

-----Original Message-----

From: OET [<mailto:oetech@fccsun07w.fcc.gov>]

Sent: Friday, July 28, 2000 8:02 AM

To: sid@ritron.com

Subject:

To: Sam Dulaney, null

From: Frank Coperich

fcoperic@fcc.gov

FCC Application Processing Branch

Re: FCC ID AIERIT13-450

Applicant: Ritron Inc

Correspondence Reference Number: 15304

731 Confirmation Number: EA98126

Date of Original E-Mail: 07/28/2000

1.) Because this unit is used with a specific antenna provided with the unit, the tests for power output should be performed as radiated to determine ERP via the substitution method.

Requested data follows.

2.) Likewise, the tests for radiated spurious emissions should be performed with the unit operating with it's normal antenna connected.

Requested data follows.

3.) Although hand-held, push-to-talk device are categorically excluded from routine RF exposure evaluation for demonstrating SAR compliance, they are not exempted from compliance. Because of the high measured output for this device, additional information is needed to determine if SAR compliance can be assured or if a request for RF exposure evaluation under the provisions of 1.1307(d) would be necessary. Please provide the following information, if applicable, so that we can consult with headquarters to determine if a request for SAR evaluation is necessary -

(a) the type and number of antenna(s) to be used for this device and a detailed description of the antenna connector, if any.

Two antennas are available for this device; an AFS-450 and an AFS-450-S. Both attach to the top of the device and are shortened quarterwave whips. The connector is a 1/4-20 stud attached to the antenna. It would be difficult to connect any other connector or antenna other than that supplied by the manufacturer.

(b) maximum antenna gain for antenna(s) indicated in (a)

AFS-450	-3.7 dBi
AFS-450-S	-4.9 dBi

(c) can this device sustain continuous operation with respect to its hardware capabilities and allowable operating functions ?

No. The transmitter chain is thermally limited to continuous operation for a period of time measured in minutes. A firmware timeout timer exists within the device to limit continuous transmit time to one minute or less. For short term (minutes) conversation, the expected duty cycle is 50% maximum. For long term (hours) use, the expected duty cycle is 10% or less.

- (d) are there any other hardware or operating restrictions that could limit a person's RF exposure ?

Ergonomically, the placement of the microphone and speaker require that for satisfactory audio performance, the unit must be held in front of the face, not against the head or body.

- (e) is source-based time-averaging (see 2.1093 of rules) applicable to reduce the average output power ?

Yes. The device operates in simplex mode. It does not transmit continuously. During the time that a conversation is actually taking place, the expected duty cycle would be 50% maximum.

- (f) this device has headset and belt-clip accessories that would allow body-worn operations, what is the minimum separation distance between the antenna and the user's body in this operating configuration ?

Typically, between 2" and 4". We recommend 4" minimum.

- (g) can this device access wire-line services to make phone calls, either directly or through an operator

Theoretically, yes, but not easy from a practical standpoint. The device does not have a keypad and operates in simplex mode. The ergonomics do not support telephone type conversations. The device at the other end would have to establish a connection with the wire-line services. This is very atypical.

- (h) can specific operating instructions be given to users to eliminate any potential RF exposure concerns for both front-of-the-face and body-worn operating configurations ?

Yes. A copy of an RF exposure warning statement is provided following this text. This statement will be added to the users' manual.

- (i) any other applicable information the applicant may provide that can serve as effective means for ensuring RF exposure compliance.

Unlike analog cordless and cellular phones, this device only emits significant RF energy when the PTT button is actually depressed. This requires a conscious action on the part of the operator. A timeout timer exists to shutdown the transmitter if the PTT button is accidentally depressed.

Upon receiving the responses to the above, we may need to consult with headquarters to determine if there is sufficient information to assure compliance or if a request for evaluation according to 1.1307(d) is necessary. Alternatively, if there is existing SAR evaluation data for this device that can be made available, it would be very helpful for completing this filing. However, there is no requirement for the applicant to submit any RF exposure evaluation data unless it is (subsequently) requested for under the provisions of 1.1307(d) of FCC rules.

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days of the original

e-mail date may result in application dismissal pursuant to Section 2.917 © and forfeiture of the filing fee pursuant to section 1.1108.

DO NOT reply to this e-mail by using the Reply button. In order for your response to be processed expeditiously, you must upload your response via the Internet at www.fcc.gov, Electronic Filing, OET Equipment Authorization Electronic Filing. If the response is submitted through Add Attachments, in order to expedite processing, a message which informs the processing staff that a new exhibit has been submitted must also be submitted via Submit Correspondence. Also, please note that partial responses increase processing time and should not be submitted.

Any questions about the content of this correspondence should be directed to the e-mail address listed below the name of the sender.

I trust that this information will be satisfactory to the Commission. While we do not fear the results of SAR testing, we are on a tight production schedule and hope that formal testing may be averted. As always, do not hesitate to contact me with any questions or comments.

Regards,

Sam L. Dulaney
Chief Engineer
RITRON, Inc.
sdulaney@ritron.com

TYPE OF TEST: FIELD STRENGTH OF SPURIOUS RADIATION

FCC PART: 2.993 (b)

MANUFACTURER: RITRON, INC.
505 West Carmel Drive
Carmel, IN 46032

MODEL: SST-444

TYPE OF UNIT: UHF-FM Handheld Transceiver

FCC ID: AIERIT13-450

DATE: August 10, 2000

PROCEDURE:

1. The following measurements were taken at the RITRON, Inc. 3 meter test site. Measurements were made in accordance with FCC Rules & Regulations Part 2.947, using the procedures of IEC Publication 106.
2. The SST-444 was aligned for transmitter operation on 465.0125 MHz at full rated power per the tune-up procedure outlined in the Preliminary Maintenance Manual. The unit was then terminated at the antenna port with the two antennas sold for use with this product.
3. All field strength measurements were made with the Hewlett-Packard Model 8559A Spectrum Analyzer and the appropriate antenna for the frequency being measured. The antennas used were:
 - Electro-Metrics BDA-25 Dipole Antenna at 0 to 200 MHz
 - Electro-Metrics LP-25 Log Periodic Antenna at 200 to 1000 MHz
 - Polarad CA-BB Microwave Antenna at 1000 to 10,000 MHz
4. For each emission, the height and polarization of the field strength measuring antenna and orientation of the SST-444 were varied to provide maximum field strength. The spectrum was searched from 4 MHz to the 10th harmonic of the transmit frequency. All unreported emissions were more than 20 dB below the FCC limits specified in Part 90.210(d)(3).

TYPE OF TEST: FIELD STRENGTH OF SPURIOUS RADIATION

FCC PART: 2.993 (b)

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505 West Carmel Drive
Carmel, IN 46032

MODEL: SST-444

TYPE OF UNIT: UHF-FM Handheld Transceiver

FCC ID: AIERIT13-450

DATE: August 10, 2000

EQUATIONS:

The equivalent RF level at the radio position is calculated as follows:

$$P_t = P_r + A_{Fr} + A_n + A_{Ft}$$

Where

P_t is level measured by spectrum analyzer attached to test site receiving antenna.

A_{Fr} is the antenna factor of the site receiving antenna including the attached cable.

A_n is the measured normalized site attenuation factor for this site at the frequency of measurement.

A_{Ft} is the antenna factor of the reference antenna at the radio location.

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FCC PART: 2.993 (b)

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505 West Carmel Drive
Carmel, IN 46032

MODEL: SST-444

TYPE OF UNIT: UHF-FM Handheld Transceiver

FCC ID: AIERIT13-450

DATE: August 10, 2000

TEST RESULTS:

Frequency	Relation to	Receiving	Pr	AFrx	An	AFtx	Pt	Radio Antenna	FCC Limit
MHz	Carrier	Antenna	dBm	dB	dB	dB	dBm		dBm
465.0125	Carrier	Log-periodic	4	21.6	-17.9	23.5	31.2	AFS-450-S	
465.0125	Carrier	Log-periodic	5	21.6	-17.9	23.5	32.2	AFS-450	
930.0250	2nd harmonic	Log-periodic	-55	28.5	-21.8	27.5	-20.8	AFS-450-S	-20
1395.0375	3rd harmonic	Conical	-86	28.9	-21.3	31	-47.4	AFS-450	-20
2325.0625	5th harmonic	Conical	-82	32.7	-25.8	35.4	-39.7	AFS-450	-20

TYPE OF TEST: TRANSMITTER EFFECTIVE RADIATED POWER

FCC PART: 2.993 (b)

MANUFACTURER: RITRON, INC.
505 West Carmel Drive
Carmel, IN 46032

MODEL: SST-444

TYPE OF UNIT: UHF-FM Handheld Transceiver

FCC ID: AIERIT13-450

DATE: August 10, 2000

PROCEDURE:

The effective radiated power was measured at the same time as the spurious transmitter radiation. Tests were conducted with the two antennas available with this product attached. The reference was an isotropic radiator.

RESULTS:

Antenna	ERP (dBm)	ERP (watts)
AFS-450-S	+31.2	1.3
AFS-450	+32.2	1.7

Exposure to Radio Frequency Energy

This radio consists of a transmitter and a receiver. The transmitter is active when the Push-to-Talk button is depressed and emits radio frequency (RF) energy at a power level up to 4 watts. Analog modulation techniques are used.

In 1991 the Institute of Electrical and Electronics Engineers (IEEE), and in 1992 the American national Standards Institute (ANSI) updated the 1982 ANSI Standard for safety levels with respect to human exposure to RF energy. Over 120 scientists, engineers, and physicians from universities, government health agencies, and industry, after reviewing the available body of research, developed this updated Standard. In March 1993 the Federal Communications Commission (FCC) proposed the adoption of this updated Standard.

This radio is designed to comply with this Standard. To limit your exposure to levels at, or below, the levels in the Standard, please observe the following:

- The antenna(s) available from RITRON for this model are the only ones that are to be used. **DO NOT** attempt to substitute any other antenna.
- Keep talk times as short and infrequent as possible. **DO NOT** depress the PTT button when not actually wishing to transmit. The radio is equipped with an internal timer to limit continuous transmit times.
- When transmitting, hold the radio in front of the mouth, preferably at a distance of at least 4 inches. **DO NOT** hold the radio in such a manner that the antenna is next to, or touching, exposed parts of the body, especially the face or eyes while transmitting.
- In belt mounted applications, when transmitting, remove the radio from the belt and hold away from the body, preferably at least 4 inches.
- When using external headset accessories, hold the unit away from the body, preferably at least 4 inches when transmitting.
- **DO NOT** allow children to operate this radio.