Application for Certification
For an RF Transmitter for use with R/C Model Surface Craft

Novak Electronics Inc.
18910 Teller Avenue
Irvine, CA 92612

RF Transmitter:

Part # M8FCC

FCC ID: I6XTX001

REPORT # RV38044

This report was prepared in accordance with the requirements of the FCC Rules and Regulations Part 2, Subpart J, 2.1031 through 2.1057, and Part 95 and other applicable sections of the rules as indicated herein.

Prepared By:

Dana Grove

DNB Engineering, Inc.
5969 Robinson Avenue
Riverside, CA 92503

11 Nov 2002

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1.0 ADMINISTRATIVE DATA

1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, Part 95. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The same test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same Interconnecting Cables arranged in identical placement to that in the test set-up, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.
All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.

C. L. Payne III (Para. 1.1)
Manager, Riverside Facility.
DNB Engineering, Inc.
Tel. (909) 637-2630 FAX (909) 637-2704

2.1033 (c) (1) Application for Certification

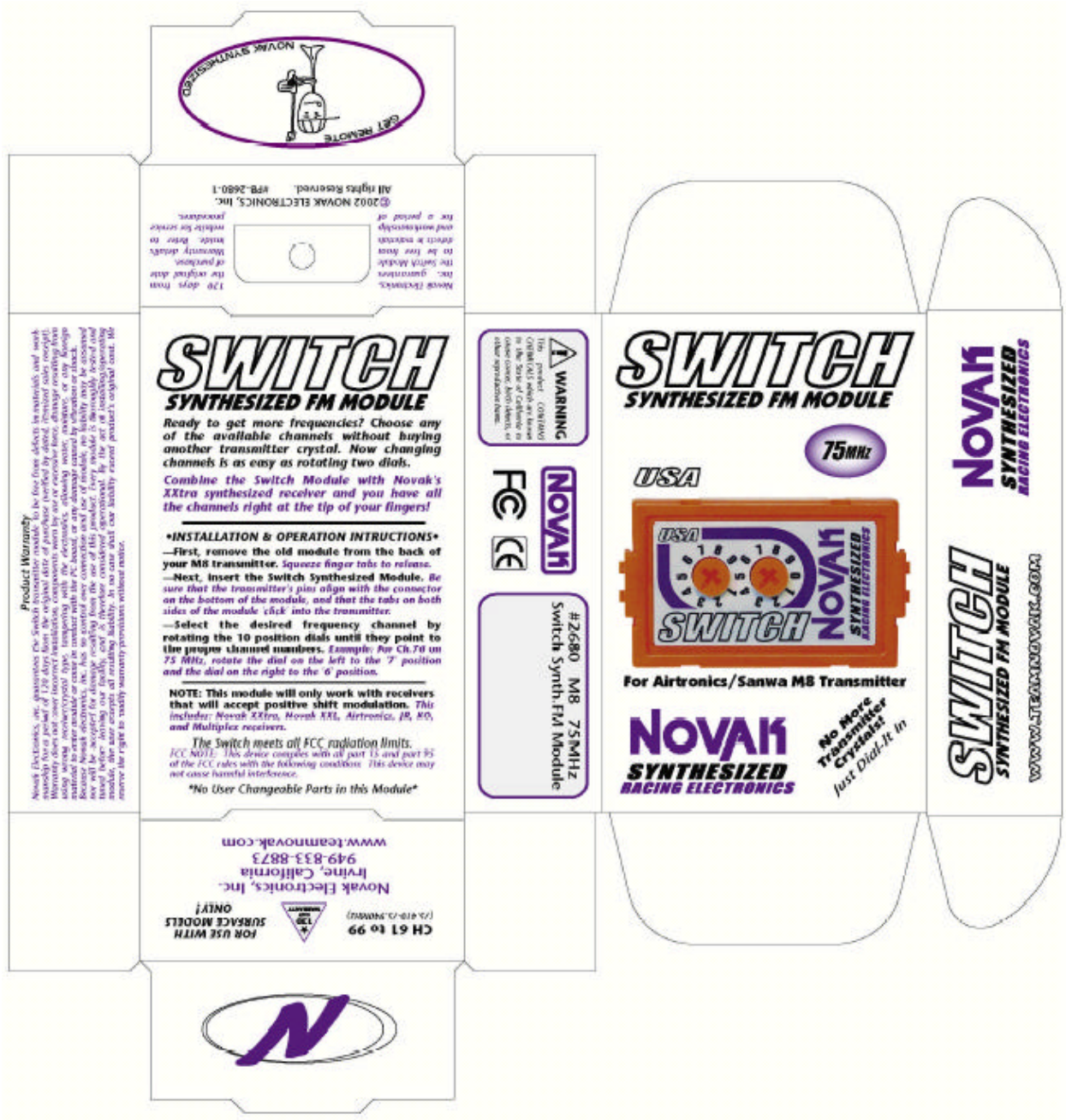
Name of Applicant:		Novak Electronics Inc. 18910 Teller Avenue Irvine, CA 92612
Applicant is:	X	Manufacturer Vendor Licensee Prospective Licensee Other
Name of Manufacturer		Novak Electronics Inc.
Description:		RF Transmitter
Part Number:		M8FCC
Anticipated Production Quantity:		Multiple Units

2.1033 (c) (2) FCC Identifier

FCC ID:	I6XTX001

2.1033 (c) (3) Installation and Operating Instructions

Complete information to the user is located on the product carton as depicted below.



2.1033 (c) (4) Type of Emissions

CW

2.1033 (c) (5) Frequency Range

75.410 to 75.990 MHz in 20KHz steps

2.1033 (c) (6) Operating Power

100 mW

2.1033 (c) (7) Maximum Power Allowed in Applicable Part(s) of the Rules

RULES PART	MAXIMUM POWER (WATTS)
Part 95.639 b 3	750mW

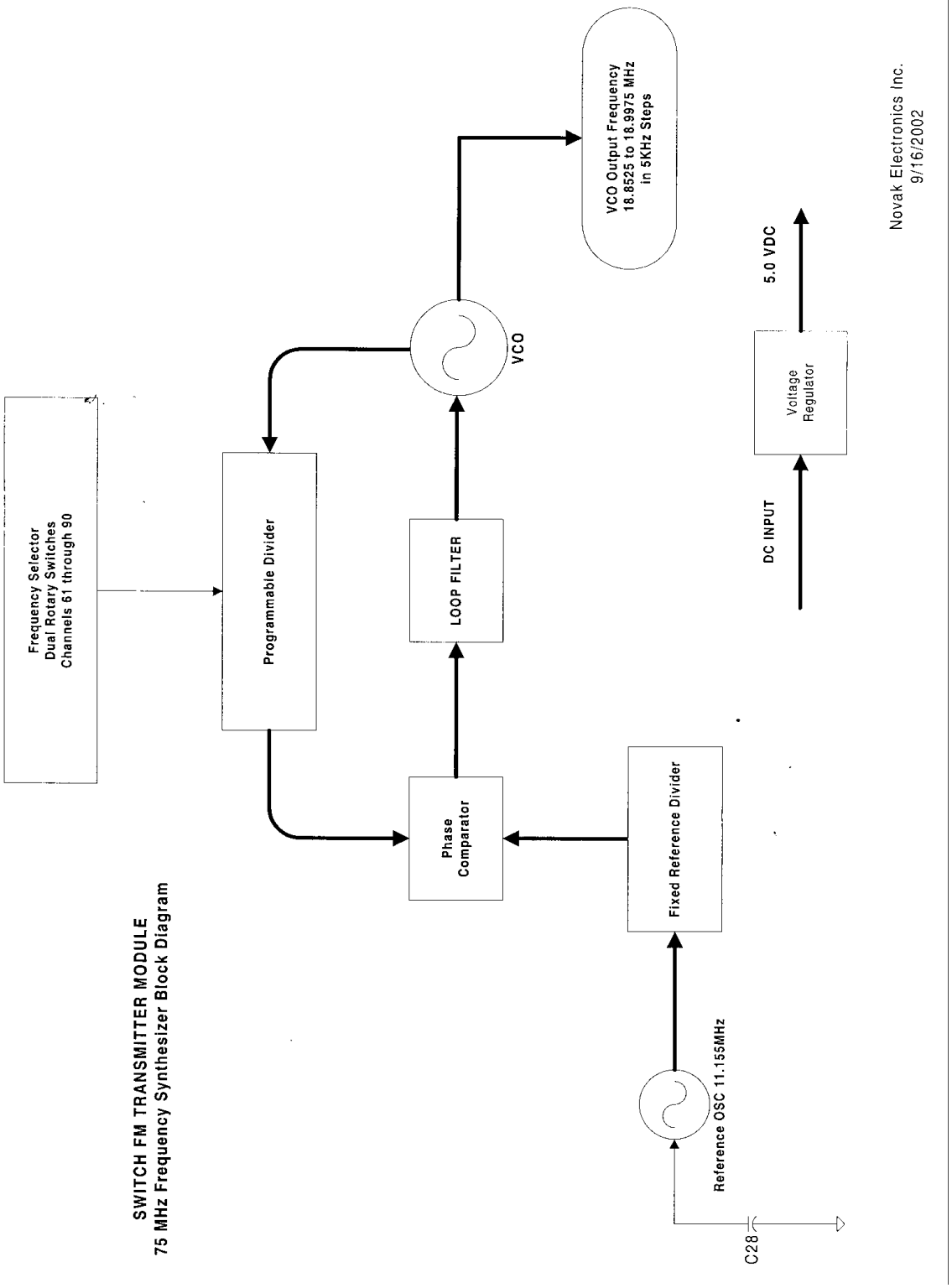
2.1033 (c) (8) DC Voltage

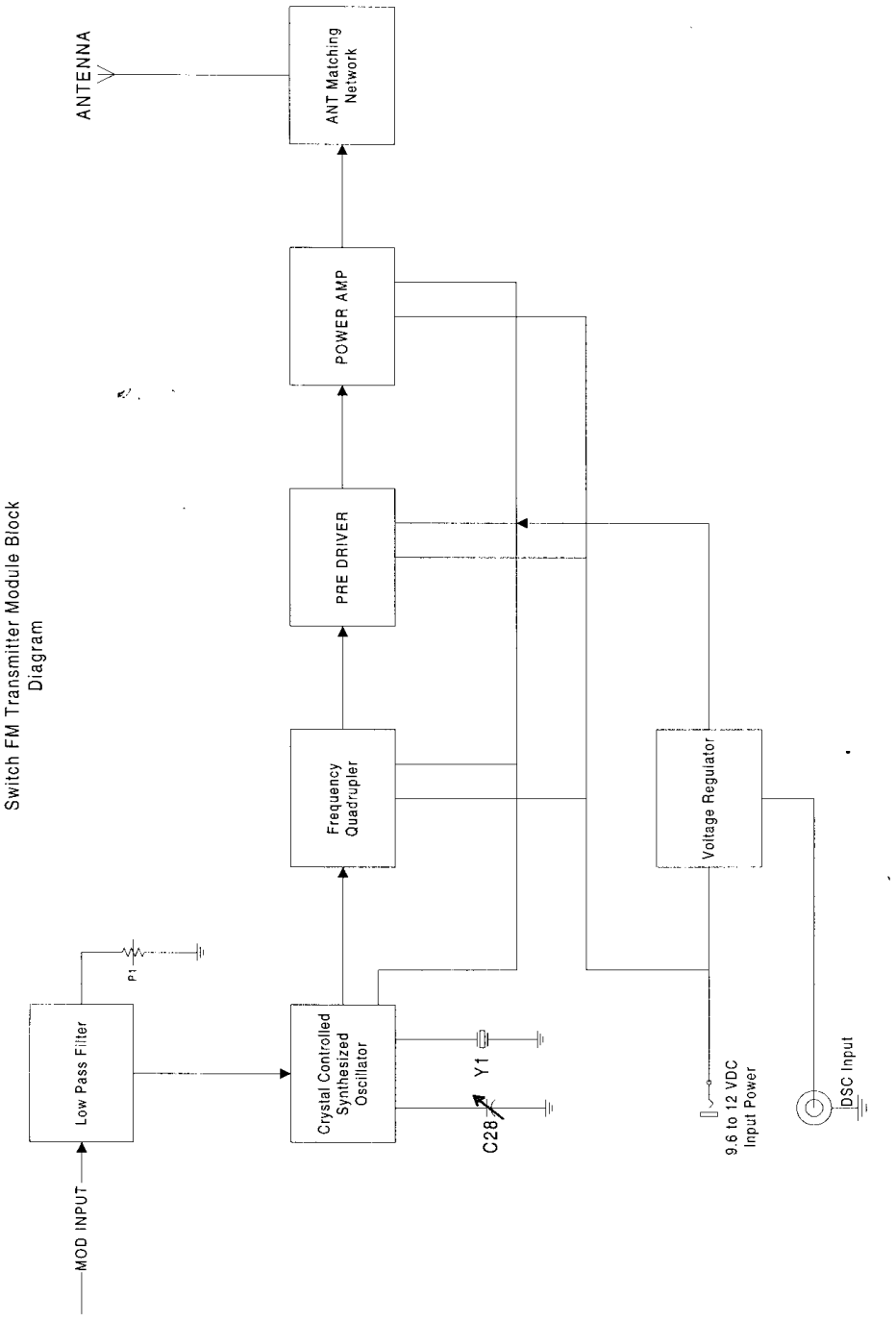
Battery operated 3Vdc

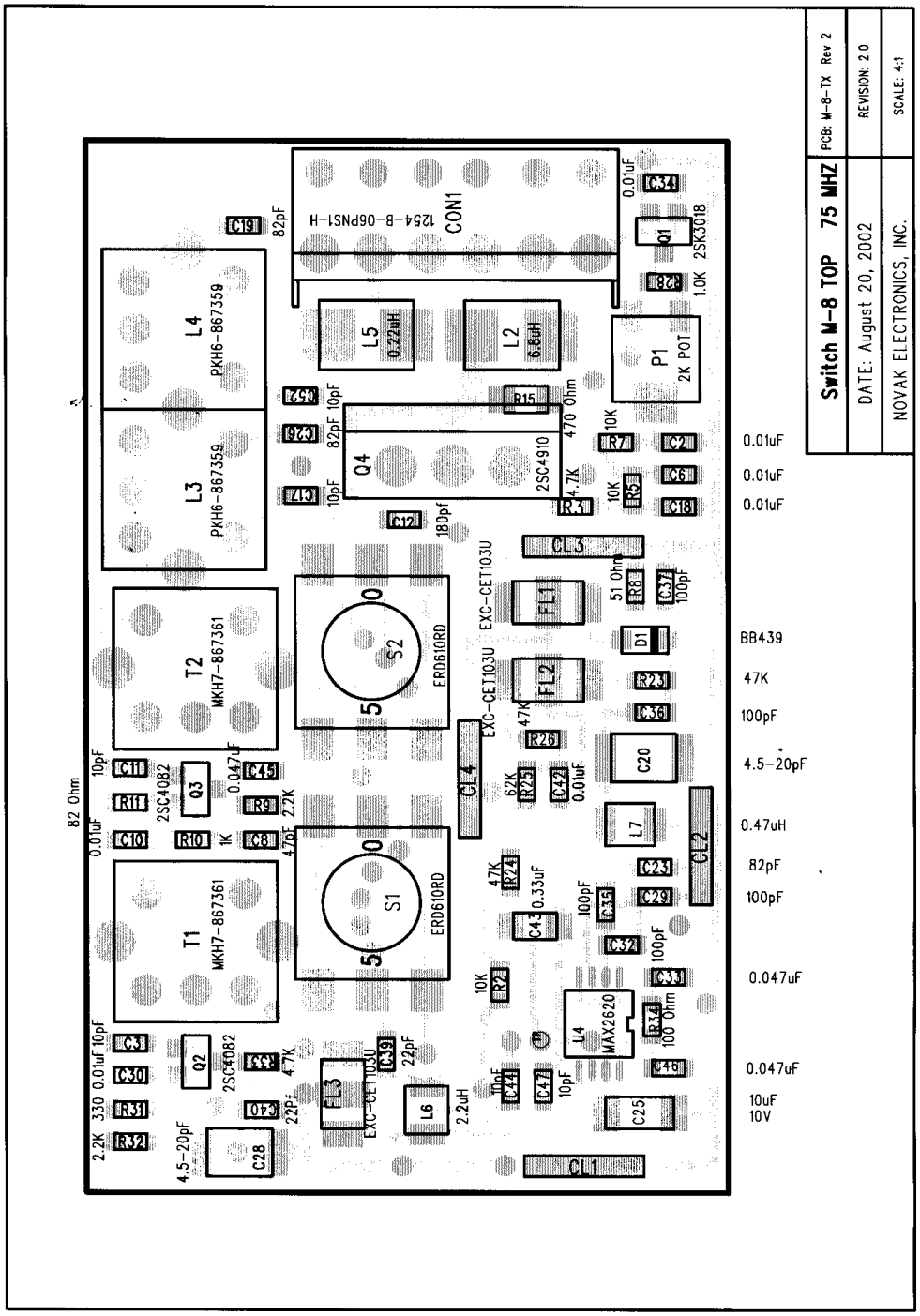
2.1033 (c) (9) Tuning Procedures

Rotating two 10 position rotary switches on the top of the module does the channel selection. Only positions 6, 7, 8, and 9 are used on the first switch and all 10 positions are used on the second to produce Channels 61 thru 90. (75.410 to 75.990 Mhz in 20 Khz steps). A lockout circuit in the microprocessor does not allow frequencies to be changed while power is being applied to the module

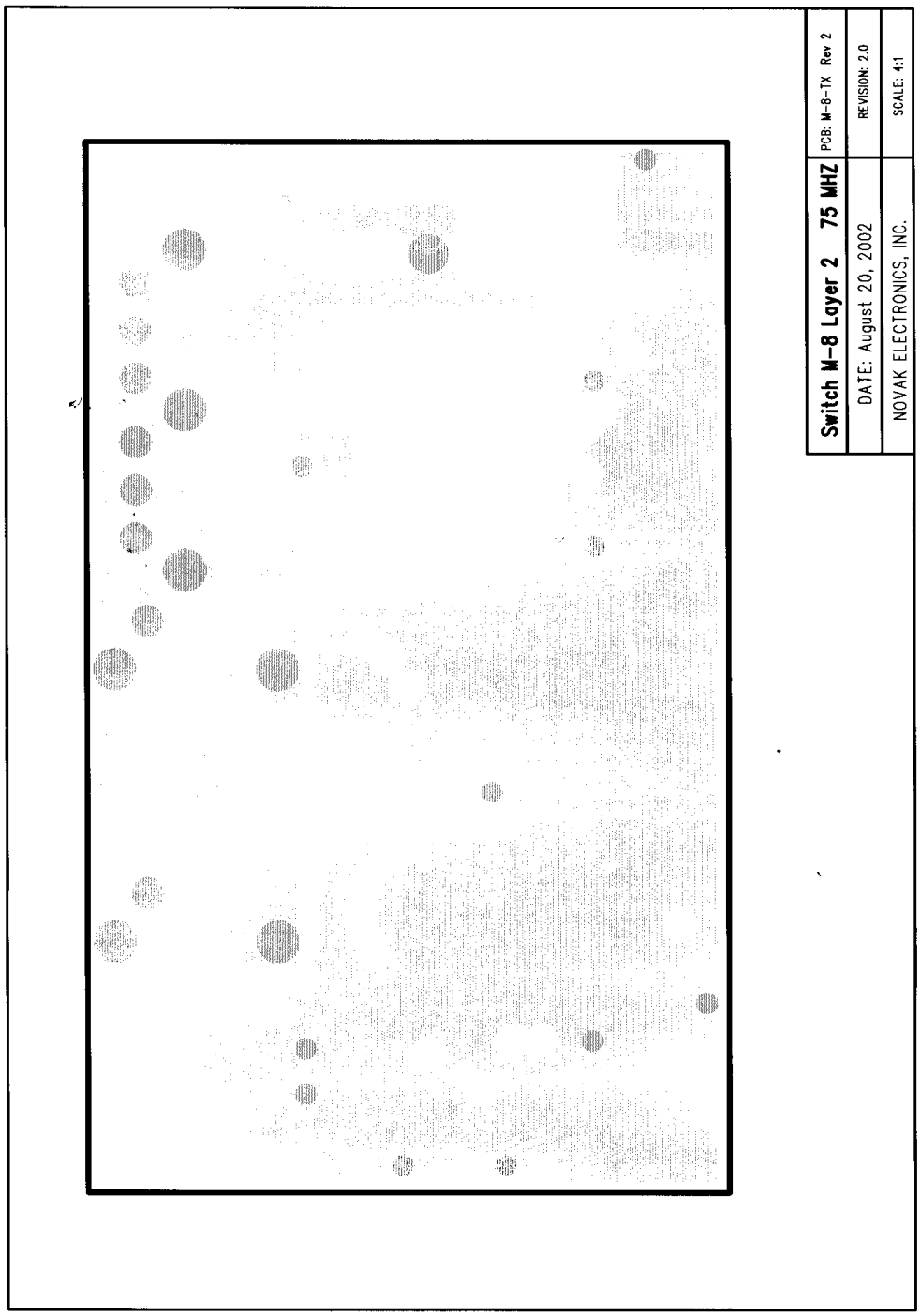
2.1033 (c) (10) Schematic Diagram and Circuit Description



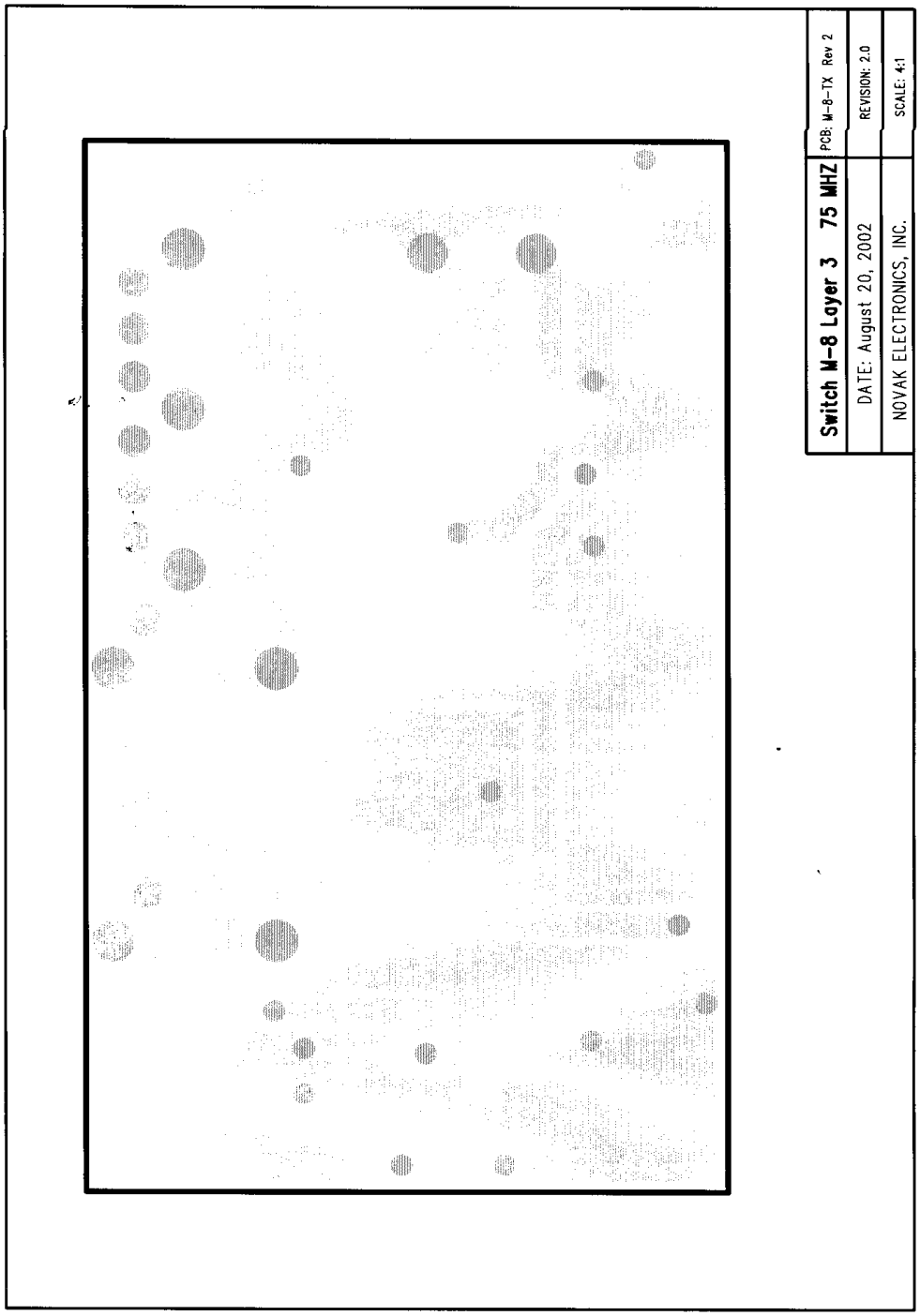

Switch FM Transmitter Module Block Diagram
Novak Electronics Inc.
9/16/2002
ANTENNA
ANT Matching Network
POWER AMP
PRE DRIVER
Frequency Quadrupler
Voltage Regulator
Low Pass Filter
Crystal Controlled Synthesized Oscillator
P1
Y1
C28
MOD INPUT
9.6 to 12 VDC Input Power
DSC Input



48-TX_Rev2c.pcb - Mon Sep 16 13:52:46 2002



M8-TX Rev2a.pcb - Mon Sep 16 13:52:54 2002



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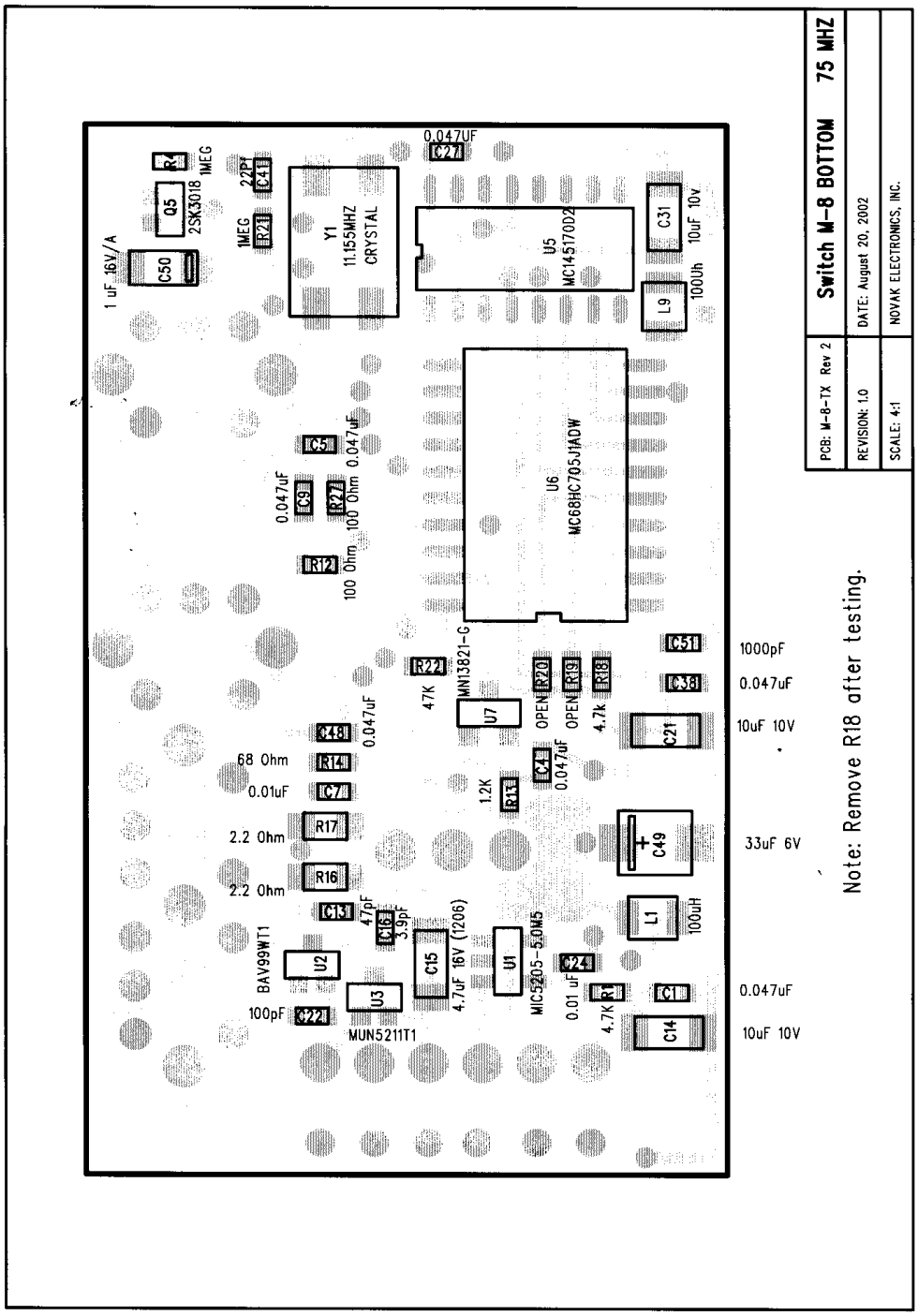
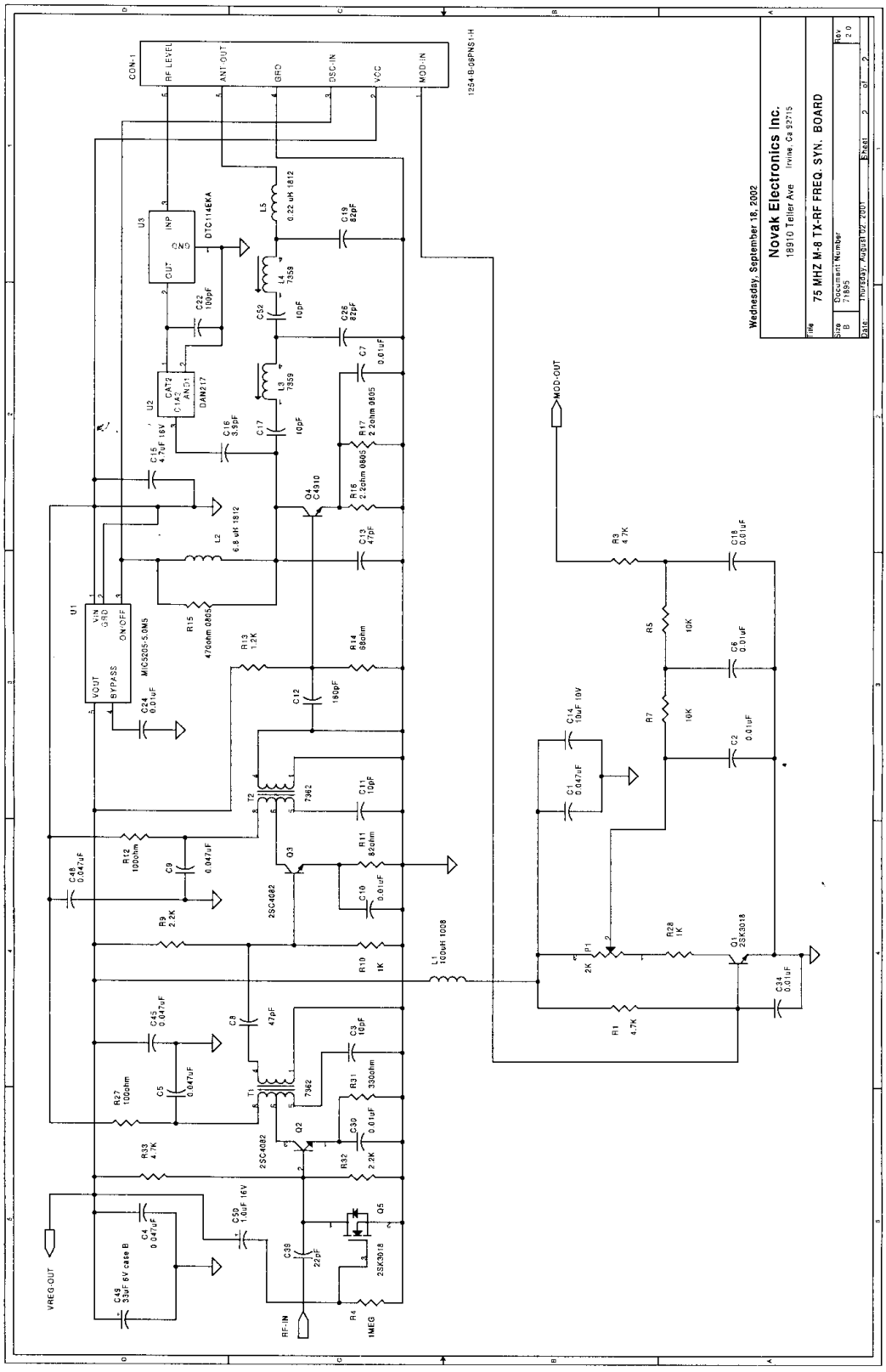
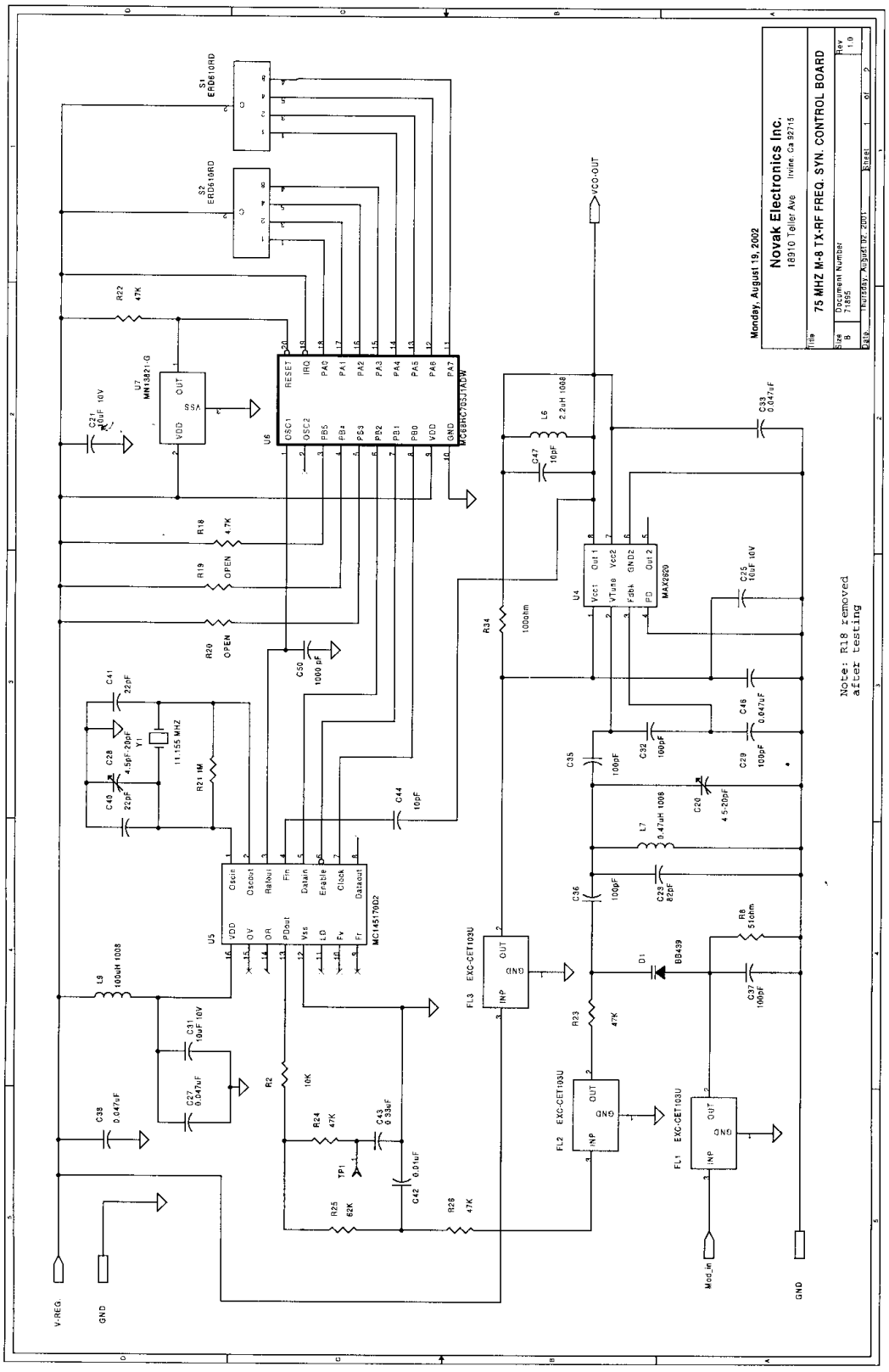


18-TX Rev2a.pcb - Mon Sep 16 13:52:55 2002


Novak Electronics Inc.
18910 Teller Ave Irvine, Ca 92715
75 MHZ M-8 TX-RF FREQ. SYN. BOARD
Wednesday, September 18, 2002
Thursday, August 02, 2001
CON-1
RF LEVEL
ANT OUT
GND
DSC-IN
VCC
MOD-IN
MOD-OUT
VREG-OUT
RF-IN
U1
MIC5205-5.0N5
U2
DAN217
U3
DTC114EKA
Q1
2SK3018
Q2
2SC4082
Q3
2SC4082
Q4
C4910
Q5
2SK3018
T1
T2
L1
100uH 1008
L2
6.8 uH 1812
L3
7359
L4
7359
L5
0.22 uH 1812
R1
4.7K
R2
1K
R3
2K
R4
1MEG
R5
10K
R7
10K
R8
4.7K
R9
2.2K
R10
1K
R11
82ohm
R12
100ohm
R13
1.2K
R14
86ohm
R15
470ohm 0805
R16
2.2ohm 0805
R17
2.2ohm 0805
R27
100ohm
R31
330ohm
R32
2.2K
R33
4.7K
C1
0.047uF
C2
0.01uF
C3
10pF
C4
0.047uF
C5
0.047uF
C6
0.01uF
C7
0.01uF
C8
47pF
C9
0.047uF
C10
0.01uF
C11
10pF
C12
180pF
C13
47pF
C14
10uF 10V
C15
4.7uF 16V
C16
3.9pF
C17
10pF
C18
0.01uF
C19
82pF
C22
100pF
C24
0.01uF
C25
82pF
C30
0.01uF
C32
10pF
C33
1.0uF 16V
C34
0.01uF
C38
22pF
C45
0.047uF
C46
0.047uF
C49
330uF 6V case B


Monday, August 19, 2002
Novak Electronics Inc.
18910 Teller Ave Irvine, Ca 92715
75 MHZ M-8 TX-RF FREQ. SYN. CONTROL BOARD
Document Number 71895
Rev 1.0
Thursday, August 02, 2001
Sheet 1 of 2
Note: R18 removed after testing
VCO-OUT
V-REG
GND
Mod_in
GND

2.1033 (c) (11) Equipment Identification Plate

NOTES:
Label will be constructed of a material suitable for permanency on the equipment with permanent adhesive.

All information on the label will be etched or stamped. Both methods will exceed the expected lifetime of the equipment.

The label will be large enough to allow all information to be legible.

2.1033 (c) (12) Equipment Photographs

Photo 1	Overall View of complete unit with Novak RF Transmitter Module
Photo 2	Detail View – Hand held transmitter with RF Transmitter removed
Photo 3	Detail View - Novak RF Transmitter - Front
Photo 4	Detail View - Novak RF Transmitter - Back
Photo 5	Detail View - PCB – Top Side
Photo 6	Detail View – PCB – Back Side

Photo 1 Overall View of complete unit with Novak RF Transmitter Module

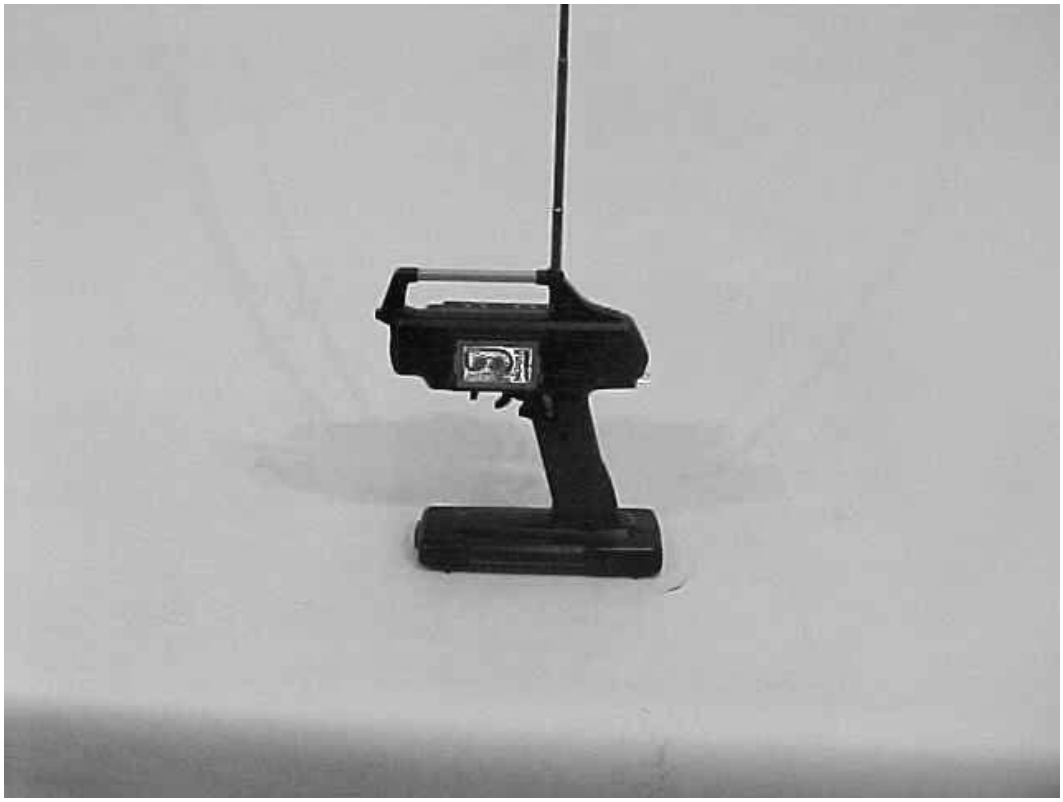


Photo 2 Detail View – Hand held transmitter with RF Transmitter removed.

Photo 3 Detail View - Novak RF Transmitter - Front

Photo 4 Detail View - Novak RF Transmitter - Back

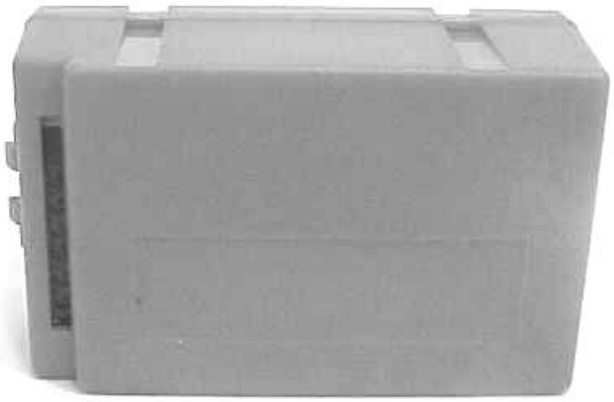


Photo 5 Detail View - PCB – Top Side

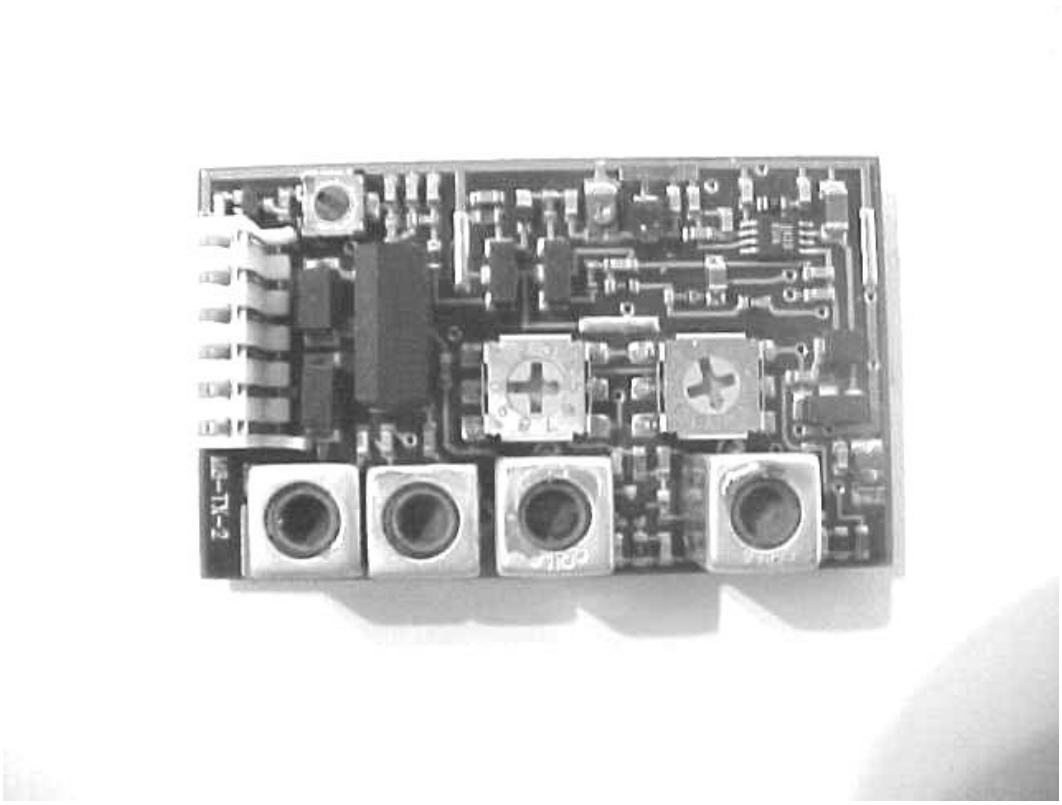
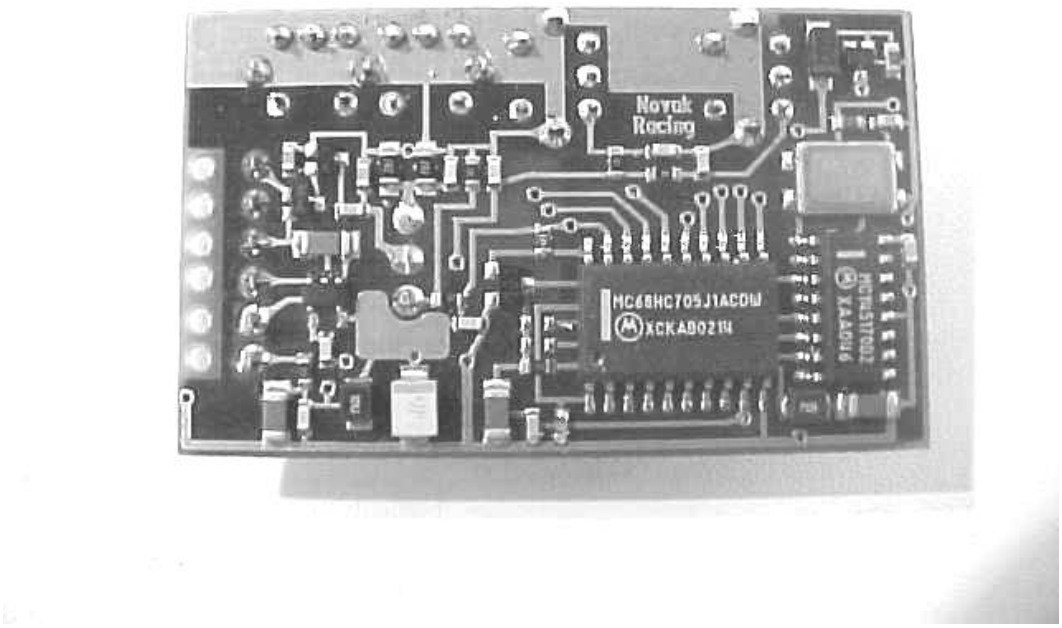


Photo 6 Detail View – PCB – Back Side



2.1033 (b) (13) Brief Description of Circuit Function

The device is a synthesized R.F. transmitter for use with the Airtronics Inc. M-8 hand held unit. The unit is composed of a crystal controlled synthesized oscillator with a base frequency of 11.155 Mhz. This base frequency is factory tuned with trimmer capacitor C28 to meet the 0.002% tolerance. The oscillator frequency can be user changed thru two rotary switches S1 and S2 from 18.8525 to 18.9975 Mhz in 5Khz steps. The output frequency of this oscillator is applied to the first amplifier whose output is tuned to the fourth harmonic to produce the final output frequencies of 75.410 to 75.990 Mhz in 20Khz steps. This signal is sent to the next tuned amplifier to supply enough energy to drive the final class C output tuned amplifier. The output of the Class C amplifier is filtered and matched to the transmitters antenna. The synthesized oscillator is FM modulated thru a low pass filter and adjusted with potentiometer P1 to obtain the proper modulation index.

The DSC input turns the power off to the module when a DSC cord is plugged into the hand held transmitter. This cord is also plugged into the receiver without danger of RF being transmitted even if the transmitters power switch is turned on.

The complete module is enclosed in an orange nylon case.

2.1033 (c) (14) Report of Measurements

Refer to 2.1046 through 2.1057

2.1046 Measurement of RF Power Output

Definition: For R/C transmitters.

Test Method:

Output Power is measured across a precision 50 ohm load with a Spectrum Analyzer. For the power measurement, CW (no modulation) is used.

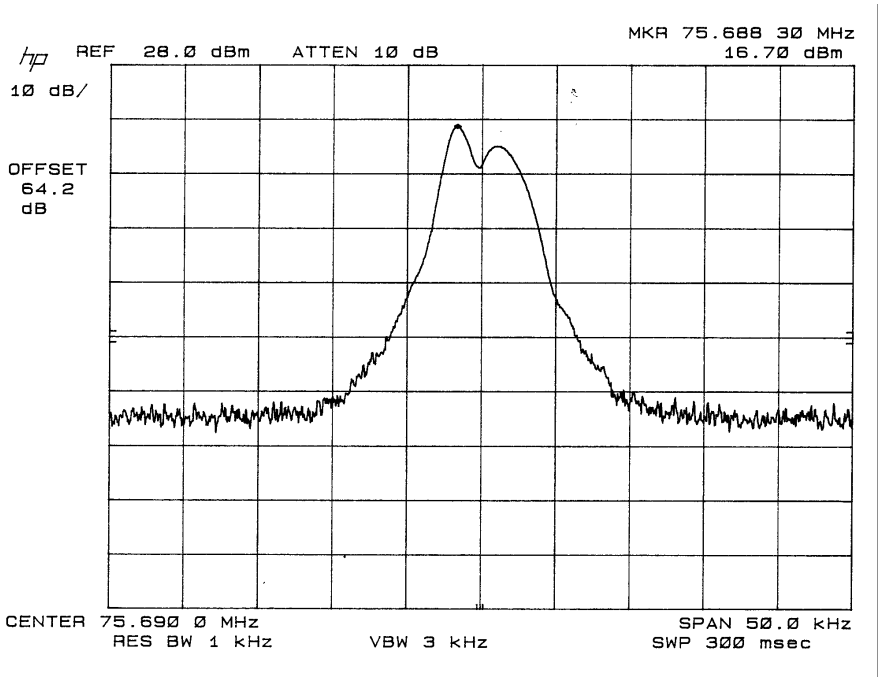
Test Results:

POWER OUTPUT MEASURED AT NOMINAL VOLTAGE WAS:

Frequency (MHz)	Power (dBm)	Power (W)
75.690	19.2	83.2 mW

2.1047 (d) Modulation Characteristics

EUT was operated in the most unfavorable condition and the resulting curve was record to demonstrate modulation characteristics.



2.1049 Measurement of Occupied Bandwidth

Definition:
Occupied Bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are equal to 0.5 percent of the total mean power radiated by a given emission.

Test Method:
Measurements were made while depressing the transmitter key in the most unfavorable position.

Test Results:

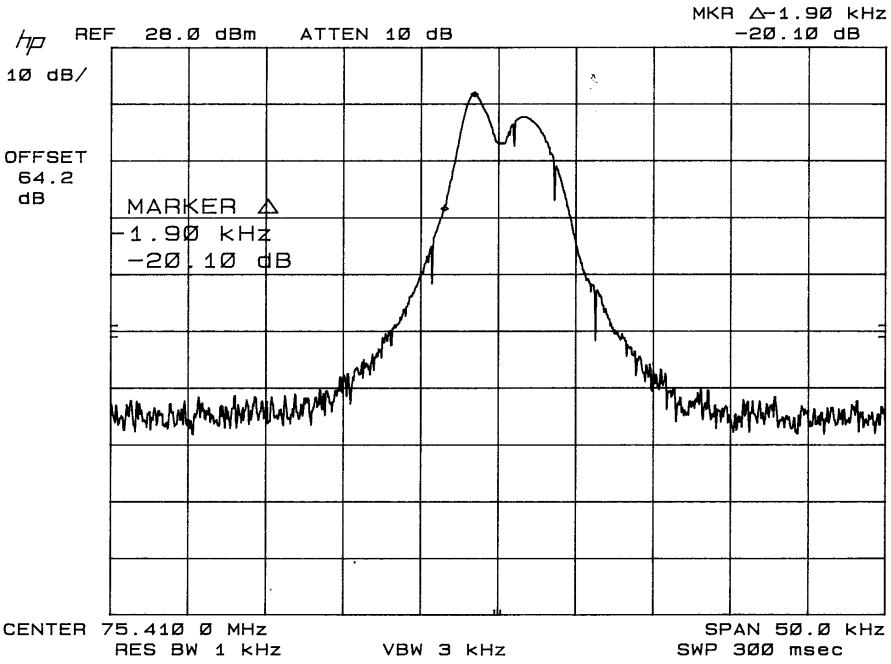
The center frequency of the signal did not shift with modulation. The Spectrum Bandwidth was well within the limits specified in the FCC Regulations.

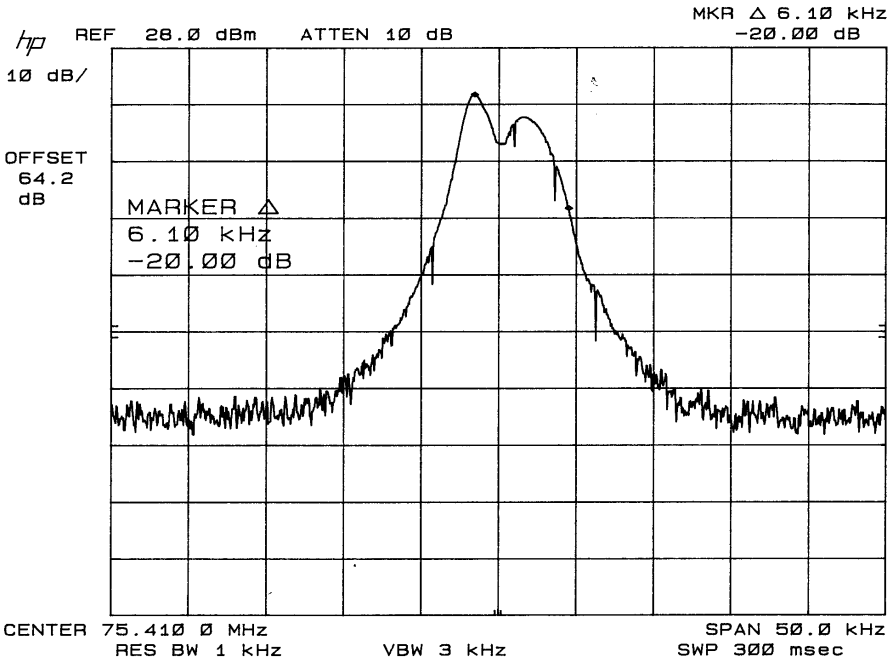
Note:

This device has multiple channels. The lowest channel is 61 the highest is 90. For the purposes of this test the lowest channel, the mid-range channel, and the highest channel were recorded.

Occupied bandwidth – Channel 60

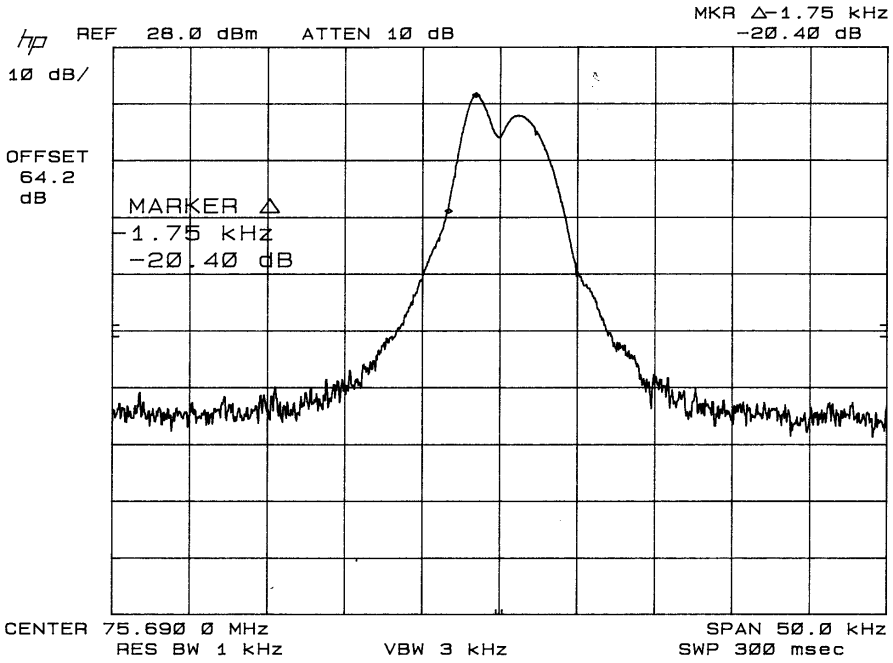
Individual channel bandwidth = 8 kHz

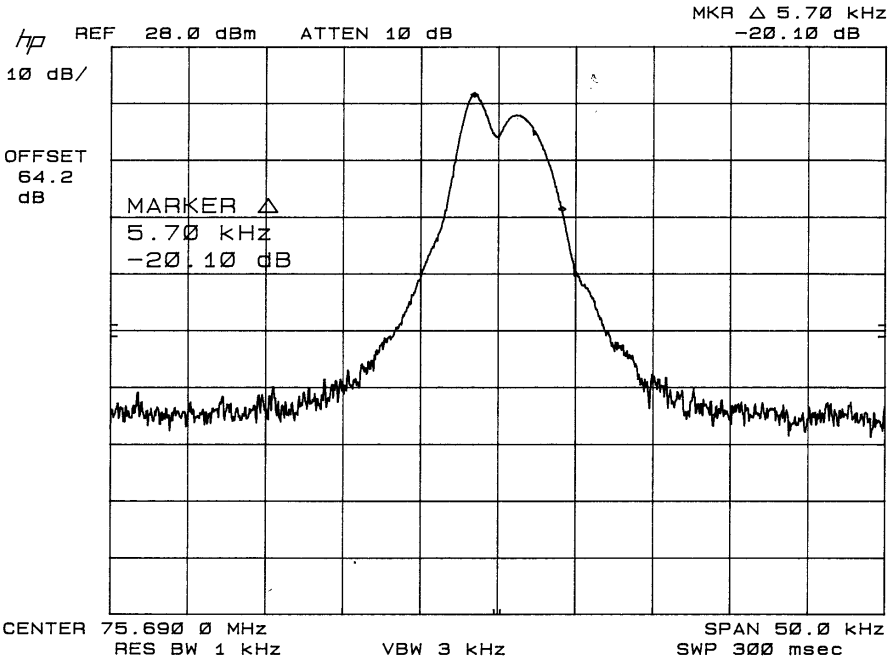




Occupied bandwidth – Channel 75

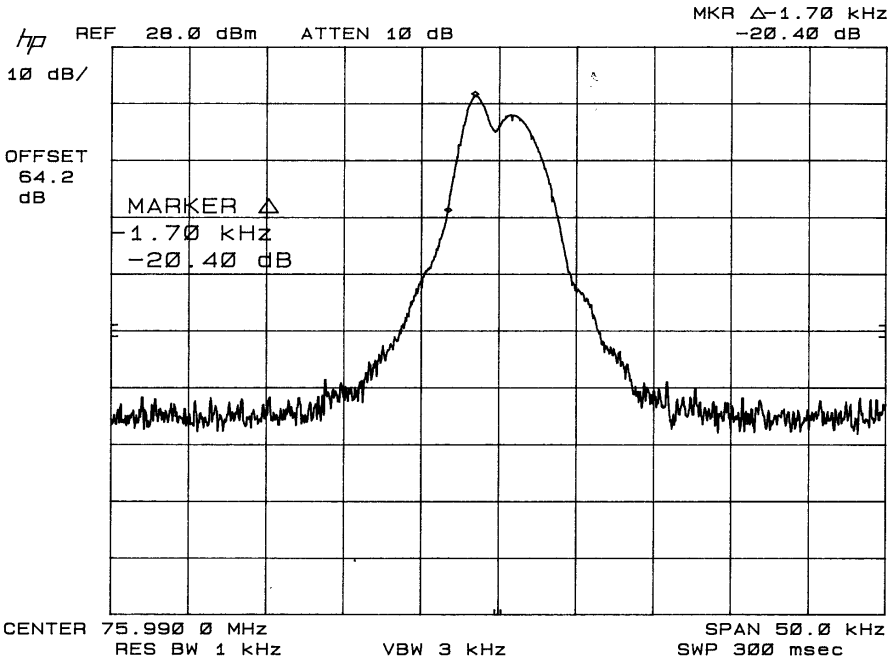
Individual channel bandwidth = 7.45 kHz

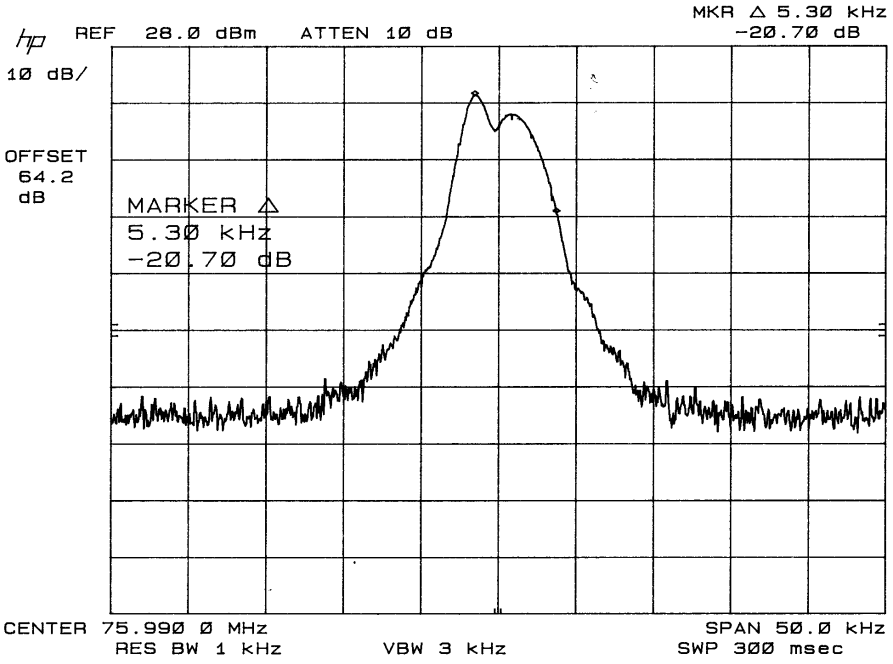




Occupied bandwidth – Channel 90

Individual channel bandwidth = 7 kHz





2.1051 Spurious Emissions at Antenna Terminals

Definition:
Conducted Spurious Emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Conducted Spurious Emissions shall be attenuated below the maximum level of the carrier frequency in accordance with the following formula:

Spurious attenuation in dB = $43 + 10 \log_{10} Po$

Where Po = Output in Watts (CW)

$= 43 + 10 \log_{10} (.1)$

= 33 dB

Test Method: Per EIA RS 152-B, Paragraph 4 as modified below.

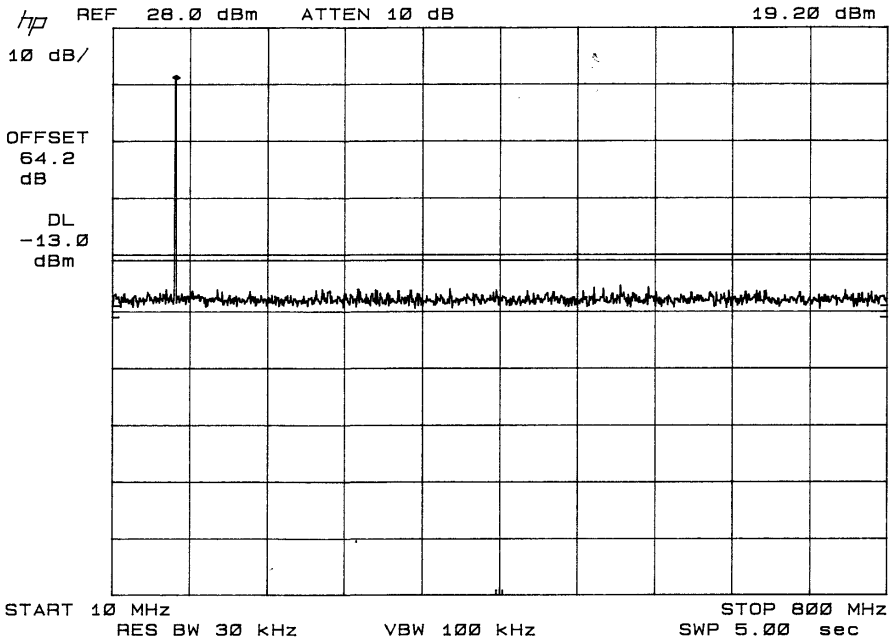
Adjust the transmitter for worst case signal source.Adjust the Spectrum Analyzer to display the Modulated Carrier.

Scan the frequency spectrum from the lowest radio frequency generated in the equipment through the 10^{th} harmonic of the carrier frequency.

Test Results:

All spurious emissions at the antenna terminals are below the FCC specifications

Conducted Spurious Emissions Plot:



2.1053 Field Strength of Spurious Radiation

Definition:
Emissions from the equipment when connected into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Test Method: Per EIA RS 152-B.

Measure the amplitude of each spurious radiated signal through the 10^{th} harmonic. The level in dBuV/m is calculated on the following page. The spurious signals are then measured on the 3 meter range.

$$\text{Spurious attenuation dB} = 10 \log \frac{\text{Po Watts}}{\text{Calc. Spurious power}}$$

Test Results: See TABLE on following Page.

All radiated spurious emissions are below the FCC Specifications.

5969 Robinson Avenue
Riverside, CA 92503
(909) 637-2630
FAX (909) 637-2704

EMI Datasheet (ITE Devices)

DNB Job Number:	38044	Date: 4 October 2002	Specification
Customer:	Novak		[X] FCC Parts: 95
Model Number:	M8	Serial Number: N/A	
Description:	R/C Transmitter		

Key to Abbreviations:

Horz = Indicates that the receive antenna is in a horizontal position
Horz Mtr / Vert Mtr = Is the received meter reading from the EUT in either the Horz or Vert antenna polarities
Power = The matching power required to be driven into the transmit antenna during substitution measurements
Corr'd = The corrected meter reading taking into account the gain of the Horn antenna, no correction used for dipole to dipole substitutions.
Dipole = Is the element length in inches at the given frequency.
Antenna = The type of antenna used for a given frequency.

Channel	Fundamental Frequency in MHz	Rated Output Power in Watts	Channel Spacing in kHz	Modulation
75	75.69	100mW	25	FM

Freq in	Dipole	Horz Mtr	Power	Corr'd	Vert Mtr	Power	Corr'd	Antenna
151.38	19.20	-40.2	-44.0	-3.8	-24.0	-27.8	12.4	Bicon
227.07	12.80	-36.3	-43.3	-7	-40.2	-47.2	-10.9	Log
302.76	9.60	-47.3	-50.1	-2.8	-50.4	-53.2	-5.9	Log
378.45	7.68	-51.8	-54.3	-2.5	-43.8	-46.3	5.5	Log
454.14	6.40	-51.5	-42.8	8.7	-48.4	-39.7	11.8	Log
529.88	5.48	-51.2	-47.2	4	-48.2	-44.2	7	Log
605.52	4.80	-50.0	-51.2	-1.2	-57.3	-58.5	-8.5	Log
681.21	4.27	-65.1	-68.9	-3.8	-66.8	-70.6	-5.5	Log
756.90	3.84	-59.2	-54.2	5	-60.1	-55.1	4.1	Log

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Riverside, CA 92503
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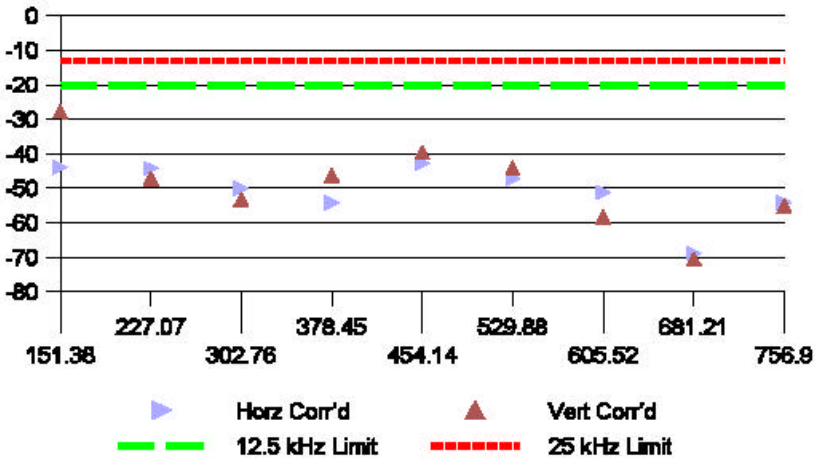
EMI Datasheet (ITE Devices)

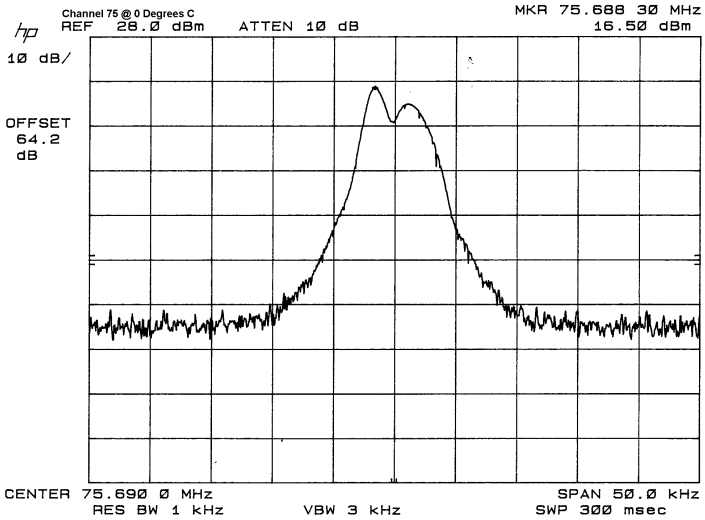
DNB Job Number:	38044	Date: 4 October 2002	Specification
Customer:	Novak		[X] FCC Parts: 95
Model Number:	M8	Serial Number: N/A	
Description:	R/C Transmitter		

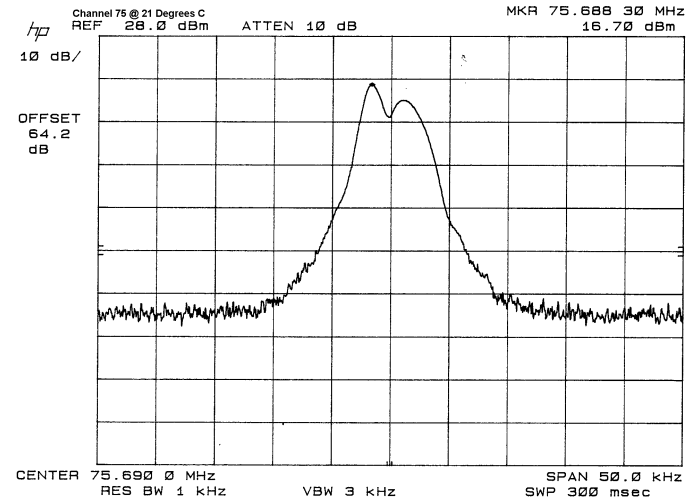
Freq	151.38	227.07	302.76	378.45	454.14	529.88	605.52	681.21	756.90
Horz Corr'd	-44.0	-44.3	-50.1	-54.3	-42.8	-47.2	-51.2	-68.9	-54.2
Vert Corr'd	-27.8	-47.2	-53.2	-46.3	-39.7	-44.2	-58.5	-70.6	-55.1
12.5 kHz Limit	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
25 kHz Limit	-13.0	-13.0	-13.0	-13.0	-13.0	-13.0	-13.0	-13.0	-13.0

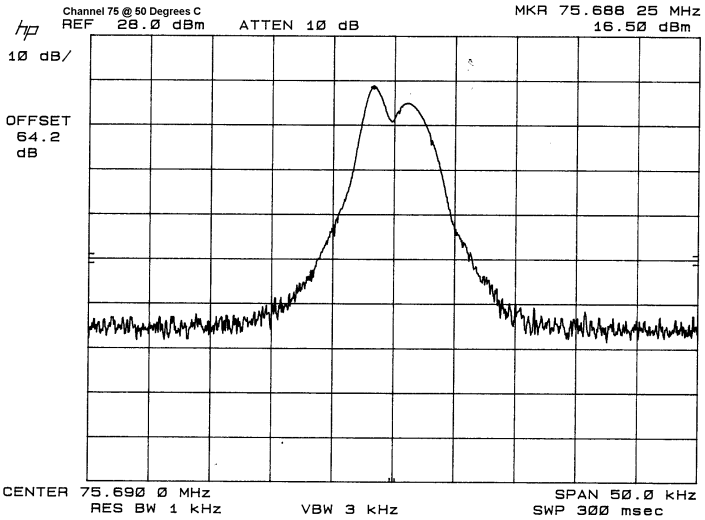


2.1055 Measurement of Frequency Stability

The EUT is was tested at 0?, 21?, and 50? C with no failures or frequency drift.







Frequency Stability – Voltage Deviation

Channel 61 Dropped out at 7.056V – no frequency drift observed

Channel 75 Dropped out at 7.024V – no frequency drift observed

Channel 90 Dropped out at 7.024V – no frequency drift observed.

2.1057 Frequency Spectrum to be Investigated

The Frequency was searched from the lowest radio frequency generated in the equipment through the 10^{th} harmonic of the carrier frequency.

15.109 Radiated Emissions – Class B

5969 Robinson Avenue
Riverside, CA 92503
(909) 637-2630
FAX (909) 637-2704

EMI Datasheet Radiated Emissions

DNB Job Number:	38044	Date: 30 Sep 2002	Specification
Customer:	NOVAK		[X] EN55022 Class B
Model Number:	M8	Serial Number:	[X] FCC Class B
Description:	R/C Transmitter - Non Transmitting		

EUT performed within the requirements of the applicable Standard(s)	X	YES		NO	Signed	Dale Sexton

Bcn = A.H. Systems SAS-200/540 Biconical Antenna S/N 138 (30-200 MHz)
Log = EMCO 3146 Log-Periodic Antenna S/N 1284 (200-1000 MHz)
Dcf = Distance Correction Factor = $20*LOG_{10}$(Test Distance/Specification Distance)
Typ = Type of reading
PK = Peak reading
QP = Quasi-peak reading

Cbl = Cable Loss
Amp = Preamplifier Gain
Pl = Antenna polarity
V = Vertical H = Horizontal
Hgt = Antenna height in meters
x.xx= 1.00 to 4.00 meters
Tbl = Table Position in degrees
xxx = 000 to 360 degrees
"*" = Readings taken with a res bandwidth of 10KHz do to nearby ambient signal

NOTES:

FREQ.	Meter	Bcn	Log	Cbl	Amp	Dcf	Corr	Lim	Delta	Corr	Lim	Delta	Typ	Tbl	Pl	Hgt
50.459	34.0	13.0	0	0.9	-24.0	0	23.9	30	-6.1	16	32	-16	PK	204	H	3.82
75.028	33.0	8.6	0	1.2	-24.0	0	18.8	30	-11	9	32	-23	PK	175	H	3.82
120.422	31.6	14.6	0	1.5	-24.0	0	23.7	30	-6.3	15	32	-17	PK	175	H	3.82
125.134	29.8	15.0	0	1.6	-24.0	0	22.4	30	-7.6	13	32	-19	PK	192	H	3.82
135.457	32.1	14.5	0	1.6	-24.0	0	24.2	30	-5.8	16	32	-16	PK	181	H	3.82
139.028	29.8	14.3	0	1.7	-24.0	0	21.8	30	-8.2	12	32	-20	PK	181	H	3.82
141.070	29.5	14.2	0	1.7	-24.0	0	21.4	30	-8.6	12	32	-20	PK	181	H	3.82
143.370	30.2	14.1	0	1.7	-24.0	0	22	30	-8	13	32	-19	PK	181	H	3.82
145.597	27.4	14.0	0	1.7	-24.0	0	19.1	30	-11	9	32	-23	PK	181	H	3.82
149.047	26.8	13.8	0	1.7	-24.0	0	18.3	30	-12	8	32	-24	PK	181	H	3.82
151.430	29.5	14.0	0	1.7	-24.0	0	21.2	30	-8.8	11	32	-21	PK	181	H	3.82
166.100	28.1	16.1	0	1.8	-24.0	0	22	30	-8	13	32	-19	PK	184	H	3.82
232.110	33.6	0	14.1	2.0	-24.1	0	25.6	37	-11	19	71	-52	PK	104	H	3.34
245.780	35.6	0	13.6	2.1	-24.2	0	27.1	37	-9.9	23	71	-48	PK	99	H	4.00
259.434	38.4	0	14.2	2.2	-24.2	0	30.6	37	-6.4	34	71	-37	PK	101	H	4.00
286.739	33.7	0	15.5	2.4	-24.2	0	27.4	37	-9.6	23	71	-48	PK	98	H	4.00
300.393	36.5	0	15.6	2.5	-24.3	0	30.3	37	-6.7	33	71	-38	PK	111	H	4.00
314.031	30.4	0	16.0	2.5	-24.3	0	24.6	37	-12	17	71	-54	PK	90	H	4.00
327.691	30.9	0	16.5	2.6	-24.4	0	25.6	37	-11	19	71	-52	PK	102	H	4.00
355.000	32.4	0	17.2	2.7	-24.4	0	27.9	37	-9.1	25	71	-46	PK	87	H	4.00
382.290	31.6	0	18.0	2.8	-24.5	0	27.9	37	-9.1	25	71	-46	PK	115	H	4.00

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EMI Datasheet Radiated Emissions

DNB Job Number:	38044	Date: 30 Sep 2002	Specification
Customer:	NOVAK		[X] EN55022 Class B
Model Number:	M8	Serial Number:	[X] FCC Class B
Description:	R/C Transmitter - Non Transmitting		

FREQ.	Meter	Bcn	Log	Cbl	Amp	Dcf	Corr	Lim	Delta	Corr	Lim	Delta	Typ	Tbl	Pl	Hgt
409.587	28.7	0	18.8	2.8	-24.5	0	25.8	37	-11	19	71	-52	PK	71	H	4.00
50.105	34.4	13.1	0	0.9	-24.0	0	24.4	30	-5.6	17	32	-15	PK	189	V	1.07
75.105	37.8	8.6	0	1.2	-24.0	0	23.6	30	-6.4	15	32	-17	PK	185	V	1.07
120.422	29.3	14.6	0	1.5	-24.0	0	21.4	30	-8.6	12	32	-20	PK	181	V	1.07
125.172	33.4	15.0	0	1.6	-24.0	0	26	30	-4	20	32	-12	QP	185	V	1.07
135.400	36.5	14.5	0	1.6	-24.0	0	28.6	30	-1.4	27	32	-5	QP	184	V	1.07
138.826	36.7	14.3	0	1.7	-24.0	0	28.7	30	-1.3	27	32	-5	QP	334	V	1.07
141.070	32.5	14.2	0	1.7	-24.0	0	24.4	30	-5.6	17	32	-15	QP	334	V	1.07
143.370	35.7	14.1	0	1.7	-24.0	0	27.5	30	-2.5	24	32	-8	QP	182	V	1.07
145.642	37.9	14.0	0	1.7	-24.0	0	29.6	30	-0.4	30	32	-2	QP	212	V	1.07
149.047	37.1	13.8	0	1.7	-24.0	0	28.6	30	-1.4	27	32	-5	QP	219	V	1.07
151.323	37.2	14.0	0	1.7	-24.0	0	28.9	30	-1.1	28	32	-4	QP	212	V	1.07
166.116	33.2	16.1	0	1.8	-24.0	0	27.1	30	-2.9	23	32	-9	QP	212	V	1.07
232.096	35.6	0	14.1	2.0	-24.1	0	27.6	37	-9.4	24	71	-47	PK	193	V	1.01
245.773	32.1	0	13.6	2.1	-24.2	0	23.6	37	-13	15	71	-56	PK	193	V	1.01
259.434	33.8	0	14.2	2.2	-24.2	0	26	37	-11	20	71	-51	PK	225	V	1.01
286.739	32.7	0	15.5	2.4	-24.2	0	26.4	37	-11	21	71	-50	PK	185	V	1.01
314.031	31.2	0	16.0	2.5	-24.3	0	25.4	37	-12	19	71	-52	PK	96	V	1.01
327.701	36.8	0	16.5	2.6	-24.4	0	31.5	37	-5.5	38	71	-33	PK	100	V	1.01
355.000	34.6	0	17.2	2.7	-24.4	0	30.1	37	-6.9	32	71	-39	PK	186	V	1.01
382.290	32.3	0	18.0	2.8	-24.5	0	28.6	37	-8.4	27	71	-44	PK	110	V	1.01
409.587	32.3	0	18.8	2.8	-24.5	0	29.4	37	-7.6	30	71	-41	PK	121	V	1.01

Test Equipment Log						
Item No:	Description	Manufacturer	M/N	S/N	DNB Asset	Cal Due
68	Antenna, Log Periodic	Emco	3146	1284	31	1/2/2004
69	Temperature Chamber	Sigma Systems	170	487	77	NCR
29	QP Adapter	Hewlett Packard	85650A	2043A00184	101	6/14/2003
71	Integtrated Stereo Amplifier	Realistic	sa-10;31-1982a	356	167	NCR
39	Oscilloscope	LeCroy	9400	85584	209	2/26/2002
73	Pre-Amplifier 4-8G	Miteq	AFD304008040	121391	364	5/10/2003
65	Pre-Amplifier	Hewlett Packard	10855A	1250-0212	387	2/15/2003
43	Artificial Mains Network	Schwarzbeck	NNLA 8120	8120288	498	6/12/2003
22	Safety Analyzer	Dynatech Nevada	431A	431A-1230	506	4/12/2003
74	Attenuator VHF	Tenuline	8341-200	902	604	5/10/2003
75	Pre-Amplifier 6Khz-500MHz	DNB	TF10010	7003	703	Out of Serv
54	Spectrum Analyzer 22 GHZ	Hewlett Packard	8565A	2232A02476	705	1/28/2003
76	Multimeter	Hewlett Packard	34740A	1213A05726	751	NCR
77	Power Supply 0-60VDC	Hewlett Packard	6024A	219A00964	769	NCR
26	QP Adapter	Hewlett Packard	85650A	2811A01240	844	8/27/2003
27	SA - RF Section	Hewlett Packard	85680B	2049A01403	845	6/14/2003
12	Oscilloscope	Tektronix	464	B133241	855	9/16/2003
30	ESD Power Supply/Gun	Haefely	PSD 25 B	083 427-05	858	3/29/2003
78	Field Monitor	Amplifier Research	FM 1000	60520	859	NCR
79	Field Probe	Amplifier Research	FP1000	60620	861	8/14/2004
44	A.C. Leakage Current Tester	Simpson	229-2	948	948	10/28/2003
15	AC/DC Current Probe	Amprobe	CT600	30301828	949	4/9/2003
4	Digital MultiMeter	Amprobe	AM-1250	330224	952	10/24/2003
5	LCR Meter	B & K Precision	878	23702237	956	10/24/2003
6	Digital MultiMeter	Amprobe	AM-1250	330139	957	8/6/2003
7	Dial Caliper	General MG	ULTRATEST	CD56903	958	12/18/2002
8	Micrometer	General MG	0-1"	N o S N #	959	12/17/2002
35	Precision Torque Gauge	SeeKonik	SL-12	967	967	7/9/2003
1	Push/Pull Scale	Imada	MF	70403	969	6/3/2003
9	Impact Hammer	E.D. & D.	F22-50	9606235-3	972	11/6/2002
51	L I S N	ComPower Corporation	L1-300	1373	997	5/13/2003
50	L I S N	ComPower Corporation	L1-300	1331	998	5/13/2003
80	Power Analyzer	Voltech	PM3000A	1273	1027	5/7/2003
32	Signal Source 9Khz-2Ghz	Marconi	2024	112231/034	1034	2/2/2003
55	WeatherLink	Davis Instruments	7400	PC70804A04	1056	2/19/2003
21	Weather Link	Davis Instruments	7400	PC70804A01	1057	1/29/2003
45	Leakage Current tester	Simpson	228	709721	1058	Out of Serv
81	Antenna Cllpsbl Bicon	Antenna Research	CB1071	1063	1063	9/30/2004
37	Step Attenuator 120dB	Hewlett Packard	355D	2522A43896	1079	11/9/2002
38	Step Attenuator 12dB	Hewlett Packard	355C	2524A42578	1080	11/9/2002
3	Digital MultiMeter	Chief Engineer	104	31220125	1092	8/26/2003
2	Power Analyzer	Combinova	300	102	1093	Out of Serv
82	Spectrum Analyzer	Hewlett Packard	3585A	2718A05908	1102	8/26/2003
53	Function Generator	Hewlett Packard	3312A	1432A05880	1108	12/20/2002
24	SA - Display Section	Hewlett Packard	85662A	2318A05282	1109	8/27/2003

Test Equipment Log						
Item No:	Description	Manufacturer	M/N	S/N	DNB Asset	Cal Due
23	SA - RF Section	Hewlett Packard	85680B	2330A02791	1110	8/27/2003
63	Control Center	Key tek	ECAT SERIES 100	9603276	1117	NCR
10	Process Meter	Newport	INFCP-210	4381880	1119	4/5/2003
11	Process Meter	Newport	INFCP-210	6150730	1120	4/5/2003
83	Oscilloscope	Tektronix	7603	B341735	1124	Out of Serv
84	LISN	Solar	8028-50-TS-24-BNC	852331	1148	4/24/2003
85	LISN	Solar	8028-50-TS-24-BNC	852332	1149	4/24/2003
61	Attenuator	JFW	PE7010-20	1196	1196	5/16/2003
62	Attenuator	JFW	PE7010-20	1197	1197	5/16/2003
60	Current Probe	Solar	6741-1	922626	1209	5/16/2003
56	Digital Multi Meter	DI-LOG	DL-297T	637652	1210	2/4/2003
17	Data Aquisition Unit	Hewlett Packard	34970A	US37016877	1214	5/21/2003
13	Line Leakage Tester	Associated Research	510L	A130511	1215	4/19/2003
14	Safety Compliance Analyzer	Associated Research	7564SA	A100601	1216	4/19/2003
16	Data Aquisition Unit	Hewlett Packard	34970A	US37017024	1217	4/29/2003
86	Surge Withstand Tester	Beckwith Electronics	M-0180B	85	1239	6/21/2003
18	Input Multiplexer	Hewlett Packard	34901A	US37017773	1399	5/21/2003
19	Input Multiplexer	Hewlett Packard	34901A	US37017729	1400	5/21/2003
34	Scale 25lb Capacity	Hanson	40	1402	1402	4/26/2003
33	Scale 300lb Capacity	Hanson	8930	1403	1403	6/3/2003
25	RF Preselector	Hewlett Packard	85685A	2724A00659	1430	8/26/2003
49	Probe	Omega	HX94V		1442	04/05/03
40	Pressure Gauge	Ashcroft	0-30 PSI	1500	1500	9/13/2003
41	Pressure Gauge	Ashcroft	0-30 PSI	1501	1501	9/13/2003
42	Pressure Gauge	Ashcroft	0-30 PSI	1502	1502	9/13/2003
87	Input Multiplexer	Hewlett Packard	34901A	US41010235	1504	4/29/2003
46	Insulation Tester	Amprobe	AMB-1A	340055	1510	10/28/2003
47	Ground Continuity Tester	Rod-L	M25	12485	1511	10/29/2003
31	ESD Contact Finger	Haefely	093 579-1	083 071-11	1671	Out of Serv
36	Precision Torque Wrench	Husky	39104	4980656019	1672	7/18/2003
28	SA - Display Section	Hewlett Packard	85662A	2112A02234	1695	6/14/2003
88	Pre-Amplifier	Miteq	AFS4-08001800-35-LN	378064	1698	5/10/2003
89	Power Amplifier	Kalmus	757LCB/1-60-485-003	7902-1	1722	NCR
90	Control Box	Kalmus	757LCB/1-60-485-003	7902-1	1723	NCR
52	Near Field Probe Kit	Credence Technologies	CTK015	None	1724	NCR
57	Amplifier	Miteq	AFS4-08001800-30-ULN	834258	1725	Out of Serv
59	EFT Generator	Haefely	P90.1	083-315-19	1726	6/14/2003
91	Plotter	Hewlett Packard	7470A	2644V00406	1727	NCR
93	Emission Loop	Fischer Custom Comm.	F-55103-2-0.13m	9951	1729	4/30/2004
94	Chassis Bay	Key tek	ECAT SERIES 100	9603277	1730	NCR
95	Surge Network	Key tek	E501A	9603278	1731	4/30/2003
96	Mains Coupler/Dec	Key tek	E551	9603279	1732	4/30/2003
97	TWTA	Hughes	8020H10F000	113	1733	NCR
64	Xwing Bilog Antenna	Chase	CBL6140	1048	1734	6/10/2003

Test Equipment Log						
Item No:	Description	Manufacturer	M/N	S/N	DNB Asset	Cal Due
58	Bicon Antenna	A.H. Systems Inc.	SAS-200/540	524	1758	1/2/2004
98	Pre-Amplifier 10-2000MHz	Mini-Circuits	ZFL-2000	8350	1760	5/10/2003
99	Pre-Amplifier	Miteq	JS2-0200400	664011	1761	5/10/2003
100	Ref Dipole Antenna	Comp Design	Antenna Kit	NSN	1762	NCR
101	Ref Dipole Antenna	Comp Design	Antenna Kit	NSN	1763	NCR
102	Biconical Antenna	AH Systems	SAS-200/540	138	1764	2/14/2004
103	Amplifier	Hughes	8020H10F000	113	1765	NCR
104	Power Supply	Hewlett Packard	8268B	1436A01139	1766	NCR
105	Random Noise Generator	General Radio	1390-B	3285	1767	NCR
107	Injection Probe	Fischer Custom Comm.	F-120-9B	33	1769	NCR
108	Attenuator	Emco	A8230M30db	NSN	1770	5/10/2003
109	Attenuator Kit	Alan	Attenuator Kit	117018	1771	5/10/2003
110	Attenuator Kit	Alan	Attenuator Kit	117019	1772	5/10/2003
111	Signal Generator	Hewlett Packard	200CD	229-45278	1773	NCR
112	Telecom Pairs Kit	Fischer Custom Comm.	FCC-TLISN-T4	20068	1774	NCR
113	Power Source	California Instruments	4500iL	51859	1775	NCR
114	Variac	Staco	3PN2210	NSN	1776	NCR
115	Variac	Staco	3PN1010V	NSN	1777	NCR
116	High Voltage Pulse	DNB	NMN	NSN	1778	NCR
117	Power Supply	California Instruments	351TC	L32208	1779	NCR
118	Attenuator	Mini-Circuits	CAT-10	931812	1786	5/10/2003
66	Power Line CDN	Fischer Custom Comm.	FCC-801-M3-16A	110	1791	6/13/2003
119	ESD Simulator	Haefely	PESD3000	H002033	1841	6/13/2003
120	RS-Bhead-Antenna Cable	DNB	RG214	11858	1858	7/26/2003
121	RSTemcell Load-9'	DNB	RG214	11859	1859	7/26/2003
122	RS-SigGen-Amp4'	DNB	RG214	11860	1860	7/26/2003
123	RS-AmpBulkhead 5'	DNB	RG214	11861	1861	7/26/2003
124	RS-Bhead Injection Probe	DNB	RG214	11862	1862	7/26/2003
125	RS-Cprobe-Bhead	DNB	RG223	11863	1863	7/26/2003
126	RS-Amplifier-Bhead 5'	DNB	RG214	11864	1864	7/26/2003
127	RS-BheadSpAntenna	DNB	RG58	11865	1865	7/26/2003
129	Riv Cable - A-3'	DNB	NMN	11871	1871	7/26/2003
130	Riv Cable - B-4'	DNB	NMN	11872	1872	7/26/2003
131	Riv Cable - C-6'	DNB	NMN	11873	1873	7/26/2003
132	Riv Cable - D-range	DNB	NMN	11874	1874	7/26/2003
133	Ric Cable - E-27'	DNB	NMN	11875	1875	7/26/2002
134	Voltage Probe	Emco	3701	9703-1156	1879	12/12/2001
135	Range Cable	DNB	NMN	11880	1880	8/14/2003
138	80' RG214 Cable	DNB	NMN	11883	1883	8/14/2003
139	60' RG214 Cable	DNB	NMN	11884	1884	8/14/2003
140	10' RG214 Cable	DNB	NMN	11885	1885	8/14/2003
67	Antenna, DRG	Emco	3115	2281		1/2/2004