

EQUIPMENT UNDER TEST :

APPARECCHIO IN PROVA :

SUPERETHERODYNE RECEIVER

Mod. WALLY4PLUS

DERIVED MODELS :

MODELLI DERIVATI :

**WALLY4, WALLY2, WALLY1, WALLY4R,
WALLY2R, WALLY1R, WALLY NC**

REFERENCE STANDARDS :

NORME DI RIFERIMENTO :

FCC 47CFR Part 15

CUSTOMER:

RICHIEDENTE:

- **Dept. / Firm :** V2 ELETTRONICA S.p.A.
Ente / Società:
- **Mr.:** MINETTI
Sig.:
- **Address:** C.SO PRINCIPI DI PIEMONTE, 63 – 12035 RACCONIGI (CN) - ITALY
Indirizzo:
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Telefono : *Fax :* *e-mail*

Site of test execution:

Località esecuzione prove:

Via Campagna, 92 - 22020 Gaggino Faloppio (CO) - Italy

Date of test samples receipt:

Data ricevimento campioni:

10/10/03

Date of start test:

Data inizio prove:

13/10/03

Date of end test:

Data fine prove:

14/10/03

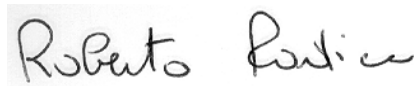
Witness to the test:

Presenti alle prove:

Nobody / Nessuno

Signature of the engineers:

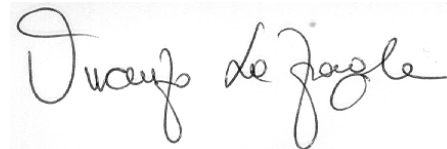
Firma esecutore prove:



R. Radice

Signature of the Laboratory Director:

Firma Direttore Laboratori:



V. La Fragola

The test results recorded in this Test Report are exclusively referred to the tested samples.

I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.

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1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 Identification

Brand name:	V2 ELETTRONICA
Equipment :	SUPERETHERODYNE RECEIVER
Model name or No. :	WALLY4PLUS
Serial number :	Not present
FCC ID :	RSK-V2-WALLY
Country of manufacturer:	ITALY

1.2 Technical data

FCC class:	Unintentional radiators, Class B
Supply voltage:	12÷24 Vac/dc
Input Power / Current :	17 mA (stand-by)
Typical usage :	WALLY is a superetherodyne receiver for external environment employ
EUT single or system:	Single
EUT dimensions :	13,2 x 2,6 x 7,4 cm.

1.3 Receiver technical data



- Working Frequency : 433,92 MHz
- Frequency Range of Operation : 433,05 ÷ 434,79 MHz

1.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test :

- None

1.5 **Ports identification**

This section contains descriptions of all signal ports and AC/DC power input/output ports, the length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connection
1	Enclosure	Plastic suurface	By pressure
2	AC power input/output ports	12÷24 Vac from external supply – Cable length not specified.	Terminals
3	DC power input/output ports	12÷24 Vdc from external supply (in alternative to AC Power Supply) – Cable length not specified.	Terminals
4	Signals ports	N° 4 N.O. Outputs. - Cable length not specified.	Terminals
<i>Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.</i>			

1.6 **Auxiliary equipment**

No auxiliary equipment

2. TEST CONDITIONS

2.1 *Operating test modes and test conditions*

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

- FCC Part 15, Subpart B

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item “Operating condition of the equipment under test” of all technical sheets of the tests (see Section 4)

<i>Operating condition</i>	<i>Description</i>
<i>#1</i>	<i>Receiver active – N° 4 Cables N.O. connected on output.</i>

2.2 *Test overview*

Sample tested is the main model of a complete set of 433,92 MHz RF receiver (see also Section 7).

The appliance is classified as “*unintentional radiator*” in conformity to FCC Part 15 Sub. A §15.201, and it is subject to “*Certification*” procedure.

The application is mainly used as remote control for automatic gate and door openers.

3. REFERENCE STANDARD FOR PERFORMED TESTS

<i>Reference standard :</i>	<i>Title :</i>
FCC Part 15 part A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)
FCC Part 15 part B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

4. SUMMARY OF TEST RESULTS

4.1 Emission tests

Port		Phenomena	Basic standard	Operating condition ¹	Result
1	Enclosure	Radiated emission	FCC Part 15	#1	Within the limit
2	AC mains Input ports	RF Disturbance voltage: • continuous	FCC Part 15	#1	Within the limit

¹ Ref. Tab. of Section 2

5. TEST RESULTS

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**TEST
1.****EMISSION OF MAINS TERMINAL DISTURBANCE VOLTAGE
(CONTINUOUS DISTURBANCE)****REFERENCE
DOCUMENT**

FCC47CFR Part 15

- **TEST SETUP:** According to reference standard
- **TEST LOCATION:** Semianechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESHS 30
Artificial Network Rohde & Schwarz Mod. ESH3-Z5

- **TESTED PORT:** AC mains
- **FREQUENCY RANGE:** 0.15 - 30 MHz
- **EMISSION LIMITS:** Section 15.107 of Standard
- **MEASUREMENT UNCERTAINTY:** Total uncertainty (k=2) ± 2.5 dB

TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 $\pm$ 3 °C
Ambient humidity :	25 - 75 %rH	38 $\pm$ 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	975 $\pm$ 50 mbar
Voltage :		12 Vac $\pm$ 3 %

OPERATING CONDITION (Rif. Section. 2) : #1

RESULT: WITHIN THE LIMIT

SCAN TABLE : Voltage Mains

Unit : dB μ V

	<u>Detector :</u>	<u>Mode :</u>
Curve 1:	MaxPeak	ClearWrite
Curve 2:	Average	ClearWrite

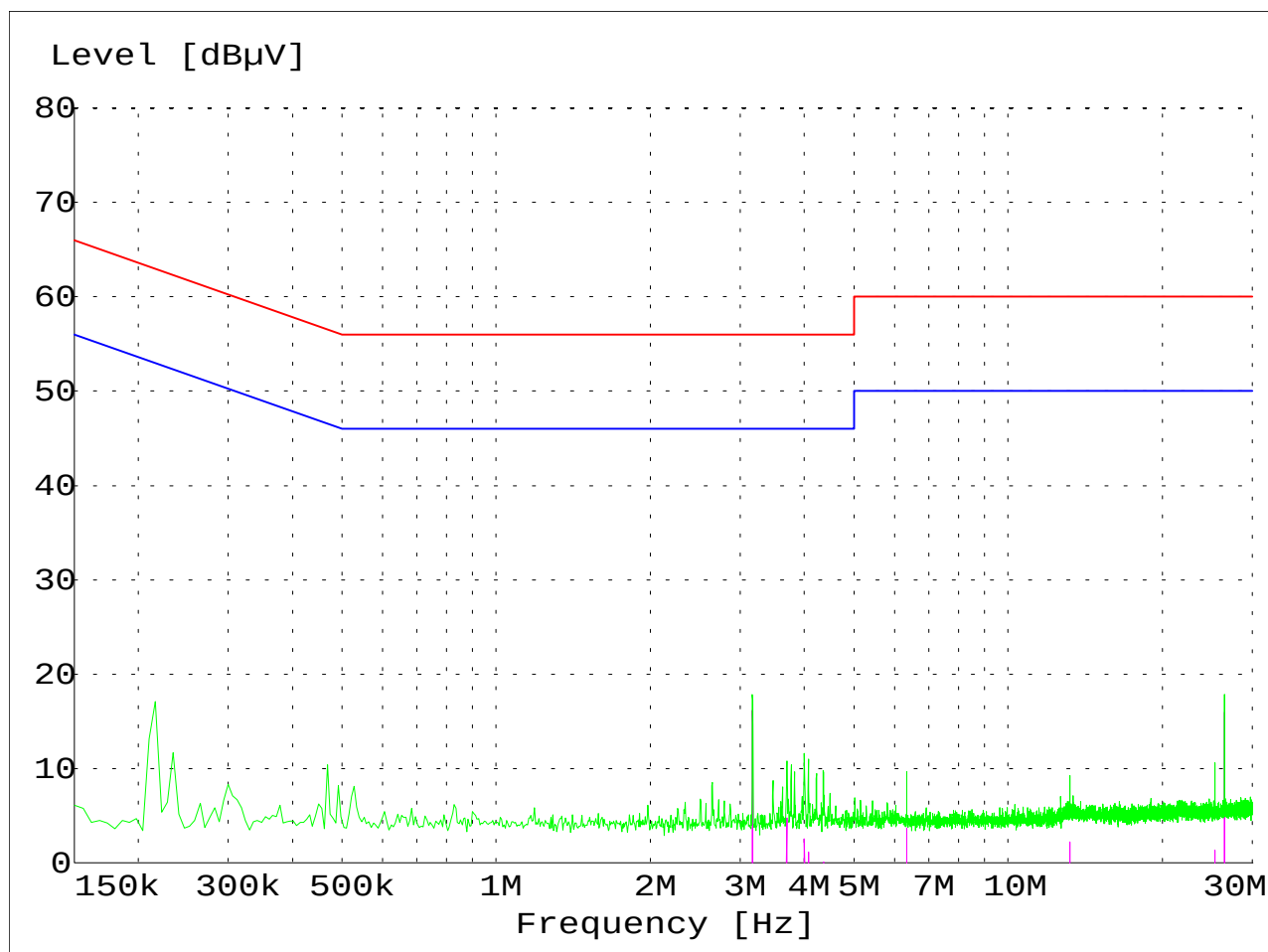
Subrange 1:

Start Frequency :	150.0 kHz		
Stop Frequency :	30.0 MHz	IF Bandwidth :	9 kHz
Measure Time :	10.0 ms	Step size :	6 kHz

Receiver :	ESHS 30	Transducer :	ESH3-Z5_PRC
Signal Path :	Path 3	System Transducer :	Rfin1-CP2/X11
Meas. Mode :	Lin	Add. Transd. 1 :	W71.03
Tracking Generator :	Off	Add. Transd. 2 :	None
Input :	1AC	Add. Transd. 3 :	None

Preamplifier :	10 dB	Demodulation :	FM Broad
RF Att. :	Coupled	Volume :	0 %
Ref. Level :	-10 dBm	Squelch :	--
Min. RF Att. :	0 dB	Option :	None
IF Att. :	0 dB		
Autorange :	On		

Curve 1 :	On	Repetition :	Single
Curve 2 :	On	Stop Mark :	On
		Stop Message :	On
		Stop Message :	Connect EUT



**TEST
2.****RADIATED EMISSION 30 - 1000 MHZ****REFERENCE
DOCUMENT**

FCC PART 15 subpart B

- **TEST LOCATION:** Semi-anechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESMI
Biconical Antenna Rohde & Schwarz Mod. HK116
Log-periodic Antenna Rohde & Schwarz Mod. HL223
Chase Antenna Mod. CBL 6111 A
- **TESTED PORT:** Enclosure
- **EMISSION LIMITS:** Acc. to Section 15.109 of reference document
- **UNCERTAINTY OF MEASURE:** Combined uncertainty = ± 1.75 dB
Total uncertainty = (k=2) ± 3.5 dB

TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 $\pm$ 3 °C
Ambient humidity :	25 - 75 %rH	40 $\pm$ 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	950 $\pm$ 50 mbar
Voltage :	12÷24 Vdc	12 Vdc

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: WITHIN THE LIMIT**

SCAN TABLE : "Radiated Emission"

Unit: dB μ V/m

Curve1: MaxPeak ClearWrite
Curve2: -- ClearWrite

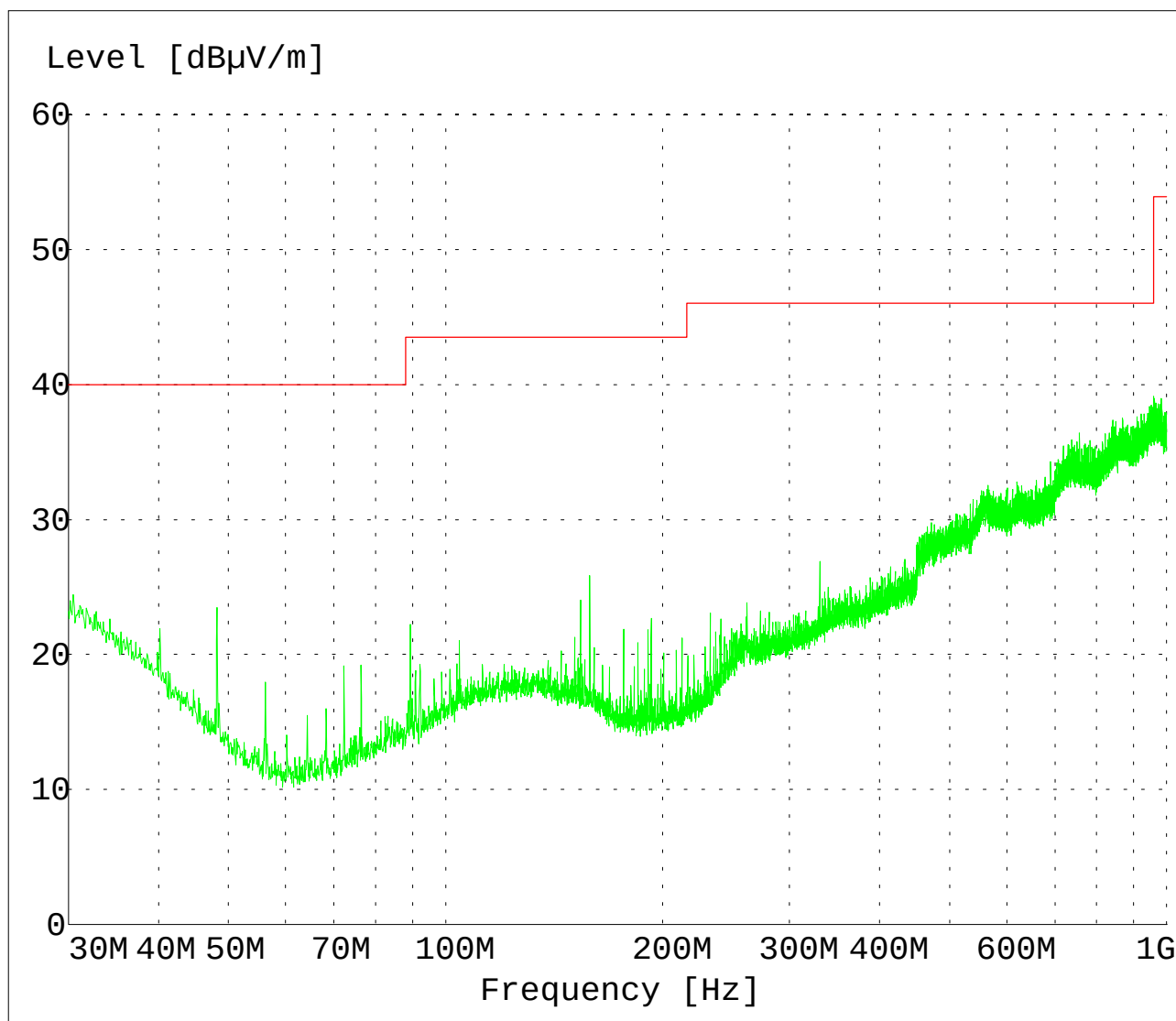
Subrange1:

Start Frequency: 30.0 MHz Step Size: 80 kHz
Stop Frequency: 1000.0 MHz
Measure Time: 0.01 sec.
IF Bandwidth: 120 kHz

Receiver: ESXI Probe Transducer: CHASE_6111_PRC
Signal Path: Path 4 System Transducer: RFin2-CP1/X11
Scan Mode: Lin Add. Transducer: W71.01
Tracking Gen.: Off
Input: 2 DC

Preamplifier: 10 dB Demodulation: FM Broad
RF att.: Coupled Volume: 0.0%
Ref. Level: -50 dBm Squelch: --
Min. RF att.: 0 dBm Option: None
Autorange: On

Curve 1: On Repetition: Single
Curve 2: Off Stop Mark: On
Stop Message: On
Text: Connect antenna



**TEST
3.****RADIATED EMISSION 1000 - 5000 MHZ****REFERENCE
DOCUMENT**

FCC PART 15 subpart B

- **TEST LOCATION:** Semi-anechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** Spectrum Analyzer Rodhe&Schwarz mod. FSP
Double Ridged Guide Antenna Electro-metrics mod. EM-6961
Log-periodica Broadband Antenna mod. HL025
- **TESTED PORT:** Enclosure
- **EMISSION LIMITS:** Acc. to Section 15.109 of reference document
- **UNCERTAINTY OF MEASURE:** Combined uncertainty = ± 1.75 dB
Total uncertainty = $(k=2) \pm 3.5$ dB

TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 $\pm$ 3 °C
Ambient humidity :	25 - 75 %rH	40 $\pm$ 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	950 $\pm$ 50 mbar
Voltage :	12÷24 Vdc	12 Vdc $\pm$ 3%

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: WITHIN THE LIMIT**

SCAN TABLE : "Radiated Emission"Unit: dB μ V/m

	Detector :	Mode:
Curve1:	MaxPeak	ClearWrite
Curve2:	--	ClearWrite

Subrange:

Start Frequency:	1000.0 MHz
Stop Frequency:	5000.0 MHz
Measure Time:	0.01 sec.
IF Bandwidth:	1000 kHz

Step Size:	kHz
Probe Transducer:	HL025

Receiver:	FSP
Signal Path:	Path 4
Scan Mode:	Lin
Tracking Gen.:	Off
Input:	2 DC

System Transducer:	RFin2-CP1/X11
Add. Transducer:	W71.01

Preamplifier:	10 dB
RF att.:	Coupled
Ref. Level:	-50 dBm
Min. RF att.:	0 dBm
Autorange:	On

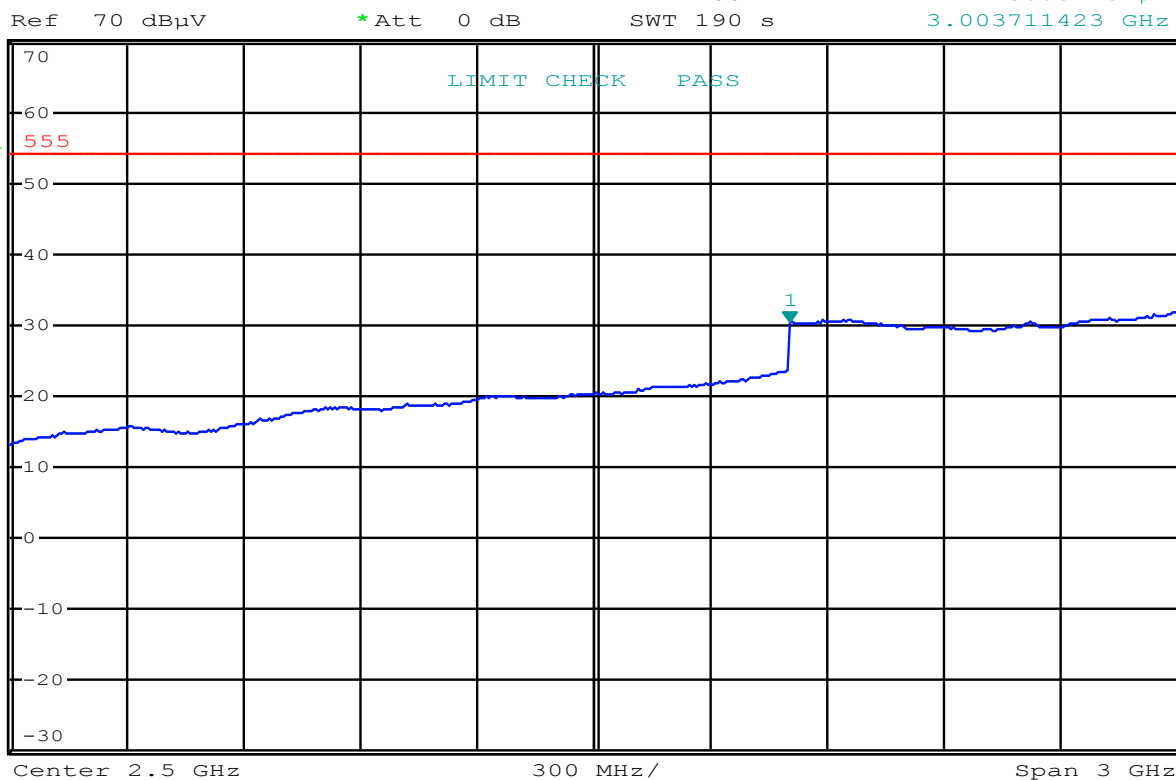
Demodulation:	FM Broad
Volume:	0.0%
Squelch:	--
Option:	None

Curve 1:	On
Curve 2:	Off

Repetition:	Single
Stop Mark:	On
Stop Message:	On
Text:	Connect antenna



*RBW 9 kHz Marker 1 [T1]
VBW 100 kHz 30.37 dBμV
SWT 190 s 3.003711423 GHz



Date: 13.OCT.2003 11:35:05

6. EUT TECHNICAL DOCUMENTATION**6.1 Wiring diagrams**

	<i>Document reference (n., edition, date, ...)</i>
WIRING DIAGRAM	WALLY4PLUS_RG10 – CF12000 30/01/03
PART LIST	WALLY4PLUS_RG10 – CF12000

6.2 Technical manual

	<i>Document reference (n., edition, date, ...)</i>
TECHNICAL DATA	166 – Ed. 10/11/2003
TECHNICAL CONSTRUCTION FILE	*****

6.3 Photographic documentation

PHOTO N° 1 – E.U.T. IDENTIFICATION



PHOTO N° 2 – INTERNAL VIEW

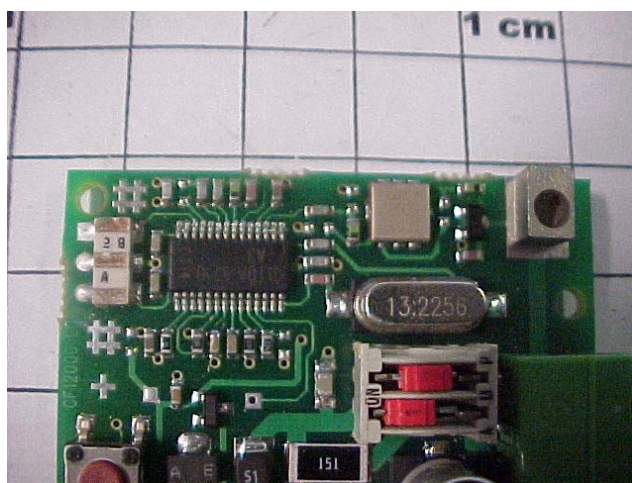
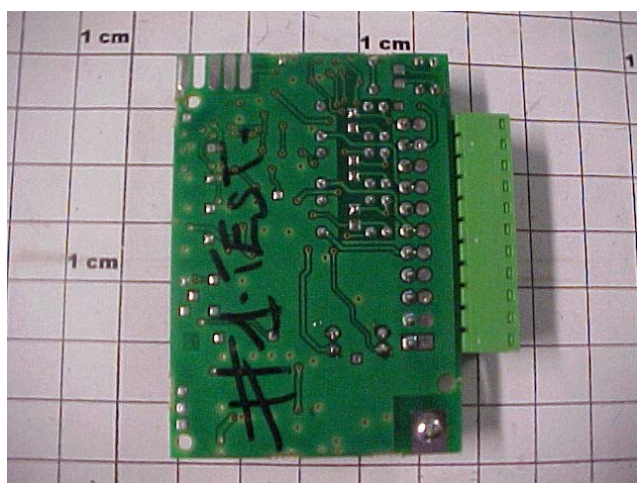
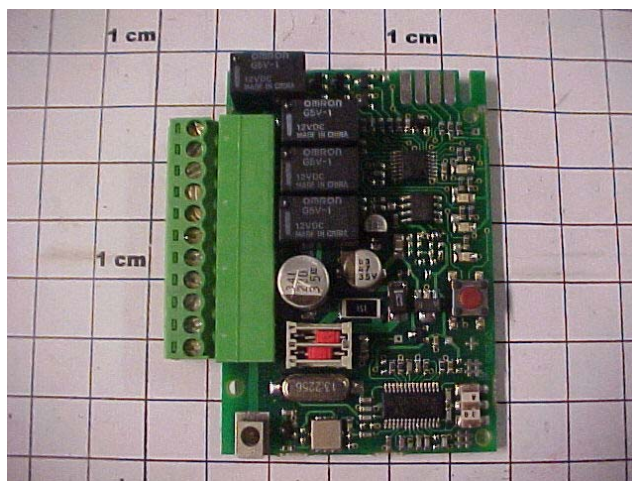
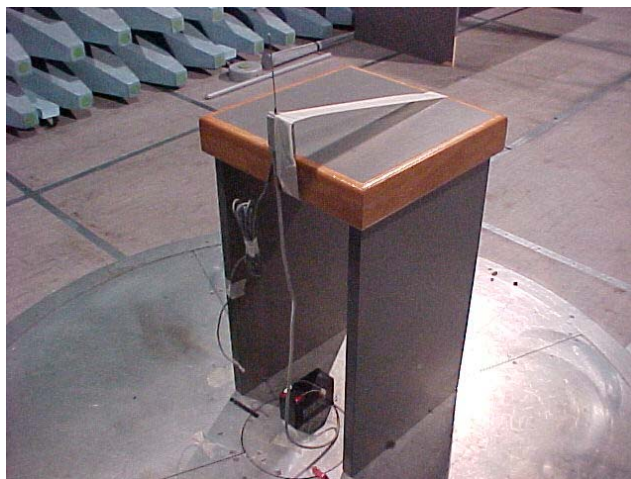
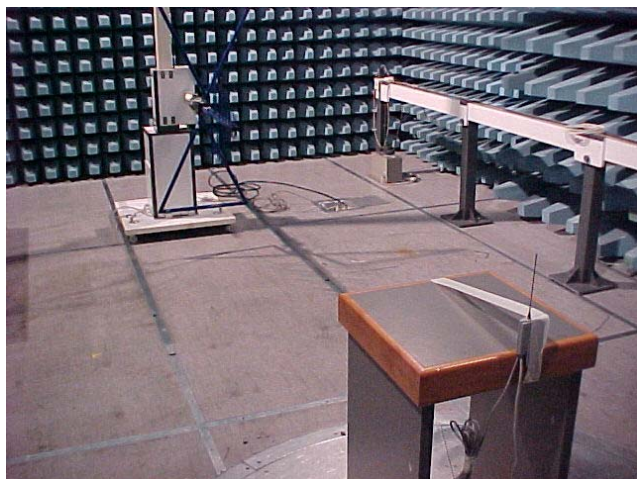


PHOTO N° 3 – SET-UP FOR EMISSION RADIATED TEST



7. TECHNICAL REPORT OF ANALYSIS OF DERIVED PRODUCTS

EQUIPMENT under ANALYSIS :		BRAND NAME
BASIC MODEL	SUPERETHERODYNE RECEIVER WALLY4PLUS	V2 ELETTRONICA
DERIVED MODELS	WALLY4 WALLY2 WALLY1 WALLY4R WALLY2R WALLY1R WALLY NC	

Prima Ricerca & Sviluppo, just on the basis of the following technical documents :

1.	Wiring diagram	• WALLY4PLUS_RG10 – CF12000 30/01/03
2.	Mounting plain	• WALLY4PLUS_RG10 – CF12000
3.	PCB layout	• CF12000_AAA.pcb
4.	Part list	• WALLY4PLUS_RG10 – CF12000
5.	Photographic documentation	• no documentation
6.	Client declaration	• ANALYSIS OF DERIVED PRODUCT (Point 3 of Technical Construction File)

States as follows :

- ◆ the basic model and the derived models have the same plastic base
- ◆ the basic model and the derived models have the same Radio Receiver Module
- ◆ the basic model and the derived models have the same Dedicated Antenna
- ◆ The different between basic model and derived models are:
 1. N° of outputs relay
 2. Different architecture codes (different microcontroller firmware)
 3. Only for WALLY N.C.: it's a receiver with a normally closed output contact.

On these basis, Prima Ricerca & Sviluppo considers the basic model more critical to the derived models, from the EMC point of view.

Therefore, all the measures performed on the basic model and carried in this test report, are completely extendable to the derived models.
