

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 two-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 two-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 web sites 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>

1.12.1 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 two-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. Your EFJohnson two-way radio has a RF exposure product label. Also, your EFJohnson user manual, or product manual, or separate safety booklet includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

1.12.2 COMPLIANCE WITH RF EXPOSURE STANDARDS

Your EFJohnson 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 100% 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.

Your EFJohnson 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.

1.12.3 EXPOSURE COMPLIANCE AND CONTROL GUIDELINES AND OPERATING INSTRUCTIONS

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), push the Push-To-Talk (PTT) button. To receive calls, release the PTT button. 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 outside the vehicle 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 1-2 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 in a vehicle.

Table 1-2 Rated Power and Recommended Lateral Distance

Rated Power of Vehicle-Installed Two-Way Radio	Recommended Minimum Lateral Distance From Transmitting Antenna
Up to 50 watts	40 inches (1.0 meter)

1.12.4 MOBILE ANTENNAS

- Install antennas at the center of the roof or the center of the trunk deck taking into account the bystander exposure conditions of backseat passengers and the recommended minimum lateral distances in Table 1-2. These mobile antenna installation guidelines are limited to metal body motor vehicles or vehicles with appropriate ground planes. The antenna installation should additionally be in accordance with:
 - a.) The requirements of the antenna manufacturer/supplier.
 - b.) Instructions in the Radio Installation Manual, including minimum antenna cable lengths.

- c.) The installation manual should provide specific information of how to install the antennas to facilitate recommended operating distances to all potentially exposed persons.
- Use only EFJohnson approved supplied antenna or EFJohnson approved replacement antenna. Unauthorized antennas, modifications, or attachments could damage the radio and may violate FCC regulations. Antennas tested with EFJohnson radios are listed in Table 1-2.

**Table 1-2 Tested Antenna Whips and Bases
(Antenna Manufacturer - Antenna Specialists)**

Frequency	Whip Model No.	Base Model No.
136-144 MHz	ASPJ1415	KM220
144-152 MHz	ASPA1415	KM220
152-162 MHz	ASPB1415	KM220
162-174 MHz	ASPC1415	KM220
400-430 MHz	ASPE1615	KM220
430-470 MHz	ASPD1615	KM220
470-512 MHz	ASPF1615	KM220
806-869 MHz	ASPA1855	KM220
890-960 MHz	ASPG1865	KM220

1.12.5 APPROVED ACCESSORIES

- This radio has been tested and meets the FCC RF exposure guidelines when used with the EFJohnson 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 EFJohnson approved accessories, refer to the radio service manual or contact the EFJohnson Company as follows.

1.12.6 CONTACT INFORMATION

For additional information on exposure requirements or other information, contact the EFJohnson Company at the address or telephone number listed in Section 1.7.

4300 SERIES MOBILE SPECIFICATIONS

The following are general specifications intended for use in testing and servicing this transceiver. For current advertised specifications, refer to the specification sheet available from your sales representative. Values are typical and are subject to change without notice.

GENERAL

Frequency Range	VHF: 136-174 MHz
Operating Modes	Conventional, Project 25 Conventional, Project 25 Trunked, SMARTNET, SmartZone

Mounting Location	Dash Mount (Remote mount optional)
Zones/Channels	Up to 16 zones with 16 channels per zone
Transmit/Receive Separation	Any frequency within the range
Channel Spacing	12.5, 15, 25, and 30 kHz
Maximum Deviation	25 kHz analog - 5 kHz 12.5 kHz analog - 2.5 kHz
Frequency Stability Receive and Transmit	2.5 PPM [−22° to +140° F (−30° to +60° C)]
Dimensions (without antenna)	2.1 inches high x 7.2 inches wide x 8.3 inches deep (5.3 cm x 18.2 cm x 21.1 cm)
Weight (with standard battery)	5 lbs. 4 oz. (2.38 kg)
Supply Voltage	13.6 volts DC nominal, negative ground
Current Drain (maximum)	Standby - 600 mA Receive (rated audio out) - 2.7 A Rated Transmit Power - 13.2 A

RECEIVER

Sensitivity	0.35 μ V (analog mode 12 dB SINAD), 0.35 μ V (digital mode 5% BER)
Selectivity	−75 dB
Spurious and Image Rejection	−75 dB
Intermodulation	−75 dB
Hum and Noise	40 dB at 25 kHz, 34 dB at 12.5 kHz
Maximum Frequency Spread	Any spread within the range
Audio Power Output	5 W with internal speaker (12 W with external 4- Ω speaker)
Audio Distortion	Less than 3% at 1 kHz

TRANSMITTER

RF Power Output	10 - 50 W variable standard
Spurious and Harmonic Emissions	−70 dB
FM Hum and Noise	−45 dB at 25 kHz bandwidth
Audio Modulation	8K10F1E, 11K0F3E, 16K0F3E, 20K0F1E
Audio Distortion	Less than 3% at 1 kHz
Maximum Frequency Spread	Any spread within the band