# 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



REPORT

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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 overthe-air radio broadcasting systems in the United States.

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# **APPENDIX AM**

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

#### 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) DAR -> Analog interference at a 35dB signal to noise ratio with the Digital Proponent on the desired frequency 3 Digital Audio Tape recording log of the Co-channel results 4

#### 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.

Fest F-1, F-4 and G-1			F-1	F-4	G-1 Urban Slow Rayleigh	G-1 Urban Fast Rayleig
45 dB S/N Receiver #1				Co-Channel DAR to Analog	Co-Channel DAR to Analog	Co-Channel DAR to Analog
Receiver #1 DELCO				DAR to Analog	with Multipath	with Multipath
16192463	Measurements		d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8.80	36.17	Interfering Audio detectable and		
Reference	Loss	40.71		tracks with ABBA beat		
	undesired	-41,43				
RX Level	Loss	21.75				
-62.00 dBm AT&T	Attn desired	22.50 -8.80	36.03	Audible background noise	DAR->FM Less Annoying than	FM-> FM same as
IBAC	Loss	-0.00 40.71	30.03	increases	FM->FM	DAR-> FM
IDAC	undesired	-15.61		DAR->FM Less Annoying than	No detectable modulation	
RX Level	Loss	47.68		FM->FM	with digital	
-62.00 dBm	Attn	22.25		d/u attn= 22.39 dB	_	
AT&T Amati	desired	-8,80	36.67	Same as Analog Reference	FM-> FM same as	FM-> FM same as
DSB IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-7.00				
RX Level	Loss	47.68				
-62.00 dBm AT&T Amati	Attn desired	31,50 -8.80	36.78	d/u attn= 31.00 dB Same as Analog Reference	FM-> FM same as	FM-> FM same as
LSB IBOC	Loss	-8.80	30,70	Same as Analog Reference	DAR-> FM	DAR-> FM
LIB IDOC	undesired	-7.11				
RX Level	Loss	47.68				
-62,00 dBm	Attn	31.50		d/u attn= 30.89 dB		
USADR FM1	desired	-8.80	35.40	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-9.73				
RX Level	Loss Attn	47.68		d/u attn= 28.27 dB		
-62.00 dBm USADR FM2	desired	27.50	35.47	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	Loss	40.71	33.47	Same as Analog Reference	DAR-> FM	DAR-> FM
	undesired	-6.05				
RX Level	Loss	47.68				
-62,00 dBm	Atta	31.25		d/u attn= 31.95 dB		

File Name:FI\_RX1T\_XLS 45dB

Measurements lesired -8.8	d/u in dB	16192463	Maximum			DELCO			
lesired -8.8			Measurements		d/u in dB	16192463	Measurements		d/u in dB
Loss 40.7		Analog to Analog Reference	desired Loss	-8.80 40.71	22.91	Analog to Analog Reference	desired Loss	-8.77	NA
indesired -41.4	.3		undesired			Reference		40.71	
	5	RX Level	Loss	2535517		RX Level		20.034313	
		-77.00 dBm	Attn				CONTRACTOR DESCRIPTION OF THE PARTY OF THE P		
(360-92-91)		AT&T	desired		22.07				NA
-04252		IBAC	Loss	40,71					INA
1010			undesired	-15.65			and the second se	20	
AUDOCOCCULATION AND ADDRESS OF A		RX Level	Loss	47.68		RX Level			
		-77.00 dBm	Attn	8.25			2.24 (Contractor VY) COCOLG.		
			desired	-8,80	23.67			ACC 54 (24) 741	NA
		DSB IBOC	Loss	40.71				0.001	IVA
State and the second			undesired	-8.00					
the second s			Loss	47.68		RX Level			
			Attn	17.50		-77.00 dBm			
			desired	-8.80	24.02				NA
		LSB IBOC	Loss	40.71		LSB IBOC		96510 1	1928
			undesired	-8.10	-D //				
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA			Loss	47.68		RX Level		2-27-26-26	
			Attn	17.75		-77.00 dBm	444400000000000000000000000000000000000		
		A STATISTICS CONTRACTOR STOCKED	desired	-8.80	21.67			ALC: NOT A	NA
Contraction of the last		IBOC	Loss	40.71			[11] S. K. S.		INA
			undesired	-9.50					
with the second s	- 1		Loss	47.68		RX Level			
000000000000000000000000000000000000000			Attn	14.00		-77.00 dBm			
	Constraint (		desired	-8.80	22.26	USADR FM2	000000000000000000000000000000000000000		NA
		IBOC	Loss	40 71			1.		1 1778
CONTRACT CONTRACTOR	1 1		undesired	-6.09				0.0	
With reconstructions			Loss	47.68		RX Level			
dn 19.75	·	-77.00 dBm	Atta	18.00		-77.00 dBm			
	.oss         21 7           stim         10.0           esired         -8.8           oss         40.7           ndesired         -15.6           oss         47.6           itin         10.2           esired         -8.8           oss         47.6           itin         10.2           esired         -8.8           oss         40.7           ndesired         -8.0           oss         47.64           itin         18.22           esired         -8.80           oss         40.71           ndesired         -8.12           oss         47.68           tim         18.50           ssiered         -8.80           oss         47.68           tim         16.25           oss         40.71           idesired         -8.80           oss         47.68           tim         16.25           oss         40.71           idesired         -6.05           oss         40.71	Anno         Anno           coss         21.75           ktm         10.00           esired         -8.80           coss         40.71           indesired         -15.61           coss         47.68           ktm         10.25           esired         -8.80           coss         40.71           indesired         -8.80           coss         40.71           indesired         -8.80           coss         47.68           tfm         18.25           estired         -8.80           coss         40.71           indesired         -8.13           coss         47.68           tfm         18.50           sstred         -8.80         23.91           coss         40.71           indesired         -9.49           coss         40.71           indesired         -9.49           coss         40.71           indesired         -8.80         23.97           coss         40.71           indesired         -6.05           coss         40.71           indesired <td>Noss         21.75         RX Level           stim         10.00         -77.00 dBm           esired         -8.80         24.03         AT&amp;T           oss         40.71         IBAC         IBAC           oss         40.71         IBAC         IBAC           oss         47.68         RX Level         -77.00 dBm           csired         -15.61         RX Level         -77.00 dBm           csired         -8.80         24.43         AT&amp;T Amati           oss         40.71         DSB IBOC         -77.00           ndesired         -8.01         -77.00         Bm           oss         47.68         RX Level         -77.00           tm         18.25         -77.00         ISB IBOC           oss         40.71         DSB IBOC         -77.00           oss         40.71         LSB IBOC         -77.00 dBm           oss         40.71         ISO         -77.00 dBm           oss         47.68         RX Level         -77.00 dBm           oss         40.71         IBOC         -77.00 dBm           oss         40.71         IBOC         -77.00 dBm           oss         40.71</td> <td>All ossAll ossAll desiredcoss21.75RX LevelLossesired-8.8024.03AT&amp;Tdesiredcoss40.71IBACLossundesired-15.61IBACLosscoss47.68RX LevelLossutin10.25-77.00 dBmAttraesired-8.8024.43AT&amp;T Amatidesiredcoss40.71DSB IBOCLossundesiredcoss40.71DSB IBOCLossundesiredcoss47.68RX LevelLossundesiredtim18.25-77.00Attracoss40.71LSB IBOCLossundesired-8.8024.80AT&amp;T Amaticoss40.71LSB IBOCLossundesired-8.13undesiredcoss40.71LSB IBOCLossundesired-8.8023.91USADR FM1desired-9.49undesiredLossundesired-9.49undesiredLossundesired-9.49S-77.00 dBmattra16.25-77.00 dBmAttraundesired-9.49undesiredLossundesired-8.8023.97USADR FM2desireduss40.71IBOCLossundesiredundesired-6.05RX LevelLossundesiredundesired-6.05RX LevelLossundesiredundesired-6.05RX LevelL</td> <td>noss       21.75       RX Level       Littessed       <math>-41.42</math>         coss       21.75       RX Level       Loss       21.75         esired       -8.80       24.03       AT&amp;T       desired       -8.80         coss       40.71       IBAC       Loss       40.71         indesired       -15.61       undesired       -15.65         coss       47.68       RX Level       Loss       47.68         cittin       10.25       -77.00 dBm       Attin       8.25         esired       -8.80       24.43       AT&amp;T Amati       desired       -8.80         coss       40.71       DSB IBOC       Loss       40.71         indesired       -8.80       DSB IBOC       Loss       40.71         indesired       -8.80       DSB IBOC       Loss       40.71         indesired       -8.80       RX Level       Loss       47.68         itm       18.25       -77.00       Attin       17.50         cesired       -8.80       24.80       AT&amp;T Amati       desired       -8.80         coss       40.71       Indesired       -8.80       -77.00       Attin       17.50         cesire</td> <td>coss       21.75       RX Level       Litestred       -41.42         coss       10.00       -77.00 dBm       Attin       9.25         esired       -8.80       24.03       AT&amp;T       desired       -8.80       22.07         ndesired       -15.61       IBAC       Loss       40.71       undesired       -15.65         coss       47.68       RX Level       Loss       47.68       47.68       47.68         dtin       10.25       -77.00 dBm       Attin       8.25       -77.00 dBm       Attin       8.25         esired       -8.80       24.43       AT&amp;T Amati       desired       -8.80       23.67         oss       40.71       DSB IBOC       Loss       40.71       undesired       -8.80       23.67         oss       47.68       RX Level       Loss       40.71       undesired       -8.80       23.67         oss       47.68       RX Level       Loss       40.71       undesired       -8.80       23.67         oss       47.68       RX Level       Loss       47.68       23.67       23.67         oss       47.68       RX Level       Loss       40.71       17.50         &lt;</td> <td>oss         21.75         RX Level         Loss         21.75         RX Level           esired         -8.80         24.03         AT&amp;T         desired         -8.80         22.07         AT&amp;T           indesired         -15.61         IBAC         Loss         40.71         IBAC         IBAC           oss         40.71         IBAC         Loss         40.71         IBAC         IBAC           oss         47.68         RX Level         Loss         40.71         IBAC         IBAC           oss         47.68         RX Level         Loss         40.71         IBAC         IBAC           oss         47.68         RX Level         Loss         40.71         IBAC         IBAC           desired         -8.80         23.67         AT&amp;T Amati         desired         -8.80         23.67         AT&amp;T Amati           oss         40.71         DSB IBOC         Loss         40.71         DSB IBOC         IDSS IBOC         IDSS         47.68         RX Level           oss         47.68         RX Level         Loss         47.61         LSB IBOC         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm<td>ass       21.75       RX Level       Loss       21.75       RX Level       Loss       21.75       RX Level       Loss       21.75       RX Level       Loss       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       0.05       47.67       desired       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       47.68       RX Level       Loss       47.68       IBAC       Loss       47.68       IBAC       Loss       47.68       RX Level       Loss       47.68       IBAC       Loss       47.68       IBAC       Loss       47.68       Imdesired       Loss</td><td>Indesired         -41.43 (ass         undesired         -41.42 (boss         undesired         -77.00 dBm         Attr         92.55           oss         40.71         IBAC         Loss         40.71         IBAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         40.71         Undesired         -8.80         23.67         AT&amp; T Amati         desired         -8.77         DSB IBOC         Loss         40.71         Undesired         -8.70         DSB IBOC         Loss         40.71         Undesired         -8.77         DSB IBOC         Loss         47.68         RX Level         Loss         47.68         RX Level         <td< td=""></td<></td></td>	Noss         21.75         RX Level           stim         10.00         -77.00 dBm           esired         -8.80         24.03         AT&T           oss         40.71         IBAC         IBAC           oss         40.71         IBAC         IBAC           oss         47.68         RX Level         -77.00 dBm           csired         -15.61         RX Level         -77.00 dBm           csired         -8.80         24.43         AT&T Amati           oss         40.71         DSB IBOC         -77.00           ndesired         -8.01         -77.00         Bm           oss         47.68         RX Level         -77.00           tm         18.25         -77.00         ISB IBOC           oss         40.71         DSB IBOC         -77.00           oss         40.71         LSB IBOC         -77.00 dBm           oss         40.71         ISO         -77.00 dBm           oss         47.68         RX Level         -77.00 dBm           oss         40.71         IBOC         -77.00 dBm           oss         40.71         IBOC         -77.00 dBm           oss         40.71	All ossAll ossAll desiredcoss21.75RX LevelLossesired-8.8024.03AT&Tdesiredcoss40.71IBACLossundesired-15.61IBACLosscoss47.68RX LevelLossutin10.25-77.00 dBmAttraesired-8.8024.43AT&T Amatidesiredcoss40.71DSB IBOCLossundesiredcoss40.71DSB IBOCLossundesiredcoss47.68RX LevelLossundesiredtim18.25-77.00Attracoss40.71LSB IBOCLossundesired-8.8024.80AT&T Amaticoss40.71LSB 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      40.71         indesired       -8.80       DSB IBOC       Loss       40.71         indesired       -8.80       RX Level       Loss       47.68         itm       18.25       -77.00       Attin       17.50         cesired       -8.80       24.80       AT&T Amati       desired       -8.80         coss       40.71       Indesired       -8.80       -77.00       Attin       17.50         cesire	coss       21.75       RX Level       Litestred       -41.42         coss       10.00       -77.00 dBm       Attin       9.25         esired       -8.80       24.03       AT&T       desired       -8.80       22.07         ndesired       -15.61       IBAC       Loss       40.71       undesired       -15.65         coss       47.68       RX Level       Loss       47.68       47.68       47.68         dtin       10.25       -77.00 dBm       Attin       8.25       -77.00 dBm       Attin       8.25         esired       -8.80       24.43       AT&T Amati       desired       -8.80       23.67         oss       40.71       DSB IBOC       Loss       40.71       undesired       -8.80       23.67         oss       47.68       RX Level       Loss       40.71       undesired       -8.80       23.67         oss       47.68       RX Level       Loss       40.71       undesired       -8.80       23.67         oss       47.68       RX Level       Loss       47.68       23.67       23.67         oss       47.68       RX Level       Loss       40.71       17.50         <	oss         21.75         RX Level         Loss         21.75         RX Level           esired         -8.80         24.03         AT&T         desired         -8.80         22.07         AT&T           indesired         -15.61         IBAC         Loss         40.71         IBAC         IBAC           oss         40.71         IBAC         Loss         40.71         IBAC         IBAC           oss         47.68         RX Level         Loss         40.71         IBAC         IBAC           oss         47.68         RX Level         Loss         40.71         IBAC         IBAC           oss         47.68         RX Level         Loss         40.71         IBAC         IBAC           desired         -8.80         23.67         AT&T Amati         desired         -8.80         23.67         AT&T Amati           oss         40.71         DSB IBOC         Loss         40.71         DSB IBOC         IDSS IBOC         IDSS         47.68         RX Level           oss         47.68         RX Level         Loss         47.61         LSB IBOC         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm <td>ass       21.75       RX Level       Loss       21.75       RX Level       Loss       21.75       RX Level       Loss       21.75       RX Level       Loss       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       0.05       47.67       desired       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       47.68       RX Level       Loss       47.68       IBAC       Loss       47.68       IBAC       Loss       47.68       RX Level       Loss       47.68       IBAC       Loss       47.68       IBAC       Loss       47.68       Imdesired       Loss</td> <td>Indesired         -41.43 (ass         undesired         -41.42 (boss         undesired         -77.00 dBm         Attr         92.55           oss         40.71         IBAC         Loss         40.71         IBAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         40.71         Undesired         -8.80         23.67         AT&amp; T Amati         desired         -8.77         DSB IBOC         Loss         40.71         Undesired         -8.70         DSB IBOC         Loss         40.71         Undesired         -8.77         DSB IBOC         Loss         47.68         RX Level         Loss         47.68         RX Level         <td< td=""></td<></td>	ass       21.75       RX Level       Loss       21.75       RX Level       Loss       21.75       RX Level       Loss       21.75       RX Level       Loss       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       9.25       -77.00 dBm       Atta       0.05       47.67       desired       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       40.71       IBAC       Loss       47.68       RX Level       Loss       47.68       IBAC       Loss       47.68       IBAC       Loss       47.68       RX Level       Loss       47.68       IBAC       Loss       47.68       IBAC       Loss       47.68       Imdesired       Loss	Indesired         -41.43 (ass         undesired         -41.42 (boss         undesired         -77.00 dBm         Attr         92.55           oss         40.71         IBAC         Loss         40.71         IBAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         40.71         Undesired         -8.80         23.67         AT& T Amati         desired         -8.77         DSB IBOC         Loss         40.71         Undesired         -8.70         DSB IBOC         Loss         40.71         Undesired         -8.77         DSB IBOC         Loss         47.68         RX Level         Loss         47.68         RX Level <td< td=""></td<>

DAT File	90000000000000000000000000000000000000	Time Code Start IDs				Grade		
Number	Start	Stop	1		Description	1 2		
DAR40110.DAT		1						
2/15/95								
			1		AT&T Co-Channel			
Disregard			2					
Disregard			3					
			4		FM1 Co-Channel			
			5		FM2 Co-Channel			
			6	1	Amati DSB Co-Channel			
			7	1	Amati LSB Co-Channel			
Disregard	************************************		8	1				
Disregard Disregard			9					
Disregard			10					
	••••••		11	1	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	· • • • • • • • • • • • • • • • • • • •	A mat DSD Orban rast with CO-Chainer			
DibioBara			21		AT&T Urban Fast with Co-Channel			
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#### Tests F1, F4 and G1

Rx No.: #2 Mfg.: DEN	ON
Model: TU-3 Serial: 4056	
ndex	
age	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
otes:	
*	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.

Test F-1, F-4 and G-1		F-1	F-4	G-1 Urban Slow Rayleigh	G-1 Urban Fast Rayleigh
45 dB S/N			Co-Channel	Co-Channel	Co-Channel
Receiver #2			DAR to Analog	DAR to Analog	DAR to Analog
DENON		1		with Multipath	with Multipath
TU-380RD	Measurements	d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired ·	8.77 43.39	Interfering Audio detectable and		
Reference	Loss 4	0.71	tracks with ABBA beat		
	undesired -4	1.37			7
RX Level	Loss 2	1,75			
-62,00 dBm	Attn 2	9.75			
AT&T	desired	8.77 42.53	Audible background noise	DAR->FM Less Annoying than	FM-> FM same as
IBAC	Loss 4	0.71	increases	FM->FM	DAR-> FM
1	undesired -1	5.58	DAR->FM Less Annoying than	No detectable modulation	
RX Level	Loss 4	7.68	FM->FM	with digital	
-62.00 dBm	Attn 2	8.75	d/u attn= 29.61 dB		
AT&T Amati	desired	8.77 42.79	Same as Analog Reference	FM-> FM same as	FM-> FM same as
DSB IBOC	Loss 4	0.71		DAR-> FM	DAR-> FM
1	undesired	7.84			
RX Level		7.68			
-62.00 dBm	CARACTERIA CONTRACTOR CONTRACTOR	6.75	d/u attn= 37.35 dB		
AT&T Amati		8.77 42.95	Same as Analog Reference	FM-> FM same as	FM-> FM same as
LSB IBOC	Loss 4	0.71		DAR-> FM	DAR-> FM
7		8.00			
RX Level		7.68			
-62.00 dBm		6.75	d/u attn= 37.19 dB		
USADR FM1		8.77 42.89	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC		0.71	5	DAR-> FM	DAR-> FM
10T		9.44			
RX Level		7.68			
-62.00 dBm	Atta	5.25	d/u attn= 35.75 dB		
USADR FM2		8.77 42.94	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC		0.71	L L	DAR-> FM	DAR-> FM
		5.99			
RX Level		7.68			
-62.00 dBm	and the second se	8.75	d/u attn= 39.20 dB		
	roup B on interfere				DAT REF No. DAR40112.DAT
The second	Noise on interfere		3 <b>67</b>		n oo oo oo ah
			010 Input Monitor with Input Gain Set to 6 dB		
	ted February 17, 19	-			

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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 TH 260DD			F-1	Test F-1 (Weak) 45 dB S/N Receiver #2 DENON		F-1
Analog to Analog	desired	-8,77	32.14	TU-380RD	Measurements			TU-380RD	Measurements	d/u in dB
Reference RX Level -62,00 dBm	Loss undesired Loss Attn	-8.77 40.71 -41.37 21.75 18.50	32.14	Analog to Analog Reference RX Level -77.00 dBm	desired Loss undesired Loss Attn	-8.77 40.71 -41.37 21.75 21.50	35.14	Analog to Analog Reference RX Level -77.00 dBm	desired Loss undesired Loss	NA
AT&T IBAC RX Level -62.00 dBm AT&T Amati	desired Loss undesired Loss Attn desired	-8.77 40.71 -15.58 47.68 17.75 -8.77	31.53	AT&T IBAC RX Level -77.00 dBm	desired Loss undesired Loss Attn	-8.77 40.71 -15.58 47.68 21.25	35.03	-77.00 dBm AT&T IBAC RX Level -77.00 dBm	Attn desired Loss undesired Loss Attn	NA
DSB IBOC RX Level -62.00 dBm AT&T Amati	Loss undesired Loss Attn desired	40.71 -7.84 47.68 25.50		AT&T Amati DSB IBOC RX Level -77.00 dBm	desired Loss undesired Loss Ann	-8.77 40.71 -7.84 47.68 29.00	35.04	AT&T Amati DSB IBOC RX Level -77.00 dBm	desired Loss undesired Loss Attn	NA
LSB IBOC RX Level -62.00 dBm USADR FM1	Loss undesired Loss Atta desired	-8.77 40.71 -8.00 47.68 25.50 -8.77		AT&T Amati LSB IBOC RX Level -77.00 dBm USADR FM1	desired Loss undesired Loss Attn	-8,77 40,71 -8.00 47.68 29.25	1 11 30	AT&T Amati LSB IBOC RX Level -77.00 dBm	desired Loss undesired Loss Attn	NA
IBOC RX Level -62.00 dBm USADR FM2	Loss undesired Loss Attn desired	40.71 -9.44 47.68 24.00 -8.77		IBOC RX Level -77.00 dBm	desired Loss undesired Loss Attn	-8.77 40.71 -9.44 47.68 27.75		USADR FM1 IBOC RX Level -77.00 dBm	desired Loss undesired Loss Attn	NA
BOC X Level -62.00 dBm	Loss undesired Loss Attr	-8.77 40.71 -5.99 47.68 27.75	31.94	USADR FM2 IBOC RX Level -77.00 dBm	desired Loss undesired Loss Attn	-8.77 40.71 -5.99 47.68 31.25	-	USADR FM2 IBOC RX Level -77.00 dBm	desired Loss undesired Loss Atta	NA

DAT File Number		Time Code Start IDs Start Stop				Ds		Description	Grade		
DAR40112.DAT		l						Desciption			
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		1	
			12					AT&T Urban Slow with Co-Channel			
			13				******	AT&T Urban Fast with Co-Channel			
			14					Amati LSB Urban Fast with Co-Channel	*******	1	
			15					Amati DSB Urban Fast with Co-Channel		1	
Disregard			16								
			17					FM1 Urban Fast with Co-Channel		1	
			18					FM2 Urban Fast with Co-Channel		1	
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File Name:F1\_RX2T.XLS DAT Log

#### Tests F1, F4 and G1

eceiver	
Rx No.: #3	
Mfg.: PAN Model: RX-I	
Serial: GR3	
Serial. GRS	
Index	
Page	Description
1 age	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
otes:	
*	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

- Audio measurements made using quasi-peak detection and a CCIR wieghting filter
   Recording gain adjusted to yield the same second in the same
- 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.

Test F-1, F-4 and G-1		F-1	F-4	G-1 Urban Slow Rayleigh	G-1 Urban Fast Rayleigh
45 dB S/N			Co-Channel	Co-Channel	Co-Channel
Receiver #3			DAR to Analog	DAR to Analog	DAR to Analog
Panasonic	1		Ű	with Multipath	with Multipath
RX-FS430	Measurements	d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8.81 40.94	Interfering Audio detectable and		
Reference	Loss	40.71	tracks with ABBA beat		
	undesired -	41.46			-
RX Level	Loss	21,75			
-62.00 dBm	Attn	27.25			
AT&T		-8.81 41.01	Audible background noise	DAR->FM Less Annoying than	FM-> FM same as
IBAC	Loss	40.71	increases	FM->FM	DAR-> FM
	ündesired -	15,60	DAR->FM Less Annoying than	No detectable modulation	
RX Level	Loss	47.68	FM->FM	with digital	
-62.00 dBm	Ann	27.25	d/u attn= 27.18 dB		
AT&T Amati	desired	-8.81 40.91	Same as Analog Reference	FM-> FM same as	FM-> FM same as
DSB IBOC	Loss	40.71		DAR-> FM	DAR-> FM
	undesired	-8.00			
RX Level	Loss	47.68			
-62.00 dBm	Attn	34.75	d/u attn= 34.78 dB		
AT&T Amati	desired	-8.81 41.03	Same as Analog Reference	FM-> FM same as	FM-> FM same as
LSB IBOC	Loss	40_71		DAR-> FM	DAR-> FM
	undesired	-8.12			
RX Level	Loss	47.68			
-62.00 dBm		34.75	d/u attn= 34.66 dB		
USADR FM1	desired	-8.81 41.14	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC		40.71		DAR-> FM	DAR-> FM
	undesired	-9.48			
RX Level	Loss	47.68			
-62.00 dBm		33.50	d/u attn= 33.30 dB		
USADR FM2	desired	-8.81 40.98	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	1	40.71		DAR-> FM	DAR-> FM
	undesired	-6.07			
RX Level		47.68			
-62.00 dBm		36.75	d/u attn= 36.71 dB		
		ers and desired ana	log.		DAT REF No. DAR40114.DAT
	Noise on interfere				
			010 Input Monitor with Input Gain Set to -3.5dB	Best Ca	se S/N =51dB
Tests conduc	ted February 22, 1	995			
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File Name: F1\_RX3T.XLS 45dB

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			35 dB S/N			F-1	Test F-1 (Weak)	1		F-1
					_		45 dB S/N			
			Receiver #3			0.0	Receiver #3			
Maguramanta		1/ 1					Panasonic			1
	0.01			Measurements		d/u in dB	RX-FS430	Measurements		d/u in dE
April 1997 August April 1997		29.94		desired	-8.81	32.69	Analog to Analog		.9.91	NA
THE PRIME			Reference	Loss	40.71			1.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	INA
				undesired	-41.46					<u> </u>
				Loss	21.75		RX Level		- Normal P	
				Attn	19,00					
		29.51		desired	-8.81	32.26				
10 IS IS			IBAC	Loss				1		NA
and the second second second second	10. State 10. State 10.			undesired			IDAC	11 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -		
			RX Level	Loss			PV Lough		0.02333	
			-77.00 dBm		10 March 10 March 10			And a horizon of a second second second	a second s	
desired	-8.81	29.66				22.16				
Loss	40.71			A. C. C. S. M. S. M. D. C.		32.10		111102 + (+21)2 (4)		NA
undesired	-8.00						D2B IBOC		40.71	
Loss	47.68		RX Level					undesired	-8.00	
Attn	23,50			<ul> <li>Contraction of which has also menore which</li> </ul>				Loss	47.68	
desired	-8.81	29.78		000000000000000000000000000000000000000	CONTRACTOR OF A DESCRIPTION OF A DESCRIP				37.50	
Loss			10.00 Get - 0			32.28		desired	-8.81	NA
undesired		1	IBOC	A CONTRACTOR OF		100	LSB IBOC	Loss	40.71	
Loss			RYLevel	TO THE PROPERTY PREMIT				undesired	-8.12	
Attn			1000	AND ADDRESS AND ADDRESS AND ADDRESS AD		1.0 3		Loss	47.68	
desired		29.89		50000000000000000000000000000000000000		1		Aftn	37.75	
	2.047	10110100			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			desired		NA
Contraction of the second s			IDUC			110	IBOC	Loss		ae
1 · · · · · · · · · · · · · · · · · · ·		1	DVI.			10 1		undesired		
							RX Level	Loss		
		20.72			24.75	1	-77.00 dBm	A REPORT OF A R	and the second se	
[1] Some Section and Section 4.					-8.81	32.48	USADR FM2		and the second se	NA
			IBOC		40.71					13/5
			and a second	Contraction and a second second	-6.07					
				Loss	47.68		RX Level			
Ivan	25.50		-77.00 dBm	Attn	28.25			and the second se		
								( tabl	39.30	
							Notes: Best Case	S/N = 38.5  dB		
	undesired Loss Attri desired Loss undesired Loss Attri	desired         -8.81           Loss         40,71           undesired         -41.46           Loss         21.75           Attn         16.25           desired         -8.81           Loss         40,71           undesired         -15.60           Loss         40,71           undesired         -15.60           Loss         47,68           Attn         15.75           desired         -8.81           Loss         40,71           undesired         -8.00           Loss         47,68           Attn         23.50           desired         -8.81           Loss         40,71           undesired         -8.12           Loss         47,68           Attn         23.50           desired         -8.81           Loss         40,71           undesired         -8.81           Loss         40,71           undesired         -8.81           Loss         40,71           undesired         -8.81           Loss         40,71           undesired         -8.81 <td>desired         -8.81         29.94           Loss         40,71           undesired         -41.46           Loss         21.75           Attn         16.25           desired         -8.81         29.51           Loss         40.71           undesired         -15.60           Loss         40.71           undesired         -15.60           Loss         47.68           Attn         15.75           desired         -8.81         29.66           Loss         40.71           undesired         -8.81         29.66           Loss         40.71           undesired         -8.81         29.78           Loss         47.68           Attn         23.50           desired         -8.81         29.78           Loss         47.68           Attn         23.50           desired         -8.81         29.89           Loss         47.68           Attn         23.50           desired         -8.81         29.89           Loss         40.71           undesired         -9.48</td> <td>Measurementsd/u in dBPanasonic RX-FS430desired-8.8129.94Analog to Analog ReferenceLoss40,71Referenceundesired-41.46-Loss21.75RX LevelAttin16.25-77.00 dBmdesired-8.8129.51Loss40,71IBACundesired-15.60-Loss40,71IBACundesired-15.60-Loss40,71UBACundesired-15.60-Loss40,71DSB IBOCundesired-8.8129.66Attin15.75-77.00 dBmdesired-8.8129.66Loss40,71DSB IBOCundesired-8.8129.78Attin23.50-77.00 dBmdesired-8.8129.78Loss40,71LSB IBOCundesired-8.8129.78Loss40,71LSB IBOCundesired-8.8129.78Loss47.68RX LevelAttin23.50-77.00 dBmdesired-8.8129.89Loss40,71IBOCundesired-9.48RX LevelAttin22.25-77.00 dBmLoss47.68RX LevelAttin22.25-77.00 dBmLoss47.68RX LevelLoss47.68RX LevelAttin22.25-77.00 dBmLoss47.68RX Level<!--</td--><td>Measurementsd/u in dBPanasonic RX-FS430Measurementsdesired-8.8129.94Analog to Analog Referencedesired Lossundesired-41.46undesired Loss21.75RX LevelLossdation16.25-77.00 dBmAttindesired-8.8129.51AT&amp;Tdesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss47.68RX LevelLossundesiredloss40.71DSB IBOCLossundesiredloss40.71DSB IBOCLossundesiredloss40.71Loss-77.00 dBmAttndesired-8.8129.78AT&amp;T Amatidesiredloss40.71LossLossundesiredloss40.71Loss-77.00 dBmAttnundesired-8.8129.78AT&amp;T Amatidesiredloss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossun</td><td>Measurementsd/u in dBPanasonic RX-FS430Measurementsdesired-8.8129.94Analog to Analog Referencedesired-8.81Loss40.71ReferenceLoss40.71undesired-41.46undesired-41.46Loss21.75RX LevelLoss21.75Attin16.25-77.00 dBmAttin19.00desired-8.8129.51AT&amp;Tdesired-8.81Loss40.71IBACLoss40.71undesired-15.60undesired-8.81Loss40.71IBACLoss40.71undesired-15.60undesired-8.81Loss40.71BACLoss47.68Attin15.75-77.00 dBmAttin18.50desired-8.8129.66AT&amp;T Amatidesired-8.81Loss40.71DSB IBOCLoss40.71undesired-8.8129.78AT&amp;T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.8129.78AT&amp;T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.8129.78AT&amp;T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.81LSB IBOCLoss40.71undesired-8.81LSB IBOCLoss40.71undesired-8.81&lt;</td><td>Measurements         d/u in dB         Panasonic RX-FS430         Measurements         d/u in dB           desired         -8.81         29.94         Analog to Analog Reference         desired         -8.81         32.69           Loss         40.71         undesired         -41.46         undesired         -41.46         32.69           Loss         21.75         RX Level         Loss         40.71         undesired         -41.46           Loss         21.75         RX Level         Loss         40.71         19.00           desired         -8.81         29.51         AT&amp;T         desired         -8.81         32.26           Loss         40.71         Undesired         -15.60         Loss         40.71         19.00           desired         -8.81         29.66         AT&amp;T Amati         desired         -8.81         32.16           Loss         40.71         Undesired         -8.00         Loss         40.71           undesired         -8.81         29.66         AT&amp;T Amati         desired         -8.81         32.16           Loss         40.71         Undesired         -8.81         32.28         32.28           Loss         47.68         RX Lev</td><td>Measurements         du in dB         Panasonic RX-FS430         Measurements         d/u in dB         Receiver         #3           desired         -8.81         29.94         Analog to Analog Reference         desired         -8.81         32.69         Analog to Analog Reference         Analog to Analog Loss         40.11         BA         Reference         0.05         40.71         Reference         -77.00 dBm         Attm         19.00         -77.00 dBm         Reference         -77.00 dBm         Attm         19.00         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         19.00         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         18.50         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         18.50         -77.00 dBm         <t< td=""><td>Measurements         d/u in dB         Panasonic RX-F5430         Measurements         d/u in dB         RX-F5430         Measurements           Loss         40.71         29.94         Analog to Analog Reference         desired         -8.81         32.69         RX Level         Loss         undesired         -77.00 dBm         Attim         16.25         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         Loss         40.71         BAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         -77.00 dBm         Attim         27.00 dBm         Attim         27.00 dBm</td></t<><td>Measurements         d/u in dB         Panasonic RX-F8430         Measurements         d/u in dB         Receiver         #.3           desired         -8.81         29.94         Analog to Analog         desired         -8.81         ave to Analog         ave to Analog         desired         -8.81         ave to Analog         ave to Analog</td></td></td>	desired         -8.81         29.94           Loss         40,71           undesired         -41.46           Loss         21.75           Attn         16.25           desired         -8.81         29.51           Loss         40.71           undesired         -15.60           Loss         40.71           undesired         -15.60           Loss         47.68           Attn         15.75           desired         -8.81         29.66           Loss         40.71           undesired         -8.81         29.66           Loss         40.71           undesired         -8.81         29.78           Loss         47.68           Attn         23.50           desired         -8.81         29.78           Loss         47.68           Attn         23.50           desired         -8.81         29.89           Loss         47.68           Attn         23.50           desired         -8.81         29.89           Loss         40.71           undesired         -9.48	Measurementsd/u in dBPanasonic RX-FS430desired-8.8129.94Analog to Analog ReferenceLoss40,71Referenceundesired-41.46-Loss21.75RX LevelAttin16.25-77.00 dBmdesired-8.8129.51Loss40,71IBACundesired-15.60-Loss40,71IBACundesired-15.60-Loss40,71UBACundesired-15.60-Loss40,71DSB IBOCundesired-8.8129.66Attin15.75-77.00 dBmdesired-8.8129.66Loss40,71DSB IBOCundesired-8.8129.78Attin23.50-77.00 dBmdesired-8.8129.78Loss40,71LSB IBOCundesired-8.8129.78Loss40,71LSB IBOCundesired-8.8129.78Loss47.68RX LevelAttin23.50-77.00 dBmdesired-8.8129.89Loss40,71IBOCundesired-9.48RX LevelAttin22.25-77.00 dBmLoss47.68RX LevelAttin22.25-77.00 dBmLoss47.68RX LevelLoss47.68RX LevelAttin22.25-77.00 dBmLoss47.68RX Level </td <td>Measurementsd/u in dBPanasonic RX-FS430Measurementsdesired-8.8129.94Analog to Analog Referencedesired Lossundesired-41.46undesired Loss21.75RX LevelLossdation16.25-77.00 dBmAttindesired-8.8129.51AT&amp;Tdesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss47.68RX LevelLossundesiredloss40.71DSB IBOCLossundesiredloss40.71DSB IBOCLossundesiredloss40.71Loss-77.00 dBmAttndesired-8.8129.78AT&amp;T Amatidesiredloss40.71LossLossundesiredloss40.71Loss-77.00 dBmAttnundesired-8.8129.78AT&amp;T Amatidesiredloss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossun</td> <td>Measurementsd/u in dBPanasonic RX-FS430Measurementsdesired-8.8129.94Analog to Analog Referencedesired-8.81Loss40.71ReferenceLoss40.71undesired-41.46undesired-41.46Loss21.75RX LevelLoss21.75Attin16.25-77.00 dBmAttin19.00desired-8.8129.51AT&amp;Tdesired-8.81Loss40.71IBACLoss40.71undesired-15.60undesired-8.81Loss40.71IBACLoss40.71undesired-15.60undesired-8.81Loss40.71BACLoss47.68Attin15.75-77.00 dBmAttin18.50desired-8.8129.66AT&amp;T Amatidesired-8.81Loss40.71DSB IBOCLoss40.71undesired-8.8129.78AT&amp;T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.8129.78AT&amp;T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.8129.78AT&amp;T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.81LSB IBOCLoss40.71undesired-8.81LSB IBOCLoss40.71undesired-8.81&lt;</td> <td>Measurements         d/u in dB         Panasonic RX-FS430         Measurements         d/u in dB           desired         -8.81         29.94         Analog to Analog Reference         desired         -8.81         32.69           Loss         40.71         undesired         -41.46         undesired         -41.46         32.69           Loss         21.75         RX Level         Loss         40.71         undesired         -41.46           Loss         21.75         RX Level         Loss         40.71         19.00           desired         -8.81         29.51         AT&amp;T         desired         -8.81         32.26           Loss         40.71         Undesired         -15.60         Loss         40.71         19.00           desired         -8.81         29.66         AT&amp;T Amati         desired         -8.81         32.16           Loss         40.71         Undesired         -8.00         Loss         40.71           undesired         -8.81         29.66         AT&amp;T Amati         desired         -8.81         32.16           Loss         40.71         Undesired         -8.81         32.28         32.28           Loss         47.68         RX Lev</td> <td>Measurements         du in dB         Panasonic RX-FS430         Measurements         d/u in dB         Receiver         #3           desired         -8.81         29.94         Analog to Analog Reference         desired         -8.81         32.69         Analog to Analog Reference         Analog to Analog Loss         40.11         BA         Reference         0.05         40.71         Reference         -77.00 dBm         Attm         19.00         -77.00 dBm         Reference         -77.00 dBm         Attm         19.00         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         19.00         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         18.50         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         18.50         -77.00 dBm         <t< td=""><td>Measurements         d/u in dB         Panasonic RX-F5430         Measurements         d/u in dB         RX-F5430         Measurements           Loss         40.71         29.94         Analog to Analog Reference         desired         -8.81         32.69         RX Level         Loss         undesired         -77.00 dBm         Attim         16.25         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         Loss         40.71         BAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         -77.00 dBm         Attim         27.00 dBm         Attim         27.00 dBm</td></t<><td>Measurements         d/u in dB         Panasonic RX-F8430         Measurements         d/u in dB         Receiver         #.3           desired         -8.81         29.94         Analog to Analog         desired         -8.81         ave to Analog         ave to Analog         desired         -8.81         ave to Analog         ave to Analog</td></td>	Measurementsd/u in dBPanasonic RX-FS430Measurementsdesired-8.8129.94Analog to Analog Referencedesired Lossundesired-41.46undesired Loss21.75RX LevelLossdation16.25-77.00 dBmAttindesired-8.8129.51AT&Tdesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss40.71IBACLossundesiredloss47.68RX LevelLossundesiredloss40.71DSB IBOCLossundesiredloss40.71DSB IBOCLossundesiredloss40.71Loss-77.00 dBmAttndesired-8.8129.78AT&T Amatidesiredloss40.71LossLossundesiredloss40.71Loss-77.00 dBmAttnundesired-8.8129.78AT&T Amatidesiredloss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossundesiredLoss47.68RX LevelLossun	Measurementsd/u in dBPanasonic RX-FS430Measurementsdesired-8.8129.94Analog to Analog Referencedesired-8.81Loss40.71ReferenceLoss40.71undesired-41.46undesired-41.46Loss21.75RX LevelLoss21.75Attin16.25-77.00 dBmAttin19.00desired-8.8129.51AT&Tdesired-8.81Loss40.71IBACLoss40.71undesired-15.60undesired-8.81Loss40.71IBACLoss40.71undesired-15.60undesired-8.81Loss40.71BACLoss47.68Attin15.75-77.00 dBmAttin18.50desired-8.8129.66AT&T Amatidesired-8.81Loss40.71DSB IBOCLoss40.71undesired-8.8129.78AT&T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.8129.78AT&T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.8129.78AT&T Amatidesired-8.81Loss40.71LSB IBOCLoss40.71undesired-8.81LSB IBOCLoss40.71undesired-8.81LSB IBOCLoss40.71undesired-8.81<	Measurements         d/u in dB         Panasonic RX-FS430         Measurements         d/u in dB           desired         -8.81         29.94         Analog to Analog Reference         desired         -8.81         32.69           Loss         40.71         undesired         -41.46         undesired         -41.46         32.69           Loss         21.75         RX Level         Loss         40.71         undesired         -41.46           Loss         21.75         RX Level         Loss         40.71         19.00           desired         -8.81         29.51         AT&T         desired         -8.81         32.26           Loss         40.71         Undesired         -15.60         Loss         40.71         19.00           desired         -8.81         29.66         AT&T Amati         desired         -8.81         32.16           Loss         40.71         Undesired         -8.00         Loss         40.71           undesired         -8.81         29.66         AT&T Amati         desired         -8.81         32.16           Loss         40.71         Undesired         -8.81         32.28         32.28           Loss         47.68         RX Lev	Measurements         du in dB         Panasonic RX-FS430         Measurements         d/u in dB         Receiver         #3           desired         -8.81         29.94         Analog to Analog Reference         desired         -8.81         32.69         Analog to Analog Reference         Analog to Analog Loss         40.11         BA         Reference         0.05         40.71         Reference         -77.00 dBm         Attm         19.00         -77.00 dBm         Reference         -77.00 dBm         Attm         19.00         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         19.00         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         18.50         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         -77.00 dBm         Attm         18.50         -77.00 dBm         -77.00 dBm <t< td=""><td>Measurements         d/u in dB         Panasonic RX-F5430         Measurements         d/u in dB         RX-F5430         Measurements           Loss         40.71         29.94         Analog to Analog Reference         desired         -8.81         32.69         RX Level         Loss         undesired         -77.00 dBm         Attim         16.25         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         Loss         40.71         BAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         -77.00 dBm         Attim         27.00 dBm         Attim         27.00 dBm</td></t<> <td>Measurements         d/u in dB         Panasonic RX-F8430         Measurements         d/u in dB         Receiver         #.3           desired         -8.81         29.94         Analog to Analog         desired         -8.81         ave to Analog         ave to Analog         desired         -8.81         ave to Analog         ave to Analog</td>	Measurements         d/u in dB         Panasonic RX-F5430         Measurements         d/u in dB         RX-F5430         Measurements           Loss         40.71         29.94         Analog to Analog Reference         desired         -8.81         32.69         RX Level         Loss         undesired         -77.00 dBm         Attim         16.25         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         -77.00 dBm         Attim         19.00         -77.00 dBm         Attim         Loss         40.71         BAC         Loss         47.68         RX Level         Loss         47.68         RX Level         Loss         -77.00 dBm         Attim         27.00 dBm         Attim         27.00 dBm	Measurements         d/u in dB         Panasonic RX-F8430         Measurements         d/u in dB         Receiver         #.3           desired         -8.81         29.94         Analog to Analog         desired         -8.81         ave to Analog         ave to Analog         desired         -8.81         ave to Analog         ave to Analog

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DAT File	Time C		Star	t IDs			Grade			
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DAR40114.DAT								1	T	
2/22/95									•	
Disregard			1						-+	
Disregard			2							
			3				AT&T Co-Channel			
			4		Ī		Amati DSB Co-Channel			
			5		1		FM1 Co-Channel			
			6				FM2 Co-Channel			
Disregard			7		1					
			8		1		Amati LSB Co-Channel		+	
			9		1	*******	Amati LSB Urban Slow with Co-Channel		•	
			10				Amati DSB Urban Slow with Co-Channel		•	
			11		1		AT&T Urban Slow with Co-Channel	***		
			12				FM1 Urban Slow with Co-Channel		-	
			13			******	FM2 Urban Slow with Co-Channel		+	
			14			******	FM2 Urban Fast with Co-Channel		+	
			15			••••••	FM1 Urban Fast with Co-Channel			
			16			•••••	Amati DSB Urban Fast with Co-Channel		+	
			17				AT&T Urban Fast with Co-Channel		+	
			18			••••••	Amati LSB Urban Fast with Co-Channel			
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File Name:F1\_RX3T.XLS DAT Log

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#### 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 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.

Test F-1, F-4 and G-1	T		F-1	F-4	G-1 Urban Slow Rayleigh	G-1 Urban Fast Rayleigh
45 dB S/N				Co-Channel	Co-Channel	Co-Channel
Receiver #4				DAR to Analog	DAR to Analog	DAR to Analog
PIONEER					with Multipath	with Multipath
SX-201	Measurements		d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8.78	44.18	Interfering Audio detectable and		
Reference	Loss	40.71		tracks with ABBA beat		
	undesired	-41.42			1	
RX Level	Loss	21.75				
-62,00 dBm	Attn	30.50				
AT&T	desired	-8,78	43.91	Audible background noise	DAR->FM Less Annoying than	FM-> FM same as
IBAC	Loss	40.71		increases	FM->FM	DAR-> FM
	undesired	-15.72		DAR->FM Less Annoying than	No detectable modulation	
RX Level	Loss	47.68		FM->FM	with digital	
-62.00 dBm	Attn	30.00		d/u attn= 30.27 dB		
AT&T Amati	desired	-8.78	43.69	Same as Analog Reference	FM-> FM same as	FM-> FM same as
DSB IBOC	Loss	40_71			DAR-> FM	DAR-> FM
	undesired	-8.00				
RX Level	Loss	47.68				
-62.00 dBm	Atm	37.50		d/u attn= 37.99 dB		
AT&T Amati	desired	-8.78	43.98	Same as Analog Reference	FM-> FM same as	FM-> FM same as
LSB IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-8.04				
RX Level	Loss	47.68				
-62.00 dBm	Attn	37.75		d/u attn= 37.95 dB		
USADR FM1	desired	-8.78	43.70	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-9,51				3
RX Level	Loss	47.68				
-62.00 dBm	Afm	36.00		d/u attn= 36.48 dB		
USADR FM2	desired	-8.78	43.70	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-6,01				
RX Level	Loss	47.68				
-62.00 dBm	Attn	39.50		d/u attn= 39.98 dB		
Subcarrier G	roup B on interfe	erers and o	desired analo	og		DAT REF No. DAR40111 DAT
	Noise on interfe					
			3 on Sony 70	10 Input Monitor with Input Gain Set to 6 dB		
	cted February 16,		Ĩ	-		
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Test F-1 35 dB S/N Receiver #4			F-1	Test F-1 (Weak) 35 dB S/N Receiver #4		-	F-1	Test F-1 (Weak) 45 dB S/N Receiver #4			F-1
PIONEER SX-201	Manual			PIONEER		- 1		PIONEER			
the second se	Measurements		d/u in dB	SX-201	Measurements		d/u in dB	SX-201	Measurements		d/u in dB
Analog to Analog	desired	-8.78	32.68	Analog to Analog	desired	-8.78	34.18	Analog to Analog	desired	-8.77	
Reference	Loss	40.71		Reference	Loss	40.71		Reference	Loss	40.71	
Destand of the Ly	undesired	-41.42			undesired	-41.42			undesired	-41.45	
Desired Signal Level	Loss	21,75		RX Level	Loss	21.75		RX Level	Loss	21.75	
-62.00 dBm	Attn	19.00		-77.00 dBm	Attn	20,50		-77.00 dBm	Attn	9.25	
AT&T	desired	-8.80	32.14	AT&T	desired	-8.80	33.64	AT&T	desired	-8.77	NA
IBAC	Loss	40.71		IBAC	Loss	40.71		IBAC	Loss	40.71	1174
	undesired	-15.72			undesired	-15.72			undesired	-15.49	
RX Level	Loss	47.68		RX Level	Loss	47.68		RX Level	Loss	47.68	
-62.00 dBm	Attn	18.25		-77.00 dBm	Attn	19.75		-77.00 dBm	Attn	8.00	
AT&T Amati	desired	-8.80	32.17	AT&T Amati	desired	-8.80	33.67	AT&T Amati	desired	-8.77	NA
DSB IBOC	Loss	40.71		DSB IBOC	Loss	40.71		DSB IBOC	Loss	40.71	INA
	undesired	-8.00			undesired	-8.00	1.1		undesired	-7.84	
RX Level	Loss	47.68		RX Level	Loss	47.68		RX Level	Loss		
-62.00 dBm	Atm	26.00		-77.00 dBm	Atta	27.50		-77.00 dBm	Attn	47.68	
AT&T Amati	desired	-8.80	32.21	AT&T Amati	desired	-8.80	33.96	AT&T Amati	desired	17.00	
LSB IBOC	Loss	40.71		LSB IBOC	Loss	40.71	00.70	LSB IBOC	Loss	-8.77	NA
	undesired	-8.04			undesired	-8.04	11. 1	LSD IDOC		40.71	
RX Level	Loss	47.68		RX Level	Loss	47.68		RX Level	undesired	-8.00	
-62.00 dBm	Attn	26.00		-77.00 dBm	Attn	27.75	10. 1	-77.00 dBm	Loss	47.68	
USADR FM1	desired	-8.80	32.18	USADR FM1	desired	-8.80	33.68	USADR FM1	Attn	16.75	
BOC	Loss	40.71		IBOC	Loss	40.71		IBOC	desired	-8.77	NA
	undesired	-9.51	_		undesired	-9.51		IBUC	Loss	40.71	
RX Level	Loss	47.68		RX Level	Loss	47.68			undesired	-9.49	
-62.00 dBm	Attn	24.50		-77.00 dBm	Attn	26.00	1	RX Level	Loss	47.68	
USADR FM2	desired	-8.80	32.18	USADR FM2	desired	-8.80	33.68	-77.00 dBm	Attn	15.00	
BOC	Loss	40,71		IBOC	Loss	40.71		USADR FM2	desired	-8.77	NA
	undesired	-6.01		200	undesired	-6.01		IBOC	Loss	40.71	
RX Level	Loss	47.68	-	RX Level	Loss				undesired	-6.07	
-62.00 dBm	Attn	28.00		-77.00 dBm	Martineous and a state of the s	47.68		RX Level	Loss	47.68	
	1.77997000000000000000000000000000000000			-11.00 UDIN	Attn	29.50	12	-77.00 dBm	Attn	18.50	
								Notes:			

DAT File	Time Code			Start	IDs		Grade
Number	Start	Stop				Description	1 2
DAR40111.DAT							
2/16/95							
Disregard	·····						
Distegatu		•••••••					
			2			Amati LSB Co-Channel	
						Amati DSB Co-Channel	
Dianozoud			4			AT&T Co-Channel	
Disregard			5				
D'			6			FM1 Co-Channel	
Disregard			7				
			8			FM2 Co-Channel	
			9			FM2 Urban Slow with Co-Channel	
			10			FM1 Urban Slow with Co-Channel	
			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			AT&T Urban Fast with Co-Channel	
			15			Amati LSB Urban Fast with Co-Channel	
			16			Amati DSB Urban Fast with Co-Channel	
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#### 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)

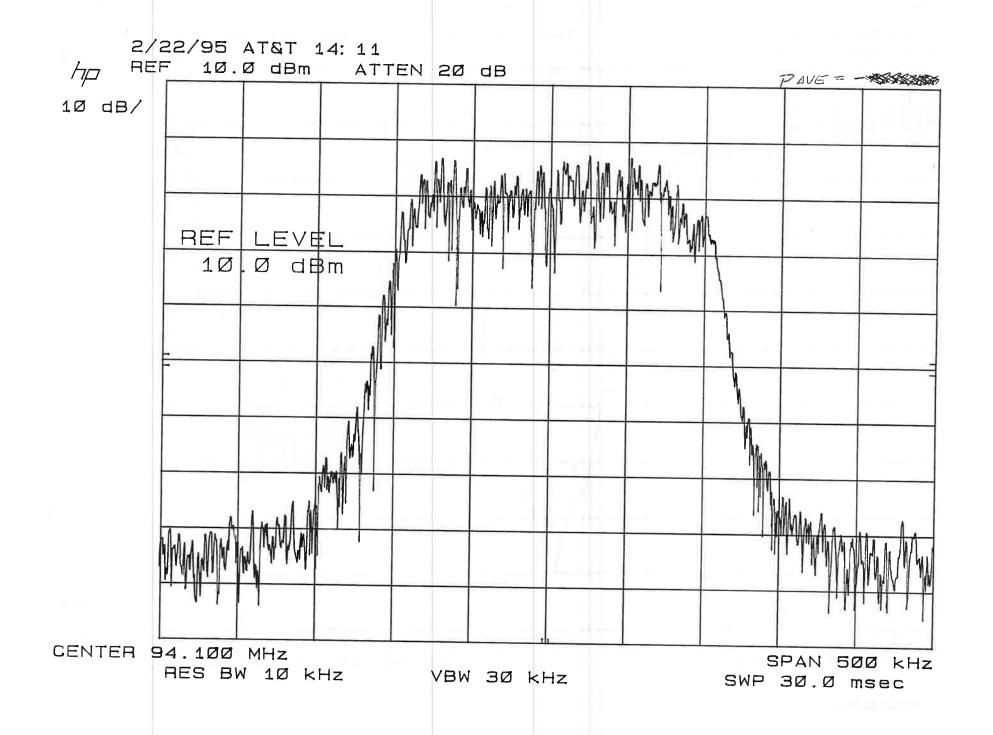
- \* ABBA used for main channel modulation on the desired analog channel
- SCA group B included on both desired and undesired (proponent) signals
- \* Total modulation on analog channels: 110% (SCA group level at 20%)
- \* Receiver audio routed through a 15KHz low pass filter
- \* Audio measurements made using quasi-peak detection and a CCIR 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.

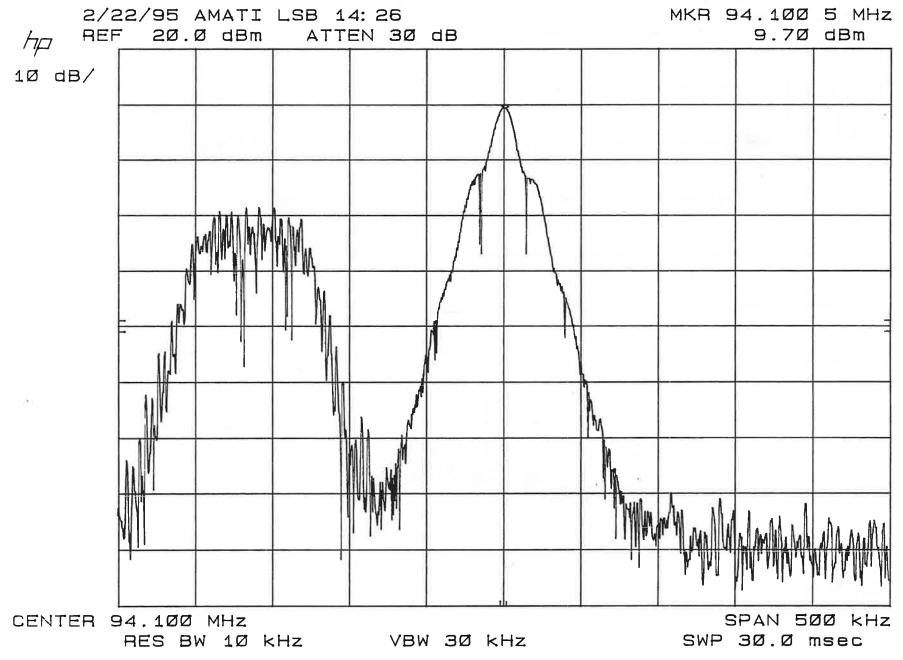
Test F-1, F-4 and G-1			F-1		G-1 Urban Slow Rayleigh	G-1 Urban Fast Rayleigh
45 dB S/N				Co-Channel	Co-Channel	Co-Channel
Receiver #5				DAR to Analog	DAR to Analog	DAR to Analog
FORD					with Multipath	with Multipath
F4XF	Measurements	d/u	'u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8.77 3		Interfering Audio detectable and		
Reference	Loss	40.71		tracks with ABBA beat		
	undesired	-41.45				
RX Level	Loss	21.75				
-62.00 dBm	Attn	21.50				
AT&T	desired	-8.77 3	34.94	Audible background noise	DAR->FM Less Annoying than	FM-> FM same as
IBAC	Loss	40.71		increases	FM->FM	DAR-> FM
	undesired	-15.49		DAR->FM Less Annoying than	No detectable modulation	
RX Level	Loss	47.68		FM->FM	with digital	
-62.00 dBm	Attn	21.25		d/u attn= 21.53 dB		
AT&T Amati	desired	-8.77 3	35.20	Same as Analog Reference	FM-> FM same as	FM-> FM same as
DSB IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-8.00				
RX Level	Loss	47.68				
-62.00 dBm	Attn	29.00		d/u attn= 29.02 dB		
AT&T Amati	desired	-8.77 3	35.31	Same as Analog Reference	FM-> FM same as	FM-> FM same as
LSB IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-8.11				
RX Level	Loss	47.68				
-62.00 dBm	Attn	29.00		d/u attn= 28.91 dB		
USADR FM1	desired	-8.77 3	35.19	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-9.49				
RX Level	Loss	47.68				
-62.00 dBm	Ann	27.50		d/u attn= 27.53 dB		
USADR FM2	desired	-8.77 3	35.27	Same as Analog Reference	FM-> FM same as	FM-> FM same as
IBOC	Loss	40.71			DAR-> FM	DAR-> FM
	undesired	-6.07				
RX Level	Loss	47.68				
-62.00 dBm	Attn	31.00		d/u attn= 30.95 dB		
Subcarrier G	roup B on interfer	rers and desi	sired analo	g	1	DAT REF No. DAR40113.DAT
Notes: Clipped Pink	Noise on interfer	rers				
Standard SC.	A Test Signal yiel	lds -20dB on	n Sony 70	10 Input Monitor with Input Gain Set to 2.3 dB		
			-			
4						

Test F-1				F-1	Test F-1 (Weak)			F-1	Test F-1 (Weak)			F-1
35 dB S/N					35 dB S/N				45 dB S/N			1-1
	#5				Receiver #5				Receiver #5			
FORD					FORD				FORD			
F4XF		Measurements		d/u in dB	F4XF	Measurements		d/u in dB	F4XF	Measurements		d/u in dI
Analog to Ana	alog	desired	-8.77	24.22	Analog to Analog	desired	-8.77	11.97	Analog to Analog	desired	-8.77	22.97
Reference		Loss	40.71		Reference	Loss	40.71		Reference	Loss	40,71	
		undesired	-41.45			undesired	-31,45		80	undesired	-41.45	
Desired Signal		Loss	21.75		RX Level	Loss	21.75		RX Level	Loss	21.75	
-62.00 (	dBm	Attn	10.50		-77.00 dBm	Attn	8,25		-77.00 dBm	Attn	9.25	
AT&T		desired	-8.77	23.69	AT&T	desired	-8.77	10.44	AT&T	desired	-8.77	21.69
BAC		Loss	40.71		IBAC	Loss	40.71		IBAC	Loss	40.71	21.09
		undesired	-15.49			undesired	-15.49	1	10110	undesired	-15.49	
X Level		Loss	47.68		RX Level	Loss	27.68		RX Level	Loss	47.68	
-62.00 (	dBm	Attn	10.00		-77.00 dBm	Attn	16.75	1 C - 1	-77.00 dBm	Attn	8.00	
AT&T Amati		desired	-8,77	23.95	AT&T Amati	desired	-8.77	11.54	AT&T Amati	desired		
OSB IBOC		Loss	40.71		DSB IBOC	Loss	40.71		DSB IBOC	Loss	-8.77	23.04
		undesired	-8.00		1112222	undesired	-7.84		DSDIBOC	undesired	40.71	
X Level		Loss	47.68		RX Level	Loss	47.68	1.1	RX Level	Loss	-7.84	
-62.00 c	dBm	Attn	17.75		-77.00 dBm	Attn	5.50	11.	-77.00 dBm		47.68	
AT&T Amati		desired	-8.77	24.20	AT&T Amati	desired	-8.77	11.70	AT&T Amati	Attn	17.00	
SB IBOC		Loss	40.71		LSB IBOC	Loss	40.71		LSB IBOC	desired	-8.77	22.95
		undesired	-8.00			undesired	-8.00	8.0	LSD IDUC	Loss	40.71	
XX Level		Loss	47.68		RX Level	Loss	47.68		RX Level	undesired	-8.00	
-62.00 d	dBm	Attn	18.00		-77.00 dBm	Attn	5.50			Loss	47.68	
JSADR FM1		desired	-8.77	23.94	USADR FM1	desired	-8.77	11.69	-77.00 dBm	Attn	16.75	
BOC		Loss	40.71		IBOC	Loss	40.71		USADR FM1 IBOC	desired	-8,77	22.69
		undesired	-9.49		200	undesired	-9.49		IBOC	Loss	40.71	
X Level		Loss	47.68	- 1	RX Level	Loss	47.68			undesired	-9.49	
-62.00 d	lBm	Attn	16.25		-77.00 dBm	Attn	47.08	1.1	RX Level	Loss	47.68	
JSADR FM2		desired	-8.77	24.02	USADR FM2	desired	-8.77	11.77	-77.00 dBm	Atm	15.00	
BOC		Loss	40.71		IBOC	Loss			USADR FM2	desired	-8.77	22.77
		undesired	-6.07		iboc	undesired	40.71		IBOC	Loss	40.71	
X Level		Loss	47.68		RX Level	Loss	-6.07			undesired	-6.07	
-62.00 d	Bm	Attn	19.75		-77.00 dBm	Territor and the second s	47.68	1.1	RX Level	Loss	47.68	
02100 4		p.+041	17.75		-77.00 dBm	Attn	7.50		-77.00 dBm	Attn	18.50	

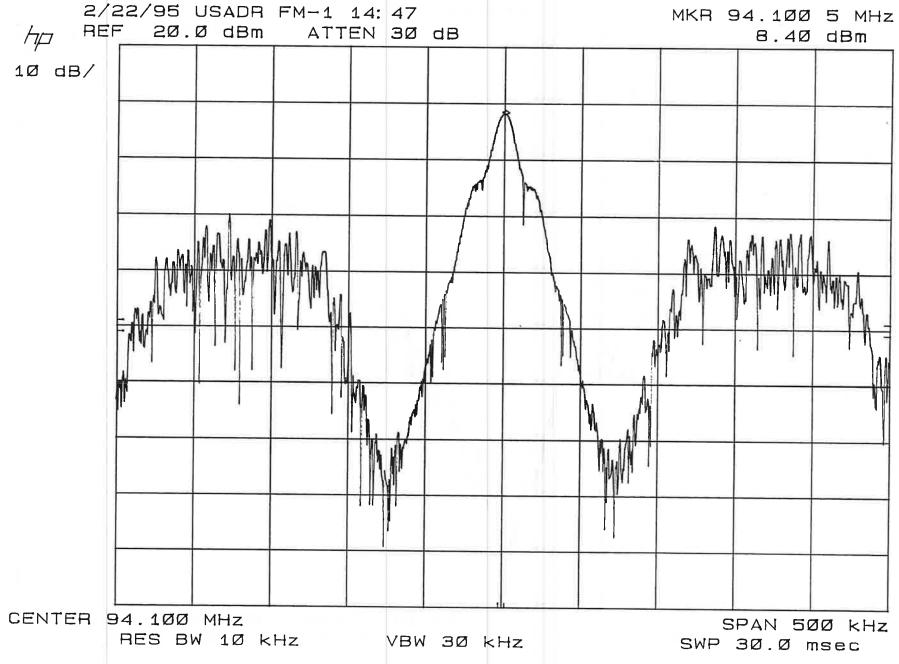
DAT File	Time Code			Start II	)s		Gra	
Number	Start	Stop	<u> </u>			Description	1	2
DAR40113.DAT								
2/17/95								
			1			AT&T Co-Channel		
			2			Amati LSB Co-Channel		
			3			Amati DSB Co-Channel		
			4			FM1 Co-Channel		
		]	5			FM2 Co-Channel		
Disregard			6					
		1	7			FM2 Urban Slow with Co-Channel		
			8			FM1 Urban Slow with Co-Channel		
			9			Amati DSB Urban Slow with Co-Channel		
			10			Amati LSB Urban Slow with Co-Channel	_	
			11			AT&T Urban Slow with Co-Channel		
			12			AT&T Urban Fast with Co-Channel		
		1	13			Amati LSB Urban Fast with Co-Channel		
		1	14	T		Amati DSB Urban Fast with Co-Channel		
			15			FM1 Urban Fast with Co-Channel		
		1	16			FM2 Urban Fast with Co-Channel		
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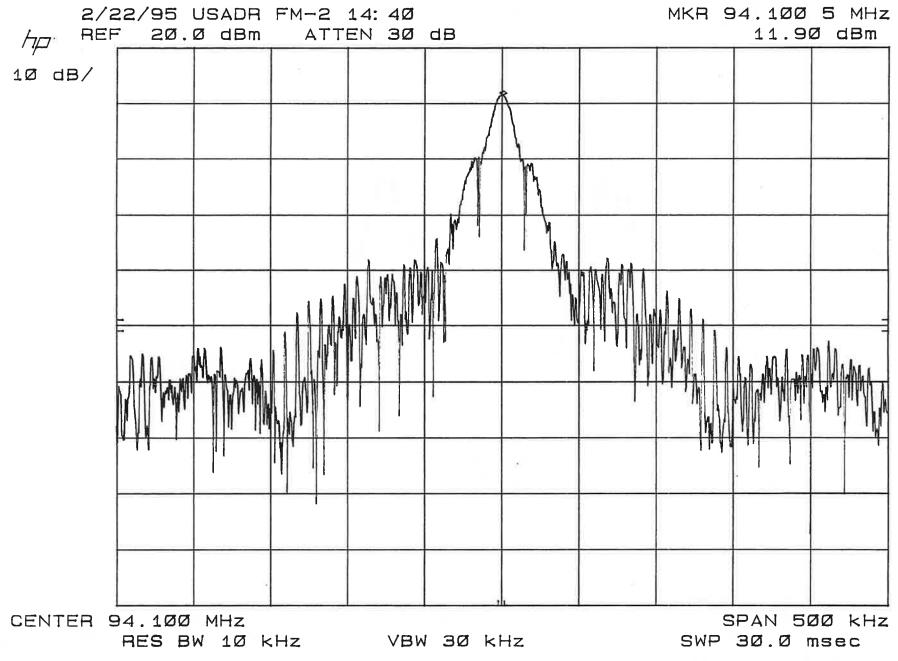
File Name:F1\_RX5T.XLS DAT Log

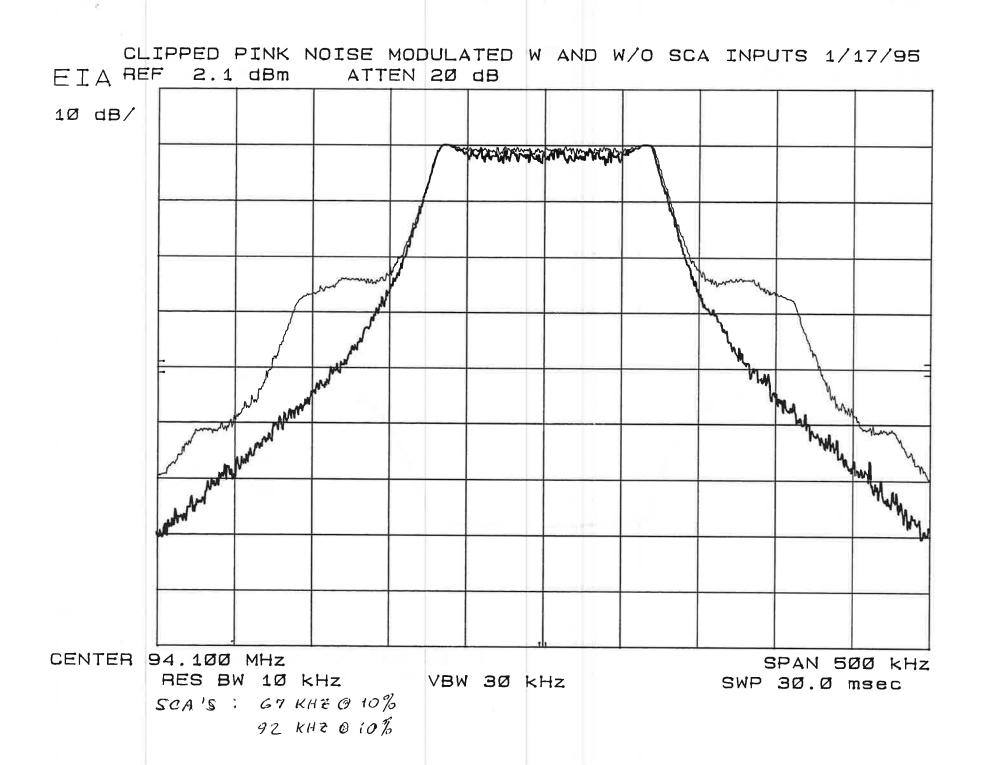




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LOC EIA <sup>ref</sup>	CAL RADIO S 30.0 dBm	TATION 16: ATTEN 2	21 2Ø dB					
1Ø dB/								
	CENTER		Jun		~~~~		-	-
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	ligen tellen and Manuscrittere	a ballow have				Mr. White	A. seed us of m	ula Ma duanta d
							3	
CENTER 9	98.500 MHz RES BW 10	kHz `	/BW 3Ø k	.Hz			SPAN 50 30.0 r	

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# **APPENDIX AN**

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

#### Tests F2, F5 and G2

Receiver Rx No.: #1 Mfg.: DELCC Model: 161924 Serial: 100049	63
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 wieghting filter
	Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receiver.

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			( VV	EIA Digital Audio F	adio Test Laboratory		
6		[	_				
Test F-2, F-5 and G-2		1	F-2	F-5	G-2 Urban Slow Rayleigh	Urban Fast Rayleigh	
45 dB S/N				Lower First Adjacent	Lower First Adjacent	Lower First Adjacent	
Receiver #1				DAR to Analog	DAR to Analog	DAR to Analog	
DELCO					with Multipath	with Multipath	
16192463	Measurements	1		EO&C	EO&C	EO&C	
Analog to Analog	desired	-8.86	4.09	Interferer Mod peaks detected			
Reference	Loss	40.71	1				
	undesired	-21,41					
RX Level	Loss	21.75		1			
-62,00 dBm	Attn	10,50					
AT&T	desired	-8.86	6.77	DAR-> FM more annoying			
IBAC	Loss	40.71		Intense constant static			
	undesired	-15.66					
RX Level	Loss	27.68		S/N eq d/u 29.5 dB			
-62.00 dBm	Attn	13.00		d/u attn= 10.32 dB			
AT&T Amati	desired	-8.86	18.37	DAR-> FM more annoying			
DSB IBOC	Loss	40,71		Hiss with intererer modulation			
	undesired	-8.01		peaks detected			
RX Level	Loss	27.68		S/N eq d/u 31.5 dB			
-62.00 dBm	Attn	32.25		d/u attn= 17.97 dB			
AT&T Amati	desired	-8.86	4.25	DAR->FM same as FM->FM			
LSB IBOC	Loss	40.71					
DV I1	undesired	-8.14		S/N eq d/u 43 dB			
RX Level	Loss	27.68		S/N eq d/u 43 dB d/u attn= 17.84 dB			
-62.00 dBm USADR FM1	Attn desired	18.00	16.12	u/u attil= 17.84 0D			
IBOC	Loss	-8.80 40.71					
ibuc	undesired	-9.51					
RX Level	Loss	27.68		S/N eq d/u 33 dB			
-62.00 dBm	Aim	28.50		d/u attn≕ 16.47 dB			
USADR FM2	desired	-8.86		10.4/ UD			
IBOC	Loss	40.71					
1000	undesired	-6.10					
RX Level	Loss	27.68		S/N eg d/u 43.5 dB			
-62.00 dBm	Attn	20.50		d/u attn= 19.88 dB			
						DAT Ref.: DAR40120 DAT	
			dB on Sonv 7	010 Input Monitor with Input Gain Set to -4.0dB		Best Case $S/N = 49 \text{ dB}$	
	cted February 23,		0 0011y /				
10000 00000							

and and

Test F-2 35 dB S/N			F-2		Effects without		
Receiver #1					Digital Modu	lation	
DELCO							
16192463	Measurements		d/u in dB	Silence	d/u in dB @ S/N=45dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog	desired	-8.86	3.34		NA	Silence	3/IN-330B
Reference	Loss	40.71					
	undesired	-21.41			1		
Desired Signal Level	Loss	21.75					
-62.00 dBm	Attn	9.75					
AT&T	desired	-8.86	4.97	-8.87	3.23	-8,87	1.73
IBAC	Loss	40.71		40.71		40.71	1.75
	undesired	-15.61		-15.38		-15.38	
RX Level	Loss	27.68		27.68	5	27.68	
-62.00 dBm	Attn	11.25		9.75		8.25	
AT&T Amati	desired	-8.86	6.87		o Difference	0,25	_
DSB IBOC	Loss	40.71			o Difference		
	undesired	-8.01					
RX Level	Loss	27,68					
-62.00 dBm	Artn	20.75					
AT&T Amati	desired	-8.86	3.50	N	o Difference		
LSB IBOC	Loss	40.71			Difference		
	undesired	-8.14					
RX Level	Loss	27.68					
-62.00 dBm	Attn	17.25					
USADR FM1	desired	-8.86	5.62	N	o Difference		
IBOC	Loss	40.71		1	o Difference	10	
	undesired	-9.51					
RX Level	Loss	27.68					
-62.00 dBm	Atta	18.00					1.5
USADR FM2	desired	-8.86	3.96	N	o Difference	-	
IBOC	Loss	40.71		1 1	o Difference		
	undesired	-6.10					
RX Level	Loss	27,68		1			
-62.00 dBm	Attn	19.75					

Notes: Same as "Lower 45dB"

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DAT File Number	Time Code Start Stop		Start IDs		Description	Grade	
DAR40120.DAT	otart	Stup		<del></del>	Description	<u> </u>	
2/23/95			·				
******		••••••	<b> </b>		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		
			ΙI				
					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		
STREET, STREET		Arrow and the second					

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Test F-2, F-5 and G-2		F-2	F-5		G-2 Urban Slow Rayleigh	Urban Fast Rayleigh
5 dB S/N			Upper First Adjacent		Upper First Adjacent	Upper First 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	desired -8.	82 5.41	Measurement varies between			Evec
Reference	Loss 40.	71	43 - 47 dB			
	undesired -21.	14				
RX Level	Loss 21.	75				
-62.00 dBm	Attn 11.	15				
AT&T	desired -8.	82 8.31				
BAC	Loss 40.	71				
	undesired -15.	66				
RX Level	Loss 27.	58	S/N eq d/u 27.5 dB			
-62.00 dBm	Attn 14.	50	d/u attn= 11.60 dB			
AT&T Amati	desired -8,1					
DSB IBOC	Loss 40.1	1				
	undesired -7.9	7				
X Level	Loss 27.6	8	S/N eq d/u 29.5 dB			
-62.00 dBm	Attn 35.2	5	d/u attn= 19.29 dB			
AT&T Amati	desired -8.8	2 21.24				
LSB IBOC	Loss 40.7	1				
	undesired -8.0	9				
XX Level	Loss 27.6	8	S/N eq d/u 31.5 dB			
-62.00 dBm	Atta 35.0	0	d/u attn= 19.17 dB			
JSADR FM1	desired -8.8	2 18.87				
BOC	Loss 40.7	1				
	undesired -9.4	7				
X Level	Loss 27.6	8	S/N eq d/u 31.75 dB			
-62.00 dBm	Atm 31.2		d/u attn= 17.79 dB			
JSADR FM2	desired -8.8	2 5.96				
BOC	Loss 40.7	1				
	undesired -6.0	6				
X Level	Loss 27.6	8	S/N eq d/u 40.5 dB			
-62,00 dBm	Atta 21.7	5	d/u attn= 21.20 dB			
	roup B on interferers a	nd desired analo	og			
lotes: Clipped Pinl	Noise on interferers					DAT Ref.: DAR40140.DAT
Standard SC	A Test Signal yields -2	dB on Sony 70	10 Input Monitor with Input Gain	Set to -4.0dB		
Tests conduc	ted March 8, 1995	-		in the second		Best Case $S/N = 49 \text{ dB}$
			×			

Test F-2			F-2	Effects with out
35 dB S/N	1 m			Digital Modulation
Receiver #1				
DELCO				d/u in dB @ d/u in dB
16192463	Measurements		d/u in dB	Silence S/N=45dB Silence S/N=35d
Analog to Analog	desired	-8.82	4.88	NA
Reference	Loss	40.71		
	undesired	-21.41		
Desired Signal Level	Loss	21.75		
-62.00 dBm	Attn	11.25		
AT&T	desired	-8,82	6.81	-8.82 5.06 -8.82 3.31
IBAC	Loss	40.71		40,71 40,71
	undesired	-15.66		-15.66 -15.66
RX Level	Loss	27.68		27.68 27.68
-62.00 dBm	Attn	13.00	·	11.25 9.50
AT&T Amati	desired	-8.82	9.62	No Difference
DSB IBOC	Loss	40.71		
	undesired	-7.97		
RX Level	Loss	27.68		
-62.00 dBm	Attri	23.50		
AT&T Amati	desired	-8.82	9.74	No Difference
LSB IBOC	Loss	40.71		
	undesired	-8.09		
RX Level	Loss	27.68		
-62.00 dBm	Attn	23.50		
USADR FM1	desired	-8.82	7.62	No Difference
IBOC	Loss	40.71		
	undesired	-9.47		
RX Level	Loss	27.68		
-62.00 dBm	Attn	20.00	· · · · · · · · · · · · · · · · · · ·	
USADR FM2	desired	-8.82	4.96	No Difference
IBOC	Loss	40.71		
	undesired	-6.06		
RX Level	Loss	27,68		
-62.00 dBm	Attn	20.75	·	
	Upper 45dB"	20.75		

DAT File	Time C	ade	T	S	art I	Ds		Grade	
Number	Start	Stop					Description	1	
DAR40140.DAT			T	T	1	ГТ	UPPER FIRST ADJACENT		2
3/8/95			1	1	1		UTTER FIRST ADJACENT		
*********			1	1		-	AT&T Amati LSB Upper 1st Adjacent		
			1				The FAmal Lob opper 1st Adjacent	-2	1
	***********								
			2				WITH MULTIPATH (URBAN SLOW)		
							AT&T Amati LSB Urban Slow with Upper 1st Adjacent	-2	
			+						
DISREGARD	******		3				WITH MULTIPATH (URBAN FAST)		
DISICLOAID									
			4	ļ			AT&T Amati LSB Urban Fast with Upper 1st Adjacent	-2.5	
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File Name: F2\_RX1T.XLS Upper DAT Log

### Tests F2, F5 and G2

Receiver Rx No.: #2 Mfg.: DEN Model: TU-3 Serial: 4056	180RD	
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 wieghting filter Recording gain adjusted to yield the same recording levels to make up for the "0dB" level differences from receiver to receive In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.	ег.

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	Lower First Adjacent
Receiver #2				DAR to Analog	DAR to Analog	DAR to Analog
DENON					with Multipath	with Multipath
TU-380RD	Measurements		d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8.84	23.61	Interferer Mod peaks detected		
Reference	Loss	40.71				
	undesired	-21.41				
RX Level	Loss	21.75				
-62.00 dBm	Attn	30.00				
AT&T	desired	-8.84	31.89	DAR-> FM more annoying		
IBAC	Loss	40.71		Intense constant static		
	undesired	-15.76			1	
RX Level	Loss	27.68		S/N at d/u 38 dB		
-62.00 dBm	Attn	38.00		d/u attn= 29.72 dB		
AT&T Amati	desired	-8.84	29.10	DAR-> FM more annoying		
DSB IBOC	Loss	40.71		Hiss with intererer modulation		
	undesired	-7.97		peaks detected		
RX Level	Loss	27.68		S/N at d/u 40.5 dB		
-62.00 dBm	Attn	43.00		d/u attn= 37.51 dB		
AT&T Amati	desired	-8.84	23.47	DAR->FM same as FM->FM		
LSB IBOC	Loss	40.71				
	undesired	-8.09				
RX Level	Loss	27.68		S/N at d/u 45 dB		
-62.00 dBm	Attn	37.25		d/u attn= 37.39 dB		
USADR FM1	desired	-8.84	27.38			
IBOC	Loss	40.71				
	undesired	-9.50				
RX Level	Loss	27.68		S/N at d/u 41.8 dB		
-62.00 dBm	Atm	39.75		d/u attn= 35.98 dB		
USADR FM2	desired	-8.84	23.93			
IBOC	Loss	40.71				
	undesired	-6.05				
RX Level	Loss	27.68		S/N at d/u 44.7 dB		
-62.00 dBm	Atm	39.75		d/u attn= 39.43 dB		
Subcarrier G	roup B on interfe	rers and	desired analo	og		DAT Ref.: DAR40121.DAT
Notes: Clipped Pink	Noise on interfer	rers				
Standard SC	A Test Signal yiel	lds -20d	B on Sony 70	10 Input Monitor with Input Gain Set to -4.0dB		Best Case $S/N = 51.5  dBr$
Tests conduc	cted February 24,	1995	2	- •		
4						

Test F-2 35 dB S/N Receiver #2			F-2	Effects with o Digital Modu		
DENON				d/u in dB		al (د. ئىر ما 10
TU-380RD	Measurements		d/u in dB	Silence S/N=45dB	Silence	d/u in dB S/N=35dB
Analog to Analog	desired	-8.84	12.61	NA		0/11 00/20
Reference	Loss	40.71				
	undesired	-21.41				
Desired Signal Level	Loss	21.75				
-62.00 dBm	Attn	19.00				
AT&T	desired	-8.84	20.64	-8.87 24.76	-8.87	14.01
BAC	Loss	40.71		40.71	40.71	14.01
	undesired	-15 76		-15.41	-15.41	
RX Level	Loss	27.68		27.68	27.68	
-62.00 dBm	Attn	26.75		31.25	27.08	
AT&T Amati	desired	-8.84	17.60	No Difference	20.30	-
OSB IBOC	Loss	40.71		The Difference		1.1.2
	undesired	-7.97				
RX Level	Loss	27.68				
-62,00 dBm	Attn	31.50				1
AT&T Amati	desired	-8.84	12.47	No Difference		
SB IBOC	Loss	40.71		The Difference		
	undesired	-8.09				
XX Level	Loss	27.68				
-62.00 dBm	Attra	26.25				
JSADR FM1	desired	-8.84	16.38	No Difference		
BOC	Loss	40.71	10.00	The Difference		
	undesired	-9.50				
X Level	Loss	27.68				
-62,00 dBm	Attn	28.75				
JSADR FM2	desired	-8.86	12.91	No Difference		
BOC	Loss	40.71		ino Difference		
	undesired	-6.05				
X Level	Loss	27.68				
-62.00 dBm	Attn	28,75				

Notes: Same as "Lower 45dB"

DAT File Time Code Number Start Stop		Start IDs	Description	Grade		
DAR40121.DAT	olari olop	$\frac{1}{1}$	Description			
2/24/95						
2124175			LOWER FIRST ADJACENT			
DISREGARD			LOWERFIRST ADJACEAU			
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	1		
		20	AMATI LSB	1		
		21	AT&T			
		22	AMATI DSB			
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2010/08

Test F-2, F-5 and G-2		F-2	F-5	G-2 Urban Slow Rayleigh	II-base Provide Laboration
5 dB S/N		1	Upper First Adjacent	Upper First Adjacent	Urban Fast Rayleigh
Receiver #1			DAR to Analog	DAR to Analog	Upper First Adjacent
DENON		1		with Multipath	DAR to Analog
TU-380RD	Measurements	d/u in dB	EO&C	EO&C	with Multipath
Analog to Analog	desired -8.77	12.46	Interferer Mod peaks detected	Boac	EO&C
Reference	Loss 40.71		interested mod peaks detected		
	undesired -21.44				
RX Level	Loss 21.75				
-62.00 dBm	Attn 18.75				
AT&T	desired -8.77				
IBAC	Loss 40.71				
	undesired -15.70				
RX Level	Loss 27.68		CDI at all		
-62.00 dBm	Attn 28.75		S/N at d/u 35.7 dB		
AT&T Amati	desired -8.77		d/u attn= 18.56 dB		
DSB IBOC	Loss 40.71				
JOD IDOC					
RX Level	100	1			
-62.00 dBm	Loss 27.68		S/N at d/u 31.9 dB		
AT&T Amati	Attn 40.50		d/u attn= 26.29 dB		
LSB IBOC	desired -8.77	26.81			
L2B IBOC	Loss 40.71				
	undesired -8.11	н ,,			
RX Level	Loss 27.68	1	S/N at d/u 31.8 dB		
-62.00 dBm	Attn 40.50		d/u attn= 26.15 dB		
JSADR FM1	desired -8,77	24.43			
BOC	Loss 40.71				
	undesired -9.48				
RX Level	Loss 27.68		S/N at d/u 34 dB		
-62.00 dBm	Attn 36.75		d/u attn= 24.78 dB		
JSADR FM2	desired -8.77	13.53			
BOC	Loss 40.71				
	undesired -6.08				
X Level	Loss 27.68		S/N at d/u 44-1 dB		
-62.00 dBm	Attn 29.25		d/u attn= 28.18 dB		
Subcarrier G	roup B on interferers and	desired analo	20110 015		
	Noise on interferers		0		DAT Ref .: DAR40141.DAT
		B on Sony 70	10 Input Monitor with Input Gain Set to -4.0dl	D	
Tests conduc	ted March 8, 1995		10 mpar monitor with input Gain Set to -4.00	D	Best Case S/N = 51.5 dB

Test F-2			F-2			Effects with		
35 dB S/N						Digital Mod	ulation	
Receiver #2								
DENON				( ) ( )		d/u in dB @		d/u in dB @
TU-380RD	Measurements		d/u in dB		Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog	desired	-8,77	1.69			NA		
Reference	Loss	40,71						0
	undesired	-21.42		()				
Desired Signal Level	Loss	21.75					1	
-62.00 dBm	Atm	8.00						
AT&T	desired	-8,77	11.65		-8,77	15.10	-8.77	4.85
IBAC	Loss	40.71			40.71		40,71	
	undesired	-15,70			-15.40		-15.40	
RX Level	Loss	27.68			27.68		27.68	
-62.00 dBm	Aun	17.75			21.50		11.25	
AT&T Amati	desired	-8.77	15.67		N	o Difference		
DSB IBOC	Loss	40,71						1
	undesired	-7.97						
RX Level	Loss	27.68						
-62.00 dBm	Attn	29,50						
AT&T Amati	desired	-8.77	15.81		N	o Difference		
LSB IBOC	Loss	40.71						
	undesired	-8.11						
RX Level	Loss	27.68						
-62.00 dBm	Afm	29,50						
USADR FMI	desired	-8.77	13.68		N	o Difference		
IBOC	Loss	40.71						
	undesired	-9.48						
RX Level	Loss	27.68						
-62.00 dBm	Attn	26.00						
USADR FM2	desired	-8,77			N	lo Difference		
IBOC	Loss	40.71						
	undesired	-6.08	1 1					
RX Level	Loss	27.68					1	
~62.00 dBm	Attn	18.50						
Notes: Same as "Up	per 45dB"							

9

Start	000000000000000000000000000000000000000						Grade	
	Stop					Description	1 1	2
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								1
					FMI		-1.5	1
					FM2		0	0
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						WITH MULTIPATH (URBAN SLOW)		
							0	0
								-2
		10			AMATI LSB			-2
		11			AT&T			-1.5
		12		1	AMATI DSB			-1.5 -2
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				2 3 4 5 6 7 7 8 9 10 11	2 3 4 5 6 7 7 8 9 10 11	2         AMATI DSB           3         AMATI DSB           4         AT&T           5         AMATI LSB           6         FM1           7         FM2           9         FM1           10         AMATI LSB           11         AT&T	2         AMATI DSB           3         AMATI DSB           4         AT&T           5         AMATI DSB           6         FM1           7         FM2           9         FM1           10         AMATI LSB           11         AT&T	2         AMATI DSB           3         AMATI DSB           4         AT&T           5         AMATI LSB           6         FM1           7         FM2           0           8         FM2           0           9         FM1           10         AMATI LSB           11         AT&T

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

Test F-2, F-5 and G-2	1	1	F-2	F-5	G-2 Urban Slow Rayleigh	Urban Fast Rayleigh
45 dB S/N				Lower First Adjacent	Lower First Adjacent	Lower First Adjacent
Receiver #3				DAR to Analog	DAR to Analog	DAR to Analog
Panasonic					with Multipath	with Multipath
RX-FS430	Measurements	- 1	d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8.87	27.33	Interferer Mod peaks detected		· · · · · · · · · · · · · · · · · · ·
Reference	Loss	40.71		,		
	undesired	-21.41				
RX Level	Loss	21.75				
-62.00 dBm	Attn	33.75				
AT&T	desired	-8.87	33.20	DAR-> FM more annoying		
IBAC	Loss	40.71				
	undesired	-15.60				
RX Level	Loss	27.68		S/N at d/u 41 dB		
-62.00 dBm	Attn	39.50		d/u attn= 33.63 dB		
AT&T Amati	desired	-8.87	29.87	DAR-> FM more annoying		
DSB IBOC	Loss	40.71		Hiss with intererer modulation		
	undesired	-8.02		peaks detected		
RX Level	Loss	27.68		S/N at d/u 43 dB		
-62.00 dBm	Attn	43.75		d/u attn= 41.21 dB		
AT&T Amati	desired	-8.87	26.19	DAR->FM same as FM->FM		
LSB IBOC	Loss	40.71				
	undesired	-8,09				
RX Level	Loss	27.68		S/N at d/u 45.5 dB		
-62.00 dBm	Attn	40.00		d/u attn= 41.14 dB		
USADR FM1	desired	-8,87	28.82			
IBOC	Loss	40.71				
	undesired	-9.47				
RX Level	Loss	27.68		S/N at d/u 44 dB		
-62,00 dBm	Attn	41.25		d/u attn= 39.76 dB		
USADR FM2	desired	-8.87	26.64			
(BOC	Loss	40.71				
	undesired	-6.04				
RX Level	Loss	27.68		S/N at d/u 45.25 dB		
-62,00 dBm	Attn	42.50		d/u attn= 43.19 dB	J	
	roup B on interfe		desired analo	og		DAT Ref.: DAR40122.DAT
	c Noise on interfe					
			B on Sony 70	10 Input Monitor with Input Gain Set to -4.0dB		Best Case $S/N = 49 \text{ dBr}$
Tests conduc	cted February 24,	1995				

Test F-2 35 dB S/N Receiver #3			F-2	Effects witho Digital Modu		
Panasonic RX-FS430	Measurements		_d/u in dB	S/N Silence 45dB	Silence	SA
Analog to Analog Reference	desired Loss undesired	-8.87 40.71	14.83	NA NA	Slience	35dB
Desired Signal Level -62,00 dBm	Loss	-21.41 21.75 21.25				
AT&T IBAC RX Level	desired Loss undesired Loss	-8.87 40.71 -15.60 27.68	20.95	-8.87 <b>26.15</b> 40.71 -15.30	-8.87 40.71 -15.30	14.90
-62.00 dBm AT&T Amati	Attn desired	27.25	17.87	27.68 32.75 No Difference	27.68 21.50	
DSB IBOC AX Level -62.00 dBm	Loss undesired Loss Attn	40.71 -8.02 27.68 31.75		in o binerence		
AT&T Amati SB IBOC X Level -62.00 dBm	desired Loss undesired Loss Attn	-8.87 40.71 -8.09 27.68	14.69	No Difference		
JSADR FM1 BOC X Level -62.00 dBm	desired Loss undesired Loss Attn	28.50 -8.84 40.71 -9.47 27.68	16.85	No Difference		
SADR FM2 BOC	desired Loss undesired	29.25 -8.87 40.71 -6.04	14.89	No Difference		
X Level -62.00 dBm	Loss Attn	27.68 30.75				

DAT File	Time Code	Start IDs		Grade
Number	Start Stop		Description	1 2
DAR40122.DAT				
2/24/95				
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			LOWER FIRST ADJACENT	
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		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	- I I
		10	AMATI DSB	
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File Name:F2\_RX3T.XLS Lower DAT Log

Page 4 of 7

Test F-2, F-5 and G-2		F-2	F-5		G-2 Urban Slow Rayleigh			
45 dB S/N			Upper First Adjacent			Urban Fast Rayleigh		
Receiver #3		1	DAR to Analog		Upper First Adjacent	Upper First Adjacent		
Panasonic					DAR to Analog	DAR to Analog		
RX-FS430	Measurements	d/u in dB	EO&C		with Multipath	with Multipath		
Analog to Analog	desired -8.78				EO&C	EO&C		
Reference	Loss 40.71							
	undesired -21,43							
XX Level	Loss 21.75							
-62.00 dBm	Attn 33.50							
AT&T	desired -8.78	30.86						
BAC	Loss 40.71							
	undesired -15.67							
X Level	Loss 27.68		S/N at d/u	42 dB				
-62.00 dBm	Attn 37.00			42 dB 3.33 dB				
T&T Amati	desired -8.78	29.17	Jan a delin	0.00 UD				
SB IBOC	Loss 40.71							
	undesired -7.98							
X Level	Loss 27.68		S/N at d/u	13.5 dB				
-62.00 dBm	Aun 43.00		2223	.02 dB				
T&T Amati	desired -8.78	29.28	4	1.02 UB				
SB IBOC	Loss 40.71							
	undesired -8.09							
X Level	Loss 27.68		S/N at d/u 4	3.5 dB				
-62.00 dBm	Atta 43.00			.91 dB				
SADR FM1	desired -8.78	28.44		.91 00				
BOC	Loss 40.71	10000						
	undesired -9,50							
X Level	Loss 27.68		S/N at d/u 4	4.2 dB				
-62.00 dBm	Attn 40.75		1000 T	50 dB				
SADR FM2	desired -8.78	27.02	57	50 00				
IOC	Loss 40.71							
	undesired -6.08	1						
X Level	Loss 27.68		S/N at d/u 4:	5.2 dB				
-62.00 dBm	Attn 42.75		d/u attn= 42	92 dB				
Subcarrier G	roup B on interferers and	desired analog	g 72.					
otes: Clipped Pink	Noise on interferers		-			DAT Ref.: DAR40142.DAT		
Standard SC	A Test Signal yields -20dE	on Sony 70	10 Input Monitor with Ir	Dut Gain Set to -4 0dB				
Tests conduc	ted March 8, 1995		T - COMMON WITH I	iput Gain Set to =4.00B		Best Case S/N $=$ 49 dB		

Test F-2 35 dB S/N			F-2		ffects with		
Receiver #3				D	igital Mod	ulation	
Panasonic RX-FS430	-			d/	′u in dB @		d/u in dB @
Analog to Analog	Measurements		d/u in dB		/N=45dB	Silence	S/N=35dB
Reference	desired Loss	-8.78	15.94		NA		
Reference	undesired	40.71					
Desired Signal Level	Loss	-21.43					
-62.00 dBm	Attn	21.75 22,25			(		
AT&T	desired	-8.78	19.61				
IBAC	Loss	40.71	19.01	-8.78	23.82	-8.78	12.32
	undesired	-15.67		40.71		40.71	
RX Level	Loss	27.68	1	-15.38		-15.38	
-62.00 dBm	Attn	25.75		27.68 30.25	_	27.68	
AT&T Amati	desired	-8.78	17.92		Difference	18.75	
DSB IBOC	Loss	40.71		NOI	Interence		
	undesired	-7.98					
RX Level	Loss	27.68					
-62.00 dBm	Attn	31.75					
AT&T Amati	desired	-8.78	18.03	No E	ifference		
SB IBOC	Loss	40.71			merence		
	undesired	-8.09					
X Level	Loss	27.68					
~62.00 dBm	Attn	31.75					
JSADR FMI	desired	-8.78	17.19	No D	ifference	_	
BOC	Loss	40.71					
WT	undesired	-9.50					1.1
-62.00 dBm	Loss	27.68					
SADR FM2	Atin	29.50					
BOC	desired	-8.78	15.77	No D	ifference		
	Loss undesired	40.71					
X Level	Loss	-6.08					
-62.00 dBm	and an and a second second second	27.68					
02.00 0.011	Attn	31.50					

File Name: F2\_RX3T XLS Upper 35dB

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DAT File Number	Time C Start	Stop			SLAF	t IDs				
AR40142.DAT		stop						Description	Grade	~~~~~
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File Name:F2\_RX3T.XLS Upper DAT Log

#### Tests F2, F5 and G2

Receiver	
Rx No.: #4	
Mfg.: PIO Model: SX-	
Serial: OA:	
oundi. On	
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 lattice channel of the Proponent signal (except A1&1)

\* 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.

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	Lower First Adjacent
Receiver #4			DAR to Analog	DAR to Analog	DAR to Analog
Pioneer				with Multipath	with Multipath
SX-201	Measurements	d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired -	8.87 31.87	Interferer Mod peaks detected		
Reference	Loss 4	0.71			
	undesired -2	1.45			
RX Level	Loss 2	1.75			
-62.00 dBm	Attn 3	8.25			
AT&T	desired -	8.87 35.32	DAR-> FM more annoying		
IBAC	Loss 4	0.71			
	undesired -1	5.72			
RX Level	Loss 2	7.68	S/N at d/u 42.4 dB		
-62,00 dBm	Attn 4	1.50	d/u attn= 38.05 dB		
AT&T Amati	desired -	8.87 32.60	DAR-> FM more annoying		
DSB IBOC	Loss 4	0.71	Hiss with intererer modulation		
	undesired ·	8.00	peaks detected		
RX Level	Loss 2	7.68	S/N at d/u 44.5 dB		
-62.00 dBm	Attn 4	6.50	d/u attn= 45.77 dB		
AT&T Amati	desired ·	8.87 31.44	DAR->FM same as FM->FM		
LSB IBOC	Loss 4	0.71			
	undesired ·	8.09			
RX Level	Loss 2	7.68	S/N at d/u 45.4 dB		
-62,00 dBm		5.25	d/u attn= 45.68 dB		
USADR FM1		8.87 32.31			
IBOC	Loss 4	0.71	1		
	undesired -	9.46			
RX Level		7.68	S/N at d/u 44.8 dB		
-62.00 dBm	Attn 4	4.75	d/u attn= 44.31 dB		
USADR FM2		8.87 <b>31.91</b>			
IBOC		0.71			
		6.06			
RX Level	Loss 2	7.68	S/N at d/u 45 dB		
-62.00 dBm	Attn 4	7.75	d/u attn= 47.71 dB		
Subcarrier G	roup B on interfere	s and desired anal	og		DAT Ref.: DAR40122.DAT
	Noise on interfere				
Standard SC	A Test Signal yield	s -20dB on Sony 7	010 Input Monitor with Input Gain Set to -4.0dB		Best Case $S/N = 51 \text{ dB}$
Tests conduc	ted February 28, 19	95			

Modulation	
B@ 5dB Silence	d/u in dB @ S/N=35dB
Sub Shellee	5/14-330B
A	
3 -8.8	87 17.98
40.7	
-15.3	-
27.6	
24.5	
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DAT File Number	Time Co Start	ide Stop		Sta	rt II	)s	Description	Gra	de   2
DAR40123.DAT	OTALL	Stop	+ +				Description		-
2/28/95									
	1+9 COC 00000003+5.001 0000 000044						LOWER FIRST ADJACENT		
					T			I	
	*********		1		Ť		AMATI DSB		l
			2				AT&T		1
			3				AMATI LSB		
			4				FM1		
			5				FM1 FM2		
							WITH MULTIPATH (URBAN SLOW)		
			6				AMATI LSB		
			7				AT&T		
			8				AMATI DSB		
******			9		T		FM1		
			10		1		FM2		1
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File Name:F2\_RX4T.XLS Lower DAT Log

Page 4 of 7

Test F-2, F-5 and G-2			F-2	F-5			G-2 Urban Slow Rayleigh	Urban Fast Rayleigh
45 dB S/N				Upper First Ad	,		Upper First Adjacent	Upper First Adjacent
Receiver #4				DAR to Analog	Ś		DAR to Analog	DAR to Analog
Pioneer							with Multipath	with Multipath
SX-201	Measurements		d/u in dB	EO&C			EO&C	EO&C
Analog to Analog	desired	-8.79	21.22					
Reference	Loss	40.71						
	undesired	-21.47						
RX Level	Loss	21.75						
-62.00 dBm	Attn	27.50						
AT&T	desired	-8,79	29.23					
IBAC	Loss	40.71						
	undesired	-15.55						
RX Level	Loss	27.68		S/N at d/u	38.1 dB			
-62.00 dBm	Attn	35.50		d/u attn=	27.49 dB			
AT&T Amati	desired	-8.79	28.65		2.1.7 40			
DSB IBOC	Loss	40.71						
	undesired	-7.97						
RX Level	Loss	27.68		S/N at d/u	38.6 dB			
-62,00 dBm	Attn	42,50		d/u attn=	35.07 dB			
AT&T Amati	desired	-8.79	28.73					
LSB IBOC	Loss	40.71						
	undesired	-8.05						
RX Level	Loss	27.68		S/N at d/u	38.6 dB			
-62.00 dBm	Attn	42.50		d/u attn=	34.99 dB			
USADR FM1	desired	-8.79	26.87					
BOC	Loss	40.71						
	undesired	-9.44						
RX Level	Loss	27.68		S/N at d/u	40.4 dB			
-62.00 dBm	Attn	39.25		d/u attn=	33.60 dB			
USADR FM2	desired	-8.79	21.48					
BOC	Loss	40.71						
	undesired	-6.05						
RX Level	Loss	27.68		S/N at d/u	44.8 dB			
-62.00 dBm	Attn	37.25		d/u attn=	36.99 dB			
Subcarrier (	Group B on interfe	rers and	desired analo	ng				DAT Parts DAD40142 DAT
Notes: Clipped Pin	k Noise on interfe	rers						DAT Ref.: DAR40143.DAT
Standard SC	CA Test Signal yie	lds -20dl	3 on Sony 70	10 Input Monito	r with Input Gain	Set to -4.0dB		
Tests condu	cted March 9, 199	5				attio noad		Best Case S/N = $51.5 \text{ dB}$

0 0	Measurements			Digital M d/u in dB		
Pioneer SX-201 Analog to Analog				d/u in dB	~	
SX-201 Analog to Analog				Jun de		
Analog to Analog						d/u in dB @
Analog to Analog Reference			d/u in dB		B Silence	S/N=35dB
Reference	desired	-8,79	10.22	NA		
	Loss	40.71				
	undesired	-21.47				
Desired Signal Level	Loss	21.75				
-62.00 dBm	Attn	16.50				
AT&T	desired	-8.79	17.98	-8.79 21.25	-8.79	10.75
IBAC	Loss	40.71		40.71	40,71	
	undesired	-15.55		-15.32	-15.32	
RX Level	Loss	27.68		27.68	27.68	
-62.00 dBm	Attn	24.25		27.75	17.25	
AT&T Amati	desired	-8.79	17.40	No Differe	ice	
DSB IBOC	Loss	40,71				
	undesired	-7.97				
RX Level	Loss	27.68				
-62.00 dBm	Attn	31.25				
AT&T Amati	desired	-8,79	17.48	No Differen	ice	
LSB IBOC	Loss	40.71		-		
	undesired	-8.05				
RX Level	Loss	27,68			1	
-62.00 dBm	Attn	31.25				
USADR FM1	desired	-8.79	15.62	No Differe	ice	
IBOC	Loss	40.71				
	undesired	-9.44				
RX Level	Loss	27.68				
-62.00 dBm	Attn	28.00				
USADR FM2	desired	-8.79	10.23	No Differe	ice	
IBOC	Loss	40.71				
	undesired	-6.05				
RX Level	Loss	27.68				
-62.00 dBm	Attn	26.00				

File Name: F2\_RX4T.XLS Upper 35dB

DAT File Number	Time Co Start	Stop		312	rt ID:		Deserted	Grade	
DAR40143.DAT					<u> </u>	<u></u>	Description	1	2
3/9/95	•••••••	••••••					UPPER FIRST ADJACE	NT.	
				ŀ					
		*****	1	·····			AMATI LSB		
		•••••••••••••••••••••••••	2				AT&T	-1	I
		•••••	3				AMATI DSB	-1	1
	********		4					-1	1
	*********		5				FM1 FM2	-1	1
******			· · · ·				FMZ	0	0
		*******	·						*********************
		••••••••					WITH MULTIPATH (URBAN	SLOW)	*****************
			6 7				11112	-0.5	•••••••
			8				FM1	-1.5	
							AMATI DSB	-1.5	*******
			9				AT&T	-1	
			10				AMATI LSB	-1.5	
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#### 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 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 FORC as aread, making interview.

\* In areas where EO&C or grade evaluation does not appear, subjective evaluator comments will be used.

Test F-2, F-5 and G-2	1	- 1	F-2	F-5	G-2 Urban Slow Rayleigh	Urban Fast Rayleigh
45 dB S/N				Lower First Adjacent	Lower First Adjacent	Lower First Adjacent
Receiver #5		1		DAR to Analog	DAR to Analog	DAR to Analog
Ford Auto				Dirty to i malog	with Multipath	with Multipath
F4XF-19B132-CB	Measurements		d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired	-8,87		Interferer Mod peaks detected		
Reference		40.71	-0.10	Interferent wou peaks delected		
Keleielice	undesired	-1.40				
RX Level		21.75				
-62.00 dBm		20.25				
AT&T	desired	-8.87	-13.55	DAR-> FM more annoying	the second s	
IBAC		40.71	-13.33	DAR-> FM more annoying		
IDAC		-15.60				
RX Level	Loss	7.68		S/N at d/u 47,5 dB		
-62.00 dBm	Attn	12.75		d/u attn= 20.12 dB		
AT&T Amati	desired	-8.87		DAR-> FM more annoying		
DSB IBOC	Loss	40.71		Hiss with intererer modulation		
DSD IBOC	undesired	-7.98		peaks detected		
RX Level	Loss	7.68		S/N at d/u 26.8 dB		
-62.00 dBm	Atta	53.25		d/u attn= 27.74 dB		
AT&T Amati	desired	-8.87		DAR->FM same as FM->FM		
LSB IBOC		40.71	-3.30	DARFIVI Salite as FIVIFIVI		
LSDIDUC	undesired	-8.09				
RX Level	Loss	7.68		S/N at d/u 43.8 dB		
-62.00 dBm		28.25		d/u attn= 27.63 dB		
USADR FM1	desired	-8.87	17.31			
IBOC		40.71	17.51			
IBOC	undesired	-9.46				
RX Level	Loss	7.68		S/N at d/u 27.5 dB		
-62.00 dBm		49,75		$d/u \operatorname{attn} = 26.26  \mathrm{dB}$		
USADR FM2	desired	-8.87	0.36	u/u attit~ 20.20 UD		
IBOC		40.71	0.30			
iboc	undesired	-6.01				
RX Level	Loss	7.68		S/N at d/u 38.8 dB		
-62.00 dBm		36.25		d/u attn = 29.71 dB		
	Froup B on interfer		(		I	DAT Ref.: DAR40124.DAT
	k Noise on interfer		uestieu affait	۲ <u>۲</u>		DAT KEL DAK40124 DAT
11 I I I I I I I I I I I I I I I I I I			Don Com. 7	10 Input Monitor with Input Gain Set to -4.0dB		Best Case $S/N = 51.5 \text{ dB}$
	cted February 28.		D OIL SOLLY A	To input Monitor with input Gain Set to -4.00B		Desi Case SIN - 31.3 QD
Tests conduc	cieu rebruary 28,	1993				

.

Test F-2 35 dB S/N Receiver #5			F-2	Effects without Digital Modulation					
Ford Auto F4XF-19B132-CB	Measurements		d/u in dB	d/u in dB @ Silence S/N=45dB	Silence	d/u in dB @ S/N=35dB			
Analog to Analog	desired	-8.87	-16.88	NA	Shence	2/IN=220B			
Reference	Loss	40.71		INA					
	undesired	-1.45							
Desired Signal Level	Loss	21.75							
-62.00 dBm	Attn	9,50							
AT&T	desired	-8.87	-16.05	-8.87 -16.27	-8.87	-18.27			
IBAC	Loss	40.71		40.71	40.71	-10.27			
	undesired	-15.60		-15.38	-15.38				
RX Level	Loss	7.68		7.68	7.68				
-62.00 dBm	Attn	10.25		10.25	8.25				
AT&T Amati	desired	-8.87	8.08	No Difference	8,23				
DSB IBOC	Loss	40.71		No Briterence					
	undesired	-7.98							
RX Level	Loss	7.68							
-62.00 dBm	Attn	42.00							
AT&T Amati	desired	-8.87	-16.81	No Difference					
LSB IBOC	Loss	40.71		The Difference					
	undesired	-8.09							
RX Level	Loss	7.68							
-62.00 dBm	Attn	17.00				1.02			
USADR FM1	desired	-8.84	6.09	No Difference					
BOC	Loss	40.71				1.1.1.1			
	undesired	-9.46							
XX Level	Loss	7.68							
-62.00 dBm	Attn	38.50							
JSADR FM2	desired	-8.87	-11.14	No Difference					
BOC	Loss	40.71							
	undesired	-6.01							
X Level	Loss	7.68				1000			
-62.00 dBm	Attn	24,75							

DAT File	Time C			Start IDs		Grade	
Number	Start	Stop			Description	1	2
DAR40124.DAT		1			Lower First Adjacent		
2/28/95			1			1	
		1					
			11		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		FM1	-1	
			8		AMATILSB	-3	
	*****		9		AT&T	-2	
			10		AMATI DSB	-2 -3	
					With Markin at (U-t E		
			11		With Multilpath (Urban Fast) Amati DSB	-3	
			11		Aman DSB AT&T	-2.5	
					Anati LSB		
			13			<u> </u>	
			14		USADR FMI	0 -3 -1	
			15		USADR FM2	-1	
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Test F-2, F-5 and G-2 45 dB S/N			F-2	F-5			G-2 Urban Slow Rayleigh	Urban Fast Rayleigh
				Upper First Adjac	ent		Upper First Adjacent	Upper First Adjacent
Receiver #5				DAR to Analog			DAR to Analog	DAR to Analog
Ford Auto	L	- 1					with Multipath	with Multipath
F4XF-19B132-CB	Measurements		d/u in dB	EO&C			EO&C	EO&C
Analog to Analog	desired	-8.78	-6.12					
Reference	Loss	40.71					1.0	
	undesired	-1.37						
RX Level	Loss	21,75						
-62,00 dBm	Attn	20.25						
AT&T	desired	-8.78	-16.76					
IBAC	Loss	40.71						
	undesired	-15.55						
RX Level	Loss	7.68		S/N at d/u	50.2 dB			
-62.00 dBm	Attn	9.50		d/u attn=	20.14 dB			
AT&T Amati	desired	-8.78	19.39		20.11 00			
DSB IBOC	Loss	40.71						
	undesired	-7.95						
RX Level	Loss	7.68		S/N at d/u	27.2 dB			
-62.00 dBm	Attn	53 25		d/u attn=	27.74 dB			
AT&T Amati	desired	-8,78	19.74	a a atti	27.74 UD			
LSB IBOC	Loss	40.71						
	undesired	-8.05						
RX Level	Loss	7.68		S/N at d/u	27.2 dB			
-62.00 dBm	Attn	53.50		d/u attn=	27.64 dB			
USADR FM1	desired	-8.78	17.38		27.04 UB			
BOC	Loss	40.71	17.50					
	undesired	-9.44						
RX Level	Loss	7.68		S/N at d/u	26.8 dB			
-62.00 dBm	Attn	49.75		d/u attn=	26.8 dB			
USADR FM2	desired	-8.78	-0.03	wu aun-	20.23 UB			
IBOC	Loss	40.71	-0.05					
CANENTS.	undesired	-6.03						
X Level	Loss	7.68		S/N at d/u	40 10			
-62.00 dBm	1. ALL CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONT	35.75			40 dB			
	roup B on interfer	33.13	doning and	d/u attn=	29.66 dB			
	Noise on interfer		Jestrea anali	og				DAT Ref.: DAR40144.DAT
Tanta and	ated Marsh 0, 100	us -200E	on Sony 70	010 Input Monitor v	vith Input Gain	Set to -4 0dB		Best Case S/N = 51.5 dB
Tests condu	ted March 9, 1995	>						

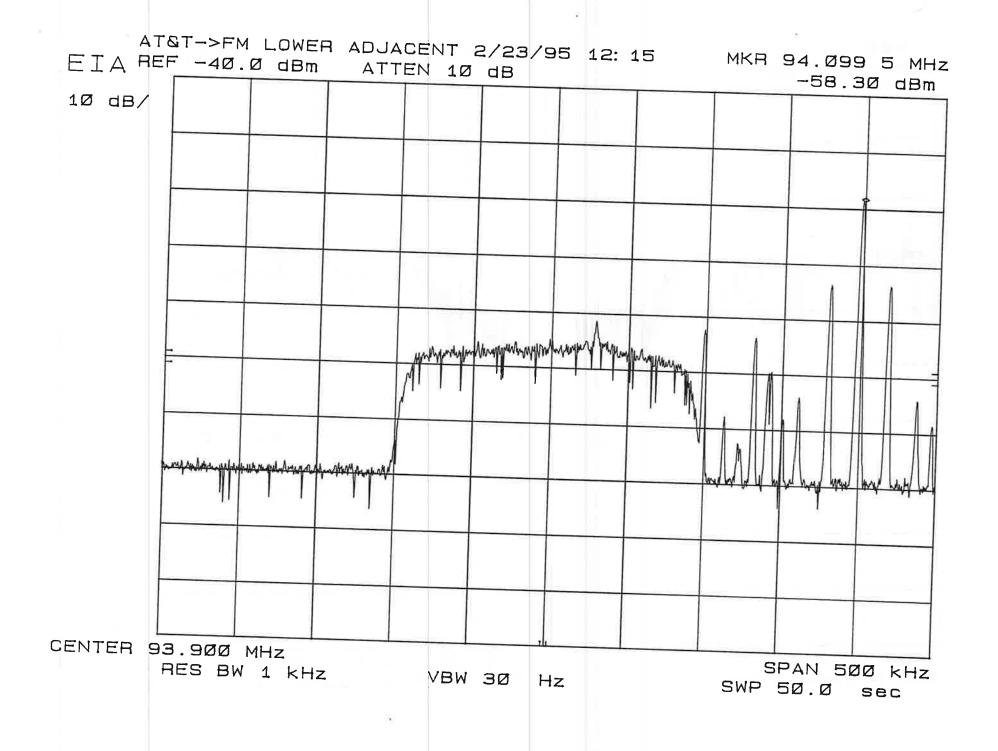
Test F-2			F-2		Effects with o Digital Modu		
35 dB S/N							
Receiver #5				1			
Ford Auto					d/u in dB @		d/u in dB @
F4XF-19B132-CB	Measurements		d/u in dB	Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog	desired	-8.78	-17.37				
Reference	Loss	40.71					
	undesired	-1.37					
Desired Signal Level	Loss	21.75					
-62.00 dBm	Attri	9.00					
AT&T	desired	-8.78	-18.01	-8.78	-4.50	-8.78	-22.50
IBAC	Loss	40.71		40.71		40.71	
	undesired	-15.55		-15,31		-15.31	
RX Level	Loss	7.68		7.68		7.68	
-62.00 dBm	Attn	8.25		22,00		4.00	
AT&T Amati	desired	-8.78	8.14				
DSB IBOC	Loss	40.71					
	undesired	-7.95		1			
RX Level	Loss	7.68					
-62,00 dBm	Atta	42.00					
AT&T Amati	desired	-8,78	8.49				
LSB IBOC	Loss	40.71					
	undesired	-8.05					
RX Level	Loss	7.68					
-62,00 dBm	Atm	42.25					
USADR FM1	desired	-8.78	6.13				
IBOC	Loss	40.71					
	undesired	-9.44			[		
RX Level	Loss	7.68		6	1		
-62.00 dBm	Attn	38.50					
USADR FM2	desired	-8.78	-12.03				
IBOC	Loss	40.71					
	undesired	-6.03					
DATA 1	Loss	7.68					
RX Level	Attn	23.75					

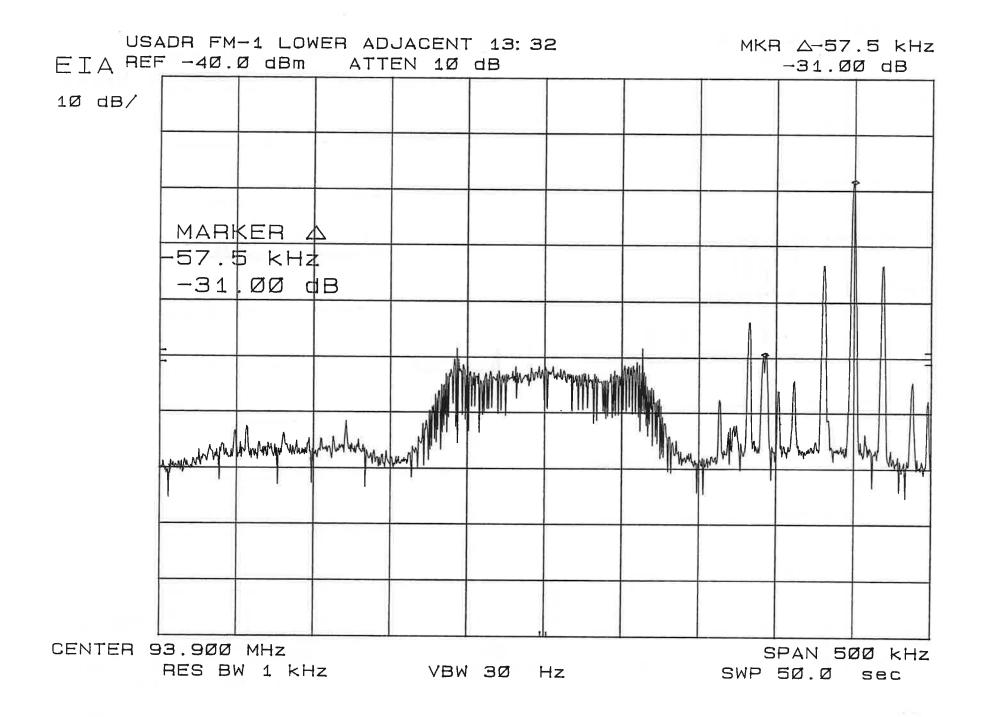
File Name: F2\_RX5T XLS Upper 35dB

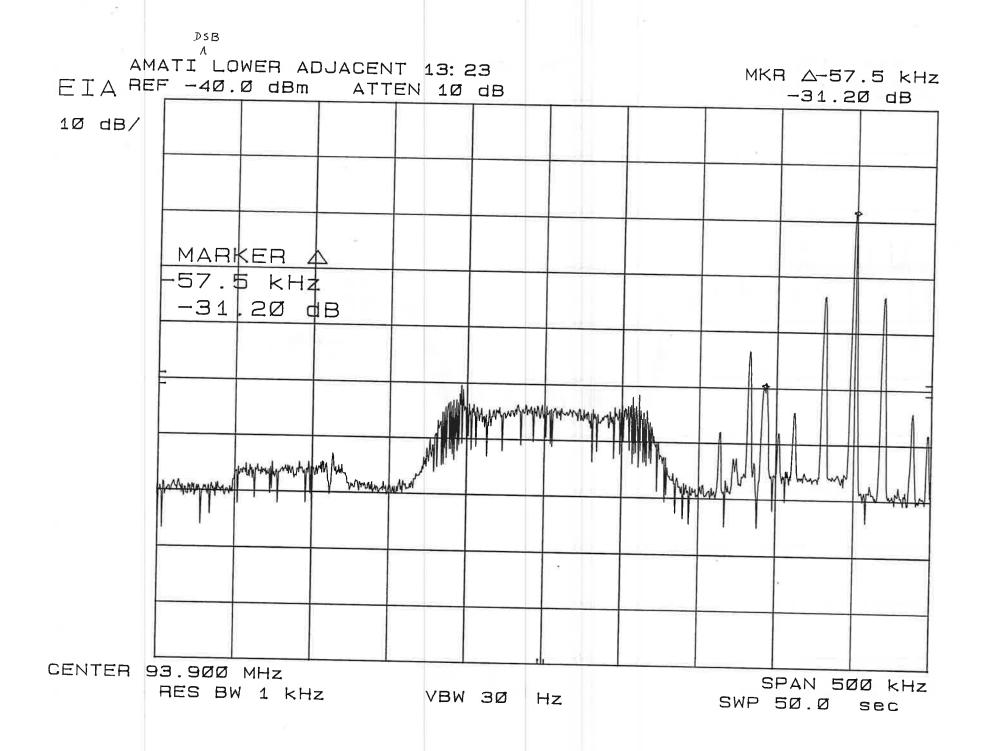
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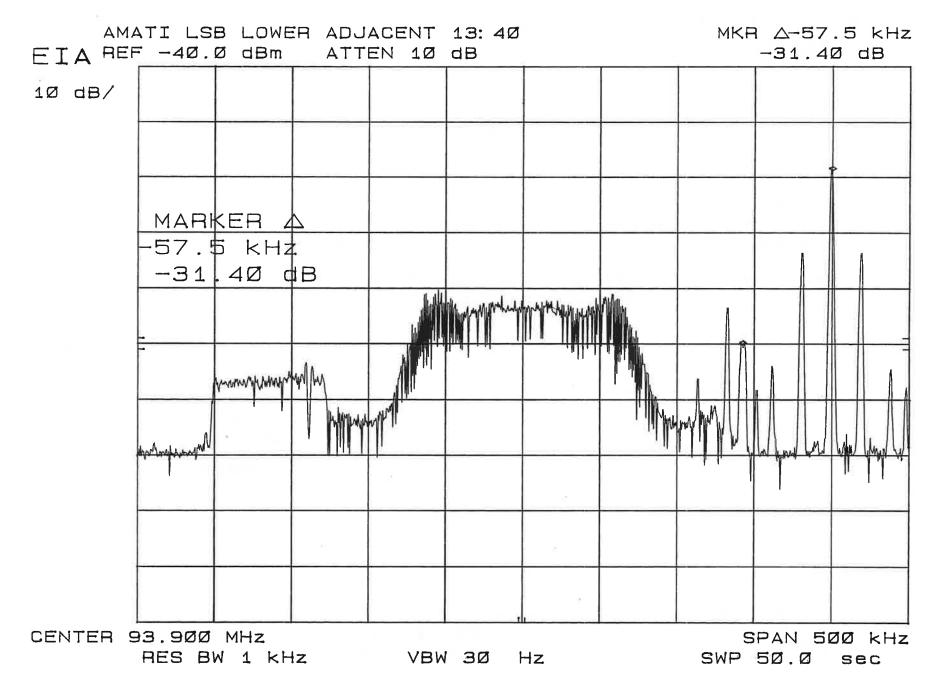
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			4			AT&T					-2.5	
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File Name:F2\_RX5T.XLS Upper DAT Log





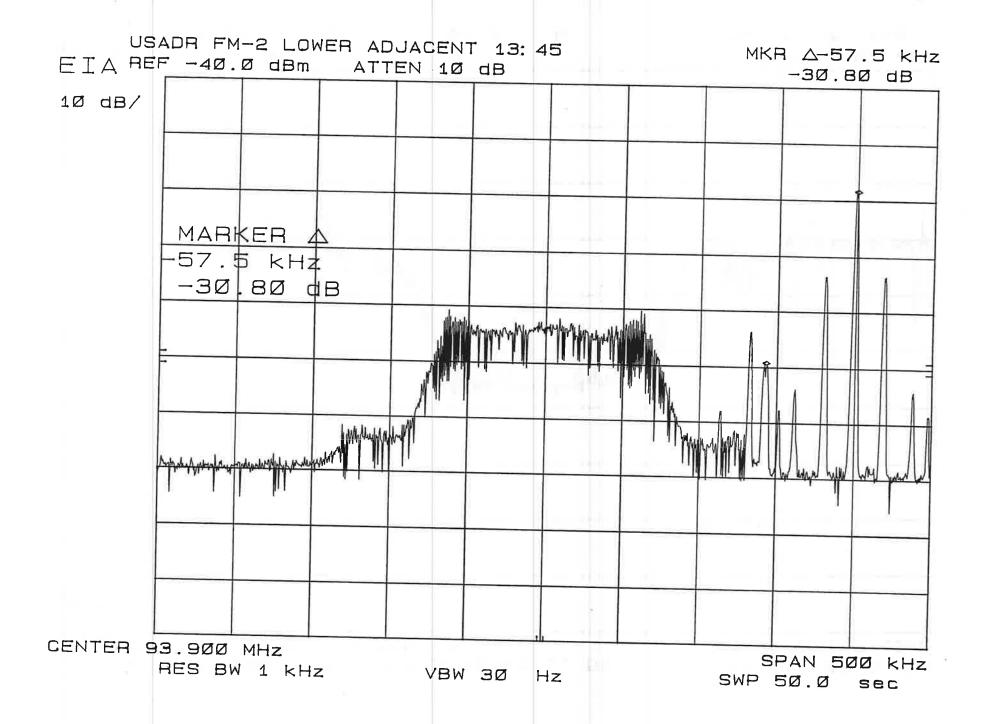


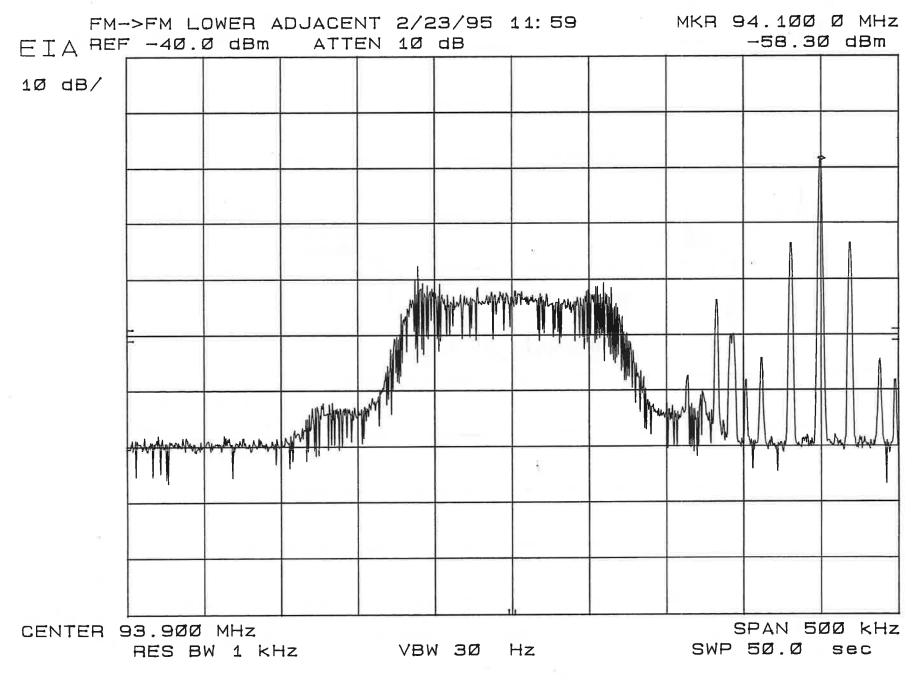


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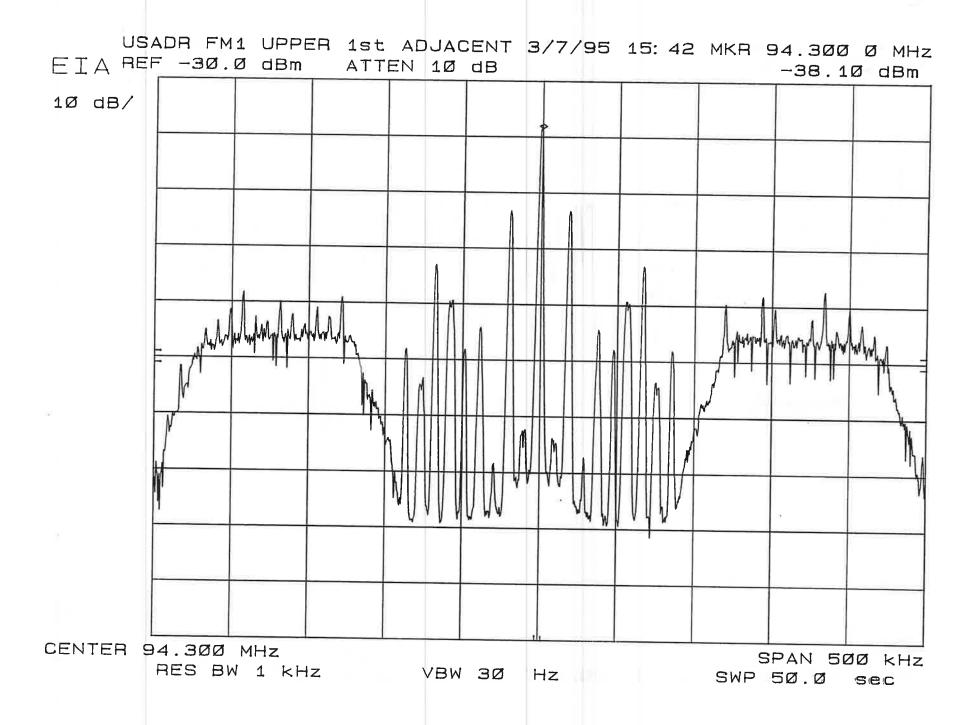
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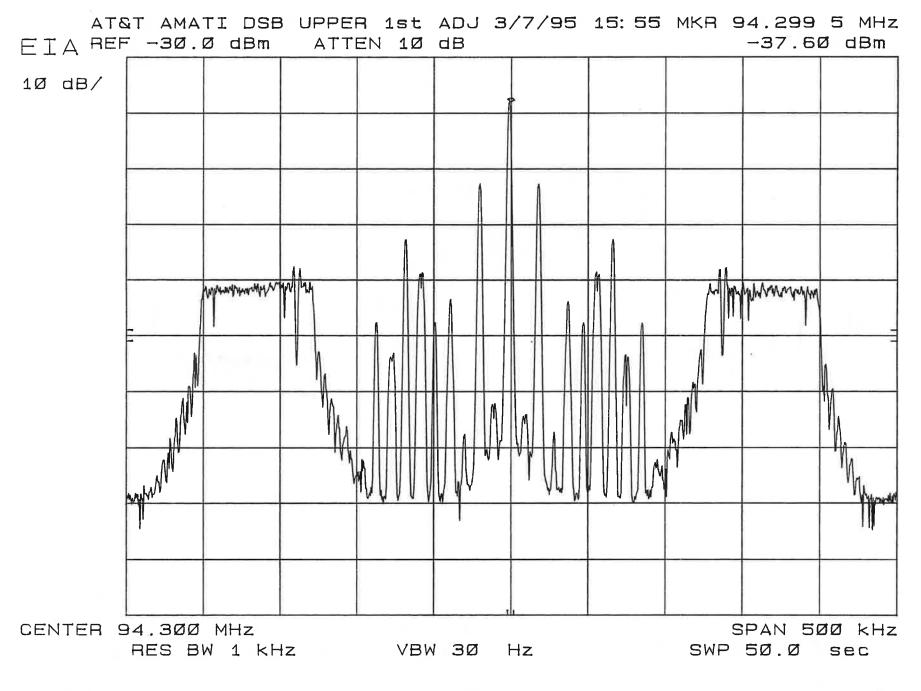




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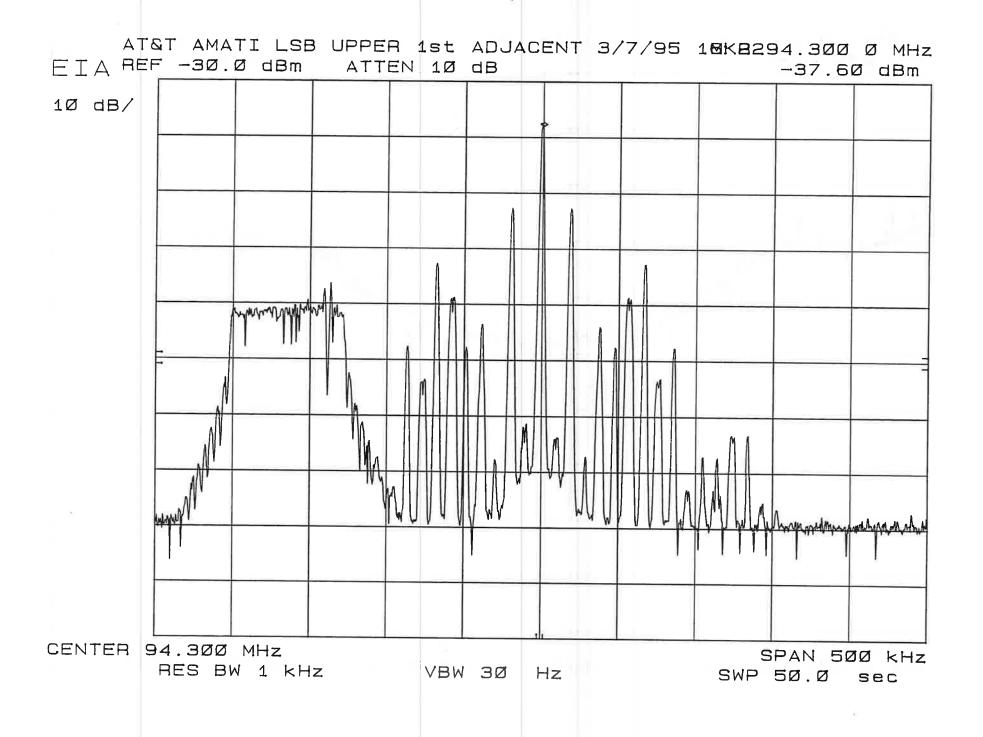
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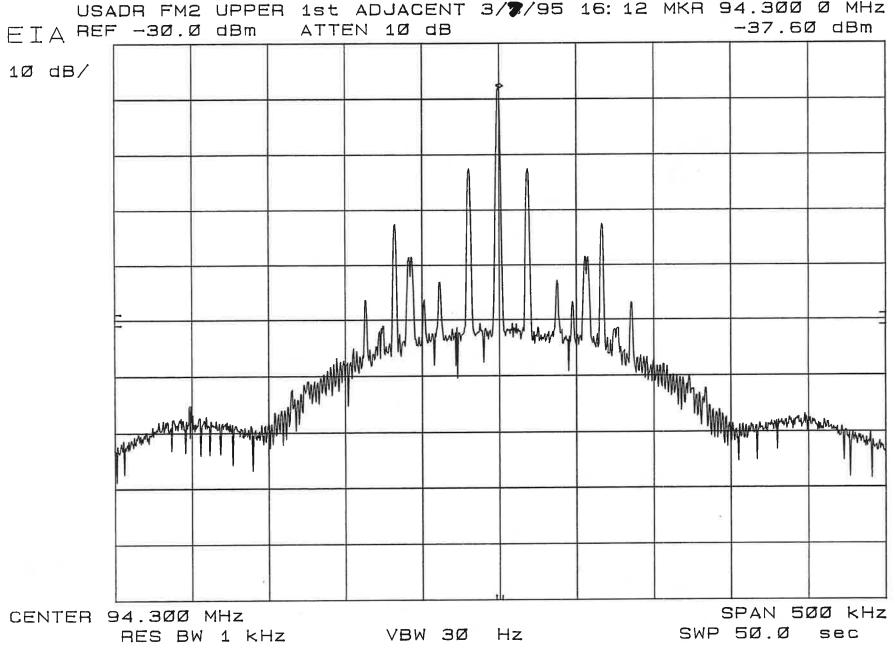




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USADR FM2 UPPER 1st ADJACENT 3/7/95 16: 12 MKR 94.300 0 MHz

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# **APPENDIX AO**

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

### 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.

File Name: F3\_RX1T\_XLS Cover

Test F-3, F-6 and G-3	1	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	desired -8.7								
Reference	Loss 40.7								
Kelefonee	undesired 8.4								
RX Level	Loss 11.7								
-62.00 dBm	Attn 22.0								
AT&T	desired -8.7								
IBAC	Loss 40.7								
	undesired -15.6	7							
RX Level	Loss 7.6	8	S/N at d/u 43 dB						
-62,00 dBm	Attn 2.0		d/u attn= 1.97 dB						
AT&T Amati	desired -8.7	8 -24.05							
DSB IBOC	Loss 40.7	1							
	undesired -8.0	1							
RX Level	Loss 7.6	8	S/N at d/u 46.6 dB						
-62.00 dBm	Atth 9.7		d/u attn= 9.63 dB						
AT&T Amati	desired -8.7								
LSB IBOC	Loss 40.7								
	undesired -8,1								
RX Level	Loss 7.6	11	S/N at d/u 46.5 dB						
-62.00 dBm	Attn 9.5		d/u attn= 9.53 dB						
USADR FM1	desired -8.7								
IBOC	Loss 40.7								
	undesired -9.4								
RX Level	Loss 7.6		S/N at d/u 45.4 dB						
-62.00 dBm	Attn 8.2		d/u attn= 8.20 dB						
USADR FM2	desired -8.7								
IBOC	Loss 40.7								
	undesired -6.0								
RX Level	Loss 7.6		S/N at d/u 38.6 dB						
-62.00 dBm	Attn 11.5		d/u attn= 11.61 dB						
	Froup B on interferers a	nd desired anal	og		DAT Ref.: DAR40130.DAT				
	k Noise on interferers	0.10 - 0 - 7							
		UaB on Sony 7	010 Input Monitor with Input Gain Set to -4.0dB		Best Case $S/N = 49 \text{ dB}$				
	cted March 1, 1995	anotorictica 1/	of SAL of 45dB not procompliated						
Due to the narrow band receiver characteristics d/u at S/N of 45dB not accomplished									

Test F-3 35 dB S/N Receiver #1			F-3		Effects with o Digital Modu		
Delco					d/u in dB @		d/u in dB @
16192463	Measurements		d/u in dB	Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog	desired	-8.87	NA		NA	Gilenee	0/11-3500
Reference	Loss	40,71					
	undesired	-1.45					
Desired Signal Level	Loss	11.75					
-62.00 dBm	Attn	9.50					
AT&T	desired	-8.87	NA	-8.78	-20.93	-8,87	NA
IBAC	Loss	40.71		40.71		40.71	INA
	undesired	-15.60		-15,38		-15.38	
RX Level	Loss	7.68		7.68		7.68	
-62.00 dBm	Attn	10.25		5.50		8.25	
AT&T Amati	desired	-8.87	NA			0.45	-
DSB IBOC	Loss	40.71					
	undesired	-7.98					
RX Level	Loss	7.68					
-62.00 dBm	Attn	42.00					
AT&T Amati	desired	-8.87	NA				
LSB IBOC	Loss	40.71					
	undesired	-8.09					
X Level	Loss	7.68					
-62.00 dBm	Attn	17.00					
JSADR FM1	desired	-8.84	NA				
BOC	Loss	40.71					
	undesired	-9.46					
X Level	Loss	7.68					
-62.00 dBm	Atta	38.50					
JSADR FM2	desired	-8.87	NA				
BOC	Loss	40.71					
	undesired	-6.01					
X Level	Loss	7.68					
-62.00 dBm	Attn	24.75					

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

DAT File	Time Code		Start IDs			Grade	
Number	Start Stop				Description	1 1	2
DAR40130.DAT					LOWER SECOND ADJACENT		
3/1/95							
						·····	
					Amati DSB Lower 2nd Adjacent	0	
			2		Amati DSB Lower 2nd Adjacent 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	
			TT			-1.5	,
			1		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	
		••••••••••••••••••••••••••••••••	1		and a second state of the second state of the state of the second	-2.5	••••••
			1		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		
			14		USADR FM1 Urban Fast with Lower 2nd Adjacent	-0.5	
			15		USADR FM2 Urban Fast with Lower 2nd Adjacent	-0.5	
			1		and a second state of the second se	-2.3	
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Test F-3, F-6 and G-3		F-3	F-6	G-3 Urban Slow Rayleigh	
7 dB S/N			Upper Second Adjacent	Upper Second Adjacent	G-3 Urban Fast Rayleigh
Receiver #1			DAR to Analog	DAR to Analog	Upper Second Adjacent
Delco			C C	with Multipath	DAR to Analog
6192463	Measurements	d/u in dB	EO&C	EO&C	with Multipath
Analog to Analog	desired -	8.78 -24.17		2000	EO&C
Reference		0.71			
	undesired 8	3.43	1		
RX Level		1.75			
-62.00 dBm	Attn 22	2.00			
AT&T	desired -8	3.78 -24.11			
BAC	Loss 40	0.71			
	undesired -15	5.70			
X Level		.68	S/N at d/u 36.7 dB		
-62.00 dBm	Attn 2	2.00	d/u attn= 1.94 dB		
AT&T Amati	desired -8	.78 -24.06			
OSB IBOC	Loss 40	0.71			
2027	undesired -8	.00			
X Level		.68	S/N at d/u 46.4 dB		
-62.00 dBm	Attn 9	.75	d/u attn= 9.64 dB		
T&T Amati	desired -8	.78 -24.21			
SB IBOC	Loss 40	.71			
	undesired -8	.10			
X Level	Loss 7	.68	S/N at d/u 46.4 dB		
-62.00 dBm		.50	d/u attn= 9.54 dB		
ISADR FM1		.78 -24.29			
BOC	Loss 40	.71			
	undesired -9	.52			
X Level		68	S/N at d/u 45.4 dB		
-62.00 dBm		.00	d/u attn= 8.12 dB		
SADR FM2		78 -24.21			
BOC	Loss 40.				
	undesired -6.				
X Level	ARRENT CONTRACTOR OFFICE		S/N at d/u 37 dB		
-62.00 dBm	Attn 11.		d/u attn= 11.54 dB		
Subcarrier G	roup B on interferers	and desired analo	g		DITE C DIDIOIS
otes: Clipped Pink	Noise on interferers				DAT Ref.: DAR40150.DAT
Standard SC.	A Test Signal yields -	20dB on Sony 70	10 Input Monitor with Input Gain Set to -4.0	dB	
lests conduc	ted March 14, 1995				Best Case $S/N = 49 \text{ dB}$
Due to the na	arrow band receiver cl	naracteristics d/u	at S/N of 45dB not accomplished		

Test F-3			F-3			Effects with o		
35 dB S/N	1					Digital Modu	lation	
Receiver #1								
Delco						d/u in dB		d/u in dB @
16192463	Measurements		d/u in dB		Silence	D/N=47dB	Silence	S/N=35dB
Analog to Analog	desired	-8.87	NA			NA		
Reference	Loss	40,71						
	undesired	-1,45						
Desired Signal Level	Loss	11.75						
-62.00 dBm	Attn	9.50						
AT&T	desired	-8.87	NA		-8.78	-24.18	-8.87	NA
IBAC	Loss	40,71			40.71		40.71	
	undesired	-15.60			-15.38		-15.38	
RX Level	Loss	7.68			7.68		7.68	
-62.00 dBm	Attn	10.25			2.25		8.25	
AT&T Amati	desired	-8.87	NA					
DSB IBOC	Loss	40.71						
	undesired	-7.98						
RX Level	Loss	7,68				1		
-62,00 dBm	Attn	42.00		· · · · · · · · · · · ·				
AT&T Amati	desired	-8.87	NA					
LSB IBOC	Loss	40.71						
	undesired	-8.09						
RX Level	Loss	7.68				1		
-62,00 dBm	Attn	17.00						
USADR FM1	desired	-8.84	NA					
IBOC	Loss	40.71						
	undesired	-9.46				1		
RX Level	Loss	7.68						
-62.00 dBm	Attn	38.50						
USADR FM2	desired	-8.87	NA					
IBOC	Loss	40.71						
	undesired	-6.01						
RX Level	Loss	7.68						
	Attn	24.75						
-62,00 dBm								

DAT File		Code		Stari	IDs								Grac	le
Number	Start	Stop							Descripti	on			1	2
DAR40150.DAT					TT			UPPER S	SECOND	ADJACENT			•	4
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	******		2	<b> </b>			Jrban Slow	with Upp	er 2nd A	djacent			-1.5	
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#### 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 Digital Audio Tape recording log of the Lower Second Adjacent results 4 5 DAR -> Analog interference at a 45dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency DAR -> Analog interference at a 35dB signal to noise ratio. Digital Proponent on the upper second adjacent frequency 6 Digital Audio Tape recording log of the Upper Second Adjacent results 7 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. \*

Test F-3, F-6 and G-3	1		F-3	F-6		G-3	Urban Slow Rayleigh	G-3	Urban Fast Rayleigh
45 dB S/N				Lower Second	Adjacent	Lower S	econd Adjacent	Lower	Second Adjacent
Receiver #2				DAR to Analog		DAR to	Analog		o Analog
Denon				-		with Mu	ltipath		lultipath
TU-380RD	Measurements		d/u in dB	EO&C		EO&C		EO&C	
Analog to Analog	desired	-8.78	-24.67	1					
Reference	Loss	40.71							
	undesired	8.43							
RX Level	Loss	11.75							
-62.00 dBm	Attn	21.50							
AT&T	desired	-8.78	-11.97						
IBAC	Loss	40.71							
	undesired	-15.59							
RX Level	Loss	7.68		S/N at d/u	22,5 dB				
-62.00 dBm	Attn	14.25		d/u attn=	1.55 dB				
AT&T Amati	desired	-8.78	-16.54						
DSB IBOC	Loss	40.71							
	undesired	-8.02							
RX Level	Loss	7.68		S/N at d/u	20.75 dB				
-62,00 dBm	Attn	17.25		d/u attn=	9.12 dB				
AT&T Amati	desired	-8.78	-19.71						
LSB IBOC	Loss	40.71							
	undesired	-8.10							
RX Level	Loss	7.68		S/N at d/u	28.6 dB				
-62.00 dBm	Attn	14.00		d/u attn=	9.04 dB				
USADR FM1	desired	-8.78	-4.64						
IBOC	Loss	40.71							
	undesired	-9.42							
RX Level	Loss	7.68		S/N at d/u	20.75 dB				
-62.00 dBm	Attn	27.75		d/u attn=	7.72 dB			·····	
USADR FM2	desired	-8.78	-4.06						
IBOC	Loss	40.71							
	undesired	-6.00		l.					
RX Level	Loss	7.68		S/N at d/u	24.5 dB				
-62.00 dBm	Attn	31.75		d/u attn=	11.14 dB			1	
	Group B on interfe		desired analo	og				DAT	Ref.: DAR40131.DAT
202020200	k Noise on interfe								
	0,		B on Sony 70	010 Input Monit	or with Input Gain Set to -4.00	iB		Best C	Case S/N = 51.5 dB
Tests condu	icted March 2, 199	95							
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<b>Test F-3</b> 35 dB S/N Receiver #2			F-3	ut lation				
Denon	0					d/u in dB @		dia in an o
TU-380RD	Measurements	_	d/u in dB		Silence	S/N=45dB	Silence	d/u in dB @ S/N=35dB
Analog to Analog	desired	-8.87	NA	1		NA I		5/11-550D
Reference	Loss	40.71						
	undesired	-1.45						
Desired Signal Level	Loss	11.75						
-62.00 dBm	Attn	9.50						
AT&T	desired	-8.87	NA		-8.78	-14.47	-8.87	NA
BAC	Loss	40.71			40.71	i i i	40.71	
	undesired	-15.60			-15.34		-15.38	
RX Level	Loss	7.68			7.68		7.68	
-62.00 dBm	Attn	10.25			12.00		8.25	
AT&T Amati	desired	-8.87	NA					
DSB IBOC	Loss	40.71						
	undesired	-7.98						
RX Level	Loss	7.68		р. 				
-62.00 dBm	Attn	42.00						
AT&T Amati	desired	-8.87	NA					-
LSB IBOC	Loss	40.71						
	undesired	-8.09						
XX Level	Loss	7.68						
-62.00 dBm	Attn	17.00						
JSADR FM1	desired	-8.84	NA					
BOC	Loss	40.71						
<b>1</b> 77 1	undesired	-9.46						
X Level	Loss	7.68						
-62.00 dBm	Attn	38.50						
ISADR FM2 BOC	desired	-8.87	NA					
DUC	Loss	40,71						
X Level	undesired	-6.01						
	Loss	7.68	1	1				
-62.00 dBm	Atin	24.75						

DAT File	Time C	Start IDs					Grade		
Number	Start	Stop					Description	1 1	2
DAR40131.DAT						Τ	LOWER SECOND ADJACENT		
3/2/95		1		T	1	1			
				I			1		
			1			1	Amati DSB Lower 2nd Adjacent	-2	1
		T	2	1	1	1	AT&T Lower 2nd Adjacent	-2.5	
			3	T T	1	1	Amati LSB Lower 2nd Adjacent	-0.5	0.5
		1	4			1	USADR FM1 Lower 2nd Adjacent	-2	0.5
}			5		1	1	USADR FM2 Lower 2nd Adjacent	-1.5	1
			1			1	1	·····	
		1	1	1	1	1	WITH MULTIPATH (URBAN SLOW)	······	
DISREGARD		1	6	7	1	1	( <u>)</u>	······	
		1	8			1	USADR FM2 Urban Slow with Lower 2nd Adjacent	-3	
		I	9	1		1	USADR FM1 Urban Slow with Lower 2nd Adjacent	-3	
		1	10	1	1	1	Amati LSB Urban Slow with Lower 2nd Adjacent	-2.5	
		1	11	1	1	1	AT&T Urban Slow with Lower 2nd Adjacent	-2.5	
			12		1	1	Amati DSB Urban Slow with Lower 2nd Adjacent	-2.5	
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File Name:F3\_RX2T.XLS Lower DAT Log

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Test F-3, F-6 and G-3		F-3	F-6	G-3 Urban Slow Rayleigh	G-3 Urban Fast Rayleigh
45 dB S/N			Upper Second Adjacent	Upper Second Adjacent	
Receiver #2			DAR to Analog	DAR to Analog	Upper Second Adjacent
Denon				with Multipath	DAR to Analog
TU-380RD	Measurements	d/u in dB	EO&C	EO&C	with Multipath
Analog to Analog	desired -8.7	7 -33.18		Louic	EO&C
Reference	Loss 40.7	1	1		
	undesired 8.4	5			
RX Level	Loss 11.7				
-62.00 dBm	Attn 13.0				
AT&T	desired -8.7				
IBAC	Loss 40.7	E · · ·			
	undesired -15,63	3			
RX Level	Loss 7.6	3	S/N at d/u 17 dB		
-62.00 dBm	Attn 31.25	5	d/u attn = 2.69 dB		
AT&T Amati	desired -8,7	-21.02			
DSB IBOC	Loss 40.7				
	undesired -7.98	3			
RX Level	Loss 7.68		S/N at d/u 15 dB		
-62.00 dBm	Attn 22.50		d/u attn= 10.34 dB		
AT&T Amati	desired -8.77	-21.89			
LSB IBOC	Loss 40.71				
	undesired -8.11				
RX Level	Loss 7.68		S/N at d/u 17.4 dB		
-62.00 dBm	Attn 21.50		d/u attn= 10.21 dB		
USADR FM1	desired -8.77	-15.98			
IBOC	Loss 40.71				
	undesired -9.52				
RX Level	Loss 7.68		S/N at d/u 17.5 dB		
-62.00 dBm	Attn 26.00		d/u attn= 8.80 dB		
USADR FM2	desired -8.77	-5.93			
IBOC	Loss 40.71				
	undesired -6.07				
RX Level	Loss 7.68		S/N at d/u 18.5 dB		
-62.00 dBm	Attn 39.50		d/u attn= 12.25 dB		
Subcarrier	Group B on interferers an	d desired analo	g		DAT Ref.: DAR40151.DAT
Notes: Clipped Pir	k Noise on interferers				DAT KEL DAR40151.DAT
Standard St	CA Test Signal yields -20	dB on Sony 70	10 Input Monitor with Input Gain Set to -4.0dE		Best Case S/N - 51 JD
Tests condu	icted March 14, 1995				Best Case $S/N = 51 dB$
2-3 KHz of	f in Undesired Analog ref	erence center l	requency yields 2-3 dB difference in S/N.		

<b>Test F-3</b> 35 dB S/N			F-3		Effects with out Digital Modulation					
Receiver #2										
Denon						d/u in dB @		d/u in dB (a		
TU-380RD	Measurements		d/u in dB		Silence	S/N=45dB	Silence	S/N=35dB		
Analog to Analog	desired	-8.77	-36.68							
Reference	Loss	40.71								
	undesired	8.45								
Desired Signal Level	Loss	11,75				1				
-62.00 dBm	Atm	9.50								
AT&T	desired	-8.77	-16.37		-8,77	-5.93	-8.77	-17.93		
IBAC	Loss	40.71			40.71		40.71			
	undesired	-15.63			-15.32		-15.32			
RX Level	Loss	7.68			7.68		7.68			
-62.00 dBm	Attn	19.50			30.25		18.25			
AT&T Amati	desired	-8.77	-25.27							
DSB IBOC	Loss	40.71								
	undesired	-7.98								
RX Level	Loss	7.68								
-62,00 dBm	Attn	18.25								
AT&T Amati	desired	-8.77	-26.14							
LSB IBOC	Loss	40.71								
	undesired	-8.11								
RX Level	Loss	7.68								
-62.00 dBm	Atto	17.25								
USADR FM1	desired	-8,77	-24,73							
IBOC	Loss	40.71								
	undesired	-9.52								
RX Level	Loss	7.68								
-62.00 dBm	Atln	17.25								
USADR FM2	desired	-8.77	-16.68							
IBOC	Loss	40.71								
	undesired	-6.07								
RX Level	Loss	7,68								
-62.00 dBm	Attn	28,75		l						

DAT File	Time Code	Start IDs		Grade	
Number	Start Ste	op	Description	1 1	2
DAR40151.DAT			UPPER SECOND ADJACENT		*
3/14/95			OT A DATE DECOND ADDATEST		
			Amati DSB		
		2	AT&T	-2	
		3	Amati LSB	-2.5 -2	0
		4	USADR FM1	-2	1
		5		-2	1
		·····	USADR FM2	-2	1
DIODECARD			WITH MULTIPATH (URBAN SLOW)	1	*****
DISREGARD	·····	6		1	
DUDDOUDD		7	FM2	-2	
DISREGARD		8			
		9	FM1	-2	
		10	AMATI LSB	-1.5	
			AT&T	-2.5	
I		12	AMATI DSB	-1.5	
				-1.5	
				······	••••••
I	1	······			
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				1	*****
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I				·····	
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### 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.

Test F-3, F-6 and G-3	1	-	F-3	F-6			G-3	Urban Slow Rayleigh	G-3	Urban Fast Rayleigh
45 dB S/N		1		Lower Second	Adjacent		Lower Seco	and Adjacent	Lower Seco	ond Adjacent
Receiver #3				DAR to Analog	ĩ		DAR to An	alog	DAR to An	alog
Panasonic							with Multip	bath	with Multi	path
RX-FS430	Measurements		d/u in dB	EO&C			EO&C		EO&C	
Analog to Analog	desired	-8.78	-22.41				1			
Reference	Loss	40.71								
	undesired	8.42								
RX Level	Loss	11.75								
-62.00 dBm	Attn	23.75								
AT&T	desired	-8.78	-12.94							
IBAC	Loss	40.71								
	undesired	-15.62								
RX Level	Loss	7.68		S/N at d/u	30 dB					
-62.00 dBm	Attn	13.25		d/u attn=	3.78 dB		· · · · · · · · · · · · · · · · · · ·			
AT&T Amati	desired	-8.78	-14.81							
DSB IBOC	Loss	40.71					8			
	undesired	-8.00								
RX Level	Loss	7.68		S/N at d/u	36.2 dB					
-62.00 dBm	Attn	19.00	l	d/u attn=	11.40 dB					
AT&T Amati	desired	-8.78	-20.45							
LSB IBOC	Loss	40.71								
	undesired	-8.11								
RX Level	Loss	7.68		S/N at d/u	42.8 dB		1			
-62.00 dBm	Attn	13.25		d/u attn=	11.29 dB					
USADR FM1	desired	-8.78	-4.39							
IBOC	Loss	40.71		1						
1	undesired	-9.42								
RX Level	Loss	7.68		S/N at d/u	28 dB				1	
-62.00 dBm	Attn	28.00		d/u attn=	9.98 dB					
USADR FM2	desired	-8,78	-5.81							
IBOC	Loss	40.71								
	undesired	-6 00								
RX Level	Loss	7,68		S/N at d/u	29.2 dB					
-62.00 dBm	Attn	30.00		d/u attn=	13.40 dB					
	Group B on interfe		desired anal	og					DAT Re	f.: DAR40132.DAT
	k Noise on interfe									
			B on Sony 7	010 Input Monit	tor with Input Gain	Set to -4.0dB			Best Case	e S/N = 51 dB
Tests condu	cted March 3, 199	95								

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Test F-3 35 dB S/N Receiver #3			F-3	Effects with out Digital Modulation						
Panasonic RX-FS430				d/u in dB @	d/u in dB @					
	Measurements		d/u in dB	Silence S/N=45dB Sile	ence S/N=35dB					
Analog to Analog	desired	-8.78	-26.16	NA						
Reference	Loss	40.71								
	undesired	8.42								
Desired Signal Level	Loss	11.75								
-62.00 dBm	Attn	20.00								
AT&T	desired	-8.78	-21.44	-8.78 -15.97	-8.78 -22.22					
BAC	Loss	40.71		40.71	40.71					
	undesired	-15.62		-15.34	-15.34					
RX Level	Loss	7.68		7.68	7.68					
-62.00 dBm	Attn	4.75		10.50	4.25					
AT&T Amati	desired	-8.78	-22.56	No Difference						
OSB IBOC	Loss	40.71								
	undesired	-8.00								
RX Level	Loss	7.68								
-62.00 dBm	Attn	11.25								
AT&T Amati	desired	-8.78	-25.20	No Difference						
SB IBOC	Loss	40.71								
	undesired	-8.11								
RX Level	Loss	7.68								
-62.00 dBm	Attn	8.50								
JSADR FM1	desired	-8.78	-15.64	No Difference						
BOC	Loss	40.71								
	undesired	-9.42								
X Level	Loss	7.68								
-62.00 dBm	Attn	16.75								
ISADR FM2	desired	-8.78	-16.83	No Difference						
BOC	Loss	40.71		. to Difference						
	undesired	-5.98								
X Level	Loss	7.68								
-62.00 dBm	Atm	19.00								

Notes:

DAT File Number	Time Code Start Stop					Description	Grade		
				<del></del>	<del></del>	LOWER SECOND ADJACENT			
DAR40132.DAT 3/3/95						LUWER SECOND ADJACEN I			
3/3/95									
			2			Amati LSB Lower 2nd Adjacent	0.00	1.00	
		3				AT&T Lower 2nd Adjacent	-2.00	1.00	
						Amati DSB Lower 2nd Adjacent	-2.00	1.00	
		e				USADR FM1 Lower 2nd Adjacent		1.00	
					····	USADR FM1 Lower 2nd Adjacent	-2.00	1.00	
						USADR FM2 Lower 2nd Adjacent	-2.00	1.00	
				-		WITH MULTIPATH (URBAN SLOW)	2.00		
		8				USADR FM2 Urban Slow with Lower 2nd Adjacent	-3.00		
		9	, 0 11			USADR FM1 Urban Slow with Lower 2nd Adjacent Amati DSB Urban Slow with Lower 2nd Adjacent	-3.00 -3.00		
		1					-3.00		
						AT&T Urban Slow with Lower 2nd Adjacent			
		1	3			Amati LSB Urban Slow with Lower 2nd Adjacent	-1.00		
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			T		1				
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File Name:F3\_RX3T.XLS Lower DAT Log

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Test F-3, F-6 and G-3		F-3	F-6		G-3 Urban Slow Rayleigh	G-3 Urban Fast Rayleigh
5 dB S/N			Upper Second Adj	acent	Upper Second Adjacent	Upper Second Adjacent
Receiver #3			DAR to Analog		DAR to Analog	DAR to Analog
Panasonic		1			with Multipath	
RX-FS430	Measurements	d/u in dB	EO&C		EO&C	with Multipath EO&C
Analog to Analog	desired -8.7	7 2.16				Eoæc
Reference	Loss 40.7	1				
	undesired -11.3	9				
RX Level	Loss 11.7					
-62.00 dBm	Attn 28.5					
AT&T	desired -8.7					
BAC	Loss 40.7					
	undesired -15.5					
RX Level	Loss 7.6		S/N at d/u	46.4 dB		
-62.00 dBm	Attn 26.5		d/u attn=	28.39 dB		
AT&T Amati	desired -8.7			28.39 dB		
DSB IBOC	Loss 40.7					
505 1200	undesired -7.9					
RX Level			0.01 -4 -14	10.1.15		
-62.00 dBm	***************************		S/N at d/u	42.4 dB		
AT&T Amati			d/u attn=	35.99 dB		
LSB IBOC	1,523,733,235, (155)					
-SD IDUC						
RX Level	148					
-62.00 dBm	Loss 7.6		S/N at d/u	42.6 dB		
	Attn 39.00		d/u attn=	35.92 dB		
JSADR FM1 BOC	desired -8.7					
BUC	Loss 40.7					
	undesired -9.48					
X Level	Loss 7.68		S/N at d/u	39.5 dB		
-62.00 dBm	Atm 41.00		d/u attn=	34.48 dB		
JSADR FM2	desired -8.77					
BOC	Loss 40.71					
	undesired -6.09					
X Level	Loss 7.68		S/N at d/u	44.2 dB		
-62.00 dBm	Attn 38.75		d/u attn=	37.87 dB		
	Froup B on interferers an	d desired anal	og .			DAT Ref.: DAR40152.DAT
	k Noise on interferers					DAT KEL DAR40 (52.0A)
Standard SC	A Test Signal yields -20	dB on Sony 70	010 Input Monitor w	ith Input Gain Se	.0dB	Post Case C/N Et JD
Tests condu	cted March 15, 1995	-				Best Case $S/N = 51 dB$

Test F-3			F-3	Effects with out
35 dB S/N				Digital Modulation
Receiver #3				
Panasonic				d/u in dB @ d/u in dB @
RX-FS430	Measurements		d/u in dB	Silence S/N=45dB Silence S/N=35dE
Analog to Analog	desired	-8.77	-9.09	NA
Reference	Loss	40.71		
	undesired	-11.39		
Desired Signal Level	Loss	11.75		
-62.00 dBm	Attn	17.25		
AT&T	desired	-8.77	-11.23	-8.77 -4.51 -8.77 -15.76
IBAC	Loss	40.71		40.71 40.71
	undesired	-15.57		-15.29 -15.29
RX Level	Loss	7.68		7.68 7.68
-62.00 dBm	Attn	15.00	()	22.00 10.75
AT&T Amati	desired	-8.77	-4.83	No Difference
DSB IBOC	Loss	40.71		
	undesired	-7.97		
RX Level	Loss	7.68		
-62.00 dBm	Attn	29.00		
AT&T Amati	desired	-8.77	-6.01	No Difference
LSB IBOC	Loss	40.71		
	undesired	-8.04		
RX Level	Loss	7.68		
-62,00 dBm	Attn	27.75		
USADR FM1	desired	-8.77	-2.57	No Difference
IBOC	Loss	40.71		
	undesired	-9.48	1 1	
RX Level	Loss	7,68		
-62.00 dBm	Attn	29.75		
USADR FM2	desired	-8.77	-7.96	No Difference
IBOC	Loss	40.71		
	undesired	-6.09		
RX Level	Loss	7.68		
-62.00 dBm	Attn	27.75		

File Name: F3\_RX3T\_XLS Upper 35dB

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DAT File	Time Code						Grade		
Number	Start Stop		itart Stop		Description	1	2		
DAR40152.DAT							UPPER SECOND ADJACENT		
3/14/95		1							
		1							
		1	1				DSB	-0.5	0
			2				AT&T	0	0
			3		I		LSB	-0.5	0
			4				FM1	-1	0 -0.5
			5				FM2	0	0.0
			1	I	1				
							WITH MULTIPATH (URBAN SLOW)		
			6	II			FM2 Urban Slow	0	
			7		1		FM1 Urban Slow	-1	
		[	8				LSB Urban Slow	-1	
			9	1			AT&T Urban Slow	-1.5	
			10	1			DSB Urban Slow	-1.5	
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### 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 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.
*	Audio measurements made using quasi-peak detection and a CCIR wighting filter

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								A		
Test F-3, F-6 and G-3	1		F-3	F-6			1	Slow Rayleigh		Urban Fast Rayleigh
45 dB S/N				Lower Second A	~		Lower Second Adjace	ent	Lower Second	
Receiver #4	1		1	DAR to Analog			DAR to Analog		DAR to Anale	0
Pioneer			N				with Multipath		with Multipat	h
SX-201	Measurements			EO&C			EO&C		EO&C	
Analog to Analog	desired	-8,78	-15.16							
Reference	Loss	40.71								
	undesired	8.42								
RX Level	Loss	11.75								
-62.00 dBm	Attn	31.00								
AT&T	desired	-8.78	-10.19							
IBAC	Loss	40.71								
		-15.62								
RX Level	Loss	7,68		S/N at d/u	40.8 dB					
-62.00 dBm	Atta	16.00		d/u attn=	11.03 dB					
AT&T Amati	desired	-8,78	1.95				1			
DSB IBOC	Loss	40.71								
	undesired	-8.01								
RX Level	Loss	7.68		S/N at d/u	29 dB		í i			
-62.00 dBm	Attn	35.75		d/u attn=	18.64 dB					
AT&T Amati	desired	-8,78	-14.72							
LSB IBOC	Loss	40.71								
	undesired	-8,09								
RX Level	Loss	7.68		S/N at d/u	44.5 dB					
-62.00 dBm	Attn	19,00		d/u attn=	18.56 dB					
USADR FM1	desired	-8.78	9.86							
IBOC	Loss	40.71								
	undesired	-9.42								
RX Level	Loss	7.68		S/N at d/u	18.6 dB					
-62.00 dBm	Attn	42.25		d∕u attn=	17.23 dB					
USADR FM2	desired		-2.06							
IBOC	Loss	40.71								
DYL	undesired	-6.00		D DI at d/a						
RX Level	Loss	7.68		S/N at d/u	33 dB					
-62.00 dBm	Attn	33.75		d/u attn=	20.65 dB				DUT D 1	
1	Group B on interfe		desired analo	og					DAT Ref.:	DAR40133.DAT
	k Noise on interfe		D C 7							
H			B on Sony 70	10 input Monito	r with Input Gain Se	et to -4,0dB			Best Case S	N = 51 dB
Tests condu	cted March 3, 199	5								

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Test F-3 45 dB S/N Receiver #4			F-3		Effects with out Digital Modulation					
Pioneer				d/u in dB @.		d/u la JD O				
SX-201	Measurements		d/u in dB	Silence S/N=45dB	Silence	d/u in dB @ S/N=35dB				
Analog to Analog	desired	-8.78	-25.66	NA		011 3545				
Reference	Loss	40.71				1				
	undesired	8.42								
Desired Signal Level	Loss	11.75								
-62.00 dBm	Attn	20.50								
AT&T	desired	-8.78	-21.44	-8.78 -13.73	-8.78	-24.48				
IBAC	Loss	40.71		40.71	40.71	- 1.10				
	undesired	-15.62		-15.33	-15.33					
RX Level	Loss	7.68		7.68	7.68					
-62.00 dBm	Attn	4.75		12.75	2.00					
AT&T Amati	desired	-8.78	-9.05	No Difference	2.00					
OSB IBOC	Loss	40.71								
	undesired	-8.01								
RX Level	Loss	7.68								
-62.00 dBm	Attn	24.75								
AT&T Amati	desired	-8,78	-24.72	No Difference						
LSB IBOC	Loss	40,71		The Difference						
	undesired	-8.09								
XX Level	Loss	7.68								
-62.00 dBm	Attn	9.00		1		-				
JSADR FM1	desired	-8.78	1.36	No Difference						
BOC	Loss	40.71								
	undesired	-9.42								
XX Level	Loss	7.68								
-62.00 dBm	Attn	33,75								
JSADR FM2	desired	-8.78	-13.06	No Difference						
BOC	Loss	40.71		The Difference						
	undesired	-6.00								
X Level	Loss	7.68								
-62.00 dBm	Attn	22.75								

Notes:

DAT File	Time C			Start IDs		Grade	
Number	Start	Stop			Description	1	2
DAR40133.DAT					LOWER SECOND ADJACENT		
3/3/95							
DISREGARD			1				
DISREGARD			2				
			3		Amati LSB Lower 2nd Adjacent	-0.5	-0.5
			4		AT&T Lower 2nd Adjacent	-1.5	0.5
			5		Amati DSB Lower 2nd Adjacent	-1	0
		1	6		USADR FM1 Lower 2nd Adjacent	-2	0
			7		USADR FM2 Lower 2nd Adjacent	-2	0
	•••••••••••••••••••••••••••••••••••••••						
					WITH MULTIPATH (URBAN SLOW)		
DISREGARD	*******	*	8				*******
	******		9		USADR FM2 Urban Slow with Lower 2nd Adjacent	-2	
	********	-	10		USADR FM1 Urban Slow with Lower 2nd Adjacent	-3	
			11		Amati DSB Urban Slow with Lower 2nd Adjacent	-3	
			12		AT&T Urban Slow with Lower 2nd Adjacent	-1.5	
		-	12		Amati LSB Urban Slow with Lower 2nd Adjacent	-1.5	*****
			15		Allati LSB Oldali Slow with Lowel 2nd Adjacent		
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		-					
			-				

File Name:F3\_RX4T.XLS Lower DAT Log

Page 4 of 7

Test F-3, F-6 and G-3		F-3	F-6	G-3 Urban Slow Rayleigh	G-3 Urban Fast Rayleigh		
45 dB S/N			Upper Second Adjacent	Upper Second Adjacent			
Receiver #4			DAR to Analog	DAR to Analog	Upper Second Adjacent		
Pioneer			5	with Multipath	DAR to Analog		
SX-201	Measurements	d/u in dB	EO&C	EO&C	with Multipath EO&C		
Analog to Analog	desired -8.7	6 -14.92			EO&C		
Reference	Loss 40.7	1					
	undesired 8.4	s					
RX Level	Loss 11.7						
-62.00 dBm	Attn 31.2						
AT&T	desired -8.7						
IBAC	Loss 40.7						
	undesired -15.6	1					
RX Level	Loss 7.6		S/N at d/u 36.2 dB				
-62.00 dBm	Attn 21.50		d/u attn= 11.22 dB				
AT&T Amati	desired -8.7		11,22 00				
DSB IBOC	Loss 40.7						
	undesired -7.9						
RX Level	Loss 7.6		S/N at d/u 39.8 dB				
-62.00 dBm	Attn 25.00		d/u attn= 18.91 dB				
AT&T Amati	desired -8.7		10.91 db				
LSB IBOC	Loss 40.71						
	undesired -8.09						
RX Level	Loss 7.68		S/N at d/u 39.5 dB				
-62.00 dBm	Attn 25.25		d/u attn= 18.80 dB				
JSADR FM1	desired -8.78		10.00 dB				
BOC	Loss 40.71						
	undesired -9.47						
RX Level	Loss 7.68	1	S/N at d/u 32.3 dB				
-62.00 dBm	Attn 31,25		d/u attn= 17.42 dB				
USADR FM2	desired -8.78	-3.48					
BOC	Loss 40.71						
	undesired -6.08						
RX Level	Loss 7.68		S/N at d/u 34.4 dB				
-62.00 dBm	Attn 32.25		d/u attn= 20.81 dB				
Subcarrier (	Group B on interferers an	d desired analo	og		DATE & CARLES		
Notes: Clipped Pin	k Noise on interferers				DAT Ref.: DAR40153.DAT		
Standard SC	A Test Signal yields -20	dB on Sony 70	010 Input Monitor with Input Gain Set to -4.0	dB			
Tests condu	cted March 14, 1995	-			Best Case S/N $=$ 51 dB		

Test F-3			F-3	Effects with out	
35 dB S/N				Digital Modulation	
Receiver #4					
Pioneer				d/u in dB @ d/u in	1 dB (a
SX-201	Measurements		d/u in dB		=35dB
Analog to Analog	desired	-8.76	-25.67	NA	
Reference	Loss	40.71			
	undesired	8.45			
Desired Signal Level	Loss	11.75			
-62.00 dBm	Attn	20.50			
AT&T	desired	-8.76	-16.14	-8.76 -6.18 -8.76 -1	7.68
IBAC	Loss	40.71		40.71 40.71	
	undesired	-15.65		-15.36 -15.36	
RX Level	Loss	7.68		7.68 7.68	
-62.00 dBm	Attn	10.00		20.25 8.75	
AT&T Amati	desired	-8.78	-19.83	No Difference	
DSB IBOC	Loss	40.71			
	undesired	-7,98			
RX Level	Loss	7,68			
-62.00 dBm	Attin	14.00			
AT&T Amati	desired	-8.78	-19.72	No Difference	
LSB IBOC	Loss	40,71			
	undesired	-8.09			
RX Level	Loss	7.68			
-62.00 dBm	Aim	14.00			
USADR FM1	desired	-8.78	-12.09	No Difference	
IBOC	Loss	40.71			
	undesired	-9.47		1 1	
RX Level	Loss	7.68			
-62.00 dBm	Attn	20,25		1 1	
USADR FM2	desired	-8.78	-14.48	No Difference	
IBOC	Loss	40.71			
	undesired	-6.08			
	Loss	7.68			
RX Level		21.25			

1.6

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DAT File Number	Time Code Start IDs Start Stop				1 1105		Grade	
	Start	Stop				Description		
DAR40153.DAT						UPPER SECOND ADJACENT		2
3/14/95						STADA OLEOND ADJACENI		
				T				
			1			Amati LSB		
			2	1		AT&T	-1	0.5
			3	1 1		Amati DSB	-1.5	-0.5
			4	†	····	USADR FM1	-1	0.5
			5	·····	····	USADR FM2	-1	0.5
	1					OSADK FM2	-1 -1	0
	******	*****	••••••••					
T.						WITH MULTIPATH (URBAN SLOW)		•••••••
t-			6			construction and a second s		••••••
······	·····		6			FM2	-1.5	
·····						FM1	-2	
·····			8			AMATI DSB		
		••••••	9			AT&T	-1 -2 -1	
			10			AMATI LSB		
							-1	
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File Name:F3\_RX4T.XLS Upper DAT Log

#### 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 onl
*	erepting about about about as the modulation signal for the analog channel of the Proponent signal (except $\Delta T \& T$ )
*	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 a leas 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.

Test F-3, F-6 and G-3	r	F-3	F-6	G-3 Urban Slow Rayleigh	G-3 Urban Fast Rayleigh
49 dB S/N	CAUTION		Lower Second Adjacent	Lower Second Adjacent	Lower Second Adjacent
Receiver #5			DAR to Analog	DAR to Analog	DAR to Analog
Ford			5	with Multipath	with Multipath
F4XF-19B132-CB	Measurements	d/u in dB	EO&C	EO&C	EO&C
Analog to Analog	desired -8.78	-43.16			
Reference	Loss 40.71				
	undesired 8.42				
RX Level	Loss 11.75				
-62.00 dBm	Attn 3.00	1			
AT&T	desired -8.78	-26.19			
IBAC	Loss 40.71				
	undesired -15.62				
RX Level	Loss 7.68		S/N at d/u 30 dB		
-62.00 dBm	Attn 0.00		d/u attn= -16.97 dB		
AT&T Amati	desired -8.78				
DSB IBOC	Loss 40.71				
	undesired -8.00				
RX Level	Loss 7.68		S/N at d/u 36.2 dB		
-62.00 dBm	Attn 0.00		d/u attn= -9.35 dB		
AT&T Amati	desired -8.78				
LSB IBOC	Loss 40.71				
	undesired -8.11				
RX Level	Loss 7.68		S/N at d/u 42.8 dB		
-62.00 dBm	Attn 0.00		d/u attn= -9.46 dB		
USADR FM1	desired -8.78				
IBOC	Loss 40.71				
	undesired -9.42	1			
RX Level	Loss 7.68		S/N at d/u 28 dB d/u attn= -10.77 dB		
-62,00 dBm	Attn 0.00		d/u attn= -10.77 dB		
USADR FM2	desired -8.78				
IBOC	Loss 40.71				
Data 1	undesired -6.00		S/N at d/u 29.2 dB		
RX Level	Loss 7.68 Attn 0.00		d/u attn= -7.35 dB		
-62.00 dBm	Attn 0.00 Group B on interferers an				DAT Ref.: None
	k Noise on interferers and		νÊ		APA DA BERREI DEMENSE
		dD on Sorry 7	010 Input Monitor with Input Gain Set to -4.0dB		Best Case S/N = $51.75 \text{ dB}$
Standard SC	A rest Signal yields -20	actoristics "	able to get 45dR S/N ratio with interference. Results	are at a 49dB S/N ratio w/interference as a demonstr	
	cted March 3, 1995	acteristics, ur	able to get soud on tanto with interference. Results	are at a 3742 0/11 fatty w/metrorence as a demonstr	
Tests condu	cicu Match 2, 1773				and the second

Test F-3 35 dB S/N Receiver #5			F-3		Effects with o Digital Modu		
Ford					d/u in dB @		d/u in dB @
F4XF-19B132-CB	Measurements		d/u in dB	Silence	S/N=45dB	Silence	S/N=35dB
Analog to Analog	desired	-8.78			1		
Reference	Loss	40.71	NA		NA		
	undesired	8.42					
Desired Signal Level	Loss	11.75					
-62.00 dBm	Attn						
AT&T	desired	-8.78		-8.78		-8.78	
IBAC	Loss	40.71	NA	40.71	NA	40.71	NA
	undesired	-15.62		-15.34		-15.34	
RX Level	Loss	7.68		7.68		7.68	
-62.00 dBm	Attn					11	
AT&T Amati	desired	-8.78					
DSB IBOC	Loss	40.71	NA				1
	undesired	-8.00					
RX Level	Loss	7.68					
-62.00 dBm	Attn						
AT&T Amati	desired	-8.78					
LSB IBOC	Loss	40,71	NA				
	undesired	-8,11					
RX Level	Loss	7.68					
-62.00 dBm	Attn						
USADR FMI	desired	-8.78					
BOC	Loss	40.71	NA				
	undesired	-9.42					
RX Level	Loss	7.68		2			
-62.00 dBm	Attn						
USADR FM2	desired	-8.78					_
BOC	Loss	40.71	NA				
	undesired	-5.98					
RX Level	Loss	7.68					
-62.00 dBm	Atin						
Notes:							

G-3

EO&C

Upper Second Adjacent

DAR to Analog

with Multipath

Could not achieve target S/N on second adj. test	1
Tests conducted March 14, 1995	

.

**Urban Slow Rayleigh** 

Test F-3, F-6 and G-3

F4XF-19B132-CB

Analog to Analog

#5

-62.00 dBm

-62.00 dBm

-62.00 dBm

-62.00 dBm

-62.00 dBm

-62.00 dBm

CAUTION

Measurements

desired

undesired

Loss

Loss Attn

desired

undesired

Loss

Loss

Attin

Loss

Loss

Attn

Loss

Loss

Attn

Loss

Loss

Atm

Loss

Attn

Clipped Pink Noise on interferers

desired

undesired Loss

desired

undesired

desired

undesired

desired

undesired

48 dB S/N

Receiver

Reference

RX Level

AT&T

IBAC

RX Level

AT&T Amati

AT&T Amati

LSB IBOC

RX Level

RX Level

USADR FM2

вос

IBOC

RX Level

Notes:

USADR FM1

DSB IBOC

RX Level

Ford

F-3

-46.18

-8.17

-26.05

-25.93

-20.79

-9.71

Standard SCA Test Signal yields -20dB on Sony 7010 Input Monitor with Input Gain Set to -4.0dB

-8.77

40.71

8.45

11.75

0.00

-8.77

40.71

-15.63

7.68

18.00

-8.77

40.71

-8,00

7.68

7.75

-8,77

40.71

-8.12

7.68

7.75

-8.77

40.71

-9.51

7.68

11.50

-8.77

40.71 -6.09

7.68

26.00

Subcarrier Group B on interferers and desired analog

F-6

d/u in dB EO&C

Upper Second Adjacent

DAR to Analog

12

Urban Fast Rayleigh

G-3

EO&C

Upper Second Adjacent

DAT Ref.: None

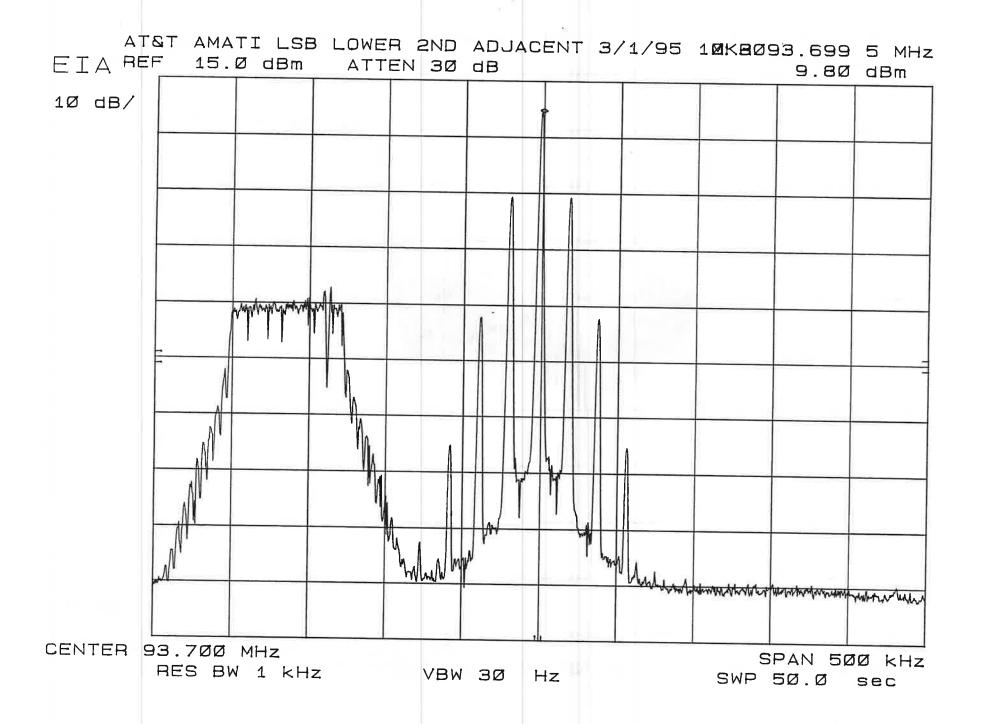
Best Case S/N = 51.75 dB

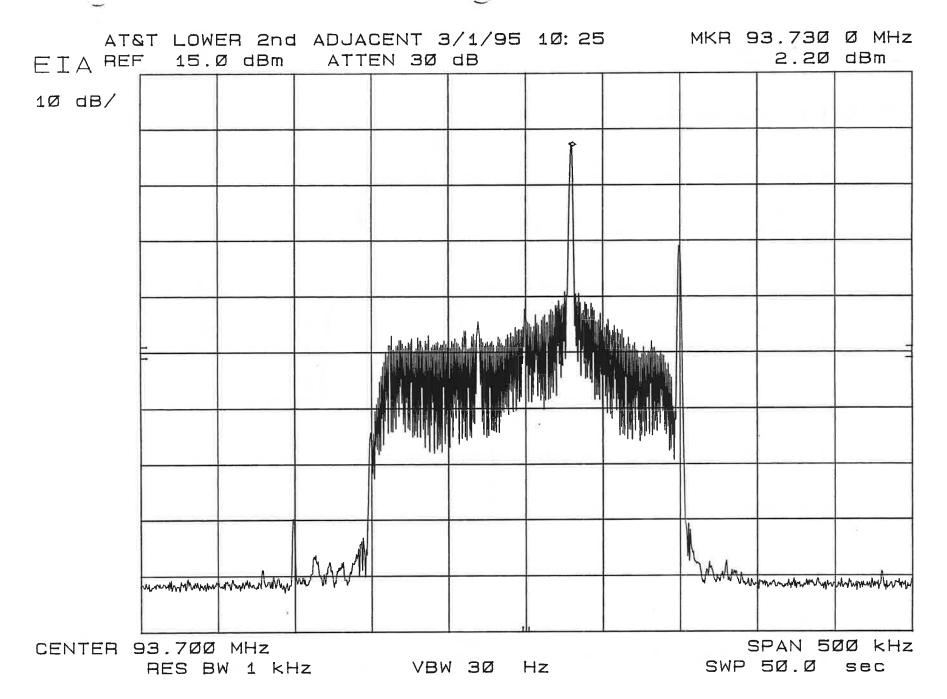
DAR to Analog

with Multipath

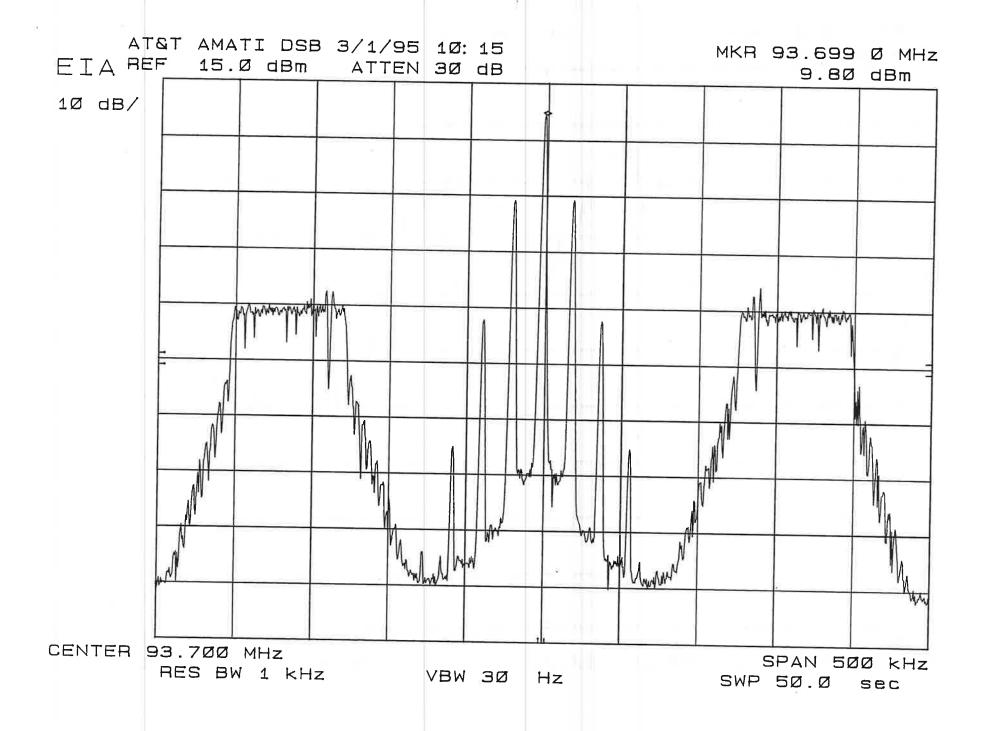
Test F-3 35 dB S/N			F-3			Effects with o Digital Modu		
Receiver #5						Ū.		
Ford						d/u in dB		d/u in dB @
F4XF-19B132-CB	Measurements		d/u in dB		Silence	D/N=47dB	Silence	S/N=35dB
Analog to Analog	desired	-8,87	NA			NA		
Reference	Loss	40.71						
	undesired	-1,45						
Desired Signal Level	Loss	11.75						
-62.00 dBm	Attn							
AT&T	desired	-8.87	NA		-8.78	NA	-8.87	NA
IBAC	Loss	40.71			40.71		40.71	
	undesired	-15.60			-15,38		-15.38	
RX Level	Loss	7.68	1		7.68		7.68	
-62.00 dBm	Attn				2.25		8.25	
AT&T Amati	desired	-8.87	NA				0.25	-
DSB IBOC	Loss	40.71						
	undesired	-7.98						
RX Level	Loss	7.68						
-62.00 dBm	Atta							
AT&T Amati	desired	-8.87	NA					
LSB IBOC	Loss	40.71						
	undesired	-8.09						
RX Level	Loss	7.68						
-62.00 dBm	Aftn							
USADR FM1	desired	-8.84	NA					
IBOC	Loss	40.71						
	undesired	-9.46						
RX Level	Loss	7.68						
-62.00 dBm	Attn	1271						
USADR FM2	desired	-8.87	NA					
BOC	Loss	40,71						
	undesired	-6.01						
RX Level	Loss	7.68						
-62.00 dBm	Attn							
Notes:	Brand							
Could not	achieve target S/N on	second ad	lj, test	<b>3</b> 1				

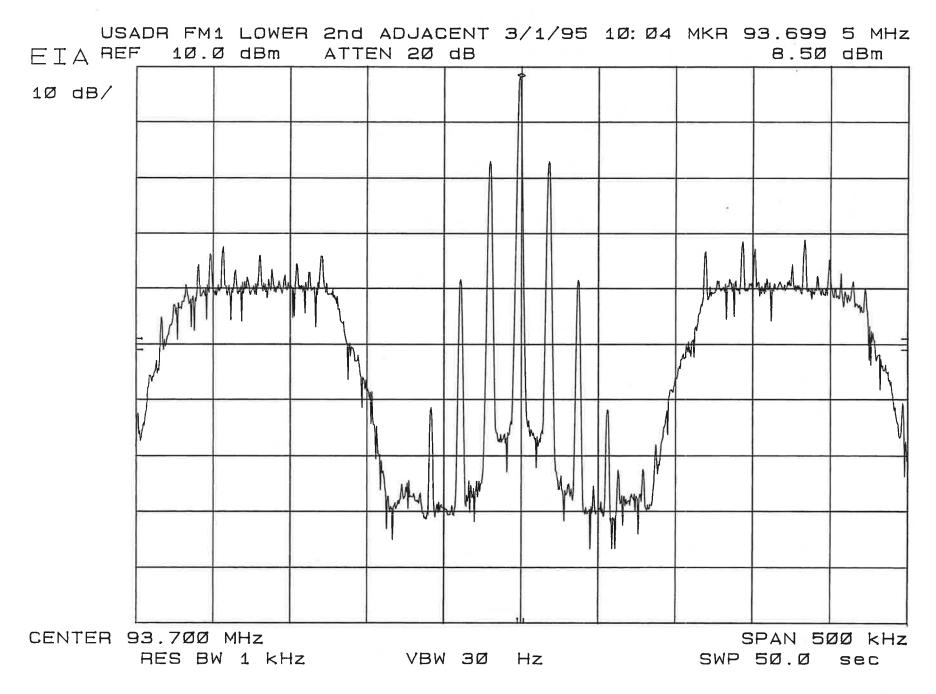
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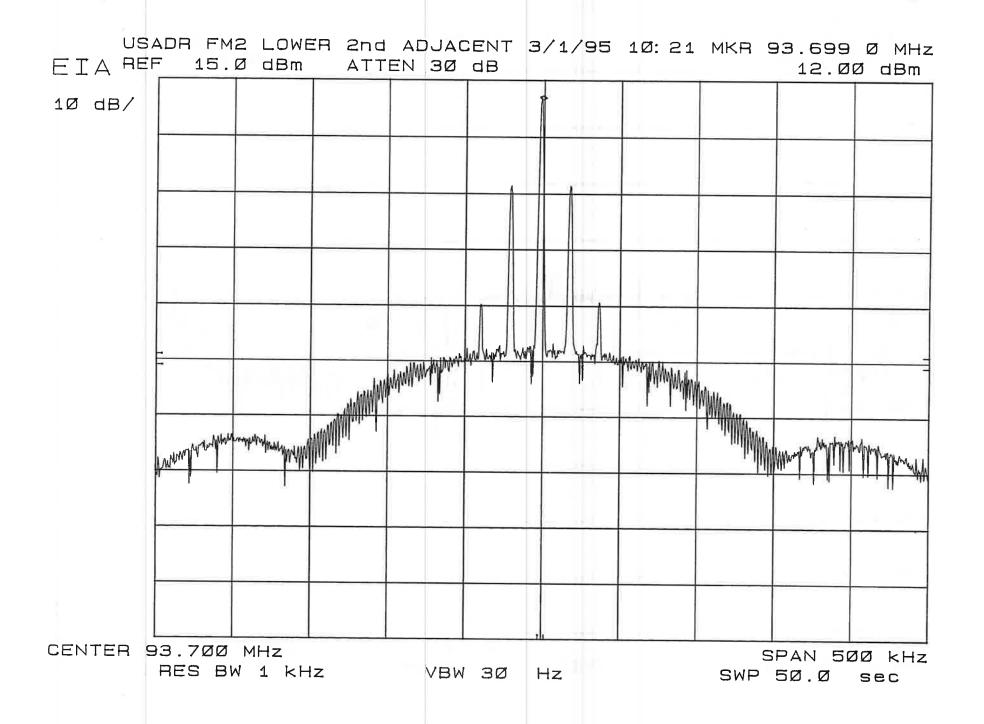


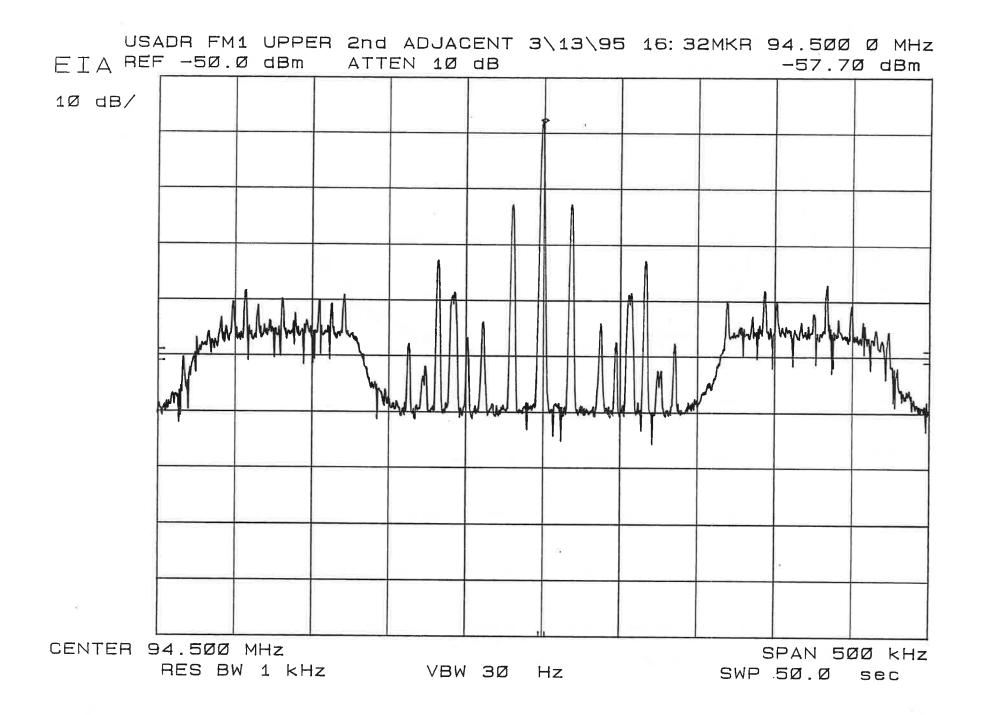


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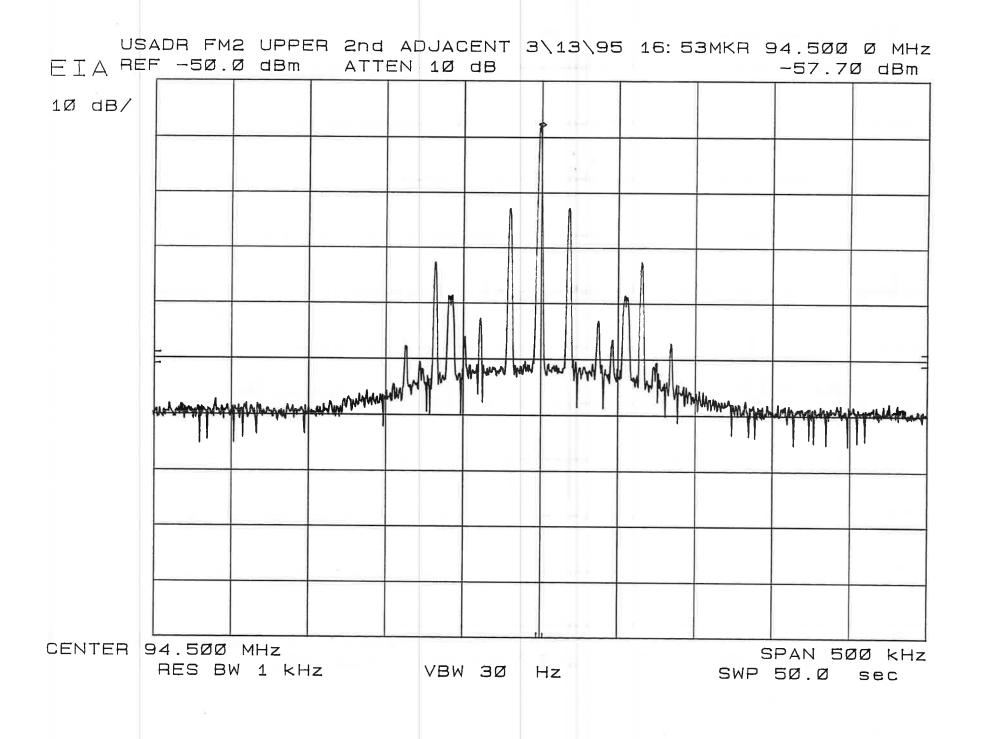


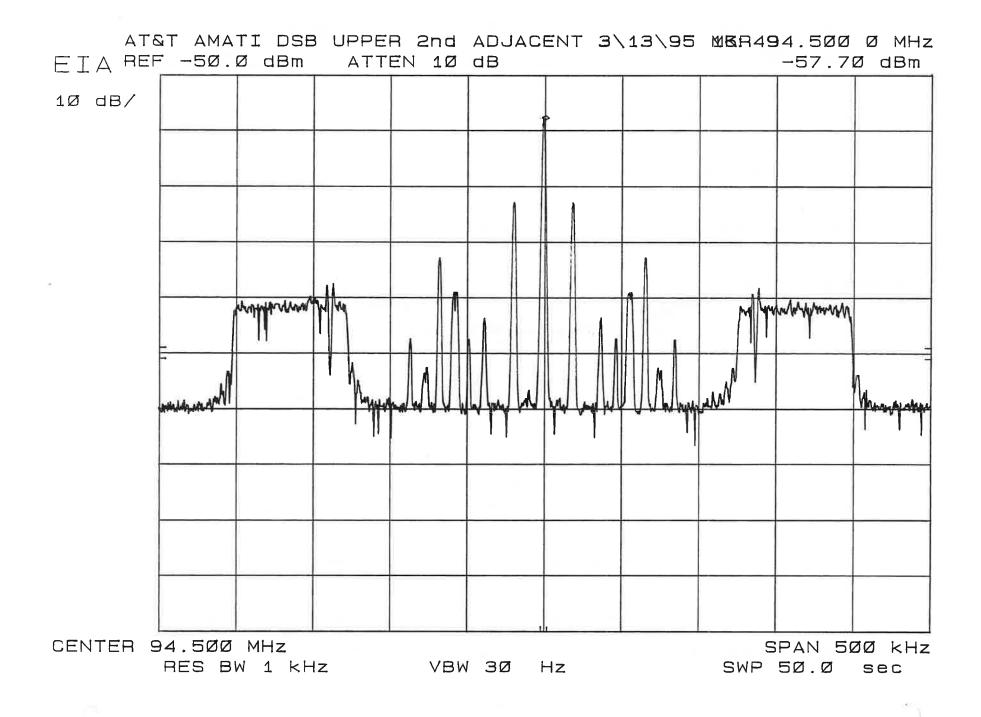


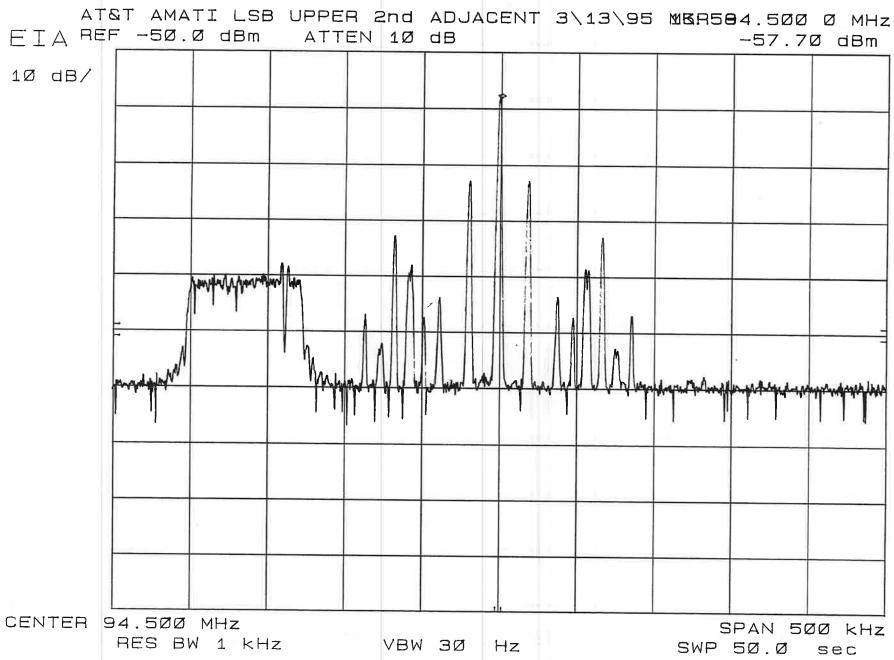


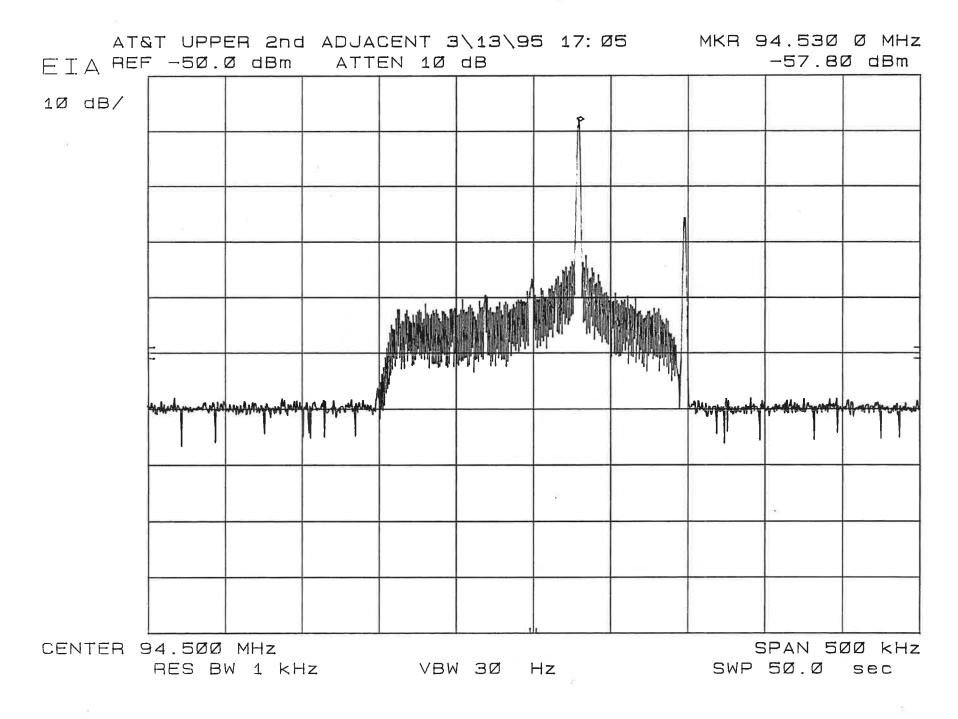
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# **APPENDIX AP**

Tests H and I Analog to DAR

#### Tests H & I, Sections 1-5

Proponent: USADR FM1

Index		
muex		
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	E. ula
	, po	
3	<ul> <li>4) Lower second adjacent or upper second adjacent tests</li> <li>5) Simultaneous lower and upper second adjacent tests</li> <li>Digital Audio Tape recording log of H &amp; I tests where applicable</li> <li>To A where applicable</li> </ul>	
Notes:	10000	
*	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 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.	-

in the front the

I and I Series						H Se	eries T	ests				I	Series Te	sts	
SADR FM1		D IL	-7.47 40.77	None D/U	Grou	SCAs p A D/U	Grou		Co, 1st and 2nd->DAR EO&C	Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh	Attn		Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh
12/05	-	U I	-7.77		Au	DIO	7100	Die	Louis	- 1	Dro	Medium	47.00		Medium
/3/95		L I	11.27									TOA occurs with no added noise	34.00	4.80	
	TOA	_	17.75	-11.45	26.75	-2.45	26.50	-2.70				Weak	54.00	4.00	Weak
Co-Channel			11.00	-11.45	20.75	-7.95		-6.70				TOA occurs with no added noise			TOA occurs with no added noise
Boonton	POP	Au	11.00	-10,20	21.25	-7.93	22.50	-0,70				TOA occurs with no added noise			TOTE COOLES WITH NO ACCOUNTS
/3/95	-	U	-7.77									Medium			Medium
3195		L I										tyredium			Medium
	TOA		11.27	25.05	23.75	24.55	23.75	24.55	No Change with SCAs			TOA occurs with no added noise	49,00	49.80	
						24.55	19.50		30 dB pad in interfering path			TOA occurs with no added horse	34,00	34.80	
Lower 1st Adj	POF	Απη	19.00	19.80	19.50	20.30	19.50	20.30	50 dB pad in interfering path		_	-	54.00	54.00	
Boonton	-		2.24									Medium	+		Medium
/4/95		U	-7.74		1 1							Wedium			Median
		L	11.27									-k., -			
	TOA		24.00	24.77								NA	1 1		NA
Upper 1st Adj	POF	Attn	18.50	19.27								-			9
Boonton	_												-		
		U										Medium			Medium
-		IL										-L		_	
	TOA								NA			NA			NA
Lower+Upper	POF	Attn										4			
1st Adj													_	_	
/4/95		U	-7.74					_	added 2 path to undesided signed to addien TOA, RF			Medium			Medium
	_	L	11.27	2P		2P		2P	added poor			4			
	TOA		4.25	-30.98	8.75	-26.48	6,50	2P -28.73 -32.23	1 Dicinel Sighert			TOA occurs with no added noise	30.00	0.77	
Lower 2nd Adj	POF	Attn	1.75	-33.48	4.00	-31.23	3.00	-32.23	to unoveri inc				10.00	-19.23	
Harris									1 class TUA, MT						
		U	-7.74				_		to available			Medium			Medium
	- 1	IL	11.27	3P 🔨	ſ _	_									
	TOA	Attn	5.75	-32.48				1	- added 2 paths			NA			NA
Upper 2nd Adj	POF	Attn	0.00	-38.23					- aduce Daths						
Boonton									P P P	I			1		
/4/95		U	-7.83				_					Medium			Medium
		L.	11.27						Hook Occurs						
E	TOA	Attn	19.25	-15.90	19.50	-15.65	19.50	-15.65	1			TOA occurs with no added noise	32.00	2.86	
Lower+Upper			15.00	-20.15				-21.15					20.00	-9.15	
2nd Adj												1			1
	linner	Pink ?	Noise onl	y at 100%										DAT Ref .:	DAR40180.DAT
						Groups A	or Bat 20	)%							
			C Host	toise at 7		Croabs II.									
	U obr	on LDC	to a non	linear cond	lition car	sed by wide	ehand Af	C affectin	g results due to the unusually high level	of secon	d adiacen	t interfering signal required for TOA			
	HUUK	refers	to a non-	unear cono	muon cau	sea by wild	coaliu AC		n that will cause variability in the test re	01 300011	a aujacen	a monome signal required for TOA.			

## EIA DAR Test Lab DAT Recording Log

DAT File Number	Time C Start	ode Stop		Si	art	lDs		Description	ATTEN.
DAR40180.DAT			1	T	T	1	1	Description	SET. (dB)
3/14/95						<b> </b>			
0,110,50				†				INTERFERING SIGNAL WITH GROUP A SCA's	
			1	2	3		<b> </b>	H5 Lower & Upper 2nd TOA	12.50
		••••••••••••••••	4	5	6	<b>†</b>	<b> </b>	IS (Urban Slow) TOA	63.75
		*****	7	8	9	<b>†</b>	<b> </b>	I5 (Urban Fast) TOA	45.00
			10	11	12	1	1	H4 Lower 2nd TOA	4.00
	************************		13	14	15	1	1	I4 (Urban Fast) TOA	25.00
			16	17	18	t	1	H4 Upper 2nd TOA	5.25
			19	20	21	t		H2 Lower 1st TOA	24.50
			22	23	24	t	1	HI Co-Chan TOA	15.75
			25	26	27			II (Urban Fast)	39.00
				Γ		[		INTERFERING SIGNAL WITH NO SCA's	
4/3/95			28	29	30	31	32	H1 Co-Chan	18.00
		l	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
			ļ						
		*****							
		•••••••							
		*****	ļ						
		0		·	-				

File Name:DA40180T.XLS DAT Log

#### Tests H & I, Sections 1-5

Proponent: AT&T Amati DSB

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

File Name: DA40181T.XLS Cover

H and I Series															
AT&T Amati DSB	D IL		-7.50 40.77	None	Grou	SCAs	eries T Grou	ip B	Co, 1st and 2nd->DAR			Analog -> DAR w/multipath Group A SCA's	eries To		Analog -> DAR w/multipath Group A SCA's
				D/U	Attn	D/U	Attn	D/U	EO&C	Attn		Urban Slow Rayleigh	Attn		Urban Fast Rayleigh
3/30/95	U		-7.77							49.00		Medium	42.00		Medium
	IL		11,27							39.00	9.77		34.00	4.77	
N	TOA At		10.75	-18.48	25.25	-3.98	21.25	-7.98				Weak			Weak
Co-Channel	POF At	tn	8.50	-20.73	22,75	-6.48	18.00	-11.23				Impairment between TOA and POF		_	TOA without impairment
Boonton		-	_											_	
3/31/95	U		-7.77									Medium			Medium
, i	IL		11.27		22.00		00.00			60.00					-
	TOA At		22.00	22.77	22.00	22.77	22.00		No Change with SCAs	52.00	52.77		38.00	38.77	
Lower 1st Adj	POF At	m	20.00	20.77	20.00	20.77	20.00	20.77	4	34.00	34.77		31.00	31,77	-
Boonton		_	2.72									Madium			Malling
	U		-7.77									Medium			Medium
a 1	TOALA		11.27		-				Summer to be a first of the second se			h			
	TOA At		22.25						Symmetrical Characteristics			NA			NA
Upper 1st Adj	POF At	ta	20.50				-		4			4			4
Boonton		_	-				-				_	h			A. P.
										1 1		Medium			Medium
	TOA	_	-						NA						
									INA	1 1		NA			NA
Lower+Upper	POF		-						4		_	-			4
1st Adj 3/31/95	U	_	-7.77									Medium			Medium
5/31/95			11.27	3P		3P		3P		1 1		Wiedrum			Medium
	TOA A		2.00	-36.23	5.75	-32.48	3.25	-34.98		25.00	-4.23		14.00	-15.23	4
Lower 2nd Adj			0.00	-38.23	4.00		1.00		POF could just be achieved	13.00	-16.23		8.00	-13.23	
Boonton	FOFA		0.00	-30.43	4.00	*J4.4J	1.00	-37.23	I OF Could just be achieved	15.00	-10.23	9	8.00	-41.43	4
Boomon	U		-7,77									Medium			Medium
	IL		11.27	3P											The working the second s
e	TOA At		0.00	-38.23					TOA could just be achieved		_			-	
Upper 2nd Adj			0.00	-30.43											
Boonton	FOF AL	<u> </u>	-		-				1			1			1
3/31/95	U	-	-7.85				-					Medium			Medium
11 - A - T - A	п		11.27	3P		3P		3P				TACALAN IN			The second secon
s 1	TOA At		3.75	-34.41	8.25		5.00		1	26.00	-3.16	1	16.00	-13.16	
Lower+Upper			2.50	-35.66	6.25		3.50		1	15.00	-14.16		8.00	-13.10	
2nd Adj	ror A	<u> </u>	2,50	-33.00	0.23	-51.91	5.50	-34,00	1	15,00	-14.10		0.00	-21.10	1
	Clinned P	ink No	ise only	y at 100%									<u> </u>	DATRef	DAR40181.DAT
				Noise at 90	0% SC 4	Groups A	or Bat 2	0%					8	on in Roll.	DIG WITH DIG
	ABBA on			110150 at 70	o lo och	Groups A	. D u. 2	0,0							
				a 9 dB inci	rease in s	ower									
				a / dib met											
	Multipath	1 ests	Conduc	cted 4/5/95	_										

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## EIA DAR Test Lab DAT Recording Log

DAT File Number	Time C Start	ode Stop		Si	art l	Ðs		Description	ATTEN.
DAR40181.DAT				1	1		Γ	Percipion	SET. (dB)
3/31/95				1	17799840				
				1	1	İ		INTERFERING SIGNAL WITH NO SCA's	
			1	2	3		1	H2 Lower 1st TOA	22.00
DISREGARD			4	5	6	7	8		
DISREGARD			9	<b>I</b>				I	
			10	11	12	13		I2 Lower 1st (Urban Slow) TOA	49.00
				15		17		I2 Lower 1st (Urban Fast) TOA	37.00
			18		20			H4 Lower 2nd TOA	2.00
			21	22	23			I4 Lower 2nd (Urban Fast) TOA	12.00
			24	25	26			14 Lower 2nd (Urban Slow) TOA	22.00
			27	28	29			H3 Lower & Upper 2nd TOA	3.75
			30	31	32			15 Lower & Upper 2nd (Urban Slow) TOA	23.00
DIODECUDE			33					15 Lower & Upper 2nd (Urban Fast) TOA	14.00
DISREGARD			37	38		40	41		
			42	43	44			H1 Co-Chan TOA	10.75
				<b>_</b>					
				<b>.</b>					
				ļ					
							_		

File Name: DA40181T.XLS DAT Log

#### 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	
	<ul><li>2) Lower first adjacent or upper first adjacent tests</li><li>3) Simultaneous lower and upper first adjacent tests</li><li>4) Lower second adjacent or upper second adjacent tests</li></ul>	
	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 signa 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 Total modulation on analog channels: 100% without SCA's, 110% with SCA's In the H series only, additional paths in the multipath simulator were turned on the The simulator paths were used for gain only, no multipath events were running.	A used in test I (Multipath) (SCA group level at 20%)
*	"2P" indicates 2 paths for a 6dB increase. "3P" indicates 3 paths for a 9 dB incre Multipath setup includes nine paths for the desired signal and three paths for the In areas where EO&C or grade evaluation does not appear, subjective evaluator	undesired signal

File Name: DA40182T.XLS Cover

IL TOA A Co-Channel POF A Boonton	L J L Attn Attn J L J L Attn	-7.54 40.77 11.27 18.75 15.50 -7.77 11.27 29.75	None D/U -10.52 -13.77	Grou Attn 32.25 29.75	SCAs	Group Attn 30.25 25.25	pВ	Co, 1st and 2nd->DAR EO&C	Attn	D/U	Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh	Attn		Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh
Co-Channel POF A Boonton 4/5/95 U 1/2 TOA A 1/5/95 U 1/2 TOA A	L Attn Attn J L Attn	11.27 18.75 15.50 -7.77 11.27 29.75					0.98							oroan rast Rayteign
Co-Channel POF A Boonton U 4/5/95 U 2 TOA A	Attn Attn J L Attn	18.75 15.50 -7.77 11.27 29.75					0.98				Medium TOA with no added interference	54.00 42.00	24.73 12.73	Medium
Co-Channel POF A Boonton U 4/5/95 U 2 TOA A	Attn J L Attn	-7.77 11.27 29.75									Weak	42.00		Weak
Boonton U 4/5/95 U 11 2 TOA A	J L Attn	-7.77 11.27 29.75	-10.77		0.10		-4.02				POF with no added interference			POF with no added noise
4/5/95 U IL 2 TOA A	L Attn	11.27 29.75												
2 TOA A	L Attn	11.27 29.75									Medium			Medium
Louise Lat Adi DOF A	Attn		30.48	30.25	30.98	30.25	30,98				TOA occurs with no added noise	53.00	53.73	
Lower Ist Auj FOFA		28.00	28.73	28.50	29.23	28.25	28.98				4	42.00	42.73	
Boonton														N
4/5/95 U		-7.77									Medium			Medium
		11.27	10 75	10.50	-18.77	10,75	-18.52				TOA occurs with no added noise	35.00	5.73	
2 TOA A		10.50 8.50	-18.77 -20.77	8.25	-18.77	8.25	-18.52				TOA occurs with no added horse	28.00	-1.27	
Upper 1st Adj POF A Boonton	Aun	8.30	-20.77	0.25	-21.02	0,2.5	-21.02				-	20100		
4/5/95 U		-7.77									Medium			Medium
п		11.27												
3 TOA A								NA			NA			NA
Lower+Upper POF A	Attn					_				_				
1st Adj														
4/4/95 U		-7.77									Medium			Medium
<u>_</u>		11.27										27.00	-2.27	
4 TOA A		2.50	-26.77	6,75	-22.52	3,75	-25.52				TOA occurs with no added noise	19.00	-10.27	
Lower 2nd Adj POF A	Attn	0.00	-29.27	4.00	-25.27	1.25	-28,02			-	-	17.00	=10.27	
Harris		-7.77								1	Medium	++		Medium
	~ I	11.27	3P		3P		3P							
4 TOĂ A		2.00	-36.27	1.50	-36.77	1.50	-36,77			0	TOA occurs with no added noise	18.00	-11.27	
Upper 2nd Adj POF A		0,25	-38.02	0.00	-38.27	0.00	-38.27			ù		10.00	-19.27	
Boonton								·			· · · · · · · · · · · · · · · · · · ·			
	U	-7.84									Medium			Medium
		11.27									4			
5 TOA A		2.75	-26.45	6.75	-22.45	4.00	-25.20				TOA occurs with no added noise	29.00	-0.20	
Lower+Upper POF A	Attn	0.50	-28.70	4.25	-24.95	1.25	-27.95					18.00	-11.20	
2nd Adj											1		AT Def.	DAR40182.DAT
Notes: Clipped	Pink No	ise only	at 100%		<b>a</b>	D	0.04/					1	JAI Kel.:	DAIX40102,DA1
			Noise at 9	0% SCA	Groups A	or B at 20	0%0							
ABBA o			a 9 dB inc	rance in -	OWAF									
Tests con				i case in p	JUWCI									

## EIA DAR Test Lab DAT Recording Log

DAT File Number	Time C Start	lode Stop		SI	art l	Ðs		Description	ATTEN.
DAR40182.DAT		1	1	T		Ī	Ī	Description	SET. (dB)
4/5/95				+	<b> </b>				
		-		t				INTERFERING SIGNAL WITH NO SCA's	
	*****		1	2	3			HI Co-Chan. TOA	
			4	5	6	7	8	H2 Lower lct	18.25
			9		11	····.	h	H2 Lower 1st H2 Lower 1st H2 Lower 1st TOA	30.00
			12		14			H2 Upper 1st TOA	29.75
******	*******		15	16	17			H4 Upper 2nd (w/group A SCA's) TOA	10.50
	******		18	19	20			H4 Upper 2nd TOA	1.50
•••••••••••••••••••••••••••••••••••••••			21	22	23			H4 Upper 2nd TOA H4 Lower 2nd TOA	2.00
**********				25	26	27	h	H5 Lower & Upper 2nd TOA	2.50
						21		13 Lower & opper 210 TOA	2.75
		1	1						
		•							
						•••••			
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File Name:DA40182T.XLS DAT Log

#### 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:
	<ol> <li>Co-Channel</li> <li>Lower first adjacent or upper first adjacent tests</li> </ol>
	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
2	
3	Digital Audio Tape recording log of H & I tests where applicable
Notes:	
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 (Multinath)
*	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.

I and I Series						ша						т	Series To	ete	
T&T	D IL	-15.2 40.2		None D/U	Grou	SCAs	eries T Grou Attn	ip B	Co, 1st and 2nd->DAR EO&C	Attn		Analog -> DAR w/multipath Group A SCA's Urban Slow Rayleigh	Attn		Analog -> DAR w/multipath Group A SCA's Urban Fast Rayleigh
/7/95	U	-7.3	7	DIO	Atur	2,0	Thur	2.0	2000	40.00		Medium	42.00		Medium
,,,,,,	п	11.2								33.00		TOA occurs with no added noise	32.00	25.07	
Г	OA At			12.32	19.00	12.07	19.25	12.32		42.00	35.07	Weak			Weak
Co-Channel P	OFAt	n 18.2	25	11.32	18.25	11.32	18.25	11.32		34.00	27.07		_		TOA with no added impairment
Boonton													_		
/10/95	U	-7.1										Medium			Medium
_	L	11.3											10.00	3.07	-
	OA At			-20.18	20.75	-16.18	22.50	-14.43		39.00	2.07		40.00	-6.93	
Lower 1st Adj	OF At	n 14.:	25	-22.68	19.25	-17.68	20.25	-16,68		31.00	-5.93		30.00	-0.93	
Boonton	-	_	-									Medium	-		Medium
4/10/95	U	-7.1													in curum
		11. n 16,:		-20.43	21.00	-15.93			Symmetrical characteristics		_	NA			NA
Upper 1st Adj F	OA At			-20.43	19.25		. 0		Symmetrical characteristics						
Boonton	OFAL	n 14.		-66.73	19.25	-17,00	-					1			1
4/10/95	Ū	-7,	88		-							Medium			Medium
41 1.01 2.2	Ĩ	11.					(n								1
з Гт	OAAt			-17.07	23.00	-13.82	25.25	-11.57		44.00	7.18		43.00	6.18	
Lower+Upper I				-19.07	22.00	-14.82	23.25	-13.57		36.00	-0.82		35.00	-1.82	
lst Adj			+												
4/10/95	U	-7.	83						POF not achievable with maximum			Medium			Medium
	L	2.	27	3P		3P		3P	RF level on undesired signal.						1
4 T	OA At	n 0.	75	-45.12	0.50	-45.37	0.25	-45.62	d/u = -45.87 dB	9.00	-27.87		8.00	-28.87	
Lower 2nd Adj H	POF At	n							Recovered audio not quite POF	2,00	-34.87	1	2.00	-34.87	1
Boonton		-			l						_				
	U	-7.							TOA not achievable with maximum			Medium			Medium
( <u></u>	L	2.	27	3P		3P		3P	RF level on undesired signal.				0.00	-27.87	-
	OA At								d/u = -45.87 dB	7,00	-29.87		9.00	-27.87 -34.87	1
Upper 2nd Adj 1	OF At	n	_				_		Recovered audio clean no audible	2.00	-34.87	4	2.00	-34.87	4
Boonton	_	_							defects		_	Medium			Medium
4/4/95	U	-7.				20		3P				Medium			I've utulli
- 57	II.		27 31		4.50	3P -41,33	4.75		4	10.00	-26.83	4	10.00	-26.83	
	OA At		25 50	-41.58 -43.33	4.50		4.75		1	3.00	-20.83		3.00		
Lower+Upper	OFAt	n 2.	50	-43.35	2.75	-43.08	3,00	-44.83	1	5.00	-33.03	1	5.00	22.00	1
2nd Adj Notes: Cl	inned D	ink Moire	anlu	at 100%						1			-	DAT Ref.	DAR40183.DAT
Notes: CI	SCAla	Clipped E	uniy tak N	at 100%	0% SC 4	Groups A	or Bat ?	0%							
		BOC Ho		10135 21 71	070 BCA	Groups A		v / v							
				9 dB inci	rease in	nower									
31	murca	63 J I 2015	101 0		case ill	Ponor									

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## EIA DAR Test Lab DAT Recording Log

DAT File Number	Time C Start	ode Stop		\$1	art l	Ds		Description	ATTEN.
DAR40183.DAT			1	T		1	I	Description	SET. (dB)
4/7/95	•••••			<b> </b>		<b> </b>			
				-		<b> </b>			
			1	2	3	4	5	H1 Co-Chan	10.60
	*****		6	7		t in the		H1 Co-Chan TOA	19.50 19.25
	•••••••••••		8		10	11	12	H2 Lower 1st TOA	19.23
			13	14	15	16	17	H2 Lower 1st TOA H2 Upper 1st	16.75
			18	19	20			H2 Upper 1st TOA	16.50
			21	22	23			H4 Lower 2nd TOA	0.75
DISREGARD			24	25	26	27	28		0.75
DISREGARD			29	30	31				
			32	33	34	35	36	H5 Lower & Upper 2nd TOA H3 Lower & Upper 1st H3 Lower & Upper 1st TOA	4.25
			37	38	39	40	41	H3 Lower & Upper 1st	20.00
		1	42	43	44	45		H3 Lower & Upper 1st TOA	19.75
		1		[			******		
		1	1	1			*******		
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#### Tests H & I, Sections 1-5

**Proponent: USADR FM2** 

Index	
Page	Description
1	Cover sheet
2	<ul> <li>Analog -&gt; DAR interference tests H and I (with multipath) including:</li> <li>1) Co-Channel</li> <li>2) Lower first adjacent or upper first adjacent tests</li> <li>3) Simultaneous lower and upper first adjacent tests</li> <li>4) Lower second adjacent or upper second adjacent tests</li> <li>5) Simultaneous lower and upper second adjacent tests</li> </ul>
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
- 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.

#### File Name: DA40184T XLS Cover

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(SCA group level at 20%)

### EIA DAR Test Laboratory

H and I Series	Tests														
		-	1	_			eries T	ests					I Series To	ests	
USADR FM2		D L	-7.42 40.76	Maria		SCAs						Analog -> DAR w/multipath			Analog -> DAR w/multipath
	IL         40.76         None         Group A         Group B         Co, 1st and 2nd->DAR           D/U         Attn         D/U         Attn         D/U         EO&C		Co, 1st and 2nd->DAR	1 44 1 88		Group A SCA's			Group A SCA's						
5/23/95		U	-7.95	Die	Aun	Die	Auu	D/0	EUac	Attn	D/U	Urban Slow Rayleigh	Attn	D/U	Urban Fast Rayleigh
14000 0 0		п.	11.36									Medium			Medium
i i	TOA	1.00	43.00	44.13	43.25	44.38	42,75	43.88	Small chirp or shattering.	-		No recovered Audio.			No recovered Audio
Co-Channel			37.50	38.63		38.63	37.50		High cut, warbling and occasional		11	NA			Weak
Boonton							57100	00100	mute.	-		NA	-		NA
/23/95		U	-7.95												
		n.	11.36												
: [	TOA		31.00	32.13	31.75	32.88	31.25	32.38	Small warble.			NA			NA
Lower 1st Adj	POF	Attn	24.75	25.88	24.75	25.88	25.00	26.13	High cut, warbling and occasional						100
Boonton	_								mute.						1
4/4/95		U	-7.95												
. г	TOA	IL	11.36	22.20	_										
2 Upper 1st Adj	TOA		31.25 25.50	32.38 26,63								NA			NA
Boonton	101	Aun	23.30	20,03							_	-			
2 conten		U									_		_		
		IL									1.1.1				
۶ [	TOA	Attn			00				NA	-	-	NA			
	POF	Attn													NA
lst Adj								7							
5/24/95	1	U	-7.99											-	
	200.1	n.	11.36												
	TOA POF		24.00	25.17	24.25	25.42	24,00		Small warble.			NA			NA
Boonton	FOr	Attn	17.00	18.17	17.00	18.17	17.75		High cut, warbling and occasional	-		4			
34843	-	U	-7.99						mute.						
		ĨL.	11.36												
ſ	TOA	Attn	25.25	26.42	-							NA	_	_	
Upper 2nd Adj	POF	Attn	17.75	18.92								INA .			NA
Boonton												1			
/24/95		U	-7.95												
F		n.	11.36												
	TOA		27.50	28.63	27.50	28.63	27.75		Small warble.		11	NA			NA
Lower+Upper 2nd Adj	POF	Attn	23.25	24.38	23.00	24.13	23.00		High cut, warbling and occasional						
	712	in' i i	Noise only	1000/					mute.						
١	W/SCA	Vs: Clip			0% SCA (	Groups A c	r B at 20	%					I	DAT Ref.:	DAR40184.DAT

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## EIA DAR Test Lab DAT Recording Log

DAT File	Time C	ode		St	art l	Ds		Description	ATTEN. SET. (dB
Number	Start	Stop						Description	361.(00
DAR40184.DAT									
5/23/95			1						
		1					1		
	•••••••		- Frank	2	3	4	5	HI Co-Chan TOA	42.75 31.00
				7	0	0	10	H2 Lower 1st TOA	31.00
			0	1	0		10	H1 Co-Chan TOA H2 Lower 1st TOA H4 Lower 2nd TOA	
				12	13	14	15	H4 Lower 2nd 1UA	24.00
				<u> </u>			<u> </u>		
					10010000	1102200	ON THE C		
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	19999-001000004 B0020000								

File Name:DA40184T.XLS DAT Log

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# **APPENDIX AQ**

Test L

#### Tests L2, L3 & L4

eceiver Rx No.: #1 Mfg.: DELCO Model: 161924 Serial: 100049!	63
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's (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 463-4 recommendation

			TEST L-	2	Radio Audio Quality	TEST L-3
rong & Weak Signal Receiver : DELCO		SCA	S/N Ratio Measu	rement (dB)		
		GROUP	RMS	Weighted	GRADE	EO&C
NALOG		None	60.0	50.5	NA	
RANSMITTER		A		50.5		
NLY		В		50.4		
		None	60.7	50,5	0	
F&T / Amati DSB	Ê	A		50,5	NA	
AR -> HOST	2 dBi	В		50,4	NA	
		None	60.7	50,5	0	
Г&Т / Amati LSB	eve	A		50,5	NA	
	Strong Signal Level (-47 dBm)	В		50,4	NA	
	g Sig	None	60.3	50.5	0	
SADR FM1	l u l	A		50.5	NA	
	st	В		50,3	NA	
		None	57.0	48.8	0	
SADR FM2		A		48.6	NA	
		В		48,3	NA	
NALOG		None	54.8	47_0	NA	
RANSMITTER		A		46.9		
NLY		В		46.6		
		None	54_2	47.0	0	
T&T / Amati DSB	2	A		47.0		
	dBm)	В		46.6		
	-1-	None	54.3	47.0	0	
T&T / Amati LSB	vel	A		47_0		
	Weak Signal Level (-77	В		46.7		
	lign	None	54.0	47,1	0	
SADR FM1	ak	A		47,0		
	Wei	В		46.7		
		None	53.3	46.2	0	
SADR FM2		A		46.2		
		В		45.7		
NOTES: * S/N Ratio 0dB F * External 15KHz	Reference with 1	KHz audio @ 9	1% modulation (pil	ot @ 9%) no SCA	l's	DAT REF No. DAR40160.DAT Audio program material: Harp, ABBA, Female voice

File Name: L\_A\_RX1 XLS L-2,3

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DAT File	Time Co	ode		Start IDs		
Number	Start	Stop			Description	Attn
DAR40160.DAT			TT			ann
3/23/95			1			
	0:03	1:07	1		AMATI LSB (STRONG)	
	1:12	2:15	2		AMATI LSB (WEAK)	
DISREGARD	2:20	2:47	3		FMI (STRONG)	
	2:52	3:55	4		FMI (STRONG)	
DISREGARD	4:00	4:16	5		FMI (WEAK)	
	4:22	5:25	6		FMI (WEAK)	
	5:29	6:31	7		FM2 (STRONG)	
	6:36	7:37	8		FM2 (WEAK)	
DISREGARD	7:42	8:36	9		AMATI DSB (STRONG)	******
	8:40	9:42	10		AMATI DSB (STRONG)	
DISREGARD	9:46	10:27	11		AMATI DSB (WEAK)	•••••••
	10:30	11:32	12		AMATI DSB (WEAK)	
			1			
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	I					
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File Name: L\_A\_RX1.XLS DAT LOG L3

Test L-4		3/24/95 DML/RMc		
OAR -> Analog Vith Multipath	Engineers:	DIVIL/KIVIC	Radio Audio	Ouality TEST L-4 Multipath Type: Urban Slow Rayleigh
trong & Weak Signal Receiver : DELCO		SCA GROUP	GRADE	Subjective EO&C
NALOG		None	NA	Fades are slightly noticable
RANSMITTER DNLY		В		Interference from SCA's not detected
		None	0 -1	Might be slightly worse
T&T / Amati DSB DAR -> HOST	Strong Signal Level (47 dBm)	В	0 -1	
		None	0 -1	
AT&T / Amati LSB	nal Leve	в	-1	
	Si Si	None	0 -1	
JSADR FM1	Strong	В	-1	Noticed slightly more break-up during fades with SCA's added
		None	-1	Fades are more hissy
JSADR FM2		В	-1	
ANALOG		None	NA	Could detect radio in "blend" (mono) mode
FRANSMITTER ONLY		в		Interference from SCA's not detected
		None	0	
AT&T / Amati DSB	dBm)	В	0	
	-17	None	0	
AT&T / Amati LSB	Weak Signal Level (-77 dBm)	в	0	
	Sign	None	0	
USADR FM1	Weak !	В	0	
		None	0	
USADR FM2		В	0	
NOTES: * SCA group A	not used for mult	inath tests	_!	DAT REF No. DAR40170.DAT
*	not nove for infun			Audio program material: Harp, ABBA, Female voice
<ul> <li>*</li> </ul>			ice from Analo	og Reference -1: Worse than Analog Reference -2: Much Worse than Analog Reference

File Name: L\_A\_RX1 XLS L-4 Urb Slo

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6 15

Test L-4 DAR -> Analog		3/24/95 DML/RMc			44-6	
With Multipath			Radio Au	dio Quality	TEST L-4	Multipath Type: Urban Fast Rayleigh
Strong & Weak Signal Receiver : DELCO		SCA GROUP	GRADE		Subjective EO&C	
ANALOG	5	None	NA	T	Subjective EO&C	
FRANSMITTER ONLY		В				
AT&T / Amati DSB		None	-1	More frequent events which tal	ke on longer, more annoying characteristics	
DAR -> HOST	Strong Signal Level (-47 dBm)	В	-1	No additional contribution to n	oise from SCA's	
AT&T / Amati LSB	vel (-	None	0			
	gnal Le	В	0			
JSADR FMI	ng Sig	None	-1	More frequent events which tak	e on longer, more annoying characteristics	
	Stro	В	-1	No additional contribution to n	oise from SCA's	
JSADR FM2		None	-1	Noisier		
		В	-1			
NALOG		None	NA			
RANSMITTER DNLY		В				
		None	0			
AT&T / Amati DSB	dBm)	В	0			
T&T / Amati LSB	(-77	None	0			
riær / Allan LSB	Signal Level (-77	В	0			
SADR FM1	Signa	None	0			
SADKTMI	Weak	В	0			
SADR FM2		None	0			
FOREAN FINZ		В	0			
NOTES: * SCA group A not	t used for multip	oath tests				DAT REF No. DAR40170.DAT
*					Audi	o program material: Harp, ABBA, Female voice
* Test L-3 Grading	Scale:	0: No differenc	e from Anal	og Reference	-1: Worse than Analog Reference	-2: Much Worse than Analog Reference

		Time Code Start IDs			
Number	Start	Stop		Description	Attn
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	I
	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	I
	10:14	11:16	10	AMATI LSB W/SCA GRP B	I
	11:21	12:23	11	FM1	
	12:29	13:30	12	FM1 W/SCA GRP B	
*****	13:36	14:39	13	FM2	I
	14:45	15:47	14	FM2 W/SCA GRP B	1
	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	1
	24:45	24:49	22	FM2 W/SCA GRP B	1
	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	I
	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	1
	33:58	34:59	31	AMATI DSB	••••••••••••••••••••••••••••••
	35:06	36:07	32	AMATI DSB W/SCA GRP B	

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(6)

#### 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.

B         42.3         NA           ANALOG IRANSMITTER ONLY         None A B         50.0         38.9 38.9         NA           AT&T / Amati DSB         A B         47.0         36.5         -1           AT&T / Amati LSB         Image: A B B         36.3         -1           USADR FM1         Image: A B B         31.4         -2           None         43.1         31.4         -2           None         48.5         37.2         0	Strong & Weak Signal		B DML/RMc	TEST L-	2	Radio Audio Quality	TEST L-3
NALOG RANSMITTER NALOG NLY         None A B         68.0         62.3 57.4 60.3         NA 60.3           VT&T / Amati DSB NAR ~ HOST         A B         So.0         40.2         -2 40.0         NA           XT&T / Amati LSB         Image: Comparison of the state of t	Receiver : DENON			S/N Ratio Measu			
RANSMITTER NULY         A B         57.4 60.3			GROUP	RMS	Weighted	GRADE	EO&C
NLY         B         60.3         Image: constraint of the second seco			None	68.0		NA	
VT&T / Amati DSB DAR ~> HOST         Mone A B         50.0         40.2 39.9         -2 NA 40.0           VT&T / Amati LSB         VI B         None A B         50.0         40.2 40.0         -2 NA A 40.0           JSADR FM1         VI B         None A B         50.7         41.0 40.8         -2 NA A 40.0           JSADR FM2         None A B         50.7         41.0 40.8         -2 NA A 40.0           None A B         50.7         41.0 40.8         -2 NA A 40.8           None A B         50.7         41.0 33.2         -2 NA A 33.2           Nane A B         50.0         38.9 38.9         NA           NALOG RANSMITTER NLY         None A B         50.0         38.9 36.3         NA           VT&T / Amati DSB         VI B         None A B         36.3         -1 36.2         -1 A B           JSADR FM1         VI B         None A B         43.1 31.4         -2 36.2         -1 A           JSADR FM1         None A B         43.1 31.4         31.4         -2 36.2         -1 A           JSADR FM2         None A B         48.5         37.2 36.9         0         0			A				
XT&T / Amail DSB DAR > HOST         UP         A B         39.9 40.0         NA NA           Y&T / Amail LSB         A B         None A B         50.7 40.0         A0.7 NA 40.8         -2 NA 33.2           JSADR FM1         Vertex / Amail LSB         None A B         33.2 33.2         -2 NA 33.2         -2 NA 33.2           ISADR FM2         None A B         53.4         42.3 42.3         NA NA           None A B         S3.4         42.3 42.3         NA NA           None SNLY         None A B         50.0 36.5         -1 NA B           None VI&T / Amail DSB         Vertex / Amail LSB         None A B         47.0 36.3         36.5 36.2         -1 NA           JSADR FM1         Vertex / Amail LSB         Vertex / Amail LSB         None A B         47.2 36.2 36.2         36.2 36.2         -1 None A B           JSADR FM1         Vertex / Amail LSB         None A B         47.2 36.2 36.2         36.2 36.2         -1 A B         -1 A B           JSADR FM1         None A B         43.1 31.4 B         31.4 31.4         -2 A B         -1 B           JSADR FM2         None A B         48.5 37.2         0         0         -1 B	ONLY		В		60.3		
DAR ~> HOST         Image: product of the state of			None	50,0		-2	
VT&T / Amati LSB       None       50,7       41.0       -2         NAME $40,7$ NA       NA         JSADR FM1 $40,9$ $33,2$ NA         JSADR FM2 $40,9$ $33,2$ NA         NNne $44,9$ $33,2$ NA         NA       B $33,2$ NA         None $44,9$ $33,2$ NA         NA       B $33,2$ NA         None $44,9$ $33,2$ NA         None $53,4$ $42,5$ -1         A       B $42,3$ NA         NALOG       None $38,9$ NA         RANSMITTER       A $38,9$ NA         NAT&T / Amati DSB       B $36,3$ $-1$ NA $36,3$ $-1$ $36,2$ $-1$ NA $36,2$ $36,3$ $-1$ $36,2$ $-1$ NA $36,2$ $36,2$ $-1$ $36,2$ $-1$ NA $36,2$ $36,2$ $-1$ $36,2$ $-1$ None $42,1$ </td <td></td> <td>Ē</td> <td></td> <td></td> <td>39,9</td> <td>NA</td> <td></td>		Ē			39,9	NA	
JSADR FM2         None         53.4         42.5         -1           A         B         23.4         42.3         NA           ANALOG TRANSMITTER DNLY         None         50.0         38.9         NA           AT&T / Amati DSB         A         36.3         36.3         -1           AT&T / Amati LSB         Mone         47.2         36.3         -1           JSADR FM1         Mone         43.1         31.4         -2           JSADR FM2         None         48.5         37.2         0	DAR -> HOST	7 dB	В		40.0	NA	
ISADR FM2     None     53.4     42.5     -1       NALOG RANSMITTER INLY     None     50.0     38.9     NA       IX&T / Amati DSB     None     47.0     36.5     -1       IXT&T / Amati LSB     Image: state stat		el (4		50,7	(***	I I	
JSADR FM2     Nome     53.4     42.5     -1       A     B     23.3     NA       ANALOG TRANSMITTER DNLY     None     50.0     38.9     NA       AT&T / Amati DSB     A     A7.0     36.5     -1       AT&T / Amati LSB     Image: Constraint of the state	AT&T / Amati LSB	evi				NA	
JSADR FM2     Nome     53.4     42.5     -1       A     B     23.3     NA       ANALOG TRANSMITTER DNLY     None     50.0     38.9     NA       AT&T / Amati DSB     A     A7.0     36.5     -1       AT&T / Amati LSB     Image: Constraint of the state		snal I	В		40.8	NA	
JSADR FM2         None         53.4         42.5         -1           MALOG RANSMITTER DNLY         None         50.0         38.9         NA           MALOG RANSMITTER DNLY         None         50.0         38.9         NA           MALOG RANSMITTER DNLY         None         47.0         36.5         -1           Mathematic DSB         None         47.0         36.3         -1           Mathematic LSB         None         47.2         36.3         -1           JSADR FM1         None         43.1         31.4         -2           JSADR FM2         None         48.5         37.2         0		g Sig		44.9			
USADR FM2 USADR FM2 USADR FM2 USADR FM2 USADR FM1 USADR FM2 USADR FM4 USADR	JSADR FM1	U U				NA	
USADR FM2     A     A     42.3     NA       ANALOG TRANSMITTER ONLY     None     50.0     38.9     NA       AT&T / Amati DSB     A     A     36.3     -1       AT&T / Amati LSB     A     43.1     31.4     -2       USADR FM1     None     43.1     31.4     -2       None     48.5     37.2     0		St	В		33.2	NA	
B         42.3         NA           NALOG TRANSMITTER NNLY         None         50,0         38.9         NA           A         38.9         38.9				53.4			
ANALOG TRANSMITTER DNLY AT&T / Amati DSB AT&T / Amati LSB JSADR FM1 USADR FM2 ANALOG INONE A None A None A None A None A A A B None A A A B A A A A A B A A A A A B A A A B A A A B A A A B A A A B A A A B A A B A A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A B A A A B A A B A A B A A A B A A B A A B A A A B A A A B A A A B A A A B A A A B A A A B A A A B A A A B A A A A B A A A A A A B A A A A A B A A A A A A A A A A A A A	JSADR FM2						
ARANSMITTER ONLY     A     38.9       AT&T / Amati DSB     B     36.3       AT&T / Amati LSB     A     36.3       USADR FM1     VA     43.1       USADR FM2     None     48.5       None     48.5     37.2       0     0			В		42.3	NA	
DNLY         B         38.9           AT&T / Amati DSB         None         47.0         36.5         -1           AT&T / Amati LSB         B         36.3         -1           JSADR FM1         Mone         47.2         36.3         -1           None         47.2         36.3         -1           None         47.2         36.3         -1           None         47.2         36.2         -1           None         47.2         36.2         -1           None         47.2         36.2         -1           None         43.1         31.4         -2           None         43.1         31.4         -2           None         48.5         37.2         0           None         48.5         36.9         -1				50.0		NA	
AT&T / Amati DSB AT&T / Amati LSB USADR FM1 USADR FM2 AT&T / Amati DSB None A A A A A A A A A A A A A			1)				
AT&T / Amati DSB       A       B       36.3       36.3         AT&T / Amati LSB       Image: Constraint of the second	ONLY						
AT&T / Amati LSB         B         36.3           AT&T / Amati LSB         None         47.2         36.3         -1           A         B         36.2         -1           USADR FM1         None         43.1         31.4         -2           None         A.8         31.4         -2           None         A8.5         37.2         0           USADR FM2         None         48.5         37.2         0			11	47.0		-1	
USADR FM2 A 36.9	AT&T / Amati DSB						
USADR FM2 A 36.9		dBrr	В	l	36.3		
JSADR FM2 A 36.9		(-11		47.2		-1	
None         48,5         37.2         0           JSADR FM2         A         36,9         36,9	AT&T / Amati LSB	svel			10		
None         48,5         37.2         0           JSADR FM2         A         36,9         36,9		al Le	В		36.2		
JSADR FM2 A 36.9		Sign	11	43.1		-2	
USADR FM2 A 36.9	JSADK FMI	sak					
JSADR FM2 A 36.9		We	В		31.4		
	ICADD EMO			48,5		0	
В 30.8	JSADK FM2						
			Шв		36.8		
NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's DAT REF No. DAR40161.DAT					ot @ 9%) no SCA'	s	
* External 15KHz low pass filter used for all audio measurements * Audio measurements are either RMS unweighted or Qpeak detetected with CCIR weighting filter as indicated					1 11 0000		Audio program material: Harp, ABBA, Female voice

File Name: L\_A\_RX2 XLS L-2,3

	Time Code Start IDs				rt IDs				
Number	umber Start Stop			Description					
DAR40161.DAT		T	T	TT	T	T		Attn	
3/22/95		[		toor					
			1	tt-		-	AMATI LSB (STRONG)		
			2	†			AMATI LSB (WEAK)		
			3			•	FM1 (STRONG)	•••••••••••••••••••••••••••••••••••••••	
	*******************************		4				FMI (WEAK)		
			5	torit		-	FM2 (STRONG)		
			6	†			FM2 (WEAK)		
			7	†		••••••	AMATI DSB (STRONG)		
DISREGARD			8	•••••		-	AMATI DSB (WEAK)		
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Test L-4 DAR -> Analog		3/24/95 DML/RMc						
With Multipath	Engineers.		Radio Auc	lio Quality	TES	ST L-4	Multipath Type: Urban	1 Slow Rayleigh
Strong & Weak Signal Receiver : DENON	Strong & Weak Signal Receiver : DENON		GRADE		Subjecti	tive EO&C		
ANALOG		None	NA	Clean audio				
TRANSMITTER ONLY		В						
		None	0					
AT&T / Amati DSB DAR -> HOST	17 dBm)	в	0					
		None	0					
AT&T / Amati LSB	Strong Signal Level (-47	В	0					(*)
	Si Si	None	0					
USADR FM1	Stron	в	0					
		None	0					
USADR FM2		в	0					
ANALOG	i	None	NA	Birdies				
TRANSMITTER								
ONLY		B None	0					
AT&T / Amati DSB	lBm)	В	0					
		None	0					
AT&T / Amati LSB	Weak Signal Level (-77 dBm)	в	0					
	igna	None	0					
USADR FM1	Weak S	В	0					
		None	0					
USADR FM2		В	0					
NOTES: * SCA group A	not used for mult	l ipath tests					DAT REF No. DAR40171.DAT	ale voice
* * * Test L-3 Grad	ing Scale:	0 <sup>.</sup> No differe	nce from Ana	log Reference	-1: Worse than Analog		program material: Harp, ABBA, Fem -2: Much Worse than Analog	

DAT File	Time C			Start IDs		
Number	Start	Stop	<u> </u>		Description	Attn
DAR40171.DAT					STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	
3/24/95			1		AMATI DSB	
			2		AMATI DSB W/SCA GRP B	
DISREGARD			3	-	FMI	
			4		FM1	
			5		FM1 W/SCA GRP B	
			6		FM2	1
			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	
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#### 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.

AR -> Analog trong & Weak Signal		DML/RMc/TB	TEST L	-2	Radio Audio Quality	TEST L-3	
Receiver : PANASONIC		SCA	S/N Ratio Measurement (dB)				
		GROUP	RMS	Weighted	GRADE	EO&C	
NALOG		None	67.5	57.1	NA		
RANSMITTER		A		54.5			
NLY		В		55,5			
	-	None	44.2	33.6	-2		
T&T / Amati DSB	Ê	A		33.6	NA		
AR -> HOST	7 dBm)	В		33.6	NA		
		None	51.2	41,0	-1		
T&T / Amati LSB	eve	A		40.8	NA		
	Strong Signal Level (-47	В		40.8	NA		
	B Sie	None	42.0	29.7	-2		
JSADR FM1	UD UD	A	8	29.7	NA		
	St	В		29.7	NA		
		None	51.0	40.0	-1		
JSADR FM2		A		39.8	NA		
		В		39.8	NA		
NALOG		None	49.2	38,3	NA		
RANSMITTER		A		38.3			
DNLY		В		38.3			
		None	43.0	32,3	-1		
AT&T / Amati DSB		A		32.2	NA		
	dBm)	В		32.2	NA		
		None	47.0	36.2	-1		
T&T / Amati LSB	vei	A		36.2	NA		
	Signal Level (-77	В		36.2	NA		
	Sign	None	41.4	29.2	-1		
JSADR FM1	ak	A		29.2	NA		
	Weak	В		29.2	NA		
		None	47.1	36.1	0		
JSADR FM2		A		36.0	NA		
		В		36.0	NA		
NOTES: * S/N Ratio 0dB Re	ference with I	KHz audio @ 9	91% modulation (pi	lot @ 9%) no SCA	's	DAT REF No. DAR40162.DAT	
<ul> <li>* External 15KHz lo</li> <li>* Audio measureme</li> </ul>	ow pass filter	used for all aud	io measurements			Audio program material: Harp, ABBA, Fer	nale voice

File Name: L\_A\_RX3\_XLS L-2,3

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DAT File Time Code		Start IDs						
Number	Start	Stop					Description	Attn
DAR40162.DAT			T	TT		T		
3/22/95			1	† T			AMATI DSB (STRONG)	
			2	†			AMATI DSB (WEAK)	
1	******		3	t			AMATI DSB (WEAK) FMI (STRONG)	••••••
	***********************	•	4	t			FM1 (WEAK)	
	••••••		5	t			FM2 (STRONG)	
		•	6	+				
			7	ł	····		FM2 (WEAK)	
	*****		8	ŀ			AMATI LSB (STRONG)	
			0				AMATI LSB (WEAK)	
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)AR -> Analog Vith Multipath	Engineers.	DML/RMc	Radio Aud	io Quality TEST L-4 Multipath Type: Urban Slow Rayleigh
rong & Weak Signal	g & Weak Signal SCA Receiver : PANASONIC GROUP		GRADE	Subjective EO&C
NALOG		None	NA	
RANSMITTER NLY		В		Could detect a low level tone or beat note from the addition of SCA's
		None	-2	Noticeable increase in noise floor
T&T / Amati DSB AR -> HOST	Strong Signal Level (-47 dBm)	В	-2	No additional contribution to noise from SCA's
		None	-1	Slight increase in audio noise floor
AT&T / Amati LSB	gnal Lev	В	-1	No additional contribution to noise from SCA's
	lg Sig	None	-2	Noticeable increase in noise floor with the addition of tone or beat note
JSADR FM1	Stror	В	-2	No additional contribution to noise from SCA's
		None	-2	Increase in noise floor with the addition of tone or beat note
JSADR FM2		В	-2	No additional contribution to noise from SCA's
NALOG		None	NA	
RANSMITTER		в		
2010		None	-1	
AT&T / Amati DSB	dBm)	В	-1	
	(-77	None	0	
AT&T / Amati LSB	Weak Signal Level (-77	В	0	
	Signi	None	0	
ISADR FM1	Weak		0	
		None	0	
ISADR FM2		В	0	
NOTES: * SCA group A not	used for multi	path tests		DAT REF No. DAR40172.DAT
				Audio program material: Harp, ABBA, Female voice

File Name: L\_A\_RX3 XLS L-4 Urb Slo

Page 4 of 5

DAT File	Time Co		Start IDs				
Number	Start	Stop				Description	Attn
DAR40172.DAT			TT		II	STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	Ann
3/24/95			1		t	AMATI DSB	
			2		†	AMATI DSB W/SCA GRP B	
			3		†i	FM1	
			4		tl-	FM1 W/SCA GRP B	
			5			FM2	
			6			FM2 W/SCA GRP B	
			7			AMATI LSB	
		· · · · · · · · · · · · · · · · · · ·	8			AMATI LSB W/SCA GRP B	
						WEAK SIGNAL W/MULTIPATH (URBAN SLOW)	
		1.001111100000000000000000000000000000	9			AMATI LSB	
			10			AMATI LSB W/SCA GRP B	
			11			FM1	
			12			FM1 W/SCA GRP B	
			13			FM2	
1			14			FM2 W/SCA GRP B	
DISREGARD			15			AMATI DSB	
			16			AMATI DSB	
			17			AMATI DSB W/SCA GRP B	
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#### 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.

trong & Weak Signal			TEST L-	2	Radio Au	dio Quality TEST L-3
Receiver : PIONEER		SCA	S/N Ratio Measu	rement (dB)		
		GROUP	RMS	Weighted	GRADE	EO&C
NALOG		None	66.0	61.0	NA	
RANSMITTER		A		53.2		
NLY		В		54.8		
		None	40.0	29.6	-2	Noticeable increase in noise floor
T&T / Amati DSB	Ê	A		29.6		No additional contribution to noise from SCA's
AR -> HOST	7 dB	В		29.6		No additional contribution to noise from SCA's
		None	40.2	29,9	-2	Noticeable increase in noise floor
T&T / Amati LSB	eve	A		29.8		No additional contribution to noise from SCA's
	nal L	В		29,8		No additional contribution to noise from SCA's
	Strong Signal Level (-47 dBm)	None	39.2	27,5	-2	Noticeable increase in noise floor
SADR FM1	luo	A		27.5		No additional contribution to noise from SCA's
	Str	В		27.5		No additional contribution to noise from SCA's
		None	57.0	45.6	-1	Some increase in noise floor
JSADR FM2		A		44.8	-1	Slight contribution to noise level with SCA's
		В		44.9	-1	Slight contribution to noise level with SCA's
NALOG		None	52.3	41.5	NA	
RANSMITTER		A		41,3	1	
NLY		В		41.3		
		None	39.7	29.2	-1	
T&T / Amati DSB		A	1	29.2		
	dBm)	В		29.2		
	LL-)	None	39.8	29.5	-1	
T&T / Amati LSB	vel	A		29.4		
	Weak Signal Level (-77	В		29.4		10,
	Sign	None	38.9	27.2	-2	
SADR FM1	ak	A		27.2		
	Me	В		27.2		
		None	50.9	39_8 39_5	0	
SADR FM2		A				
		В		39.5		Y
NOTES: * S/N Ratio 0dB Re				ot @ 9%) no SCA	's	DAT REF No. DAR40163.DAT
* External 15KHz 1	ow pass filter i	ised for all audi	o measurements			Audio program material: Harp, ABBA, Female voice

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File Name: L\_A\_RX4 XLS L-2,3

DAT File	Time C			Start	IDs		
Number	Start	Stop				Description	Attn
DAR40163.DAT		1		T	T		Aitti
3/22/95		1	1			AMATI DSB (STRONG)	•••••••
		1	2		1	AMATI DSB (WEAK)	
			3		-	AMATI DSB (WEAK) FMI (STRONG)	
			4		-	FM1 (WEAK)	
			5		1	FM2 (STRONG)	
		1	6		1	FM2 (WEAK)	
			7			AMATI LSB (STRONG)	
			8		1	AMATI LSB (WEAK)	
			9		1	FM2 (STRONG)	
			10		1	FM2 (STRONG) W/SCA GROUP A	
DISREGARD			11		1	FM2 (STRONG) FM2 (STRONG) W/SCA GROUP A FM2 (STRONG) W/SCA GROUP B	
			12		1	FM2 (STRONG) W/SCA GROUP B	
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File Name: L\_A\_RX4.XLS DAT LOG L3

Test L-4		3/24/95			
DAR -> Analog With Multipath	Engineers:	DML/RMc	Radio Aud	io Quality TEST L-4	Multipath Type: Urban Slow Rayleigh
Strong & Weak Signal Receiver : PIONEER		SCA GROUP	GRADE	Subjective EO&C	
ANALOG		None	NA		
TRANSMITTER ONLY		В			
		None	-2	Noticeable increase in noise floor	
AT&T / Amati DSB DAR -> HOST	Strong Signal Level (-47 dBm)	В	-2	No additional contribution to noise from SCA's	
	el (-	None	-2	Noticeable increase in noise floor	
AT&T / Amati LSB	nal Lev	В	-2	No additional contribution to noise from SCA's	
	Si Si	None	-2	Noticeable increase in noise floor	
USADR FM1	Stron	В	-2	No additional contribution to noise from SCA's	
		None	-1	Slight increase in noise floor	
USADR FM2		В	-1	No additional contribution to noise from SCA's	
ANALOG		None	NA		
TRANSMITTER ONLY		в			
		None	0		
AT&T / Amati DSB	dBm)	В	0		
	(-77	None	0		
AT&T / Amati LSB	Weak Signal Level (-77 dBm)	В	0		
	Signa	None	0		
USADR FM1	Weak	В	0		
		None	0		
USADR FM2		В	0		
NOTES: * SCA group A n	not used for mult	ipath tests			DAT REF No. DAR40173.DAT Audio program material: Harp, ABBA, Female voice
* * Test L-3 Gradin	ne Scale	0: No differen	ce from Ana	log Reference -1: Worse than Analog Reference	-2: Much Worse than Analog Reference

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DAT File	Time C			Start	IDs		
Number	Start	Stop				Description	Attn
DAR40173.DAT					1.11	STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	
3/24/95			1		T	AMATI DSB	+
			2		I	AMATI DSB W/SCA GRP B	+
			3		Ī	FM1	+
			4		T	FM1 W/SCA GRP B	+
			5			FM2	-
			6			FM2 W/SCA GRP B	+
			7			AMATI LSB	ł
			8		İ III	AMATI LSB W/SCA GRP B	<u>+</u>
		[				WEAK SIGNAL W/MULTIPATH (URBAN SLOW)	
			9		t	IAMATI LSB	
			10			AMATI LSB W/SCA GRP B	
			11		·····	FM1	<u> </u>
			12		<u> </u>	FMI W/SCA GRP B	
			13			FM2	<b>.</b>
			14			FM2 W/SCA GRP B	
			15			AMATI DSB	
			16			AMATI DSB W/SCA GRP B	
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#### 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
N	otes:	
	*	Total modulation on analog abarmates 1000/ when as 000 to a total total states are a series
	*	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.

Stong & Weak Signal Receiver : FORD         TEST L-3 SNR all o Audio Quality         TEST L-3 SNR all o Audio Quality         TEST L-3           ANALOG TRANSMITTER ONLY         SNR all o Mone A B         65.2         51.9         NA         EO&C           AT&T / Amati DSB DAR > HOST         None A B         64.0         52.5         NA         EO&C           AT&T / Amati DSB DAR > HOST         None A B         64.0         52.5         NA         EOAC           MALOG TRANSMITTER DAR > HOST         None A B         Song & 46.9         0         0         EOAC           MAT&T / Amati LSB         None A B         Song & 46.9         0         EOAC         EOAC           USADR FM1         Song & 64.0         52.3         0         Very slight contribution to noise floor           USADR FM2         None A B         Song & 46.9         -1 40         Sight inerase in noise floor           MALOG TRANSMITER ONLY         None A B         Song & 53.3         NA           MALOG TRANSMITER ONLY         None A B         Song & 53.5         Sight inerase in noise floor           USADR FM1         Song & 53.5         Song & 53.5         Sight inerase in noise floor           USADR FM1         Song & 53.5         Song & 53.5         Sight inerase in noise floor           Song	Test(s) L-2 & L3 DAR -> Analog		: 3/21/95 : DML/RMc/TB	K			
ORCUP         RMS         Weighted 0rADE         GROE         EDEC           NALOG TRANSMITTER ONLY         NA         65.2         51.7         NA         EDEC           NALOG TRANSMITTER ONLY         Na         65.2         51.7         NA         EDEC           AT&T/Amati DSB DAR > HOST         Nane         64.0         52.5         0            AT&T/Amati LSB         Nane         64.0         52.5         0             Name         64.0         52.5         0               MALOG         Nane         64.0         52.5         0                USADR FMI         Nane         64.0         52.5         0                USADR FM2         Name         64.0         53.7         0						Radio Au	dio Quality TEST L-3
NALOG TRANSMITTER ONLY         None A B         652         537 525         NA         Totoc           AT&T / Amati DSB DAR > HOST         Image: Control of the second seco	Receiver : FORD						
TRANSMITTER ONLY     Image: Second seco	ANALOC						EO&C
ONLY         B         52.5         Image: constraint of the section of the sectin tene section of the sectin the sectin tene section of				65.2		NA	
AT&T / Amati DSB DAR > HOST         Very B         C <thc< th="">         C         <thc< th=""> <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<></thc<></thc<>							
AT&T / Amati DSB DAR > HOST         USADR FM1         USADR FM1         USADR FM1         Mone A B         64.0 52.0 52.5         50.0 52.0 0         0 0           USADR FM1         USADR FM2         None A B         62.7 52.8         52.9 0         0 Very slight contribution to noise floor Very slight contribution to noise floor           USADR FM2         None A B         59.3 48.9         48.9 46.9         -1 4 0         Slight inrease in noise floor           NALOG TRANSMITTER DNLY         None A B         64.0 53.3         53.1 45.7         NA           None A & B         59.3 46.9         48.9 -1 46.9         -1 4         Slight inrease in noise floor           None A & B         63.0 53.5         53.1 53.5         0         None 53.5         NA           None A & S3.5         63.0 53.5         53.5         0         None 53.5         NA           JSADR FM1         None A B         63.0 53.5         53.5         0         NO           JSADR FM2         None A B         63.0 53.5         53.5         0         NO         NO           JSADR FM2         None A B         63.0 53.5         53.5         0         NO         NO         A 53.4 B         0         NO           NONE B         63.0 53.5         53.5         0<	UNLY		В		52.5		
DAR -> HOST         Image: block of the state of th			None	64.0	54.0	0	
VT&T / Amati LSB         FO         A         64.0         55.0         0           JSADR FM1         VF         A         64.0         52.5         0         Very slight contribution to noise floor           JSADR FM1         VF         A         62.7         52.2         0         Very slight contribution to noise floor           JSADR FM2         None         62.7         52.8         0         Very slight contribution to noise floor           JSADR FM2         None         64.0         53.3         NA           NNALOG         None         63.3         53.5         Signt intrease in noise floor           VT&T / Amati DSB         VE         None         63.5         53.1         0           ISADR FM1         VE         None         63.0         52.5         0           ISADR FM1         VE         None         63.0         53.5         0           ISADR FM1         VE         None         63.0         53.5         0      <	AT&T / Amati DSB	Ê	A		52.3	0	
USADR FM2         None A B         59.3 48.9 46.9 47.0         -1 -1         Slight intease in noise floor           ANALOG TRANSMITTER NALOG TRANSMITTER NALY         None A B         64.0         53.3 53.7         NA           ANALOG TRANSMITTER NALY         None A B         64.0         53.3 53.7         NA           AT&T / Amati DSB         (F) B         None A B         63.3         53.1 53.5         0           AT&T / Amati LSB         (F) B         None A B         63.5         53.1 53.5         0           JSADR FM1         (F) B         (F) B         62.8         52.9 53.4         0           JSADR FM2         (F) A B         (F) B         (F) B         (F) B         (F) B         (F) B           JSADR FM2         (F) DAT REF No. DAR40164. DAT         (F) DAT REF No. DAR40164. DAT	DAR -> HOST	7 dB	В		52,9	0	
JSADR FM2         None A B         59.3 48.9 47.0         48.9 -1 -1         Slight intease in noise floor           INALOG (RANSMITTER NNLY         None A B         64.0         53.3 53.7         NA           INALOG (RANSMITTER NNLY         None A B         64.0         53.3 53.7         NA           INALY         B         53.7         NA           INALY         B         53.7         NA           IT&T / Amati DSB         Image for the state of the state		<u> </u>	None	64.0	55.0	0	
JSADR FM2         None A B         59.3 48.9 47.0         48.9 -1 -1         Slight intease in noise floor           INALOG (RANSMITTER NNLY         None A B         64.0         53.3 53.7         NA           INALOG (RANSMITTER NNLY         None A B         64.0         53.3 53.7         NA           INALY         B         53.7         NA           INALY         B         53.7         NA           IT&T / Amati DSB         Image for the state of the state	AT&T / Amati LSB	se			(E)		
USADR FM2         None B         59.3 48.9 46.9 47.0         48.9 -1 -1         -1 B         Slight intease in noise floor           ANALOG TRANSMITTER ONLY         None A         64.0         53.3 53.7         NA         Slight intease in noise floor           AT&T / Amati DSB         (fg)         A         53.7         None         63.3         53.1         0           AT&T / Amati DSB         (fg)         None         63.5         53.1         0         0           AT&T / Amati LSB         (fg)         None         63.5         53.5         0         0           JSADR FM1         (fg)         (fg)         (fg)         (fg)         (fg)         (fg)         0           JSADR FM2         (fg)         (fg)         (fg)         (fg)         (fg)         (fg)         (fg)           None         63.0         52.8         0         (fg)         (fg)         (fg)         (fg)           JSADR FM2         (fg)         (fg)         (fg)         (fg)         (fg)         (fg)         (fg)         (fg)           IVSADR FM2         (fg)         (	a	al Le					
USADR FM2         None A B         59.3 48.9 46.9 47.0         -1 -1         Slight intease in noise floor           ANALOG TRANSMITTER ONLY         None A B         64.0         53.3 53.7         NA           ANALOG TRANSMITTER ONLY         None A B         64.0         53.3 53.7         NA           AT&T / Amati DSB         (f) A B         None A B         63.3         53.1 53.5         0           AT&T / Amati LSB         (f) B         None A B         63.5         53.1 53.5         0           JSADR FM1         (f) A B         None A B         63.0         52.8 53.5         0           JSADR FM2         None A B         62.8         52.9 53.4 B         0         0           None A B         53.4 53.5         0         0         0         0           JSADR FM2         None A B         62.8         52.9 53.4 53.4         0         0           NOTES: * S/N Ratio 0dB Reference with IKHz audio @ 91% modulation (pilot @ 9%) no SCA's         DAT REF No. DAR40164 DAT		Sign	None	62.7	52.2	0	
USADR FM2         None A B         59.3 48.9 46.9 47.0         -1 -1         Slight intease in noise floor           ANALOG TRANSMITTER NALOG TRANSMITTER NALY         None A B         64.0         53.3 53.7         NA           ANALOG TRANSMITTER NALY         None A B         64.0         53.3 53.7         NA           AT&T / Amati DSB         (F) B         None A B         63.3         53.1 53.5         0           AT&T / Amati LSB         (F) B         None A B         63.5         53.1 53.5         0           JSADR FM1         (F) B         (F) B         62.8         52.9 53.4         0           JSADR FM2         (F) A B         (F) B         (F) B         (F) B         (F) B         (F) B           JSADR FM2         (F) DAT REF No. DAR40164. DAT         (F) DAT REF No. DAR40164. DAT	USADR FM1	guc			1		Very slight contribution to poice floor
USADR FM2         None A B         59.3 48.9 46.9 47.0         48.9 -1 -1         -1 Slight inrease in noise floor           ANALOG TRANSMITTER ONLY         None A B         64.0         53.3 53.7         NA           AT&T / Amati DSB         A B         63.3         53.1 53.5         0           AT&T / Amati LSB         A B         53.5         0           USADR FM1         A B         63.0         52.8 53.5         0           USADR FM2         None A B         63.0         52.8 53.5         0           None A B         63.0         52.8 53.5         0           USADR FM1         A B         53.4 53.5         0           USADR FM2         None A B         62.8         52.9 53.4 53.4 B         0           None A B         53.4 53.5         0         0           USADR FM2         None A B         62.8         52.9 53.4 53.4         0           NOTES: * S/N Ratio 0dB Reference with IKH2 audio @ 91% modulation (pilot @ 9%) no SCA's         DAT REF No. DAR40164 DAT		Strc		1			
USADR FM2         A         A         46.9         -1           ANALOG TRANSMITTER ONLY         None         64.0         53.3         NA           AT&T / Amati DSB         A         53.7         -           AT&T / Amati LSB         Image: Amate and the second s						Ĭ	And and the contribution to 10026 1000
Image: Second second	ICADD EMO			59,3			Slight inrease in noise floor
ANALOG TRANSMITTER ONLY AT&T / Amati DSB AT&T / Amati LSB JSADR FM1 JSADR FM2 NOTES: * S/N Ratio 0dB Reference with IKHz audio @ 91% modulation (pilot @ 9%) no SCA's None 64.0 53.3 NA 53.7 None 64.0 53.3 NA 53.7 None 63.3 53.1 0 A 53.5 B S3.5 NA 53.7 NA S3.7 NA SA SA SA SA SA SA SA SA SA S	JSADK FMZ						
TRANSMITTER ONLY     A     53.7       ONLY     B     53.7       AT&T / Amati DSB     A     53.7       AT&T / Amati LSB     B     53.5       JSADR FM1     JSADR FM2     None     63.0     52.8       None     63.0     52.8     0       AT&T / Amati LSB     None     63.0     52.8     0       JSADR FM1     JSADR FM2     None     62.8     52.9     0       NOTES: * S/N Ratio 0dB Reference with IKHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT			В		47.0	-1	
ONLY         B         53.7           AT&T / Amati DSB         None         63.3         53.1         0           AT&T / Amati DSB         B         53.5         0           AT&T / Amati LSB         Difference         None         63.5         53.1         0           USADR FM1         DSADR FM2         None         63.0         52.8         0           None         63.0         53.5         0         0         0           NOTES: * S/N Ratio 0dB Reference with IKHz audio @91% modulation (pilot @ 9%) no SCA's         DAT REF No. DAR40164.DAT         DAT REF No. DAR40164.DAT			None	64.0	53.3	NA	
AT&T / Amati DSB     Image: Constraint of the second							
AT&T / Amati DSB       A       53.5         AT&T / Amati LSB       Image: Constraint of the law of the	ONLY						
B         53.5           B         53.5           AT&T / Amati LSB         None         63.5         53.1         0           AT&T / Amati LSB         Date         A         53.5         0           USADR FM1         Date         A         53.5         0           None         63.0         52.8         0         0           USADR FM1         None         63.0         52.8         0         0           USADR FM2         None         62.8         52.9         0         0           NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's         DAT REF No. DAR40164.DAT				63.3		0	
USADR FM1         A         53,5           B         53,5         53,5           USADR FM2         None         62.8         52.9         0           NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's         DAT REF No. DAR40164.DAT	AT&T / Amati DSB						
USADR FM1     A     53,5       USADR FM2     None     62.8     52.9     0       NOTES: * S/N Ratio 0dB Reference with I KHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT		dBm	В		53.5		
ISADR FM1       Image: Constraint of the second secon		-17-)	None	63.5	53,1	0	
JSADR FM1     A     53,5       JSADR FM2     A     B     53,5       None     62.8     52,9     0       A     53,4     53,4       B     53,4     53,4       NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT	T&T / Amati LSB	kel					
JSADR FM1     A     53,5       JSADR FM2     None     62.8     52,9     0       JSADR FM2     A     53,4     53,4       NOTES: * S/N Ratio 0dB Reference with IKHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT		l Le	В		53.5		
A     53.5       B     53.5       JSADR FM2     None       A     B       None     62.8       S3.4       B     53.4       S3.4       B     53.4       DAT REF No. DAR40164.DAT		Signa	None	63.0	52,8	0	
JSADR FM2     None     62.8     52.9     0       A     53.4     53.4     0       NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT	JSADR FM1	X	A				
JSADR FM2     A     53.4       B     53.4       NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT		Wes	В		53.5		
JSADR FM2     A     53.4       B     53.4       NOTES: * S/N Ratio 0dB Reference with 1KHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT			None	62.8	52.9	0	
B     53.4       NOTES: * S/N Ratio 0dB Reference with IKHz audio @ 91% modulation (pilot @ 9%) no SCA's     DAT REF No. DAR40164.DAT	JSADR FM2	1 8	A				
* External 1 SI/ He have a Classical Company of Company							
* External 1 SKII a law and C. U. State and C. U. State and C. U. State and C. C. State and State and Stat	NOTES: * S/N Ratio OdB Re	eference with 1	KHz audio @ 91	% modulation (pile	t @ 9%) no SCA!e	1	
EAGUIAL LANELA DW DASS LIDER USED TOF ALL AUTO THEASUREMENTS	* External 15KHz k	ow pass filter i	ised for all audio	measurements	a a short to SCAS		
* Audio measurements are either RMS unweighted or Qpeak detected with CCIR weighting filter as indicated	* Audio measureme	ents are either l	RMS unweighter	or Oneak detetecte	d with CCIR weig	hting filter o	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     -2: Much Worse than Analog Reference	* Test L-3 Grading	Scale:	0. No difference	from Analog Defe	u with CUIK Welg		

File Name: L\_A\_RX5 XLS L-2,3

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DAT File	Time C			Start ID	)s		
Number	Start	Stop				Description	
DAR40164.DAT		1	T		T	Description	Atto
3/23/95			1			AMATI DSB (STRONG)	
			2	••••••••••••••••••••••••••••••••••••••	•••••	AMATI DSD (STRONG) AMATI DSD (WEAK)	
	•••••		3			AMATI DSD (WEAK)	
		******	4			AMATI DSB W/SCA GRP A (STRONG)	1
			5		•••••	AMATI DSB W/SCA GRP B (STRONG) FMI (STRONG)	
		*****	6				
***************************************			7			FM1 (WEAK)	
	******		8			FM1 W/SCA GRP A (STRONG)	
DISREGARD	*****		9			FMI W/SCA GRP B (STRONG)	1
	•••••••		******			FM2 (STRONG)	1
		*****	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)	
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File Name: L\_A\_RX5.XLS DAT LOG L3

AR -> Analog Vith Multipath	Engineers:		Radio Aud	io Quality TEST L-4	Multipath Type: Urban Slow Rayleigh
trong & Weak Signal Receiver : FORD		SCA GROUP	GRADE	Subjective EO&C	
NALOG RANSMITTER NLY		None B	NA	Multipath fade events slightly noticeable as noise increase with slight tone or beat note	
		None	0	Multipath fade events slightly noticeable	
T&T / Amati DSB AR -> HOST	Strong Signal Level (-47 dBm)	В	0	No additional contribution to noise from SCA's	
T&T / Amati LSB	vel (-4	None	0	Multipath fade events slightly noticeable	
Ter / Andr Lob	gnal Le	В	0	No additional contribution to noise from SCA's	
ISADR FM1	ong Sig	None	-1		
	Stro	В	-1	No additional contribution to noise from SCA's	
SADR FM2		None	-2		
		В	-2	No additional contribution to noise from SCA's	
NALOG RANSMITTER		None	NA		
DNLY		B None	0		
T&T / Amati DSB	Bm)	B	0		
	<i>LL-)</i>	None	0		
.T&T / Amati LSB	Weak Signal Level (-77 dBm)	В	0		
ISADR FM1	Signa	None	0		
SADE FINI	Weak	В	0		
SADR FM2		None	0		
Charlen a little		В	0		
NOTES: * SCA group A no	ot used for mult	path tests			EF No. DAR40174.DAT naterial: Harp, ABBA, Female voice

File Name: L\_A\_RX5 XLS L-4 Urb Slo

\*)

a.,

DAR -> Analog		3/23/95 DML/RMc					
With Multipath			Radio Aud	lio Quality		TEST L-4	Multipath Type: Urban Fast Rayleigh
Strong & Weak Signal Receiver : FORD		SCA GROUP	GRADE			Subjective EO&C	inderspace Type. Orden Tast Rayleigh
ANALOG IRANSMITTER ONLY		None B	NA	Multipath events are ve	ery noticeable		
AT&T / Amati DSB DAR -> HOST	(7 dBm)	None B	0				
AT&T / Amati LSB	Strong Signal Level (-47 dBm)	None B	0				
JSADR FMI	Strong Sig	None B	0				
JSADR FM2		None B	-1 -1	No additional contribut	tion to noise from SCA's		
ANALOG FRANSMITTER DNLY		None	NA			4 F 1 - 1	
T&T / Amati DSB	dBm)	None B	0				
T&T / Amati LSB	Level (-77 c	None B	0				
SADR FM1	Weak Signal Level (-77 dBm)	None B	0				
SADR FM2		None B	0				
NOTES: * SCA group A n * *	ot used for multip	ath tests	<u></u>				DAT REF No. DAR40174.DAT Audio program material: Harp, ABBA, Female voice
* Test L-3 Gradin	ng Scale: (	): No differenc	e from Analog	g Reference	-1: Worse the	an Analog Reference	-2: Much Worse than Analog Reference

DAT File	Time Co		Start ID		
Number	Start	Stop		Description	Attn
DAR40174.DAT				STRONG SIGNAL W/MULTIPATH (URBAN SLOW)	
3/23/95			1	AMATI DSB	1
DISREGARD			2	AMATI DSB W/SCA GRP B	1
			3	AMATI DSB W/SCA GRP B	1
		******************	4	FM1	
			5	FM1 W/SCA GRP B	1
	1		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	1
	[]		21	AMATI DSB W/SCA GRP B	
		********	22	FMI	
			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 AMATI DSB W/SCA GRP B	

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File Name: L\_A\_RX5.XLS DAT LOG L4

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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: ABBASCA 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 Protocal Analyzer) receiver & software utility.67KHZ Analog:Compol SCA receiver, Unit No. 1 67KHz/94.1MHz92KHz Analog:Compol SCA receiver, Unit No. 2 92KHz/94.1MHz92KHz Digital:Mainstream Data, Intelligent Data Receiver



# FEC Lage 1

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'est L-2 & L-3 ubcarriers		$\checkmark$	Composite Subcarrier Group A	٨	Composite Subcarrie	ier Group B	$\langle \rangle$	Group D	/ / /
DAR -> Host SC	5	57 KHz RBDS 3% ERRORS MAX:(%)	66.5 KHz HS Data 8.5% ERRORS	92KHz Analog 8.5% S/N (dB)	57KHz RBDS 10% ERRORS MAX:(%)	67KHz Analog 10% S/N (dB) R MS	92K	#FEC2	10% SQ #UNC
<sup>F</sup> M		0	-6	46	0	45.3	210 0	0	170 0
AT&T / Amati DSB		0	-5,95 \ 0	20	0	41	209 1290	4558	92-130 455
AT&T / Amati LSB		0	-6 [D	27	0	43	209 1310	4272	76-130 475
USADR FM1 មើរនេះ 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		0	NA	22.4	0	35.4	113 NA	NA	0 NA
AT&T / Amati DSB		0	NA	16	0	34		NA	
AT&T / Amati LSB USADR FMI		0	NA	18	0	34,5		NA	
USADR FMI version set and the set of the set		0	NA	16	0	33.5		NA	
USADR FM2		0	NA	19,9	0	34.6		NA	

\* 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.

File Name: LSC.XLS L-2 & L3 SC

Page 2 of 3

Test L-4 Subcarriers			Composite Subcarrier Group	A	Composite Sultan	nion Choup B			
DAR -> Host SC Moderate Signal Level		57 KHz RBDS 3% ERRORS	66.5 KHz HS Data 8.5%	92KHz Analog 8.5% EO&C	Composite Subcar 57KHz RBDS 10% ERRORS	rier Group B 67KHz Analog 10% EO&C	92]	Group D KHz Digita ERRORS	10%
	1+						# FEC1	# FEC2	# UNC
FM		2	-5.5	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
AT&T / Amati DSB	gh	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
AT&T / Amati LSB	Urban Slow Rayleigh	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
JSADR FM1	Urbat	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
JSADR FM2		2	-3.8	Fair audio - noisy (hiss) most of the time - worse during fades usable audio	<b>1</b> .	Good audio with mild noise during fades Usable audio	965	1023	106
FM		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
AT&T / Amati DSB	gh	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
AT&T / Amati LSB	ı Fast Rayleigh	12	-2,4	Fair audio quality - noisy with some main channel audio noise Usabilty: Marginal	11	Fair audio with medium multipath type spits Usable audio	273	644	249
JSADR FM1	Urban	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
JSADR FM2		1	-1.9	Fair audio quality -noisy with faint whine in background	0	Good audio with medium multipath type spits	254	405	238
				Usable audio		Usable audio			
* 57KHz * 66_5KH	RDS: Ei IZ Seiko	raded as the number of observed er ror = Percentage of maximum bloc Error = Average log BER observe	k errors indicated by MAX:(%) in d on the Seiko RPA utility with a	n the RDS CHECKUP utility print-out of a typical 20 sec. segment as indicated on the Mainstream receiv		* Analog SCA quality: EO&C of 11 * Main channel modulation : Abba * Mainstream data not valid - Rx no	t in lock dur	3	th

\* 66.5KHZ Seiko: Error = Average log BER observed on the Seiko RPA utility with a print-out of a typical 20 sec. segment \* Mainstream data not valid - Rx not in lock \* 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

# **APPENDIX AR**

Test M

#### Tests M1 & M2

Analog to IBOC Host Interference

8	
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 Terain 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 Terain Obstructed Doppler multipath events
Natara	
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.
*	Table required, So an groups it, S, 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.

File Name: M\_SERIES.XLS Cover

#### 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

Test	M-1			M-1-1		T		Sub-camit	4-1-2	
Signal	Strength		Medium		Weak	FM w/		Medium	1-1-2	Weak
	MOD	TOA Co/No (dB)	EO&C	I Provide the second second	EO&C	SCA GRP	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
AT&T	cw	Attn 14.50 Co/No 10.32	Small drop out	Attn 14.50 Co/No	Small drop out	A	15.25 11.07	Small Drop out	15.75	Smal! Drop out
mati SB AR40202 DAT		Attn [4.50		10.32		В	15.25	Small Drop out	15.25	Small Drop out
AK40202.DA1	FM	Co/No 10.32	Small drop out	14 75 Co/No 10.57	Small drop out	D	15.50 11,32	Small drop out	15.25	Small drop out
T&T	cw	Attn 21.25 Co/No 17,27	Small drop out	Attn 22.30 Co/No 18.52	Small drop out	A	63.65 59.67	With no added noise TOA level of impairment.	63.75 59.77	With no added noise TOA level of impairment
<b>.mati</b> .SB AR40203.DAT		Attn 21.25		Attn 22.50		B	24.75 20.77 63.75	Small drop out	27.75 23.77	Small drop out.
	FM	Co/No 17.27 Aun	Small drop out		Small drop out	D	<b>59.7</b> 7	With no added noise TOA level of impairment.	<u>53 75</u> 59.77	With no added noise TOA level of impairment.
SADR	cw	18.25	Small warble.	18.75	Small warble.	A	12.66	Wind Chime effect/ signal shattering.	13.41	Shattering and warbles.
M1 R40201.DAT		Attn 18.25		Ann 18.75		В	12.91	Shattering.	13.91	Warble or chirp.
	FM	000000000000000000000000000000000000000	Small warble.		Small warble.	D	12.41	Warble or Chirp.	13.16	Warble and shattering.
SADR	cw	36.50	Small warble.	63.75 Co/No	Could not achieve TOA. Level of impairment	A	25.65	Small warble.	63.75 50.15	NA
<b>42</b> R40204 DAT		Aith 39.25		Attn	between TOA and POF.	В	39.25 25.65 39.50	Small warble.	63.75 50.15	NA
Notes:	FM		Small warble,	Co/No	Level of impairment between TOA and POF.	D		Small warble.	<u>63.75</u> 50.15	NA
Notes:		Testers: 1	DML,RMc		gnal Strength= -62.0 gnal Strength= -77.0	00 dBm	- Anna - A			

92 Kette Problem

# EIA Digital Audio Radio DAT Recording Log

DAT File	Time Co	ode		P	rogra	am			
Number	Start	Stop	_	_	ID #	1		Description	Attn
DAR40203.DAT							Γ		
15-May-95			1	2	3	4	5	AT&T Amati LSB CPN@ 100% Small drop out #5.	21.25
		Aed						Small drop out #5.	
		i i							
		Si	6	7	8		ļ	AT&T Amati LSB CPN@ 100% Group D @10%	21.25
		gna	ļ				ļ	Larger more frequent drop outs and flutter (Beyond POF).	
		l St		10					
		- Fen	9	10	11		ļ	AT&T Amati LSB CPN@ 90% Group B @20%	21.25
		gth	<b>.</b>		<b> </b>		ŀ	More freguent drop outs and flutter.	
		Medium Signal Strength -62 dBm	12	13	14		ŀ	AT&T Amati LSB CPN@ 90% Group A @20%	21.25
		d₿	14	1.5			<b> </b>	Larger more frequent drop outs and flutter.	21.23
		3	1						
			15	16	17		<b> </b>	AT&T Amati LSB CPN@ 100%	22.50
		l s	1		1		l I	Small drop outs #16.	
		I ak					I		
		Sig	18	19	20			AT&T Amati LSB CPN@ 100% Group D @10%	22.50
		nal	ļ	<b> </b>	ļ		ļ	More frequent drop outs and flutter.	
		Weak Signal Strength -77 dBm	21	22	23			AT&T Amati LSB CPN@ 90% Group B @20%	22.50
		l Igth	1					More frequent drop outs and flutter.	
		-77					ļ		
		dB B	24	25	26		ļ	AT&T Amati LSB CPN@ 90% Group A @20%	22.50
		B	-					More frequent drop outs and flutter.	
		ļ							
							-		
		ļ	_	ļ					
							<b> </b>	Impairment:	
		1		1	1		1	FM, SCA and Gaussian Noise	

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# EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Co Start	ode Stop		Р	rogram ID #		
DAR40202.DAT	Start	Stop	+			Description	Attn
15-May-95			1	2	3	AT&T Amati DSB CPN@ 100%	14.50
		Me	1	1		AT&T Amati DSB CPN@ 100% Small drop outs.	14.50
		diu	1	1			
		s	4	5	6	AT&T Amati DSB CPN@ 90% Group A @20%	14.50
		ign				More frequent drop outs and flutter.	14.50
		al S					
		tre	7	8	9	AT&T Amati DSB CPN@ 90% Group B @20%	14.50
	••••••••	ligth			ļ	More freguent drop outs and flutter.	
		Medium Signal Strength -62 dBm					
		D dE	-41	-8	41	AT&T Amati DSB CPN@ 100% Group D @10%	14.50
	•••••••	Ĭ'n		-23		Larger more frequent drop outs and flutter.	
		il					
			13	14	15	AT&T Amati DSB CPN@ 100%	14.75
		We				Small drop outs.	1.12
		ak	Į				
		Sig	16	17	18	AT&T Amati DSB CPN@ 100% Group D @10%	14.75
		Weak Signal Strength -77 dBm				More frequent drop outs and flutter.	
		Stre	19	20	21	ATET Amoti DOD ODVO 2004 Come D CO2004	
		ngti		20	- 21	AT&T Amati DSB CPN@ 90% Group B @20% More freguent drop outs and flutter.	14.75
		1-7	1			note reguent drop outs and funct.	
		7 di	22	23	24	AT&T Amati DSB CPN@ 90% Group A @20%	14.75
		Bm	1			More freguent drop outs and flutter.	14.75
							1
		•••••••••••••••					
						Impairment:	
						FM, SCA and Gaussian Noise	

DAT File	Time Co	ode		Pr	ogra	m			
Number	Start	Stop			ID #		_	Description	Attn
DAR40201.DAT									
12-May-95			1	2	3	4	5	USADR FM1 CPN@100% #4 at end of 1st arpeggio	18.25
		Medium Signal Strength -62 dBm						10.1 DD D1(1.00)(0000 Crown A @ 20%	18.25
			6	7	8			USADR FMI CPN@90@ Group A @ 20%	10.25
		I Si	ļ					With the addition of SCAs high cut in addition to more warbles were heard.	
		gna	ļ					wardles were neard.	
		1 St	9	10	11			USADR FM1 CPN@90% Group B @ 20%	18.25
		ren		10				With the addition of SCAs high cut, shattering and warbles	
		gth						were detected	
		- 62	-						
		₿	12	13	14			USADR FM1 CPN@100% Group D @ 10%	18.25
		÷ B			le trice			Increase in warbles and error indicator frequency detected.	
		1	15	16	17	18	19	USADR FM1 CPN@100% #16 end of 1st arpeggio	18.75
		1 5							
*****		'cal	20	21	22			USADR FM1 CPN@100% Group D @ 10%	18.75
		Si	1		1	1		Increase in warbles, high cut and error light frequency.	
		Weak Signal Strength -77 dBm							
		1 St	23	24	25			USADR FM1 CPN@90% Group B @ 20%	18.75
		ren						Increase in warbles, high cut and error light frequency.	
		l gth					ļ		10.75
		-77	26	27	28			USADR FM1 CPN@90@ Group A @ 20%	18.75
		d				ļ	ļ	Buzz mute increase in warbles and error light detected.	
		, B					<b>.</b>		
						ļ			
				ļ					
				. <b> </b>					
				. <b> </b>					
						. <b>.</b>			
						·			
					-		-	Impairment:	
				-		-		FM, SCA and Gaussian Noise	1

1.25

# EIA Digital Audio Radio DAT Recording Log

DAT File Number	Time Co Start	ode Stop		P	rogra ID #			
DAR40204.DAT		Joop		1			Description	Attn
16-May-95			1	2	3		USADR FM2 CPN @ 100%	
		Me		1	1		USADR FM2 CPN @ 100% Shattering and warbles.	39.25
		diu		1				
		a s	4	5	6		USADR FM2 CPN @ 100% Group D @10%	
		ign	1	1	1		Construction of the second state of the second	39.25
		al		1	1			
		Medium Signal Strength -62 dBm		1			USADR FM2 CPN @ 90% Group A @ 20%	
		ngt	1				No Difference detected.	39.25
		-	1	0000110				
		52 d					USADR FM2 CPN @ 90% Group B @ 20%	20.25
		IBn					USADR FM2 CPN @ 90% Group B @ 20% No difference detected.	39.25
		D D	1		1			
						1		
			7	8	9		USADR FM2 CPN @ 100%	62.75
		We					Insufficient receiver sensitivity. Level of impairment between TOA and POF.	63.75
		Weak Signal Strength -77 dBm					Level of impairment between TOA and POF.	
		Sig						
		nal						
		St						
		ene						
		oth						
	I	-77						
		dB						
		B						
			ļļ					
	<b>-</b>							
			ļļ.					1
	·····	<i>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</i>					Impairment:	1
							FM, SCA and Gaussian Noise	

#### **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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Signal Streng	M-2		Urban	Slow Rayleigh				Urba	n Slow Rayleigh		
mpairment	;th 	TOA	Medium Multipath + Noise		Weak Multipath + Noise	FM w/	Mu	Medium Itipath + Noise + SCA		Weak Iltipath + Noise + SCA	
	Mod	Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C	SCA GRP	TOA Co/No (dB)	EO&C	TOA Co/No (dB)		
AT&T	cw	Attn 38.00 Co/No 33.74	Small drop out	Attn 63 75 Co/No 59,49	Excessive muting POF	A	41.00 Co/No 36.74	Medium drop out	63.75 Co/No 59,49	NA	
Amati DSB		Attn 38.00		Attn 63 75	level of impairment.	В	42.00 Co/No 37.74 41.00	Small drop out	63.75 Co/No 59.49	NA	
	FM	Co/No 33.74	Small drop out	Co/No 59.49	Excessive muting POF level of impairment.	D	Co/No 36,74	Small drop out	63.75 Co/No 59,49	NA	
T&T	cw	Aitn 63.75 Co/No 59,66	Level of impairment consistent with POF.	Attn 0 00 Co/No -4.09	NA (NO COUMAS)	A	0.00 Co/No -4.09	NA	0.00 Co/No -4.09	NA	
sB		Aim 63 75	Level of impairment	Attn	(meaningless)	B	0.00 Co/No -4.09	NA	0.00 Co/No -4.09	NA	
	FM	Co/No 59.66	consistent with POF.	0.00 Co/No -4.09	NA (melanin)	D	0.00 Co/No -4.09	NA	0.00 Co/No	NA	
SADR	cw	Attn 63 75 Co/No 56.71	High cut and warbles level of impairment Between TOA and POF closer to TOA.	Attn 0.00 Co/No -7.04	NA	A	0.00 Co/No -7.04 0.00	NA	-4.09 0.00 Co/No -7.04	NA	7,5
MI		Attn 0.00		Attn 0.00		В	Co/No -7.04 0.00	NA	0.00 Co/No -7.04	NA	) B all
	FM	-7.04	NA	200000000000000000000000000000000000000	NA	D	Co/No -7.04	NA	0.00 Co/No -7.04	NA	
SADR	cw		Long mutes with brief periods of recovered audio with warbles and high cut, beyond POF.	Attn 0.00 Co/No -13.73	NA	A	0.00 Co/No -13.73 0.00	NA	0.00 Co/No -13.73	NA	19.2
M2		Attn 0.00		Aitn		В		NA	0.00 Co/No -13.73	NA	
	FM		NA	0.00 Co/No -13.73	NA	D	0.00 Co/No -13.73	NA	0.00 Co/No -13.73	NA	

File Name: M\_SERIES XLS M2 Urb. Slow Ray.

Гest	M-2		Urban	Fast Rayleigh			Urban Fast Rayleigh					
Signal Streng	gth		Medium		Weak			Medium		Weak		
mpairment		1	Multipath + Noise		Multipath + Noise	FM w/	Multipath + Noise + SCA			tipath + Noise + SCA		
		TOA		TOA		SCA	TOA		TOA			
	Mod	Co/No (dB)	EO&C	Co/No (dB)	EO&C	GRP	Co/No (dB)	EO&C	Co/No (dB)	EO&C		
		Attn		Attn			28.00		63.75			
	CW	28 00		63.75	Small drop out.	A	Co/No	Small flutter,	Co/No	NA		
		Co/No	Small flutter.	Co/No	TOA level of impairment		23.74		59.49			
АТ&Т		23.74		59.49	without added noise.		28.00		63.75			
Amati						В	Co/No	Small flutter.	Co/No	NA		
DSB		Atto		Attn			23.74		59.49			
		28.00		63.75	Small drop out.		29.00		63,75			
	FM	Co/No	Small drop out.	Co/No	TOA level of impairment	D	Co/No	Small drop out	Co/No	NA		
		23.74		59,49	without added noise.		24.74		59.49			
		Attn		Attn			63.75	Level of impairment	0.00			
	CW	39.00	Small flutter.	63.75	Without added noise	A	Co/No	between TOA and POF	Co/No	NA		
		Co/No	]	Co/No	worse than POF level		59.66	closer to TOA.	-4.09			
AT&T		34.91		59,66	of impairment.		63.75	Level of impairment	0.00			
Amati						В	Co/No	between TOA and POF	Co/No	NA		
LSB		Attn		Attn			59.66	closer to TOA.	-4.09			
		40.00	Small drop out,	63.75	Without added noise		63.75	Level of impairment	0.00			
	FM	Co/No	1	Co/No	worse than POF level	D	Co/No	between TOA and POF	Co/No	NA		
		35.91		59.66	of impairment.	_	59.66	closer to TOA.	-4.09			
		Attn		Attn	High cut and warbles		63.75		63.75	High Cut and		
	CW	37.00	Slight high cut.	63,75	Impairment level	A	Co/No	Small chirp	Co/No	background		
		Co/No		Co/No	between TOA and POF		56,71		56.71	noise		
USADR		29.96		56.71	closer to POF.	<b>-</b> .	63.75	0 11 12	63.75	High Cut and		
FM1						В	Co/No	Small chirp	Co/No 56.71	background noise		
		Attn		Attn	High cut, warbles and	-	56.71 63.75		63.75	High Cut and		
		41.00	Small chirp.	63.75	slight mute impairment			Small chirp	Co/No	background		
	FM	Co/No		Co/No	level between TOA and POF.	D	Co/No 56.71	Sman chirp	56,71	noise		
	_	33.96		56.71		-	0.00		0.00			
		Attn	Virtually no recovered	Attn			Co/No	NA	Co/No	NA		
	CW	63.75	audio, beyond a POF	0.00	NA	A	-13.73		-13.73	inter .		
		Co/No	level of impairment.	Co/No -13.73	IN/A		0.00		0.00			
USADR		50.02		-13.73		В	Co/No	NA	Co/No	NA		
FM2				Attn		-	-13.73		-13.73			
		Attn 0.00		0.00			0.00		0.00			
	EM		NA	Co/No	NA	D	Co/No	NA	Co/No	NA		
	FM	Co/No -13.73		-13,73			-13.73		-13.73			
Not	tes:	Testers	: DML,RMc				Signal Strength= Signal Strength=					

File Name: M\_SERIES XLS M2 Urb, Fast Ray,

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## EIA Digital Audio Radio Test Laboratory

Test	M-2		Rural	Fast Rayleigh				Rural	Fast Rayleigh	
Signal Stren Impairment	0		Medium Multipath + Noise		Weak			Medium		Weak
mpunnent		TOA	Internation + INDISE	TOA	Multipath + Noise	FM w/		ltipath + Noise + SCA		tipath + Noise + SCA
	Mod	Co/No (dB)	EO&C	Co/No (dB)	EO&C	SCA GRP	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
АТ&Т	cw	Attn 32.00 Co/No 27.74	Small drop out.	Attn 63.75 Co/No	Many flutters and mutes. Level of impairment between TOA and POF,	A	32.00 Co/No 27.74	Small flutter.	0.00 Co/No -4.26	NA
Amati DSB		Attn 32.00		59,49	Closer to POF.	В	32.00 Co/No 27.74	Medium drop out.	0 00 Co/No -4.26	NA
	FM	Co/No 27.74	Small drop out.	Co/No 59.49	Level of impairment between TOA and POF, closer to POF.	D	32.00 Co/No 27.74	Small drop out.	0.00 Co/No -4.26	NA
АТ&Т	CW	Attn 59.00 Co/No 54.91	Small flutter.	Attn 63.75 Co/No	No recovered Audio.	A	63.75 Co/No 59.66	Level of impairment between TOA and POF closer to POF.	0.00 Co/No -4.09	NA
Amati LSB		Attn	Small flutter,	59.66		В	63.75 Co/No 59.66	Level of impairment between TOA and POF closer to POF.	0:00 Co/No -4.09	NA
	FM	Co/No 54.91		63.75 Co/No 59.66	No recovered Audio.	D		Level of impairment between TOA and POF closer to POF.	0.00 Co/No -4.09	NA
USADR	cw	Attn 63 75 Co/No 56.71	TOA level of impairment, Occasional chirp,	Attn 0.00 Co/No -7,04	NA	A	-7.04	NA	-7.04	NA
FM1		Attn 0.00		Atm 0.00		B	0.00 Co/No -7.04 0.00	NA	0.00 Co/No -7.04	NA
	FM	-7.04	NA Virtually no recovered	Co/No -7.04 Attn	NA	D	Co/No -7.04	NA	0.00 Co/No -7.04	NA
USADR	CW	63.75 Co/No	audio. Beyond a POF level of impairment.	0.00	NA		0.00 Co/No -13.73 0.00	NA	0.00 Co/No -13.73	NA
FM2		Attn 0.00		Attn 0.00		B		NA	-13.73	NA
	FM	Co/No -13.73	NA		NA	D		NA	0.00 Co/No -13.73	NA
Not	es:	Testers:	DML,RMc				gnal Strength= gnal Strength=	-62 dBm -77 dBm		

File Name: M\_SERIES XLS M2 Rural Fast Ray.

ſest	M-2		Terrain Ob	structed Rayleigh			Terrain Obstructed Rayleigh			
Signal Streng	gth		Medium		Weak			Medium		Weak
mpairment	and A	11	Multipath + Noise		Multipath + Noise	FM w/		tipath + Noise + SCA		tipath + Noise + SCA
		TOA		TOA		SCA	TOA		TOA	
	Mod	Co/No (dB)	EO&C	Co/No (dB)	EO&C	GRP	Co/No (dB)	EO&C	Co/No (dB)	EO&C
		Attin		Attn	Many drop outs.		32.00		0.00	
	CW	30.00		63.75	Without added noise	A	Co/No	Small drop out,	Co/No	NA
		Co/No	Small drop out,	Co/No	Level of impairment		27.74		-4.26	
АТ&Т	1	25,74		59.49	between TOA and POF.		31.00		0.00	
Amati						В	Co/No	Medium drop out.	Co/No	NA
DSB		Attn		Atin	Many drop outs.		26.74		-4.26	
		31.00		63 75	Without added noise		32.00		0.00	
	FM	Co/No	Small drop out	Co/No	Level of impairment	D	Co/No	Small drop out.	Co/No	NA
		26.74		59.49	between TOA and POF.		27.74		-4.26	
	1	Atto	1	Attn		1	0.00		0.00	1
	CW	63.75	Level of impairment	63 75		A	Co/No	NA	Co/No	NA
		Co/No	between TOA and POF	Co/No	NA		-4.09		-4.09	
AT&T		59.66	Closer ro TOA.	59.66			0.00		0.00	
Amati						В	Co/No	NA	Co/No	NA
LSB		Attn		Atin		_	-4.09		-4.09	
		63.75	Level of impairment	63.75			0.00		0.00	
	FM	Co/No	between TOA and POF	Co/No	NA	D	Co/No	NA	Co/No	NA
		59.66	Closer ro TOA.	59.66			-4.09		-4.09	
		Attn	POF level of	Attn			0.00		0.00	
	CW	63 75	imairment.	0.00		A	Co/No	NA	Co/No	NA
		Co/No	High cut, warbles and	Co/No	NA		-7.04		-7.04	
USADR		56.71	occasional mutes	-7.04			0.00		0.00	
FM1						В	Co/No	NA	Co/No	NA
		Atto		Attn			-7.04		-7.04	
		0.00		0.00			0.00		0.00	
	FM	Co/No	NA	Co/No	NA	D	Co/No	NA	Co/No	NA
		-7.04		-7.04		-	-7.04		-7.04	
		Atto		Attn		1	0.00		0.00	
	CW	63.75	No recovered audio.	0.00		A	Co/No	NA	Co/No	NA
	C	Co/No	Beyond a POF level	Co/No	NA		-13.73		-13.73	
USADR		50.02	of impairment.	-13.73			0.00		0.00	
FM2						В	Co/No	NA	Co/No	NA
		Attn	8	Attn			-13.73		-13.73	
		0.00		0.00			0.00		0.00	
	FM	Co/No	NA	Co/No	NA	D	Co/No	NA	Co/No	NA
	1.144	-13.73		-13.73			-13.73		-13.73	
Not	an'	1.000					1,		4	
100	.03.	Tecters	DML,RMc			Medium	Signal Strength=	-62 dBm		
		1031013	. 151110,11110				Signal Strength=			

File Name: M\_SERIES XLS M2 Ter. Obst. Ray,

### EIA Digital Audio Radio Test Laboratory

Fest Signal Stren	M-2 Urban Slow Doppler			Slow Doppler			Urban Slow Doppler				
mpairment	gui		Medium Multipath + Noise	1	Weak Multipath + Noise	FM w/	Ma	Medium ltipath + Noise + SCA		Weak	
		TOA		TOA		SCA	TOA	Tupatit + INDISE + SUA		ltipath + Noise + SCA	
	Mod	Co/No (dB)	EO&C	Co/No (dB)	EO&C	GRP	Co/No (dB)	EO&C	TOA Co/No (dB)	FO&C	
	<b>C</b> 111	Attn	Static Pop and mute.	Attn	Medium duration mute.	1	0.00		0.00	locae	
	CW	63.75	Level of impairment	0.00	Level of impairment	A	Co/No	NA	Co/No	NA	
	4	Co/No	between TOA and POF,	Co/No	between TOA and POF,		-4.26		-4.26		
T&T		59.49	closer to TOA.	-4.26	closer to POF.		0.00		0.00	8	
mati						в	Co/No	NA	Co/No	NA	
OSB		Attn	Flutter and mute.	Attn	Long duration mute.		-4.26		-4,26	NA	
		63.75	Level of impairment	0.00	Level of impairment		0.00	8	0.00		
	FM	Co/No	between TOA and POF,	Co/No	between TOA and POF.		Co/No	NA			
		59.49	closer to TOA.	-4.26	closer to POF.		-4.26	114	Co/No	NA	
		Attn	With no added noise	Attn			0.00	1			
	CW	63.75	recovered audio is	0.00			Co/No	NT 4	0.00		
		Co/No	consistent with POF	Co/No	NA	A		NA	Co/No	NA	
T&T		59.66	at deepest mp fades.	-4.09			-4.09		-4.09		
mati						_	0.00		0.00		
SB		Attn	With no added noise	Atte		B	Co/No	NA	Co/No	NA	
		63 75	recovered audio is	0.00			-4.09				
	FM	Co/No	consistent with POF	Co/No	NA		0.00		0.00		
		59.66	at deepest mp fades.	-4.09	NA	D	Co/No	NA	Co/No	NA	
	_	Attn	at deepost mp lades.			_	-4.09		-4.09		
	cw	0.00		Attn			0.00		0.00		
	0"	Co/No		0.00		A	Co/No		Co/No	1	
SADR		-7.04		Co/No			-7.04		-7.04		
M1		-7,04		-7.04		L	0.00		0.00		
		Attn				B	Co/No		Co/No		
		0.00		Attn			-7.04		-7.04		
	FM	Co/No		0.00			0.00		0.00		
	L'IVI	-7.04		Co/No		D	Co/No		Co/No		
-	-	Attn		-7.04			-7.04		-7.04		
	cw	0.00		Attn			0.00		0.00		
	Cw			0.00		A	Co/No		Co/No		
SADR		Co/No		Co/No			-13.73		-13.73		
M2		-13.73		-13.73			0.00		0.00		
12				-		В	Co/No		Co/No		
		Attn 0.00		Attn			-13.73		-13.73		
	173.6			0.00			0.00		0.00		
	FM	Co/No		Co/No		D	Co/No		Co/No		
Maria		-13.73		-13.73			-13.73		-13.73		
Note	25.	Teet	DM DM				and a second sec				
		l esters:	DML,RMc			Medium Sig	gnal Strength=	-62 dBm			
						Weak Sig	gnal Strength=	-77 dBm			
								(			
File Name	e: M_SERIE	ES XLS M2 Urb.	Slow Dop.		0-14	n	15 11	G. (also p	$ \langle d \rangle \rangle$	D 10	
					NICITIC.	151	1 1 1	VII IGINA A	1 T - (0)	Page 13 o	

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ſest	M-2		Urban Fast Doppler		Urban Fast Doppler			
ignal Stren	gth	Medium	Weak			Medium		Weak
mpairment		Multipath + Noise	Multipath + Noise	FM w/		tipath + Noise + SCA		tipath + Noise + SCA
	Mod	TOA Co/No (dB) EO&C	TOA Co/No (dB) EO&C	SCA GRP	TOA Co/No (dB)	EO&C	TOA Co/No (dB)	EO&C
	CW	Attn 21.00 Co/No	Attn 22.00 Small flutter, Co/No	A	0.00 Co/No -4.26	NA	0.00 Co/No -4.26	NA
T&T mati		16.74	17.74	в		NA	0.00 Co/No	NA
DSB	FM	Atm 22.00 Small flutter, Co/No 17.74	Attn 22.00 Small flutters. Co/No 17.74	D	-4.26 0.00 Co/No -4.26	NA	-4.26 0.00 Co/No -4.26	NA
	cw	Attn 0.00 Co/No	Attn 0:00 Co/No	A	0.00 Co/No -4.09		0.00 Co/No -4.09	
AT&T Amati LSB		-4.09	-4.09	в	0.00 Co/No -4.09		0.00 Co/No -4.09	
	FM	0 00 Co/No -4.09	0.00 Co/No -4.09	D	0.00 Co/No -4.09		0.00 Co/No -4.09	
	cw	Attn 0.90 Co/No	Attin 0.00 Co/No	A	0.00 Co/No -7.04		0.00 Co/No -7.04	
USADR FM1		-7.04	-7.04 Aim	В	0.00 Co/No -7.04		0.00 Co/No -7.04	
	FM	0.00 Co/No -7.04	0.00 Co/No -7.04	D	0.00 Co/No -7.04		0.00 Co/No -7.04	
	cw	Atta 0.00 Co/No	Attn 0.00 Co/No	A	0.00 Co/No -13.73		0.00 Co/No -13.73	
USADR FM2		-13.73	-13.73 Aun	В	0.00 Co/No -13.73		0.00 Co/No -13.73	
	FM	0.00 Co/No	0.00 Co/No -13.73	D	0.00 Co/No -13.73		0.00 Co/No -13.73	
No	tes:	-13.73 Testers: DML,RMc	-13.73		-13.73 Signal Strength= Signal Strength=		-13.73	

File Name: M\_SERIES.XLS M2 Urb. Fast Dop.

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## EIA Digital Audio Radio Test Laboratory

Fest	M-2		Rura	al Fast Doppler			Rural Fast Doppler			
Signal Stren Impairment		Mult	Medium ipath + Noise		Weak Multipath + Noise	FM w/	Mul	Medium tipath + Noise + SCA		Weak tipath + Noise + SCA
	Mod	TOA Co/No (dB) EO	&C	TOA Co/No (dB)		SCA GRP	TOA	EO&C	TOA Co/No (dB)	
AT&T	CW	Attn 18.00 Sm Co/No flut 13.74	all drop out and ter.	Attn 18.00 Co/No 13.74	Small drop out.	A	0.00 Co/No -4.26 0.00	NA	0.00 Co/No -4.26	NA
Amati DSB			all flutter.		Small flutter.	В	Co/No -4.26 0.00	NA	0.00 Co/No -4.26 0.00	NA
	FM	Co/No 14.74		Co/No 13.74		D	Co/No -4.26	NA	Co/No -4.26	NA
AT&T	CW	Attn 0.00 Co/No		Attn 0 00 Co/No		A	0.00 Co/No -4,09		0.00 Co/No -4.09	
Amati LSB		-4.09		Attn		В	0.00 Co/No -4.09		0.00 Co/No -4.09	
	FM	Co/No -4.09		0.00 Co/No -4.09		D	0.00 Co/No -4.09		0.90 Co/No -4.09	
USADR	cw	Attn 0.00 Co/No		Attn 0.00 Co/No		A	0:00 Co/No -7.04		0.00 Co/No -7.04	
FM1		-7.04 Attn 0.00		-7.04 Attn 0.00		В	0.00 Co/No -7.04		0.00 Co/No -7.04	
	FM	Co/No -7.04 Attn		Co/No -7.04 Attn		D	0.00 Co/No -7.04		0.00 Co/No -7.04	
JSADR	CW	0.00 Co/No -13.73		0.00 Co/No -13,73		A	6:00 Co/No -13.73		0.00 Co/No -13.73	
FM2		Attn 0.00		Attin 0.00		В	0.00 Co/No -13.73		0.00 Co/No -13.73	
	FM	Co/No -13.73		Co/No -13.73		D	0.00 Co/No -13.73		0.00 Co/No -13.73	
Not	es:	Testers: DMI	L,RMc				gnal Strength= gnal Strength=	-62 dBm -77 dBm		

est	M-2	Terrai	n Obstructed Doppler		Terrain Obstructed Doppler			
ignal Streng		Medium	Weak		Medium	Weak		
mpairment		Multipath + Noise	Multipath + Noise	FM w/	Multipath + Noise + SCA	Multipath + Noise + SCA		
		TOA	TOA	SCA	TOA	TOA		
	Mod	Co/No (dB) EO&C	Co/No (dB) EO&C	GRP	Co/No (dB) EO&C	Co/No (dB) EO&C		
		Attn	Altn		0.00	0.00		
	CW	25 00 Small drop out.	24.00 Small drop out.	A	Co/No NA	Co/No NA		
		Co/No	Co/No		-4.26	-4.26		
T&T		20.74	19.74		0.00	0.00		
Amati				В	Co/No NA	Co/No NA		
DSB		Attn	Aun		-4.26	-4.26		
		24.00 Small drop out,	24.00 Small flutter.		0.00	0.00		
	FM	Co/No	Co/No	D	Co/No NA	Co/No NA		
		19.74	19.74		-4.26	-4.26		
		Aitn	Atin		0.00	0.00		
	CW	0.00	0.00	A	Co/No	Co/No		
		Co/No	Co/No		-4.09	-4.09		
AT&T		-4.09	-4.09	в	Co/No	Co/No		
Amati			Attn		-4.09	-4.09		
LSB		Aun 0.00	0,00		0.00	0.00		
	FM	Co/No	Co/No	D	Co/No	Co/No		
	FINI	-4.09	-4.09	l v	-4.09	-4.09		
	_	Attn	Attn		0.00	0.00		
	CW	0.00	0.00	A	Co/No	Co/No		
		Co/No	Co/No		-7.04	-7.04		
USADR		-7.04	-7.04		0.00	0.00		
FM1				В	Co/No	Co/No		
		Aitn	Atm		-7.04	-7.04		
		0.00	0.00		0.00	0.00		
	FM	Co/No	Co/No	D	Co/No	Co/No		
		-7.04	-7.04		-7.04	-7.04		
		Aun	Atm		0.00	0.00		
	CW	0.00	0.00	A	Co/No	Co/No		
		Co/No	Co/No		-13.73	-13.73		
USADR		-13.73	-13.73		0.00	0.00		
F <b>M2</b>				В	Co/No	Co/No		
		Attn	Atin		-13.73	-13.73		
	1	0.00	0.00		0.00			
	FM	Co/No	Co/No 13.17	D	Co/No -13.73	Co/No -13.73		
		-13.73			-13,73	-13.73		
Note	es:	Tester DM DM	I	Medium	Signal Strength= -62 dBm			
		Testers: DML,RMc			Signal Strength= -77 dBm			
				vy cak 2	Signal Strength// UDIN			

File Name: M\_SERIES XLS M2 Ter. Obst. Dop.

# **APPENDIX AS**

Test O

EIA Digital Audio L .o Test Laboratory

DISTRIBUTED AT 111/1/95 MTG. J. (DAR WONKING GRAVE B)

Test: O

### DAR -> Analog Subcarrier Interference, Part F Date: 8/11/95 Index Description Page I Cover sheet (F1)2 DAR -> Analog subcarrier interference with the Digital Proponent on the desired frequency (Co-channel). (F2)DAR -> Analog subcarrier interference with the Digital Proponent on the lower first adjacent channel. 3 (F3)DAR -> Analog subcarrier interference with the Digital Proponent on the lower second adjacent channel. 4 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.

EIA Digital Audio K. ...o Test Laboratory

-quadesized signal (IBOC) level varied to establish target S/N ratio

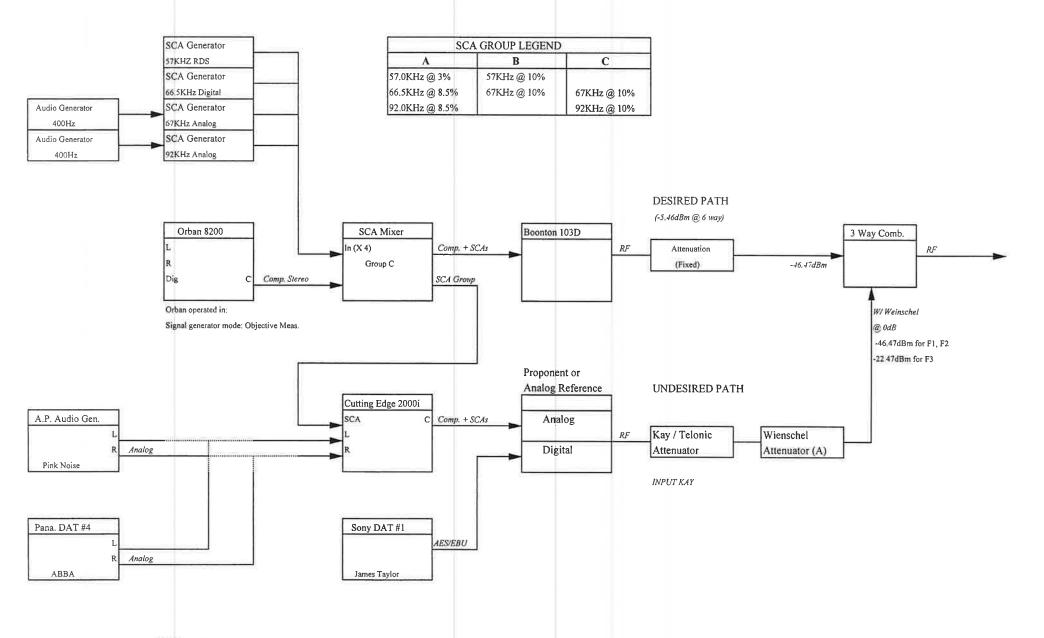
	DML/RMc						
RECEIVER: DELCO	SCA GROUP	Analog Ref. D / U	F1 D/U @ Eq. S/N	67KHz F S/N/ RATIO dB	THD %	92KHz F S/N/ RATIO dB	Receiver THD %
DESIRED TRANSMITTER ONLY	С	NA	NA	40.00	1.47	48.50	2.44
INTERFERERS							
ANALOG TRANSMITTER	С	36.00		38.80	1,58	45.60	2,48
AT&T	С	36,00		39.50	1,55	39.80	2.63
			36.00	39.50	1.55	39,80	2.63
AT&T / Amati DSB	С	36.00		38.75	1.58	45.50	2.48
			36.75	39.00	1.55	46.00	2,45
JSADR FM1	с	36.00		39.80	1.48	48.40	2.45
			35.50	39.70	1.48	48.30	2.46
<ul> <li>SCA S/N ratio measureme</li> </ul>	) 0dB reference with 400Hz aud nts are RMS unweighted nodulation: 110% with SCAs ation: 110% with SCAs			) Group C SCAs		<u> </u>	

				67KHz F	Receiver	92KHz H	Receiver
RECEIVER: DELCO	SCA GROUP	Analog Ref. D / U	F2 D/U @ Eq. S/N	S/N/ RATIO dB	THD %	S/N/ RATIO dB	THD %
DESIRED TRANSMITTER ONLY	С	NA	NA	40.00	1.47	48,50	2.45
INTERFERERS							
ANALOG TRANSMITTER	С	4.00	NA	36.00	2.00	26.60	5.50
AT&T	с	4.00		40.00	1.50	15.00	22,00
			6.75	40.00	1.50	19,00	11,50
AT&T / Amati DSB	С	4.00		30.00	10.00	25.00	5.90
			18.50	39.50	1.50	39.00	2,65
USADR FM1	С	4.00		32.00	8.00	25.00	6.60
5			16.00	39.50	1.58	36,50	2,90
NOTES: * S/N Ratio (Auto Radio cros	s check only) 0dB Reference w	ith 1KHz audio @ 81% mod	lulation (pilot @ 9%)	Group C SCAs			
* S/N Ratio (SCA Receivers)	0dB reference with 400Hz aud ts are RMS unweighted						

.

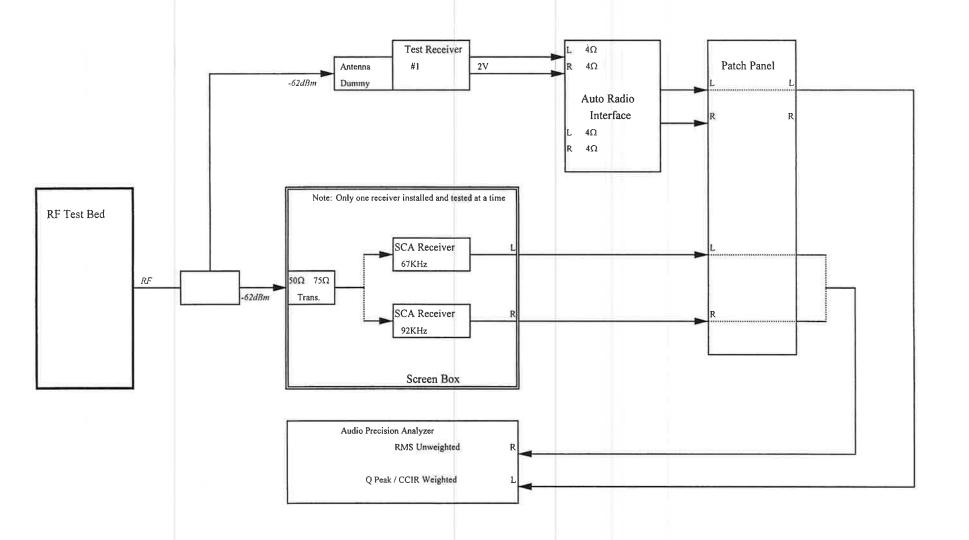
				1	67KHz R	eceiver	92KHz R	leceiver
Receiver : DELCO	SCA GROUP	A	nalog Ref. D/U	F3 D/U @ Eq. S/N	S/N/ RATIO dB	THD %	S/N/ RATIO dB	THD %
DESIRED TRANSMITTER	с		NA	NA	40.00	1.47	48.50	2.45
INTERFERERS								
ANALOG TRANSMITTER	С		-24.00		41.00	1,45	28,00	5.00
AT&T	с		-24.00					
				-24.00	33.70	4.50	26.00	6.00
AT&T / Amati DSB	С		-24.00					
	_			-24.00	11.00	45.00	7.00	85.00
JSADR FM1	С		-24.00					
				-24.00	8.00	55.00	7.00	90.00
NOTES: * S/N Ratio (Auto Radio cros * S/N Ratio (SCA Receivers)					Group C SCAs			
<ul> <li>* S/N Ratio (SCA Receivers)</li> <li>* SCA S/N ratio measurement</li> </ul>		udio at 10KHz de	viation (Basel	band)				

EIA Digital Audio Lio Test Laboratory



File Name:F\_SCA1.XLS F&G (SCA) Trans Block

EIA Digital Audio K io Test Laboratory



### **NRSC Document Improvement Proposal**

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

National Radio Systems Committee c/o Consumer Electronics Association Technology & Standards Department 1919 S. Eads St. Arlington, VA 22202 FAX: 703-907-4190

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a. Clause Number and/or Drawing:	
b. Recommended Changes:	
c. Reason/Rationale for Recommendation	on:
ADDITIONAL REMARKS:	
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Co-chairmen:	
Date forwarded to co-chairmen:	



