

Exhibit 1: Description of Emission, Modulating Signal and Necessary Bandwidth

The emitter is an X-band Airborne Maritime Surveillance Radar employing various complex waveforms and PRF's. A description of the waveforms is as follows:

The transmission power is:

- Mean – 32 to 400 watts at the output of the transmitter
- Peak – 7943 watts at the output of the transmitter
- ERP – 33 MW (ERP)

The radar employs frequency agility. The radar transmits on one of 100 frequencies in the range of 9.05 to 10.05 GHz on a PRI to PRI basis or block to block (CPI) basis.

The radar varies the nominal PRF from 383 to 1600 Hz with 0.1, 11.25, 12, 22.5, 45, 125 or 180 microseconds pulse widths according to mode selections (see Table 1).

The radar employs an azimuth scanning radar antenna with rates from 3 RPM to 120 RPM. The antenna may also stare at a target or sector scan a region of interest. The antenna beam widths vary from 1 to 3.5 degrees in azimuth 3 dB width and from 6 to 14 degree elevation beamwidth with a gain of 30 – 36 dB above isotropic level.

The radar transmits with a variety of Pulse Amplitude Modulated Linear Frequency Modulated waveforms including Linear FM chirp, Stepped Frequency, and Frequency hopping. The waveform characteristics are detailed in Table 1.

Station Location:

Farmingdale (SUFFOLK), NY – NL 40-43-25; WL 73-25-15

Mobile: within 160 km

Emission Designator: 239M (MHz bandwidth), M (Modulated in position/phase), X (Cases not otherwise covered), N (No information transmitted).

Frequency	Station Class	Emission Designator	Power	Frequency Tolerance
9.05 – 10.05 GHz	FX	Table 1	33 MW (ERP)	within 24 MHz of the specified frequency
9.05 – 10.05 GHz	MO	Table 1	33 MW (ERP)	within 24 MHz of the specified frequency

Table 1 Transmitted Waveform Characteristics

Mode	TX Pulse Width	TX BW	Modulation	PRF	PRI	Scan Rate	Av Power	Peak Pwr	Emission Designators
	(µsec)	(MHz)	Type (MHz)	(Hz)	microsecs	(°/sec)	(watts)	(watts)	
Low RCS	30	125	Freq agile, LFM	1600 ⁽³⁾	625	360	400	7943	163MM1N
Wid Area Surv. 100	10	12	Freq agile, LFM	750 ⁽³⁾	1333	72	300	7943	15M6M1N
Wid Area Surv. 200	50	12	Freq agile, LFM	395 ⁽³⁾	2532	72	160	7943	15M6M1N
WX & NAV (100)	10	12	Freq agile, LFM	395 ⁽³⁾	2532	72	32	7943	15M6M1N
WX & NAV (200)	50	12	Freq agile, LFM	395 ⁽³⁾	3532	72	160	7943	15M6M1N
GMTI	45	45, 22.5, 11.25	block agile, Stepped LFM	900 - 1100 ⁽³⁾	1111 - 909	10	360	7943	58M5M7N
SART	10	0.1	Fixed Freq 9375 MHz	1500 ⁽³⁾	666	72/360	120	7943	130KM1N
A-Scan	30, 10, 50	180	Fixed Freq	1600/750/395	625/1333/2531	360/72/72	400/300/160	7943	234MM1N
Landspot – UH	10	210 ⁽²⁾	210 (x3) ⁽²⁾ LFM	1100 ⁽¹⁾	909	searchlight	264	7943	273MM7N
- 1 m	40	215	215 LFM	1100 ⁽¹⁾	909	searchlight	264	7943	280MM1N
Stripmap – UH	10	210 ⁽²⁾	210 (x3) ⁽²⁾ LFM	1100 ⁽¹⁾	1072	searchlight	264	7943	273MM7N
- 1 m	40	215	215 LFM	1100 ⁽¹⁾	1072	searchlight	264	7943	280MM1N
- 3 m	40	71.7	71.7 LFM	1100 ⁽¹⁾	1072	searchlight	264	7943	71M7M1N
- 10 m	40	21.7	21.7 LFM	1100 ⁽¹⁾	1072	searchlight	264	7943	21M7M1N
Seaspot – UH	13	210 ⁽²⁾	210 (x3) ⁽²⁾ LFM	388	2577	searchlight	264	7943	273MM7N
- 1 m	50	215	215 LFM	383	2611	searchlight	160	7943	280MM1N

- Note:
- The Imaging mode PRF is fixed at 1100 Hz at 300 kts, but updated to maintain a fixed PRF/V. In general for these Radar modes PRF = 1100/300*V*cos (Squint Angle) where V = ground speed of aircraft, Squint Angle = (A/C Ground Track - Swath Ground Track)
 - In the UH imaging modes, 3 separate pulses, each of 210 MHz, are transmitted and stitched together on receive
 - The PRF stager for LRCS, WAS100, WAS200, WX & NAV (100), WX & NAV(200) and SART is pulse to pulse. The PRF stager for GMTI is block to block. There is no PRF stager for A-scan
 - The pulse compression ratios by mode are LRCS – 3750, WAS100 - 600, WAS200 – 600, WX & NAV (100) – 120, WX & NAV (200) – 600, GMTI – 2025, 1012, 506 and A-Scan – 5400, 1800, 9000
 - The average and peak power shown are at the transmitter output. The transmit losses are 3.27 dB so the peak and average power at the antenna terminals is 0.471 of the power shown in the table.
 - The antenna gain is 34.5 dB for the VV antenna and 35.1 for the GMTI antenna
 - The GMTI transmit antenna is horizontally polarized
 - Non-GMTI antenna is vertically polarized