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FCC PART 73

AND IC BETS-4

TEST REPORT

APPLICANT	Nicom USA Inc.
	2626 Southport Way Suite B
	National City, CA 91950
FCC ID	RMYNT15FP06
IC CERTIFICATION	4788A-NT15
MODEL NUMBER	NT15
PRODUCT DESCRIPTION	TV TRANSMITTER
DATE SAMPLE RECEIVED	June 26, 2006
DATE TESTED	June 30, 2006
TESTED BY	Mario R. de Aranzeta C.E.T.
APPROVED BY	Mario R. de Aranzeta
TIMCO REPORT NO.	1334AUT6 TestReport.doc
TEST RESULTS	☒ PASS ☐ FAIL

TABLE OF CONTENTS

GENERAL INFORMATION

EUT SPECIFICATION

The test results relate only to the items tested.		
FCC ID	RMYNT15FP06	
Model Number	NT15	
IC Cert #	4788A-NT15	
Product Description	TV TRANSMITTER	
Operating Frequency	477 MHz	
Max. output power	15 W	
Type of Modulation	6M25C3F (NTSC format)	
EUT Power	*Primary Power*	220 Vac/60Hz
	Secondary Power	110 Vac/ 60 Hz
Test Item	☐ Prototype	
	☐ Pre-Production	
	☒ Production	
Type of Equipment	☒ Fixed	
	☐ Mobile	
	☐ Portable	
Antenna	NONE	
Antenna Connector	DIN	
Modifications to DUT	None	
Test Exercise	Continuous transmit mode of operation	
Test Standards	ANSI C63.4-2003	

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Biconnical Antenna	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Biconnical Antenna	Eaton	94455-1	1096	CAL 10/11/06	10/11/08
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Tan Tower Quasi-Peak Adapter	HP	85650A	330A01690	CAL 12/8/05	12/8/07
Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 12/7/05	12/7/07
Tan Tower Spectrum Analyzer	HP	8566B OPT462	31388A07786 3144A20661	CAL 12/7/05	12/7/07
Tan Tower Pre-Amplifier	HP	8449B-H02	3008A00372	CAL 12/8/05	12/8/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Log-Periodic Antenna	Eaton	96005	1243	CAL 12/14/05	12/14/07

TEST PROCEDURE

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POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed. The ambient temperature of the UUT was 76°F with a humidity of 55%.

BANDWIDTH 6 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

POWER OUTPUT: The RF power output was measured at the antenna feed point using a peak power meter.

ANTENNA CONDUCTED EMISSIONS: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 76°F with a humidity of 55%.

VIDEO FREQUENCY RESPONSE

RULES PART NO.: 73.687 and BETS-4

TEST PROCEDURE: A sine wave was varied through the video range. The data recorded is relative to the 200 kHz sideband amplitude.

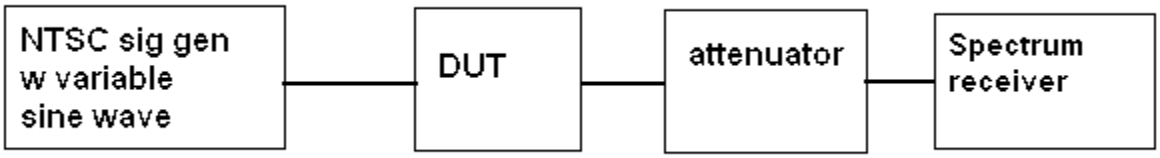
TEST DATA:

Frequency MHz	Sidebands MHz	Relative Output (dBc)
472.50	-4.75	<-60
473.07	-4.18	-57
473.67	-3.58	-46
475.25	-2	-38
476.00	-1.25	-25
476.50	-.75	-1
476.75	-.5	-1
477.25	V	
477.45	Ref	0
477.75	+.5	0
478.50	+1.25	0
479.25	+2	-.5
480.25	+3	-.2
480.83	+3.58	0
481.43	+4.18	0
482.00	+4.75	-55

Test setup and description of modulation.

An NTSC signal consisting of standard sync and a variable sine wave in the interval normally occupied by the video. The sine wave amplitude was held constant at 75% of the peak output.

The power output was held at 15 Watts peak sync with 87.5% video modulation.



VIDEO CHANNEL ATTENUATION CHARACTERISTICS

RULES PART NO.: 73.687 and BETS-4

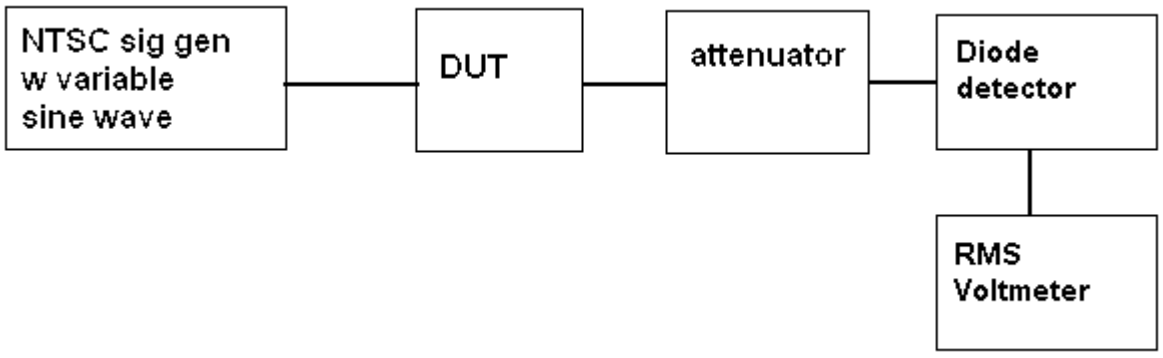
:TEST PROCEDURE: A sine wave was varied through the video range. The data recorded is relative to the 200 kHz sideband amplitude.

TEST DATA:

Modulation Freq	Detected Output dB
200 kHz	0
500 kHz	-.5
800 kHz	-1.7
1.2 MHz	-6.0
2 MHz	-6.3
3 MHz	-6.4
3.58 MHz	-6.1
4.2 MHz	-6.2

Test setup and description of modulation.

An NTSC signal consisting of standard sync and a variable sine wave in the interval normally occupied by the video. The sine wave amplitude was held constant at 75% of the peak output.



DIFFERENTIAL PULSE AND GAIN

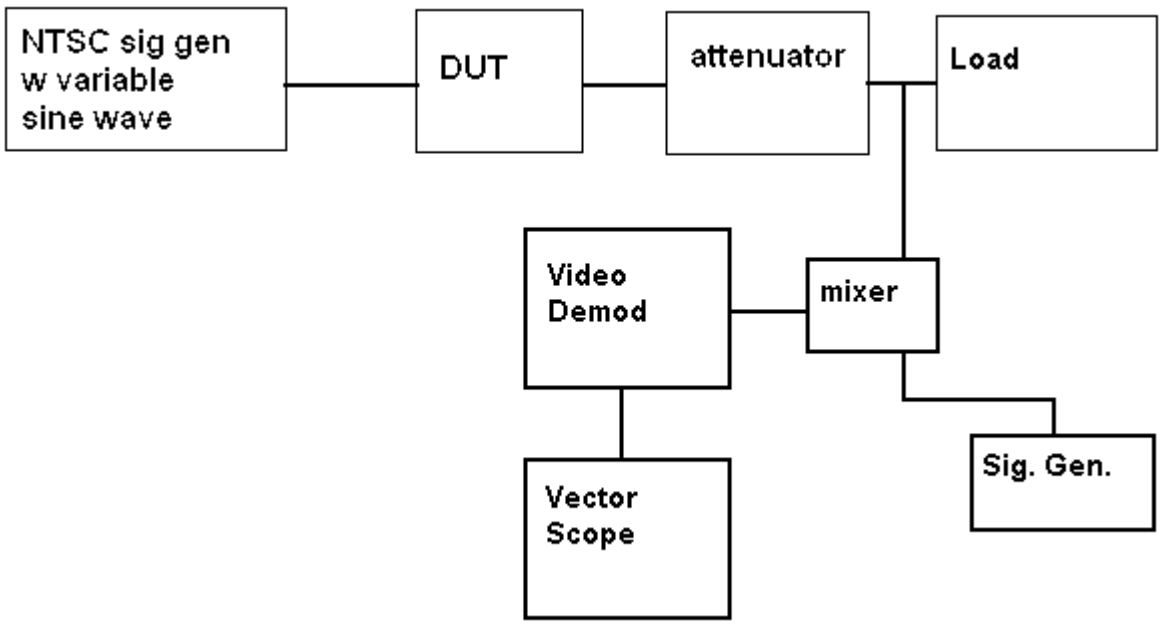
RULES PART NO.: 73.687 and BETS-4

TEST PROCEDURE: A NTSC 5 level staircase pattern with color was applied to the EUT. The data from the vector scope is presented below.

TEST DATA: Differential gain +2 %
Differential phase 0.7 °

Test setup and description of modulation.

An NTSC signal consisting of standard 5 level staircase pattern with color burst on was used as the test material source. The demod output was fed to a vector scope after the chroma was filtered off.



ENVELOPE DELAY

RULES PART NO.: 73.687(a)(5) and BETS-4

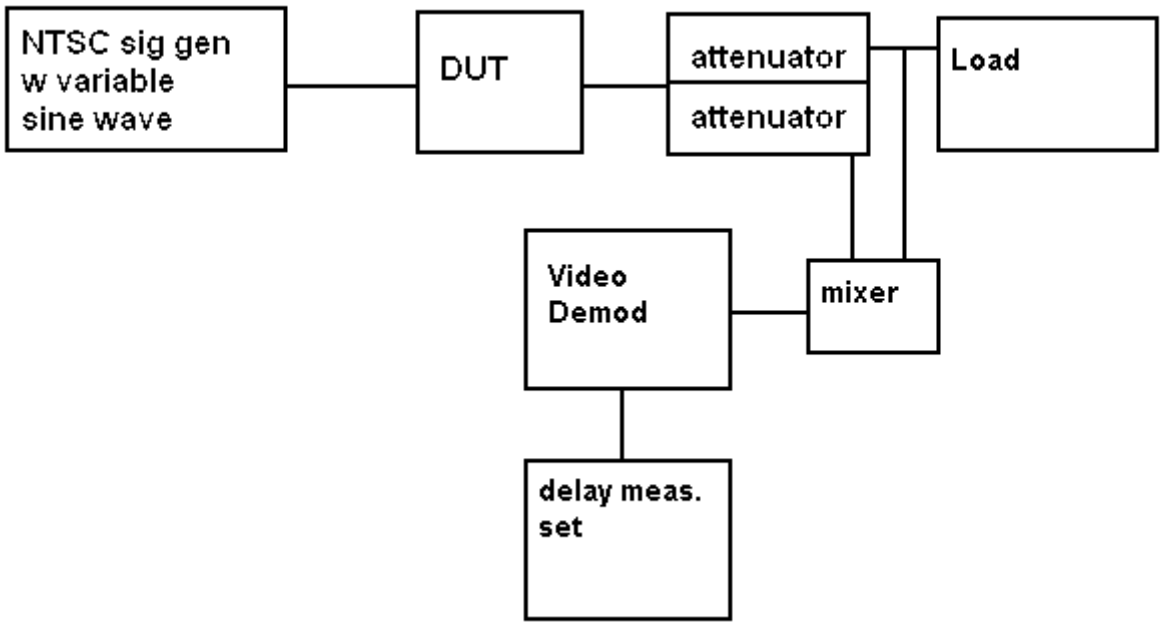
TEST PROCEDURE: An NTSC signal consisting of standard sync and a variable sine wave in the interval normally occupied by the video. The sine wave amplitude was held constant at 75% of the peak output.

TEST DATA:

Frequency MHz	Envelope delay ns
.20	0
.50	+30
1.0	+35
1.5	+30
2.1	+7
2.5	+30
3.0	+4
3.2	-60
3.4	-110
3.58	-165
4.0	-290
4.18	-340

MEASUREMENT PROCEDURE AND TEST SETUP

An NTSC signal consisting of standard sync and a variable sine wave in the interval normally occupied by the video. The sine wave amplitude was held constant at 75% of the peak output. The envelope delay was then measured.

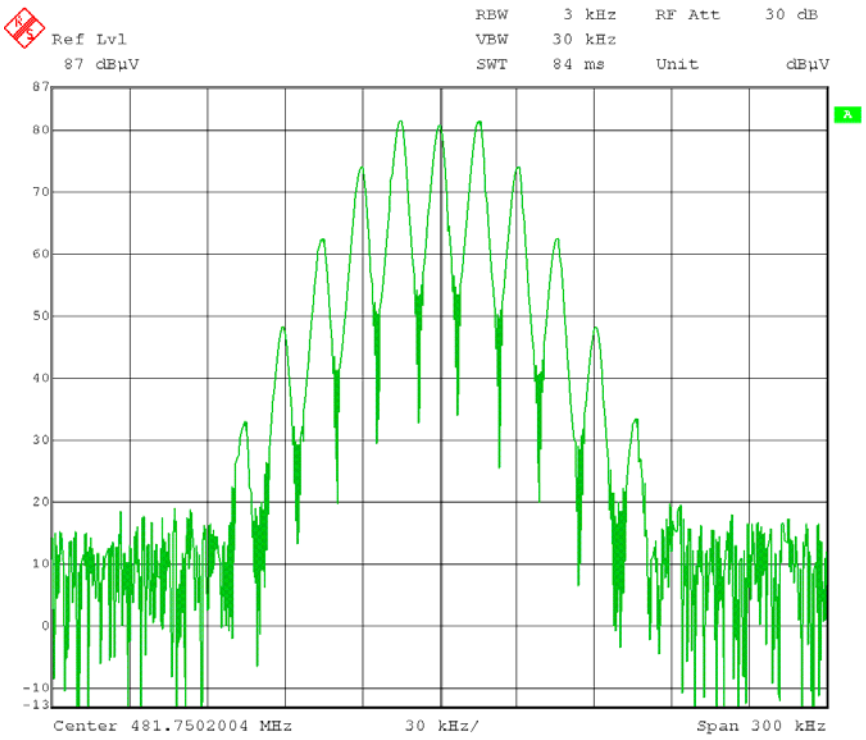


AUDIO CHANNEL OCCUPIED BW

RULES PART NO.: 2.1049 and BETS-4

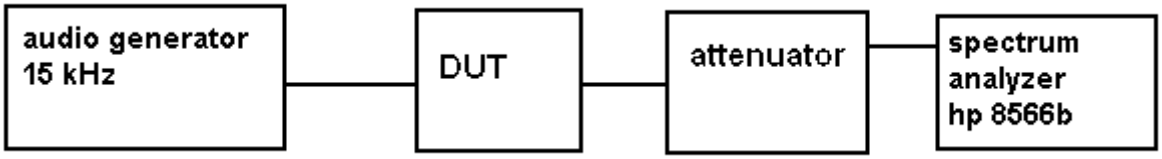
TEST PROCEDURE: A fixed sine wave of 15 kHz was applied to the audio input. A spectrum analyzer was used to capture the following:

TEST DATA:



Measurement procedure and test setup

An audio tone of 15 kHz was applied to the audio input with a deviation of 21.25 kHz (85%). The video channel was unmodulated.



AUDIO DISTORTION

RULES PART NO.: 73.687 and BETS-4

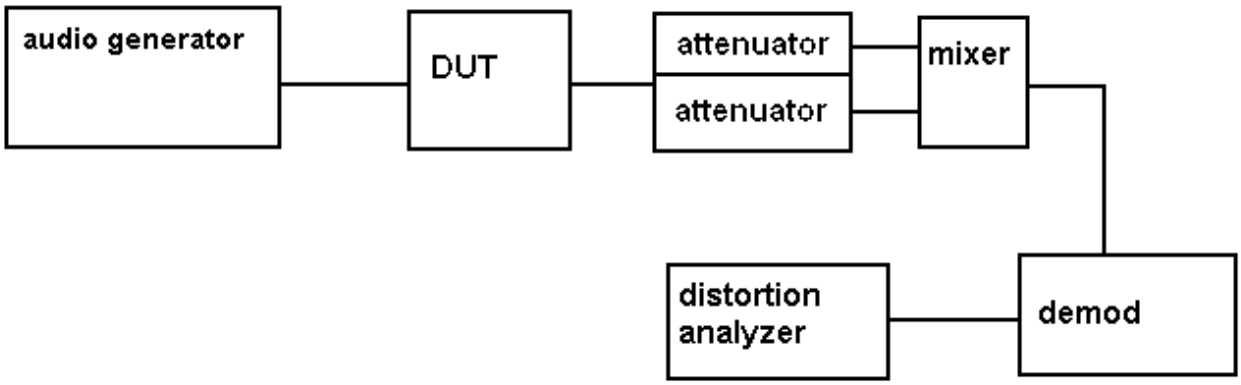
TEST PROCEDURE: A variable frequency sine wave was applied to the audio input. The video was modulated with a 10 stair stairstep waveform. The RF output was demodulated and the audio distortion measured.

TEST DATA:

Frequency Hz	% Distortion 100% modulation	50% modulation	25% modulation
50	.25	.24	.27
100	.27	.28	.29
500	.24	.26	.28
1000	.23	.24	.30
5000	.24	.28	.35
7500	.3		
10k	.33		
15k	.38		

MEASUREMENT PROCEDURE AND TEST SETUP

An variable frequency audio tone is applied to the audio input with deviations of 25, 50, and 100%. The RF output was demodulated and measured with a distortion analyzer.



AUDIO FREQUENCY RESPONSE

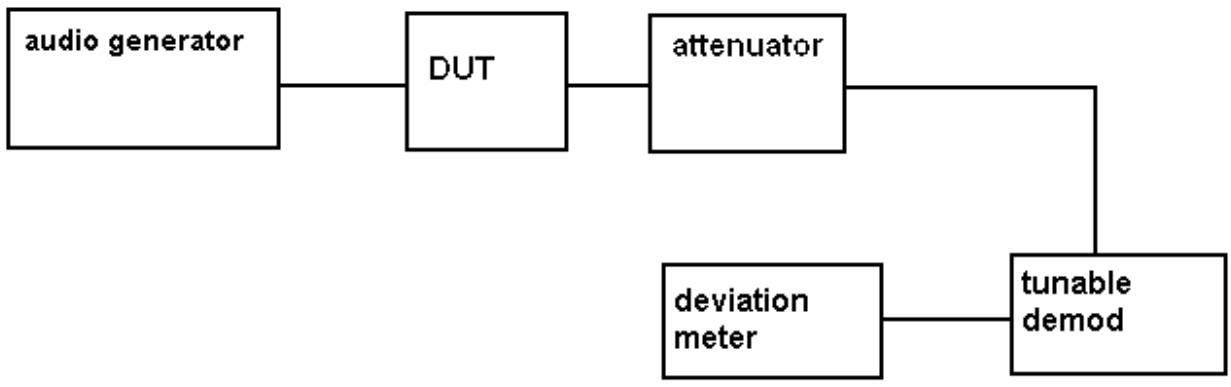
RULES PART NO.: 2.1047 (a) and BETS-4

TEST PROCEDURE: A variable frequency sine wave was applied to the audio input. The video was modulated with a 10 stair stairstep waveform. The RF output was demodulated and the audio deviation measured.

TEST DATA:

Frequency Hz	Relative to 1kHz 100% modulation	50% modulation	25% modulation
50	-2	-2	-2
100	-1	-1.5	-1.5
500	-1	-1	-1
1000	0	0	0
3000	+2.7	+3	+3.1
5000	+5.5	+6	+6.5
7500	+10	+10	+9.9
10k	+11	+11	+11.5
15k	+15	+15	+15

Measurement procedure and test setup



AUDIO CHANNEL RESIDUAL AM NOISE

RULES PART NO.: 2.1047 (a) and BETS-4

TEST PROCEDURE: A fixed frequency sine wave (400 Hz)was applied to the audio input. The video was unmodulated. The RF output was demodulated and the audio distortion measured. The AM residual noise was measured using a R&S ESIB 40 spectrum receiver.

TEST DATA: The AM residual noise was >60 dB down.

AUDIO CHANNEL RESIDUAL FM NOISE (S/N)

RULES PART NO.: 2.1047 (a) and BETS-4

TEST PROCEDURE: A fixed 400 Hz sine wave was applied to the audio input. The video was unmodulated. The RF output was demodulated and the audio turned on and off. The FM residual noise was measured using a R&S ESIB 40 spectrum receiver.

TEST DATA: FM residual noise was > 65 dB down.

FREQUENCY STABILITY

RULES PART NO.: 2.1047 (a) and BETS-4

TEST PROCEDURE: The video was unmodulated.
The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15 second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15 second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 degrees C.

TEST DATA:

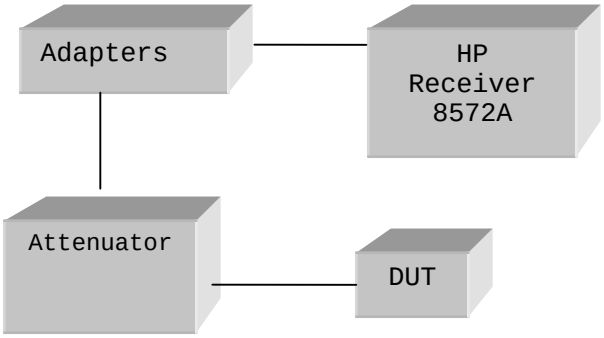
	Data		PPM
-30C	477.250898		1.88
-20C	477.250461		0.97
-10C	477.250084		0.18
0C	477.249905		-0.20
10C	477.249826		-0.36
20C	477.249757		-0.51
30C	477.249537		-0.97
40C	477.249203		-1.67
50C	477.248985		-2.13

SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

RULES PART NO.: 2.1047 (a) and BETS-4

REQUIREMENTS: 60 dBc

Method of Measuring:



NOTE: THE SPECTRUM WAS CHECKED TO THE TENTH HARMONIC.

TEST DATA:

TF	EF	dB below carrier
477.260	**477.260**	**0.0**
	954.520	**64.8**
	1431.780	**71.6**
	1909.040	**94.5**
	2386.300	**90.9**
	2863.560	**97.8**
	3340.820	**98.3**
	3818.080	**98.3**
	4295.340	**98.7**
	4772.600	**99.3**

FIELD_STRENGTH_OF_SPURIOUS_EMISSIONS

RULES PART NO.: 73.687 and BETS-4

REQUIREMENTS: Harmonics shall be a minimum of 60 dB below the video carrier.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m.

METHOD OF MEASUREMENT: The procedure used was ANSI C63.4-2003.
Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

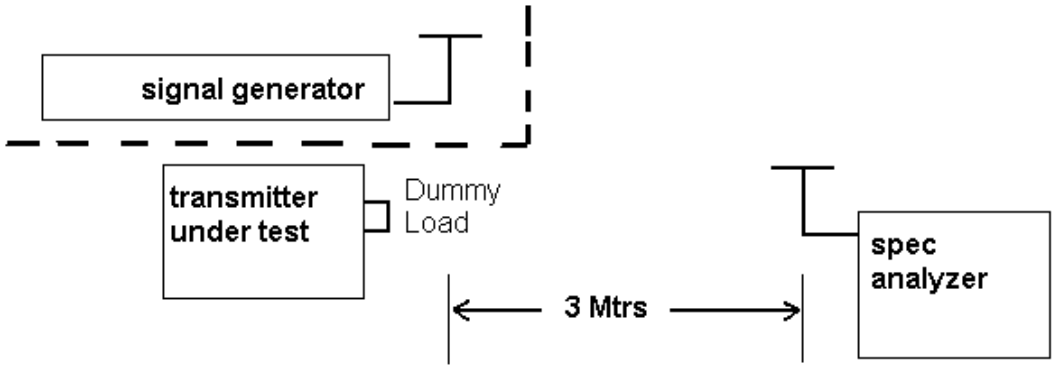
Equipment placed 80cm above ground on a rotatable platform.

Harmonics were checked through the 10th harmonic*

TEST DATA:

Emission Frequency MHz	Ant. Polarity	dB below Carrier (dBc)
477.26	0	0
954.52	V	101.32
1431.78	H	100.525
1909.04	H	93.587
2386.30	H	105.017
2863.56	V	103.856
3340.82	H	106.112
3818.08	H	105.448
4295.34	V	102.79
4772.60	H	101.478

TEST SETUP


signal generator
transmitter under test
Dummy Load
3 Mtrs
spec analyzer