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CERTIFICATE OF COMPLIANCE
MPE EVALUATION

Tait International Limited		Dates of Test:	April 29, 2021
245 Wooldridge Road		Test Report Number:	MPE.20210402
Harewood			Revision B
Christchurch 8051			
New Zealand			

Contains FCC ID:	CASTBDB1G
Model:	TBDB1G
Test Sample:	Engineering Unit Same as Production
Equipment Type:	Wireless PTT Base Station Radio
Classification:	Mobile Transmitter
TX Frequency Range:	136 – 174 MHz
Frequency Tolerance:	± 2.5 ppm
Maximum RF Output:	150 MHz – 46.99 dBm Conducted
Signal Modulation:	FM, FFSK
Antenna Type:	Internal
Application Type:	Certification
KDB Test Methodology:	KDB 447498 D01 v06
FCC Rules:	47 CFR 1.1310 & 47 CFR 2.1091
Maximum Power Density Value:	0.12 mW/cm^2 (FCC)
Maximum E-Field Value:	21.3 V/m (FCC)
Maximum H-Field Value:	0.057 A/m (FCC)
Separation Distance:	650 cm for Body

This wireless mobile and/or portable device has been shown to be compliant for RF exposure requirements for uncontrolled environment/general exposure limits specified in 47 CFR 1.1310 & 47 CFR 2.1091 (See test report).

I attest to the accuracy of the data. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Jay M. Moulton
Vice President

ACCREDITED
Certificate # 2387.01

Table of Contents

Comment/Revision	Date
Original Release	April 29, 2021
Revision A – Correct distance in tables in Annex B and title in item B2.2	May 4, 2021
Revision B – Correct E-Field and H-Field Calculated Values	May 7, 2021

Note: The latest version supersedes all previous versions listed in the above table. The latest version shall be used.

1. Introduction

This measurement report shows compliance of the Tait International Limited Model TBDB1G Wireless PTT Base Station Radio with 47 CFR 1.1310 & 47 CFR 2.1091.

2. Characteristics of the Evaluation

2.1 Requirements and Methods

RF exposure assessment of the Tait International Limited Model TBDB1G Wireless PTT Base Station Radio.

Requirements	Frequency Bands
47 CFR 1.1310 Radio Frequency (RF) Radiation Exposure Limits & 47 CFR 2.1091 Radio Frequency Radiation Exposure Evaluation: Mobile Device.	136 – 174 MHz

3. Data Supplied by the Applicant

3.1 Applicant

Name/Company: Tait International Limited
Address: 245 Wooldridge Road, Harewood, Christchurch 8051
Country: New Zealand

3.2 Representative

Name: Danielle Mellado
Address: 15354 Park Row Drive, Houston, TX 77084
Country: USA

3.3 Identification of Item Evaluated

Product: Wireless PTT Base Station Radio
Model: TBDB1G
Manufacturer: Tait International Limited

4. Evaluation Results

Abbreviations used in the RESULTS column of the following tables are:

C Compliant with requirements
NC Not Compliant with requirements
NA Not Applicable
NE Not Evaluated

Document/Standard	Results
47 CFR 1.1310 Radio Frequency (RF) Radiation Exposure Limits & 47 CFR 2.1091 Radio Frequency Radiation Exposure Evaluation: Mobile Device.	C

5. Summary

Considering the results of the performed analysis and evaluation, stated in Appendix A and B, the item under evaluation is **IN COMPLIANCE** with the specifications listed in Section 2.1 “Requirements and Methods”.

Appendix A

Host Analysis

A.1. Device

The device is in a mobile exposure condition (antenna-to-user distance > 20 cm).

Main/Primary Transmitter:

PTT Transmitter:

Type of Equipment : Wireless PTT Base Station Radio
Model : TBDB1G
Antennas Evaluated : Model RFI OA40-41(11.1 dBi Gain)
Cable Use for Install: : AVA5-50FX
Minimum Cable Loss: : No Cable Loss was used for the evaluation. Therefore, any cable length could be used for the installation.
Maximum gain (Ant – Cable) : 11.1 dBi
Output power : 46.99 dBm

Frequency Band	Mode	Frequency Range (MHz)	Maximum Conducted output power (dBm)	Maximum Conducted output power (mW)	Duty Cycle	Equivalent conducted output power (mW)	Maximum antenna gain (dBi)	Maximum antenna gain (numerical)	EIRP (mW)
150 MHz	PTT	136-174	46.99	50,000	100%	50,000	11.1	12.88	644,000

Worst Case Considerations:

- Minimum Antenna-to-user distance: 650 cm
  - Any antenna-to-user distance > 650 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Maximum Antenna gains: 150 MHz band PTT: 11.1 dBi
  - Any antenna gains below the specified would be covered by the analysis included in this report as far as it would provide better exposure conditions.

Appendix B

RF Exposure Assessment

B.1 Maximum Permissible Exposure (MPE) Limits

B.1.2 FCC MPE Limits

Normative document:

- 47 CFR 1.1310 Radio Frequency (RF) Radiation Exposure Limits & 47 CFR 2.1091 Radio Frequency Radiation Exposure Evaluation: Mobile Device.

Reference levels:

The table below is excerpted from Table 1 of 47 CFR 1.1310 Radio Frequency (RF) Radiation Exposure Limits:

Frequency Range (MHz)	E-field strength (V/m)	H-field strength (A/m)	Power Density (S) (mW/cm^2)	Averaging Time (minutes)
0.3-3.0	614	1.63	100	30
3.0-30	842/f	2.19/f	$180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1500	30
1,00-100,000	--	--	1.0	30

Note: f is frequency in MHz.

MPE limits:

Frequency Band	Mode	Frequency Range (MHz)	Reference frequency (MHz)	MPE limit S_{eq} (mW/cm^2)	E-Field Strength (V/m)	H-Field Strength (A/m)
150 MHz	PTT	136-174	174	0.20	27.5	0.073

B.2 RF Exposure Assessment – Individual Transmitters

B.2.1 Introduction

Calculations to predict power density levels in the far-field of the antenna are made by use of the following equation:

$$S = \frac{P \bullet G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g. mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (in appropriate units, e.g. cm)

B.2.2 RF Exposure Assessment for TBDB1G Wireless PTT Base Station Radio

FCC Requirements

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	Power Density (S_{eq}) $S = \frac{P \bullet G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$ (mW/cm^2)	MPE limit (S_{lim}) (mW/cm^2)	Compliance ($S_{eq} < S_{lim}$) (mW/cm^2)
150 MHz	PTT	136-174	644,000	650	0.12	0.2	**COMPLIANT**

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	E-Field Strength (V/m)	MPE limit	Compliance
150 MHz	PTT	136-174	644,000	650	21.3	27.5	**COMPLIANT**

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	H-Field Strength (A/m)	MPE limit	Compliance
150 MHz	PTT	136-174	644,000	650	0.057	0.073	**COMPLIANT**