

## **Camp Blanding Training Center, Range Control Needs Statement to Replace Radio System Components**

### **I. General Overview of Equipment and Services**

Camp Blanding Joint Training Center, Range Control owns a base wide radio system that contains a master station, a central repeater station and two remote repeater stations. It has been determined that this existing system is unreliable and does not transmit clear signals when it does operate. This radio system is critical for safety and emergency response and needs to be replaced. It has been decided that the existing radio equipment will be replaced in order to improve the system reliability and performance. The radio system supplier shall provide a complete turn-key replacement of the existing radio system as described herein including labor, equipment start up services, testing services and a one year warranty for the entire system. Camp Blanding intends to keep the same repeater, central repeater and master station locations along with their associated antenna towers. Camp Blanding currently uses Vertex radios for their land mobile units and plans to keep them in operation, so the proposed radio replacement equipment shall be compatible with these radios. The new radio system must comply with the 12.5 kHz bandwidth channel as defined by the NTIA and shall be in compliance with P25 standards.

### **II. Existing System Description**

Camp Blanding Joint Training Center, Range Control currently owns a base wide radio system that consists of the following:

- A. A main central radio base system that includes two radio units with a master radio antenna tower and antennas. This central base system transmits to the central repeater station using channels 2, 3, and 4. The frequencies for each of these channels are as follows:
  - 1. Channel #1 Transmits on 150.7250 MHz receives on 148.6000 MHz (This transmits and receives to a repeater that is outside the scope of this bid request.)
  - 2. Channel #2 Transmits on 148.6875 MHz receives on 148.6875 MHz
  - 3. Channel #3 Transmits on 150.5875 MHz receives on 148.5875 MHz
  - 4. Channel #4 Transmits on 150.7625 MHz receives on 148.7625 MHz

Also in the same location with the main central radio base system is the singars radio station that operates at a frequency of 40.60 MHz. The main central radio base system can also communicate to remote mobile singars radios through channel #2. This is possible through a receiver and voter at the central repeater that receives this signal on channel #2 and converts and retransmits it out at 40.60 MHz. There is another receiver at the central repeater that receives 40.60 MHz signals on channel #2 and retransmits them at 148.6875 MHz making two-way radio communications possible between the singars radios and channel #2.

- B. A central repeater that includes several transmitter modules, two main power transmitter amplifiers for transmission to the base system, and a central radio antenna tower with antennas. The signals generated at the central repeater are of sufficient strength and line of site so they do not have to be repeated anywhere else to reach the main central radio base or any remote radio. The central repeater receives signals from the central main radio base station, the two remote repeater units and nearby mobile radios. The radio equipment for the central repeater is contained within a block type building that has sufficient air conditioning.
- C. The central repeater transmits and receives signals on the following frequencies:
1. Receives signals on the 40.60 MHz (the singars radio frequency), 453.23750 MHz from remote repeater #1, 458.36250 from remote repeater #2 and selects and transmits the strongest of these three signals using a voter at 148.6875 MHz to an omni directional antenna (Channel 2 receive at the main base station and mobile radios). This output signal is muted whenever a transmission output is being detected on the 40.60 MHz. frequency.
  2. Receives signals on the 148.6875 MHz (Channel 2 transmit at the main base and the mobile radios), 453.31250 MHz from remote repeater #1, 453.36250 from remote repeater #2 and transmits the strongest of these three signals of these signals using a voter at 40.60 MHz. This output signal is muted whenever a transmission output is being detected on the 148.6875 MHz. frequency.
  3. Receives signals on the 150.5875 MHz (Channel 3 transmit at the main base and the mobile radios), 458.23750 MHz from remote repeater #1, 453.41250 from remote repeater #2 and transmits the strongest of these three signals using a voter at 148.5875 (Channel 3 receive at the main base station and mobile radios). There is an existing large power amplifier at the central repeater station to boost this transmitted signal so that it has sufficient strength to reach all required locations within the area.
  4. Receives signals on the 150.7625 MHz (Channel 4 transmit at the main base and the mobile radios), 458.31250 MHz from remote repeater #1, 458.41250 from remote repeater #2 and transmits the strongest of these three using a voter at 148.7625 (Channel 4 receive at the main base station and mobile radios). There is an existing large power amplifier at the central repeater station to boost this transmitted signal so that it has sufficient strength to reach all required locations within the area.
- D. There are two repeater sites, each that include several transmitter and receiver modules and a repeater antenna tower with several antennas. The repeater sites receive VHF signals from the mobile radio units and retransmit these signals back to the central repeater using a UHF frequency. The radio equipment for the repeater sites is contained in a weather proof enclosure.

1. Repeater station #1 transmits and receives signals on the following frequencies:
  - a) Receives on 40.60 MHz from remote mobile radio units and retransmits this signal out on 453.23750 MHz to the central repeater.
  - b) Receives on 148.6875 MHz (Ch #2) from mobile radio units and retransmits this signal out on 453.31250 MHz to the central repeater.
  - c) Receives on 150.5875 MHz from remote mobile radio units and retransmits this signal out on 458.23750 MHz to the central repeater.
  - d) Receives on 150.7625 MHz from remote mobile radio units and retransmits this signal out on 458.31250 MHz to the central repeater.
  
2. Repeater station #2 transmits and receives signals on the following frequencies:
  - a) Receives on 40.60 MHz from remote mobile radio units and retransmits this signal out on 458.36250 MHz to the central repeater.
  - b) Receives on 148.6875 MHz (Ch #2) from mobile radio units and retransmits this signal out on 453.26250 MHz to the central repeater.
  - c) Receives on 150.5875 MHz from remote mobile radio units and retransmits this signal out on 453.41250 MHz to the central repeater.
  - d) Receives on 150.7625 MHz from remote mobile radio units and retransmits this signal out on 458.41250 MHz to the central repeater.

E. Camp Blanding has a block diagram of the existing radio system, which can be available upon request.

### III. Replacement Equipment and Operation

- A. In order to upgrade the existing system it is desired to replace the following items and equipment:
  1. All radio units, radio modules and transmitter amplifiers. All radio units shall be capable of operating in either a digital or analog mode.
  2. All voter units at the central repeater site if required for proper operation with the new system. The radio systems supplier may offer other alternatives to this voter method and submit with his bid.
  3. All directional radio antennas with a high grade antenna.
  4. All omni-directional antennal with a high grade antenna.
  5. All radio antenna cables with a higher grade coaxial radio antenna cable.
  6. A trunked or hybrid radio system, if superior to the existing radio system configuration, will be considered.
  7. The proposed system shall include network scalability to include the ability to seamlessly increase system capacity by adding communication channels.

8. The proposed system shall include network security to prevent unauthorized personnel from accessing system components or communications. Such actions include jamming, eavesdropping and spoofing.

B. In addition the following equipment shall be added at each of the four locations:

1. An uninterruptible power supply (UPS) that will provide 40 minutes minimum of backup power in the event of loss of utility power. This would be required at the central base radio, the central repeater and the remote repeater sites, 4 locations.
2. A power loss annunciator panel at the central base radio that indicates any station that has lost utility power. The power lost signal should be transmitted back even though the UPS may be providing backup power so personnel could operate the system from a standby generator before the UPS battery runs low.
3. Surge suppression for power with sufficient clamping capacity and short circuit withstand capacity at all 4 locations. Surge protection plug-in power strips alone will not be acceptable.
4. Lightning protection for all antennas with appropriate ground connections at all 4 locations.

#### IV. Radio Submission Bid Requirements

C. The radio equipment supplier and installer shall submit the following with their bid:

1. A complete description of the radio equipment to be supplied including the system operation. This description shall also include how each frequency is used for the repeater, trunk, hybrid and or voter systems.
2. A list of all radio parts supplied including model numbers for radio equipment, surge suppression equipment, uninterruptible power supplies, antenna cable, antennas and miscellaneous hardware.
3. Catalog cuts of all radio equipment to be supplied.
4. Catalog cuts of all antennas and antenna cable to be supplied.
5. Enclosure data for the radio equipment, uninterruptible power supply and transient voltage surge suppressor to be installed at the two remote sites.
6. A written guarantee that the radio system will be not be subject to excessive noise or interference.
7. The location and telephone number of the local radio system repair and parts service.
8. A one year warranty for all parts and labor for any repairs to the radio system after final acceptance of the system.
9. The option for a maintenance contract or agreement after the warranty of the equipment has expired.