

<b>TEST REPORT</b>	
<b>56730-2 TRF EMC</b>	
<i>ITU Radio Regulations: Volume 2, Appendix 2 &amp; 3, (WRC 2000).</i>	
<b>Report Reference No.</b> .....	56730-2 TRF EMC
<b>Tested by (name+signature)</b> .....	G. Curioni 
<b>Witnessed by (name+signature)</b> .....	Not applicable
<b>Supervised by (name+signature)</b> .....	Not applicable
<b>Approved by (name+signature)</b> .....	P. Barbieri 
<b>Date of issue</b> .....	2006-01-04
<b>Testing Laboratory</b> .....	<b>Nemko Spa</b>
<b>Address</b> .....	Via Trento e Trieste, 116 I-20046 Biassono MI (Italy)
<b>Testing location/ procedure</b> .....	Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing methods <input type="checkbox"/> Non-standard testing methods <input type="checkbox"/> SINAL accredited test report <input type="checkbox"/>
<b>Testing location/ address</b> .....	Nemko Spa - Via Trento e Trieste, 116 - I-20046 Biassono MI (Italy)
<b>Applicant's name</b> .....	Hurma Elektronik Sanayi ve Ticaret Koll. Sti.
<b>Address</b> .....	Eskoop Sanayi Sitesi C5 Blok No: 243 Organize sanayi Bölgesi İkitelli/İstanbul/Türkiye
<b>Test specification:</b>	
<b>Standard</b> .....	ITU Radio Regulations: Volume 2 ,appendix 2 & 3, (WRC 2000)
<b>Test procedure</b> .....	Nemko PT 177
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	TRF EMC SpA
<b>TRF Originator</b> .....	Nemko Spa
<b>Master TRF</b> .....	2005-04
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<b>Test item description</b> .....	Analogue TV Broadcasting service transmitter
<b>Trade Mark</b> .....	HURMA
<b>Manufacturer</b> .....	Hurma Elektronik Sanayi ve Ticaret Koll. Sti
<b>Model/Type reference</b> .....	TVV 1000
<b>Ratings</b> .....	198 – 242 Vac, 50 Hz, 1000 W Peak Sync.

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## EMC -- TEST REPORT

<b>Test Report No. :</b> <b>56730-2 TRF EMC</b>	2006-01-04 Date of issue
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Type / Model : TVV 1000 s/n 010605

Equipment : The E.U.T. was composed of a single unit (cabinet).[including: power supply, TV TX exciter (TVV 200), power amplifier (1000 W), RF output filter].

**Applicant** : Hurma Elektronik Sanayi ve Ticaret Koll. Sti.

Address : Eskoop Sanayi Sitesi C5 Blok No: 243  
Organize sanayi Bölgesi İkitelli/İstanbul/Türkiye

**Manufacturer** : Hurma Elektronik Sanayi ve Ticaret Koll. Sti.

Address : Eskoop Sanayi Sitesi C5 Blok No: 243  
Organize sanayi Bölgesi İkitelli/İstanbul/Türkiye

<b>Test Result</b> according to the standards on page 5:	<b>Positive</b>
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The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## CONTENTS

• Equipment under test	Page 4 of 14
• Frequency identification	Page 5 of 14
• Reference documents	Page 5 of 14
• List of measurements	Page 6 of 14
• Test results	Page 7/11 of 14
• Test equipment and ancillaries used for tests	Page 12 of 14
• Additional information supplementary to the test report	Page 13 of 14
• Photos	Page 14 of 14

## 1 - EQUIPMENT UNDER TEST (E.U.T.)

### 1.1 - Product description:

- Model / (s/n) : TVV 1000 / s.n. 010605

### 1.2 - E.U.T. specifications:

- E.U.T. use : base station for fixed use
- Antenna connector : 7/16, 50  $\Omega$
- Antenna type : external antenna (not provided)

#### 1.2.1 – Electric characteristics:

- Rated voltage : 220 V, 3 phase
- Voltage supply source : AC mains
- Rated power : 3500 W

#### 1.2.2 – RF characteristics:

- RF rated power @ 50  $\Omega$  : 1000 W peak sync.
- Transmission frequency : Ch 32 (559.250 MHz)
- Assigned band : IV – V (UHF)
- Operating frequency range : 470 ÷ 860 MHz
- Channel step : 8 MHz
- Necessary bandwidth : 7.607 MHz
- Colour/system : PAL/ B,G
- ITU designation : VISION C3F / SOUND 1 F3E
- Video IF : 38.9 MHz
- Local osc. : higher

## FREQUENCY IDENTIFICATION

Each equipment, whether one or more submitted for tests, shall carry clear identification (such as a serial number), together with the frequency identification displayed on the equipment.

Equipment identification, e.g. serial number	Channel No. (if applicable)	Transmit Nominal Freq. (MHz)	Audio TX Freq. (MHz)
TVV 1000	32 anl	559.250	564.750
	-	-	-

*Analog only  $F_v$  [MHz] = 471.25 + 8 k with k = any integral number 0 to 49 (B-IV, B-V)*

## REFERENCE DOCUMENTS

- Nemko PT 124:  
General procedure to verify the technical characteristics of radio equipment.
- I T U Radio Regulations: Volume 2, Appendix 2 & 3, (WRC 2000).
- Rec. I T U-R SM.329-10  
Unwanted emissions in the spurious domain

**LIST OF MEASUREMENTS**

**I T U Radio Regulations: Appendix 2 & 3, (RR A2, RR A3).**

Clause	Parameter	Test result
RR A2 Section II	Transmitter frequency tolerance	Passed
RR A3	Transmitter spurious emission (conducted)	Passed
RR A3 Section II	Transmitter spurious emission (radiated)  Guidance: ITU-R SM.329	Passed

**Remarks (Test result)**

- Declared = the parameter is compliant according to the Manufacturer's declaration.
- Passed = the E.U.T. complied with the test specification limits.
- Failed = the E.U.T. did not comply with the test specification limits.
- N.A. = the test is not applicable to the E.U.T..

Ambient temperature: 20 °C      Relative humidity: 40 %

**TRANSMITTER FREQUENCY TOLLERANCE**  
(ITU RR A2)

Reference: local oscillator frequency at ambient temperature

<i>Test conditions</i>		<i>Frequency error (Hz)</i>		
		-	CH 32 (analog)	CH 32 (analog)*
T <sub>nom</sub> (20) °C	V <sub>nom</sub> (220V)	-	Passed	-
-	V <sub>min</sub> (198V)	-	Passed	-
-	V <sub>max</sub> (242V)	-	Passed	-
-	-	-	-	-
-	-	-	-	-
Maximum freq. error (Hz)		-		-
<i>Measurement uncertainty</i>		$\pm 1 \times 10^{-11}$		

\* With connection to an external reference oscillator. NOT AVAILABLE.

**LIMITS** (ITU RR A2 table AP2-4)

Vision and sound carriers under normal and extreme test conditions:

<i>Rated power</i>	<i>Frequency error NORMAL OFFSET</i>	
	<i>Normal test conditions</i>	<i>Extreme test conditions</i>
Up to 100W	500 Hz	-
-	-	-

<i>Rated power</i>	<i>Frequency error PRECISION OFFSET</i>	
	<i>Normal test conditions</i>	<i>Extreme test conditions</i>
Up to 500W	± 1 Hz	± 1 Hz (AC Mains ± 10 %)
Above 500W	± 1 Hz	± 1 Hz (AC Mains ± 2 %)

Ambient temperature: 20 °C

Relative humidity: 40 %

**TRANSMITTER SPURIOUS EMISSION (CONDUCTED)**

( ITU RR A3)

E.U.T.: SYSTEM

Power level at which the measurement has been performed: 1000 W Peak sync.

According to RR A3 table II (P: mean power in W)

For digital: P in W RMS, for analogue: P in W Peak sync. minus 2.5 dB

Frequency Range Of spurious emissions (MHz)	Measurement BANDWIDTH (kHz)	Spurious Emissions Measured Level (dBm)	Spurious Emissions Limit Level (dBm)
0.019 to 0.150	1	< -70	≤ -2.5 dBm
0.150 to 30	10	< -70	≤ -2.5 dBm
30 to Out of B. E.	100	< - 75	≤ -2.5 dBm
Out of Band Emission	-	-	-
Out of B, E. to 1000	100	< - 73	≤ -2.5 dBm
> 1000	1000		≤ -2.5 dBm
2 <sup>nd</sup> harmonic		-35	
3 <sup>rd</sup> harmonic		-28	
4 <sup>th</sup> harmonic		-14	
<i>Measurement uncertainty: ± 1.5 dB</i>			

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver.  
See ITU RR A3 AP3-4 par. 10.

RBW [kHz]	Frequency range [MHz]
1	0.009 ÷ 0.150
10	0.150 ÷ 30
100	30 ÷ 1000
1000	> 1000

**LIMITS** (RR A3 section II, par. 10, table II )

<i>Broadcast TV Spurious emission limit 9 kHz ≤ out of band ≤ 110 GHz</i>
46+10log(P), or 60 dBc whichever is less stringent
Without exceeding the absolute mean power level of 1mW for VHF stations or 12 mW for UHF stations. However, greater attention may be necessary on a case by case basis.

**Note:**

According to RR A3 table II (P: mean power in W)  
For digital: P in W RMS, for analog: P in W Peak sync. minus 2.5 dB

**Out of band emission:  $F_c \pm 250\%$  of necessary bandwidth**  
According to ITU RR A3 AP3-4 par. 11.

**TRANSMITTER SPURIOUS EMISSION (RADIATED)**

Power level at which the measurement has been performed: 1000 W Peak sync.

According to ITU vol. II RR A3 table II & ITU-R SM.329-10 table 2 (P: mean power in W)  
 For digital: P in W RMS, for analogue: P in W Peak sync. minus 2.5 dB

<b>Frequency Range of spurious emissions (MHz)</b>	<b>Measurement BANDWIDTH (kHz)</b>	<b>Spurious Emissions Measured Level (dBm)</b>	<b>Spurious Emissions Limit Level (dBm)</b>
<b>30 to out of B. E.</b>	100	Ground noise	<b>≤ -2.5 dBm</b>
<b>out of Band Emission</b>	-	-	-
<b>out of B. E. to 1000</b>	100	Ground noise	<b>≤ -2.5 dBm</b>
<b>Above 1000</b>	1000	-	<b>≤ -2.5 dBm</b>
2 <sup>nd</sup> harmonic	1000	-13	<b>≤ -2.5 dBm</b>
3 <sup>rd</sup> harmonic	1000	-35	<b>≤ -2.5 dBm</b>
4 <sup>th</sup> harmonic	1000	-27	<b>≤ -2.5 dBm</b>
5 <sup>th</sup> harmonic	1000	Ground noise	<b>≤ -2.5 dBm</b>

*Measurement uncertainty: ± 1.5 dB*

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver.  
See ITU-R SM.329-10 par 4.1.

RBW [kHz]	Frequency range [MHz]
1	0.009 ÷ 0.150
10	0.150 ÷ 30
100	30 ÷ 1000
1000	> 1000

**LIMITS** (ITU-R SM.329-10 table 2 Category A )

<i>Broadcast TV Spurious emission limit lower limit ≤ Out of band ≤ upper limit</i>
46+10log(P), or 60 dBc whichever is less stringent
Without exceeding the absolute mean power level of 1mW for VHF stations or 12 mW for UHF stations. However, greater attention may be necessary on a case by case basis.

**Note:**

According to RR A3 table II (P: mean power in W)

For digital: P in W RMS, for analogue: P in W Peak sync. minus 2.5 dB

**Frequency range for measurement of unwanted emissions:**

According to ITU-R SM.329-10 table 1.

Fundamental frequency range Fc	Frequency range of measurements	
	Lower limit	Upper limit
9 kHz – 100 MHz	9 kHz	1 GHz
100 MHz – 300 MHz	9kHz	10 <sup>th</sup> harmonic
300 MHz – 600 Mhz	30 MHz	3 GHz
600 MHz – 5.2 GHz	30 MHz	5 <sup>th</sup> harmonic
5.2 GHz – 13 GHz	30 MHz	26 GHz
13 GHz – 150 GHz	30 MHz	2 <sup>nd</sup> harmonic
150 GHz – 300 GHz	30 MHz	300 GHz

**Out of Band emission:**

**Definition:** ITU RR 1. No. 1.144

**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS  
(provided by the manufacturer)**

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

<i>Equipment</i>	<i>Model / type</i>	<i>Manufact.</i>	<i>Serial No.</i>
Signal generator	SFF	R&S	177
TV Demodulator	AMFS	R&S	155
Video Analyzer	UAF	R&S	156
Video Measurement	1781 R	Tektronix	392
Spectrum analyzer	FSEK	R & S	88255/905
Level Meter	8992A	H.P.	2745
Counter	53181	H.P.	4282
TV Network Analyzer	SWKF	R&S	4247
TV test receiver	EFA	R&S	4828
Turn table	HCT	R&S	835 803/03
Antenna mast	HCT	R&S	836 529/05
Controller	HCT	R&S	836 620/7
Semi-anechoic chamber	EMC 1010	ExtraVEGA-CMB-E&C	2020
Spectrum Analyzer	8560E	H.P.	4804
Power Meter	E4419B	AGILENT	4816
Power Sensor	8482A	H.P.	4810
Dummy Load *	BN 531692	Spinner	D-63472
Bilog antenna 30-1000MHz	CBL6111A	Chase	1769
Log Periodic Antenna 1 ÷ 18 GHz	HL-025	Rohde & Schwarz	351 387/002

\* Client's property.

**ADDITIONAL INFORMATION SUPPLEMENTARY TO THE TEST REPORT**

*Page No.*

*Remarks*

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PHOTOS

