

Exhibit No. 1
(See Items 4 and 13 of Form 442)

Experimental Station

1. **Frequency:** Any or all frequencies in the band from 9.2 to 10.0 GHz may be selected in a predetermined sequence.
2. **Peak Power:** 3.0 kW, or +35 dBW, is the total RF peak power generated by the system.
3. **Antenna Gain:** Mid-band antenna gain of the system in 23 dB.
4. **ERP:** Effective Radiated Power (ERP) of the system +55 dBW.
5. **Average Power:** The 35 dBW transmitter power and the 55 dBW ERP are maximum peak power values for radar duty cycles from 1 to 33 percent. Maximum average transmitter power is therefore 1.0 kW.
6. **Modulation:** Emission classification was selected in accordance with FCC Rule 2.201.

NOTE: All FCC Rules referenced herein may be found in 47 CFR

Telecommunications (FCC Rules, 10/1/95).

The transmission is a sequence of pulses containing either biphasic or polyphase modulation. The modulation has no information content and is provided solely for the purpose of enhancing detectability via matched filter processing, therefore the emission classification is G1N. The modulation is either:

- a) up to 256-CHIP (change in phase) biphasic modulation at a 5 MHz CHIP rate, or
- b) 8-bit (256 phase states) polyphase modulation at a 5 MHz CHIP rate, with up to 256 contiguous phase values per pulse.

7. **Waveform characteristics:**

- | | |
|-------------------------------|------------------------|
| a) Pulse Repetition Frequency | 0.5 to 315 kHz |
| b) Pulsewidths | 0.2 to 53 microseconds |
| c) Duty Cycle | 1 to 33 percent |

8. **Necessary Bandwidth:** Calculated in accordance with FCC Rule 2.202 (g).

Bandwidth: $(2K)/t$, where K depends on the ratio of pulse duration to pulse rise time, and $t = (2 \times \text{range resolution}) / \text{velocity of light}$. For this application, range resolution is specified to be 30 meters, thus $t = 200$ ns. K is defined to be 1.5, thus the necessary bandwidth = 15.0 MHz. (15M0)

The resulting emission designation is: 15M0G1N.

Exhibit No. 2
(See items 4 and 13 of Form 442)

Support Equipment, VHF Ground Station

1. **Type of Operation:** The VHF ground station will be operated as an Aeronautical Multicom per FCC Rules 87.237 and 87.241.
NOTE: All FCC Rules referenced herein may be found in *47 CFR Telecommunications* (FCC Rules, 10/1/95).
2. **Purpose:** To provide ground-to-air voice communications essential to testing the radar system. Voice communication will be required to direct the activities of target aircraft which the test radar will be tracking.
3. **Times and Dates of Operation:** In conjunction with operation of the test radar system.
4. **Class of station and Name of Radio Service:** Fixed base station for Aeronautical Multicom service.
5. **Location:** Raytheon facility at 1151 East Hermans Road, Tucson, AZ 85706, Hanger coordinates are: 110° 56.2' W, 32° 6.4' N
6. **Number of Units:** One fixed base station.
7. **Operating Frequency:** 122.850 MHz, per 87.241(b). If required, the station could be operated instead at 122.900 MHz.
8. **Output Power of Transmitter:** 10 Watts maximum. The transmitter is a component of VHF/AM Mobile Transceiver System 860605, manufactured by Technisonic Industries Limited, FCC ID No. IMA 90-6R. This is a synthesized transceiver, capable of tuning across the band of 177.975 MHz to 138.000 MHz in 25 kHz steps.
9. **Type of Transmission:** VHF, amplitude modulated voice transmissions. Modulation frequency response is 300 Hz to 2500 Hz, +1 /-3 dB. Maximum modulation capacity is 95%. Per FCC Rule 2.201, the emission type is A3E.
10. **Necessary Bandwidth:** Calculated in accordance with FCC Rule 2.202 (g). Bandwidth = 2M, where M is 2500 Hz, thus necessary bandwidth = 5000 Hz (5K00). The resulting emission designation is: 5K00A3E.
11. **Description of Antenna:** Omni-directional monopole antenna assembly, Technisonic Industries Limited part no. 861910-1, Series 1, approximately 2 feet in length when extended. The antenna will be mounted on a trailer housing the VHF transceiver and other equipment, or on a portable antenna base plate/ground plane.

Exhibit No. 3
(See Items 7 of Form 442)

PROJECT DESCRIPTION

This radar is to be used as part of a program to characterize the detection and tracking capabilities of modern technology radar. This radar was developed by Raytheon Missile Systems on a proprietary program. This radar is designed for evaluation of solid state phased array technology as it applies to radar systems.

The primary objective is to demonstrate the radar's capability to detect and track aircraft targets of various types and flight geometries.

The radar will be installed in a test aircraft and operated within a 120-km (75-mile) radius of the Raytheon facility in Tucson, Arizona.

VHF voice communications and UHF data link equipment will be required to support the planned tests. The support equipment VHF and UHF base stations will continue to be operated at the Raytheon facility in Tucson, Arizona, for the entire period of testing.

The VHF base station is included in this filing. An separate application has been filed separately for the UHF data link equipment as a mobile service in the Business Radio Service WA2XOU.

The government contract number is not available. If additional information is required, please contact the individual identified in item 20 of Form 442.