



TEST REPORT NO: RL1147/6611

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ISSUE NO: 1

FCC ID: MF3019174

**REPORT ON THE CERTIFICATION TESTING OF A
C A BLATCHFORD & SONS LTD
ADAPTIVE LIMB
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.109, 15.209 & 15.249
INTENTIONAL RADIATOR SPECIFICATION**

TEST DATE: 21st and 22nd JANUARY 2002

TESTED BY: ----- I FORSHAW

APPROVED BY: ----- S HAYES
MANAGER EMC
DIVISION

DATE: -----

Distribution:

Copy Nos: 1. C A BLATCHFORD & SONS LTD
2. FCC EVALUATION LABORATORIES
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TRL COMPLIANCE SERVICES LTD EMC DIVISION
LONG GREEN FORTHAMPTON GLOUCESTER GL19 4QH UNITED KINGDOM
TELEPHONE +44 (0)1684 833818 FAX +44 (0)1684 833858
E-MAIL test@trlcompliance.com www.trlcompliance.com



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Notes:

1. Component failure during test	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
2. If Yes, details of failure:		
3. The facilities used for the testing of the product contained 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:	MF3019174
PURPOSE OF TEST:	FCC CERTIFICATION
TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.109, 15.209 & 15.249
TEST RESULT:	COMPLIANT TO SPECIFICATION
EQUIPMENT UNDER TEST:	ADAPTIVE LIMB
EQUIPMENT SERIAL No:	NOT APPLICABLE
ITU: EMISSION CODE:	75K0F1D
EQUIPMENT TYPE:	ADAPTIVE LIMB, REMOTE CONTROL TRANSCEIVER
PRODUCT USE:	DATA TRANSMISSION, TELEMETRY, TELECOMMAND OF AN ADAPTIVE LIMB
CARRIER EMISSION:	18407.7 μ V/m @ 3 metres
ANTENNA TYPE:	FIXED
ALTERNATIVE ANTENNA:	NONE AS PER PART 15.203
BAND OF OPERATION:	914 MHz \pm 75kHz
CHANNEL SPACING:	NARROWBAND
NUMBER OF CHANNELS:	1 (ONE)
FREQUENCY GENERATION:	SAW Resonator <input type="checkbox"/> Crystal <input checked="" type="checkbox"/> Synthesiser <input type="checkbox"/>
MODULATION METHOD:	Amplitude <input type="checkbox"/> Digital <input checked="" type="checkbox"/> Angle <input type="checkbox"/>
POWER SOURCE(s):	+9V DC, INTEGRAL BATTERY
TEST DATE(s):	21 st AND 22 nd JANUARY 2002
ORDER No(s):	PR39211
APPLICANT:	C A BLATCHFORD & SONS LTD
ADDRESS:	LISTER ROAD BASINGSTOKE HAMPSHIRE G22 4AH

TESTED BY: I FORSHAW

APPROVED BY: _____ S HAYES
MANAGER EMC
DIVISION

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT): ADAPTIVE LIMB

EQUIPMENT TYPE: ADAPTIVE LIMB, REMOTE CONTROL
TRANSCEIVER

SERIAL NUMBER OF EUT: NOT APPLICABLE

PURPOSE OF TEST: FCC CERTIFICATION

TEST SPECIFICATION(s): FCC RULES CFR 47, Part 15.109, 15.209 & 15.249

TEST RESULT: COMPLIANT Yes No

APPLICANT'S CATEGORY: MANUFACTURER
IMPORTER
DISTRIBUTOR
TEST HOUSE
AGENT

APPLICANT'S ORDER No(s): PR39211

APPLICANT'S CONTACT PERSON(s): Mr ANDY SYKES

E-mail address: andys@blatchford.co.uk

APPLICANT: C A BLATCHFORD & SONS LTD

ADDRESS: LISTER ROAD
BASINGSTOKE
HAMPSHIRE
G22 4AH

TEL: +44 01256 316600

FAX: +44 01256 316711

EUT(s) COUNTRY OF ORIGIN: UNITED KINGDOM

TEST LABORATORY: TRL EMC LTD

UKAS ACCREDITATION No: 0728

TEST DATE(s) 21st AND 22nd JANUARY 2002

TEST REPORT No: RL1147/6611

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.	TEST/EXAMINATION	RULE PART	COMMENT	APPLICABILITY
	Intentional Emission Frequency:	15.249	Quasi – Peak Detector	Applicable
	Intentional Emission Field Strength:	15.249	Quasi – Peak Detector	Applicable
	Intentional Emission Band Occupancy:	15.249	Quasi – Peak Detector	Applicable
	Spurious Emissions – Conducted	15.207	Not Applicable	Not Applicable
	Receiver Spurious Emissions – Radiated :	15.109	Quasi – Peak Detector	Applicable
	Transmitter Spurious Emissions – Radiated :	15.209	Quasi – Peak Detector	Applicable
	Maximum Frequency of Search:	15.33	Up to 10 GHz	Applicable
	Antenna Arrangements Integral:	15.203	Antenna Permanently Attached	Applicable
	Antenna Arrangements External Connector:	15.204	Not Applicable	Not Applicable
	Restricted Bands	15.205	FC 914MHz	Not Applicable
	Extrapolation Factor	15.31(f)	9.5dB from 1m-3m	Applicable
2.	Product Use:	DATA TRANSMISSION, TELEMETRY, TELECOMMAND OF AN ADAPTIVE LIMB		
3.	Emission Designator:	75K0F1D		
4.	Duty Cycle:	23	%	
5.	Transmitter bit or pulse rate:	9600	bps	
6.	Temperatures:	Ambient (T _{nom})	(SEE TEST)	
7.	Supply Voltages:	V _{nom}	+9.0V DC	
	Note: V _{nom} 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	[X]	
		Wideband	[]	

RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS – RADIATED – PART 15.109

Ambient temperature	=	9°C(<1GHz), 9°C (>1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	68% (<1GHz), 68% (>1GHz)	1m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 1m	[]
Supply voltage	=	Nom 12V		
Channel number	=	1		

	FREQ. (MHz)	MEAS. Rx. (dB μ V)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dB μ V/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (μ V/m)
30MHz - 88MHz	NO SIGNIFICANT EMISSION DETECTED						
88MHz - 216MHz	190.95	13.7	1.90	8.60	24.2	N/A	16.2
216MHz - 960MHz	625.8	7.40	4.30	18.70	30.4	N/A	33.1
960MHz - 1GHz	NO SIGNIFICANT EMISSION DETECTED						
1GHz - 10GHz	1.829	16.6	1.0	27.0	44.6	9.5	56.9
Limits	30MHz to 88MHz	100 μ V/m @ 3m					
	88MHz to 216MHz	150 μ V/m @ 3m					
	216MHz to 960MHz	200 μ V/m @ 3m					
	960MHz to 1GHz	500 μ V/m @ 3m					
	1GHz to 10GHz	500 μ V/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 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 New batteries used for battery powered products.

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 orthogonal planes.
Maximum results recorded.

The test equipment used for the Receiver Spurious Emissions – Radiated – Part 15.109 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	X
BICONE ANTENNA	CHASE	BBA9106	N/A	193	
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	
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	X
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	X
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	
RANGE 1	TRL	3 METRE	N/A	8B	X
RANGE 1	TRL	3 METRE	N/A	UH06	
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	

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

Ambient temperature	=	9°C(<1GHz), 9°C (>1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	68% (<1GHz), 68% (>1GHz)	1m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 1m	[]
Supply voltage	=	Nom 12V		
Channel number	=	1		

	FREQ. (MHz)	MEAS. Rx. (dB μ V)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dB μ V/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (μ V/m)
30MHz - 88MHz	NO SIGNIFICANT EMISSIONS DETECTED						
88MHz - 216MHz	190.95	13.7	1.90	8.60	24.2	N/A	16.2
216MHz - 960MHz	625.8	7.40	4.30	18.70	30.4	N/A	33.1
960MHz - 1GHz	NO SIGNIFICANT EMISSIONS DETECTED						
1GHz - 10GHz	1.829	16.6	1.0	27.0	44.6	9.5	56.9
Limits	1.705 to 30MHz		30 μ V/m @ 30m				
	30MHz to 88MHz		100 μ V/m @ 3m				
	88MHz to 216MHz		150 μ V/m @ 3m				
	216MHz to 960MHz		200 μ V/m @ 3m				
	960MHz to 1GHz		500 μ V/m @ 3m				
	1GHz to 10GHz		500 μ V/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 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 New batteries used for battery powered products.

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 orthogonal 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	X
BICONE ANTENNA	CHASE	BBA9106	N/A	193	
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	
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	X
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	X
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	
RANGE 1	TRL	3 METRE	N/A	8B	X
RANGE 1	TRL	3 METRE	N/A	UH06	
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	

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.249

Ambient temperature	=	8°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	71%(<1GHz),	10m measurements @ fc	[]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[]
Supply voltage	=	9V DC	30m extrapolated from 3m	[]
Channel number	=	1	30m extrapolated from 10m	[]

FREQ. (MHz)	MEASUREMENT Rx. READING (dB μ V)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dB μ V/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (μ V/m)
914.53	58.6	6.2	20.5	85.3	N/A	18407.7
Limit		914.53MHz		50,000 μ V/m		@3m

Band occupancy @ spurious limit value	f lower	f higher
	914.13 MHz	914.90 MHz

See spectrum plot – Annex C

Notes:

- 1 Results quoted are extrapolated as indicated
- 2 Receiver detector @ fc = Quasi -Peak 120kHz
- 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 orthogonal 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	
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	
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	X
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	X
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	
RANGE 1	TRL	3 METRE	N/A	8B	X
RANGE 1	TRL	3 METRE	N/A	UH06	
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	

ANNEX A
PHOTOGRAPHS

PHOTOGRAPH No. 1

TEST SITE WITH TX/RX

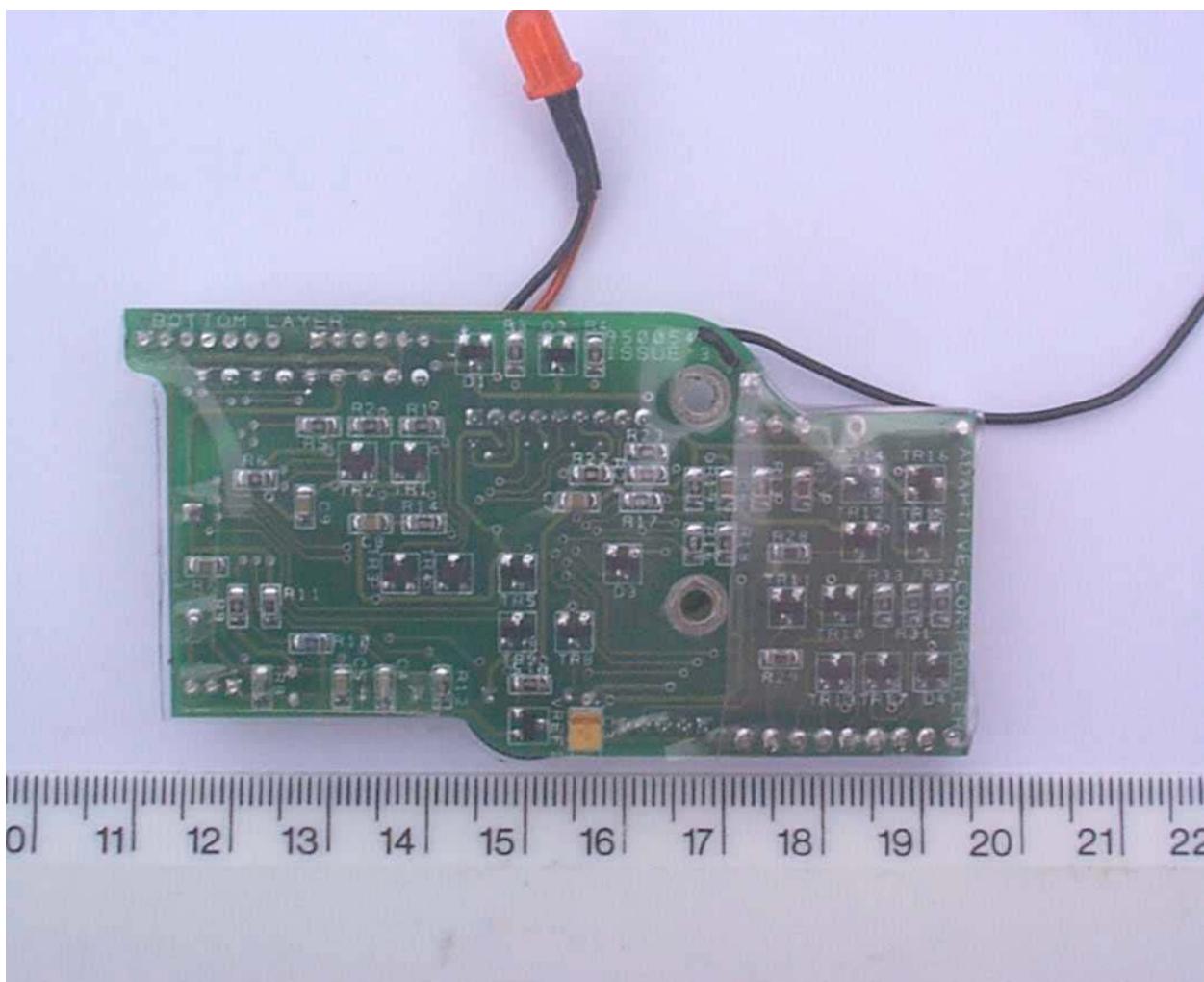


PHOTOGRAPH No. 2 GENERAL PHOTOGRAPH OF THE EQUIPMENT



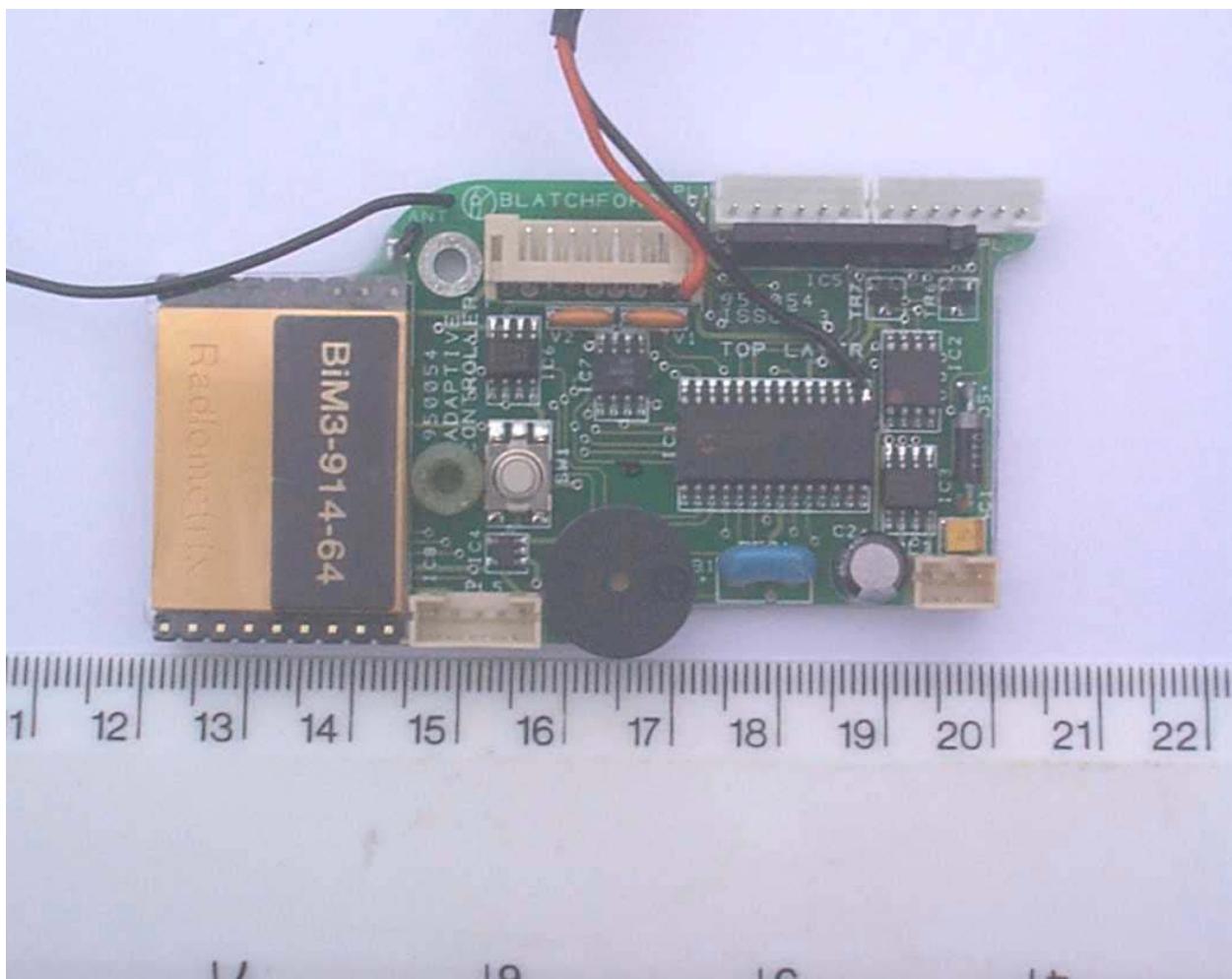
PHOTOGRAPH No. 3

TX/RX RF PCB TRACK SIDE



PHOTOGRAPH No. 4

TX/RX RF 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)	-		[X]
e.	LABELLING	-	PHOTOGRAPHS	[X]
		-	DECLARATION	[X]
		-	DRAWINGS	[X]
f.	TECHNICAL DESCRIPTION	-		[X]
g.	BLOCK DIAGRAMS	-	Tx	[X]
		-	Rx	[X]
		-	PSU	[]
		-	AUX	[]
h.	CIRCUIT DIAGRAMS	-	Tx	[X]
		-	Rx	[X]
		-	PSU	[]
		-	AUX	[]
i.	COMPONENT LOCATION	-	Tx	[X]
		-	Rx	[X]
		-	PSU	[]
		-	AUX	[]
j.	PCB TRACK LAYOUT	-	Tx	[X]
		-	Rx	[X]
		-	PSU	[]
		-	AUX	[]
k.	BILL OF MATERIALS	-	Tx	[X]
		-	Rx	[X]
		-	PSU	[]
		-	AUX	[]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		[X]

ANNEX C
BAND OCCUPANCY PLOT

BAND OCCUPANCY PLOT

