
		d/u in dB	Silence	d/u in dB @ S/N=45dB	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.82 40.71 -21.41	4.88	NA	
Desired Signal Level -62.00 dBm	Loss Attn	21.75 11.25			
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.82 40.71 -15.66 27.68 13.00	6.81	-8.82 40.71 -15.66 27.68 11.25	5.06 -8.82 40.71 -15.66 27.68 9.50
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.82 40.71 -7.97 27.68 23.50	9.62	No Difference	
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.82 40.71 -8.09 27.68 23.50	9.74	No Difference	
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.82 40.71 -9.47 27.68 20.00	7.62	No Difference	
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.82 40.71 -6.06 27.68 20.75	4.96	No Difference	
Notes: Same as "Upper 45dB" *					

EIA Digital Audio Radio Test Laboratory

Tests F2, F5 and G2

Receiver

Rx No.: #2
Mfg.: DENON
Model: TU-380RD
Serial: 4056301149

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
4	Digital Audio Tape recording log of the Lower First Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
7	Digital Audio Tape recording log of the Upper First Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #2 DENON TU-380RD	Measurements	F-2 d/u in dB	F-5 Lower First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Lower First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Lower First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.84 Loss 40.71 undesired -21.41	23.61	Interferer Mod peaks detected		
RX Level -62.00 dBm	Loss 21.75 Attn 30.00				
AT&T IBAC	desired -8.84 Loss 40.71 undesired -15.76	31.89	DAR-> FM more annoying Intense constant static		
RX Level -62.00 dBm	Loss 27.68 Attn 38.00		S/N at d/u 38 dB d/u attn= 29.72 dB		
AT&T Amati DSB IBOC	desired -8.84 Loss 40.71 undesired -7.97	29.10	DAR-> FM more annoying Hiss with interer modulation peaks detected		
RX Level -62.00 dBm	Loss 27.68 Attn 43.00		S/N at d/u 40.5 dB d/u attn= 37.51 dB		
AT&T Amati LSB IBOC	desired -8.84 Loss 40.71 undesired -8.09	23.47	DAR->FM same as FM->FM		
RX Level -62.00 dBm	Loss 27.68 Attn 37.25		S/N at d/u 45 dB d/u attn= 37.39 dB		
USADR FM1 IBOC	desired -8.84 Loss 40.71 undesired -9.50	27.38			
RX Level -62.00 dBm	Loss 27.68 Attn 39.75		S/N at d/u 41.8 dB d/u attn= 35.98 dB		
USADR FM2 IBOC	desired -8.84 Loss 40.71 undesired -6.05	23.93			
RX Level -62.00 dBm	Loss 27.68 Attn 39.75		S/N at d/u 44.7 dB d/u attn= 39.43 dB		
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted February 24, 1995			DAT Ref.: DAR40121.DAT Best Case S/N = 51.5 dB	

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #2 DENON TU-380RD	Measurements	F-2		Effects with out Digital Modulation			
		d/u in dB		d/u in dB		d/u in dB	
				Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.84 40.71 -21.41	12.61		NA		
Desired Signal Level -62.00 dBm	Loss Attn	21.75 19.00					
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.84 40.71 -15.76 27.68 26.75	20.64		-8.87 40.71 -15.41 27.68 31.25	24.76	-8.87 40.71 -15.41 27.68 20.50
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.84 40.71 -7.97 27.68 31.50	17.60		No Difference		
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.84 40.71 -8.09 27.68 26.25	12.47		No Difference		
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.84 40.71 -9.50 27.68 28.75	16.38		No Difference		
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.86 40.71 -6.05 27.68 28.75	12.91		No Difference		
Notes: Same as "Lower 45dB"							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40121.DAT									
2/24/95									
							LOWER FIRST ADJACENT		
DISREGARD			1						
DISREGARD			2						
DISREGARD			3						
DISREGARD			4						
DISREGARD			5						
DISREGARD			6						
DISREGARD			7						
DISREGARD			8						
DISREGARD			9						
DISREGARD			10						
			11				AMATI DSB		
DISREGARD			12				AT&T		
			13				AT&T		
			14				AMATI LSB		
			15				FM1		
			16				FM2		
							WITH MULTIPATH (URBAN SLOW)		
			17				FM2		
DISREGARD			18				FM1		
			19				FM1		
			20				AMATI LSB		
			21				AT&T		
			22				AMATI DSB		

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #1 DENON TU-380RD	Measurements	F-2 d/u in dB	F-5 Upper First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -21.44 Loss 21.75 Attn 18.75	12.46	Interferer Mod peaks detected		
RX Level -62.00 dBm					
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.70 Loss 27.68 Attn 28.75	22.65		S/N at d/u 35.7 dB d/u attn= 18.56 dB	
RX Level -62.00 dBm					
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.97 Loss 27.68 Attn 40.50	26.67		S/N at d/u 31.9 dB d/u attn= 26.29 dB	
RX Level -62.00 dBm					
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.11 Loss 27.68 Attn 40.50	26.81		S/N at d/u 31.8 dB d/u attn= 26.15 dB	
RX Level -62.00 dBm					
USADR FMI IBOC	desired -8.77 Loss 40.71 undesired -9.48 Loss 27.68 Attn 36.75	24.43		S/N at d/u 34 dB d/u attn= 24.78 dB	
RX Level -62.00 dBm					
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.08 Loss 27.68 Attn 29.25	13.53		S/N at d/u 44.1 dB d/u attn= 28.18 dB	
RX Level -62.00 dBm					
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 8, 1995				DAT Ref.: DAR40141.DAT Best Case S/N = 51.5 dB

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #2 DENON TU-380RD		F-2		Effects with out Digital Modulation			
Measurements		d/u in dB		d/u in dB @ Silence S/N=45dB		d/u in dB @ Silence S/N=35dB	
Analog to Analog Reference	desired Loss undesired	-8.77 40.71 -21.42	1.69	NA			
Desired Signal Level -62.00 dBm	Loss Attm	21.75 8.00					
AT&T IBAC	desired Loss undesired	-8.77 40.71 -15.70					
RX Level -62.00 dBm	Loss Attm	27.68 17.75		27.68 21.50		27.68 11.25	
AT&T Amati DSB IBOC	desired Loss undesired	-8.77 40.71 -7.97	15.67	No Difference			
RX Level -62.00 dBm	Loss Attm	27.68 29.50					
AT&T Amati LSB IBOC	desired Loss undesired	-8.77 40.71 -8.11					
RX Level -62.00 dBm	Loss Attm	27.68 29.50					
USADR FM1 IBOC	desired Loss undesired	-8.77 40.71 -9.48	13.68	No Difference			
RX Level -62.00 dBm	Loss Attm	27.68 26.00					
USADR FM2 IBOC	desired Loss undesired	-8.77 40.71 -6.08					
RX Level -62.00 dBm	Loss Attm	27.68 18.50					
Notes: Same as "Upper 45dB"							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40141.DAT 3/8/95							UPPER FIRST ADJACENT		
DISREGARD			1				AMATI DSB		
DISREGARD			2				AMATI DSB		
			3				AMATI DSB		
			4				AT&T	-1.5	1
			5				AMATI LSB	-1	1
			6				FM1	-1.5	1
			7				FM2	-1.5	1
								0	0
							WITH MULTIPATH (URBAN SLOW)		
			8				FM2	0	0
			9				FM1		-2
			10				AMATI LSB		-2
			11				AT&T		-1.5
			12				AMATI DSB		-2

EIA Digital Audio Radio Test Laboratory

Tests F2, F5 and G2

Receiver

Rx No.: #3
Mfg.: PANASONIC
Model: RX-FS430
Serial: GR3J01184

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
4	Digital Audio Tape recording log of the Lower First Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
7	Digital Audio Tape recording log of the Upper First Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-2 d/u in dB	F-5 Lower First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Lower First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Lower First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.87 Loss 40.71 undesired -21.41	27.33	Interferer Mod peaks detected		
RX Level -62.00 dBm	Loss 21.75 Attn 33.75				
AT&T IBAC	desired -8.87 Loss 40.71 undesired -15.60	33.20	DAR-> FM more annoying		
RX Level -62.00 dBm	Loss 27.68 Attn 39.50		S/N at d/u 41 dB d/u attn= 33.63 dB		
AT&T Amati DSB IBOC	desired -8.87 Loss 40.71 undesired -8.02	29.87	DAR-> FM more annoying Hiss with interer modulation peaks detected		
RX Level -62.00 dBm	Loss 27.68 Attn 43.75		S/N at d/u 43 dB d/u attn= 41.21 dB		
AT&T Amati LSB IBOC	desired -8.87 Loss 40.71 undesired -8.09	26.19	DAR->FM same as FM->FM		
RX Level -62.00 dBm	Loss 27.68 Attn 40.00		S/N at d/u 45.5 dB d/u attn= 41.14 dB		
USADR FM1 IBOC	desired -8.87 Loss 40.71 undesired -9.47	28.82			
RX Level -62.00 dBm	Loss 27.68 Attn 41.25		S/N at d/u 44 dB d/u attn= 39.76 dB		
USADR FM2 IBOC	desired -8.87 Loss 40.71 undesired -6.04	26.64			
RX Level -62.00 dBm	Loss 27.68 Attn 42.50		S/N at d/u 45.25 dB d/u attn= 43.19 dB		
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted February 24, 1995			DAT Ref.: DAR40122.DAT Best Case S/N = 49 dB	

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #3 Panasonic RX-FS430		F-2		Effects without Digital Modulation			
Measurements		d/u in dB	Silence		S/N 45dB	Silence	
						S/N 35dB	
Analog to Analog Reference	desired Loss undesired	-8.87 40.71 -21.41	14.83		NA		
Desired Signal Level -62.00 dBm	Loss Attn	21.75 21.25					
AT&T IBAC	desired Loss undesired	-8.87 40.71 -15.60	20.95	-8.87 40.71	26.15	-8.87 40.71	14.90
RX Level -62.00 dBm	Loss Attn	27.68 27.25		-15.30 27.68 32.75		-15.30 27.68 21.50	
AT&T Amati DSB IBOC	desired Loss undesired	-8.87 40.71 -8.02	17.87	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 31.75					
AT&T Amati LSB IBOC	desired Loss undesired	-8.87 40.71 -8.09	14.69	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 28.50					
USADR FM1 IBOC	desired Loss undesired	-8.84 40.71 -9.47	16.85	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 29.25					
USADR FM2 IBOC	desired Loss undesired	-8.87 40.71 -6.04	14.89	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 30.75					
Notes: Same as "Lower 45dB"							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40122.DAT									
2/24/95									
							LOWER FIRST ADJACENT		
			1				AMATI DSB		
			2				AT&T		
			3				AMATI LSB		
			4				FM1		
			5				FM2		
							WITH MULTIPATH (URBAN SLOW)		
			6				FM2		
			7				FM1		
			8				AMATI LSB		
			9				AT&T		
			10				AMATI DSB		

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-2 d/u in dB	F-5 Upper First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired -21.43	27.19			
RX Level -62.00 dBm	Loss 21.75 Attn 33.50				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.67	30.86			
RX Level -62.00 dBm	Loss 27.68 Attn 37.00		S/N at d/u 42 dB d/u attn= 33.33 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -7.98	29.17			
RX Level -62.00 dBm	Loss 27.68 Attn 43.00		S/N at d/u 43.5 dB d/u attn= 41.02 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.09	29.28			
RX Level -62.00 dBm	Loss 27.68 Attn 43.00		S/N at d/u 43.5 dB d/u attn= 40.91 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.50	28.44			
RX Level -62.00 dBm	Loss 27.68 Attn 40.75		S/N at d/u 44.2 dB d/u attn= 39.50 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.08	27.02			
RX Level -62.00 dBm	Loss 27.68 Attn 42.75		S/N at d/u 45.2 dB d/u attn= 42.92 dB		
<p>Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 8, 1995</p> <p style="text-align: right;">DAT Ref.: DAR40142.DAT Best Case S/N = 49 dB</p>					

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #3 Panasonic RX-FS430		F-2		Effects without Digital Modulation								
Measurements		d/u in dB		d/u in dB @ Silence S/N=45dB		d/u in dB @ Silence S/N=35dB						
Analogue to Analogue Reference	desired Loss undesired	-8.78 40.71 -21.43	15.94	NA								
Desired Signal Level -62.00 dBm	Loss Attn	21.75 22.25										
AT&T IBAC	desired Loss undesired	-8.78 40.71 -15.67						19.61	-8.78 40.71 -15.38	23.82	-8.78 40.71 -15.38	12.32
RX Level -62.00 dBm	Loss Attn	27.68 25.75							27.68 30.25		27.68 18.75	
AT&T Amati DSB IBOC	desired Loss undesired	-8.78 40.71 -7.98	17.92	No Difference								
RX Level -62.00 dBm	Loss Attn	27.68 31.75										
AT&T Amati LSB IBOC	desired Loss undesired	-8.78 40.71 -8.09						18.03	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 31.75										
USADR FM1 IBOC	desired Loss undesired	-8.78 40.71 -9.50	17.19	No Difference								
RX Level -62.00 dBm	Loss Attn	27.68 29.50										
USADR FM2 IBOC	desired Loss undesired	-8.78 40.71 -6.08						15.77	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 31.50										

Notes: Same as "Upper 45dB"

EIA Digital Audio Radio Test Laboratory

Tests F2, F5 and G2

Receiver

Rx No.: #4

Mfg.: PIONEER

Model: SX-201

Serial: OA3965843C

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
4	Digital Audio Tape recording log of the Lower First Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
7	Digital Audio Tape recording log of the Upper First Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-2 d/u in dB	F-5 Lower First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Lower First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Lower First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.87 Loss 40.71 undesired -21.45	31.87	Interferer Mod peaks detected		
RX Level -62.00 dBm	Loss 21.75 Attn 38.25				
AT&T IBAC	desired -8.87 Loss 40.71 undesired -15.72	35.32	DAR-> FM more annoying		
RX Level -62.00 dBm	Loss 27.68 Attn 41.50		S/N at d/u 42.4 dB d/u attn= 38.05 dB		
AT&T Amati DSB IBOC	desired -8.87 Loss 40.71 undesired -8.00	32.60	DAR-> FM more annoying Hiss with interer modulation peaks detected		
RX Level -62.00 dBm	Loss 27.68 Attn 46.50		S/N at d/u 44.5 dB d/u attn= 45.77 dB		
AT&T Amati LSB IBOC	desired -8.87 Loss 40.71 undesired -8.09	31.44	DAR->FM same as FM->FM		
RX Level -62.00 dBm	Loss 27.68 Attn 45.25		S/N at d/u 45.4 dB d/u attn= 45.68 dB		
USADR FM1 IBOC	desired -8.87 Loss 40.71 undesired -9.46	32.31			
RX Level -62.00 dBm	Loss 27.68 Attn 44.75		S/N at d/u 44.8 dB d/u attn= 44.31 dB		
USADR FM2 IBOC	desired -8.87 Loss 40.71 undesired -6.06	31.91			
RX Level -62.00 dBm	Loss 27.68 Attn 47.75		S/N at d/u 45 dB d/u attn= 47.71 dB		
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted February 28, 1995					DAT Ref.: DAR40122.DAT Best Case S/N = 51 dB

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #4 Pioneer SX-201		F-2		Effects without Digital Modulation			
		Measurements	d/u in dB	d/u in dB @ Silence S/N=45dB		d/u in dB @ Silence S/N=35dB	
Analog to Analog Reference	desired Loss undesired	-8.87 40.71 -21.45	20.62	NA			
Desired Signal Level -62.00 dBm	Loss Attn	21.75 27.00					
AT&T IBAC	desired Loss undesired	-8.87 40.71 -15.72		-8.87 40.71 -15.38	29.23	-8.87 40.71 -15.38	17.98
RX Level -62.00 dBm	Loss Attn	27.68 30.00		27.68 35.75		27.68 24.50	
AT&T Amati DSB IBOC	desired Loss undesired	-8.87 40.71 -8.00	21.60	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 35.50					
AT&T Amati LSB IBOC	desired Loss undesired	-8.87 40.71 -8.09		No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 34.25					
USADR FM1 IBOC	desired Loss undesired	-8.84 40.71 -9.46	21.09	No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 33.50					
USADR FM2 IBOC	desired Loss undesired	-8.87 40.71 -6.06		No Difference			
RX Level -62.00 dBm	Loss Attn	27.68 36.25					
Notes: Same as "Lower 45dB"							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40123.DAT 2/28/95									
							LOWER FIRST ADJACENT		
			1				AMATI DSB		
			2				AT&T		
			3				AMATI LSB		
			4				FM1		
			5				FM2		
							WITH MULTIPATH (URBAN SLOW)		
			6				AMATI LSB		
			7				AT&T		
			8				AMATI DSB		
			9				FM1		
			10				FM2		

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-2 d/u in dB	F-5 Upper First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.79 Loss 40.71 undesired -21.47	21.22			
RX Level -62.00 dBm	Loss 21.75 Attn 27.50				
AT&T IBAC	desired -8.79 Loss 40.71 undesired -15.55		29.23		
RX Level -62.00 dBm	Loss 27.68 Attn 35.50	S/N at d/u 38.1 dB d/u attn= 27.49 dB			
AT&T Amati DSB IBOC	desired -8.79 Loss 40.71 undesired -7.97	28.65			
RX Level -62.00 dBm	Loss 27.68 Attn 42.50		S/N at d/u 38.6 dB d/u attn= 35.07 dB		
AT&T Amati LSB IBOC	desired -8.79 Loss 40.71 undesired -8.05		28.73		
RX Level -62.00 dBm	Loss 27.68 Attn 42.50	S/N at d/u 38.6 dB d/u attn= 34.99 dB			
USADR FM1 IBOC	desired -8.79 Loss 40.71 undesired -9.44	26.87			
RX Level -62.00 dBm	Loss 27.68 Attn 39.25		S/N at d/u 40.4 dB d/u attn= 33.60 dB		
USADR FM2 IBOC	desired -8.79 Loss 40.71 undesired -6.05		21.48		
RX Level -62.00 dBm	Loss 27.68 Attn 37.25	S/N at d/u 44.8 dB d/u attn= 36.99 dB			
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 9, 1995					DAT Ref.: DAR40143.DAT Best Case S/N = 51.5 dB

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-2		Effects with out Digital Modulation			
		d/u in dB		Silence	d/u in dB @ S/N=45dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.79 40.71 -21.47	10.22		NA		
Desired Signal Level -62.00 dBm	Loss Attn	21.75 16.50					
AT&T IBAC	desired Loss undesired	-8.79 40.71 -15.55		17.98	-8.79 40.71 -15.32	21.25	-8.79 40.71 -15.32
RX Level -62.00 dBm	Loss Attn	27.68 24.25			27.68 27.75		27.68 17.25
AT&T Amati DSB IBOC	desired Loss undesired	-8.79 40.71 -7.97	17.40		No Difference		
RX Level -62.00 dBm	Loss Attn	27.68 31.25					
AT&T Amati LSB IBOC	desired Loss undesired	-8.79 40.71 -8.05		17.48	No Difference		
RX Level -62.00 dBm	Loss Attn	27.68 31.25					
USADR FM1 IBOC	desired Loss undesired	-8.79 40.71 -9.44	15.62		No Difference		
RX Level -62.00 dBm	Loss Attn	27.68 28.00					
USADR FM2 IBOC	desired Loss undesired	-8.79 40.71 -6.05		10.23	No Difference		
RX Level -62.00 dBm	Loss Attn	27.68 26.00					
Notes: Same as "Upper 45dB"							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40143.DAT 3/9/95							UPPER FIRST ADJACENT		
			1				AMATI LSB	-1	1
			2				AT&T	-1	1
			3				AMATI DSB	-1	1
			4				FM1	-1	1
			5				FM2	0	0
							WITH MULTIPATH (URBAN SLOW)		
			6				FM2	-0.5	
			7				FM1	-1.5	
			8				AMATI DSB	-1.5	
			9				AT&T	-1	
			10				AMATI LSB	-1.5	

EIA Digital Audio Radio Test Laboratory

Tests F2, F5 and G2

Receiver

Rx No.: #5

Mfg.: FORD

Model: F4XF-19B132-CB

Serial: 281150B010

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower first adjacent frequency
4	Digital Audio Tape recording log of the Lower First Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper first adjacent frequency
7	Digital Audio Tape recording log of the Upper First Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #5 Ford Auto F4XF-19B132-CB		F-2	F-5	G-2	Urban Slow Rayleigh	Urban Fast Rayleigh
	Measurements	d/u in dB	EO&C	Lower First Adjacent DAR to Analog with Multipath EO&C	Lower First Adjacent DAR to Analog with Multipath EO&C	Lower First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.87 Loss 40.71 undesired -1.40	-6.18	Interferer Mod peaks detected			
RX Level -62.00 dBm	Loss 21.75 Attn 20.25					
AT&T IBAC	desired -8.87 Loss 40.71 undesired -15.60	-13.55	DAR-> FM more annoying			
RX Level -62.00 dBm	Loss 7.68 Attn 12.75		S/N at d/u 47.5 dB d/u attn= 20.12 dB			
AT&T Amati DSB IBOC	desired -8.87 Loss 40.71 undesired -7.98	19.33	DAR-> FM more annoying Hiss with interer modulation peaks detected			
RX Level -62.00 dBm	Loss 7.68 Attn 53.25		S/N at d/u 26.8 dB d/u attn= 27.74 dB			
AT&T Amati LSB IBOC	desired -8.87 Loss 40.71 undesired -8.09	-5.56	DAR->FM same as FM->FM			
RX Level -62.00 dBm	Loss 7.68 Attn 28.25		S/N at d/u 43.8 dB d/u attn= 27.63 dB			
USADR FM1 IBOC	desired -8.87 Loss 40.71 undesired -9.46	17.31				
RX Level -62.00 dBm	Loss 7.68 Attn 49.75		S/N at d/u 27.5 dB d/u attn= 26.26 dB			
USADR FM2 IBOC	desired -8.87 Loss 40.71 undesired -6.01	0.36				
RX Level -62.00 dBm	Loss 7.68 Attn 36.25		S/N at d/u 38.8 dB d/u attn= 29.71 dB			
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted February 28, 1995					DAT Ref.: DAR40124.DAT Best Case S/N = 51.5 dB	

EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #5 Ford Auto F4XF-19B132-CB	Measurements	F-2 d/u in dB	Effects without Digital Modulation			
			Silence	d/u in dB @ S/N=45dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired -8.87 Loss 40.71 undesired -1.45	-16.88		NA		
Desired Signal Level -62.00 dBm	Loss 21.75 Attn 9.50					
AT&T IBAC	desired -8.87 Loss 40.71 undesired -15.60	-16.05				
RX Level -62.00 dBm	Loss 7.68 Attn 10.25		-8.87 -16.27 40.71 -15.38		-8.87 -18.27 40.71 -15.38	
AT&T Amati DSB IBOC	desired -8.87 Loss 40.71 undesired -7.98	8.08		No Difference		
RX Level -62.00 dBm	Loss 7.68 Attn 42.00					
AT&T Amati LSB IBOC	desired -8.87 Loss 40.71 undesired -8.09	-16.81		No Difference		
RX Level -62.00 dBm	Loss 7.68 Attn 17.00					
USADR FM1 IBOC	desired -8.84 Loss 40.71 undesired -9.46	6.09		No Difference		
RX Level -62.00 dBm	Loss 7.68 Attn 38.50					
USADR FM2 IBOC	desired -8.87 Loss 40.71 undesired -6.01	-11.14		No Difference		
RX Level -62.00 dBm	Loss 7.68 Attn 24.75					
Notes: Same as "Lower 45dB"						

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40124.DAT							Lower First Adjacent		
2/28/95									
			1				Amati DSB	-3	0.5
			2				AT&T	1	-1.5
			3				Amati LSB	0	0
			4				USADR FM1	-3	0
			5				USADR FM2	-1.5	-0.5
							With Multilpath (Urban Slow)		
			6				FM2	-1	
			7				FMI	-3	
			8				AMATI LSB	0	
			9				AT&T	-2	
			10				AMATI DSB	-3	
							With Multilpath (Urban Fast)		
			11				Amati DSB	-3	
			12				AT&T	-2.5	
			13				Amati LSB	0	
			14				USADR FMI	-3	
			15				USADR FM2	-1	

EIA Digital Audio Radio Test Laboratory

Test F-2, F-5 and G-2 45 dB S/N Receiver #5 Ford Auto F4XF-19B132-CB	Measurements	F-2 d/u in dB	F-5 Upper First Adjacent DAR to Analog EO&C	G-2 Urban Slow Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C	Urban Fast Rayleigh Upper First Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired -1.37 Loss 21.75 Attn 20.25	-6.12			
RX Level -62.00 dBm					
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.55 Loss 7.68 Attn 9.50	-16.76	S/N at d/u 50.2 dB d/u attn= 20.14 dB		
RX Level -62.00 dBm					
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -7.95 Loss 7.68 Attn 53.25	19.39	S/N at d/u 27.2 dB d/u attn= 27.74 dB		
RX Level -62.00 dBm					
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.05 Loss 7.68 Attn 53.50	19.74	S/N at d/u 27.2 dB d/u attn= 27.64 dB		
RX Level -62.00 dBm					
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.44 Loss 7.68 Attn 49.75	17.38	S/N at d/u 26.8 dB d/u attn= 26.25 dB		
RX Level -62.00 dBm					
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.03 Loss 7.68 Attn 35.75	-0.03	S/N at d/u 40 dB d/u attn= 29.66 dB		
RX Level -62.00 dBm					
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 9, 1995			DAT Ref.: DAR40144.DAT Best Case S/N = 51.5 dB	

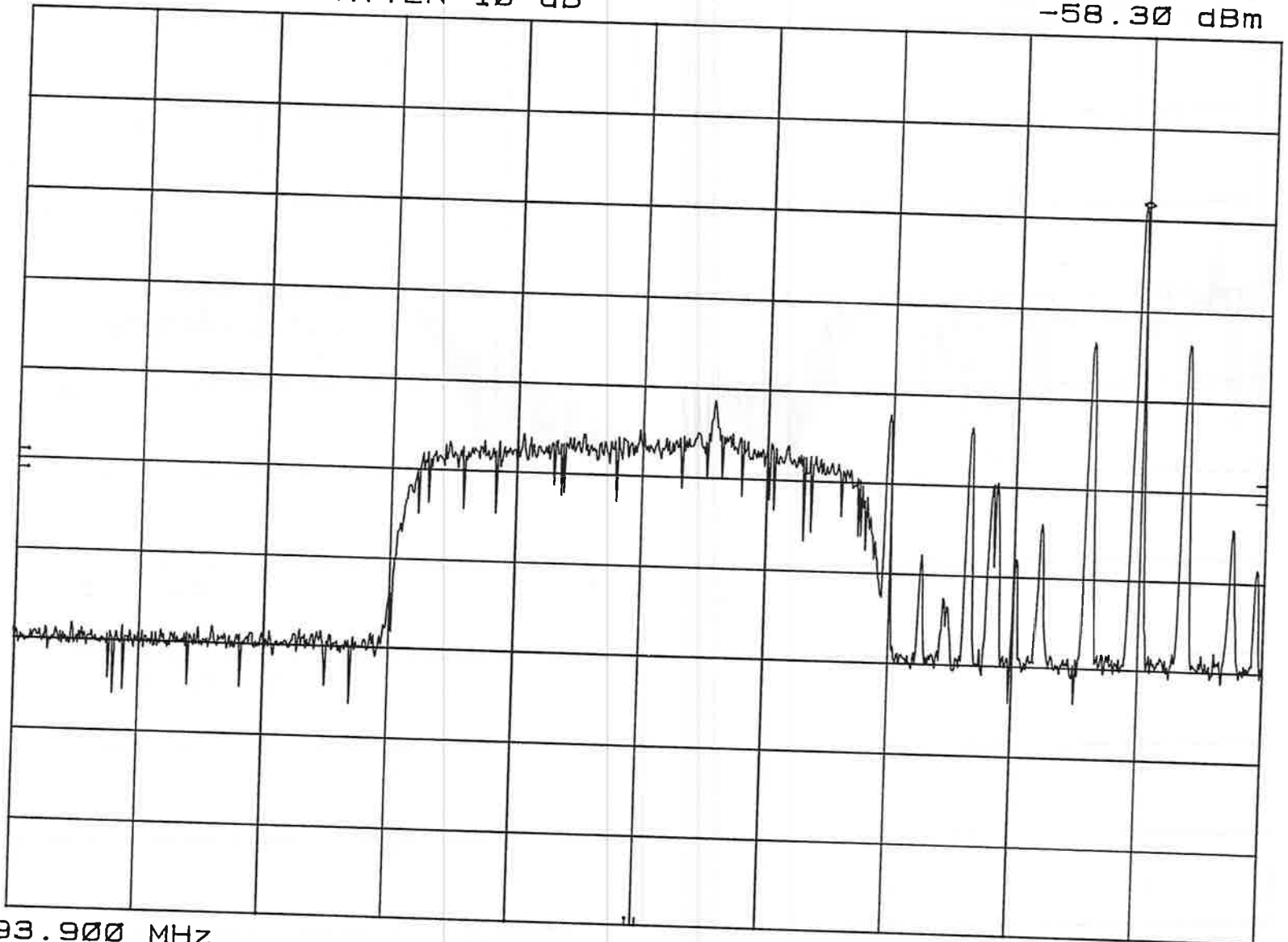
EIA Digital Audio Radio Test Laboratory

Test F-2 35 dB S/N Receiver #5 Ford Auto F4XF-19B132-CB	Measurements	F-2 d/u in dB		Effects with out Digital Modulation			
				d/u in dB @ Silence S/N=45dB		d/u in dB @ Silence S/N=35dB	
				Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.78 40.71 -1.37	-17.37				
Desired Signal Level -62.00 dBm	Loss Attn	21.75 9.00					
AT&T IBAC	desired Loss undesired	-8.78 40.71 -15.55		-18.01	-8.78	-4.50	-8.78
RX Level -62.00 dBm	Loss Attn	7.68 8.25	40.71		40.71	-15.31	-15.31
AT&T Amati DSB IBOC	Loss undesired	7.68 -7.95	7.68		7.68	7.68	7.68
RX Level -62.00 dBm	Loss Attn	7.68 42.00	22.00	4.00	4.00	4.00	
AT&T Amati LSB IBOC	desired Loss undesired	-8.78 40.71 -8.05	8.14				
RX Level -62.00 dBm	Loss Attn	7.68 42.25					
AT&T Amati USADR FM1	desired Loss undesired	-8.78 40.71 -9.44		8.49			
IBOC	Loss undesired	7.68 -9.44					
RX Level -62.00 dBm	Loss Attn	7.68 38.50					
USADR FM2	desired Loss undesired	-8.78 40.71 -6.03	6.13				
IBOC	Loss undesired	7.68 -6.03					
RX Level -62.00 dBm	Loss Attn	7.68 23.75					
Notes: Same as Upper 45dB"							

AT&T->FM LOWER ADJACENT 2/23/95 12: 15
EIA REF -40.0 dBm ATTEN 10 dB

MKR 94.099 5 MHz
-58.30 dBm

10 dB/



CENTER 93.900 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

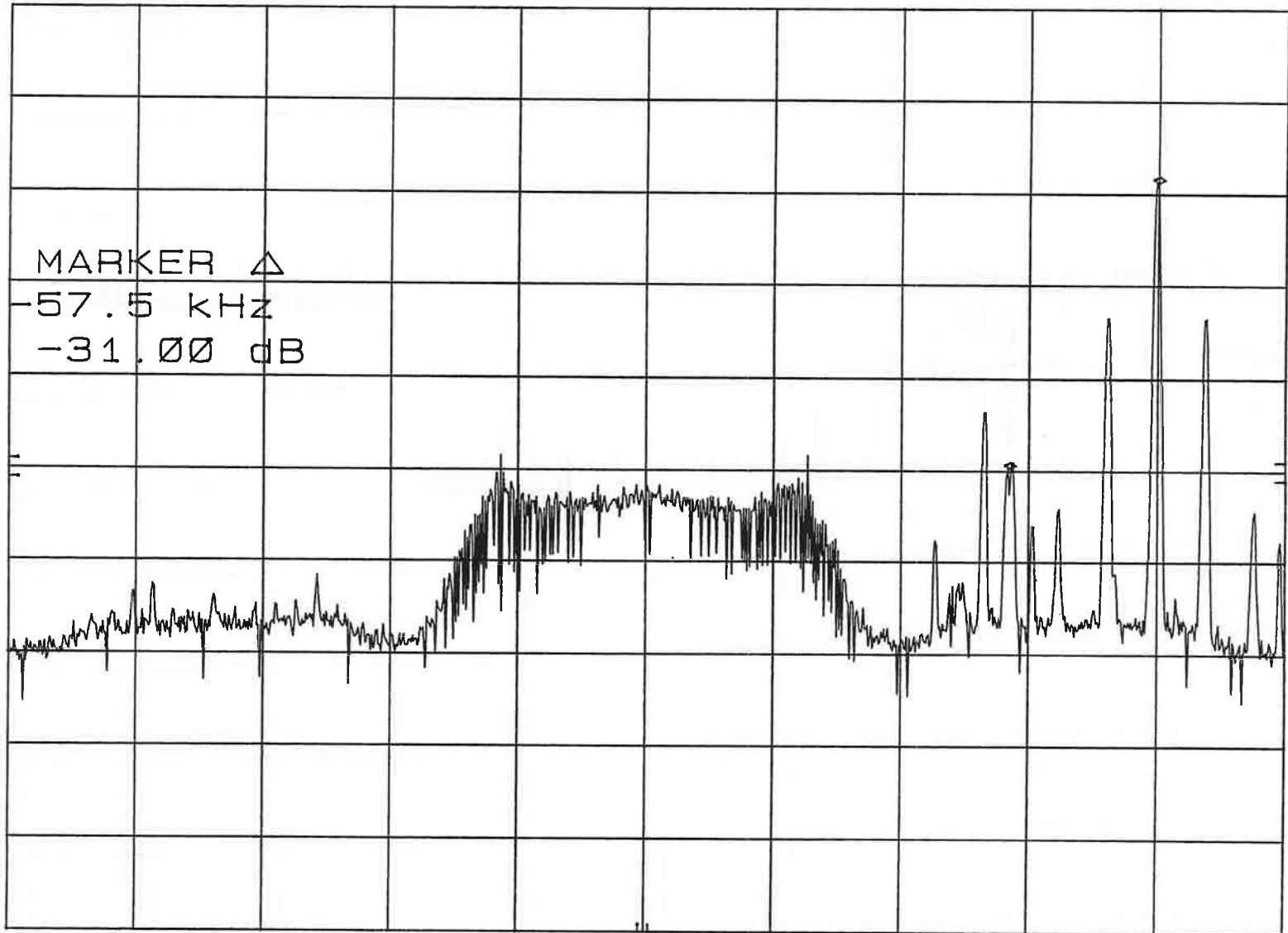
USADR FM-1 LOWER ADJACENT 13:32

MKR Δ -57.5 kHz

EIA REF -40.0 dBm ATTN 10 dB

-31.00 dB

10 dB/



CENTER 93.900 MHz

RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

DSB

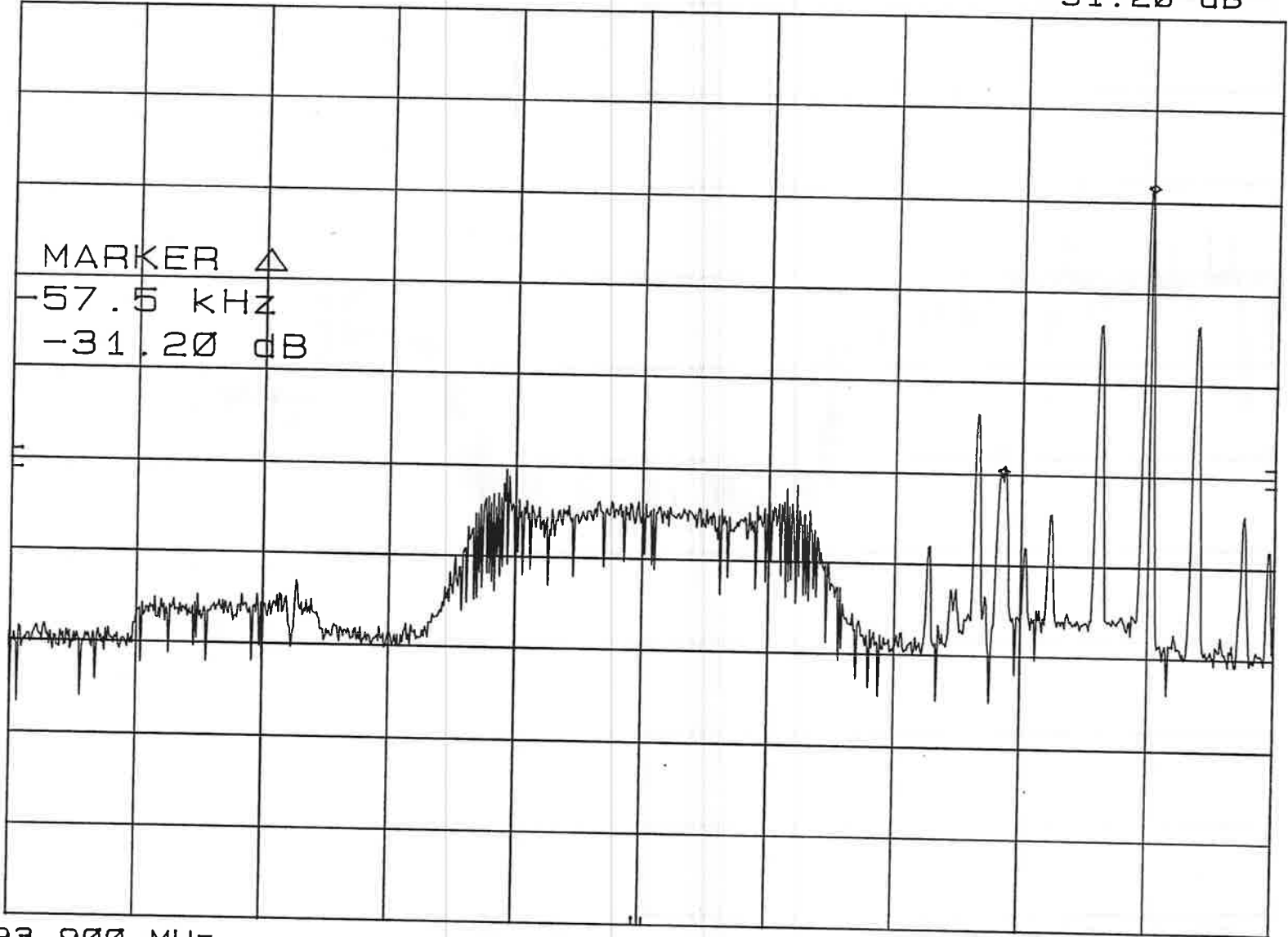
^

AMATI LOWER ADJACENT 13: 23

MKR Δ -57.5 kHz
-31.20 dB

EIA REF -40.0 dBm ATTEN 10 dB

10 dB/



MARKER Δ
-57.5 kHz
-31.20 dB

CENTER 93.900 MHz

RES BW 1 kHz

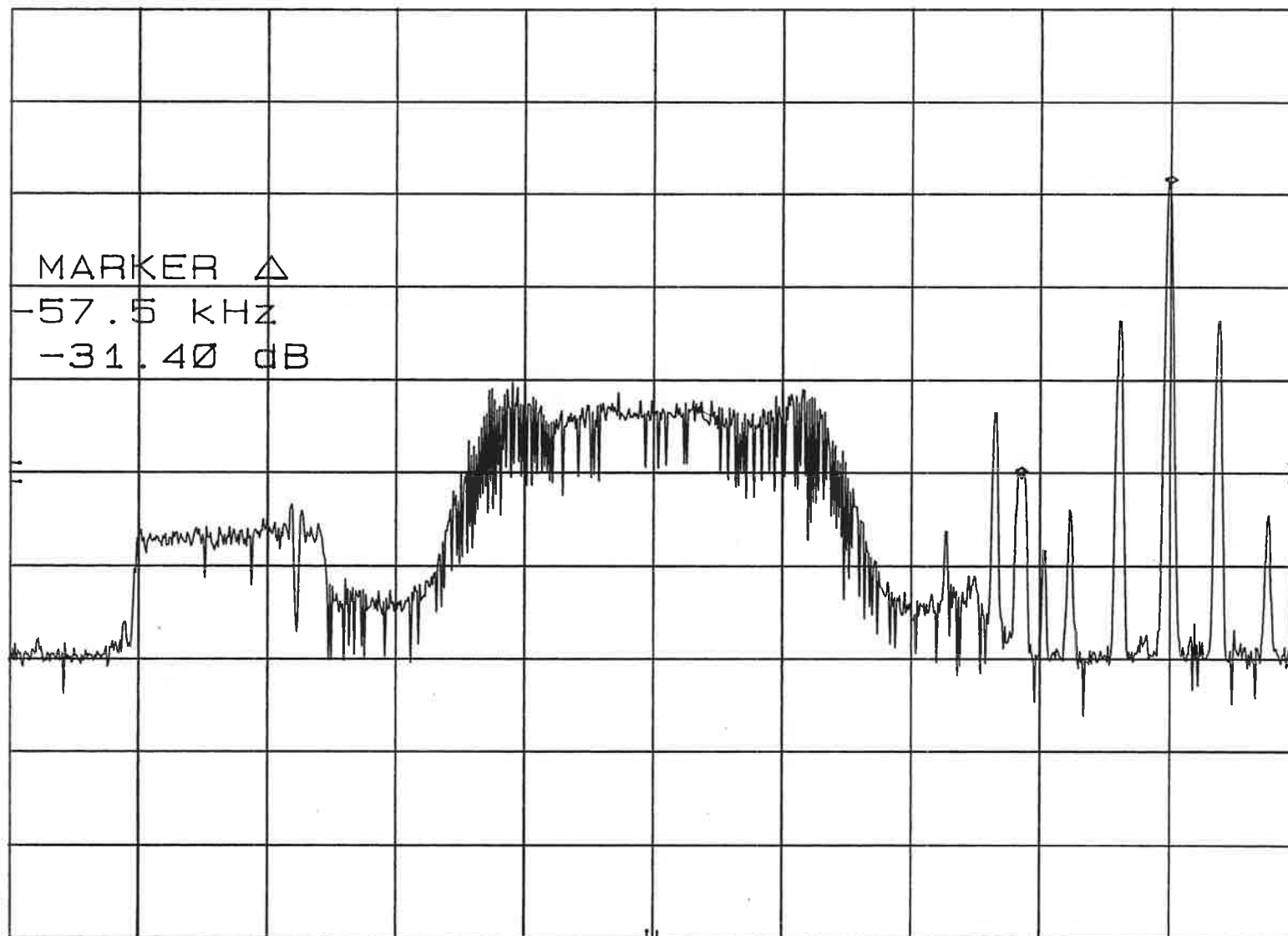
VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

AMATI LSB LOWER ADJACENT 13:40
EIA REF -40.0 dBm ATTEN 10 dB

MKR Δ -57.5 kHz
-31.40 dB

10 dB/



CENTER 93.900 MHz
RES BW 1 kHz

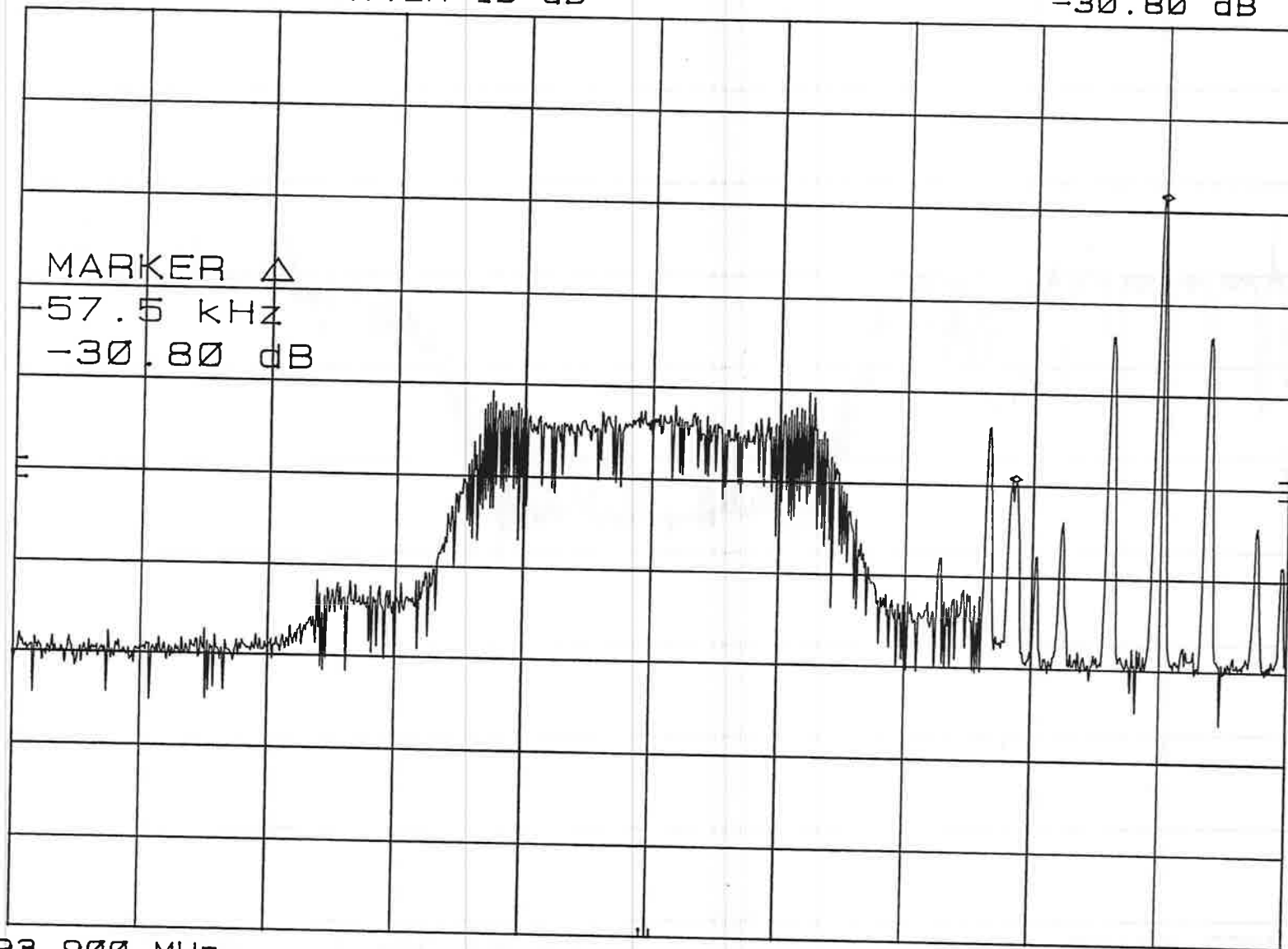
VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

USADR FM-2 LOWER ADJACENT 13:45
EIA REF -40.0 dBm ATTEN 10 dB

MKR Δ -57.5 kHz
-30.80 dB

10 dB/



CENTER 93.900 MHz

RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

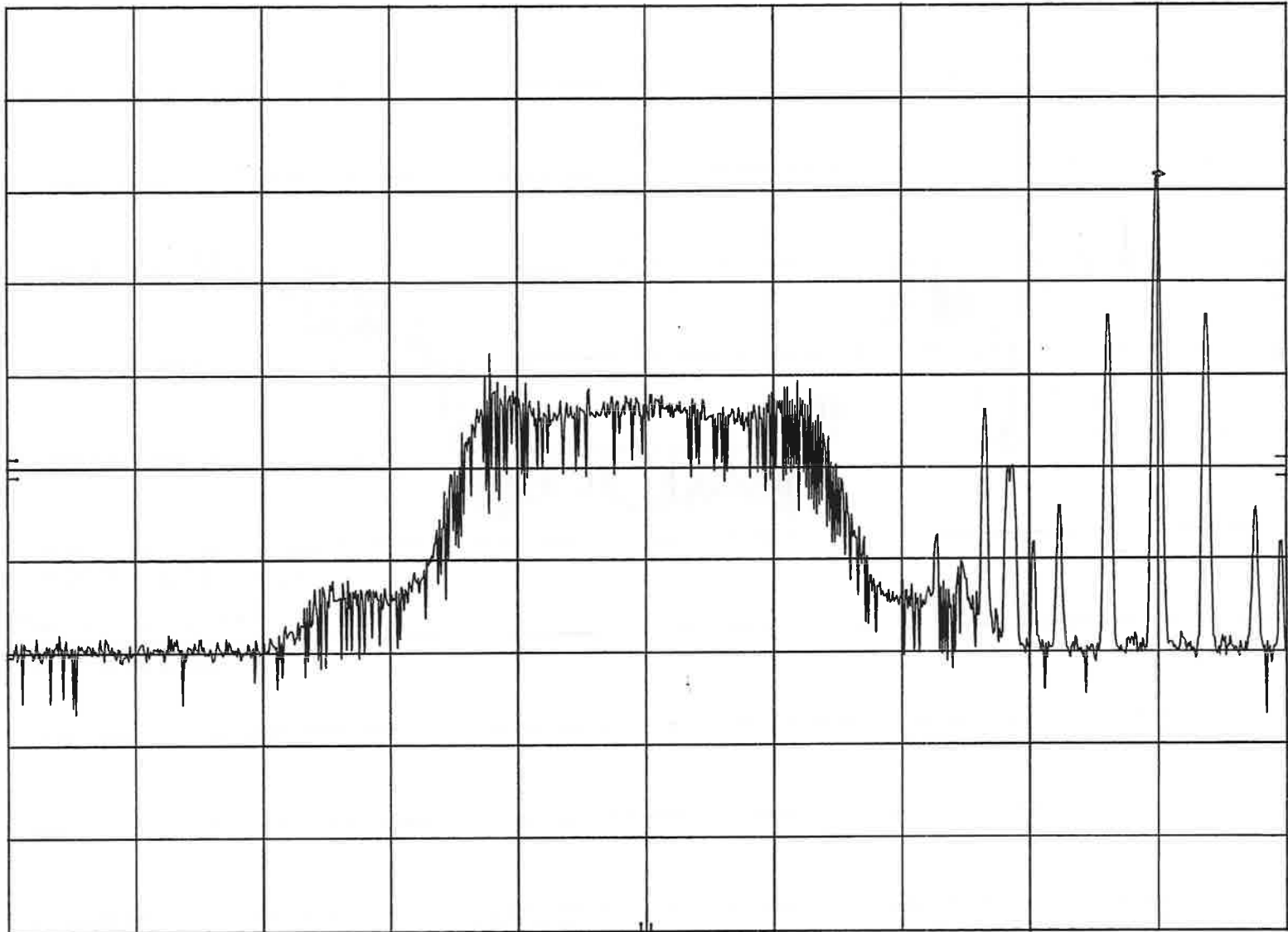
FM->FM LOWER ADJACENT 2/23/95 11:59

MKR 94.100 0 MHz

EIA REF -40.0 dBm ATTEN 10 dB

-58.30 dBm

10 dB/



CENTER 93.900 MHz

RES BW 1 kHz

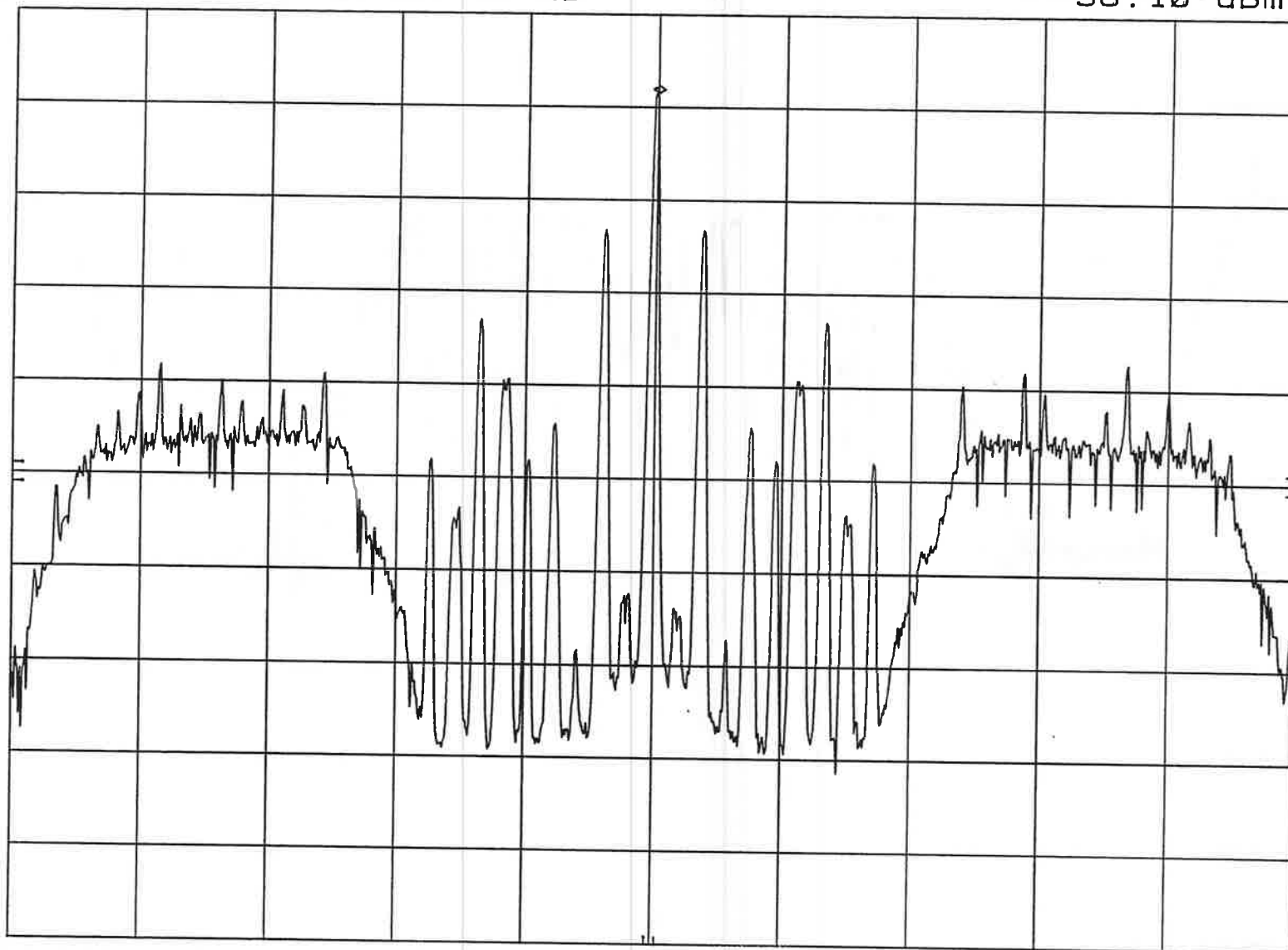
VBW 30 Hz

SPAN 500 kHz

SWP 50.0 sec

USADR FM1 UPPER 1st ADJACENT 3/7/95 15:42 MKR 94.300 0 MHz
EIA REF -30.0 dBm ATTEN 10 dB -38.10 dBm

10 dB/



CENTER 94.300 MHz

RES BW 1 kHz

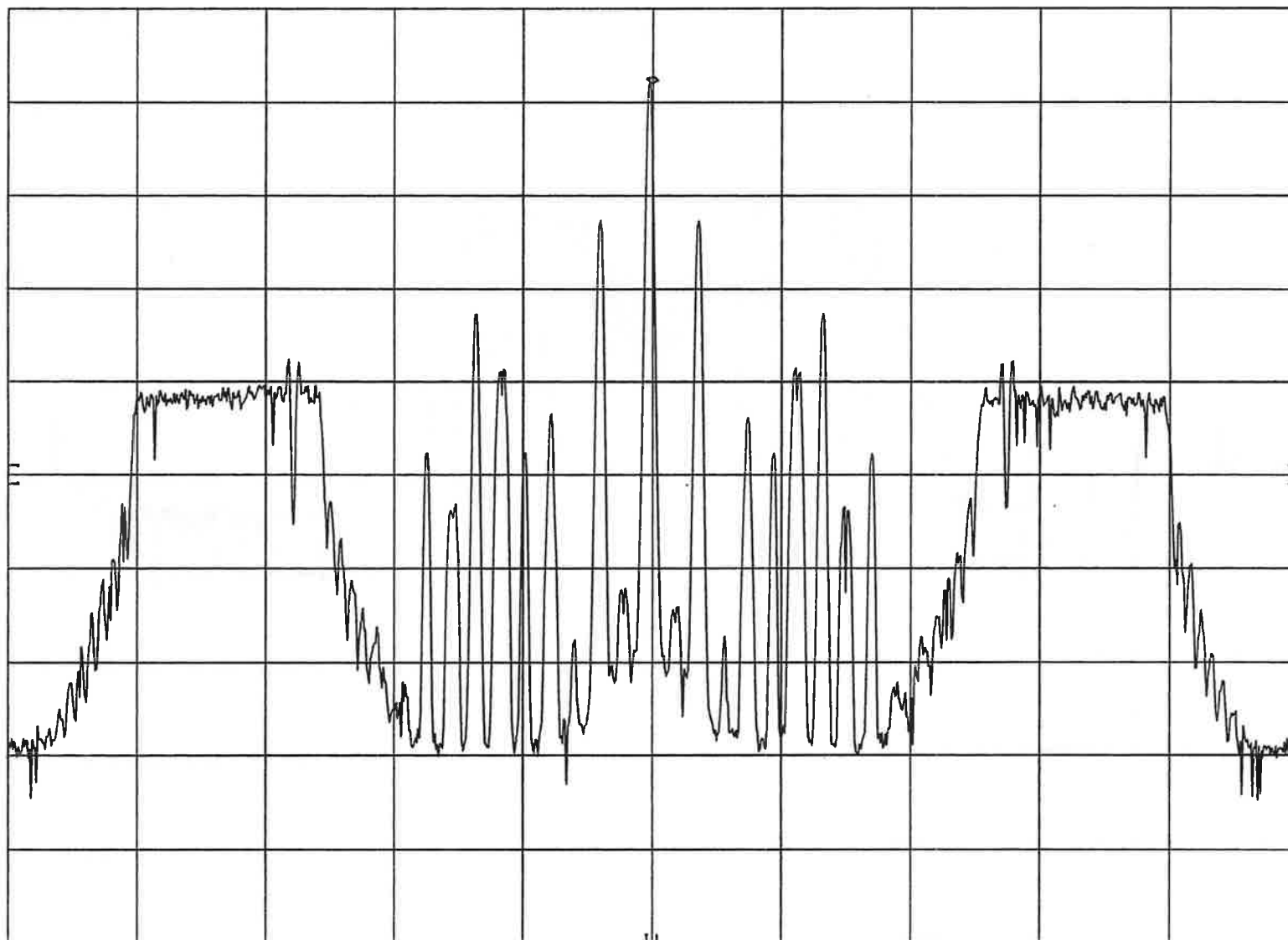
VBW 30 Hz

SPAN 500 kHz

SWP 50.0 sec

AT&T AMATI DSB UPPER 1st ADJ 3/7/95 15:55 MKR 94.299 5 MHz
EIA REF -30.0 dBm ATTEN 10 dB -37.60 dBm

10 dB/



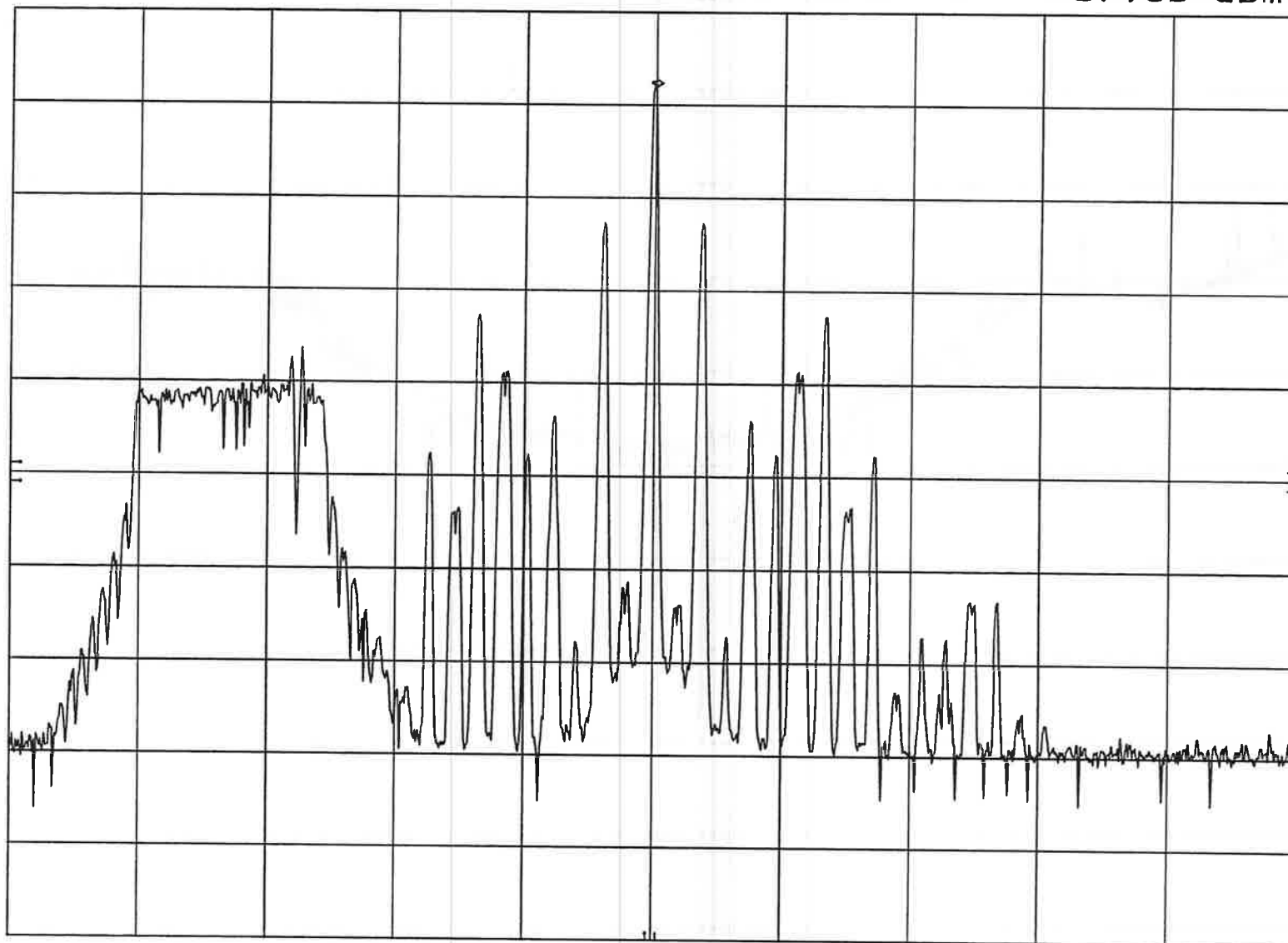
CENTER 94.300 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

AT&T AMATI LSB UPPER 1st ADJACENT 3/7/95 10KB294.300 0 MHz
EIA REF -30.0 dBm ATTEN 10 dB -37.60 dBm

10 dB/



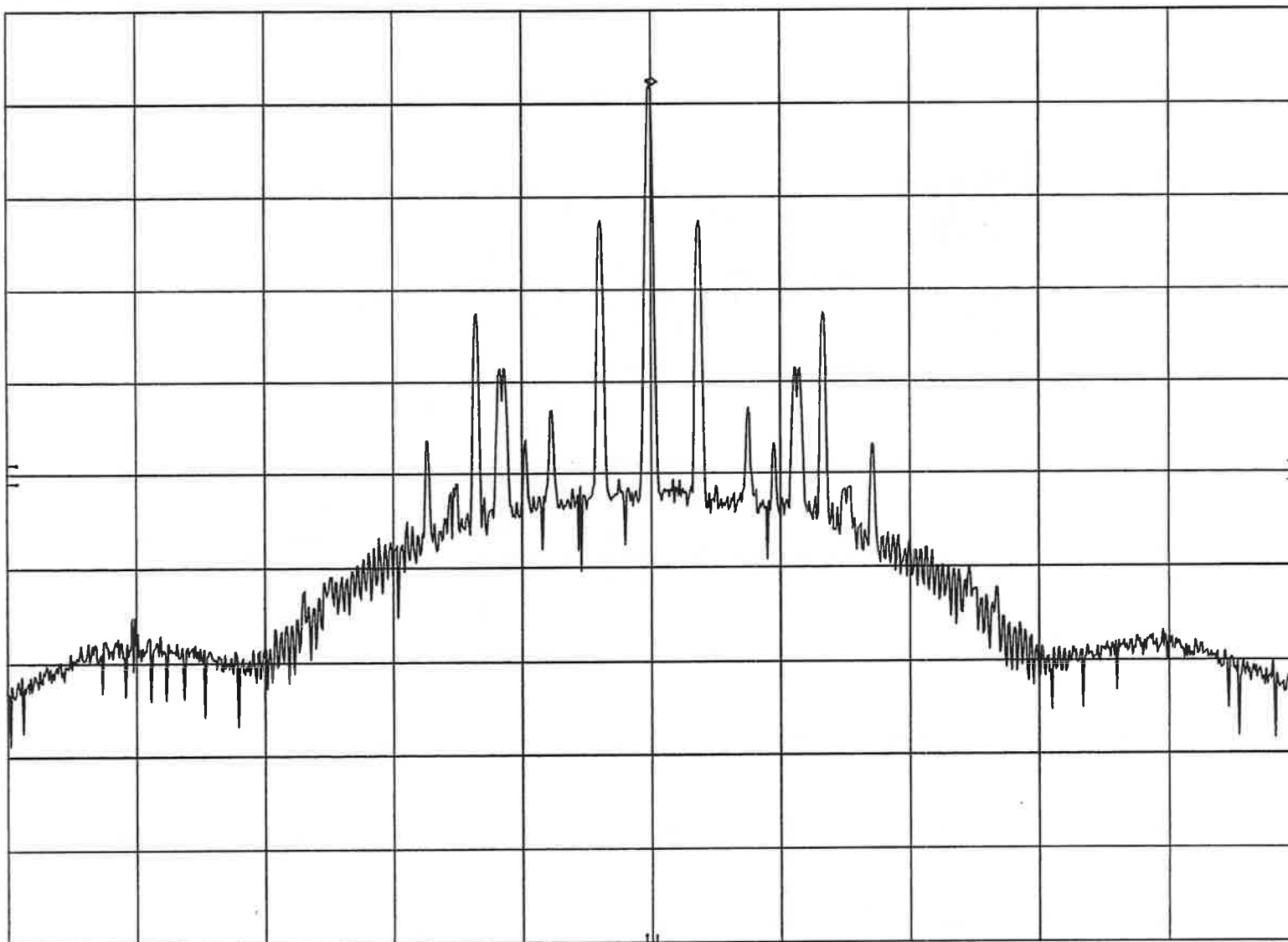
CENTER 94.300 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

USADR FM2 UPPER 1st ADJACENT 3/7/95 16:12 MKR 94.300 0 MHz
EIA REF -30.0 dBm ATTEN 10 dB -37.60 dBm

10 dB/



CENTER 94.300 MHz
RES BW 1 kHz

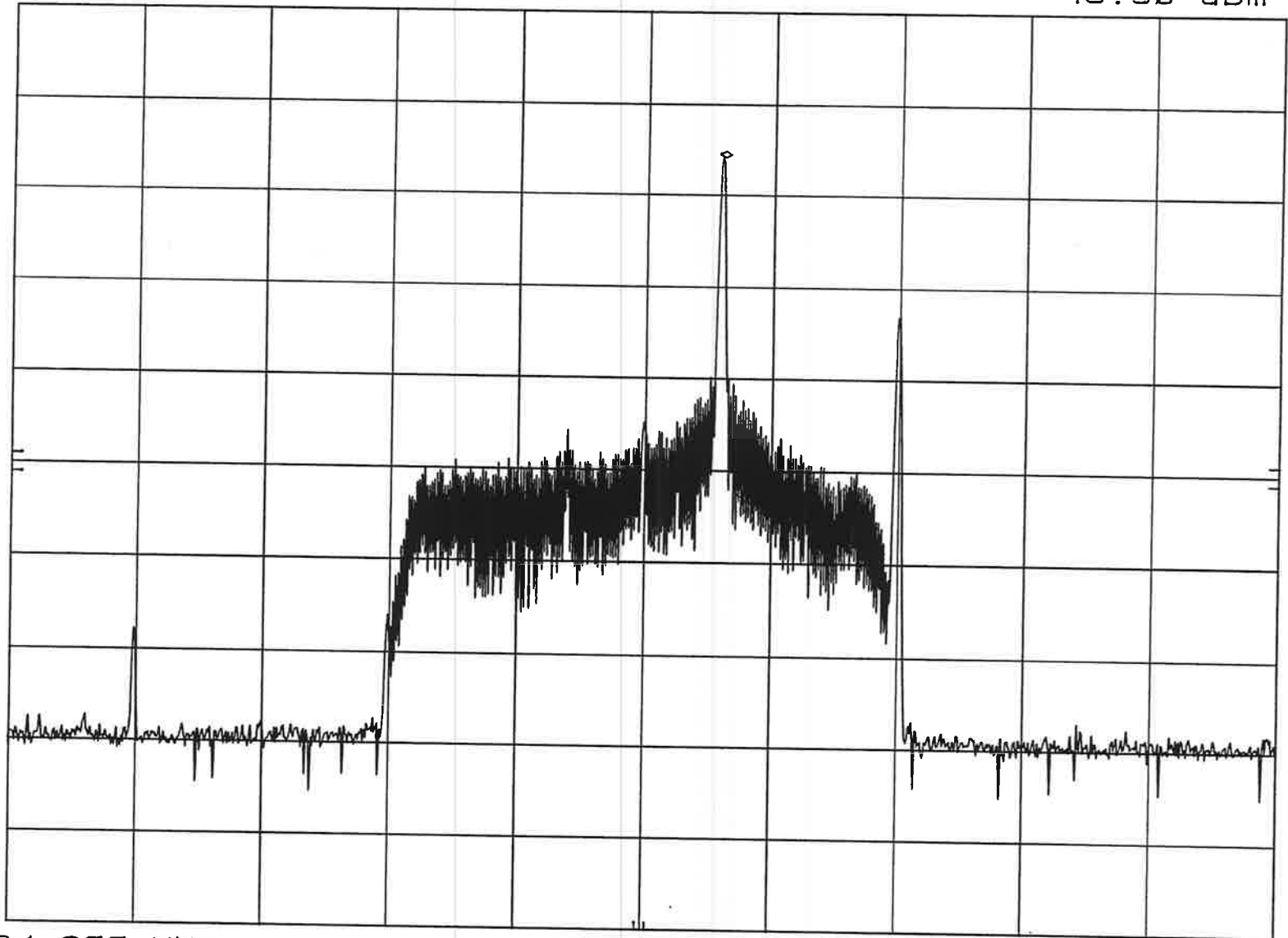
VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

AT&T UPPER 1st ADJACENT 3/7/95 16:48
EIA REF -30.0 dBm ATTEN 10 dB

MKR 94.330 0 MHz
-45.50 dBm

10 dB/



CENTER 94.300 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

APPENDIX AO

Tests F-3, F-6 and G-3 Second-adjacent DAR to Analog

EIA Digital Audio Radio Test Laboratory

Tests F3, F6 and G3

Receiver

Rx No.: #1
Mfg.: DELCO
Model: 16192463
Serial: 1000499

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
4	Digital Audio Tape recording log of the Lower Second Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
7	Digital Audio Tape recording log of the Upper Second Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR wieghting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.
- * In certain cases portions of the second adjacent test can not be performed due to narrow band characteristics of some receivers.

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3		F-3	F-6	G-3	Urban Slow Rayleigh	G-3	Urban Fast Rayleigh
47 dB S/N			Lower Second Adjacent	Lower Second Adjacent		Lower Second Adjacent	
Receiver #1			DAR to Analog	DAR to Analog		DAR to Analog	
Delco				with Multipath		with Multipath	
16192463	Measurements	d/u in dB	EO&C	EO&C		EO&C	
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired 8.43	-24.17					
RX Level -62.00 dBm	Loss 11.75 Attn 22.00						
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.67	-24.14					
RX Level -62.00 dBm	Loss 7.68 Attn 2.00		S/N at d/u 43 dB d/u attn= 1.97 dB				
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.01	-24.05					
RX Level -62.00 dBm	Loss 7.68 Attn 9.75		S/N at d/u 46.6 dB d/u attn= 9.63 dB				
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.11	-24.20					
RX Level -62.00 dBm	Loss 7.68 Attn 9.50		S/N at d/u 46.5 dB d/u attn= 9.53 dB				
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.44	-24.12					
RX Level -62.00 dBm	Loss 7.68 Attn 8.25		S/N at d/u 45.4 dB d/u attn= 8.20 dB				
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.03	-24.28					
RX Level -62.00 dBm	Loss 7.68 Attn 11.50		S/N at d/u 38.6 dB d/u attn= 11.61 dB				
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 1, 1995 Due to the narrow band receiver characteristics d/u at S/N of 45dB not accomplished						DAT Ref.: DAR40130.DAT Best Case S/N = 49 dB	

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #1 Delco 16192463		F-3		Effects with out Digital Modulation			
		Measurements	d/u in dB	d/u in dB @		d/u in dB @	
				Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog Reference	desired	-8.87	NA	NA			
	Loss	40.71					
	undesired	-1.45					
	Loss	11.75					
Desired Signal Level -62.00 dBm	Attn	9.50					
	desired	-8.87	NA	-8.78	-20.93	-8.87	NA
	Loss	40.71		40.71		40.71	
	undesired	-15.60		-15.38		-15.38	
Loss	7.68	7.68			7.68		
RX Level -62.00 dBm	Attn	10.25		5.50		8.25	
	desired	-8.87	NA				
	Loss	40.71					
	undesired	-7.98					
Loss	7.68						
AT&T Amati DSB IBOC	Attn	42.00					
	desired	-8.87	NA				
	Loss	40.71					
	undesired	-8.09					
Loss	7.68						
RX Level -62.00 dBm	Attn	17.00					
	desired	-8.84	NA				
	Loss	40.71					
	undesired	-9.46					
Loss	7.68						
USADR FM1 IBOC	Attn	38.50					
	desired	-8.87	NA				
	Loss	40.71					
	undesired	-6.01					
Loss	7.68						
RX Level -62.00 dBm	Attn	24.75					

Notes: Due to the narrow band receiver characteristics d/u at S/N of 35dB not accomplished

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40130.DAT 3/1/95							LOWER SECOND ADJACENT		
			1				Amati DSB Lower 2nd Adjacent	0	
			2				AT&T Lower 2nd Adjacent	-1	
			3				Amati LSB Lower 2nd Adjacent	0	
			4				USADR FM1 Lower 2nd Adjacent	-0.5	
			5				USADR FM2 Lower 2nd Adjacent	-1.5	
							WITH MULTIPATH (URBAN SLOW)		
			6				Amati LSB Urban Slow with Lower 2nd Adjacent	0	
			7				AT&T Urban Slow with Lower 2nd Adjacent	-2	
			8				Amati DSB Urban Slow with Lower 2nd Adjacent	-1	
			9				USADR FM1 Urban Slow with Lower 2nd Adjacent	-1.5	
			10				USADR FM2 Urban Slow with Lower 2nd Adjacent	-2.5	
							WITH MULTIPATH (URBAN FAST)		
			11				Amati DSB Urban Fast with Lower 2nd Adjacent	0	
			12				AT&T Urban Fast with Lower 2nd Adjacent	-2	
			13				Amati LSB Urban Fast with Lower 2nd Adjacent	0	
			14				USADR FM1 Urban Fast with Lower 2nd Adjacent	-0.5	
			15				USADR FM2 Urban Fast with Lower 2nd Adjacent	-2.5	

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 47 dB S/N Receiver #1 Delco 16192463	Measurements	F-3 d/u in dB	F-6 Upper Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired 8.43	-24.17			
RX Level -62.00 dBm	Loss 11.75 Attn 22.00				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.70	-24.11			
RX Level -62.00 dBm	Loss 7.68 Attn 2.00		S/N at d/u 36.7 dB d/u attn= 1.94 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.00	-24.06			
RX Level -62.00 dBm	Loss 7.68 Attn 9.75		S/N at d/u 46.4 dB d/u attn= 9.64 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.10	-24.21			
RX Level -62.00 dBm	Loss 7.68 Attn 9.50		S/N at d/u 46.4 dB d/u attn= 9.54 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.52	-24.29			
RX Level -62.00 dBm	Loss 7.68 Attn 8.00		S/N at d/u 45.4 dB d/u attn= 8.12 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.10	-24.21			
RX Level -62.00 dBm	Loss 7.68 Attn 11.50		S/N at d/u 37 dB d/u attn= 11.54 dB		
<p>Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 14, 1995 Due to the narrow band receiver characteristics d/u at S/N of 45dB not accomplished</p>					
				DAT Ref.: DAR40150.DAT Best Case S/N = 49 dB	

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #1 Delco I6192463	Measurements	F-3 d/u in dB	Effects with out Digital Modulation			
			Silence	d/u in dB D/N=47dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.87 40.71 -1.45	NA	NA		
Desired Signal Level -62.00 dBm	Loss Attn	11.75 9.50				
AT&T IBAC	desired Loss undesired	-8.87 40.71 -15.60	NA	-8.78 40.71 -15.38	-24.18	-8.87 40.71 -15.38
RX Level -62.00 dBm	Loss Attn	7.68 10.25		7.68 2.25		7.68 8.25
AT&T Amati DSB IBOC	desired Loss undesired	-8.87 40.71 -7.98	NA			
RX Level -62.00 dBm	Loss Attn	7.68 42.00				
AT&T Amati LSB IBOC	desired Loss undesired	-8.87 40.71 -8.09	NA			
RX Level -62.00 dBm	Loss Attn	7.68 17.00				
USADR FM1 IBOC	desired Loss undesired	-8.84 40.71 -9.46	NA			
RX Level -62.00 dBm	Loss Attn	7.68 38.50				
USADR FM2 IBOC	desired Loss undesired	-8.87 40.71 -6.01	NA			
RX Level -62.00 dBm	Loss Attn	7.68 24.75				
Notes: Due to the narrow band receiver characteristics d/u at S/N of 35dB not accomplished						

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40150.DAT 3/14/95							UPPER SECOND ADJACENT		
			1				AT&T Upper 2nd Adjacent	-1.5	
							WITH MULTIPATH (URBAN SLOW)		
			2				AT&T Urban Slow with Upper 2nd Adjacent	-1.5	
							WITH MULTIPATH (URBAN FAST)		
			3				AT&T Urban Fast with Upper 2nd Adjacent	-2	

EIA Digital Audio Radio Test Laboratory

Tests F3, F6 and G3

Receiver

Rx No.: #2
Mfg.: DENON
Model: TU-380RD
Serial: 4056301149

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
4	Digital Audio Tape recording log of the Lower Second Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
7	Digital Audio Tape recording log of the Upper Second Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR wieghting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 45 dB S/N Receiver #2 Denon TU-380RD	Measurements	F-3 d/u in dB	F-6 Lower Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired 8.43	-24.67			
RX Level -62.00 dBm	Loss 11.75 Attn 21.50				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.59	-11.97			
RX Level -62.00 dBm	Loss 7.68 Attn 14.25		S/N at d/u 22.5 dB d/u attn= 1.55 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.02	-16.54			
RX Level -62.00 dBm	Loss 7.68 Attn 17.25		S/N at d/u 20.75 dB d/u attn= 9.12 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.10	-19.71			
RX Level -62.00 dBm	Loss 7.68 Attn 14.00		S/N at d/u 28.6 dB d/u attn= 9.04 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.42	-4.64			
RX Level -62.00 dBm	Loss 7.68 Attn 27.75		S/N at d/u 20.75 dB d/u attn= 7.72 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.00	-4.06			
RX Level -62.00 dBm	Loss 7.68 Attn 31.75		S/N at d/u 24.5 dB d/u attn= 11.14 dB		
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 2, 1995					DAT Ref.: DAR40131.DAT Best Case S/N = 51.5 dB

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #2 Denon TU-380RD	Measurements	F-3 d/u in dB	Effects with out Digital Modulation			
			d/u in dB @ S/N=45dB		d/u in dB @ S/N=35dB	
			Silence	Silence	Silence	Silence
Analog to Analog Reference	desired Loss undesired	-8.87 40.71 -1.45	NA	NA		
Desired Signal Level -62.00 dBm	Loss Attn	11.75 9.50				
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -15.60 7.68 10.25	NA	-8.78 40.71 -15.34 7.68 12.00	-14.47	-8.87 40.71 -15.38 7.68 8.25
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -7.98 7.68 42.00	NA			
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -8.09 7.68 17.00	NA			
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.84 40.71 -9.46 7.68 38.50	NA			
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -6.01 7.68 24.75	NA			
Notes: Due to receiver characteristics d/u at S/N of 35dB not accomplished						

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40131.DAT 3/2/95							LOWER SECOND ADJACENT		
			1				Amati DSB Lower 2nd Adjacent	-2	1
			2				AT&T Lower 2nd Adjacent	-2.5	1
			3				Amati LSB Lower 2nd Adjacent	-0.5	0.5
			4				USADR FM1 Lower 2nd Adjacent	-2	1
			5				USADR FM2 Lower 2nd Adjacent	-1.5	1
							WITH MULTIPATH (URBAN SLOW)		
DISREGARD			6	7					
			8				USADR FM2 Urban Slow with Lower 2nd Adjacent	-3	
			9				USADR FM1 Urban Slow with Lower 2nd Adjacent	-3	
			10				Amati LSB Urban Slow with Lower 2nd Adjacent	-2.5	
			11				AT&T Urban Slow with Lower 2nd Adjacent	-2.5	
			12				Amati DSB Urban Slow with Lower 2nd Adjacent	-2.5	

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 45 dB S/N Receiver #2 Denon TU-380RD		F-3	F-6 Upper Second Adjacent DAR to Analog	G-3 Urban Slow Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C
Measurements		d/u in dB	EO&C		
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired 8.45	-33.18			
RX Level -62.00 dBm	Loss 11.75 Attn 13.00				
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.63	-4.62			
RX Level -62.00 dBm	Loss 7.68 Attn 31.25		S/N at d/u 17 dB d/u attn= 2.69 dB		
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.98	-21.02			
RX Level -62.00 dBm	Loss 7.68 Attn 22.50		S/N at d/u 15 dB d/u attn= 10.34 dB		
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.11	-21.89			
RX Level -62.00 dBm	Loss 7.68 Attn 21.50		S/N at d/u 17.4 dB d/u attn= 10.21 dB		
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.52	-15.98			
RX Level -62.00 dBm	Loss 7.68 Attn 26.00		S/N at d/u 17.5 dB d/u attn= 8.80 dB		
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.07	-5.93			
RX Level -62.00 dBm	Loss 7.68 Attn 39.50		S/N at d/u 18.5 dB d/u attn= 12.25 dB		
<p>Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 14, 1995 2-3 KHz off in Undesired Analog reference center frequency yields 2-3 dB difference in S/N.</p>					
				DAT Ref.: DAR40151.DAT	
				Best Case S/N = 51 dB	

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #2 Denon TU-380RD	Measurements	F-3		Effects with out Digital Modulation			
		d/u in dB	d/u in dB @		d/u in dB @		
			Silence	S/N=45dB	Silence	S/N=35dB	
Analog to Analog Reference	desired Loss undesired	-8.77 40.71 8.45	-36.68				
Desired Signal Level -62.00 dBm	Loss Attn	11.75 9.50					
AT&T IBAC	desired Loss undesired	-8.77 40.71 -15.63	-16.37	-8.77 40.71 -15.32	-5.93	-8.77 40.71 -15.32	-17.93
RX Level -62.00 dBm	Loss Attn	7.68 19.50		7.68 30.25		7.68 18.25	
AT&T Amati DSB IBOC	desired Loss undesired	-8.77 40.71 -7.98	-25.27				
RX Level -62.00 dBm	Loss Attn	7.68 18.25					
AT&T Amati LSB IBOC	desired Loss undesired	-8.77 40.71 -8.11	-26.14				
RX Level -62.00 dBm	Loss Attn	7.68 17.25					
USADR FM1 IBOC	desired Loss undesired	-8.77 40.71 -9.52	-24.73				
RX Level -62.00 dBm	Loss Attn	7.68 17.25					
USADR FM2 IBOC	desired Loss undesired	-8.77 40.71 -6.07	-16.68				
RX Level -62.00 dBm	Loss Attn	7.68 28.75					
Notes:							

EIA Digital Audio Radio Test Laboratory

Tests F3, F6 and G3

Receiver

Rx No.: #3
Mfg.: PANASONIC
Model: RX-FS430
Serial: GR3J01184

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
4	Digital Audio Tape recording log of the Lower Second Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
7	Digital Audio Tape recording log of the Upper Second Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR wieghting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 45 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-3 d/u in dB	F-6 Lower Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired 8.42	-22.41			
RX Level -62.00 dBm	Loss 11.75 Attn 23.75				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.62	-12.94			
RX Level -62.00 dBm	Loss 7.68 Attn 13.25		S/N at d/u 30 dB d/u attn= 3.78 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.00	-14.81			
RX Level -62.00 dBm	Loss 7.68 Attn 19.00		S/N at d/u 36.2 dB d/u attn= 11.40 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.11	-20.45			
RX Level -62.00 dBm	Loss 7.68 Attn 13.25		S/N at d/u 42.8 dB d/u attn= 11.29 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.42	-4.39			
RX Level -62.00 dBm	Loss 7.68 Attn 28.00		S/N at d/u 28 dB d/u attn= 9.98 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.00	-5.81			
RX Level -62.00 dBm	Loss 7.68 Attn 30.00		S/N at d/u 29.2 dB d/u attn= 13.40 dB		
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 3, 1995				DAT Ref.: DAR40132.DAT Best Case S/N = 51 dB

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-3 d/u in dB	Effects with out Digital Modulation			
			Silence	d/u in dB @ S/N=45dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.78 40.71 8.42	-26.16	NA		
Desired Signal Level -62.00 dBm	Loss Attn	11.75 20.00				
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -15.62 7.68 4.75	-21.44	-8.78 40.71 -15.34 7.68 10.50	-15.97	-8.78 40.71 -15.34 7.68 4.25
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.00 7.68 11.25	-22.56	No Difference		
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.11 7.68 8.50	-25.20	No Difference		
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -9.42 7.68 16.75	-15.64	No Difference		
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -5.98 7.68 19.00	-16.83	No Difference		
Notes:						

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 45 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-3 d/u in dB	F-6 Upper Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired -11.39 Loss 11.75 Attn 28.50	2.16			
RX Level -62.00 dBm					
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.57 Loss 7.68 Attn 26.50	0.27			
RX Level -62.00 dBm			S/N at d/u 46.4 dB d/u attn= 28.39 dB		
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -7.97 Loss 7.68 Attn 39.00	5.17			
RX Level -62.00 dBm			S/N at d/u 42.4 dB d/u attn= 35.99 dB		
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.04 Loss 7.68 Attn 39.00	5.24			
RX Level -62.00 dBm			S/N at d/u 42.6 dB d/u attn= 35.92 dB		
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.48 Loss 7.68 Attn 41.00	8.68			
RX Level -62.00 dBm			S/N at d/u 39.5 dB d/u attn= 34.48 dB		
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.09 Loss 7.68 Attn 38.75	3.04			
RX Level -62.00 dBm			S/N at d/u 44.2 dB d/u attn= 37.87 dB		
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 15, 1995				DAT Ref.: DAR40152.DAT Best Case S/N = 51 dB

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #3 Panasonic RX-FS430	Measurements	F-3		Effects with out Digital Modulation			
		d/u in dB		d/u in dB @ Silence S/N=45dB		d/u in dB @ Silence S/N=35dB	
Analog to Analog Reference	desired Loss undesired	-8.77 40.71 -11.39	-9.09	NA			
Desired Signal Level -62.00 dBm	Loss Attn	11.75 17.25					
AT&T IBAC	desired Loss undesired	-8.77 40.71 -15.57	-11.23	-8.77 40.71 -15.29	-4.51	-8.77 40.71 -15.29	-15.76
RX Level -62.00 dBm	Loss Attn	7.68 15.00		7.68 22.00		7.68 10.75	
AT&T Amati DSB IBOC	desired Loss undesired	-8.77 40.71 -7.97	-4.83	No Difference			
RX Level -62.00 dBm	Loss Attn	7.68 29.00					
AT&T Amati LSB IBOC	desired Loss undesired	-8.77 40.71 -8.04	-6.01	No Difference			
RX Level -62.00 dBm	Loss Attn	7.68 27.75					
USADR FM1 IBOC	desired Loss undesired	-8.77 40.71 -9.48	-2.57	No Difference			
RX Level -62.00 dBm	Loss Attn	7.68 29.75					
USADR FM2 IBOC	desired Loss undesired	-8.77 40.71 -6.09	-7.96	No Difference			
RX Level -62.00 dBm	Loss Attn	7.68 27.75					
Notes:							

EIA Digital Audio Radio Test Laboratory

Tests F3, F6 and G3

Receiver

Rx No.: #4

Mfg.: PIONEER

Model: SX-201

Serial: OA3965843C

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
4	Digital Audio Tape recording log of the Lower Second Adjacent results
5	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
6	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
7	Digital Audio Tape recording log of the Upper Second Adjacent results

Notes:

- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

*d/u req'd to
out 45 dB S/N*

Test F-3, F-6 and G-3 45 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-3 d/u in dB	F-6 Lower Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired 8.42	-15.16			
RX Level -62.00 dBm	Loss 11.75 Attn 31.00				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.62	-10.19			
RX Level -62.00 dBm	Loss 7.68 Attn 16.00		S/N at d/u 40.8 dB d/u attn= 11.03 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.01	1.95			
RX Level -62.00 dBm	Loss 7.68 Attn 35.75		S/N at d/u 29 dB d/u attn= 18.64 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.09	-14.72			
RX Level -62.00 dBm	Loss 7.68 Attn 19.00		S/N at d/u 44.5 dB d/u attn= 18.56 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.42	9.86			
RX Level -62.00 dBm	Loss 7.68 Attn 42.25		S/N at d/u 18.6 dB d/u attn= 17.23 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.00	-2.06			
RX Level -62.00 dBm	Loss 7.68 Attn 33.75		S/N at d/u 33 dB d/u attn= 20.65 dB		
Notes:	Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 3, 1995			DAT Ref.: DAR40133.DAT Best Case S/N = 51 dB	

EIA Digital Audio Radio Test Laboratory

Test F-3 45 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-3		Effects with out Digital Modulation			
		d/u in dB		d/u in dB @		d/u in dB @	
				Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.78 40.71 8.42	-25.66		NA		
Desired Signal Level -62.00 dBm	Loss Attn	11.75 20.50					
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -15.62 7.68 4.75	-21.44	-8.78 40.71 -15.33 7.68 12.75	-13.73	-8.78 40.71 -15.33 7.68 2.00	-24.48
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.01 7.68 24.75	-9.05	No Difference			
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.09 7.68 9.00	-24.72	No Difference			
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -9.42 7.68 33.75	1.36	No Difference			
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -6.00 7.68 22.75	-13.06	No Difference			
Notes:							

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 45 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-3 d/u in dB	F-6 Upper Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.76 Loss 40.71 undesired 8.45	-14.92			
RX Level -62.00 dBm	Loss 11.75 Attn 31.25				
AT&T IBAC	desired -8.76 Loss 40.71 undesired -15.65	-4.64			
RX Level -62.00 dBm	Loss 7.68 Attn 21.50		S/N at d/u 36.2 dB d/u attn= 11.22 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -7.98	-8.83			
RX Level -62.00 dBm	Loss 7.68 Attn 25.00		S/N at d/u 39.8 dB d/u attn= 18.91 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.09	-8.47			
RX Level -62.00 dBm	Loss 7.68 Attn 25.25		S/N at d/u 39.5 dB d/u attn= 18.80 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.47	-1.09			
RX Level -62.00 dBm	Loss 7.68 Attn 31.25		S/N at d/u 32.3 dB d/u attn= 17.42 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.08	-3.48			
RX Level -62.00 dBm	Loss 7.68 Attn 32.25		S/N at d/u 34.4 dB d/u attn= 20.81 dB		
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Tests conducted March 14, 1995					DAT Ref.: DAR40153.DAT Best Case S/N = 51 dB

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #4 Pioneer SX-201	Measurements	F-3		Effects with out Digital Modulation			
		d/u in dB		d/u in dB @ Silence S/N=45dB		d/u in dB @ Silence S/N=35dB	
Analog to Analog Reference	desired Loss undesired	-8.76 40.71 8.45	-25.67	NA			
Desired Signal Level -62.00 dBm	Loss Attn	11.75 20.50					
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.76 40.71 -15.65 7.68 10.00	-16.14	-8.76 40.71 -15.36 7.68 20.25	-6.18	-8.76 40.71 -15.36 7.68 8.75	-17.68
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -7.98 7.68 14.00		-19.83	No Difference		
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.09 7.68 14.00	-19.72		No Difference		
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -9.47 7.68 20.25		-12.09	No Difference		
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -6.08 7.68 21.25	-14.48		No Difference		
Notes:							

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs				Description	Grade	
	Start	Stop						1	2
DAR40153.DAT							UPPER SECOND ADJACENT		
3/14/95									
			1				Amati LSB		
			2				AT&T	-1	0.5
			3				Amati DSB	-1.5	-0.5
			4				USADR FM1	-1	0.5
			5				USADR FM2	-1	0.5
								-1	0
							WITH MULTIPATH (URBAN SLOW)		
			6				FM2		
			7				FM1	-1.5	
			8				AMATI DSB	-2	
			9				AT&T	-1	
			10				AMATI LSB	-2	
								-1	

EIA Digital Audio Radio Test Laboratory

Tests F3, F6 and G3

Receiver

Rx No.: #5

Mfg.: FORD

Model: F4XF-19B132-CB

Serial: 281150B010

Index

Page	Description
1	Cover sheet
2	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
3	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the lower second adjacent frequency
4	DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency
5	DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency

Notes:

- * **Due to narrow-band receiver characteristics, unable to get 45dB S/N ratio with interference. Results are at a 49dB S/N ratio w/interference as a demonstration only**
- * Clipped pink noise used as the modulation signal for the analog channel of the Proponent signal (except AT&T)
- * ABBA used for main channel modulation on the desired analog channel
- * SCA group B included on both desired and undesired (proponent) signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Receiver audio routed through a 15KHz low pass filter
- * Audio measurements made using quasi-peak detection and a CCIR wieghting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.
- * In certain cases portions of the second adjacent test can not be performed due to narrow band characteristics of some receivers.

EIA Digital Audio Radio Test Laboratory

Test F-3, F-6 and G-3 49 dB S/N Receiver #5 Ford F4XF-19B132-CB	CAUTION Measurements	F-3 d/u in dB	F-6 Lower Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Lower Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.78 Loss 40.71 undesired 8.42	-43.16			
RX Level -62.00 dBm	Loss 11.75 Attn 3.00				
AT&T IBAC	desired -8.78 Loss 40.71 undesired -15.62	-26.19			
RX Level -62.00 dBm	Loss 7.68 Attn 0.00		S/N at d/u 30 dB d/u attn= -16.97 dB		
AT&T Amati DSB IBOC	desired -8.78 Loss 40.71 undesired -8.00	-33.81			
RX Level -62.00 dBm	Loss 7.68 Attn 0.00		S/N at d/u 36.2 dB d/u attn= -9.35 dB		
AT&T Amati LSB IBOC	desired -8.78 Loss 40.71 undesired -8.11	-33.70			
RX Level -62.00 dBm	Loss 7.68 Attn 0.00		S/N at d/u 42.8 dB d/u attn= -9.46 dB		
USADR FM1 IBOC	desired -8.78 Loss 40.71 undesired -9.42	-32.39			
RX Level -62.00 dBm	Loss 7.68 Attn 0.00		S/N at d/u 28 dB d/u attn= -10.77 dB		
USADR FM2 IBOC	desired -8.78 Loss 40.71 undesired -6.00	-35.81			
RX Level -62.00 dBm	Loss 7.68 Attn 0.00		S/N at d/u 29.2 dB d/u attn= -7.35 dB		
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Due to narrow-band receiver characteristics, unable to get 45dB S/N ratio with interference. Results are at a 49dB S/N ratio w/interference as a demonstration only. Tests conducted March 3, 1995					DAT Ref.: None Best Case S/N = 51.75 dB

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #5 Ford F4XF-19B132-CB	Measurements	F-3 d/u in dB	Effects with out Digital Modulation			
			Silence	d/u in dB @ S/N=45dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.78 40.71 8.42	NA		NA	
Desired Signal Level -62.00 dBm	Loss Attn	11.75				
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -15.62 7.68	NA	-8.78 40.71 -15.34 7.68	NA	-8.78 40.71 -15.34 7.68
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.00 7.68	NA			
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -8.11 7.68	NA			
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -9.42 7.68	NA			
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.78 40.71 -5.98 7.68	NA			
Notes: Could not achieve target S/N on second adj. test						

EIA Digital Audio Radio Test Laboratory

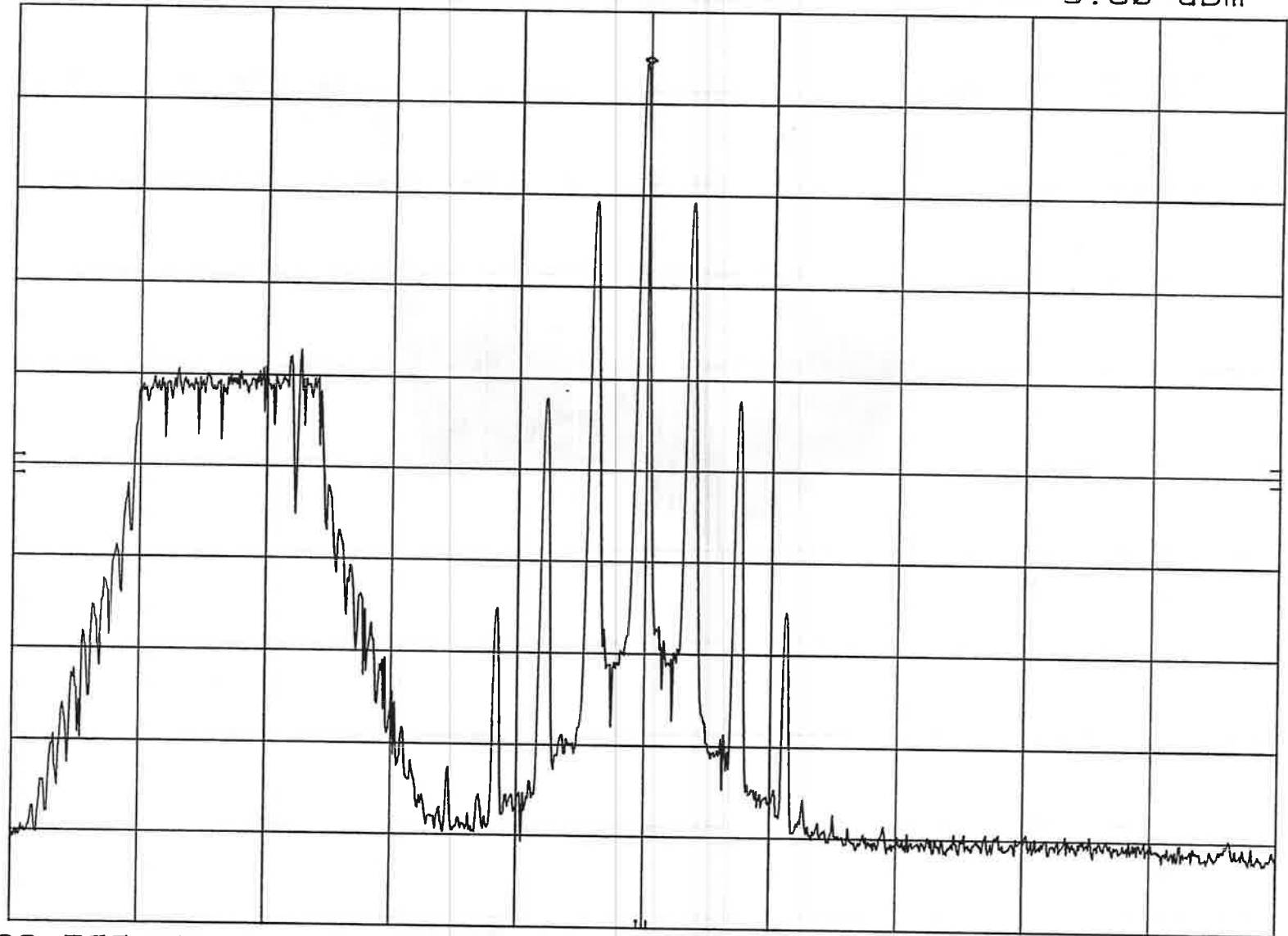
Test F-3, F-6 and G-3 48 dB S/N Receiver #5 Ford F4XF-19B132-CB	CAUTION Measurements	F-3 d/u in dB	F-6 Upper Second Adjacent DAR to Analog EO&C	G-3 Urban Slow Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C	G-3 Urban Fast Rayleigh Upper Second Adjacent DAR to Analog with Multipath EO&C
Analog to Analog Reference	desired -8.77 Loss 40.71 undesired 8.45	-46.18			
RX Level -62.00 dBm	Loss 11.75 Attm 0.00				
AT&T IBAC	desired -8.77 Loss 40.71 undesired -15.63	-8.17			
RX Level -62.00 dBm	Loss 7.68 Attm 18.00				
AT&T Amati DSB IBOC	desired -8.77 Loss 40.71 undesired -8.00	-26.05			
RX Level -62.00 dBm	Loss 7.68 Attm 7.75				
AT&T Amati LSB IBOC	desired -8.77 Loss 40.71 undesired -8.12	-25.93			
RX Level -62.00 dBm	Loss 7.68 Attm 7.75				
USADR FM1 IBOC	desired -8.77 Loss 40.71 undesired -9.51	-20.79			
RX Level -62.00 dBm	Loss 7.68 Attm 11.50				
USADR FM2 IBOC	desired -8.77 Loss 40.71 undesired -6.09	-9.71			
RX Level -62.00 dBm	Loss 7.68 Attm 26.00				
Notes: Subcarrier Group B on interferers and desired analog Clipped Pink Noise on interferers Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB Could not achieve target S/N on second adj. test Tests conducted March 14, 1995					DAT Ref.: None Best Case S/N = 51.75 dB

EIA Digital Audio Radio Test Laboratory

Test F-3 35 dB S/N Receiver #5 Ford F4XF-19B132-CB	Measurements	F-3 d/u in dB	Effects with out Digital Modulation			
			Silence	d/u in dB D/N=47dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog Reference	desired Loss undesired	-8.87 40.71 -1.45	NA	NA		
Desired Signal Level -62.00 dBm	Loss Attn	11.75				
AT&T IBAC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -15.60 7.68	NA	-8.78 40.71 -15.38 7.68 2.25	NA 40.71 -15.38 7.68 8.25	NA
AT&T Amati DSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -7.98 7.68	NA			
AT&T Amati LSB IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -8.09 7.68	NA			
USADR FM1 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.84 40.71 -9.46 7.68	NA			
USADR FM2 IBOC RX Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -6.01 7.68	NA			
Notes: Could not achieve target S/N on second adj. test						

AT&T AMATI LSB LOWER 2ND ADJACENT 3/1/95 10K8093.699 5 MHz
EIA REF 15.0 dBm ATTEN 30 dB 9.80 dBm

10 dB/



CENTER 93.700 MHz SPAN 500 kHz
RES BW 1 kHz VBW 30 Hz SWP 50.0 sec

AT&T LOWER 2nd ADJACENT 3/1/95 10:25

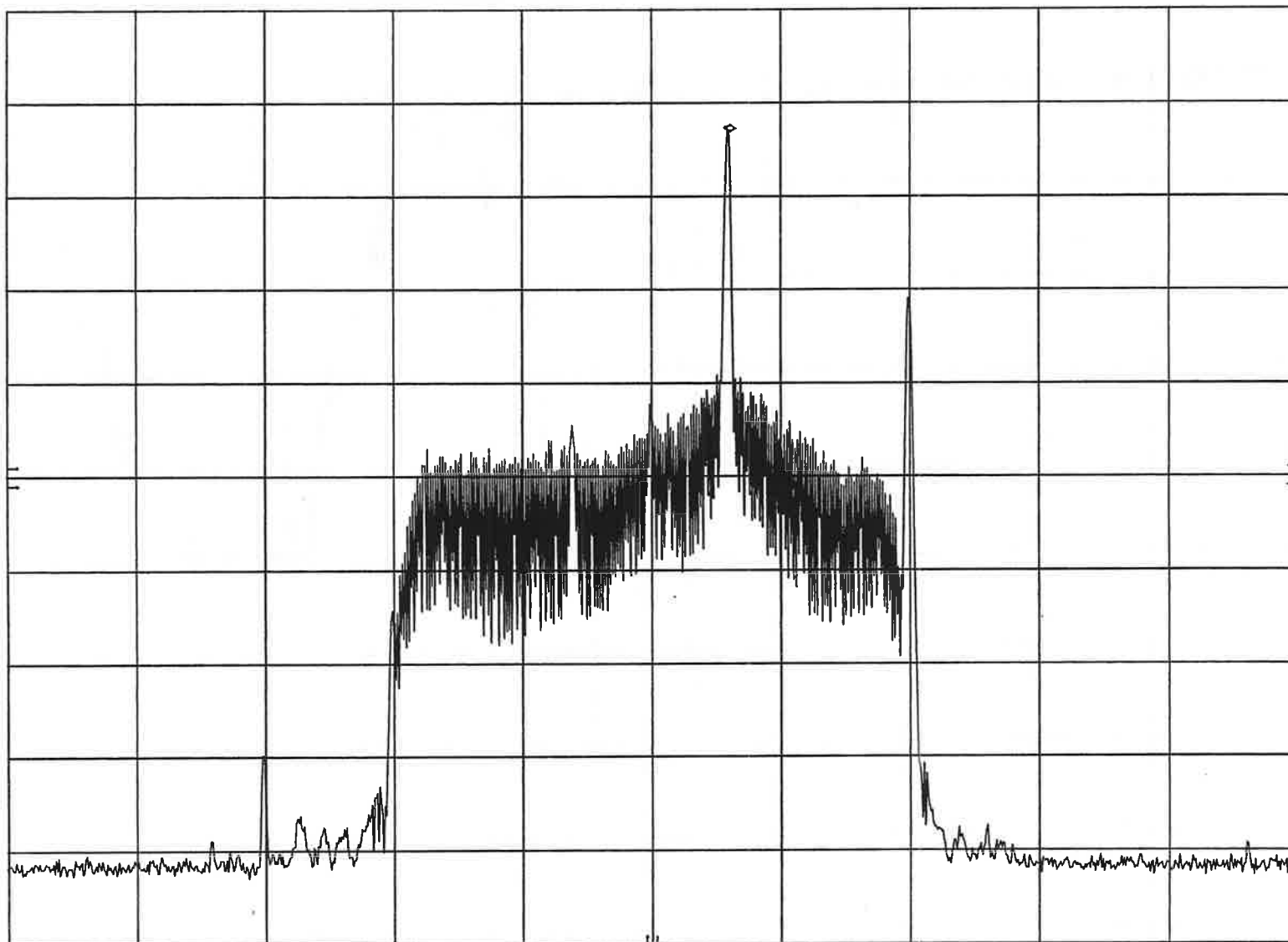
MKR 93.730 0 MHz

EIA REF 15.0 dBm

ATTEN 30 dB

2.20 dBm

10 dB/



CENTER 93.700 MHz

RES BW 1 kHz

VBW 30 Hz

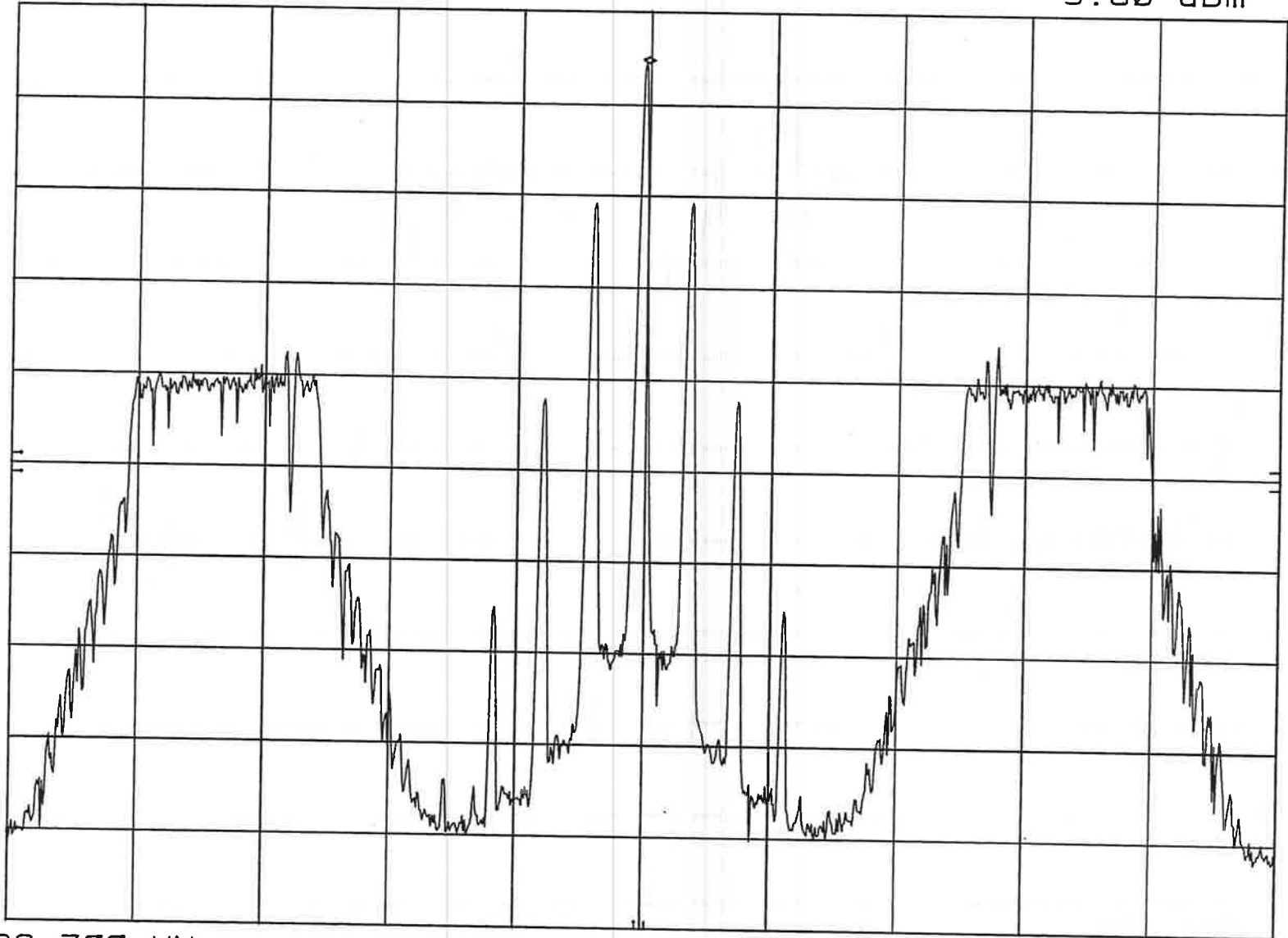
SPAN 500 kHz

SWP 50.0 sec

AT&T AMATI DSB 3/1/95 10:15
EIA REF 15.0 dBm ATTEN 30 dB

MKR 93.699 0 MHz
9.80 dBm

10 dB/



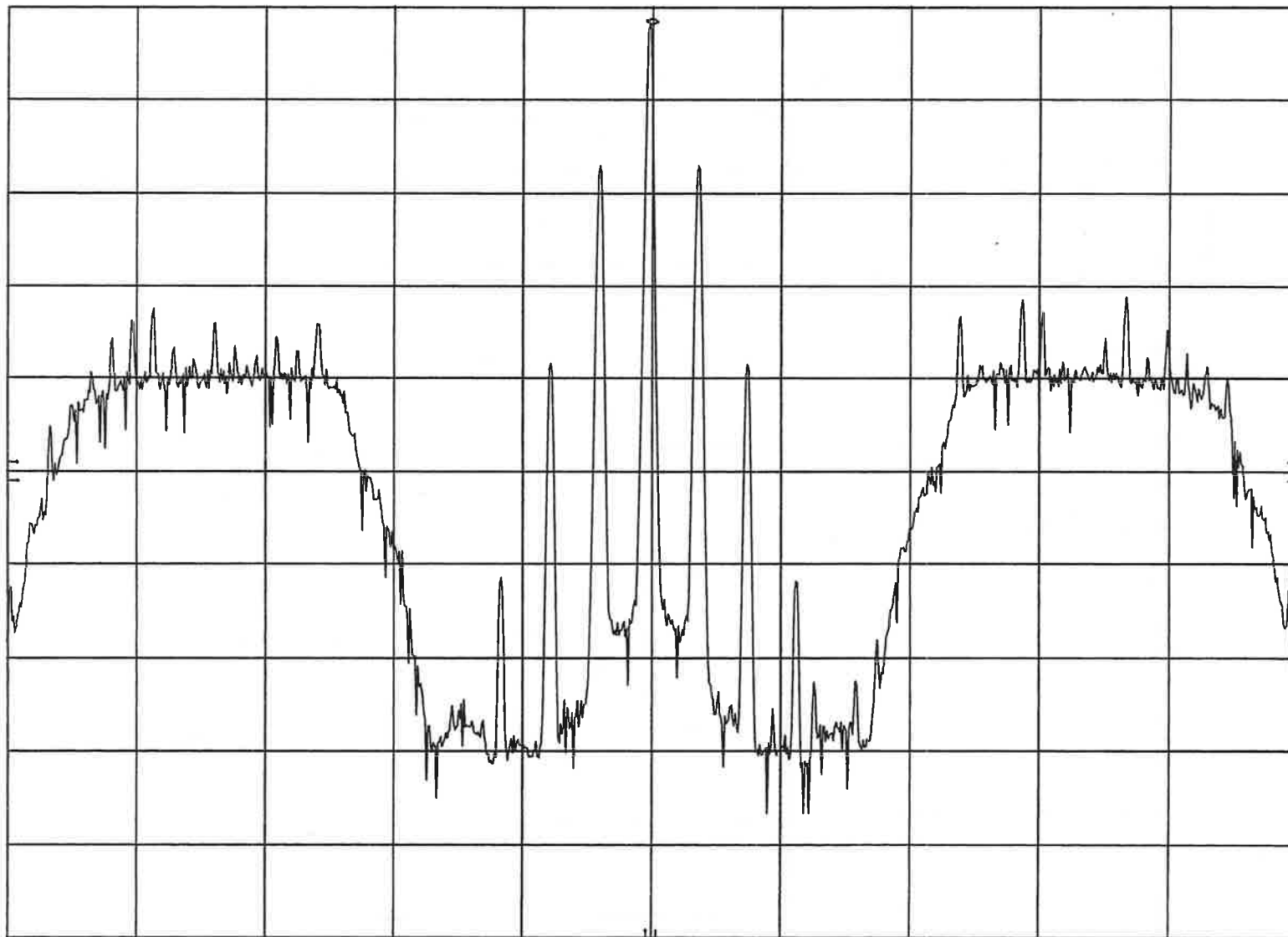
CENTER 93.700 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

USADR FM1 LOWER 2nd ADJACENT 3/1/95 10:04 MKR 93.699 5 MHz
EIA REF 10.0 dBm ATTEN 20 dB 8.50 dBm

10 dB/



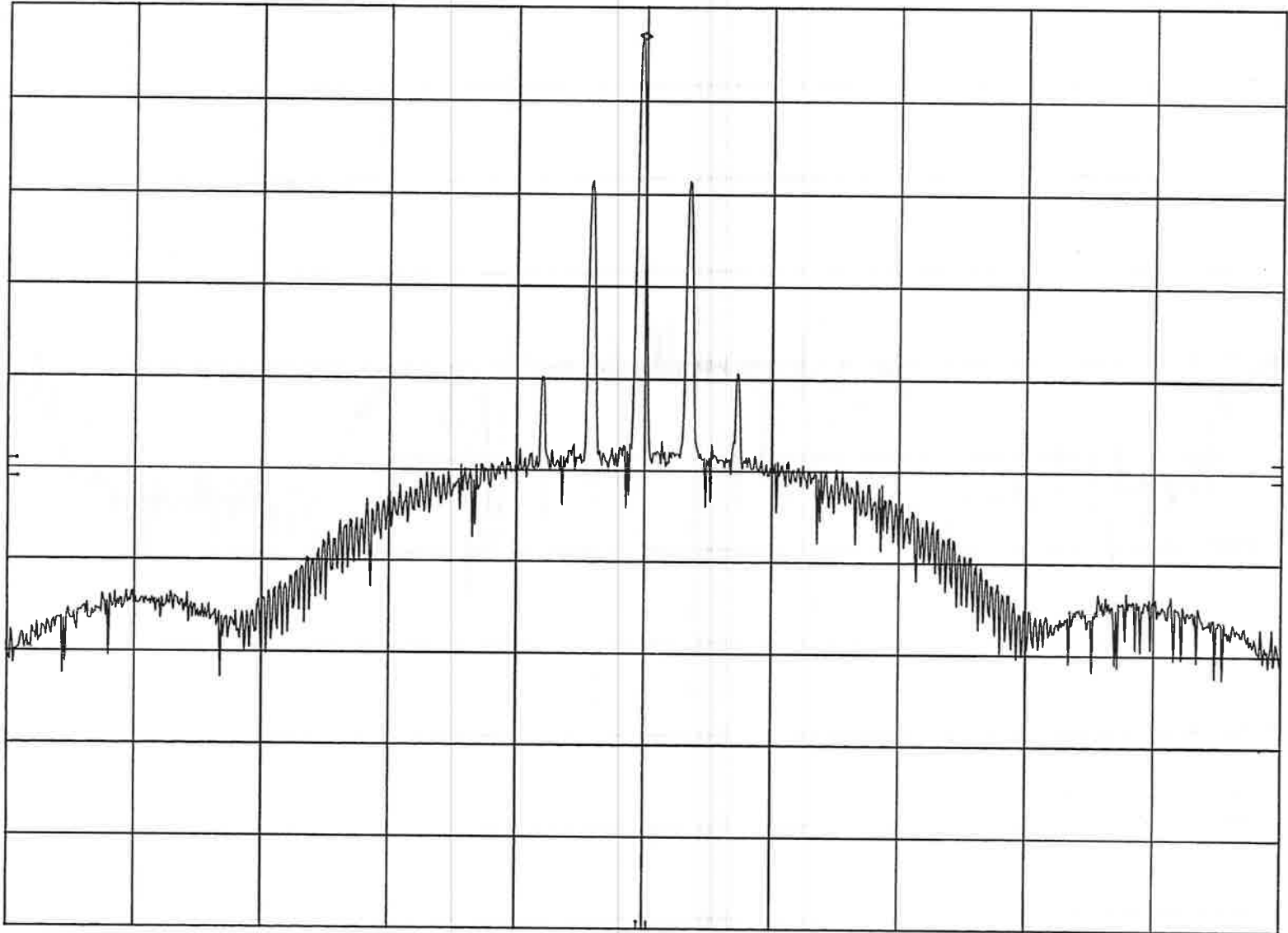
CENTER 93.700 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

USADR FM2 LOWER 2nd ADJACENT 3/1/95 10:21 MKR 93.699 0 MHz
EIA REF 15.0 dBm ATTEN 30 dB 12.00 dBm

10 dB/



CENTER 93.700 MHz

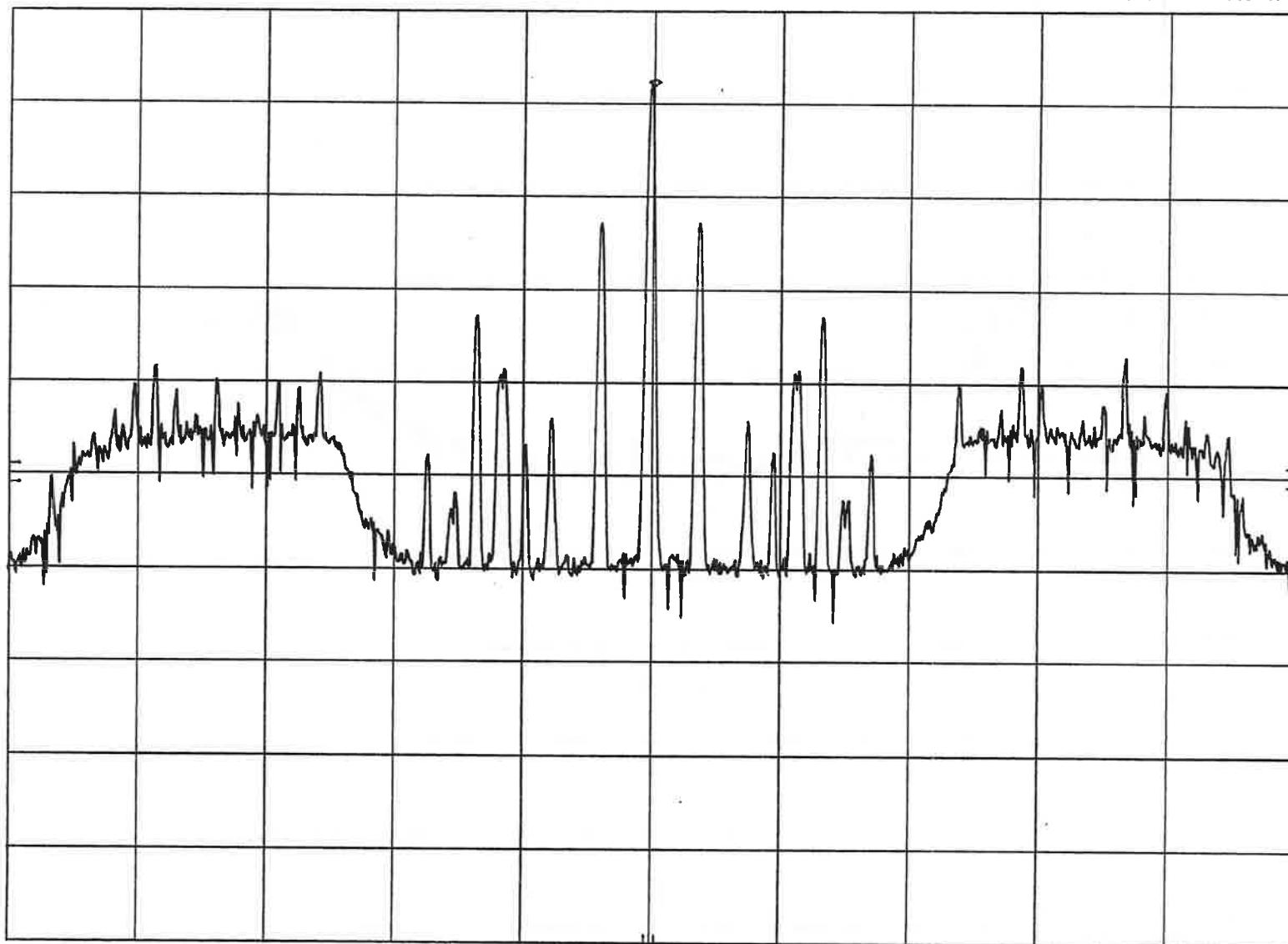
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

USADR FM1 UPPER 2nd ADJACENT 3\13\95 16:32MKR 94.500 0 MHz
EIA REF -50.0 dBm ATTEN 10 dB -57.70 dBm

10 dB/



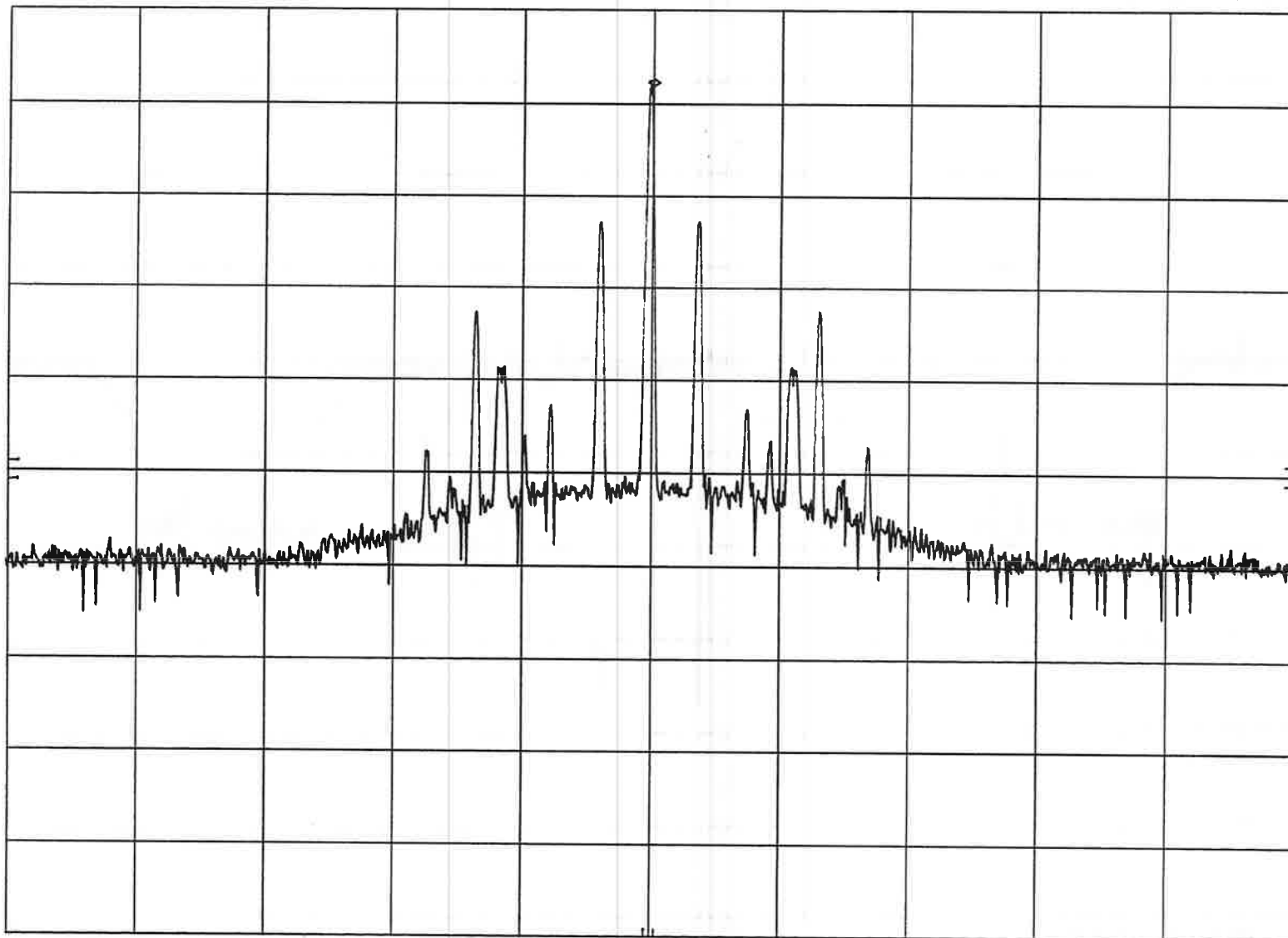
CENTER 94.500 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

USADR FM2 UPPER 2nd ADJACENT 3\13\95 16:53MKR 94.500 0 MHz
EIA REF -50.0 dBm ATTEN 10 dB -57.70 dBm

10 dB/



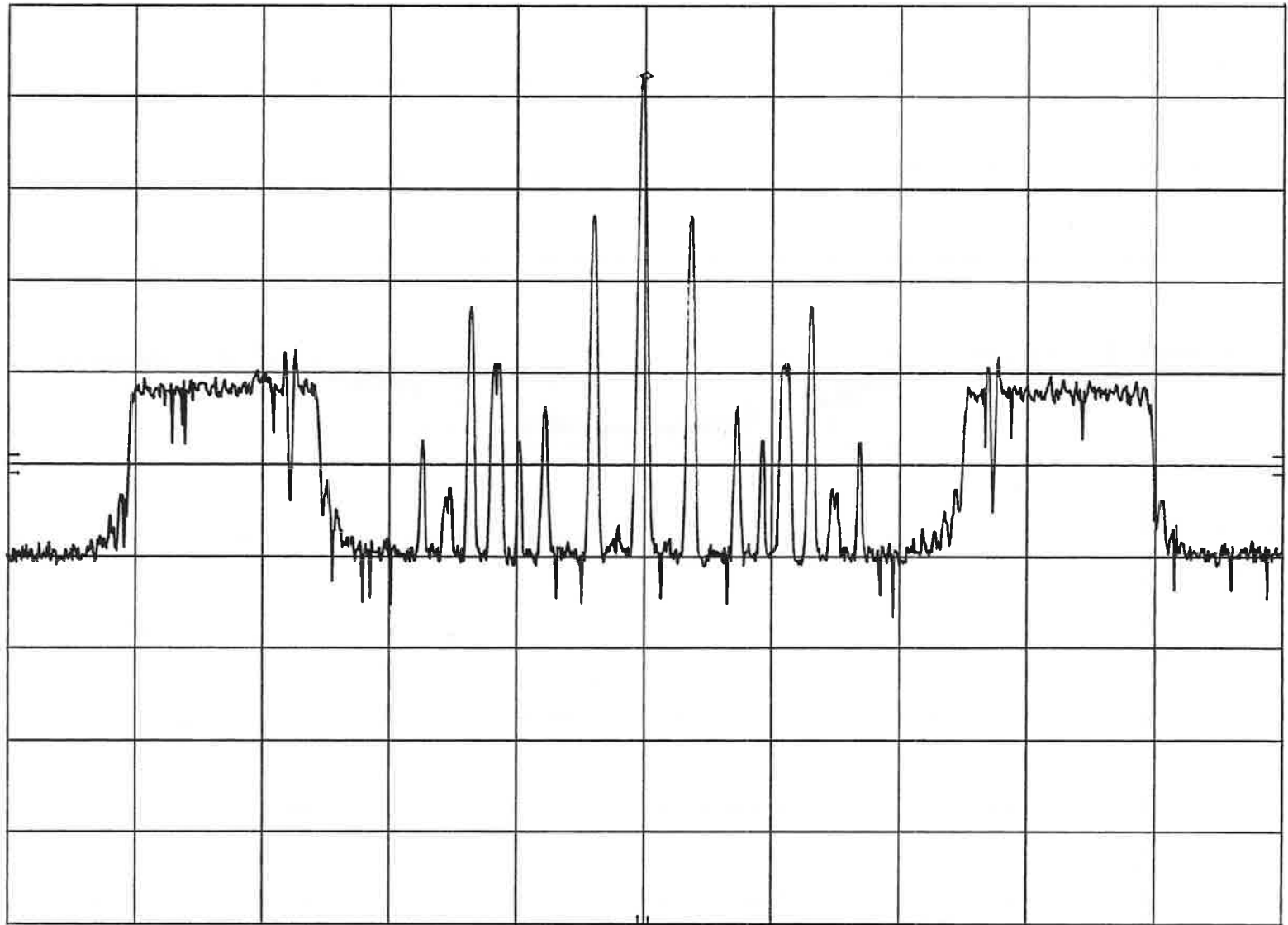
CENTER 94.500 MHz
RES BW 1 KHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

AT&T AMATI DSB UPPER 2nd ADJACENT 3\13\95 MR494.500 0 MHz
EIA REF -50.0 dBm ATTEN 10 dB -57.70 dBm

10 dB/



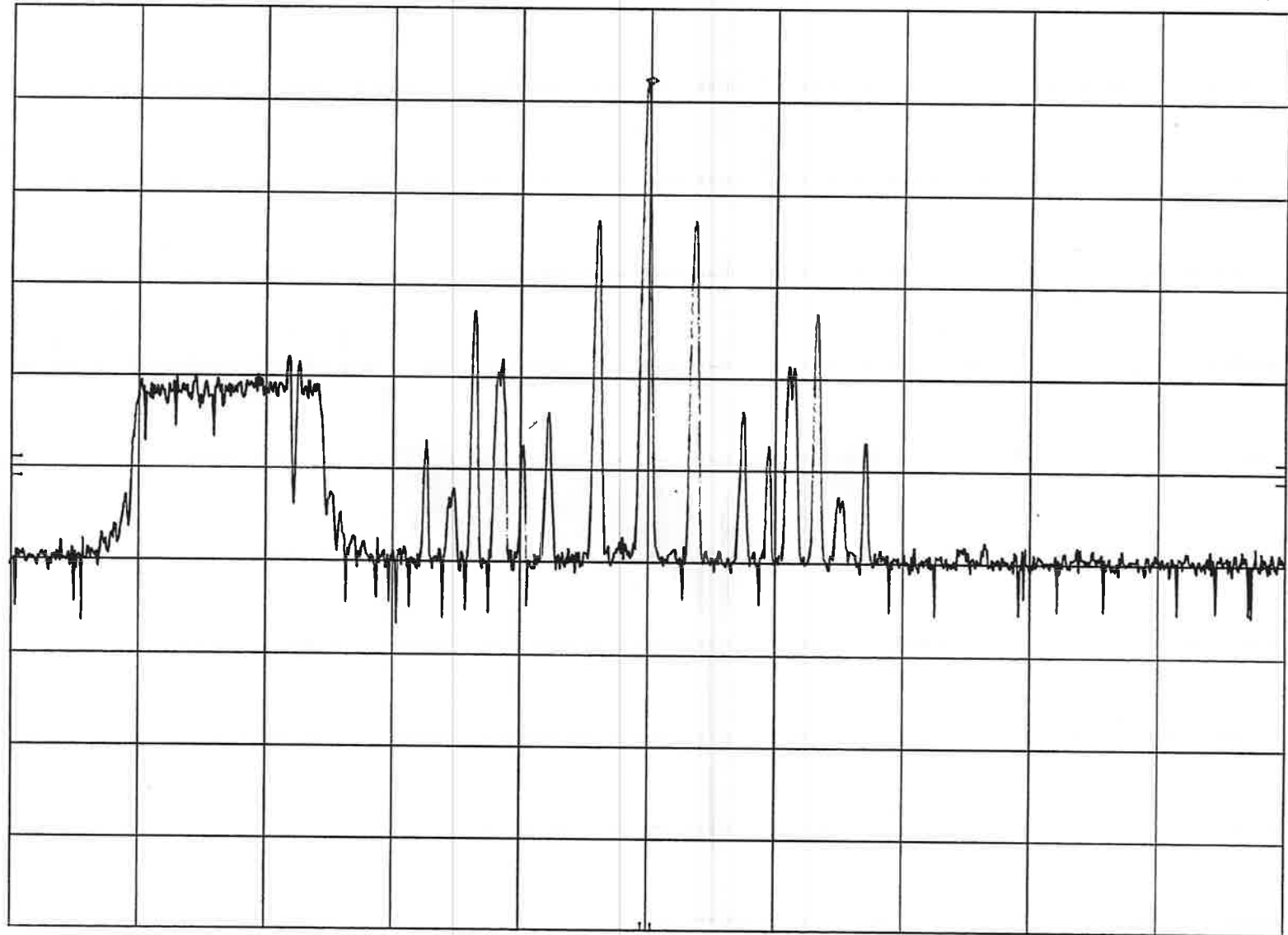
CENTER 94.500 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

AT&T AMATI LSB UPPER 2nd ADJACENT 3\13\95 MBR504.500 0 MHz
EIA REF -50.0 dBm ATTEN 10 dB -57.70 dBm

10 dB/

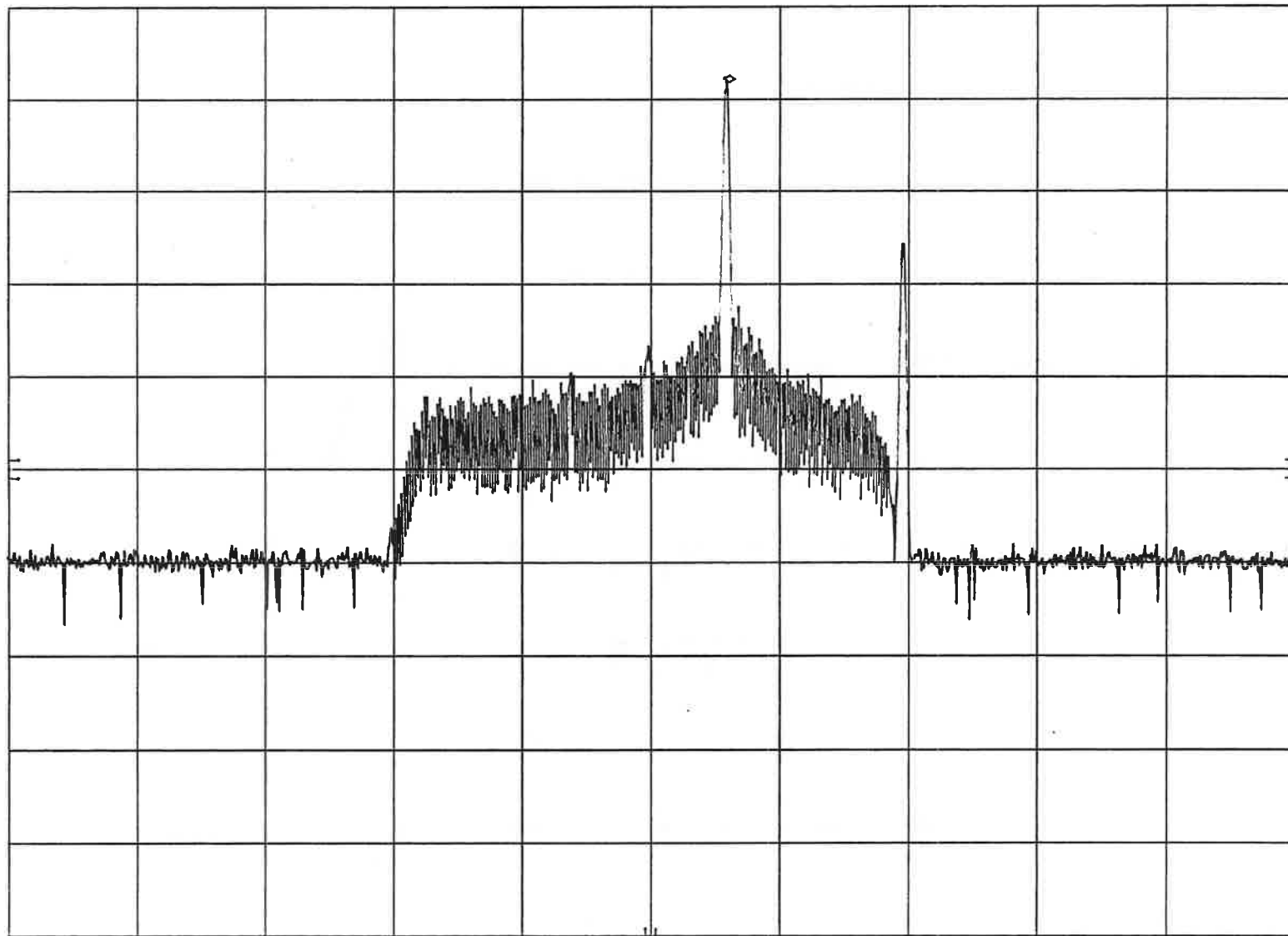


CENTER 94.500 MHz
RES BW 1 kHz
VBW 30 Hz
SPAN 500 kHz
SWP 50.0 sec

AT&T UPPER 2nd ADJACENT 3\13\95 17:05
EIA REF -50.0 dBm ATTEN 10 dB

MKR 94.530 0 MHz
-57.80 dBm

10 dB/



CENTER 94.500 MHz
RES BW 1 kHz

VBW 30 Hz

SPAN 500 kHz
SWP 50.0 sec

APPENDIX AP

Tests H and I Analog to DAR

EIA Digital Audio Radio Test Laboratory

Tests H & I, Sections 1-5

Proponent: USADR FM1

Index

Page

Description

1	Cover sheet
2	Analog -> DAR interference tests H and I (with multipath) including: 1) Co-Channel 2) Lower first adjacent or upper first adjacent tests 3) Simultaneous lower and upper first adjacent tests 4) Lower second adjacent or upper second adjacent tests 5) Simultaneous lower and upper second adjacent tests
3	Digital Audio Tape recording log of H & I tests where applicable

D/u at T0A Lab PoF Lab

Notes:

- * Clipped pink noise used as the modulation signal on the analog interfering signal
- * ABBA used as modulation on the IBOC host analog channel (100% mod. lev.)
- * When required, SCA groups A or B included on undesired signal. Only group A used in test I (Multipath)
- * Total modulation on analog channels: 100% without SCA's, 110% with SCA's (SCA group level at 20%)
- * In the H series only, additional paths in the multipath simulator were turned on to provide a higher undesired signal level when required. The simulator paths were used for gain only, no multipath events were running.
- * "2P" indicates 2 paths for a 6dB increase. "3P" indicates 3 paths for a 9 dB increase in undesired signal.
- * Multipath setup includes nine paths for the desired signal and three paths for the undesired signal
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

100%

EIA Digital Audio Radio Test Laboratory

infer from is stronger than desired

H and I Series		H Series Tests							I Series Tests					
USADR FM1	D IL	-7.47 40.77	SCAs					Co, 1st and 2nd->DAR EO&C	Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh		Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh	
			None	Group A		Group B					Attn	D/U	Attn	D/U
			D/U	Attn	D/U	Attn	D/U							
1	Co-Channel Boonton	U	-7.77								Medium	47.00	17.80	Medium
		IL	11.27								TOA occurs with no added noise	34.00	4.80	Weak
		TOA Attn	17.75	-11.45	26.75	-2.45	26.50	-2.70			Weak			Weak
		POF Attn	11.00	-18.20	21.25	-7.95	22.50	-6.70			TOA occurs with no added noise			TOA occurs with no added noise
2	Lower 1st Adj Boonton	U	-7.77								Medium			Medium
		IL	11.27								TOA occurs with no added noise	49.00	49.80	
		TOA Attn	24.25	25.05	23.75	24.55	23.75	24.55	No Change with SCAs			34.00	34.80	
		POF Attn	19.00	19.80	19.50	20.30	19.50	20.30	30 dB pad in interfering path					
2	Upper 1st Adj Boonton	U	-7.74								Medium			Medium
		IL	11.27								NA			NA
		TOA Attn	24.00	24.77										
		POF Attn	18.50	19.27										
3	Lower+Upper 1st Adj	U									Medium			Medium
		IL									NA			NA
		TOA Attn							NA					
		POF Attn												
4	Lower 2nd Adj Harris	U	-7.74								Medium			Medium
		IL	11.27	2P		2P		2P			TOA occurs with no added noise	30.00	0.77	
		TOA Attn	4.25	-30.98	8.75	-26.48	6.50	-28.73	<i>added 2 paths to undesired signal to achieve TOA, RF</i>			10.00	-19.23	
		POF Attn	1.75	-33.48	4.00	-31.23	3.00	-32.23						
4	Upper 2nd Adj Boonton	U	-7.74								Medium			Medium
		IL	11.27	3P							NA			NA
		TOA Attn	5.75	-32.48					<i>added 2 paths</i>					
		POF Attn	0.00	-38.23										
5	Lower+Upper 2nd Adj	U	-7.83								Medium			Medium
		IL	11.27								TOA occurs with no added noise	32.00	2.86	
		TOA Attn	19.25	-15.90	19.50	-15.65	19.50	-15.65	Hook Occurs			20.00	-9.15	
		POF Attn	15.00	-20.15	15.00	-20.15	14.00	-21.15						

Notes: Clipped Pink Noise only at 100%
W/SCA's: Clipped Pink Noise at 90% SCA Groups A or B at 20%
ABBA on IBOC Host
"Hook" refers to a non-linear condition caused by wideband AGC affecting results due to the unusually high level of second adjacent interfering signal required for TOA.
Other related terms are hysteresis or foldback. This is an unstable condition that will cause variability in the test results.

DAT Ref.: DAR40180.DAT

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs					Description	ATTEN. SET. (dB)
	Start	Stop							
DAR40180.DAT									
3/14/95									
							INTERFERING SIGNAL WITH GROUP A SCA's		
			1	2	3		H5 Lower & Upper 2nd TOA	12.50	
			4	5	6		I5 (Urban Slow) TOA	63.75	
			7	8	9		I5 (Urban Fast) TOA	45.00	
			10	11	12		H4 Lower 2nd TOA	4.00	
			13	14	15		I4 (Urban Fast) TOA	25.00	
			16	17	18		H4 Upper 2nd TOA	5.25	
			19	20	21		H2 Lower 1st TOA	24.50	
			22	23	24		H1 Co-Chan TOA	15.75	
			25	26	27		I1 (Urban Fast)	39.00	
							INTERFERING SIGNAL WITH NO SCA's		
4/3/95			28	29	30	31	32	H1 Co-Chan	18.00
			33	34	35	36	37	H1 Co-Chan TOA	17.75
DISREGARD			38						
			39	40	41	42		H2 Lower 1st TOA	24.25
4/4/95			43	44	45			H4 Lower 2nd TOA	4.25
DISREGARD			46	47	48				
			49	50	51			H5 Lower & Upper 2nd TOA	6.75

EIA Digital Audio Radio Test Laboratory

Tests H & I, Sections 1-5

Proponent: AT&T Amati DSB

Index

Page	Description
1	Cover sheet
2	Analog -> DAR interference tests H and I (with multipath) including: 1) Co-Channel 2) Lower first adjacent or upper first adjacent tests 3) Simultaneous lower and upper first adjacent tests 4) Lower second adjacent or upper second adjacent tests 5) Simultaneous lower and upper second adjacent tests
3	Digital Audio Tape recording log of H & I tests where applicable

Notes:

- * Clipped pink noise used as the modulation signal on the analog interfering signal
- * ABBA used as modulation on the IBOC host analog channel (100% mod. lev.)
- * When required, SCA groups A or B included on undesired signal. Only group A used in test I (Multipath)
- * Total modulation on analog channels: 100% without SCA's, 110% with SCA's (SCA group level at 20%)
- * In the H series only, additional paths in the multipath simulator were turned on to provide a higher undesired signal level when required. The simulator paths were used for gain only, no multipath events were running.
- * "2P" indicates 2 paths for a 6dB increase. "3P" indicates 3 paths for a 9 dB increase in undesired signal.
- * Multipath setup includes nine paths for the desired signal and three paths for the undesired signal
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

H and I Series		H Series Tests								I Series Tests							
		AT&T Amati DSB	D IL	-7.50 40.77	SCAs				Co, 1st and 2nd->DAR EO&C	Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh		Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh	
					None	Group A		Group B				Attn	D/U			Attn	D/U
			D/U	Attn	D/U	Attn	D/U										
1	Co-Channel Boonton	U	-7.77						49.00	19.77	Medium		42.00	12.77	Medium		
		IL	11.27						39.00	9.77			34.00	4.77			
		TOA Attn	10.75	-18.48	25.25	-3.98	21.25	-7.98			Weak Impairment between TOA and POF				Weak TOA without impairment		
		POF Attn	8.50	-20.73	22.75	-6.48	18.00	-11.23									
2	Lower 1st Adj Boonton	U	-7.77								Medium				Medium		
		IL	11.27														
		TOA Attn	22.00	22.77	22.00	22.77	22.00	22.77	No Change with SCAs	52.00	52.77			38.00	38.77		
		POF Attn	20.00	20.77	20.00	20.77	20.00	20.77	34.00	34.77			31.00	31.77			
2	Upper 1st Adj Boonton	U	-7.77								Medium				Medium		
		IL	11.27								NA				NA		
		TOA Attn	22.25						Symmetrical Characteristics								
		POF Attn	20.50														
3	Lower+Upper 1st Adj	U	-7.77								Medium				Medium		
		IL	11.27								NA				NA		
		TOA Attn	22.25						NA								
		POF Attn	20.50														
4	Lower 2nd Adj Boonton	U	-7.77								Medium				Medium		
		IL	11.27	3P		3P		3P									
		TOA Attn	2.00	-36.23	5.75	-32.48	3.25	-34.98	POF could just be achieved	25.00	-4.23			14.00	-15.23		
		POF Attn	0.00	-38.23	4.00	-34.23	1.00	-37.23	13.00	-16.23			8.00	-21.23			
4	Upper 2nd Adj Boonton	U	-7.77								Medium				Medium		
		IL	11.27	3P													
		TOA Attn	0.00	-38.23					TOA could just be achieved								
		POF Attn															
5	Lower+Upper 2nd Adj	U	-7.85								Medium				Medium		
		IL	11.27	3P		3P		3P									
		TOA Attn	3.75	-34.41	8.25	-29.91	5.00	-33.16		26.00	-3.16			16.00	-13.16		
		POF Attn	2.50	-35.66	6.25	-31.91	3.50	-34.66	15.00	-14.16			8.00	-21.16			

Notes: Clipped Pink Noise only at 100%
W/SCA's: Clipped Pink Noise at 90% SCA Groups A or B at 20%
ABBA on IBOC Host
3P indicates 3 Paths for a 9 dB increase in power
Multipath Tests Conducted 4/5/95

DAT Ref.: DAR40181.DAT

EIA DAR Test Lab DAT Recording Log

DAT File Number	Time Code		Start IDs					Description	ATTEN. SET. (dB)
	Start	Stop							
DAR40181.DAT									
3/31/95									
								INTERFERING SIGNAL WITH NO SCA's	
			1	2	3			H2 Lower 1st TOA	22.00
DISREGARD			4	5	6	7	8		
DISREGARD			9						
			10	11	12	13		I2 Lower 1st (Urban Slow) TOA	49.00
			14	15	16	17		I2 Lower 1st (Urban Fast) TOA	37.00
			18	19	20			H4 Lower 2nd TOA	2.00
			21	22	23			I4 Lower 2nd (Urban Fast) TOA	12.00
			24	25	26			I4 Lower 2nd (Urban Slow) TOA	22.00
			27	28	29			H3 Lower & Upper 2nd TOA	3.75
			30	31	32			I5 Lower & Upper 2nd (Urban Slow) TOA	23.00
			33	34	35	36		I5 Lower & Upper 2nd (Urban Fast) TOA	14.00
DISREGARD			37	38	39	40	41		
			42	43	44			H1 Co-Chan TOA	10.75

EIA Digital Audio Radio Test Laboratory

Tests H & I, Sections 1-5

Proponent: AT&T Amati LSB

Index

Page

Description

1	Cover sheet
2	Analog -> DAR interference tests H and I (with multipath) including: 1) Co-Channel 2) Lower first adjacent or upper first adjacent tests 3) Simultaneous lower and upper first adjacent tests 4) Lower second adjacent or upper second adjacent tests 5) Simultaneous lower and upper second adjacent tests
3	Digital Audio Tape recording log of H & I tests where applicable

Notes:

- * Clipped pink noise used as the modulation signal on the analog interfering signal
- * ABBA used as modulation on the IBOC host analog channel (100% mod. lev.)
- * When required, SCA groups A or B included on undesired signal. Only group A used in test I (Multipath)
- * Total modulation on analog channels: 100% without SCA's, 110% with SCA's (SCA group level at 20%)
- * In the H series only, additional paths in the multipath simulator were turned on to provide a higher undesired signal level when required. The simulator paths were used for gain only, no multipath events were running.
- * "2P" indicates 2 paths for a 6dB increase. "3P" indicates 3 paths for a 9 dB increase in undesired signal.
- * Multipath setup includes nine paths for the desired signal and three paths for the undesired signal
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

H and I Series		H Series Tests							I Series Tests					
AT&T Amati LSB	D IL	-7.54 40.77	SCAs					Co, 1st and 2nd->DAR EO&C	Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh		Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh	
			None D/U	Group A Attn	Group A D/U	Group B Attn	Group B D/U				Attn	D/U	Attn	D/U
1	Co-Channel Boonton	U	-7.77								Medium	54.00	24.73	Medium
		IL	11.27								TOA with no added interference	42.00	12.73	
		TOA Attn	18.75	-10.52	32.25	2.98	30.25	0.98			Weak			Weak
		POF Attn	15.50	-13.77	29.75	0.48	25.25	-4.02			POF with no added interference			POF with no added noise
2	Lower 1st Adj Boonton	U	-7.77								Medium			Medium
		IL	11.27								TOA occurs with no added noise	53.00	53.73	
		TOA Attn	29.75	30.48	30.25	30.98	30.25	30.98				42.00	42.73	
		POF Attn	28.00	28.73	28.50	29.23	28.25	28.98						
2	Upper 1st Adj Boonton	U	-7.77								Medium			Medium
		IL	11.27								TOA occurs with no added noise	35.00	5.73	
		TOA Attn	10.50	-18.77	10.50	-18.77	10.75	-18.52				28.00	-1.27	
		POF Attn	8.50	-20.77	8.25	-21.02	8.25	-21.02						
3	Lower+Upper 1st Adj	U	-7.77								Medium			Medium
		IL	11.27								NA			NA
		TOA Attn							NA					
4	Lower 2nd Adj Harris	U	-7.77								Medium			Medium
		IL	11.27								TOA occurs with no added noise	27.00	-2.27	
		TOA Attn	2.50	-26.77	6.75	-22.52	3.75	-25.52				19.00	-10.27	
		POF Attn	0.00	-29.27	4.00	-25.27	1.25	-28.02						
4	Upper 2nd Adj Boonton	U	-7.77								Medium			Medium
		IL	11.27	3P		3P		3P			TOA occurs with no added noise	18.00	-11.27	
		TOA Attn	2.00	-36.27	1.50	-36.77	1.50	-36.77				10.00	-19.27	
		POF Attn	0.25	-38.02	0.00	-38.27	0.00	-38.27						
5	Lower+Upper 2nd Adj	U	-7.84								Medium			Medium
		IL	11.27								TOA occurs with no added noise	29.00	-0.20	
		TOA Attn	2.75	-26.45	6.75	-22.45	4.00	-25.20				18.00	-11.20	
		POF Attn	0.50	-28.70	4.25	-24.95	1.25	-27.95						

Notes: Clipped Pink Noise only at 100%
W/SCA's: Clipped Pink Noise at 90% SCA Groups A or B at 20%
ABBA on IBOC Host
3P indicates 3 Paths for a 9 dB increase in power
Tests conducted 4/5/95

DAT Ref.: DAR40182.DAT

EIA Digital Audio Radio Test Laboratory

Tests H & I, Sections 1-5

Proponent: AT&T

Index

Page	Description
1	Cover sheet
2	Analog -> DAR interference tests H and I (with multipath) including: 1) Co-Channel 2) Lower first adjacent or upper first adjacent tests 3) Simultaneous lower and upper first adjacent tests 4) Lower second adjacent or upper second adjacent tests 5) Simultaneous lower and upper second adjacent tests
3	Digital Audio Tape recording log of H & I tests where applicable

Notes:

- * Clipped pink noise used as the modulation signal on the analog interfering signal
- * ABBA used as modulation on the IBOC host analog channel (100% mod. lev.)
- * When required, SCA groups A or B included on undesired signal. Only group A used in test I (Multipath)
- * Total modulation on analog channels: 100% without SCA's, 110% with SCA's (SCA group level at 20%)
- * In the H series only, additional paths in the multipath simulator were turned on to provide a higher undesired signal level when required. The simulator paths were used for gain only, no multipath events were running.
- * "2P" indicates 2 paths for a 6dB increase. "3P" indicates 3 paths for a 9 dB increase in undesired signal.
- * Multipath setup includes nine paths for the desired signal and three paths for the undesired signal
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

H and I Series		H Series Tests								I Series Tests						
AT&T	D	IL	-15.20 40.77	SCAs				Co, 1st and 2nd->DAR EO&C	Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh		Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh	
				None	Group A		Group B				Attn	D/U			Attn	D/U
			D/U	Attn	D/U	Attn	D/U									
1	U	IL	-7.77 11.27													
	POF	Attn	18.25	11.32	18.25	11.32	18.25	11.32	34.00	27.07	Weak			Weak		
2	U	IL	-7.77 11.27													
	POF	Attn	14.25	-22.68	19.25	-17.68	20.25	-16.68	31.00	-5.93		30.00	-6.93			
2	U	IL	-7.77 11.27													
	POF	Attn	14.00	-22.93	19.25	-17.68					NA			NA		
3	U	IL	-7.88 11.27													
	POF	Attn	17.75	-19.07	22.00	-14.82	23.25	-13.57	36.00	-0.82		35.00	-1.82			
4	U	IL	-7.83 2.27	3P		3P		3P								
	POF	Attn								2.00	-34.87		2.00	-34.87		
4	U	IL	-7.83 2.27	3P		3P		3P								
	POF	Attn								2.00	-34.87		2.00	-34.87		
5	U	IL	-7.87 2.27	3P		3P		3P								
	POF	Attn	2.50	-43.33	2.75	-43.08	3.00	-42.83	3.00	-33.83		3.00	-33.83			

Notes: Clipped Pink Noise only at 100%
W/SCA's: Clipped Pink Noise at 90% SCA Groups A or B at 20%
ABBA on IBOC Host
3P indicates 3 Paths for a 9 dB increase in power

DAT Ref.: DAR40183.DAT

EIA Digital Audio Radio Test Laboratory

Tests H & I, Sections 1-5

Proponent: USADR FM2

Index

Page	Description
1	Cover sheet
2	Analog -> DAR interference tests H and I (with multipath) including: 1) Co-Channel 2) Lower first adjacent or upper first adjacent tests 3) Simultaneous lower and upper first adjacent tests 4) Lower second adjacent or upper second adjacent tests 5) Simultaneous lower and upper second adjacent tests
3	Digital Audio Tape recording log of H & I tests where applicable

Notes:

- * Clipped pink noise used as the modulation signal on the analog interfering signal
- * ABBA used as modulation on the IBOC host analog channel (100% mod. lev.)
- * When required, SCA groups A or B included on undesired signal. Only group A used in test I (Multipath)
- * Total modulation on analog channels: 100% without SCA's, 110% with SCA's (SCA group level at 20%)
- * In the H series only, additional paths in the multipath simulator were turned on to provide a higher undesired signal level when required. The simulator paths were used for gain only, no multipath events were running.
- * "2P" indicates 2 paths for a 6dB increase. "3P" indicates 3 paths for a 9 dB increase in undesired signal.
- * Multipath setup includes nine paths for the desired signal and three paths for the undesired signal
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA DAR Test Laboratory

H and I Series Tests		H Series Tests							I Series Tests											
		D IL	-7.42 40.76	SCAs			Co, 1st and 2nd->DAR EO&C			Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh	Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh									
None D/U	Group A Attn			Group B D/U	Group A Attn	Group B D/U	Attn	D/U	Attn		D/U									
5/23/95 1 Co-Channel Boonton	U	-7.95						Small chirp or shattering. High cut, warbling and occasional mute.			Medium No recovered Audio.			Medium No recovered Audio						
	IL	11.36																		
	TOA POF	Attn Attn	43.00 37.50	44.13 38.63	43.25 37.50	44.38 38.63	42.75 37.50								43.88 38.63	Weak NA			Weak NA	
5/23/95 2 Lower 1st Adj Boonton	U	-7.95						Small warble. High cut, warbling and occasional mute.			NA			NA						
	IL	11.36																		
	TOA POF	Attn Attn	31.00 24.75	32.13 25.88	31.75 24.75	32.88 25.88	31.25 25.00								32.38 26.13					
4/4/95 2 Upper 1st Adj Boonton	U	-7.95						NA			NA			NA						
	IL	11.36																		
	TOA POF	Attn Attn	31.25 25.50	32.38 26.63																
3 Lower+Upper 1st Adj	U							NA			NA			NA						
	IL																			
	TOA POF	Attn Attn																		
5/24/95 4 Lower 2nd Adj Boonton 34843	U	-7.99						Small warble. High cut, warbling and occasional mute.			NA			NA						
	IL	11.36																		
	TOA POF	Attn Attn	24.00 17.00	25.17 18.17	24.25 17.00	25.42 18.17	24.00 17.75								25.17 18.92					
4 Upper 2nd Adj Boonton	U	-7.99						NA			NA			NA						
	IL	11.36																		
	TOA POF	Attn Attn	25.25 17.75	26.42 18.92																
5/24/95 5 Lower+Upper 2nd Adj	U	-7.95						Small warble. High cut, warbling and occasional mute.			NA			NA						
	IL	11.36																		
	TOA POF	Attn Attn	27.50 23.25	28.63 24.38	27.50 23.00	28.63 24.13	27.75 23.00								28.88 24.13					

Notes: Clipped Pink Noise only at 100%
W/SCA's: Clipped Pink Noise at 90% SCA Groups A or B at 20%
ABBA on IBOC Host

DAT Ref.: DAR40184.DAT

APPENDIX AQ

Test L

EIA Digital Audio Radio Test Laboratory

Tests L2, L3 & L4

Receiver

Rx No.: #1
Mfg.: DELCO
Model: 16192463
Serial: 1000499

Index

Page	Description
1	Cover sheet
2	DAR -> Analog Host interference at both strong and weak signal levels.
3	Digital Audio Tape recording log of test L2
4	DAR -> Analog Host interference at both strong and weak signal levels under Urban Slow multipath conditions.
5	DAR -> Analog Host interference at both strong and weak signal levels under Urban Fast multipath conditions.
6	Digital Audio Tape recording log of test L4

Notes:

- * Total modulation on analog channels: 100% when no SCA's are included. 110% with SCA's (SCA group level at 20%)
- * Signal/Noise Ratio measurement 0dB taken with 1KHz at 91%, Pilot at 9%, noSCA's. With SCA groups included, 0dB is accordingly re-adjusted to accomodate the reduced main channel modulation.
- * Automobile receivers operated into a four ohm load at the standard output level of 1 Watt
- * Receiver audio routed through a 15KHz low pass filter
- * Weighted audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

CCIR 468-4 recommendation

EIA Digital Audio Radio Test Laboratory

Test(s) L-2 & L3		Date: 3/21/95		Engineers: DML/RMc		
DAR -> Analog Strong & Weak Signal Receiver: DELCO		TEST L-2		Radio Audio Quality		
		S/N Ratio Measurement (dB)		TEST L-3		
		SCA GROUP	RMS	Weighted	GRADE	EO&C
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	60.0	50.5	NA	
		A		50.5		
		B		50.4		
		None	60.7	50.5	0	
		A		50.5	NA	
AT&T / Amati DSB DAR -> HOST		B		50.4	NA	
		None	60.7	50.5	0	
		A		50.5	NA	
AT&T / Amati LSB		B		50.4	NA	
		None	60.3	50.5	0	
		A		50.5	NA	
USADR FM1		B		50.3	NA	
		None	57.0	48.8	0	
		A		48.6	NA	
USADR FM2		B		48.3	NA	
		None	54.8	47.0	NA	
		A		46.9		
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	B		46.6		
		None	54.2	47.0	0	
		A		47.0		
AT&T / Amati DSB		B		46.6		
		None	54.3	47.0	0	
		A		47.0		
AT&T / Amati LSB		B		46.7		
		None	54.0	47.1	0	
		A		47.0		
USADR FM1		B		46.7		
		None	53.3	46.2	0	
		A		46.2		
USADR FM2		B		45.7		

NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's
 * External 15KHz low pass filter used for all audio measurements
 * Audio measurements are either RMS unweighted or Qpeak detected with CCIR weighting filter as indicated
 * Test L-3 Grading Scale: 0: No difference from Analog Reference -1: Worse than Analog Reference -2: Much Worse than Analog Reference

DAT REF No. DAR40160.DAT
 Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

Test L-4		Date: 3/24/95		Engineers: DML/RMc	
DAR -> Analog With Multipath Strong & Weak Signal Receiver: DELCO		Radio Audio Quality		TEST L-4	Multipath Type: Urban Slow Rayleigh
		SCA GROUP	GRADE	Subjective EO&C	
Strong Signal Level (-47 dBm)	ANALOG TRANSMITTER ONLY	None	NA	Fades are slightly noticable	
		B		Interference from SCA's not detected	
	AT&T / Amati DSB DAR -> HOST	None	0 -1	Might be slightly worse	
		B	0 -1		
	AT&T / Amati LSB	None	0 -1		
		B	-1		
	USADR FM1	None	0 -1		
		B	-1	Noticed slightly more break-up during fades with SCA's added	
	USADR FM2	None	-1	Fades are more hissy	
		B	-1		
Weak Signal Level (-77 dBm)	ANALOG TRANSMITTER ONLY	None	NA	Could detect radio in "blend" (mono) mode	
		B		Interference from SCA's not detected	
	AT&T / Amati DSB	None	0		
		B	0		
	AT&T / Amati LSB	None	0		
		B	0		
	USADR FM1	None	0		
		B	0		
	USADR FM2	None	0		
		B	0		

NOTES: * SCA group A not used for multipath tests
 *
 *
 * Test L-3 Grading Scale: 0: No difference from Analog Reference -1: Worse than Analog Reference -2: Much Worse than Analog Reference

DAT REF No. DAR40170.DAT
 Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

Test L-4		Date: 3/24/95		
DAR -> Analog With Multipath		Engineers: DML/RMc		
Strong & Weak Signal Receiver: DELCO		Radio Audio Quality		
		TEST L-4	Multipath Type: Urban Fast Rayleigh	
		SCA GROUP	GRADE	
		Subjective EO&C		
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	NA	
		B		
AT&T / Amati DSB DAR -> HOST		None	-1	More frequent events which take on longer, more annoying characteristics
B		-1	No additional contribution to noise from SCA's	
AT&T / Amati LSB		None	0	
B		0		
USADR FM1		None	-1	More frequent events which take on longer, more annoying characteristics
B		-1	No additional contribution to noise from SCA's	
USADR FM2		None	-1	Noisier
B		-1		
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	None	NA	
		B		
AT&T / Amati DSB		None	0	
B		0		
AT&T / Amati LSB		None	0	
B		0		
USADR FM1		None	0	
B		0		
USADR FM2		None	0	
B		0		

NOTES: * SCA group A not used for multipath tests

DAT REF No. DAR40170.DAT

Audio program material: Harp, ABBA, Female voice

* Test L-3 Grading Scale: 0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code		Start IDs				Description	Attn
	Start	Stop						
DAR40170.DAT							STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	
24-Mar-95	0:04	1:06	1				AMATI DSB	
	1:12	2:14	2				AMATI DSB W/SCA GRP B	
	2:20	3:21	3				FM1	
	3:28	4:29	4				FM1 W/SCA GRP B	
	4:34	5:36	5				FM2	
	5:41	6:43	6				FM2 W/SCA GRP B	
	6:48	7:51	7				AMATI LSB	
	7:57	8:59	8				AMATI LSB W/SCA GRP B	
							WEAK SIGNAL W/MULTIPATH (URBAN SLOW)	
	9:05	10:09	9				AMATI LSB	
	10:14	11:16	10				AMATI LSB W/SCA GRP B	
	11:21	12:23	11				FM1	
	12:29	13:30	12				FM1 W/SCA GRP B	
	13:36	14:39	13				FM2	
	14:45	15:47	14				FM2 W/SCA GRP B	
	15:53	16:56	15				AMATI DSB	
	17:01	18:03	16				AMATI DSB W/SCA GRP B	
							STRONG SIGNAL W/MULTIPATH (URBAN FAST)	
	18:09	19:11	17				AMATI DSB	
	19:17	20:19	18				AMATI DSB W/SCA GRP B	
	20:25	21:27	19				FM1	
	21:33	22:34	20				FM1 W/SCA GRP B	
	22:40	23:41	21				FM2	
	24:45	24:49	22				FM2 W/SCA GRP B	
	24:54	25:57	23				AMATI LSB	
	26:03	27:05	24				AMATI LSB W/SCA GRP B	
							WEAK SIGNAL W/MULTIPATH (URBAN FAST)	
	27:12	28:15	25				AMATI LSB	
	28:20	29:23	26				AMATI LSB W/SCA GRP B	
	29:28	30:30	27				FM1	
	30:35	31:37	28				FM1 W/SCA GRP B	
	31:42	32:44	29				FM2	
	32:50	33:52	30				FM2 W/SCA GRP B	
	33:58	34:59	31				AMATI DSB	
	35:06	36:07	32				AMATI DSB W/SCA GRP B	

EIA Digital Audio Radio Test Laboratory

Tests L2, L3 & L4

Receiver

Rx No.: #2
Mfg.: DENON
Model: TU-380RD
Serial: 4056301149

Index

Page	Description
1	Cover sheet
2	DAR -> Analog Host interference at both strong and weak signal levels.
3	Digital Audio Tape recording log of test L2
4	DAR -> Analog Host interference at both strong and weak signal levels under Urban Slow multipath conditions.
5	Digital Audio Tape recording log of test L4

Notes:

- * Total modulation on analog channels: 100% when no SCA's are included. 110% with SCA's (SCA group level at 20%)
- * Signal/Noise Ratio measurement 0dB taken with 1KHz at 91%, Pilot at 9%, noSCA's. With SCA groups included, 0dB is accordingly re-adjusted to accomodate the reduced main channel modulation.
- * Receiver audio routed through a 15KHz low pass filter
- * Weighted audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test(s) L-2 & L3		Date: 3/22/95		Engineers: DML/RMc		
DAR -> Analog Strong & Weak Signal Receiver : DENON		SCA GROUP	TEST L-2		Radio Audio Quality	
			S/N Ratio Measurement (dB)		TEST L-3	
			RMS	Weighted	GRADE	EO&C
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	68.0	62.3	NA	
		A		57.4		
		B		60.3		
		None	50.0	40.2	-2	
		A		39.9	NA	
AT&T / Amati DSB DAR -> HOST		B		40.0	NA	
		None	50.7	41.0	-2	
		A		40.7	NA	
AT&T / Amati LSB		B		40.8	NA	
		None	44.9	33.2	-2	
		A		33.2	NA	
USADR FM1		B		33.2	NA	
		None	53.4	42.5	-1	
		A		42.3	NA	
USADR FM2		B		42.3	NA	
		None	50.0	38.9	NA	
		A		38.9		
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	B		38.9		
		None	47.0	36.5	-1	
		A		36.3		
AT&T / Amati DSB		B		36.3		
		None	47.2	36.3	-1	
		A		36.2		
AT&T / Amati LSB		B		36.2		
		None	43.1	31.4	-2	
		A		31.4		
USADR FM1		B		31.4		
		None	48.5	37.2	0	
		A		36.9		
USADR FM2		B		36.8		

NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's

* External 15KHz low pass filter used for all audio measurements

* Audio measurements are either RMS unweighted or Qpeak detected with CCIR weighting filter as indicated

* Test L-3 Grading Scale: 0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

DAT REF No. DAR40161.DAT

Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

Test L-4		Date: 3/24/95		
DAR -> Analog		Engineers: DML/RMc		
With Multipath		Radio Audio Quality		
Strong & Weak Signal		TEST L-4		
Receiver : DENON		Multipath Type: Urban Slow Rayleigh		
		SCA GROUP	GRADE	
		Subjective EO&C		
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	NA	Clean audio
		B		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	None	NA	Birdies
		B		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		

NOTES: * SCA group A not used for multipath tests

DAT REF No. DAR40171.DAT

Audio program material: Harp, ABBA, Female voice

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* Test L-3 Grading Scale:

0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code		Start IDs				Description	Attn
	Start	Stop						
DAR40171.DAT							STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	
3/24/95			1				AMATI DSB	
			2				AMATI DSB W/SCA GRP B	
DISREGARD			3				FM1	
			4				FM1	
			5				FM1 W/SCA GRP B	
			6				FM2	
			7				FM2 W/SCA GRP B	
DISREGARD			8				AMATI LSB	
			9				AMATI LSB	
			10				AMATI LSB W/SCA GRP B	
							WEAK SIGNAL W/MULTIPATH (URBAN SLOW)	
			11				AMATI LSB	
			12				AMATI LSB W/SCA GRP B	
			13				FM1	
			14				FM1 W/SCA GRP B	
			15				FM2	
			16				FM2 W/SCA GRP B	
			17				AMATI DSB	
DISREGARD			18				AMATI DSB W/SCA GRP B	
			19				AMATI DSB W/SCA GRP B	

EIA Digital Audio Radio Test Laboratory

Tests L2, L3 & L4

Receiver

Rx No.: #3

Mfg.: PANASONIC

Model: RX-FS430

Serial: GR3J01184

Index

Page	Description
1	Cover sheet
2	DAR -> Analog Host interference at both strong and weak signal levels.
3	Digital Audio Tape recording log of test L2
4	DAR -> Analog Host interference at both strong and weak signal levels under Urban Slow multipath conditions.
5	Digital Audio Tape recording log of test L4

Notes:

- * Total modulation on analog channels: 100% when no SCA's are included. 110% with SCA's (SCA group level at 20%)
- * Signal/Noise Ratio measurement 0dB taken with 1KHz at 91%, Pilot at 9%, noSCA's. With SCA groups included, 0dB is accordingly re-adjusted to accomodate the reduced main channel modulation.
- * Receiver audio routed through a 15KHz low pass filter
- * Weighted audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test(s) L-2 & L3		Date: 3/21/95			
DAR -> Analog		Engineers: DML/RMc/TBK			
Strong & Weak Signal Receiver : PANASONIC	SCA GROUP	TEST L-2		Radio Audio Quality	
		S/N Ratio Measurement (dB)		TEST L-3	TEST L-3
		RMS	Weighted	GRADE	EO&C
ANALOG TRANSMITTER ONLY	None	67.5	57.1	NA	
	A		54.5		
	B		55.5		
	None	44.2	33.6	-2	
	A		33.6	NA	
AT&T / Amati DSB DAR -> HOST	B		33.6	NA	
	None	51.2	41.0	-1	
	A		40.8	NA	
AT&T / Amati LSB	B		40.8	NA	
	None	42.0	29.7	-2	
	A		29.7	NA	
USADR FM1	B		29.7	NA	
	None	51.0	40.0	-1	
	A		39.8	NA	
USADR FM2	B		39.8	NA	
	None	49.2	38.3	NA	
	A		38.3		
ANALOG TRANSMITTER ONLY	B		38.3		
	None	43.0	32.3	-1	
	A		32.2	NA	
AT&T / Amati DSB	B		32.2	NA	
	None	47.0	36.2	-1	
	A		36.2	NA	
AT&T / Amati LSB	B		36.2	NA	
	None	41.4	29.2	-1	
	A		29.2	NA	
USADR FM1	B		29.2	NA	
	None	47.1	36.1	0	
	A		36.0	NA	
USADR FM2	B		36.0	NA	

NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's

* External 15KHz low pass filter used for all audio measurements

* Audio measurements are either RMS unweighted or Qpeak detected with CCIR weighting filter as indicated

* Test L-3 Grading Scale: 0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

DAT REF No. DAR40162.DAT

Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

Test L-4		Date: 3/24/95		
DAR -> Analog		Engineers: DML/RMc		
With Multipath		Radio Audio Quality		
Strong & Weak Signal		TEST L-4		
Receiver : PANASONIC		Multipath Type: Urban Slow Rayleigh		
		SCA GROUP	GRADE	
		Subjective EO&C		
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	NA	
		B		Could detect a low level tone or beat note from the addition of SCA's
None		-2	Noticeable increase in noise floor	
B		-2	No additional contribution to noise from SCA's	
None		-1	Slight increase in audio noise floor	
B		-1	No additional contribution to noise from SCA's	
None		-2	Noticeable increase in noise floor with the addition of tone or beat note	
B		-2	No additional contribution to noise from SCA's	
None		-2	Increase in noise floor with the addition of tone or beat note	
B		-2	No additional contribution to noise from SCA's	
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	None	NA	
		B		
None		-1		
B		-1		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		

NOTES: * SCA group A not used for multipath tests

DAT REF No. DAR40172.DAT

Audio program material: Harp, ABBA, Female voice

* Test L-3 Grading Scale: 0: No difference from Analog Reference -1: Worse than Analog Reference -2: Much Worse than Analog Reference

EIA Digital Audio Radio Test Laboratory

Tests L2, L3 & L4

Receiver

Rx No.: #4
Mfg.: PIONEER
Model: SX-201
Serial: OA3965843C

Index

Page	Description
1	Cover sheet
2	DAR -> Analog Host interference at both strong and weak signal levels.
3	Digital Audio Tape recording log of test L2
4	DAR -> Analog Host interference at both strong and weak signal levels under Urban Slow multipath conditions.
5	Digital Audio Tape recording log of test L4

Notes:

- * Total modulation on analog channels: 100% when no SCA's are included. 110% with SCA's (SCA group level at 20%)
- * Signal/Noise Ratio measurement 0dB taken with 1KHz at 91%, Pilot at 9%, noSCA's. With SCA groups included, 0dB is accordingly re-adjusted to accomodate the reduced main channel modulation.
- * Receiver audio routed through a 15KHz low pass filter
- * Weighted audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test(s) L-2 & L3		Date: 3/21/95					
DAR -> Analog		Engineers: DML/RMc					
Strong & Weak Signal Receiver : PIONEER		TEST L-2		Radio Audio Quality		TEST L-3	
		S/N Ratio Measurement (dB)		GRADE		EO&C	
		SCA GROUP	RMS	Weighted			
Strong Signal Level (-47 dBm)	ANALOG TRANSMITTER ONLY	None	66.0	61.0	NA		
		A		53.2			
		B		54.8			
	AT&T / Amati DSB DAR -> HOST	None	40.0	29.6	-2	Noticeable increase in noise floor	
		A		29.6		No additional contribution to noise from SCA's	
	B		29.6		No additional contribution to noise from SCA's		
Strong Signal Level (-47 dBm)	AT&T / Amati LSB	None	40.2	29.9	-2	Noticeable increase in noise floor	
		A		29.8		No additional contribution to noise from SCA's	
		B		29.8		No additional contribution to noise from SCA's	
	USADR FM1	None	39.2	27.5	-2	Noticeable increase in noise floor	
		A		27.5		No additional contribution to noise from SCA's	
	B		27.5		No additional contribution to noise from SCA's		
Weak Signal Level (-77 dBm)	USADR FM2	None	57.0	45.6	-1	Some increase in noise floor	
		A		44.8	-1	Slight contribution to noise level with SCA's	
		B		44.9	-1	Slight contribution to noise level with SCA's	
	ANALOG TRANSMITTER ONLY	None	52.3	41.5	NA		
		A		41.3			
	B		41.3				
Weak Signal Level (-77 dBm)	AT&T / Amati DSB	None	39.7	29.2	-1		
		A		29.2			
		B		29.2			
	AT&T / Amati LSB	None	39.8	29.5	-1		
		A		29.4			
	B		29.4				
Weak Signal Level (-77 dBm)	USADR FM1	None	38.9	27.2	-2		
		A		27.2			
		B		27.2			
	USADR FM2	None	50.9	39.8	0		
		A		39.5			
	B		39.5				

NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's

* External 15KHz low pass filter used for all audio measurements

* Audio measurements are either RMS unweighted or Qpeak detected with CCIR weighting filter as indicated

* Test L-3 Grading Scale: 0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

DAT REF No. DAR40163.DAT

Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

Test L-4		Date: 3/24/95		
DAR -> Analog		Engineers: DML/RMc		
With Multipath		Radio Audio Quality		
Strong & Weak Signal		TEST L-4		
Receiver : PIONEER		Multipath Type: Urban Slow Rayleigh		
		SCA GROUP	GRADE	
		Subjective EO&C		
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	NA	
		B		
None		-2	Noticeable increase in noise floor	
B		-2	No additional contribution to noise from SCA's	
None		-2	Noticeable increase in noise floor	
B		-2	No additional contribution to noise from SCA's	
None		-2	Noticeable increase in noise floor	
B		-2	No additional contribution to noise from SCA's	
None		-1	Slight increase in noise floor	
B		-1	No additional contribution to noise from SCA's	
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	None	NA	
		B		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		
None		0		
B		0		

NOTES: * SCA group A not used for multipath tests

DAT REF No. DAR40173.DAT
Audio program material: Harp, ABBA, Female voice

* Test L-3 Grading Scale: 0: No difference from Analog Reference -1: Worse than Analog Reference -2: Much Worse than Analog Reference

EIA Digital Audio Radio Test Laboratory

Tests L2, L3 & L4

Receiver

Rx No.: #5

Mfg.: FORD

Model: F4XF-19B132-CB

Serial: 281150B010

Index

Page	Description
1	Cover sheet
2	DAR -> Analog Host interference at both strong and weak signal levels.
3	Digital Audio Tape recording log of test L2
4	DAR -> Analog Host interference at both strong and weak signal levels under Urban Slow multipath conditions.
5	DAR -> Analog Host interference at both strong and weak signal levels under Urban Fast multipath conditions.
6	Digital Audio Tape recording log of test L4

Notes:

- * Total modulation on analog channels: 100% when no SCA's are included. 110% with SCA's (SCA group level at 20%)
- * Signal/Noise Ratio measurement 0dB taken with 1KHz at 91%, Pilot at 9%, noSCA's. With SCA groups included, 0dB is accordingly re-adjusted to accomodate the reduced main channel modulation.
- * Automobile receivers operated into a four ohm load at the standard output level of 1 Watt
- * Receiver audio routed through a 15KHz low pass filter
- * Weighted audio measurements made using quasi-peak detection and a CCIR weighting filter
- * Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

EIA Digital Audio Radio Test Laboratory

Test(s) L-2 & L3		Date: 3/21/95		Engineers: DML/RMc/TBK	
DAR -> Analog		Strong & Weak Signal		Receiver : FORD	
	SCA GROUP	TEST L-2		Radio Audio Quality	
		S/N Ratio Measurement (dB)		TEST L-3	
		RMS	Weighted	GRADE	EO&C
ANALOG TRANSMITTER ONLY	None	65.2	55.7	NA	
	A		51.9		
	B		52.5		
AT&T / Amati DSB DAR -> HOST	None	64.0	54.0	0	
	A		52.3		
	B		52.9		
AT&T / Amati LSB	None	64.0	55.0	0	
	A		52.0		
	B		52.5		
USADR FM1	None	62.7	52.2	0	Very slight contribution to noise floor
	A		52.1		
	B		52.8		
USADR FM2	None	59.3	48.9	-1	Slight increase in noise floor
	A		46.9		
	B		47.0		
ANALOG TRANSMITTER ONLY	None	64.0	53.3	NA	
	A		53.7		
	B		53.7		
AT&T / Amati DSB	None	63.3	53.1	0	
	A		53.5		
	B		53.5		
AT&T / Amati LSB	None	63.5	53.1	0	
	A		53.5		
	B		53.5		
USADR FM1	None	63.0	52.8	0	
	A		53.5		
	B		53.5		
USADR FM2	None	62.8	52.9	0	
	A		53.4		
	B		53.4		

NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's

* External 15KHz low pass filter used for all audio measurements

* Audio measurements are either RMS unweighted or Qpeak detected with CCIR weighting filter as indicated

* Test L-3 Grading Scale: 0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

DAT REF No. DAR40164.DAT

Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code		Start IDs				Description	Attn
	Start	Stop						
DAR40164.DAT								
3/23/95			1				AMATI DSB (STRONG)	
			2				AMATI DSB (WEAK)	
			3				AMATI DSB W/SCA GRP A (STRONG)	
			4				AMATI DSB W/SCA GRP B (STRONG)	
			5				FM1 (STRONG)	
			6				FM1 (WEAK)	
			7				FM1 W/SCA GRP A (STRONG)	
			8				FM1 W/SCA GRP B (STRONG)	
DISREGARD			9				FM2 (STRONG)	
			10				FM2 (STRONG)	
			11				FM2 (WEAK)	
			12				FM2 W/SCA GRP A (STRONG)	
			13				FM2 W/SCA GRP B (STRONG)	
			14				AMATI LSB (STRONG)	
			15				AMATI LSB (WEAK)	
			16				AMATI LSB W/SCA GRP A (STRONG)	
			17				AMATI LSB W/SCA GRP B (STRONG)	

EIA Digital Audio Radio Test Laboratory

Test L-4		Date: 3/2395		
DAR -> Analog		Engineers: DML/RMc		
With Multipath		Radio Audio Quality		
Strong & Weak Signal		TEST L-4		
Receiver : FORD		Multipath Type: Urban Slow Rayleigh		
		SCA GROUP	GRADE	
		Subjective EO&C		
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	NA	Multipath fade events slightly noticeable as noise increase with slight tone or beat note
		B		
AT&T / Amati DSB DAR -> HOST		None	0	Multipath fade events slightly noticeable
		B	0	No additional contribution to noise from SCA's
AT&T / Amati LSB		None	0	Multipath fade events slightly noticeable
		B	0	No additional contribution to noise from SCA's
USADR FM1		None	-1	
		B	-1	No additional contribution to noise from SCA's
USADR FM2		None	-2	
		B	-2	No additional contribution to noise from SCA's
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	None	NA	
		B		
AT&T / Amati DSB		None	0	
		B	0	
AT&T / Amati LSB		None	0	
		B	0	
USADR FM1		None	0	
		B	0	
USADR FM2		None	0	
		B	0	

NOTES: * SCA group A not used for multipath tests

DAT REF No. DAR40174.DAT

Audio program material: Harp, ABBA, Female voice

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* Test L-3 Grading Scale:

0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

EIA Digital Audio Radio Test Laboratory

Test L-4 DAR -> Analog With Multipath Strong & Weak Signal Receiver : FORD		Date: 3/23/95 Engineers: DML/RMc		Radio Audio Quality	
		SCA GROUP	GRADE	TEST L-4	Multipath Type: Urban Fast Rayleigh
		Subjective EO&C			
ANALOG TRANSMITTER ONLY	Strong Signal Level (-47 dBm)	None	NA	Multipath events are very noticeable	
		B			
AT&T / Amati DSB DAR -> HOST		None	0		
		B	0		
AT&T / Amati LSB		None	0		
		B	0		
USADR FM1		None	0		
		B	0		
USADR FM2		None	-1	No additional contribution to noise from SCA's	
		B	-1		
ANALOG TRANSMITTER ONLY	Weak Signal Level (-77 dBm)	None	NA		
		B			
AT&T / Amati DSB		None	0		
		B	0		
AT&T / Amati LSB		None	0		
		B	0		
USADR FM1		None	0		
		B	0		
USADR FM2		None	0		
		B	0		

NOTES: * SCA group A not used for multipath tests

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* Test L-3 Grading Scale: 0: No difference from Analog Reference

-1: Worse than Analog Reference

-2: Much Worse than Analog Reference

DAT REF No. DAR40174.DAT

Audio program material: Harp, ABBA, Female voice

EIA Digital Audio Radio Test Laboratory

DAT File Number	Time Code		Start IDs			Description	Attn
	Start	Stop					
DAR40174.DAT						STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	
3/23/95			1			AMATI DSB	
DISREGARD			2			AMATI DSB W/SCA GRP B	
			3			AMATI DSB W/SCA GRP B	
			4			FM1	
			5			FM1 W/SCA GRP B	
			6			FM2	
			7			FM2 W/SCA GRP B	
			8			AMATI LSB W/SCA GRP B	
			9			AMATI LSB	
						WEAK SIGNAL W/MULTIPATH (URBAN SLOW)	
			10			AMATI LSB	
DISREGARD			11			AMATI LSB W/SCA GRP B	
			12			AMATI LSB W/SCA GRP B	
			13			FM1	
DISREGARD			14			FM1 W/SCA GRP B	
			15			FM1 W/SCA GRP B	
			16			FM2	
			17			FM2 W/SCA GRP B	
			18			AMATI DSB	
			19			AMATI DSB W/SCA GRP B	
						STRONG SIGNAL W/MULTIPATH (URBAN FAST)	
			20			AMATI DSB	
			21			AMATI DSB W/SCA GRP B	
			22			FM1	
			23			FM1 W/SCA GRP B	
			24			FM2	
			25			FM2 W/SCA GRP B	
			26			AMATI LSB	
			27			AMATI LSB W/SCA GRP B	
						WEAK SIGNAL W/MULTIPATH (URBAN FAST)	
			28			AMATI LSB	
			29			AMATI LSB W/SCA GRP B	
			30			FM1	
			31			FM1 W/SCA GRP B	
			32			FM2	
			33			FM2 W/SCA GRP B	
			34			AMATI DSB	
			35			AMATI DSB W/SCA GRP B	

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Tests L2, L3 & L4
Subcarrier specific

Index

Page	Description
1	Cover sheet
2	L-2 and L3, DAR -> Analog Host Subcarrier interference at both strong and weak signal levels.
3	L-4, DAR -> Analog Host interference at both strong and weak signal levels under multipath conditions. Including both Urban slow and Urban fast scenarios

Notes:

- * Total modulation on analog channel: 110% with SCA's (SCA group level at 20%)
- * Main channel program material: ABBA
- * SCA receivers used:
 - 57KHz RDS: Denon TU-380RD modified to provide clock and data signals for use by the RDS Checkup software utility.
 - 66.6KHz Seiko: Seiko RPA (Receptor Protocol Analyzer) receiver & software utility.
 - 67KHZ Analog: Compol SCA receiver, Unit No. 1 67KHz/94.1MHz
 - 92KHz Analog: Compol SCA receiver, Unit No. 2 92KHz/94.1MHz
 - 92KHz Digital: Mainstream Data, Intelligent Data Receiver

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System in good shape RDS checked software

FEC layer 1

relative sig strength

very bad out of service relative sig strength > 120 ok

Test Subcarriers DAR -> Host SC	L-2 & L-3	Composite Subcarrier Group A			Composite Subcarrier Group B		Group D		
		57 KHz RBDS 3% ERRORS MAX:(%)	66.5 KHz HS Data 8.5% ERRORS log BER	92KHz Analog 8.5% S/N (dB)	57KHz RBDS 10% ERRORS MAX:(%)	67KHz Analog 10% S/N (dB) RMS	SS # FEC1	#FEC2	SQ #UNC
FM	Strong Signal Level (-47 dBm)	0	-6 10	46	0	45.3	210 0	0	170 0
AT&T / Amati DSB		0	-5.95 10	20	0	41	209 1290	4558	92-130 455
AT&T / Amati LSB		0	-6 10	27	0	43	209 1310	4272	76-130 475
USADR FM1		0	-5 ↓	20	0	41	209 1350	6199	58-109 288
USADR FM2		0	-5.3	32.5	0	43.2	210 0	0	167 0
FM	Weak Signal Level (-77 dBm)	0	NA	22.4	0	35.4	113 NA	NA	0 NA
AT&T / Amati DSB		0	NA	16	0	34	NA	NA	NA
AT&T / Amati LSB		0	NA	18	0	34.5	NA	NA	NA
USADR FM1		0	NA	16	0	33.5	NA	NA	NA
USADR FM2		0	NA	19.9	0	34.6	NA	NA	NA

via Caradillo blocks - # 2 error

5 min tests

BIT RATE 25 Kbps (w/overhead)

NOTES: * Digital SCA's graded as the number of observed errors within a five minute period. * Main channel modulation: Abba
 * 57KHz RDS: Error = Percentage of maximum block errors indicated by MAX:(%) in the RDS CHECKUP utility * NA = RF level too low for proper operation
 * 66.5KHz Seiko: Error = Average log BER observed on the Seiko RPA utility with a print-out of a typical 20 sec. segment
 * 92KHz Mainstream: Error = # FEC1, # FEC2, # Blocks Uncorrected(#UNC) figures, as indicated on the Mainstream receiver. Failure considered as > 5 first layer errors (# FEC1) in a five minute period.

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Test Subcarriers DAR -> Host SC Moderate Signal Level	Composite Subcarrier Group A			Composite Subcarrier Group B		Group D			
	57 KHz RBDS 3% ERRORS	66.5 KHz HS Data 8.5% (log BER)	92KHz Analog 8.5% EO&C	57KHz RBDS 10% ERRORS	67KHz Analog 10% EO&C	92KHz Digital 10% ERRORS			
						# FEC1	# FEC2	# UNC	
FM AT&T / Amati DSB AT&T / Amati LSB USADR FM1 USADR FM2	Urban Slow Rayleigh	2	-5.5 10	Good audio. medium noise and some main chan. audio noise detected during fades	0	Good audio with mild noise during fades. Weak main ch. audio noise heard during fades	110	142	3
		4	-5.2 ↓	Poor audio (raspy) with main chan. audio noise heard at all times - worse during fades Unusable audio	2	Good audio with mild main channel audio noise heard during the fades Usable audio	1274	4608	524
		4	-4.8	Fair audio quality with main channel audio noise heard in background most of the time Usability: Marginal	3	Good audio with mild main channel audio heard during the fades Usable audio	1334	1325	219
		3	-4.5	Poor audio (raspy) with main chan. audio noise heard at all times - worse during fades Unusable audio	3	Fair audio with mild main channel audio at all times - more during fades Usable audio	1333	5494	626
		2	-3.8	Fair audio - noisy (hiss) most of the time - worse during fades usable audio	1	Good audio with mild noise during fades Usable audio	965	1023	106
FM AT&T / Amati DSB AT&T / Amati LSB USADR FM1 USADR FM2	Urban Fast Rayleigh	11	-2.6	Good audio with medium multipath type spits Usable audio	8	Good audio with mild multipath type spits Usable audio	271	527	245
		12	-2.3	Poor raspy audio with severe tearing sounds. Main chan. audio noise heard at all times Unusable audio	9	Fair audio with medium multipath type spits Usable audio	318	684	300
		12	-2.4	Fair audio quality - noisy with some main channel audio noise Usability: Marginal	11	Fair audio with medium multipath type spits Usable audio	273	644	249
		13	-2.1	Poor raspy audio with severe tearing sounds. Main chan. audio noise heard at all times Unusable audio	9	Fair audio with medium to heavy spitting or tearing noise Usability: Marginal	294	716	257
		1	-1.9	Fair audio quality -noisy with faint whine in background Usable audio	0	Good audio with medium multipath type spits Usable audio	254	405	238
NOTES: * Digital SCA's graded as the number of observed errors within a five minute period. * 57KHz RDS: Error = Percentage of maximum block errors indicated by MAX:(%) in the RDS CHECKUP utility * 66.5KHz Seiko: Error = Average log BER observed on the Seiko RPA utility with a print-out of a typical 20 sec. segment * 92KHz Mainstream: Error = # FEC1, # FEC2, # Blocks Uncorrected(#UNC) figures, as indicated on the Mainstream receiver. Failure considered as > 5first layer errors (# FEC1) in afive minute period * Analog SCA quality: EO&C of 1KHz audio quality * Main channel modulation : Abba * Mainstream data not valid - Rx not in lock during multipath									

APPENDIX AR

Test M

EIA Digital Audio Radio Test Laboratory

Tests M1 & M2

Analog to IBOC Host Interference

Index

Page	Description
1	Cover sheet
2	Overhead data used for calculations in tests M1. These numbers are required for calculating the C0/N0 figures and include: Signal level, Noise level, Digital Signal band width, Noise filter bandwidth and Testbed Path loss.
3	M1 test results.
4	AT&T Amati LSB DAT log of M1 tests
5	AT&T Amati DSB DAT log of M1 tests
6	USADR FM1 DAT log of M1 tests
7	USADR FM2 DAT log of M1 tests
8	Overhead data used for making calculations in tests M2.
9	M2 test results with Urban Slow Rayleigh multipath events
10	M2 test results with Urban Fast Rayleigh multipath events
11	M2 test results with Rural Fast Rayleigh multipath events
12	M2 test results with Terrain Obstructed Rayleigh multipath events
13	M2 test results with Urban Slow Doppler multipath events
14	M2 test results with Urban Fast Doppler multipath events
15	M2 test results with Rural Fast Doppler multipath events
16	M2 test results with Terrain Obstructed Doppler multipath events

Notes:

- * Clipped pink noise used as the FM modulation signal on the analog signal
- * When required, SCA groups A, B, and D included on analog signal.
- * Total modulation on analog channels: 100% without SCA's, 110% with SCA's
- * In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

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M-1 OVERHEAD DATA SHEET

Keypoint data used by (linked to) M1 test sheet for calculations

Test	M-1	Digital BW Hz	Noise dBm	Signal dBm	Path Loss dB	Noise Filter BW Hz	Date
AT&T Amati Digital only	DSB	1.47E+05	-40.78	-7.40 -20.59	40.79	6.45E+06	15-May-95
AT&T Amati Digital only	LSB	7.35E+04	-40.77	-7.53 -23.39	40.79	6.45E+06	15-May-95
USADR FM1 Digital only		2.00E+05	-40.84	-7.45 -21.97	40.79	6.45E+06	12-May-95
USADR FM2 Digital only		3.00E+05	-40.75	-7.38 -26.88	40.79	6.45E+06	16-May-95 TK,DL,RM

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sub-carrier group

Test	M-1		M-1-1				FM w/ SCA GRP	M-1-2					
	Signal Strength		Medium		Weak			Medium		Weak			
	MOD	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)		EO&C	TOA Co/No (dB)	EO&C			
AT&T Amati DSB DAR40202.DAT	CW	Attn 14.50	Small drop out	Attn 14.50	Small drop out	A	15.25	Small Drop out	15.75	Small Drop out			
		Co/No 10.32		Co/No 10.32			11.07		11.57				
	FM	Attn 14.50	Small drop out	Attn 14.75	Small drop out		D	15.25	Small Drop out	15.25	Small Drop out		
		Co/No 10.32		Co/No 10.57				11.07		11.07			
		Attn 14.50		Small drop out				Attn 14.75	Small drop out	15.50	Small drop out	15.25	Small drop out
		Co/No 10.32						Co/No 10.57		11.32		11.07	
AT&T Amati LSB DAR40203.DAT	CW	Attn 21.25	Small drop out	Attn 22.50	Small drop out	A	63.65	With no added noise TOA level of impairment.	63.75	With no added noise TOA level of impairment.			
		Co/No 17.27		Co/No 18.52			59.67		59.77				
	FM	Attn 21.25	Small drop out	Attn 22.50	Small drop out		D	24.75	Small drop out	27.75	Small drop out.		
		Co/No 17.27		Co/No 18.52				20.77		23.77			
		Attn 21.25		Small drop out				Attn 22.50	Small drop out	63.75	With no added noise TOA level of impairment.	63.75	With no added noise TOA level of impairment.
		Co/No 17.27						Co/No 18.52		59.77		59.77	
USADR FM1 DAR40201.DAT	CW	Attn 18.25	Small warble.	Attn 18.75	Small warble.	A	19.50	Wind Chime effect/ signal shattering.	20.25	Shattering and warbles.			
		Co/No 11.41		Co/No 11.91			12.66		13.41				
	FM	Attn 18.25	Small warble.	Attn 18.75	Small warble.		D	19.75	Shattering.	20.75	Warble or chirp.		
		Co/No 11.41		Co/No 11.91				12.91		13.91			
		Attn 18.25		Small warble.				Attn 18.75	Small warble.	19.25	Warble or Chirp.	20.00	Warble and shattering.
		Co/No 11.41						Co/No 11.91		12.41		13.16	
USADR FM2 DAR40204.DAT	CW	Attn 36.50	Small warble.	Attn 63.75	Could not achieve TOA. Level of impairment between TOA and POF.	A	39.25	Small warble.	63.75	NA			
		Co/No 22.90		Co/No 50.15			25.65		50.15				
	FM	Attn 39.25	Small warble.	Attn 63.75	Could not achieve TOA. Level of impairment between TOA and POF.		D	39.25	Small warble.	63.75	NA		
		Co/No 25.65		Co/No 50.15				25.65		50.15			
		Attn 39.25		Small warble.				Attn 63.75	Small warble.	39.50	Small warble.	63.75	NA
		Co/No 25.65						Co/No 50.15		25.90		50.15	
Notes:													
Testers: DML,RMc			Medium Signal Strength=		-62.00 dBm								
			Weak Signal Strength=		-77.00 dBm								

*92 kHz
problem*

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code		Program ID #					Description	Attn
	Start	Stop	1	2	3	4	5		
DAR40203.DAT 15-May-95			1	2	3	4	5	AT&T Amati LSB CPN@ 100% Small drop out #5.	21.25
		Medium Signal Strength -62 dBm	6	7	8			AT&T Amati LSB CPN@ 100% Group D @10% Larger more frequent drop outs and flutter (Beyond POF).	21.25
			9	10	11			AT&T Amati LSB CPN@ 90% Group B @20% More frequent drop outs and flutter.	21.25
			12	13	14			AT&T Amati LSB CPN@ 90% Group A @20% Larger more frequent drop outs and flutter.	21.25
			15	16	17			AT&T Amati LSB CPN@ 100% Small drop outs #16.	22.50
		Weak Signal Strength -77 dBm	18	19	20			AT&T Amati LSB CPN@ 100% Group D @10% More frequent drop outs and flutter.	22.50
			21	22	23			AT&T Amati LSB CPN@ 90% Group B @20% More frequent drop outs and flutter.	22.50
			24	25	26			AT&T Amati LSB CPN@ 90% Group A @20% More frequent drop outs and flutter.	22.50
			Impairment: FM, SCA and Gaussian Noise						

EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Code		Program ID #					Description	Attn	
	Start	Stop								
DAR40201.DAT 12-May-95		Medium Signal Strength -62 dBm	1	2	3	4	5	USADR FM1 CPN@100% #4 at end of 1st arpeggio	18.25	
			6	7	8			USADR FM1 CPN@90@ Group A @ 20% With the addition of SCAs high cut in addition to more warbles were heard.	18.25	
			9	10	11			USADR FM1 CPN@90% Group B @ 20% With the addition of SCAs high cut, shattering and warbles were detected	18.25	
			12	13	14			USADR FM1 CPN@100% Group D @ 10% Increase in warbles and error indicator frequency detected.	18.25	
			15	16	17	18	19	USADR FM1 CPN@100% #16 end of 1st arpeggio	18.75	
			20	21	22			USADR FM1 CPN@100% Group D @ 10% Increase in warbles, high cut and error light frequency.	18.75	
			23	24	25			USADR FM1 CPN@90% Group B @ 20% Increase in warbles, high cut and error light frequency.	18.75	
			26	27	28			USADR FM1 CPN@90@ Group A @ 20% Buzz mute increase in warbles and error light detected.	18.75	
				Weak Signal Strength -77 dBm						
								Impairment: FM, SCA and Gaussian Noise		

EIA Digital Audio Radio Test Laboratory

M-2 OVERHEAD DATA SHEET

Keypoint data used by (linked to) M2 test sheet for calculations

Test	M-2	Digital BW Hz	Noise dBm	Signal dBm	Path Loss dB	Noise Filter BW Hz	Date
AT&T Amati Digital only	DSB	1.47E+05	-40.71	-7.42 -20.60	40.79	6.45E+06	18-May-95
AT&T Amati Digital only	LSB	7.35E+04	-40.65	-7.55 -23.38	40.79	6.45E+06	19-May-95
USADR FM1 Digital only		2.00E+05	-40.60	-7.41 -21.93	40.79	6.45E+06	22-May-95
USADR FM2 Digital only		3.00E+05	-40.64	-7.40 -26.90	40.79	6.45E+06	23-May-95

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Test	M-2	Urban Slow Rayleigh						Urban Slow Rayleigh					
		Medium				Weak		FM w/ SCA GRP	Medium			Weak	
		Multipath + Noise		Multipath + Noise		Multipath + Noise + SCA			Multipath + Noise + SCA				
Signal Strength Impairment	Mod	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C		
AT&T Amati DSB	CW	Attn	Small drop out	Attn	Excessive muting POF level of impairment.	A	41.00	Medium drop out	63.75	NA			
		38.00		63.75			Co/No		59.49				
		33.74		59.49									
	FM	Attn	Small drop out	Attn	Excessive muting POF level of impairment.	D	41.00	Small drop out	63.75	NA			
		38.00		63.75			Co/No		59.49				
		33.74		59.49									
AT&T Amati LSB	CW	Attn	Level of impairment consistent with POF.	Attn	NA (no counts)	A	0.00	NA	0.00	NA			
		63.75		0.00			Co/No		-4.09				
		59.66		-4.09									
	FM	Attn	Level of impairment consistent with POF.	Attn	NA (meaningless data)	D	0.00	NA	0.00	NA			
		63.75		0.00			Co/No		-4.09				
		59.66		-4.09									
USADR FM1	CW	Attn	High cut and warbles level of impairment between TOA and POF closer to TOA.	Attn	NA	A	0.00	NA	0.00	NA			
		63.75		0.00			Co/No		-7.04				
		56.71		-7.04									
	FM	Attn	NA	Attn	NA	D	0.00	NA	0.00	NA			
		0.00		0.00			Co/No		-7.04				
		-7.04		-7.04									
USADR FM2	CW	Attn	Long mutes with brief periods of recovered audio with warbles and high cut, beyond POF.	Attn	NA	A	0.00	NA	0.00	NA			
		63.75		0.00			Co/No		-13.73				
		50.02		-13.73									
	FM	Attn	NA	Attn	NA	D	0.00	NA	0.00	NA			
		0.00		0.00			Co/No		-13.73				
		-13.73		-13.73									

see also B-3 app. AL 19.8 of 94

Notes:

Testers: DML, RMc

Medium Signal Strength= -62 dBm
Weak Signal Strength= -77 dBm

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Test	M-2	Urban Fast Rayleigh				FM w/ SCA GRP	Urban Fast Rayleigh			
		Medium Multipath + Noise		Weak Multipath + Noise			Medium Multipath + Noise + SCA		Weak Multipath + Noise + SCA	
		TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C		TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
AT&T Amati DSB	CW	Attn 28.00	Small flutter.	Attn 63.75	Small drop out. TOA level of impairment without added noise.	A	28.00	Small flutter.	63.75	NA
		Co/No 23.74		Co/No 59.49			Co/No 23.74		Co/No 59.49	
	FM	Attn 28.00	Small drop out.	Attn 63.75	Small drop out. TOA level of impairment without added noise.	D	28.00	Small drop out.	63.75	NA
		Co/No 23.74		Co/No 59.49			Co/No 24.74		Co/No 59.49	
AT&T Amati LSB	CW	Attn 39.00	Small flutter.	Attn 63.75	Without added noise worse than POF level of impairment.	A	63.75	Level of impairment between TOA and POF closer to TOA.	0.00	NA
		Co/No 34.91		Co/No 59.66			Co/No 59.66		Co/No -4.09	
	FM	Attn 40.00	Small drop out.	Attn 63.75	Without added noise worse than POF level of impairment.	D	63.75	Level of impairment between TOA and POF closer to TOA.	0.00	NA
		Co/No 35.91		Co/No 59.66			Co/No 59.66		Co/No -4.09	
USADR FM1	CW	Attn 37.00	Slight high cut.	Attn 63.75	High cut and warbles Impairment level between TOA and POF closer to POF.	A	63.75	Small chirp	63.75	High Cut and background noise
		Co/No 29.96		Co/No 56.71			Co/No 56.71		Co/No 56.71	
	FM	Attn 41.00	Small chirp.	Attn 63.75	High cut, warbles and slight mute impairment level between TOA and POF.	D	63.75	Small chirp	63.75	High Cut and background noise
		Co/No 33.96		Co/No 56.71			Co/No 56.71		Co/No 56.71	
USADR FM2	CW	Attn 63.75	Virtually no recovered audio, beyond a POF level of impairment.	Attn 0.00	NA	A	0.00	NA	0.00	NA
		Co/No 50.02		Co/No -13.73			Co/No -13.73		Co/No -13.73	
	FM	Attn 0.00	NA	Attn 0.00	NA	D	0.00	NA	0.00	NA
		Co/No -13.73		Co/No -13.73			Co/No -13.73		Co/No -13.73	
Notes:										
Testers: DML, RMc				Medium Signal Strength= -62 dBm				Weak Signal Strength= -77 dBm		

EIA Digital Audio Radio Test Laboratory

Test		Rural Fast Rayleigh				Rural Fast Rayleigh				
Signal Strength Impairment		Medium Multipath + Noise		Weak Multipath + Noise		Medium Multipath + Noise + SCA		Weak Multipath + Noise + SCA		
Mod	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	FM w/ SCA GRP	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	
AT&T Amati DSB	CW	Attn 32.00	Small drop out.	Attn 63.75	Many flutters and mutes. Level of impairment between TOA and POF, closer to POF.	A	32.00	Small flutter.	0.00	NA
		Co/No 27.74		Co/No 59.49			Co/No 27.74		-4.26	
	FM	Attn 32.00	Small drop out.	Attn 63.75	Many flutters and mutes. Level of impairment between TOA and POF, closer to POF.	D	32.00	Medium drop out.	0.00	NA
		Co/No 27.74		Co/No 59.49			Co/No 27.74		-4.26	
AT&T Amati LSB	CW	Attn 59.00	Small flutter.	Attn 63.75	No recovered Audio.	A	63.75	Level of impairment between TOA and POF closer to POF.	0.00	NA
		Co/No 54.91		Co/No 59.66			Co/No 59.66		-4.09	
	FM	Attn 59.00	Small flutter.	Attn 63.75	No recovered Audio.	D	63.75	Level of impairment between TOA and POF closer to POF.	0.00	NA
		Co/No 54.91		Co/No 59.66			Co/No 59.66		-4.09	
USADR FM1	CW	Attn 63.75	TOA level of impairment. Occasional chirp.	Attn 0.00	NA	A	0.00	NA	0.00	NA
		Co/No 56.71		Co/No -7.04			Co/No -7.04		-7.04	
	FM	Attn 0.00	NA	Attn 0.00	NA	D	0.00	NA	0.00	NA
		Co/No -7.04		Co/No -7.04			Co/No -7.04		-7.04	
USADR FM2	CW	Attn 63.75	Virtually no recovered audio. Beyond a POF level of impairment.	Attn 0.00	NA	A	0.00	NA	0.00	NA
		Co/No 50.02		Co/No -13.73			Co/No -13.73		-13.73	
	FM	Attn 0.00	NA	Attn 0.00	NA	D	0.00	NA	0.00	NA
		Co/No -13.73		Co/No -13.73			Co/No -13.73		-13.73	

Notes:

Testers: DML, RMc

Medium Signal Strength= -62 dBm
Weak Signal Strength= -77 dBm

EIA Digital Audio Radio Test Laboratory

Test	M-2	Terrain Obstructed Rayleigh				FM w/ SCA GRP	Terrain Obstructed Rayleigh			
		Medium Multipath + Noise		Weak Multipath + Noise			Medium Multipath + Noise + SCA		Weak Multipath + Noise + SCA	
		TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C		TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
AT&T Amati DSB	CW	Attn	Small drop out.	Attn	Many drop outs. Without added noise Level of impairment between TOA and POF.	A	32.00	Small drop out.	0.00	NA
		30.00		63.75			27.74		-4.26	
		Co/No 25.74		59.49			31.00		0.00	
	FM	Attn	Small drop out	Attn	Many drop outs. Without added noise Level of impairment between TOA and POF.	D	32.00	Small drop out.	0.00	NA
		31.00		63.75			26.74		-4.26	
		Co/No 26.74		59.49			27.74		-4.26	
AT&T Amati LSB	CW	Attn	Level of impairment between TOA and POF Closer to TOA.	Attn	NA	A	0.00	NA	0.00	NA
		63.75		63.75			-4.09		-4.09	
		Co/No 59.66		59.66			0.00		0.00	
	FM	Attn	Level of impairment between TOA and POF Closer to TOA.	Attn	NA	D	0.00	NA	0.00	NA
		63.75		63.75			-4.09		-4.09	
		Co/No 59.66		59.66			0.00		0.00	
USADR FM1	CW	Attn	POF level of impairment. High cut, warbles and occasional mutes.	Attn	NA	A	0.00	NA	0.00	NA
		63.75		0.00			-7.04		-7.04	
		Co/No 56.71		-7.04			0.00		0.00	
	FM	Attn	NA	Attn	NA	D	0.00	NA	0.00	NA
		0.00		0.00			-7.04		-7.04	
		Co/No -7.04		-7.04			0.00		0.00	
USADR FM2	CW	Attn	No recovered audio. Beyond a POF level of impairment.	Attn	NA	A	0.00	NA	0.00	NA
		63.75		0.00			-13.73		-13.73	
		Co/No 50.02		-13.73			0.00		0.00	
	FM	Attn	NA	Attn	NA	D	0.00	NA	0.00	NA
		0.00		0.00			-13.73		-13.73	
		Co/No -13.73		-13.73			0.00		0.00	
Notes:										
		Testers: DML,RMc				Medium Signal Strength=		-62 dBm		
						Weak Signal Strength=		-77 dBm		

EIA Digital Audio Radio Test Laboratory

Test		Urban Slow Doppler								
Signal Strength Impairment		Medium Multipath + Noise				Weak Multipath + Noise				
Mod	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	FM w/ SCA GRP	Medium Multipath + Noise + SCA		Weak Multipath + Noise + SCA		
						TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	
AT&T Amati DSB	CW	Attn	Static Pop and mute. Level of impairment between TOA and POF, closer to TOA.	Attn	Medium duration mute. Level of impairment between TOA and POF, closer to POF.	A	0.00	NA	0.00	NA
		63.75		0.00			-4.26		-4.26	
		Co/No		-4.26			-4.26		-4.26	
	FM	Attn	Flutter and mute. Level of impairment between TOA and POF, closer to TOA.	Attn	Long duration mute. Level of impairment between TOA and POF, closer to POF.	B	0.00	NA	0.00	NA
		63.75		0.00			-4.26		-4.26	
		Co/No		-4.26			-4.26		-4.26	
AT&T Amati LSB	CW	Attn	With no added noise recovered audio is consistent with POF at deepest mp fades.	Attn	NA	A	0.00	NA	0.00	NA
		63.75		0.00			-4.09		-4.09	
		Co/No		-4.09			-4.09		-4.09	
	FM	Attn	With no added noise recovered audio is consistent with POF at deepest mp fades.	Attn	NA	B	0.00	NA	0.00	NA
		63.75		0.00			-4.09		-4.09	
		Co/No		-4.09			-4.09		-4.09	
USADR FM1	CW	Attn		Attn		A	0.00		0.00	
		0.00		0.00			-7.04		-7.04	
		Co/No		-7.04			-7.04		-7.04	
	FM	Attn		Attn		B	0.00		0.00	
		0.00		0.00			-7.04		-7.04	
		Co/No		-7.04			-7.04		-7.04	
USADR FM2	CW	Attn		Attn		A	0.00		0.00	
		0.00		0.00			-13.73		-13.73	
		Co/No		-13.73			-13.73		-13.73	
	FM	Attn		Attn		B	0.00		0.00	
		0.00		0.00			-13.73		-13.73	
		Co/No		-13.73			-13.73		-13.73	

Notes:

Testers: DML, RMc

Medium Signal Strength= -62 dBm
Weak Signal Strength= -77 dBm

DELETE THIS PG. (also pg. 14-16)

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Test	M-2	Urban Fast Doppler				FM w/ SCA GRP	Urban Fast Doppler			
		Medium Multipath + Noise		Weak Multipath + Noise			Medium Multipath + Noise + SCA		Weak Multipath + Noise + SCA	
		TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C		TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
AT&T Amati DSB	CW	Attn 21.00	Small flutter.	Attn 22.00	Small flutter.	A	0.00	NA	0.00	NA
		Co/No 16.74		Co/No 17.74			-4.26		-4.26	
	FM	Attn 22.00	Small flutter.	Attn 22.00	Small flutters.	D	0.00	NA	0.00	NA
		Co/No 17.74		Co/No 17.74			-4.26		-4.26	
AT&T Amati LSB	CW	Attn 0.00		Attn 0.00		A	0.00		0.00	
		Co/No -4.09		Co/No -4.09			-4.09		-4.09	
	FM	Attn 0.00		Attn 0.00		D	0.00		0.00	
		Co/No -4.09		Co/No -4.09			-4.09		-4.09	
USADR FM1	CW	Attn 0.00		Attn 0.00		A	0.00		0.00	
		Co/No -7.04		Co/No -7.04			-7.04		-7.04	
	FM	Attn 0.00		Attn 0.00		D	0.00		0.00	
		Co/No -7.04		Co/No -7.04			-7.04		-7.04	
USADR FM2	CW	Attn 0.00		Attn 0.00		A	0.00		0.00	
		Co/No -13.73		Co/No -13.73			-13.73		-13.73	
	FM	Attn 0.00		Attn 0.00		D	0.00		0.00	
		Co/No -13.73		Co/No -13.73			-13.73		-13.73	

Notes: Testers: DML,RMc Medium Signal Strength= -62 dBm Weak Signal Strength= -77 dBm

EIA Digital Audio Radio Test Laboratory

Test	M-2	Rural Fast Doppler						Rural Fast Doppler					
		Medium				Weak		FM w/ SCA GRP	Medium			Weak	
		Multipath + Noise		EO&C		Multipath + Noise			Multipath + Noise + SCA		Multipath + Noise + SCA		
Signal Strength Impairment	Mod	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C		
AT&T Amati DSB	CW	Attn	Small drop out and flutter.	Attn	Small drop out.	A	0.00	NA	0.00	NA	0.00	NA	
		18.00		18.00			-4.26		-4.26				
		Co/No 13.74		Co/No 13.74			0.00		0.00				
	FM	Attn	Small flutter.	Attn	Small flutter.	D	0.00	NA	0.00	NA	0.00	NA	
		19.00		18.00			-4.26		-4.26				
		Co/No 14.74		Co/No 13.74			0.00		0.00				
AT&T Amati LSB	CW	Attn		Attn		A	0.00		0.00		0.00		
		0.00		0.00			-4.09		-4.09				
		Co/No -4.09		Co/No -4.09			0.00		0.00				
	FM	Attn		Attn		D	0.00		0.00		0.00		
		0.00		0.00			-4.09		-4.09				
		Co/No -4.09		Co/No -4.09			0.00		0.00				
USADR FM1	CW	Attn		Attn		A	0.00		0.00		0.00		
		0.00		0.00			-7.04		-7.04				
		Co/No -7.04		Co/No -7.04			0.00		0.00				
	FM	Attn		Attn		D	0.00		0.00		0.00		
		0.00		0.00			-7.04		-7.04				
		Co/No -7.04		Co/No -7.04			0.00		0.00				
USADR FM2	CW	Attn		Attn		A	0.00		0.00		0.00		
		0.00		0.00			-13.73		-13.73				
		Co/No -13.73		Co/No -13.73			0.00		0.00				
	FM	Attn		Attn		D	0.00		0.00		0.00		
		0.00		0.00			-13.73		-13.73				
		Co/No -13.73		Co/No -13.73			0.00		0.00				

Notes:

Testers: DML,RMc

Medium Signal Strength=-62 dBm
Weak Signal Strength=-77 dBm

EIA Digital Audio Radio Test Laboratory

Test	M-2	Terrain Obstructed Doppler				Terrain Obstructed Doppler				
		Medium		Weak		Medium		Weak		
		Multipath + Noise		Multipath + Noise		Multipath + Noise + SCA		Multipath + Noise + SCA		
Signal Strength Impairment	Mod	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	FM w/ SCA GRP	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
AT&T Amati DSB	CW	Attn	Small drop out.	Attn	Small drop out.	A	0.00	NA	0.00	NA
		25.00		24.00			Co/No		-4.26	
		Co/No		19.74			Co/No		-4.26	
	FM	Attn	Small drop out.	Attn	Small flutter.	D	0.00	NA	0.00	NA
		24.00		24.00			Co/No		-4.26	
		Co/No		19.74			Co/No		-4.26	
AT&T Amati LSB	CW	Attn		Attn		A	0.00		0.00	
		0.00		0.00			Co/No		-4.09	
		Co/No		-4.09			Co/No		-4.09	
	FM	Attn		Attn		D	0.00		0.00	
		0.00		0.00			Co/No		-4.09	
		Co/No		-4.09			Co/No		-4.09	
USADR FM1	CW	Attn		Attn		A	0.00		0.00	
		0.00		0.00			Co/No		-7.04	
		Co/No		-7.04			Co/No		-7.04	
	FM	Attn		Attn		D	0.00		0.00	
		0.00		0.00			Co/No		-7.04	
		Co/No		-7.04			Co/No		-7.04	
USADR FM2	CW	Attn		Attn		A	0.00		0.00	
		0.00		0.00			Co/No		-13.73	
		Co/No		-13.73			Co/No		-13.73	
	FM	Attn		Attn		D	0.00		0.00	
		0.00		0.00			Co/No		-13.73	
		Co/No		-13.73			Co/No		-13.73	

Notes:

Testers: DML,RMc

1

Medium Signal Strength=
Weak Signal Strength=

-62 dBm
-77 dBm

APPENDIX AS

Test O

Test: O

DAR -> Analog Subcarrier Interference, Part F

Date: 8/11/95

Index

Page	Description
1	Cover sheet
2	DAR -> Analog subcarrier interference with the Digital Proponent on the desired frequency (Co-channel). (F1)
3	DAR -> Analog subcarrier interference with the Digital Proponent on the lower first adjacent channel. (F2)
4	DAR -> Analog subcarrier interference with the Digital Proponent on the lower second adjacent channel. (F3)
5	Conceptual block diagram of the signal set up.
6	Conceptual block diagram of the receiver and measurement set up.

Notes:

- * Clipped pink noise used as modulation of the analog channel of the undesired (Proponent) signal.
- * 1KHz tone at 81% (9% pilot, 20% group SCA) used for main channel 0dB signal reference.
- * 400Hz at 10KHz baseband deviation used as SCA 0dB signal reference.
- * SCA group C (67KHz and 92KHz analog) included on both desired and undesired signals
- * Total modulation on analog channels: 110% (SCA group level at 20%)
- * Main channel audio measurements made using quasi-peak detection and a CCIR weighting filter
- * SCA audio measurements made as RMS unweighted.
- * Receivers tested at medium signal strength (-62dBm)
- * "Analog Ref. D/U" column indicates test performed at a constant D / U. (Proponent RF lev. = Analog Ref. RF lev.)
- * "D/U @ Eq. S/N" column indicates test performed at a constant main channel signal to noise ratio. (45dB)
- * F3 main channel target signal to noise ratio is 47dB due to receiver characteristics.

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→ undesired signal (IBoC) level varied to establish target S/N ratio

RECEIVER: DELCO		SCA GROUP	Analog Ref. D / U	F1 D/U @ Eq. S/N	67KHz Receiver		92KHz Receiver	
					S/N/ RATIO dB	THD %	S/N/ RATIO dB	THD %
DESIRED TRANSMITTER ONLY		C	NA	NA	40.00	1.47	48.50	2.44
INTERFERERS								
ANALOG TRANSMITTER		C	36.00		38.80	1.58	45.60	2.48
AT&T		C	36.00		39.50	1.55	39.80	2.63
				36.00	39.50	1.55	39.80	2.63
AT&T / Amati DSB		C	36.00		38.75	1.58	45.50	2.48
				36.75	39.00	1.55	46.00	2.45
USADR FM1		C	36.00		39.80	1.48	48.40	2.45
				35.50	39.70	1.48	48.30	2.46

NOTES: * S/N Ratio (Auto Radio cross check only) 0dB Reference with 1KHz audio @ 81% modulation (pilot @ 9%) Group C SCAs
 * S/N Ratio (SCA Receivers) 0dB reference with 400Hz audio at 10KHz deviation (Baseband)
 * SCA S/N ratio measurements are RMS unweighted
 * Boonton (desired signal) modulation: 110% with SCAs
 * Undesired (analog) modulation: 110% with SCAs
 * SCA injection levels measured at 10% each

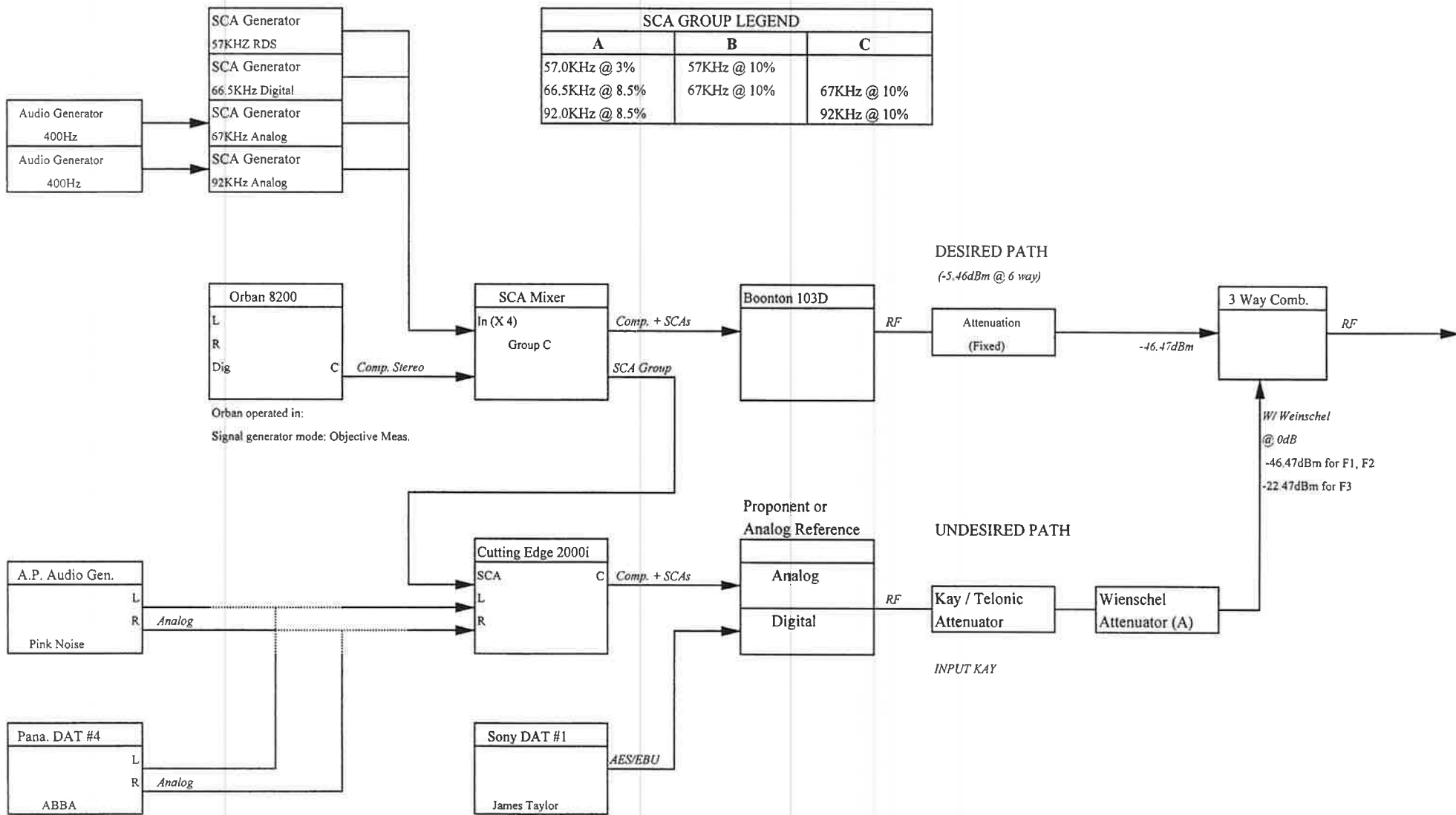
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Test O, F2 DAR -> Analog (SCAs) Lower 1st adjacent		Date : 8/11/95 Engineers: DML/RMc		Target S/N ratio for "D / U @ Eq. S/N" is 45dB				
		DML/RMc						
RECEIVER: DELCO	SCA GROUP		Analog Ref. D / U	F2 D/U @ Eq. S/N	67KHz Receiver		92KHz Receiver	
					S/N/ RATIO dB	THD %	S/N/ RATIO dB	THD %
DESIRED TRANSMITTER ONLY		C	NA	NA	40.00	1.47	48.50	2.45
INTERFERERS								
ANALOG TRANSMITTER		C	4.00	NA	36.00	2.00	26.60	5.50
AT&T		C	4.00		40.00	1.50	15.00	22.00
				6.75	40.00	1.50	19.00	11.50
AT&T / Amati DSB		C	4.00		30.00	10.00	25.00	5.90
				18.50	39.50	1.50	39.00	2.65
USADR FM1		C	4.00		32.00	8.00	25.00	6.60
				16.00	39.50	1.58	36.50	2.90
NOTES: * S/N Ratio (Auto Radio cross check only) 0dB Reference with 1KHz audio @ 81% modulation (pilot @ 9%) Group C SCAs * S/N Ratio (SCA Receivers) 0dB reference with 400Hz audio at 10KHz deviation (Baseband) * SCA S/N ratio measurements are RMS unweighted * Boonton (desired signal) modulation: 110% with SCAs * Undesired (analog) modulation: 110% with SCAs * SCA injection levels measured at 10% each								

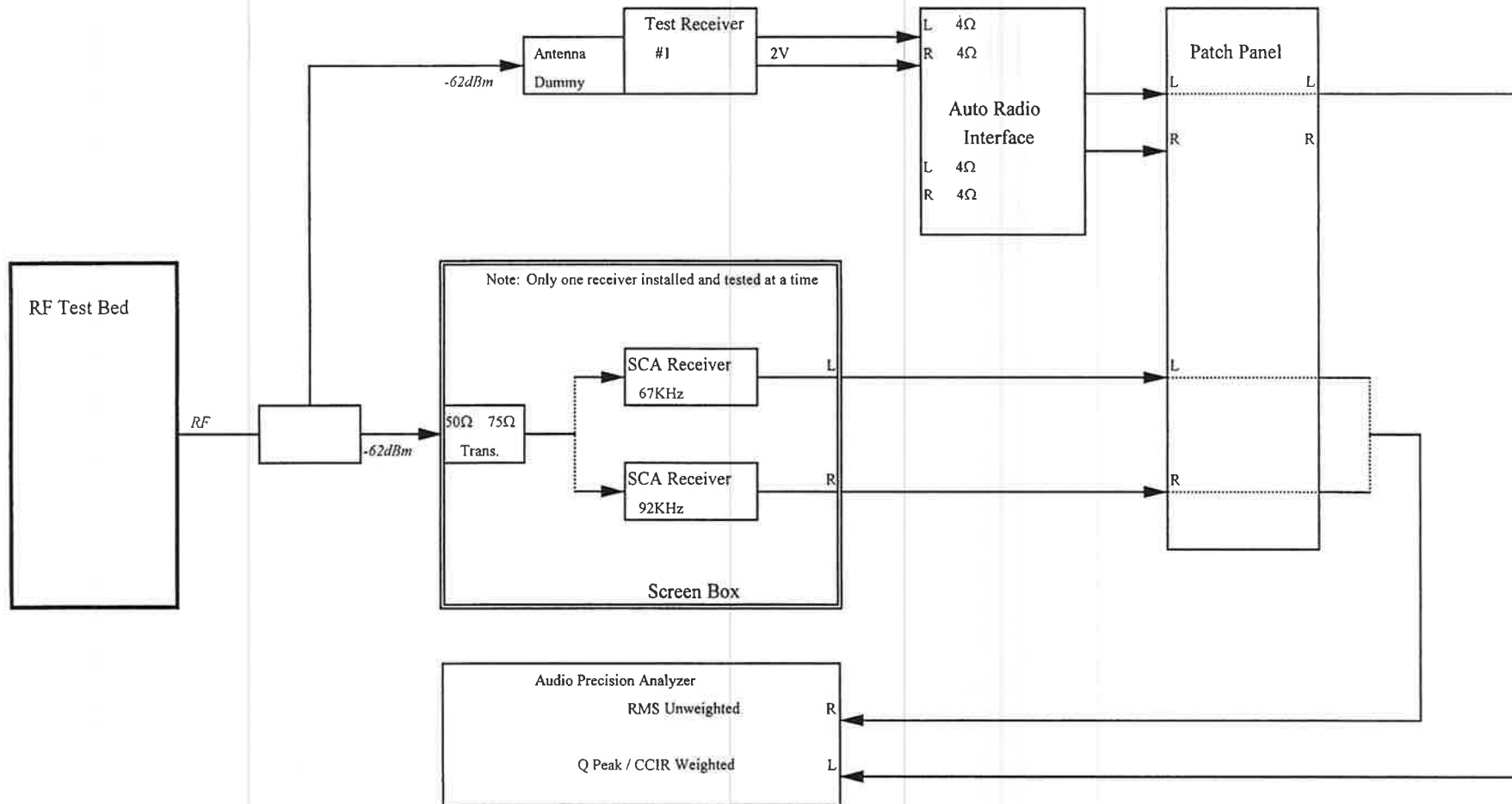
EIA Digital Audio R) Test Laboratory

Test O,F3 DAR -> Analog (SCAs) Lower 2nd adjacent		Date : 8/11/95 Engineers: DML/RMc		Target S/N ratio for "D / U @ Eq. S/N" is 47dB				
		DML/RMc						
Receiver : DELCO					67KHz Receiver		92KHz Receiver	
	SCA GROUP		Analog Ref. D / U	F3 D/U @ Eq. S/N	S/N/ RATIO dB	THD %	S/N/ RATIO dB	THD %
DESIRED TRANSMITTER	C		NA	NA	40.00	1.47	48.50	2.45
INTERFERERS								
ANALOG TRANSMITTER	C		-24.00		41.00	1.45	28.00	5.00
AT&T	C		-24.00					
				-24.00	33.70	4.50	26.00	6.00
AT&T / Amati DSB	C		-24.00					
				-24.00	11.00	45.00	7.00	85.00
USADR FM1	C		-24.00					
				-24.00	8.00	55.00	7.00	90.00
NOTES: * S/N Ratio (Auto Radio cross check only) 0dB Reference with 1KHz audio @ 81% modulation (pilot @ 9%) Group C SCAs * S/N Ratio (SCA Receivers) 0dB reference with 400Hz audio at 10KHz deviation (Baseband) * SCA S/N ratio measurements are RMS unweighted * Boonton (desired signal) modulation: 110% with SCAs * Undesired (analog) modulation: 110% with SCAs * SCA injection levels measured at 10% each								

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NRSC-R58

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: _____



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