TEST REPORT NO: RU1015/3762

COPY NO: See below

ISSUE NO: 1

FCC ID: QBZ627T

REPORT ON THE CERTIFICATION TESTING OF A
JMG SYSTEMS Ltd.
TX4A REMOTE CONTROL TRANSMITTER
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.249
INTENTIONAL RADIATOR SPECIFICATION

TEST DATE: 30th APRIL 2002

TESTED BY: JOHN CHARTERS Digitally signed by JOHN CHARTERS DN: cn=JOHN CHARTERS, o=TRL COMPLIANCE SERVICES, c=US Date: 2002.05.17 10:36:51 Z J CHARTERS

APPROVED BY: Peter Green Digitally signed by Peter Green DN: cn=Peter Green, o=TRL Compliance Services Ltd, c=GB Date: 2002.05.17 11:16:49 Z PETER GREEN PRINCIPAL ENGINEER

DATE: 17th May 2002

Distribution:

Copy Nos:
1. JMG SYSTEMS Ltd.
2. FCC EVALUATION LABORATORIES
3. TRL EMC

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Quality System Certified
To BS EN ISO 9001 (1994)
Registration FS 21805

UKAS TESTING
0728

CONTENTS

Notes:

1. Component failure during test — YES [ ] NO [X]
2. If Yes, details of failure:
3. The facilities used for the testing of the product contain in this report are FCC Listed.
4. The contents of the attached applicants declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations' and is provided in good faith.

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY:	QBZ627T					
PURPOSE OF TEST:	Certification					
TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.249					
TEST RESULT:	Compliant to Specification					
EQUIPMENT UNDER TEST:	TX4A REMOTE CONTROL TRANSMITTER					
EQUIPMENT SERIAL No:	3					
ITU: EMISSION CODE:	61K0F1D					
EQUIPMENT TYPE:	Remote control transmitter					
PRODUCT USE:	Telecommand of outdoor vehicles					
CARRIER EMISSION:	13000μV/m					
ANTENNA TYPE:	Integral					
ALTERNATIVE ANTENNA:	None					
BAND OF OPERATION:	902MHz – 928MHz					
CHANNEL SPACING:	Wideband					
NUMBER OF CHANNELS:	1					
FREQUENCY GENERATION:	SAW Resonator	[ ]	Crystal	[X]	Synthesiser	[ ]
MODULATION METHOD:	Amplitude	[ ]	Digital	[X]	Angle	[ ]
POWER SOURCE(s):	+3Vdc (integral battery power only)					
TEST DATE(s):	30th APRIL 2002					
ORDER No(s):	992					
APPLICANT:	JMG SYSTEMS Ltd.					
ADDRESS:	68a Derry Road Omagh Co Tyrone BT78 5ED Northern Ireland					

TESTED BY: JOHN CHARTERS — J CHARTERS

APPROVED BY: Peter Green — P GREEN
PRINCIPAL
ENGINEER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	TX4A REMOTE CONTROL TRANSMITTER
EQUIPMENT TYPE:	Remote control transmitter
SERIAL NUMBER OF EUT:	3
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.249
TEST RESULT:	COMPLIANT Yes [X] No [ ].
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S ORDER No(s):	992
APPLICANT'S CONTACT PERSON(s):	Mr Joe McGoldrick
E-mail address:	Joe@jmgsystems.co.uk
APPLICANT:	JMG SYSTEMS Ltd.
ADDRESS:	68a Derry Road Omagh Co Tyrone BT78 5ED Northern Ireland
TEL:	028 8224 4131
FAX:	028 8225 2686
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL EMC
UKAS ACCREDITATION No:	0728
TEST DATE(s)	30th APRIL 2002
TEST REPORT No:	RU1015/3762

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
Intentional Emission Frequency:	15.249	Quasi peak	Yes
Intentional Emission Field Strength:	15.249	Quasi peak	Yes
Intentional Emission Band Occupancy:	Supplied for information		Yes
Intentional Emission ERP (mW):			No
Spurious Emissions – Conducted:	15.207		No
Spurious Emissions – Radiated <1000MHz:	15.209	Quasi peak	Yes
Spurious Emissions – Radiated >1000MHz:	15.209 & 15.249	Peak	Yes
Maximum Frequency of Search:	15.33		Yes
Antenna Arrangements Integral:	15.203		Yes
Antenna Arrangements External Connector:	15.204		No
Restricted Bands	15.205		Yes
Extrapolation Factor	15.31(f)		Yes

2. Product Use: Telecommand of outdoor vehicles

3. Emission Designator: 61K0F1D

4. Duty Cycle: 33% During operation

5. Transmitter bit or pulse rate and level: 1000 Bps

6. Temperatures: Ambient (Tnom) 11°C

7. Supply Voltages: Vnom +3Vdc

Note: Vnom voltages are as stated above unless otherwise shown on the test report page

8. Equipment Category:
   Single channel [X]
   Two channel [ ]
   Multi-channel [ ]

9. Channel spacing:
   Narrowband [ ]
   Wideband [X]

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209 & 15.249

Ambient temperature	=	11°C(<1GHz) 19°C(>1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	60% (<1GHz) 60% (>1GHz)	0.3m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 1m	[ ]
Supply voltage	=	+3Vdc	3m extrapolated from 0.3m	[X]
Channel number	=	1		

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
30MHz - 88MHz							
88MHz - 216MHz							
216MHz - 960MHz							
960MHz - 1GHz							
1GHz - 10GHz	1829.0	30.94	0.2	26.7	57.84	20	78.0
	2734.5	22.92	0.3	30.0	53.22	20	45.8
	3658.0	23.49	0.4	32.0	55.89	20	62.3
	4572.5	24.59	0.4	32.8	57.79	20	77.5
	5487.0	16.97	0.5	34.6	52.07	20	40.1
Limits	1.705MHz to 30MHz	30µV/m @ 30m					
	30MHz to 88MHz	100µV/m @ 3m					
	88MHz to 216MHz	150µV/m @ 3m					
	216MHz to 960MHz	200µV/m @ 3m					
	960MHz to 1GHz	500µV/m @ 3m					
	1GHz to 10GHz	500µV/m @ 3m					

Notes:
1 Results quoted are extrapolated as indicated
2 Emissions were searched to: 10GHz inclusive, as per Part 15.33a
3 Extrapolation factor 20dB from 0.3m to 3m, as per Part 15.31f
4 Measurements >1GHz @ 1m as per Part 15.31f(1)
5 Receiver detector >1GHz = CISPR, Quasi-Peak, 120kHz bandwidth
6 Receiver detector >1GHz = Peak Hold, 1MHz resolution bandwidth.
7 New batteries used for battery powered products.
8 Only emissions within 20dBs of respective limit line are included above

Test Method:
1 As per Radio – Noise Emissions, ANSI C63.4: 1992
2 Measuring distances as Notes 1 to 4 above
3 EUT 0.8 metre above ground plane
4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisation's, of the receive antenna.
EUT orientation in three orthagonal planes.
Maximum results recorded.

The test equipment used for the Transmitter Spurious Emissions – Radiated – Part 15.209 tests is shown overleaf:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
HORN ANTENNA	EMCO	3115	9010-3580	138	
HORN ANTENNA	EMCO	3115	9010-3581	139	**X**
SPECTRUM ANALYSER	TEKTRONIX	2756P	B010109	164	
BICONE ANTENNA	CHASE	BBA9106	N/A	193	**X**
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	**X**
RECEIVER	ROHDE & SCHWARZ	ESHS20	837960/003	237	
ANTENNA, BICONE 20MHz - 300MHz	CHASE	VBA6106A	1193	251	
BILOG ANTENNA	CHASE	CBL6112	2098	274	
RECEIVER	ROHDE & SCHWARZ	ESVS10	837948/003	317	
RECEIVER	ROHDE & SCHWARZ	ESVS10	844594/003	352	
RECEIVER	ROHDE & SCHWARZ	ESHS10	844077/019	353	
V / UHF RECEIVER 20MHz - 1GHz	ROHDE & SCHWARZ	ESVS 20	838804 / 005	415	
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	**X**

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.249

Ambient temperature	=	11°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	60%(<1GHz),	10m measurements @ fc	[ ]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[ ]
Supply voltage	=	+3Vdc	30m extrapolated from 3m	[ ]
Channel number	=	1	30m extrapolated from 10m	[ ]

FREQ. (MHz)	MEASUREMENT Rx. READING (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
914.5	54.0	5.7	22.6	82.3	N/A	13000
Limit value @ fc			**50000µV/m**			
Band occupancy @ spurious limit value			**f lower**		**f higher**	
			914.279MHz		914.814MHz	

See spectrum analyser plot – Annex D

Notes:
1 Results quoted are extrapolated as indicated
2 Receiver detector @ fc = Quasi Peak 120kHz bandwidth
3 When battery powered the EUT was powered with new batteries

Test Method:
1 As per Radio – Noise Emissions, ANSI C63.4: 1992
2 Measuring distances 3m
3 EUT 0.8 metre above ground plane
4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthagonal planes.
Maximum results recorded

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.249 tests is shown overleaf:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
HORN ANTENNA	EMCO	3115	9010-3580	138	
HORN ANTENNA	EMCO	3115	9010-3581	139	
SPECTRUM ANALYSER	TEKTRONIX	2756P	B010109	164	
BICONE ANTENNA	CHASE	BBA9106	N/A	193	**X**
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	**X**
RECEIVER	ROHDE & SCHWARZ	ESHS20	837960/003	237	
ANTENNA, BICONE 20MHz - 300MHz	CHASE	VBA6106A	1193	251	
BILOG ANTENNA	CHASE	CBL6112	2098	274	
RECEIVER	ROHDE & SCHWARZ	ESVS10	837948/003	317	
RECEIVER	ROHDE & SCHWARZ	ESVS10	844594/003	352	
RECEIVER	ROHDE & SCHWARZ	ESHS10	844077/019	353	
V / UHF RECEIVER 20MHz - 1GHz	ROHDE & SCHWARZ	ESVS 20	838804 / 005	415	
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	**X**

ANNEX A

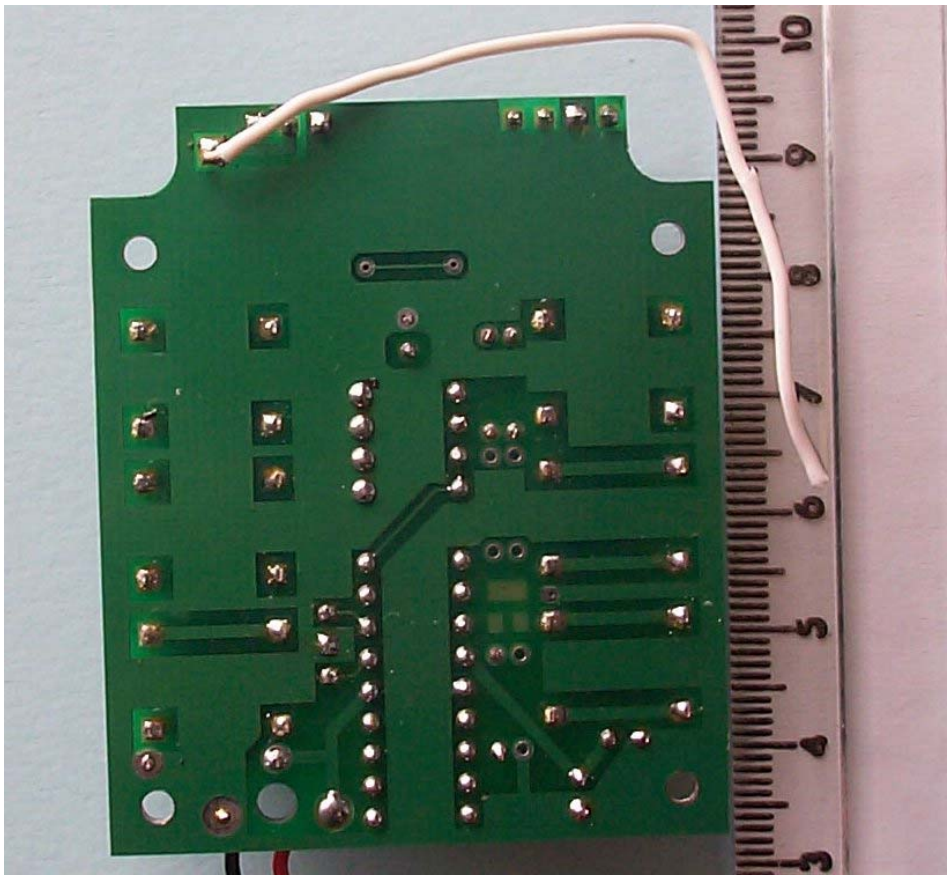
PHOTOGRAPHS

PHOTOGRAPH No. 1 **TEST SETUP**

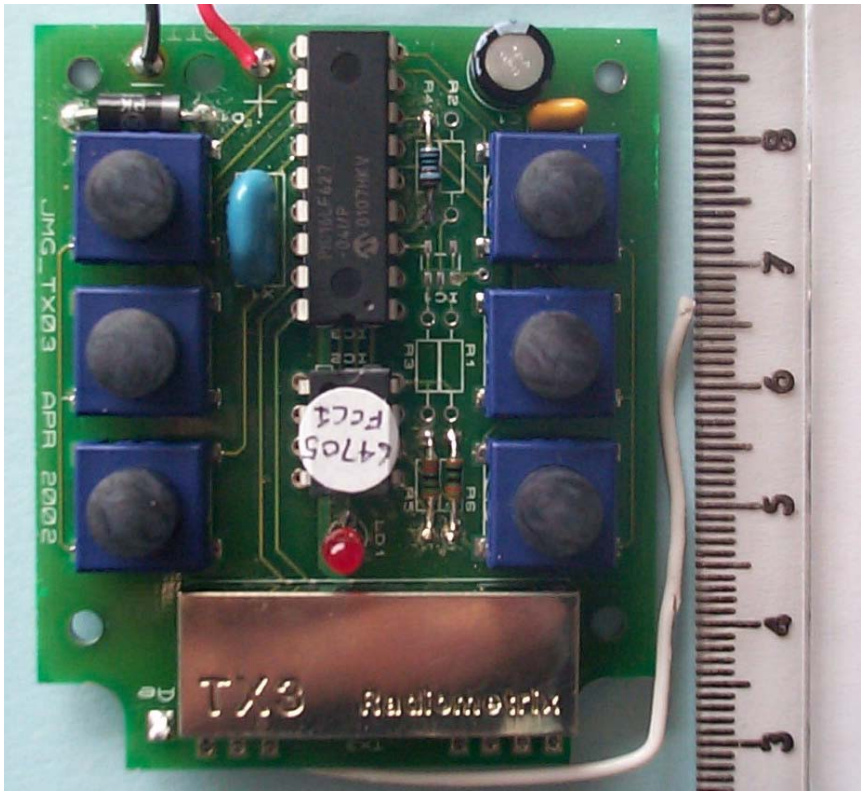
PHOTOGRAPH No. 2 **TRANSMITTER FRONT VIEW**

PHOTOGRAPH No. 3 **TRANSMITTER REAR VIEW**

PHOTOGRAPH No. 4 **TRANSMITTER PCB TRACK SIDE**



PHOTOGRAPH No. 5 **TRANSMITTER PCB COMPONENT SIDE**



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	[X]
		-	FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION	-		[X]
c.	MODEL(s) vs IDENTITY	-		[X]
d.	ALTERNATIVE TRADE NAME DECLARATION(s)	-		[ ]
e.	LABELLING	-	PHOTOGRAPHS	[X]
		-	DECLARATION	[X]
		-	DRAWINGS	[X]
f.	TECHNICAL DESCRIPTION	-		[X]
g.	BLOCK DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
h.	CIRCUIT DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
i.	COMPONENT LOCATION	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
j.	PCB TRACK LAYOUT	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
k.	BILL OF MATERIALS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		[X]

ANNEX C

BANDWIDTH PLOT

BANDWIDTH PLOT