READ ME FIRST

October 1997

Radar Intelligent Tool (RIT) Users

Attn: ASR-9 Radar Sites (NOT collocated with a Mode-S System)

AOS, as part of the ASR-9 program, is outfitting selected sites with a system maintenance tool called the Radar Intelligent Tool (RIT) System to be used for sensor performance monitoring and optimization.

Below is a list of last minute items that did not make it into the Getting Started Guide.

STARTING MICROSOFT WINDOWS™.

THE WINDOWS™ SWAP FILE IS CORRUPT WHEN DELIVERED !!

THIS IS EXPECTED AND NO HARM HAS COME TO YOUR RIT SYSTEM !!

Each RIT System has Microsoft DOS and Windows™3.11 installed. Due to the duplication process used by AOS at the time of shipment, the Windows™ permanent swap file was corrupted. **The first time when starting Windows™, the user will be prompted to delete and create a new permanent swap file. Say YES to delete and create a new swap file.** Windows™ will then perform normally when the new swap file is created. The swap file is used by Windows™ to extend your RAM memory (virtual memory).

CUSTOMIZE DOS CONFIG.SYS.

ON INITAL BOOTUP RIT WILL BEEP AND DISPLAY ERRORS WHEN DELIVERED !!

THIS IS EXPECTED AND NO HARM HAS COME TO YOUR RIT SYSTEM !!

Since there are five (5) different microcomputer platforms of RIT, there are several small editing tasks required to “customize” DOS for each platform. The hard drive image, as it is installed on your newly arrived RIT requires users to remark out some unneeded drivers in the configuration files. Use an ASCII editor like DOS Editor (Edit.com), PFE for Windows™, or Windows™ Notepad customize your RIT System’s config.sys file.

1. Customize CONFIG.SYS

    a. Remark out the ASPI drivers that do not pertain to your SCSI Host Adapter.

For RIT v4, ASPI Managers should be edited like:

rem DEVICEHIGH=c:\scsi\ASPI2DOS.SYS /D
rem DEVICEHIGH=c:\scsi\ASPI4DOS.SYS /D
DEVICEHIGH=c:\scsi\ASPI8DOS.SYS /D
rem DEVICEHIGH=c:\scsi\ASPIEDOS.SYS /D
rem DEVICEHIGH=c:\scsi\ASPIDISK.SYS /D
DEVICEHIGH=c:\scsi\ASPICD.SYS /D:RITCD
DEVICE=C:\Windows\BackIt\BKTAPE.SYS

Note: [NOTE: Reference the SCSI Subsystem Section in the RIT System Getting Started Guide. RIT v4 uses ASPI8DOS.sys, ASPICD.sys, BKTAPE.sys device drivers.]

b. Customize the EMM386.EXE statement in CONFIG.SYS

EMM386 should exclude the area where RDI resides:

DEVICE=C:\DOS\EMM386.EXE NOEMS **x=D000-D1FF**

2. Customize SYSTEM.INI

a. Customize the EMM386.EXE statement in SYSTEM.INI

[386ENH] section should exclude the area where RDI resides:
EMMEXCLUDE=**D000-D1FF**

Note: [NOTE: Reference the SCSI Subsystem Section in the RIT System Getting Started Guide. The CONFIG.sys EMM386.EXE statement excludes must match exactly the SYSTEM.ini EMMEXCLUDE statement.]

HARD DRIVE BACKUP. AOS included blank tapes and encourages all users to perform a FULL backup of their RIT System upon receipt (may require two tapes). It is encouraged that each site will institute their own system backup schedule to backup valuable custom site files. AOS maintains only the initial delivery image of the hard drive as delivered. All custom files are the responsibility of each site (i.e., flight check, history files, data files, etc.).

VIRUS PROTECTION RECUE DISK. Upon receiving RIT, users are encouraged to make a virus protection rescue disk. This disk is a bootable disk that contains the virus protection utility. A blank diskette(s) is required. Write protect the diskette after the operation has completed. Refer to the RIT System Getting Started Guide's Computer Viruses - How To Create a Rescue Disk for guidance or the Symantec Norton AntiVirus online help file.

RIT BOOT DISKETTE. Upon receiving RIT, users are encouraged to make a clean boot disk. This disk is a bootable disk that contains the operating system, device drivers to access

the SCSI peripherals and some utility programs. Generally, it is always a good idea to keep a bootable floppy available because you never know when evil may strike. A blank diskette(s) is required. Write protect the diskette after the operation has completed. Refer to the RIT System Getting Started Guide's Computer Viruses - What Should Be On A Clean Boot Disk for guidance.

TECHNICAL SUPPORT. Reference the RIT System Getting Started Guide's Technical Support section. AOS and the FAA Logistics Center, AML-442 have signed a repair support agreement for all RIT System microcomputer hardware.

AOS maintains an FAA Intranet World Wide Web (WWW) site.

http://www.aos.tc.faa.gov/

For radar analysis tools go to http://www.aos.tc.faa.gov/AOS270/. You will be able to view radar analysis information on-line and download program updates and new programs.

RIT System v4 Inventory and Shipping Report

Ship to
site name: _____
addr: _____
_____
city/st/zip: _____

ATTN:: _____
phone: ( ) _____
Sequence #: _____

Ship Date: _____
Partial Ship _____ No _____ Yes (IF YES, SEE BELOW)
Ship carrier: _____
Air bill #: _____

Installer/Packer: _____
Total # box: _____

√	Box	Value	Qty	Component Description	OATS	Serial Number	
RIT System v4 PC							
	4	$0	___	1. RDI System (RDIBoard,RDIAdapter Box,RDICable)	No	1. RDIB:	1. RDIA:
	4	$45	1	2. s/w: Back-It for Windows	Yes	2. RDIB:	2. RDIA:
	4	$275	1	3. s/w: MS Word v6.0	Yes	3. RDIB:	3. RDIA:
	4	$72	1	4. s/w: Adaptec EZ SCSI drivers	Yes	4. RDIB:	4. RDIA:
		$60	1	5. s/w: DOS/Windows License (manual)	Yes	5. RDIB:	5. RDIA:
		$10	2	6. s/w: blank tapes		P/N RDIC:	COUNT LOOPBACK PLUG(S):
		internal	1	7. Modem: v.32bis 14.4K baud, int.	Yes	Packing Notes	
		internal	1	8. RAM: 16MB	Yes		
		internal	1	9. SCSI Host Adapter: PCI Bus	Yes		
		internal	1	10. Hard Drive: 2.1GB int. SCSI	Yes		
		internal	1	11. Tape Drive: int. SCSI	Yes		
		internal	1	12. CD-ROM Drive: 4x int. SCSI	No		
	4	$75	1	13. Power Center/Conditioner	Yes		
	1	$75	1	14. Mouse: PS/2	Yes		
	1	$75	1	15. Keyboard	Yes		
	4	$8	1	16. Cable: 6' Printer	No		
	1	$3800	1	17. NCR S10 Server - Pentium 100 PC	Yes	S/N:	
	2	$350	1	18. Monitor: CRT 15" SVGA .28mm	Yes	S/N:	
	3	$349	1	19. Printer: Canon BJ230e bubble jet	No	S/N:	

Shipping Notes

SITE TECHNICAL BULLETIN

DATE: August 24, 1993 **NUMBER:** STB-RIT-001

SYSTEM/TYPE: RADAR INTELLIGENT TOOL (RIT)

SUBJECT: RADAR INTELLIGENT TOOL SYSTEM DELIVERY

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1. **PURPOSE.**

a. This Site Technical Bulletin (STB) delivers the Radar Intelligent Tool (RIT) radar analysis computer system, including the hardware system platform and its initial Radar Intelligent Tool Technical Reference Manual to selected facilities. This new system is to be used as an analysis platform to support the performance and coverage checks of the various radar and surveillance equipment within the FAA inventory. The RIT Deployment Plan (attachment 1) provides the background and strategy regarding the RIT design and planning. The RIT system is being placed under configuration management and will require a Configuration Control Decision (CCD) to change its baseline.

b. Attachment 2 identifies those facilities that are to receive a RIT system. Deployment is initiated with this STB and will continue over the next 18 months.

2. **DISTRIBUTION.** The RIT distribution follows a selected site schedule. Hardware shipments are authorized each month in conjunction with the Mode-S deployment schedule.

3. **REFERENCES.** Not applicable.

4. **DESCRIPTION OF PROBLEM.** Not applicable.

5. **SITE APPLICATION.** As listed in attachment 2.

6. **CONTENTS.**

ITEM	DESCRIPTION	QUANTITY
Attachment 1	RIT Deployment Plan	1
Attachment 2	RIT System Candidates	1
Attachment 3	RIT Technical Reference Manual	1

87-6077

DISTRIBUTION: Selected Airway Facilities Field and Regional Offices **INITIATED BY:** AOS-520

7. **RECOMMENDED SOLUTION.** Not applicable.

8. **HARDWARE IMPACT.** Not applicable.

9. **CLARIFICATION OR COMMENTS.** The RIT Technical Instruction Manual is delivered under this cover as a draft document. As it becomes available, additional information will be delivered to the offices identified in the attachment 2 distribution lists.

For further information or comments, please contact the National Data Communications Systems Engineering Division, AOS-500, on (609)485-HELP.

for Edward L. Schuman
Charles L. Stith
Director, Operational Support Service

3 Attachments

ATTACHMENT 1

RIT System v4

Deployment Plan

RIT System Deployment Plan

Current as of October 1997

RIT Hardware

The RIT System consists of a standard commercial-off-the-shelf (COTS) personal computer (PC) with some FAA interface hardware.

Initially, the RIT System was deployed in cooperation with the Mode-S program. An enhanced version of RIT more commonly known as E-RIT (En Route - RIT) System was deployed to selected multi-sensor sites, namely ARTCC's, CERAP's and selected TRACON's. Currently, ASR-9 radar sensor sites not collocated with Mode-S have been selected as candidates to receive the next deployment of RIT System PC's. AOS's RIT System candidates include:

- Single-sensor sites
  - Mode-S (148 sites)
  - ASR-9 (35 sites)
- Multi-sensor sites
  - ARTCC's (22 sites)
  - CERAP's (3 sites)
  - selected TRACON's (5 sites)

Both, single-sensor sites and the multi-sensor sites, will make use of the same data capture systems and microcomputer hardware features. Software options will allow for different site configurations.

RIT System Software

All FAA radar analysis functions will be consolidated into a single development environment (Borland C++) for a single microcomputer operating system and graphical user interface (Microsoft DOS 5 & Windows™3.1).

The RIT Analysis Tools will be used by both, single-sensor and multi-sensor sites. Output data file formats will be compatible to popular COTS software packages for display and reporting (allowing users to customize reports).

RIT System Hardware Repair

The FAA Logistics Center will provide microcomputer hardware support for all RIT Systems.

RIT System Training

To maximize the usefulness of RIT and the RIT Analysis Tools (RAV - Radar Analysis Visual suite), AOS is actively pursuing the establishment of a radar analysis course with the FAA Academy. Currently, the Academy conducts a radar analysis class in conjunction with ASR-9 Optimization and Host RDAS (Radar Data Acquisition Subsystem) training course.

ATTACHMENT 2

RIT System v4

Candidates

RIT v4 Candidates

RIT System v4 is deployed to all ASR-9 radar sites not collocated with Mode-S systems.

#	Site	POC	Shipping Address	Phone
1.	ACK ✓	Alan Priestly	FAA (ASR-9 Radar) Tower Bldg. Room 204 Nantucket Memorial Airport Nantucket, MA 02554	(508)228-1785
2.	HSV ✓	Allan Hodge	FAA Huntsville SSC (ASR-9 Radar) ATC Tower 100 John S. Harrison Drive Huntsville, AL 35824	(205)772-9311
3.	FAY ✓	Tim Hilton	Fayetteville SSC (ASR-9 Radar) Tower Bldg, Tower Rd Fayetteville Regional Airport Fayetteville, NC 28306	(910) 484-3760
4.	FYV ✓	Art Sellers	Fayetteville SSC (ASR-9 Radar) 4370 South School Fayetteville, AR 72701	(501) 646-7300
5.	ROW ✓	Don Kaysinger	ROW SFU (ASR-9 Radar) 30 West Challenger Roswell, NM 83201	(505)347-5500
6.	LYH ✓	Bob McMann	Lynchburg SSC (ASR-9 Radar) ATC Tower Bldg. 2011-A Airport Road Lynchburg, VA 24502	(804) 239-0241
7.	MSN ✓	Dennis Kolbusz	MSN SSC (ASR-9 Radar) 4301 International Lane Madison, WI 53704	(608)244-7774
8.	MFR ✓	Mark Dorner	FAA/Medford Radar (ASR-9 Radar) 3650 Biddle Road Medford, OR 97504	(541) 776-4307
9.	PSC ✓	Gary Anderson	Columbia Basin SSC (ASR-9 Radar) 3601 North 20th Avenue Pasco, WA 99301	(509)376-0625
10.	YKM ✓	Gary Anderson	Columbia Basin SSC (ASR-9 Radar) 3601 North 20th Avenue Pasco, WA 99301	(509)376-0625
11.	GSO ✓	George Webb	FAA/SSC (ASR-9 Radar) 6429 Airport Parkway Greensboro, NC 27409	(910) 333-5132
12.	TYS ✓	Gerald Vowell	FAA/SSC (ASR-9 Radar) 2207 Air Base Road Louisville, TN 37777	(423) 970-2691
13.	GJT ✓	Harlow Brown	Grand Junction SSC (ASR-9 Radar) 805 Eagle Drive Grand Junction, CO 81506-8601	(970)243-0969
14.	PWM ✓	Jeff Fowler	FAA (ASR-9 Radar) 993 Westbrook St. Portland Jetport, ME 04102	(207)780-3319

#	Site	POC	Shipping Address	Phone
15.	Cedar ✓	Jeffrey Larsen	Cedar Mountain ASR-9 Radar 765 N. 2200 West, Bldg #7 Salt Lake City, UT 84116	(801)595-2328
16.	FWA ✓	Jim Carpa	FAA/Fort Wayne SSC (ASR-9 Radar) 9300 Airport Dr. Suite G Ft. Wayne, IN 46809	(219)747-2011/3194
17.	ACY ✓	Joe Heitz	FAA Technical Center (ASR-9 Radar) Bldg. 284 ACY SSC 83LH Atlantic City, NJ 08405	(609)485-6429
18.	CHO ✓	Joe Lemon	RIC SSC 82FH (ASR-9 Radar) Suite 108 1 Richard Byrd Terminal Drive Richmond IAP, VA 23250	(804)222-7383
19.	RIC ✓	Joe Lemon	RIC SSC 82FH (ASR-9 Radar) Suite 108 1 Richard Byrd Terminal Drive Richmond IAP, VA 23250	(804)222-7383
20.	HOP ✓	Joe Wootten	ATC Branch (ASR-9 Radar) Bldg. 7164 H Street Ft. Campbell, KY 42223-5000	(502)798-6520/2288
21.	HRL ✓	John Delarosa	Harlingen SSC (ASR-9 Radar) FAA Control Tower Valley Int'l Airport Harlingen, TX 78550	(956) 423-3827
22.	WSMRC ✓	John Frederickson	New Tech Radar Dept (ASR-9 Radar) WSMR Site C White Sands, NM 88002	(505)679-2138
23.	WSMRD ✓	John Frederickson	New Tech Radar Dept (ASR-9 Radar) WSMR Site D White Sands, NM 88002	(505)679-2138
24.	WSMRE ✓	John Frederickson	New Tech Radar Dept (ASR-9 Radar) WSMR Site E White Sands, NM 88002	(505)679-2138
25.	SJT ✓	Rodger Young	San Angelo SSC (ASR-9 Radar) Mathis Field 8485 Hangar Road San Angelo, TX 76904	(915)944-1760
26.	MSO ✓	Larry Conrad	Missoula RNC (ASR-9 Radar) 4955 Highway 10 West Missoula, MT 59802	(406) 549-8300
27.	LBB ✓	Lloyd Wellman	FAA/Lubbock Radar SSC ASR-9 Radar Route 3 Box 211B Lubbock, TX 79401	(806)766-6403/6412
28.	MXF ✓	Bob Dayoan	MXF/MGM SSC (ASR-9 Radar) 4701A Tower Road Hope Hull, AL 36043	(334) 223-7209
29.	GRK ✓	Mel Cash	Installation Aviation Office ASR-9 Radar/Attn: AFZF-AV-ATC Building 90067 Fort Hood, TX 76544	(254)288-9040/9238

#	Site	POC	Shipping Address	Phone
30.	MWH ✓	Mike Montani	Columbia Basin SSC (ASR-9 Radar) Grant County Arpt. 7810 NE Andrews St. Moses Lake, WA 98837	(509) 762-5292
31.	OZR ✓	Rex Williams	COMMANDER 1-11th Aviation ATC/NAVAIDS Maint. Div. Bldg. 30810-CAAF (ASR-9 Radar) Ft. Rucker, AL 36362	(334)255-8508
32.	TOL ✓	Rick Etter	FAA AFSFO R/A (ASR-9 Radar) 11013 Airport Highway Swanton, OH 43558	(419)865-6721
33.	LSV ✓	Tsg Joh Jessee	99th CS/SCMQR (ASR-9 Radar) 3664 Tyndall Ave. Bldg. 213 Nellis AFB, NV 89191-6080	(702)652-7300/7301
34.	BOV ✓	Steven Morley	Bovine Mountain Radar/299th RCS (ASR-9 Radar) 1508 Skyhawk Dr. Wendover AFB Wendover, UT 84083-0877	(801)777-9440
35.	RCS ✓	Steven Morley	Wendover Radar Station/299 RCS (ASR-9 Radar) 1508 Skyhawk Dr. Wendover AFB Wendover, UT 84083-0877	(801)777-9440

ATTACHMENT 3

RIT System v4

Getting Started Guide

RIT System v4

Radar Intelligent Tool version 4

Getting Started Guide

FAA Operational Support
AOS-500, FAA William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405
Main & Tech Support: (609)485-HELP
Fax: (609)485-4235

About This Guide

This guide provides you with minimal information to quickly setup and power on your Radar Intelligent Tool (RIT) System v4.

Change Proposals

Change proposals, comments and requests for copies should be directed to:

FAA Operational Support
National Airways Systems Engineering Division
ASR-9 Terminal/RDAS Branch
AOS-270
FAA William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405

Main & Tech Support: (609) 485-HELP
AOS-200 Fax: (609) 485-6488

Table of Contents

List of Illustrations

List of Tables

2. RIT System v4 Unpacking

Introduction

You have just received the FAA's Radar Intelligent Tool (RIT), the fourth version (v4) of the hardware configuration. The RIT System v4 consists of a single personal computer system. This RIT System is the FAA's radar data recording and analysis system for single sensor sites. This RIT System records data via the Radar Data Interface (RDI) system onto the internally mounted hard drive. Radar analysis is then performed on the data file.

RIT v4 Packing

The RIT System v4 delivery is a multi-part/box shipment comprising four (4) boxes. Boxes may arrive at different times and out of order due to the assembly, testing and shipping conditions. Each box contains a packing list, with box #1 containing the Inventory and Shipping Report.

Box #	Contents Description
1.	RIT v4 NCR Desktop Server computer
2.	AT&T 15" SVGA monitor
3.	Canon BJ230e bubble jet printer
4.	Software/power center/RDIA/RDIC/Misc.

TABLE 2-1: RIT V4 PACKING

RIT v4 Components

The RIT System v4 comprises several small components that are necessary to the proper installation and operation of the system. Below is a list of components:

RIT v4
HARDWARE:
NCR Desktop Server Minitower computer
CRT 15" SVGA
Power center/conditioner
PS/2 mouse
6' parallel printer cable
Canon BJ230e bubble jet printer
[1]Wangtek Hi-capacity SCSI internal tape drive
[1]US Robotics internal v.32 modem
[1]Toshiba 4x speed internal SCSI CD-ROM drive
SOFTWARE (installed):
[12]MS DOS v6.22
[12]Adaptec EZ-SCSI drivers

[12]MS Windows v3.11
[12]Norton AntiVirus Protection
[12]Back-it for Windows
[12]MS Word for Windows v6.0
[1]TRACS-9 Radar Analysis Tools
[1]RDI Record Program
1 = installed by AOS prior to delivery 2 = commercial software license required (supplied to each site upon delivery)

TABLE 2-2: RIT V4 HARDWARE & SOFTWARE LIST

Receiving Instructions

RIT/E-RIT System Configuration Verification

AOS, contracted AT&T/NCR through the OATS contract to provide, assemble, configure, test, and deliver each RIT (and E-RIT) System PC to each candidate. Site users are requested to inventory and verify the RIT System PC hardware and software configuration upon receipt. The following sections will discuss how to verify the RIT System configuration.

Warning !	The PC cabinet is lockable and is shipped unlocked with the keys strapped to the rear of the PC cabinet. Do NOT lose the keys, the computer keys are not recorded and are NOT replaceable. AOS recommends that site users NOT lock the cabinet unless PC security is a local issue.

Optional Subsystem Component Configuration

The RIT System PC is comprised of several internal subsystems. These optional component subsystems were purchased and installed into the RIT System PC:

- SCSI Host Adapter card
- SCSI internal Hard disk
- SCSI internal Tape drive
- SCSI internal CD-ROM drive
- 16MB RAM (total memory installed)
- Internal or external modem
- MX-6A radar interface card
- Mode-S TDIC system with external ribbon cable adapter (Mode-S sites only)

Note:	Opening the PC cabinet is NOT required to verify internal components.

Serial Numbers

Each RIT System included an "Inventory and Shipping Report" which lists serial numbers and purchase cost of all components. AOS has a record of these reports for technical support purposes only (i.e., PC upgrades, component failure trends, etc.).

Note: AOS recommends that the site user establish and maintain a local file of all RIT System hardware component serial numbers, the hardware and software documentation, as well as the installed COTS software serial numbers and licenses.

Serials numbers can usually be found on the following list of major system components:

- PC cabinet (CPU)
- Printers (one or more supplied)
- CRT monitor
- External modem (if supplied)
- MX-6A Card (internally installed)
- RDI Board (one or more internally installed)
- RDI Adapter box (one more external)
- Mode-S TDIC board (internally installed)
- Mode-S Cable Adapter board (external paddle board)

DOT/FAA Bar Coding

Several components of the RIT System are required to be bar coded by your local property mangers as per FAA regulations. AOS has included a purchase value on the "Inventory and Shipping Report" included with each RIT System shipment. Bar coding should be done as soon as possible after receiving the PC.

The following components are recommended to be bar coded (as a minimum):

- PC cabinet (CPU)
- Printer(s)
- Monitor
- External modem

Note: There is no need to bar code internal components.

RIT System v4 Assembly

Assembling and preparing the RIT System v4 is a simple and straightforward task. The RIT v4 delivery has these peripherals:

- monitor
- keyboard

- PS/2 mouse
- 6 foot printer cable
- bubble jet printer

Steps for installation

STEP 1. Choose and prepare a location for the RIT v4 PC.

STEP 2. Unpack the system, connect the peripherals to the PC, and power on the PC to verify proper operation. Notify AOS of any damage.

STEP 3. Bar code the PC hardware.

STEP 4. Power on the PC.

STEP 5. Backup the hard drive image.

STEP 6. Fabricate interface cables.

STEP 7. Install and connect interface cables to the radar sensor and the RIT.

STEP 8. RIT v4 is ready for operation.

Warning !	Installing components or altering switch settings while the computer is on can permanently damage the computer and its components.

RIT v4 Location

The RIT v4 is recommended to be installed at a desk location in close proximity to the ASR-9 Local/Remote SCIP cabinet not to exceed 150 feet and in an area where radar analysis can be performed without disrupting facility day-to-day activities.

RIT v4 PC Setup

Damage During Shipment

When unpacking the PC hardware, note any damage to the hardware. If physical damage is great enough that the PC can not be assembled and powered on, call the AOS Help line, (609) 485-HELP to report the damage, have your model numbers and serial numbers ready.

Note: For more details refer to the Technical Support section in this Guide.

Connect the monitor, keyboard and mouse

STEP 1. Connect the monitor high density 15 pin connector to the integrated VGA port on the back of the computer.

STEP 2. Connect the keyboard DIN connector to the keyboard port on the back of the computer.

STEP 3. Connect the AT&T Mouse with the PS/2 DIN interface to the mouse port on the back of the computer.

Connect the printer, modem and electrical power

STEP 1. Connect the Canon bubblejet printer using the 6' parallel printer cable.

STEP 2. Connect the DB25 male plug to the parallel printer port (female DB25 interface) located in the back of the computer.

STEP 3. Connect the Centronics cable plug to the back of the printer.

STEP 4. Connect the monitor power cord (110V) and the computer power cord to the power conditioner's sockets marked COMPUTER and MONITOR.

STEP 5. Plug the power conditioner into a 110/115v outlet (house power - 110 volt).

STEP 6. Connect the modem to the telephone line at your convenience.

Machine Power-On

STEP 1. Power on the computer by switching the power switch, usually located to the right rear of the PC cabinet, to **ON** (frequently denoted by 1=ON or 0=OFF).

STEP 2. Power on the monitor by switching the power switch, usually located to the left rear of the monitor cabinet or the lower right front panel, to **ON** (frequently denoted by 1=ON or 0=OFF).

STEP 3. Depress the computer power on switch, marked COMPUTER**,** on the power conditioner. The red LED will light up showing that jack is active.

STEP 4. Depress the monitor power on switch, marked MONITOR on the power conditioner. The red LED will light up showing that jack is active.

STEP 5. Depress the main power on switch, marked ON/OFF, on the power conditioner. The red LED will light up showing that jack is active.

STEP 6. Press the large green button, the power on switch, located on the front cabinet of the CPU.

STEP 7. The machine will now power on.

Warning !	If smoke emits or hissing noises are present, immediately power off the PC. (Depress the main power switch on the power conditioner.) Refer to the Technical Support section in this Guide for further action.

Commercial Software Licenses

For each RIT System, a software usage license was purchased and delivered with each commercial software product, i.e., Microsoft Windows™3.1. Site users are required and responsible to keep the software licenses and original equipment diskettes for each commercial software product in a safe place.

Warning !	AOS has purchased single user software licenses for each copy of commercial software for each RIT PC. Site users ARE responsible to keep all commercial software licenses (manuals) and original equipment diskettes in a safe and available location.

RIT System Backup

With each RIT System, AOS installed the backup utility, Gazelle Back-It for Windows and included a blank tape cartridge for the purpose of making a complete backup of the RIT System. (refer to OEM manual page 44 “Running Preset Backups”)

Steps for FULL system back up

STEP 1. Boot the computer into Windows™.

STEP 2. Execute the Back-It for Windows program (left mouse button double click on the Back-It icon) located in the Back-It program group.

STEP 3. Choose Backup Manager (single left mouse click on the Backup Manager button).

STEP 4. In the Backup Manager dialog box, select the FULL RIT - FULL RIT BACKUP OF C: item (single click left mouse button on the top of the text). User's choice will be highlighted.

STEP 5. Insert the blank tape cartridge into the tape drive.

STEP 6. Choose Backup (single left mouse click on the Backup button) to start the selected FULL RIT preset. Back-It will perform the tape backup (you may require two tape cartridges).

RIT v4 Interface Cables

The RIT v4 requires Interface Cables to connect the ASR-9 Local/Remote SCIP cabinet to the RIT System's RDI Adapter box (one cable per channel). The cables should be shielded, plenum rated cables.

Each site is required to fabricate a set of custom interface cables for their site. The ASR-9 Local SCIP cable configuration is different from the ASR-9 Remote SCIP cable configuration. Drawings for both configurations are found in the rear of this document.

Cables - ASR-9 Local SCIP

Cables for attachment to the ASR-9 Local SCIP should be fabricated according to drawing: "ASR9 Local SCIP - RIT/RDI Cable Assy", drawing #8014.4-L, sheet 1 of 1 (refer to Section 2 of this document).

Cables - ASR-9 Remote SCIP

Cables for attachment to the ASR-9 Remote SCIP should be fabricated according to drawing: "ASR9 Local SCIP / ERIT Cable Assy", drawing #8014.5-L, sheet 1,2,3,4 of 4 (refer to Section 2 of this document).

Note: Label each end of the cable with *SENSOR+CHANNEL NUMBER* to keep track of which sensors are installed into which RDI Adapter.

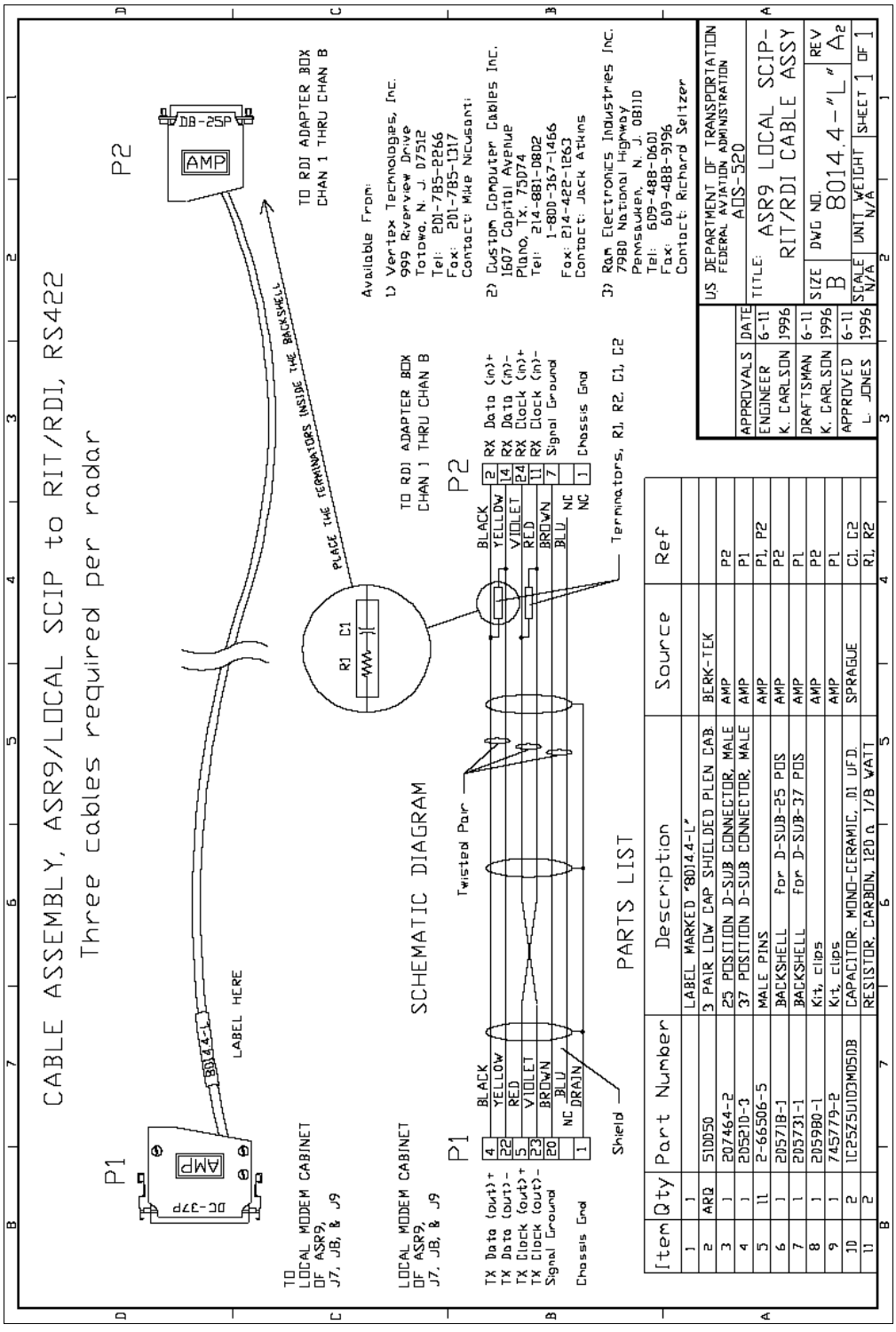
Radar Data Recordings

Site users will record radar data on the internal hard drive. The RIT v4 has been configured with a 2.0 gigabyte hard drive for this purpose.

No other internal adjustments are required. AOS has installed and configured all options for you to startup immediately.

3. RIT v4 Interface Cable Drawings

ASR-9 Local SCIP to RDI Cable



Item	Qty	Part Number	Description	Source	Ref
1	1		LABEL MARKED "80144-L"		
2	ARQ	510050	3 PAIR LOW CAP SHIELDED PLEN CAB	BERK-TEK	
3	1	207464-2	25 POSITION D-SUB CONNECTOR, MALE	AMP	P2
4	1	205210-3	37 POSITION D-SUB CONNECTOR, MALE	AMP	P1
5	11	2-66506-5	MALE PINS	AMP	P1, P2
6	1	205718-1	BACKSHELL for D-SUB-25 POS	AMP	P2
7	1	205731-1	BACKSHELL for D-SUB-37 POS	AMP	P1
8	1	205980-1	Kit, clips	AMP	P2
9	1	745779-2	Kit, clips	AMP	P1
10	2	1C25Z5U1D3M50B	CAPACITOR, MONO-CERAMIC, .01 UFD	SPRAGUE	C1, C2
11	2		RESISTOR, CARBON, 120 Ω 1/8 WATT		R1, R2

TX Data (out)+	BLACK	4
TX Data (out)-	YELLOW	22
TX Clock (out)+	RED	5
TX Clock (out)-	VIOLET	23
Signal Ground	BROWN	20
Chassis Gnd	BLU	NC
	DRAIN	1

RX Data (in)+	BLACK	2
RX Data (in)-	YELLOW	14
RX Clock (in)+	VIOLET	24
RX Clock (in)-	RED	11
Signal Ground	BROWN	7
	BLU	NC
Chassis Gnd		1

FIGURE 3-1 RIT V4: ASR-9 LOCAL SCIP TO RDI CABLE

ASR-9 Remote SCIP to RDI Cable (sheet 1 of 4)

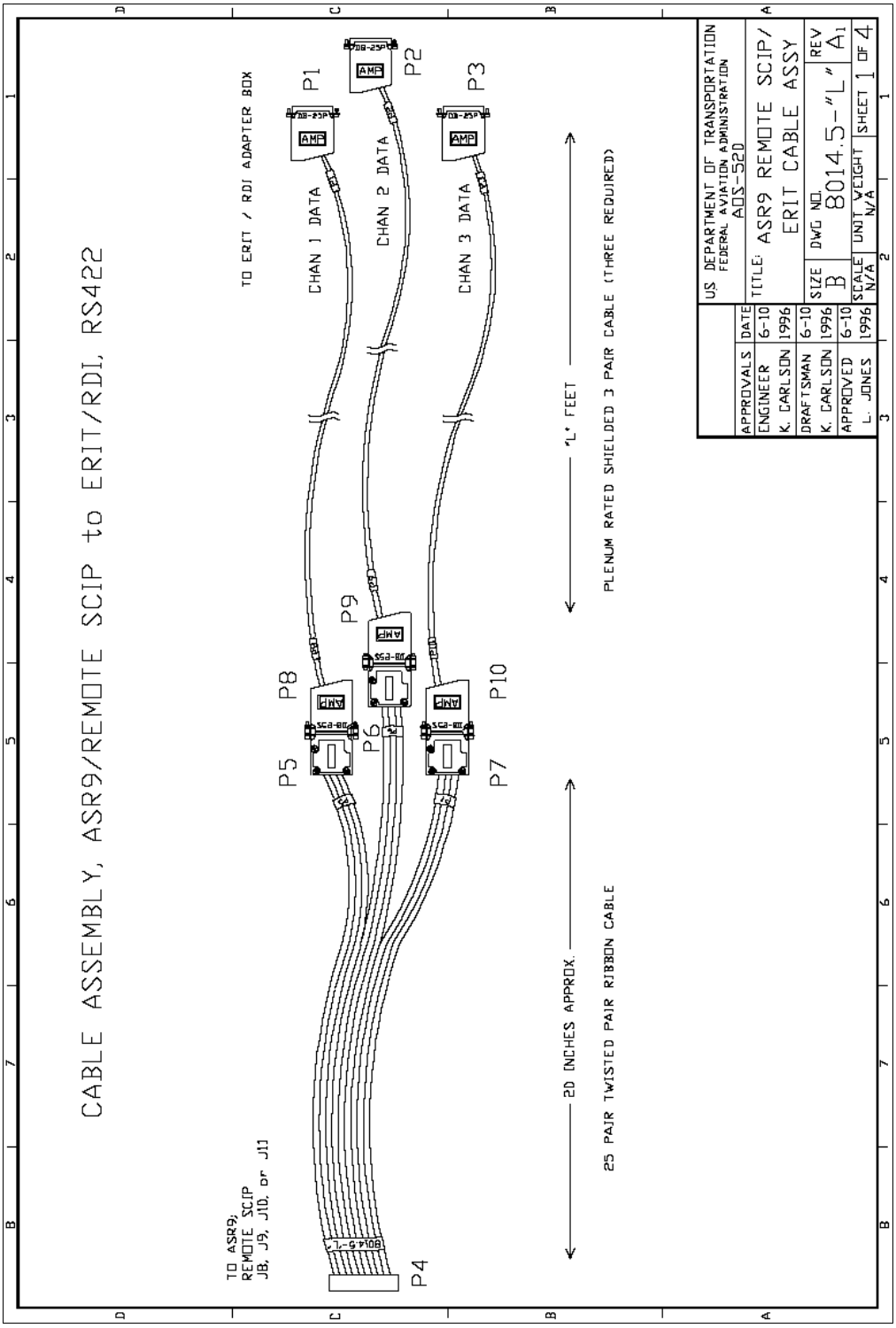
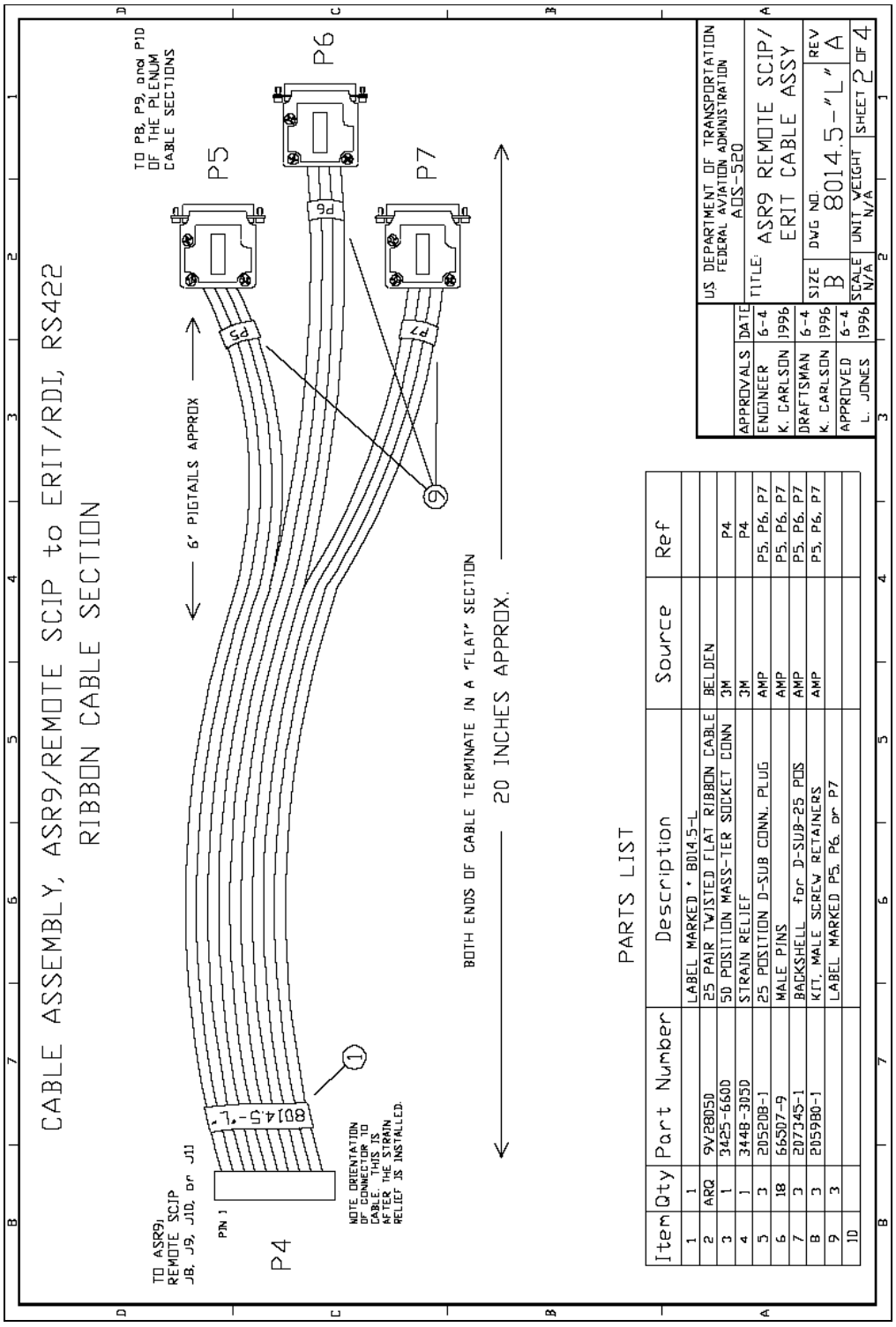


FIGURE 3-2 RIT V4: ASR-9 REMOTE SCIP TO RDI CABLE (SHEET 1 OF 4)

ASR-9 Remote SCIP to RDI Cable (sheet 2 of 4)



Item	Qty	Part Number	Description	Source	Ref
1	1		LABEL MARKED " 8014.5-L		
2	ARQ	9V28050	25 PAIR TWISTED FLAT RIBBON CABLE	BELDEN	
3	1	3425-6600	50 POSITION MASS-TER SOCKET CONN	3M	P4
4	1	3448-3050	STRAIN RELIEF	3M	P4
5	3	205208-1	25 POSITION D-SUB CONN. PLUG	AMP	P5, P6, P7
6	18	66507-9	MALE PINS	AMP	P5, P6, P7
7	3	207345-1	BACKSHELL for D-SUB-25 POS	AMP	P5, P6, P7
8	3	205980-1	KIT, MALE SCREW RETAINERS	AMP	P5, P6, P7
9	3		LABEL MARKED P5, P6, or P7		
10					

APPROVALS	DATE
ENGINEER K. CARLSON	6-4 1996
DRAFTSMAN K. CARLSON	6-4 1996
APPROVED L. JONES	6-4 1996

FIGURE 3-3 RIT V4: ASR-9 REMOTE SCIP TO RDI CABLE (SHEET 2 OF 4)

ASR-9 Remote SCIP to RDI Cable (sheet 3 of 4)

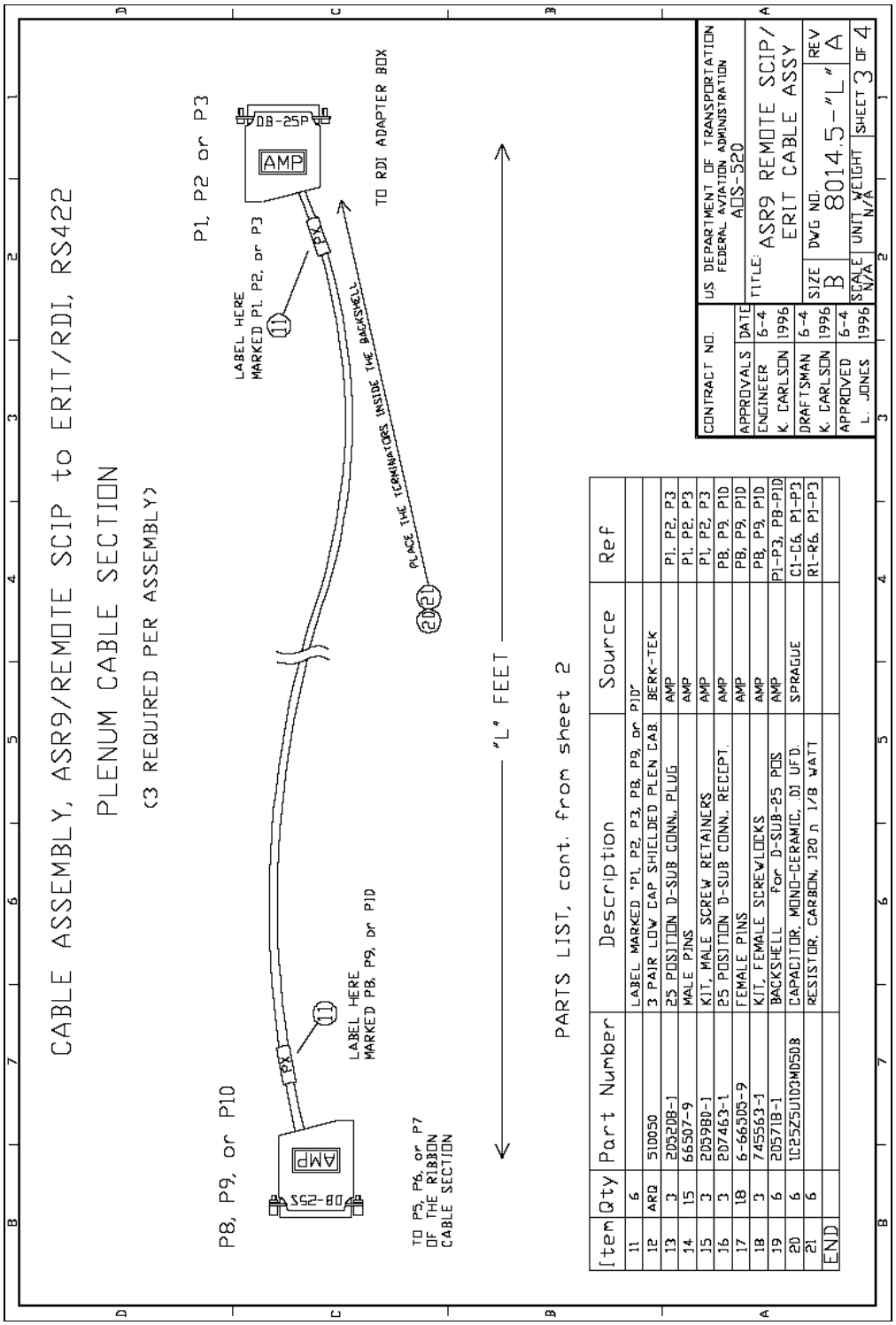


FIGURE 3-4 RIT V4: ASR-9 REMOTE SCIP TO RDI CABLE (SHEET 3 OF 4)

ASR-9 Remote SCIP to RDI Cable (sheet 4 of 4)

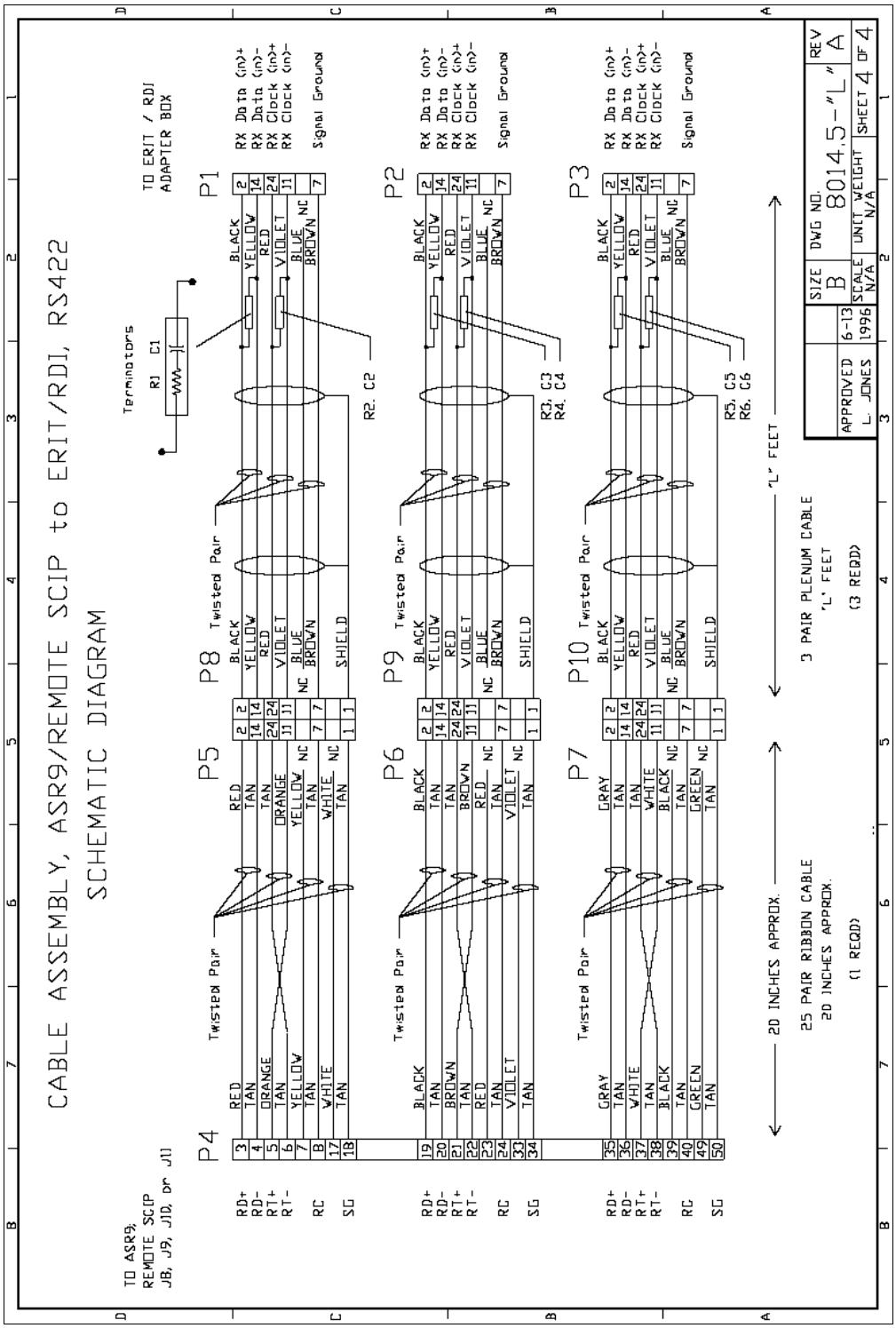


FIGURE 3-5 RIT V4: ASR-9 REMOTE SCIP TO RDI CABLE (SHEET 4 OF 4)

4. RIT Overview

AOS's standardization effort to commonize and modernize the FAA's radar analysis tasks and methods via software tools and personal computers (PC) was initiated in 1991 under the CIP 56-41, The Radar Intelligent Tool (RIT, pronounced: */writ/*) Project and the Enhanced - Radar Intelligent Tool (E-RIT, pronounced: */ee-writ/*) Project.

RIT Project

The RIT Project is the FAA's effort to rehost all FAA radar analysis algorithms to a Microsoft DOS/Windows™3.1 PC platform. AOS-520's objective is to standardize the radar analysis algorithms and to make available as many radar analysis functions as possible to the radar analyst in a single operating environment.

RIT System Hardware

A RIT System is a commercial off the shelf personal computer, Windows compatible. A desktop, lunchbox or notebook type PC will be able to execute the RIT Analysis Tools.

Each RIT System is outfitted with a radar data capture system (the MX-6A Card or the RDI System) to record radar data to hard disk or any PC secondary storage medium. A Windows compatible black and white, wide carriage, near-letter quality printer is used to print hardcopies of radar analysis summaries.

Software required:

System operation (COTS):
1. MS DOS
2. SCSI device drivers
3. MS Windows™3.1

Management reports (COTS):
1. MS Word v6.0
2. a screen capture utility for including screen images in reports

Housekeeping (COTS):
1. a backup utility for system backups
2. a hard drive maintenance utility

Radar Analysis Tools (GFE):
1. TRACS-9 software suite - DOS based
2. ***NEW!*** RAV - Radar Analysis Visual suite

RAV - Radar Analysis Visual Suite

FIGURE 4-6 RAV LOGO

Radar Analysis Tools

All of the various FAA radar analysis programs and functions (HOST, UNIX, and DOS based) are currently being redeveloped for the Microsoft Windows™3.1 environment. This software development effort is referred to as the Radar Analysis Visual Suite (RAV).

RAV (pronounced rave) is the latest in radar analysis software to be developed by AOS, specifically as a 32 bit, multi-tasking application, that works on Windows™3.1 platform with the WIN32S extension. RAV works best on the Windows™95/NT platforms. RAV will interpret and analyze prerecorded radar data files providing graphical and statistical summaries to assist radar analysts to maintain the various radar sensors in the FAA's inventory.

What is RAV?

The RAV is a project in development by the FAA's Operational Support Service (AOS) Radar Analysis Group. RAV will eventually replace all existing FAA radar analysis software tools (En Route and Terminal). RAV is intended to be the first generation of Windows™ based radar analysis tools that take advantage of the user-friendly graphical user interface (GUI) of the Microsoft Windows™ environments as well as the standard output devices supported by Windows™. As a tool of this environment, standard output devices such as printers and displays can be supported without the need for customizing the software for specific printers or display types and drivers.

Why RAV?

The history of radar analysis has been a bleak one until the advent of the personal computer. Computing speeds, disk access, and display quality has drastically improved. The Graphical User Interface or GUI such as Microsoft Windows™ has made user friendly and standardization within the PC environment available to users of varying degrees of expertise.

Standardization within radar analysis software was drastically lacking. Software programs had been developed for multiple platforms and operating systems such as UNIX, DOS, Windows™, RISC, 80XXX, 680XX, Workstations, mini-computers, etc.. Most programs were unuser-friendly and were extremely difficult to use. Many programs were developed by radar analysts and thus lacked the finesse and forethought required for novices to the radar analysis function and assumed the expert level analyst to be the end user..

When will it be completed?

Due to limited resources (staffing) RAV took several years to develop. RAV will be delivered in phases. The first ALPHA release was delivered to a limited group a FAA personnel October 1st 1997. The official release should be delivered around early 1998. A core consisting of a common radar format, Radar Data Interface (RDI), along with common file I/O, memory routines, a RAPPI display, and a Horizon display is currently near completion. The initial phase of delivery will attach two or three applications that are severely needed. These applications are Beacon False Target Analysis and Surveillance Analysis.

Other applications from existing programs will continue to be enhanced, converted, standardized, and improved upon. Most applications will be converted to C++.

Tip: Check out the radar analysis page on the FAA Intranet AOS Web site at http://www.aos.tc.faa.gov/aos270/.

E-RIT Project

The Enhanced - Radar Intelligent Tool (E-RIT) Project is the FAA's PC based continuous radar data recorder system. E-RIT is designed to provide multi-sensor sites (primarily ARTCC's) with PC based radar data recording and analysis tools.

E-RIT System Hardware

An E-RIT System consists of two commercial off the shelf personal computers, both Windows compatible. One PC is the E-RIT/Recorder and the second PC is the E-RIT/Analyzer.

E-RIT/Analyzer

The E-RIT/Analyzer is a RIT System with the addition of a single optical drive. The E-RIT/A is used by site personnel to analyze pre-recorded radar data files recorded on the optical disk using the FAA RIT Analysis Tools.

Software required:

System operation (COTS):
1. MS DOS
2. SCSI device drivers
3. MS Windows™3.1

Management reports (COTS):
1. MS Word v6.0
2. a screen capture utility for including screen images in reports

Radar Analysis Tools (GFE):
1. TRACS-9 software suite - DOS based
2. ***NEW!*** RAV - Radar Analysis Visual suite

E-RIT/Recorder

The E-RIT/Recorder is a commercial off the shelf personal computer with two optical drives and one or more radar data capture boards (the Radar Data Interface System).

The E-RIT/R provides the means of capturing all radar data products using one or more RDI Systems to record radar data to an optical drive or any PC secondary storage medium (hard drives, LAN based drives, removable media drives, etc.). The removable optical disk containing the pre-recorded radar data, is then analyzed on the E-RIT/A.

Software required:

System operation (COTS):
1. MS DOS
2. SCSI device drivers
3. MS Windows™3.1

Radar Analysis Tools (GFE):
1. RDI Recording Program

Radar Data Capture Boards

In order to record radar data using a PC, a radar data capture system must be employed. The FAA has employed several types of PC compatible radar data capture systems in the past. Currently, the FAA has standardized on the MX-6A Card and the newly developed RDI System. Following is a brief discussion of both systems, site users should refer to the respective reference manuals for a more in-depth discussion.

MX-6A Card System

The MX-6A Card is designed to capture most radar data products, making them available for real-time display or storage. The MX-6A can capture six channels of synchronous serial radar data for display or recording on the PC.

The MX-6A Card is designed to be a passive, non-intrusive radar data interface and is currently used by the FAA, the U.S. Air Force and several other government organizations at operational sites. The MX-6A is used in the RIT System for radar data recording and analysis.

The MX-6A is designed to operate in an 8/16/32 bit AT bus slot using interrupts to notify the PC that data is available for display or storage. The MX-6A can accept RS-232, RS-422 or TTL type input signals with a maximum throughput of 9600 baud of data.

The on board firmware and the PC program (currently DOS based) are selected dependent on the application. PC programs record the radar data in data files on the PC’s secondary storage devices (such as a hard drive, an optical drive, or network drive).

RDI System

The Radar Data Interface (RDI) System is designed to capture all the radar data products, making them available for real-time display or storage. The RDI System comprises three hardware components: the RDI Board, the RDI Cable and the RDI Adapter box.

The RDI System is designed to be a passive, non-intrusive radar data interface and currently used by the FAA and U.S. Air Force at operational sites. Both RIT and E-RIT Systems will use the RDI System for radar data recording, analysis and playback.

RDIB - RDI Board

The RDI Board (RDIB) is a 16 bit PC AT (ISA) bus card which can capture or transmit eight channels of synchronous serial radar data for display or recording on the PC. It is designed to operate in a 16/32 bit AT bus slot in a 80386 or better PC. The RDI Board receives and transmits TTL level signals up to 19.2K baud per channel to its single DB44 high density connector.

The RDI Board hosts a Motorola MC68000 microprocessor, 768 Kbytes of onboard RAM, 4 Kbytes of dual ported RAM and an eight serial port VLSI chip. The RDI Board receives and transmits TTL level signals up to 19,200 baud per channel to its single DB44 high density connector.

The PC and RDI Board communicate via the PC polling the RDI Board to verify if there is data present. Each and every radar message is transferred in upto 2000 byte blocks. Radar idle messages are counted.

RDIC - RDI Cable

The RDI Cable (RDIC) is a 50 conductor twisted pair shielded cable with high density DB44 connectors on both ends. The RDI Cable connects the RDI Board with the RDI Adapter Box.

RDIA - RDI Adapter

The RDI Adapter (RDIA) hosts RS232 and RS530 transceivers to convert the radar data signals to TTL levels compatible with the RDI Board for each of the eight radar channel interface ports. The RDIA connects to the RDI Board via the RDI Cable and provides a hardware interface for cables connected to the radar data source.

Radar Data Recording Software

MX-6A Recording Software

The MX-6A has a multitude of unique software applications which receive the radar data from the card and process it. There is no one MX-6A software standard. The MX-6A has no playback capability.

RDI Record Software

The RDI Record Software is a Microsoft Windows™ application allowing site personnel to customize/configure (radar type, site designator, file type, etc.) the RDI System recording or playback configuration.

Radar Sensor Interface Cables

The RIT / E-RIT System requires interface cables designed to connect the radar data source with the RIT / E-RIT data capture system. The interface cables should be shielded plenum rated cables designed to be installed under the floor at each site.

Using various interface cable designs, the MX-6A or RDI can interface to a variety of radar sensors (CD-1, CD-2, ARSR-3, ASR-9, Mode-S, and FPS-117). For additional information on the MX-6A Card, RDI System or the applicable cables designs, refer to the MX-6A Users and Technical Reference Manual or the RDI System Users and Technical Reference Manual.

Due to the fact that each site is custom configured, cables required to interface the MX-6A Card or RDI System with a specific radar data source is the responsibility of the site user.

NOTE: AOS has cable designs for interfacing either system, MX-6A or the RDI System to a variety of radar sensors.

RIT / E-RIT System Deployment

The RIT / E-RIT Systems will not be reflected in the PMSRS. AOS shipped the systems using the OATS Technical Orders and instructed each site personnel to incorporate the hardware systems into their local property custodian lists.

Each shipment included a detailed shipping and inventory document which listed every component included in the shipment. This document listed the serial number and value for each item.

Site users will use their own local bar codes and retain full ownership and custodianship over each system once it arrives at their facility. Bar-coding should be limited to the main components that have serial numbers; e.g., the CPUs, printers, magneto-optical drives, monitors, etc. Items such as the mouse and keyboard need not be bar coded.

Radar Data File Formats

The FAA is standardized on the CD-record message format for all radar data communications. Newly developed radar sensors and any upgrades or enhancements to existing sensors have the capability to provide much more data than just primary and secondary radar message formats. These sensors require special consideration in the standard CD-record formatted files.

CD-record File Format

The CD-record file format is a very rigid and static file format that does not provide for expansion and flexibility. Frequently, various civilian and military organizations require specific groups of data blocks in the CD-record header for comments or special information. These set aside areas are frequently overwritten by legacy software. As new radar sensors and radar messages are required by radar analysts, the CD-record standardization is modified, further exacerbating the legacy radar analysis software compatibility problem.

RDI File Format

AOS has, in conjunction with the Air Force, developed and established a new radar data file format designated, the Radar Data Interface (RDI) File Format. The RDI File Format provides more dynamic and flexible data storage capabilities for post analysis functions. Conversion programs to convert legacy file formats to the RDI format are currently under development at AOS and the Air Force. A RDI recording driver (DOS and Windows™) for use with the MX-6A Card is under development to promote the RDI standard.

Electronic Documentation

AOS in conjunction with the FAA's Gemini Team, is developing electronic documentation products and procedures in an effort to shorten and reduce the technical documentation production, delivery and maintenance time and costs while making the information more user friendly and accessible. This effort, as it pertains to RIT and the E-RIT Project is called, the Electronic Book Technology (EBT) Project.

The EBT Project's objective is to host on-line, all pertinent technical documentation on compact disc-read only memory (CD-ROM) media. A Microsoft Windows™ compatible hypertext viewer (SGML compliant) will be used to view the information (text and graphical) on-line allowing the user to perform text based searches for specific topics, allowing the user to make notes and remarks electronically, and permit viewing schematics and printing hardcopies when necessary.

The EBT Pilot Project: Mode-S

The EBT Project will start with the Mode-S System technical documentation manuals and handbooks as the pilot system. All pertinent Mode-S technical documentation, schematics, diagrams, figures, tables and checklists will be hosted on CD-ROM media with hypertext links. As the EBT Project evolves, AOS will be establishing electronic media and hypertext development methodologies and techniques for long term documentation configuration management and maintenance.

Note: 10/97: ASR-9 Radar System technical documentation will soon be published and distributed as electronic media on CD-ROM.

These documents will be available to site personnel via the EBT hypertext viewing system, Worldview, included with each CD-ROM delivery. Ad-hoc searches via a

full-text search engine will be available by subject, by topic, or by document for review of technical details while on-line or can be printed in hardcopy format. The hardware platform designated to host the EBT System is the RIT System.

EBT & RIT

Each RIT System will host a CD-ROM drive and a super VGA monitor to view the hypertext documents. A black and white 11”x17” bubblejet printer will provide hardcopy output capability for text as well as graphical schematic diagrams.

All of the field installed RIT Systems will be upgraded to meet the minimum EBT configuration. The upgrade as it pertains to the RIT System is referred to as the RIT System EBT Upgrade.

EBT & E-RIT

Each E-RIT/A System will host a CD-ROM drive and a super VGA monitor to view the hypertext documents. A black and white 11”x17” bubblejet printer will provide hardcopy output capability for text as well as graphical schematic diagrams. The RIT System EBT Upgrade will be included with the E-RIT System deployment.

5. RIT System Definition

The RIT System

The Radar Intelligent Tool (RIT) System project (includes En Route-RIT; E-RIT) and will be referenced as The RIT Project or RIT System or RIT.

RIT = Radar Intelligent Tool (pronounced */writ/*)

E-RIT = En Route-RIT (pronounced */ee-writ/*)

The RIT System is a collection of IBM compatible commercial-off-the-shelf (COTS) microcomputers running MS DOS/Windows™ based radar analysis (data reduction/summarization) software tools.

RIT System Purpose

The RIT System is primarily designed to collect, replay and analyze primary and secondary radar data for the following purposes.

- Assist in trouble shooting radar systems
- Assist in integrating new radar systems
- Optimization of radar systems
- Assist in the certification of radar systems
- Aid in the day to day maintenance effort

Secondary purposes are:

- Radar training tool
- Serve as storage media (emulate a tape unit) for the Mode-S radar system operational program image.
- Serve as electronic book/documentation viewer.

The RIT System has a wide variety of radar analysis software tools enabling it to work with almost any FAA digital radar signal source including CD-1, CD-2, ARSR-3, ARSR-4, ASR-9, and Mode-S.

Versions of RIT

All versions of RIT have standard features and subsystems meeting the minimum RIT System specification.

RIT Version designation	PC Model	SCSI Host Adapter
RIT v1	AST Premium 486/33	AHA-1540B/1542B
RIT v2	AST Premium 486/33	AHA-1540C/1542C
RIT v3	AST Premmia 4/66d	AHA-1740A/1742A
RIT v4	NCR S10 Desktop Server	AHA-2940
E-RIT/R & E-RIT/A	AST Premium SE 4/66d	AHA-1740A/1742A

TABLE 5-1 RIT VERSION DESIGNATIONS

RIT Project

Since the initiation of the RIT Project and due to procurement schedules, several microcomputer hardware platforms (different motherboards, microprocessors, device controllers, etc.) were purchased and deployed to selected operational FAA field sites.

Each "version" of RIT hardware may define a different COTS microcomputer system or a different hardware configuration. Each RIT System's operating system is MS DOS/Windows™ 3.1 and has several commercial application software in addition to the FAA suite of radar analysis tools.

Electronic Documentation

AOS-200 in conjunction with the FAA's Gemini Team, is developing electronic documentation products and procedures in an effort to shorten and reduce the technical documentation production, delivery and maintenance time and costs while making the information more user friendly and accessible. This effort, as it pertains to The RIT Project is called, the Electronic Book Technology (EBT) Project.

The EBT Project's objective is to host on-line, all pertinent technical documentation on compact disc-read only memory (CD-ROM) media. A Microsoft Windows™ compatible hypertext viewer (SGML compliant) will be used to view the information (text and graphical) on-line allowing the user to perform text based searches for specific topics, allowing the user to make notes and remarks electronically, and permit viewing schematics and printing hardcopies when necessary.

EBT & RIT

Each RIT System will host a CD-ROM drive and a super VGA monitor to view the hypertext documents. A black and white 11"x17" bubblejet printer will provide hardcopy output capability for text as well as graphical schematic diagrams.

All of the field installed RIT Systems will be upgraded to meet the minimum EBT configuration. The upgrade as it pertains to the RIT System is referred to as the RIT System EBT Upgrade.

EBT & E-RIT

Each E-RIT/A System will host a CD-ROM drive and a super VGA monitor to view the hypertext documents. A black and white 11"x17" bubblejet printer will provide hardcopy output capability for text as well as graphical schematic diagrams. The RIT System EBT Upgrade will be included with the E-RIT System deployment.

6. RIT Hardware Specification

RIT System

The Radar Intelligent Tool (RIT) System is designed to record and analyze (summarize) radar data from single-sensor sites. A RIT System has the capability of recording radar data directly from the radar sensor for a short duration of time. After a predetermined time period, the data recording is terminated and then analyzed using the same microcomputer.

Micro Computer

A microcomputer (can be a desktop, portable or notebook PC), that has SVGA capability, the required ISA slots available and is MS Windows™ 3.1 compatible, can be utilized as a RIT System. The RDI System or the MX-6A Card each require a full size, ISA compatible expansion slot for each board installed.

Radar Data Capture System

RIT Systems were configured and delivered with the MX-6A radar interface card or the RDI System to capture and record radar data.

Interface Cables

Custom interface cables are required to interface the radar data source to the RIT data capture board.

Tape Drive Interface Card

All Mode-S sites, require the FAA Tape Drive Interface Card (TDIC) to upload and download the Mode-S Radar System’s operational program image and is not currently required at other radar sensor sites.

PC System option	MINIMUM RIT & E-RIT/A specification	MAXIMUM RIT & E-RIT/A specification
Microprocessor:	80486DX/33 MHz MS Windows 3.1 compatible PC	Pentium xxMHz
Power supply:	250W	250+W
Bus architecture:	ISA (full size card capable)	ISA/PCI (full size card capable)
Video:	SVGA (800x600 16 colors) 512 KB video RAM	SVGA (PCI or 32/64 bit local bus preferred) 2.0+ MB VRAM (4.0MB preferred)
Monitor:	14" SVGA non-interlaced	SVGA non-interlaced (17" preferred)
Memory:	16 megabytes	16+ megabytes (32MB preferred)
Pointing device:	Microsoft mouse compatible	Microsoft mouse compatible
Modem:	internal 9600 baud	internal 14.4+K baud or better
Hard drive controller:	16 bit SCSI Controller with external SCSI-2 connector	SCSI-2 or EIDE (PCI or 32/64 bit local bus preferred)
Hard drive:	internal 600MB SCSI-2 10.5 ms access time	internal SCSI or EIDE (2.0GB preferred)
CD-ROM:	internal SCSI 4x speed (600+KB transfer rate)	internal SCSI or EIDE (6x or better preferred)
Tape drive:	1/4" tape media compatible	internal SCSI or IDE removable media drive capacity not less than 100MB per data cartridge side (Iomega Zip drive preferred)
Printer:	black & white bubblejet (360x360 dpi) capable of 11"x17" output	color, letter quality, 600x600 dpi capable of 11"x17" output
Radar data capture system:	MX-6A Card (card only) - or - RDI System(s) = one system per 8 data channels (includes RDIB, RDIC, RDIA)	MX-6A Card (card only) - or - RDI System(s) = one system per 8 data channels (includes RDIB, RDIC, RDIA)
Optical drive: (for E-RIT/A)	one external SCSI optical drive capacity not less than 1.2/1.3 GB (650MB per side)	one external SCSI optical drive capacity not less than 1.2/1.3 GB (650MB per side)
Interface Cables:	interface cables are customized to the radar data sensor interface and the RIT data capture system	interface cables are customized to the radar data sensor interface and the RIT data capture system

TABLE 6-1 MAX & MIN RIT SYSTEM PC HARDWARE SPECIFICATION

7. E-RIT Hardware Specification

En Route-RIT System

An E-RIT System is designed to record radar data from multi-sensor sites, primarily ARTCC's, on a continuous basis and then analyze the recorded data on a second PC.

An E-RIT System comprises two (2) COTS microcomputer systems (Microsoft DOS/Windows™ 3.1 compatible) and is usually used at multi-sensor sites.

E-RIT/Analyzer

The E-RIT/Analyzer, is used to analyze the recorded data and generate reports without impacting the continuous radar data recording capability.

Note: The E-RIT/A is primarily a RIT System with a removable media drive.

E-RIT/Recorder

The E-RIT/Recorder is designed to be a dedicated, continuous radar data recorder that switches between two removable media drives. The E-RIT/R requires an ISA compatible slot for each RDI Board (RDIB) installed.

PC system option	MINIMUM E-RIT/R specification	MAXIMUM E-RIT/R specification
Microprocessor:	80486DX2 66Mhz	Pentium xxMHz
Power supply:	300W	300W
Bus architecture:	ISA (E-RIT/R requires 7 available ISA slots for radar capture cards)	ISA/PCI (E-RIT/R requires at least seven available ISA compatible slots for radar data capture cards)
Video:	SVGA (800x600 16 colors) 512 KB video RAM	SVGA (PCI or 32/64 bit local bus preferred) 2.0+ MB VRAM (4.0MB preferred)
Monitor:	14" SVGA non-interlaced	SVGA non-interlaced (17" preferred)
Memory:	16 megabytes	16+ megabytes (32MB preferred)
Pointing device:	Microsoft mouse compatible	Microsoft mouse compatible
Hard drive controller:	16 bit SCSI Controller with external SCSI-2 connector	SCSI-2 or EIDE (PCI or 32/64 bit local bus preferred)
Hard drive:	internal 600MB SCSI-2 10.5 ms access time	internal SCSI or EIDE (2.0GB preferred)
Radar data capture system:	RDI System(s) = one system per 8 data channels (includes RDIB, RDIC, RDIA)	RDI System(s) = one system per 8 data channels (includes RDIB, RDIC, RDIA)
Removable Media drive:	two external SCSI optical drive capacity not less than 1.2/1.3 GB (650MB per side)	at least two (2) internal SCSI removable media drives capacity not less than 1.0GB per data cartridge side (Iomega Jaz drive preferred)
Interface Cables	six conductor, plenum rated, custom length, one cable per channel	six conductor, plenum rated, custom length, one cable per channel

TABLE 7-1 MAX & MIN E-RIT/R SYSTEM PC HARDWARE SPECIFICATION