APPENDIX G

SYSTEM CHARACTERISTICS

INTRODUCTION

This appendix contains a conpendium of system characteristics of radars in the 2.7 to 2.9 GHz band.

TABLE G-1

ASR-5 SYSTEM CHARACTERISTICS*

ANTENNA CHARACTERISTICS

A.	Type:	Shaped beam, cosecant squared in elevation from half power point to +30 degrees
B.	Gain:	34 dB
C.	Beamwidth: elevation: 5 degrees azimuth: 1.5 degrees	
D.	Polarization:	Linear, vertical, or circular; remotely selectable
E.	Antenna Rotation Rate:	13 or 15 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnetron (5586, DX276 or QK1643)
B.	Frequency:	Tunable 2.7 to 2.9 GHz
C.	Peak Power:	400 - 500 kW
D.	Pulsewidth:	.833 microsecond
E.	PRF:	Selectable 900 to 1200 PPS (2-pulse stagger on or off)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4 dB maximum
B.	Receiver Bandwidth:	
	Normal IF:	2.7 MHz
	MTI IF:	5.0 MHz
	Normal Video:	2.0 MHz
	MTI Video:	2.0 MHz
C.	Minimum Discernible Signal (MDS):	
	Normal Receiver:	-109 dBm
	MTI Receiver:	-107 dBm
D.	Scope Range (NM):	60 nautical miles

*Also applicable to ASR-4, ASR-6, and AN/FPN-47

TABLE G-2

ASR-7 SYSTEM CHARACTERISTICS*

ANTENNA CHARACTERISTICS

A.	Type:	Shaped beam, cosecant squared in elevation from upper half power point to +30 degrees
B.	Gain:	34 dB
C.	Beamwidth:	
	elevation: 5 degrees azimuth: 1.5 degrees	
D.	Polarization:	Linear, vertical, or circular; remotely selectable
E.	Antenna Rotation Rate:	15 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnetron (DX276, 8798)
B.	Frequency:	2.7 to 2.9 GHz
C.	Peak Power:	425 kW
D.	Pulsewidth:	0.833 microsecond
E.	PRF:	6-pulse stagger with 1002 PPS average, or fixed (selectable from 713 - 1200 PPS)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4.75 dB
B.	Receiver Bandwidth:	
	Normal IF: 2.7 MHz MTI IF: 5.0 MHz	
C.	Minimum Discernible Signal (MDS):	
	Normal Receiver: -108 dBm Log Receiver: -106 dBm MTI Receiver: -106 dBm Log MTI Receiver: -104 dBm	
D.	Scope Range (NM):	60 nautical miles

*Also applicable to AN/GPN-12

TABLE G-3

ASR-8 SYSTEM CHARACTERISTICS

ANTENNA CHARACTERISTICS

A.	Type:	Shaped Beam, cosecant squared in elevation from half power point to +30 degrees
B.	Gain:	33.5 dB Normal Beam 32.5 dB Passive Beam
C.	Beamwidth:	
	elevation: 4.8 degrees azimuth: 1.35 degrees	
D.	Polarization:	Linear verticle or circular, remotely selectable
E.	Antenna Rotation Rate:	12.5 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Klystron (VA-87E)
B.	Frequency:	Tunable 2.7 to 2.9 Hz
C.	Peak Power:	1.4 MW
D.	Pulsewidth:	0.6 microsecond
E.	PRF:	4-pulse stagger with 1040 average, or fixed (selectable from 700 - 1200 PPS)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4.0 dB maximum
B.	Receiver Bandwidth:	
	Normal IF: 1.2 MHz MTI IF: 5.0 MHz Log IF: 1.2 MHz MTI Video: 585 kHz	
C.	Minimum Discernible Signal (MDS):	
	Normal Receiver: -110 dBm Log Receiver: -109 dBm MTI Receiver: -108 dBm	
D.	Scope Range (NM):	60 nautical miles

TABLE G-4

WSR-57 SYSTEM CHARACTERISTICS

ANTENNA CHARACTERISTICS

A.	Type:	Parabolic disk (12 ft. diameter)
B.	Gain:	38 dB
C.	Beamwidth:	2.2 degrees
D.	Polarization:	Linear, horizontal
E.	Antenna Rotation Rate:	0 to 5' RPM -5 to +45 degrees elevation

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnetron (QK729-733)
B.	Frequency:	Tunable 2.7 to 2.9 GHz
C.	Peak Power:	500 kW
D.	Pulsewidth:	0.5 microsecond (short pulse) 4.0 microseconds (long pulse)
E.	PRF:	658 PPS (short pulse) 164 PPS (long pulse)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4.0 dB
B.	Receiver IF Bandwidth:	4.5 MHz for short pulse and 0.75 MHz for long pulse
C.	Minimum Discernible Signal (MDS):	
	-100 dBm (short pulse) -108 dBm (long pulse)	
D.	Scope Range (NM):	250 nautical miles

TABLE G-5

WSR-74S SYSTEM CHARACTERISTICS

ANTENNA CHARACTERISTICS

A.	Type:	Parabolic Disk (12 ft. diameter)
B.	Gain:	38 dB
C.	Beamwidth:	2.2 degrees maximum
D.	Polarization:	Linear, horizontal
E.	Antenna Rotation Rate:	0 to 5 RPM -5 to +45 degrees elevation

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Coaxial Magnetron
B.	Frequency:	2.7 to 2.9 GHz
C.	Peak Power:	565 kW
D.	Pulsewidth:	1 microsecond (short pulse) 4 microseconds (long pulse)
E.	PRF:	545 PPS on short pulse 164 PPS on long pulse

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	
B.	Receiver IF Bandwidth:	Not less than 1.5 MHz for short pulse and .375 MHz for long pulse
C.	Minimum Discernible Signal (MDS):	
D.	Scope Range (NM):	50, 125, and 250 nautical miles

TABLE G-6

AN/FPS-6 SYSTEM PARAMETERS*

ANTENNA CHARACTERISTICS	
A. Type:	Shaped beam, fan beam in azimuth
B. Gain:	39 dB
C. Beamwidth:	
vertical: 0.85 degree horizontal: 3.2 degrees	
D. Polarization:	
E. Antenna Rotation Rate:	7.5 RPM, 20-30 CPM
TRANSMITTER CHARACTERISTICS	
A. Output Tube:	Magnetron (QK327A) or Coaxial Magnetron (VSM-1143)
B. Frequency:	Tunable 2.7 to 2.9 GHHz
C. Peak Power:	5.0 MW
D. Pulsewidth:	2.0 microseconds
E. PRF:	250 to 400 PPS
RECEIVER CHARACTERISTICS	
A. System Noise Figure:	8.0 dB
B. Receiver Bandwidth:	800 kHz
C. Minimum Discernible Signal (MDS):	
Normal: -106 dBm	
D. Scope Range (NM):	200 nautical miles

*Also applicable to AN/FPS-90

TABLE G-7

AN/GPN-20 SYSTEM CHARACTERISTICS

ANTENNA CHARACTERISTICS

A.	Type:	Shaped beam, cosecant squared in elevation from half power point to +30 degrees
B.	Gain:	33.5 dB Normal beam 32.5 dB Passive beam
C.	Beamwidth:	
	elevation: 4.8 degrees azimuth: 1.35 degrees	
D.	Polarization:	Vertical or circular (LH)
E.	Antenna Rotation Rate:	12 or 15 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnetron (8798), diplex filtered
B.	Frequency:	Tunable 2.7 to 2.9 GHz
C.	Peak Power:	500 kW
D.	Pulsewidth:	0.833 microsecond
E.	PRF:	Staggered with 1040 average (selectable from 849 - 1204 PPS)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4 dB
B.	Receiver Bandwidth:	
	Normal IF: 1.2 MHz MTI IF: 5.0 MHz Log IF: 1.2 MHz MTI Video: 585 kHz	
C.	Minimum Discernible Signal (MDS):	
	Normal Receiver: -110 dBm Log Receiver: -109 dBm MTI Receiver: -108 dBm	
D.	Scope Range (NM):	60 nautical miles

TABLE G-8

AN/CPN-4 SYSTEM CHARACTERISTICS

ANTENNA CHARACTERISTICS

A.	Type:	Shaped beam, cosecant squared in elevation from half power point to +30 degrees
B.	Gain:	31 dB
C.	Beamwidth:	
	elevation: 3.6 degrees azimuth: 2.2 degrees	
D.	Polarization:	Horizontal or circular, remotely selectable
E.	Antenna Rotation Rate:	20 $\pm$ 2 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnetron (5586)
B.	Frequency:	Tunable 2780 to 2820 MHz
C.	Peak Power:	600 kW
D.	Pulsewidth:	0.5 microsecond
E.	PRF:	1500 PPS

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4.0 dB
B.	Receiver Bandwidth:	
	Normal IF: 2.25 MHz MTI IF: 4.5 MHz	
C.	Minimum Discernible Signal (MDS):	
	Normal: -106 dBm MTI: -104 dBm	
D.	Scope Range (NM):	30 nautical miles

TABLE G-9

AN/MPN-13 SYSTEM CHARACTERISTICS*

ANTENNA CHARACTERISTICS

A.	Type:	Shaped beam, cosecant squared in elevation from half power point to +30 degrees
B.	Gain:	32 dB
C.	Beamwidth:	
	elevation: 3.6 degrees azimuth: 2.2 degrees	
D.	Polarization:	Horizontal or circular, remotely selectable
E.	Antenna Rotation Rate:	15 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnatron (8798)
B.	Frequency:	Tunable 2780 to 2820 MHz
C.	Peak Power:	750 kW
D.	Pulsewidth:	0.7 microsecond
E.	PRF:	1100 PPS (3-pulse stagger on or off)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	4.0 dB
B.	Receiver Bandwidth:	
	Normal: 2.25 MHz MTI: 4.5 MHz	
C.	Minimum Discernible Signal (MDS):	
	Normal: -106 dBm MTI: -104 dB,	
D.	Scope Range (NM):	30 nautical miles

*Also applicable to AN/MPN-14 and AN/MPN-15

TABLE G-10

AN-TPN-24 SYSTEM CHARACTERISTICS

ANTENNA CHARACTERISTICS

A.	Type:	Shaped beam, cosecant squared in elevation from half power point to +30 degrees
B.	Gain:	33.6 dB
C.	Beamwidth:	
	elevation: 6 degrees azimuth: 1.55 degrees	
D.	Polarization:	Vertical or circular
E.	Antenna Rotation Rate:	15 RPM

TRANSMITTER CHARACTERISTICS

A.	Output Tube:	Magnetron (8798), diplex filtered
B.	Frequency:	Tunable 2.7 to 2.9 GHz
C.	Peak Power:	450 kW
D.	Pulsewidth:	1.0 microseconds
E.	PRF:	12 staggered (1050 Hz average)

RECEIVER CHARACTERISTICS

A.	System Noise Figure:	2.5 dB
B.	Receiver Bandwidth:	
	Normal: 1.0 MHz	
C.	Minimum Discernible Signal (MDS):	
	Normal: -112 dBm for 6 dB S/N	
D.	Scope Range (NM):	60 nautical miles

APPENDIX H

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