Data for FCC Form 442

Source 1 – DSS110B

Form 442 – Box 4

A) 100 – 300 MHz
B) 348 MW (85 dBW)
C) 564 MW (88 dBW)
D) Peak
E) I don't know what is required for this box
F) 25 Hz PRF, 30 sec BL
G) I am working on this. Explanation of how necessary bandwidth was obtained: The radiated electric field has been documented in previous outdoor tests. The recorded waveform is squared to give the power density at range. The power density waveform is fast fourier transformed, the magnitude of which is representative of the power spectral density, from which the bandwidth can be calculated. A -20 dB threshold criteria is assumed.

Exhibit A – experimental program description and objectives sought

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.

Source 2 – DSS110A3

Form 442 – Box 4

A) 350 MHz
B) 1400 MW (91 dBW)
C) 6800 MW (98 dBW)
D) Peak
E) I don't know what is required for this box
F) 25 Hz PRF, 30 sec BL
G) I am working on this. Explanation of how necessary bandwidth was obtained: The radiated electric field has been documented in previous outdoor tests. The recorded waveform is squared to give the power density at range. The power density waveform is fast Fourier transformed, the magnitude of which is representative of the power spectral density, from which the bandwidth can be calculated. A -20 dB threshold criteria is assumed.

Exhibit A – experimental program description and objectives sought

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 array. 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 the resonant circuits in the resonator antenna array. The resonant circuits subsequently discharge into the dipole antennas of the array where the energy is radiated. 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 array. 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.

Source 3 – L-MILO

Form 442 – Box 4

A) 1300 MHz
B) 2000 MW (93 dBW)
C) 800,000 MW (119 dBW)
D) Peak
E) I don't know what is required for this box
F) 10 Hz PRF, 10 sec BL
G) I am working on this. Explanation of how necessary bandwidth was obtained: A 1300 MHz waveform, 100 nanoseconds (ns) in duration is used as the power density waveform and the basis for the calculations of bandwidth. The power density waveform is fast Fourier transformed, the magnitude of which is representative of the power spectral density, from which the bandwidth can be calculated. A -20 dB threshold criteria is assumed.

Exhibit A – experimental program description and objectives sought

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, magnetically insulated line oscillator (MILO) microwave generator, and slant-cut open ended waveguide with a reflector 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 ~500 kV pulse that serves as input to the MILO. The MILO converts the 500 kV input pulse into a high-power microwave pulse with a fundamental frequency of approximately 1300 MHz. The energy is radiated from a slant-cut waveguide with reflector antenna. The radiated waveform has a duration of approximately 100 ns. During testing the transmitter will be operated in the regime from a single pulse to a 10 second burst at a pulse repetition frequency of 10 Hz. The objectives sought to be accomplished are: characterization of short pulse propagation 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.