

Exhibit Information-Description of Experiment

The experimental source that has had its radiation properties characterized at other test ranges will be used to study short pulse propagation close to the earth, as a test bed for component lifetime testing, and to conduct electromagnetic interference / electromagnetic compatibility (EMI / EMC) testing. The major subsystems of the transmitter are: prime power (batteries), high-voltage DC (HV-DC) power supplies, Marx generator, and resonator antenna. The HV-DC power receives as input 28V DC from the batteries and converts it to bipolar high-voltage (± 50 kV) which is the input to the Marx generator. The Marx generator, a voltage multiplication device, then converts the ± 50 kV DC input from the HV-DC into a ~ 800 kV pulse that charges the energy storage elements of a resonant circuit in the resonator antenna. This resonant circuit subsequently discharges into a dipole antenna where the energy is radiated. The fundamental frequency of the radiation is selectable in the range from 100 MHz to 300 MHz by tuning the resonant circuit. The radiated waveform can be represented by a damped sinusoid of approximately 5 cycles. During testing the transmitter will be operated in the regime from a single pulse to a 30 second burst at a pulse repetition frequency of 25 Hz. The source is configured to provide horizontal or vertical polarization by rotating the antenna element. The objectives sought to be accomplished are: characterization of short pulse propagation (horizontal and vertical polarization) near the earth as a function of source height, sensor height, range, and polarization; determination of expected lifetime, time between maintenance requirements, and failure modes of the transmitter; and identification of EMI / EMC issues related to a variety of civilian and military systems and mitigation approaches to these issues. Of particular interest is the effect the high power transient waveform has on civilian and military equipment (EMI / EMC), a technical area hardly investigated for these waveforms.

Lockheed Martin was previously authorized for this experimentation under call sign WD2XTR