

**Applicant:** Aclara Technologies LLC  
**Correspondence Reference Number:** 125660  
**Form 731 Confirmation Number:** TC801972  
**Date of Original E-mail:** 06/05/2012

**Response:**

**1. The grant lists 450-470 MHz as the operation frequency range. However, the band consists of non-Part 90 channels (454-456 MHz and portions of 462 MHz and 467 MHz). To list contiguous frequencies outside the applicable rule parts, guidelines in KDB 634817 should be followed and so noted on the grant. In addition, non-Part 90 channels should be disabled. Please provide justification for extended frequency listing, revise grant to add EF note, and attest that non-Part 90 channels are not selectable as well as explain how control is maintained so that the device operates only on authorized frequencies. The submitted file "BandExp Attestation" contains none of the above.**

The radios in question operate only on Part 90 frequencies. Every radio shipped is preset at the factory to a Part 90 frequency pair in accord with the customer's license. Frequencies cannot be changed in the field. Aclara has no objection to a note on the grant that limits the certification to Part 90 frequencies.

**2. The EUT, a 12.5 kHz single mode device is not achieving the 4800 bps per 6.25 kHz (or 9600 bps per 12.5 kHz) spectral efficiency as required in 90.203(j)(3). Noted that although the Commission has relaxed the 1/1/2013 migration deadline for 470-512 MHz as announced in FCC Order DA 12-642 (April 26, 2012); 450-470 MHz is notably not covered in the waiver and furthermore the Commission stated in Paragraph 9 that "we reiterate our commitment to the narrowbanding transition in the 150-174 MHz and 421-470 MHz bands, as demand for scarce PLMR spectrum continues to grow." Therefore I would like to re-state my previous advice (in the audit of FCC ID: LLB11009X) that the manufacturer upgrade its technology from 7200 bps to 9600 bps transmission rate. The spectral efficiency analysis presented in the application, which is based on combining a large number of transmitters each transmits only a small percentage of time, is not without flaw: a. Transmitting at 9600 bps would take only 54 ms to send the 520 bits of data, compared to 72 ms at 7200 bps. The faster each MTU (Meter Transmitter Unit) can send its status report, the more MTUs can be using the same channel, thus requiring less number of channel allocation in a cluster of cells consisting of many DCUs (data collection units) and MTUs.**

Aclara does not dispute that the January 1, 2013, narrowbanding deadline applicable to 450-470 MHz has not been waived.

However, when the Commission first adopted spectrum efficiency requirements under Part 90, it also ruled:

The Commission's Equipment Authorization Division may, on a case by case basis, grant type acceptance to equipment with slower bit rates than specified in Sections 90.203(j)(3) and 90.203(j)(5) of our rules, provided that an acceptable technical analysis is submitted with the application which demonstrates that the slower data rate will provide more spectral efficiency than the standard data rate.<sup>1</sup>

The Commission has never withdrawn this exception, which remains in force.

The file titled BandExp Attestation, which accompanied the application, contains the required showing. Additional showings that Aclara submitted in connection with FCC ID LLB11009X apply to this EUT as well—in particular, those uploaded on January 20 and February 6, 2012. Aclara will, on request, re-submit those showings into the present application file, and will provide any additional information you may request.

The Commission's most recent restatement of 90.203(j), in DA 12-12, provides:

by January 1, 2013, Industrial/Business and Public Safety Radio Pool licensees must:

- operate on 12.5 kHz (11.25 kHz occupied bandwidth) or narrower channels, *or*
- employ a technology that achieves the narrowband equivalent of one channel per 12.5 kHz of channel bandwidth for voice and transmission rates of at least 4800 bits per second per 6.25 kHz for data systems operating with bandwidths greater than 12.5 kHz.<sup>2</sup>

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<sup>1</sup> *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services*, 11 FCC Rcd 17676 at ¶ 22 (1996).

<sup>2</sup> *Less Than One Year Remains for Land Mobile Radio Licensees in the 150-174 MHz and 421-512 MHz Bands to Transition to Narrowband Operations*, Public Notice, DA 12-12 (released Jan. 5, 2012) (emphasis added).



We note the word “or” after the first bullet item. In the second bullet item, moreover, the requirement of 4800 bits per second per 6.25 kHz applies only to data systems operating with bandwidths greater than 12.5 kHz. According to both of these wordings, and considering that recent Aclara radios all operate on 12.5 kHz, we submit that the 4800 bits per second per 6.25 kHz should not apply. (Similar language also appears in earlier versions of the public notice at DA 11-1189 and DA 10-2294.)

Aclara does not rely on this interpretation by the Commission, however, as its radios in the aggregate in fact do comply with, and far exceed, the specified value of 4800 bits per second per 6.25 kHz.

Aclara agrees that increasing the data rate from 7200 bps to 9600 bps would shorten the data transmission time, and would allow the use of more MTUs in near geographic proximity at any given collision rate. However, as Aclara explained in its submission of February 6, 2010, under FCC ID LLB11009X, the Aclara system handles collisions with no difficulty, as simultaneous or overlapping transmissions are captured by different receivers. Aclara engineers have nonetheless given the 9600 bps option full consideration and have decided against it, at least for the present. The reasons for this decision bear on proprietary aspects of the technology, the disclosure of which would potentially put Aclara at a competitive disadvantage. Aclara continues to evaluate this option, however, and may adopt it in the future.

**b. Using the same argument, Public Safety equipment (one of the main reasons for the narrowbanding effort) can apply the standard duty cycle assumption of 5/5/90 (transmit/receive/standby). If each radio on average transmits only 5% of the time every 24 hours, combining a few radios would easily qualify them jointly for the higher spectral efficiency with the current P25 Phase I technology without migrating to Phase II.**

Aclara claims no expertise in public safety communications. We note however, that the 5% transmit duty cycle assumed above for public safety radios exceeds the duty cycle of a single Aclara radio by many orders of magnitude; and although we lack hard data on public safety deployments, we are confident that Aclara radios, in the markets we serve, greatly outnumber public safety radios, again by many orders of magnitude. Because of these vast differences in numbers, the two technologies cannot fairly be compared.

As noted above, moreover, the Aclara system properly handles simultaneous nearby transmissions on the same frequency, which makes possible much denser spectrum usage than can be obtained with traditional Part 90 systems.

Finally, in an Aclara system—unlike a public safety system—an occasional missed transmission has only minor consequences. This fact may allow Aclara to achieve much higher densities, and hence greater spectrum efficiency, than is feasible for public safety users.

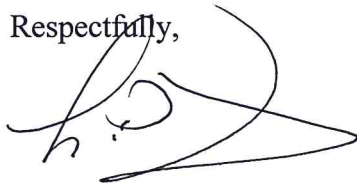
**c. If spectral efficiency is conditioned on the number of transmitters and duty cycles, the grant should be conditional too so that the device is not installed when the conditions are not met.**

Aclara would not object to a grant condition along these lines: "The certification is limited to systems which, when fully built out, in the aggregate achieve spectrum efficiencies specified in 47 C.F.R. § 90.203(j) as applicable on the date of the grant." The "when fully built out" language is needed because the earliest stages of deploying a large system may temporarily have too few radios in service to meet the requirement.

**d. 2 kHz frequency deviation (Operational Description) for a binary 7.2 kbps data rate (modulation index 0.55) is less spectrally efficient than the standard MSK (modulation index 0.5) and the C4FM used in Project 25 Phase I (modulation index 0.25) technology. Has the manufacturer looked into simply reducing index to 0.5 or less?**

Aclara has considered the full range of options as to modulation. As in the response to No. 2, above, the basis for the design rests on proprietary considerations that Aclara chooses not to disclose. The company continues to evaluate other possibilities, however, and in the future may move to a different modulation scheme.

Respectfully,

A handwritten signature in black ink, appearing to read "L. D. Murphy", with a large, sweeping flourish extending from the end of the signature.

Larry D. Murphy  
Executive Director of Engineering