

System Overview

Purpose of STA Request

Cubic is seeking a STA to demonstrate a communication system, composed of two radio networks, for a US Army acquisition program at the Big Oaks Ranch facility in Chuluota, Florida.

Specifically, the STA is required in support of the Army Mobile Instrumentation Training System (AMITS) acquisition program. The demonstrations will be conducted at a customer facility for which Cubic does not currently have a license in the operational bands. A STA is required for the demonstration period to demonstrate the radio networks at the customer facility in the two operational bands. Attached as an exhibit with this application is a letter from the AMITS Project Director requesting that Cubic be provided a STA for the purpose of demonstrating two data radio networks in support of the AMITS acquisition program.

System Overview

The system is composed of two radio networks. Both radio networks have a fixed base station at a common location and one or more mobile land radios operating within a 5km radius of the fixed base station. Please reference Figure 1 or the file "Demo_System_Block_Diagram.pdf" submitted as an exhibit with the STA application.

Radio Network 1 is comprised of the fixed base station radio and twelve mobile land radios, for a total of 13 radios of Cubic part number 325015. These radios communicate in a TDMA system over one of four 20.1kHz channels in the 225 – 240MHz band. Mean ERP is 20W.

Radio Network 2 is composed of two commercial off the shelf (COTS) radios manufactured by Fortress Technologies. One radio (part number ES2440-3444m) is the fixed location base station radio. The second radio (part number ES210-4) is a mobile land radio. These radios communicate utilizing the 802.11a/n standards over one of twenty-one channels in the 4.41 – 4.81GHz band. Maximum occupied bandwidth on the selected channel is 36.09MHz in 40MHz channel mode or 16.64MHz in 20MHz channel mode. Peak ERP is 19.42W.

Channels for both radio networks are selected at the time of operation from the channel frequencies submitted with this application.

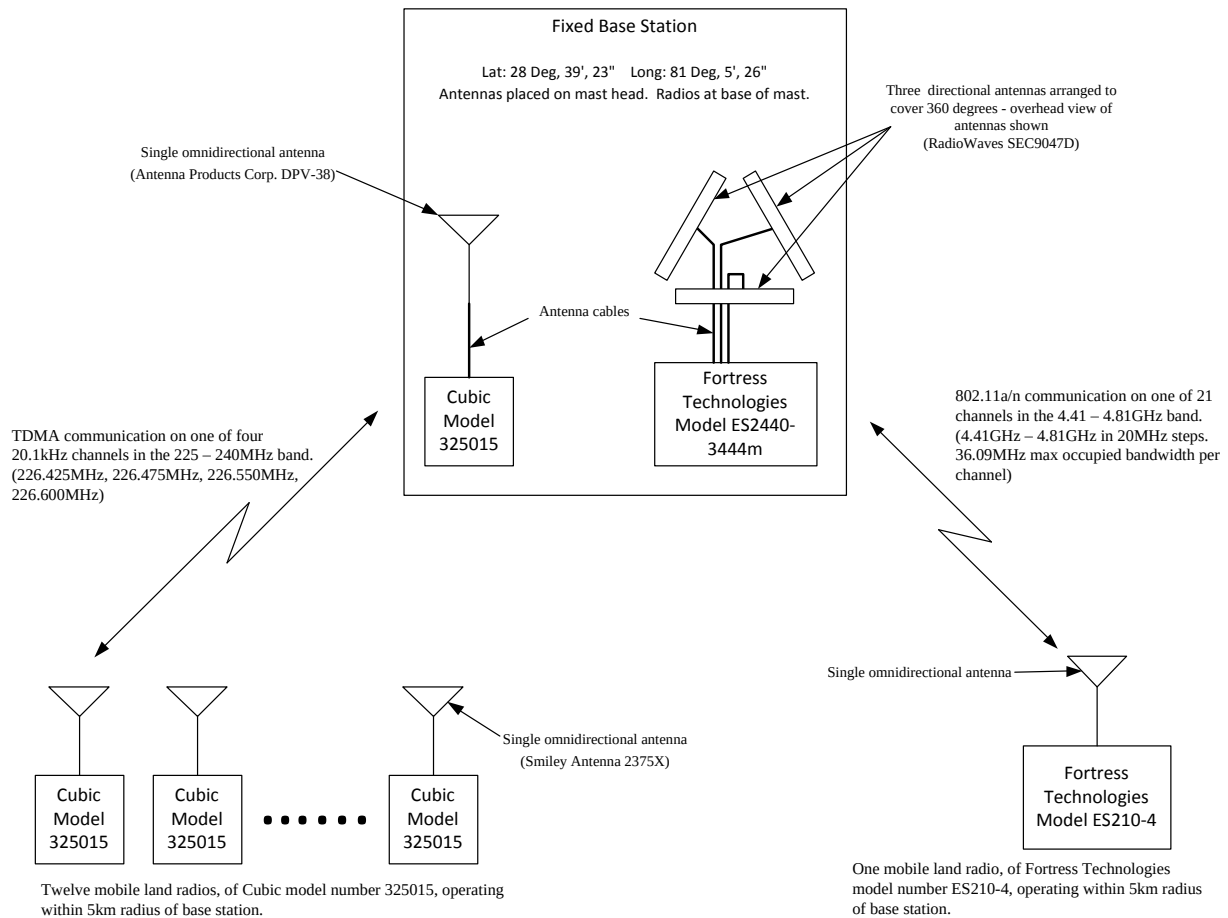


Figure 1 - Communications system to be demonstrated for US Army acquisition program. System is composed of two radio networks as described in this document. Figure 1 is also included as an exhibit with the STA application under the file name "Demo_System_Block_Diagram.pdf".

Channel Center Frequencies

The table below lists the available channel center frequencies for both radio networks. Only one channel on each network is used at any point in time. The Radio Network 2 frequencies are mapped to NTIA defined channels in the 4.41 – 4.81GHz band. NTIA channel designation depends on whether 20MHz or 40MHz channel mode is selected by the user. Both emission designators are provided with the STA application.

Channel Center Frequencies		
Channel Number	Radio Network 1 (Cubic Proprietary TDMA)	Radio Network 2 (802.11a/n)
1	226.425MHz	4.41GHz
2	226.475MHz	4.43GHz
3	226.550MHz	4.45GHz
4	226.600MHz	4.47GHz
5		4.49GHz
6		4.51GHz
7		4.53GHz
8		4.55GHz
9		4.57GHz
10		4.59GHz
11		4.61GHz
12		4.63GHz
13		4.65GHz
14		4.67GHz
15		4.69GHz
16		4.71GHz
17		4.73GHz
18		4.75GHz
19		4.77GHz
20		4.79GHz
21		4.81GHz

Antennas

Three directional antennas are arranged at the fixed base station to effectively produce one omnidirectional antenna. These antennas operate in the 4.41 – 4.81GHz band for Radio Network 2. They are connected to the Fortress Technologies model ES2440-3444m radio as shown in Figure 1. All three antennas, the associated 21 802.11a/n channel frequencies, and the emission designators are listed separately in the STA application.

The three directional antennas are manufactured by RadioWaves, part number SEC9047D. A datasheet is included as an exhibit with the STA application.

The mobile land radio for Radio Network 2 uses an omnidirectional whip antenna with 2dBi gain.

The fixed base station radio for Radio Network 1 uses an omnidirectional whip antenna manufactured by Antenna Products Corporation, part number DPV-38. A datasheet is included as an exhibit with the STA application.

The mobile land radios for Radio Network 1 use omnidirectional whip antennas manufactured by Smiley Antenna, part number 2375X.