

RF Exposure Lab

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CERTIFICATE OF COMPLIANCE MPE EVALUATION

Tait International Limited
245 Wooldridge Road
Harewood
Christchurch 8051
New Zealand

Dates of Test: January 24, 2025
Test Report Number: MPE.20250101
Revision A
Lab Designation Number: US1195

FCC ID:	CASTBDK4F
Model:	TBDK4F
Test Sample:	Engineering Unit Same as Production
Equipment Type:	Wireless PTT Base Station Radio
Classification:	Mobile Transmitter
TX Frequency Range:	762 – 776 MHz, 850 – 870 MHz
Frequency Tolerance:	± 2.5 ppm
Maximum RF Output:	800 MHz – 41.76 dBm Conducted
Signal Modulation:	P25, DMR, Analogue
Antenna Type:	External
Application Type:	Certification
KDB Test Methodology:	KDB 447498 D01 v06
FCC Rules:	47 CFR 1.1310, 47 CFR 1.1307 & 47 CFR 2.1091
Maximum Power Density Value:	0.0726 mW/cm ²
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 2.1307, 47 CFR 2.1091 & KDB447498 (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



Certificate # 2387.01

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Comment/Revision	Date
Original Release	January 28, 2025
Revision A – Correct FCC Representative	January 28, 2025

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 TBDK4F Wireless PTT Base Station Radio with 47 CFR 1.1310, 47 CFR 1.1307, 47 CFR 2.1091 & KDB447498.

2. Characteristics of the Evaluation

2.1 Requirements and Methods

RF exposure assessment of the Tait International Limited Model TBDK4F Wireless PTT Base Station Radio.

Requirements	Frequency Bands
47 CFR 1.1310 Radio Frequency (RF) Radiation Exposure Limits, 47 CFR 1.1307 Actions Which May Have A Significant Environmental Effect & 47 CFR 2.1091 Radio Frequency Radiation Exposure Evaluation: Mobile Device.	762 – 776 MHz 850 – 870 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 US Representative

Name: Mark Reeves, Senior System Design Engineer
Company: Tait North America, Inc.
Address: 1315 W Sam Houston Parkway N, Suite 140, Houston, TX
Country: USA
FRN: 0033506585

3.3 Identification of Item Evaluated

Product: Wireless PTT Base Station Radio
Model: TBDK4F
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 1.1307 Actions Which May Have A Significant Environmental Effect & 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 : TBDK4F
 Duplexers Installed: : T993-050-09-02 Duplexer Notch 780-960 MHz 50W 10-15 MHz or 45 MHz spacing
 Antennas Evaluated : Model dBpectrum DS7B12F36U-D (14.1 dBi Gain)
 Cable Use for Install: : RG213 or RG223 6 meters Minimum
 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) : 14.1 dBi
 Output power : 41.76 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)
800 MHz	PTT	762-776	41.76	15,000	100%	15,000	14.1	25.70	385,500
800 MHz	PTT	850-870	41.76	15,000	100%	15,000	14.1	25.70	385,500

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: 800 MHz band PTT: 14.1 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.1.1 FCC MPE Limits

Normative document:

- 47 CFR 1.1310 Radio Frequency (RF) Radiation Exposure Limits, 47 CFR 1.1307 Actions Which May Have A Significant Environmental Effect & 47 CFR 2.1091 Radio Frequency Radiation Exposure Evaluation: Mobile Device: 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)
800 MHz	PTT	762-776	776	0.52	N/A	N/A
800 MHz	PTT	850-870	870	0.58	N/A	N/A

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:

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

where: S = power density (in appropriate units, e.g. mW/cm²)

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 TBDK4F Wireless PTT Base Station Radio

FCC Requirements

Frequency Band	Mode	Frequency Range (MHz)	EIRP (mW)	Evaluation distance (R) (cm)	Power Density (S _{eq}) $S = \frac{P \cdot G}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$ (W/m ²)	MPE limit (S _{lim}) (mW/cm ²)	Compliance (S _{eq} < S _{lim}) (mW/cm ²)
800 MHz	PTT	762-776	385,500	650	0.0726	0.52	COMPLIANT
800 MHz	PTT	850-870	385,500	650	0.0726	0.58	COMPLIANT