

STA File 0819-EX-ST-2020 Technical Exhibit*Purpose Note*

SRI is submitting this STA due in support of testing an experimental transmitter. Testing will occur over a six-month period at Fort Story, VA (36.92° N, 76.02° W) operations will take place within 50km of the center of this location. The area of operation is shown below for reference in Figure 1. We request the window of operations to be July 1st 2020 – December 31st 2020. Expected usage during this period is 2-6 hours a day approximately 3 days a week.

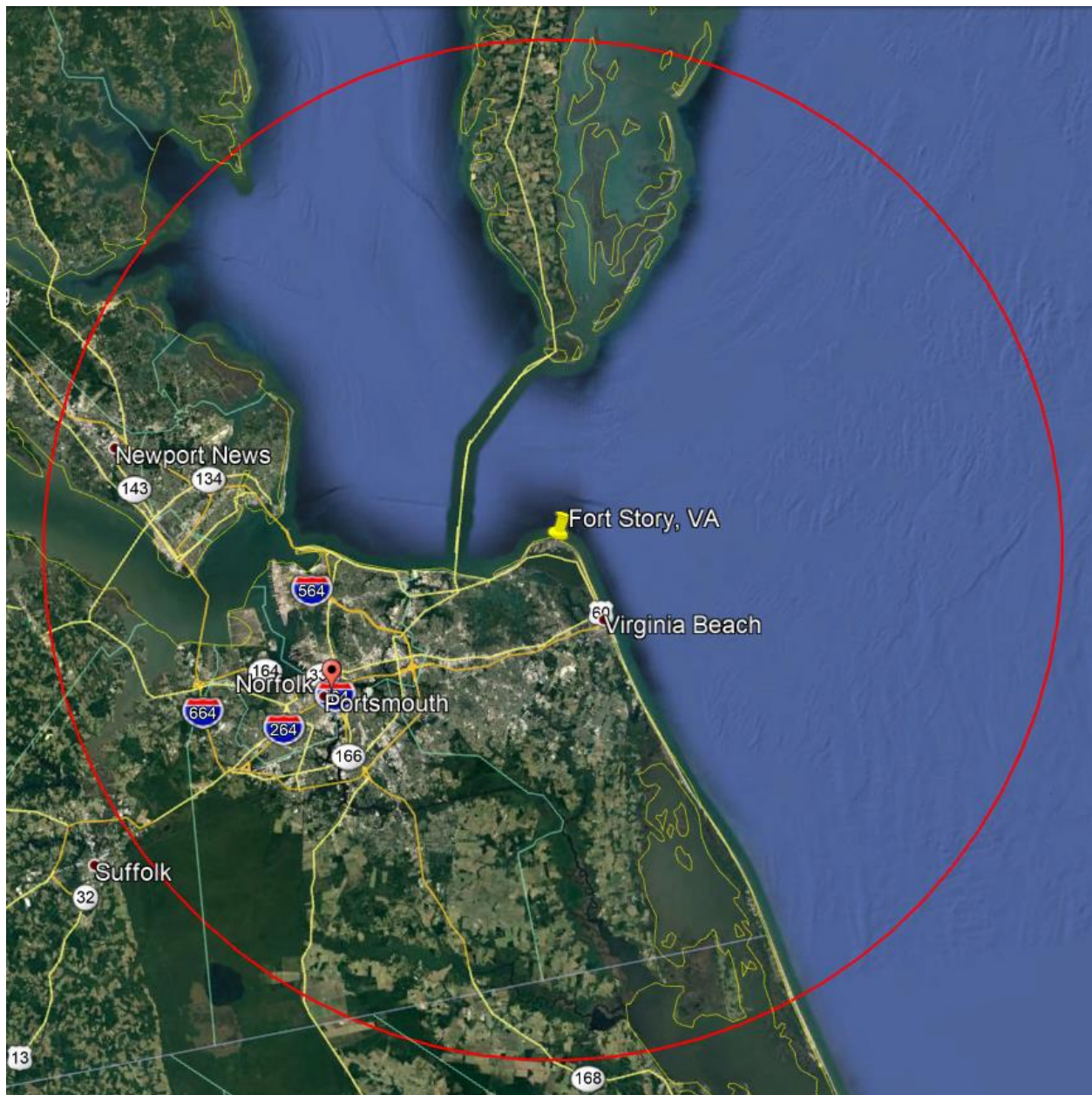


Figure 1

SRI engineers will be directly operating the transmitter, on site, and will have the ability to immediately turn off the transmitter.

Persons of Contact:

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Transmitter Description

The transmitter is a custom system developed by SRI International. It is comprised of a software defined radio, followed by an Intermediate Frequency (IF) to Radio Frequency (RF) frequency converter, followed by an active, electronically steered phased array (AESA). The AESA is custom hardware manufactured by Ball Aerospace. It will be statically mounted about 2 meters above ground on a tripod. The transmit beam is fixed in elevation and steerable in azimuth. In elevation, the beam will be directed between -2 and +8 degrees of the horizon, with a half-power, full-width of 11 degrees. Thus the half-ERP point may be up to 14 degrees above the horizon. The transmitter may be pointed in any azimuth direction, and the azimuth beamwidth is 4.2°. The transmitter output power envelope will be pulsed with a duty factor not to exceed 30%, and pulse duration will not exceed 30 μ s. The interval between pulse-starts will be at least 20 μ s. The stated mean ERP of 3.7kW is based on 30% duty factor operation.

Signal Descriptions

As stated in the STA application, emissions in this region of operation will be confined to the 8521 – 9000 MHz and 9200 – 9326 MHz bands. SRI can control where the signal emission falls within these two bands, allowing SRI's transmitter system to be used in allowed frequency bands without interfering with nearby transmitters and receivers that may also operate in those bands. Instantaneous bandwidth will not exceed 60 MHz. Overall pulse amplitude will be Tukey window shaped with sharpness varying between rectangular and raised-cosine. Within the windowed pulse, un-modulated, frequency modulated, and phase modulated emissions will be generated at different times. Since our system's waveform generator is a software defined radio, we can modify some parameters, including notching frequencies in some modes, if required. Below are further details on each emission defined in the application.

100KP1N, on/off modulation

- The signal within the pulse envelope will be CW. The bandwidth is stated as 100 kHz due to spreading from the not-to-exceed 50 kHz pulse rate.

60MQ1N, pulsed linear fm

- The signal within the pulse envelope will be a linear FM sweep, with a bandwidth of up to 60 MHz.