RF Exposure Lab

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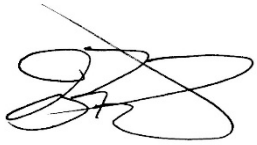
CERTIFICATE OF COMPLIANCE
MPE EVALUATION

Tait International Limited	Dates of Test: March 10, 2025
245 Wooldridge Road	Test Report Number: MPE.20250301
Harewood	Revision A
Christchurch 8051	Lab Designation Number: US1195
New Zealand	

FCC ID:	CASTMBK5B
Model:	TMBK5B
Test Sample:	Engineering Unit Same as Production
Equipment Type:	Wireless K5 Band Mobile Radio
Classification:	Mobile Transmitter
TX Frequency Range:	757 – 806 MHz, 850 – 870 MHz
Frequency Tolerance:	± 2.5 ppm
Maximum RF Output:	800 MHz – 44.8 dBm; 860 MHz – 45.4 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:	1.25 mW/cm^2
Separation Distance:	90 cm for Body

This wireless mobile and/or portable device has been shown to be compliant for RF exposure requirements for controlled environment/occupational 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

ACCREDITED
Certificate # 2387.01

Table of Contents

Comment/Revision	Date
Original Release	March 12, 2025
Revision A – Correct units in table on page 10	March 14, 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 TMBK5B Wireless K5 Band Mobile 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 TMBK5B Wireless K5 Band Mobile 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.	757 – 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 K5 Band Mobile Radio
Model: TMBK5B
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 K5 Band Mobile Radio
Model : TMBK5B
Antennas Evaluated : Monopole ¼ wave (2.15 dBi Gain); Monopole (5.65 dBi Gain)
Cable Use for Install: : Not Specified
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) : 5.65 dBi
Output power : 44.8 dBm Low Band; 45.4 dBm High Band

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	44.8	30,200	100%	30,200	5.65	3.67	110,834
860 MHz	PTT	850-870	45.4	34,674	100%	34,674	5.65	3.67	127,254

Worst Case Considerations:

- Minimum Antenna-to-user distance: 90 cm
  - Any antenna-to-user distance > 90 cm would be covered by the analysis included in this report as far as it would provide better exposure conditions.
- Maximum Antenna gains: Low and High Band: 5.65 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.

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	1842/f	4.89/f	$900/f^2$	30
30-300	61.4	0.163	1.0	30
300-1,500	--	--	f/300	30
1,00-100,000	--	--	5.0	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	757-776	776	2.59	N/A	N/A
860 MHz	PTT	850-870	870	2.90	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:

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

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 TMBK5B Wireless K5 Band Mobile 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)
800 MHz	PTT	757-776	110,834	90	1.09	2.59	**COMPLIANT**
860 MHz	PTT	850-870	127,254	90	1.25	2.90	**COMPLIANT**