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APPENDIX 3

COMPUTER PROGRAM OPERATORS MANUAL (CPOM)

FINAL SOFTWARE REPORT

DATA ITEM NO. A005

INTEGRATED ELECTRONIC WARFARE SYSTEM
ADVANCED DEVELOPMENT MODEL (ADM)

PREPARED FOR:

NAVAL AIR DEVELOPMENT CENTER
WARMINSTER, PENNSYLVANIA

CONTRACT N62269-75-C-0070

RAYTHEON
ELECTROMAGNETIC
SYSTEMS DIVISION

1 OCTOBER 1977

APPENDIX 3

COMPUTER PROGRAM OPERATORS MANUAL
FINAL SOFTWARE REPORT
DATA ITEM A005

INTEGRATED ELECTRONIC WARFARE SYSTEM (IEWS)
ADVANCED DEVELOPMENT MODEL (ADM)

Contract No. N62269-75-C-0070

Prepared for:

Naval Air Development Center
Warminister, Pennsylvania

Prepared by:

RAYTHEON COMPANY
Electromagnetic Systems Division
6380 Hollister Avenue
Goleta, California 93017

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TABLE OF CONTENTS

SECTION I
SCOPE

1.1 Introduction

(U) This document contains the Computer Program Operator's Manual (CPOM) for the Integrated Electronic Warfare System (IEWS). The IEWS is described in terms of the necessary hardware, software, and operator tasks and procedures required to exercise the system.

1.2 Functional Summary

(U) This document provides the necessary information to load, operate, monitor, and restart the operational system.

1.2.1 Loading

(U) Loading establishes the power up procedures and the transfer of operational software to the System Controller. See Table 2.

1.2.2 Operation

(U) Operation provides the necessary operator command definitions and procedures for the system control and display units. See Table 4.

1.2.3 Monitor

(U) Monitor provides the available methods to examine the system operation via the special test equipment. See Table 8.

1.2.4 Restart

(U) Restart enables the operator to restart the IEWS operational system if a failure occurs.

SECTION II

OPERATIONAL ENVIRONMENT

(U) This section defines the necessary equipment and computer programs required to operate the Integrated Electronic Warfare System (IEWS). It also identifies the documentation available to further develop specific operations, procedures, and installations.

2.1 Equipment Requirements

(U) The IEWS comprises a number of units which are integrated to form an advnaced electronic warfare system. These units include receivers that detect, and encode in a digital format, all pulse signals within the operating frequency range. The encoded information is processed digitally to separate the signals into groups corresponding to individual emitters in the environment. Each emitter shall be identified and analyzed to determine the level of threat it poses to the aircraft. Defensive countermeasures shall be initiated against all emitters which are identified as threats.

2.1.1 Peripheral Equipment Identification

(U) When configured in the operational state, the SC interfaces with the following units:

1) Multibeam Receiver,*
2) Heterodyne Receiver,*
3) Instantaneous frequency measurement receiver,*
4) Parameter Encoder,
5) Signal Sorter,
6) Emitter Tracker,
7) Technique Generator,

8) Display and Control,
9) Program tape cassette, *
10) Instrumentation Tape, *
11) External Device 1 (HARM), *
12) External Device 2 (ALE-39), *
13) External Device 3 (MAWS), and *
14) External Device 4 (EO). *

(U) When configured for maintenance, the SC also interfaces with the following maintenance control panels and special test equipment (STE):

1) Response CPU Maintenance Control Panel,
2) Classification CPU Maintenance Control Panel,
3) Analysis CPU Maintenance Control Panel, and
4) STE

(U) The following support peripheral equipments can be accessed through the STE interface:

1) CRT
2) Line Printer
3) Floppy Disk
4) Paper Tape Reader
5) Paper Tape Punch

(U) A block diagram of the operationally configured IEWS is shown in figure 1. The primary data functional flow between the various units is separated from the command and control path. Data flow in general proceeds along two paths. The first consists of a flow from the receiver through the parameter encoder and the signal sorter to the system controller for analysis and response assessment. The second proceeds from the receiver and parameter encoder and signal sorter to the emitter tracker, techniques

*Growth Capability

generator, and multibeam transmitter to generate an active countermeasure response. The command and control extends from the SC to all indicated units. The system operation is normally automatic; however, the operator can exercise certain override functions through the display and control unit to the system controller.

2.1.3 Computer Interface Block Diagram

(U) The computer interface block diagram is shown in figure 2. The diagram shows all SC/equipment interfaces in IEWS. Three parallel bus systems operate between the SC and other equipment. They are:

1) Classification bus,
2) Auxiliary bus, and
3) Resource Management bus.

The classification bus handles message traffic between the SC and the SS. The auxiliary bus distributes PDWs throughout the system. The resource management bus interfaces to many of the other units in the system. Low data rate interfaces comprise six serial data busses. The address allocation to each unit or processor in the system is shown in figure 2.

2.2 Computer Program Materials

(U) The computer programs required for IEWS operation and maintenance are divided into 4 areas.

1) System Controller (SC)
2) Signal Sorter (SS)
3) Techniques Generator (TG)
4) Special Test Equipment (STE)

Each group of available software consists of a floppy disk file and associated backup paper tapes. The software used for initial loading, the STE operating system and linking loader, are not loadable by the floppy disk and exist only as paper tape. The list of available software is contained in table 1.

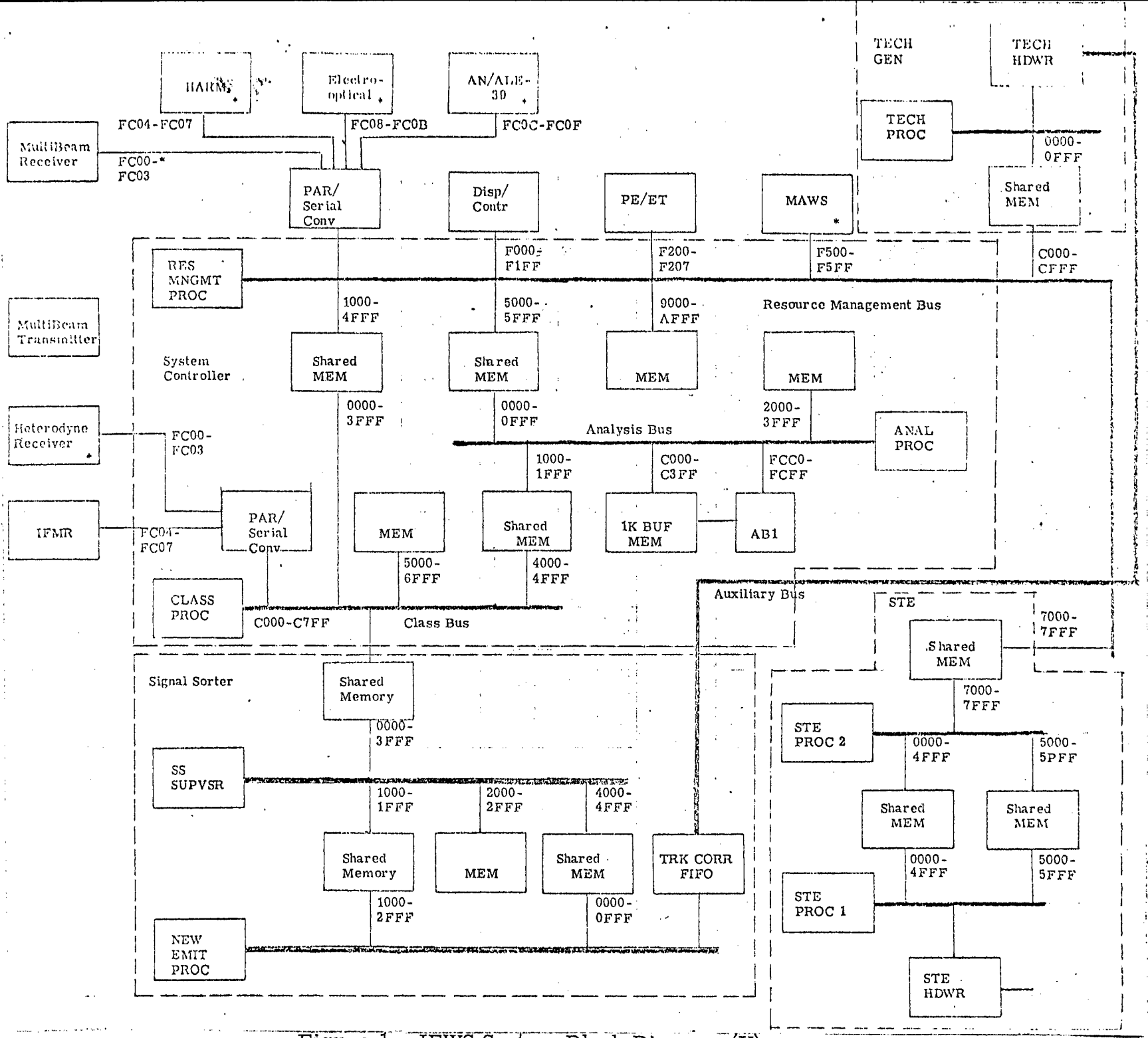

Figure 1. IEWS System Block Diagram (U)

TABLE 1

COMPUTER PROGRAM MATERIAL

UNIT	FUNCTION	PAPER TAPE	FLOPPY DISK	LISTING
SC	RMP Operation		RMP. FD	RMP. LS
		RMPEX. BB		
		DCDR. BB		
		RMEXTS. BB		
		RMPDE. BB		
	RMP Loader	RMPLD. BB	RMPLD. FD	RMPLD. LS
	RMP XFER	XFRMP. BB	XFRMP. FD	XFRMP. LS
	CP Operation		CP. FD	CP. LS
		CPEX. BB		
		ARFG. BB		
		ECFG. BB		
		CPBE. BB		
	CP Loader	CPLD. BB	CPLD. BB	CPLD. LS
	CP XFER	XFCP. BB	XFCP. FD	XFCP. LS
	AP Operation		AP. FD	AP. LS
		APEX. BB		
		APEX. BB		
	AP Loader	APLD. BB	APLD. FD	APLD. LS
	AP XFER	XFAP. BB	XFAP. FD	XFAP. LS

TABLE I (Continued)

COMPUTER PROGRAM MATERIAL

UNIT	FUNCTION	PAPER TAPE	FLOPPY DISK	LISTING
SS	SS Operation			
			SUPV. FD	
			NESU. FD	
	SS Loader	SSLD. BB	SSLD. FD	SSLD. LS
	SS XFER	XFSS. BB	XFSS. FD	XFSS. LS
TG	TG Operation	TGOP. BQ	1 TGOP. FD	TGOP. LS
	TG XFER	XTG. BB	STG. FD	XTG. LS
STE	Operating System	FDOS. BQ		FDOS. LS
	Linking Loader	LLDR. BQ		LLDR. LS
	Data Recording	DRCD. BW	DRCD. FD	DRCD. LS
	Data Reduction	DRDR. BQ	DRDR. FD	DRDR. LS
	SC Loader	SCLT1. BQ	SCLT1. FD	SCLT1. LS
	STE Loader	STELT. BB	STELT. FD	STELT. LS

2.3 Supporting Documentation

(U) The information available for each unit consists of hardware and software specifications. Additional information is available in the form of operation manuals.

2.3.1 System Controller

	System Controller Software Functional Requirements
061290529	Computer Program Performance Specification for System Controller Unit, IEWS, ADM
93959-GT-0301	System Controller Unit Hardware Development Specification (ADM) IEWS
53959-GT-0750	System Controller Program Design Specification (ADM) IEWS
53959-JK-1002	System Controller - Sorter Interface Control Document
9211/RA/IEWS #292 9211/RA/IEWS #303 9211/RMB/IEWS #468	Display/Control Manual Switch Operation Task Requirements
	Computer Subprogram Design Document, Executive, IEWS

Computer Subprogram Design Document , Sorter Message Processing, IEWS

Computer Subprogram Design Document, Analysis Return Processing, IEWS

Computer Subprogram Design Document, Emitter Classification Processing 1, IEWS

Computer Subprogram Design Document, CW Processing, IEWS

Computer Subprogram Design Document, ABI Management, IEWS

Computer Subprogram Design Document, Resource Management, IEWS

Computer Subprogram Design Document, Display/Control, IEWS

Computer Subprogram Design Document, System Management 2, IEWS

Common Data Base Design Document, IEWS

Data Extraction Design Document

2.3.2	Signal Sorter	
(U)	ESD-SB-001	Signal Sorter, IEWS, Equipment Design and Performance Specification
	CG-893645	IEWS Signal Sorter, Computer Program Performance Specification
	53959-JK-1002	System Controller - Sorter Interface Control Document
2.3.3	Technique Generator	
(U)		Technique Generator, Computer Program Performance Specification
	53959-HM-0410	Technique Generator, Unit Hardware Development Specification
2.3.4	Special Test Equipment	
(U)	9211/DB/IEWS #517	Software Development Center Paper Tape Software System
	9211/DB/IEWS #566	Data Recording Operation Manual RP-16 Linking Loader RP-16 Relocatable Object Text

SECTION III

PRESTANDBY PROCEDURES

(U) This section describes the operator tasks and procedures prior to normal system operation. It includes the power up and equipment setup, program loading, and program initialization. Table 2 contains a list of these necessary operator functions.

3.1 Equipment Setup

3.1.1 Power Up

(U) The IEWS system power is routed via a central distribution box controlled by the POWER ON switch on the display and control panel. The Special Test Equipment must be powered up separately. This includes the main power switch on the front panel, the floppy disk power switch, the paper tape reader power switch, and the paper tape punch power switch.

3.1.2 Equipment Reset

(U) The IEWS is master cleared prior to operation via the RESET switch on the system controller.

3.2 Program Loading

3.2.1 STE Operating System and Linking Loader

(U) The floppy disk operating system (FDOS.BQ) and the linking loader (LLDR.BQ) are loaded via the RP-16 bootstrap loader. The bootstrap loader, located at "FF$\phi\phi_{16}$, requires starting and the typing of "H" then the stack address of '$\phi\phi\phi$1$\phi\phi$' for each load.

3.2.2 STE/SC Loader

(U) The SC loader (SCLT1.FD) must be moved into the STE processor one so that the additional loaders and data can be obtained. This loader is

available on a floppy disk and is loaded by starting the FDOS at "$4\phi_{16}$" and by placing the disk in the drive, assigning the file handler BIN1 to the loader file and by executing the "LO" load command.

3.2.3 STE and RMP Loaders

(U) The SC loader is now used to load the various loaders. The first two are the STE processor 2 loader (STELT. FD) and the RMP loader (RMPLD. FD). This is accomplished by assigning the file handler BIN1 to the correct disk file and by executing the SC loader.

3.2.4 AP and CP Loaders

(U) If the RMP and CP control panels are present, the AP and CP loaders, APLD. FD and CPLD. FD respectively, must be manually initiated by first starting the RMP at "$7\phi44_{16}$", then by assigning the file handler BIN1 to the correct disk file and by executing the SC loader. The CP is then started at "$2\phi4_{16}$".

3.2.5 SC Software

(U) The SC software is loaded by assigning the disk file containing the SC software to the BIN 1 file handler and by starting the SC loader. The data is positioned automatically to the correct memory via the various loaders.

3.2.6 Data Recording

(U) To load the data recording software in the STE, assign the Linking Loader to the disk file containing the DATA RECORD (DRCD. FD) and start the linking loader via the "LO" command.

3.2.7 Data Reduction

(U) After the test is performed and data has been recorded on a disk file the data reduction software should be loaded. Halt the STE then reload the Linking Loader LLDR. BQ(see 3.2.1). Assign the

BIN 1 file holder to the disk file containing the DATA REDUCTION (DRDR. FD) and start the loader via the "LO" command.

Table 2. Prestandby Procedures (U)

1) Depress D/C Power On (3.1.1)
2) STE Power On (3.1.1)
   Main Power
   Floppy Disk
   Paper Tape Reader
   Paper Tape Punch
3) Depress SC Reset (3.1.2)
4) Load FDOS. BQ in PTR (3.2.1)
5) Start STE @ "FFØØ$_{16}$" Observe "?" (3.2.1)
   Type "H" Observe "??"
   Type "ØØØ1ØØ" Tape loads half "FF58$_{16}$"
6) Load LLDR. BQ in PTR (3.2.1) Repeat (5)
7) Start STE @ "4Ø"$_{16}$ Observe "Operating System" Place SCLT1. FD in Disk Drive A (3.2.2) Type "As BIN 1, FDA, Ø
   Type LO Files load Observe "Busy"
8) Place SC. FD in Disk Drive B Type "As BIN 1, FDB, Ø" (3.2.3)
   "Go TBD" Files Load Observe "Busy"
9) Start RMP @ "7Ø4Ø$_{16}$" Type "As BIN 1, FDA, 1" (3.2.4) "CO TBD" Files load observe "Busy"
   Start cp @ "2Ø4$_{16}$"
10) Type "As BIN 1, FDA, 2" (3.25) "Go TBD" Files load observe "Busy"
11) Type "As BIN 1, FDB, 1" (3.2.6)
   'LO' Files load observe "Busy"
12) Master Clear STE (3.2.7)
   Start @ "FFØØ$_{16}$" observe "?" Load LLDR. BQ in PTR (3.2.1)
   Type "H" Observe "??" Type "ØØØ1ØØ" Tape Loads Hait "FF58$_{16}$"
   Start @ "4Ø" Observe "Operating System" "As BIN 1, FDB, 2"
   "LO" Files load observe 'Busy"

3.3 Program Adaption

(U) All the computer programs associated with IEWS are selfinitializing and require no operator inputs prior to operation.

SECTION IV

STANDBY/OPERATE PROCEDURES

(U) This section describes the operator tasks and procedures required for normal system operation. It includes the Special Test Equipment and IEWS Display/Control commands.

4.1 Special Test Equipment

4.1.1 I/O Device Assignment

(U) The STE outputs must be assigned to the appropriate devices prior to program operation. The STE outputs are as follows:

1) BIN2 = Raw Data Output
2) BIN1 = ASCII Record Output
3) LST1 = ASCII Print Output

The available I/O devices are as follows:

1) TYP = Operator Console
2) FDA = Floppy Disk Drive A
3) FDB = Floppy Disk Drive B
4) PTP = Paper Tape Punch
5) PTR = Paper Tape Reader
6) SLO = Serial Line Output
7) SLO1 = Operator Console (no LFCR)
8) SLI = Serial Line Input
9) NOP = Nothing

4.1.2 Data Recording Operation

(U) The starting address of DATA RECORDING is "$1\emptyset\emptyset\emptyset_{16}$". Initiating a "GO" command causes the STE to start processing messages and display them to the operator. Additional commands are available for

message control (see table 3) such as "SF 1" which will record all the incoming message via BIN2. The operation is terminated by the "QU" quit command and the recorded data file is closed via the "EF" command.

TABLE 3

DATA RECORDING COMMANDS

A. Primary Commands

Go Initializes and Starts Processor 2

In Initializes Processor 1

Qu Stops Processor 2 and Returns Control to Operating System

B. Review Mode

RV Rewinds BIN 2 and Loads Input Cyclic Buffer

C. Message Control

*** Default All Messages Sent to Display ***

SF<SW1>, <SW2>, <SW3> if SW1=1 RAW Data to BIN 2
if SW2=1 ASC II Data to I. LST1
if SW3=1 ASC II Data to I. BIN1

DS <OP CODE>, <FILE , <COUNT> DISPLAY (I, OPLS)

PR <OP CODE>, <FILE , <COUNT> PRINT (I, LST1)

RD <OP CODE>, <FILE , <COUNT> RECORD (I, BIN 1)

AF <OP CODE>, <SWITCH> ALL FILES ON =1, OFF=0

EXAMPLES:

DS 80, 1, 1 - Display Data Extraction Point MSG 80 For Track File 1 Every Time

PR 81, 2, 10-Print MSG 81 For File 2 Every 10TH Time

RD 81, 3, 100-Record MSG 81 For File 3 Every 100TH Time

AF 81, 1 - Print And Record Every MSG 81

D. SC Messages

DM PROC # , ADDRESS Dump 15 Contigous Memory Locations

MO PROC # , ADDRESS , ARG1 ,,,,, ARG8 Modify Up To 8 Memory Locations

EM ARG , ARG ,,,,, ARG CREATE ANY SC MESSAGE

(Processor Numbers: 3=RMP, 4=AP, 5=TG, 6=CP, 7=SS)

E. INS Control

HEAD ALT PITCH ROLL

IL From, To, Inc, From, To, Inc, From, To, Inc, From, To, Inc. (In (LSB = .1°/SEC or 10 FT/SEC)

4.1.3 Data Review

(U) To review the RAW DATA file the SC/RMP must be halted so as not to interfere. The Data Recording program must be restarted and the review mode (RV) entered. Processing is identical to normal operation.

4.1.4 INS Simulation

(U) To simulate changes in aircraft heading the start and stop limits and the rate of change must be entered via the "IL" command.

TABLE 4. STE OPERATION

1) Start STE @ "$4Ø_{16}$" Observe "operating system"
Insert raw data floppy disk in drive A
Under write protect switch Observe "ready" wp off

Insert record data floppy disk in drive B
Under write protect switch Observe "ready" wp off

Type "as BIN2, FDS" (4.1.1)
Type "as BIN1, FDB"
Type "as LST1, SLO"

2) Type "go 1ØØØ" (4.1.2) Observe "data extraction"
Type "SF 1"
Type "GO"

** Data received from SC is displayed and stored **

Type "QU" Observe "operating system"
Type "EF BIN2" Observe "file closed"

3) Halt RMP
Type "go 1ØØØ" (4.1.3) Observe "data extraction"
Type "RV"
Type "GO"

** Data received from stored file and displayed **

Type "QU"

4) Type "IL Ø, FF, 1Ø" (4.1.4) Observe "target movement 0-256° at 1°/sec"

4.2 IEWS Operation

4.2.1 Starting

(U) Each processor must be started via the associated control panels. The RMP starts at "$9\emptyset8E_{16}$" the cp at "$5\emptyset\emptyset2_{16}$". IEWS is now processing received data.

4.2.2 Transmit

(U) To provide high voltage to the transmitter TWT's the transmit switch must be enabled on the D/C panel.

4.2.3 Display Priority

(U) To select the highest 8 priority emitters for the polar display, the priority/all switch must be enabled on the D/C panel.

4.2.4 Emitter Parameters

(U) To obtain detailed emitter paramters on the alphanumeric display, the cursor must be positioned to the selected emitter and the emitter hooked. The parameters will continue to be displayed and updated.

4.2.5 Expand Display

(U) To resolve a multiple emitter symbol on the polar display, the cursor must be positioned to the multiple emitter symbol and the expand mode enabled. The highest priority emitter within the resolved group becomes hooked.

4.2.6 List Display

(U) To display a list of 8 detected emitters in order of priority, the keyboard must be used. The list mode is entered by typing "L" then the desired priority level.

4.2.7 Acquire

(U) To obtain detailed parameters on an emitter with a specific priority the keyboard must be used. The acquisition mode is entered by typing "A" then the desired priority level.

4.2.8 Manual Priority

(U) To modify the priority assigned to an emitter, the emitter is hooked and the new prioty is entered by typing "P" then the desired priority level.

4.2.9 Manual Technique

(U) To modify the technique assigned to an emitter, the emitter is hooked and the new technique is entered by typing "T" then the desired technique number.

4.2.10 Return Technique And Priority

(U) To return a modified technique and priority to SC contro, type "R" then the present priority level.

TABLE 5. SC OPERATION

1) Depress Reset (4.2.1) Observe Processor Halt
Set RMP Switches to "$9\emptyset8E_{16}$"
Load P-Reg
Execute Run
Set cp Switches to "$5\emptyset\emptyset2_{16}$"
Load p.reg
Execute Run Observe Detected Emitters

if desired

2) Depress XMIT (4.2.2) Observe "XMIT Indicator"
3) Depress Priority (4.2.3) Observe "Indicator"
4) Position Cursor To Emitter Parameters
5) Position Cursor to Multiple Emitter Symbol (4.2.5)
Depress Expand Observe Display Change
6) Type "Lnnn" (4.2.6) Observe Emitter List nnn=priority level
7) Type "Annn" (4.2.7) Observe Emitter Parameters nnn=priority level
8) Type "pnnn" (4.2.8) Observe Changed Priority
nnn=priority level
9) Type "Tnnn" (4.2.9) Observe Changed Technique nnn=technique number
10) Type "Rnnn" (4.2.10) Observe Changed Priority and Technique
nnn=Priority Level

SECTION V

MONITORING PROCEDURES

(U) This section describes the operator tasks and procedures required to monitor the IEWS system operation. Monitoring capabilities exist in the Special Test Equipment and consists of me mory read/write commands and data extraction routines. The list of possible operations is found in Table 8.

5.1 Special Test Equipment

5.1.1 Memory Read

(U) The STE allows the capability to interrogate all the memory within the address spectrum of IEWS. By entering the "DM" command, the processor number, and the starting address 15 contiguous memory locations are returned as a data extraction message. The assigned processor numbers are:

3=RMP

4=AP

5=TG

6=CP

7=SS

5.1.2 Memory Write

(U) The STE allows the capability to modify all the memory within the address spectrum of IEWS, except a portion of the technique generator memory. By entering the "MO" command, processor number, start address, and up to 8 data words, contiguous memory locations are modified.

5.1.3 Data Extraction Monitoring

(U) The STE allows the capability to handle certain data extraction messages in various manors. In normal operation or while in review mode (4.1.3) specific message may be displayed, printed, or recorded. The operator

can specify which message, which track number, and how many must be received prior to an output. The command "DS" selects the operator display, "PR" selects LST1 assignment (see 4.1.1), and "RD" selects BIN 1 assignment (see 4.1.1). By entering the command, data extraction opcode, track number, and count, various capabilities exist. If the track and count is not required, the "AF" command will enable all files for the specified opcode. See table 6 for SC Opcodes for the available opcode messages.

5.2 IEWS Data Extraction

(U) Data extraction points peovide the monitoring of the SC operational software. Each data extraction point must be assembled or patched into the SC operational code. Whenever a DE point is encountered during execution a message is generated if the processor, opcode, and DE point is enabled. This message is sent to the STE for processing.

5.2.1 Data Extraction Points

(U) A data extraction points may send the contents of the registers, 16 contiguous memory locations, or 16 non-continguous locations, See the data extraction design document for specific coding details.

5.2.2 Processor Enable

(U) Each processor is initially enabled when it is loaded. If the processor is to be disabled a Ø should be sent to "$AC53_{16}$" for the RMP, "$6C53_{16}$" for the CP, "$3C5B_{16}$" for the AP.

5.2.3 Opcode Enable

(U) Each opcode must be enabled by the STE operator. If the opcode is to be enabled a non-Ø should be sent to the appropriate location "$AC53+1+opcode_{16}$" for the RMP, "$6C53+1+opcode_{16}$" for the CP, "$3C5B+1+opcode_{16}$" for the AP.

	SORTER	RMP		CP		AP	
0	80 PTDW	A0		C0		E0	
1	81 NEW EMITTER ALERT	A1	UNEXPECTED INTERUPT	C1	UNEXPECTED INTERUPT	E1	UNEXPECTED INTERUPT
2	82 CAM FILE DUMP	A2	NON-EXIST DRIVER	C2	NON-EXIST DRIVER	E2	NON-EXIST DRIVER
3	83 AOA READOUT	A3		C3		E3	
4	84 THROTTLE ALERT	A4	MEMORY DUMP	C4	MEMORY DUMP	E4	MEMORY DUMP
5	85 CONFIRM FILE CREATION	A5		C5		E5	
6	86 ERROR ALERT	A6		C6		E6	
7	87 INACTIVE FILE ALERT	A7		C7		E7	
8	88 LONG PULSE PARAMETERS	A8		C8		E8	
9	89 IB<1/4 FULL	A9		C9		E9	
A	8A IB>3/4 FULL	AA		CA		EA	
B	8B FILES FULL	AB		CB		EB	
C	8C TROTTLE FILES FULL	AC		CC		EC	
D	8D BUS HUNG	AD		CD		ED	
E	8E WATCH DOG TIMER	AE		CE		EE	
F	8F ALR-50	AF		CF		EF	
70	90 NPDW MESSAGE	B0	WATCHDOG TIMER	D0		F0	
71	91 MEMORY DUMP	B1	SYSTEM TEST DRIVER	D1		F1	
72	92 MULTIFREQ FLAG	B2	PRIORITY DUMP	D2		F2	
73	93 BIT STATUS	B3	ID DUMP	D3		F3	
74	TG MEMORY DUMP 94	B4		D4		F4	
75	95	B5		D5		F5	
76	96	B6		D6		F6	
77	97	B7		D7		F7	
78	98	B8		D8		F8	
79	99	B9		D9		F9	
7A	9A	BA		DA		FA	
7B	9B	BB		DB		FB	
7C	9C	BC		DC		FC	
7D	9D	BD		DD		FD	
7E	9E	BE		DE		FE	
7F	9F	BF		DF		FF	

TABLE 6. SC OPCODES

The opcode can be Ø through FF_{16}. See table 6 SC opcodes for those presently implimented.

5.2.4 Extraction Point Enable

(U) Each data extraction point must be enabled by the STE operator. If the DE point is to be enabled a non-Ø must be sent to the appropriate location. These locations are contained in Table 7.

PROCESSOR	MESSAGE	ROUTINE	AREA
	Update	ANOC2	EDC Processing 2 (Part of Anal Return)
		ANOC4	EOC Processing 4
		SOOC1	EOC Processing 1
CP	Deletion	SODE L	Inact File Alert Processing (Part of SS MSG Processing)
	Acquisition	SONE 1	New Emitter Processing
	Response	AB1DR	ABI Management 1 Driver
	Class.	ANAMB	(Ambiguity Resolution Part of and/RTN)
	Id Dump	RMARPR	Arrange Priorities (Res Mng)
RMP	Priority Dump	RMARPR	Arrange Priorities (Res Mng)
CP	Sorter 80-93	SODR	SS Msg Proc Driver (Sorter Msg Processing)

Table 7. DE Points (U)

TABLE 8, MONITORING

1) Type "DM p, ADDR" (5.1.1) observe memory dump message
p=processor 3=RMP, 4=AP, 5=TG, 6=CP, 7=SS ADDR=Address

2) Type "MO P, ADDR, DATA 1, DATA 2, ...DATA 8" (5.1.2)
p=processor ADDR=Address

3) Type "DS CODE, TRK, COUNT" (5.1.3)
"PR CODE, TRK, COUNT"
"RD CODE, TRK, COUNT"
"AF CODE"

4) Type "MO 3, AC53, Ø" (5.2.2) Disable RMP
Type "MO 6, 6C53, Ø" Disable CP
Type "MO 4, 3C5B, Ø" Disable AP

5) Type "MO 6, 6D2F, 1" (5.2.3) Enable Acquisition

SECTION VI
RECOVERY PROCEDURES

(U) This section describes the operator tasks and procedures required to restart the IEWS system after an abnormal interruption.

6.1 STE Restart

(U) The reinitialize the STE prior to SC restart the operator must enter an "IN" and a "GO" command.

6.2 SC Restart

(U) If an SC processor is halted or becomes hung, the system must be reinitialized. This requires restarting the RMP at "$9\emptyset8E_{16}$" and the CP at "$5\emptyset\emptyset2_{16}$". If the system fails to restart, it must be reloaded (see section 3.)