Transmitter Equipment Characteristics (Measured Values) for Form 1494

Item	Description	Units	Modes: Hi Res Spotlight	Spotlight	Stripmap	GMTI	HRR GMTI
1	Nomenclature		AN/APY-8 (Lynx Radar)				
2	Manufacturer's Nme		General Atomics				
3	Transmitter installation		manned and unmanned aircraft				
4	Transmitter Type		Synthetic Aperture Radar and Ground Moving Target Indicator				
5	Tuning Range	GHz	15.2 - 18.2	16.2 - 17.3	16.2 - 17.3	16.55 - 16.85	15.93 - 17.47
6	Method of Tuning		Direct Digital Synthesis				
7	RF Channeling Capability		N/A				
8	Emission Designator		1G88FQ3N	636MFQ3N	636MFQ3N	296MFQ3N	1G56FQ3N
9	Frequency Tolerance	ppm	<5				
10	Filter Employed		Yes				
11	Spread Spectrum		No				
	Bandwidth of Frequency Deviation [1]	MHz	938.9	316.9	317.0	147.2	780.2
12	Emission Bandwidth						
	a. -3 dB	MHz	1770.0	610.0	610.0	295.0	1538.0
	b. -20 dB [2]	MHz	1880.0	636.0	636.0	295.0	1561.0
	c. -40 dB	MHz	4000.0	2280.0	2280.0	1670.0	3232.0
	d. -60 dB	MHz	*4420.0*	*4400.0*	*4400.0*	*3970.0*	*4425.0*
	e. OC-BW [3]	MHz	1880.0	636.0	636.0	295.0	1561.0
13	Maximum Bit Rate		N/A				
14	Modulation Techniques and Coding		Swept Linear FM Chirp				
15	Maximum Modulation Frequency		N/A [3]				
16	Pre-emphasis		No				
17	Deviation Ratio		N/A [3]				
18	Pulse Characteristics						
	a. min rate [5]	Hz	1970	667	667	*2200*	*2200*
	max rate [6]	Hz	4,180	4,180	5,320	3968	4030
	b. min width [6]	microsec	18	18	20	64	60
	max width [5]	microsec	116	116	300	*140*	*140*
	c. risetime	nsec	2 - 5				
	d. falltime	nsec	2 - 5				
	e. Compression Ratio						
	at min width [6]		3.19E+04	1.10E+04	1.22E+04	1.89E+04	9.23E+04
	at max width [5],[7]		6.84E+03	7.08E+03	1.83E+04	4.13E+04	2.15E+05
19	Power						
	a. Mean at min width [6]	W	24.1	24.1	34.0	81.3	77.4
	Mean at max width [5]	W	73.1	24.8	64.0	98.6	98.6
	b. Peak	W	320				
20	Output Device		dB Control, Inc. Traveling Wave Tube Amplifier using CPI VTU-5010W				
21	Harmonic Level						
	a. 2nd	dBc	<-80				
	b. 3rd	dBc	<-80				
	c. Other	dBc	<-80				
22	Spurious Level	dBc	-40				
23	FCC Type Acceptance No.		NA				
24	Remarks						

[1] The frequency deviation is determined from the measured bandwidth at –20 dB using the equation in Section 3.1 paragraph 1a. in Annex J using a 2 nsec risetime and the measured minimum pulsewidth.

[2] The radar single pulse emission bandwidth is given by this number. During the synthetic aperture, the radar shifts (or self-tunes) its center frequency so that the minimum frequncy and maximum frequency attained during the aperture is obtained as shown in box 5. This occurs both in spotlight modes and in strip mode. In the Lynx radar, the strip mode essentially concatenates a series of spotlight images.

[3] We find roughly, that the OC-BW corresponds, for these lineshapes, to approximately –20 dB down.

[4] The modulation of the pulse is a linear FM chirp which corresponds to the bandwidths shown in box 12. The modulation is fixed in the sense that it does not depend on the image content. This is different from sources such as FM radio where the extent of the modulation depends on the information being transmitted.

[5] The minimum pulse repetition frequency obtains with the maximum pulsewidth

[6] The maximum pulse repetition frequency obtains with the minimum pulsewidth

[7] The SAR pulse compression ratio at maximum width assumes a far range with a resolution of 3 m and thus a correspondingly smaller chirp rate compared to a 0.1 m chirp rate. The bandwidth of the chirp is thus decreased by a factor of 30.

Other Note: The frequency values in italics at the –60 dB level represent estimated values based on the spectral measurements. The pulse characteristic values in italics for the GMTI modes represent expected values that the radar will achieve by August 2002.

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