

Licensing and Technical Requirements for Radio Transmitters used in RTK Applications

Introduction

Radio transmitters are often the preferred choice for making the link between an RTK reference station and an RTK rover in survey and machine control applications. In 1999, the FCC reviewed the use of radio transmitters for these applications and as a result clarified the applicable rules and regulations. (See the actual FCC communication piece following this bulletin). Robotic total station applications, while not specifically reviewed, are assumed to have the same set of user and technical requirements.

Note: This technical bulletin only applies to survey and machine control applications in the United States.

Requirement for Licensing

All radio transmitters used in the United States for surveying and machine control applications require licensing. There is no lower limit on RF output power that negates this requirement. Operation of an unlicensed radio transmitters subjects the operator to potential penalties and legal liabilities.

Equipment Technical Requirements

Radio transmitters used for surveying and machine control applications must provide the following features:

1. Carrier Monitoring (CFR Title 47 Sections 90.173 and 90.403)

This capability is called Carrier Sense Multiple Access (CSMA). With this feature, the radio transmitters is required to sense RF activity on the channel of operation, and to hold-off broadcast until the frequency is free of activity. This feature minimizes the chances of more than one transmitter being active at the same time on a given frequency.

2. Auto ID (CFR Title 47 Section 90.425)

Transmitters must identify themselves by periodically transmitting the station call sign. The call sign must be broadcast in International Morse Code at an approximate rate and audio tone as defined in the regulations. The call sign can be found on the station License Certificate.

If your radio transmitter does not provide these features, then you are likely in violation of the rules as clarified by the FCC in 1999. If you are not sure if your radio transmitter provides these features, contact your radio provider to find out.

Pacific Crest Corporation (PCC) Equipment

Since 1999, all radio modems manufactured by PCC include CSMA and Auto ID capabilities. For models delivered before 1999, firmware upgrades are available that provide these features. Equipment is factory configured to enable CSMA and set the digital squelch settings to recommended values. To enter your call sign, run PDLCONF and enter the call sign on the Identification page.

Technical Support

If you need assistance please contact our Technical Assistance Center at 1.800.795.1001 or via email at support@pacificcrest.com.



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PS&PWD-LTAB-622

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Mark Sellers
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Dear Manufacturer/User

During the past few months the staff of the Licensing and Technical Analysis Branch (Branch) of the Wireless Telecommunications Bureau's Public Safety and Private Wireless Division has undertaken an extensive review of the issues related to the authorization and operation of radio devices used to send Global Positioning System (GPS) correction data. This review was prompted by complaints we received from FCC licensees and additional information provided by the FCC's Compliance and Information Bureau. It appears that early equipment design and poor user education led to several reported interference cases around the country.

After several discussions between manufacturers and Branch staff, it is our understanding that manufacturers have taken or will take steps to minimize interference potential through modifications to GPS equipment. The industry promised to and it also is our understanding that manufacturers will take specific measures to increase user awareness about the responsibilities associated with being an FCC licensee on shared channels. We take this opportunity to provide guidance on the requirements of our rules, and suggestions on how to avoid interference when using shared channels.

Section 90.173 (47 CFR § 90.173) obligates all licensees to cooperate in the use of shared channels. GPS licensees who operate in an itinerant mode are responsible for assuring that when they enter a new area, they cooperate with existing licensees. We believe that the most effective means of fulfilling this responsibility is for GPS licensees to monitor the channel prior to operation and to do so at a time when other users are likely to be conducting their business on the channel. In this connection, we note that GPS licensees may also need to contact users directly and inform them of their operation.

Section 90.403 (47 CFR § 90.403) requires licensees to take precautions to avoid interference which includes monitoring prior to transmitting. Users should be aware that this is an ongoing requirement, and monitoring the channel in the morning prior to all day operation is not an effective means of minimizing interference.

Section 90.425 (47 CFR § 90.425) requires that stations identify themselves. We have encouraged GPS users to identify their transmissions to facilitate the resolution of interference problems by both other licensees and our field agents.

While we understand that GPS users desire to use PLMRS channels, we will continue to require that users use appropriate methods to prevent interference to other licensees. If you have questions about this matter, please contact Al Knerr, Chief of our Technical Analysis Section at (717) 338-2622.

Sincerely,

A handwritten signature in blue ink that reads "Mary M. Shultz". The signature is written in a cursive style with a long, sweeping tail on the final letter.

Mary M. Shultz
Chief, Licensing and Technical Analysis Branch
Public Safety and Private Wireless Division