



MASTER

Terminal Surveillance Performance & Registration Group

Facility Brief

Presented to: Northern California TRACON

By: William Pomales, TSPRG Lead

Date: January 31, 2012

TSPRG Objective

The objective of the TSPRG is to establish a land-based sensor performance parameters baseline that will be used to identify areas of improvement necessary to meet more stringent Fuse Mode certification requirements.

TSPRG Motivation

Order JO 6190.12D, Maintenance of the Automated Radar Terminal System Expansion (ARTS IIIE), Page 18, Paragraph 304 ADS-B PERFORMANCE PARAMETERS, sets the Inter-Sensor Linking for Fuse Mode using Radar to Radar or Radar to ADS-B correction to .12 of a nautical mile (729 foot) for Short Range Radars (SRR) with center-to-center distances of less than 80 nautical miles and up to .36 of a nautical mile (2,187 foot) for Long Range Radars (LRR) with center-to-center distances exceeding 80 nautical miles. In order to meet this tolerance in registration, it is necessary to ensure that each radar is working at its best.



TSPRG Approach

Sequence of activities:

- Sensor Data Verification
- Remote System Monitor and Permanent Echoes Verification
- Continuous Data Recording Collection and Analysis
- Registration Data Collection and Analysis
- Corrective Action Implementation
- Improvement Verification
- Recommendations Report

All these activities require the support of the ATO-TFOS Operational Support Facilities,
Site Technical Operations, Service Area Representatives , ATO- Terminal Automation
and Surveillance Broadcast Services Program Offices



TSPRG Team & Schedule of Activities

TSPRG Management: Mr. Michael C. Ryan, TSPRG Manager (609) 485-5783

TSPRG Technical: Mr. William Pomales, TSPRG Lead (609) 485-6738

Mr. Jignesh Sangani, TSPRG Co-Lead (609) 485-8774

Mr. Howard Tibbs III, TSPRG Analyst (609) 485-5463

Jan. 29 Sun - Messrs. Sangani & Tibbs Travel Day - In

Jan. 30 Mon - Mr. Pomales Travel Day - In
Messrs. Sangani & Tibbs start Data Collection on 4th Rack with OSF & Tech Ops assistance

Jan. 31 Tue - Mr. Pomales will brief TRACON managers about TSPRG activities,

Messrs. Sangani & Tibbs continue System Monitoring and Data Collection

Feb. 1 Wed. - Mr. Pomales Travel Day - Out

Messrs Sangni & Tibbs continue System Monitoring and Data Collection

Feb. 2 Thu . - Messrs. Sangani & Tibbs Travel Day - Out



TSPRG's NCT Preliminary Review

begin SEN_LOCATIONS

% Name	Sens	Sens	Sens	Sens	Sens	Sens	Sens	Region Name	Region Text
%	Latitude	Longitude	Align	Mag	Mag	Rng	Alt		
%			Var	Dir					
MCC	38:40:26.305N	121:21:54.274W	M	15	E	61	148	MCCSEN	"MCC ASR9"
BAB	39:07:47.725N	121:27:39.658W	M	15	E	61	126	BABSEN	"BAB ASR9"
NUQ	37:25:28.449N	122:00:53.272W	M	15	E	61	60	NUQSEN	"NUQ ASR9"
OAK	37:42:22.082N	122:13:31.143W	M	15	E	61	37	OAKSEN	"OAK ASR9"
MRY	36:41:40.633N	121:45:36.928W	M	15	E	61	333	MRYSEN	"MRY ASR11"
SCK	37:53:15.777N	121:14:36.654W	M	15	E	61	90	SCKSEN	"SCK ASR11"
MCE	37:17:13.7N	120:30:32.7W	M	15	E	61	237	MCESEN	"MCE ASR11"
RNO	39:30:01.35N	119:46:52.68W	M	15	E	61	4450	RNOSEN	"RNO ASR8"
PRB	35:23:40.58N	120:21:15.98W	T	15	E	250	3649	PRBSEN	"PRB ASR"
QMV	37:55:26.3N	122:35:52W	T	15	E	250	2646	QMVSEN	"QMV ASR"
SAC	38:33:13.758N	121:16:08.704W	T	15	E	250	184	SACSEN	"SAC ASR"
FLX	39:24:19.78N	118:43:20.74W	T	15	E	250	4032	FLXSEN	"FLX ASR"
POT	37:08:34.476N	120:19:29.262W	M	15	E	61	2646	POTSEN	"POT PSEUDO"

Norm H 10/16/04 updated MCC, BAB, OAK, & MER for data collection.

#DJ 12-13-00 ARSR SENS RNG CHANGED TO 250 NM.

#DJ 1-7-02 NEW REGION NAMES, CHANGED ORDER TO MATCH SEN_SERIAL_RADAR

#DJ 1-17-02 ENTERED MOST ACCURATE SENSOR LOCATIONS AVAILABLE

#DD 1-30-02 CORRECTED OAK AND OAR ALTITUDES

#DJ 10-19-04 INITIAL SCZ ASR11 DATA

#DJ - ADD RNO AND FLX AND REORDER SENSORS

end;

Visual Verification with Google Earth Pro:

- All sensor markers are within the boundaries of the antenna or antenna tower
- POT pseudo of QMV: not needed in Fusion Mode



TSPRG's NCT Preliminary Review cont.

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begin TGT_RSM_DEFINES
% RSM Ben RSM RSM Range RSM Region Text
% Num Radar Ben Reported MSL
% Indicator Code Alt Alt
% Select
Select Verify Delay Range SENS
Region Name
Region Text
MCC RSM1
"MC C RSM1"
MCC RSM2
"MC C RSM2"
BAB RSM3
"BA B RSM3"
BAB RSM4
"BA B RSM4"
NUQ RSM5
"NU Q RSM5"
NUQ RSM6
"NU Q RSM6"
OAK RSM7
"OAK RSM7"
MRY RSM8
"MR Y RSM8"
SAC RSM9
"SA C RSM9"
SAC RSM10
"SA C RSM10"
OMV RSM11
"OM V RSM11"
PRB RSM12
"PR B RSM12"
MCE RSM13
"MC E RSM13"
SCK RSM14
"SCK RSM14"
OMV RSM15
"OM V RSM15"
OMC MTH16
"OM C MTH16"
OAK RSM16
"OAK RSM16"
MCC MTH17
"MC C MTH17"
BAB MTH18
"BA B MTH18"
BAB MTH19
"BA B MTH19"
NUQ MTH20
"NU Q MTH20"
NUQ MTI21
"NU Q MTI21"
OAK MTI22
"OAK MTI22"
OAK MTI23
"OAK MTI23"
MRY PE24
"MR Y PE24"
BAB MTI18
"BA B MTI18"
BAB MTI19
"BA B MTI19"
NUQ MTI20
"NU Q MTI20"
NUQ MTI21
"NU Q MTI21"
OAK MTI22
"OAK MTI22"
OAK MTI23
"OAK MTI23"
MRY PE25
"MR Y PE25"
BAB MTI19
"BA B MTI19"
PE26
"PE26"
MCE PE27
"MC E PE27"
PE27
"PE27"
SCK PE28
"SCK PE28"
SCK PE29
"SCK PE29"
PRB RSM30
"PR B RSM30"
RNO RSM31
"RN O RSM31"
RNO RSM32
"RN O RSM32"
FLX RSM33
"FL X RSM33"
FLX RSM34
"FL X RSM34"
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#DJ 1-7-02 PER AF: RSM1 AND 2 DATA UPDATED. MER RSM REMOVED.
end;
#DJ 1-6-02 CORRECTED ALTITUDE INFO
#DJ 4-4-02 ELIMINATED ARSR PER M. ADAM
#MA 5-15-02 REMOVED MCC "RSM1" 1272 DUE TO RELOCATION OF CPME. MADE 1271 RSM1 ADDED DATA FOR BAR NUQ,
# MER, AND SCK. NOTE: MER, SCK, MAY NEED UPDATE WHEN DATA CONFIRMED. OAK AND MCC'S SECOND CPME'S
# WILL BE UPDATED WHEN THEY'RE REINSTALLED. CORRECTED PRB, SAC REPORTED ALT.
#DJ 10-19-04 INITIAL SCZ ASRII DATA

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Visual Verification with Google Earth Pro:

a) All RSM's, PE's and MTI contain actual physical locations which are very accurate



TSPRG's Suggestions to Automation SSC

- 1) Verify antenna, CPME and MTI/PE latitude/longitudes (at least 5 decimal positions) and altitudes from the current precision survey D-Sized drawings.
- 2) Verify CPME location and range delay settings from the CPME thumb-wheel by having Radar personnel travel on-site.
- 3) Verify performance of long range sensors ensuring no malfunctions, synchronization and parity errors on the communication lines. These will lead to discarded messages which will affect tracking in Fusion mode.
- 4) Verify only one CODEX modem is used per long range sensor, in active or back-up paths. The practice of having multiple long range radars per modem is not correct. Only one master clock exists, two radars will constantly compete for its signal.
- 5) Verify radar to site telecommunication lines by scheduling and FTI check.
- 6) Map all telecommunications between radar site to TRACON.
- 7) If any radar fails to meet the aforementioned criteria, consider excluding its use from Fuse Mode or request an implementation delay until Automation SSC corrects the issues.

Action Items

Action Item #	Actionee	Phone#	Action	Due Date



List Of Attendees

Name Organization Phone # E-mail

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List Of Attendees

Name	Organization	Phone #	E-mail

