TYPE OF EXHIBIT: MPE(Maximum Permissible Exposure) Calculation

MANUFACTURER: RITRON, Inc.

MODEL: DTXM-460-0BN6I-NXDN

TYPE OF UNIT: UHF Transceiver

FCC ID: AIERIT51-46006

IC ID: 1084A-RIT5146006

DATE: October 5, 2021

DETERMINING MPE DISTANCE:

Because this product is used as a mobile device, an RF calculation can be done to determine maximum permissible exposure.

Power density is related to EIRP:

$S(W/m^2) = EIRP(W)/4\pi r^2$ where r is the distance from the source in meters. Solving for distance as a function of transmitter power and required power density per area we get:

$r = \sqrt{(EIRP/4\pi S)}$

The MPE (maximum permissible exposure) for a device operating in a occupational/controlled exposure environment is $(f/300)mW/cm^2$. Converting to W/m^2, the limit becomes $10(f/300)\ W/m^2$. The MPE limit is substituted for S and EIRP is entered in the above equation. With the maximum 6 watt unit transmitting into a unit gain quarter wave dipole on a ground plane we have an ERP of 6W. The EIRP will be 1.64 times that or 9.84 W. Also, the DTXM-460 must operate at 50% transmit duty cycle which gives a 4.92 W time averaged EIRP. Using that for the three test frequencies across the band the following minimum distances result when using the unity gain antenna.

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DATE: November 9, 2021

RESULTS FOR MPE:

RESULTS FOR EIRP:

Frequency (MHz)	EIRP (Watts)	Duty Cycle %	S limit W/m^2	Distance cm	Distance in
450.000	9.84	50	15.0	16.2	6.4
460.000	9.84	50	15.3	16.0	6.3
470.000	9.84	50	15.7	15.8	6.2

RF WARNING STATEMENT:

The following statement appears in the Users Manual regarding RF safety:

RF ENERGY EXPOSURE AWARENESS AND CONTROL INFORMATION, AND OPERATIONAL INSTRUCTIONS FOR FCC OCCUPATIONAL USE REQUIREMENTS:

BEFORE USING THIS TWO-WAY RADIO, READ THIS IMPORTANT RF ENERGY AWARENESS AND CONTROL INFORMATION AND OPERATIONAL INSTRUCTIONS TO ENSURE COMPLIANCE WITH THE FCC'S AND IC'S RF EXPOSURE GUIDELINES.

NOTICE: This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC/IC limits. This radio device is NOT authorized for general population, consumer, or any other use.

This DTXM two-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. It uses radio frequency (RF) energy or radio waves to send and receive calls. RF energy is one

form of electromagnetic energy. Other forms include, but are not limited to, electric power, sunlight and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which when used improperly can cause biological damage. Very high levels of x-rays, for example, can damage tissues and genetic material.

Experts in science, engineering, medicine, health and industry work with organizations to develop standards for exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection. All 2-way radios marketed in North America are designed, manufactured and tested to ensure they meet government established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of 2-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it. Please refer to the following websites for more information on what RF energy exposure is and how to control your exposure to assure compliance with established RF exposure limits.

http://www.fcc.gov/oet/rfsafety/rf-faqs.html
http://www.osha.gov/SLTC/radiofrequencyradiation/index.html

Federal Communications Commission Regulations:

The FCC rules require manufacturers to comply with the FCC RF energy exposure limits for mobile two-way radios before they can be marketed in the U.S. When 2-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a label directing users to specific user awareness information.
The DTXM two-way radio has an RF exposure product label. Also, this DTXM manual includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

Compliance with RF Exposure Standards:

The DTXM two-way radio is designed and tested to comply with a number of national and international standards and guidelines (listed below) regarding human exposure to radio frequency electromagnetic energy. This radio complies with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at duty factors of up to 50% talk and 50% listen and is authorized by the FCC for occupational use. In terms of measuring RF energy for compliance with the FCC exposure guidelines, your radio antenna radiates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode. The DTX two-way radio complies with the following RF energy exposure standards and guidelines:

• United States Federal Communications Commission, Code of Federal Regulations; 47 CFR §§ 2 sub-part J.
• American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992.
• Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition.

To control exposure to yourself and others and ensure compliance with the occupational/controlled environment exposure limits always adhere to the following procedures:

Guidelines:

• User awareness instructions should accompany device when transferred to other users.
• Do not use this device if the operational requirements described herein are not met.

Instructions:

• Transmit no more than the rated duty factor of 50% of the time. To transmit (talk or send data), assert the PTT input pin. To receive calls, un-assert the PTT input. Transmitting 50% of the time, or less, is important because this radio generates measurable RF energy exposure only when transmitting (in terms of measuring for standards compliance).
• Transmit only when people are at least the recommended minimum lateral distance away, as shown in Table 1, from a properly installed according to installation instructions, externally-mounted antenna.

NOTE - Table 1 lists the recommended minimum lateral distance for bystanders in an uncontrolled environment from transmitting types of antennas (i.e., monopoles over a ground plane, or dipoles) at several different ranges of rated radio power for mobile radios installed on a vehicle.

Table 1. Rated Power and Recommended Lateral Distance for quarter-wave ground plane antenna:

Rated Power of DTXM Two-way Radio	Recommended Minimum Lateral Distance from Transmitting Antenna
6 watts	6.4 inches (16.2 cm)

Antennas

• Install antennas taking into account the recommended minimum lateral distances in Table 1. These antenna installation guidelines are limited to antennas with appropriate ground planes. The antenna installation should additionally be in accordance with:

a.) The requirements of the antenna manufacturer/supplier.
b.) Instructions in this manual including minimum antenna cable lengths.
c.) Antennas other than those shown in Table 1 must be tested with the DTX module for FCC and IC RF exposure compliance.

• Use only a UHF quarterwave antenna or equivalent antenna or other antennas as specified in Table 1. Unauthorized antennas, modifications, or attachments could damage the radio and may violate FCC and IC regulations.

Approved Accessories

• This radio has been tested and meets the FCC and IC RF exposure guidelines when used with the Ritron accessories supplied or designated for this product. Use of other accessories may not ensure compliance with the FCC's RF exposure guidelines, and may violate FCC regulations.

• For a list of Ritron approved accessories see this user manual, or visit the following website which lists approved accessories: www.ritron,com

Contact Information:

For additional information on exposure requirements or other information, contact Ritron at (317) 846-1201 or at www.ritron.com.