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FAA Technical Center
Atlantic City International Airport,
N.J. 08405

FAA Technical Center Enhanced Airport Security System Project

Maintenance/Repair Manual

Walter Wall
Edward Ocker

August 1994

Manual

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16. Abstract

This report provides details of the maintenance actions performed for the security equipment utilized in the Enhanced Airport Security System Project. Maintenance action details have been assembled from on-site maintenance records and compiled into a comprehensive report. Maintenance actions are grouped according to type of sensor and location of the sensor within the EASSP.

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LIST OF ACRONYMS AND ABBREVIATIONS

BWI	Baltimore-Washington International Airport
EASSP	Enhanced Airport Security System Project
FRS	Fire Rescue Services
SOC	Security Operations Center
RAIDS	Ramp Area Intrusion Detection System

EXECUTIVE SUMMARY

This Maintenance/Repair Manual has been prepared in support of the Federal Aviation Administration Technical Center (FAATC) Enhanced Airport Security System Project (EASSP), established as a research and development project at the Baltimore-Washington International Airport (BWI). The Maintenance/Repair Manual provides details on the maintenance actions, both corrective and preventive, for the equipment utilized in the security enhancement of Baltimore-Washington International Airport (BWI). The maintenance actions are collated in subsystem and date sequence, and cover the maintenance actions for the EASSP equipment from May 23, 1993 thorough January 31, 1994.

The maintenance actions contained in this Maintenance/Repair Manual were collected from daily records maintained by the on-site personnel and include maintenance actions, the tools, test equipment, parts, and the man-hours needed to complete these actions.

1. INTRODUCTION.

1.1 OBJECTIVES. This is the Maintenance/Repair Manual for the Enhanced Airport Security System Project (EASSP) at Baltimore-Washington International Airport (BWI). The manual has been prepared under contract DTFA03-93-C-00042, Task Order 001, and covers EASSP periodic maintenance and repair tasks for the period May 3, 1993 through January 31, 1994.

1.2 ORGANIZATION. The Maintenance/Repair Manual is organized by subsystem, sectors and sensors. All maintenance actions for a given subsystem sector and sensor are grouped together. The subsystems discussed in the manual as follows:

a. Pier/Alert/Duress;
b. Pier Delay/Intercom/Fire Rescue Service (FRS);
c. Security Operations Center (SOC);
d. Ramp Area Intrusion Detection System (RAIDS);
e. Vehicle Portal;
f. Revolving Doors;
g. Secure Communications; and
h. Image Processing

The sectors of interest are RAIDS Sectors 1 through 14, pier A, pier B, and spaces within the South Terminal (Baggage Make-up Area and the Delta Ticket Counter).

2. MAINTENANCE ACTIONS.

2.1 CORRECTIVE/SCHEDULED MAINTENANCE. Maintenance actions are grouped into corrective and scheduled or preventive maintenance. Corrective maintenance actions are those required to restore the EASSP equipment to full operational capability once a malfunction has been identified. Scheduled maintenance actions are those actions required to prevent an equipment malfunction.

The scheduled maintenance actions for the equipment within the RAIDS sectors together with their recommended frequency are identified in table 1. The revolving doors, piers A and B, and areas in the South Terminal (Baggage Make-up and Delta ticket counter), do not have formally identified scheduled maintenance. The analysis of the maintenance actions performed for these areas will lead to development of scheduled maintenance procedures as necessary to preserve the operational capability of the equipments in those areas.

2.2 MAINTENANCE TRACKING. The maintenance actions described in this Maintenance/Repair Manual are the result of hardware maintenance actions of tasks performed by the on-site personnel. The information contained in this Maintenance Repair Manual was gathered from notes entered into individual notebooks kept by the on-site personnel and subsequently reported in their weekly reports. The weekly reports and notebooks were reviewed to identify the maintenance/repair tasks which were performed on the equipment contained within the EASSP.

2.3 MAINTENANCE/REPAIR ANALYSIS. The maintenance/repair tasks contained in table 2 are grouped into subsystem/sensor groups and listed in chronological sequence. Table 2 provides details of Maintenance/Repair tasks as follows:

a. Subsystem, sensor, and sector;
b. Reason for maintenance;
c. Maintenance action performed;
d. Result of the maintenance/repair action;
e. Man-hours expended on maintenance tasks;
f. Parts, tools,and test equipment required to perform the task;
g. Cost to perform maintenance/repair task; and
h. Status and comments regarding the maintenance/repair task.

Table 1. RAIDS Scheduled Maintenance

EQUIPMENT	SCHEDULED MAINTENANCE	FREQUENCY
IR SENSORS	VISUAL INSPECTION-CLEAN WINDOWS IF NECESSARY	MONTHLY
MICROWAVE 385 TRANSCEIVER	WAX RADOME	QUARTERLY
TAUT WIRE FENCE	SYSTEM CHECK, TEST ALARMS ON ALL FENCE PROCESSORS	QUARTERLY
FENCE CABLE SYSTEM	SYSTEM TEST, COMPLETE VISUAL INSPECTION	QUARTERLY
IPID	CHECK ALIGNMENT, CLEAN LENSES, CHECK CONNECTIONS	QUARTERLY
GATE A2 CABLE REEL	CLEAN BRUSH ASSEMBLY AND COLLECTOR RING, CHECK CABLE FOR CRACKS	QUARTERLY
A1, A2 GATE CONTROLLERS	CHECK HYDRAULIC FLUID LEVEL, CHECK ALL BOLTS FOR TIGHTNESS, CHECK AND ADJUST DRIVE WHEELS	QUARTERLY
OBJECT PRESENT SENSORS (AT POWER GATES)	VISUAL INSPECTION, CLEAN WINDOWS IF NECESSARY CLEAN WINDOWS, INSPECT INTERIOR LENSES, CLEAN IF REQUIRED. CLEAN/ALIGN MIRRORS, SYSTEM OPERATION CHECK, SENSITIVITY TEST USING TEST SHEETS.	MONTHLY BIMONTHLY SEMIANNUAL
GENERAL RAIDS MAINTENANCE	INSPECT RAIDS PERIMETER, REMOVE DEBRIS, MOW GRASS IN SECTOR 9 AS REQUIRED. CLEAN SAND FROM PRLS PADS IN SECTORS 10, 11 & 12. INSPECT AND CLEAN PRLS PAD DRAIN HOLES.	WEEKLY MONTHLY

Table 2. Maintenance Actions for BWI EASSP Equipment

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
08/25/93	IMAGE PROCESSING Image processor pier B	Image processor would not initialize during test.	Investigated and determined that Touch monitor has failed and will not start the x-ray bell. Constructed two interface cable to allow use of spare SOC touch screen monitor for testing.	Image processing system non operational.	2.0	Cable, cable connectors, solder	Soldering iron, wire strippers	N/A		Open Closed 09/08/93
08/30/93	IMAGE PROCESSING Image processor pier B	Continued maintenance from 8/25/93.	Performed trouble shooting on Image processor. Built touch screen controller from Microtouch board and power supply from broken SOC monitor. Discovered that we did not have Hi-Res monitor for replacement. Determined that touch screen and controller was operating (responded to calibration). A software problem is suspected. Tried to load backups.	Backup files did not resolve problem, Image processor non-operational.	3.0	Microtouch board, power supply		N/A	$290.00	Open Closed 09/08/93
09/01/93	IMAGE PROCESSING Image processor pier B	Continued maintenance from 08/30/93	Attempted to load files from the tape backup, however was unable to load backups from tape.	Image processing system non operational.	4.0	N/A	Tape drive, backup tapes	N/A		Open Closed 09/08/93
09/07/93	IMAGE PROCESSING Image processor pier B	Continued maintenance from 08/30/93	Replaced touch screen controller, tested and calibrated touch screen. Discovered that IP data base had been corrupted, restored database from backup, modified files for changed video board port, modified X-Ray control files, tested system with test articles.	Image processor restored to satisfactory operation	16.0	N/A	Tape drive, tape backups	N/A		Closed 09/09/93
09/14/93	IMAGE PROCESSING Image processor pier B	Image processor would not work with touch screen at X-Ray.	Investigated and discovered that cable from X-Ray to computer is bad. Fabricated touch screen controller cable and connected from computer to monitor at X-Ray machine.	Image processor touch screen operational.	2.0	Coasial cable, 2 BNC connectors, solder	wire strippers, soldering iron, adjustable wrench	Digital Multimeter	N/A	Closed 09/15/93
12/27	IMAGE PROCESSING Color x-ray	Advised by Screeners that power cord plug on color x-ray keeps working out of the wall socket.	Installed retaining device.	Power cord remains in wall socket	.5	Tape	pocket Knife	N/A		Closed 12/27/93
01/05	MSP VIDEO	MSP requested that CCTV camera monitor and video switch pad be moved.	Moved monitor and video key pad, re-routed coaxial cable.	MSP video operating satisfactorily	1.0	N/A	N/A	N/A		Closed 01/06/93
06/07/93	PIER/ALERT/DURESS Pier A low battery	Received "Low battery" alarm on pier A.	Isolated low battery to SPM transmitter inside Pier A receiver box. Removed receiver 4 to access transmitter UT7. Replaced 4.5 V battery and reassembled receiver box.	Alarm cleared.	1.0	Battery	Screwdriver	N/A	$ 6.50	Closed 06/07/93
07/08/93	PIER/ALERT/DURESS Duress pendant transmitter pier B	Notified by Pier B CSS that Duress transmitter on X-Ray machine 1 had been knocked off and broken.	Obtained new pendant transmitter from stock, programmed and tested.	Duress pendant transmitter restored to normal operation.	1.0	Pendant transmitter	Programamer	N/A	$36.00	Closed 07/08/93

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
07/30/93	PIER/ALERT/DURESS Duress transmitter pier A	Advised by Pier A screeners that Duress pendant transmitter had broken from its mounting plate at the glue bond.	Reattached transmitter using "Super-Lok"	Duress pendant transmitter reattached to mounting plate	1.0	Super Lok	Knife	N/A	$1.00	Closed 07/30/93
08/12/93	PIER/ALERT/DURESS SLU-2 pier B	SLU-2 did not recycle after a momentary power loss (approx 2 3:55 on 8/11). No alarms from pier B were recorded during time SLU was out of service.	Physically reset SLU-2	All sensors and cameras are back on line.	0.5	N/A	N/A	N/A		Closed 08/12/93
11/16-17	PIER ALERT/DURESS	During WRA testing, attempted to put the Pier Alert/Duress/Delay system into test configuration. Upon receipt of an alert signal, the system would not reset. Also, putting the loading bridges into power-down test mode caused the power to be cut off.	After a thorough review of schematics and conversations with Chris Hoover of Sandia, a procedural problem was uncovered. In test mode, all alarms must be reset at the SOC only (the MSP key pads do not function in test mode). In addition, the relays in the loading bridge power cabinet must be reset before putting the bridges into the test mode.	Procedures have been revised to reflect these clarifications.	3.0	N/A	7/16" nut driver	Multimeter		Closed 11/17
12/22	PIER/ALERT/DURESS pier A	One of the rubber push tabs had come off of the duress pendant transmitter and been lost.	A tab was taken from one of the spare alert transmitters and glued to the duress pendant transmitter. The Alert transmitter was then taken to the lab and repaired and reattached to its base with "Superlok"	Pendant transmitters repaired and operational	2.0	Super Lok adhesive	N/A	N/A	$1.00	Closed 12/22
12/23	PIER/ALERT/DURESS Pier A & B	One pendant transmitter on pier A and one pendant transmitter on pier B had become detached from their mounting plates.	Reattached both transmitters with "Superlok" adhesive strips.	Pendant transmitters properly mounted	1.0	super Lok adhesive	N/A	N/A	$2.00	Closed 12/23
01/05	PIER/ALERT/DURESS pier A	Alert pendant transmitter became detached from it's mounting plate.	Reattached pendant transmitter to mounting plate with "Super-Loc" adhesive.	Pendant transmitter reattached to it's mounting plate.	2.0	Super Lok adhesive	N/A	N/A	$1.00	Closed 01/05

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
01/12	PIER ALERT/DURESS	Received request from Delta Station Manager to remove strike plate hardware from roll up door on b1 and b4 Jetways.	Removed strike plate hardware from roll up doors.	Lock down capability no longer available on Jetways.	4.0	N/A	Flat blade screwdriver adjustable wrench, socket, ratchet	N/A		closed 01/12
05/07/93	PIER DELAY/INTERCOM/FRS Pier B fire alarms	Pier B fire alarms in constant alarm with no fire found.	Contacted Fire Rescue Service and advised them to contact Sandia. Chris Hoover investigated and discovered that a wire which had been disconnected for a demonstration had not been reconnected properly and had worked loose causing the normally closed circuit to indicate open. Wire reconnected	Pier B fire alarms restored to normal operation.	1.0	N/A	Screwdriver	N/A		Closed 05/07/93
05/19/93	PIER DELAY/INTERCOM/FRS Emergency exit	Emergency exit doors 107 and 110 not latching properly.	Adjusted closer on exit doors	Doors restored to normal operation	1.0	N/A	Screwdriver, 4" adjustable wrench	N/A		Closed 05/19/93
08/05/93	PIER DELAY/INTERCOM/FRS Pier B exit doors	Request by Vic Laytar, Delta Station Manager, to install supplemental annunciators for Exit doors 107 and 110.	At each junction box, paralleled two conductors from the horn cable pair to the screening point above the ceiling and connected two piezo horns.	Screeners can now hear the annunciators when the exit doors are opened.	2.0	2 Piezo horns, connector cable, "stak-on" terminals	Flat blade screwdriver, wire crimpers	N/A	$16.00	Closed 08/05/93
09/09/93	PIER DELAY/INTERCOM/FRS	Vic Laytar, Delta Station Manager requested that a key-pad annunciator cut-off be installed for exit door 107.	Installed keypad, attached junction box to wall beside door, ran wiring to ceiling junction box, installed 12 VDC power supply and programmed keypad.	Keypad cut-off for exit 107 annunciator operational.	1.0	Keypad, power supply, stak-on terminals, wire	Screwdriver	N/A	$155.00	Closed 09/09/93
11/23	PIER DELAY/INTERCOM/FRS, EXIT DOOR 110	Balanced magnetic switch on exit door 110 in constant alarm.	Performed fault isolation on Balanced Magnetic Switch (BMS) on emergency exit door 110.	Balanced magnetic switch is faulty, no replacement parts available, sensor off line.	1.5, 2 men @ .75 hrs.	N/A	N/A	Test magnet		Open, Balanced Magnetic Swi required, SENTROL P/I 2706AF
08/10/93	RAIDS CCTV camera 1 sector 1	Bad video from CCTV camera 1.	Fault isolated trouble to faulty Fiber optic link between the receiver and transmitter. Switched link to spare fiber.	Video link restored.	2.0	N/A	7/16" nut driver	N/A		Closed 08/10/93
05/08/93	RAIDS CCTV camera 3 sector 3	Video on camera 3 rolling.	Changed Fiber Optic receiver in SOC and Fiber Optic transmitter in camera box with no change. Will replace camera with bucket truck next week.	CCTV camera 3 non operational	3.0	N/A	N/A	Known good Fiber optic transmitter, Known good Fiber optic receiver		Open Closed 06/10/93
06/04/93	RAIDS CCTV camera 3 sector 3	Low video output	Borrowed bucket truck from CINCO and removed camera 3. Brought camera into lab for bench test. Camera tested good and was reinstalled.	Video is still low.	2.0		Bucket truck			Open Closed 06/10/93

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
06/10/93	RAIDS CCTV camera 3 sector 3	Low video output.	Isolated low video output to a faulty Fiber Optic transmitter in the camera junction box. Replaced Fiber Optic transmitter and tested video link.	Video image is now satisfactory.	1.0	Fiber Optic transmitter	7/16" nut driver	N/A	$244.12	Closed 06/10/93
08/09/93	RAIDS CCTV camera 4 sector 4	Bad video link for CCTV camera 4.	Fault isolated to a bad Fiber optic transmitter in the junction box on T-4 (Transmitter was full of water). Replaced Fiber optic transmitter and attached to inside of junction box with "Super-Lok" fasteners to prevent water intrusion.	Video link from CCTV camera 4 restored to normal operation.	2.0	Fiber optic transmitter, "Super-Lok" fastener	7/16" nut driver	N/A	$245.12	Closed 08/09/93
12/07-08	RAIDS CCTV camera 13 sector 11A	Video image was intermittently dropping off line so that the image was only useable 25% of the time.	Replaced fiber optic transmitter at camera pole. Replaced fiber optic receiver in SOC, replaced intensified Burle camera. Replacement camera performed very poorly displaying a washed out (from too much light) image. Took original malfunctioning camera to lab, removed it from the environmental housing, cleaned and tightened connections, reassembled camera to housing and charged with housing with dry nitrogen. Repaired camera then reinstalled on camera pole.	video image from CCTV camera is satisfactory.	4.0	N/A	Bucket truck from CINCO, extension ladder	Known good fiber optic dtransmitter, known good fiber optic receiver		Closed 12/08
11/03	RAIDS CCTV camera 16 sector 14	Poor (washed out) video from sector 14 CCTV camera.	Trouble isolated a poor quality video image to the camera. The automatic iris of the camera's lens had stuck in the open position, causing the video signal to be washed out due to high light levels. Powered the camera off and on several times by disconnecting and connecting the power plug to the supply in the camera's power box.	After several cycles, the iris was freed and the camera operated normally. The problem has not reoccurred.	4.0, 2 men @ 2 hrs.	N/A	7/16" nut driver	video monitor, known good video transmitter, known good receiver.		Closed 11/03
05/07/93	RAIDS Fiber optic sensor sector 9	Fiber Optic sensor generating frequent alarms.	Monitored Fiber Optic sensor with Sandy Reynolds of Fibersens, made adjustments.	Alarms decreased to 2-3 in a 3 hour period. Continuing to monitor.	1.0	N/A	N/A	N/A		Monitoring
05/10/93	RAIDS Fiber optic sensor sector 9	Sandia and Sandy Reynolds requested 12 VDC be disconnected and a 12 V battery be connected.	Removed 12 VDC power from Fiber Optic sensor processor and connected a 12 V battery. Monitor and recording false alarms. Constructed battery charger.	Monitoring Fiber Optic sensor alarms.	2.0	Battery	N/A	N/A	$45.00	Monitoring
05/11/93	RAIDS Fiber Optic sensor sector 9	Test of Fiber Optic sensor.	Removed battery from Fiber Optic sensor processor and reconnected 12 VDC power at 09:00 hrs.- Reinstalled battery in Fiber Optic processor 16:38 hrs.	Monitoring Fiber Optic sensor.	1.0	N/A	N/A	N/A		Monitoring
05/13/93	RAIDS Fiber Optic sensor sector 9	Test of Fiber Optic sensor.	Removed battery from Fiber Optic sensor Processor.	Monitoring Fiber Optic sensor.	1.0	N/A	N/A	N/A		Monitoring

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
05/17/93	RAIDS Fiber Optic sensor sector 9	Test of Fiber Optic sensor.	Installed 12 V battery in Fiber Optic Processor.	Monitoring Fiber Optic sensors.	1.0	Battery	N/A	N/A	In stock from 05/10	Monitoring
05/18/93	RAIDS Fiber Optic sensor sector 9	Battery installed on 5/17 powered processor for only 8 hrs.	Installed new battery in Fiber Optic sensor box.	Monitoring Fiber Optic sensors.	1.0	Battery	N/A	N/A	$45.00	Monitoring
05/19/93	RAIDS Fiber Optic sensor sector 9	Test of Fiber Optic sensor.	Removed battery from Fiber Optic sensor processor and reconnected 12 VDC power.	Monitoring Fiber Optic sensors.	1.0	N/A	N/A	N/A		Monitoring.
05/21/93	RAIDS Fiber Optic sensor sector 9	Testing of Fiber Optic sensor.	Switched SLU input cable lines for Fiber Optic sensor with PLS lines in sector 10.	Monitoring Fiber Optic sensors.	1.0	N/A	Screwdriver	N/A		Monitoring
05/24/93	RAIDS Fiber Optic sensor sector 9	Testing Fiber Optic sensor.	Returned SLU input lines for sector 10 PLS and sector 9 Fiber Optic sensor to original configuration	Monitoring Fiber Optic sensor.	1.0	N/A	Screwdriver	N/A		Monitoring
05/27/93	RAIDS Fiber optic sensor sector 9	Testing Fiber Optic sensor	Reset parameters on Fiber Optic processor to sensitivity 12% and threshold 65%	Monitoring Fiber Optic sensor.	1.0	N/A	Programmer	N/A		Monitoring
05/27/93	RAIDS Fiber Optic sensor sector 9	Testing Fiber Optic sensor	At the recommendation of Sandy Reynolds, set the Fiber Optic sensor processor sensitivity at 1% and threshold at 99% to attempt to isolate alarms to the Fiber Optic processor.	Monitoring Fiber Optic sensor.	1.0	N/A	Programmer	N/A		Monitoring
06/03/93	RAIDS Fiber optic sensor sector 9	Testing Fiber Optic sensor	Reset Fiber Optic processor sensitivity to 11% and Threshold to 70%. Tested detection capability by walking through sector and observing alarms.	Monitoring Fiber Optic sensor.	1.0	N/A	Programmer	N/A		Monitoring
06/24/93	RAIDS Fiber Optic sensor sector 9	Fiber optic sensor continues to generate false alarms.	Removed processor board and soldered jumper to provide a ground path to the -12 VDC line. Installed chassis ground to ground FOS chassis, processor box and small Hoffman box. Disconnected Fiber Optic cable and replaced with short coil of fiber in the processor box to determine if alarms are generated inside or outside of processor box.	Monitoring Fiber Optic sensor.	1.0	Fiber optic loop, jumper, solder	Soldering iron	N/A		Monitoring
06/25/93	RAIDS Fiber Optic sensor sector 9	Fiber Optic sensor continues to generate false alarms.	Removed test loop Fiber Optic cable and reconnected to ground Fiber Optic cable, inserted temperature probe in Fiber optic processor box to monitor temperature inside processor box.	At 14:00 hrs. temperature inside processor box was 52 degrees C (125.6 degrees F.).	1.0	N/A	N/A	Digital Multimeter, temperature probe		Monitoring

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
07/14/93	RAIDS Fiber optic sensor sector 9	Fiber optic sensor continues to generate false alarms.	Placed Fiber optic loop in processor box. Will monitor sensor operation	Monitoring fiber optic sensor.	1.0	Fibere optic loop	N/A	N/A		Monitoring
07/23/93	RAIDS Fiber Optic sensor sector 9	Fiber optic sensor continues to generate false alarms.	Reconnected buried Fiber Optic senssor, set sensitivity to 13% and threshold dto 75%.	Monitoring Fiber Optic sensor.	1.0	N/A	Programmer	N/A		Monitoring
07/28/93	RAIDS Fiber optic sensor sector 9	Fiber optic sensor generating frequent alarms.	Installed short Fiber optic loop in Fiber optic sensor processor box.	Monitoring Fiber optic sensor for false alarms.	1.0	Fiber optic loop	N/A	N/A		Monitoring
07/29/93	RAIDS Fiber optic sensor sector 9	Fiber optic sensor in constant alarm.	Took temperature measurements. Internal temperature 44 degrees C.	Monitoring Fiber optic sensor	1.0	N/A	N/A	Digital Multimeter, temperature probe		Monitoring
08/02/93	RAIDS Fiber optic sensor sector 9	Fiber optic sensor in constant alarm.	Reconnected in ground Fiber optic sensor.	Monitoring Fiber optic sensor for false alarms.	2.0	N/A	N/A	N/A		Monitoring
05/17/93	RAIDS Field Junction Box 1 sector 1	24 VAC power to IR lost.	Repaired 24 VAC transformer and reapplied 24 VAC power to sector 1 Infrared sensors.	Infrared sensors restored to operation.	2.0	Solder	7/16" nut driver, flat blade screwdriver, Soldering Iron	Digital Multimeter		Closed 5/17/93
08/18/93	RAIDS Field Junction Box-1 TO SLU-1 cable	Improper wiring and non functional high beam discovered during previous maintenance.	Fault isolated cabling from FJB-1 to SLU-1, located spare shielded twisted pair to be used.	Indications of short on one side of shielded pair to ground. Identified spare twisted shielded pair.	1.0		7/16" Nut driver	Digital Multimeter		Open
05/10/93	RAIDS IPID sector 9A sector 14	Periodic maintenance.	Checked alignment and made minor adjustments to IPIDs in sector 9A and 14.	IPIDs functioning satisfactorily.	2.0	N/A	Bore Scope, Hex key set	N/A		Closed 01/10/93
05/24/93	RAIDS IPID sector 9A	IPID alarming frequently.	Realigned IPID in sector 9A.	IPID restored to normal operation.	1.0		Bore scope, Hex key set			Closed 05/24/93
06/01/93	RAIDS IPID sector 9A	IPID closest to sector 10 fell over apparently due to strong winds.	Reset IPID pole and aligned IPID.	IPID restored to normal operation.	1.0		Bore scope, Hex key set			Closed 06/01/93

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN PARTS HRS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
06/03/93	RAIDS IPID sector 9A	Periodic maintenance.	Checked IPID in sector 9A and made minor adjustments.	IPID functioning normally.	1.0	Bore scope, Hex key set			Closed 06/03/93
06/07/93	RAIDS IPID sector 9A	IPID had gone into constant alarm.	Found that one of the tripod leg locks on the transmitter pole had slipped and allowed the sensor to go out of alignment. Straightened transmitter pole tightened lock and aligned IPID.	IPID restored to normal operation.	1.0	Bore scope, Hex key set			Closed 06/07/93
06/08/93	RAIDS IPID sector 9A	Checked IPID after rain storm.	Made minor adjustments.	IPID operating satisfactorily.	1.0	Bore scope, Hex key set			Closed 06/08/93
06/23/93	RAIDS IPID sector 9A	IPID in sector 9A generating frequent alarms.	Checked alignment of IPID, raised transmitter lower beam module approximately 3" to prevent alarms caused by tall weeds/grass. Adjusted IPID.	IPID restored to normal operation.	1.0	Bore scope, Hex key set			Closed 06/23/93
06/24/93	RAIDS IPID sector 9A	IPID in constant alarm condition.	Isolated fault to lower half of beam, will continue trouble shooting tomorrow.	IPID still in constant alarm. Require IR test equipment to complete trouble shooting.	2.0				Open
06/25/93	RAIDS IPID sector 9A	Continued from 06/24.	Trouble shot IPID in sector 9A.	IPID still in constant alarm, can not continue trouble shooting until Infrared Viewer arrives.	2.0				Open
06/29/93	RAIDS IPID sector 9A	Continued from 06/24	Using IR viewer, localized IPID malfunction to lower module on transmitter pole B (no IR output). Problem isolated to faulty coax cable connection to transmitter module. Moved coax BNC connector to BNC connector Z on the module. Tested IR transmitter function by interrupting each beam and observing an alarm at the SOC.	IPID restored to normal operation.	2.0	Bore scope, Hex key set	Infrared viewer		Closed 06/26/93
08/03/93	RAIDS IPID sector 9A	IPID blown over by jet blast.	Righted receiver pole and aligned sensor.	IPID operating satisfactorily.	2.0	Bore scope, Hex key set			Closed 08/03/93
08/05/93	RAIDS IPID sector 9A	Base of IPID had settled during rainstorm and sensor was out of alignment.	Realigned sensor.	IPID restored to normal operation.	1.0	Bore scope, Hex key set			Closed 08/05/93

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08/11/93	RAIDS IPID sector 9A	IPID generating (nearly constant) alarms.	Relocated transmitter pole to a more stable footing and realigned eyes.	Alarms in sector 9A have ceased.	3.0		Bore scope, Hex key set		Closed 08/11/93
09/07/93	RAIDS IPID sector 9A	Grounds Maintenance completely severed cable to the receiver pole with lawn mower.	Cut out bad section of cable, spliced conductors, taped splices, and coated with silicon. Tested IPID.	IPID fully operational.	2.0				Closed 09/07/93
11/04	RAIDS IPID sector 9A	Frequent alarms with no apparent cause.	Realigned the IPID sensor in Sector 9A.	Non valid alarms ceased, IPID restored to normal operation	2.0	N/A	Site glass, Allen wrench	N/A	Closed 11/04
12/14	RAIDS sector 9A IPID	Storms and high winds over the week end had pushed the transmitter pole out of alignment by nearly 30 degrees due to the non-stable design of the tripod support.	Turned pole back to line transmitters and performed minor adjustments to the transmitter and receiver poles.	IPID restored to normal operation.	.5	N/A	hex wrench set, Bore Scope	N/A	Closed 12/14
12/20 & 12/21	RAIDS sector 9A IPID	IPID was going in and out of alarm with out apparent cause.	Attempted to align eyes with no success (12/20). Cleaned lenses and attempted to discern reason to the intermittent alarm but was unable to isolate cause (12/21).	IPID placed off line, IPID subsequently removed for return to vendor for refurbishment.	4.0 2 men @ 2.0 hrs.	Cleaning solution, wiping cloth	hex wrench set, flat blade screwdriver.	N/A	Open pending refurbis ECSI-EAG.
05/17/93	RAIDS IPIDs sector 9A sector 14	IPIDs alarming as result of storm on 5/16.	Realigned IPIDS in sectors 9A and 14.	IPIDs restored to normal operation.	0.0		Bore Scope, Hex key set		Closed 5/17/93
06/09/93	RAIDS IPID sector 14	IPID generating frequent alarms with out apparent cause.	Adjusted IR transmitter on pole B from 2" from ground to 8" from ground and aligned IPID to eliminate alarms due to grass.	False alarms have ceased.	1.0		Bore scope, Hex key set		Closed 06/09/93
08/11/93	RAIDS IPID sector 14	IPID generating frequent alarms.	Aligned eyes.	Alarms in sector 14 have been reduced.	1.0		Bore scope, Hex key set		Closed 08/11/93
07/19/93	RAIDS IRs IPIDs sectors 9, 9A, 12, 13, and 14	Infrared sensors in sectors 9,9A, 12, 13, and 14 alarming frequently	Used weed eater to trim tall weeds in sectors 9, 9 A, 12, 13, and 14.	Alarms reduced in sectors 9, 9A, 12, 13, and 14	2.0		Gas powered weed trimmer.		Closed 07/19/93

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08/24/93	RAIDS IR sector 1 FJB-2	Improper wiring and non functional high beam discovered during previous maintenance.	Installed 2 24 VAC 50 Va power supplies in FJB-2 replacing the test 24 VAC transformer which had been previously installed.	Sector 1 and 2 IR sensors now have separate 24 VAC power source, work continues on IR sensors.	1.0	2 24 VAC 50 Va transformers, "slak-on" terminals, cable ties	7/16" nut driver, flat blade screwdriver	Digital Multimeter, Step ladder		Open
05/13/93	RAIDS IR sector 1	Infrared interference alarms are constant.	Disassembled receiver and transmitter poles, rewired in accordance with Bird-Eye drawings.	Interference alarm problem not corrected.	4.0	N.A	#2 Phillips screwdriver, Flat blade screwdriver			Open
05/14/93	RAIDS IR sector 1	Infrared interference alarms are constant.	Returned IR sensors in sector 1 to their original condition.	Interference alarm problem not corrected.	4.0	N/A	#2 Phillips screwdriver, Flat blade screwdriver			Open
06/30/93	RAIDS IR sector 1	Infrared sensor in sector 1 alarming frequently.	Using BIRD-EYE test equipment, aligned all transmitters and receivers for optimum gain. Tested sensor.	Infrared sensor tested ok.	4.0	N/A	Phillips screwdriver	Bird-Eye IR test meters,IR viewer		Closed 06/30/93
06/30/93	RAIDS IR sector 1	IR interference went into constant alarm at 13:59 hrs.	Investigated cause of interference alarm. Appears to be reflected sunlight from window behind the transmitter pole.	Non reflective coating or filter required to eliminate reflected IR sources.	2.0	N/A	IR viewer			Open
07/01/93	RAIDS IR sector 1	Frequent IR interference alarms during certain parts of the day.	Investigated sources of IR light in sector 1.	Reflected infrared light appears to be coming from automobile bumpers and windows.	2.0			Infrared viewer		Open
07/27/93	RAIDS IR sector 1	Sector 1 IR interference in constant alarm.	Attempted corrective maintenance on sector 1 IR. Using Bird-Eye meters discovered IR light from other sources was entering receivers. By blocking the space between sector 1 and sector 2 receiver poles the extraneous IR went away. Even with optimum alignment of the 9 receivers and transmitters the sensors remain in constant alarm.	Investigation is continuing, IRIN sensor is off line.	4.0		#2 Phillips screwdriver,	Bird-Eye alignment meters, Bird-eye IR viewer		Open
08/02/93	RAIDS IR sector 1	IR in constant alarm.	Continued maintenance, attempted alignment of IR.	IR still in constant alarm.	4.0		#2 Phillips screwdriver, step ladder	Bird-Eye meters, IR viewer		Open

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08/04/93	RAIDS IR sector 1	IR in constant alarm.	Keith Futty and Jeff Aston of Fairfield arrived to trouble shoot the Bird-Eye IR sensor in sector 1. 1 faulty receiver was found and replaced. IR sensor was aligned. Discovered that none of the top 3 eyes in any 9 high pole would alarm. Investigated sectors 2 and 3 and found the same. These eyes have apparently never worked.	Constant alarm condition resolved. Fairfield recommends rewiring sensors IAW Bird-Eye specs.	18.0	Receiver eye	#2 Phillips screwdriver.	Digital Multimeter, Bird-Eye meters, IR viewer		Closed 08/04/93
08/13/93	RAIDS IR sector 1	Improper wiring and non functional high beam discovered during previous maintenance.	Installed test 24 VAC transformer in Field Junction box 2. Installed batteries in receiver and transmitter poles, disconnected external 12 VDC and connected internal 12 VDC.	Sector 1 low beam operational, high beam non operational, interference constant.	6.0	24 V transformer	7/16" nut driver, #2 Phillips screwdriver	Digital Multimeter		Open
08/17/93	RAIDS IR sector 1	Improper wiring and non functional high beam discovered during previous maintenance.	Replaced receiver board and top receiver optic (optic previously replaced with a used optic and apparently failed)	Sector 1 IR operational, interference non operational.	4.0	Receiver optic, receiver board	7/16" Nut driver, #2 phillips screwdriver	Digital Multimeter		Open
08/25/93	RAIDS IR sector 1	Improper wiring and non functional high beam discovered during previous maintenance.	Continued troubleshooting sector 1 IR. Transmitter and receiver poles pulled and taken to factory for repair by Keith Futty of Fairfield on 8/26/93.	IR poles returned to factory for repair on 08/26/93.	14.0					Open
08/30/93	RAIDS IR sector 1	Return of sector 1 IR poles from factory	Installed repaired IR poles, attempted IR alignment, replaced top receiver on transmitter pole and bottom receiver on receiver pole, aligned optics.	Bottom beams operational, top beam will not go into alarm.	15.0	2 receiver optics	7/16" Nut driver, flat blade screwdriver #2 Phillips screwdriver, Step ladder.	Digital Multimeter, Bird-Eye Meters, IR viewer		Open
09/02/93	RAIDS IR sector 1	Continued maintenance from 08/30/93.	Checked sector 1 IR per request of Keith Futty of Fairfield.	Discovered that there is an apparent wiring problem with the pole to pole alarm pair.	0.5		#2 Phillips screwdriver, step ladder	Digital Multimeter		Open
09/03/93	RAIDS IR sector 1	Continued maintenance from 08/30/93.	Checked pole to pole alarm pair for continuity, found to be faulty, located and connected spare pair (Replaced orange/black pair with red/brown pair).	Pole to pole alarm pair now good.	1.0	"Stak-on" terminals, cable ties	#2 Phillips screwdriver, Flat blade screwdriver step ladder			Open

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09/20/93	RAIDS IR sector 1	Continued maintenance	Connected new shielded wire pair for interference alarm to SLU-1	Have known good interference pair to SLU-1.	0.5	2 "slak-on" terminals	7/16" Nut driver, flat blade screwdriver			Open
09/23/93	RAIDS IR sector 1	Sector 1 IRIN going in and out of alarm	Investigated, found that interference resistor pair not connected. Connected interference resistor pair.	Sector 1 IRIN secure.	1.0		7/16" Nut driver, flat blade screwdriver.			Closed 09/23/93
09/24/93	RAIDS IR sector 1	Sector 1 IRIN going in and out of alarm.	Used IR viewer to identify optic causing interference, adjusted optic on transmitter pole	Sector 1 IRIN secure.	2.0		#2 Phillips screwdriver, step ladder	Bird-Eye meters, IR viewer		Closed 09/24/93
08/11/93	RAIDS IR sector 1, 2, 3 and 4	Improper wiring and non functional high beam discovered during previous maintenance.	Began tracing wiring of IR sensors. Recorded pole side and field side wiring. Installed shield between sector 1 and 2 to reduce interference alarms. Discovered that sector 3 high beam is alarming at Junction Box but is not being reported to SOC.	Maintenance continues.	12.0		7/16" Nut driver, #2 phillips screwdriver	Digital Multimeter		Open
08/17/93	RAIDS IR sector 2	Improper wiring and non functional high beam discovered during previous maintenance.	Rewired transmitter and receiver poles to specifications, Cleaned lenses, tested upper and lower beam interference alarms. Lifted shield on twisted pair to SLU-1 (in FJB)	Sector 2 IR operational after shield was lifted.	8.0		7/16" Nut driver, #2 Phillips screwdriver	Digital Multimeter		Closed 08/16/93
08/27/93	RAIDS IR sector 2	Sector 2 IR in constant alarm	Investigated and discovered that SLU pair had been left disconnected during maintenance on 08/26/93. Reconnected SLU pair.	Sector 2 IR fully operational.	1.0		7/16" nut driver, flat blade screwdriver			Closed 08/27/93
07/01/93	RAIDS IR sector 2	Frequent IR interference alarms during certain parts of the day.	Investigated sources of IR light in sector 2.	Reflected infrared light appears to be coming from automobile bumpers and windows.	1.0			IR viewer		Open
08/16/93	RAIDS IR sector 3	Improper wiring and non functional high beam discovered during previous maintenance.	Traced and rewired both transmitter and receiver poles.	Top beam interference appears to work at FJB, bottom beam inoperative, appears to be bad pair to SLU	8.0		7/16" nut driver, #2 Phillips screwdriver	Digital Multimeter		Open
08/23/93	RAIDS IR sector 3	Improper wiring and non functional high beam discovered during previous maintenance.	Began fault isolating sector 3 IR, found all six transmitters bad on transmitter pole, (probably results of improper wiring)	Awaiting replacement transmitters.	9.0		7/16" Nut driver, #2 Phillips screwdriver	Digital Multimeter		Open

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08/25/93	RAIDS IR sector 3	Improper wiring and non functional high beam discovered during previous maintenance.	Installed repaired transmitters in sector 3 IR transmitter pole, rewired sector 3 IR, cleaned optics and lenses.	Sector 3 IR and IRIN operational to FJB 3-5, but goes in and out of alarm when connected to SLU pair	12.0	6 Transmitters	7/16" Nut driver, flat blade screwdriver #2 Phillips Screwdriver	Digital multimeter, Bird-Eye meters, IR viewer		Open
09/20/93	RAIDS IR sector 3	Continued maintenance	Installed new interference alarm resistor pair.	Sector 3 IR and IRIN now fully operational.	0.5	2 "stak-on" terminals 2 resistors	7/16" Nut drive r, flat blade screwdriver			Closed 09/20/93
08/12/93	RAIDS IR sector 3 and 4	Improper wiring and non functional high beam discovered during previous maintenance.	Installed 1x1 jumper on receiver pole and connected 1x1 jumper in transmitter pole, disconnected external 12 VDC power and installed a 2nd 24 VAC 50 Va transformer in Field Junction Box 3, installed batteries in transmitter and receiver poles, cleaned lenses and aligned optics.	Upper beam and lower beam operational, interference alarm constant, trouble shooting to continue.	12.0	24 VAC transformer, jumper.	7/16" nut driver, #2 Phillips screwdriver	Digital Multimeter, Step ladder, Bird-Eye meters, IR viewer.		Open
08/23/93	RAIDS IR sector 4	Improper wiring and non functional high beam discovered during previous maintenance.	Rewired sector 4 IR, installed new 24 VAC power supply in FJB 3-5 to replace the one previously installed.	Sector 4 100% operational.	8.0	24 VAC 50 Va transformer	7/16" Nut driver, #2 Phillips screwdriver	Digital Multimeter		Closed 08/23/93
09/20/93	RAIDS IR sector 4	Continued maintenance	Installed new interference alarm resistor pair.	Sector 4 IR and IRIN now fully operational.	0.5	2 "stak-on" terminals 2 resistors	7/16" Nut driver, flat blade screwdriver			Closed 09/20/93
09/22/93	RAIDS IR sector 4	Continued maintenance	Assisted Keith Futty of Fairfield in alignment of sector 1 IR.	Sector 1 IR and IRIN operational.	8.0		#2 Phillips screwdriver, step ladder	Bird-Eye Meters, IR viewer		Closed 09/22/93
06/10/93	RAIDS IR sector 9	Infrared sensors in sector 9 generating frequent alarms.	Removed black plastic fencing which had come loose and moved into sensor area.	Alarms have ceased	0.5					Closed 06/10/93
05/08/93	RAIDS Obstruction light sector 9	Light bulb in sector 9 obstruction light is out.	Replaced light Bulb in obstruction light.	Obstruction light operational.	0.5	40 Watt light bulb	N/A	N/A		Closed 05/08/93
01/11	RAIDS Obstruction light sector 9.	Warning light on sector 9 lence burned out.	Replaced light bulb	Warning light operational	.5		40 watt light bulb	N/A		Closed 01/11
06/01/93	RAIDS Power Junction Box tamper switch sector 9	Extra weather proofing installed by CINCO caused switch to not engage fully when door was closed.	Adjusted tamper switch so that switch will close when door is closed.	Tamper switch restored to normal operation.	0.5		Flat blade screwdriver			Closed 06/01/93

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06/21/93	RAIDS sector lighting sector 9	Sector lighting not turning on/off at proper times.	Reset light control in sector 9.	Sector lighting now turns on at dusk and off at dawn.	0.5	N/A				Closed 06/21/93
08/03/93	RAIDS sector lighting sector 9	Lighting in sector 9 is on constantly and does not turn off with timer.	Investigated and discovered possible relay failure. Notified CINCO.	Sector lighting on constantly pending repairs to be made by CINCO.	2.0			Digital multimeter		Open
08/12/93	RAIDS sector lighting sector 9	Lighting in sector 9 is on constantly and does not turn off with timer.	Chuck Ledy of CINCO assisted with trouble shooting of the Sodium vapor lights in sector 9, fault isolated to failed lighting contactor module (probable cause moisture). Wired around faulty module as a temporary measure.	Lighting control has temporary fix until parts can be obtained.	2.0			Digital Multimeter		Open
06/21/93	RAIDS SLU-1 sector 9	SLU-1 went down for no apparent reason at approx 09:00 hrs.	Inspected SLU-1 and discovered a red light on the XVME-560 card. Reset MVME-133 (CPU) card and SLU-1 came back on line.	SLU-1 restored to normal operation.	0.5				Closed 06/21/93	
07/08/93	RAIDS SLU-1 sector 9	SLU-1 went off line.	Malfunction is apparently temperature related. Opened signal junction box door, powered down SLU-1 and let it cool down about 20 minutes.	Upon power up SLU-1 came back on line and functioned normally.	1.0		7/16" Nut driver			Closed 07/08/93
07/28/93	RAIDS SLU-1 sector 9	Continued action required from previous maintenance reports. Temperature.	Installed fan in SLU-1 box, opened vent hole in bottom of box to allow air circulation.	Weather proof louvers are required.	2.0	Fan, electrical plug, power cord	Screwdriver, 7/16" nut driver			Open

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10/11	RAIDS PIEZO ELECTRIC SENSORS	Not receiving correct alarm indication at SOC console.	Don Halvorsen of AMP investigated the condition of the piezoelectric sensors buried in Sector 11 (Taxiway F). Assisted Don and one of his technicians in setting up their diagnostic equipment and provided a keyboard and monitor to interface with the SPLCU computer. Verified that four of the five installed sensor strips are functioning properly. Sensor "C" is shorted and does not function. AMP will contact FAATC to arrange for a possible replacement	Piezoelectric sensors functioning at degraded capability.	9.0 3 men @ 3 hrs.	N/A	N/A	Keyboard, Monitor	Open, pending correct by AMP
01/26-27 01/29	RAIDS Piezo strips taxi way "F" sector 11	MAA operations advised that substantial damage was done to piezo electric strips embedded in taxi way "F" during snow removal	Removed as much of loose piezo electric strips as possible. It appears sensors will have to be replaced.	Piezo electric sensors inoperable.	6.0	N/A	knife, end nip cutters	N/A	Open pending refurbis AMP
9/28-10/1	RAIDS PRLS sector 13	Moved PRLS sensors from Sector 13 to Sector 10 to support WRA testing. Upon connection, the sensors did not work - even though they had functioned in Sector 13 prior to movement.	Problem was isolated to the Transmitter unit (S/N 104), but cause is not known	PRLS non operational	4.0 2 men @ 2 hrs.	N/A	Multimeter	N/A	Closed 10/01
10/04	RAIDS PRLS sector 13	PRLS failed during WRA test.	Moved PRLS sensors back to Sector 13 and verified that the transmitter has failed.	PRLS does not function.	2.0 2 men @ 1.0 hrs.	N/A	N/A	N/A	Closed Re RAIDS-PRL
10/15	RAIDS PRLS sector 13	PRLS failed during WRA tests.	Retrieved PRLS sensors from Sector 13 in preparation for shipment to SNL next week.	PRLS off line pending repair or replacement.	1.5 2 men @ .75 hrs.	N/A	N/A	N/A	closed 10/15 Sensor installed
10/12-13	RAIDS TAUT WIRE sector 1	Taut wire stressed during WRA test	Inspected the taut wire sensors in Sector 1 after intrusion tests to verify that no damage had been done to the system (no damage found).	Taut wire fully functional.	.5	N/A	N/A	N/A	Closed 10/13
05/06/93	RAIDS Vehicle Portal sector 4 gate A1 limit switch	Limit switch bracket on gate A1 came loose and jammed the gate. Upon investigation it appeared that several bolts were loose or missing.	Manually operated portal, using gate A2 as the entry gate while Sandia personnel put the A1 bracket back on track and replaced the missing bolts in the bracket. Sandia personnel also installed additional bolts in the limit switch bracket on gate A2 (two bolts were missing).	Gate A1 limit switch restored to normal operation.	5.0	Bolts	socket set	N/A	Closed 05/05/93

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07/06/93	RAIDS Vehicle Portal sector 4 A2 cable reel	Periodic maintenance for gate A2 cable reel.	Disassembled brush/slip ring assembly and cleaned slip rings with solvent, polished contact surfaces with solvent and .3 micron polishing paper. Reassembled brushes and cable reel. Operated gate to verify operation.	Gate/reel operated satisfactorily.	2.0	Solvent, Polishing cloth				Closed 07/06/93
01/21	RAIDS Vehicle Portal sector 4 crash gate A2	Gate A2, Air side, jammed by ice due to winter storm.	During evaluation after winter storm, gate jammed during evaluation. removed all visible ice and obstructions. Gate would not open with controller. Removed spring tension from the drive wheels and manually pushed gate open.	further evaluation will be performed when weather moderates.	1.0	flat blade screwdriver	N/A	N/A		Open 01/21 Closed 02/03
11/17-18	RAIDS VIDEO LINK sector 13	Lost video from sector 13 CCTV camera. (camera 15)	Replaced both fiber optic receiver in the SOC and the fiber optic transmitter at camera pole, changed the signal to the spare fiber, and disconnected the camera from the fiber link and monitoring the video at the camera. At this time, it appears that the signal has been interrupted somewhere in the fiber optic cable itself.	Video from sector 13 bad.	8.0 2 men @ 4 hrs.	Fiber optic receiver, Fiber optic transmitter	Screw driver, 7/16" Nut Driver	Video monitor	Open, OTDR and Amplifie d Light source required.	
05/26/93	REVOLVING DOORS Door 108 Light curtain	Door 108 in constant alarm	Found a light module in the "spider" section had come out of alignment. Modules were adjusted and light curtain turned back on.	Door 108 restored to normal operation.	1.0		Pocket screwdriver			Closed 05/26/93
05/08/93	REVOLVING DOORS Door 109 Light curtain	Light curtain in constant alarm.	Discovered that light module closest to "spider" had vibrated loose. Disconnected module and tested door with test blocks.	Operation is satisfactory, will replace module and glue in place at a future date. Door 109 light curtain operating at acceptable level of performance.	2.0		Pocket screwdriver	test blocks		Open
05/19/93	REVOLVING DOORS Door 109 Light curtain	Door 109 light curtain alarming frequently.	Cleaned reflectors	Alarms ceased.	0.5	Cleaning fluid, wiping cloth	N/A	N/A		Closed 05/19/93
05/26/93	REVOLVING DOORS Door 109 Light curtain	Door 109 in constant alarm	Found a light module in the "spider" section had come out of alignment. Modules were adjusted and light curtain turned back on.	Door 109 restored to normal operation.	1.0		Pocket screwdriver			Closed 05/26/93
06/02/93	REVOLVING DOORS Door 109 Light curtain	Light curtain for door 109 had been turned off by CSS due to constant alarm condition.	Attempted to determine faulty module but was unable to do so without assistance	Light curtain off until additional personnel available to assist.	0.5					Open

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06/09/93	REVOLVING DOORS Door 109 Light curtain	Door 109 light curtain generating random alarms.	Adjusted two light curtain modules which had drifted out of alignment. Tested light curtain with 3" and 1" block.	Light curtain is functioning satisfactorily.	1.0		Pocket screwdriver	test blocks		Closed 06/09/93
06/16/93	REVOLVING DOORS Door 109 Magnetic locks	On 6/15, a parent attempted to get to a child standing in the light curtain and somehow disengaged the magnetic locks and broke a wing free.	The CSS stopped the door, released the magnetic locks and reset the wing. The light curtain was turned off. Light curtain was turned on at 14:00 hrs.	Door 109 appears to be functioning properly, will monitor for further problems.	1.0					Closed 06/16/93
06/18/93	REVOLVING DOORS Door 109 Magnetic locks	The 24 VDC wires supplying power to the Magnetic Lock slip rings had become wrapped around the shaft, pulling wires from the contact brush assembly and breakout box.	Replaced Brush assembly, and attached wires to break out box, found no 24 VDC at terminal lug on breakout box, troubleshooting isolated trouble to disconnected wire at output of break out box, connected wire.	Door 109 magnetic locks restored to normal operation.	3.0		Stubby screwdriver	Digital Multimeter		Closed 06/18/93
06/29/93	REVOLVING DOORS Door 109 Light curtain	Light curtain generating frequent alarms.	Adjusted light curtain modules, tested detection with test block.	Door 109 light curtain restored to normal operation.	0.5			Test blocks		Closed 06/29/93
06/30/93	REVOLVING DOORS Door 109 Light curtain	Door 109 light curtain turned off by CSS at 21:52 hrs. due to excessive alarms.	Deferred until Ben Brannen of Horton Automatic arrives on site.	Door operating with light curtain off.	0.5					Open Closed 07/15/93
06/30/93	REVOLVING DOORS Door 108 Light curtain	Door 108 light curtain turned off by CSS at 09:05 hrs. due to excessive alarms.	Deferred until Ben Brannen of Horton Automatic arrives on site.	Door operating with light curtain off.	0.5					Open Closed 07/14/93
07/05/93	REVOLVING DOORS Door 109 Magnetic locks	Notified by Pier B CSS at 13:33 hrs that door 109 was making strange sounds and had been shut off.	Trouble shooting revealed the Slip ring set screw had come loose allowing Magnetic lock slip ring to move up on central shaft. Contact brushes were only making occasional contact with slip ring assembly. Repositioned and secured Slip ring assembly and tested Magnetic locks.	Door 109 Magnetic locks restored to normal operation	3.0		Allen wrench			Closed 07/05/93
07/26/93	REVOLVING DOORS	Request from Delta station manager to install extension speakers for revolving door message.	Installed two speakers in pier B screening area.	Revolving door message now annunciates in screening area.	3.0	2 4" speakers, wire, 2 "stak-on" terminals	Screwdriver			Closed 07/26/93

TABLE 2. MAINTENANCE ACTIONS FOR BWI EASSP EQUIPMENT

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07/13/93	REVOLVING DOORS Door 108 Light curtain	Continued maintenance from 06/30/93	With Ben Brannen of Horton Automatic, began alignment of light curtain. Removed reflectors, cleaned and installed new reflectors. Aligned light modules. Observed an extreme amount of dirt around reflectors and optics. Alignment procedure completed on 07/14/93 at 15:00 hrs.	Light curtain functioning properly.	16.0	Reflectors, cleaning solution, wiping cloth	Pocket screwdriver, business card			Closed 07/14/93
07/14/93	REVOLVING DOORS Door 109 Light curtain	Continued maintenance from 06/30/93	With Ben Brannen of Horton, Cleaned reflectors and optic on light curtain, aligned light curtain. Adjusted sensitivity of sensors, light curtain on at 14:25 hrs.	Light curtains operational.	8.0	Cleaning solution, wiping cloth	Pocket screwdriver, business card			Closed 07/15/93
07/14/93	REVOLVING DOORS Door 108 Light curtain	Pedestrian got a luggage cart jammed in revolving door. Another pedestrian attempted to assist in extricating the cart. Wing was apparently sprung, light curtain in constant alarm.	With Ben Brannen of Horton, Checked wings of door and found wing C/D to be out of true. Trued wing and checked sensor alignment.	Light curtain operational 11:00 hrs.	3.0		Pocket screwdriver			Closed 07/15/93
07/19/93	REVOLVING DOORS Door 109 - ght curtain	Light curtain generating frequent random alarms.	With Ben Brannen of Horton, aligned sensors near drum side of wings.	Light curtain on at 10:00; door operating satisfactorily.	2.0		Pocket screwdriver			Closed 07/19/93
07/19/93	REVOLVING DOORS Door 108 Light curtain	Light curtain generating frequent random alarms.	With Ben Brannen of Horton, adjusted sensors, isolated alarming sensors to last 6 nearest "spider" section, aligned sensors and turned light curtain on.	Light curtain on at 14:50, door operating satisfactorily.	4.0		Pocket screwdriver			Closed 07/19/93
07/21/93	REVOLVING DOORS Door 108 Light curtain	Alarms on door 108 are inconsistent with light curtain alarms.	With Ben Brannen of Horton, wiped dust from Lexan strips, found sensor in "spider" section with loose lens and repaired and realigned sensors.	Light curtain on and operating satisfactorily at 16:45 hrs.	5.0	Super glue	Pocket screwdriver			Closed 07/21/93
07/27/93	REVOLVING DOORS Door 109 Light curtain	Light curtain generating random alarms and was turned off by CSS.	Found two light modules out of alignment, adjusted modules.	Light curtain performing satisfactorily.	2.0		Pocket screwdriver			Closed 07/27/93
08/09/93	REVOLVING DOORS Door 109 Light curtain	Periodic maintenance	Cleaned Lexan covers to light curtain reflectors.	Preventative maintenance completed.	1.0	Cleaning solution, wiping cloth				Closed 08/09/93
08/09/93	REVOLVING DOORS Door 108 Light curtain	Door 108 generating random alarms.	Cleaned Lexan covers to light curtain reflectors.	Door 108 light curtain restored to normal operation.	1.0	Cleaning solution, wiping cloth				Closed 08/09/93

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DATE	SUBSYSTEM/ SENSOR	REASON FOR MAINTENANCE	MAINTENANCE ACTION/PROCEDURE	RESULT OF MAINTENANCE	MAN HRS	PARTS	TOOLS	TEST EQUIPMENT	COST	STATUS/ COMMENTS
09/02/93	REVOLVING DOORS Door 109 Light curtain	Door 109 light curtain generating random alarms.	Cleaned Lexan strips over light curtain reflectors.	Door 109 light curtain restored to normal operation.	0.5	Cleaning solution, wiping cloth				Closed 09/02/93
09/02/93	REVOLVING DOORS Door 108 Light curtain	Door 108 light curtain generating random alarms.	Cleaned Lexan strips over light curtain reflectors.	Door 108 Light curtain restored to normal operation.	0.5	Cleaning solution, wiping cloth				Closed 09/02/93
09/09/93	REVOLVING DOORS Door 108 Magnetic locks	During revolving door testing, Magnetic locks began disengaging and engaging as door rotated.	Investigated and discovered that the slip ring assembly set screws had backed out and allowed the slip ring to move away from the contact brush assembly. Repositioned slip ring assembly and attempted to tighten set screws. One set screw has stripped the threads from the plastic and will not tighten.	Door 108 operational, but testing will be curtailed until permanent repairs can be accomplished.	2.0		Stubby screwdriver, step ladder			Open
09/16/93	REVOLVING DOORS Door 109 Magnetic locks	Magnetic locks began disengaging and engaging as door rotated.	Slip ring assembly set screws had come loose allowing slip ring to move away from contact brush assembly.Repositioned slip ring assembly and attempted to tighten set screws, one set screw has stripped the threads from the plastic.	Door 109 operational, but slip ring is subject to possible movement until permanent repairs can be accomplished.	1.5		Stubby screwdriver, step ladder			Open
09/20/93	REVOLVING DOORS Door 108 Magnetic locks	Continued maintenance from 09/09/93. Installation of locking screw in slip ring assembly.	Removed allen head set screw, drilled and tapped into central shaft, installed locking screw. Cleaned and vacuumed door area, including above door.	Door 108 restored to normal operation.	3.0	1 10x32x2" screw	Drill motor, drill bit, flat blade screwdriver			Closed 09/20/93
09/20/93	REVOLVING DOORS Door 109 Magnetic locks	Continued maintenance from 09/16/93. Installation of locking screw in slip ring assembly.	Removed allen head set screw, drilled and tapped into central shaft, installed locking screw. Cleaned and vacuumed door area, including above door. Adjusted 2 light modules on light curtain.	Door 109 restored to normal operation.	3.0	1 10x32x2" screw	Drill motor, drill bit, flat blade screwdriver			Closed 09/20/93
06/16/93	REVOLVING DOORS Door 108 Light curtain	Light curtain went into constant alarm on 6/14 after numerous alarms on 6/13.	Adjusted two light modules, one on the "spider" section and the other the second closest to the "spider".	Door 108 light curtain restored to normal operation.	1.0		Pocket screwdriver			Closed 06/16/93
06/22/93	REVOLVING DOORS Door 108 Light curtain	Light curtain turned off by CSS due to frequent alarms.	Aligned light curtain and cleaned reflectors.	Door 108 light curtain restored to normal operation.	0.5	Cleaning solution, wiping cloth				Closed 06/22/93

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06/29/93	REVOLVING DOORS Door 108 Light curtain	Light curtain generating frequent alarms	Adjusted light curtain modules, tested detection with test block.	Door 108 light curtain restored to normal operation.	0.5			Test blocks		Closed 06/29/93
9/28-29	REVOLVING DOORS Door 108 Light Curtain.	Light curtain generating false alarms.	Used shop vacuum to clean overhead of door.	False alarms seem to have ceased, Door 108 restored to normal operation.	2.0	N/A	Shop Vacuum	N/A		Closed 9/29
10/5-6	REVOLVING DOOR DOOR 108 LIGHT CURTAIN	Light curtain for Door 108 generating false alarms.	Cleaned Light curtain Lexan strips.	Attempts to correct light curtain problem not successful. Door 108 operating with light curtain off.	2.5	cleaning solution, wiping cloth	N/A	N/A		Closed 10/6
10/6	REVOLVING DOORS DOOR 108 LIGHT CURTAIN	Light curtain generating false alarms.	One faulty module was located and replaced, the sensitivity of one module in the spider section was adjusted, and the light curtain lexan strips cleaned. RELATED MAINTENANCE: The set screw securing the slip ring assembly to door shaft was checked. Set screw was removed from the tapped hole, "Loc-Tite" applied to the threads and then the screw reinserted.	Door 108 restored to normal operation.	6.0 3 men @ 2 hrs.	1 light module, cleaning solution, wiping cloth, Loc-Tite.	Jewelers screw driver	N/A	From stock	Closed 10/6
10/26	REVOLVING DOORS DOOR 108 LIGHT CURTAIN	Light curtain generating false alarms.	Made minor adjustments to two light curtain modules.	Door 108 restored to normal operation.	1.5		Jewelers Phillips screw driver.	N/A		Closed 10/26
11/11	REVOLVING DOORS DOOR 108 LIGHT CURTAIN	Light curtain generating random alarms.	Cleaned lexan strips on light curtain.	Door restored to normal operation.	1.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 11/11
11/12	REVOLVING DOORS DOOR 108 LIGHT CURTAIN	Light curtain generating random alarms.	Removed Lexan strips, cleaned reflectors and Lexan strips and reinstalled Lexan strips on revolving door.	Door restored to normal operation.	1.0	Cleaning solution, wiping cloth	N/A			Closed 11/12
11/23	REVOLVING DOORS LIGHT CURTAIN Door 108	Light curtain generating false alarms.	Cleaned Lexan strips on revolving door 108, removed lexan shield below light modules and cleaned, cleaned clear lexan shield below spider section light modules.	Door 108 restored to normal operation.	2.5	Cleaning solution, wiping cloth	#2 Phillips Screw Driver	N/A		Closed 11/23

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10/26	REVOLVING DOORS DOOR 108 MAGNETIC LOCKS	Magnetic locks engaging and disengaging as door rotates.	Replaced Magnetic Lock contact brush assembly (apparently broken previously and temporarily repaired) on door and cleaned Light Curtain reflectors and lexan strips.	Door 108 restored to normal operation.	2.5 hrs.	cleaning solution, wiping cloth, Contact Brush assembly.	Flat blade screw driver.	N/A	$200.00	Closed 10/26
11/05	REVOLVING DOORS DOOR 108 MAG LOCKS	Magnetic locks disengaging and engaging as door rotates.	Contact Brush assembly not making constant contact with slip ring assembly. Removed the magnetic lock brush assembly and inserted washers between the assembly body and the mounting bracket to relocate the brushes. Replaced the original mounting bolts with new and longer ones to account for the washers.	The brushes are now centered on the slip rings and are providing constant power to the magnetic wing locks.	4.0 2 men @ 2 hrs.	10 washers, 2 4"x 1/8" screws, 2 locking nuts.	Flat blade screw driver, 4" adjustable wrench.	N/A		Closed 11/05
10/18	REVOLVING DOORS DOORS 108 AND 109 light curtain	Light curtains generating false alarms.	Made minor adjustments to two light curtain modules on Door 109. Cleaned Door 108 and attempted to align light curtain.	Door 109 restored to normal operation The 108 curtain seems to be very temperamental and does not hold alignment well.	3.0	Cleaning solution, wiping cloth,	Jewelers Phillips screw driver.	N/A		Closed 10/18
10/21	REVOLVING DOORS DOORS 108 & 109 Light Curtain	Both doors started false alarming after VSP maintenance personnel cleaned doors.	Cleaned Lexan strips on light curtains. Advised the VSP supervisor that the Lexan strips must be free of dust and water drops to allow the doors to operate properly.	Door restored to normal operation.	2.0	cleaning solution, wiping cloth	N/A	N/A		Closed 10/21
10/26	REVOLVING DOORS. DOORS 108 AND 109 LIGHT CURTAINS.	Light curtains generating false alarms.	Cleaned Lexan strips on both 108 and 109.	Doors 108 and 109 restored to normal operation.	2.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 10/26
11/05	REVOLVING DOORS DOORS 108 AND 109 LIGHT CURTAIN	Exit Doors 108 and 109, alarming randomly.	Cleaned reflectors on light curtain.	Doors 108 and 109 restored to normal operation.	2.0	Cleaning solution, wiping cloth.	N/A	N/A		Closed 11/05
11/05	REVOLVING DOORS DOORS 108 AND 109 LIGHT CURTAIN	Light curtains generating false alarms, second report for the day.	Cleaned light curtain Lexan strips and reflectors on Revolving Doors 108 and 109.	Doors 108 and 109 restored to normal operation.	2.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 11/05

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11/08	REVOLVING DOORS DOORS 108 AND 109 LIGHT CURTAIN	Light curtains generating false alarms.	Cleaned reflectors and Lexan strips on revolving doors 108 and 109.	Revolving doors restored to normal operation.	2.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 11/08
11/15	REVOLVING DOORS DOORS 108 AND 109 LIGHT CURTAIN	Light curtains generating random alarms.	Cleaned reflectors and Lexan strips on revolving doors 108 and 109.	Doors restored to normal operation.	2.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 11/15
11/29	REVOLVING DOORS LIGHT CURTAIN Doors 108 and 109	Light curtains generating false alarms. Doors had started false alarming over the week end and the light curtains had been turned off by the CSS.	Cleaned the reflectors and Lexan covers.	Doors restored to normal operation.	2.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 11/29
11/09	REVOLVING DOOR DOOR 109 LIGHT CURTAIN	Light curtain generating random alarms.	Removed upper Lexan plate below light modules and examined clear Lexan below light modules. An extreme amount of dust and evidence of liquid intrusion was observed on the clear Lexan. The Lexan plate was also very dusty in the "spider" area. Cleaned and reinstalled Lexan plate, removed lower Lexan strips, cleaned reflectors and Lexan strips and reinstalled.	Door restored to normal operation, operating with light curtain on.	3.0 2 men @ 1.5 hrs.	Cleaning solution, wiping cloth	#2 Phillips screwdriver	N/A		Closed 11/09
12/2	REVOLVING DOORS LIGHT CURTAIN Door 109	Light curtain generating false alarms.	Cleaned Lexan strips on revolving doors 109.	Door 109 restored to normal operation.	1.0	Cleaning solution, wiping cloth.	N/A	N/A		Closed 12/02
10/12	REVOLVING DOORS DOOR 109	Continued maintenance from 9/30 slip ring maintenance.	Installed Contact Brush assembly provided by Horton Automatic Door in revolving door 109. Tightened Lock bar on top of door which dropped during emergency exit training. Corrected light curtain problems by cleaning Lexan strips and adjusting light modules.	Door 109 restored to normal operation.	10.0 2 men @ 5 hrs.	Contact Brush assembly, cleaning solution, wiping cloth.	Flat blade screw driver, hex head socket driver.	N/A		Closed 10/12

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9/30-10/01	REVOLVING DOORS DOOR 109 Magnetic locks.	Door wing broke away as passenger was exiting the sterile area	The Slip ring assembly on door 109 had again come loose and slid down on the shaft. The problem was compounded by the head of the screw striking the contact brush assembly and breaking the casing. The Contact Brush Assembly was repaired and the Slip Ring assembly repositioned. On start up, light curtain alarms began, attempted to correct problem (suspected dirt in optics from work on contact brush and slip ring assembly).	Attempts to correct light curtain problem not successful. Door operating with light curtain off.	14.0 2 men for 7.0 hrs.	Repaired Contact Brush Assembly, Super Glue, flat blade screw driver.	battery powered drill motor, allen wrench, #2 phillips screw driver.	Multimeter		Closed 10/01
10/20	REVOLVING DOORS DOOR 109 MAGNETIC LOCKS	Magnetic locks disengaged.	Locking screw previously installed had worked loose allowing slip ring assembly to move on shaft. The locking screw interfered with contact brush assembly causing contact brush assembly to break. Additionally the wires connecting the slip ring assembly to door wings had become tangled and one wire had broken off next to the slip ring assembly. Contacted Ben Brannen of Horton Automatic Door regarding replacement parts and repair procedures for replacing or repairing slip ring assembly, replacement contact brush assembly and replacement miscellaneous function board. Removed Miscellaneous function board (C9954) from door 109 and swapped with faulty board in door 108. Rebuilt 109 magnetic lock slip ring assembly and installed temporary magnetic lock contact brush assembly. Installed faulty miscellaneous function board in door 109 to allow door to operate at degraded capability until replacement parts arrive from Horton Automatic Door.	On start up door annunciated on alarm. Doors 108 and 109 restored to normal operation. EXPLANATION: The micro chips on the board had been reseated while board was out of the system. Fault was probably due to corrosion/poor contact of chips to their sockets	14.0 2 men @ 7.0 hrs.	Super glue, solder	#2 Phillips screw driver, soldering gun, portable battery powered drill motor, 6" needle nose pliers, ice pick.	N/A		Closed 10/20
11/05	REVOLVING DOORS DOOR 109 RESET RELAY	Notified by Pier B Screening Point CSS at 6:00 p.m. that Door 109 had stopped rotating and was locked in position.	Responded and investigated, but could not determine the cause of the lock down. Powered off then on motor and logic control circuits and attempted to reset door, which now free-wheeled but would not start. Again went through the power off and on sequence and, upon reset, the door functioned normally. Discussed the problem with Horton Automatics who suggested that the most likely cause was probably a stuck relay. Monitored door for 6 days and anomaly did not reoccur.	Door 109 restored to normal operation	3.0	N/A	N/A	N/A		Closed 11/05
11/23	REVOLVING DOORS DOOR 109 RESET RELAY	Door stopped rotating during test.	Fault isolated to a bad relay in the reset/speaker/safety edge circuit. Replaced relay and reset door	Door restored to normal operation.	4.0 2 men @ 2 hrs.	Relay	Ladder	N/A		Closed 11/23

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10/20	REVOLVING DOORS DOOR 108 LOGIC CONTROL	Door annunciating with non alarm condition	Secured logic, motor and light curtain control boxes then turned back on. No annunciation on alarm condition. Door is stopping on alarm condition. Placed call to Ben Brannen of Horton Automatic Door for trouble shooting assistance. Isolated malfunction to Miscellaneous function board C9954 in logic processor box.	Door 108 operating in degraded capacity with no annunciation	5.0	Integrated circuits enroute from Horton Automatic Door.	N/A	N/A	Closed 10/20 Re Door 109 Magnetic Locks	
12/07	REVOLVING DOORS Doors 108 & 109 Light Curtain	Light curtains started generating random alarms over weekend. Light curtains turned off by CSS	Cleaned reflectors and Lexan strips.	Doors 108 & 109 restored to normal operation.	1.0	Cleaning Solution, wiping cloth	N/A	N/A		Closed 12/07
12/08	REVOLVING DOORS Doors 108 & 109 light curtains	Light curtains generating random alarms.	Cleaned Lexan strips on doors 108 & 109.	Doors 108 & 109 restored to normal operation.	1.0	Cleaning solution, wiping cloth	N/A	/A		Closed 12/08
12/13	REVOLVING DOORS Doors 108 & 109 Light Curtain	Doors started generating random alarms over weekend. Light curtains turned off by CSS	Cleaned reflectors and Lexan strips.	Doors 108 & 109 restored to normal operation.	1.0	Cleaning solution, wiping cloth.	N/A	N/A		Closed 12/13
12/14	REVOLVING DOOR Door 108 Light curtain	Light curtain generating random alarms.	Vacuumed matting, wings and light curtain Lexan strips.	Door 108 restored to normal operation.	1.0	N/A	shop vacuum	N/A		Closed 12/14
12/16	REVOLVING DOOR Door 108 Magnetic Locks	Magnetic locks disengaging and engaging as door rotates.	Removed Contact brush assembly and installed additional spacing washers to better align contact brush assembly with slip ring assembly.	Magnetic locks are engaged and door operating satisfactorily.	3.0 2 men @ 1.5 hrs	8 washers	short flat blade screwdriver, 4" adjustable wrench.	N/A		Closed 12/16
01/03	REVOLVING DOOR Magnetic Locks Door 108	Wing Magnetic Locks disengaging and engaging as door rotates.	Removed washer shims previously installed which had allowed the contact brush assembly to shift. Fabricated and installed a flat surface shim.	Door 108 Wing Magnetic Locks restored to normal operation.	3.0	Shim, 2 10-28 x3" machine screws.	Stubby flat blade screwdriver	N/A	$.76	Closed 01/03
12/20	REVOLVING DOORS Doors 108 & 109 light curtains	Light curtains had started generating random alarms over the week end.	Cleaned reflectors and Lexan strips.	doors 108 & 109 restored to normal operation.	1.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 12/20
12/22	REVOLVING DOORS Doors 108 & 109 Light Curtain	Light curtains generating random alarms.	Vacuumed matting and light curtain lexan strips.	Revolving doors 108 & 109 restored to normal operation.	1.0	Shop vacuum	N/A	N/a		Closed 12/22
01/06	REVOLVING DOORS Doors 108 & 109 light curtains	Light curtains generating random alarms.	Cleaned Lexan shields below light modulas and Lexan stripe on doors 108 & 109.	Doors 108 & 109 restored to normal operation.	1.5	Cleaning solution, wiping cloth	No. 2 Phillips screwdriver	N/A		Closed 01/06

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01/10	REVOLVING DOORS Doors 108 Light Curtain	Screening personnel advised that Door 108 started generating random alarms over weekend. Light curtains turned off by CSS	Vacuumed matting and cleaned Lexan strips	Doors 108 restored to normal operation.	1.0	Cleaning solution, wiping cloth	shop vacuum	N/A		Closed 01/10
01/10	REVOLVING DOOR DOOR 109 light curtain	Preventative maintenance	Vacuumed matting and cleaned Leaxan strips.		1.0	Cleaning solution, wiping cloth	Shop Vacuum	N/A		Closed 01/10
01/12	REVOLVING DOOR Door 108 Light curtain	Screening personnel advised that Light curtain generating random alarms.	Cleaned dust from light curtain Lexan strips.	Door 108 restored to normal operation.	.5	Cleaning solution, wiping cloth	N/A	N/A		Closed 01/12
01/13	REVOLVING DOOR Door 108 Light Curtain	Screening personnel advised that light curtain generating random alarms.	Vacuumed matting and cleaned Lexan strips.	Door 108 restored to normal operation.	1.0	N/A	Shop vacuum	N/A		Closed 01/13
01/13	REVOLVING DOOR DOOR 109 LIGHT CURTAIN	Preventative maintenance	Vacuumed matting and cleaned Lexan strips on door 109.		1.0	Cleaning solution, wiping cloth	Shop vacuum	N/A		Closed 01/13
01/14	REVOLVING DOORS Doors 108 light curtain	Light curtain turned off evening of 1/13.	Removed Lexan strips and cleaned dust from reflectors, cleaned Lexan strips.	doors 108 restored to normal operation.	1.0	Cleaning solution, wiping cloth	N/A	N/A		Closed 01/14
06/21/93	SOC Video Storage System	Two hour recording format required.	Changed VSS recorder PROMS from 72 hour to 2 hour format.	VSS recorder now records and plays back in two hour format.	1.0	PROMs				Closed 06/21/93
07/07/93	SOC Support equipment	Equipment modification to support testing.	Installed quad video multiplexer in Support Equipment rack. Connected video cameras to Multiplexer so that four cameras may be observed on one monitor.	Viewing of four video sources can be viewed on one monitor.	1.0	Quad video multiplexer.				Closed 07/07/93
07/09/93	SOC COHU video driver S/N 167311	Video driver has no video output.	Trouble shot Video driver. Malfunction isolated to failed output transistor. Parts obtained and replacement transistor installed on 07/12/93.	Video driver operational.	2.0	2N6715 transistor, solder	Soldering iron, needle nose & diagonal pliers			Closed 07/12/93
07/09/93	SOC COHU video driver S/N 164523	Video driver has no video output.	Trouble shot Video driver. Malfunction isolated to failed output transistor. Parts obtained and replacement transistor installed on 07/12/93.	Video driver looses video after approximately 2 to 3 minutes.	2.0	2N6715 transistor, solder	Soldering iron, needle nose & diagonal pliers			Open

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07/14/93	SOC CCTV camera	Planned installation of camera in SOC to support WRA testing	Constructed lens control cable for 50mm lens for use on CCTV camera to be installed in SOC.	CCTV camera lens operational.	1.0	Solder, wire, 2 connectors	Soldering iron			Closed 07/14/93
9/23-10/01	SOC MSP TELEPHONE LINK	During the WRA test, it was discovered that the telephone link from the SOC to the MSP dispatcher did not function.	Notified Roger Wilkenson of AT&T (who installed the link) of the problem and he investigated. It was determined that the MSP-end of the link was not connected.	MSP telephone link scheduled for repair on 10/04	1.0	N/A	N/A	N/A		Closed 10/04
10/04	SOC MSP TELEPHONE LINK	Assisted AT&T technician in checking the telephone link between the SOC and the MSP dispatch office.	Verified that the link operated properly. Made labels for the MSP telephones to identify the FAA SOC lines.	MSP telephone link operational.	.5	Label tape	Label maker	N/A		Closed 10/04
10/11	SOC VIDEO SUBSYSTEM	Video frame storage intermittently locks up.	Disassembled and cleaned the video subsystem rack in the SOC. Many of the boards in the Video Frame Storage processor were extremely dusty, as were the intake and exhaust fan vents which were vacuumed. Occasional VSS lock-ups are becoming annoying and will be monitored closely.	Video frame storage operating at degraded capability.	3.0 2 men @ 1.5 hrs.	N/A	Shop vacuum	N/A		Open, in depth trouble shooting required.
10/12	SOC FRS VIDEO LINK	FRS video link lost during maintenance on Video Subsystem in SOC.	Assisted Fire Rescue Service (by phone) in getting their video monitor for pier B operating correctly. (The internal/external sync switch was in the external position.	FRS video link operational	.5	N/A	N/A	N/A		Closed 10/12
10/21	SOC VMD	Equipment to be returned to Sandia National Labs.	Removed the Video Motion Detection systems, both the David and the Geutebruck, from the SOC. Disconnected all video inputs and signal outputs and reconfigured the video matrix to operate without the VMD. Assisted Ed Ocker in packing the VMDs and shipping them to Sandia. Also removed the Wave form Monitor and the associated Conrac black and white display for shipment to Sandia. Reinstalled new B/W display in the equipment rack.	Video motion detection capability disabled until new equipment installed.	4.5 3 men @ 1.5 hrs.	N/A	Phillips screw driver	N/A		Closed 10/21, sensor not installed.
12/2	SOC MSP VIDEO LINK	Video on MSP video monitor fades.	The fiber optic transmitter in the SOC support equipment rack had developed a low output condition. Replaced the transmitter and adjusted the fiber optic SMA connector to optimize the display picture at MSP Headquarters.	Video link now functions properly.	2.0	Fiber optic transmitter	Screw driver	N/A		Closed 12/02

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