Attachment 5

R-2508 Panamint Valley ASR-11 Tables, Appendix B (Procedures) and Appendix C (RF Interference Mitigation Analysis)

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TABLE OF CONTENTS

Tables:
1 Key Personnel ATT5-5
2 General Site Data ATT5-6
3 Preconstruction Meeting Information ATT5-8
4 ASR-11 Site Cable Requirements ATT5-9
5 TRACON Cable Requirements ATT5-10
6 RF Interference Mitigation Analysis Recommendations ATT5-11
7 Predismantling Meeting Information ATT5-12
8 DDS Line Service Requirements ATT5-13
9 Equipment Parts List ATT5-14
9.a Government Furnished Equipment Parts List ATT5-15
10 Space Requirements ATT5-16
11 Circuit Breaker Assignments ATT5-17
12 Cable Run List ATT5-18

Figures:
1. System Interconnection Diagram ATT5-21

Appendices:
B Procedures ATT5/B-1
C RF Interference Mitigation Analysis Study ATT5/C-1

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Table 1. Key Personnel

Organization/Title	Name	Telephone
Raytheon/FATD Engineer	Mark D. Murphy	(781) 238-2788
Raytheon/SATP Engineer	Hank Hyche	(770) 907-3346
Raytheon/Site Construction Engineer	Jim Gaved	(208) 244-2577
Raytheon/Site Installation Team Lead	TBD	
FAA ATB-460/ASR-11 Requirements Lead	JoEllen Kleindienst	(202) 493-4229
FAA ATO-T/Deployment Lead	Tom Jones	(202) 385-8729
FAA ATO-T/FATD POC	Isaac Coleman	(405) 200-4530
FAA ATO-T/SATP POC	Dwight Bradford	(301) 565-2970
FAA ASU-250/Site Acceptance Test Lead	Jamal Abuswai	(202) 267-5740
FAA ANI-90/NAS Implementation POC	Neil Angelotti	(202) 493-6596
FAA ANI-960 Surveillance Programs Manager	Jerry Duhonich	(310) 725-7770
FAA AWP-510/Regional AT Requirements	Rose Sardisco	(310) 725-6510
FAA AWP-470/Regional Lead Engineer	Joseph Heil	(310) 725-3478
FAA SMO ASR-11 POC	Robert Ellington	(661) 277-9604
FAA AF Coordinator	John LaFontaine	(661) 816-3726
FAA SSC/AF Manager	Michael Flynn	(661) 258-4436
FAA Air Traffic Manager	Mark Heinrich	(661) 258-6300
FAA ATO-T/Regulus-Group Resident Engineer (RE)	Trip French	(540) 335-8747
FAA ANI-960/Technical Onsite Representative (TOR)	TBD	
Airport Manager (Director of Operations)	Bill Shelton	(661) 277-9831

Table 2. General Site Data

New ASR-11 Site Data	
Site Location	Panamint Valley, CA
ASR-11 Antenna Coordinates	Latitude N 36° 02' 02.11" Longitude W 117° 16' 10.72" (NAD83, Source-survey, Accuracy+-16ft) Site Elevation 1,196 feet above mean sea level (AMSL), Source-Handheld GPS
Recommended Tower Height and PSR Antenna Tilt	17 feet above ground level (AGL) and 0° relative to the horizon (mechanical). Final PSR tilt may change during system optimization.
Radome Required?	No
Fiber Optic Cable Link Distance	N/A
Access Road Length and Type	Existing gravel road
Location of QPM Communications Rack	The Raytheon I&CO team will install the QPM Communications Rack in its permanent location inside the equipment room, room 118, located on the first floor of the new R-2508 TRACON building without connection to the operational equipment. The rack AC outlets will be hard-wired to their respective power feeds. Space will be made available in the QPM Communications Rack for installation of the SIUs for REHOST. Communications from the Panamint radar site will be over microwave and enters the R-2508 TRACON via the TELCO room and routes to inside the QPM Communications Rack and all intercabinet cables will be installed. See FATD drawings E35, E32 and E20 for a System Interconnection Diagram, QPM Communications Rack Configuration, and R-2508 TRACON Equipment Room Plan. Refer to Appendix B, Installation Procedure B1.
Location of the OMT	The OMT will be installed in the Coordinators Area located in the first floor of the new R-2508 TRACON building and connected to the Router CC mounted in the QPM Communications Rack. Refer to FATD drawing E35 for Interconnection Diagram, drawing E20 for Equipment Location, and Attachment 5 Appendix B, Installation Procedure B2.
Location of the RCP	N/A
Location of MTI Reflector # 1	Latitude N 35° 53' 54.0" Longitude W 117° 17' 18.2" (NAD83, Source-Handheld GPS, Accuracy-+-15 Ft) MTI#1 will be located on the existing tower at the Slate Range RLMR site. The MTI reflector is located approximately 49,668.903 feet from the ASR-11 antenna at an azimuth of 186.418° true.
Location of MTI Reflector # 2	Delivered but not installed.
MRSM	Latitude N 35° 53' 54.0" Longitude W 117° 17' 18.2" (NAD83, Source-GPS, Accuracy-+-15 feet) The MRSM antenna is located on the existing tower at the Slate Range RLMR site. The MRSM antenna is located approximately 49,668.903 feet from the ASR-11 antenna at an azimuth of 186.418° true.
Permanent Echoes	According the site survey report, FAA-provided permanent echoes would not be detected by the ASR-11. Permanent echoes will need to be determined during optimization.
Plot Size	ASR-11 will be constructed inside fence at existing radar site.
Fenced Area	ASR-11 will be constructed inside fence at existing radar site.

Table 2. General Site Data (Continued)

Approved Modifications to the Generic Design	The following modifications were approved by the FAA via letter F-FAASS-05-0024, dated 15 March 2005.
Frequency Assignment	2,825 and 2,895 MHz
FAA Address	FAA – Edwards SSC, 2508 Rosamond, Attn: John LaFontaine, Edwards AFB, CA, 93523
Existing Surveillance Environment Data	
Primary Radar Type	ASR-8
Beacon Type	ATCBI-5
Antenna Coordinates	Latitude N 36° 02' 03" Longitude W 117° 16' 11" (NAD83, Source-FAA Facility Transmission Authority document) Site Elevation 1,196 feet AMSL, Source-FAA The existing ASR-8 is located approximately 92.891 feet from the ASR-11 antenna center at an azimuth of 345.667° true.
Tower Height and PSR Antenna Tilt	17 feet above ground level (AGL) and 2.2° relative to the horizon (mechanical).
Type of Automation System	REHOST-2
Automation Display Configuration	The TRACON utilizes a unique Automation/Display System called REHOST 2. The system includes a mosaic display with inputs from multiple radars. This is an interim system that will eventually be replaced with STARS. In addition the ASR-11 will provide a feed to two additional locations. Each of the locations will require a “CD-2 format” data input. The feeds will include landlines, microwave links, TELCO, and possible F/O cable. **NOTE: The REHOST-2 interface and distribution design has not been developed and is not a part of this delivery order.**
DBRITE Configuration	None. A REHOST tower display is utilized. Interface by others.
Hours of Low Activity	12:00 AM to 6:00 AM for the R-2508 TRACON Operations Room
Frequency Assignment	2,865 and 2,735 MHz

Table 3. Preconstruction Meeting Information

ASR-11 Site Access	From Ridgecrest, CA, travel northeast on Highway 178 for approximately 45 miles and turn right on Ballarat Road, go approximately 1 mile and the existing radar site will be visible to the left on a gravel road.
FAA Facility Access	Enter Edwards AFB at west gate (State Hwy 14) and continue east on Rosamond to 2508 Rosamond.
Security	The Panamint Valley radar site is located off base property. The TRACON facility is located on Edwards AFB and entry to the base requires coordination. Security levels and requirement for entry are subject to change. Provide to Robert.ellington@edwards.af.mil the following: Full name, date and place of birth, name of your organization. Two forms of identification, i.e. driver's license, FAA or company ID are required to enter. Additional security requirements will be provided at the time of requested access. Contact John LaFontaine (661) 258-4436 or (661) 816-3726 (cell).
Coordination	All coordination for access to the base, to radar site and TRACON must be through John LaFontaine, (661) 258-4436 or (661) 816-3726 (cell).
Vehicles	All POV's operating on Edwards AFB must be insured with $15,000 Personal liability, $30,000 each accident, $5,000 property damage. Decals are obtained from security police Pass and Registration Section, Bldg 2860. Vehicles are required to be registered within 10 days of arrival. To register a vehicle on base a registration, drivers license, and ID card is required. Vehicles registered outside the state of California must have a smog check before registering.

Table 4. ASR-11 Site Cable Requirements

Radar Data Communication Media	Radar data communications requires two government provided microwave 128 KBps digital data service (DDS) lines between the ASR-11 equipment shelter (at the site TELCO demarcation), the TRACON Telco room #119 and the TRACON equipment room (Communications Rack) inside the TRACON facility. The OMT link requires at least one Government provided 56 KBps DDS line (two lines are required at all ATC facilities). Refer to Table 8 of Attachment 5 for microwave service requirements.
Telephone Cables	• The site telecommunications system requires a minimum of three single voice-grade lines to connect to the local telephone system. Telephones for voice communications will be located in the ASR-11 equipment shelter, the ASR-11 engine generator shelter, and the mezzanine level of the antenna tower. • All telecommunications will be by microwave link through existing microwave equipment. The Edwards AFB Standards and Planning Division provide all TELCO and Fiber Optic cables on the Base. The POC is John Kellas (661) 277-3810 and Herman Lewis (661) 277-8484. The voice circuits will tie into the base telephone system. The S&P Division will provide a demark point within the ASR-11 building and inside the new TRACON building for both data link and voice.
ASR-11 Facility Power	The electrical power requirement is for a 480/277 VAC, three-phase, four-wire 112.5 kVA feed. Power to the site will originate at an existing pole south of the site and be run underground to the transformer inside the fence by Southern California Edison. Extending the power service from the secondary side of the transformer to the main disconnect switch, as well as for installing the meter socket in a location mutually agreed to with Southern California Edison will be accomplished by the Raytheon subcontractor. Raytheon's subcontractor assumes responsibility for leased material and temporary service during site preparation up through the completion of the Facility SAT (SAT, Part I). At this date, the Government will assume responsibility for service.

Table 5. TRACON Cable Requirements

Radar Data Communication Media	The government-provided microwave circuits will be available at the microwave LAN demarcation rack inside the TRACON Telco room #119 of the TRACON building. Additional cables will be routed between the DDS demarcation and the Communications Rack (Routers AA, BB, CC and DD). See Table 8 of Attachment 5 for microwave DDS requirements. See FATD drawing E20 for proposed equipment location.
Internal Cables	• Refer to FATD drawing E35 and Table 12, contained in Attachment 5, for a complete communications interconnect diagram and cable lists. • The ASR-11 will provide a feed to two additional locations. Each of the locations, which are listed below, will require a "CD-2 format" data input. The feeds will include landlines, microwave links, TELCO, and possible F/O. The interface and distribution is not included in this SATP. The following is the planned distribution: High Desert TRACON, Sport, China Lake (North Base). NOTE: The REHOST-2 interface and distribution design has not been developed and is not a part of this delivery order.
Electrical Power	A subcontractor will position electrical power connections for the ASR-11 equipment in the TRACON Operations and Equipment Rooms. Power will be derived from critical power panels using circuit breakers assigned by local FAA AF personnel. See Table 11 and FATD drawing E20 for proposed circuit breaker assignments and equipment location. Refer to the FATD for specific power and grounding details inside the TRACON Operations and Equipment Rooms.

Table 6. RF Interference Mitigation Analysis Recommendations

Recommended Transmission Scenario	Simultaneous Radiation Scenario (See Section 1.9.1 for details).
Facilities Analyzed	The existing ASR is the only S-band emitter noted.
Filter Requirements	Filters will be installed in the ASR-11. The ASR-11's receiver STC will need to be adjusted to +72 dB between 345.6° and 5.6° true to diminish reception of the ASR-8 transmissions.
Transmitter Blanking Requirements	The ASR-11 will be sector blanked from 345.6° and 5.6°. The existing ASR-8 will be sector blanked from 155.6 ° and 175.6 °.
Personnel Safety Requirements	• The existing ASR is located 92.891 feet (28.313 meters) from the ASR-11. Utilizing equations provided in the report entitled, "Radiofrequency Impact Analysis for Airport Surveillance Radar-11" by SRI International, the main lobe emissions from the existing ASR at the ASR-11 tower are below the industry standard permissible exposure limitations as set forth in IRPA, NCRP, and FCC guidelines, as well as the more restrictive requirements defined by Raytheon. No radiation mitigation with respect to subcontractor personnel safety is required. • Additionally, based on ANSI/IEEE guidelines as adopted by the FAA, personnel should be excluded from the area within 500 feet directly in front of the ASR-11 (within the main beam) when the radar is operating in maintenance mode (when the antenna is stationary and transmitting a signal for maintenance and or testing purposes).

Table 7. Predismantling Meeting Information

Existing ASR Site Access	From Ridgecrest CA travel northeast on Highway 178 for approximately 45 miles and turn right on Ballarat Road, go approximately 1 mile and the existing radar site will be visible to the left on a gravel road.
Disposition Requirements	The existing building will be removed. The radar tower will be dismantled. The engine generator is to be removed. These facilities will be removed in phases during construction.
FAA Facility Access	Enter Edwards AFB at west gate (State hwy 14) and continue east on Rosamond to 2508 Rosamond. The address is: 100 E. Sparks Drive, Bldg 2580, Edwards AFB, CA, 93523
Security	The Panamint Valley radar site is located off base property. The TRACON facility is located on Edwards AFB and entry to the base requires coordination. Security levels and requirement for entry are subject to change. Provide to Robert.ellington@edwards.af.mil the following: Full name, date and place of birth, name of your organization. Two forms of identification, i.e., drivers license, FAA or company ID are required to enter. Additional security requirements will be provided at the time of requested access. Contact John LaFontaine (661) 258-4436 or (661) 816-3726 (cell).
Coordination	All coordination for access to the base, to radar site and TRACON must be through John LaFontaine, (661) 258-4436 or (816) 3726 (cell).
Vehicles	All POV's operating on Edwards AFB must be insured with $15,000 Personal liability, $30,000 each accident, and $5,000 property damage. Decals are obtained from security police, Pass and Registration Section, Bldg 2860. Vehicles are required to be registered within 10 days of arrival. To register a vehicle on base, a registration, drivers license, and ID card is required. Vehicles registered outside the state of California must have a smog check before registering.

Table 8. DDS Line Service Requirements

Name of Service:	ASR-11 Data Link
Service Requirements	Government Furnished Microwave Link 2 x 56 KBPS lines for the OMT (1 56 KBPS line is for additional government provided OMT) 2 x 128 KBPS lines for the SIU's
ASR-11 Address Contact Name Termination Point	ASR-11 Site Ballarat Road Panamint Valley, CA John LaFontaine (661) 258-4436 or (661) 816-3726 (cell) Telco Demarcation ASR-11 Shelter
TRACON Address Contact Name Termination Point	FAA Edwards SSC BLDG. 2580 Edwards AFB, CA 93524 John LaFontaine (661) 258-4436 or (661) 816-3726 (cell) Telco Demarcation Room 119
Date Service Required	6 August 2006
Additional Service Requirements	

Table 9. Equipment Parts List

FIND NO. (Per G710560-1, Rev E)	PART NUMBER	DESCRIPTION	VENDOR	QTY.
17	SRM-5A/M/RJ-45/NEW	Modem, 2.4 KBPS, Sync. Short Haul, 25-pin Male RJ-45	RAD-DATA	1
19	2014MC-MT	Cable, V.35 to EIA-530, 6 ft.	Patton	4
31	**G710563-1**	**Cable Configuration Drawing (See FNs 31 (1) & 31 (2))**(Government Furnished Equipment**)**		**1**
31 (1)	G710564-1	Cable Assembly, Cross Connect, 6 in. (Pins Crossed: 3 & 4, 5 & 6)	Black Box	1
31 (2)	FM508	Coupler, RJ45 (M) to RJ45 (M)	Black Box	1
34	TRD450CR-50	Cable, 10Base-T Crossover, 50 ft. (Pins Crossed: 1 & 3, 2 & 6), Nonshielded	L-COM	2
36	CPX-1501-BA	RS530 Line Splitter, Rack Mountable	The Logical Co.	2
37	FAB-1001-A	Rack Mount for CPX-1501-BA	The Logical Co.	1
38	SRM-5A/F/RJ-45/NEW	Modem, 2.4 KBps, Sync. Short Haul, 25-pin Female RJ-45	RAD-DATA	1
39	PSA	Power Supply Adapter	RAD-DATA	1
41	G780408-2-300	Cable Configuration Drawing for Interface Cable, ASR-11 to REHOST	Globaltec	4
43	G780408-1-5	Cable Configuration Drawing for Interface Cable, ASR-11 to REHOST	Globaltec	2
48	6500	Switch, Ethernet, 8-port	Omnitron	2
49	6100	Switch, Ethernet, 24-port w/ FX Expansion Port	Omnitron	2
57	PLG780342-1	OMT Router Assembly	- See PLG -	2
59	PLH331078-2	SDT Router Assembly, 128K FT1 Configuration	- See PLG -	4
60	02655	Extension Cable, DB25 (M) to DB25 (F)	Cables to Go	1
71	MTV132V-R2	DSU/CSU	Black Box	4
	525075-3F	**Rack, 23" (w/ Side Panels) - (Communications Rack)**	**Black Box**	**1**
	RM589	23" Shelves, Vented, Fixed, 22-1/4" Deep - 7/8" Height	Black Box	4
	37907	Rack Mount Adapter Set, 19" to 23", 2U (3.50" high)	Black Box	3
	37908	Rack Mount Adapter Set, 19" to 23", 3U (5.25" high)	Black Box	2
	37910	Rack Mount Adapter Set, 19" to 23", 5U (8.75" high)	Black Box	2
	CXCG -20	Guide Brackets for MRSM Chassis	Emcor	1
	G584025-2	Rack Mount Kit for RCP	Raytheon	1
		SIU DTE System	Sensis	2

For information regarding quantities for Panamint Valley (QPM), contact Hank Hyche, RTSC, AT (770) 907-3346.
Date Completed: 06/22/05.

The following equipment should be shipped to:
FAA Edwards SSC
BLDG 2580
Edwards AFB, CA 93524
POC: John LaFontaine (661) 258-4436

Table 9a. Government Furnished Equipment Parts List (Above Normal Installation)

FIND NO. (Per G710560-1, Rev E)	PART NUMBER	DESCRIPTION	VENDOR	QTY.
57	PLG780342-1	OMT Router Assembly	- See PLG -	2
34	TRD450CR-100	Cable, 10Base-T Crossover, 100 ft. (Pins Crossed: 1 & 3, 2 & 6), Nonshielded	L-COM	2
66	PLH364726-1	SIU Maintenance Port	Raytheon Parts List	2
	G534265-40	Operator Maintenance Terminal (OMT)	Raytheon Spec.	1

For information regarding quantities for Panamint Valley (QPM), contact Hank Hyche, RTSC, AT (770) 907-3346.
Date Completed: 06/22/05.

The following equipment should be shipped to:
FAA Edwards SSC
BLDG 2580
Edwards AFB, CA 93524
POC: John LaFontaine (661) 258-4436

Table 10. Space Requirements

Find #	Equipment	Height (in.)	Width (in.)	Depth (in.)	Power Requirement
17	Modem (RAD SRM-5A/M/RJ-45/NEW)	0.7	2.1	2.1	N/A (Powered from DTE)
18	Modem (Motorola DDS/MR64)	2.5	7.0	9.6	120VAC. 300mA
36	Line Splitter (Logical Co. CPX-1501-BA)	5.1	3.4	1.0	120V, 10mA
37	Rack Mount (for Line Splitter)	5.25	19.0	3.0	N/A
38	Modem (RAD SRM-5A/F/RJ-45/NEW)	0.7	2.1	2.1	N/A (Powered from DCE)
39	Power Supply Adapter for FN 38 (above)	0.7	2.1	2.1	120VAC, 500mA
P/O 47	Modem (RAD SRM-9/V.24/RJ-45)	0.7	2.1	2.1	120VAC, 25mA
P/O 47	Power Transformer (for remote VDCU)	1.3	2.3	3.6	120VAC, 500mA
48	Ethernet Switch, 8-Port (Omnitron 6700)	1.75	6.0	4.0	110VAC, 300mA
49	Ethernet Switch (Omnitron 6100)	1.75	19.0	8.0	110VAC, 300mA
52	Ethernet Switch, 4-Port for Multimode Fiber (Omnitron 6551-0)	1.75	6.5	8.0	110VAC, 300mA
53	Ethernet Switch, 4 Port for Single mode Fiber (Omnitron 6551-2)	1.75	6.5	8.0	110VAC, 300mA
P/O 57	Router (Cisco 1605)	2.19	11.15	8.67	120VAC, 225mA
P/O 58	Router (Cisco 1602)	2.19	11.15	8.67	120VAC, 225mA
P/O 59	Router (Cisco 1721)	3.1	11.2	8.7	120VAC, 500mA
Raytheon	SIU Communications Rack (19” Rack)	78.5	23.88	32.88	N/A
Raytheon	SIU Communications Rack (23” Rack)	78.5	27.88	32.88	N/A
Raytheon	OMT	19.0	16.0	17.0	120VAC, 3A
Raytheon	RCPs 1 through 3	12.0	16.0	4.0	120VAC, 500mA
Raytheon	MRSM Rack	52.5	24.0	35.0	N/A
Raytheon	MRSM Chassis	10.5	19.0	15.0	120VAC, 1A
Raytheon	LAN Surge Suppression Panel	3.5	19.0	4.0	N/A
Sensis	SIU Chassis A and B	5.20	19.0	10.0	Each 120VAC, 500mA
Sensis	SDT Rack	33.4	24.1	29.4	2 Circuits, each 120VAC, 2.5A
Sensis	CMC	17	24.1	29.4	120VAC, 3A
Sensis	Ethernet Hub A and B	1.8	17.0	10.6	Each 120VAC, 1A
Sensis	DVG Switches 1 and 2	5.25	19.0	8.0	Each 120VAC, 1.75A
Sensis	DVGs 1 through 12	8.4	9.1	16.2	Each 120VAC, 3A
Sensis	VDCUs 1 through 12	7.4	8.5	2.5	N/A
Sensis	SDT Mode Controller (Future)	8.4	9.1	16.2	120VAC, 3A (estimated)
Sensis	SDT Mode Control Local/Remote Control Unit (Future)	10	10	5	Each 120VAC, 1A

NOTE: This table includes dimensions and power requirements for all equipment (excluding radar system equipment at the radar site) required for system communications to the ATCT and/or TRACON or Remote Automation Facility. Refer to Table 11 for specific equipment required for this implementation.

Table 11. Circuit Breaker Assignments

Power Panel and Circuit Breaker Assignment	Circuit Breaker Rating	Location and Name of Load	Expected Load
TRACON Equipment Room			
CP219A, CB#**	20 A, single pole	QPM Communications Rack, Circuit 1, Phase A	SIU A (0.15A), Ethernet Switch AA (0.3A), Router AA (0.4A), Line Splitter A (0.2A) = 120VAC, **1.05 A**
CP219A, CB#**	20 A, single pole	QPM Communications Rack, Circuit 2, Phase B	SIU B (0.15A), Ethernet Switch BB (0.3A), Router BB (0.4A), Line Splitter B (0.2A) = 120VAC, **1.05 A**
CP219A, CB#**	20 A, single pole	QPM Communications Rack, Circuit 3, Phase A	SIU C (0.15A), Router CC (0.4A), Line Splitter C (0.2A), Line Splitter E (0.2A), DSU A1 (0.3A) = 120VAC, **1.25 A**
CP219A, CB#**	20 A, single pole	QPM Communications Rack, Circuit 4, Phase B	SIU D (0.15A), Line Splitter D (0.2A), Line Splitter F (0.2A), DSU B1 (0.3A) = 120VAC, **0.85 A**
CP#219A, CB#**	15 A, single pole	RCP	RCP (with modem) 120 VAC, 0.5A
CP219A, CB#**	20 A, single pole	OMT workstation	120VAC, 3.0 A (estimated)
MRSM Location (Slate Range RLMR Building)			
CP#TBD, CB#**	15 A, single pole	MRSM (in existing rack)	120VAC, 1.0 A
SPORT (remote REHOST)			
CP#TBD, CB#**	20 A, single pole	DSUs	DSU A2 (QPM) (0.3A), DSU B2 (QPM) (0.3A) = 120VAC, **0.6 A**
CHINA LAKE (remote REHOST)			
N/A	N/A	N/A	N/A
INYOKERN AIRPORT (remote REHOST)			
CP#TBD, CB#**	20 A, single pole	*OMT workstation	120VAC, 3.0 A (estimated)
CP#TBD, CB#**	15 A, single pole	*Router DD	120 VAC, 0.4A

* Government provided and installed equipment

** Spare breaker to be assigned by FAA AF technician at installation.

Table 12. Cable Run List

REF #	FROM	TO	TYPE	LABEL (F)	LABEL (T)	LENGTH (FT)
CL001	Ethernet Switch (ESW) A1 Port 1	SCDI A Port A	Cat-5E Shielded	ESW_A1/P1 (SCDI_A/PA)	SCDI_A/PA (ESW_A1/P1)	6
CL002	ESW A1 Port 2	SCDI B Port A	Cat-5E Shielded	ESW_A1/P2 (SCDI_B/PA)	SCDI_B/PA (ESW_A1/P2)	6
CL003	ESW A1 Port 3	MPS800 A	Cat-5E Shielded	ESW_A1/P3 (MPS800_A)	MPS800_A ESW_A1/P3	6
CL004	ESW A1 Port 4	Router A1 LAN Input	Cat-5E Shielded	ESW_A1/P4 (RTR_A1/LAN_IN)	RTR_A1/LAN_IN ESW_A1/P4	30
CL005	ESW A1 Port 5	Router C1 Port A	Cat-5E Shielded	ESW_A1/P5 (RTR_C1/PA)	RTR_C1/PA (ESW_A1/P5)	30
CL006	ESW B1 Port 1	SCDI A Port B	Cat-5E Shielded	ESW_B1/P1 (SCDI_A/PB)	SCDI_A/PB (ESW_B1/P1)	6
CL007	ESW B1 Port 2	SCDI B Port B	Cat-5E Shielded	ESW_B1/P2 (SCDI_B/PB)	SCDI_B/PB (ESW_B1/P2)	6
CL008	ESW B1 Port 3	MPS800 B	Cat-5E Shielded	ESW_B1/P3 (MPS800_B)	MPS800_B ESW_B1/P3	6
CL009	ESW B1 Port 4	Router B1 LAN Input	Cat-5E Shielded	ESW_B1/P4 (RTR_B1/LAN_IN)	RTR_B1/LAN_IN ESW_B1/P4	30
CL010	ESW B1 Port 5	Router C1 Port B	Cat-5E Shielded (Government Provided and Installed)	ESW_B1/P5 (RTR_C1/PB)	RTR_C1/PB (ESW_B1/P5)	30
CL011 (GFE)	ESW A1 Port 6	Router D1 Port A	Cat-5E Shielded (Government Provided and Installed)	ESW_A1/P6 (RTR_D1/PA)	RTR_D1/PA ESW_A1/P6	30
CL012 (GFE)	ESW B1 Port 6	Router D1 Port B	Cat-5E Shielded (Government Provided and Installed)	ESW_B1/P6 (RTR_D1/PB)	RTR_D1/PB ESW_B1/P6	30
CL013	Router A1 TELCO Out	Radar Site MW Demarc (Circuit 1 - 128KBPS)	Cat-5E Shielded	RTR_A1/TELCO_OUT (SITE_DEMARC/CKT1)	SITE_DEMARC/CKT1 (RTR_A1/TELCO_OUT)	50
CL014	Router B1 TELCO Out	Radar Site MW Demarc (Circuit 2 - 128KBPS)	Cat-5E Shielded	RTR_B1/TELCO_OUT (SITE_DEMARC/CKT2)	SITE_DEMARC/CKT2 (RTR_B1/TELCO_OUT)	50
CL015	Router C1 TELCO Out	Radar Site MW Demarc (Circuit 3 - 56KBPS)	Cat-5E Shielded	RTR_C1/TELCO_OUT (SITE_DEMARC/CKT3)	SITE_DEMARC/CKT3 (RTR_C1/TELCO_OUT)	50
CL016 (GFE)	Router D1 TELCO Out	Radar Site MW Demarc (Circuit 4 - 56KBPS)	Cat-5E Shielded (Government Provided and Installed)	RTR_D1/TELCO_OUT (SITE_DEMARC/CKT4)	SITE_DEMARC/CKT4 (RTR_D1/TELCO_OUT)	50
CL018	Microwave Demarc (Circuit 1 - 128KBPS)	Comm Rack Router AA TELCO Input	Cat-5E Shielded	M/W_DEMARC/CKT1 (RTR_AA/TELCO_IN)	RTR_AA/TELCO_IN (M/W_DEMARC/CKT1)	60
CL019	M/W Demarc (Circuit 2 - 128KBPS)	Comm Rack Router BB TELCO Input	Cat-5E Shielded	M/W_DEMARC/CKT2 (RTR_BB/TELCO_IN)	RTR_BB/TELCO_IN (M/W_DEMARC/CKT2)	60
CL020	M/W Demarc (Circuit 3 - 56KBPS)	Comm Rack Router CC TELCO Input	Cat-5E Shielded	M/W_DEMARC/CKT3 (RTR_CC/TELCO_IN)	RTR_CC/TELCO_IN (M/W_DEMARC/CKT3)	60
CL020 (GFE)	M/W Demarc (Circuit 4 - 56KBPS)	Digital Patch Panel	Cat-5E Shielded (Government Provided and Installed)	M/W_DEMARC/CKT4 (DIGITAL_PATCH/ASR-11)	DIGITAL_PANEL/ASR-11 (M/W_DEMARC/CKT4)	15
CL021 (GFE)	Digital Patch Panel	Digital Patch Panel	Cat-5E Shielded (Government Provided and Installed)	DIGITAL_PATCH/ASR-11 (DIGITAL_PATCH/INYO)	DIGITAL_PATCH/INYO (DIGITAL_PATCH/ASR-11)	4

Table 12. Cable Run List (Continued)

REF #	FROM	TO	TYPE	LABEL (F)	LABEL (T)	LENGTH (FT)
CL022 (GFE)	Digital Patch Panel	M/W Demarc (Circuit 5 - 56KBPS)	Cat-5E Shielded (Government Provided and Installed)	DIGITAL_PANEL/INYO (M/W_DEMARC/CKT5)	M/W_DEMARC/CKT5 (DIGITAL_PATCH/INYO)	15
CL023 (GFE)	INYOKERN M/W Demarc (Circuit TBD - 56KBPS)	INYOKERN Router DD TELCO Input	Cat-5E Shielded (Government Provided and Installed)	M/W_DEMARC/CKTX (RTR_EE/TELCO_IN)	RTR_EE/TELCO_IN (M/W_DEMARC/CKTX)	TBD
CL024	RTR CC Port 1	OMT Port A	Cat-5E Shielded Crossover Cable	RTR_CC/P1 (OMT/PA)	OMT/PA (RTR_CC/P1)	See Table C-6, Find # 34
CL025	RTR CC Port 2	OMT Port B	Cat-5E Shielded Crossover Cable	RTR_CC/P2 (OMT/PB)	OMT/PB (RTR_CC/P2)	See Table C-6, Find # 34
CL026	Modem (MDM) A1 (OMT Serial Port A End)	RCP A	Cat-5E Shielded	MDM_A1 (RCP_A)	RCP_A (MDM_A1)	40
CL027 (GFE)	RTR DD Port 1	OMT Port A (INYOKERN AIRPORT)	Cat-5E Shielded Crossover Cable (Government Provided and Installed)	RTR_DD/P1 (OMT/PA)	OMT/PA (RTR_DD/P1)	See Table C-6, Find # 34
CL028 (GFE)	RTR DD Port 2	OMT Port B (INYOKERN AIRPORT)	Cat-5E Shielded Crossover Cable (Government Provided and Installed)	RTR_DD/P2 (OMT/PB)	OMT/PB (RTR_DD/P2)	See Table C-6, Find # 34
CL023	Router AA	ESW AA	Cat-5E Shielded	RTR_AA (ESW_AA)	ESW_AA (RTR_AA)	6
CL024	Router BB	ESW BB	Cat-5E Shielded	RTR_BB (ESW_BB)	ESW_BB (RTR_BB)	6
CL025	ESW AA Port 21	SIU A A1J1	Cat-5E Shielded	ESW_AA/P2 (SIU_A/A1J1)	SIU_A/A1J1 (ESW_AA/P2)	4
CL026	ESW BB Port 2	SIU B A1J1	Cat-5E Shielded	ESW_BB/P2 (SIU_B/A1J1)	SIU_B/A1J1 (ESW_BB/P2)	4
CL027	ESW AA Port 3	SIU C A1J1	Cat-5E Shielded	ESW_AA/P3 (SIU_C/A1J1)	SIU_C/A1J1 (ESW_AA/P3)	6
CL028	ESW BB Port 3	SIU D A1J1	Cat-5E Shielded	ESW_BB/P3 (SIU_D/A1J1)	SIU_D/A1J1 (ESW_BB/P3)	6
CL035	SIU A	Line Splitter A	G780408-1-5	SIU_A (SPLTR_A)	SPLTR_A (SIU_A)	See Table 9, Find # 43
CL036	SIU B	Line Splitter B	G780408-1-5	SIU_B (SPLTR_B)	SPLTR_B (SIU_B)	See Table 9, Find # 43
CL037 (GFE)	SIU C Nunio 1	Line Splitter C (SIU MAINTENANCE PORT)	PLH352384-1 SIU MAINT PORT CABLE (Government Provided and Installed)	SIU_C/NUNIO_1 (SPLTR_C)	SPLTR_C (SIU_C/NUNIO_1)	2
CL038 (GFE)	SIU C Nunio 2	Line Splitter E (SIU MAINTENANCE PORT)	PLH352384-1 SIU MAINT PORT CABLE (Government Provided and Installed)	SIU_C/NUNIO_2 (SPLTR_E)	SPLTR_E (SIU_C/NUNIO_2)	2
CL041 (GFE)	SIU D Nunio 1	Line Splitter D (SIU MAINTENANCE PORT)	PLH352384-1 SIU MAINT PORT CABLE (Government Provided and Installed)	SIU_D/NUNIO_1 (SPLTR_D)	SPLTR_D (SIU_D/NUNIO_1)	2

Table 12. Cable Run List (Continued)

REF #	FROM	TO	TYPE	LABEL (F)	LABEL (T)	LENGTH (FT)
CL042 (GFE)	SIU D Nunio 2	Line Splitter F (SIU MAINTENANCE PORT)	PLH352384-1 SIU MAINT PORT CABLE (Government Provided and Installed)	SIU_D/NUNIO_2 (SPLTR_F)	SPLTR_2 (SIU_D/NUNIO_2)	2
CL045	Line Splitter A	REHOST A (EDW)	G780408-2-300	SPLTR_A (REHOST_A)	REHOST_A (SPLTR_A)	See Table 9, Find # 41
CL046	Line Splitter B	REHOST B (EDW)	G780408-2-300	SPLTR_B (REHOST_B)	REHOST_B (SPLTR_B)	See Table 9, Find # 41
CL047	Line Splitter A	REHOST TEST (EDW)	G780408-2-300	SPLTR_A (REHOST_TEST)	REHOST_TEST (SPLTR_A)	See Table 9, Find # 41
CL048	Line Splitter B	REHOST BACKUP (EDW)	G780408-2-300	SPLTR_B (REHOST_BKUP)	REHOST_BKUP (SPLTR_B)	See Table 9, Find # 41
CL049	Line Splitter C (SIU MAINTENANCE PORT)	DSU A1 (EDW)	RS530 to V.35	SPLTR_C (DSU_A1)	DSU_A1 (SPLTR_C)	See Table 9, Find # 19
CL050	Line Splitter D (SIU MAINTENANCE PORT)	DSU B1 (EDW)	RS530 to V.35	SPLTR_D (DSU_B1)	DSU_B1 (SPLTR_D)	See Table 9, Find # 19
CL051 (GFE)	Line Splitter E (SIU MAINTENANCE PORT)	EDWARDS DIGITAL PATCH PANEL	R530 DB25MM Straight-Thru (Government Provided and Installed)	SPLTR_E (EDW_PATCH)	EDW_PATCH (SPLTR_E)	75
CL052 (GFE)	Line Splitter F SIU MAINTENANCE PORT)	EDWARDS DIGITAL PATCH PANEL	R530 DB25MM Straight-Thru (GOVERNMENT FURNISHED AND INSTALLED)	SPLTR_F (EDW_PATCH)	EDW_PATCH (SPLTR_F)	75
CL057	DSU A1 - B1 (2 connections)	TELCO Room Demarc (2 connections)	Cat-5E Shielded	DSU_A1-B1 (EDW_DEMARC)	EDW_DEMARC (DSU_A1-B1)	60 (each)
CL060	SPORT TELCO Demarc	DSU A2 (SPORT)	Cat-5E Shielded	SPORT_DEMARC (DSU_A2)	DSU_A2 (SPORT_DEMARC)	5
CL061	SPORT TELCO Demarc	DSU B2 (SPORT)	Cat-5E Shielded	SPORT_DEMARC (DSU_B2)	DSU_B2 (SPORT_DEMARC)	5
CL067 (GFE)	EDWARDS DIGITAL PATCH PANEL	EDWARDS MICROWAVE CHANNEL BANK	R530 DB25MM Straight-Thru (Government Provided and Installed)	EDW_PATCH (EDW_CHANNEL_BANK)	EDW_CHANNEL_BANK (EDW_PATCH)	12
CL068 (GFE)	EDWARDS DIGITAL PATCH PANEL	EDWARDS MICROWAVE CHANNEL BANK	R530 DB25MM Straight-Thru (Government Provided and Installed)	EDW_PATCH (EDW_CHANNEL_BANK)	EDW_CHANNEL_BANK (EDW_PATCH)	12
CL069	DSU A2 (SPORT)	REHOST A (SPORT)	RS530 to V.35	DSU_A2 (REHOST_A_SP)	REHOST_A_SP (DSU_A2)	See Table 9, Find # 19
CL070	DSU B2 (SPORT)	REHOST B (SPORT)	RS530 to V.35	DSU_B2 (REHOST_B_SP)	REHOST_B_SP (DSU_B2)	See Table 9, Find # 19
CL073 (GFE)	CHINA LAKE MICROWAVE CHANNEL BANK	REHOST A (CHINA LAKE)	TBD (Government Provided and Installed)	CHLK_CHANNEL_BANK (REHOST_CHLK)	REHOST_CHLK (CHLK_CHANNEL_BANK)	TBD
CL074 (GFE)	CHINA LAKE MICROWAVE CHANNEL BANK	REHOST B (CHINA LAKE)	TBD (Government Provided and Installed)	CHLK_CHANNEL_BANK (REHOST_CHLK)	REHOST_CHLK (CHLK_CHANNEL_BANK)	TBD

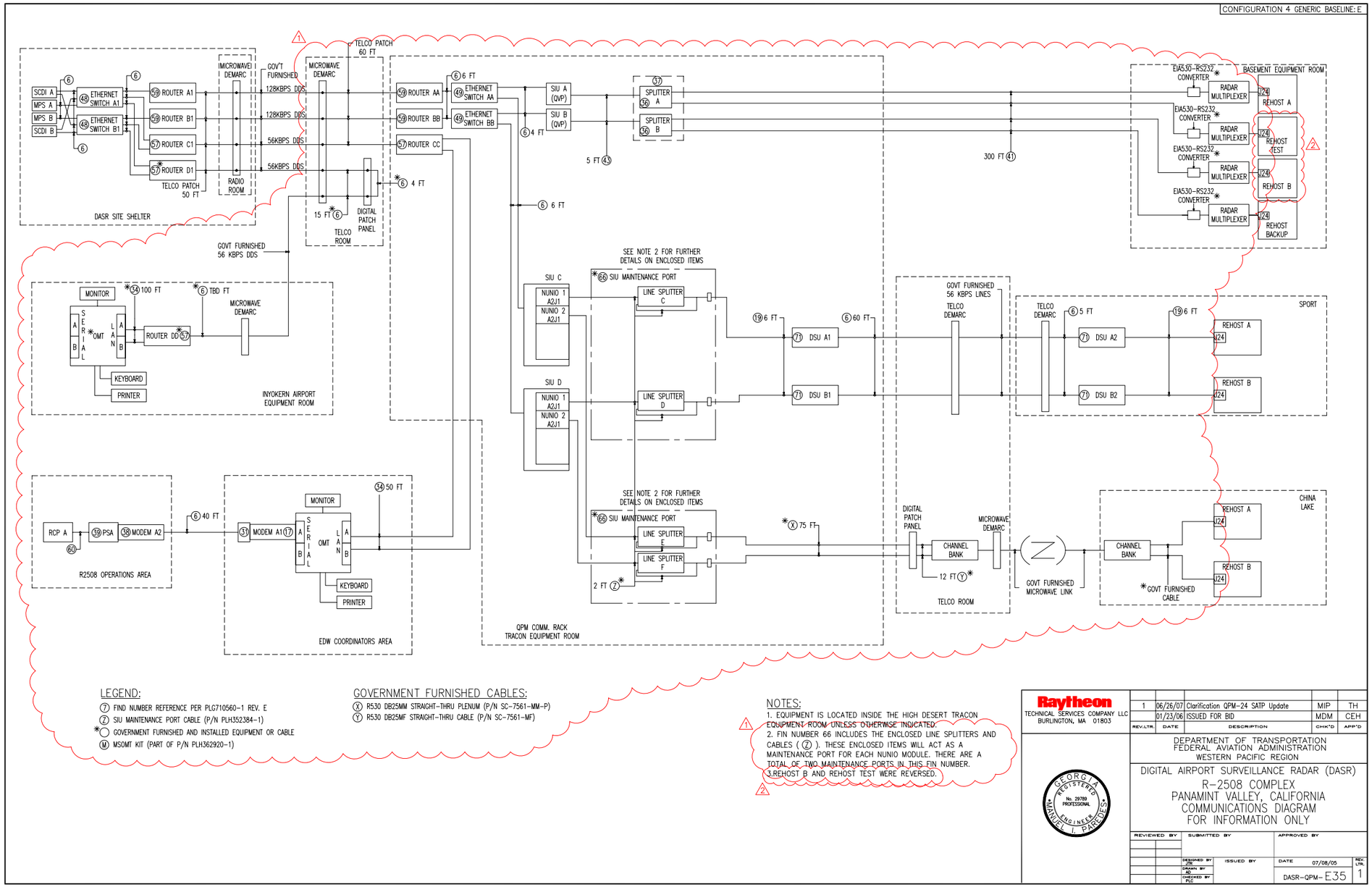

Figure 1. System Interconnection Diagram

R-2508 Panamint Valley Addendum to the Edwards AFB SATP
Appendix B

PROCEDURES

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B1. Communications Rack

Equipment Placement – The Communications Rack will be installed in the location identified in FATD drawing E20.

Power and Grounding Connections – Power for the Communications Rack has been placed near the rack location from the designated power panel. Verify that circuit breakers in the panel have been correctly connected and labeled on the panel before connecting any equipment. Connect the four power strips mounted in the Communications Rack to the appropriate circuits, made available by the site preparation subcontractor near the rack location. Ensure rack is properly connected to the existing multipoint ground plate per FAA-STD-019b, Paragraph 3.11 (Electronic Multipoint Ground System Requirements). Any electronic equipment installed in this FAA facility must be grounded in accordance with FAA-STD-020b.

Rack Configuration – Refer to the Installation, Operation, and Maintenance Manual for the System Interface Unit (SIU), Section 6, for details on the installation, assembly, and connection of the SIU Hub and Module. After the rack is mounted in place, populate the rack with Ethernet Switches AA and BB, Ethernet Hubs A and B, and routers, modems, fiber optic patch panel, and DVGs and VDCUs, as required. Refer to FATD drawing E32 for rack configuration. After the equipment is mounted in the rack, connect the internal and external rack cabling as listed below and shown in FATD drawing E35.

NOTE: Ethernet Switches AA and BB (and Ethernet Switches A1 and B1 at the Radar Site) must be configured for 10Base-T/Half Duplex operation prior to installation. Refer to manufacturers' documentation for complete procedure.

Cable Connections – Route and connect the supplied appropriate length cables between components. Connect the following cables as required by FATD drawing E35:

___ 1. Router AA to Ethernet Switch AA, Port 1
___ 2. Router BB to Ethernet Switch BB, Port 1
___ 3. Ethernet Switch AA, Port 2 to SIU A, A1J1
___ 4. Ethernet Switch BB, Port 2 to SIU B, A1J1
___ 5. Ethernet Switch AA, Port 3 to SIU C, A1J1
___ 6. Ethernet Switch BB, Port 3 to SIU D, A1J1
___ 7. Microwave Demarcation to Routers AA, BB, and CC
___ 8. Router CC, Ports 1 and 2 (LAN A and B), to the OMT
___ 9. Modem A1 to Modem A2
___ 10. Ethernet Switch CC, Port 7 to NIMS, Port 1 (if applicable)
___ 11. Ethernet Switch DD, Port 7 to NIMS, Port 2 (if applicable)
___ 12. SIU A to Line Splitter A (QPM)
___ 13. SIU B to Line Splitter B (QPM)
___ 14. Line Splitter A (QPM) to REHOST A
___ 15. Line Splitter A (QPM) to REHOST TEST
___ 16. Line Splitter B (QPM) to REHOST B
___ 17. Line Splitter B (QPM) to REHOST BACKUP
___ 18. Line Splitter C (QPM) to DSU A1 (QPM)
___ 19. Line Splitter D (QPM) to DSU B1 (QPM)
___ 20. DSU A1 (QPM) to TELCO Demarc
___ 21. DSU B1 (QPM) to TELCO Demarc
___ 22. Line Splitter E (QPM) to Digital Patch Panel
___ 23. Line Splitter F (QPM) to Digital Patch Pane

The following cables will be provided but installed by local personnel:

___ 24. SPORT TELCO Demarc to DSU A2 (SPORT)
___ 25. SPORT TELCO Demarc to DSU B2 (SPORT)
___ 26. DSU A2 (SPORT) to REHOST A (SPORT)
___ 27. DSU B2 (SPORT) to REHOST B (SPORT)

The following cables will be provided and installed by the government:

___ 28. Microwave Demarcation to Digital Patch Panel
___ 29. Digital Patch Panel to Digital Patch Panel
___ 30. Digital Patch Panel to Microwave Demarcation
___ 31. Inyokern Microwave Demarcation to Router DD
___ 32. Router CC, Ports 1 and 2 (LAN A and B), to the OMT
___ 33. SIU C Nunio 1 to Line Splitter C (QPM)
___ 34. SIU C Nunio 2 to Line Splitter E (QPM)
___ 35. SIU D Nunio 1 to Line Splitter D (QPM)
___ 36. SIU D Nunio 2 to Line Splitter F (QPM)
___ 37. Digital Patch Panel to EDW Channel Bank
___ 38. Digital Patch Panel to EDW Channel Bank
___ 39. CHINA LAKE Channel Bank to REHOST A (CHNLK)
___ 40. CHINA LAKE Channel Bank to REHOST B (CHNLK)

B2. Operator Maintenance Terminal (OMT)

Equipment Placement – The OMT will be placed at a location specified and/or provided by the FAA (GFE) as identified in FATD drawing E20.

Power Connection and Equipment Placement – Verify that the new location for the OMT is available and ready to receive the equipment. Power for the OMT has already been placed near the OMT location from the designated power panel. Verify that circuit breakers in the panel have been correctly connected and labeled on the panel before connecting any equipment.

External Connections – Verify the existence of the SCDI LAN cables (two each) for the OMT connection. The SCDI LAN cables are new Cat-5 cables terminated with RJ-45 connectors and routed between the Communications Rack (Router CC) and the OMT.

B2.1. Mac Address Verification

___ 1. Perform the following procedure to validate the Mac Addresses:

- ___ a. At SCDI/OMT, select “Update Users”
- ___ b. Enter username and password
- ___ c. In the UNIX window that appears, type: “su root” and press enter
- ___ d. Enter password: “root” and press enter
- ___ e. At prompt, type “arp –a” and press enter

___ f. Ensure that omt1 and omt1-2 have unique Mac Addresses. The Mac Address is the address located in the right column with heading "Phys Address". See Table B-1 for examples of Mac Addresses using the "arp –a" command:

Table B-1. OMT Mac Address Examples

Device	IP Address	Mask	Flags	Physical Address
Qfe3	scdia-ext-2	255.255.255.255		08:00:20:f6:91:af
Qfe3	scdib-ext-2	255.255.255.255		08:00:20:f4:ba:0b
Qfe2	scdib-ext-1	255.255.255.255		08:00:20:f4:ba:0a
Qfe2	scdia-ext-1	255.255.255.255		08:00:20:f6:91:ae
Qfe2	omt1	255.255.255.255	SP	08:00:20:f4:b7:fe
Qfe3	omt1-2	255.255.255.255	SP	08:00:20:f4:b7:ff
Qfe3	224.0.0.0	224.0.0.0	SM	01:00:5e:00:00:00
Qfe2	224.0.0.0	255.255.255.255	SM	01:00:5e:00:00:00

___ 2. All addresses for the "scdia", "scdib", "omt1" and "omt1-2" are different. If addresses are the same, set unique Mac Addresses for the SCDI/OMT using the following procedure:

___ a. Left click on SCDI/OMT screen to bring up the site pop-up menu
___ b. Select Local Workstation Actions
___ c. Select SCDI shutdown
___ d. Enter Username and Password. Wait for application to go down
___ e. When OK prompt appears, type: "setenv local-mac-address? true" and press enter. Process responds with "local-mac-address? = true"
___ f. At OK prompt, type "boot" and press enter. The SCDI/OMT will now reboot
___ g. When application returns, go to Site pop-up menu and select Local Workstation Actions
___ h. Select Update Users
___ i. Enter username and password
___ j. In the UNIX window that appears, type "su root" and enter password: root
___ k. At prompt, type "arp –a" and press enter. Ensure that "omt1" and "omt1-2" have unique Mac Addresses
___ l. If you would like to save the arp table to a file to download to your PC, use the command "arp -a > arptable.txt"
___ m. Close the window

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ATTACHMENT 5 - APPENDIX C

RESULTS OF THE RF INTERFERENCE MITIGATION ANALYSIS

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ADDENDUM
RFI Mitigation Analysis

ASR-11 and Existing ASR-8

Panamint Valley Radar

Panamint Valley, CA

RECOMMENDATION

Recommendations for implementing ASR-11 into existing environment:

- The ASR-11's receiver STC will need to be adjusted to +72 dB between 345.6° and 05.6° true which would diminish reception of the ASR-8 transmissions.
- Install Filters in the ASR-11.
- Sector blank the ASR-8 in the direction of the ASR-11 (155.6 ° and 175.6 °).

Suggestions for mitigating ASR-11's effect on the ASR-8:

- The ASR-11 will be sector blanked from 345.6° and 5.6°.

SUMMARY OF PROBLEM

ASR-8s Effect on the ASR-11 (Cases 1-4):

1. Main Lobe - Main Lobe — 74.1 dB above receiver LNA saturation level; I/N = 116.6 dB (interference not handled by RIS)
2. Side Lobe - Main Lobe — 40.1 dB above receiver LNA saturation level; I/N = 82.6 dB (interference handled by RIS)
3. Main Lobe - Side Lobe — 49.1 dB above receiver LNA saturation level; I/N = 91.6 dB (interference not handled by RIS)
4. Side Lobe - Side Lobe — I/N = 57.6 dB (interference handled by RIS)

SUMMARY OF MITIGATION

ASR-8s Effect on the ASR-11 (Cases 1-4):

1.	Main Lobe - Main Lobe	Adjust ASR-11 receiver STC to +72 dB in the sector between azimuths of 345.6° and 05.6° true for all ranges. Sector blank the ASR-8 between azimuths 155.6 ° and 175.6 °.
1.	Side Lobe - Main Lobe	Adjust ASR-11 receiver STC to +72 dB in the sector between azimuths of 345.6° and 05.6° true for all ranges
2.	Main Lobe - Side Lobe	Install filters in the ASR-11
3.	Side Lobe - Side Lobe	Handled by ASR-11's RIS

The ASR-8 transmissions do not require mitigation due to personnel safety during construction. Without blanking, the average power density calculated from the ASR-8 main lobe transmissions along the ASR-11 tower is approximately 0.075 mW/cm2. APD from side lobe transmissions is approximately 1% of the main lobe, or 0.75 μW/cm2. These levels are below the permissible exposure limits (0.5 mW/cm2) as specified by the IEEE Std. C95.1 and Raytheon policy). (Without blanking, the average power density calculated from the ASR-11 main lobe transmissions along the ASR-8 tower is approximately 0.21 mW/cm2.

ANALYSIS

Analytical Parameters

The ASR-11 is located 92.8 feet (.015 nautical miles) from the existing ASR-8 at an azimuth of 165.6° true which is considered in the far-field of both systems.

The ASR-8 frequency assignments are 2,735 and 2,865 MHz. ASR-11 frequency assignments of 2,825 and 2,895 MHz were used for this analysis.

The nominated ASR-11 frequencies can be the final permanent operating frequencies provided that no receiver blanking is required. If, however, receiver blanking is required, the ASR-11 will need to transition to the existing radar's frequencies during the flight check phase of commissioning.

The antenna tilt for the ASR-11 is assumed to be 2.5° above horizon (electrical) and will be adjusted at optimization. The tilt setting for the existing ASR-8 was 2.0° (mechanical) which provides an electrical tilt of 4.5°.

Ground signal reflection of up to 6 dB is not included in this analysis. This analysis only considers line of sight.

Existing ASR-8 Effects on the ASR-11

Co-Site Analysis, ASR-8 Main Lobe to ASR-11 Main Lobe, No Filters (Case 1)

SIGNAL LEVELS SEEN BY VICTIM RADAR ASR-11
(EXCERPT FROM IPREDICT PROGRAM)

THE ASR-11 MINIMUM DISCERNIBLE SIGNAL IS -112 dBm.

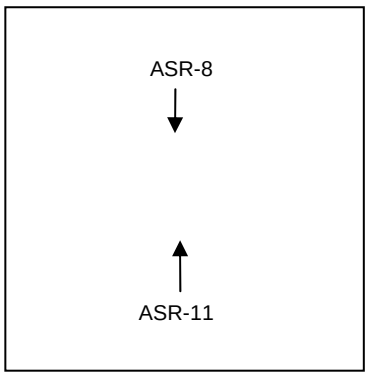
CONTRIBUTION FROM: **ASR-8 (RADAR2)**

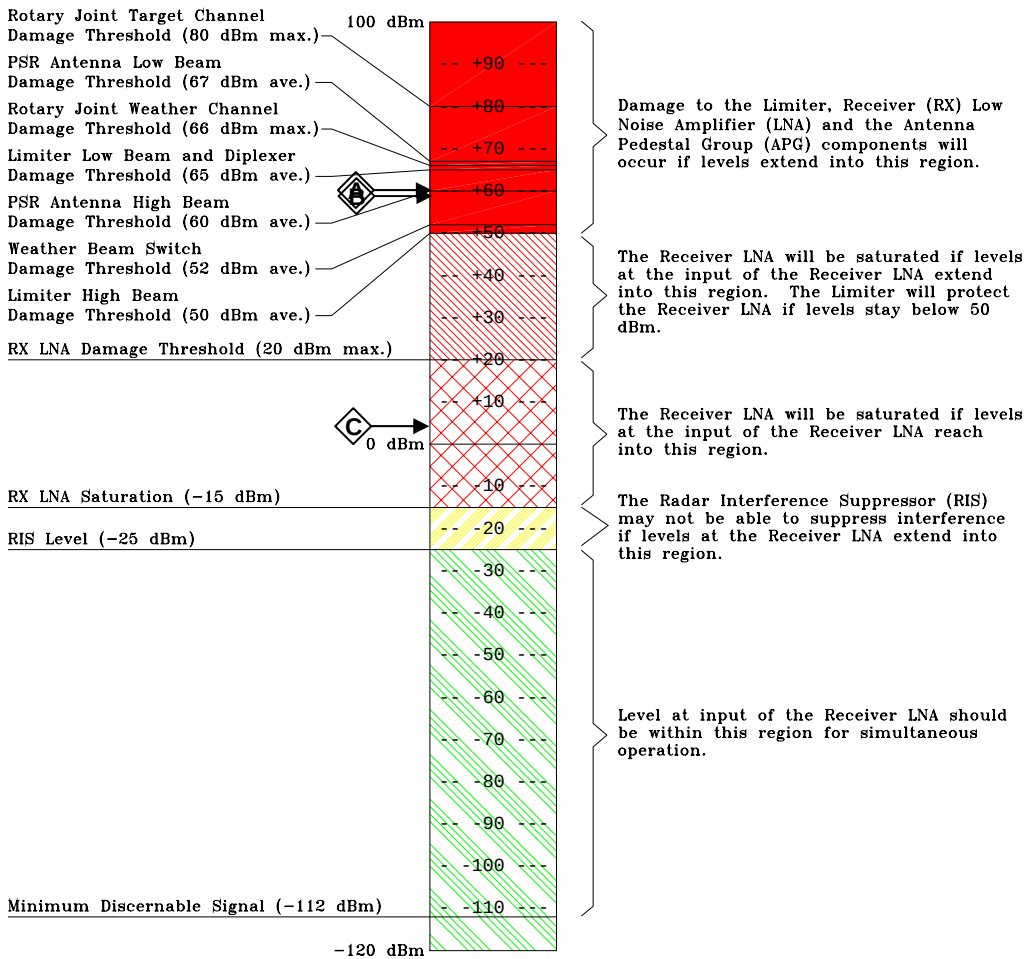
POWER AT THE OUTPUT OF THE ASR-11 ANTENNA: 60.4 dBm (A)

POWER AT THE INPUT TO THE ASR-11 RECEIVER: 59.1 dBm (B)

INTERFERENCE LEVEL: 4.6 dBm (C)

RADAR GEOMETRY





ASR-11 Damage/Interference Thresholds

Co-Site Analysis, ASR-8 Side Lobe to ASR-11 Main Lobe, No Filters (Case 2)

SIGNAL LEVELS SEEN BY VICTIM RADAR ASR-11
(EXCERPT FROM IPREDICT PROGRAM)

THE ASR-11 MINIMUM DISCERNIBLE SIGNAL IS -112 dBm.

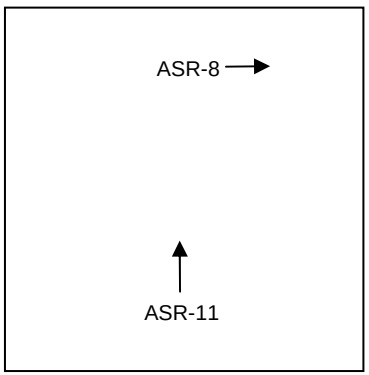
CONTRIBUTION FROM: **ASR-8 (RADAR2)**

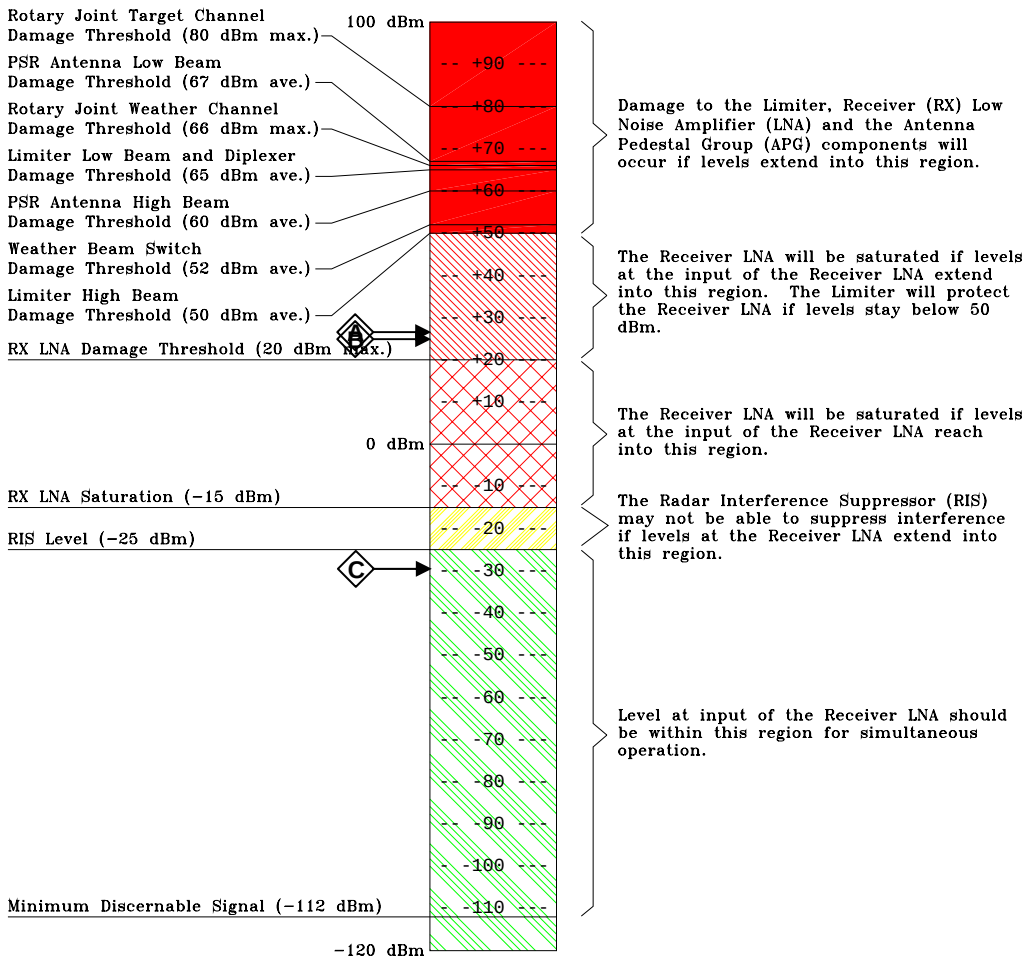
POWER AT THE OUTPUT OF THE ASR-11 ANTENNA: 26.4 dBm (A)

POWER AT THE INPUT TO THE ASR-11 RECEIVER: 25.1 dBm (B)

INTERFERENCE LEVEL: -29.4 dBm (C)

RADAR GEOMETRY





ASR-11 Damage/Interference Thresholds

Co-Site Analysis, ASR-8 Main Lobe to ASR-11 Side Lobe, No Filters (Case 3)

SIGNAL LEVELS SEEN BY VICTIM RADAR ASR-11
(EXCERPT FROM IPREDICT PROGRAM)

THE ASR-11 MINIMUM DISCERNIBLE SIGNAL IS -112 dBm.

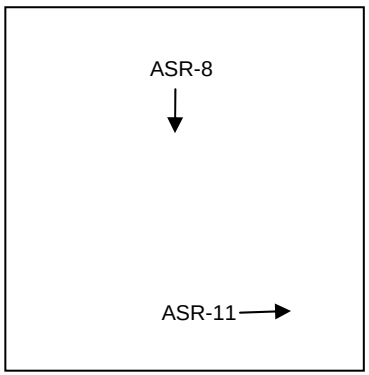
CONTRIBUTION FROM: **ASR-8 (RADAR2)**

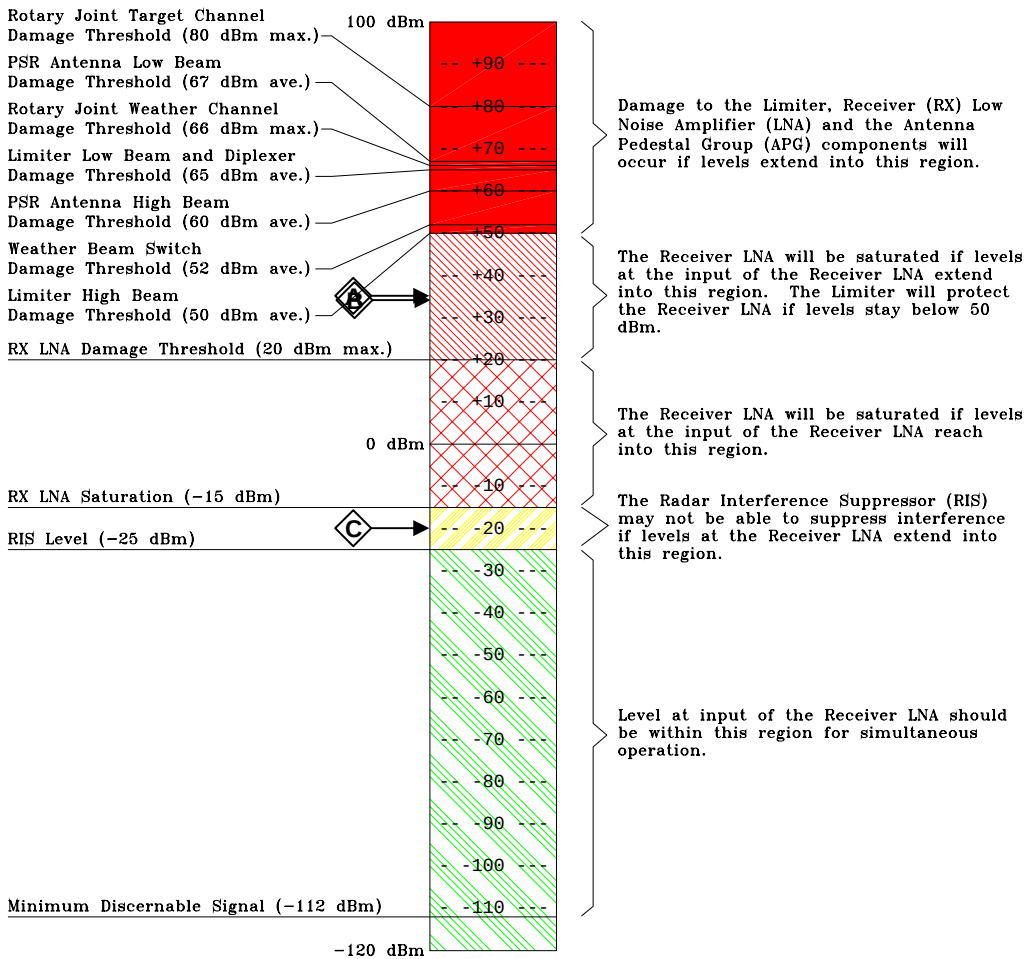
POWER AT THE OUTPUT OF THE ASR-11 ANTENNA: 35.4 dBm (A)

POWER AT THE INPUT TO THE ASR-11 RECEIVER: 34.1 dBm (B)

INTERFERENCE LEVEL: -20.4 dBm (C)

RADAR GEOMETRY





ASR-11 Damage/Interference Thresholds

Co-Site Analysis, ASR-8 Side Lobe to ASR-11 Side Lobe, No Filters (Case 4)

SIGNAL LEVELS SEEN BY VICTIM RADAR ASR-11
(EXCERPT FROM IPREDICT PROGRAM)

THE ASR-11 MINIMUM DISCERNIBLE SIGNAL IS -112 dBm.

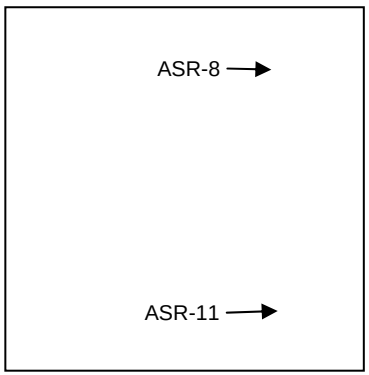
CONTRIBUTION FROM: **ASR-8 (RADAR2)**

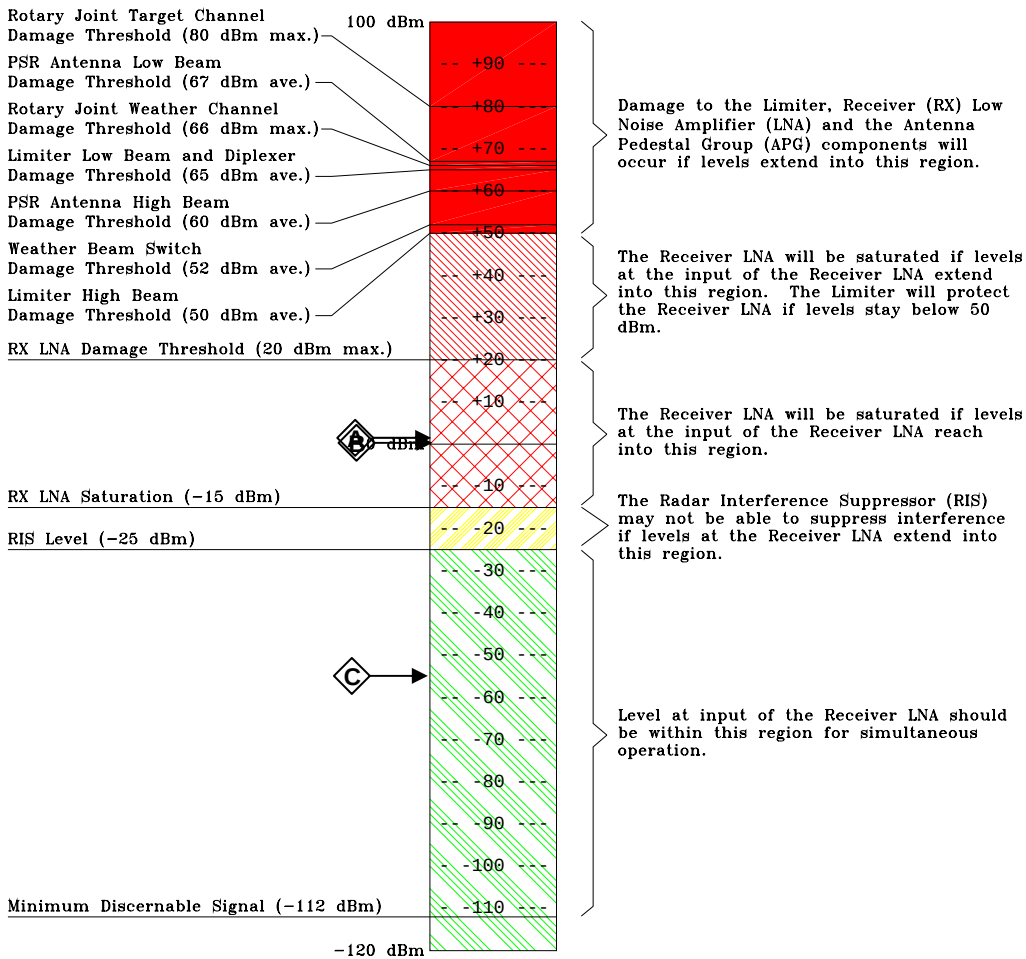
POWER AT THE OUTPUT OF THE ASR-11 ANTENNA: 1.4 dBm (A)

POWER AT THE INPUT TO THE ASR-11 RECEIVER: 0.1 dBm (B)

INTERFERENCE LEVEL: -54.4 dBm (C)

RADAR GEOMETRY





ASR-11 Damage/Interference Thresholds

DATA ANALYSIS
Existing ASR-8s Effect on the ASR-11 (Cases 1 through 4)

- Coupled levels at ASR-11 Antenna (Damage Assessment)
  - ASR-8 Main Lobe to ASR-11 Main Lobe: 60.4 dBm (1)
  - ASR-8 Side Lobe to ASR-11 Main Lobe: 26.4 dBm (2)
  - ASR-8 Main Lobe to ASR-11 Side Lobe: 35.4 dBm (3)
  - ASR-8 Side Lobe to ASR-11 Side Lobe: 1.4 dBm (4)
- The case 1 level is above the damage threshold for some Antenna Group components. Cases 2-4 should cause no damage to the antenna pedestal group (APG), receiver low noise amplifier (LNA), or limiter.
- Coupled levels at ASR-11 receiver LNA (Saturation Assessment)
  - ASR-8 Main Lobe to ASR-11 Main Lobe: 59.1 dBm (1)
  - ASR-8 Side Lobe to ASR-11 Main Lobe: 25.1 dBm (2)
  - ASR-8 Main Lobe to ASR-11 Side Lobe: 34.1 dBm (3)
  - ASR-8 Side Lobe to ASR-11 Side Lobe: 0.1 dBm (4)
- The receiver LNA under Case 1 will be in saturation by 74.1 dB. The receiver LNA under Case 2 will be in saturation by 40.1 dB. The receiver LNA under Case 3 will be in saturation by 49.1 dB. The levels for Case 4 are below the LNA saturation level.

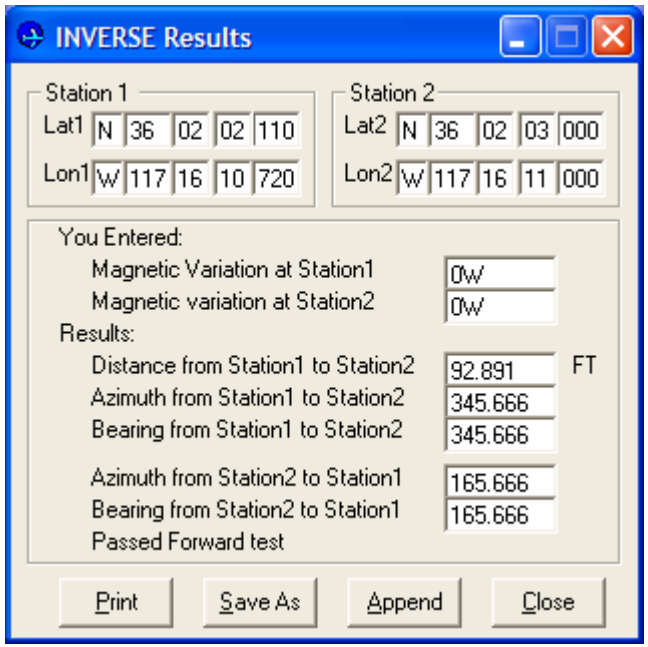
DATA ANALYSIS (Continued)
Existing ASR-8's Effect on the ASR-11
(Cases 1 through 4)

- Interference Assessment - With the additional off-frequency rejection provided inside the ASR-11 receiver, the levels are shown below:
  - ASR-8 Main Lobe to ASR-11 Main Lobe: 4.6 dBm (1)
  - ASR-8 Side Lobe to ASR-11 Main Lobe: - 29.4 dBm (2)
  - ASR-8 Main Lobe to ASR-11 Side Lobe: - 20.4 dBm (3)
  - ASR-8 Side Lobe to ASR-11 Side Lobe: - 54.4 dBm (4)

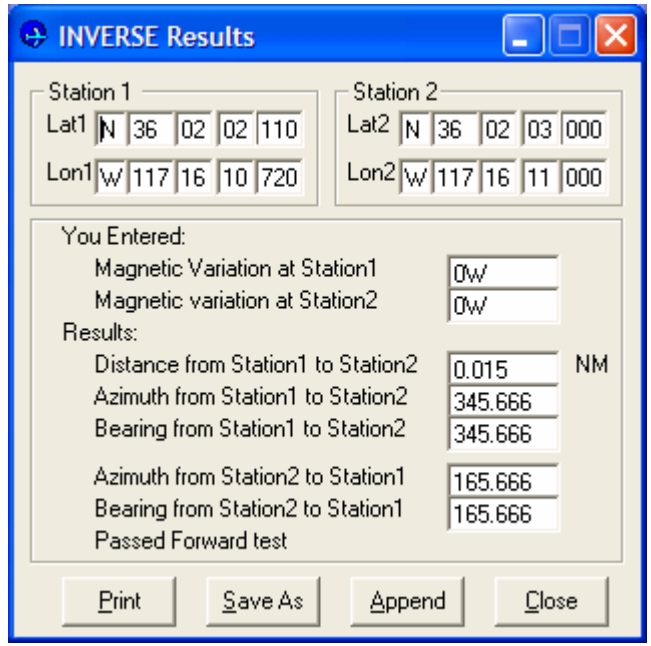
- The interference level for cases 1 and 3 will not be handled by the RIS (RIS max. level –25 dBm) . All other cases are within acceptable limits and interference will be handled by the RIS.

Attachment A

Coordinate Calculations:



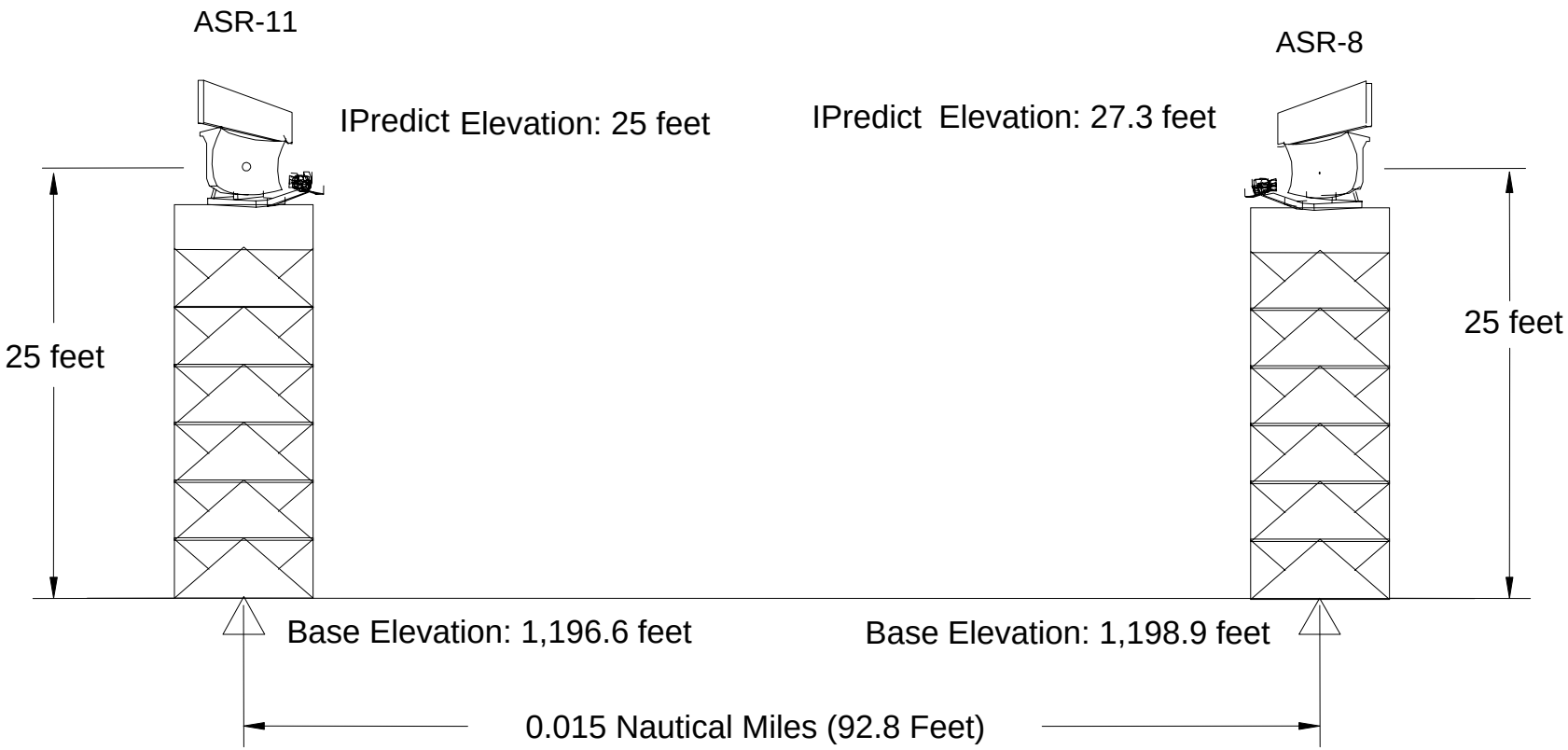
STATION 1: ASR-11
STATION 2: ASR-8



STATION 1: ASR-11
STATION 2: ASR-8

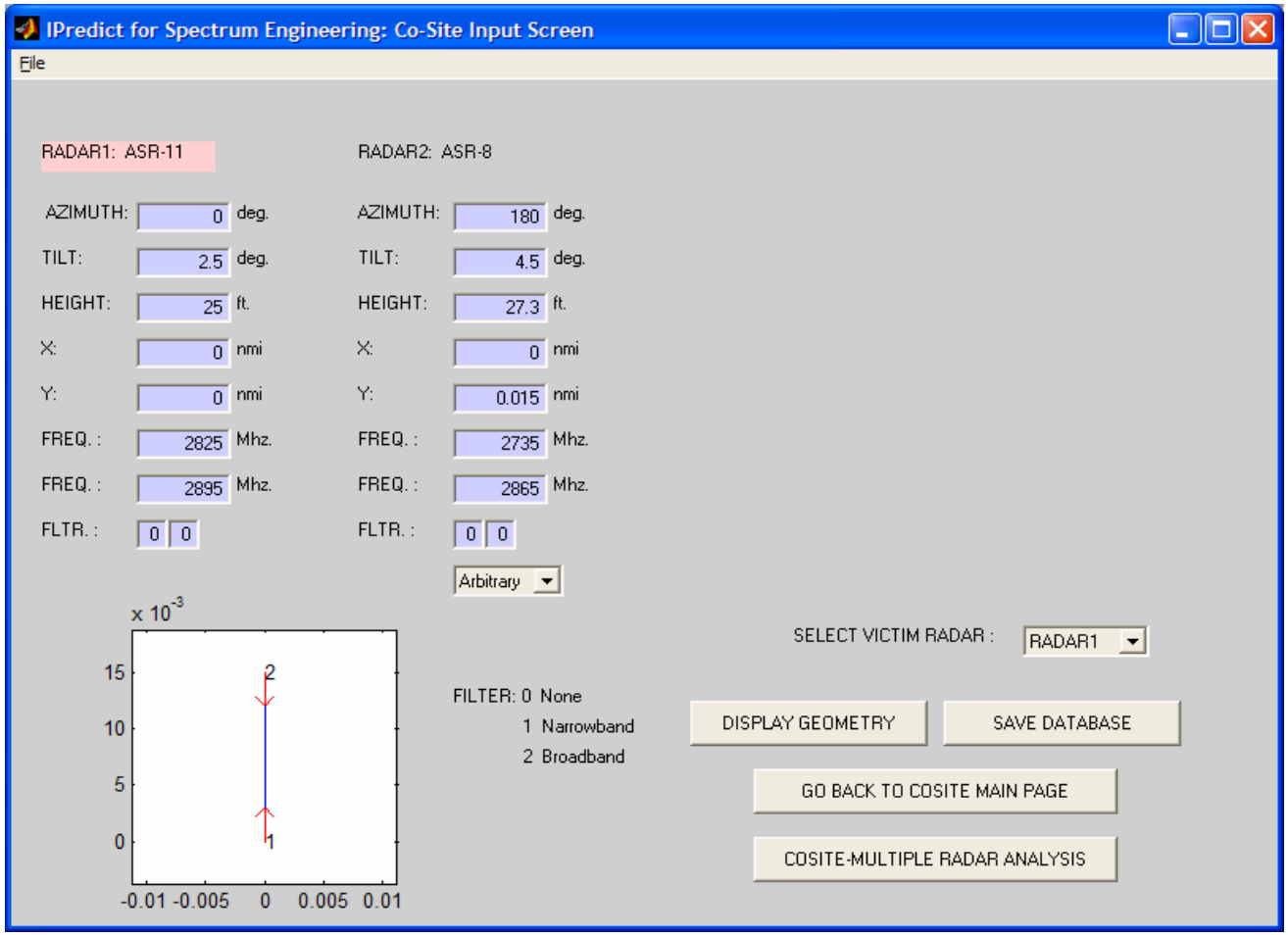
Attachment B

IPredict Height Calculation:



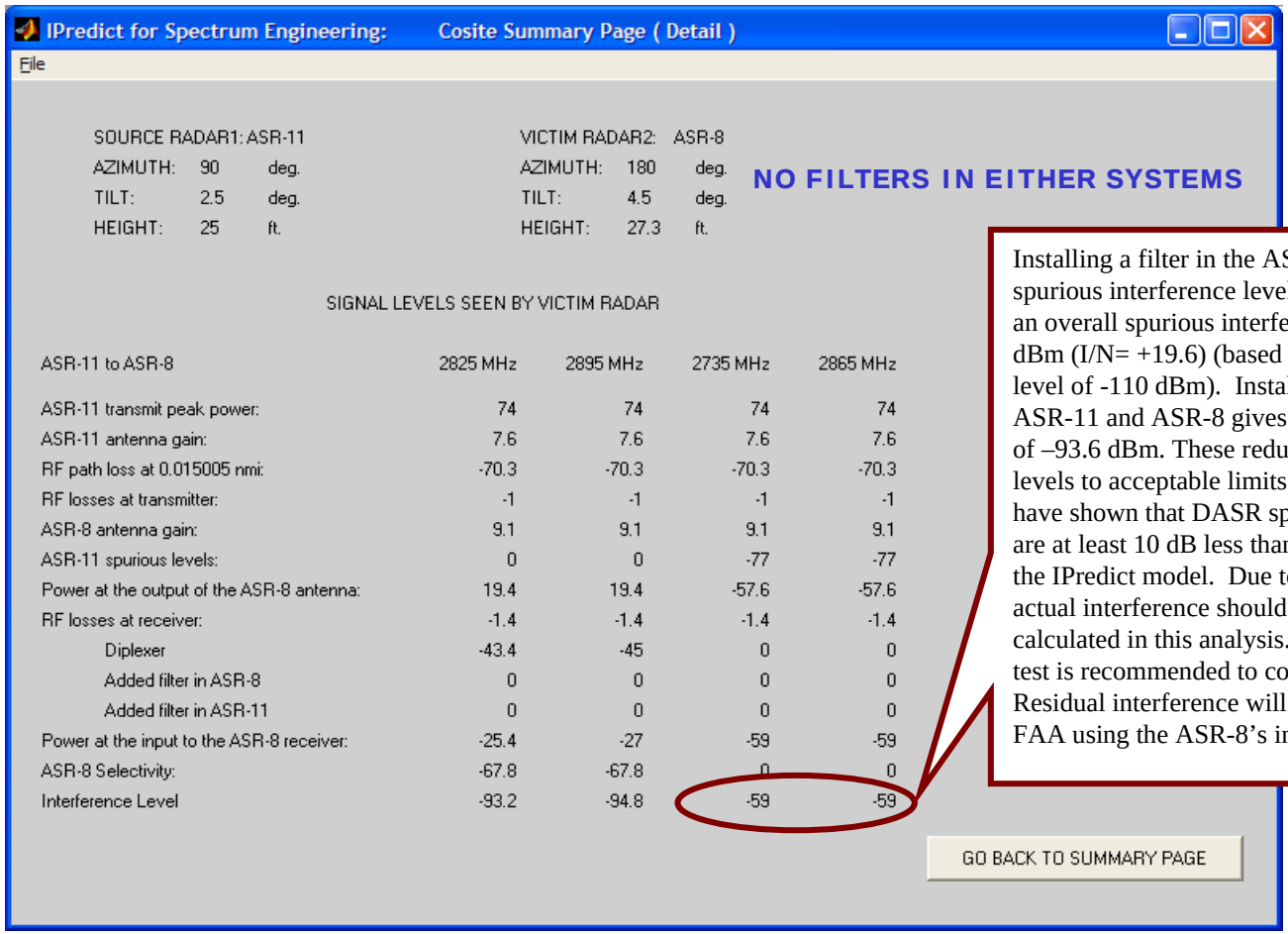
Attachment C

Screenshot of IPredict Data Input Page: (ASR-8 Mainlobe to ASR-11 Mainlobe)



Attachment D

Screenshot of IPredict Detail Page (ASR-11 Sidelobe to ASR-8 Mainlobe)



IPredict for Spectrum Engineering: Cosite Summary Page (Detail)

File

SOURCE RADAR1:	ASR-11		VICTIM RADAR2:	ASR-8		NO FILTERS IN EITHER SYSTEMS
AZIMUTH:	90	deg.	AZIMUTH:	180	deg.	
TILT:	2.5	deg.	TILT:	4.5	deg.	
HEIGHT:	25	ft.	HEIGHT:	27.3	ft.	

SIGNAL LEVELS SEEN BY VICTIM RADAR

ASR-11 to ASR-8	2825 MHz	2895 MHz	2735 MHz	2865 MHz
ASR-11 transmit peak power:	74	74	74	74
ASR-11 antenna gain:	7.6	7.6	7.6	7.6
RF path loss at 0.015005 nmi:	-70.3	-70.3	-70.3	-70.3
RF losses at transmitter:	-1	-1	-1	-1
ASR-8 antenna gain:	9.1	9.1	9.1	9.1
ASR-11 spurious levels:	0	0	-77	-77
Power at the output of the ASR-8 antenna:	19.4	19.4	-57.6	-57.6
RF losses at receiver:	-1.4	-1.4	-1.4	-1.4
Diplexer	-43.4	-45	0	0
Added filter in ASR-8	0	0	0	0
Added filter in ASR-11	0	0	0	0
Power at the input to the ASR-8 receiver:	-25.4	-27	-59	-59
ASR-8 Selectivity:	-67.8	-67.8	0	0
Interference Level	-93.2	-94.8	-59	-59

GO BACK TO SUMMARY PAGE

Installing a filter in the ASR-11 would reduce the spurious interference level by –34.6 dB, giving an overall spurious interference level of –90.4 dBm (I/N= +19.6) (based upon the ASR-8 MDS level of -110 dBm). Installing a filter in both the ASR-11 and ASR-8 gives an interference level of –93.6 dBm. These reductions do not lower the levels to acceptable limits. However, recent tests have shown that DASR spurious transmissions are at least 10 dB less than what is calculated in the IPredict model. Due to these measurements, actual interference should be less than what is calculated in this analysis. An interoperability test is recommended to confirm this expectation. Residual interference will be reduced by the FAA using the ASR-8's internal MTI processing.