RADAR

QUICK

REFERENCE

GUIDE

V2.0

Federal Aviation Administration
ATC Spectrum Engineering Services
AJW-63
Contact: (202) 267-9739
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COMMON RADAR FORMULAS

Radar Range Equation for a Single Pulse Detection

$$R_{max} = \sqrt[4]{\frac{PG\sigma A_e \tau}{(4\pi)^2 S_{min}}}$$

R_{max} = Maximum Range in Meters
P = Peak Power in Watts
G = Antenna Gain as a factor (not dB)
σ = Radar Cross Section of Target in Square Meters
A_e = Effective antenna Area in Square Meters
τ = Pulse Width in micro seconds
S_{min} = Minimum Detectable Signal in Watts

Pulse Repetition Interval

PRI = 1 / PRF

PRI = Pulse Repetition Interval in seconds
PRF = Pulse Repetition Frequency in hertz
PRR = Pulse Repetition Rate
PRR = PRF
Both PRR and PRF actually indicate the number of interrogations-per-second

Average Power

P_{avg} = P (τ / PRI) or
P_{avg} = P (τ * PRF)

P_{avg} = Average Power in watts
P = Peak Power in watts
τ = Pulse Width in seconds

Duty Cycle

Duty Cycle = τ / PRI or Duty Cycle = τ * PRF

The units of τ and PRI must be the same. The unit of τ must be seconds when using PRF.

The Duty Cycle is the percent of time the radar is transmitting (decimal in answer needs to be moved two places to the right to get the percentage.)

Average PRF

Average PRF = 1/[(PRI 1 + PRI 2 + PRI 3 + PRI (n)) / n] or

Average PRF = 1/[((1/ PRF 1) + (1/PRF 2) + (1/PRF 3) + (1/(PRI (n))) / n],
where n is the stagger number. For example: n = 4 for a 4X stagger.

This is the equation for a radar with an (n) times stagger sequence. You take the PRI in seconds of each PRF in the stagger sequence, add them together, divide by the number of PRI's (n), and take the reciprocal of the result to determine the average PRF. Note that the average PRF is NOT calculated by adding the PRRs and dividing by the stagger number (n).

Delay of a Parrot

delay of parrot = $2d / c$

delay of parrot = delay in seconds
d = distance in nautical miles
c = speed of light

Speed of light = 161,634 nautical miles per second
0.869 NM = 1 statute mile

TIPS FOR DOING RADAR ASSIGNMENTS

1. Most radar systems have more then one frequency associated with it – if one frequency assignment is getting worked, work all of the assignments associated with the system.

2. Make sure site specific data (coordinates, antenna height, and elevation) is consistent between assignments associated with the same system.

3. The receive data for a 1090 MHz parrot assignment should be the same as the transmit data of the 1030 MHz beacon that the parrot is serving. The transmit data for a parrot can not be the same as the beacon.

4. Make sure the paired with data is correct to include no errors in the serial numbers or paired with frequencies.

5. If an assignment is modified that has other frequency assignments paired with it, then the paired with assignments might need modified also (but if the assignments are worked as a system as suggested in item one, then this mistake should never happen).

6. Verify that the equipment is capable of operating with the technical characteristics in the assignment (i.e. if an ASR-9 frequency is operating on a PRR of 1172 PPS, then the associated beacon PRR should be 429 PPS—if it is not, then the data in one of the assignments is wrong because the equipment is not capable of any other configuration).

7. Include the Mode-A squawk code, Mode-C altitude, and the delay in NM and microseconds for parrot assignments. Altitude should be either over 90,000 feet or below sea level (i.e. –1000 ft).

8. If a new primary radar frequency is being requested, make sure there is an assignment for the associated beacon or that one is being requested. This also applies if a beacon frequency is being requested – make sure that there are either assignments or accompanying requests for the primary radar frequencies. If there is not an associated primary radar, then state so in the assignment, i.e. “Beacon-only System (BOS).”

RADAR ENGINEERING CRITERIA

(Rule of thumb criteria for terminal, en route, and TDWR radar systems)

DISTANCE (NMI)	REQUIRED FREQUENCY SEPARATION (in MHz)
1 – 2.5	30
2.5 – 5	25
5 - 10	23
10 - 50	20
50 - 100	10
100 - 150	5
Over 150	0

BEACON ENGINEERING CRITERIA

The Pulse Repetition Interval (PRI) (the PRI is also referred to as the Pulse Repetition Time (PRT)) of beacon systems should be separated by at least 25 microseconds from any other beacon system that is less than the distances (distances are expressed in NMI) in the table below. For example, a beacon associated with an ASR-9 terminal radar should be at least 25 microseconds from the beacon associated with any other terminal system within 200 NMI, en route radar system within 300 NMI, or ARSR-4 facility within 350 NMI.

	ARSR-4	**TERMINAL**	**EN ROUTE**
ARSR-4	500	350	400
TERMINAL	350	200	300
EN ROUTE	400	300	360

ASDE-X SMR and SMRi ENGINEERING CRITERIA

The ASDE-X Surface Movement Radar (SMR) and Surface Movement Radar Improved (SMRi) are airport surface primary surveillance radars that operate in the 9.0 GHz to 9.2 GHz frequency band. The military Precision Approach Radar (PAR) also operates in this band and must be protected. The following is a rule-of-thumb engineering criteria for ASDE-X SMR and SMRi to PAR protection.

The following distance separation can be applied between ASDE-X SMR and PAR's:

ASDE-X SMR within +/- 10 degrees of PAR centerline: **27 NM**,
where the PAR centerline is the runway centerline.

ASDE-X SMR that is more than +/- 10 degrees of PAR centerline: **17 NM**

This is based on the worse case PAR power of 100KW, Antenna gain 39.7 dBi, PRF 3300, pulse width 240ns, duty cycle .08%, antenna side lobe of -30 dB below main beam, antenna 8 meters above ground
.
ASDE-X noise floor of -90 dBm, 36 dBi antenna gain, I/N requirement of +60 dB based on a .08% duty cycle, antenna 30 meters above ground.

This equates to a maximum PAR signal of -30 dBm at the ASDE-X receiver in the PAR main beam, and 0 dBm in the side lobe.

Based on MSAM single emitter analysis using the IPS propagation model:

27 NM yields a PAR received signal of -32.6 dBm at the ASDE-X receiver.
17 NM yields a PAR side lobe received signal of +0.81dBm at the ASDE-X receiver.

The following distance separation can be applied between the ASDE-X SMRi and PAR's:

ASDE-X SMRi within +/- 10 degrees of PAR centerline: **30 NM**

ASDE-X SMR that is more than +/- 10 degrees of PAR centerline: **21 NM**

This is based on the same assumptions used above from the SMR, with the exception that 11 dB additional attenuation is required to protect for the SMRi based on the VOLPE interference analysis. The distances reflected are the additional distances required to achieve and additional 11 dB of attenuation.

Based on MSAM single emitter analysis using the IPS propagation model:

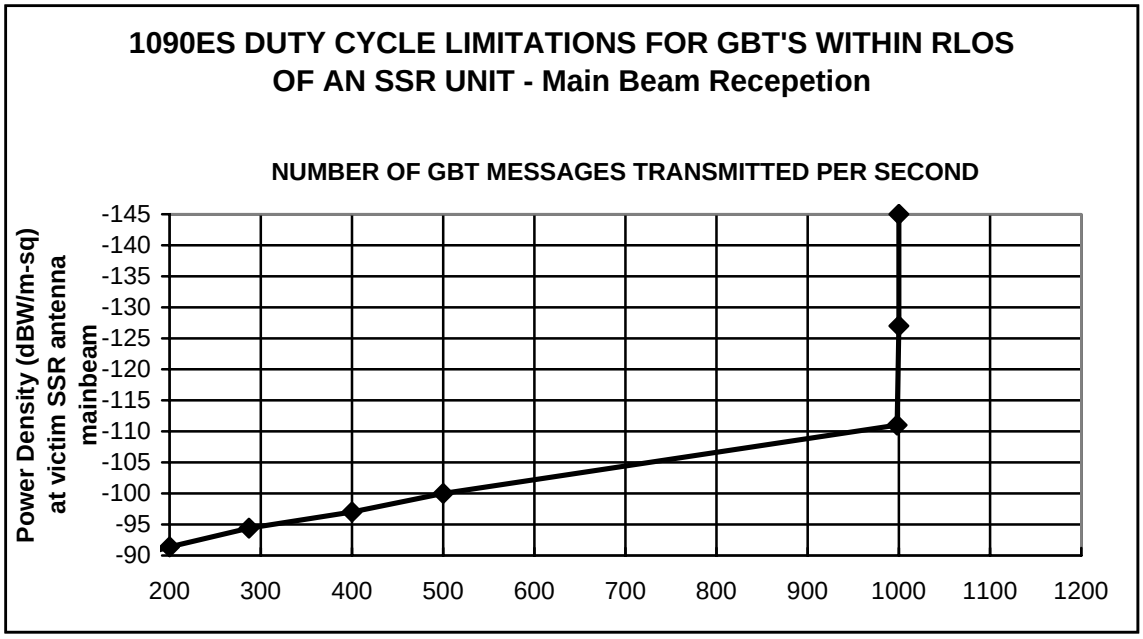
30 NM yields a PAR received signal of -42.8 dBm at the ASDE-X receiver.
21 NM yields a PAR side lobe received signal of -11.8 dBm at the ASDE-X receiver.

ADS-B Ground Based Transceiver Engineering Criteria

The Automatic Dependant Surveillance – Broadcast Ground Based Transceiver (GBT) will need to hold FAA frequency assignments on 1090 MHz and 978 MHz. The radar band component of this system transmits and receives 1090 Extended Squitter (1090ES) messages at a message rate commensurate with the number of aircraft in the surveillance volume. The GBT is not an interrogator because it does not transmit interrogations on 1030 MHz like a beacon. Instead, it is more like a data relay transceiver that communicates with aircraft that are ADS-B equipped which are predominantly commercial air carriers. The GBT receives 1090 ES transmissions from aircraft in its surveillance volume and transmits Traffic Information System – Broadcast (TIS-B) information back to the aircraft. Since the GBT operates on the same channel as aircraft replying to Secondary Surveillance Radar (SSR) systems, the SSR must be protected by controlling the maximum message rate the GBT may employ.

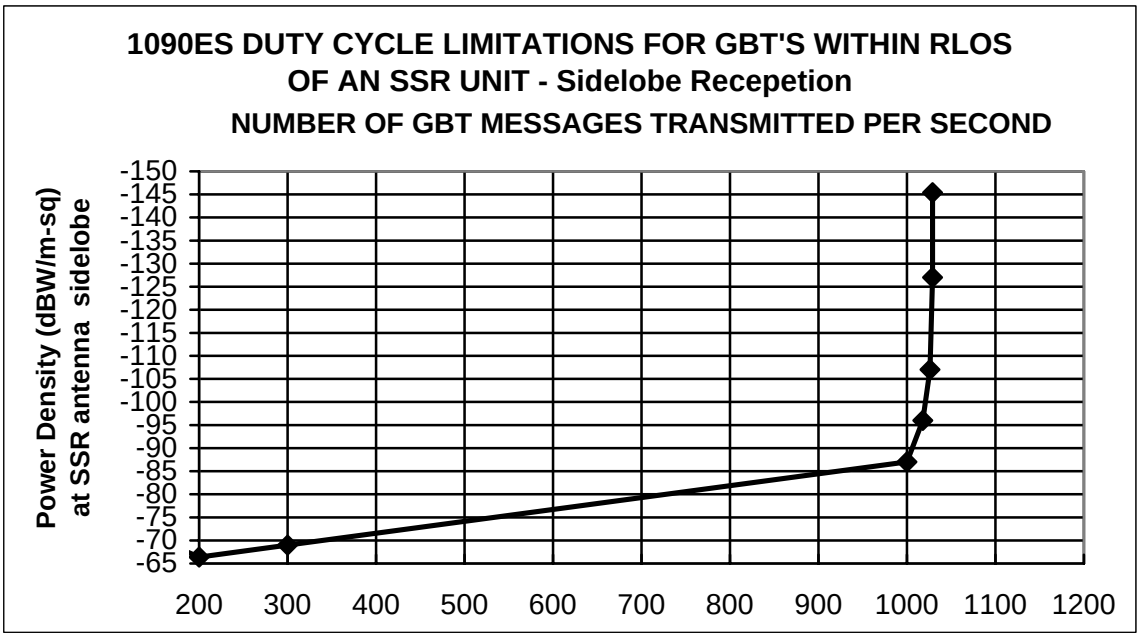
When a 1090ES GBT or multiple GBT's are located within RLOS of an SSR and the signal level at the main beam of the victim(s) antenna exceeds -X dBm, with "X" being the signal strength reflected in Figure 1, then the cumulative number of messages received by the victim per second from all GBT's will not exceed the amounts depicted in Figure 2. If the signal strength at a victim SSR antenna exceeds –90 dBW/m^2, then a method shall be implemented to prevent the GBT from transmitting when the main beam of the SSR rotates through the antenna beam of the GBT. The maximum power at the victim antenna shall not exceed -90 dBW/m^2 in order to prevent receiver saturation.

Figure 1



When a 1090ES GBT or multiple GBT's are located *within* RLOS of an SSR (victim(s)), and the signal level at the *side lobes* of the victim(s) antenna, exceeds -X dBw/m^2, with "X" being the signal strength reflected in Figure 2, then the cumulative number of messages received by the victim per second from all GBT's will not exceed the amounts depicted in Figure 2. The maximum power at the victim receiver shall not exceed -65 dBw/m^2 in order to prevent receiver saturation.

Figure 2



When a 1090ES MHz GBT or multiple GBT's are located *beyond* RLOS of an SSR and/or multilateration R/T unit (victim), the cumulative number of messages transmitted by all GBT's within reception range of any aircraft cannot exceed 1,000 messages per second. The protection criterion for GBT's located within RLOS of multilateration R/T units is TBD.

Example Coordination Procedure for the ADS-B GBT:

The ADS-B contractor contacts spectrum management to initiate coordination for an ADS-B GBT.

The Spectrum Manager requests:

- The power density at every SSR antenna within RLOS of the GBT and the calculation used to derive the value.
- The proposed maximum message rate of the GBT.
- The GBT service volume (radius).

The Spectrum Manager uses the information to:

- Verify the distances and the number of SSRs the contractor provided.
- Verify the Power Density at each SSR by reviewing the contractor's calculations.
- Use the Power Density to check if the proposed message rate satisfies the main beam criteria in Figure 1.
- If the message rate is less than or equal to the maximum rate allowed by the main beam criteria, then the spectrum manager provides coordination and creates an FAA assignment.
- If the message rate is greater than the maximum rate allowed by the main beam criteria, then the spectrum manager notifies the contractor that a device that ensures the GBT does not transmit when it is in the SSR main beam is required. The method is at the discretion of the contractor, but the method must be communicated to the spectrum manager and details entered into the SUP lines of the assignment.
- If the main beam criterion fails, check the side lobe criteria using Figure 2.
- If the message rate is less than or equal to the maximum rate allowed by the side lobe criteria, then provide coordination and create an FAA assignment with the main beam suppression requirement in the SUP lines.
- If the message rate is greater than the maximum rate allowed, reject the GBT as proposed unless the Power Density is reduced or the message rate is reduced to a value that passes the curve in Figure 2.

Secondary Surveillance Radar Coordination Requests

The following is a list of questions to assist in coordinating the use of 1030 MHz or 1090 MHz. Use the information gathered to perform a compatibility analysis using the Beacon Engineering Criteria prior to coordinating.

1. What is the equipment nomenclature of the interrogator?
2. What system(s) is the interrogator paired with? Do they need FAA coordination?
3. What type of antenna, what is the gain, and what is the 3db beamwidth?
4. Is the location fixed, portable, or will the interrogator be one a mobile platform (i.e. airborne or marine), and what is the operating radius the interrogator will be located?
5. What is the peak output power of the interrogator?
6. What is the surveillance range?
7. Is the interrogator capable of sector blanking? If so, what is the minimum sector size and how many sectors can be blanked?
8. What modes of interrogation are being requested? Modes: 1, 2, 3/A, C, 4, 5, or S.
9. Is the PRF adjustable or fixed and does the interrogator stagger or jitter?
10. How does it stagger? Example: Operator enters an average PRF and the system randomly chooses an 8X stagger sequence that staggers +/- 10 % about the average PRF entered.
11. What is the maximum selection range of fixed or average PRFs that can be assigned and what is the selection increment? What is the ideal range for acceptable performance? Example: Engineer can choose an average PRF in the range 150 to 450 Hz in 1 Hz increments. The operators would like a PRF above 250 Hz.
12. If the interrogator employs Mode-4 and is being requested, is the interrogation sequence automatically or manually initiated?
13. Describe how Mode-4 is interrogated. Is it interlaced? Does it send out initial interrogations per beam dwell? Does it re-interrogate if no response? Is the re-interrogation rate adjustable and what is the selection range? What is the number or range of number of Mode-4 interrogations per beam dwell? What is the size of the beam dwell?
14. Is the antenna rotating or e-scan? If rotating, what is the rotation rate?
15. If the system employs Mode-S:
    a. Forward the Certification of Spectrum Support or the J-12, DD 1494, and the MCEB recommendations.
    b. Provide all Mode S interrogation modes supported (i.e. ATCRBS/Mode S All-Call(P1-P3w/wide P4), Mode S Only All Call (UF11), Selective/Roll-Call (UF4,5,20,21).
    c. Does this system have a second transmitter for Mode S SLS (P5)? If not, describe scheme used
    d. Provide mode interlace patterns, interval durations (listening windows) required, and roll-call scheduling scheme.
    e. Provide description of Mode S acquisition and lock-out methods that the system will use.
    f. Does the system provide dynamic transmitter power control for selective interrogations?
    g. If the system utilizes Mode S all-calls in its normal 360 degree interlace pattern, can it maintain lockout of all acquired aircraft within its volume, on a continuous basis.

Note: All Mode-4, 5, and/or S requests must be forwarded to HQ after this information is obtained.

Example Coordination Procedure for SSR systems:

An Army frequency manager contacts the FAA spectrum manager with a 1030 MHz coordination request. The spectrum manager sends the requestor the list of questions for SSR systems.

The requestor returns the following information:
(1) AN/TPX-56 (2) Beacon-only (3) Planar Array, 14 dBi, and 3 degrees. (4) Fixed Location (5) 200 W (6) 50 nmi (7) Yes, can blank 6 degrees in 3 wedges (8) Mode-1, 2, 3/A, and C (9) adjustable and staggered (10) Staggers +/- 5 % about selected average PRF (11) 200 – 450 Hz, but request 250 – 450 Hz (12) No Mode-4 requested (13) N/A (14) Mechanically rotated at 12 RPM (15) Not Mode-S capable

From the information provided, the spectrum manager uses the AFM to circle search 350 nmi about the coordinates provided because the surveillance range is terminal-like and worst case victim radar would be an ARSR-4 according to the Beacon Engineering Criteria.
The spectrum manager uses the results of the circle search to determine an average PRF to assign the system. The goal is to reduce the amount of interrogations in the environment. The lower the PRF the lower the number of interrogations, so interrogators must be assigned the lowest PRF possible. The spectrum manager determines that the average PRF of 255 Hz complies with the Beacon Engineering Criteria and satisfies the request of 250 to 450 Hz.
The spectrum manager then coordinates with the following conditions: The TPX-56 must operate in staggered mode with an average PRF of 255 Hz. The interrogator may only interrogate Mode-1, 2, 3/A, and C. Issue an AR TXXXXXX coordination number and email HQ with all information.

Sample Terminal ATCBI-3, 4, or 5

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0314770

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U         M1030.000000       FAA 731150    SO           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN     6M00M1D        W350.0000C048                   730522   060823

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
NC   SOMEWHERE               000000N 000000W 21GPLANARARRY02241H0062T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
AVL              V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
NC   SOMEWHERE               000000N 000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                        *PRR,333
                        *RAD,0060,R
                        *EQT,G,ATCBI-4,INTGR,FX,PD0.8
                        *AGN,P/W=FAA 941170 + ASR-8 M2710
                        *AGN,P/W=FAA 941171 + ASR-8 M2770
                        *AGN,P/W=FAA 953094 + RBPM M1090
                        *AGN,FA=,SO,ATCRB,AVL,AVL,AVL,ASR
                        *AGN,FTA=SO01093


SUP-----------------------------------------------------------------
```

Sample En Route ATCBI-3, 4, or 5

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
I9741824

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M1030.000000      FAA 712712    CE           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN     6M00M1D       W600.0000C045                   990917

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
MO   SOMEWHERE          000000N 0000000W 28GPARABOLIC 00633H0075T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
STL            V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
MO   SOMEWHERE            000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                    *PRR,360.23
                    *RAD,0200
                    *EQT,G,ATCBI-3,INTGR,FX,PD0.8
                    *AGN,+SSR/DMTI MOD, PRR 360.23 AVG
                    *AGN,+NATIVE ANTENNA
                    *AGN,P/W=FAA 821056 + ARSR-1E M1298
                    *AGN,P/W=FAA 821057 + ARSR-1E M1312
                    *AGN,P/W=FAA 820731 + RBPM M1090
                    *AGN,FA=,CE,ATCRB,STL,ZKC,STL,ARSR
                    *AGN,FTA=CE00064


SUP----------------------------------------------------------------------
```

Sample ATCBI-6

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0327210

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M1030.000000      FAA 050778    SO           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN    21M50V1D      K1.50000  C048                   050603   061018

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
AL   SOMEWHERE          000000N 0000000W 27GPLANARARRY01129H0075T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
QPC             V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
AL   SOMEWHERE             000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                    *PRR,99
                    *RAD,0200,R
                    *EQT,G,ATCBI-6,INTGR,FX,PD0.8
                    *AGN,+MODE-S SITE ID=7,11,11,15,15,15,15
                    *AGN,+SITE ID=15,15,9,9,9,9,4,7,7
                    *AGN,P/W=FAA 915251 + AN/FPS-67B M1320
                    *AGN,P/W=FAA 915236 + AN/FPS-67B M1340
                    *AGN,P/W=FAA 020907 + RBPM M1090
                    *AGN,P/W=FAA 020908 + RBPM M1090
                    *AGN,+LOCKOUT RANGE LIMITED TO 200 NM
                    *NTS,M015,I21895,SPS-5409
                    *AGN,FA=,SO,ATCRB,QPC,ZME,QPC,ARSR
                    *AGN,FTA=SO01921


SUP-----------------------------------------------------------------
```

Sample ATCBI-6M

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0370344

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M1030.000000      FAA 060343    SO           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN    21M50V1D      K1.50000  C048                   060727   070502


XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
FL   SOMEWHERE           000000N 0000000W 27GPLANARARRY00007H0085T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
NQX            V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
FL   SOMEWHERE          000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                     *PRR,120
                     *RAD,0250
                     *EQT,G,ATCBI-6M,INTGR,FX,PD0.8
                     *AGN,+MODE-S SITE ID=8,8,2,2,2,2,3,3
                     *AGN,+DEFAULT=2
                     *AGN,P/W=FAA 061259 + ARSR-4 M1257.01
                     *AGN,P/W=FAA 061260 + ARSR-4 M1339.87
                     *AGN,P/W=FAA 070224 +MK2D MSRM
                     *AGN,P/W=FAA 070225 +MK2D MSRM
                     *AGN,+LOCKOUT RANGE LIMITED TO 250NM
                     *NTS,M015,I21895,SPS-5409
                     *AGN,FA=,SO,ATCRB,NQX,NQX,NQX,ARSR
                     *AGN,FTA=SO00815


SUP----------------------------------------------------------------------
```

Sample Terminal Mode-S

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0219958

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U         M1030.000000       FAA 710301    WP            X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN     21M50V1D       W375.000C043                     710322   050615

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
CA   SOMEWHERE          000000N 0000000W 21GPLANARRAY 00125H0046T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
               V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
CA  SOMEWHERE               000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                        *PRR,395
                        *RAD,0060,R
                        *EQT,G,MODE-S,INTGR,FX,PD0.8
                        *AGN,+MODE-S SITE ID=1
                        *AGN,+LAX ASR-9 NORTH SITE
                        *AGN,P/W=FAA 921234 +ASR-9 M2855
                        *AGN,P/W=FAA 921235 +ASR-9 M2885
                        *AGN,P/W=FAA 991002 +CPME  M1090
                        *AGN,P/W=FAA 991003 +CPME  M1090
                        *NTS,M015,I21895,SPS-5409
                        *AGN,FA=,WP,MODES,LAXN,LAXN,LAXN,ASR
                        *AGN,FTA=WP00627


SUP-------------------------------------------------------------------
SITE ID LAXN WAS LAX
```

Sample En Route Mode-S

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0212025

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M1030.000000      FAA 694602    NM           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN    21M50V1D      W500.000C042                  620422   050516

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
WY   SOMEWHERE          000000N 0000000W 21GPLANARARRY 08662H0046T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
RKS            V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
WY   SOMEWHERE           000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                    *PRR,364.17
                    *RAD,0200,R
                    *EQT,G,MODE-S,INTGR,FX,PD0.8
                    *AGN,+MODE-S SITE ID=13
                    *AGN,P/W=FAA 890149 + ARSR-2 M1330
                    *AGN,P/W=FAA 890150 + ARSR-2 M1335
                    *AGN,P/W=FAA 010547 + CPME M1090
                    *AGN,P/W=FAA 010548 + CPME M1090
                    *AGN,FA=,NM,MODES,RKS,ZLC,RKS,ARSR
                    *NTS,M015,I21895,SPS-5409
                    *AGN,FTA=NM00619


SUP-------------------------------------------------------------------
```

Sample MSSR

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0377563

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M1030.000000      FAA 060025    SW           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
RN    9M00M1D       W150.000C046                    060131   070614
                    S872

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
TX   SOMEWHERE           000000N 0000000W 27GPLANARARRY03609H0102T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
AMA             V     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
TX   SOMEWHERE           000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                    *PRR,155
                    *RAD,0060,R
                    *EQT,C,COSMK2D MSSR,FX,PD0.8
                    *EQR,C,COSMK2D MSSR
                    *AGN,P/W=FAA 060023 +M2733
                    *AGN,P/W=FAA 060024 +M2815
                    *AGN,P/W=FAA 070147 +M1090
                    *NTS,M015,I31761/1,SPS-12650
                    *AGN,FA=,SW,ATCRB,AMA,AMA,AMA,ASR
                    *AGN,FTA=SW02367


SUP---------------------------------------------------------------------
```

Sample PARROT

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0386534

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U         M1090.000000       FAA 070514    WP            X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
ALTO   6M00M1D       W100.00                          070709   070709

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
HI   SOMEWHERE          000000N 0000000W 13GHORN      02526H0079T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
ZHN              V     341

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
HI   SOMEWHERE             000000N 0000000W 27GPLANARARRY04016H0085T

RRC------ACL------RAP---RAZ-----REM-----------------------------------
              V     R      *EQT,G,FA-9852,TRANSPONDER,FX,PD0.45
                           *EQR,G,ATCBI-6
                           *AGN,+REMOTE BEACON PERFORMANCE MONITOR
                           *AGN,+CODE=1273, ALT=90000
                           *AGN,+DELAY=67 NM/828 MICROSEC
                           *AGN,P/W=FAA 070513 + PRF 120 AVG
                           *AGN,FA=,WP,RBPM,QMK,ZHN,QMK,RCL
                           *AGN,FTA=WP01358


SUP----------------------------------------------------------------------
REQUIRED FOR RADAR BEACON RANGE/AZIMUTH VERIFICATION.
```

Sample ASDE-X Multilateration R/T Unit

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0381828

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M1030.000000 FAA 070281 EA X 090621

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
XD 9M20M1D W160.000C049 070618 070618

XSC--XAL----------XLA-----XLG------XAD (feet)----------
VA SOMEWHERE 000000N 0000000W 02GDIPOLE 00289H0128T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
IAD V ND

RSC--RAL----------RLA-----RLG------RAD (feet)----------
VA SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,1-155
*RAD,0005,R
*EQT,C,SSNRU-5,INTGR,FX,PD0.8
*EQR,C,SSNRU-5
*AGN,P/W=FAA 070282 + R/T M1030
*AGN,P/W=FAA 070283 + R/T M1030
*AGN,P/W=FAA 070284 + R/T M1030
*AGN,P/W=FAA 070285 + R/T M1030
*AGN,P/W=FAA 070286 + REF M1090
*AGN,P/W=FAA 070287 + REF M1090
*AGN,FA=EA,ASDE,IAD,IAD,IAD,ASDE
*AGN,FTA=EA02464
*AGN,+SITE 01 (RAMP TOWER)

SUP----------
REQUIRED TO SUPPORT THE MULTILATERATION COMPONENT OF THE ASDE-X SYSTEM. THE PWR IS THE MAX AUTHORIZED PEAK ERP, BUT WILL BE ADUSTED USING WHISPER SHOUT TECHNIQUES. THE POWER AND INTERROGATION RATES SHALL BE LIMITED THAT THE AGGREGATE EFFECT OF ALL SYSTEMS THAT ARE PART OF THIS SYSTEM DO NOT EXCEED ONE-QUARTER OF ONE PERCENT OF THE MOST EFFECTED TRANSPONDERS OCCUPANCY. ADDITIONALLY, THE INTERROGATION RATE SHALL BE LIMITED SUCH THAT THE ELICITED FRUIT FROM AIRCRAFT WILL BE LESS THAT 10 FRUIT PER SECOND PER AIRCRAFT.

Sample ASDE-X Multilateration Reference Transmitter

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0381844

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M1090.000000 FAA 070287 EA X 090621

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
XD 14M00M1D W70.0000 070618 070618

XSC--XAL----------XLA-----XLG------XAD (feet)----------
VA SOMEWHERE 000000N 0000000W 02GDIPOLE 00007H0036T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
IAD V ND

RSC--RAL----------RLA-----RLG------RAD (feet)----------
VA SOMEWHERE 000000N 0000000W 03GDIPOLE 00289H0125T
VA SOMEWHERE 000000N 0000000W 06GDIPOLEARRY00308H0039T
VA SOMEWHERE 000000N 0000000W 03GDIPOLE 00308H0121T
VA SOMEWHERE 000000N 0000000W 03GDIPOLE 00322H0059T
VA SOMEWHERE 000000N 0000000W 06GDIPOLEARRY00259H0039T

RRC------ACL------RAP---RAZ-----REM----------
V ND *RAD,0005,T
V ND *EQT,C,SSNREFTRAN,FX,PD0.45
V ND *EQR,C,SSNRU-5
V ND *AGN,P/W=FAA 070281 + R/T M1030
V ND *AGN,P/W=FAA 070282 + R/T M1030
*AGN,P/W=FAA 070283 + R/T M1030
*AGN,P/W=FAA 070284 + R/T M1030
*AGN,P/W=FAA 070285 + R/T M1030
*AGN,P/W=FAA 070286 + R/T M1090
*AGN,FA=EA,ASDE,IAD,IAD,IAD,ASDE
*AGN,FTA=EA02470
*AGN,+SITE X2 (RAMP TOWER)
*AGN,+REFTRAN 1 TOP ID=ADFBDD
*AGN,+REFTRAN 1 BOTTOM ID=ADF991

SUP----------
REQUIRED AS A REFERENCE TRANSMITTER FOR A MULTILATERATION SYSTEM. THE PWR IS THE MAX AUTHORIZED PEAK ERP, BUT WILL BE ADUSTED USING WHISPER-SHOUT TECHNIQUES. ANY ALTITUDE SETTING WILL BE SET TO EITHER BELOW SEA-LEVEL OR ABOVE 60K FEET.

Sample ARSR-1/2 or FPS-6X

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0374029

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U         M1288.000000       FAA 921021    CE            X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
ALS    6M00P0N        M5.00000  C045                    920304   070517

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
KS   SOMEWHERE           000000N 0000000W 34GPARABLRFLC01165H0039T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
QBZ              T     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
KS   SOMEWHERE              000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                        *PRR,354.48
                        *EQT,G,ARSR-2,TC,PD2.0
                        *EQR,G,ARSR-2
                        *AGN,+SSR/DMTI MOD, PRR 354.48 AVG
                        *AGN,P/W=FAA 921020 +M1324
                        *AGN,P/W=FAA 851003 +ATCBI-6, 354.48 AVG
                        *AGN,FA=,CE,ARSR,QBZ,ZKC,QBZ,ARSR
                        *AGN,FTA=CE00476


SUP-------------------------------------------------------------------
REQUIRED FOR AIR TRAFFIC CONTROL.
```

Sample ARSR-3

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0300492

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M1320.490000 FAA 892859 SO X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
ALS 8M00P0N M5.00000 C048 920327 060614

XSC--XAL---------------------XLA-----XLG------XAD (feet)-----------------
GA SOMEWHERE 000000N 0000000W 34GPARABLRFLC00797H0079T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
QNK T R

RSC--RAL---------------------RLA-----RLG------RAD (feet)--------------
GA SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,319
*EQT,G,ARSR-3,TC,PD3.2
*EQR,G,ARSR-3
*AGN,+PRR 8X STAGGER, 319 AVG, 254 NM
*AGN,C/W=FAA 892861 +M1346.38
*AGN,P/W=FAA 060522 +ATCBI-6,PRR 085 AVG
*AGN,FA=,SO,ARSR,QNK,ZTL,QNK,ARSR
*AGN,FTA=SO01051

SUP----------
REQUIRED FOR AIR TRAFFIC CONTROL.

Sample ARSR-4

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0343132

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M1254.420000 FAA 945205 NM X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
ALS 2M76Q3N K80.0000 C042 950128 061229

XSC--XAL----------XLA-----XLG------XAD (feet)----------
MT SOMEWHERE 000000N 0000000W 34GPARABLRFLC07005H0059T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
QLA T R

RSC--RAL----------RLA-----RLG------RAD (feet)----------
MT SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,315.5
*EQT,G,ARSR-4,TS,PD90.0
*EQR,G,ARSR-4
*JNT,FAA ,AF
*AGN,P/W=FAA 945204 +M1337.28
*AGN,P/W=FAA 804725 +ATCBI-5, PRR 315.5
*AGN,FA=,NM,ARSR,QLA,ZLC,QLA,ARSR
*AGN,+CANADIAN COORDINATION NUM=940018
*NTS,M015,IRAC 25978, SPS-7987
*AGN,FTA=NM01025

SUP----------
REQUIRED FOR AIR TRAFFIC CONTROL.

Sample LRR SLEP

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
N HC 5/14/2007

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M1252.410000 FAA 070393 GL X 090621

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
XT 2M25Q3N K60.00000 C047
XT 2M50Q3N K60.00000

XSC--XAL----------XLA-----XLG------XAD (feet)----------
MI SOMEWHERE 000000N 0000000W 34GPARABLRFLC00659H0075T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
CPV V R

RSC--RAL----------RLA-----RLG------RAD (feet)----------
MI SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,368
*EQT,G,LRR SLEP,TC,PD120/20
*EQR,G,LRR SLEP
*AGN,PRF=368 +MAX PRF
*AGN,+REQUIRED TO BE BLANKED FROM 158
*AGN,+TO 168 AND 219
*AGN,+TO 229 DEGREES REF TRUE NORTH.
*AGN,C/W=FAA 070394 +M1257.59
*AGN,C/W=FAA 070395 +M1300.41
*AGN,C/W=FAA 070396 +M1305.59
*AGN,P/W=FAA 892235 +ATCBI-6 PRF=94
*AGN,+CANADA COORDINATION=RADAR1/07
*AGN,FA=,GL,ARSR,CPV,CPV,CPV,ARSR
*AGN,FTA=GL00680

SUP----------
REQUIRED FOR TESTING THE LONG RANGE RADAR SERVICE LIFE EXTENSION PROGRAM UPGRADE TO EXISTING ARSR. THE SYSTEM WILL NOT BE COMMISSIONED UNTIL THE CERTIFICATION OF SPECTRUM SUPPORT STAGE - 4 IS COMPLETE. THE SYSTEM IS REQUIRED TO BLANK 158 DEGREES TO 168 DEGREES AND 219 TO 229 DEGREES REFERENCED TO TRUE NORTH. THE BLANKING MAY BE REMOVED WHEN TESTING INDICATES NO SYSTEM PERFORMANCE DEGRADATION TO THE LRR SLEP OR THE VICTIM RADARS OBSERVED.

Sample ASR-7

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0362474

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M2860.000000 FAA 815367 SW X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
ALS 8M00P0N K425.00000C046 811122 070402

XSC--XAL---------------------XLA-----XLG------XAD (feet)----------------
LA SOMEWHERE 000000N 0000000W 34GPARABLRFLC00069H0046T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
BTR V R

RSC--RAL---------------------RLA-----RLG------RAD (feet)--------------
LA SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,1.002K
*EQT,G,ASR-7,TC,PD0.833
*EQR,G,ASR-7
*AGN,+PRR 6X STAGGER, 1002 AVG, SET P
*AGN,C/W=FAA 860031 +M2840
*AGN,P/W=FAA 730619 +ATCBI-4, 445.34
*AGN,FA=,SW,ASR,BTR,BTR,BTR,ASR
*AGN,FTA=SW00108

SUP----------
REQUIRED FOR AIR TRAFFIC CONTROL.

Sample ASR-8

```
DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT-----------
J0265523

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M2710.000000      FAA 941906    SO           X

STC----EMS------------PWR-------NTS-------AUS------AUD------RVD---
ALS    6M00P0N       K500.0000C048                    940802   060124

XSC--XAL----------------------XLA-----XLG------XAD (feet)-----------------
NC   SOMEWHERE         000000N 0000000W 34GPARABLRFLC00026H0066T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
ILM             T     R

RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
NC   SOMEWHERE              000000N 0000000W

RRC------ACL------RAP---RAZ-----REM-----------------------------------
                    *PRR,1.139K/816/1.082K/991
                    *EQT,G,ASR-8,TC,PD0.6
                    *EQR,G,ASR-8
                    *AGN,PRF=991 +AVG, 4X STAGGER
                    *AGN,C/W=FAA 941907 +M2770
                    *AGN,P/W=FAA 785788 +MODE-S, PRR 330
                    *AGN,FA=,SO,ASR,ILM,ILM,ILM,ASR
                    *AGN,FTA=SO00131


SUP-----------------------------------------------------------------
REQUIRED FOR AIR TRAFFIC CONTROL.
```

Sample ASR-9

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0377579

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M2760.000000 FAA 010040 WP X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
ALS 5M00P0N M1.30000 C043 010301 070614
S373

XSC--XAL----------XLA-----XLG------XAD (feet)----------
CA SOMEWHERE 000000N 0000000W 35GPARABLRFLC01414H0026T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
PSP T R

RSC--RAL----------RLA-----RLG------RAD (feet)----------
CA SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,1.101K
*EQT,G,ASR-9,TC,PD1.03
*EQR,G,ASR-9
*AGN,+RADAR PRF SET 24, PRR 1101 AVG
*AGN,+PSP ASR-9
*AGN,C/W=FAA 010039 +M2710
*AGN,P/W=FAA 010041 +MODE-S PRR 403 AVG
*AGN,FA=WP,ASR,PSP,PSP,PSP,ASR
*AGN,FTA=WP02254
*NTS,M015,I23320,SPS-6285

SUP----------
REQUIRED FOR AIR TRAFFIC CONTROL.

Sample Experimental ASR-11 with Blanking

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0281170

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M2705.000000 FAA 060380 GL X 080327

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
XT 2M80Q3N K25.00000 C047 060328 060328
XT 5M10P0N K25.00000 S373

XSC--XAL----------XLA-----XLG------XAD (feet)----------
IL SOMEWHERE 000000N 0000000W 34GPARABLRFLC00764H0095T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
RFD V R

RSC--RAL----------RLA-----RLG------RAD (feet)----------
IL SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,692/896/958/1.01K
*EQT,G,ASR-11,TC,PD89/1.45
*EQR,G,ASR-11
*AGN,PRF=840 + AVG, 4X STAGGER
*AGN,C/W=FAA 060381 +M2865
*AGN,P/W=FAA 060379 +MK2D MSSR
*AGN,+TRANSMISSIONS REQUIRED TO BE
*AGN,+BLANKED 012 DEGREES TO 022 DEGREES
*AGN,+AND 238 DEG TO 248 DEG TRUE NORTH.
*NTS,M015,I31761/1,SPS-12650
*AGN,FA=,GL,ASR,RFD,RFD,RFD,ASR
*AGN,FTA=GL03106

SUP----------
TEMPORARY FREQUENCY FOR USE DURING THE INITIAL TEST PHASES. ONCE THE ASR-11 IS READY FOR THE FLIGHT CHECK PHASE OF COMMISSIONING, THE FREQ WILL NEED TO BE CHANGED TO THE FINAL FREQUENCY OF 2760 MHZ CURRENTLY BEING USED BY THE ROCKFORD ASR-8.

Sample Operational ASR-11

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0362473

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M2845.000000 FAA 070173 GL X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
ALS 2M80Q3N K25.00000 C049 070402 070402
ALS 5M10P0N K25.00000 S373

XSC--XAL----------XLA-----XLG------XAD (feet)----------
PA SOMEWHERE 000000N 0000000W 34GPARABLRFLC01863H0095T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
AVP V R

RSC--RAL----------RLA-----RLG------RAD (feet)----------
PA SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,692/896/758/1.01K
*EQT,G,ASR-11,TC,PD89/1.45
*EQR,G,ASR-11
*AGN,PRF=840 + AVG, 4X STAGGER
*AGN,C/W=FAA 070172 +M2740
*AGN,P/W=FAA 070171 +MK2D MSSR
*AGN,FA=,EA,ASR,AVP,AVP,AVP,ASR
*NTS,M015,I31761/1,SPS-12650
*AGN,FTA=EA00606

SUP----------
REQUIRED FOR AIR TRAFFIC CONTROL.

Sample NEXRAD

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0362852

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M2865.000000 FAA 955605 AL X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
SMD 4M60P0N K750.0000C071 950802 070403
S373

XSC--XAL----------XLA-----XLG------XAD (feet)----------
AK SOMEWHERE 000000N 0000000W 46GPARABLRFLC02792H0115T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
FAI S R

RSC--RAL----------RLA-----RLG------RAD (feet)----------
AK SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,320-1.3K
*EQT,G,WSR-88D,TC,PD1.5/4.5
*EQR,G,WSR-88D
*AGN,+NEXRAD WEATHER RADAR
*AGN,P/W=FAA 932077 +M2913
*AGN,FA=,AL,NXRAD,FAI,ZAN,FAI,NXRAD
*AGN,FTA=AL00802

SUP----------
REQUIRED FOR WEATHER SURVEILLANCE AND STORM DETECTION.

Sample TDWR

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0265908

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M5610.000000 FAA 931007 NM X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
SMD 3M26P0NAN K250.00000 930213 060125

XSC--XAL---------------------XLA-----XLG------XAD (feet)----------------
UT SALT LAKE CITY 405802N 1115547W 50GPARABLRFLC04219H0098T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
SLC H R

RSC--RAL---------------------RLA-----RLG------RAD (feet)--------------
UT SOMEWHERE 0000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,325/1.946K
*EQT,G,TDWR,TC,PD1.2
*EQR,G,TDWR
*AGN,FA=,NM,TDWR,SLC,SLC,SLC,TDWR
*NTS,M015,IRAC 25877,SPS-7914
*AGN,FTA=NM00770

SUP----------
TERMINAL DOPPLER WEATHER RADAR (TDWR) USED FOR HAZARDOUS WEATHER DETECTION AT AIRPORTS.

Sample ASDE-X SMR

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0102922

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M9040.000000 FAA 040043 X

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
ALS 54M10Q3N W70.0000 C048 040219 040219
ALS 70M30P0N W70.0000

XSC--XAL---------------------XLA-----XLG------XAD (feet)----------------
KY SOMEWHERE 000000N 0000000W 35GDIPOLEARRY00486H0036T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
R R

RSC--RAL---------------------RLA-----RLG------RAD (feet)--------------
KY SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*PRR,4.096K
*EQT,C,RAYSMR,TC,PD4/.04
*EQR,C,RAYSMR
*AGN,P/W=FAA 040042 +M9080
*AGN,P/W=FAA 040041 +M9120
*AGN,P/W=FAA 040044 +M9160
*AGN,FA=,SO,ASDE,SDF,SDF,SDF,ATCT
*AGN,FTA=SO03132
*NTS, M015, I35798, SPS-15958

SUP----------
REQUIRED TO SUPPORT THE AIRPORT SURFACE DETECTION EQUIPMENT THAT HAS BEEN CONGRESSIONALLY MANDATED RUNWAY INCURSION REDUCTION PROGRAM.

Sample ASDE-X SMRi

DKT--------SEC---TYP-RTN--STT---DEC----LSR--------ACN--------DAT----------
J0383511

CLA-CDD----FRQ----------BIN--SER----------BUR--NET---MBR-FOI---EXD-----
U M8940.000000 FAA 070438 EA X 090625

STC----EMS----------PWR-------NTS-------AUS------AUD------RVD---
XD 62M00Q3N W155.0000E039 070625 070625
XD 208M00P0N W1.50000 C049

XSC--XAL---------------------XLA-----XLG------XAD (feet)----------
VA SOMEWHERE 000000N 0000000W 38GDIPOLEARRY00243H0384T

XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD---
IAD R R

RSC--RAL---------------------RLA-----RLG------RAD (feet)----------
VA SOMEWHERE 000000N 0000000W

RRC------ACL------RAP---RAZ-----REM----------
*FRB,M08940.000000,M09264.000000
*PRR,16.384K
*EQT,c,SSNASDE-XSMRI,TC,PD4/0.04
*EQR,C,SSNASDE-XSMRI
*AGN,FA=,EA,ASDE,IAD,IAD,IAD,ASDE
*AGN,+PRR=16.384K
*AGN,FTA=EA02471

SUP----------
THIS ASSIGNMENT IS TO SUPPORT THE DEVELOPMENT OF A NEW SURFACE MOVEMENT RADAR (SMRI) THAT IS IN SUPPORT OF THE CONGRESSIONALLY MANDATED RUNWAY INCURSION REDUCTION PROGRAM. THIS IMPROVED VERSION OF THE SMR IS INTENDED TO IMPROVE DETECTION IN RAIN. THE SHORT PULSE HAS AN EXCESSIVE BANDWIDTH THAT EXTENDS BEYOND THE ALLOCATED 9.0 TO 9.2 GHZ BAND. THE RADAR IS UNDERGOING IMPROVEMENTS TO CONTAIN THE EMISSIONS IN THE BAND IN PREPARATION FOR THE SPS SUBMISSION. ASSIGNMENTS ARE NECESSARY TO ALLOW THE VENDOR TO REFINE THE SYSTEM IN AN OPERATIONAL ENVIRONMENT. THE SMRI HOPS ON 16 CARRIER FREQUENCIES ALL CONTAINED IN THE ALLOCATED BAND. THE EMISSION OF THE LONG PULSE IS CONTAINED IN THE BAND. ALTHOUGH THE NECESSARY BANDWIDTH OF THE SHORT PULSE EXTENDS OUTSIDE OF THE BAND, THE POWER IS 1/100TH OF THE LONG PULSE AND DOES NOT POSE AN INTERFERENCE THREAT TO ADJACENT BAND SYSTEMS THAT ARE LOCATED MORE THAN 1.4 NMI. THE SHORT PULSE EMISSION DESIGNATOR REFLECTS THE WORST CASE BANDWIDTH. THE ACTUAL SHORT PULSE BW VARIES BETWEEN 134 AND 208 MHZ.

SAMPLE ASDE-3 ASSIGNMENT USING FREQUENCY HOPSET #1

DKT--------SEC---TYP-RTN-status-DEC----LSR--------ACN--------DAT---

CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U M15700.000000 - FAA 922598 SW M X
STC----EMS-----------PWR-----------NTS--AUS------AUD----RVD---
LR 125M00P0N K3.00000 E039 I9875684 921209 070713

XSC--XAL----------XLA-----XLG------XAD (feet)----------
TX SOMEWHERE 000000N 0000000W 44GPARABLRFLC 00545H0233T
XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD
DFW R R
RSC--RAL----------RLA-----RLG------RAD (feet)----------
TX SOMEWHERE 000000N 0000000W
RRC------ACL------RAP---RAZ-----REM----------
*FRB,M15700.000000,M16200.000000
*PRR,16.384K
*EQT,G,ASDE-3,FA,PD0.04 (TWT)
*EQR,G,ASDE-3
*AGN,+SINGLE FREQUENCY TEST 15950 MHZ
*AGN,FA=,SW,ASDE,MB2,ZFW,MB2,ATCT
*NTS,M015,I21833,SPS-5305
*AGN,FTA=SW00822
SUP----------
OPERATES ON 16 DESCRETE FREQUENCIES IN FREQUENCY AGILE MODE.
FREQUENCIES
AND HOP SEQUENCE ARE 15950, 16075, 15825, 16000, 16125, 15875, 16050, 15800, 15925, 16100, 15850, 15975, 16150, 15900, 16025, AND 15775 MHZ.

SAMPLE ASDE-3 ASSIGNMENT USING FREQUENCY HOPSET #2

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DKT--------SEC---TYP-RTN-status-DEC----LSR--------ACN--------DAT---
I
CLA-CDD----FRQ-----------BIN--SER-----------BUR--NET---MBR-FOI---EXD-----
U        M15700.000000 -    FAA 922728    SW            X
   STC----EMS------------PWR-----------NTS--AUS------AUD----RVD---
   LR     28M00P0N       K3.00000       E039              921231 040825
XSC--XAL----------------------XLA-----XLG------XAD (feet)--------------
TX   SOMEWHERE          000000N 0000000W 44GPARABLRFLC 00095H0135T
   XRC------XCL------XAP---XAZ-----SPD---TME---ICI-MSD
   IAH             R     R
RSC--RAL----------------------RLA-----RLG------RAD (feet)--------------
TX   SOMEWHERE           000000N 0000000W
   RRC------ACL------RAP---RAZ-----REM-----------------------------------
   ASDE-3                    *FRB,M15700.000000,M16200.000000
                             *PRR,16.384K
                             *EQT,G,ASDE-3,FA,PD0.04
                             *EQR,G,ASDE-3
                             *AGN,+SINGLE FREQUENCY TEST 15950 MHZ
                             *AGN,FA=,SW,ASDE,IAH,IAH,IAH,ASDE
                             *NTS,M015,IRAC 21833,SPS-5305
                             *AGN,FTA=SW00532
SUP----------------------------------------------------------------------
OPERATES ON 16 DESCRETE FREQUENCIES IN FREQUENCY AGILE MODE.
FREQUENCIES AND HOP SEQUENCE ARE 15950, 15775, 16025, 15900, 16150,
15975, 15850, 16100, 15925, 15800, 16050, 15875, 16125, 16000, 15825,
AND 16075 MHZ.
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