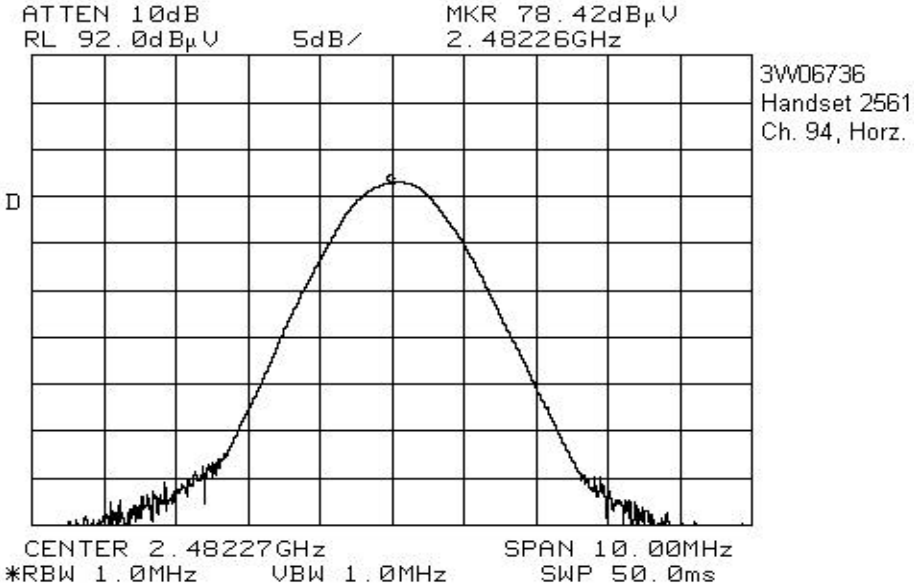

ATTEN 10dB
RL 92.0dBμV
5dB/
MKR 78.42dBμV
2.48226GHz
3W06736
Handset 2561
Ch. 94, Horz.
D
CENTER 2.48227GHz
SPAN 10.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms

Section 6. Spurious Emissions (Radiated)

Para. No.: 15.247(c)

Test Performed By: Kevin Carr	**Date of Test: 22 Jan. 2003**

Test Results: Complied.

The worst-case emission level is 37.0dBµV/m @ 3m at 38.37MHz. This is 3.0 dB below the specification limit.

Measurement Data: See attached graphs.

Radiated Disturbance Test Data: Digital Emissions, VTECH 2656

Test Date: 22 Jan 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): -10	Humidity %: 30
Tested as per (Table Top/Floor Standing): Table Top	
Test Distance (meters): 3	Range: Ottawa, Range 1
Emissions within 20 dB of the limit have been recorded. Pre-scan data can be found at the back of this section	

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Amp.
41.4700	BC1	V	13.3	11.3	N/A	1.1	25.7	40.0	14.3	Q-Peak	None
41.4700	BC1	H	7.4	12.8	N/A	1.1	21.3	40.0	18.7	Q-Peak	None
38.0000	BC1	V	9.8	11.7	N/A	1.1	22.6	40.0	17.4	Q-Peak	None
38.0000	BC1	H	11.7	13.4	N/A	1.1	26.2	40.0	13.8	Q-Peak	None
248.7000	BC1	V	10.7	16.8	N/A	2.8	30.3	46.0	15.7	Q-Peak	None
248.7000	BC1	H	15.5	16.1	N/A	2.8	34.4	46.0	11.6	Q-Peak	None
155.5200	BC1	V	12.3	13.3	N/A	2.1	27.7	43.5	15.8	Q-Peak	None
155.5200	BC1	H	17.1	12.9	N/A	2.1	32.1	43.5	11.4	Q-Peak	None
51.8410	BC1	V	14.9	10.2	N/A	1.1	26.3	40.0	13.7	Q-Peak	None
51.8410	BC1	H	9.7	10.9	N/A	1.1	21.8	40.0	18.2	Q-Peak	None
238.4610	BC1	V	10.5	16.8	N/A	2.7	30.0	46.0	16.0	Q-Peak	None
238.4610	BC1	H	9.9	15.8	N/A	2.7	28.4	46.0	17.7	Q-Peak	None
217.7200	BC1	V	11.9	15.7	N/A	2.6	30.1	46.0	15.9	Q-Peak	None
217.7200	BC1	H	10.3	15.2	N/A	2.6	28.1	46.0	17.9	Q-Peak	None
497.6630	LP1	V	8.8	17.9	N/A	4.1	30.8	46.0	15.2	Q-Peak	None
497.6630	LP1	H	8.8	19.0	N/A	4.1	31.9	46.0	14.1	Q-Peak	None
300.7100	LP1	V	12.4	14.5	N/A	3.1	30.0	46.0	16.0	Q-Peak	None
300.7100	LP1	H	8.1	15.8	N/A	3.1	27.0	46.0	19.0	Q-Peak	None
539.1360	LP1	V	9.5	18.4	N/A	4.2	32.1	46.0	13.9	Q-Peak	None
539.1360	LP1	H	10.1	18.8	N/A	4.2	33.1	46.0	12.9	Q-Peak	None
476.9290	LP1	V	8.7	17.8	N/A	3.9	30.3	46.0	15.7	Q-Peak	None
476.9290	LP1	H	7.6	18.0	N/A	3.9	29.4	46.0	16.6	Q-Peak	None
705.0230	LP1	V	8.8	21.6	N/A	4.8	35.2	46.0	10.8	Q-Peak	None
705.0230	LP1	H	7.0	21.8	N/A	4.8	33.7	46.0	12.4	Q-Peak	None
663.5560	LP1	V	10.2	21.0	N/A	4.7	35.9	46.0	10.1	Q-Peak	None
663.5560	LP1	H	7.4	20.9	N/A	4.7	33.0	46.0	13.0	Q-Peak	None

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW

Notes:

Radiated Disturbance Test Data: Digital Emissions, VTECH 2651

Test Date: 22 Jan 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): -10	Humidity %: 30
Tested as per (Table Top/Floor Standing): Table Top	
Test Distance (meters): 3	Range: Ottawa, Range 1
Emissions within 20 dB of the limit have been recorded. Pre-scan data can be found at the back of this section	

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Amp.
51.8890	BC1	V	16.4	10.2	N/A	0.8	27.5	40.0	12.5	Q-Peak	None
51.8890	BC1	H	13.6	10.9	N/A	0.8	25.3	40.0	14.7	Q-Peak	None
39.6400	BC1	V	19.1	11.5	N/A	0.8	31.4	40.0	8.6	Q-Peak	None
39.6400	BC1	H	17.3	13.2	N/A	0.8	31.3	40.0	8.7	Q-Peak	None
38.3700	BC1	V	24.6	11.7	N/A	0.8	37.0	40.0	3.0	Q-Peak	None
38.3700	BC1	H	22.0	13.4	N/A	0.8	36.1	40.0	3.9	Q-Peak	None
62.2000	BC1	V	19.7	9.0	N/A	0.9	29.6	40.0	10.4	Q-Peak	None
62.2000	BC1	H	13.4	9.2	N/A	0.9	23.5	40.0	16.5	Q-Peak	None
51.5900	BC1	V	17.2	10.3	N/A	0.8	28.3	40.0	11.7	Q-Peak	None
51.5900	BC1	H	19.4	11.0	N/A	0.8	31.2	40.0	8.8	Q-Peak	None
155.3800	BC1	V	12.0	13.3	N/A	1.5	26.8	43.5	16.7	Q-Peak	None
155.3800	BC1	H	6.7	12.9	N/A	1.5	21.1	43.5	22.4	Q-Peak	None
37.3560	BC1	V	21.8	11.8	N/A	0.8	34.4	40.0	5.6	Q-Peak	None
37.3560	BC1	H	13.4	13.5	N/A	0.8	27.7	40.0	12.3	Q-Peak	None
72.6600	BC1	V	15.2	8.8	N/A	1.0	25.0	40.0	15.0	Q-Peak	None
72.6600	BC1	H	17.4	8.6	N/A	1.0	27.0	40.0	13.0	Q-Peak	None
497.6650	LP1	V	6.5	17.9	N/A	2.9	27.3	46.0	18.7	Q-Peak	None
497.6650	LP1	H	8.4	19.0	N/A	2.9	30.3	46.0	15.7	Q-Peak	None
476.9280	LP1	V	7.5	17.8	N/A	2.8	28.1	46.0	17.9	Q-Peak	None
476.9280	LP1	H	6.3	18.0	N/A	2.8	27.1	46.0	18.9	Q-Peak	None
435.4570	LP1	V	6.9	16.4	N/A	2.7	26.0	46.0	20.0	Q-Peak	None
435.4570	LP1	H	9.8	16.8	N/A	2.7	29.3	46.0	16.7	Q-Peak	None
518.4000	LP1	V	7.3	18.8	N/A	2.9	29.0	46.0	17.0	Q-Peak	None
518.4000	LP1	H	6.5	19.3	N/A	2.9	28.7	46.0	17.4	Q-Peak	None
559.8730	LP1	V	3.0	18.9	N/A	3.1	25.0	46.0	21.0	Q-Peak	None
559.8730	LP1	H	8.3	19.3	N/A	3.1	30.7	46.0	15.3	Q-Peak	None
311.0410	LP1	V	8.1	15.4	N/A	2.3	25.8	46.0	20.2	Q-Peak	None
311.0410	LP1	H	15.7	15.7	N/A	2.3	33.7	46.0	12.3	Q-Peak	None

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW

Notes:

Radiated Disturbance Test Data: VTECH 2651 Base Station Harmonics, Average

Test Date: 22 Jan 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): -10	Humidity %: 30
Tested as per (Table Top/Floor Standing): Table Top	
Test Distance (meters): 3	Range: Ottawa, Range 1
Emissions within 20 dB of the limit have been recorded. Pre-scan data can be found at the back of this section	

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. Factor (dB)	Cable Loss (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Amp.
Ch. 47											
4883.3100	Horn1	V	72.6	34.4	54.9	20.0	8.0	40.1	54.0	13.9	4-8GHz
4883.3900	Horn1	H	75.3	34.2	54.9	20.0	8.0	42.6	54.0	11.4	4-8GHz
7325.3500	Horn1	V	71.2	36.5	56.0	20.0	11.9	43.6	54.0	10.4	4-8GHz
7324.8500	Horn1	H	72.1	36.5	56.0	20.0	11.9	44.5	54.0	9.5	4-8GHz
Ch. 00											
4802.0500	Horn1	V	68.6	34.3	55.2	20.0	7.3	35.1	54.0	18.9	4-8GHz
4802.2200	Horn1	H	74.3	34.1	55.2	20.0	7.3	40.6	54.0	13.4	4-8GHz
7203.1100	Horn1	V	69.7	36.5	56.0	20.0	12.5	42.7	54.0	11.3	4-8GHz
7203.8100	Horn1	H	71.2	36.5	56.0	20.0	12.5	44.2	54.0	9.8	4-8GHz
Ch. 94											
4964.5400	Horn1	V	72.2	34.4	54.6	20.0	8.3	40.3	54.0	13.7	4-8GHz
4964.3700	Horn1	H	77.5	34.2	54.6	20.0	8.3	45.4	54.0	8.6	4-8GHz
7446.6800	Horn1	V	71.2	36.5	56.0	20.0	12.4	44.1	54.0	9.9	4-8GHz
7446.5600	Horn1	H	70.5	36.5	56.0	20.0	12.4	43.4	54.0	10.6	4-8GHz

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW

Notes:	The RF Circuitry in the VTECH 2651 and VTECH 2656 are identical, therefore only the VTECH 2651 was tested

Radiated Disturbance Test Data: VTECH 2651 Handset Harmonics, Average

Test Date: 28 Jan 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): 7	Humidity %: 65
Tested as per (Table Top/Floor Standing): Table Top	
Test Distance (meters): 3	Range: Almonte Range
Emissions within 20 dB of the limit have been recorded. Pre-scan data can be found at the back of this section	

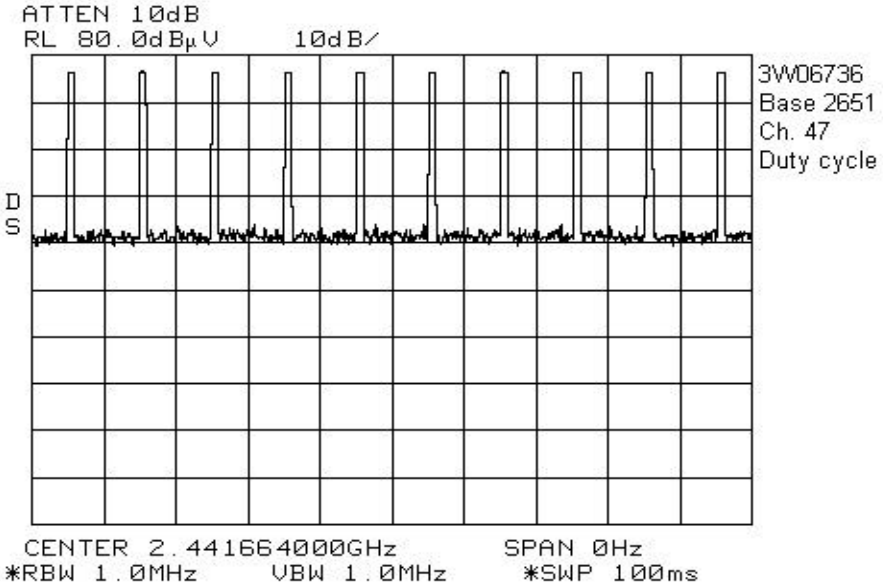
Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. Factor (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Amp.
Ch. 47										
4883.49	Horn 3	V	51.7	46.3	37.0	20	41.0	54.0	13.0	HP 8449
4883.24	Horn 3	H	52.3	46.3	37.0	20	41.6	54.0	12.4	HP 8449
7324.99	Horn 3	V	50.8	51.8	36.9	20	45.7	54.0	8.3	HP 8449
7324.98	Horn 3	H	48.4	51.8	36.9	20	43.3	54.0	10.7	HP 8449
Ch. 00										
4801.95	Horn 3	V	52.0	46.1	37.0	20	41.1	54.0	12.9	HP 8449
4802.4	Horn 3	H	54.5	46.1	37.0	20	43.6	54.0	10.4	HP 8449
7203.17	Horn 3	V	45.8	51.6	36.9	20	40.5	54.0	13.5	HP 8449
7203.17	Horn 3	H	49.0	51.6	36.9	20	43.7	54.0	10.3	HP 8449
Ch. 94										
4964.5	Horn 3	V	53.5	46.6	37.0	20	43.1	54.0	10.9	HP 8449
4964.36	Horn 3	H	52.5	46.6	37.0	20	42.1	54.0	11.9	HP 8449
7447.07	Horn 3	V	53.2	52.3	36.9	20	48.5	54.0	5.5	HP 8449
7446.98	Horn 3	H	52.8	52.3	36.9	20	48.1	54.0	5.9	HP 8449

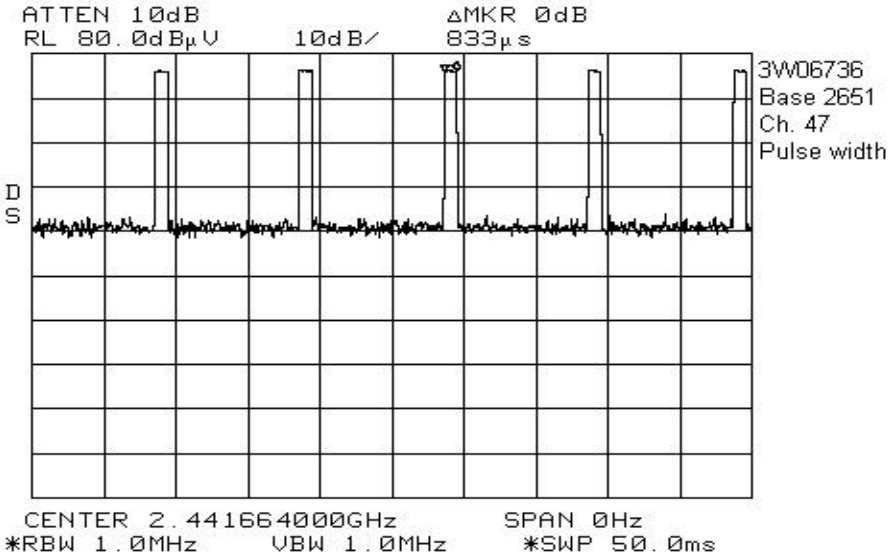
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW

Notes:	The RF Circuitry in the VTECH 2651 and VTECH 2656 are identical, therefore only the VTECH 2651 was tested

Final Test Result (Please Check One):	☒ Pass	☐ Fail
Were their deviations from the standard test procedure?	☐ Yes	☒ No
If yes, document:		
Has rented equipment been used?	☐ Yes	☒ No
If yes, document:		
Exercise Program: The mode used to exercise the various system components in a manner similar to typical use.	S/W Ver. Not supplied by client	

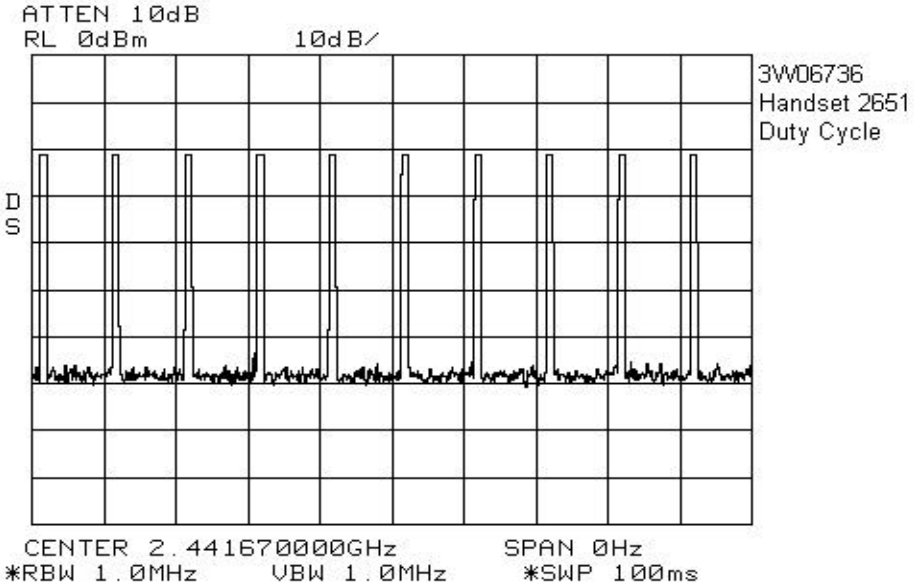
VTECH 2651, Base, Duty Cycle

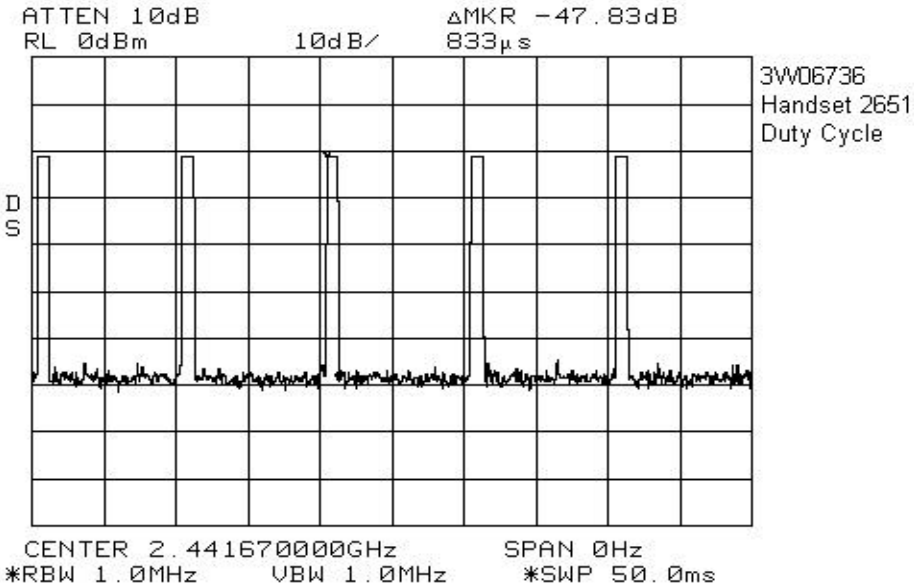




Duty Cycle Correction: 20Log{(10 x 0.83) / 100} = -21.6dB

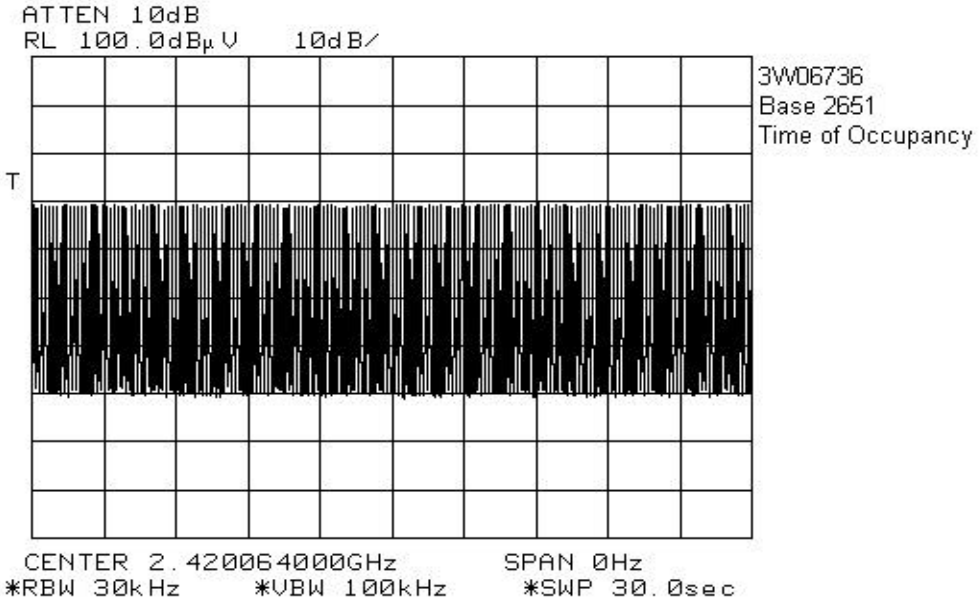
VTECH 2651, Handset, Duty Cycle

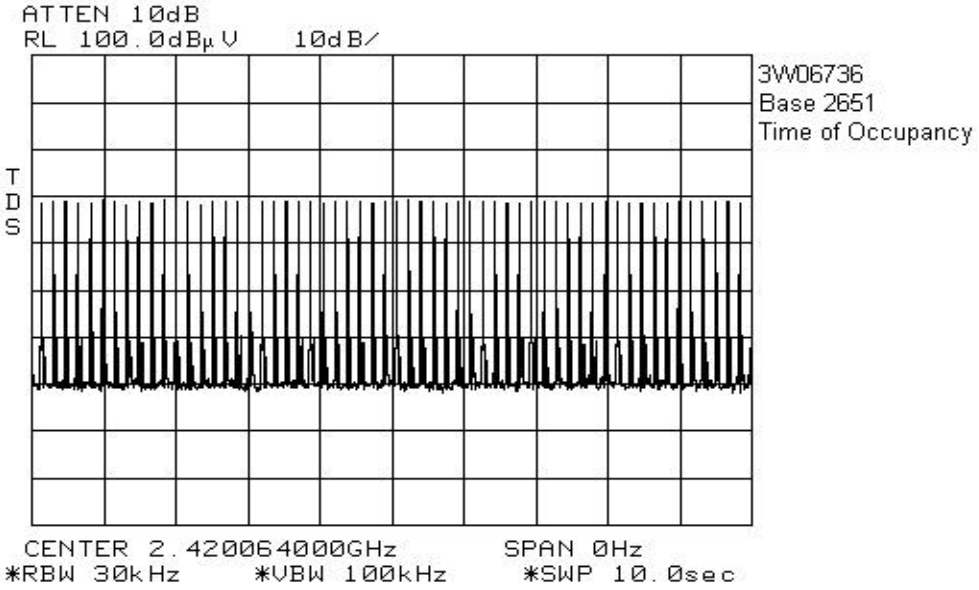


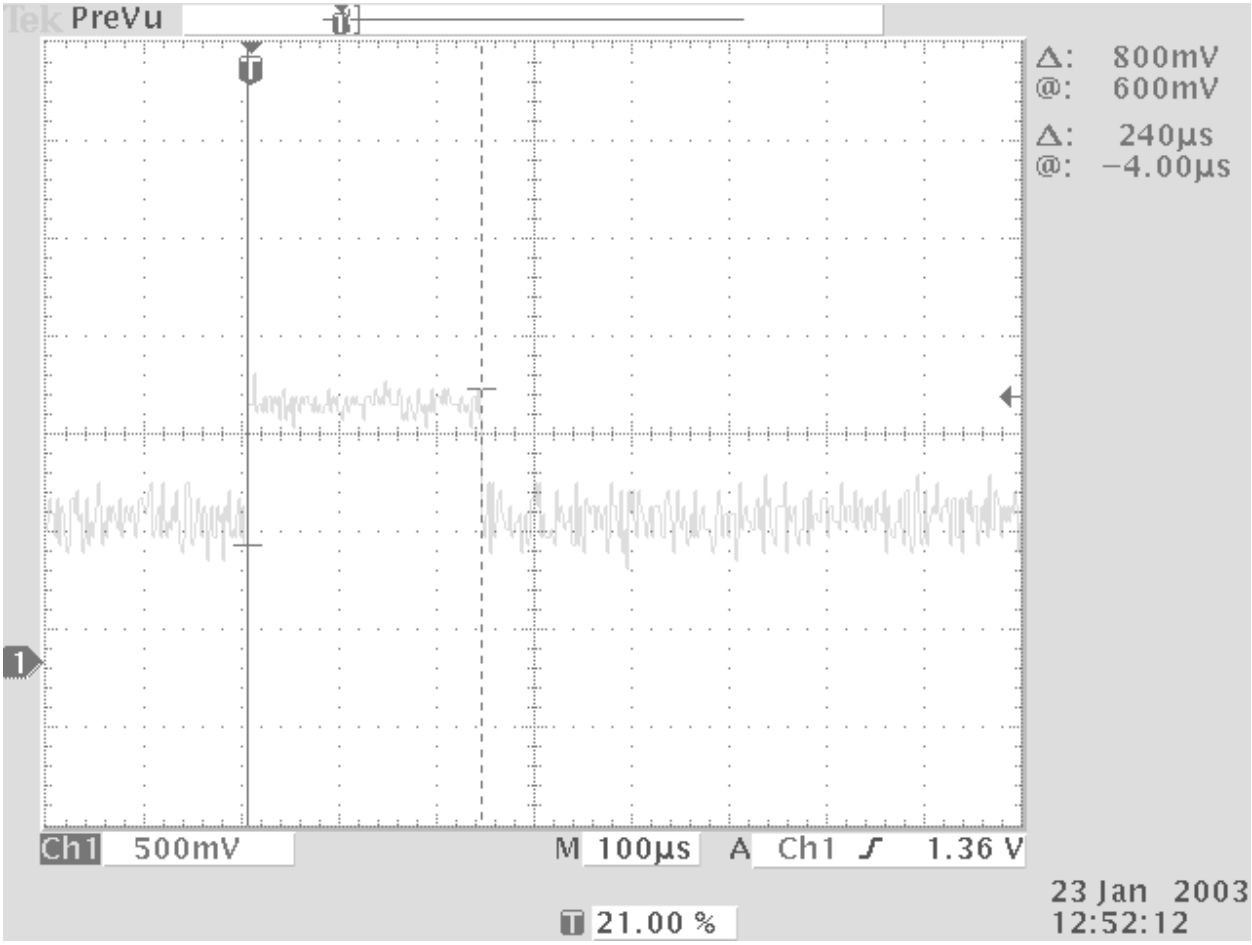


Duty Cycle Correction Factor: Same as Base

Time of Occupancy, Base Station

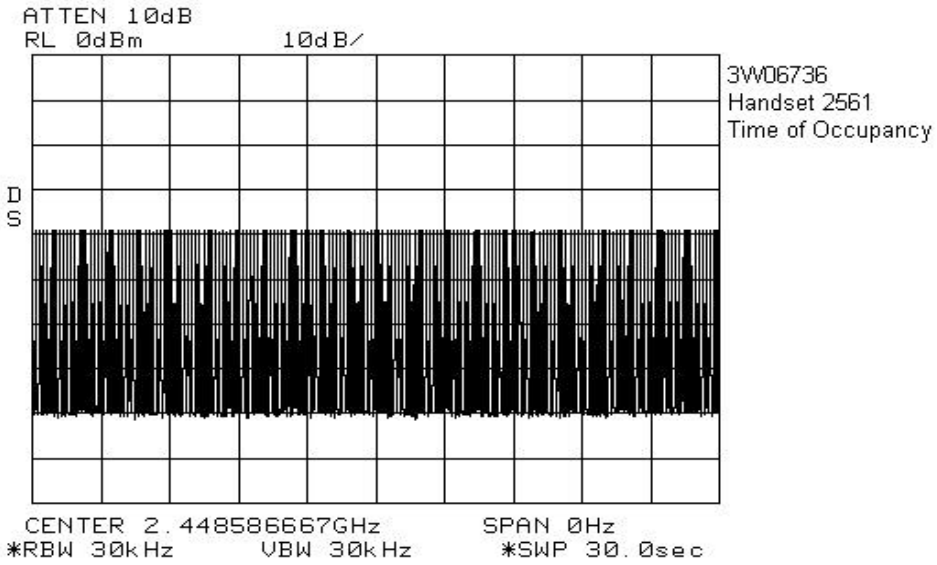


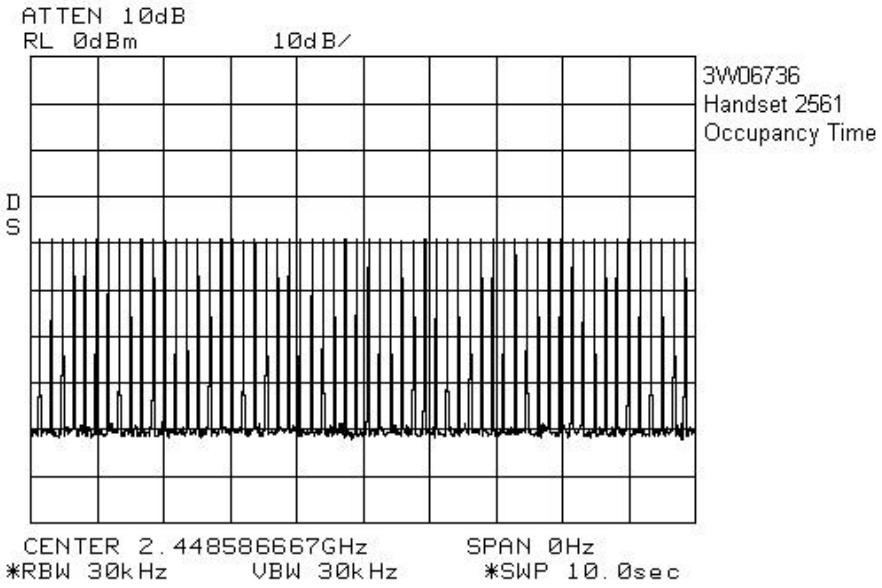


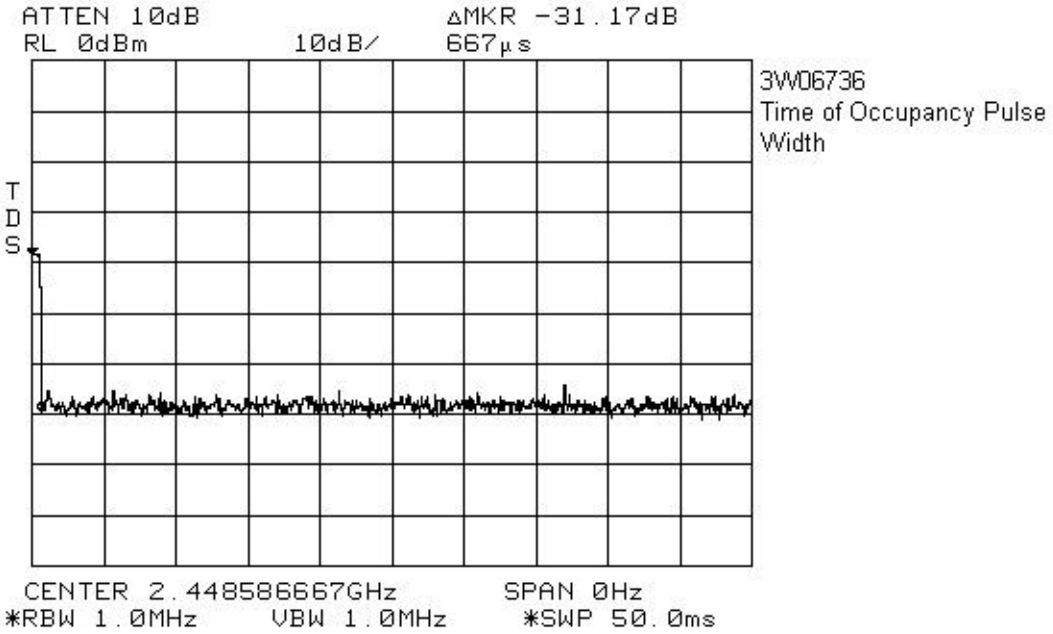


Base Station Time of Occupancy in 30 Seconds
58 X 3 X 0.24ms = 41.76 ms

Time of Occupancy, Hand Set

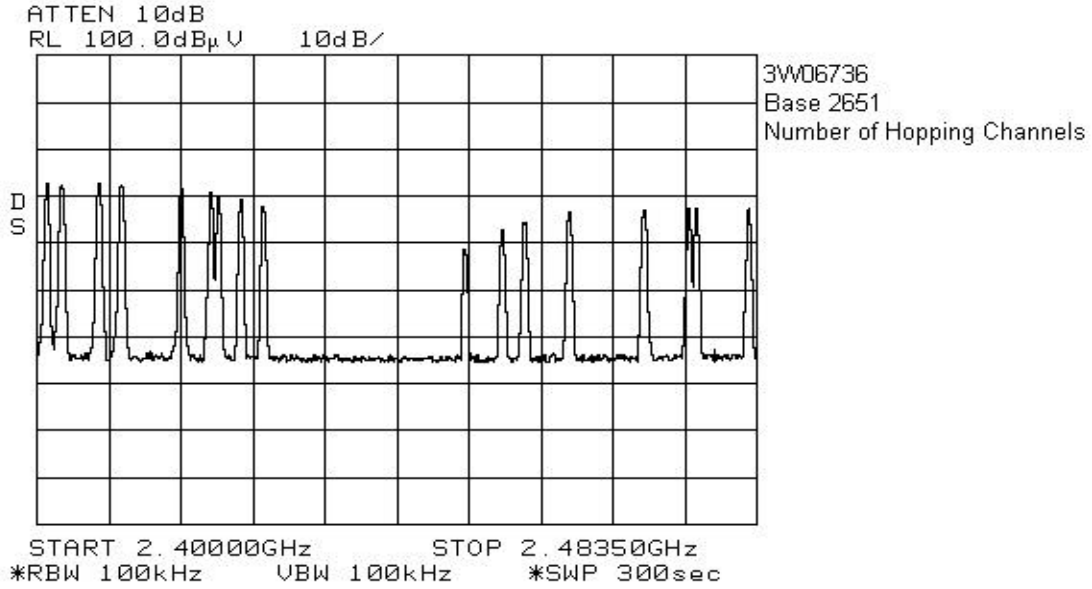


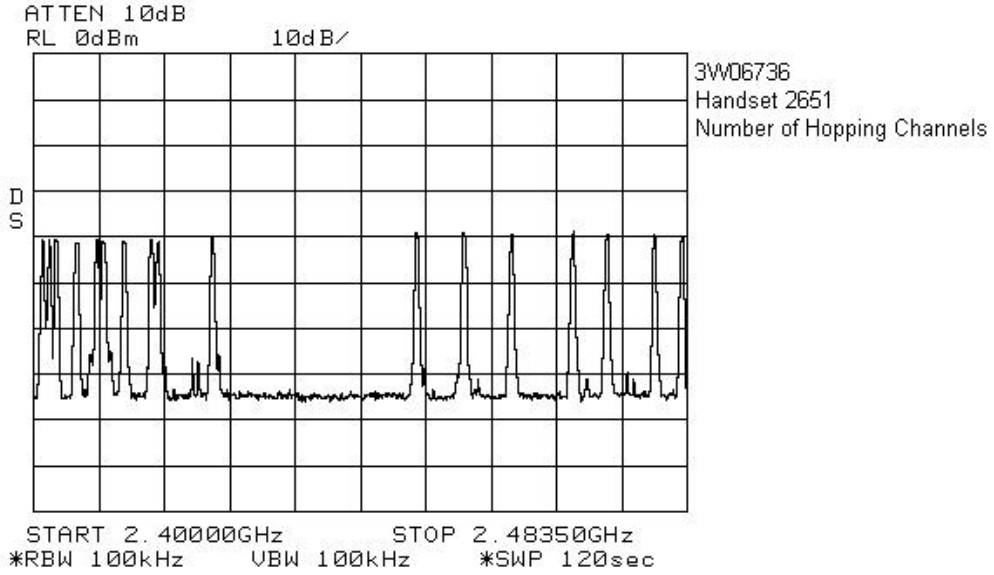




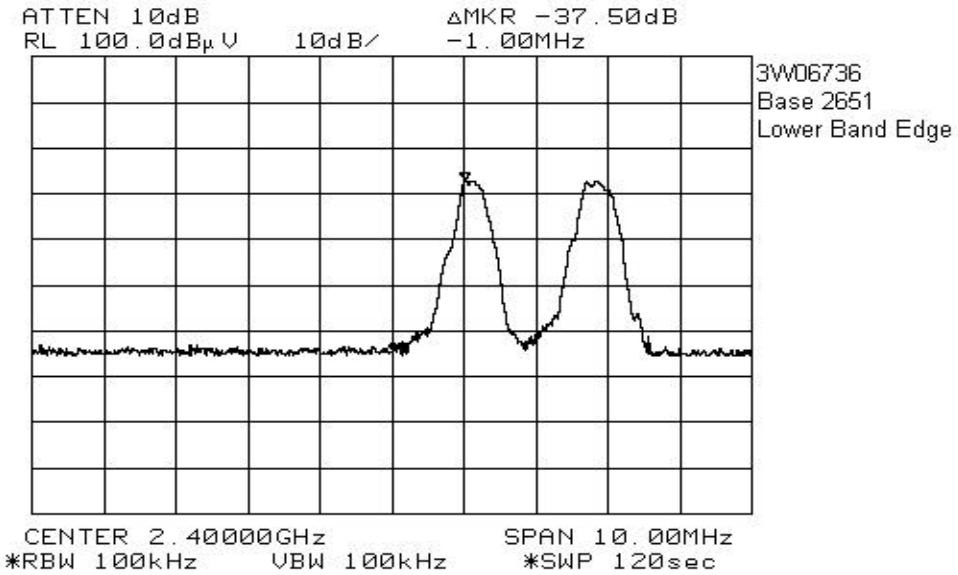
Hand Set Time of Occupancy in 30 Seconds
58 X 3 X .67ms = 116.6ms

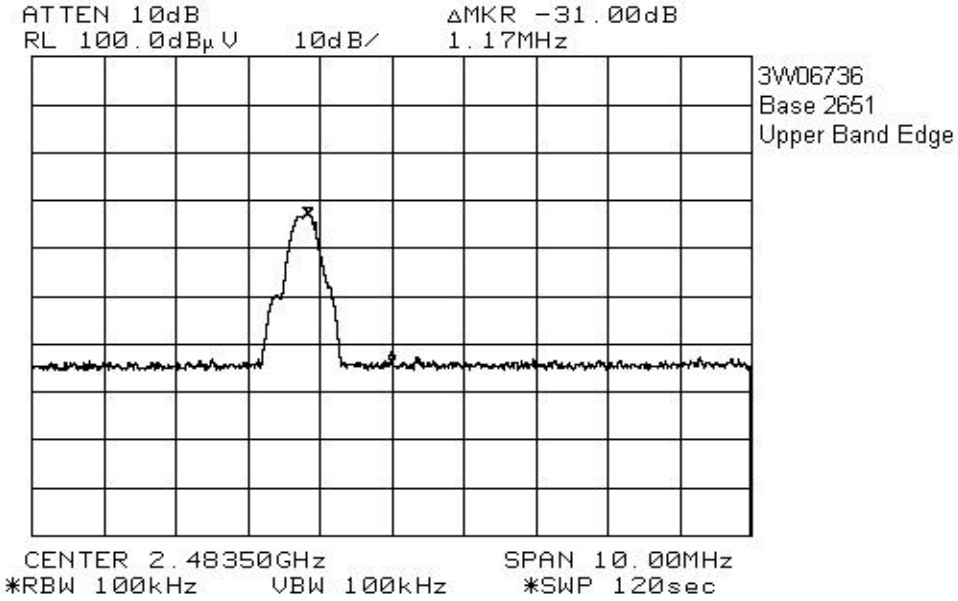
Number of Hopping Channels

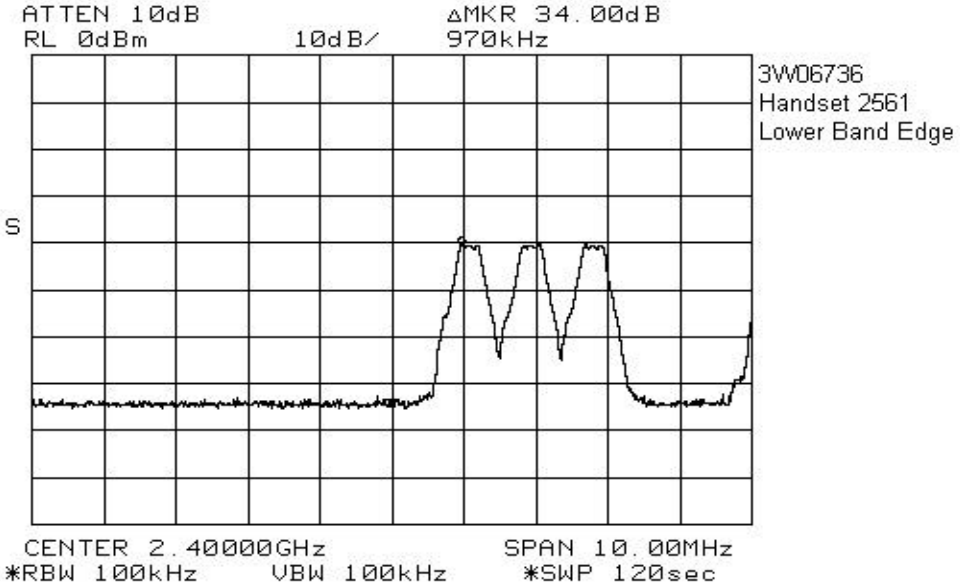




Band Edges, Hopping On



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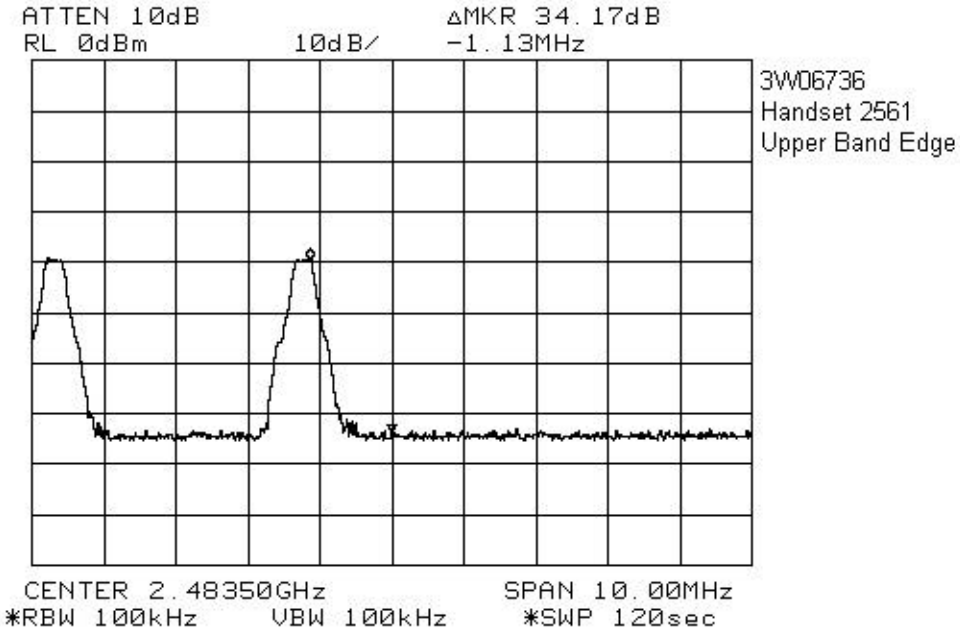
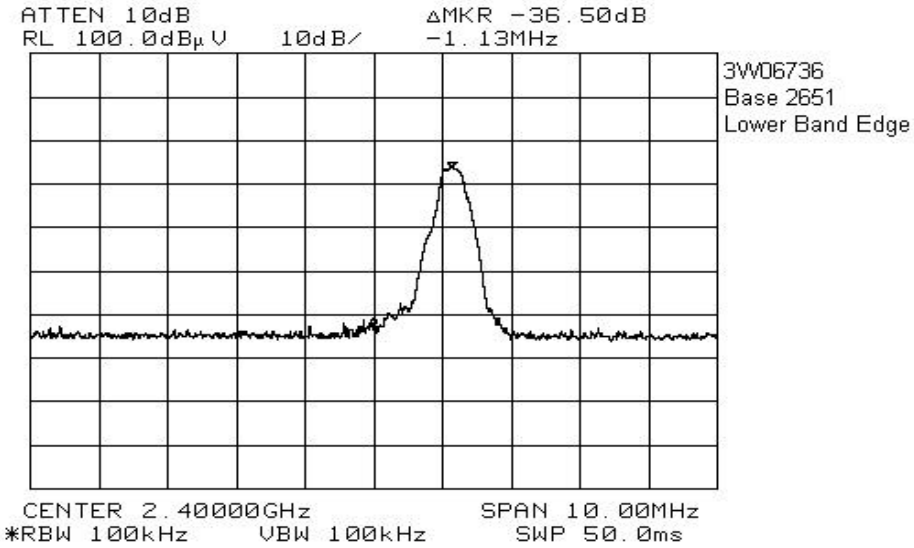
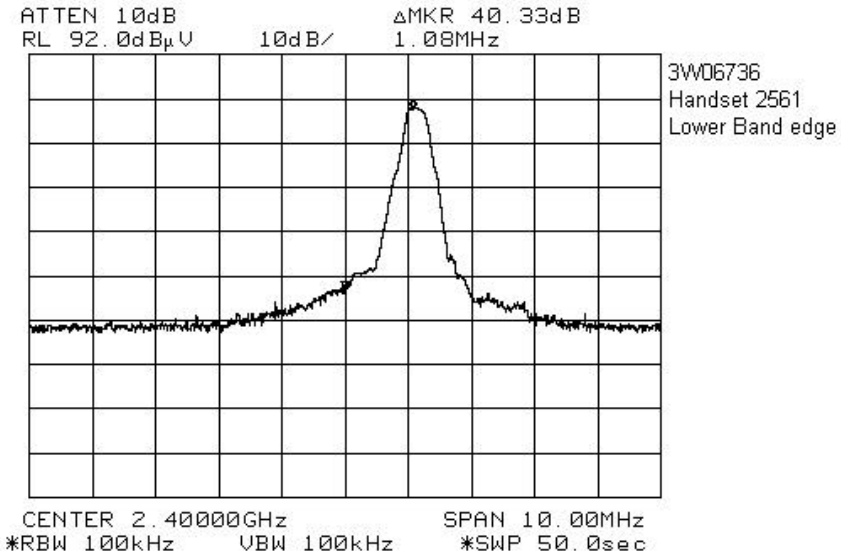
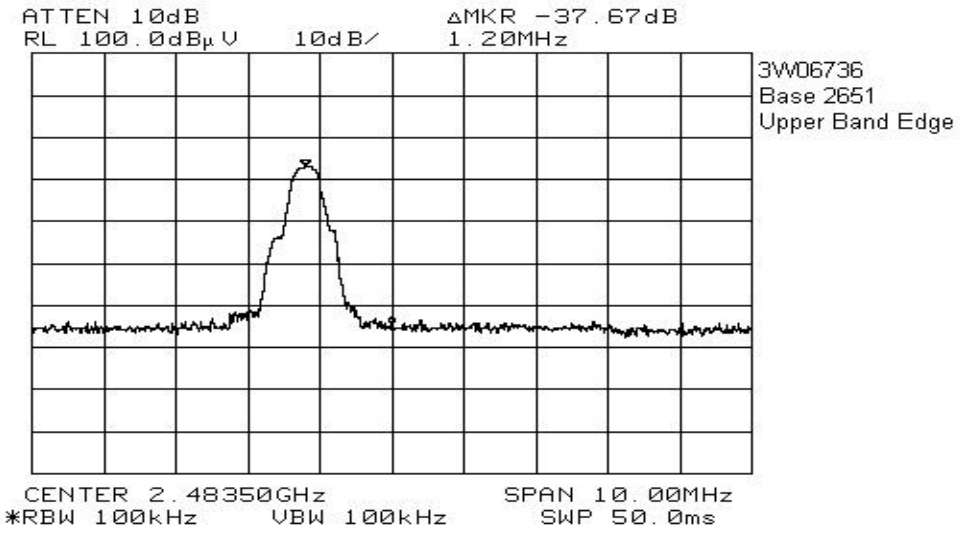
RL 0dBm
10dB/
ΔMKR 34.00dB
970kHz
3W06736
Handset 2561
Lower Band Edge
S
CENTER 2.40000GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
*SWP 120sec

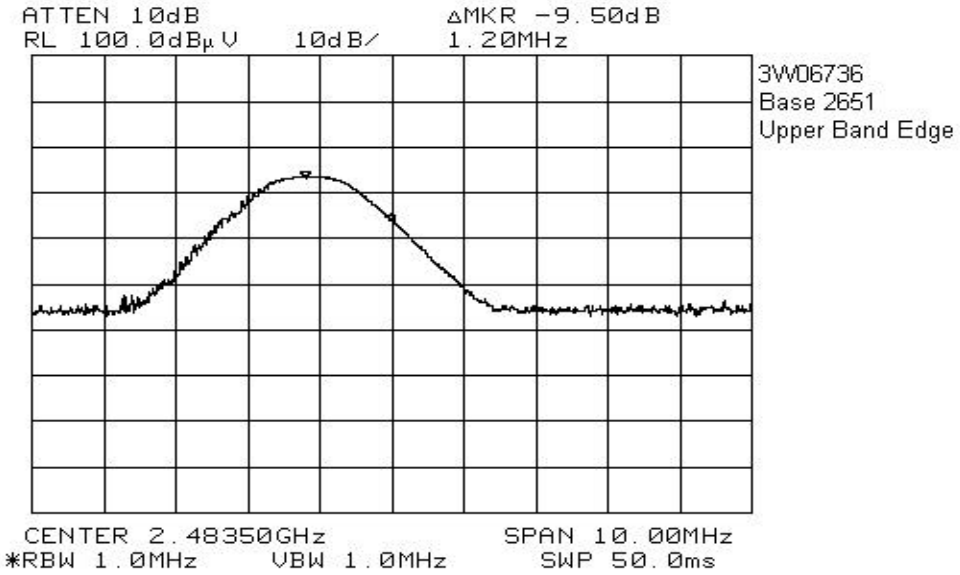

ATTEN 10dB
RL 0dBm
10dB/
ΔMKR 34.17dB
-1.13MHz
3W06736
Handset 2561
Upper Band Edge
CENTER 2.48350GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
*SWP 120sec

Band Edge, Hopping Off

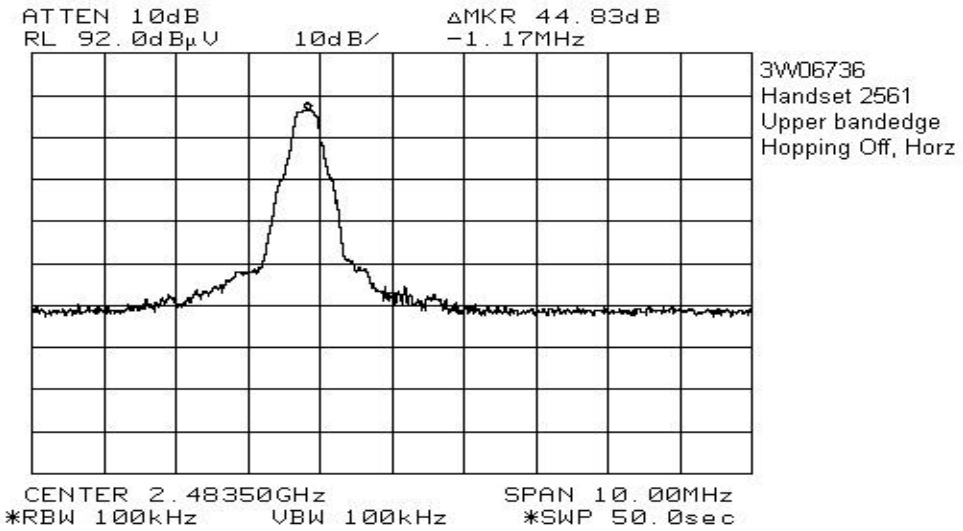


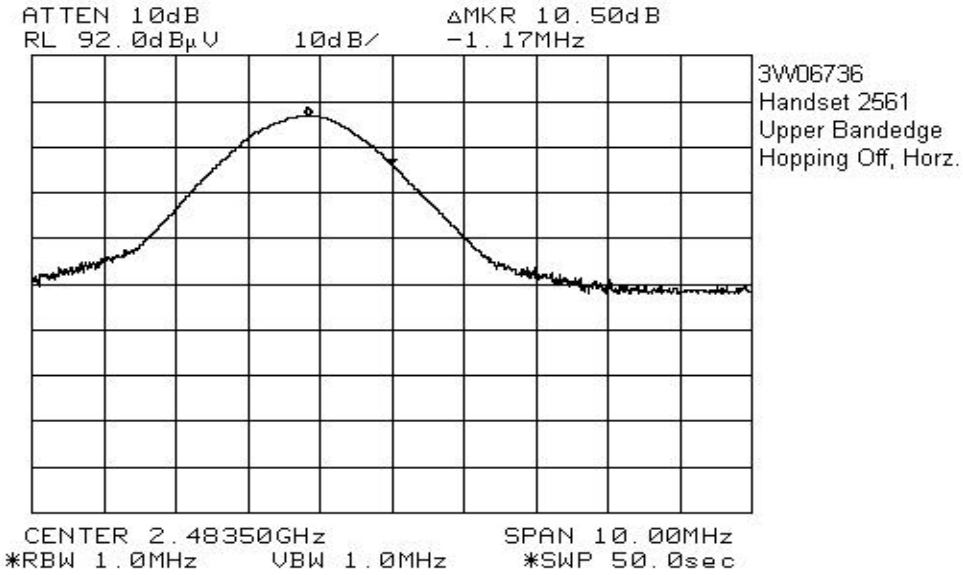






Field Strength at Band Edge: 108.5dBuv/m@3m-9.5 = 99.0dBuV/m@3m
Marker Delta, 100kHz RBW = 37.7 dB
Therefore:
Peak Fields Strength: 99.0dBuV/m@3m - 37.7dB = 61.3 dBuV/m@3m
Average Field Strength: 61.3dBuV/m@3m – 20 dB = 41.3 dBuV/m@3m

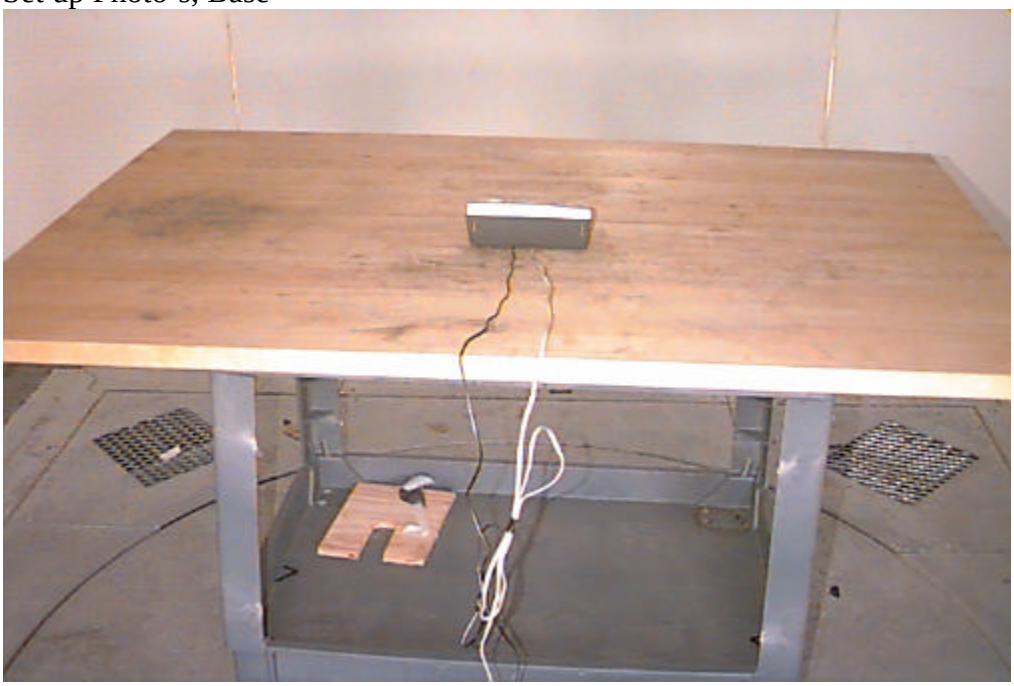




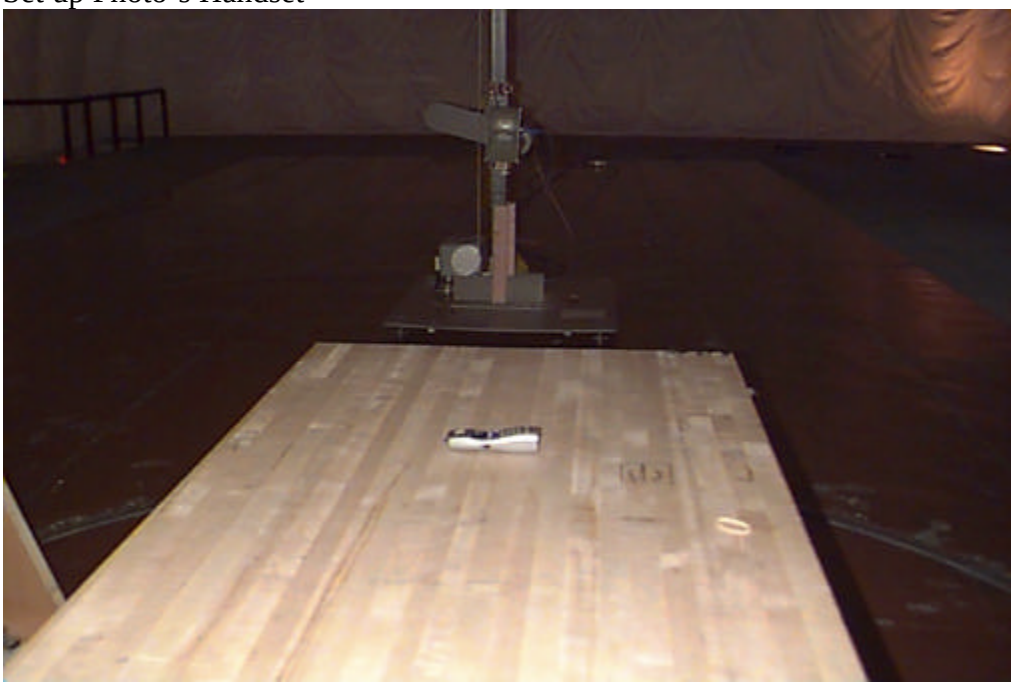
Field Strength at Band Edge: 116.5dBuV/m@3m-10.5 = 106.0dBuV/m@3m
Marker Delta, 100kHz RBW = 44.8 dB
Therefore:
Peak Fields Strength: 106.0dBuV/m@3m – 44.8dB = 61.2dBuV/m@3m
Average Field Strength: 61.2 dBuV/m@3m – 20 dB = 41.2 dBuV/m@3m

Set up Photo's, Digital Emissions

Set up Photo's, Base

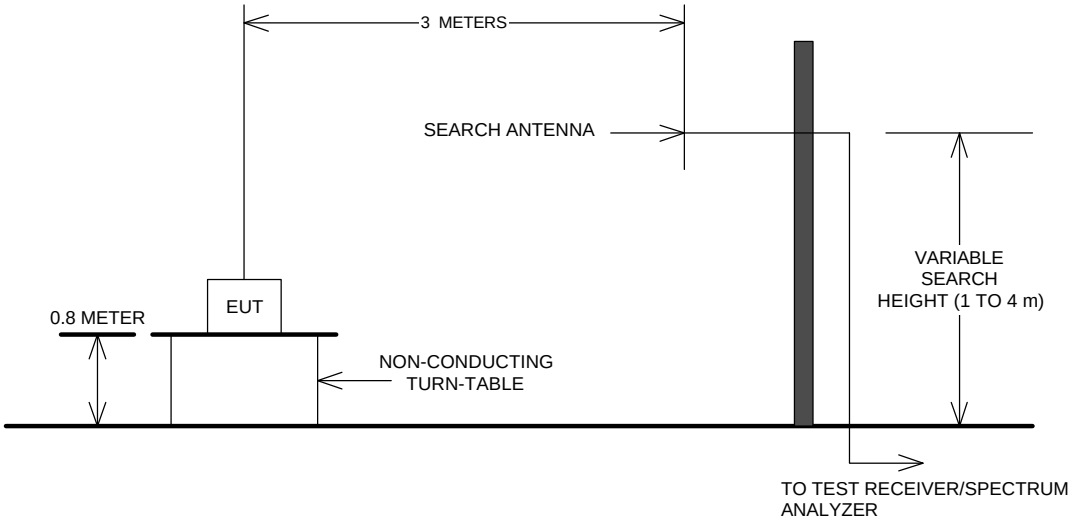


Set up Photo's Handset



Section 7. Block Diagrams

Test Site For Radiated Emissions

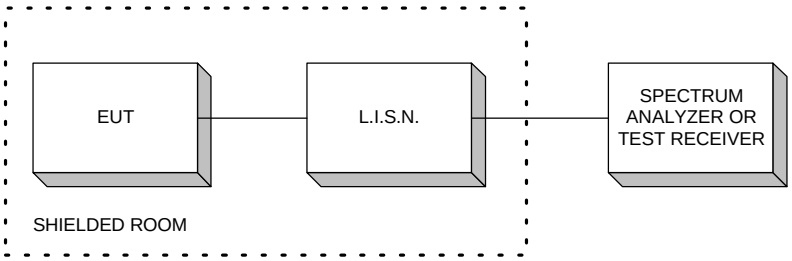


<u>Below 1 GHz</u>
Peak detector.
RBW = 100 kHz

<u>Above 1 GHz For Peak Emission Levels</u>
Peak detector
RBW = 1 MHz
VBW = >RBW

<u>Above 1 GHz For Average Emission Levels</u>
Peak detector
RBW = 1 MHz
VBW = 10 Hz

Conducted Emissions



Section 8. Test Equipment List

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.
1 Year	LISN	EMCO	4825/2	FA001545
1 Year	LISN(peripheral)	Tegam	95300-50	FA000986
1 Year	LISN(peripheral)	Tegam	95300-50	FA000986
1 Year	Receiver	Rohde & Schwarz	ESH3	FA000872
Extended	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309
Extended	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA000975
1 Year	Biconical (1) Antenna	EMCO	3109	FA000805
1 Year	1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498
1 Year	2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496
1 Year	4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497
COU	5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409
1 Year	Log Periodic Antenna #1	EMCO	LPA-25	FA000477
1 Year	Spectrum Analyzer	Hewlett-Packard	8565E	FA000981
1 Year	Horn Antenna #3	EMCO	3115	FA001451
1 Year	Horn Antenna #1	EMCO	3115	FA000649
1 Year	Pre-Amplifier 1- 26.5 GHz	Hewlett-Packard	HP 8449	FA001761

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair