LABORATORY TEST REPORT

RADIO PERFORMANCE MEASUREMENTS

for the

TBDB3G BASE STATION Transceiver

Tested in accordance with:

FCC 47 CFR Parts 22, 74 and 90

RSS-119 Issue 12 RSS-Gen Issue 4

Report Revision:

1

Issue Date:

07 June 2016

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Laboratory Technical Manager



OATS FCC LISTING REGISTRATION: 837095 OATS IC LISTING REGISTRATION: SITE# 737A-1

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

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FCC ID: CASTBDB3G IC : 737A-TBDB3G Page 1 of 16 Issue Date: 7 June 2016 Report Revision: 1

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REVISION

Date	Revision	Comments		
7 June 2016 1		Initial test report		

INTRODUCTION

Type approval testing of the TBDB3G, 50 Watt, BASE STATION transceiver in order to demonstrate compliance with FCC 47 Parts 22, 74 & 90, and RSS-119 Issue 12 & RSS-Gen Issue 4. This Class-2 Permissive Change report adds FFSK to the list of modulations supported. The original test report is TARF 3711.

in accordance with:

FCC 47 CFR Parts 22, 74 and 90 RSS-119 Issue 12 & RSS-Gen Issue 4

REPORT PREPARED FOR Tait Ltd 245 Wooldridge Road Harewood Christchurch 8051 New Zealand

DESCRIPTION OF SAMPLEManufacturerTait LimitedEquipment:BASE STATION TransceiverType:TBDB3GQuantity:1

FFSK tests were performed using a 511 bit pseudo-random sequence. Data rate: 1200 bits/second

HARDWARE & SOFTWARE

Description	Product Code	Serial Number	Firmware Version	Hardware Version
Reciter	T01-01403-DAAA	18234644 dmr-2.15.00.0006		1
Power Amplifier T01-01405-BZZZ		18229893	N/A	0.01
Front Panel	T01-01410-AAAA	2882097	1.08.00.0002	0.01

TEST CONDITIONS

All testing was performed on 7 June 2016, and under the following conditions:Ambient temperature: $15^{\circ}C \rightarrow 30^{\circ}C$ Relative Humidity: $20\% \rightarrow 75\%$ Standard Test Voltage $13.8 V_{DC}$

STATEMENT OF COMPLIANCE

We, TELTEST LABORATORIES of 558 Wairakei Road, Christchurch, New Zealand, declare under our sole responsibility that the product:

Equipment:	BASE STATION Transceiver
Туре:	TBDB3G

Consisting Of:

HARDWARE & SOFTWARE

Description	Product Code	Serial Number	Firmware Version	Hardware Version
Reciter	T01-01403-DAAA	18234644	18234644 dmr-2.15.00.0006	
Power Amplifier T01-01405-BZZZ		18229893	N/A	0.01
Front Panel	T01-01410-AAAA	2882097	1.08.00.0002	0.01

to which this declaration relates, is in conformity with the following standards:

FCC 47 CFR Parts 22, 74 and 90

RSS-119 Issue 12 & RSS-Gen Issue 4

Signature: _____

Mike James Technical Manager

Date:

MODULATION TYPES, NECESSARY BANDWIDTH & EMISSION DESIGNATORS

MODULATION TYPES:

F2D Fast Frequency Shift Keying

1200 symbols/sec

1200 bps

EMISSION DESIGNATORS:

Channel Spacing 12.5 kHz				
FFSK	7K60F2D			

CALCULATIONS

Fast Frequency Shift Keying (FFSK – 1200 bps) 12.5 kHz Channel Spacing
Emission DesignatorM = 1.8 kHzEmission DesignatorD = 2.0 kHz7K60F2D $Bn = (2 \times 1.8) + (2 \times 2.0) \times 1$ F2D represents a FM data transmission with
the use of a modulating sub carrier

TEST RESULTS

TRANSMITTER OCCUPIED BANDWIDTH AND SPECTRUM MASKS

SPECIFICATION: FCC 47 CFR 2.1049 (c)

RSS-119 5.5

GUIDE: TIA/EIA-603D 2.2.11

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment Set up.

2. For analogue measurements: The EUT was modulated by a 2500 Hz tone at an input level 16 dB above a level that produced 50% deviation. The input level was established at the frequency of maximum response of the audio modulating circuit.

3. The Occupied Bandwidth was measured on the Spectrum Analyser, with bandwidth settings as follows.

Emission Mask D - Resolution Bandwidth = 100 Hz, Video Bandwidth = 1 kHz

MEASUREMENT RESULTS: See the plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSE:	FCC 47 CFR 90.210	RSS-119 5.5
EMISSION MASKS		
Emission Mask D	12.5 kHz Channel Spacing	FFSK



Occupied Bandwidth and Spectrum Masks



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Occupied Bandwidth and Spectrum Masks



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TEST EQUIPMENT LIST

Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Power Supply	AC Variac	Yamabishi	S-260-5	TX-533	E1737	
Spectrum Analyser	13.2GHz	Hewlett Packard	HP8562E	3821A00779	E3715	15-Oct-16
RF Attenuator	30dB 350W	Weinschel	67-30-33	BR0531	E4280	18-Oct-16
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack5	E4850	16-Oct-16
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack6	E4849	16-Oct-16

NOTE: Items without calibration dates are calibrated immediately before use, or set using calibrated instruments.

ANNEX A – TEST SETUP DETAILS

All testing is performed using the Teltest Radio **EVA**luation system (TREVA), which is configured as shown below. The Spectrum Analyser is connected to the EUT via the attenuator network for Conducted Emissions testing, and Occupied Bandwidth.

