TEST REPORT No: RL1130/6130

COPY NO: .....

ISSUE NO: 2

FCC ID: PSGRCWEBSTER19Z

REPORT ON THE CERTIFICATION TESTING OF A RADIO CONTROLLED TOY SPIDER WITH RESPECT TO THE FCC RULES CFR 47, PT'S 15,209 & 15.227 INTENTIONAL RADIATOR SPECIFICATION ON BEHALF OF TRIGGERFISH INTERNATIONAL LTD

TEST DATE: 24 & 25 JULY 2001

TESTED BY: _____ I FORSHAW

APPROVED BY: _____ S P HAYES

DATE: 23 August 2001

Distribution:

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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.

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	RADIO CONTROLLED TOY SPIDER
EQUIPMENT TYPE:	19Z
SERIAL NUMBER OF EUT:	Not applicable
PURPOSE OF TEST:	FCC Certification
TEST SPECIFICATION(s):	FCC CFR 47 Pt's15,209 & 15.227
TEST RESULT:	COMPLIANT Yes [**X**] No [ ]
APPLICANT'S CATEGORY:	(a) MANUFACTURER [ ] (b) IMPORTER [ ] (c) DISTRIBUTOR [**X**] (d) AGENT [ ]
APPLICANT'S ORDER No(s):	FAX
APPLICANT'S CONTACT PERSON(s):	MR PHILIP SAVAGE
APPLICANT:	TRIGGERFISH INTERNATIONAL LTD
ADDRESS:	KILVER COURT KILVER STREET SHEPTON MALLET SOMERSET BA4 5NF UNITED KINGDOM
TEL:	+44 1749 346393
FAX:	+44 1749 346425
MANUFACTURER:	LUNG CHEONG TOYS LTD
ADDRESS:	LUNG CHEONG BUILDING 1 LOK YIP ROAD ON LOK TSUEN FANLING N.T. HONG KONG
TEL:	+ 852 2677 6699
FAX:	+ 852 2682 2161
EUT(s) COUNTRY OF ORIGIN:	CHINA
TEST LABORATORY:	TRL EMC
UKAS ACCREDITATION No:	0728
TEST DATE(s)	24 & 25 JULY 2001
TEST REPORT No:	RL1130/6130

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY:	PSGRCWEBSTER19Z
PURPOSE OF TEST:	FCC Certification
TEST SPECIFICATION:	FCC CFR 47 Pt's15,209 & 15.227
TEST RESULT:	Compliant to Specification
EQUIPMENT UNDER TEST:	Part No: 19Z
EQUIPMENT SERIAL No:	Not applicable
ITU: EMISSION CODE:	1K00A
EQUIPMENT TYPE:	Remote Control Transmitter
UTILISATION:	Control of Toy
CARRIER EMISSION:	2213µV/m@3m
ANTENNA TYPE:	Integral
ALTERNATIVE AE:	None, as per Part 15.203
BAND OF OPERATION:	26.96 – 27.28 MHz
CHANNEL SPACING:	Not applicable
NUMBER OF CHANNELS:	1 (one)
FREQUENCY GENERATION:	SAW Resonator [ ] Crystal [**X**] Synthesizer [ ]
MODULATION METHOD:	Amplitude [ ] Digital [**X**] Angle [ ]
POWER SOURCE(s):	+9Vdc, integral battery powered only
TEST DATE(s):	24 & 25 July 2001
ORDER No(s):	FAX
APPLICANT:	TRIGGERFISH INTERNATIONAL LTD
ADDRESS:	KILVER COURT KILVER STREET SHEPTON MALLET SOMERSET BA4 5NF UNITED KINGDOM

TESTED BY: _____ I FORSHAW

APPROVED BY: _____ S P HAYES
EMC MANAGER

EQUIPMENT TEST CONDITIONS

1.

EQUIPMENT SERIAL / MODEL IDENTITY	CHANNEL NUMBER	Tx NOMINAL FREQUENCY MHz	Rx NOMINAL FREQUENCY MHz	TESTS REQUIRED	REMARKS
19Z	1	27.145	27.142	Tx Radiated Spurious	Pt .15.209
				Tx Intentional Emission	Pt. 15.227

2. Equipment category:

Single channel	[**X**]
Two channel	[ ]
Multi-channel	[ ]

3. Supply voltages Vnom = +9.0Vdc

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

4. Temperatures: Ambient Tnom = 25°C

5. Transmitter maximum deviation or shift: kHz = N/A

6. Transmitter maximum bit or pulse rate & level: bps = 500 b/s

7. Channel spacing:

kHz	=	N/A
Narrowband		[ ]
Wholeband		[**X**]

TESTS REQUIRED

TRANSMITTER TESTS

Transmitter Spurious Emissions –	Power line – Part 15.207	N/A
Transmitter Spurious Emissions –	Power line – Part 15.209	N/A
Transmitter Intentional Emission –	Field Strength – Part 15.227	[**X**]
Transmitter Intentional Emission –	Frequency – Part 15.227	[**X**]

Notes:

1.	Equipment tested for (mains ac) 110V Power line emissions	N/A
2.	Equipment tested as (fixed) integral antenna configuration	[**X**]
3.	All tests were carried out with new batteries, as per Part 15.31.e	N/A
4.	Equipment tested for radiated emissions as per Part 15.209	[**X**]
5.	Equipment tested for radiated emissions as per Part 15.227	[**X**]
6.	Equipment tested for unintentional radiator digital device Class B	N/A

SAMPLE CALCULATIONS

Parts 15.209 & 15.227 - Radiated

Frequency (MHz)	Rx Reading (dBµV/m)	Detector	Field Strength @ 3m (µV/m)
27.142	69.90	Average	2213 µV/m
27.142	70.00	Peak	3162 µV/m
54.300	22.20	Quasi Peak	27µV/m
570.000	38.24	Quasi Peak	31.6 µV/m

Notes:

1. Unit under test (EUT) is to be integral battery powered when in commercial use.
2. Integral antenna

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

Ambient temperature	=	+25^{o}C(<1GHz),	3m measurements <1GHz	[**X**]
Relative humidity	=	52% (<1GHz),	1m measurements >1GHz	[ ]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 1m	[ ]
Supply voltage	=	Vnom		
Channel number	=	1		

Frequency & Level 30MHz to 88MHz		543MHz	27µV/m
Frequency & Level 88MHz to 216MHz		Nil emissions	-29dB below limit
Frequency & Level 216MHz to 960MHz		570.00MHz	31.6µV/m
Frequency & Level 960MHz to 1GHz		Nil emissions	-85dBm
Frequency & Level 1GHz to 5MHz		Nil emissions	-50dBm
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 5GHz	500µV/m @ 3m	

Notes:
1. Results quoted are extrapolated as indicated
2. Emissions were searched to: (**x**) 1000MHz inclusive, as per Part 15,33a
3. Extrapolation factor 9.5dB from 1m 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. Sample calculation, see page 6

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 polarisations, of the receive antenna.
   EUT orientation in three orthagonal planes.
   Maximum results recorded.

Test Equipment used:
1. Full description at Annex B
2. TRL 7, TRL 90, TRL 203, TRL 251, TRL 415

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – PART 15.227

Ambient temperature	=	+25°C(<1GHz),	3m measurements @ fc	[**X**]
Relative humidity	=	52% (<1GHz),	10m measurements @ fc	[ ]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[ ]
Supply voltage	=	Vnom	30m extrapolated from 3m	[ ]
Channel number	=	1	30m extrapolated from 10m	[ ]

Frequency & Level		27.142 MHz (Average) 27.142 MHz (Peak)	2213µV/m @ 3m 3162µV/m @ 3m
Limit	26.96MHz to 27.28MHz	10,000µV/m @ 3m	

Band occupancy @ spurious limit value	f lower	f higher
	27.134 MHz	27.153 MHz

See spectrum analyzer plot on page 9

Notes:
1. Results quoted are extrapolated as indicated
2. Receiver detector @ fc = Average 120 kHz bandwidth
   = Peak 120 kHz bandwidth
3. Sample calculation, see page 6

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.

Test Equipment used:
1. Full description at Annex B
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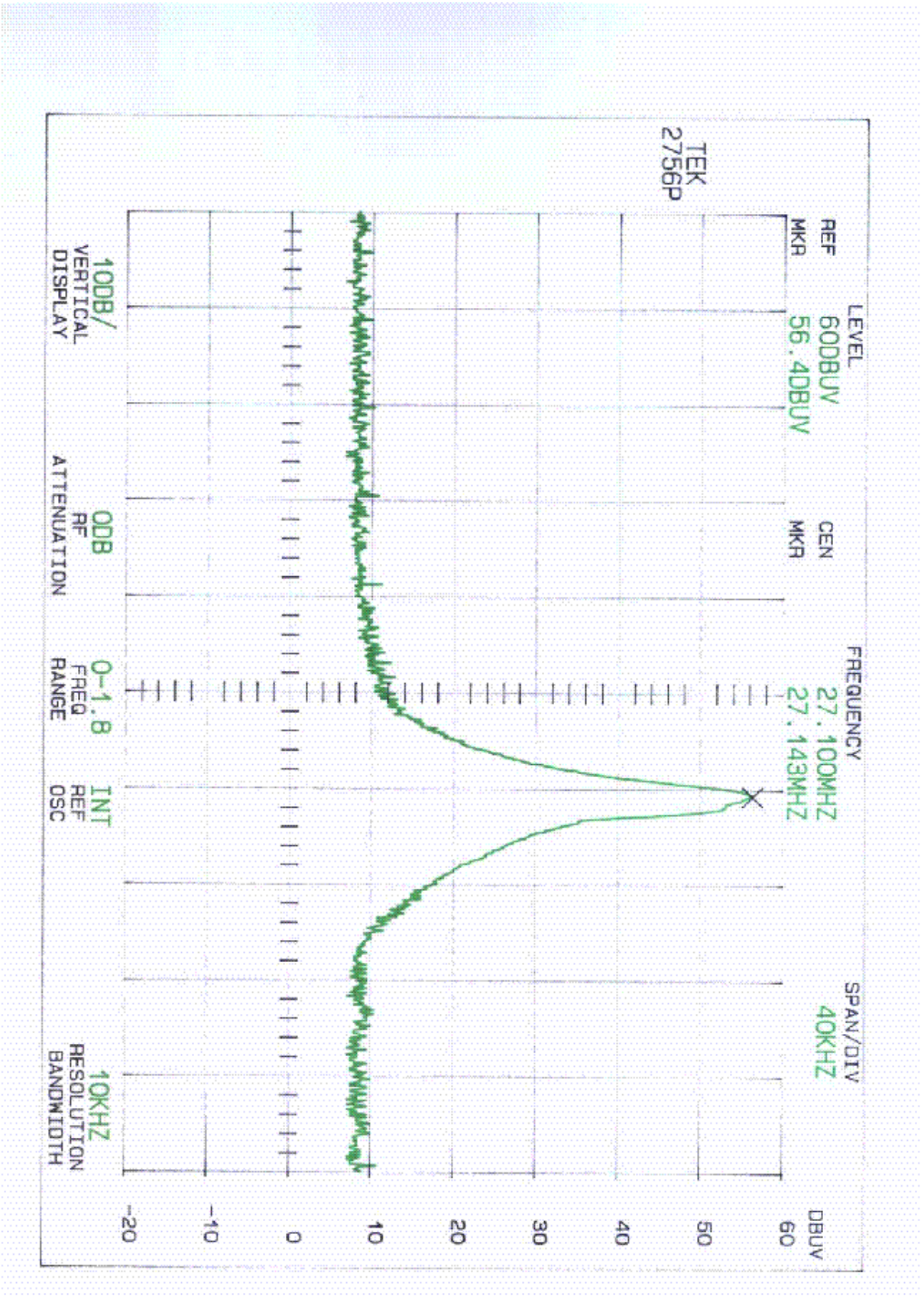

TEK
2756P
LEVEL
REF 60DBUV
MKR 56.4DBUV
FREQUENCY
CEN 27.100MHZ
MKR 27.143MHZ
SPAN/DIV
40KHZ
DBUV
60
50
40
30
20
10
0
-10
-20
10DB/
VERTICAL
DISPLAY
0DB
RF
ATTENUATION
0-1.8
FREQ
RANGE
INT
REF
OSC
10KHZ
RESOLUTION
BANDWIDTH

ANNEX A

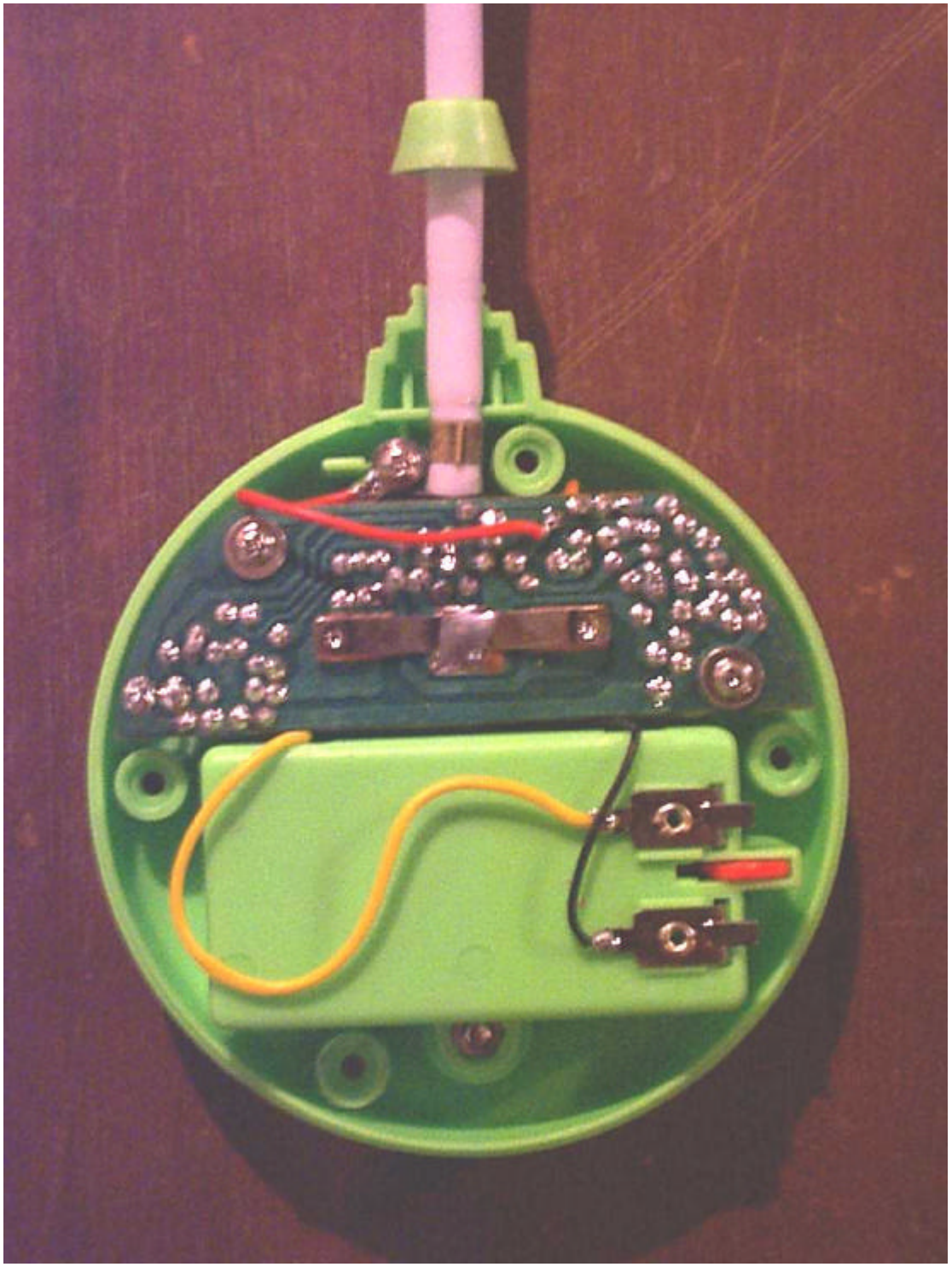
PHOTOGRAPHS

PHOTOGRAPH No. 1 **TEST SITE WITH TRANSMITTER**

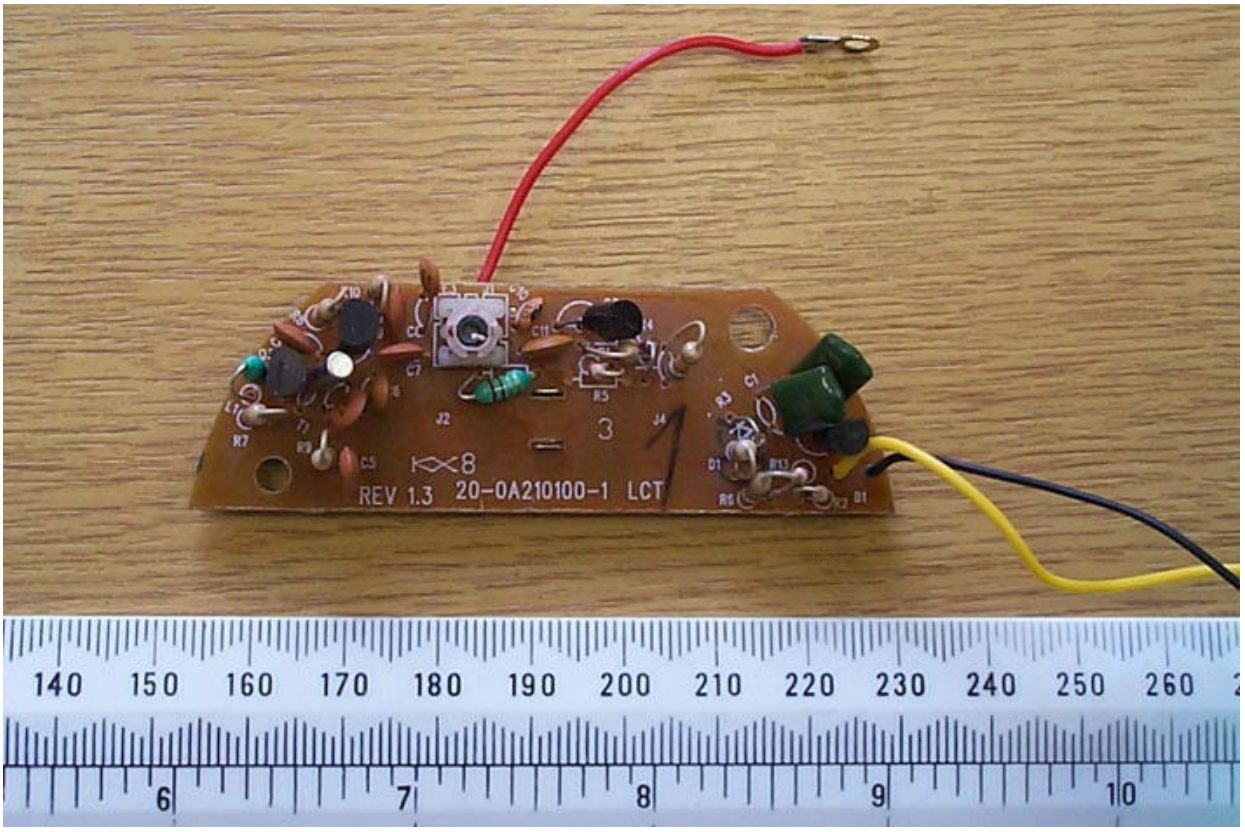
PHOTOGRAPH No. 2 **TRANSMITTER FRONT VIEW**

PHOTOGRAPH No. 3 **TRANSMITTER UNDERSIDE VIEW**

PHOTOGRAPH No. 4 **TRANSMITTER PCB UNDERSIDE**



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



ANNEX B

TEST EQUIPMENT LIST

TEST EQUIPMENT LIST

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No
LF / HF RECEIVER 9kHz - 30MHz	R & S	ESH2	879014 / 028	06
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203
ANTENNA, BICONE 20MHz - 300MHz	CHASE	VBA6106A	1193	251
V / UHF RECEIVER 20MHz - 1GHz	R & S	ESVS 20	838804 / 005	415
OATS 1 LOW LOSS CABLE				90

ANNEX C

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	[ ]
		-	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**]