

## Jon Hughes

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**From:** oetech@fccsun27w.fcc.gov  
**Sent:** Tuesday, May 29, 2012 7:40 AM  
**To:** Jon Hughes  
**Subject:** Response to Inquiry to FCC (Tracking Number 505282)  
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### Office of Engineering and Technology

#### Inquiry on 05/04/2012 :

##### Inquiry:

On behalf of Garmin International, we hereby request the Commission's guidance, in accordance with FCC KDB 447498 D01v04 Section 1)c), as to whether SAR evaluation can be excluded for Part 95J certification of the Alpha100 2W Hand-held/Body-worn MURS Radio Transceiver based on source-based time-averaged duty cycle and transmission durations described in the operational description submitted herein.

#### Attachments

Alpha 100 Operational Description.pdf  
 Alpha 100 antenna configurations\_1.pdf  
 Alpha 100 antenna configurations\_2.pdf  
 Alpha 100 antenna configurations\_3.pdf  
 Alpha 100 antenna configurations\_4.pdf

Thank you for your time and consideration in this matter.

#### FCC response on 05/09/2012

The SAR exclusion criteria for hand-held, push-to-talk radios is provided in KDB447498. This document has recently been revised and is in draft form. For push-to-talk radios with a maximum operating duty factor of less than 50%, a 50% duty factor is used for determining SAR exclusion. The 2 watt radio described would, therefore be evaluated at 1 watt.

The 1 watt operation at 2.5 cm from face and 3.0 cm from body will not meet the SAR exclusion threshold when evaluated using either the current or draft versions of KDB447498:

Power > 250 mW, and  $(\text{Power}[\text{mW}]/\text{separation distance}[\text{mm}])^{1/2} < 3.0$ , respectively.

Therefore SAR evaluation is required.

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Please use the new guidance provided in the attached draft version of KDB865664 SAR measurement 100 MHz to 6 GHz DR01 for SAR evaluation at 150 MHz:

When SAR measurements are required in the 100 to 300 MHz range, the following must be considered.

- 1) The tissue dielectric parameters in Supplement C 01-01 must be interpolated and/or extrapolated to prepare tissue-equivalent media for measurements.
- 2) This frequency range must be supported by the SAR measurement system. The SAR probe must be calibrated for the device test frequency range and also at 300 MHz.
- 3) When dipoles or equivalent RF sources are available from SAR system manufacturers for system validation and verification, the applicable sources must be used.<sup>5</sup> When unavailable, the 300 MHz dipole defined in IEEE Std 1528-2003 must be used in conjunction with these procedures to perform SAR system validation and verification.
- a) The SAR probe must be calibrated at both 300 MHz and 150 MHz or 300 MHz and the applicable device measurement frequency.
- b) A normal SAR system verification is required at 300 MHz.
- 4) The test laboratory must establish a new SAR target value for the 300 MHz dipole using the 150 MHz SAR probe calibration point and 150 MHz tissue dielectric parameters with the dipole transmitting at 300 MHz, according to the procedures required for establishing a new SAR target at the tuned dipole frequency according to the probe calibration and tissue dielectric parameters at an offset frequency.
- i) If any of these conditions cannot be satisfied, a KDB inquiry is required to determine acceptable solutions, especially before testing devices.

**---Reply from Customer on 05/10/2012---**

Thank you for the response.

Please note that this device is not considered a "push-to-talk" radio by definition. It does not support voice transmissions and is not held in front of the face. The user can initiate a transmission by pushing a button on the radio, however the transmit button is not continuously depressed and released as is the case for typical transmit/receive push-to-talk radios. The maximum transmission duty cycle of 32.4% is only applicable for hand-held operations and the maximum transmission time is only 10 seconds. For body-worn configuration (periodic transmission only, not initiated by the user), the maximum duty cycle is only 2.8%.

Based on the above details, please kindly reconfirm if SAR evaluation is required or if test exclusion with a justification of compliance document may be considered by the Commission for Certification of this device.

Thank you.

#### **FCC response on 05/14/2012**

Please provide a detailed description of how the radio is intended to be used. Please include the user's manual if it is available.

Also, please address the following:

What protocol is used for radio to radio communications?

What protocol is used for radio to training collar communications?

What communication is occurring during periodic transmission (2.8% duty cycle)?

**---Reply from Customer on 05/16/2012---**

#### Celltech Response to FCC Comments

1. User manual is not yet available per client - please refer to the attachment "Description of Alpha 100 Intended Operation" submitted herein.
2. & 3. Both radio to radio and radio to training collar use the same TDMA protocol. It is a custom

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protocol for this application that has the opportunity to transmit and receive a packet every 125 ms. Typically, the radio will not be transmitting. In the worst-case transmission scenario, the radio would transmit for 38 ms out of every 125 ms for no more than 8 seconds. This transmission (radio to training collar) is sending stimulation commands to the training collar. All transmissions occur at 1500 BAUD as a GFSK modulated MURS band signal.

4. The communication during periodic transmission is sending the Alpha 100 device position to other Alpha 100 users. Periodic transmissions occur once every 2.5 seconds. The transmission takes 70 ms and transmits data at 1500 BAUD using GFSK modulation on the MURS bands.

#### Attachment List:

Description of Alpha 100 Intended Operation.pdf

---Reply from Customer on 05/23/2012---

Please kindly confirm when we can expect to receive the Commission's response to our previous reply on May 16.

Thank you for your consideration in this matter.

#### FCC response on 05/29/2012

You may proceed with the application for certification for the Alpha 100 MURS radio omitting SAR measurement results. However, the application must still include a report documenting compliance with FCC RF exposure rules.

The report should include:

- 1) A statement of compliance with respect to the applicable FCC RF exposure rules. Please reference this KDB inquiry.
- 2) The duty factor analysis used to justify omitting SAR measurements.
- 3) Device information identifying all wireless technologies, operating modes and exposure conditions applicable to the SAR exclusion including:
  - a) The nominal and maximum output power specifications and tolerances for all wireless modes.
  - b) The specific wireless protocols used by the DUT
  - c) A description of the antennas provided with the DUT

SAR exclusion based upon duty-factor consideration is on the Permit but Ask List. Please reference this KDB Inquiry number on the Form 731.

#### Attachment Details:

[Device and antenna photos 1of4](#)

[Device and antenna photos 2of4](#)

[Device and antenna photos 3of4](#)

[Device and antenna photos 4of4](#)

[KDB865664 SAR measurement 100 MHz to 6 GHz DR01](#)

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