

FCC Type Acceptance Application

Submitted By: Pyramid Communications
15182 Triton Lane #102
Huntington Beach, CA 92649
Mahesh Kiwalkar, RF Engineer

Prepared: March 10, 2006

Pyramid Model #: SVR-200

Transmitter Type: LRUSVR-200LA

Test Site: 15182 Triton Lane #102
Huntington Beach, CA 92649

Timco Engineering Inc.
849 NW State Road 45
Newberry FL 32669

Prepared in accordance with the requirements of
FCC Rules and Regulations Part 2, Subpart F,
Paragraphs 2.983 through 2.999 and applicable
Portions of parts 22 and 90

Form References

1. Name of Applicant

Pyramid Communications
15182 Triton Lane #102
Huntington Beach, CA 92649 [Form 731 section 1]
Applicant is a vendor.

2. Identification of equipment

LRUSVR-200LA [Form 731 Section 1]
Low Band Transceiver [Form 731 (7) (a)]

3. Production Planned

Normal mass production, 500pcs/lot

4. Technical Description
 - (a) Types of emission

20K0F3E

 - (b) Frequency range

29-40 MHz [Form 731 (10) (a)]
36-50 MHz

 - (c) Range of operation power

100mW – 2W continuously variable [Form 731(10)(b)]

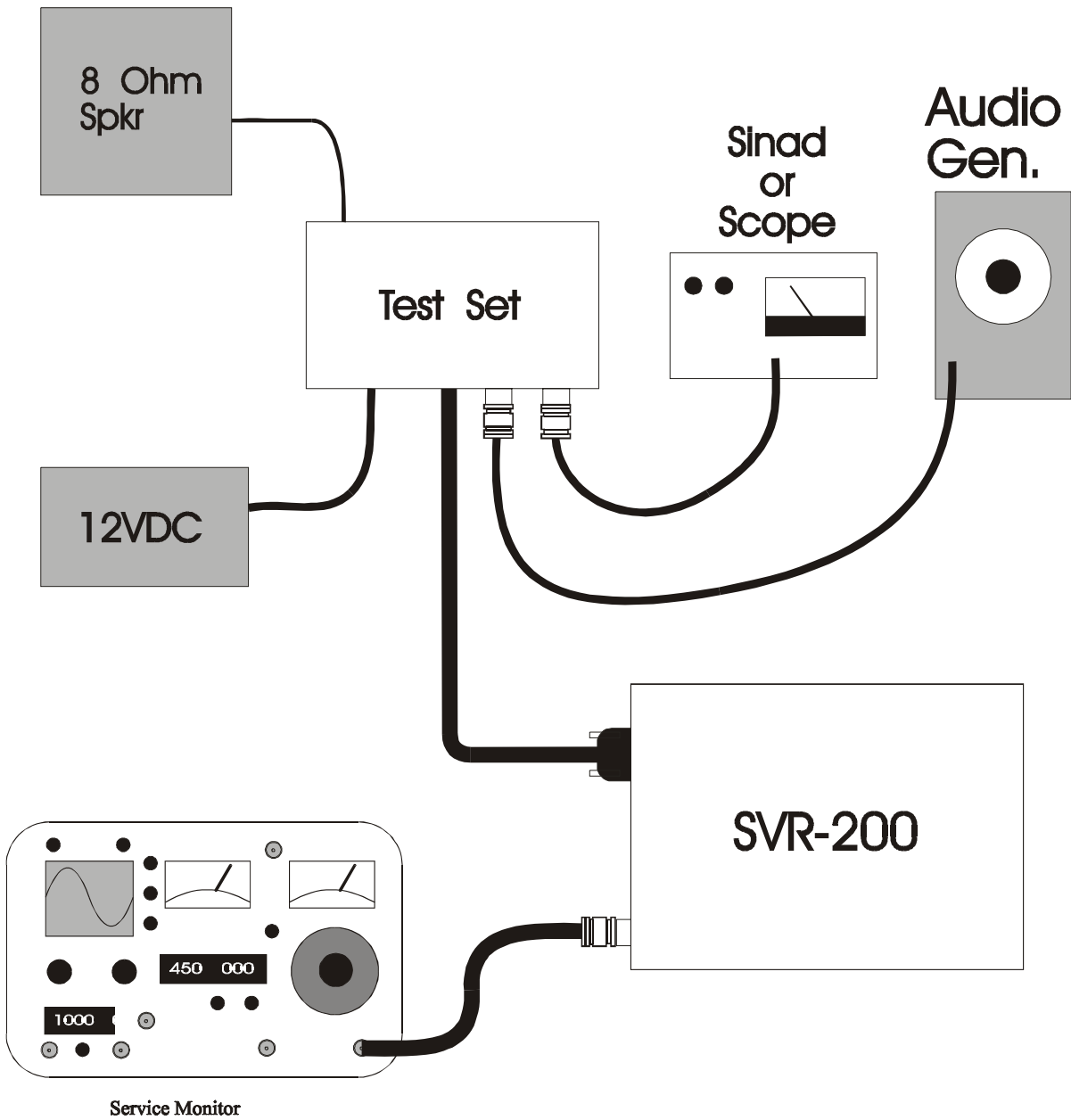
 - (d) Maximum power

2W

 - (e) DC voltage and current to final RF amplifier

9.0 VDC @ 1A

SVR Test set



Knob on the front of the test set needs to be switched on and it then controls the volume of the audio when a speaker is connected to the test set.
Enable is switched to ON position to turn on the SVR.
When COR is switched to ON position, SVR goes into Transmit mode.

Page: E7
Exhibit F

LRUSVR-200LA
Subpart 2.985

RF Power Output/Frequency

Minimum Standard

Power: 2W

Frequency Tolerance: ± 20 ppm maximum

Measurements

Frequency (MHz)	Power (mW)	Error (ppm)
30.1	2.00	+0.99
40.1	2.00	+0.75
50.1	2.00	+1.4

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Modulation Characteristics

Frequency response of the audio modulating circuits. The SVR-200 is designed to interface to a variety of mobile radios; the receiver audio that is available may or may not be de-emphasized. Therefore PC programming provides for flat audio response, or +6db/octave pre-emphasis; both responses were measured and plotted.

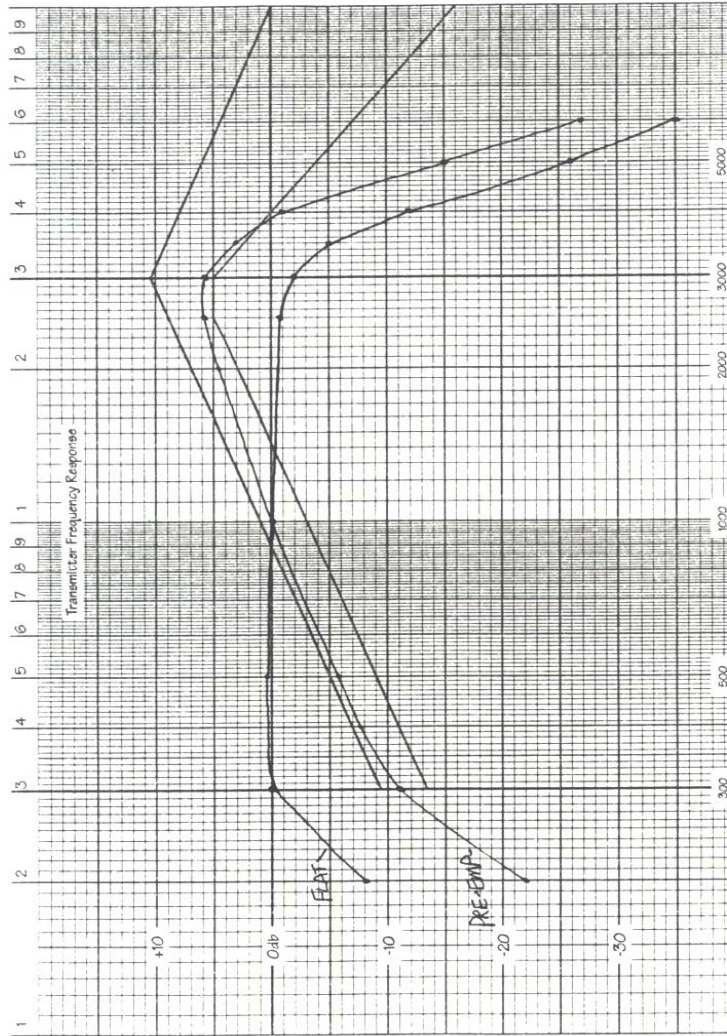
Frequency	Flat	+6db/octave pre-emphasis
200	-8	-22
300	0	-11
400	+0.3	-7.5
500	+0.5	-6
1000	0	0
1500	-0.25	+2.5
2000	-0.5	+4.5
2500	-0.75	+6
3000	-1.75	+6
3500	-5	+3
4000	-12	-1
4500	-20	-9
5000	-26	-15

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Transmit Audio Response

Page: F2



LRU-SVR200M
Exhibit F

Subpart 2.9878 (a)(1)

Transmit Audio Response

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Audio Low pass Filter Response

Frequency	Response
1000	0 db
2000	-0.46
3000	-2.6
4000	-10.3
5000	-26.7
6000	-45.6
7000	-52.7
8000	-52.7 {Noise Floor}
9000	-52.7
10000	-52.7
12000	-52.7
14000	-52.7
16000	-52.7
18000	-52.7
20000	-52.7

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**Modulation Characteristics
Limiter Response
5kHz Maximum Deviation**

30.1 MHz

Input Level	300 Hz	1.0kHz	2.5 kHz
0dB	1.60	1.60	1.60
2	2.01	2.08	2.00
4	2.52	2.60	2.60
6	3.04	3.25	2.84
8	3.76	3.88	3.06
10	4.55	3.97	3.10
12	4.60	4.02	3.16
14	4.62	4.10	3.20
16	4.71	4.15	3.22
18	4.72	4.12	3.24
20	4.75	4.20	3.24
22	4.76	4.20	3.26
24	4.75	4.20	3.26
26	4.75	4.20	3.25
28	4.75	4.20	3.26
30	4.75	4.20	3.26

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**Modulation Characteristics
Limiter Response
5kHz Maximum Deviation**

40.1 MHz

Input Level	300 Hz	1.0kHz	2.5 kHz
0dB	1.60	1.60	1.60
2	2.03	2.04	2.07
4	2.53	2.60	2.60
6	3.16	3.30	2.97
8	3.93	3.84	3.14
10	4.52	3.99	3.25
12	4.61	4.03	3.31
14	4.65	4.11	3.34
16	4.67	4.17	3.35
18	4.68	4.17	3.40
20	4.68	4.20	3.41
22	4.71	4.24	3.41
24	4.76	4.25	3.38
26	4.76	4.28	3.42
28	4.76	4.33	3.36
30	4.77	4.33	3.4

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**Modulation Characteristics
Limiter Response
5kHz Maximum Deviation**

50.1 MHz

Input Level	300 Hz	1.0kHz	2.5 kHz
0dB	1.60	1.60	1.60
2	2.18	2.08	2.07
4	2.83	2.52	2.64
6	3.47	3.40	3.03
8	4.07	3.72	3.10
10	4.31	3.89	3.18
12	4.45	4.03	3.21
14	4.53	4.12	3.24
16	4.58	4.16	3.28
18	4.63	4.20	3.3
20	4.68	4.20	3.34
22	4.69	4.24	3.32
24	4.69	4.25	3.31
26	4.66	4.25	3.33
28	4.65	4.26	3.42
30	4.69	4.23	3.44

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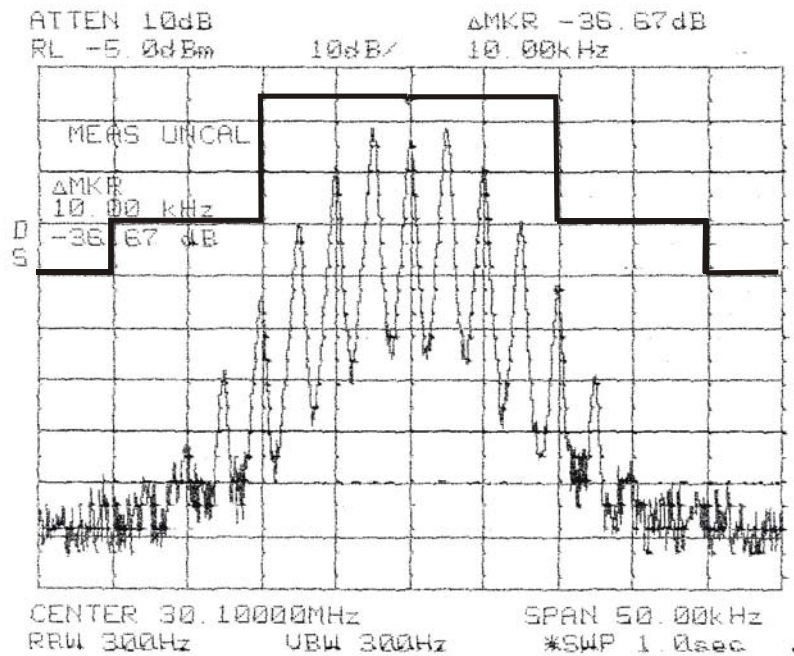


Occupied Bandwidth
20 kHz Channel Spacing

30.1 MHz

Emission 20K0F3E

The SVR-200 transmits voice and single tone frequencies in the 300-3000 bandwidth; emissions are amplitude limited and band limited by high pass and low pass filters per the previous sections. The following plot was made with a 2.5 kHz tone at 16db above 50% level for 1kHz (per EIA-152C).



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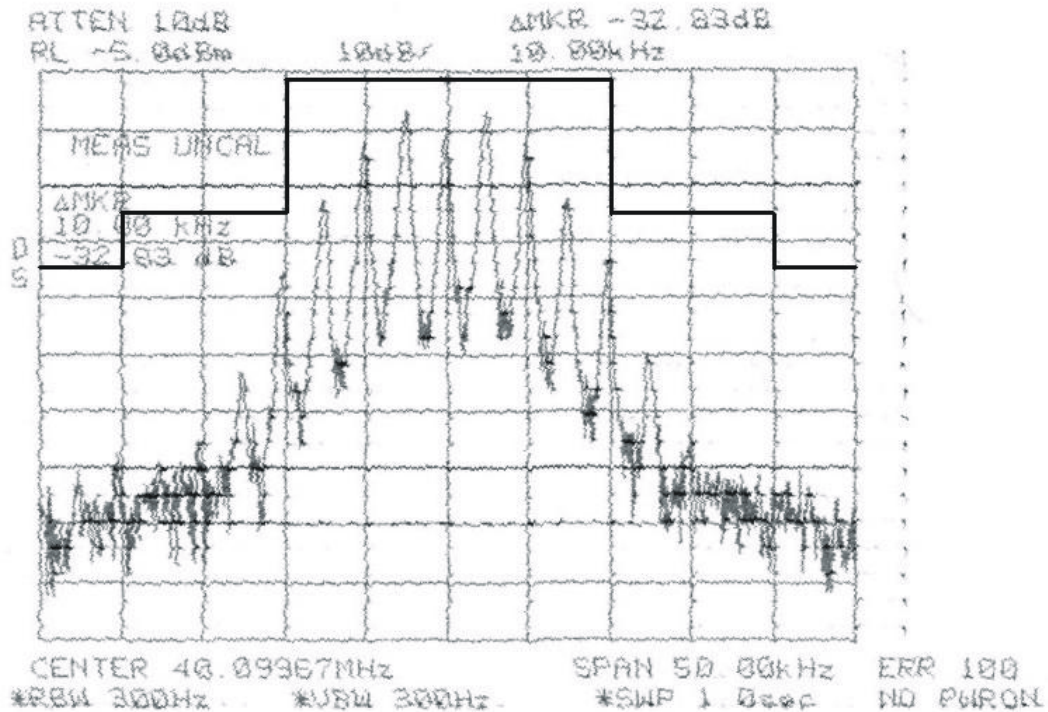
M. K. Walker

Occupied Bandwidth
20 kHz Channel Spacing

40.1 MHz

Emission 20K0F3E

The SVR-200 transmits voice and single tone frequencies in the 300-3000 bandwidth; emissions are amplitude limited and band limited by high pass and low pass filters per the previous sections. The following plot was made with a 2.5 kHz tone at 16db above 50% level for 1kHz (per EIA-152C).



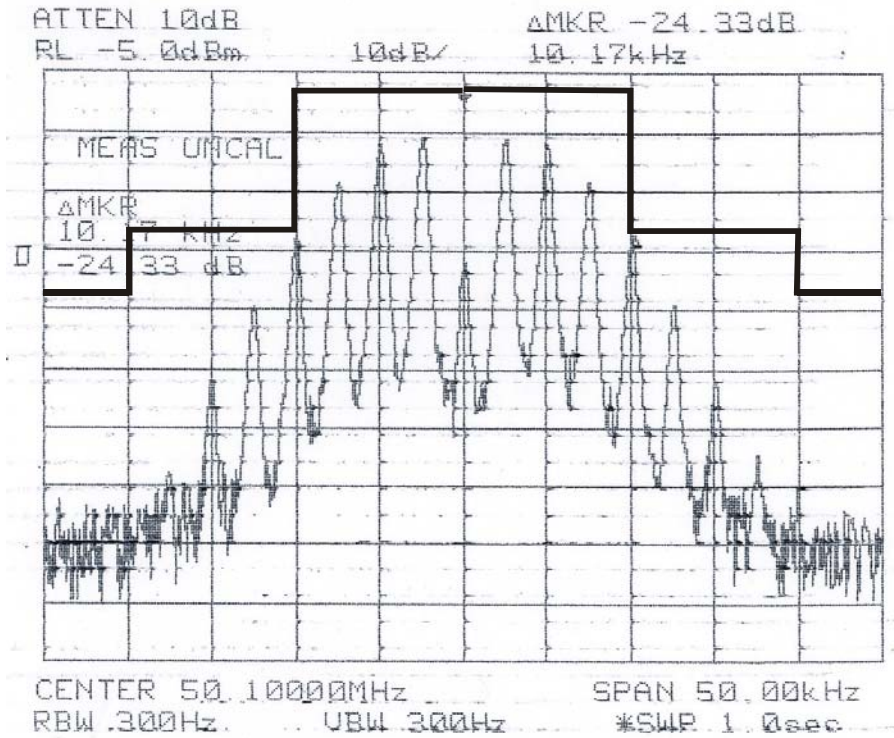
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Occupied Bandwidth
20kHz Channel Spacing
50.1 MHz

Emission 20K0F3E

The SVR-200 transmits voice and single tone frequencies in the 300-3000 bandwidth; emissions are amplitude limited and band limited by high pass and low pass filters per the previous sections. The following plot was made with a 2.5 kHz tone at 16db above 50% level for 1kHz (per EIA-152C).



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Spurious emission at the antenna terminal at 2W

Minimum Standard

-46dbc

Measurements

Power 2W

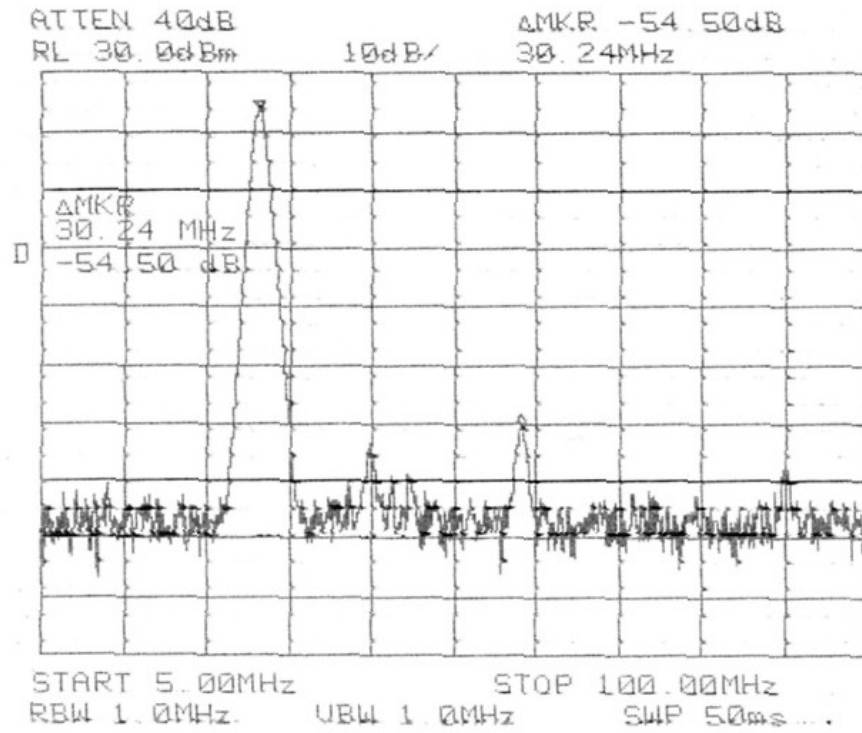
Frequency	Level
30.1	0 dB
60.2	- 54.50 dbc
40.1	0 dB
80.2	- 54.84 dbc
50.1	0 dB
100.2	-52dbc

All other spurious signals were at least 20dB below the FCC limit.
Frequency spectrum was investigated out to the 10th harmonic

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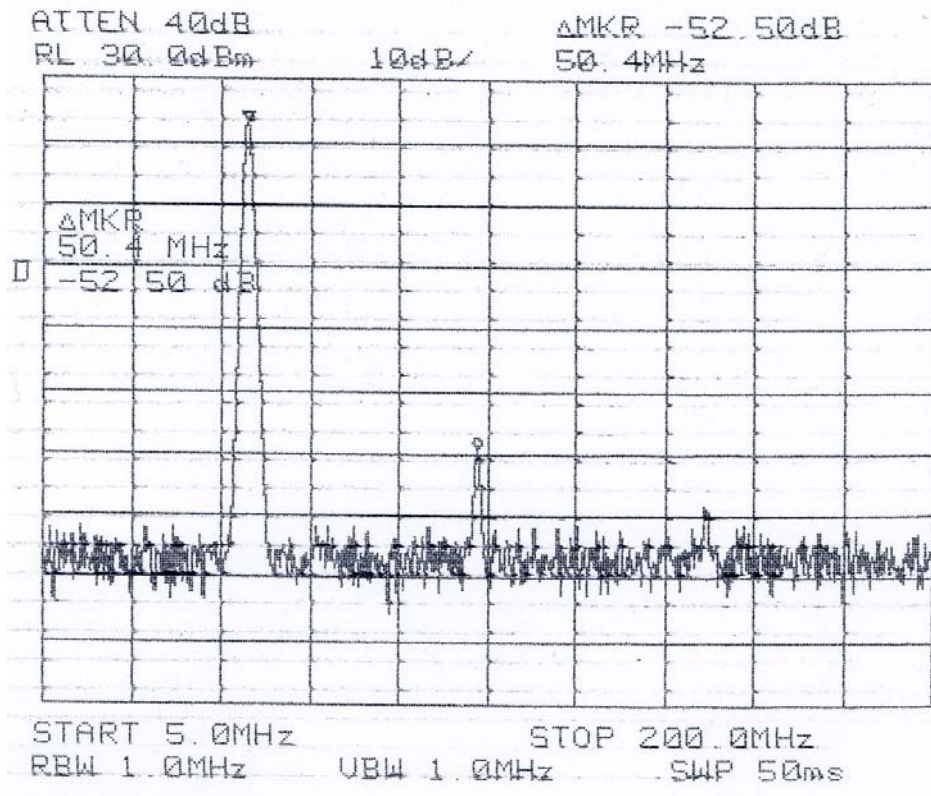
30.1 MHz



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50.1 MHz



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Minimum Standard

± 20 ppm (±600Hz)

(a) Frequency stability over Temperature

30.1 MHz

Temp (°C)	Frequency	Error
-30	30.10007	+1.74
-20	30.10007	+1.74
-10	30.10006	+1.99
0	30.10005	+1.49
+10	30.10004	+1.33
+20	30.10004	+1.33
+30	30.10004	+1.33
+40	30.10006	+1.99
+50	30.10006	+1.99
+60	30.10002	+0.66

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Minimum Standard

± 20 ppm (±800 Hz)

(b) Frequency stability over Temperature

40.1 MHz

Temp (°C)	Frequency	Error
-30	40.10006	+1.49
-20	40.10008	+1.99
-10	40.10007	+1.74
0	40.10006	+1.49
+10	40.10004	+0.99
+20	40.10003	+0.75
+30	40.10003	+0.75
+40	40.10003	+0.75
+50	40.10003	+0.75
+60	40.10004	+0.99

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Minimum Standard

± 20 ppm (±1000 Hz)

(c) Frequency stability over Temperature

50.1 MHz

Temp (°C)	Frequency	Error
-30	50.10038	+7.58
-20	50.10028	+5.58
-10	50.10012	+2.39
0	50.10004	+0.80
+10	50.09996	-0.80
+20	50.09993	-1.39
+30	50.09993	-1.39
+40	50.09993	-1.39
+50	50.09991	-1.79
+60	50.09989	-2.19

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Minimum Standard

± 20 ppm

(a) Frequency stability with variation in primary supply voltage

30.1 MHz

Voltage	% Standard	Frequency	Error (ppm)
11.56	-15 %	30.10002	0.66
12.24	-10 %	30.10003	0.99
12.92	-5 %	30.10003	0.99
13.6	0 %	30.10003	0.99
14.28	5 %	30.10000	0.00
14.96	10 %	30.10001	0.33
15.64	15 %	30.09998	0.66

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Minimum Standard

± 20 ppm

(b) Frequency stability with variation in primary supply voltage

40.1 MHz

Voltage	% Standard	Frequency	Error (ppm)
11.56	-15 %	40.10004	+0.997
12.24	-10 %	40.10004	+0.997
12.92	-5 %	40.10004	+0.997
13.6	0 %	40.10004	+0.997
14.28	5 %	40.10004	+0.997
14.96	10 %	40.10004	+0.997
15.64	15 %	40.10004	+0.997

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Minimum Standard

± 20 ppm

(c) Frequency stability with variation in primary supply voltage

50.1 MHz

Voltage	% Standard	Frequency	%Error
11.56	-15 %	50.10001	+0.20
12.24	-10 %	50.10002	+0.40
12.92	-5 %	50.10003	+0.60
13.6	0 %	50.10007	+1.40
14.28	5 %	50.10006	+1.20
14.96	10 %	50.10005	+1.00
15.64	15 %	50.10004	+0.80

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Receiver conducted Spurious at antenna port:

Minimum Standard

2nW

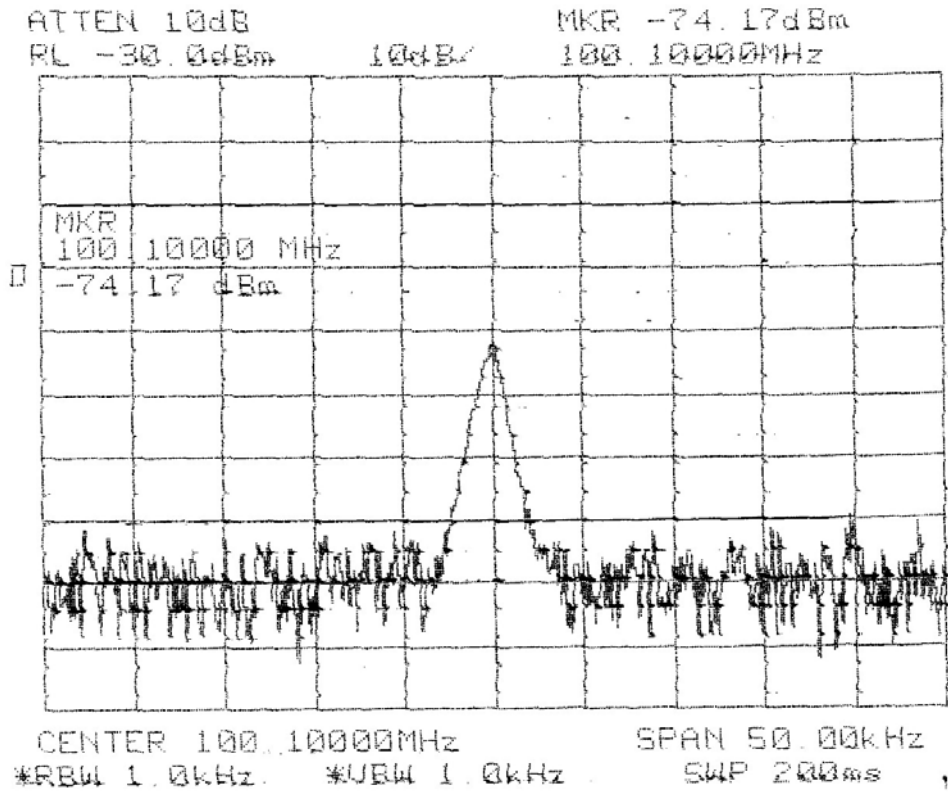
-57 dBm

Frequency	Rx spur (nW)	Rx spur (dBm)
30.1	0.039	-74
40.1	0.199	-67
50.1	0.050	-73

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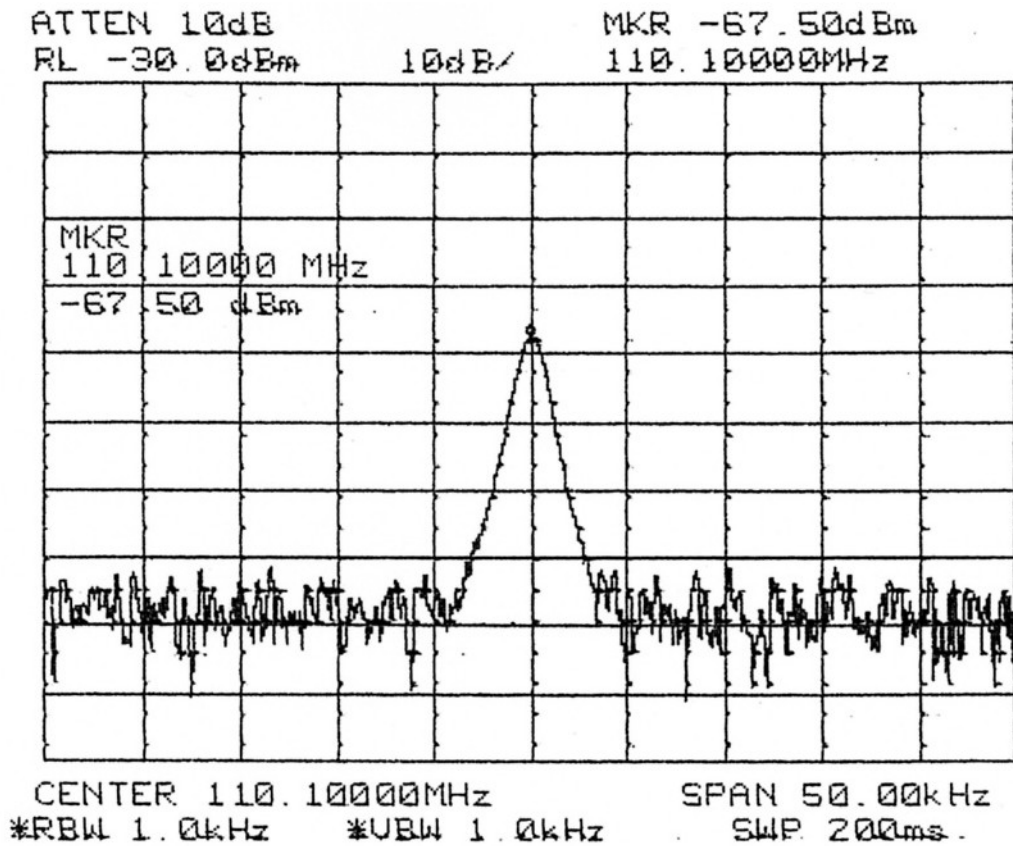
30.1 MHz +70 MHz High Side Injection



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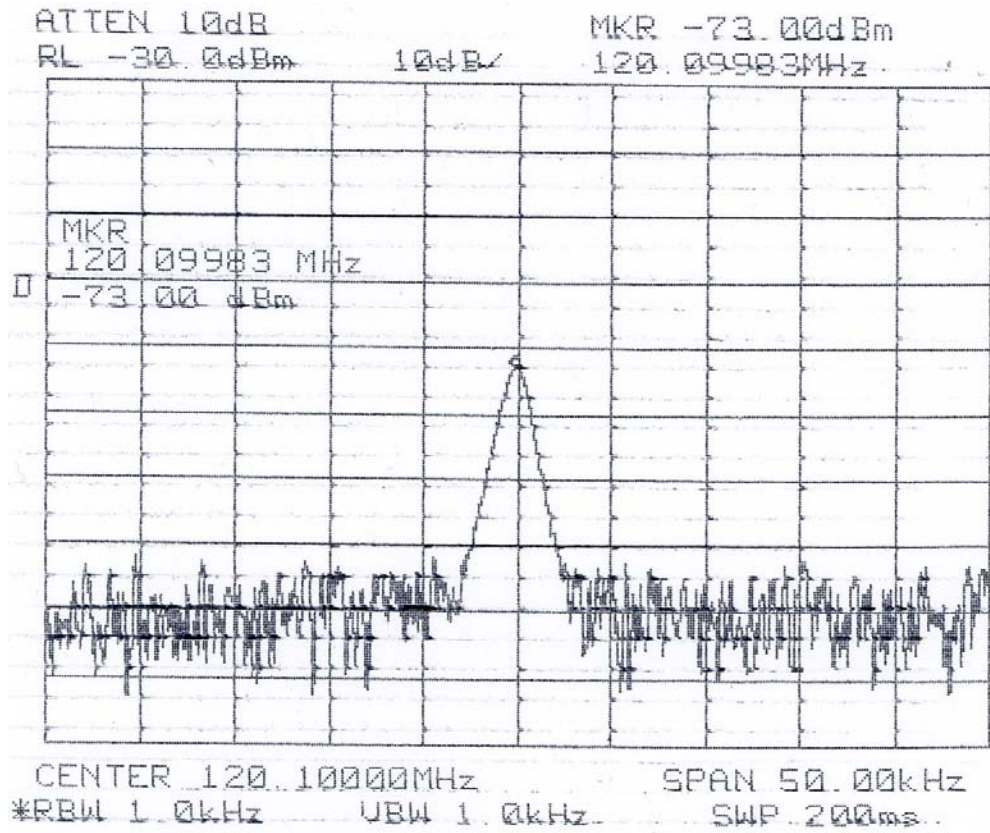
40.1 MHz + 70 MHz High Side Injection



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50.1 MHz + 70 MHz High Side Injection



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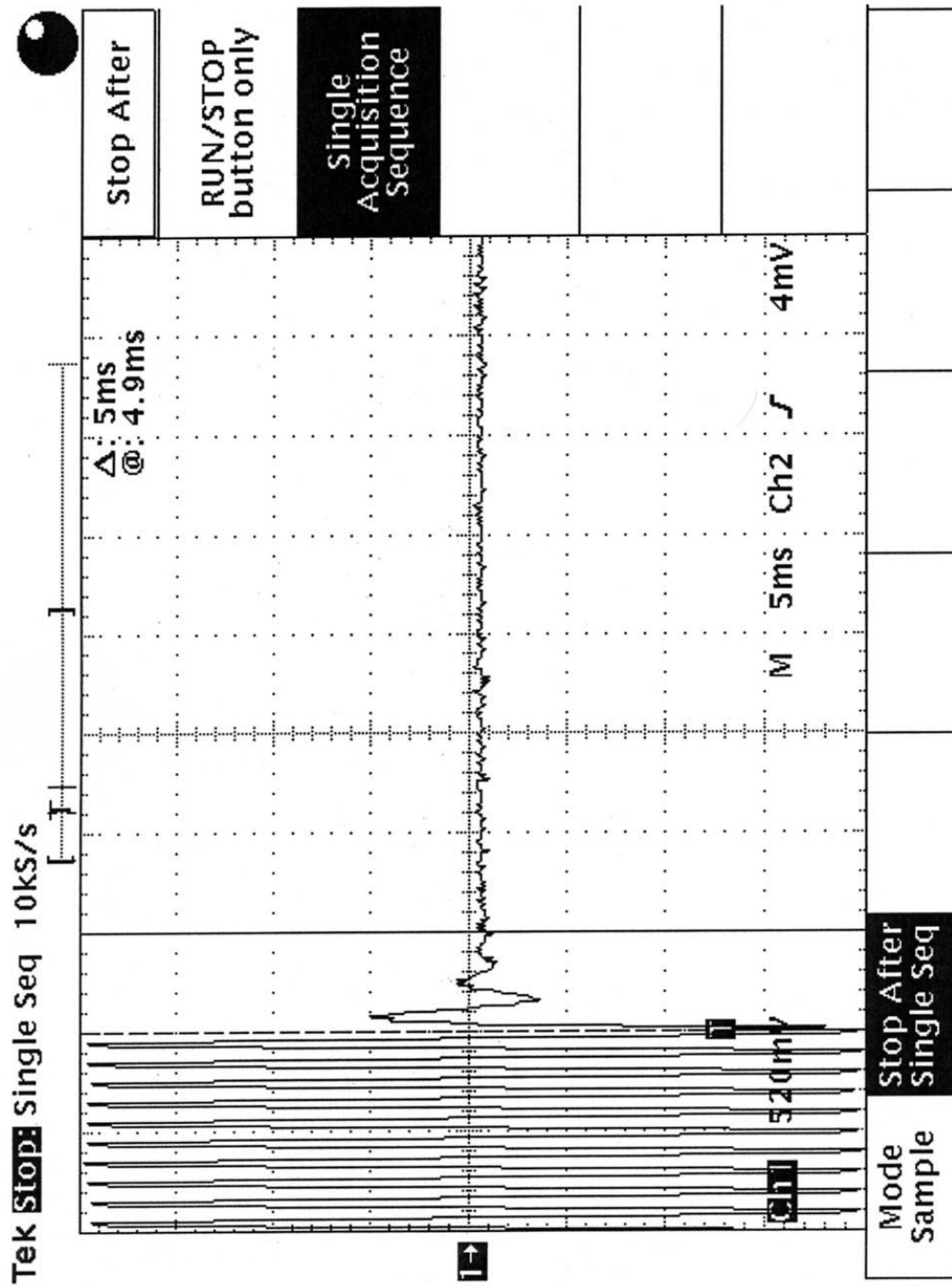
Transient Frequency Behavior

Minimum Standard	20K0F3E	
T1	5mS	±25 kHz
T2	20mS	±12.5 kHz
T3	5 mS	±25 kHz

Transient Frequency Response

T1	5 mS	+10 kHz
T2	10 mS	within FCC limits per Part 90.214
T3	700 uS	within ±12.5 kHz

Transient Frequency Behavior

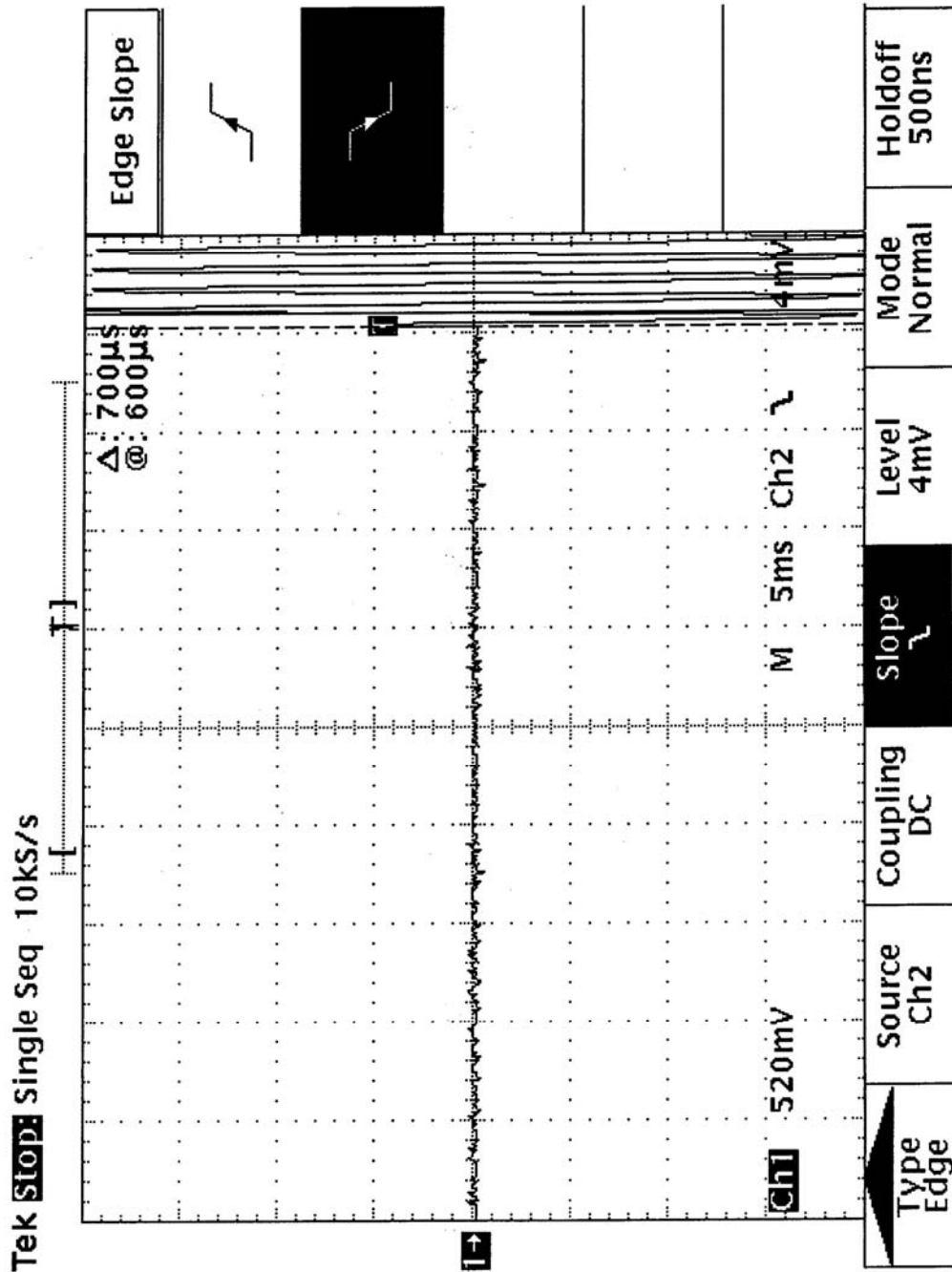


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LRUSVR-200LA
Subpart 90.214

Transient Frequency Behavior



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A handwritten signature in black ink, appearing to read "M. K. Inwalkar", written over a horizontal line.

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LRUSVR-200LA