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AFAL-TR-76-209
Volume II - Appendices

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SPECIFICATIONS FOR IDAMST SOFTWARE

GOVERNMENT AVIONICS DEPARTMENT
DOUGLAS AIRCRAFT COMPANY
3855 LAKEWOOD BOULEVARD
LONG BEACH, CALIFORNIA 90846

JULY 1977

TECHNICAL REPORT AFAL-TR-76-209, Volume II
Final Report for period March 1976 – November 1976

AIR FORCE AVIONICS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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This final report was submitted by the McDonnell Douglas Corporation, Douglas Aircraft Company, 3855 Lakewood Blvd., Long Beach, California 90846, under contract F33615-76-C-1297, job order 2003 01 09, with the Air Force Avionics Laboratory, System Avionics Division. Mr. Gary D. Wambold/AFAL/AAA-1 was the project engineer. This report has been reviewed and cleared for open publication and/or public release by the Aeronautical Systems Division Office of Information (ASD/OIP) in accordance with AFR 190-17 and DODD 5230.9. There is no objection to unlimited distribution of this to the National Technical Information Service (NTIS). Publication of this report does not constitute Air Force approval of the reports findings or conclusions. It is published only for the exchange and stimulation of ideas. **This technical report has been reviewed and is approved for publication.**

Gary D Wambold
GARY D. WAMBOLD
Project Engineer

Richard L. Bush
RICHARD L. BUSH, Major, USAF
Chief, Avionics Syn. & Analysis Br.
System Avionics Division

FOR THE COMMANDER

James D Everett
JAMES D. EVERETT, Colonel, USAF
Chief, System Avionics Division
Air Force Avionics Laboratory

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SOFTWARE	RECONFIGURATION	DIAGRAMS
SPECIFICATIONS	FUNCTIONAL	SYSTEM

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The significance of this research and development to the Air Force is the completion of major system analysis tasks defining software requirements and specification baselines on the Integrated Digital Avionics for the Medium STOL Transport (IDAMST). The work was performed under Contract F33615-76-C1297 for the Air Force Base, Dayton, Ohio. These Phase I tasks have been completed to the point required by the contract. They furnish the system requirements baseline for the Type B5 IDAMST Software Specifications published separately as contract data items. Volume I is the technical report and Volume II contains the appendices to the technical report.

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PREFACE

TO AFAL-TR-76-209,

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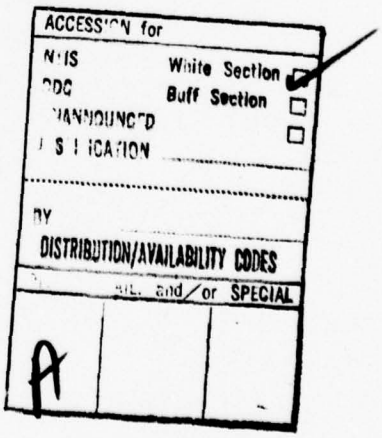
VOLUME II - APPENDICES

This volume contains the Appendices to the report, separated from the main text to reduce individual book size.

Each appendix includes introductory material to provide a "stand alone" capability. However, Volume I should be utilized where a detailed understanding of ancillary data and background is required.



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APPENDIX A

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST MISSION

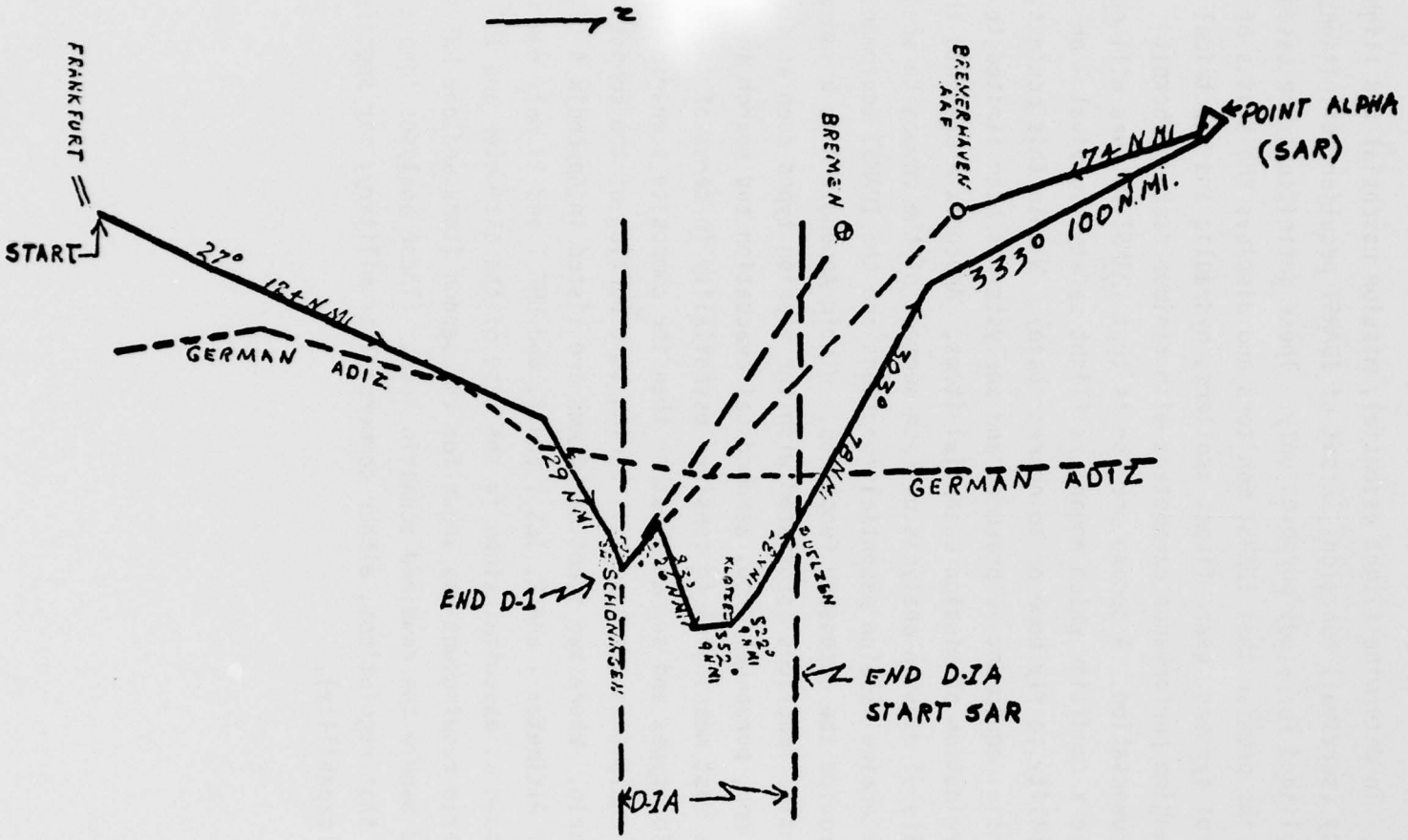
AND

ESSENTIAL EQUIPMENT ANALYSIS

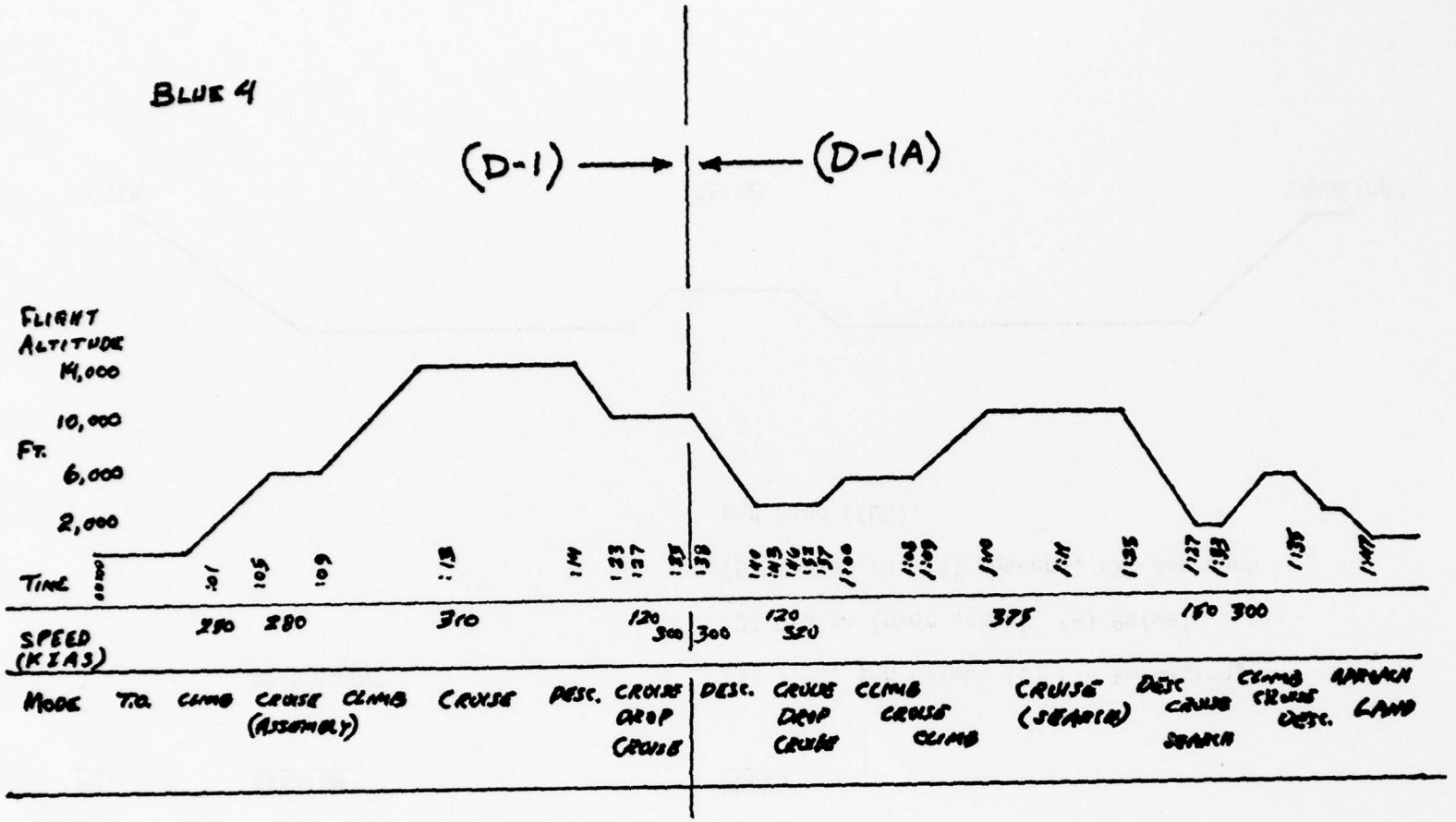
The procedures for Mission Scenario Analysis employed an approach designed to reduce operations to manageable segments which can be graphically portrayed on normal size paper. This approach also enhances detail analysis of mission operational segments such as a specific Air Drop and the attendant time sequence of events/functions involved for crew, hardware and software. Page 6 shows a map/route representation of the flights involved in the scenario covering D-1, (heavy airdrop originating at Frankfurt and dropping at Schoningen), D-1A (Covert personnel drop at KLOTZE) and continuing to the search and rescue mission north to Bremerhaven. The flight distance, headings, and relative location of vital points such as drop location, airbases and etc. are illustrated. Page 7 portrays the same flights in profile, with time sequence corresponding to changing flight speeds and flight modes. The development of Functional Sequence Analysis Worksheets which show scenario events time sequenced to incremental mission time, flight phase/function, crew functions and subsystems involved provide adequate information for development of top-level Functional Sequence Diagrams. Worksheets have been prepared and were delivered to AFAL as part of the Interim Technical Report.

The IDAMST Avionics Suite lists twenty items of equipment designed to perform specific functions. Some equipment items such as the Radar Set provide multi-functional-capability, i.e., ground mapping, weather mapping, etc. Each individual function is performed with the equipment in a specified operational mode and will require software functionally designed for that mode. The IDAMST Avionics Suite provides functional alternatives for mission performance to ensure world wide operational capability. This capability was analyzed by evaluating the essential functions of communications, navigation, target acquisition, vehicle defense, and mission management and the sub-functions which occur under each.

To determine flight essential, mission essential and flight safety (survival) functions, a set of IDAMST peculiar definitions was established for study purposes only. These definitions are based upon the premise that IDAMST monitors and displays the status of flight control systems, gear, flaps, spoilers, hydraulic and electrical systems, and engine performance parameters with minimum back-up cockpit instrumentation. A second premise is that IDAMST failure will not create a condition which endangers flight safety (survival - or capability to fly home or to nearest base). Within this context, flight essential equipment is presumed and analysis has been limited to determination of mission essential items. Appendix A presents the results of mission analysis of each segment of the composite scenario to determine mission essential functions and the IDAMST equipment required to provide the necessary functions. Within Appendix A is a summary of essential functions associated with the mission types such as deployment, air drop, personnel drop, aeromedical evacuation and search and rescue. It is most meaningful to consider essentiality in terms of the discrete mission types and segments rather than the composite scenario because most equipments are essential during some portion of the composite scenario. Where two identical items are listed in Appendix A (i.e., Radar Altimeter 1 and 2, ILS 1 and 2, and UHF 1 and 2) only one each is shown as essential since in the case of the altimeter and ILS no scenario requirement was shown for the second items and one UHF set could handle the combined scenario load. (These analyses ignore the fact that regulations, either commercial or military; may specify some dual capability).



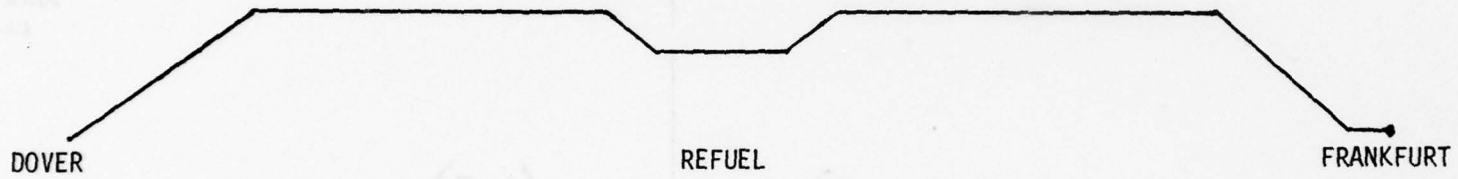
D-1, D-1A and SAR Route



D-1, D-1A, and SAR Flight Profile

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
1.	DEPLOYMENT	(1) T. O. and Climb, (2) Fly Formation, (3) Cruise (over water), (4) Refuel, (5) Repeat #3, (6) Descend, (7) Approach and Land (ILS).



MISSION FUNCTION: DEPLOYMENT

MODES: T.O., Climb, Fly Formation, Cruise, Refuel, Cruise, Descend, Approach & Land

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Long range comm-flt control, pos. rep.		X
VHF/AM	Comm-tower, dep. control, report points		X
VHF/FM			
IC			
SV			
IFF	Flight and position identification		X
UHF-1	Formation Control-comm. with tankers		
UHF-2			
NAVIGATION			
RS	Update INS (over Europe)		X
RA-1			
RA-2			
INS	Precise navigation control		X
OMEGA	Update INS (over water)		X
UHF/ADF	Locate approach control points		X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	SKE-Back-up in formation flight		X
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB	Position relative to tankers		X
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS	Position relative to tankers (refuel)		X
SKE	Assist assemble in flight formation		X
ILS-1	Landing system for IFR landing		X
ILS-2			
TACAN			

IDAMST AVIONICS SUITE

S. NO.	SUBSYSTEM	HARDWARE FUNCTION
1.	Radar Set	Multi-mode to include terrain mapping.
2.	Radar Altimeter	Indicate precise altitude, (below 5,000 ft.)
3.	INS	Indicate precise position, (latitude/longitude)
4.	Omega	Long range navigation aid
5.	Public Address System	Loud Speaker
6.	HF/SSB Radio	Long range communication (beyond L.O.S.)
7.	VHF/AM Radio	Traffic control (military and commercial)
8.	VHF/FM Radio	Tactical Command System (air to ground)
9.	Intercom	Communication within aircraft
10.	Secure Voice	Coded/Scrambled
11.	IFF	Identify and locate friendly aircraft

IDAMST AVIONICS SUITE Continued

S. NO.	SUBSYSTEM	HARDWARE FUNCTION
12.	UHF Radio	L.O.S. communication system (relatively interference free)
13.	UHF/ADF	Directional indicator-to/from broadcast station
14.	VOR/ILS	Landing aid system in aircraft using ILS aids-ground or portable
15.	LF/ADF	Directional broadcast receiver
16.	SKE	Formation position indicator
17.	Radar Beaxon	Transponder-activated by radar QDERY
18.	TACAN	In-theater tactical navigation aid
19.	Infrared Detection	Detects rocket/and other IR firings
20.	ESM/Passive Radar	Indicate painting by radar

MISSION FUNCTION: DEPLOYMENT MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Comm-tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC		X	
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Back-up SKE in assemble formation	X	
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE	Assemble flight formation	X	
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOYMENT MODE: Cruise (Over Water)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Flight Control/Pos. Rept-Long Range	X	X
VHF/AM	Position Report/Flight Control	X	X
VHF/FM			
IC		X	
SV			
IFF	AC/Flight-Identification	X	X
UHF-1	Formation Control & Communication	X	X
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS	Precise Navigation Control	X	X
OMEGA	Update INS	X	X
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE		X	
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOYMENT MODE: Refuel

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Traffic Control - Beyond L.O.S.	X	X
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1	Formation Comm. & Control Tanker Fleet Comm.	X	X
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS	Precise Navigation/Position	X	
OMEGA	Update INS	X	
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS	Precise Position	X	
OMEGA	Update INS	X	
TACAN			
SKE			
RB	Position Relative to Tankers	X	X
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS	Position Relative to Tankers	X	X
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOYMENT MODE: Descend

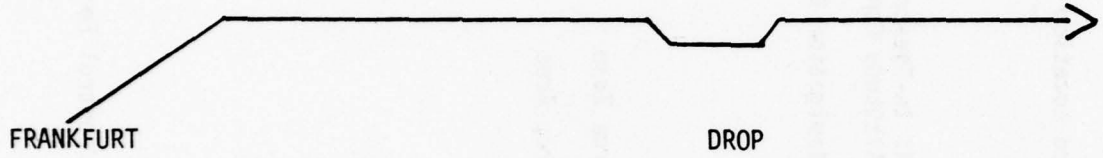
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOYMENT MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions - Fixed or Portable	X	X
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
2.	AIR DROP (HIGH ALTITUDE)	(1) T. O. and Climb, (2) Fly Formation, (3) Short Range Cruise, (4) Descend, (5) Formation Drop, (6) Repeat #3.



MISSION FUNCTION: HIGH ALTITUDE AIR DROP

MODES: T.O. and Climb, Fly Formation, Cruise, Descend, Formation Drop, Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Long Range Communication with ALCE		X
VHF/AM	Comm-Tower, Dep. Control, Reporting		X
VHF/FM	Communicate with Drop Zone		X
IC			
SV			
IFF	Ident. and Location		X
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS In-Theater		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation Control		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate Drop Zone		X
RA-1			
INS	Locate Drop Area		X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE	Assemble/Control Formation		X
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AIR DROP HIGH ALT. MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Comm-Tower, Dep. Control, Rep Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Back-Up SKE in Assemble Formation	X	
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE	Assemble Flight Formation	X	
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: HIGH ALTITUDE AIR DROP MODE: Fly Formation

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Beyond Line-Of-Sight Comm.	X	X
VHF/AM			
VHF/FM			
IC			
SV			
IFF	Ident. & Location		
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS In-Theater	X	X
RA-1	Precise Alt. Control Below 5,000 Ft.	X	
RA-2			
INS	Precise Navigation	X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE	Maintain Formation Position	X	X
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: HIGH ALTITUDE AIR DROP MODE: Cruise (Short Range)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM	Enroute Reporting	X	
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: **HIGH ALTITUDE AIR DROP** MODE: **Descend**

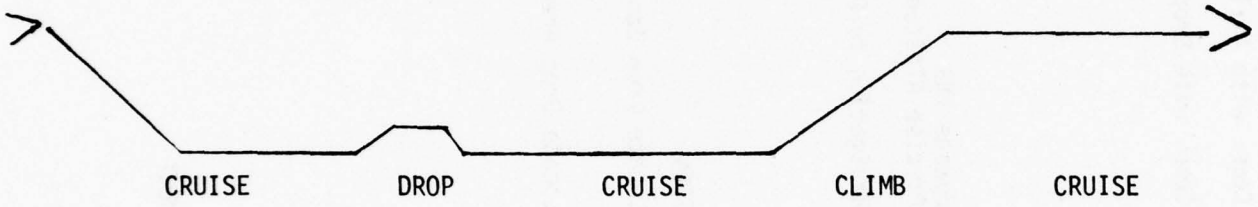
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: HIGH ALTITUDE AIR DROP MODE: Air Drop (Cargo)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Comm. with Airlift Control Element	X	X
VHF/AM			
VHF/FM	Comm. with Drop Zone Command	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1	Precise Altitude to Limit Drop Dispersion	X	
RA-2			
INS	Navigation to Drop Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate Drop Zone	X	X
RA-1			
RA-2			
INS	Locate Drop Area	X	X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION		MODES
3.	PERSONNEL DROP (COVERT)	DIA	(1) Descend, (2) Short Range Cruise, (3) Radar Painted, (4) Personnel Drop, (5) Repeat #2.



MISSION FUNCTION: PERSONNEL DROP

MODES: Descend, Cruise, Drop, Cruise (Low Altitude), Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Comm. to ALCE		X
VHF/AM			
VHF/FM			
IC			
SV	Comm. to ECM Support Aircraft		X
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS/Ground Mapping		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV	Comm. to ECM Support Aircraft		X
IFF	Ident/Position		X
ESM	Determine Radar Painting		X
ID	Detect Missile Launch		X
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: PERSONNEL DROP MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1	Precise Altitude Control		
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: PERSONNEL DROP MODE: Cruise (Short Range)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1	Precise Altitude Control	X	X
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: PERSONNEL DROP MODE: Condition - Radar Painted

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV	Comm. to ECM Support Aircraft	X	X
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS for Fix	X	
RA-1			
RA-2			
INS	Position Required	X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV	Relay Message for ECM Help	X	X
IFF	Identify as Friend	X	X
ESM	Determine Radar Freq. AZMUTH, DECL	X	X
ID	Detect Missile Launch	X	X
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: PERSONNEL DROP MODE: Condition - IR Source

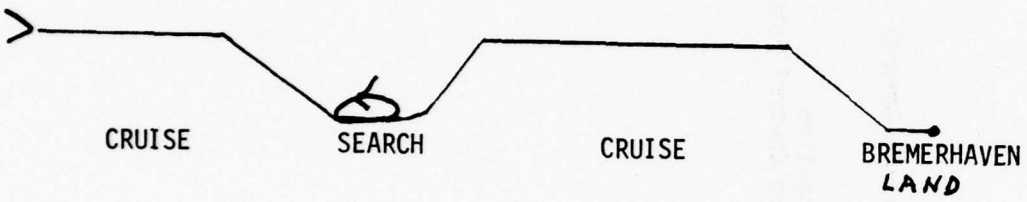
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate to ALCE		
VHF/AM			
VHF/FM			
IC			
SV	Communicate Threat to Proper Command	X	X
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS for Fix	X	
RA-1			
RA-2			
INS	Aircraft Position Required	X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV	Request for Support	X	X
IFF	Identify as Friend	X	X
ESM			
ID	Detect & Locate IR Source	X	X
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: PERSONNEL DROP MODE: Air Drop - Personnel

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate Drop Zone		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Locate Drop Area		X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
4.	SEARCH AND RESCUE DIA	(1) Cruise, (2) Search, (3) Descend, (4) Repeat #1, (5)Approach/Land (ILS)



MISSION FUNCTION: SEARCH AND RESCUE

MODES: Cruise, Descend, Search, Cruise, Approach/Land (ILS)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM	Receive ELF Signal		X
IC			
SV			
IFF			
UHF-1	Communicate with Airborne C.P.		X
UHF-2			
NAVIGATION			
RS	Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS			
OMEGA	Precise Navigation		X
UHF/ADF	Navigation to Control Point		X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: SEARCH AND RESCUE MODE: Cruise (Short Range)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: SEARCH AND RESCUE MODE: Condition - Search

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Receive Search Order (ALCE)	X	X
VHF/AM			
VHF/FM	Receive ELF Signal	X	X
IC			
SV			
IFF			
UHF-1	Communicate with Airborne Command Post	X	
UHF-2			
NAVIGATION			
RS	Update INS	X	
RA-1	Low Altitude Profile - Precision Alt.	X	
RA-2			
INS	Navigate to Estimated Location	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VHF/FM	Locate Downed Pilot Position	X	X
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: SEARCH AND RESCUE MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: SEARCH AND RESCUE MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: SEARCH AND RESCUE MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions Fixed or Portable	X	X
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
5.	LOW ALTITUDE PARACHUTE DROP, D2	(1) T.O./Climb, (2) Cruise, (3) Descent, (4) Go Around, (5) Repeat #3, (6) Repeat #2.

MISSION FUNCTION: LOW ALTITUDE PARACHUTE DROP

MODES: T.O. & Climb, Cruise, Descend, Cruise (Go-Around), Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Comm-ALCE for Instructions		X
VHF/AM	Comm-Tower, Dep. Control, Rep. Points		X
VHF/FM	Comm. with Drop Zone		X
IC			
SV			
IFF			
UHF-1	Communicate-Direct Flight		
UHF-2			
NAVIGATION			
RS	Ground Mapping/Update INS		X
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Identify Drop Zone		X
RA-1	Precise Altitude Control		X
INS	Locate Drop Area		X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

LOW ALTITUDE
MISSION FUNCTION: PARACHUTE DROP MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Comm - Tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Cruise (Go-Around)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Call ALCE for Instructions		X
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1	Communicate Advise Flight		X
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Identify Drop Zone		X
RA-1	Precise Altitude Control		X
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Air Drop

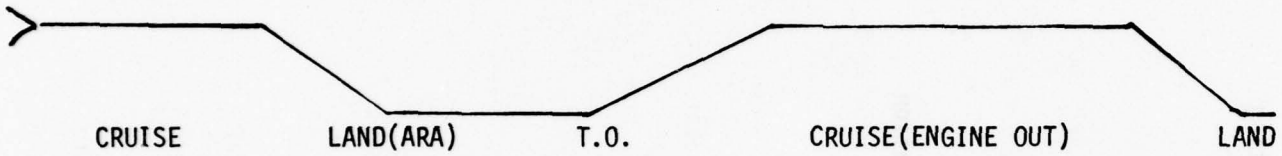
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with Airlift Control Element	X	X
VHF/AM			
VHF/FM	Communicate with Drop Zone Command	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1	Precise Altitude Required	X	X
RA-2			
INS	Navigation to Drop Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate Drop Zone	X	X
RA-1			
RA-2			
INS	Locate Drop Area	X	X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF,'ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

No.	MISSION	MODES
6.	RESUPPLY - AIRLAND. D3 AEROMEDICAL EVACUATION	(1) Cruise, (2) Descend, (3) ARA Landing, (4) T. O. & Climb, (5) Engine Out Operation, (6) Repeat #1, (7) Approach/Land



MISSION FUNCTION: BARE BASE LANDING (ARA)

MODES: Cruise, Descend, ARA, T.O./Climb, Engine Out, APP./Land

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting		X
VHF/FM	Communicate Military Ground Unit		X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping/Update INS		X
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF	Locate Approach/Fix Point		X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate/Create Area Display Data		X
RA-1	Precise Altitude Control		X
INS	Navigate to Landing Area		X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS	Control Landing Approach Data		X
SKE			
ILS-1	Control Approach Data		X
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - AIRLAND MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - AIRLAND MODE: Approach/Landing (ARA)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM	Communicate w/Military Unit on Ground	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Locate & Create Area Display Data	X	X
RA-1	Precise Altitude Indication	X	X
RA-2			
INS	Navigation to Landing Area	X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate/Display Landing Area	X	X
RA-1			
RA-2			
INS	Fly to/Locate Landing Area	X	
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS	Control Landing Approach	X	X
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
	PA		
	HF/SSB		
	VHF/AM		
	VHF/FM		
	IC		
	SV		
	IFF		
	UHF-1		
	UHF-2		
NAVIGATION			
	RS		
	RA-1		
	RA-2		
	INS		
	OMEGA		
	UHF/ADF		
	LF/ADF		
	TACAN		
	SKE	X	X
TARGET ACQUISITION			
	RS		
	RA-1		
	RA-2		
	INS		
	OMEGA		
	TACAN		
	SKE		
	RB		
VEHICLE DEFENSE			
	IC		
	SV		
	IFF		
	ESM		
	ID		
MISSION MANAGEMENT			
	RS		
	SKE		
	ILS-1		
	ILS-2		
	TACAN		

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: N/A Special Condition - Engine Out

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Obtain Emergency Clearance Procedures	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Fly Short Route to Destination	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: Descend

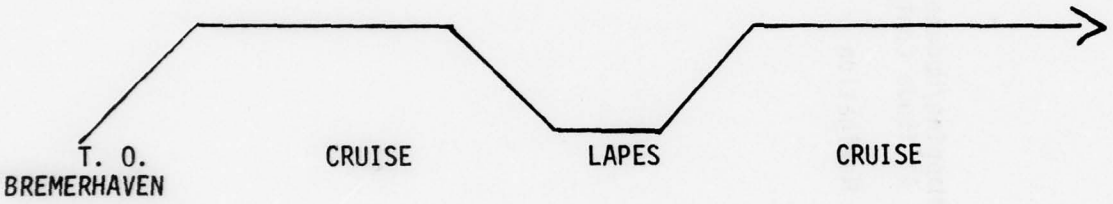
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: Approach & Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions - Fixed or Portable	X	X
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
7.	LOW ALTITUDE PARACHUTE EXTRACTION (LAPES) D4	(1) T. O. & Climb, (2) Cruise, (3) Descend, (4) LAPES, (5) Repeat #2



MISSION FUNCTION: LOW ALTITUDE PARACHUTE EXTRACTION (LAPES)

MODES: T.O./Climb, Cruise, Descend, LAPES, Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Comm.-Tower, Dep. Control, Rep. Points		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping/Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LAPES MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LAPES MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LAPES MODE: Air Drop

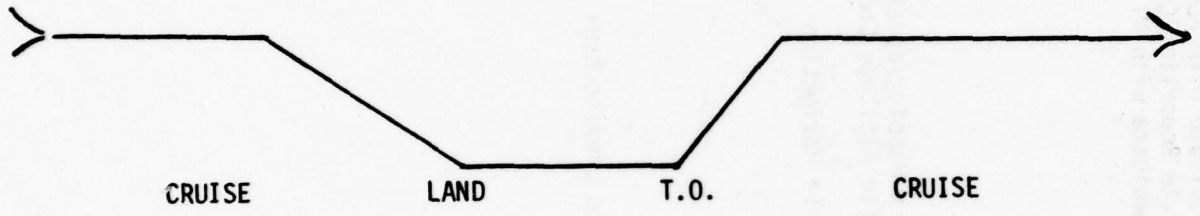
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communication with Airlift Control Element	X	X
VHF/AM			
VHF/FM	Communication with Drop Zone Command	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1	Precise Altitude Required	X	
RA-2			
INS	Navigation to Drop Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate Drop Zone	X	X
RA-1			
RA-2			
INS	Locate Drop Area	X	X
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC	Control Drop Approach	X	X
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LAPES MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
8.	ROAD LANDING D5	(1) Cruise, (2) Descend, (3) Land, (4) T. O., (5) Repeat #1



MISSION FUNCTION: ROAD LANDING/DELIVERY

MODES: Cruise, Descend, Land (VFR), T.O./Climb, Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting/Control		X
VHF/FM	Communicate with Military Ground		X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping/Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS	Locate Landing Area		X
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM	Communicate with Military Ground		X
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Locate Landing Area		X
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: ROAD LANDING/ DELIVERY MODE: Take Off/Climb

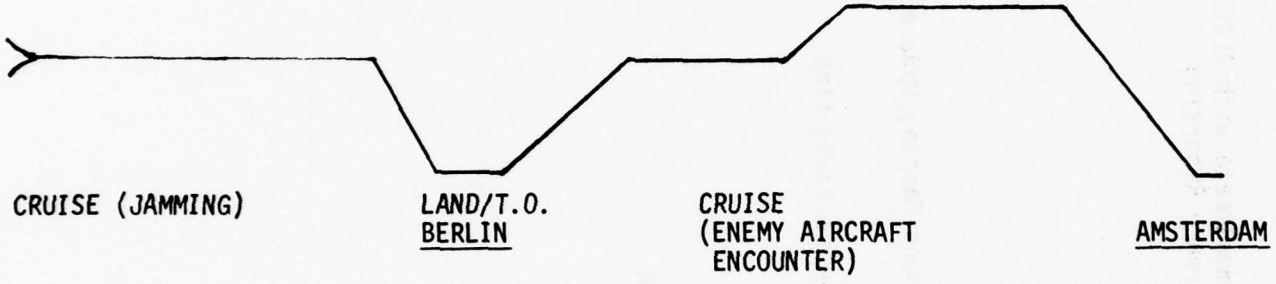
EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Comm-Tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
SKE		X	X
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

NO.	MISSION	MODES
9.	SPECIAL CONDITIONS D5A TO/FROM BERLIN CORRIDOR OPERATIONS	(1) Cruise, (2) Radio Frequency Jamming, (3) Enemy Aircraft Encounter



MISSION FUNCTION: DEPLOY, EVACUATION - AIRLAND MODE: RF JAMMING,ENEMY A/C ENCOUNTER

MODES: Cruise (RF Jamming) Land, T.O./Climb, Cruise (Enemy A/C Encounter)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF	Aircraft Position/Identification		X
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS		X
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA	Locate Reporting Points		X
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF	Transmit Harrass Signal/Mode 3 Code 40		X
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1	ILS Landing - Berlin		X
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: RF JAMMING

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV			
IFF	Aircraft/Posotion Identification	X	X
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Navigate thru Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION:DEPLOY, EVACUATION MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions - Fixed or Portable	X	X
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Comm-Tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			
NAVIGATION			
RS			
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF			
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: ENEMY A/C ENCOUNTER

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
COMMUNICATION			
PA			
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV			
IFF	Aircraft & Position Identification	X	X
UHF-1			
UHF-2			
NAVIGATION			
RS	Update INS	X	X
RA-1			
RA-2			
INS	Fly Planned Course	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			
TARGET ACQUISITION			
RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VEHICLE DEFENSE			
IC			
SV			
IFF	Transmit Harras Signal - Mode 3 Code 40	X	X
ESM			
ID			
MISSION MANAGEMENT			
RS			
SKE			
ILS-1			
ILS-2			
TACAN			

APPENDIX B

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST OPERATIONAL SEQUENCE DIAGRAMS

Operational Sequence Diagrams have been developed to reflect the narrative description of the mission operations described in the AMST scenario and where applicable, the influence of the USAF Employment Concept, and the AMST ROC. Operational Sequence Diagrams is the collective name for sequence diagrams designed to address specific levels of detail in the analytical process for determining system (man-machine) requirements. OSD's may be constructed to any level of detail and written to serve different purooses. Functional Sequence Diagrams (FSD's) produced during Phase I are first level OSD's designed to define man and machine system information requirements, task allocations, and general system requirements. Subsystem Sequence Diagrams (SSD's) to be developed during Phase II, partially in Phase I, are expected to produce equipment requirements to a level of detail from which detailed specifications may be written to facilitate the translation of system requirements into the level of software necessary to drive it.

The composite Mission Scenario furnished by the Air Force coupled with functional sequence and systems analysis provides the basis for development of Functional Sequence Diagrams. The scenario events analyzed and plotted in time sequence work sheets provide the data for development of FSD's which may then be used to identify operational level performance requirements including man/machine requirements, task allocations and general equipment requirements.

Each mission phase deployment through D5, has been treated as a major FSD event with the various flight phases treated as minor events. The flight phases constitute IDAMST master modes and correlate with cockpit equipment and software concepts. The minor events within the scenario were sometimes repetitive and were handled via FSD annotation, however, many similar minor events do involve scenario variations thus have been completely diagrammed within the FSD's.

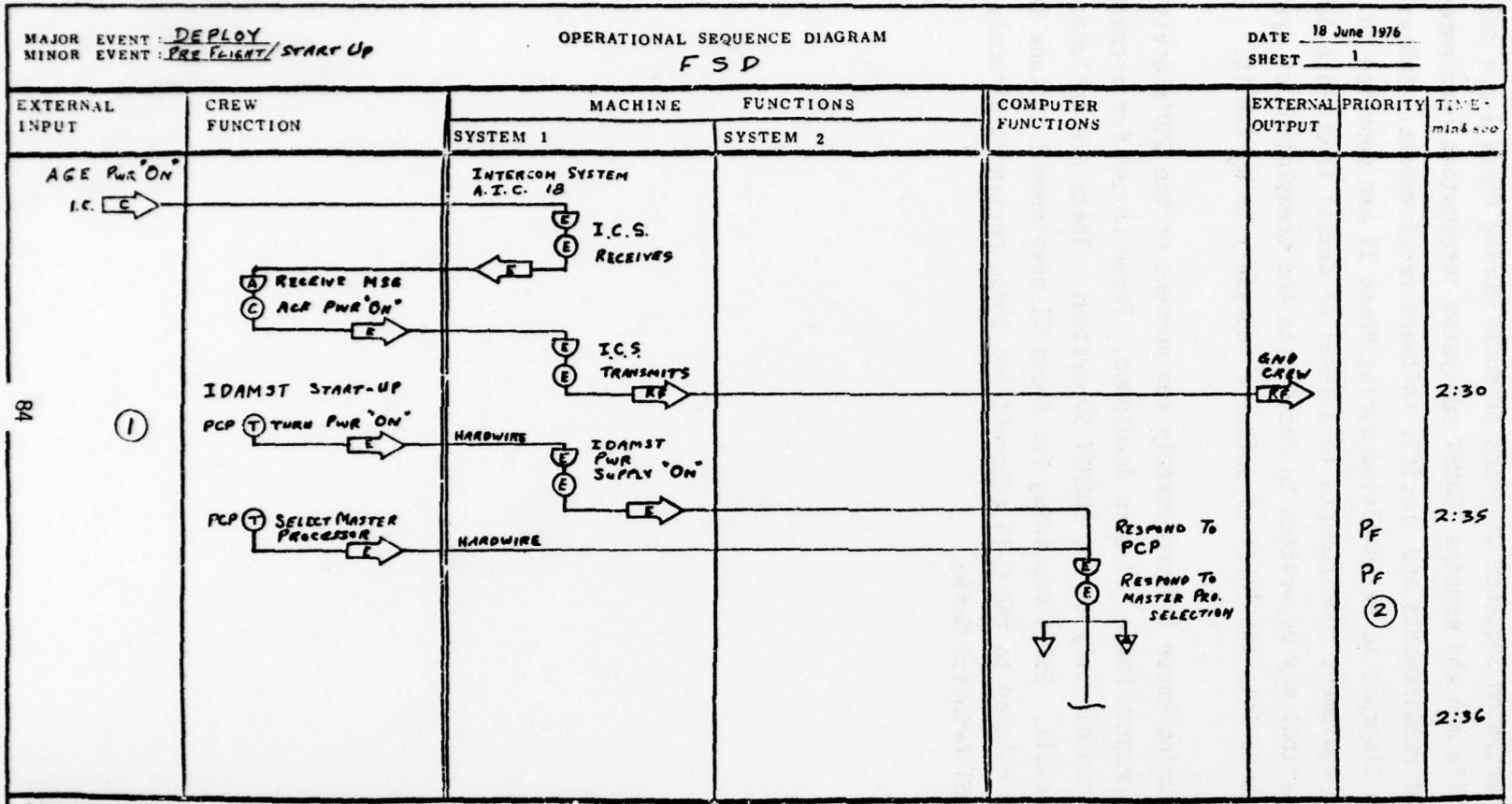
Subsystem Sequence Diagrams produced during Phase I are designed to identify man and machine IDAMST subsystem information requirements, equipment requirements and specific software requirements. Subsystem Sequence Diagrams to be completed during Phase II are expected to complete equipment requirements to a level of detail from which detailed specifications may be written to facilitate the translation of system requirements into the level of software necessary to derive it.

During Phase I approximately ten percent of the SSD's envisioned for the Program Phase II were developed. Those chosen for preparation are related directly to the IDAMST Subsystems. These are included in this Appendix. SSD's remaining for Phase II development include those directly related to the C-15 aircraft and those pertinent directly to the IDAMST Avionics Suite.

MAJOR EVENT : DEPLOY
MINOR EVENT : PRE FLIGHT/ START UP

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 1



REMARKS:

(1) PCP — PROCESSOR CONTROL PANEL

(2) P_F — FLIGHT ESSENTIAL
P_M — MISSION ESSENTIAL
P_S — FLIGHT SURVIVAL

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

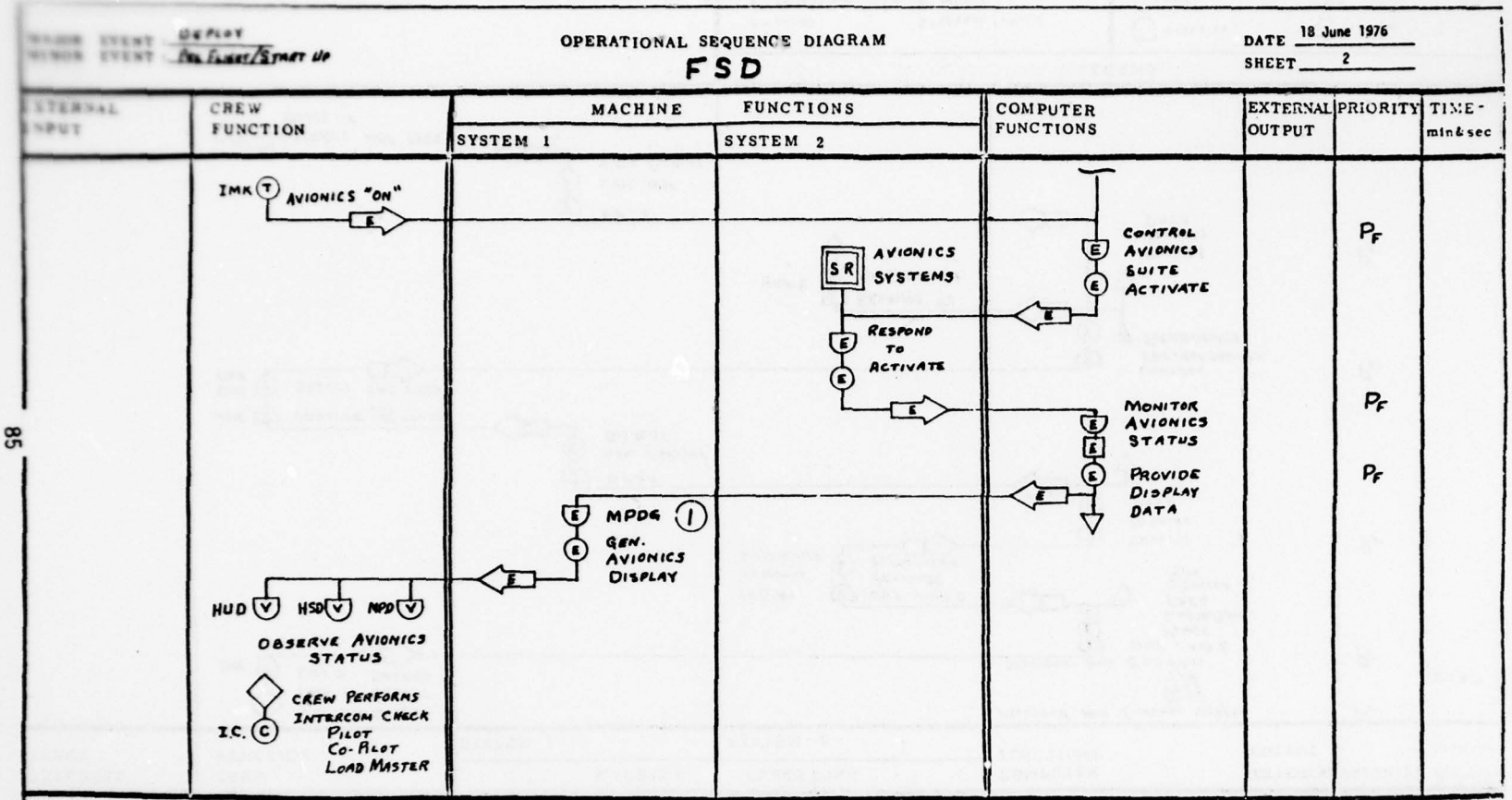
double symbol denotes continuous/current

EAU - 2 mar 76

TRIGGER EVENT DEPLOY
TRIGGER EVENT PRE FLIGHT/START UP

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 2



REMARKS:
(1) MPDG MODULAR PROGRAMMABLE DISPLAY GENERATOR

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

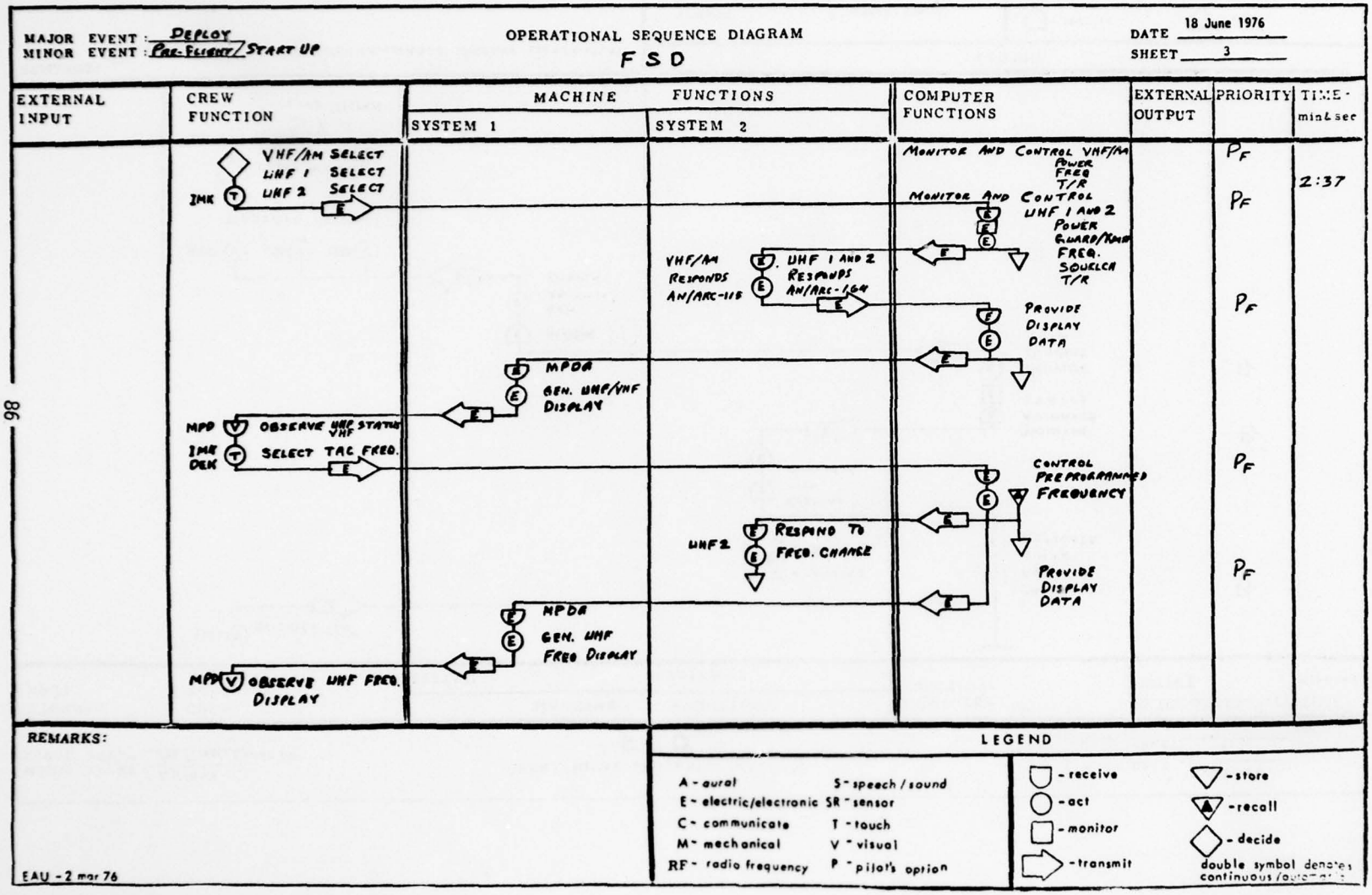
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : PRE-FLIGHT / START UP

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 3



REMARKS:

LEGEND

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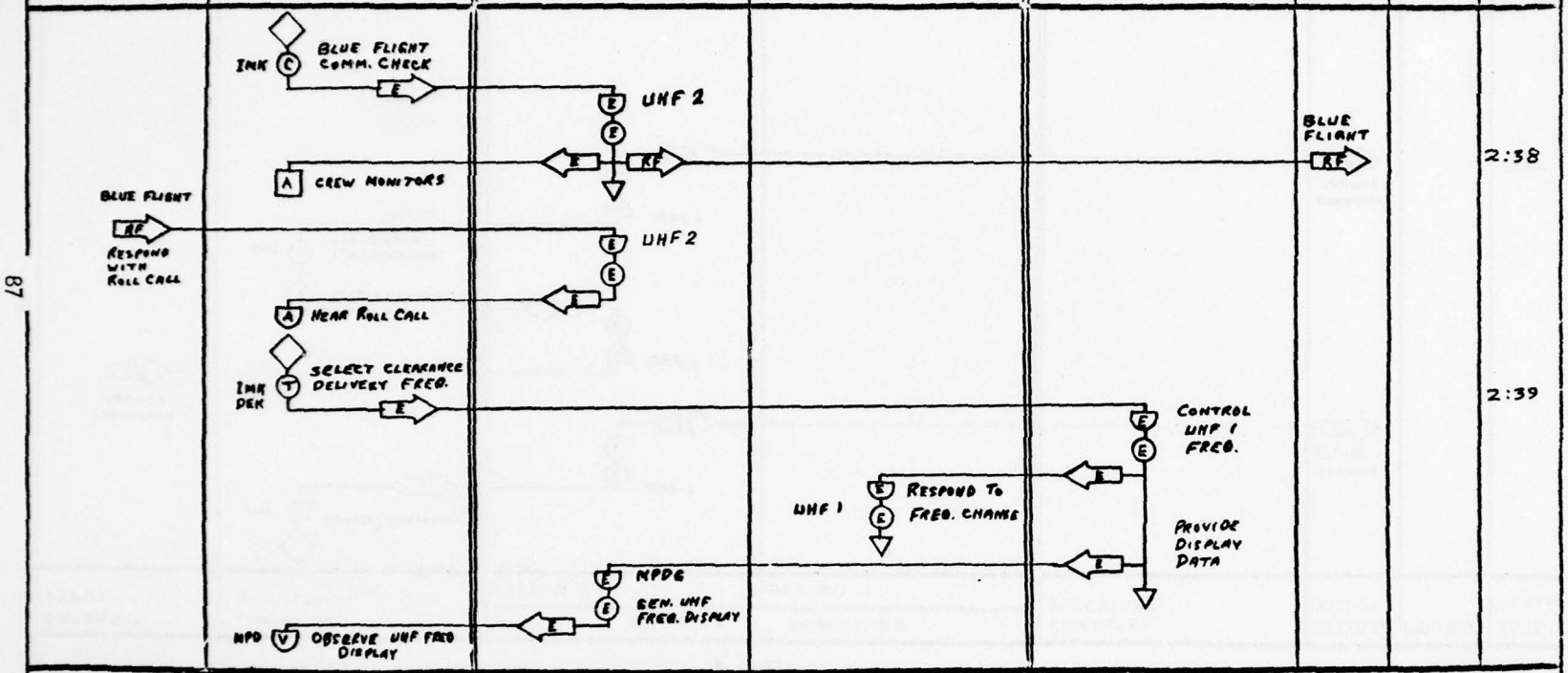
EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : PRE-FLIGHT/START UP

OPERATIONAL SEQUENCE DIAGRAM

F 3 D

DATE 18 June 1976
SHEET 4



REMARKS:

LEGEND

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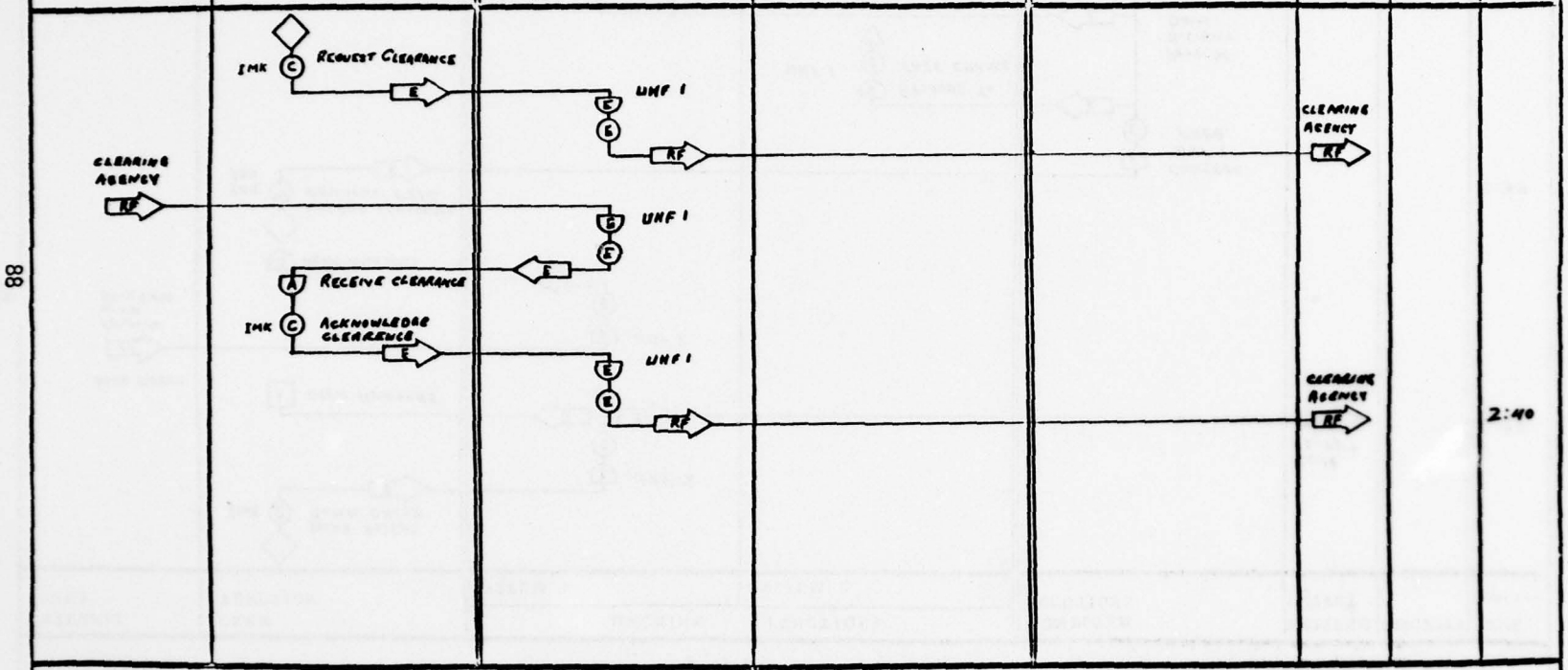
double symbol denotes continuous

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : PRE-FLIGHT/START-UP

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 5



REMARKS:

LEGEND

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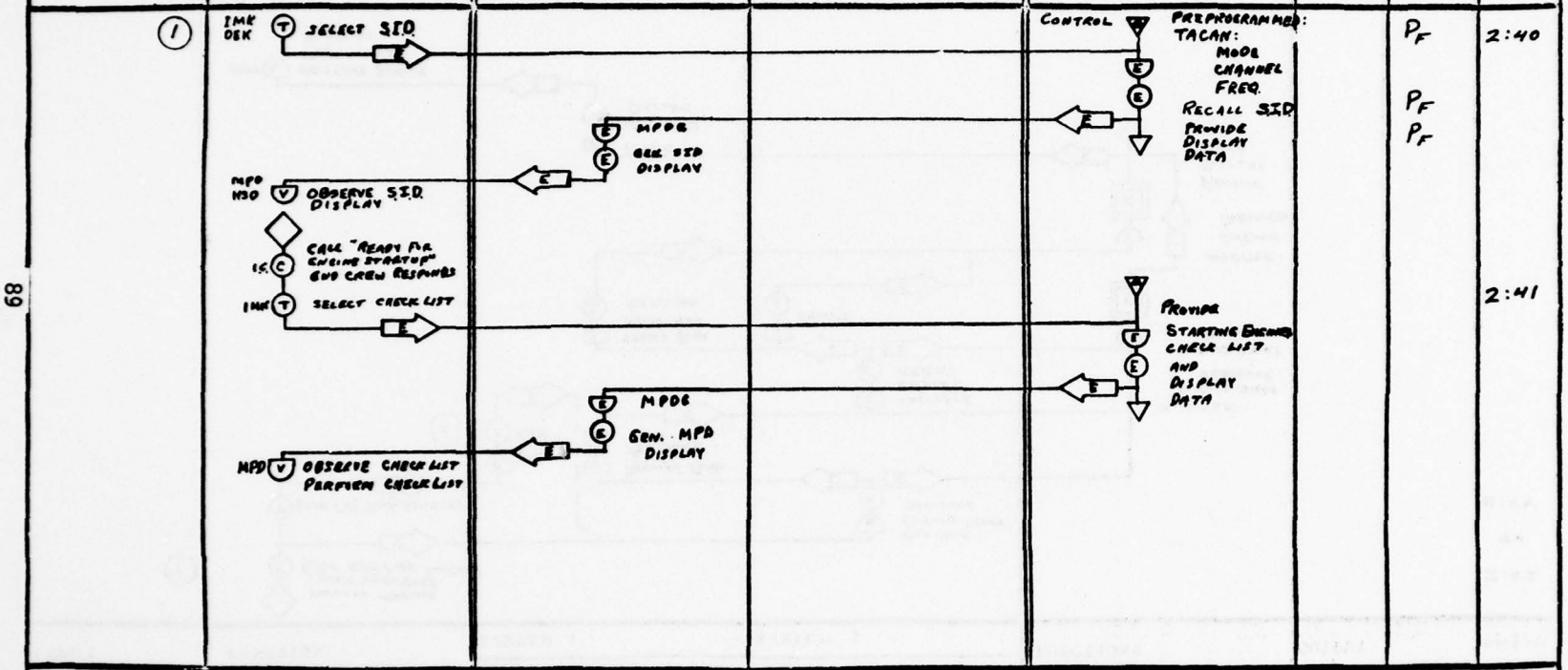
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : PRE-FLIGHT / START-UP

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 6



REMARKS:
(1) SID STANDARD INSTRUMENT DEPARTURE

LEGEND

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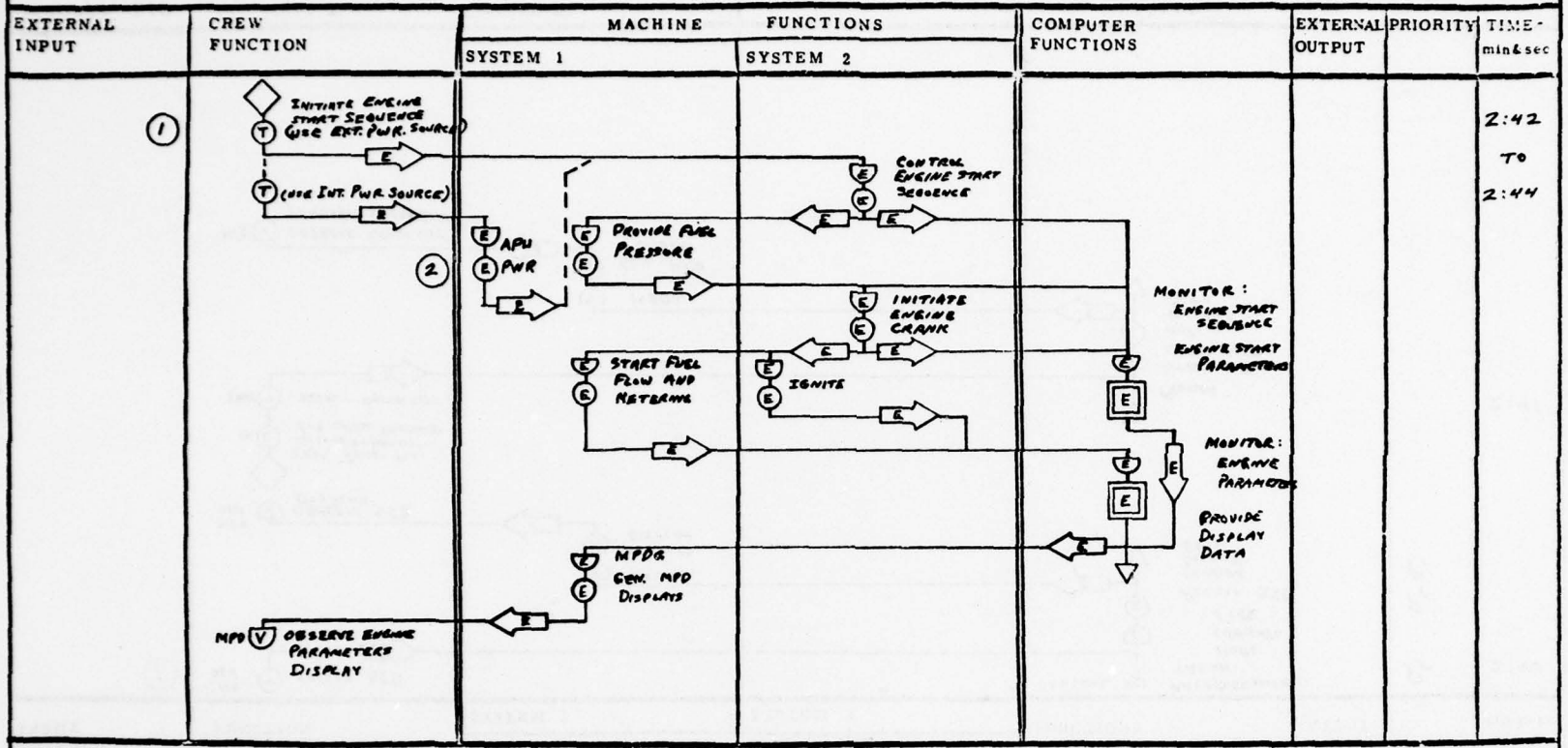
EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : PRE-FLIGHT/START UP

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 7



REMARKS:

(1) REPEAT THIS SEQUENCE FOR EACH ENGINE

(2) APU AUXILIARY POWER UNIT

LEGEND

A - aural
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- recall
- decide

double symbol denotes continuous/automatic

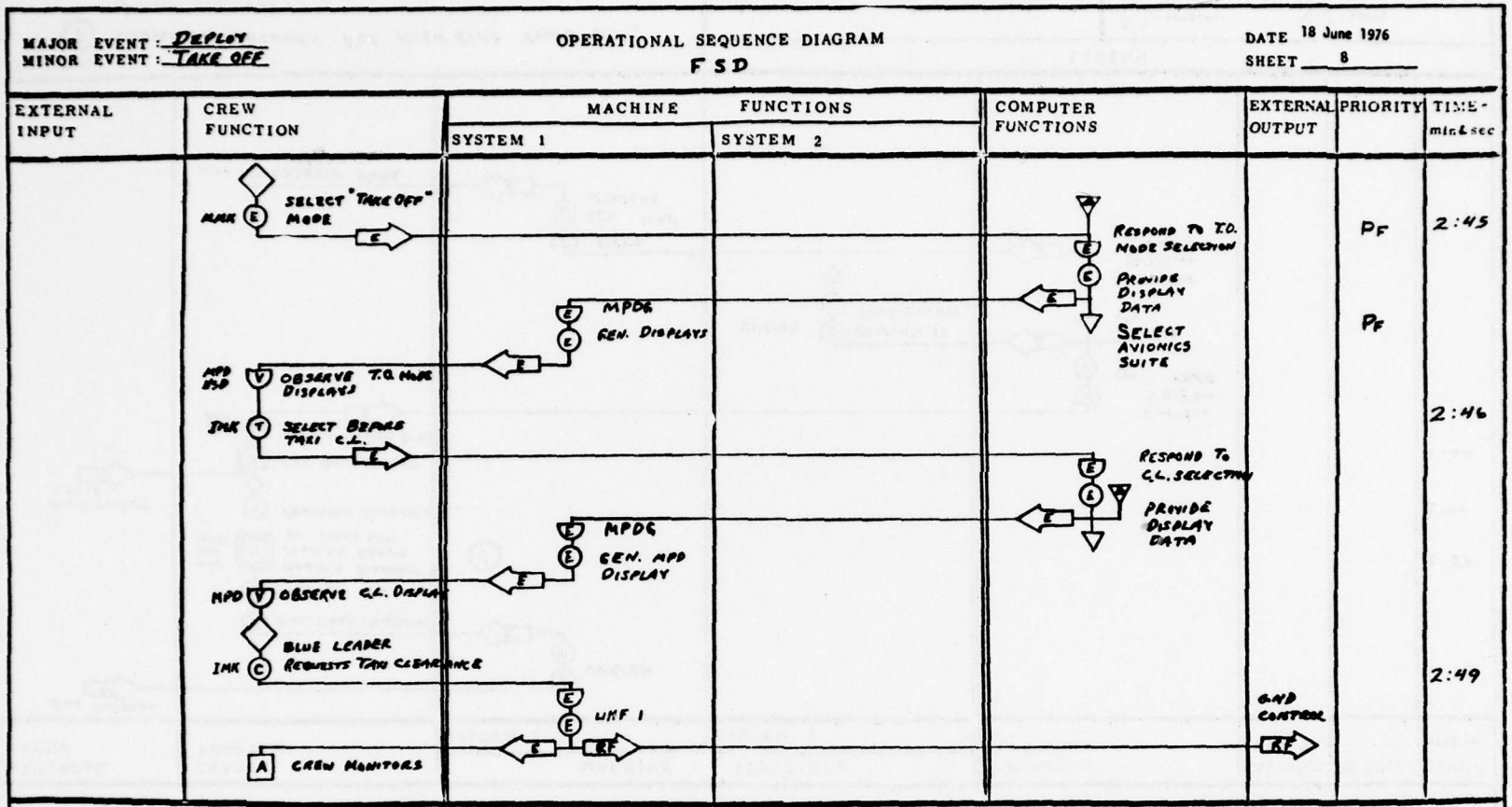
EAU - 2 mar 76

06

MAJOR EVENT : DEPLOY
MINOR EVENT : TAKE OFF

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 8



REMARKS:

EAU - 2 mar 76

LEGEND

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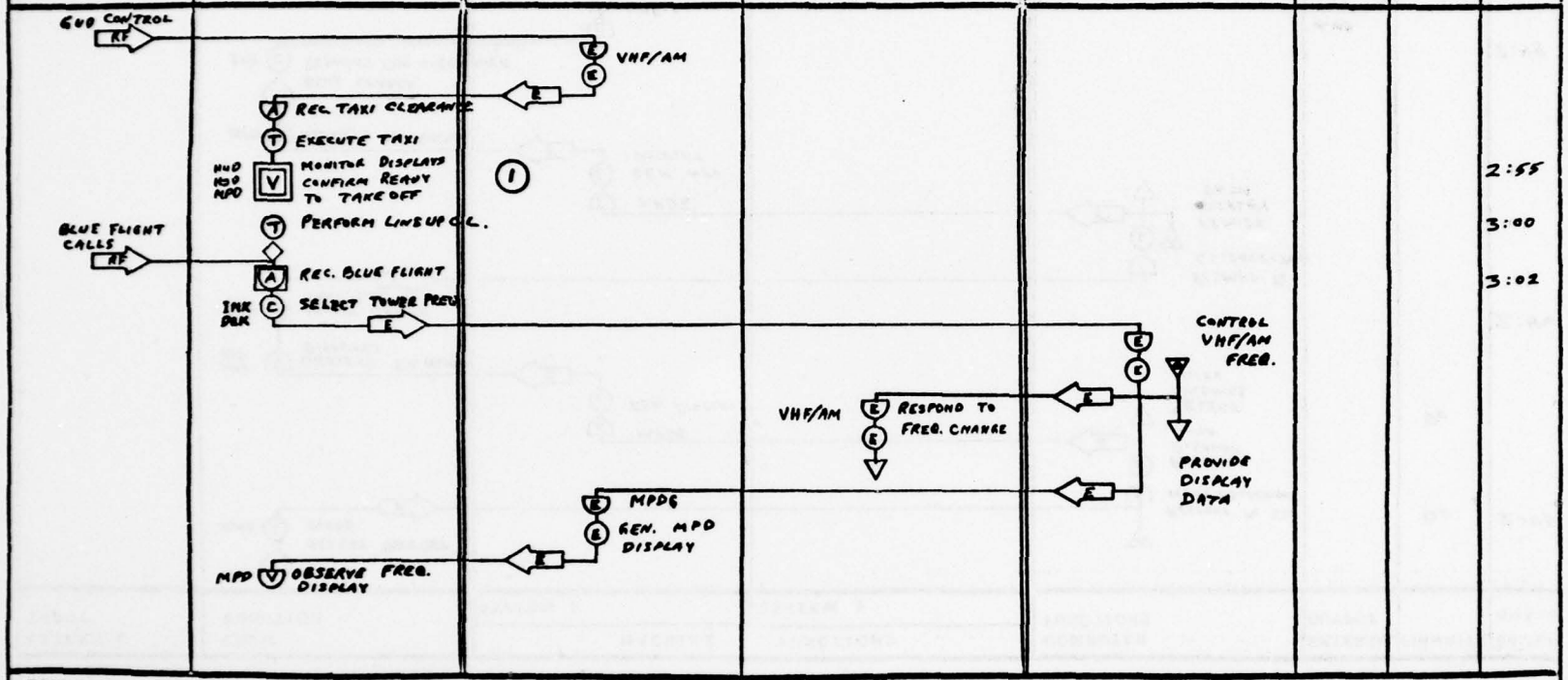
double symbol denotes continuous/automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : TAKE OFF

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 9



REMARKS:

(1) CONFIGURE AIRCRAFT FOR HIGH LIFT TAKE OFF, FLAP SETTINGS.
PERFORM BEFORE TAKE OFF CHECK LIST.

LEGEND

A - aural
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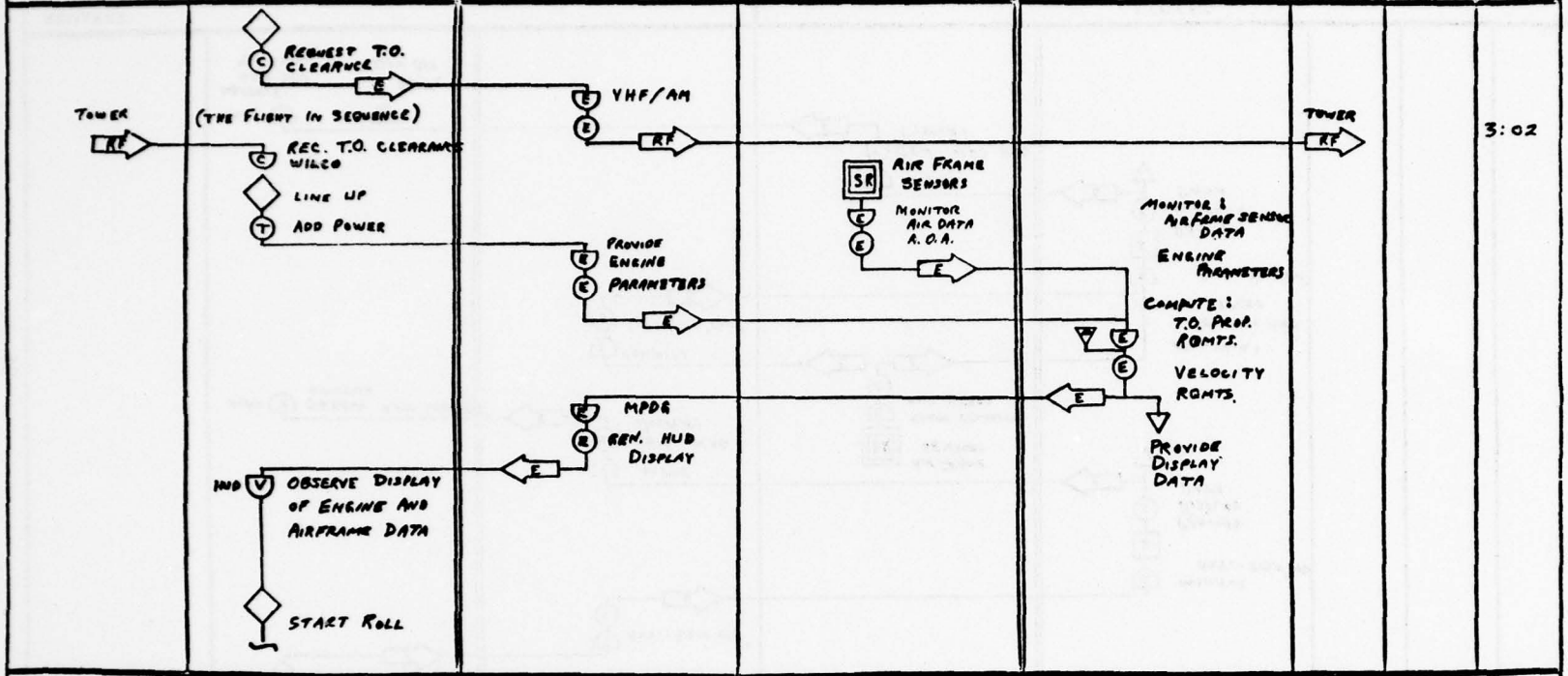
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : TAKE OFF

OPERATIONAL SEQUENCE DIAGRAM
F 3 D

DATE 18 June 1976
SHEET 10



REMARKS:

LEGEND

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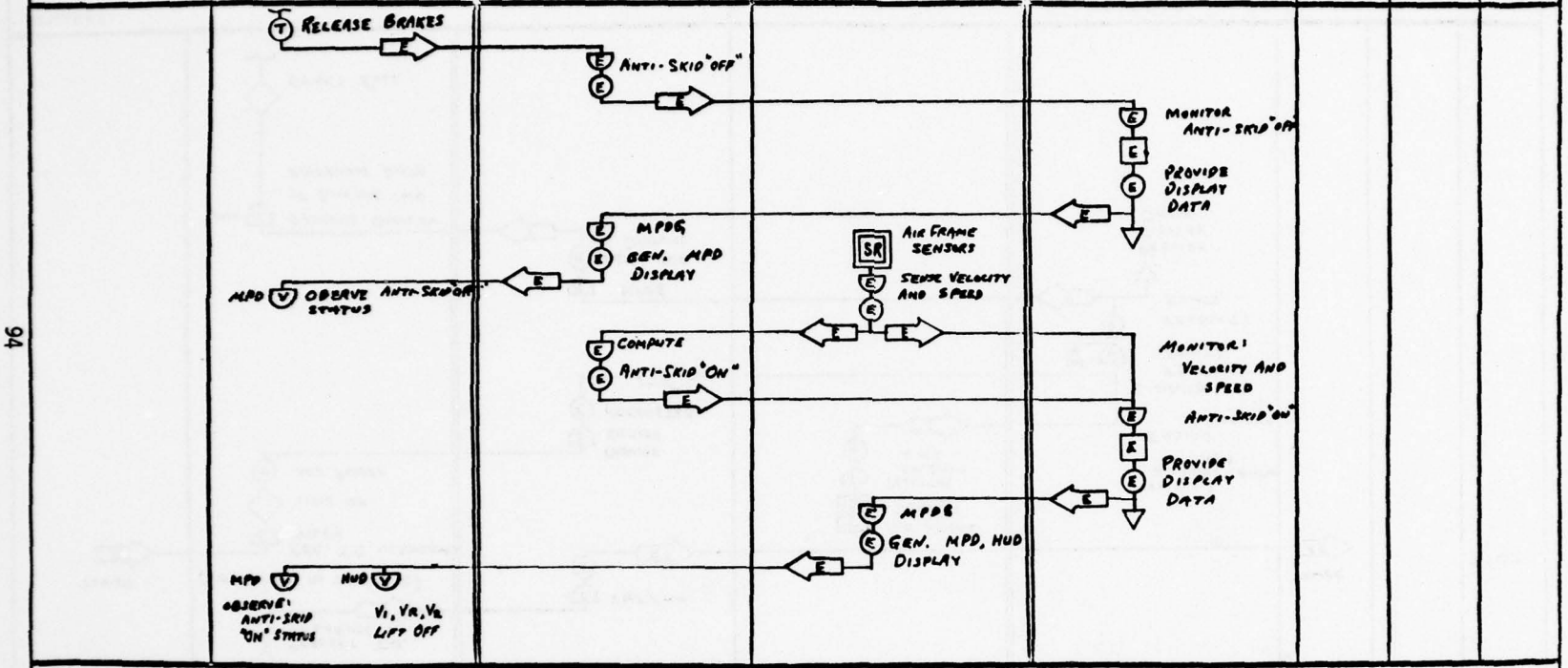
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : TAKE OFF

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 11



REMARKS:

EAU - 2 mar 76

LEGEND

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M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
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P - pilot's option

- receive
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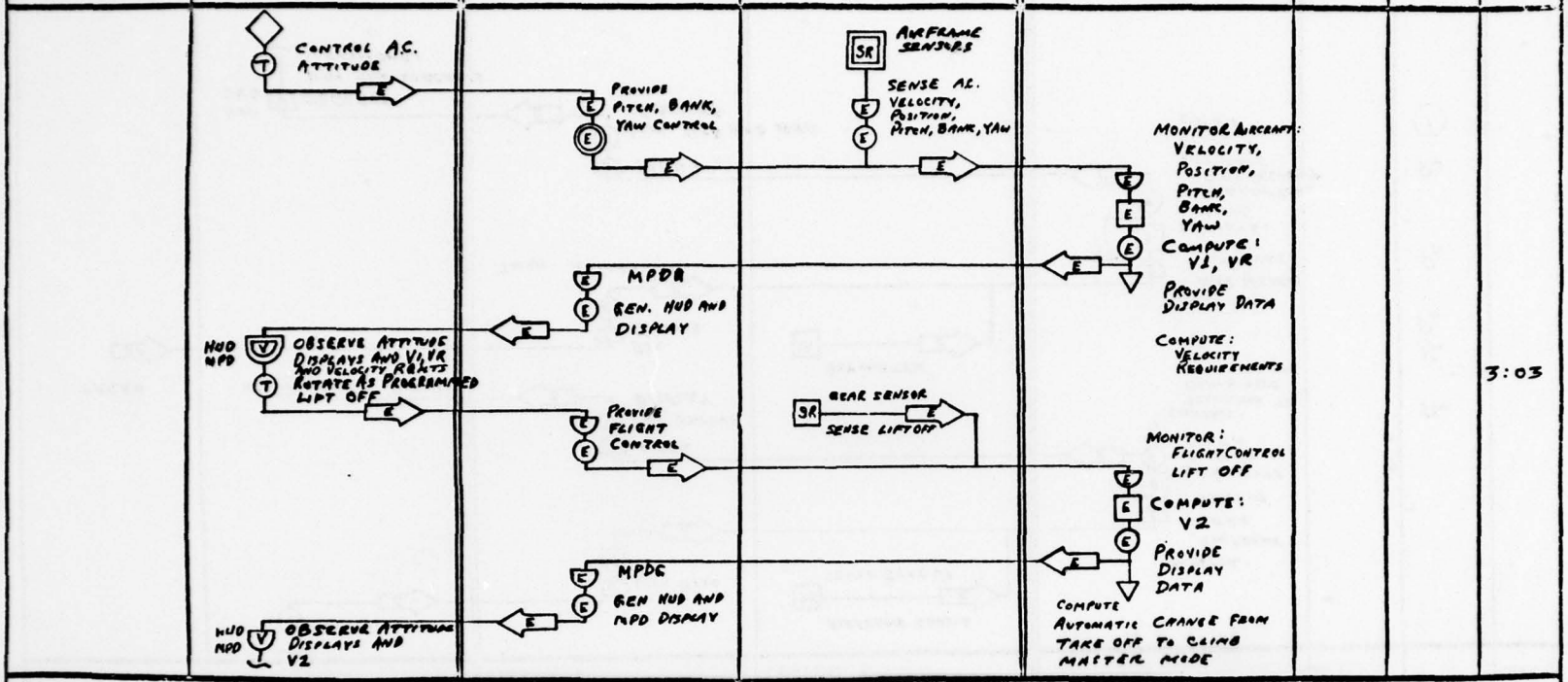
- transmit
- store
- recall
- decide

double symbol denotes continuous / automa...

MAJOR EVENT : DEPLOY
MINOR EVENT : TAKE OFF

OPERATIONAL SEQUENCE DIAGRAM
F 5 D

DATE 18 June 1976
SHEET 12



REMARKS:

EAU - 2 mar 76

LEGEND

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E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

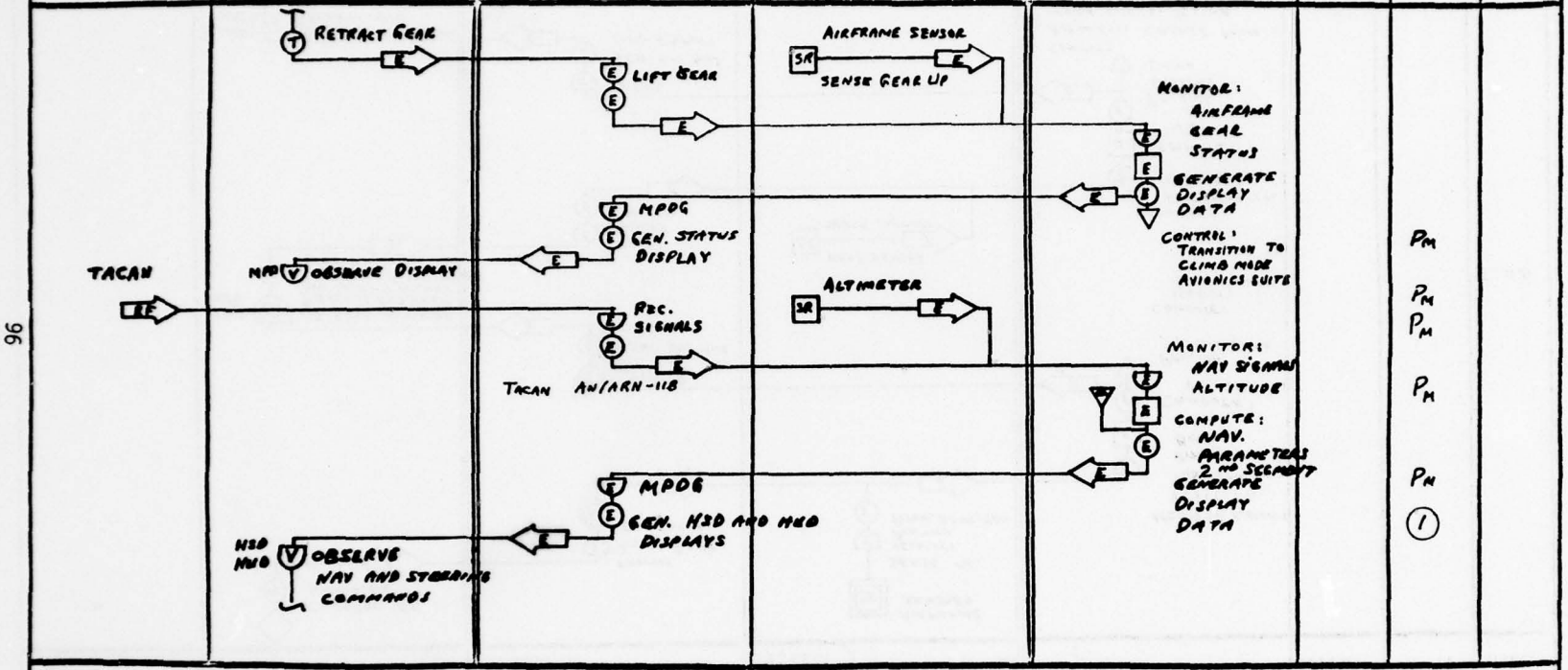
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : CLIMB

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 16 June 1976
SHEET 13



REMARKS:

(1) P_M MISSION ESSENTIAL
P_F FLIGHT ESSENTIAL
P_S FLIGHT SURVIVAL

EAU - 2 mar 76

LEGEND

A - aural
E - electric/electronic
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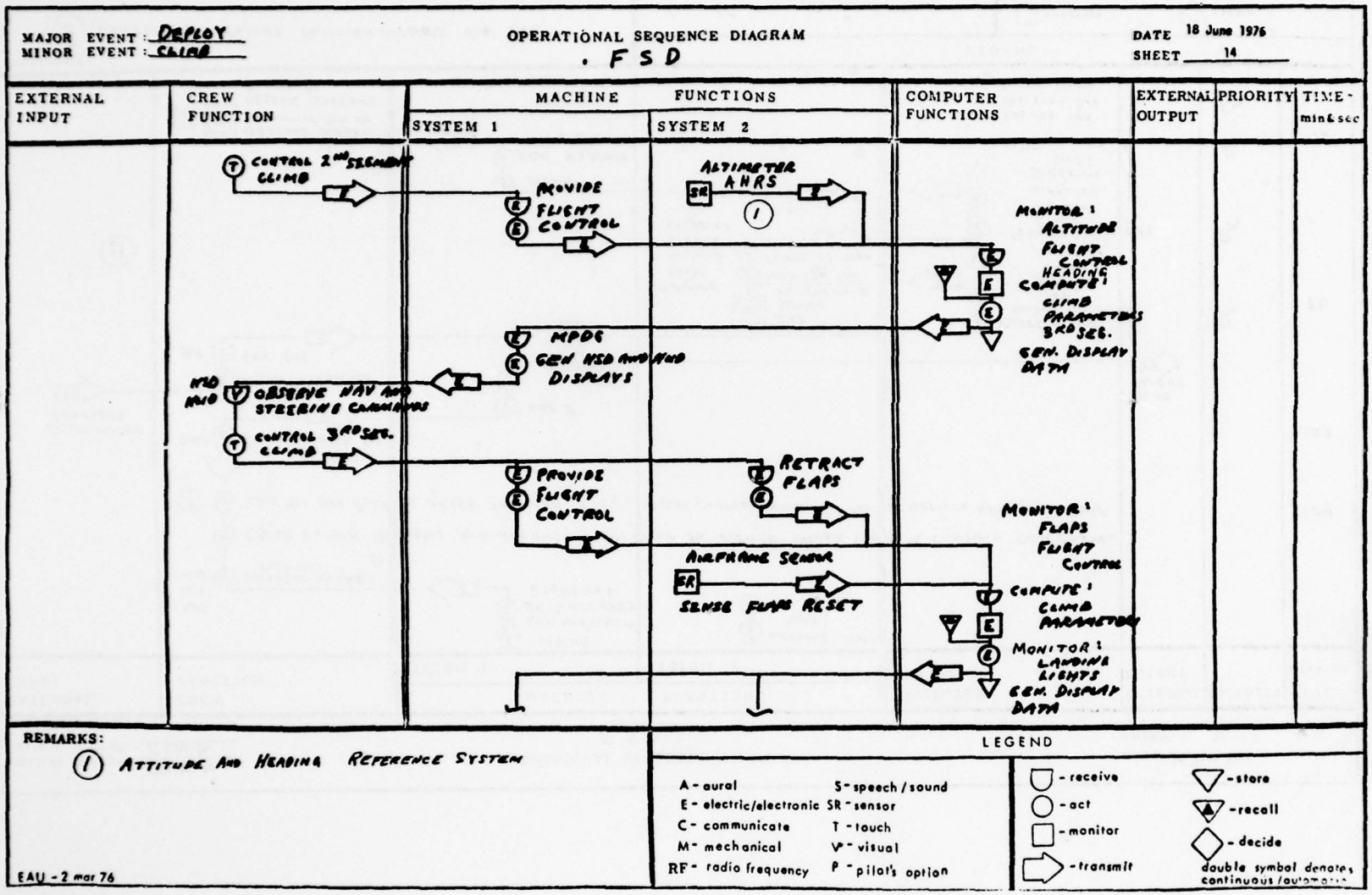
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : CLIMB

OPERATIONAL SEQUENCE DIAGRAM
. F S D

DATE 18 June 1976
SHEET 14



REMARKS:

(1) ATTITUDE AND HEADING REFERENCE SYSTEM

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
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P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
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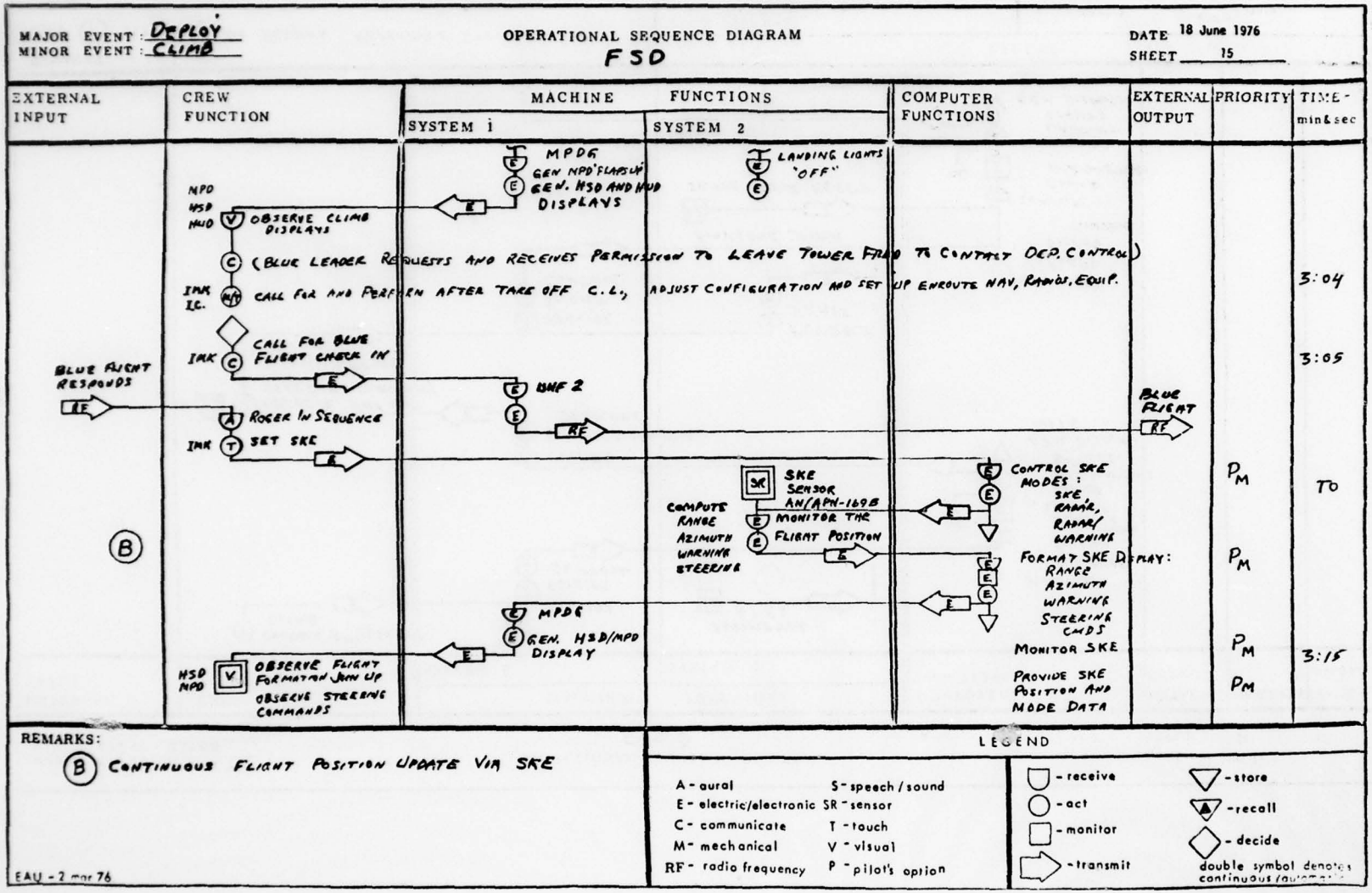
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : CLIMB

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 15



REMARKS:

(B) CONTINUOUS FLIGHT POSITION UPDATE VIA SKE

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

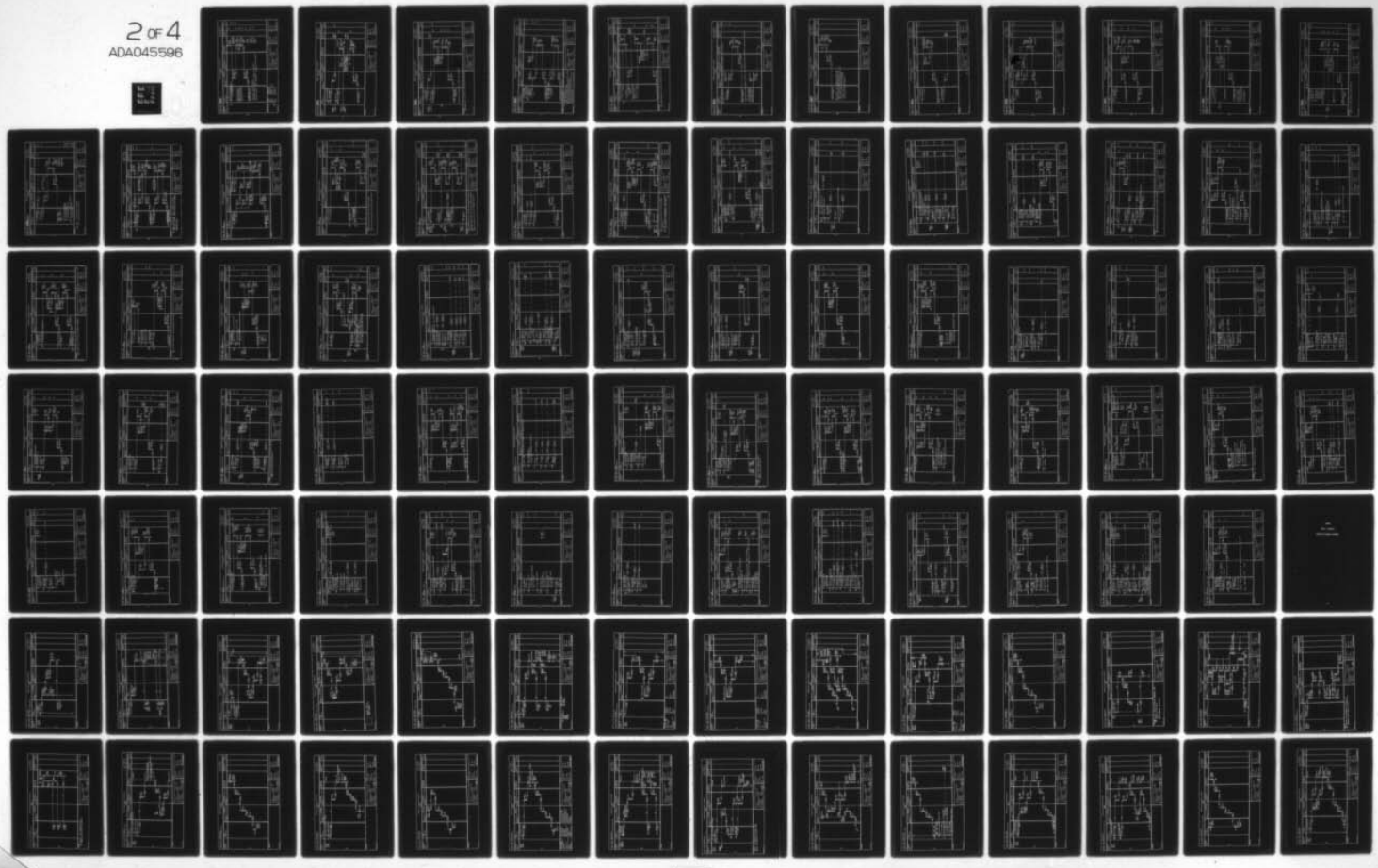
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous (automatic)

EAU - 2 mar 76

AD-A045 596 DOUGLAS AIRCRAFT CO LONG BEACH CA GOVERNMENT AVIONIC--ETC F/G 1/3
SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)
JUL 77 A CHAMBERLAIN, F J DILLON, F H KISHI F33615-76-C-1297
UNCLASSIFIED MDC-J7271-VOL-2 AFAL-TR-76-209-VOL-2 NL

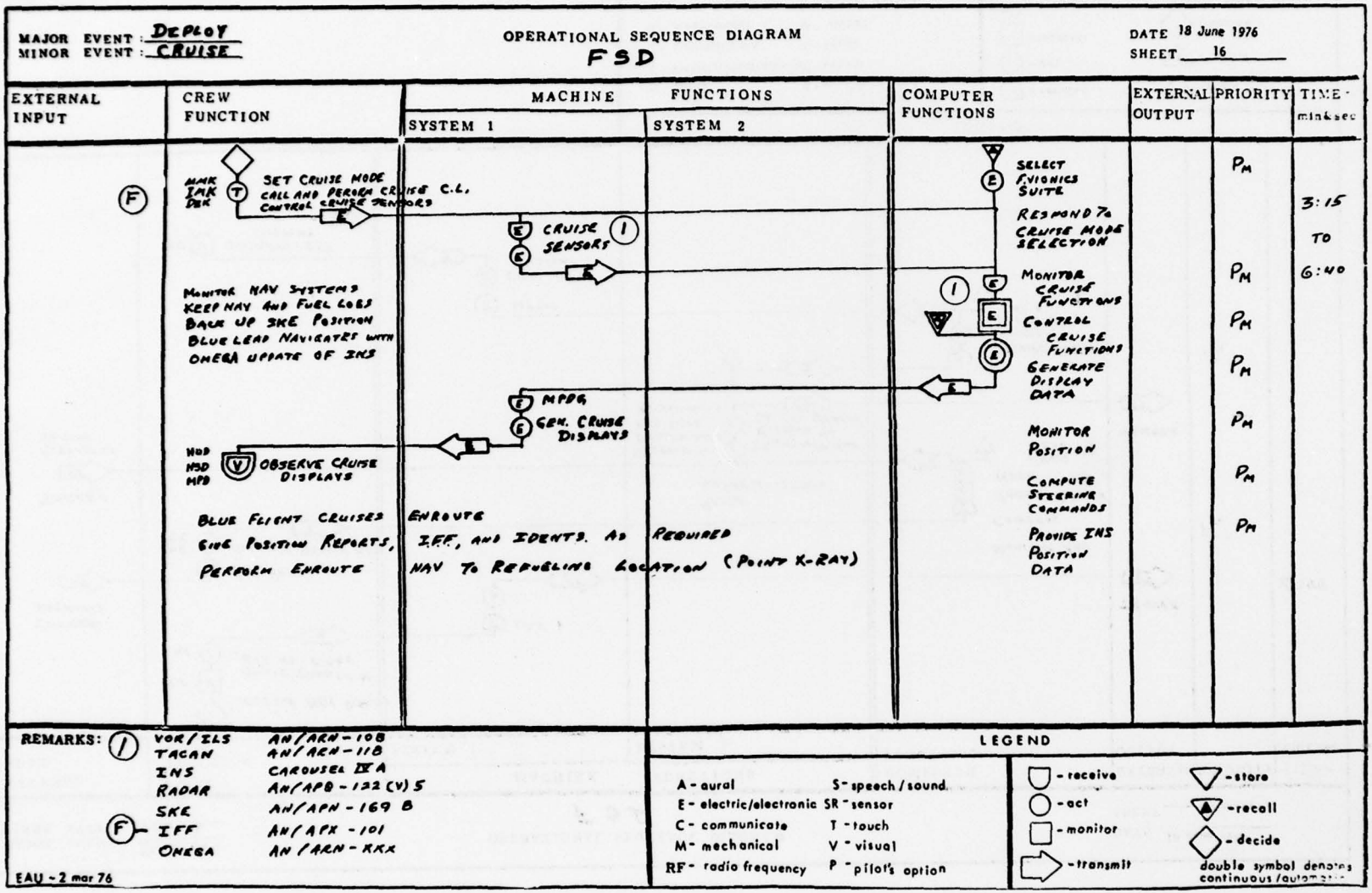
2 OF 4
ADA045596



MAJOR EVENT: DEPLOY
MINOR EVENT: CRUISE

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 16



REMARKS:

(1)	VOR/ILS	AN/ARN-108
	TACAN	AN/ARN-118
	INS	CAROUSEL IV A
	RADAR	AN/APQ-122(V)5
	SKE	AN/APN-169 B
(F)	IFF	AN/APX-101
	OMEGA	AN/ARN-XXX

LEGEND

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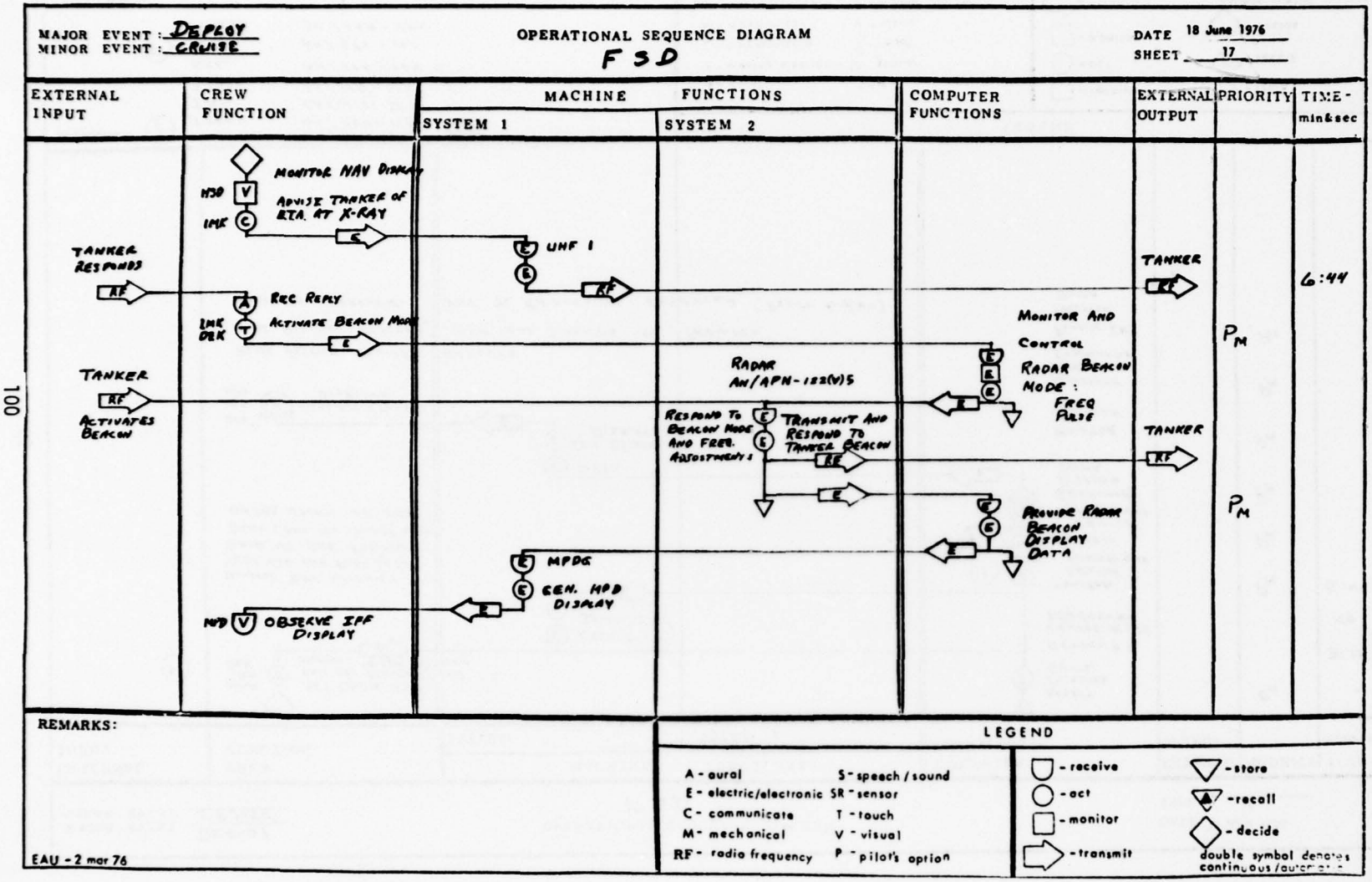
double symbol denotes continuous/automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F 5 D

DATE 18 June 1976
SHEET 17



REMARKS:

EAU - 2 mar 76

LEGEND

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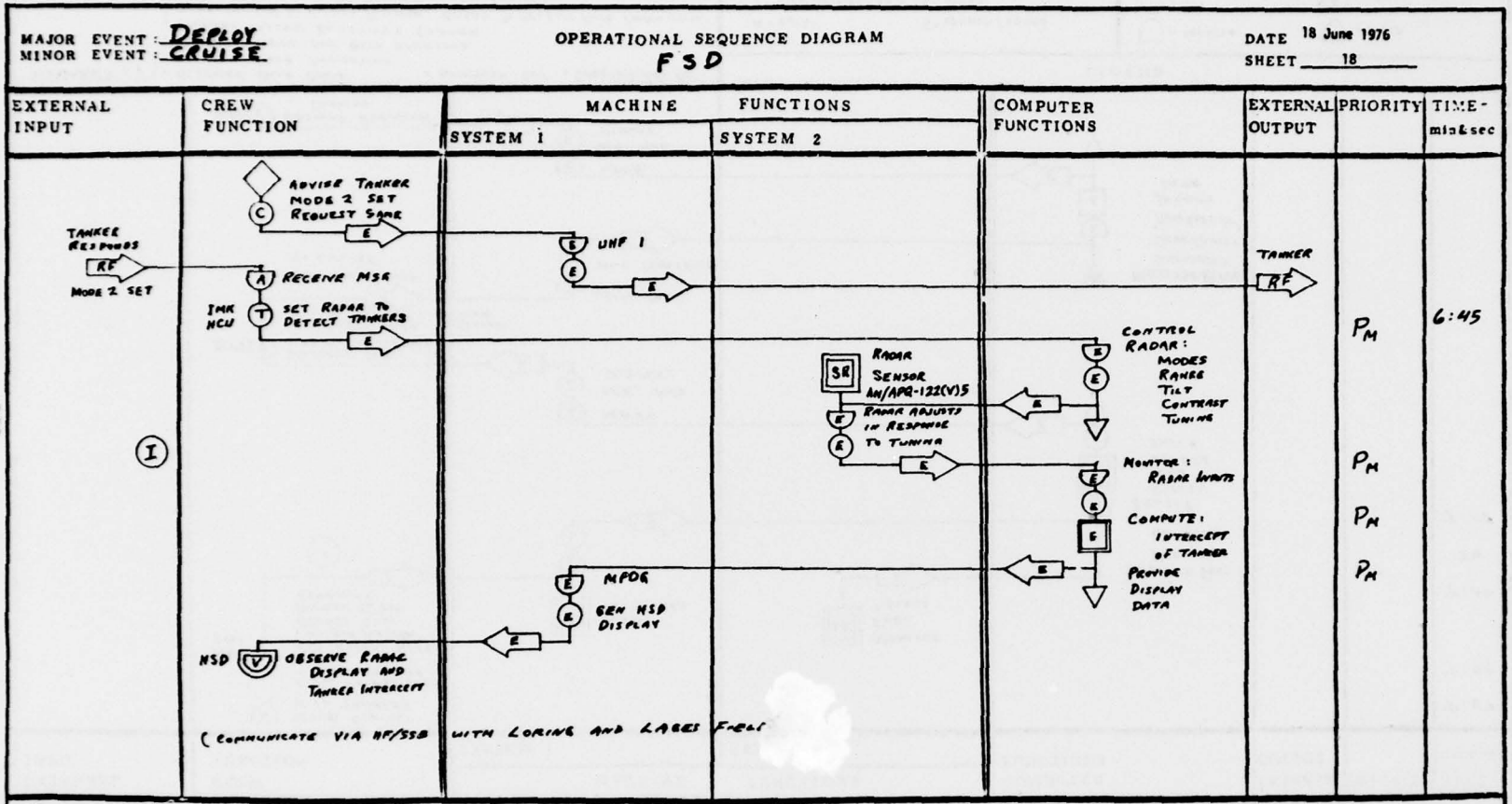
double symbol denotes continuous / automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 18



REMARKS:

(I) RADAR CONTROL VIA IMK AND IDAMST COMPUTER AND MCU

LEGEND

A - aural
E - electric/electronic
C - communicate
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RF - radio frequency
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P - pilot's option

- receive
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double symbol denotes continuous / automatic

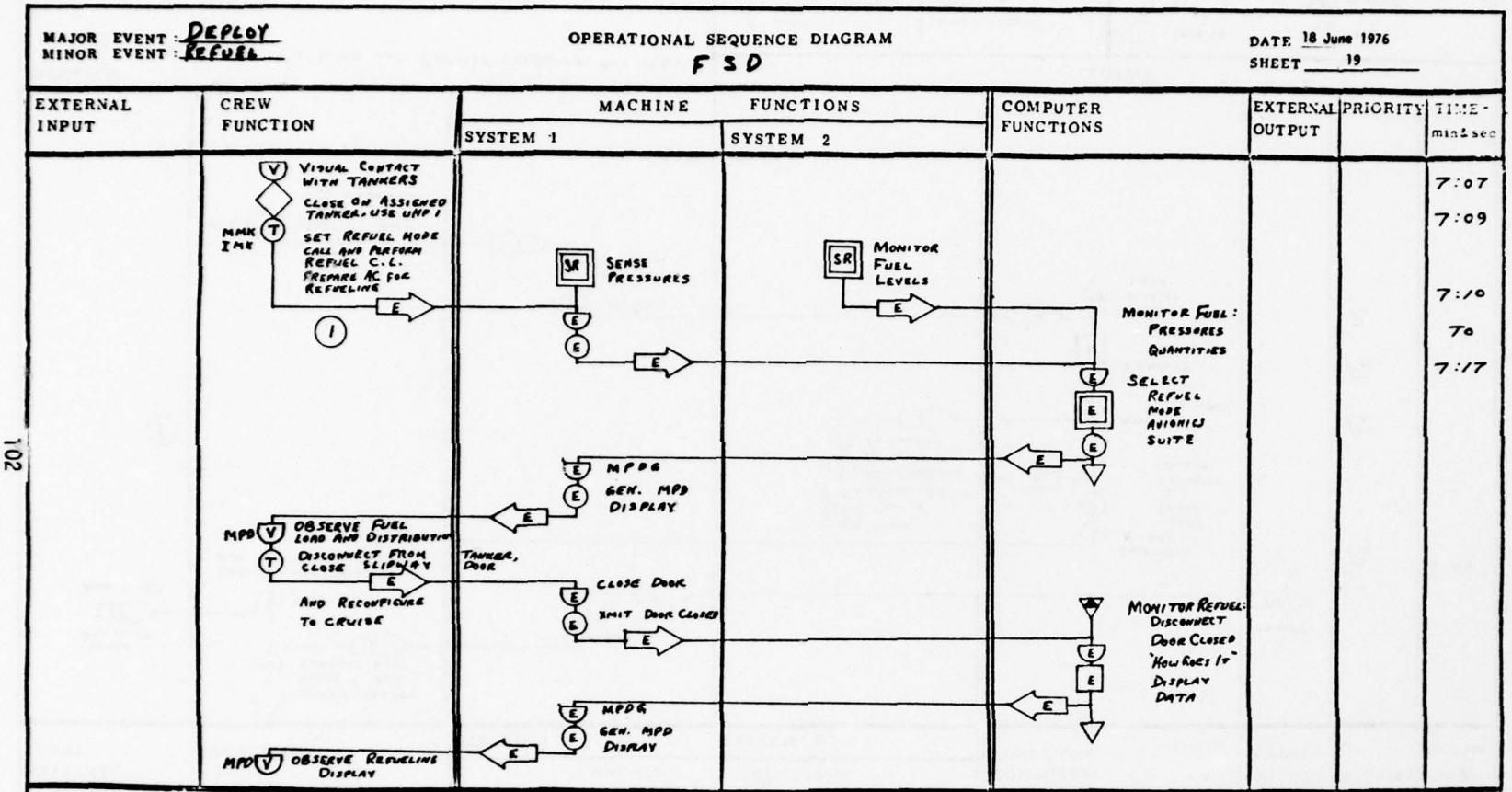
EAU - 2 mar 76

101

MAJOR EVENT: DEPLOY
MINOR EVENT: REFUEL

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 19



REMARKS: (1)
- SLIPWAY DOOR OPEN
- AUTOPILOT OFF
- SPEEDBRAKES ON
- SLIPWAY DOOR INDICATION
- SLIPWAY LIGHTS FOR BOOM OPERATOR
- SLIPWAY LIGHTS INTENSITY CONTROL
- BOOM NOZZLE IN LOCKED POSITION, READY TO RECEIVE FUEL INDICATION
- FUEL PRESSURE SHUT OFF VALVE INDICATIONS
- AUTOMATIC PUMPS AND DISCONNECT OF NOZZLE
- DISCONNECT INDICATIONS THRU NORMAL AC CONFIGURATION
- SLIPWAY DOOR CLOSED
- NECESSARY OVERRIDES
- TURN OFF ANTI-ICE EQUIPMENT

EAU - 2 mar 76

LEGEND

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double symbol denotes continuous / automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 20

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME min & sec
	(BLUE 8 CANNOT REFUEL AND TO REFORM TO CONTINUE THE	IS DIVERTED TO LAJES AND IS FLIGHT TO RHEIN MAIN. SEE IS	TO REJOIN THE FLIGHT AT RHEIN REACTIVATED AND THE FLIGHT	MAIN. BLUE LEADER DIRECTS ADVISED ON UHF2) LAJES	THE FLIGHT IS CONTACTED FOR CLEARANCE		7:40
E	IMK (T) ACTIVATE HF/SSB	E		CONTROL HF/SSB POWER FREQ T/R MONITOR HF/SSB		P_M	7:45
	IMK (C) CONTACT CROUGHTON, UK. TO PASS FIR PENETRATION TO SHANWICK	E HF/SSB AN/ARC-123 RF		E	CROUGHTON ACKNOWLEDGES RF		
	(CALLS CLEAR OF SHANWICK CTA/FIR AND FORWARDS NTS NAMES ESTIMATE)						
	IMK (T) ACTIVATE BEACON	E	RADAR BEACON AN/UPN-25	CONTRL BEACON MODE CODE FREQ E E E		P_M	
			E TRANSMIT BEACON CODE AND MODE ON SELECTED FREQ RF E	RF	RF		
				MONITOR : MODE CODE FREQ. E E E		P_M P_M	
		MPDR		E		P_M	
	MPD (V) OBSERVE DISPLAY	E GEN. MPD DISPLAY		PROVIDE DISPLAY DATA			

REMARKS:

(E) HF/SSB RADIO CONTROL VIA IMK AND IDAMST COMPUTER

LEGEND

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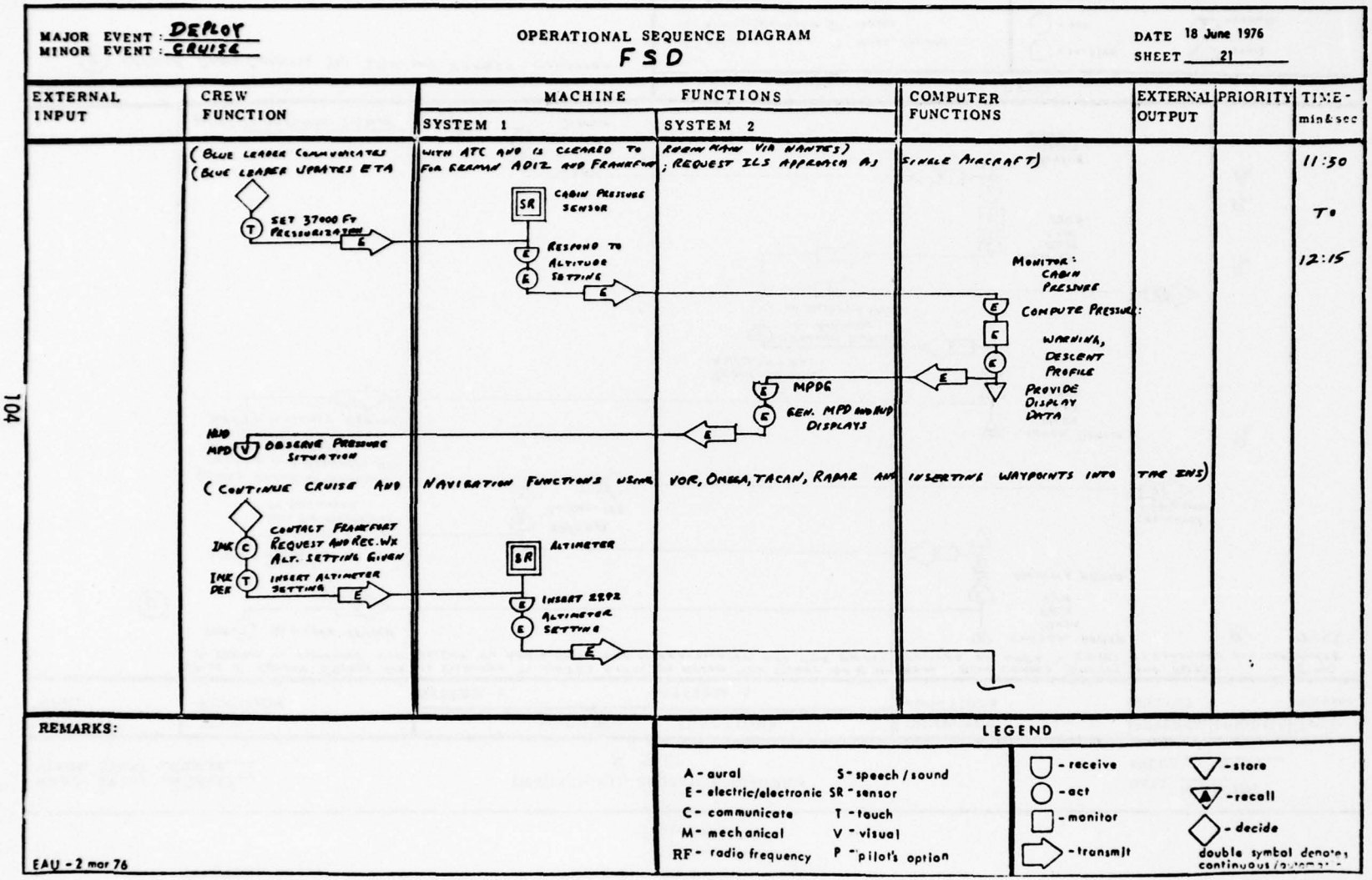
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 21



104

REMARKS:

EAU - 2 mar 76

LEGEND

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double symbol denotes continuous / automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 22

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	HUD (V) OBSERVE ALTITUDE DISPLAY		(E) MPDG (E) GEN. HUD. DISPLAY (E)	(E) MONITOR: ALTITUDE ALTIMETER SETTING (E) COMPUTE: TRUE 18000 FT MSL ALTITUDE SWITCH OVER ALTITUDE (E) PROVIDE DISPLAY DATA			
	(BLUE LEADER COMMUNICATES WITH ATC AND IS DIRECTED TO CONTACT FFM RADAR ON 289.1 AFEER CROSSING NATTENHEIM (NTM) AND COMPLIES. FFM RADAR CLEARS BLUE FLIGHT TO DESCEND IMMEDIATELY TO 20,000 FT AND HOLD ON RUDESHEIM (RUH) NDB. FURTHER CLEARANCE AND AN ILS APPROACH ARE EXPECTED. BLUE FLIGHT ROGERS)						

REMARKS:

LEGEND

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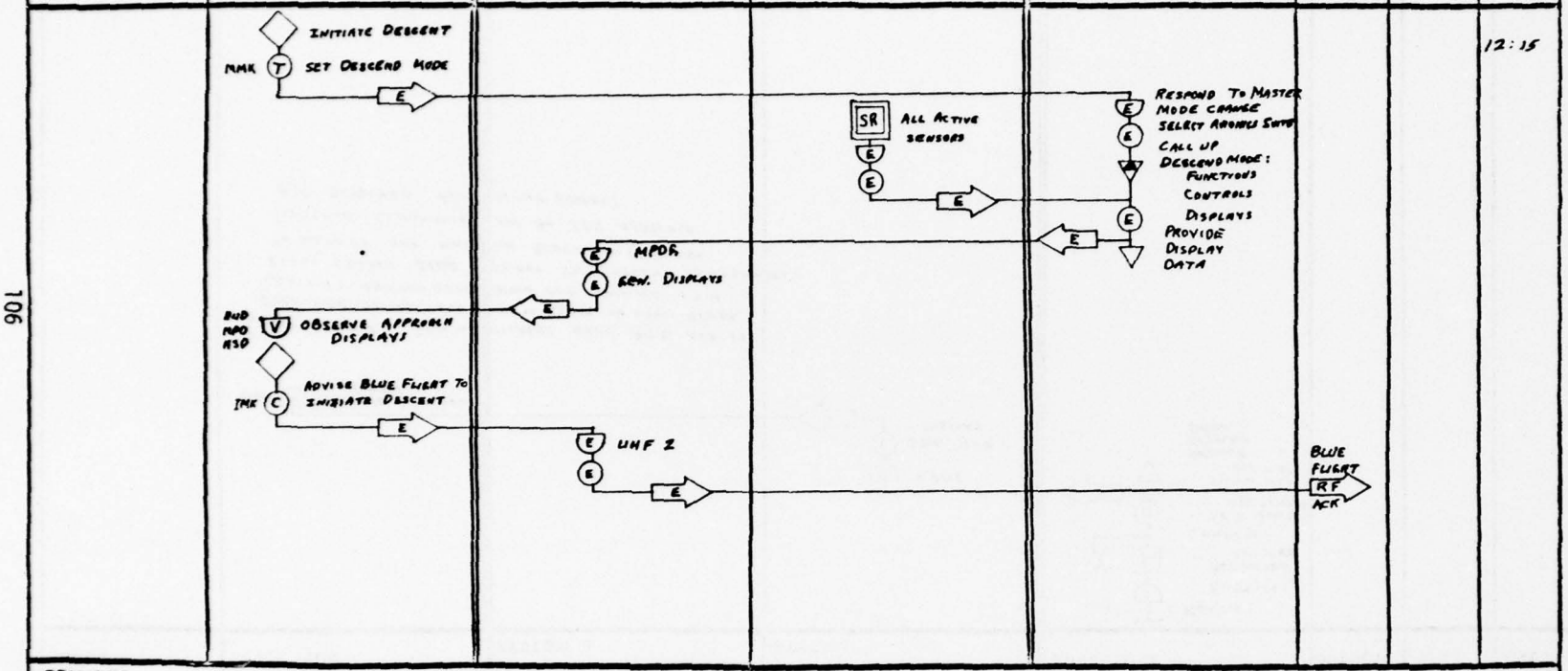
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : DESCEND

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 23



REMARKS:

LEGEND

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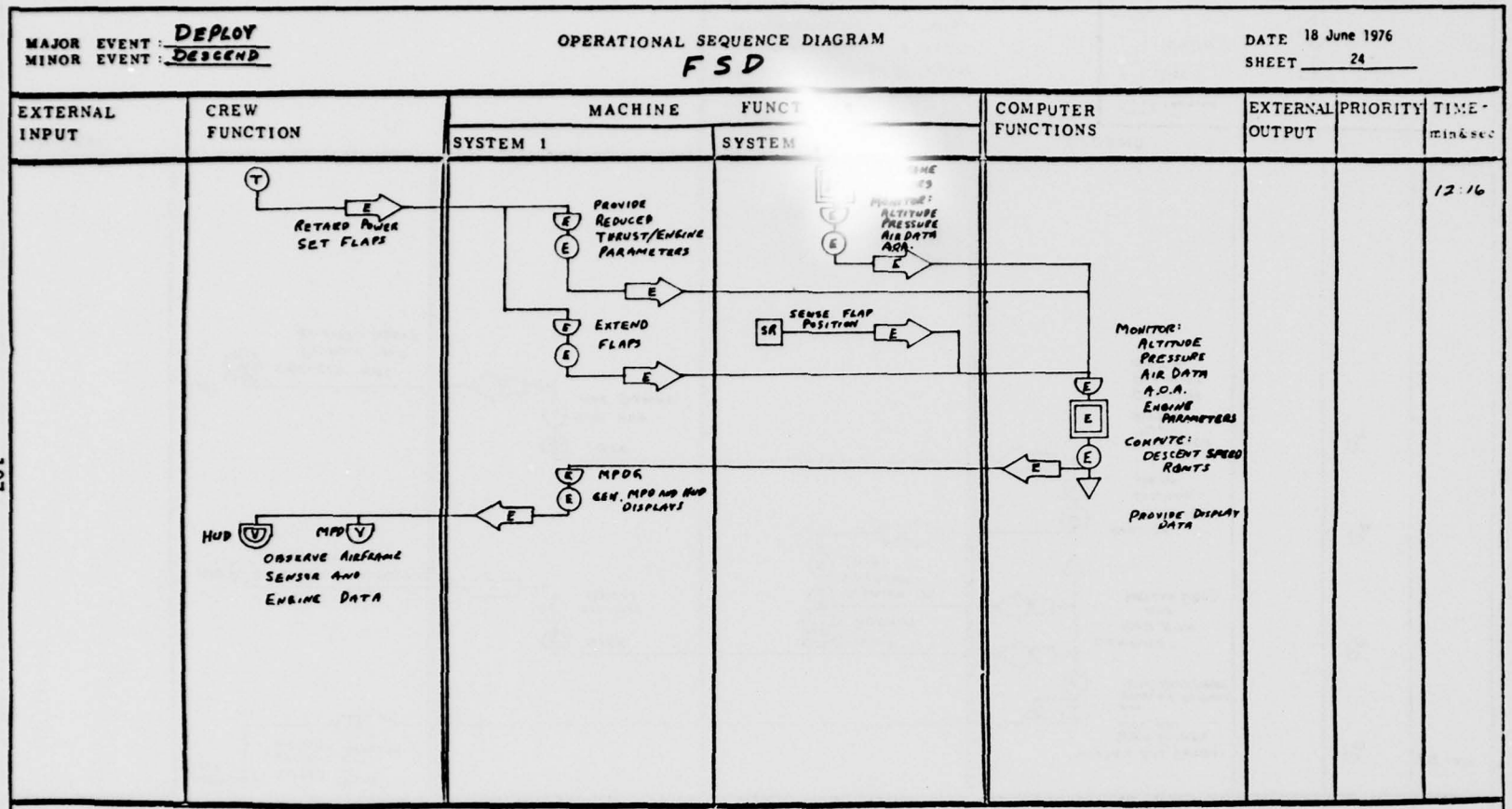
double symbol denotes continuous operation

EAU - 2 mar 76

MAJOR EVENT: DEPLOY
MINOR EVENT: DESCEND

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 24



REMARKS:

EAU - 2 mar 76

LEGEND

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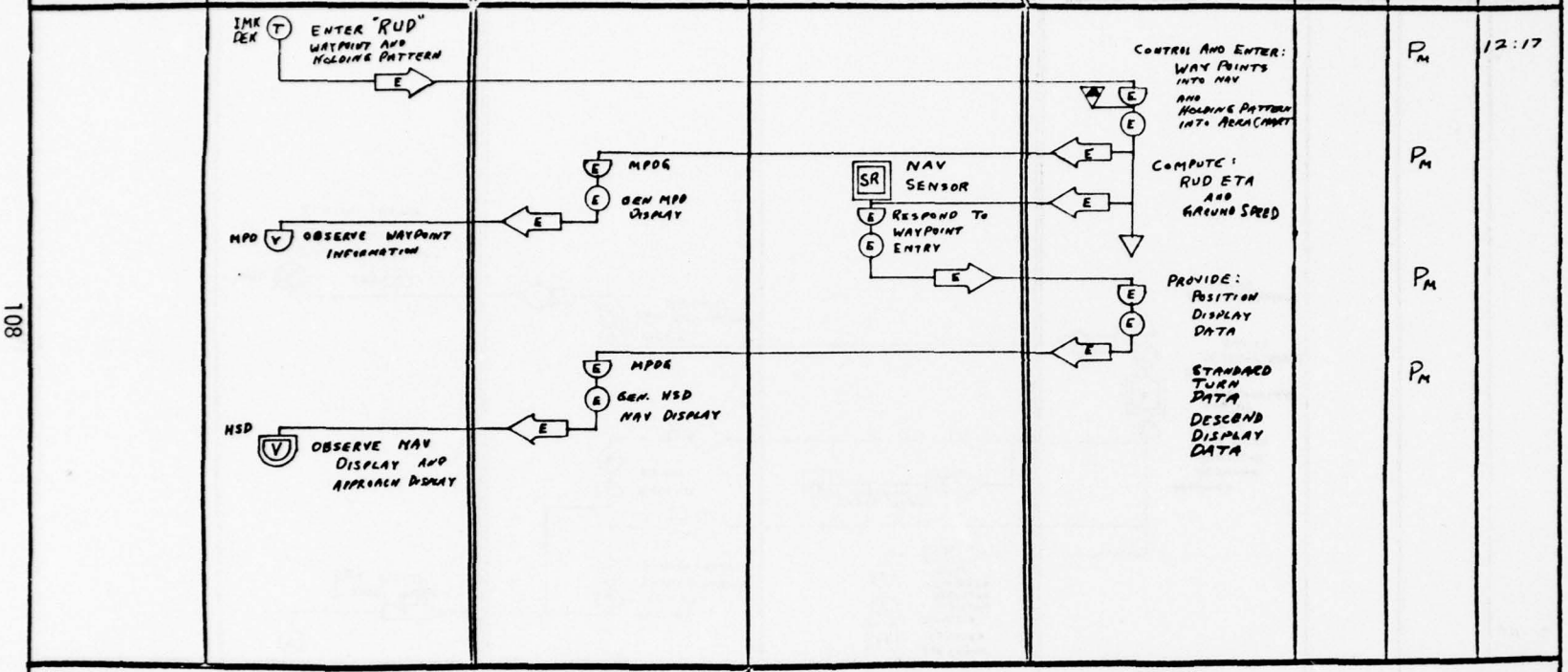
double symbol denotes continuous/automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : DESCEND

OPERATIONAL SEQUENCE DIAGRAM
F S O

DATE 18 June 1976
SHEET 25



REMARKS:

EAU - 2 mar 76

LEGEND

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RF - radio frequency
S - speech / sound
SR - sensor
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- store
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double symbol denotes continuous / automatic

MAJOR EVENT : DEPLOY
MINOR EVENT : DESCEND

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 26

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS: SYSTEM 1	MACHINE FUNCTIONS: SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	(ADVISE FRANKFORT RADAR	-FFA- BLUE FLIGHT DEPARTING	BLOCK ALTITUDE!)				12:18
	ACTIVATE UHF ADF SELECT "RUD" FREQ.						
	IMMEDIATE (T)			CONTROL: UHF ADF FREQ		P_M	
			SR UHF ADF DF-301E				
RF							
			RECEIVE "RUD" BEACON (E) RESPOND TO FREQ CHANGE (330)				
	(A) HEAR "RUD" AUDIO					P_M	
				FORMAT: ADF BEARING DISPLAY PROVIDE DISPLAY DATA		P_M	
		(E) MPDB (E) GEN. NAV DISPLAY				P_M	
	HSD (V) OBSERVE NAV DISPLAY OF "RUD"						
	DESCEND TO 4000 FT. SLOW DOWN TO 250 KIAS FLY TO TAUNUS VOR AT TAUNUS TURN TO 093° TO INTERCEPT RHEIN MAIN ILS						
	CALL FOR AND PERFORM PRE LANDING C.L.						

109

REMARKS:

EAU - 2 mar 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

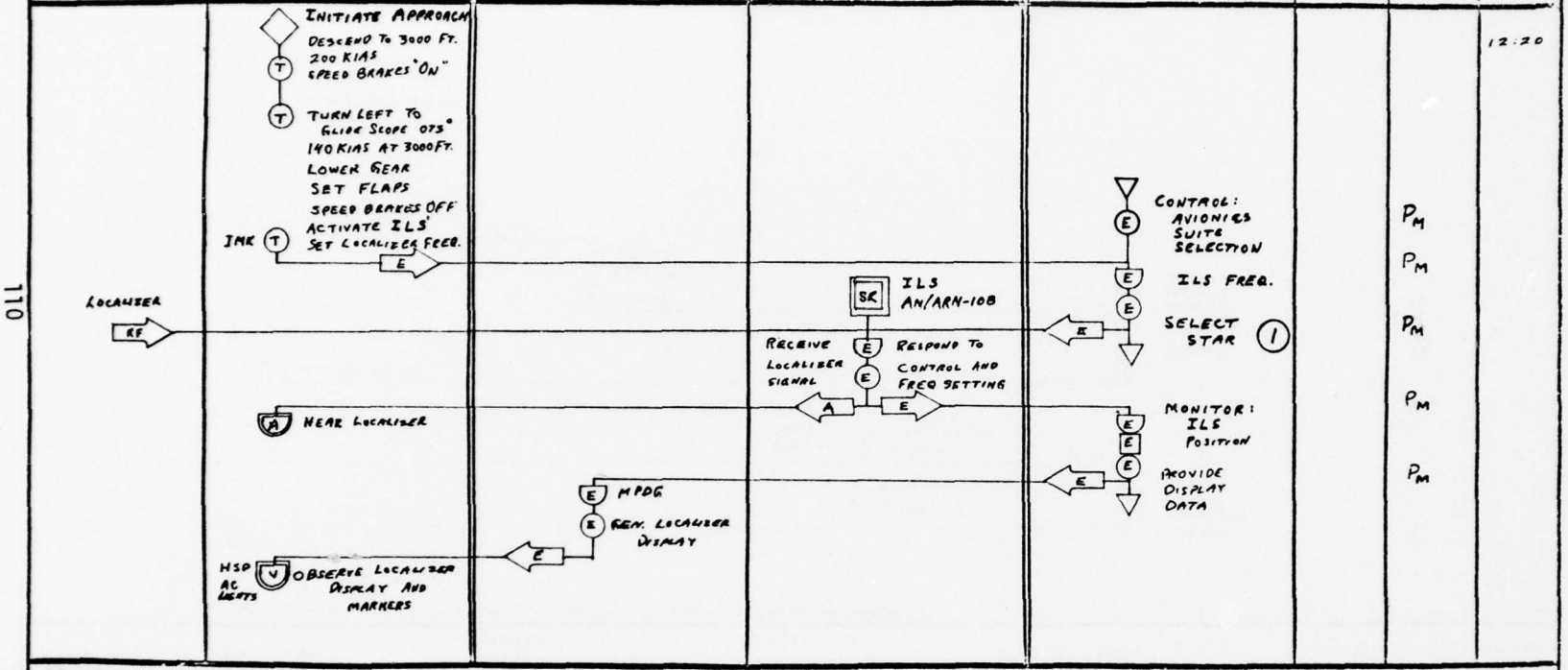
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT: DEPLOY
MINOR EVENT: APPROACH

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 27



REMARKS:

(1) STAR STANDARD TERMINAL ARRIVAL ROUTE

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

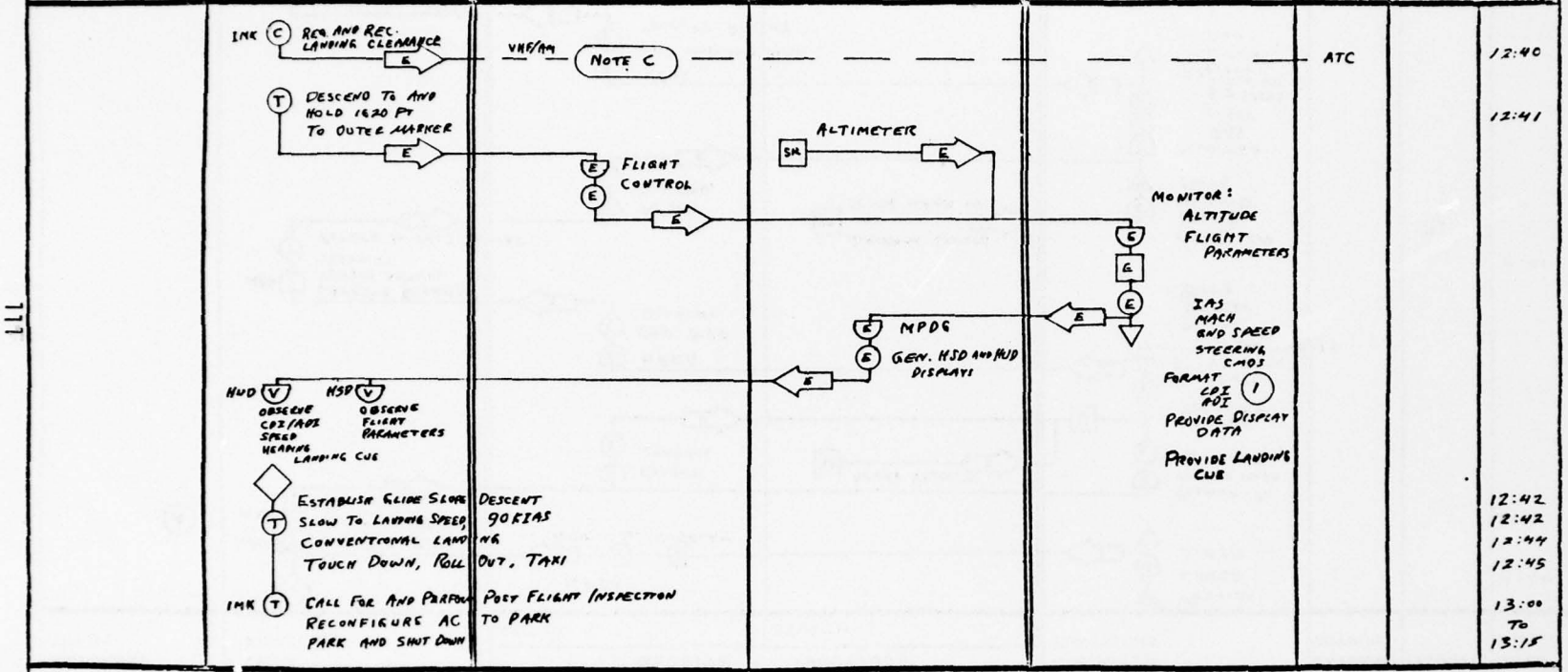
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : DEPLOY
MINOR EVENT : APPROACH / LAND

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 28



REMARKS:

(1) ADI ATTITUDE DIRECTOR INDICATOR
CDI COURSE DEVIATION INDICATOR

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

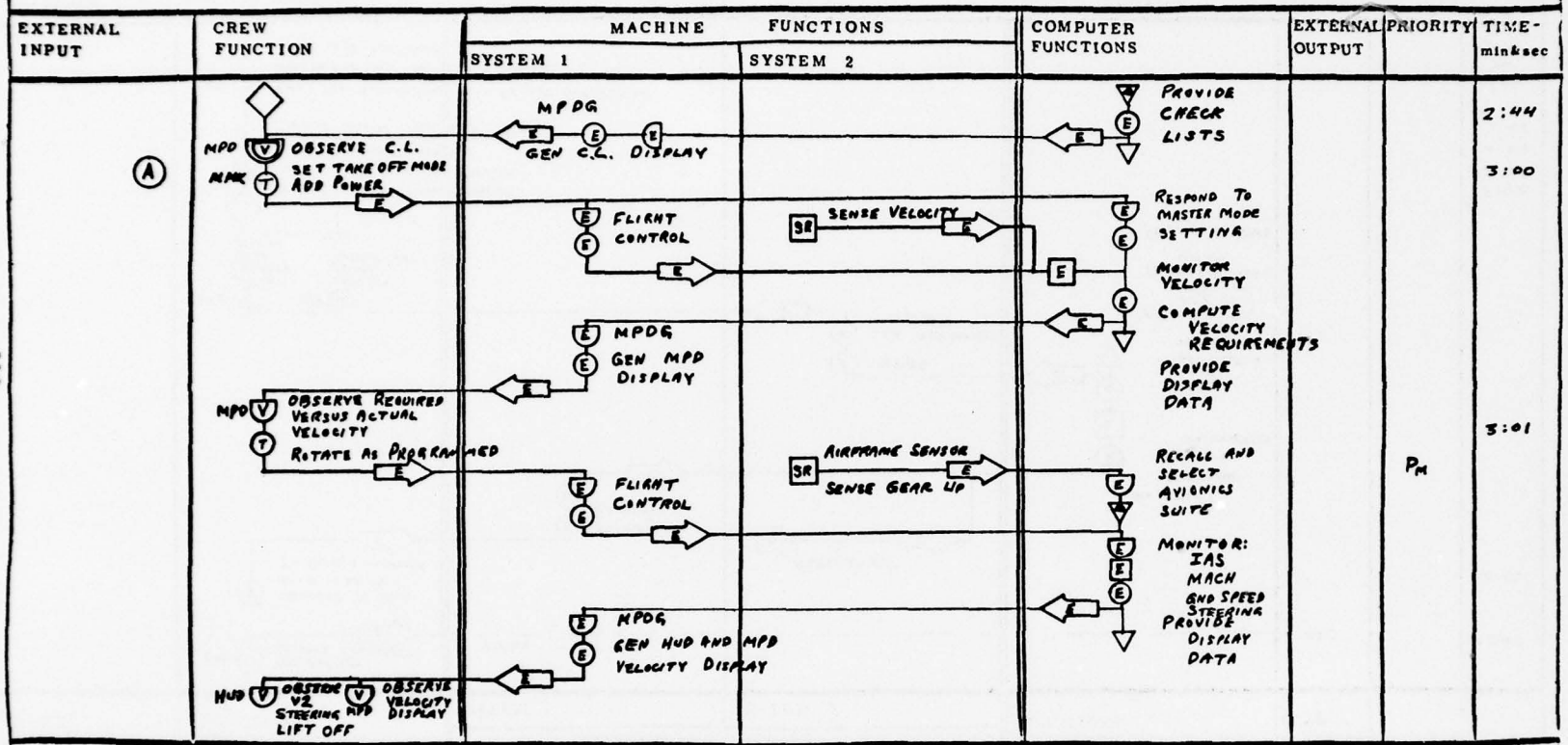
double symbol denotes continuous / automatic

EAU - 2 mar 76

MAJOR EVENT : D1
MINOR EVENT : TAKE OFF & CLIMB

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 29.



REMARKS:

(A) CREW ESTABLISHES NORMAL TAKE OFF AND CLIMB OBSERVING AIRCRAFT TAKE OFF AND CLIMB DISPLAYS, SHEETS 1, 2 AND 3.

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

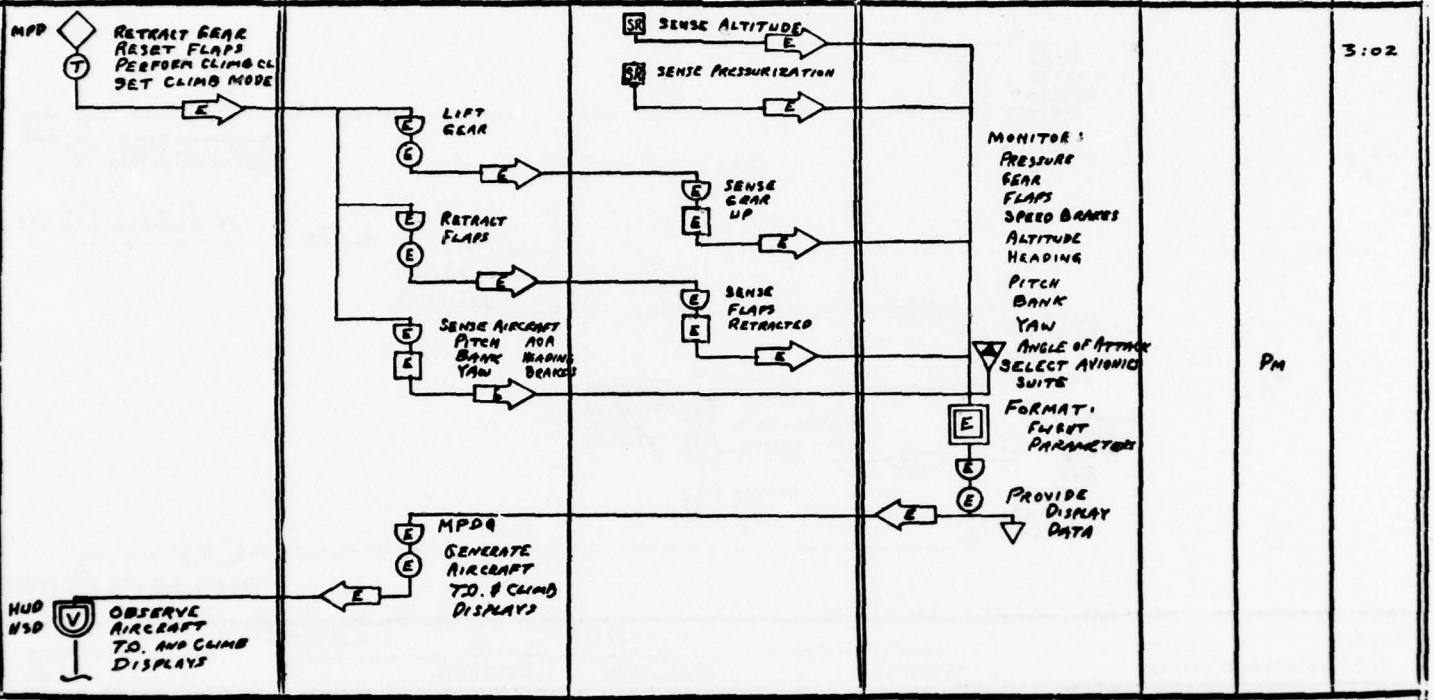
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous operation

MAJOR EVENT : D1
MINOR EVENT : T.O. & CLIMB

OPERATIONAL SEQUENCE DIAGRAM
F 5 D

DATE 18 June 1976
SHEET 30



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

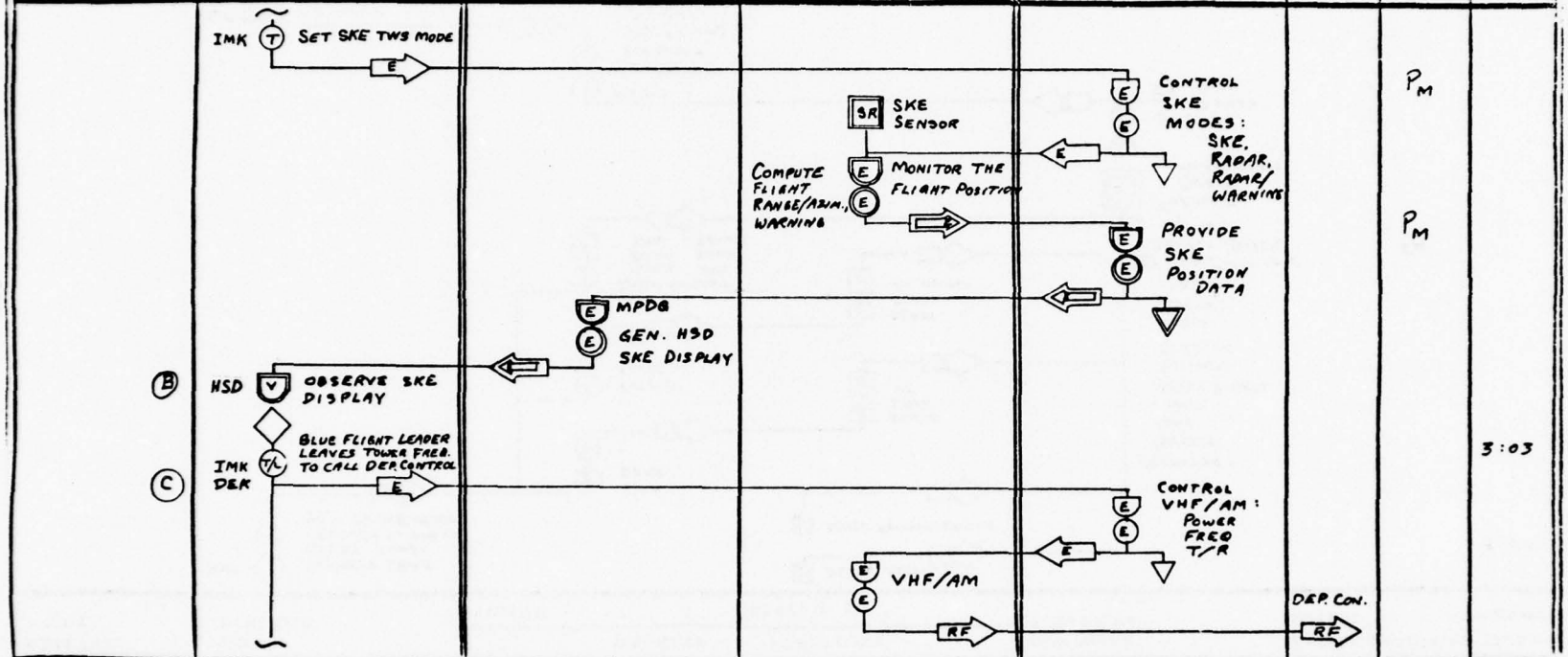
double symbol denotes

MAJOR EVENT : D1
MINOR EVENT : T.O. & CLIMB

OPERATIONAL SEQUENCE DIAGRAM

FSD

DATE 18 June 1976
SHEET 31



REMARKS:

(B) CONTINUOUS FLIGHT POSITION UPDATE VIA SKE

(C) VHF/AM RADIO CONTROL VIA IMK AND IDAMST COMP.

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

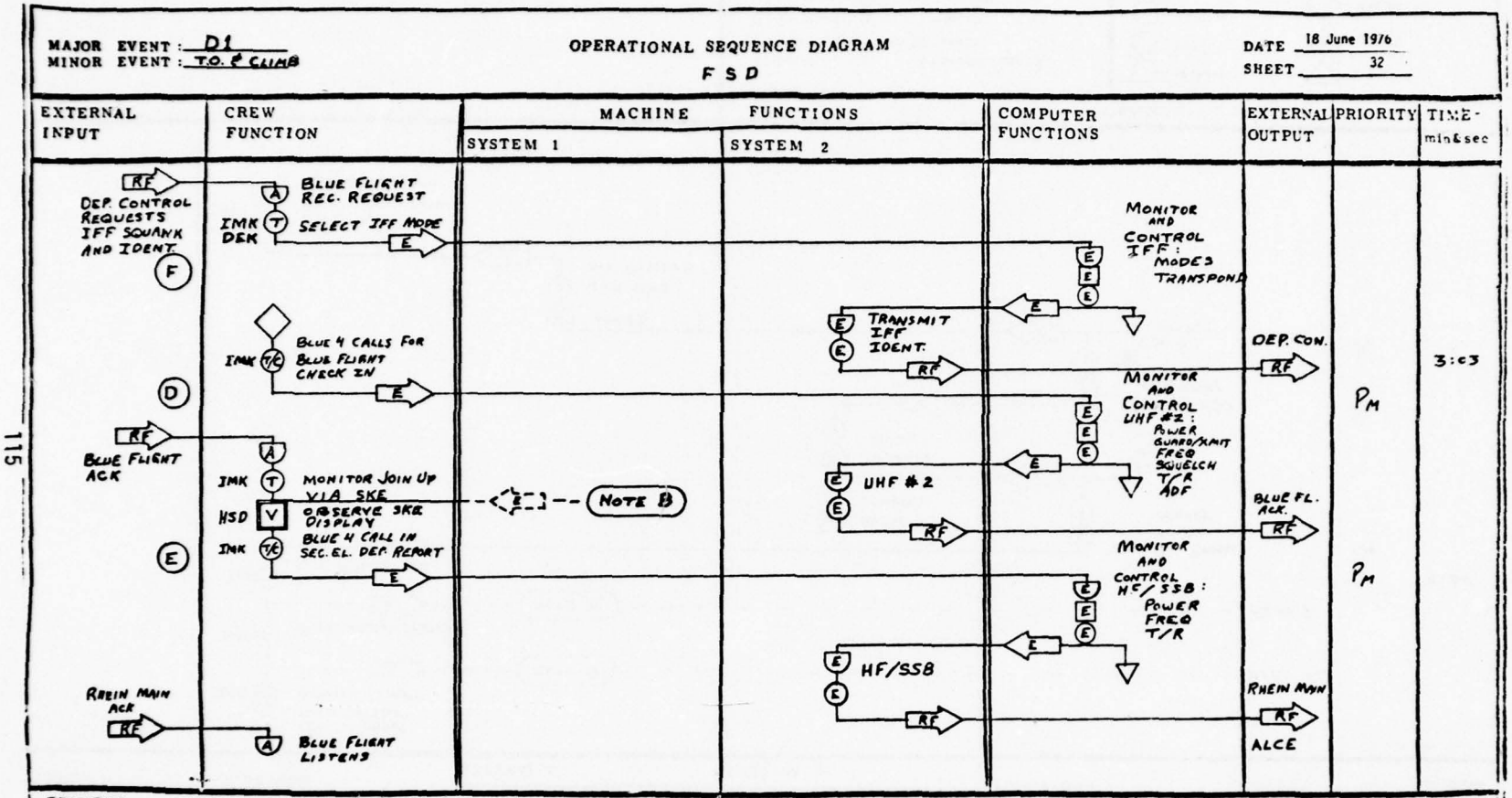
double symbol denotes

MAJOR EVENT : D1
MINOR EVENT : T.O. & CLIMB

OPERATIONAL SEQUENCE DIAGRAM

F S D

DATE 18 June 1976
SHEET 32



REMARKS:

(D) UHF #2 RADIO CONTROL VIA IMK AND IDAMST COMPUTER

(E) HF/SSB RADIO CONTROL VIA IMK AND IDAMST COMPUTER

(F) IFF CONTROL VIA IMK AND IDAMST COMPUTER

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

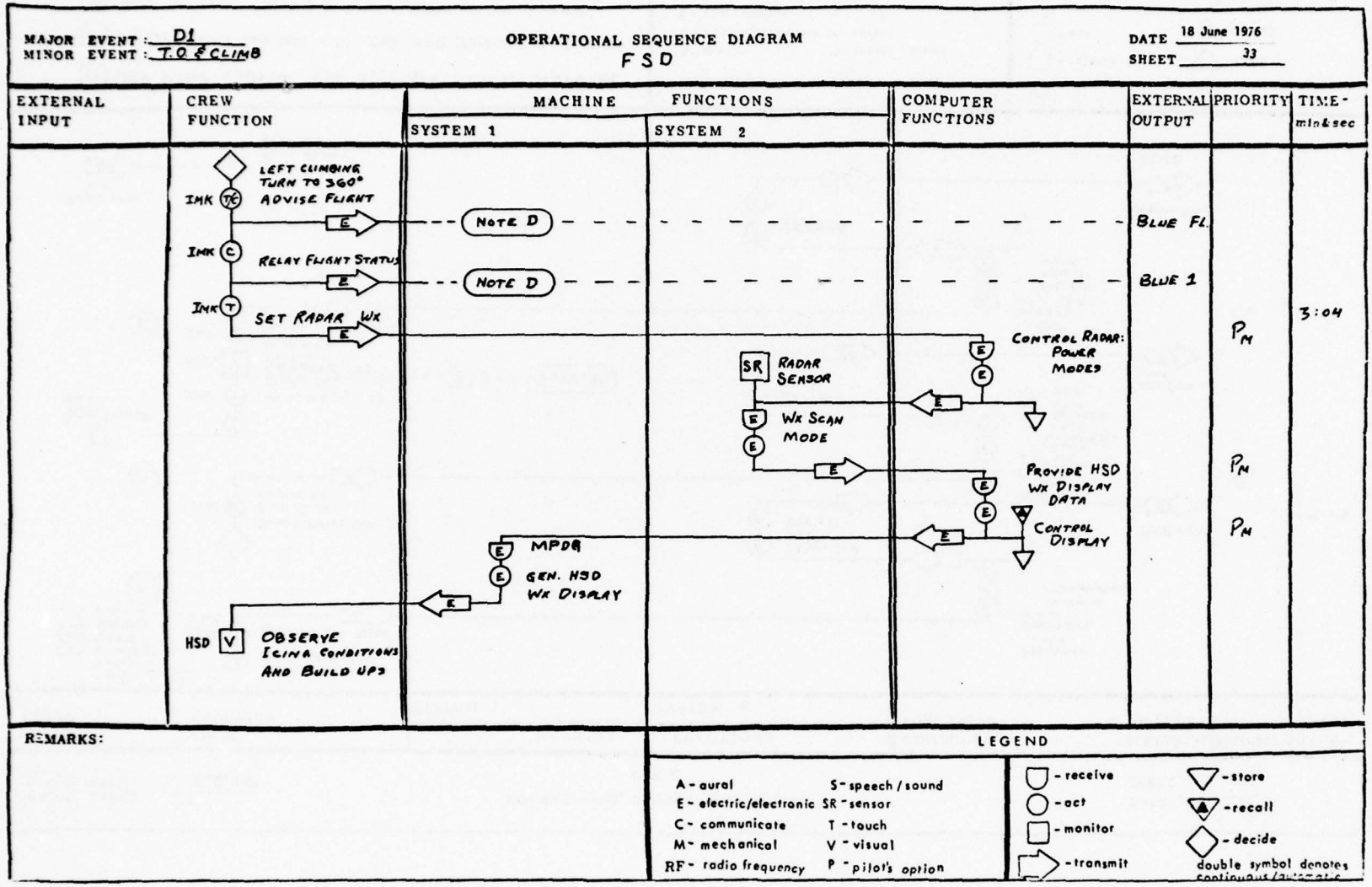
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1
MINOR EVENT : T.O & CLIMB

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 33



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

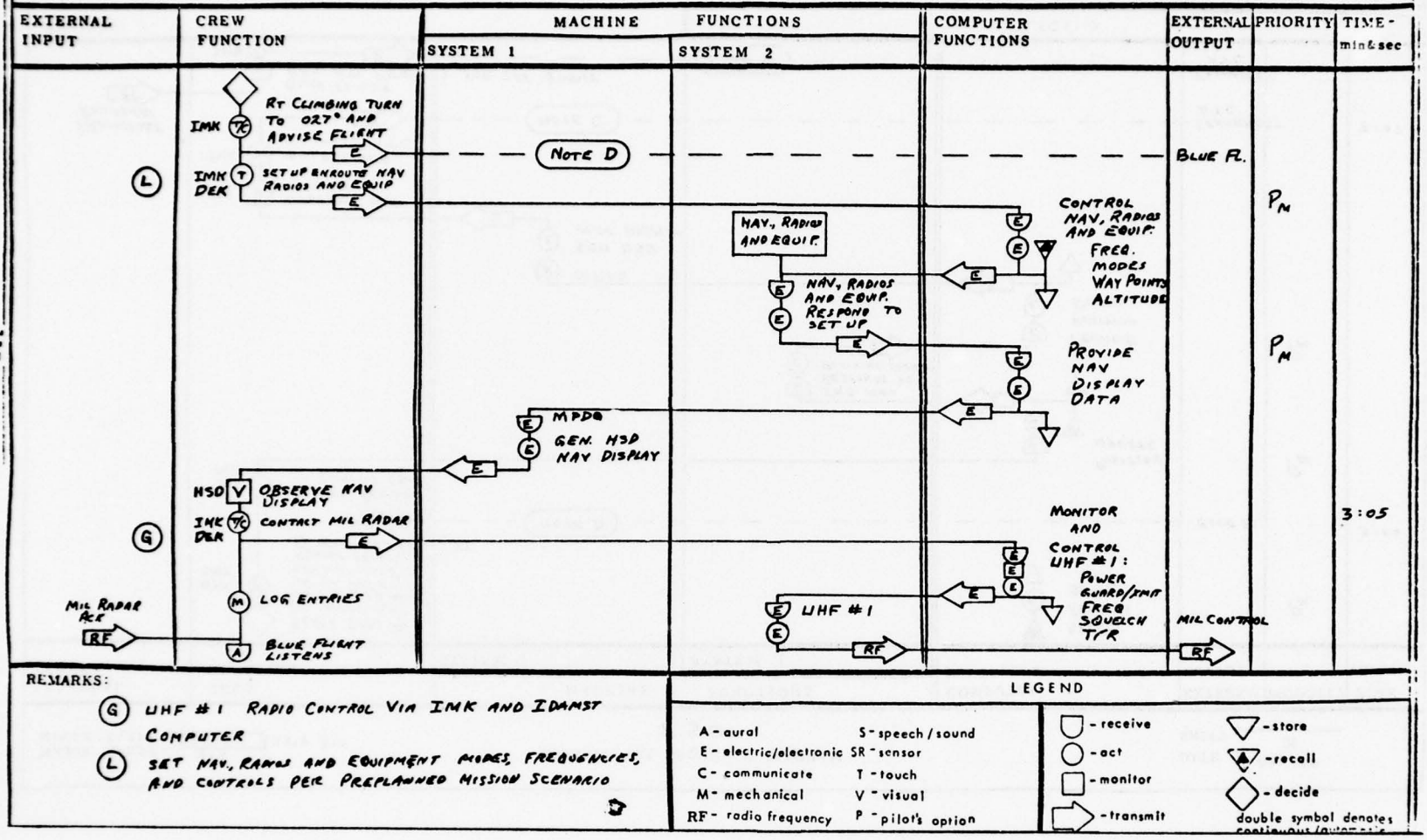
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1
MINOR EVENT : TO & CLIMB

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 34



REMARKS:

(G) UHF #1 RADIO CONTROL VIA IMK AND IDAMST COMPUTER

(L) SET NAV., RADIOS AND EQUIPMENT MODES, FREQUENCIES, AND CONTROLS PER PREPLANNED MISSION SCENARIO

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

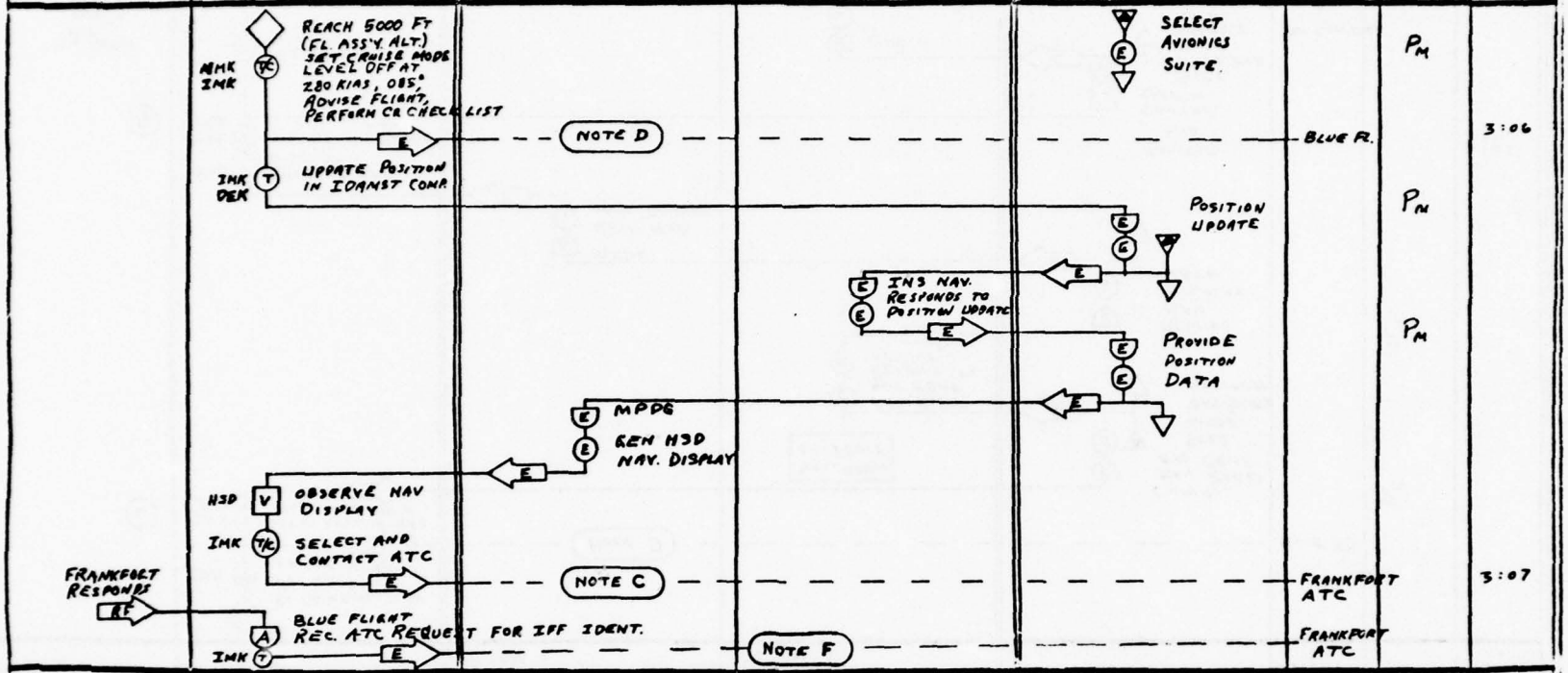
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1
MINOR EVENT : CRUISE ASS'Y ALT

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 35



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

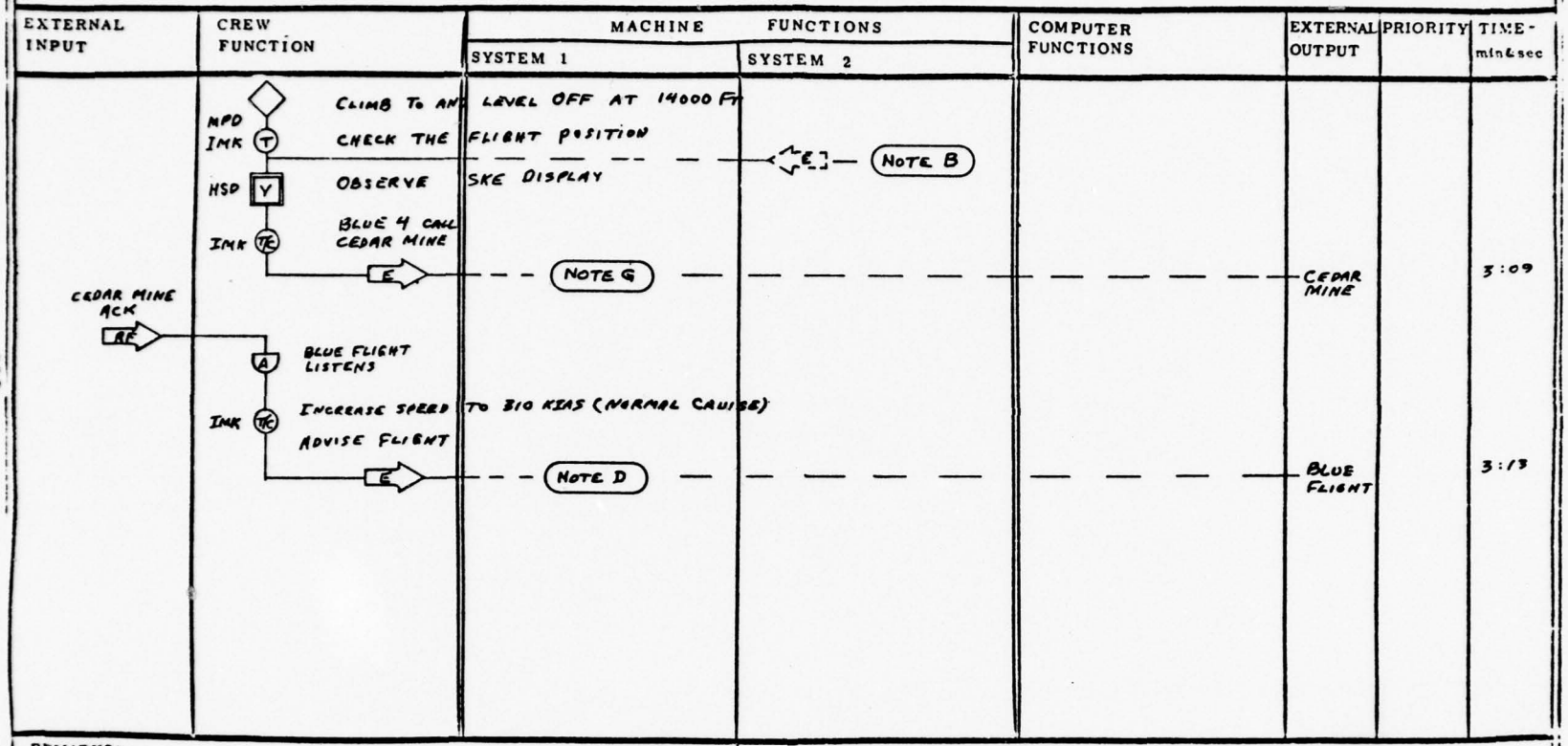
double symbol denotes continuous/repetitive

MAJOR EVENT: 01
MINOR EVENT: CLIMB - 14000, CRUISE - 310 KIAS

OPERATIONAL SEQUENCE DIAGRAM

FSD

DATE 18 June 1976
SHEET 36



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

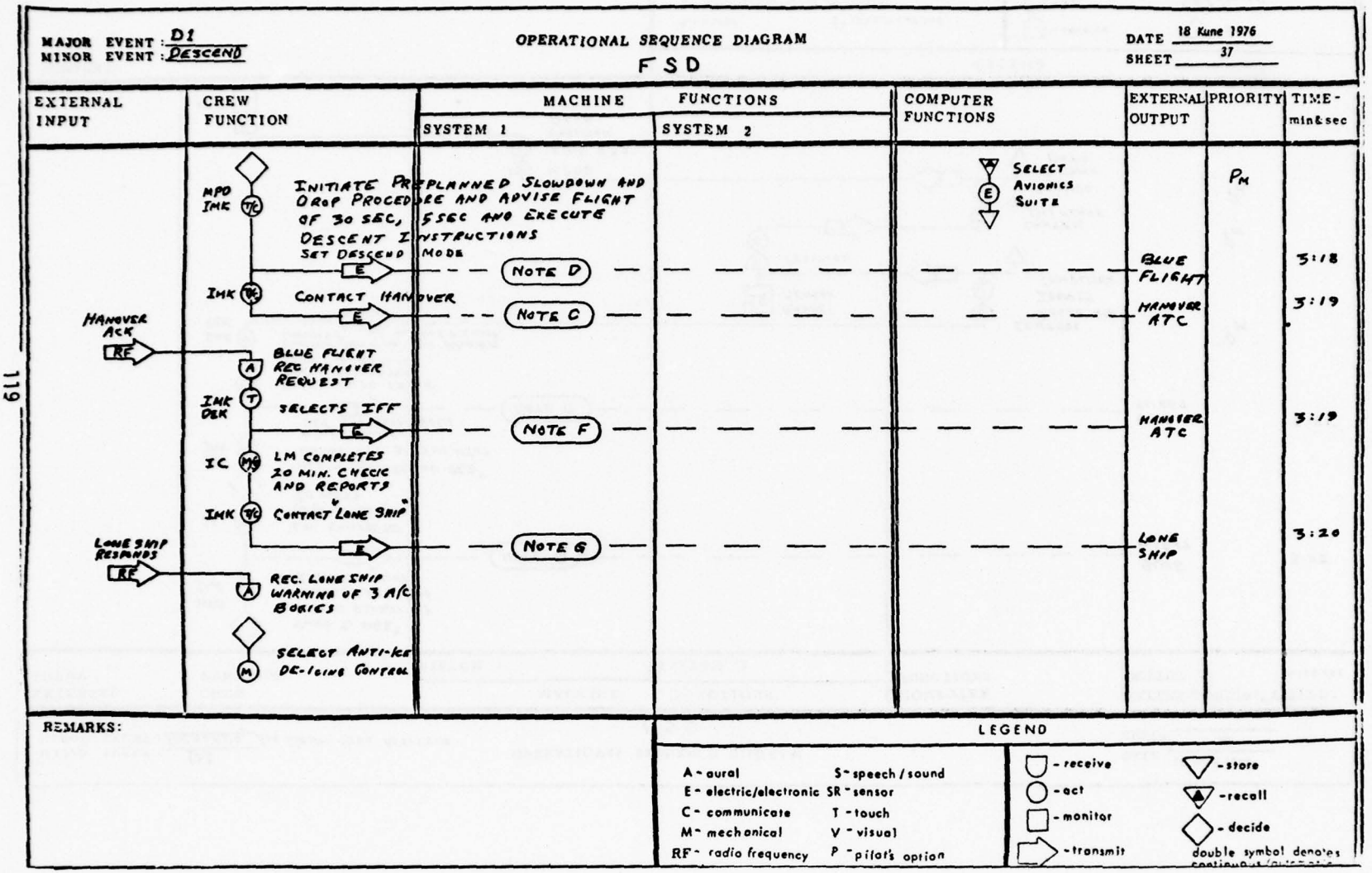
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1
MINOR EVENT : DESCEND

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 37



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

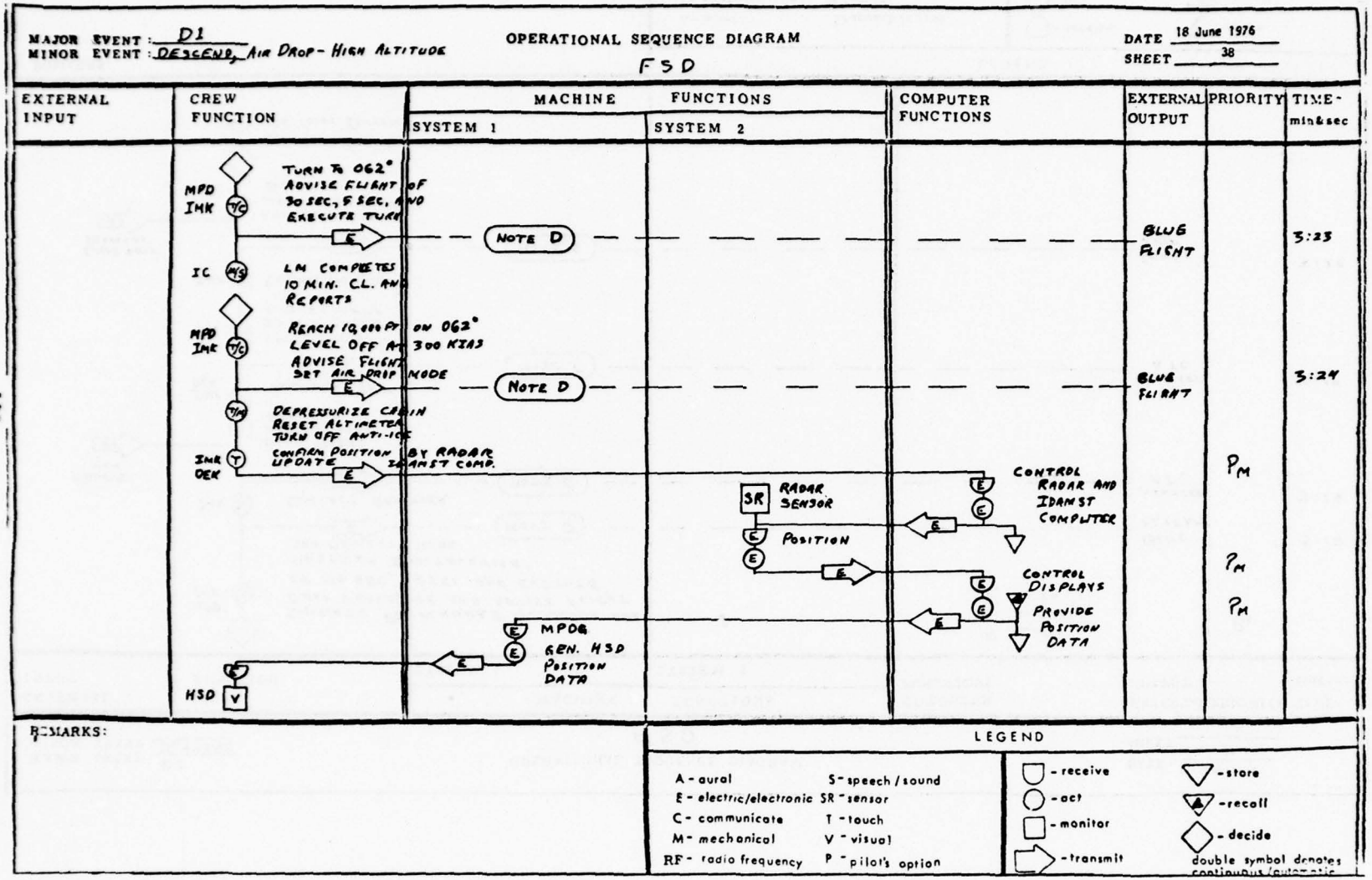
double symbol denotes continuous/automatic

MAJOR EVENT: D1
MINOR EVENT: DESCEND, AIR DROP - HIGH ALTITUDE

OPERATIONAL SEQUENCE DIAGRAM

F5D

DATE 18 June 1976
SHEET 38



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

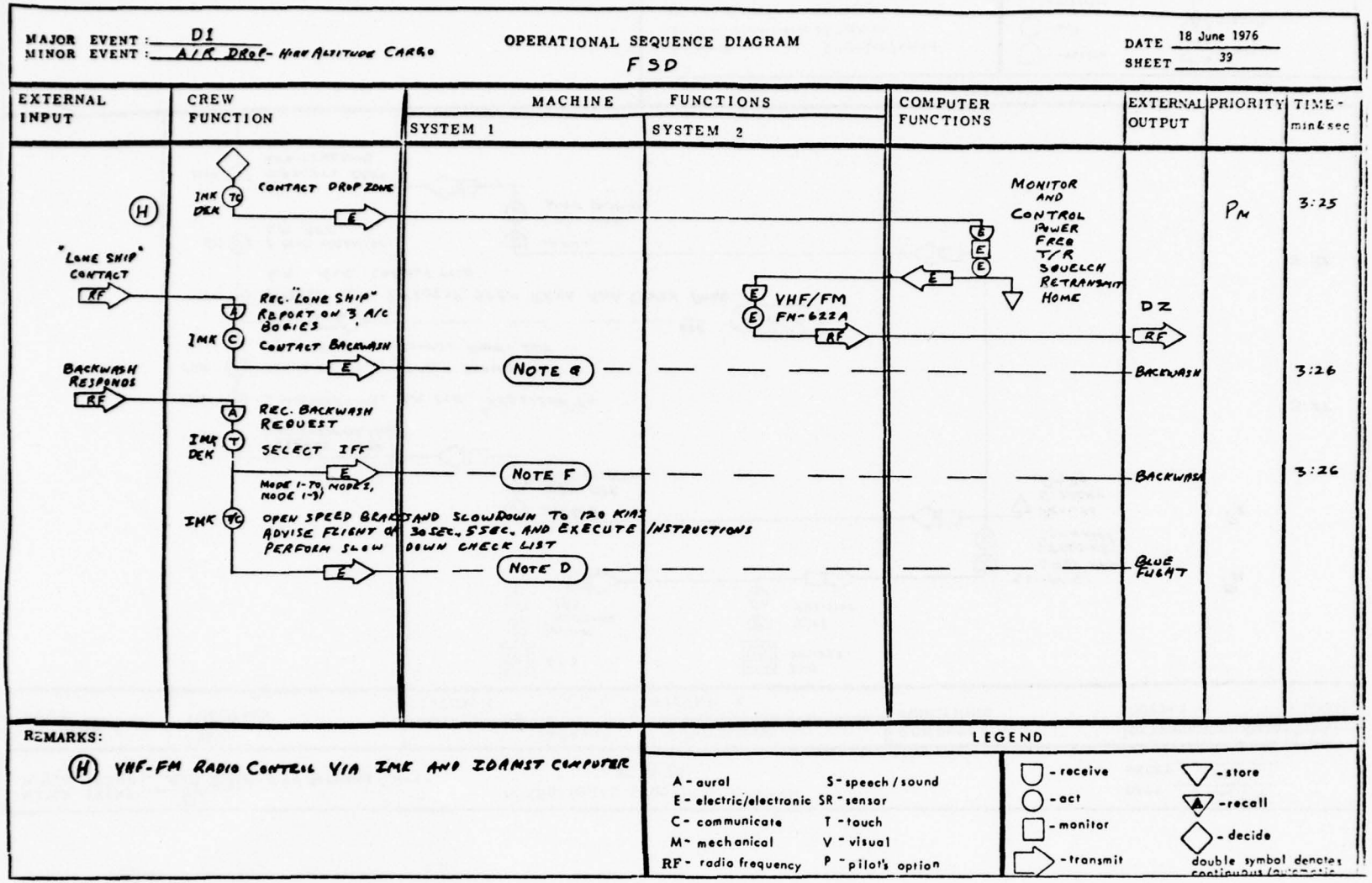
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1
MINOR EVENT : A/R DROP - HIGH ALTITUDE CARGO

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 39



REMARKS:

(H) VHF-FM RADIO CONTROL VIA IMR AND IDAMST COMPUTER

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

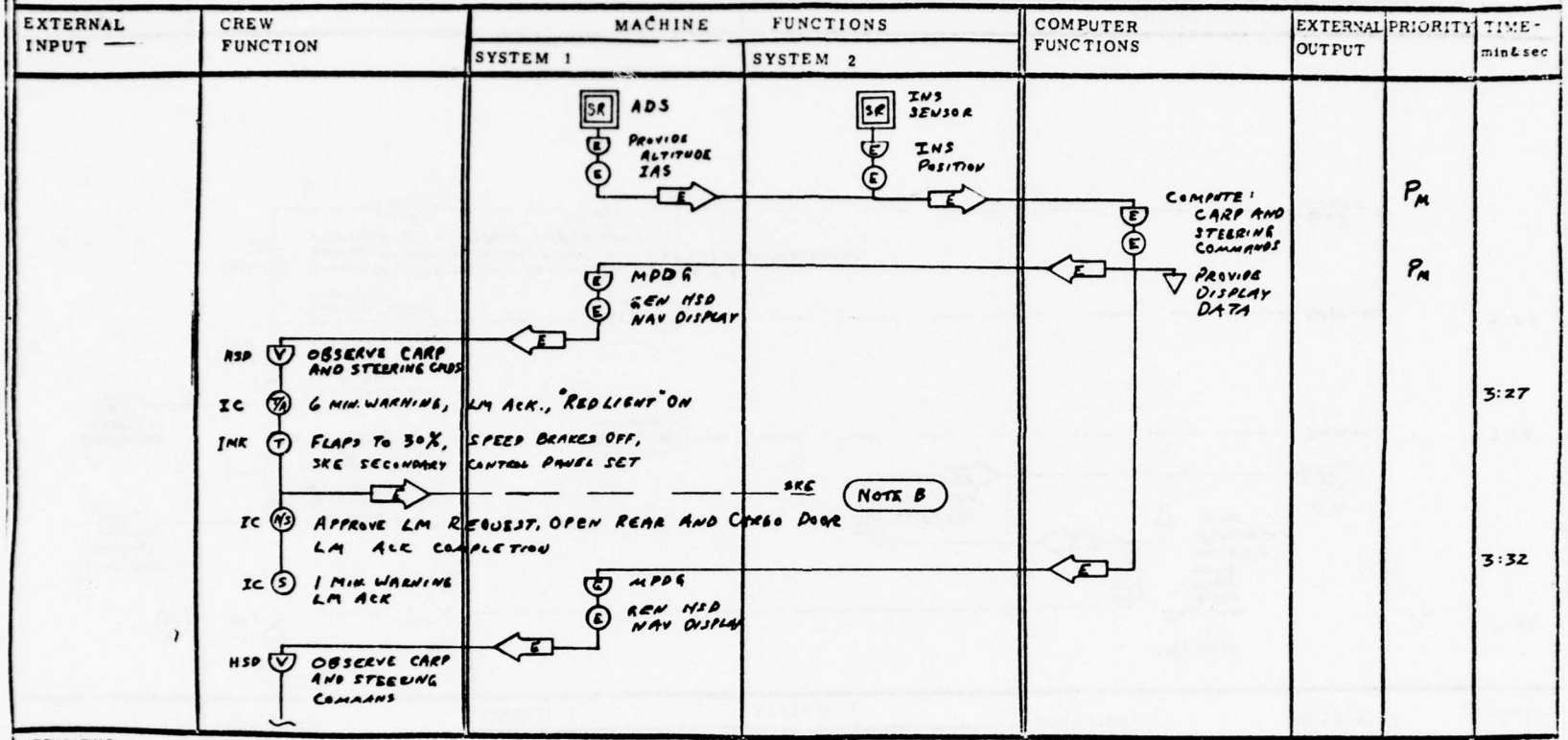
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1
MINOR EVENT : AIR DROP – HIGH ALTITUDE CARGO

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 40



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D1
MINOR EVENT : AIR DROP - HIGH ALTITUDE CARGO

OPERATIONAL SEQUENCE DIAGRAM

F 5D

DATE 18 June 1976
SHEET 41

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	T GREEN LIGHT ON ACTUATE ADS "EXECUTE" SKE						3:33
	IMR T		E NOTE B				3:34
	HSD V OBSERVE SKE DISPLAY						
	IC TS TIME DROP DURATION, TURN RED LIGHT ON ACK LM "LOAD CL & CARGO DOORS CLOSED AND LOCKED, TURN RED LIGHT OFF						3:35
	IC TM ACCELERATE TO 300 KIAS RETRACT FLAPS, LEFT TURN TO 312° RESET PRESSURIZATION, COMPLETE AFTER DROP CHECK LIST						
BACKWASH CONTACT RF	A REC. STATUS OF BABIES						
	IMR TC RESPOND E	NOTE G			BACKWASH		
	IMR TC PROVIDE DROP STATUS REPORT E	NOTE E			ALCE		

NOTE : BLUE 4 PASSES THE FLIGHT CONTROL TO BLUE 5

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

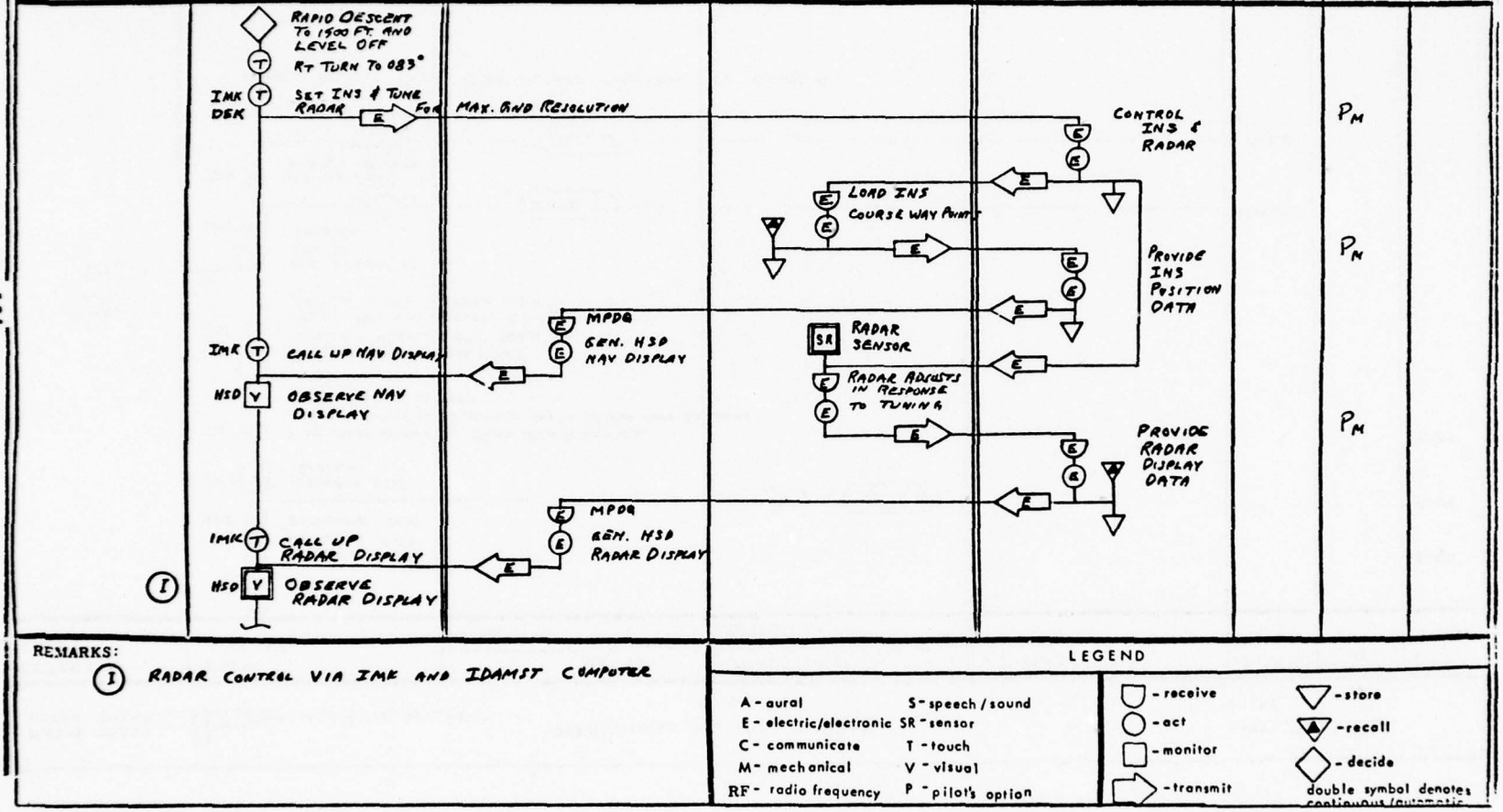
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT: D1A
MINOR EVENT: DESCEND

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 42



REMARKS:

(I) RADAR CONTROL VIA IMR AND IDAMST COMPUTER

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

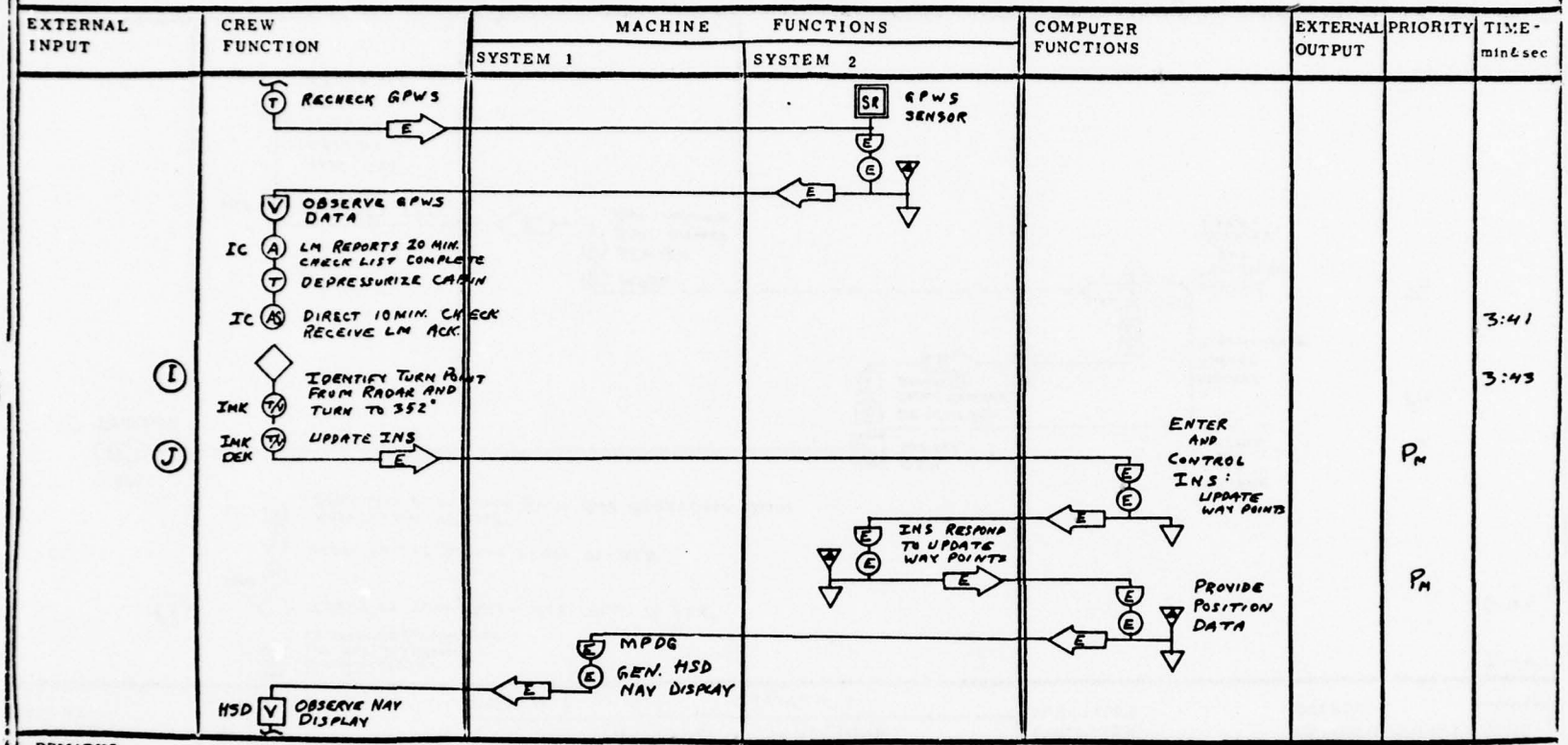
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1A
MINOR EVENT : AIR DROP - PERSONNEL

OPERATIONAL SEQUENCE DIAGRAM
F5D

DATE 18 June 1976
SHEET 43



REMARKS:

(J) INS NAV CONTROL VIA IMK AND IDAMST COMPUTER

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

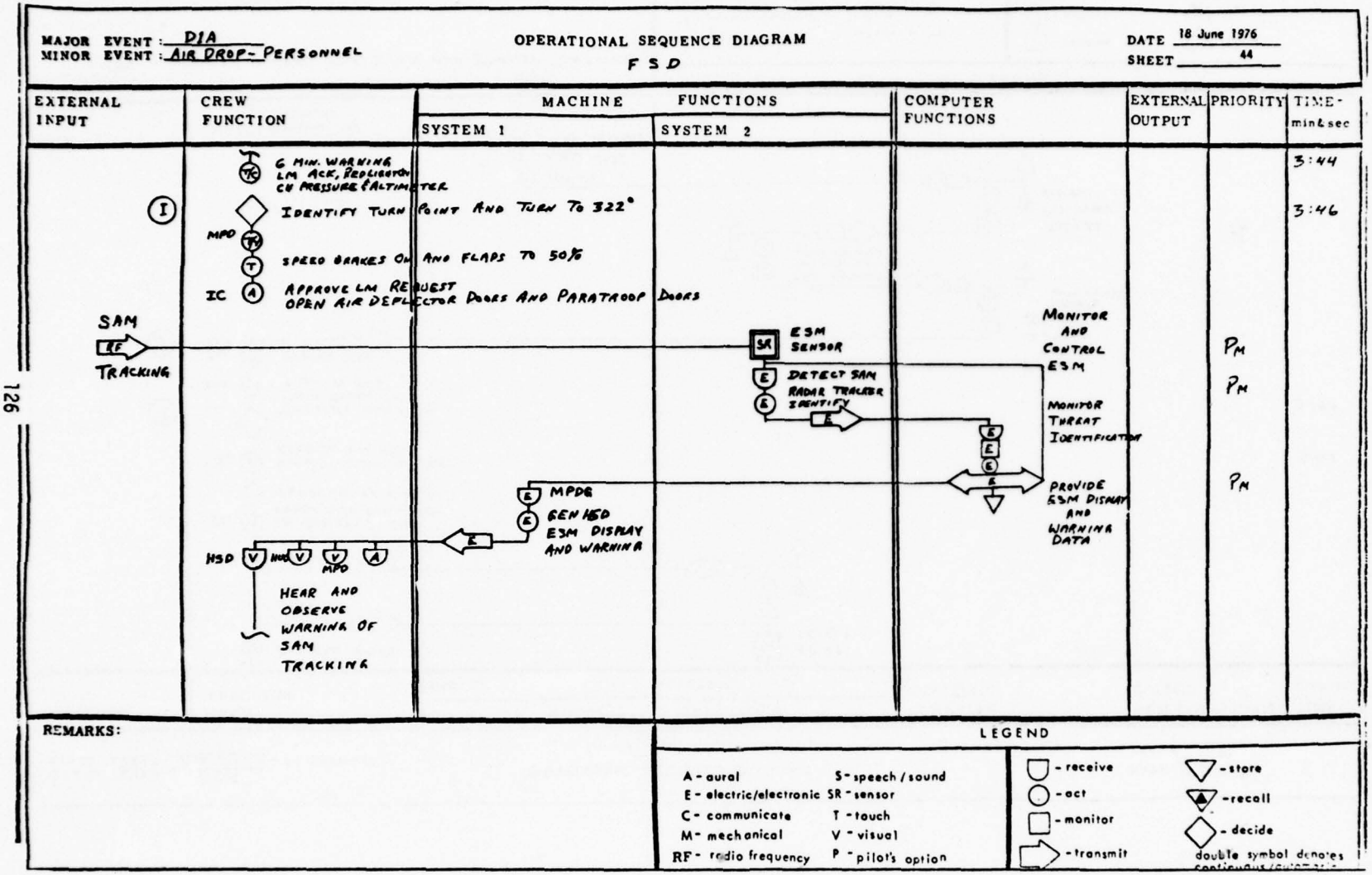
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1A
MINOR EVENT : AIR DROP- PERSONNEL

OPERATIONAL SEQUENCE DIAGRAM
F S D

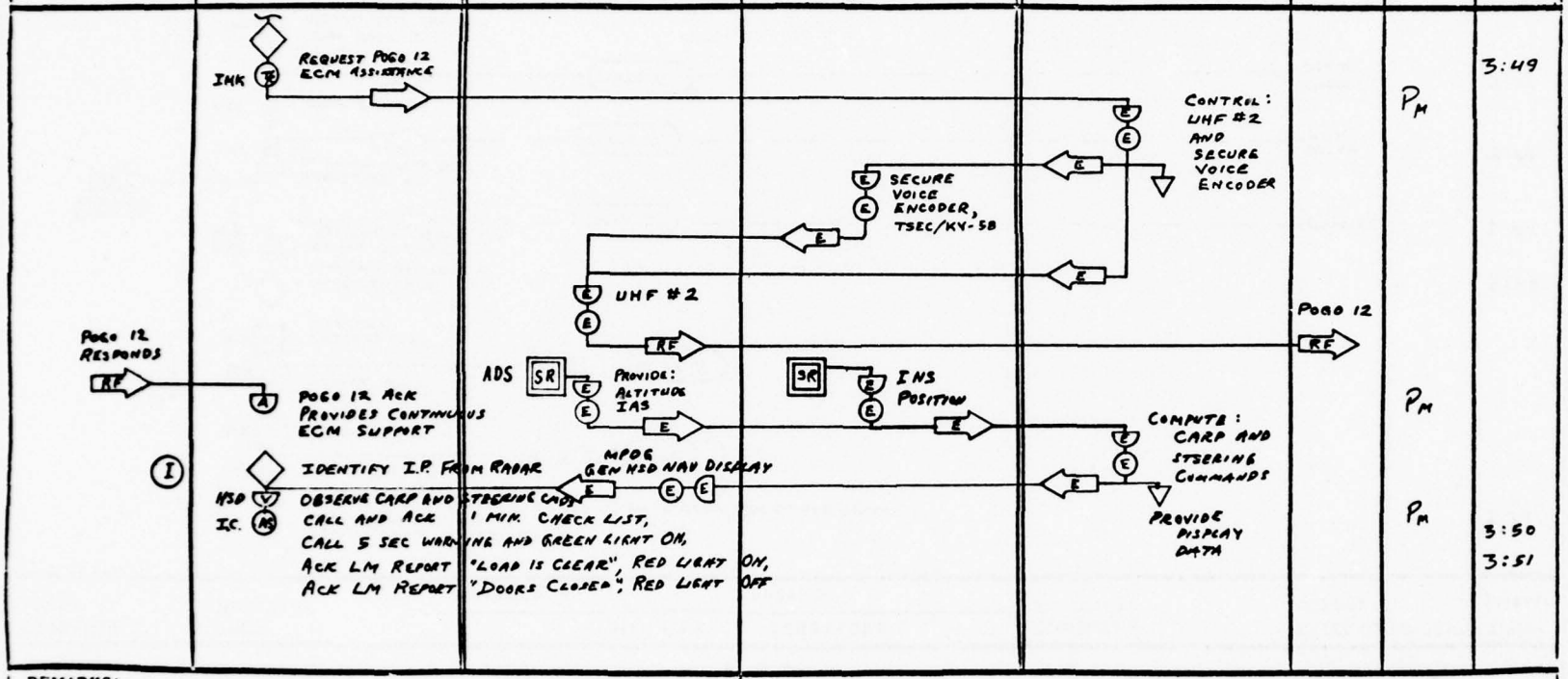
DATE 18 June 1976
SHEET 44



MAJOR EVENT: D1A
MINOR EVENT: AIR DROP - PERSONNEL

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 44



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

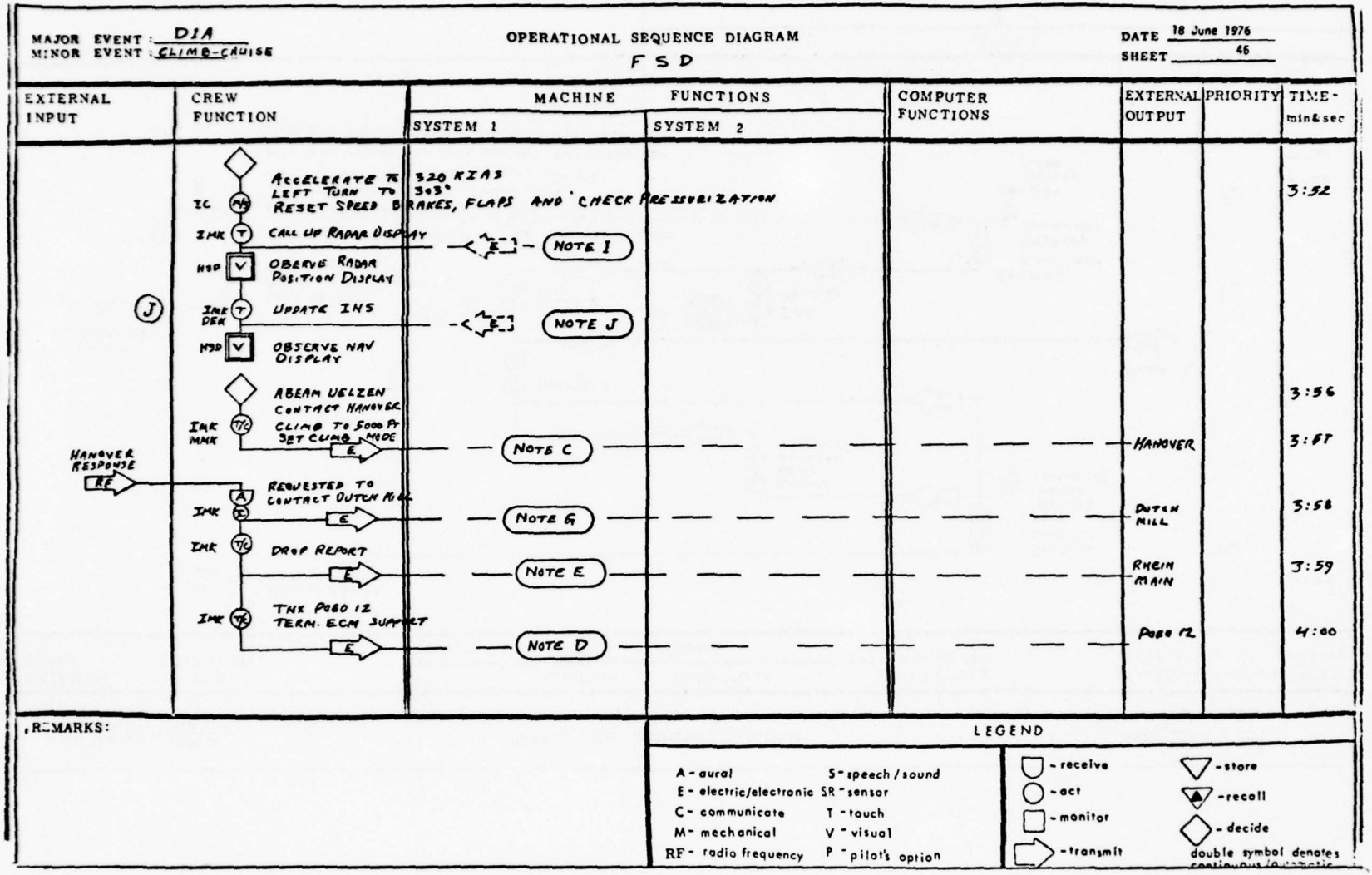
double symbol denotes continuous/automatic

MAJOR EVENT: D1A
MINOR EVENT: CLIMB-CRUISE

OPERATIONAL SEQUENCE DIAGRAM

FSD

DATE 18 June 1976
SHEET 46



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

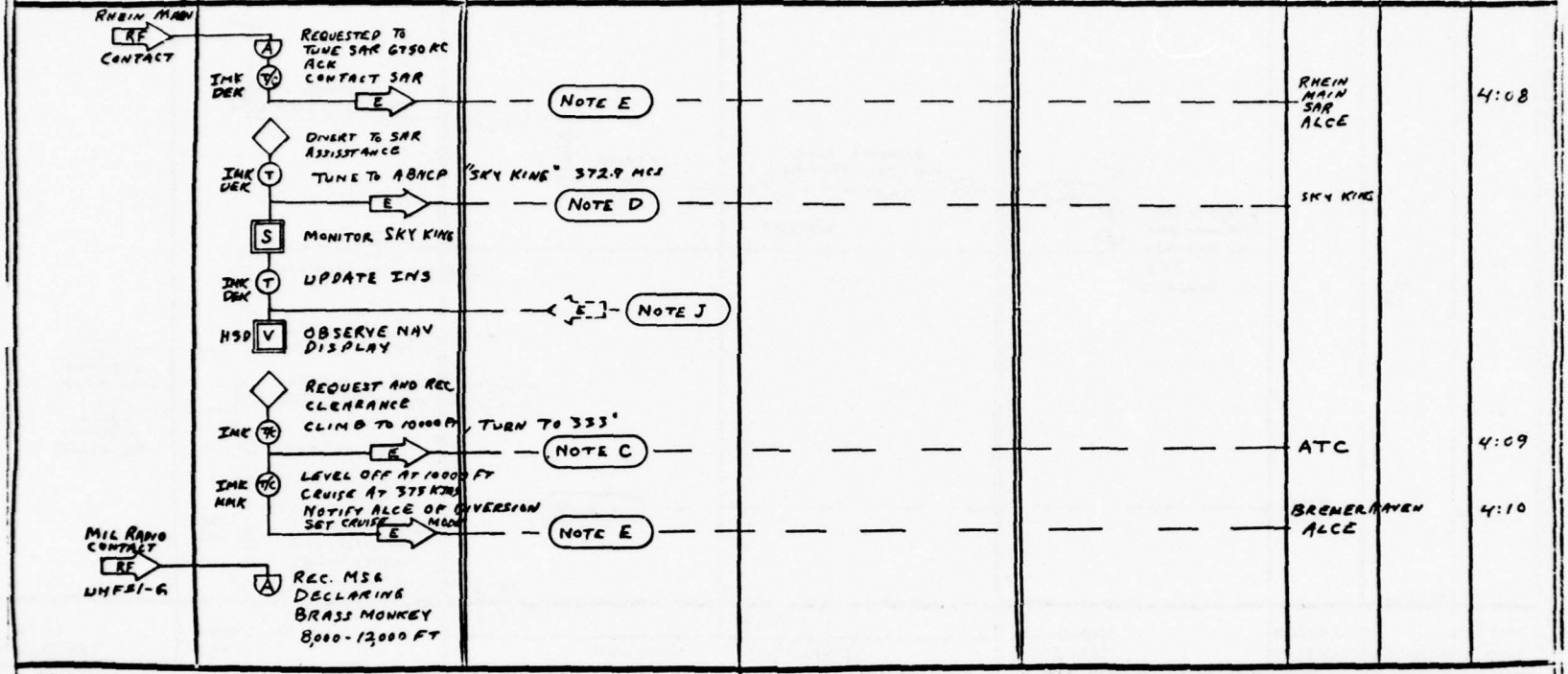
double symbol denotes continuous/automatic

MAJOR EVENT : DIA
MINOR EVENT : CLIMB-CRUISE (SEARCH)

OPERATIONAL SEQUENCE DIAGRAM

FSD

DATE 18 June 1976
SHEET 47



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

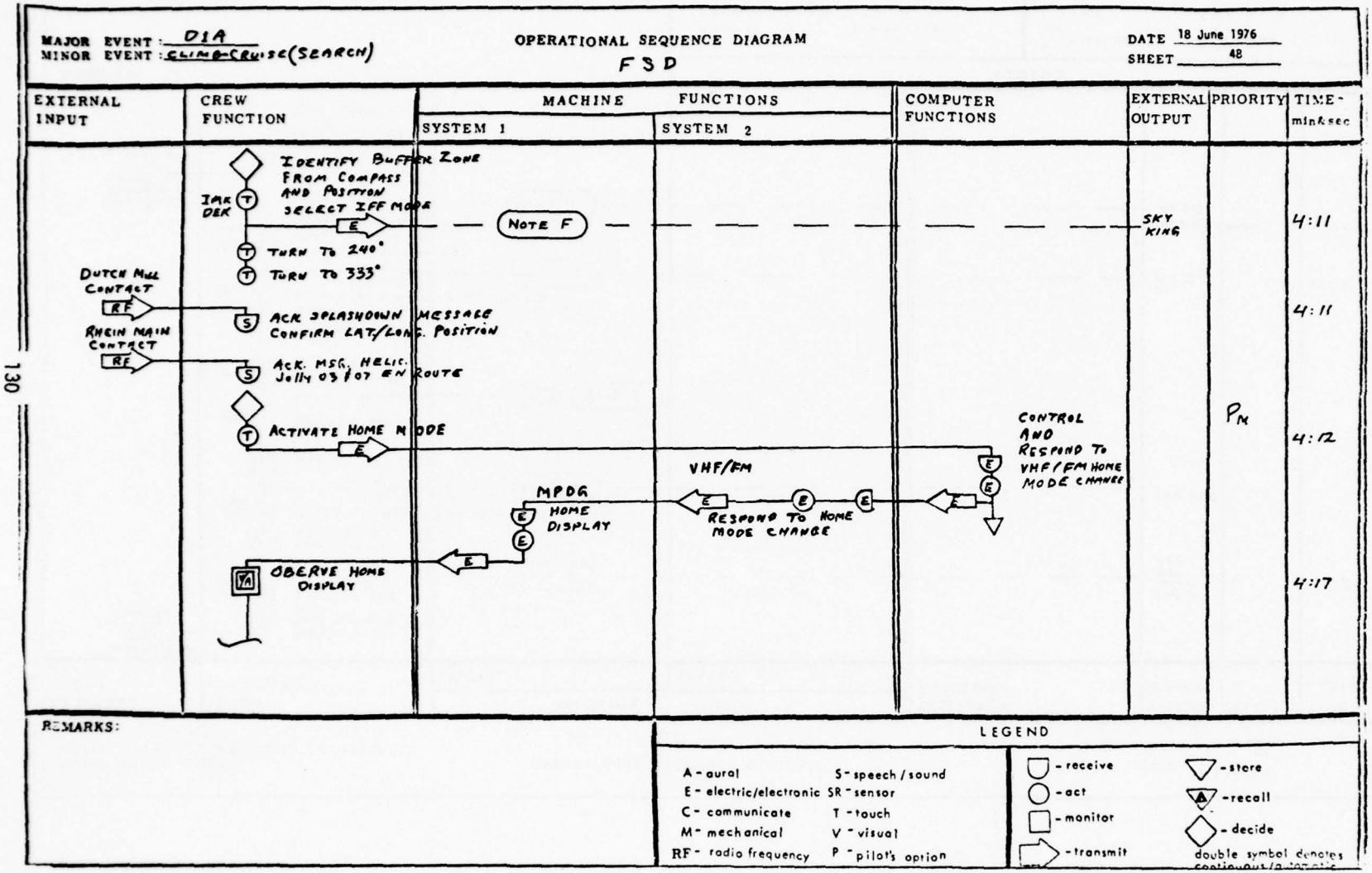
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes

MAJOR EVENT: DIA
MINOR EVENT: CLIMB-CRUISE (SEARCH)

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 48



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

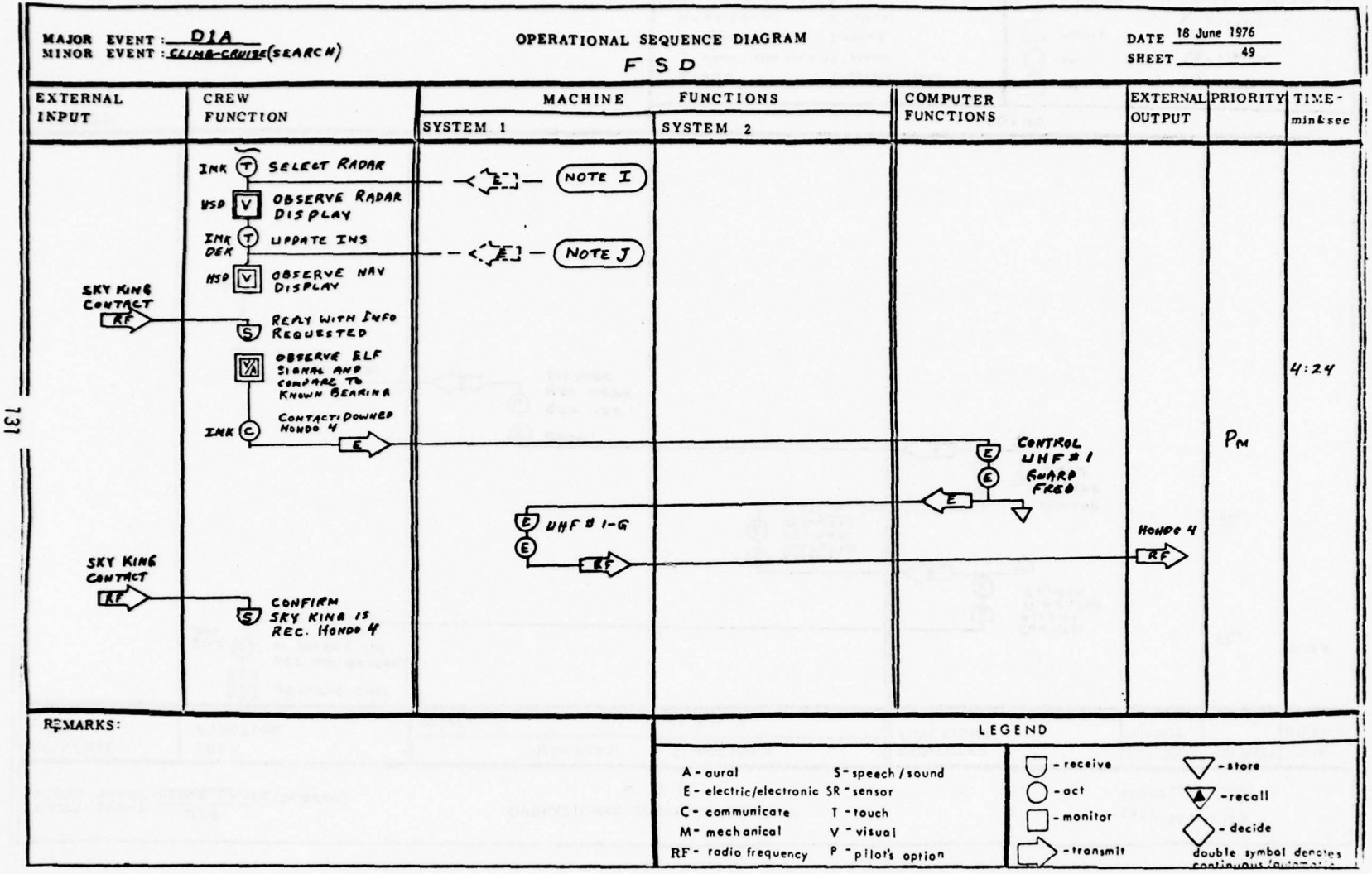
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1A
MINOR EVENT : CLIMB-CRUISE(SEARCH)

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 49



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

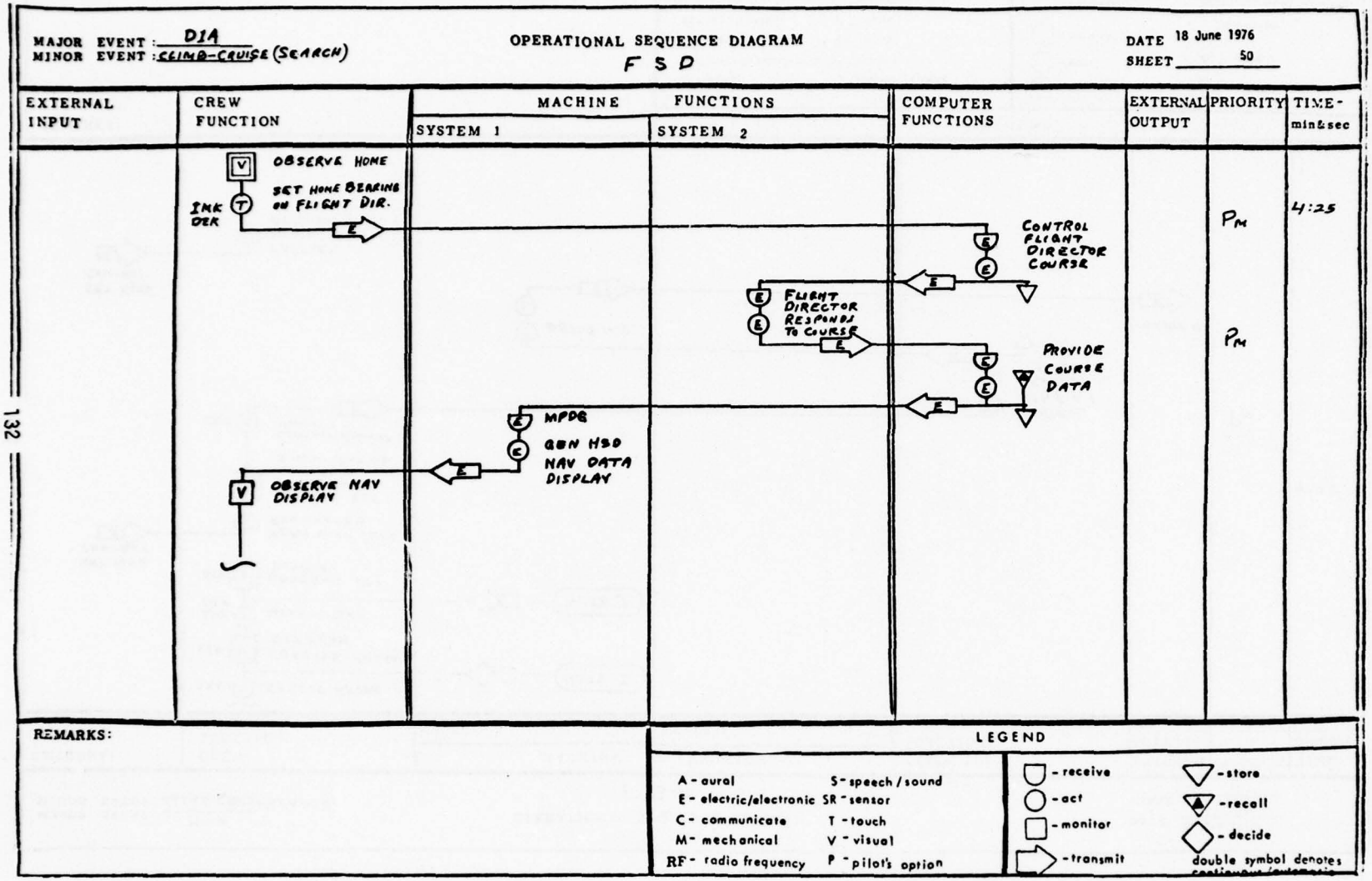
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1A
MINOR EVENT : CLIMB-CRUISE (SEARCH)

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 50



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

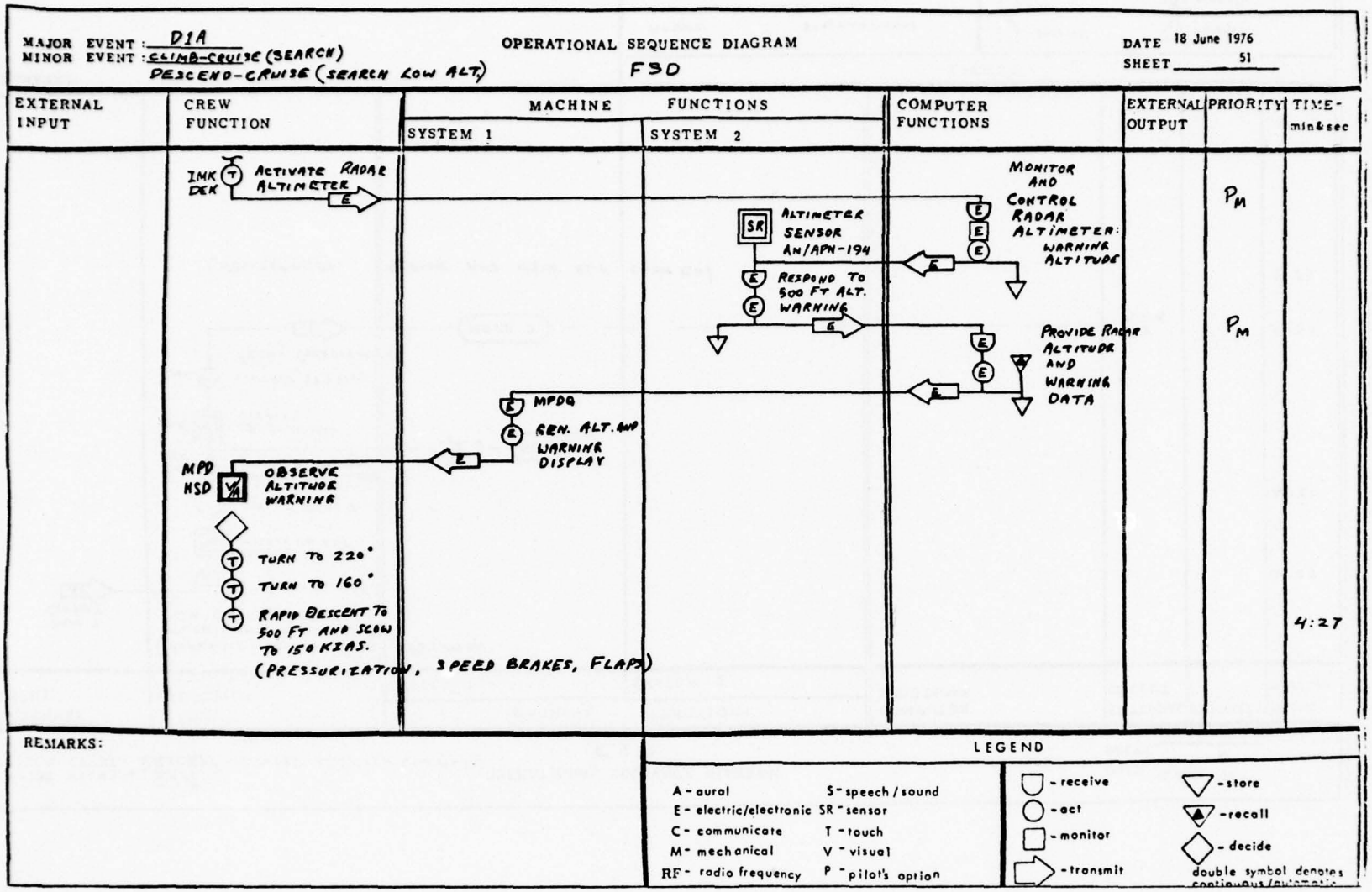
double symbol denotes

MAJOR EVENT: D1A
MINOR EVENT: CLIMB-CRUISE (SEARCH)
DESCEND-CRUISE (SEARCH LOW ALT)

OPERATIONAL SEQUENCE DIAGRAM

F3D

DATE 18 June 1976
SHEET 51



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

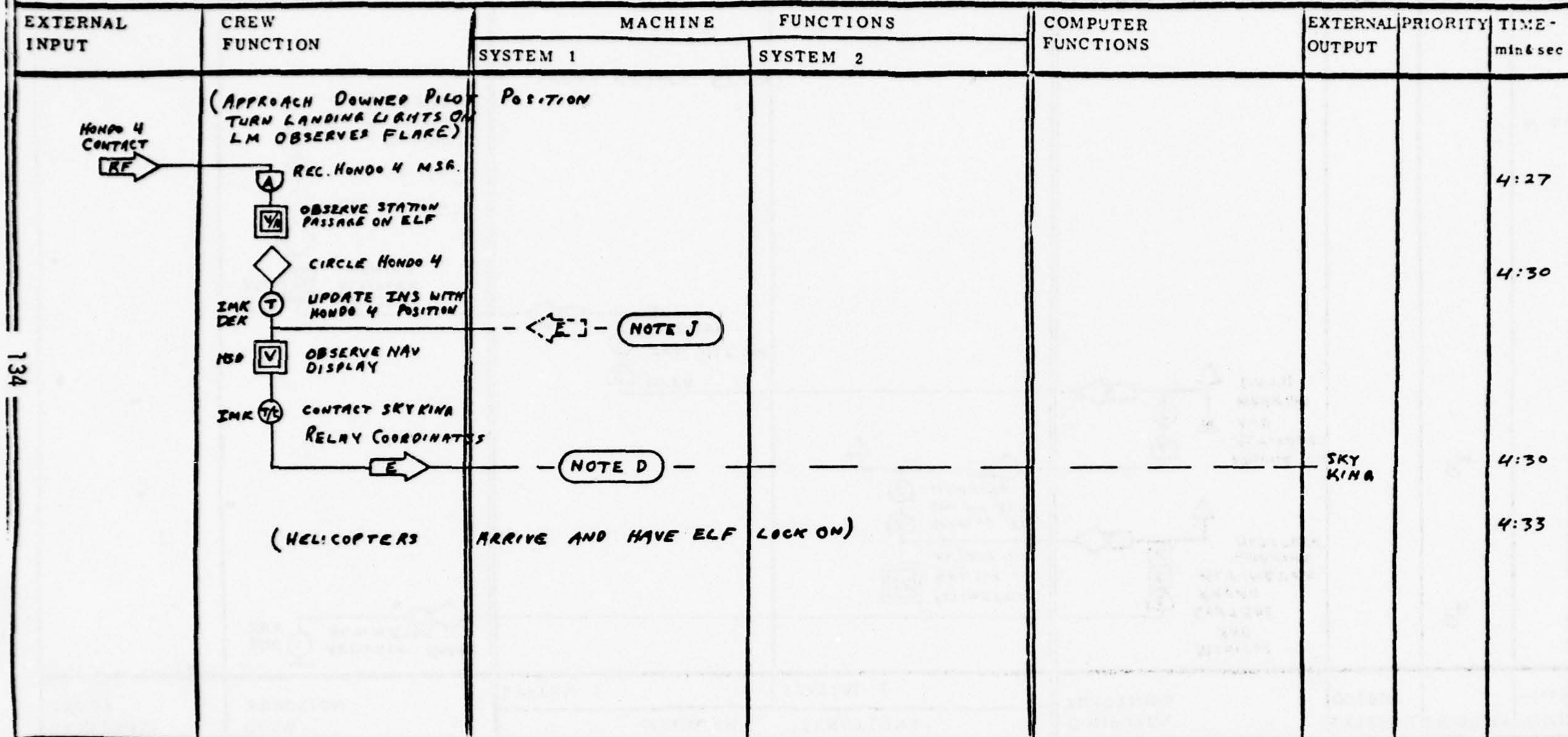
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT: DIA
MINOR EVENT: DESCEND - CRUISE (SEARCH LOW ALT.)

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 52



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1A
MINOR EVENT : CLIMB- CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 53

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	(M) RT CLIMBING TURN TO 160° AND 500 FT ALTITUDE, LANDING LIGHTS OFF.						4:33
IMK	(VC) REQUST BREMERHAVEN CLEARANCE				HANOVER ATC ACK		4:34
	E	NOTE C					
IMK DER	(T) UPDATE INS WITH REVISED WAYPOINTS						
	E	NOTE J					
HSD	(V) OBSERVE NAV DISPLAY						

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D1A
MINOR EVENT : DESCEND AND LAND - CTOL

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 54

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	INK MMK (M/C) REQUEST AND REC. DESCENT CLEARANCE SET LANDING MODE (E)	NOTE C			HANOVER ATC		4:34
	INK (T) CALL UP RADAR DISP	(E) NOTE I					
	HSD (V) OBSERVE RADAR POSITION						
	INK DER (T) UPDATE INS	(E) NOTE J					
	HSD (V) OBSERVE NAV DISPLAY						4:35
	(M) COMPLETE DESCENT CHECK LIST						4:47
	(T) CONVENTIONAL LANDING (CTOL)						4:51
	(PERFORM AFTER	LANDING CL., TAXI,	SHUT DOWN)				

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

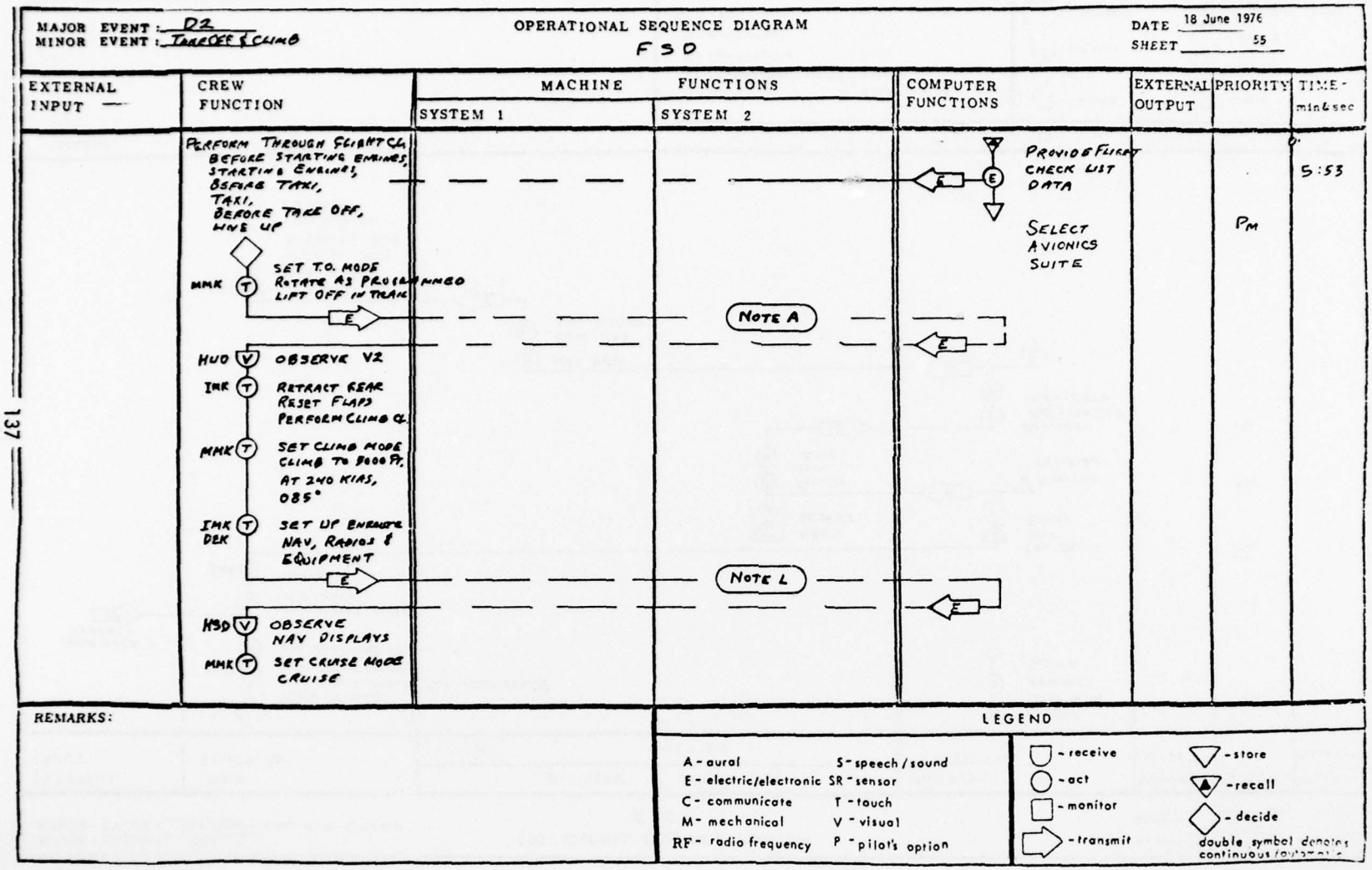
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D2
MINOR EVENT : TAKEOFF & CLIMB

OPERATIONAL SEQUENCE DIAGRAM
F 5 D

DATE 18 June 1976
SHEET 55



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

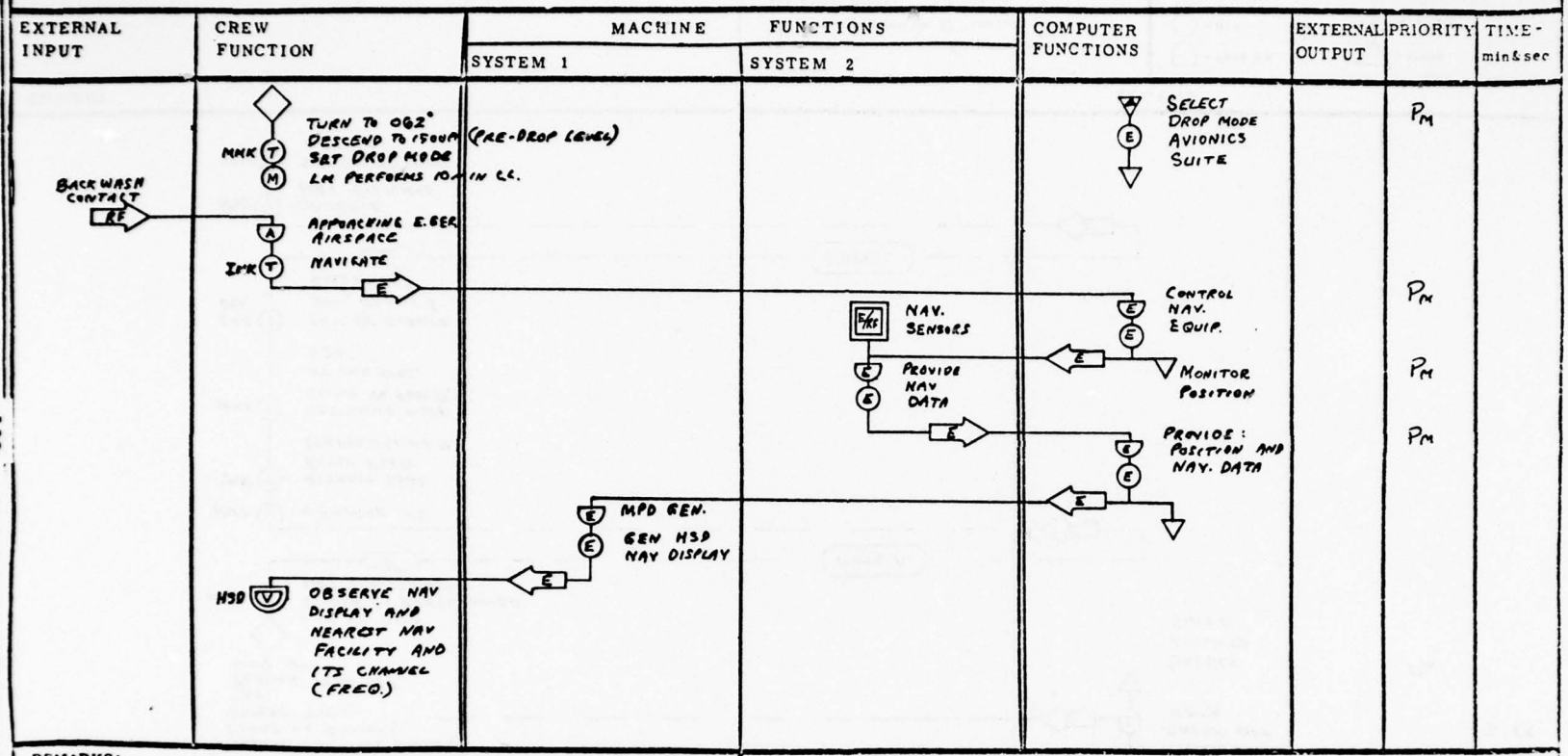
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D2
MINOR EVENT : Air Drop - Low Alt. Cargo

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 56



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

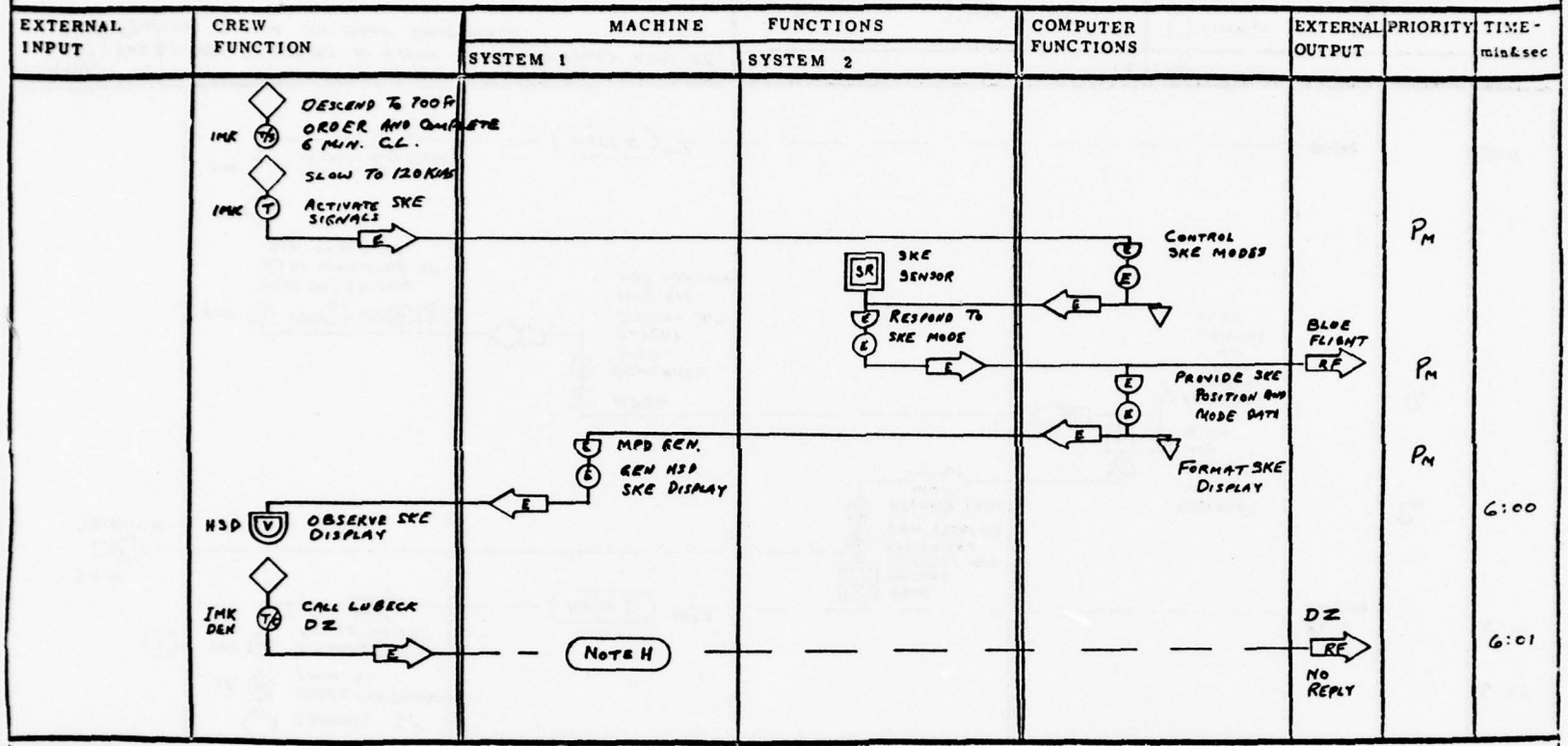
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT: DZ
MINOR EVENT: AIR DROP - LOW ALT. CARGO

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 57



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

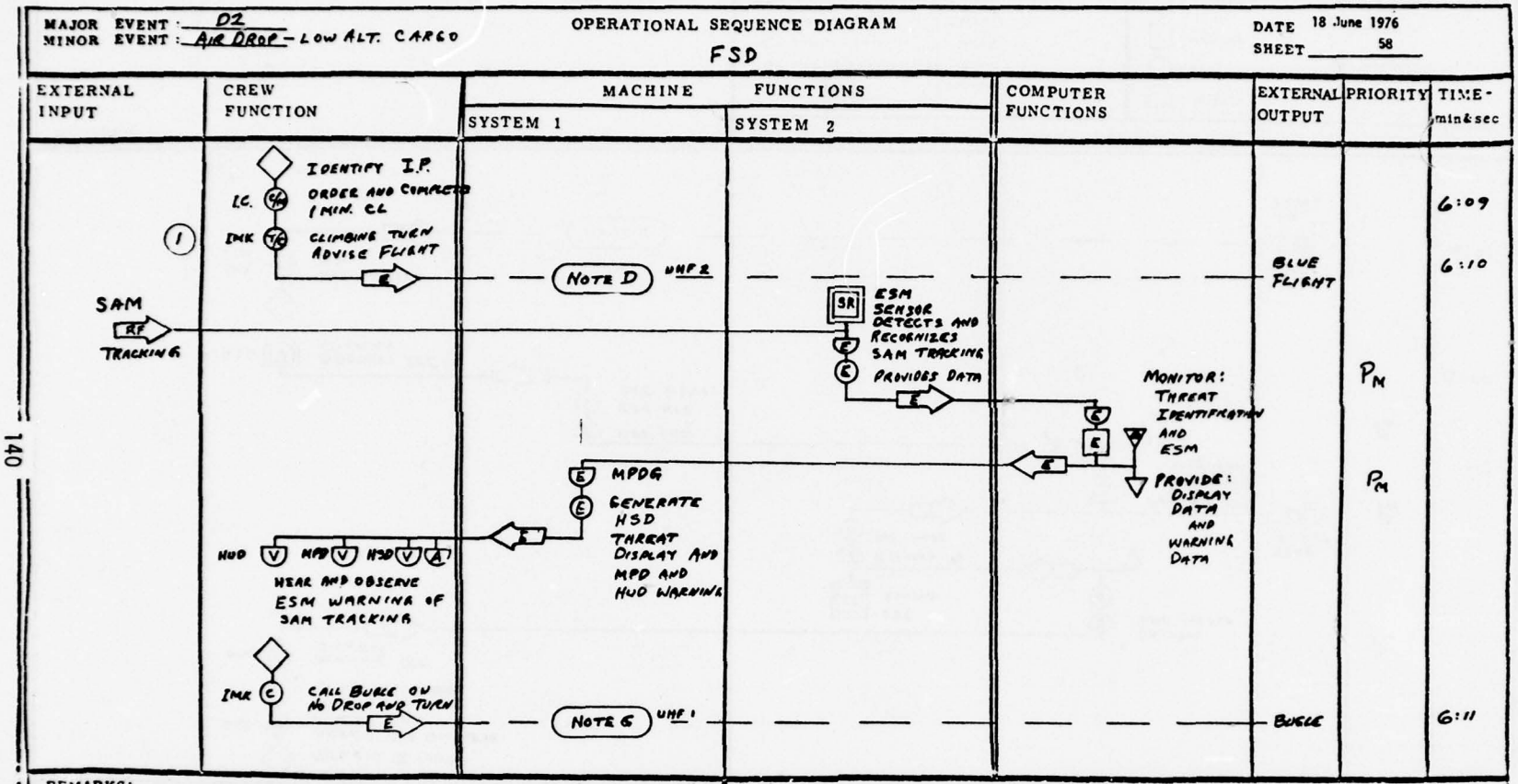
double symbol denotes continuous/automatic

MAJOR EVENT: D2
MINOR EVENT: AIR DROP – LOW ALT. CARGO

OPERATIONAL SEQUENCE DIAGRAM

FSD

DATE 18 June 1976
SHEET 58



REMARKS:

(1) PREBRIEFED PROCEDURE IN EVENT OF NO CONTACT WITH DZ, PERFORM 2 MIN. RT HAND RACETRACK

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech/sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D2
MINOR EVENT : AIR DROP – LOW ALTITUDE CARGO

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 59

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	◇ C CALL BREMERHAVEN REQUEST DROP APPROVAL → E	NOTE HF/SSB			BREMERHAVEN ALCE		6:15
	◇ INF C ADVISE BLUE FLIGHT RELAYING DROP CLEARANCE → E	NOTE D UHF 2			BLUE FLIGHT		6:21
	◇ T DESCEND TO 700 FT INBOUND TO DZ						6:21
	IC. C PILOT CALLS 1 MIN. WARNING						
	T SLOW TO 120 KIAS SET SPEED BRAKES SET FLAPS						

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

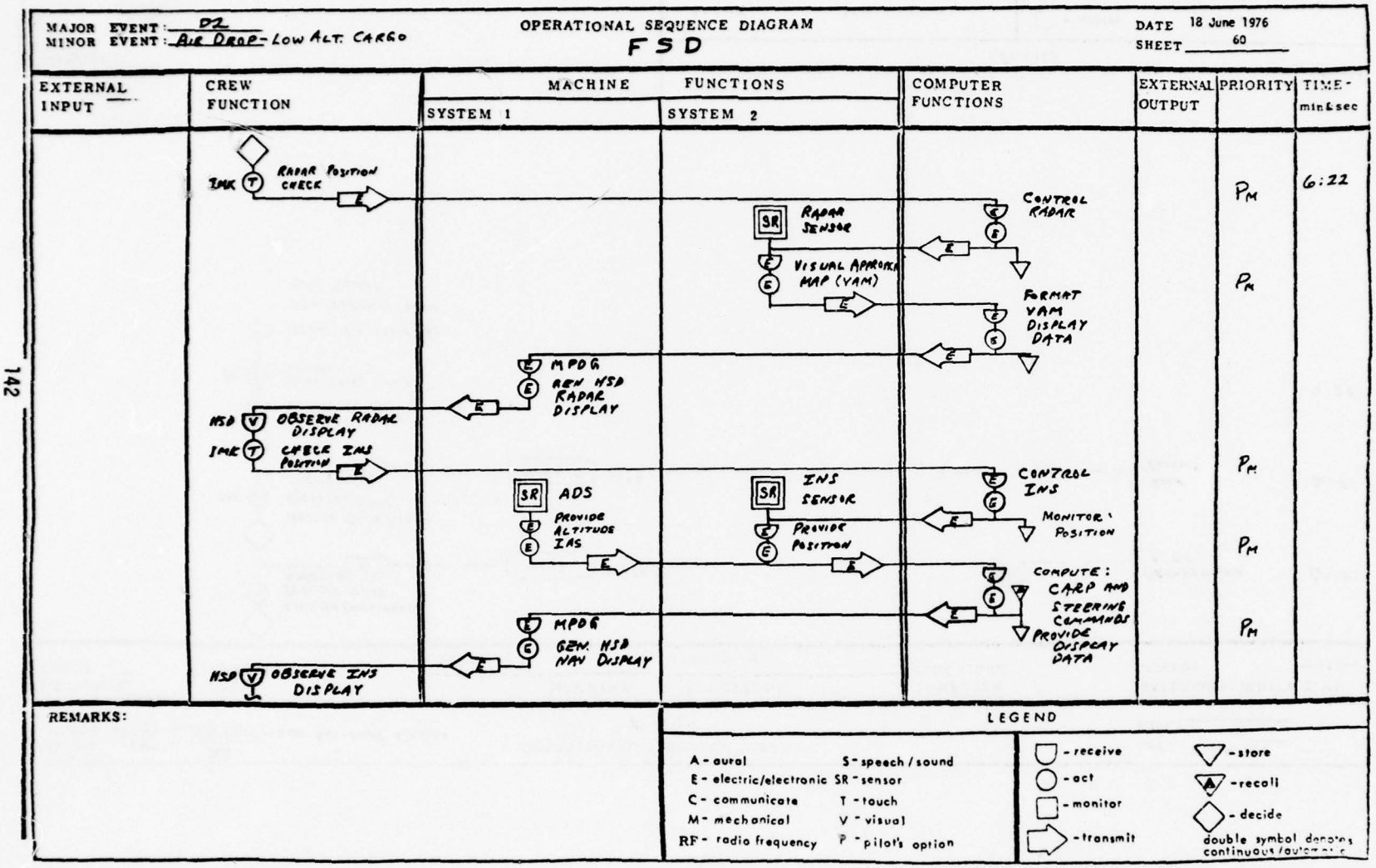
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT: D2
MINOR EVENT: AIR DROP - LOW ALT. CARGO

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 60



MAJOR EVENT : D2
MINOR EVENT : AIR DROP-LOW ALT. CARGO

OPERATIONAL SEQUENCE DIAGRAM

F 5D

DATE 18 June 1976
SHEET 61

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	(M) CORRELATE RADAR AND INS POSITION AND CARP AND STEERING COMMANDS						
	I.C. (T) CALL 5 SEC WARNING TURN ON "GREEN LIGHT" COMPLETE DROP PROCEDURE AND RECOVERY						6:24
	IMC (C) REPORTS (E)	HF/SSB NOTE E			ALCE		
	IMC (C) CALLS BUGLE (E)	UHF 1 NOTE G			BUGLE		
	IMC (C) CALLS ATC (E)	VHF/AM NOTE C			ATC		
	IMC (C) ADVISE BLUE FLIGHT (E)	UHF 2 NOTE D			BLUE FLIGHT		

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

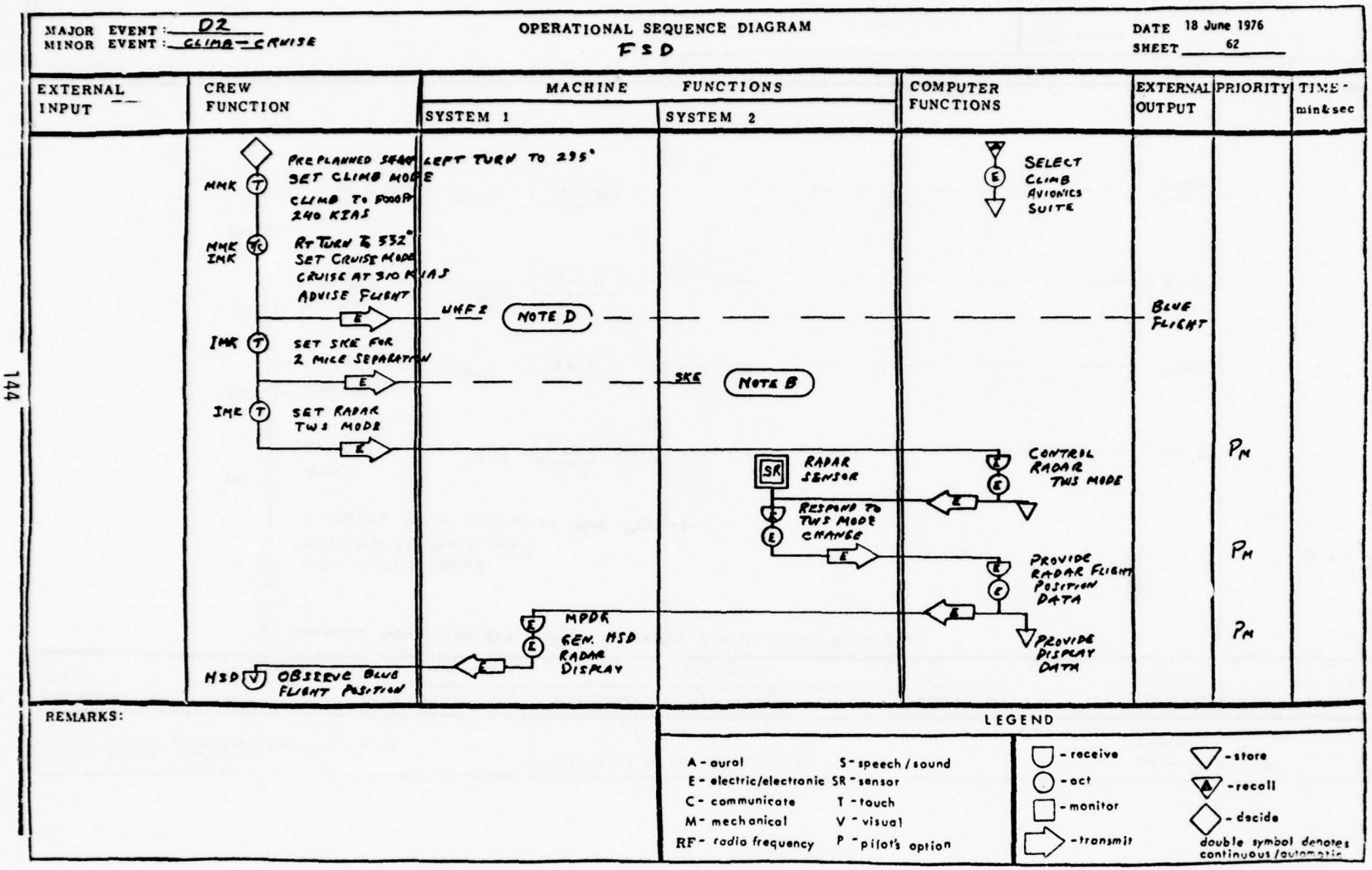
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT: D2
MINOR EVENT: CLIMB – CRUISE

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 62



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

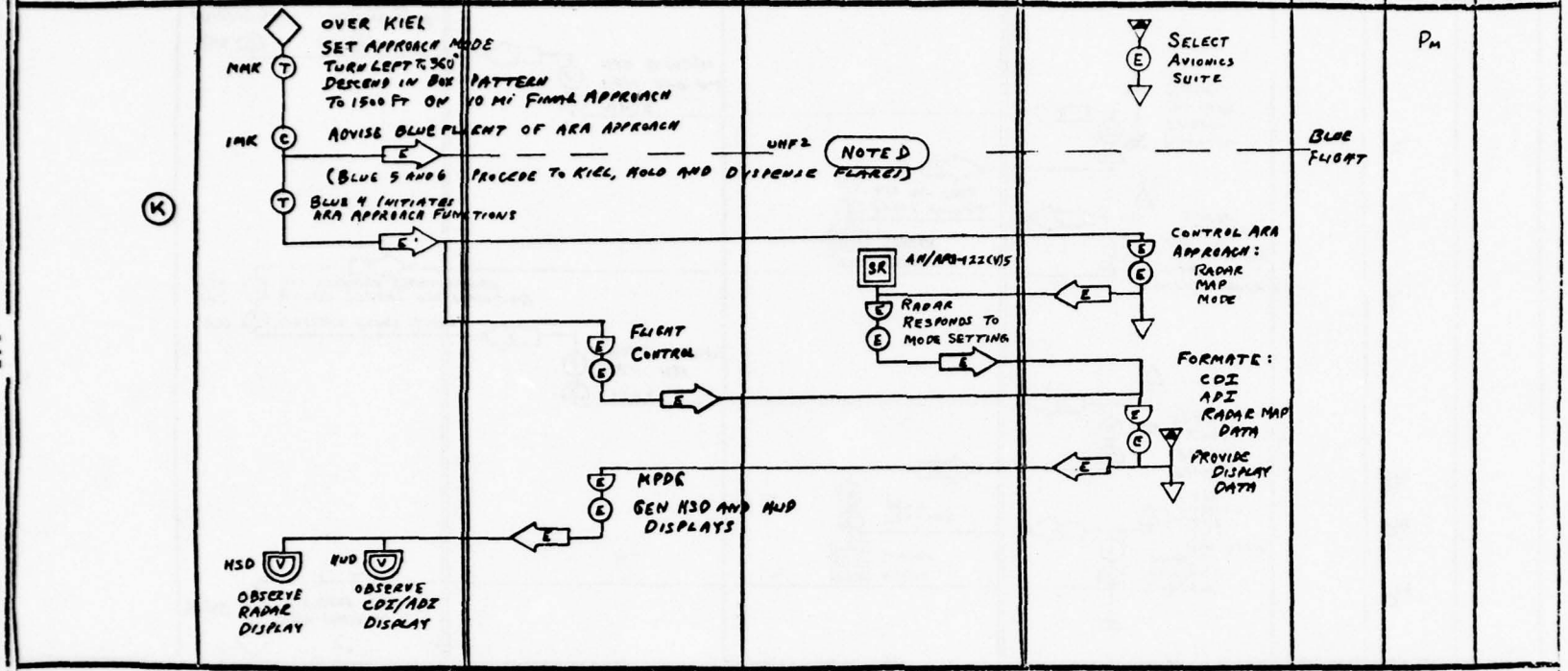
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D2
MINOR EVENT : APPROACH - ARA

OPERATIONAL SEQUENCE DIAGRAM
F 3 D

DATE 18 June 1976
SHEET 63



REMARKS:

(K) AIRBORNE RADAR APPROACH (ARA) FUNCTIONS WITH VFR LANDING

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

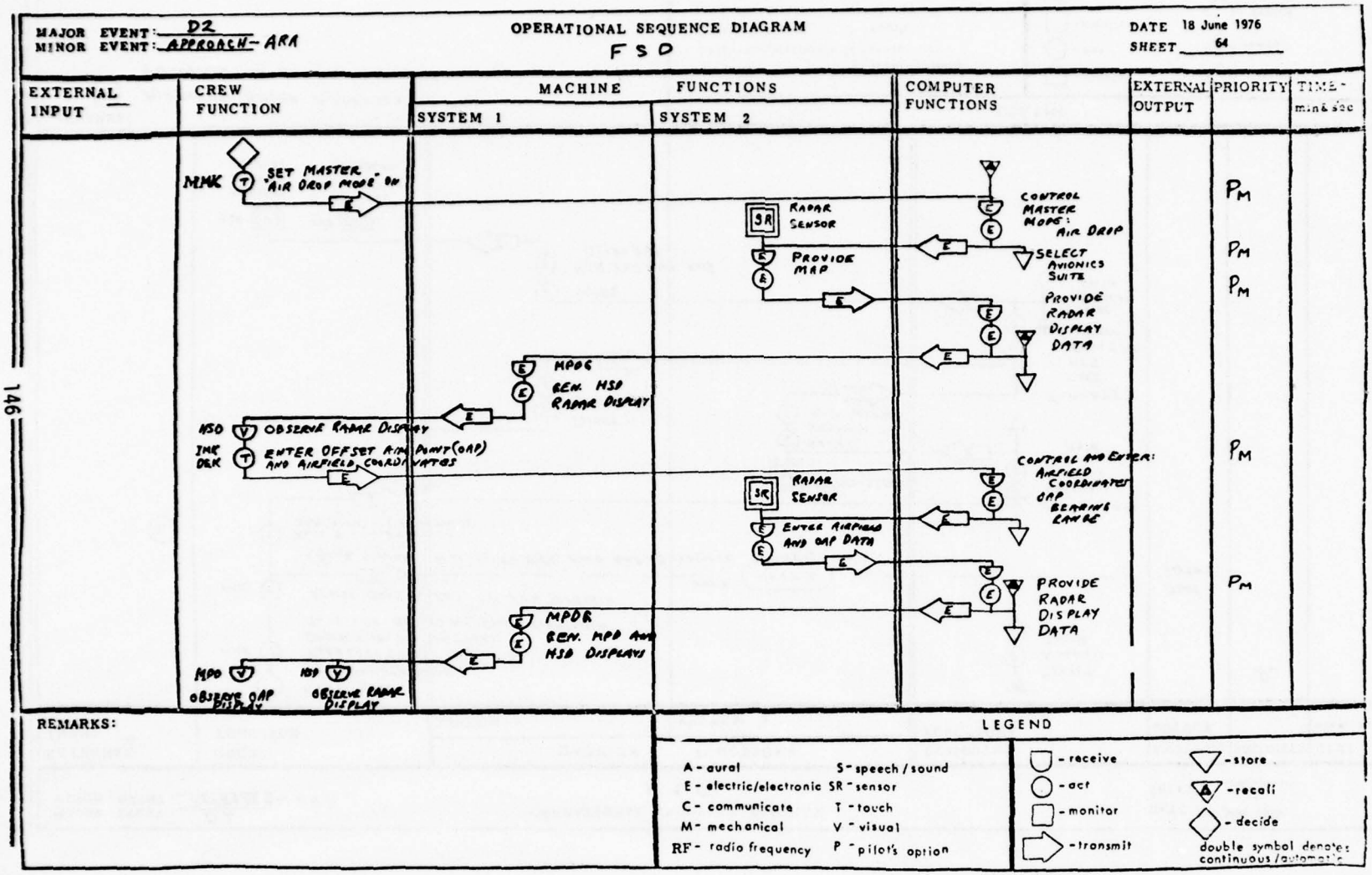
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT: D2
MINOR EVENT: APPROACH - ARA

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 64



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

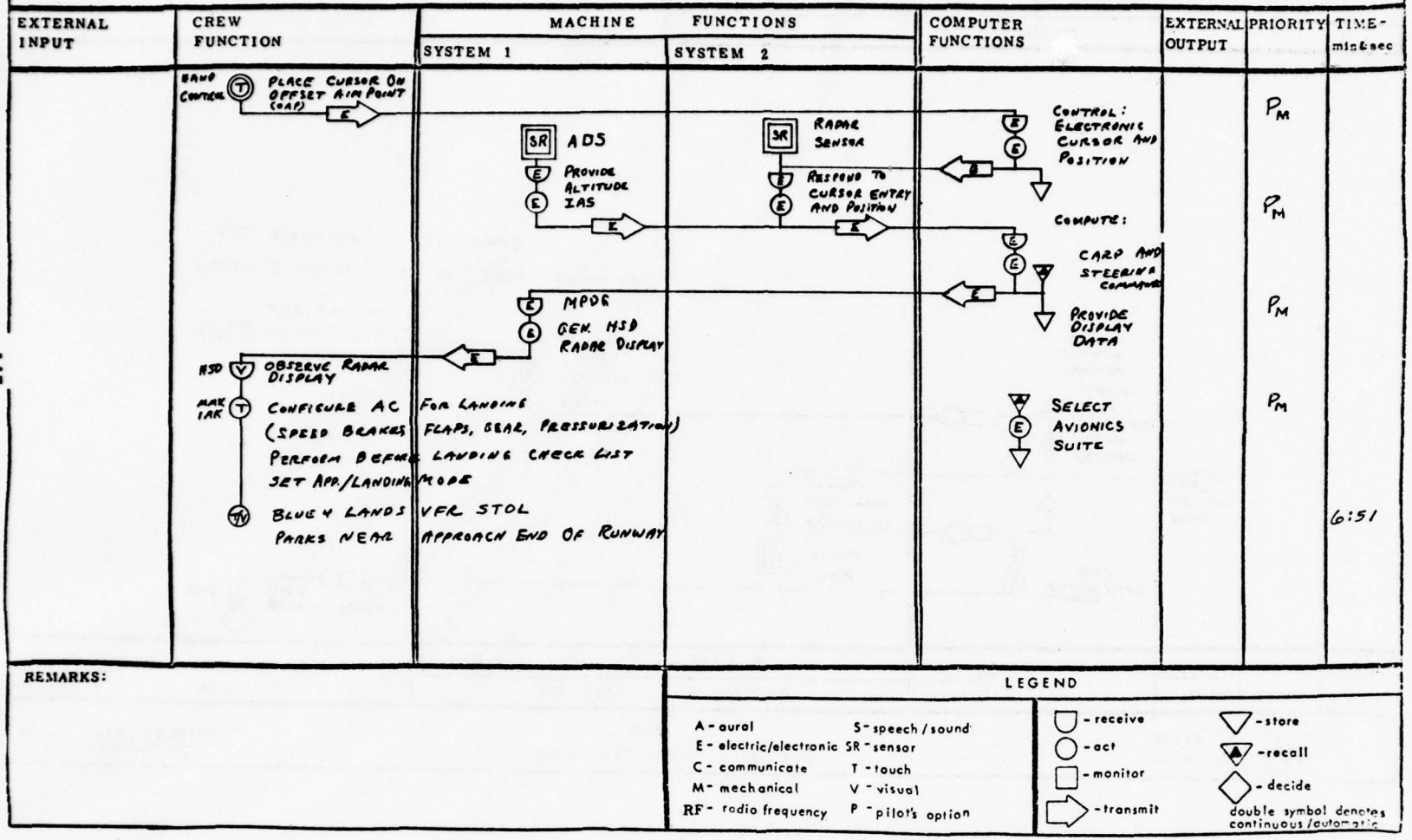
- receive
- act
- monitar
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D2
MINOR EVENT : APPROACH - LANDING (STOL)

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 JAN 66 1976
SHEET 65



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REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

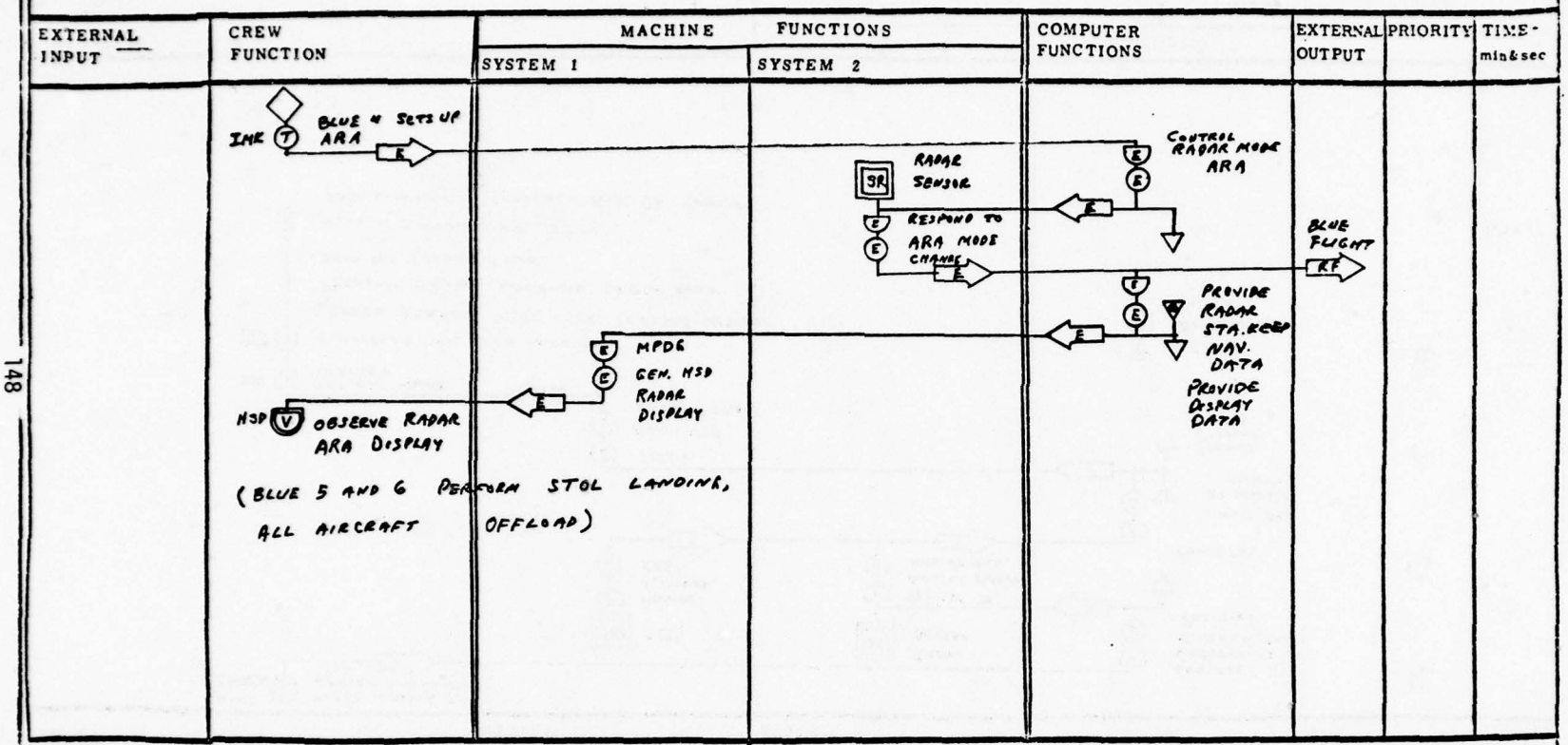
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : 02
MINOR EVENT : LANDING

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 65



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

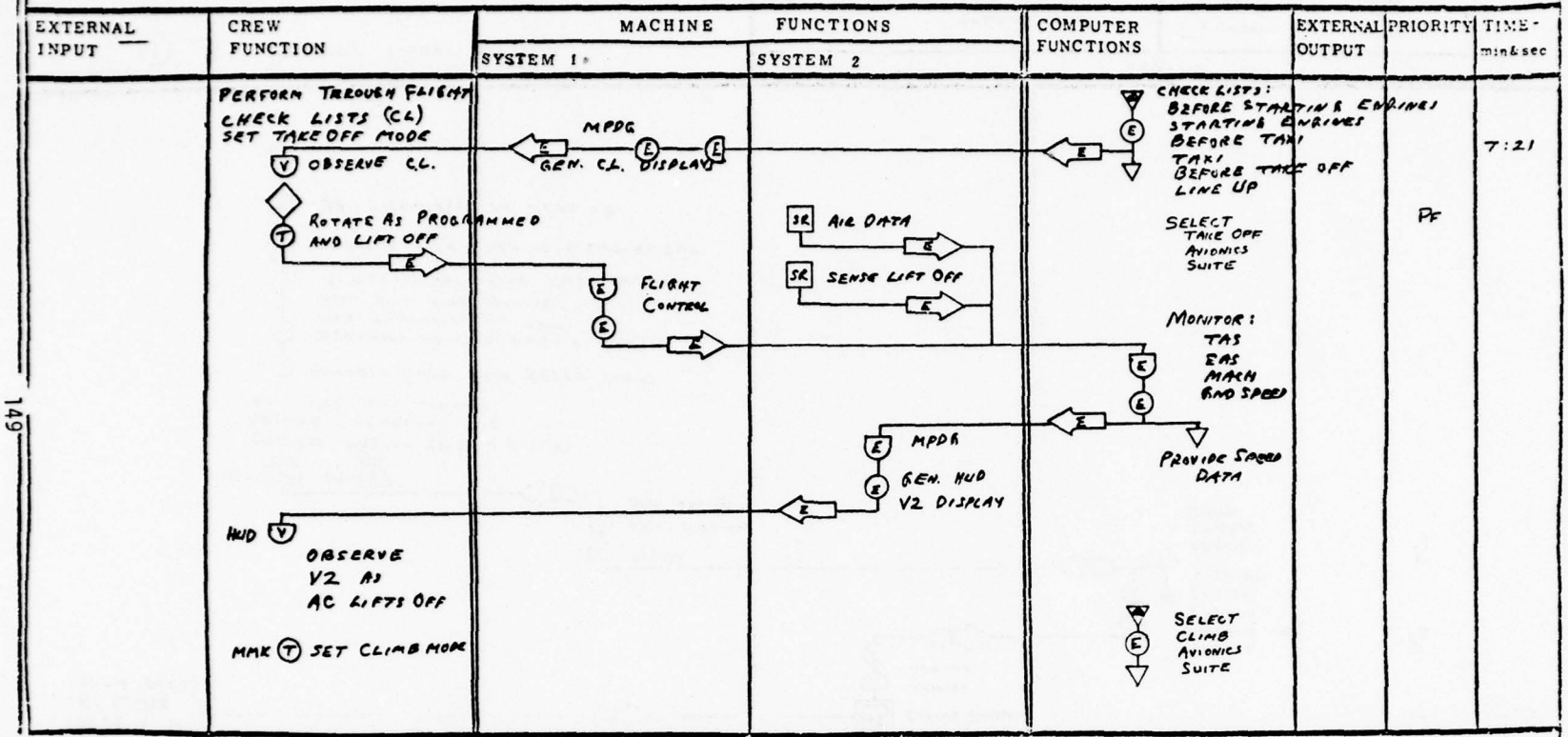
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D3
MINOR EVENT : TAKE OFF/CLIMB

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE , 18 June 1976
SHEET 67



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

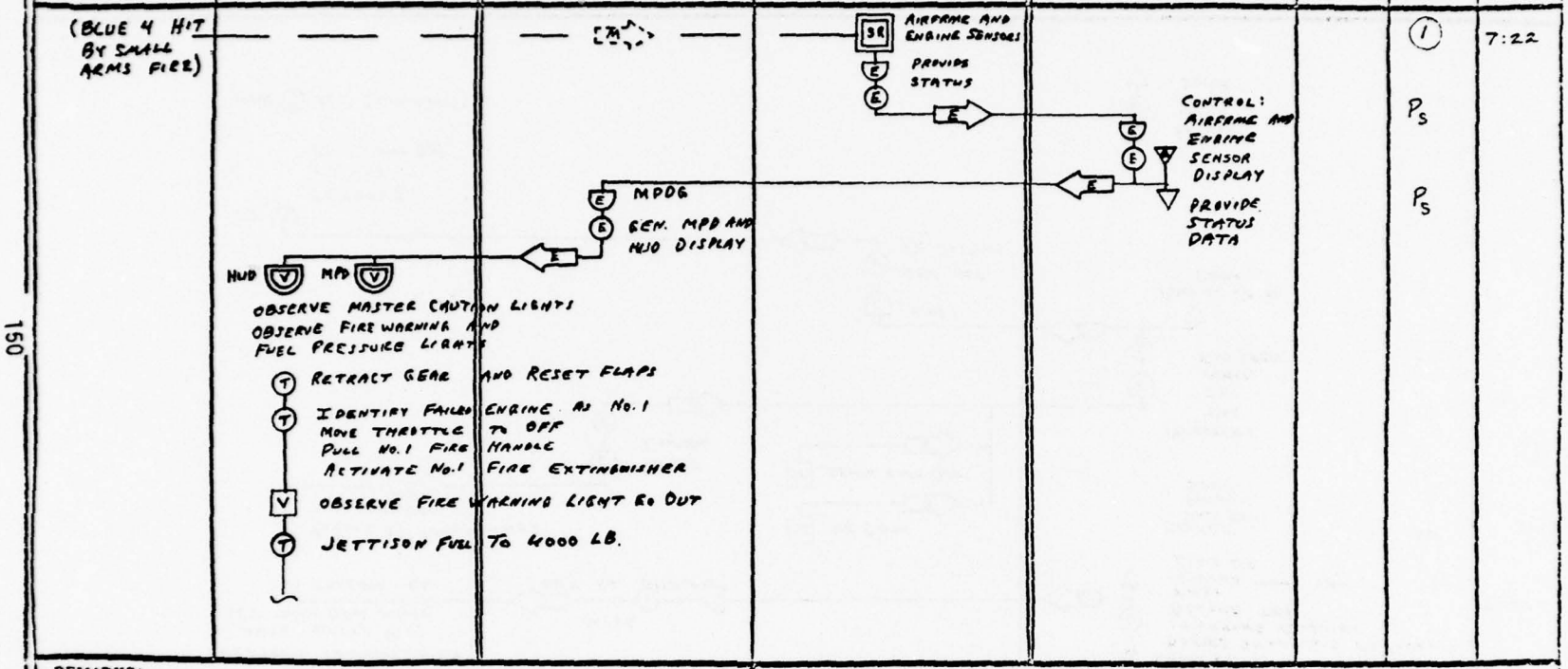
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D3
MINOR EVENT : CLIMB

OPERATIONAL SEQUENCE DIAGRAM
F 5 D

DATE 18 June 1976
SHEET 68



REMARKS:

(1) Ps PRIORITY FLIGHT SURVIVAL

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT: D3
MINOR EVENT: CLIMB

OPERATIONAL SEQUENCE DIAGRAM
F 3 D

DATE 18 June 1976
SHEET 69

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	IMK (Ts) CALL AND PERFORM ENGINE FAILURE CL. (E)		(SR) AIRFRAME AND ENGINE SENSORS (E) PROVIDE STATUS (E)	RECALL: ENGINE FAILURE CHECK LIST (E) PROCESS: AC AND ENGINE FAILURE STATUS (E) (V) PROVIDE STATUS DATA		Ps	
		(E) MPDG (E) GEN. HSD CHECK LIST DISPLAY (E)				Ps	
	HSD (V) OBSERVE ENG. FAIL. CL. AND STATUS					Ps	
	(NOTE: RADAR INOPERATIVE/LACK OF POWER)						7:23
	MMK (T) CLIMB TO 5000 FT						
	IMK (C) ADVISE FLIGHT OF EMERGENCY DIRECT SKE FORMATION EJECT (E)	UHF 2 NOTE D			BLUE FLIGHT		7:25
	IMK (C) ADVISE BUGLE (E)	UHF 1 NOTE G			BUGLE		7:26
	IMK (C) ADVISE HANDOVER REQ & REC CL TO BREMERHAVEN (E)	VHF/AM NOTE H			HANDOVER ATC		7:27

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D3
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F 3D

DATE 18 June 1976
SHEET 70

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec
	(T) SET CRUISE MODE ACCELERATE TO 250 KIAS AND CRUISE			(E) SELECT AVIONICS SUITE		P_M	7:27
	IMK (C) ADVISE ALCE OF EMERGENCY AND FLIGHT PLAN (E)	HF/SSB (NOTE E)			ALCE		7:37
	IMK (T) PERFORM AND OBSERVE SKE FUNCTIONS (V)						
	(T) CRUISE TO BREMERHAVEN						
	PERFORM CRUISE CHECKS: INS						
	VOR TACAN	RADIO					
	ESTABLISH RNAV APPROACH	PATTERN					

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

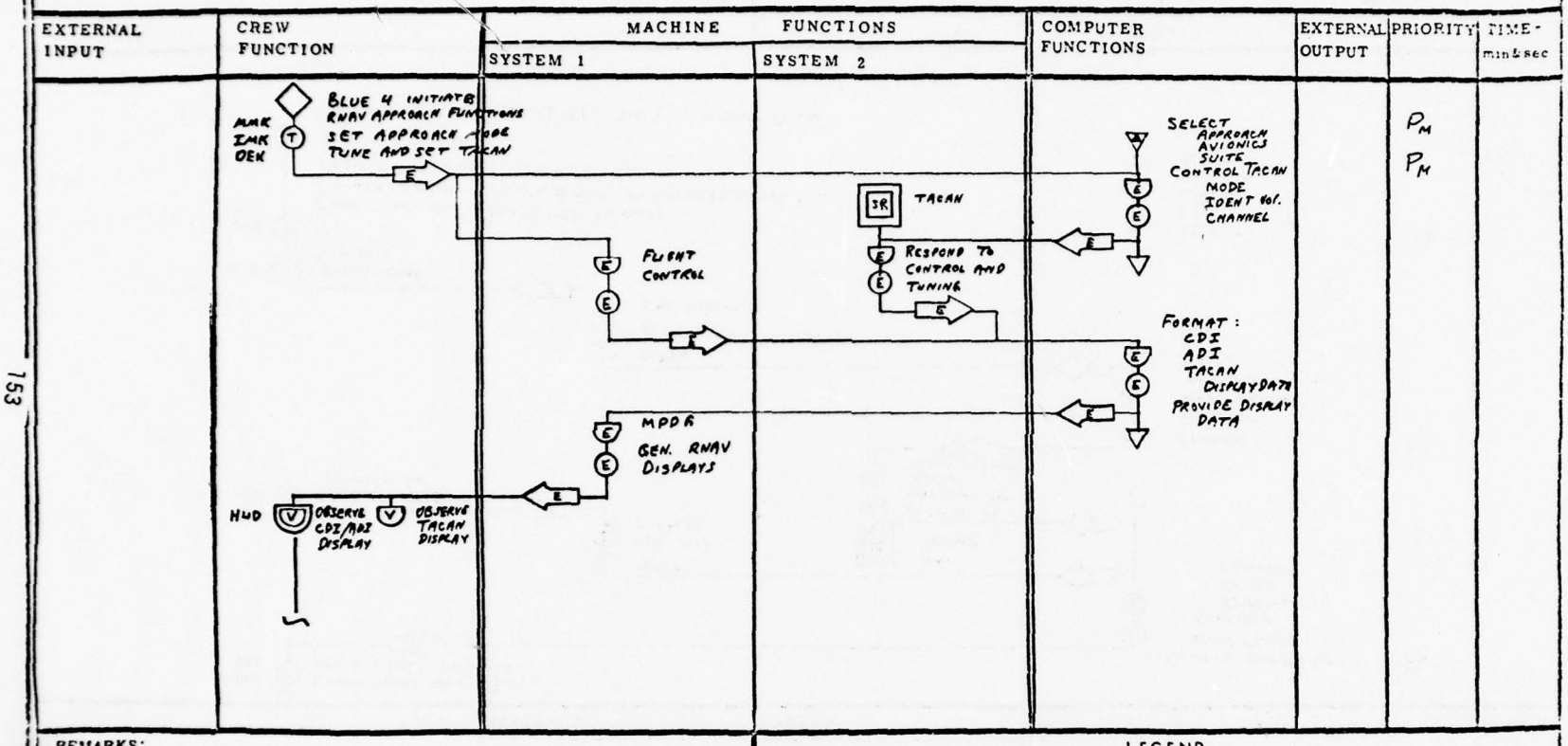
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : D3
MINOR EVENT : APPROACH / LANDING (STOL)

OPERATIONAL SEQUENCE DIAGRAM
F5D

DATE 18 June 1976
SHEET 71



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

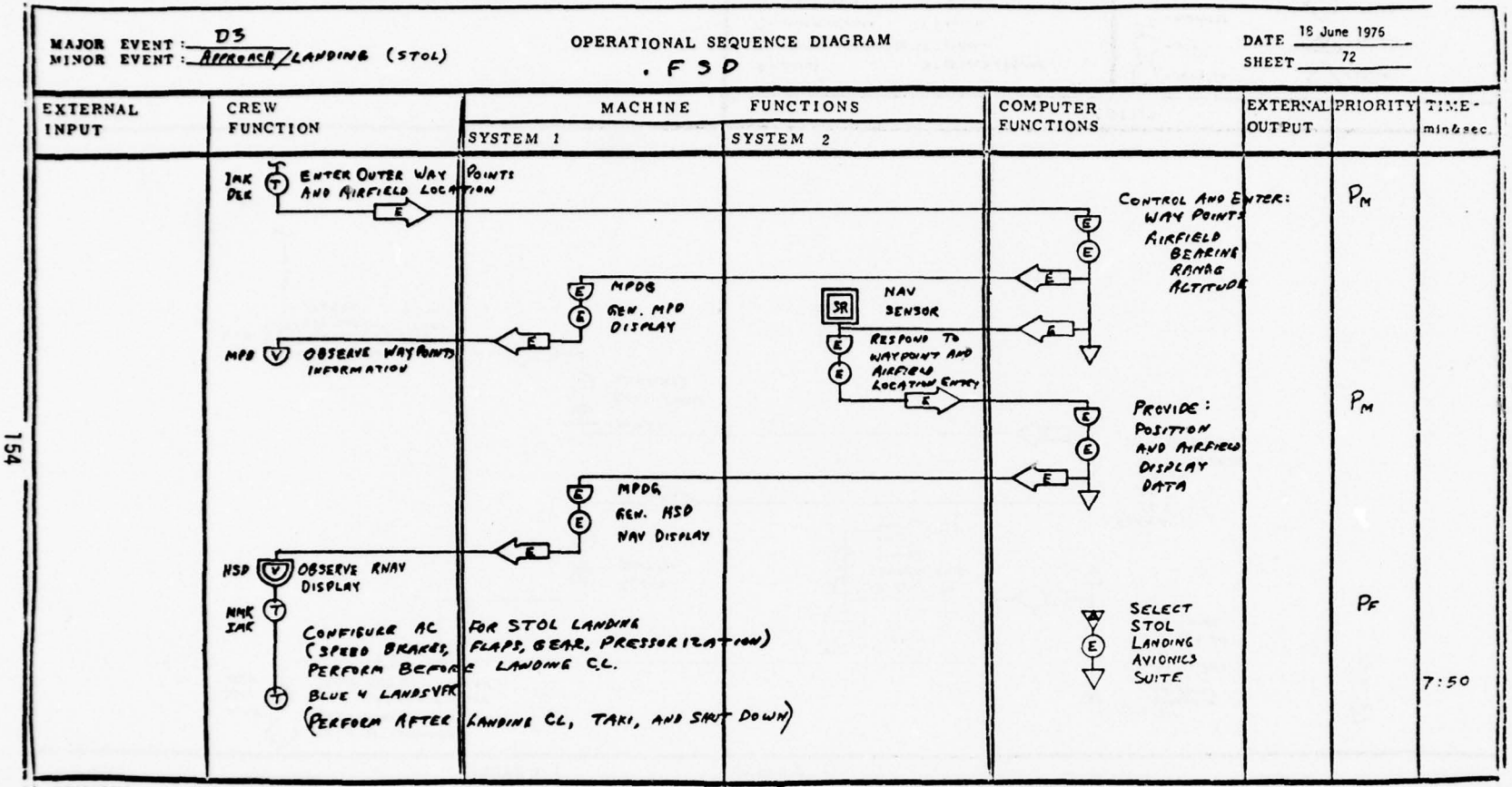
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT: D3
MINOR EVENT: APPROACH/LANDING (STOL)

OPERATIONAL SEQUENCE DIAGRAM
. F3D

DATE 18 June 1975
SHEET 72



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes

MAJOR EVENT : D4
MINOR EVENT : TAKE OFF / CLIMB / CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F 30

DATE 18 June 1976
SHEET 73

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	PERFORM THROUGH FLIGHT CHECK LISTS SET TAKE OFF MODE	MPDG E GEN. C.L. DISPLAYS E		CHECK LISTS: BEFORE STARTING ENGINES STARTING ENGINES BEFORE TAXI TAXI BEFORE TAKE OFF SELECT AVIONICS SUITE			
	V OBSERVE C.L.						
	ROTATE AS PROGRAMMED LIFT OFF CLIMB TO 8000FT						
MMK IMK T	SET CRUISE MODE CRUISE AT 300KTAS ON 106°						
IC A/S	LM COMPLETES 20 MIN. CHECK AND REPORTS						
IC W/H	LM COMPLETES 10 MIN. CHECK AND REPORTS						
IMK T	CALL UP RADAR DISPLAY	E	NOTE I				
MSD V	OBSERVE RADAR DISPLAY						10:15
	IDENTIFY OVER LUNEBURG						
IMK DEK T	UPDATE INS	E	NOTE J				
MSD V	OBSERVE INS DISPLAY						
	T RT TURN TO 169°						

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

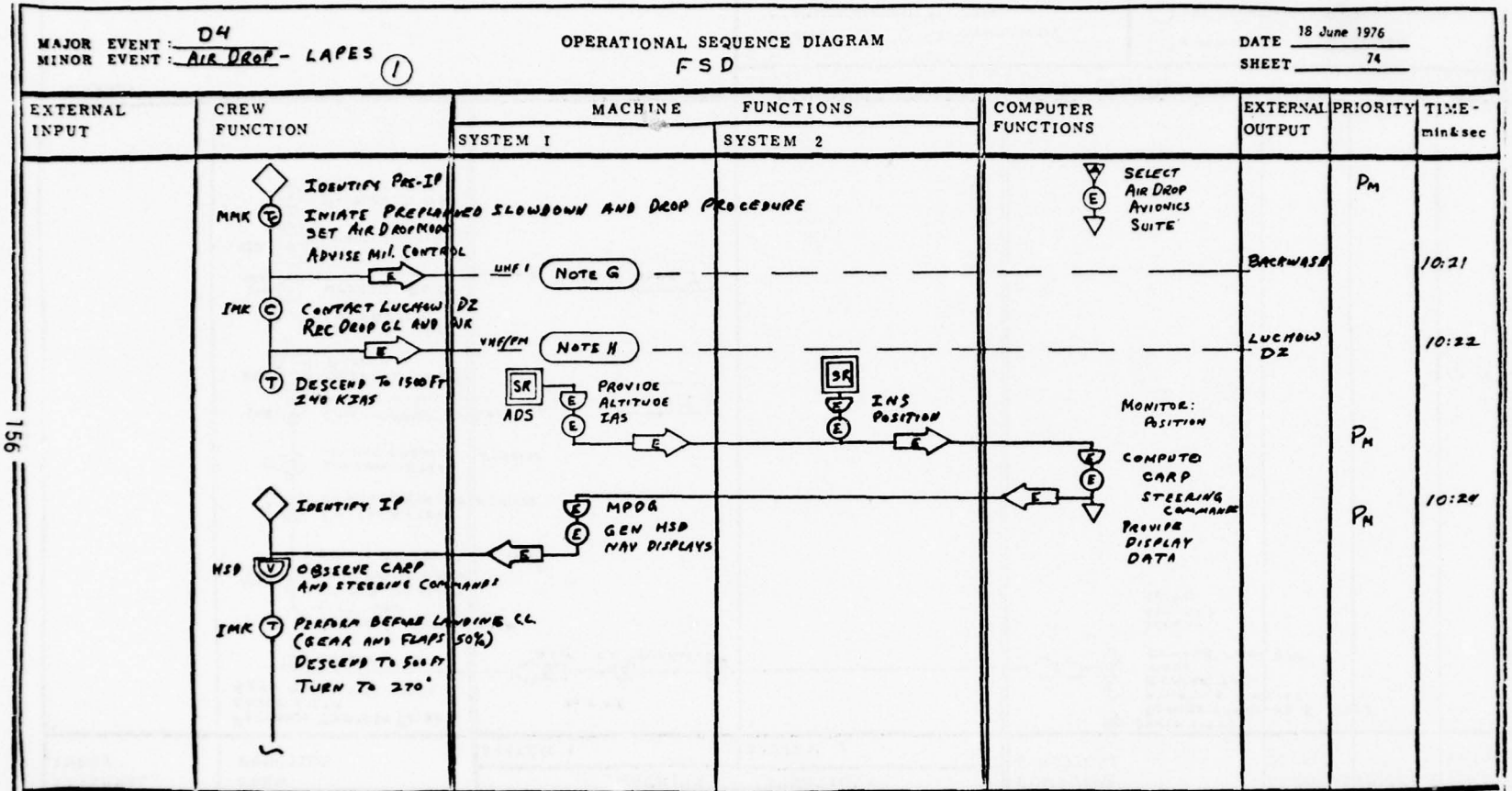
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT: D4
MINOR EVENT: AIR DROP - LAPES (1)

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 18 June 1976
SHEET 74



REMARKS:

(1) LAPES LOW ALTITUDE PARACHUTE EXTRACTION SYSTEM

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech/sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT: D4
MINOR EVENT: AIR DROP- LAPES

OPERATIONAL SEQUENCE DIAGRAM
FSD

DATE 13 June 1976
SHEET 75

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec
	I.C. (S) 1 MIN. WARNING LM ACK RED LIGHT ON						10:27
	I.C. (V/S) DESCEND TO	5 FT					10:28
	ACTUATE ADS LM CALLS PARACHUTE STABILIZED GREEN LIGHT ON						
	I.C. (S) LM CALLS LOAD CLEAR						10:29
	MNR (T) ADD POWER SET CLIMB	MODE		(A) SELECT (E) AVIONICS (V) SUITE			
	START CLIMB	TO 8000 FT					
	240 KIAS						
	IMR (T) PERFORM "GO AROUND" CL.						
	GEAR AND FLAPS UP						
	DOOR CLOSED	AND LOCKED					
	RED LIGHT OFF						
ALCE 338 (RF)	IMR (C) REC. CHANGE IN LANDING LOCATION						10:30
	MNR (T) SET CRUISE MODE CRUISE						

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D5
MINOR EVENT : CRUISE / DESCEND

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 76

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
	IDENTIFY WOLFSBURG ON MAP CHANGE FLIGHT PLAN IMK DER (T) UPDATE INS/RNAV						10:33
		<E> - NOTE J					
	HSD (V) OBSERVE INS DISPLAY						
	IMK (C) ADVISE MIL CONTROL OF REV. FLIGHT PLAN						
	(E)	UHF 1 NOTE G			BACKWASA		
	IMK (C) ADVISE ATC OF REV. FLIGHT PLAN						
	(E)	UHF/FM NOTE H			HANOVER ATC		
	(T) TURNS TO 161° CRUISE DESCEND TO 1000 FT.						10:35

REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

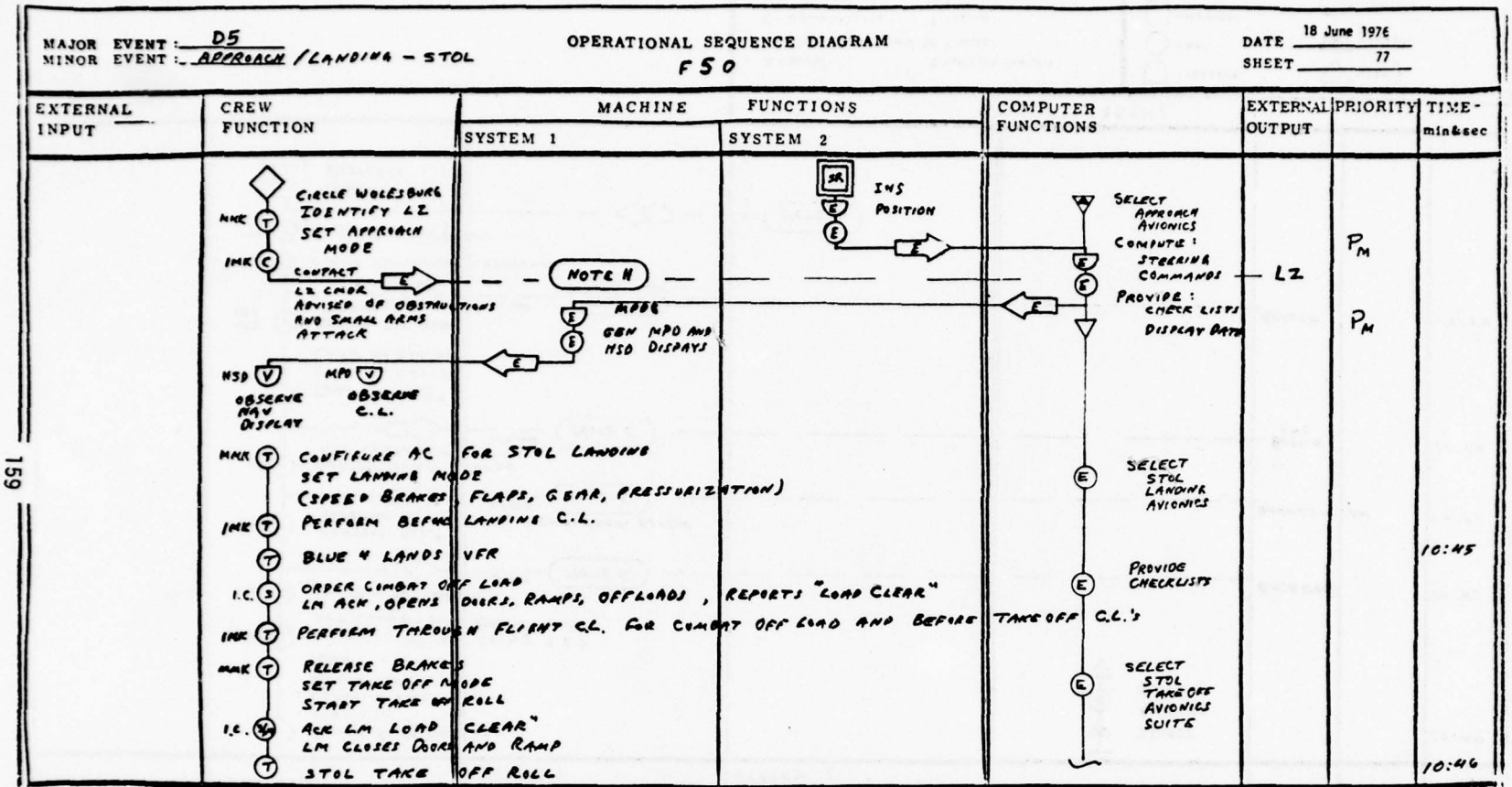
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : D5
MINOR EVENT : APPROACH / LANDING – STOL

OPERATIONAL SEQUENCE DIAGRAM
F 5 0

DATE 18 June 1976
SHEET 77



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

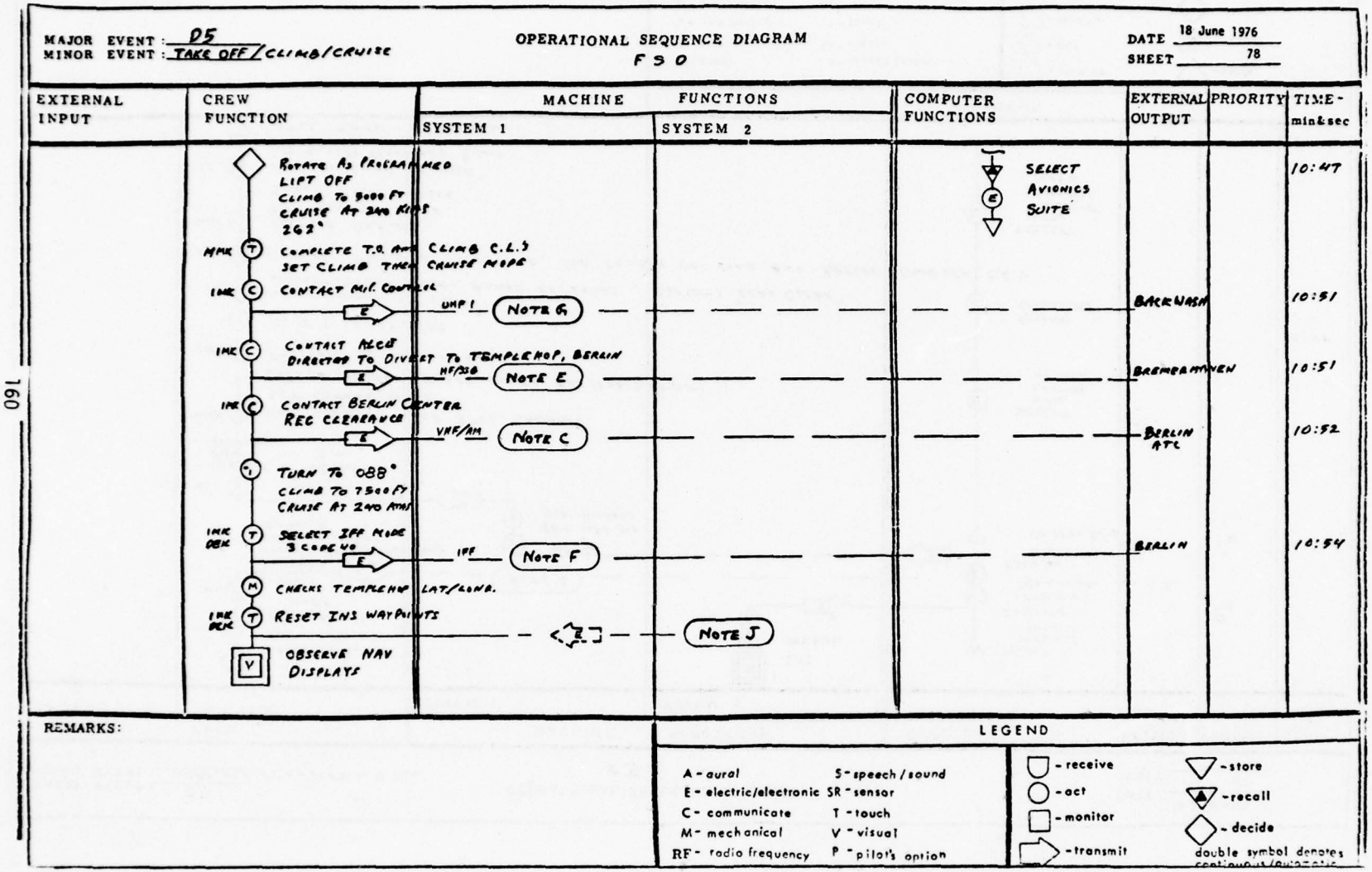
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : 05
MINOR EVENT : TAKE OFF / CLIMB / CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F 5 0

DATE 18 June 1976
SHEET 78



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

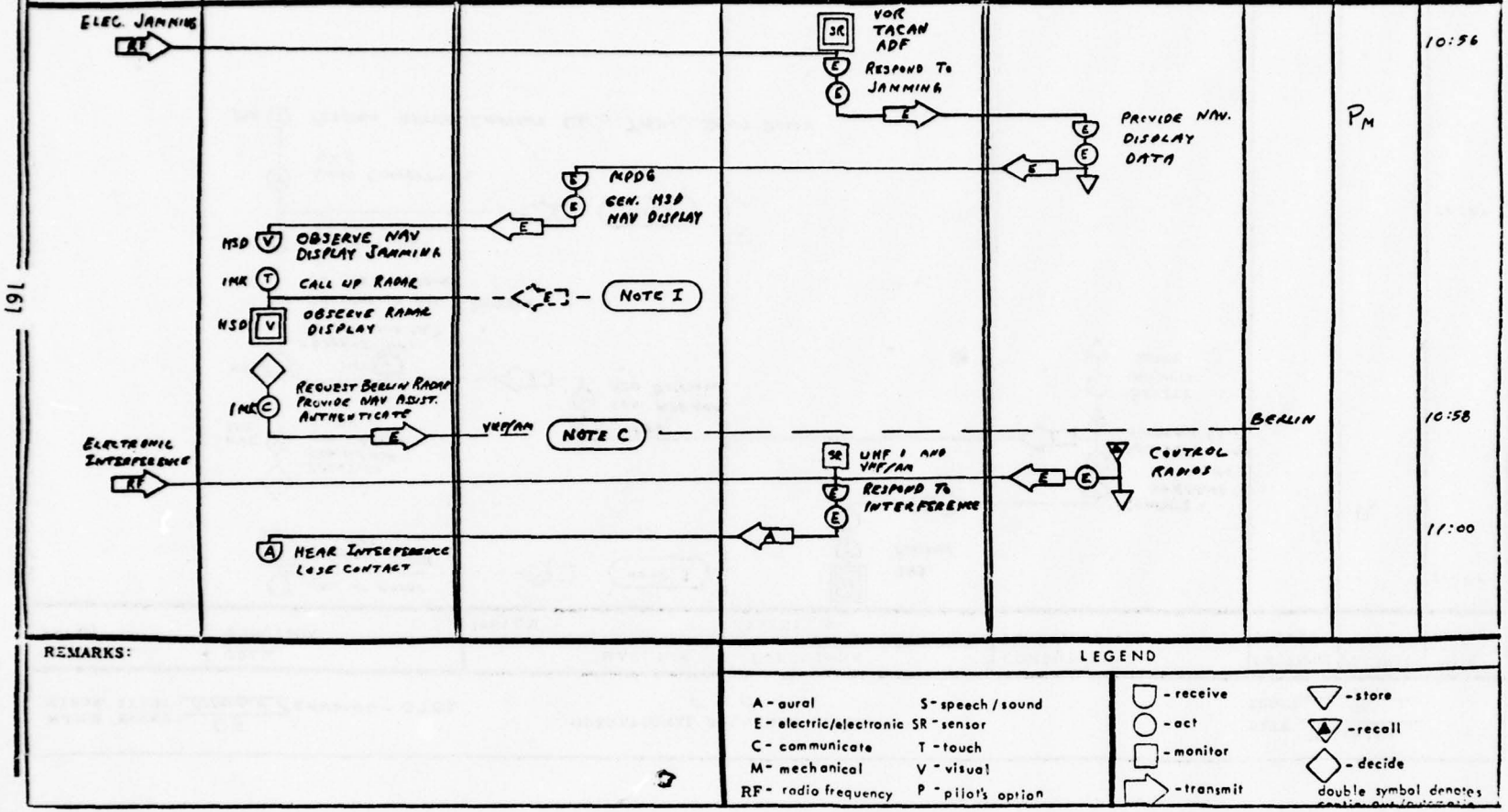
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : 03
MINOR EVENT : CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F 3 D

DATE 18 June 1976
SHEET 79



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

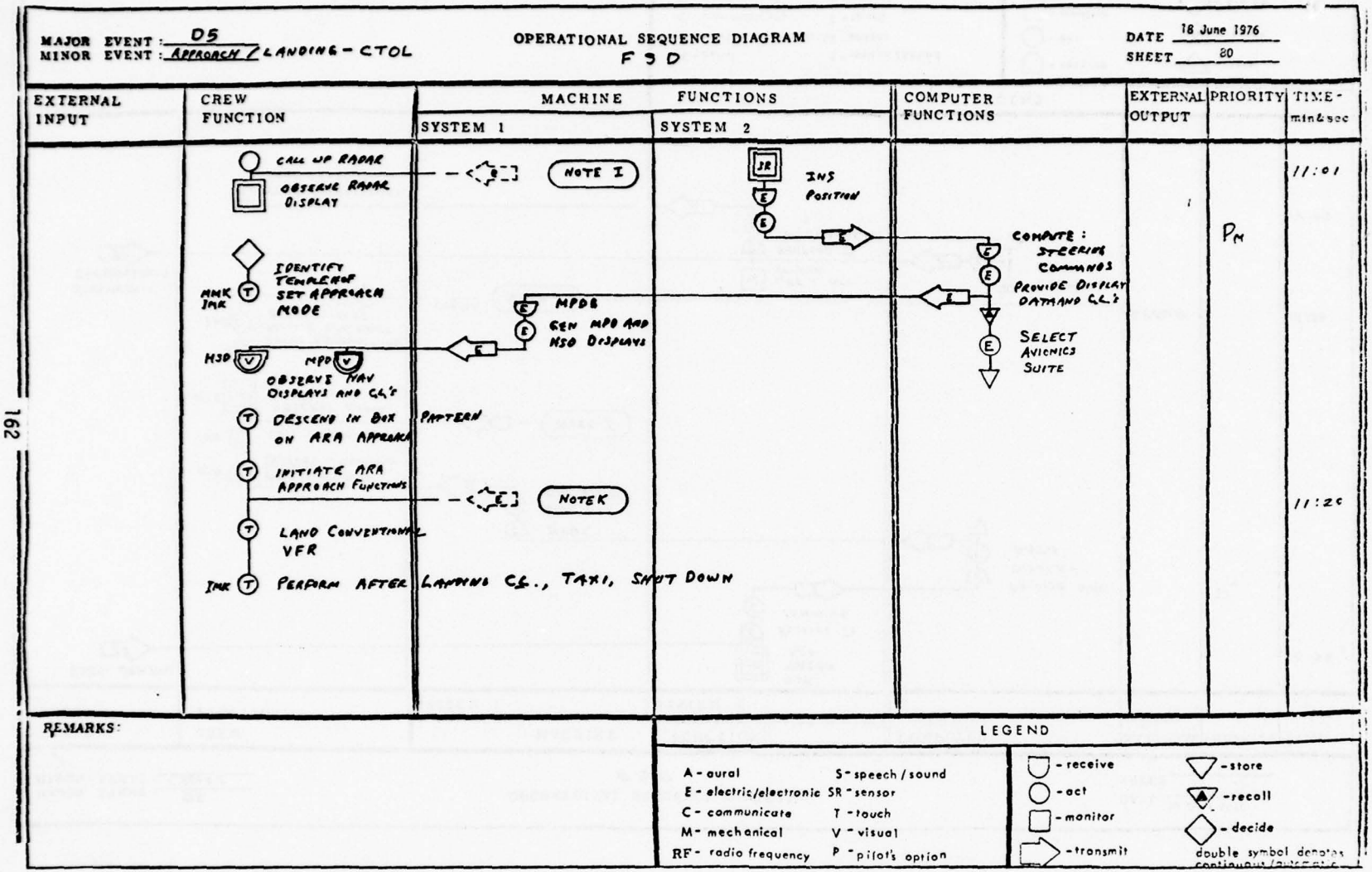
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes

MAJOR EVENT : D5
MINOR EVENT : APPROACH / LANDING - CTOL

OPERATIONAL SEQUENCE DIAGRAM
F 3 D

DATE 18 June 1976
SHEET 80



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

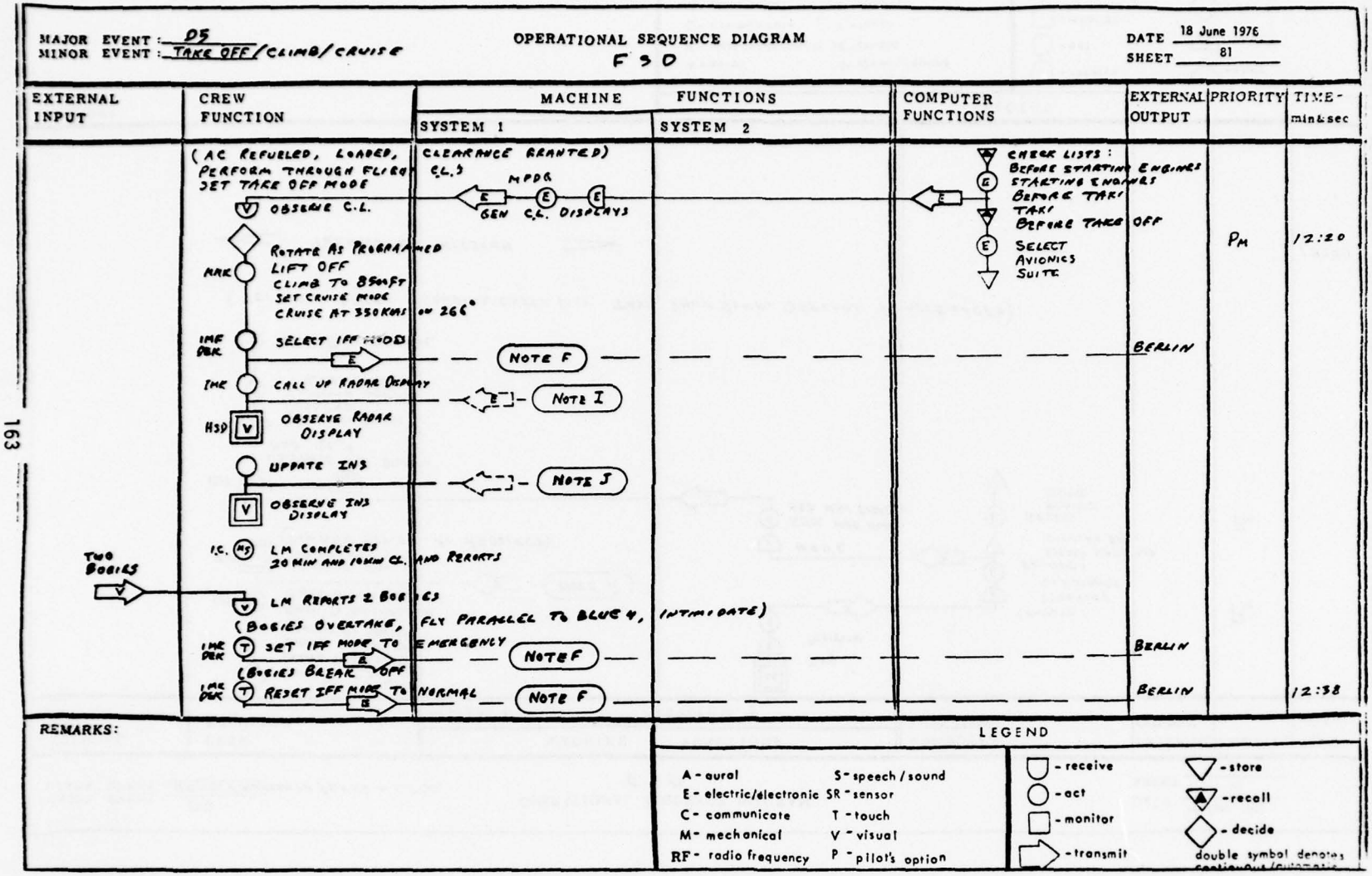
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : 05
MINOR EVENT : TAKE OFF / CLIMB / CRUISE

OPERATIONAL SEQUENCE DIAGRAM
F 5 D

DATE 18 June 1976
SHEET 81



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - pilot's option

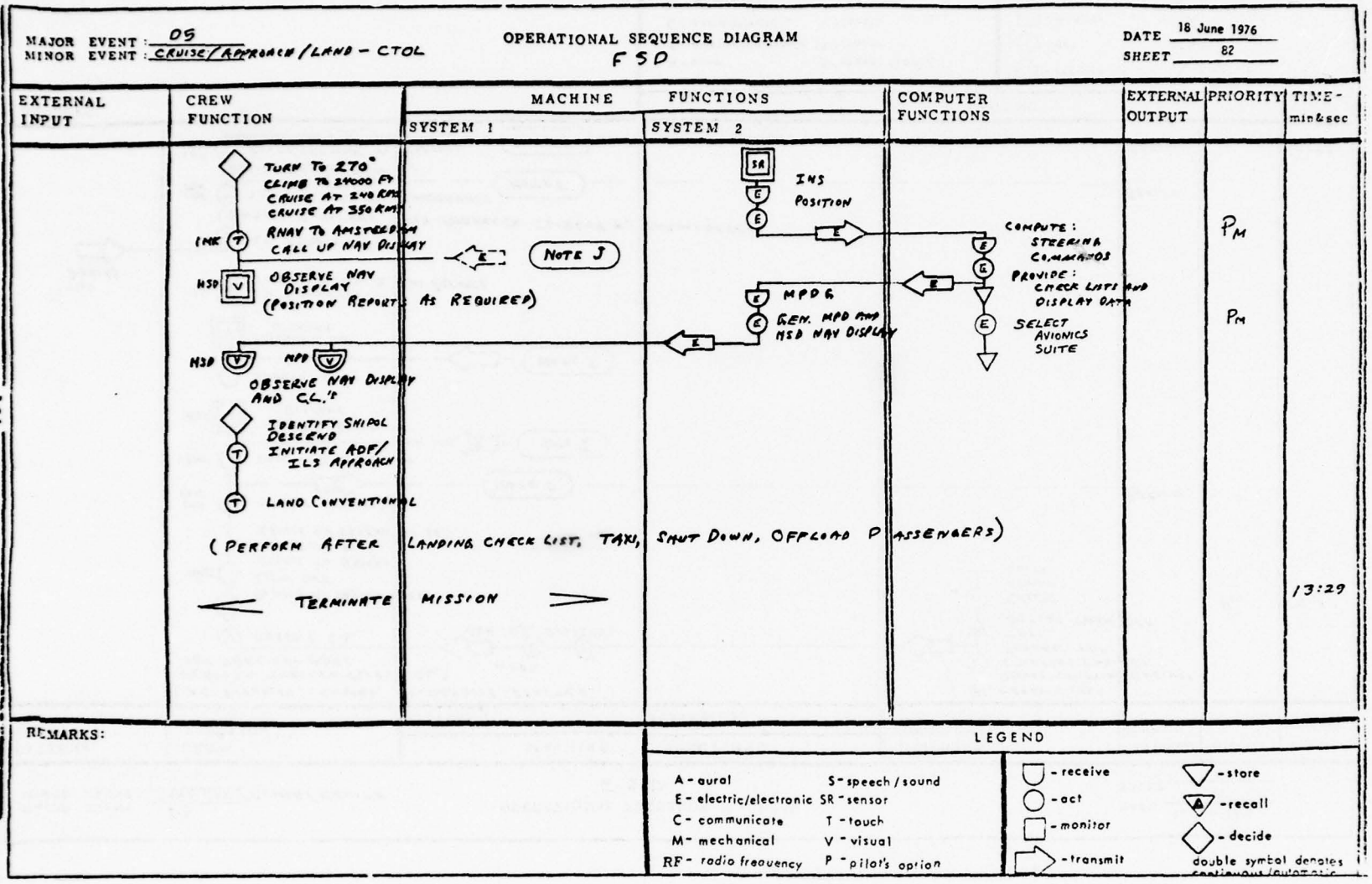
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes

MAJOR EVENT : 05
MINOR EVENT : CRUISE/APPROACH/LAND - CTOL

OPERATIONAL SEQUENCE DIAGRAM
F5D

DATE 18 June 1976
SHEET 82



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech/sound
SR - sensor
T - touch
V - visual
P - pilot's option

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

IDAMST

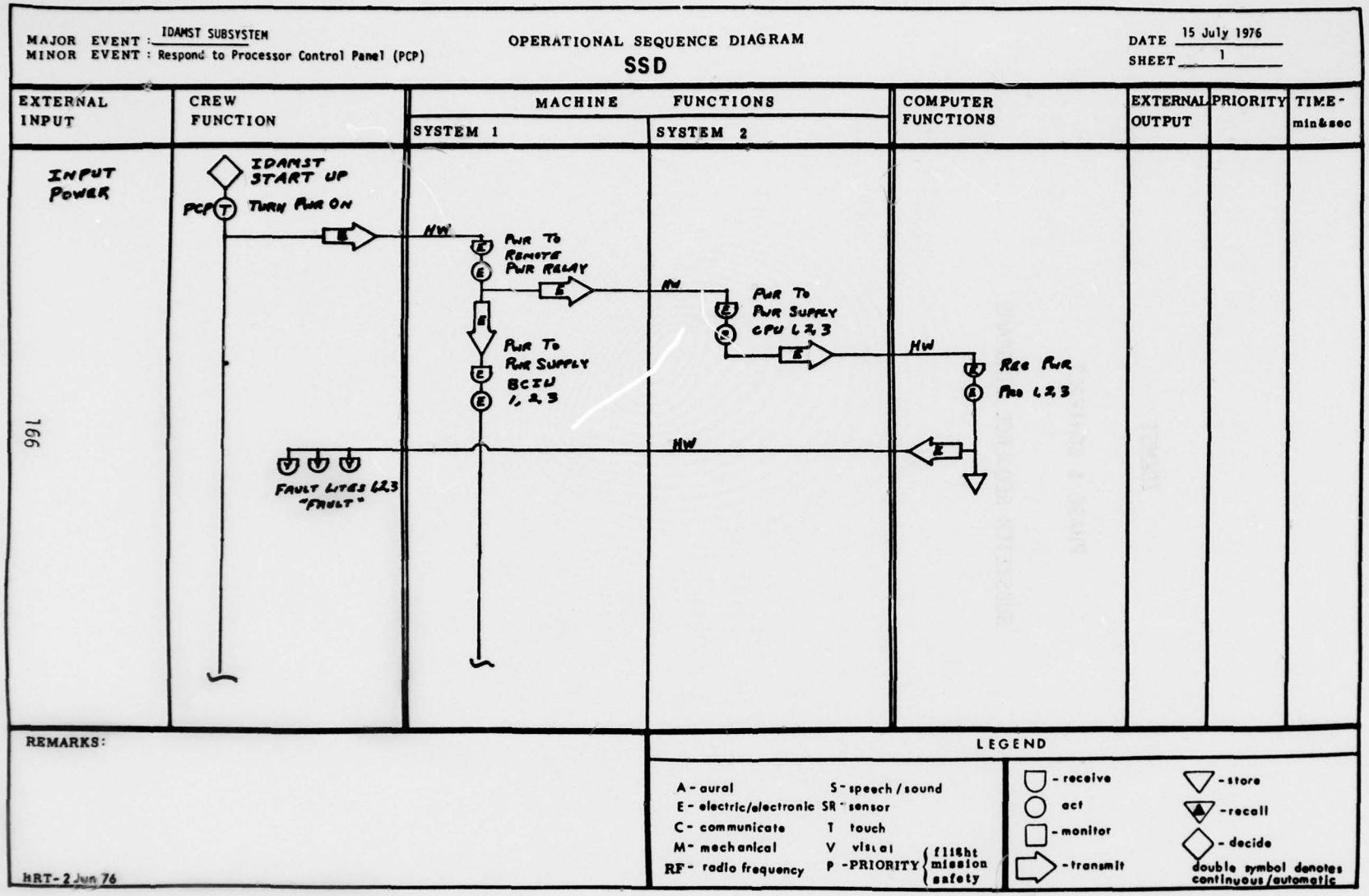
PHASE I CONTRACT

SUBSYSTEM SEQUENCE DIAGRAMS

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Respond to Processor Control Panel (PCP)

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 1



166

REMARKS:

HRT - 2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

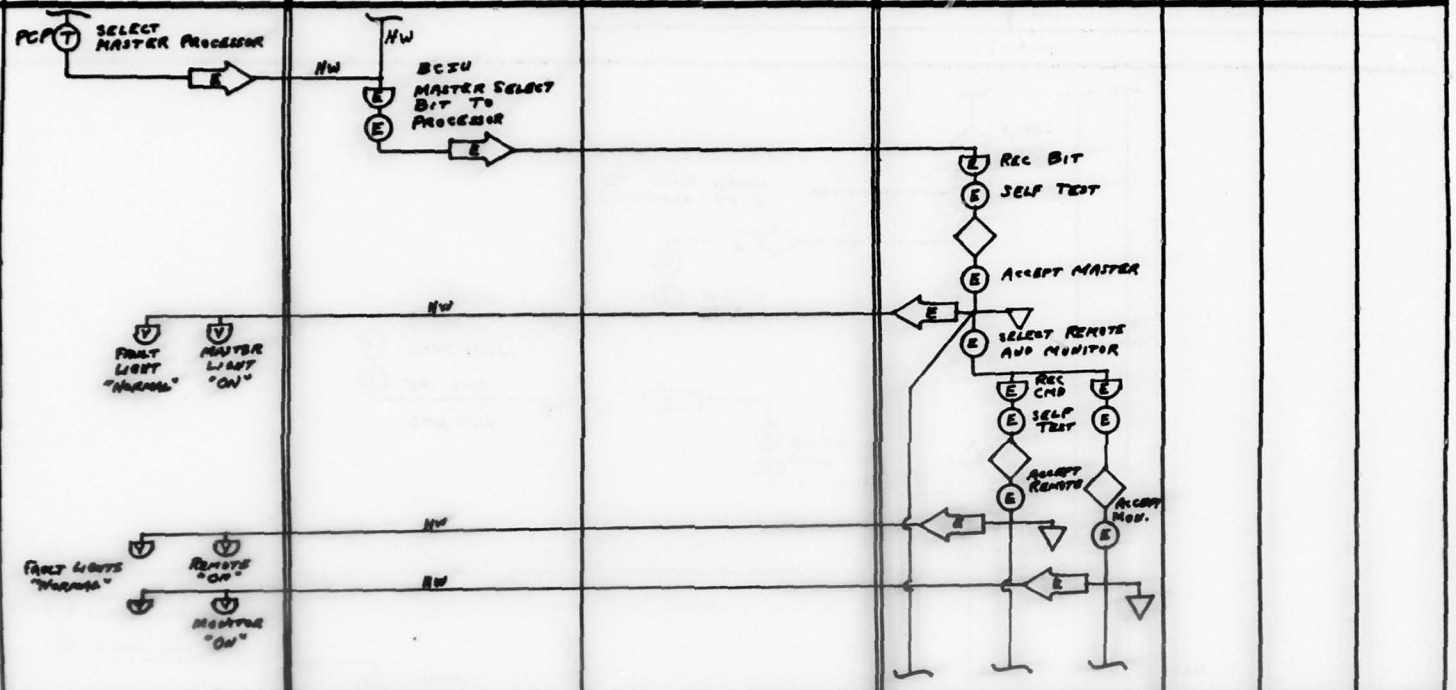
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Respond to Processor Control Panel (PCP)

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 2

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



167

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight, mission, safety }

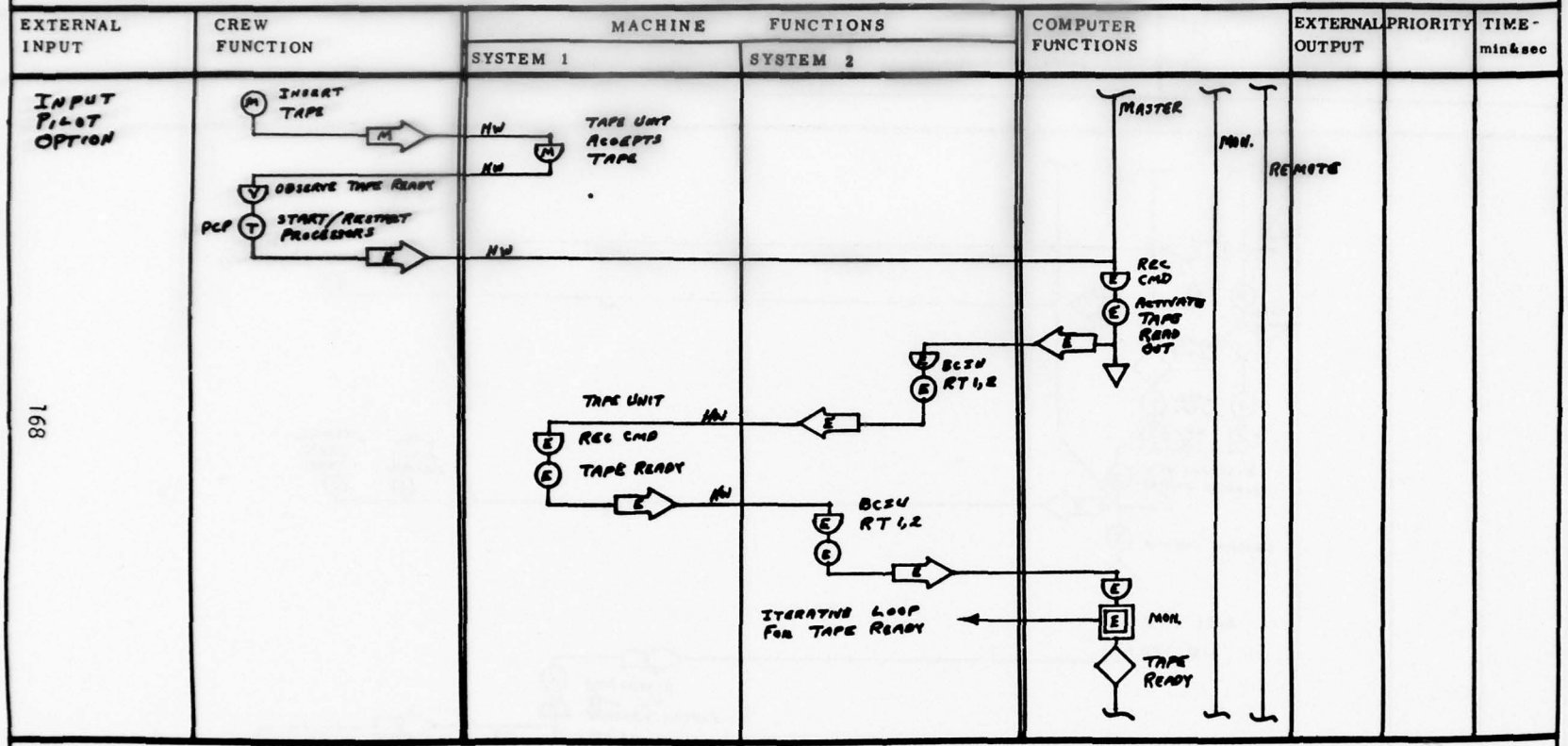
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Respond to Master Processor Selection

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 3



168

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

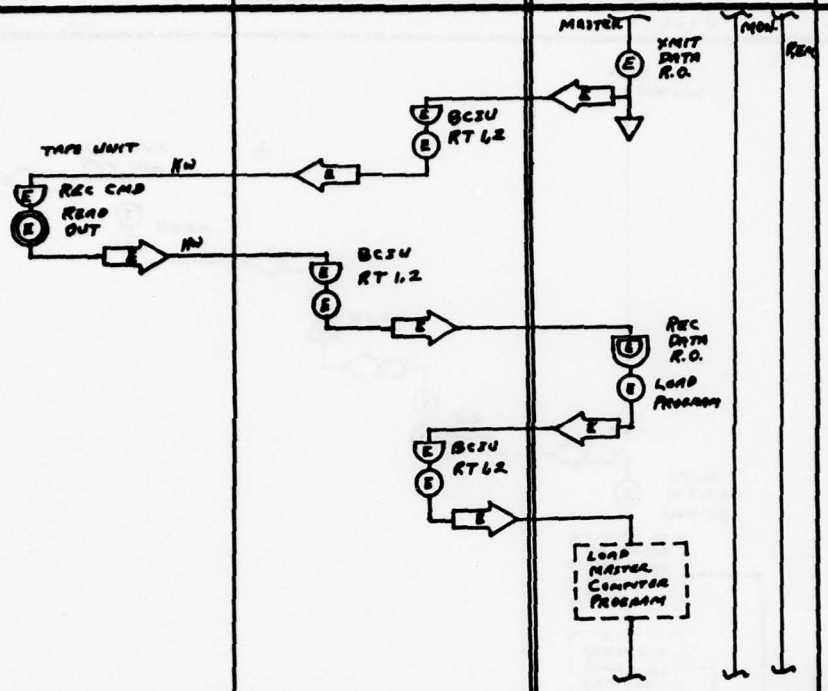
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Respond to Master Processor Selection

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 4

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



169

REMARKS:

DENOTES TYPICAL COMMAND LOAD FROM MASS MEMORY

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

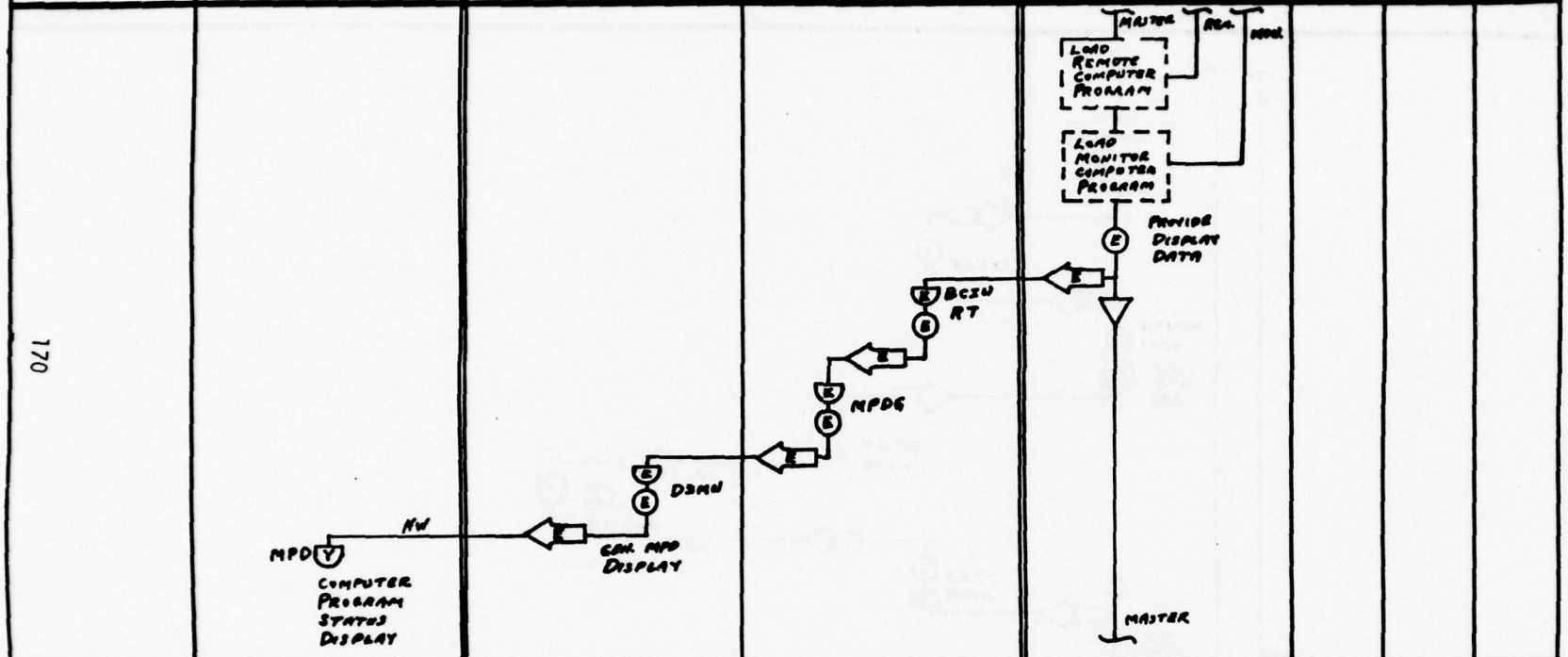
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Respond to Master Processor Selection

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1[illegible]
SHEET 5

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



170

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

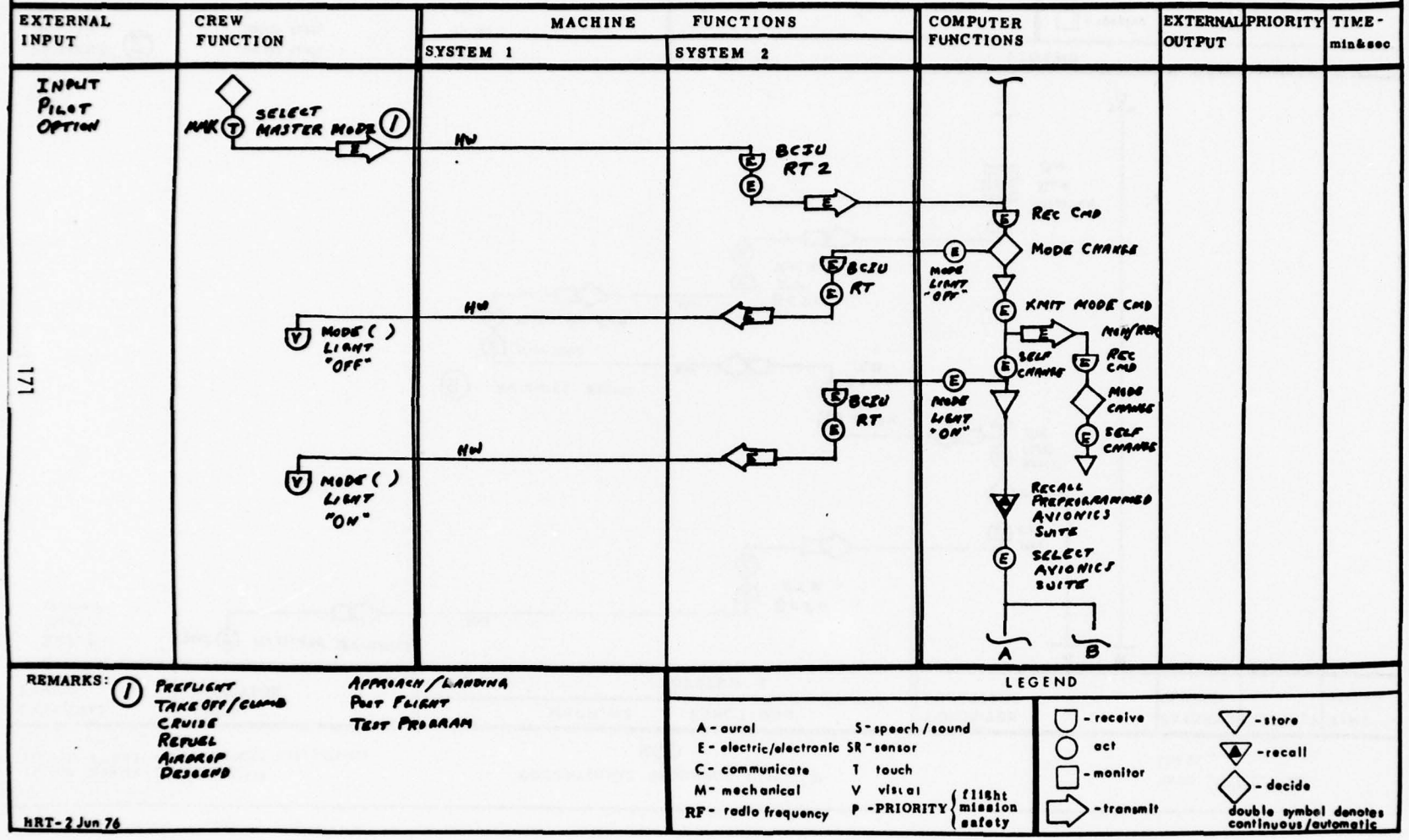
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Respond to Master Mode Selection

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 6



171

REMARKS: (1) PREFLIGHT, TAKE OFF/CLIMB, CRUISE, REFUEL, AIRDROP, DESCEND, APPROACH/LANDING, POST FLIGHT, TEST PROGRAM

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech/sound
SR - sensor
T - touch
V - visual
P - PRIORITY { flight, mission, safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

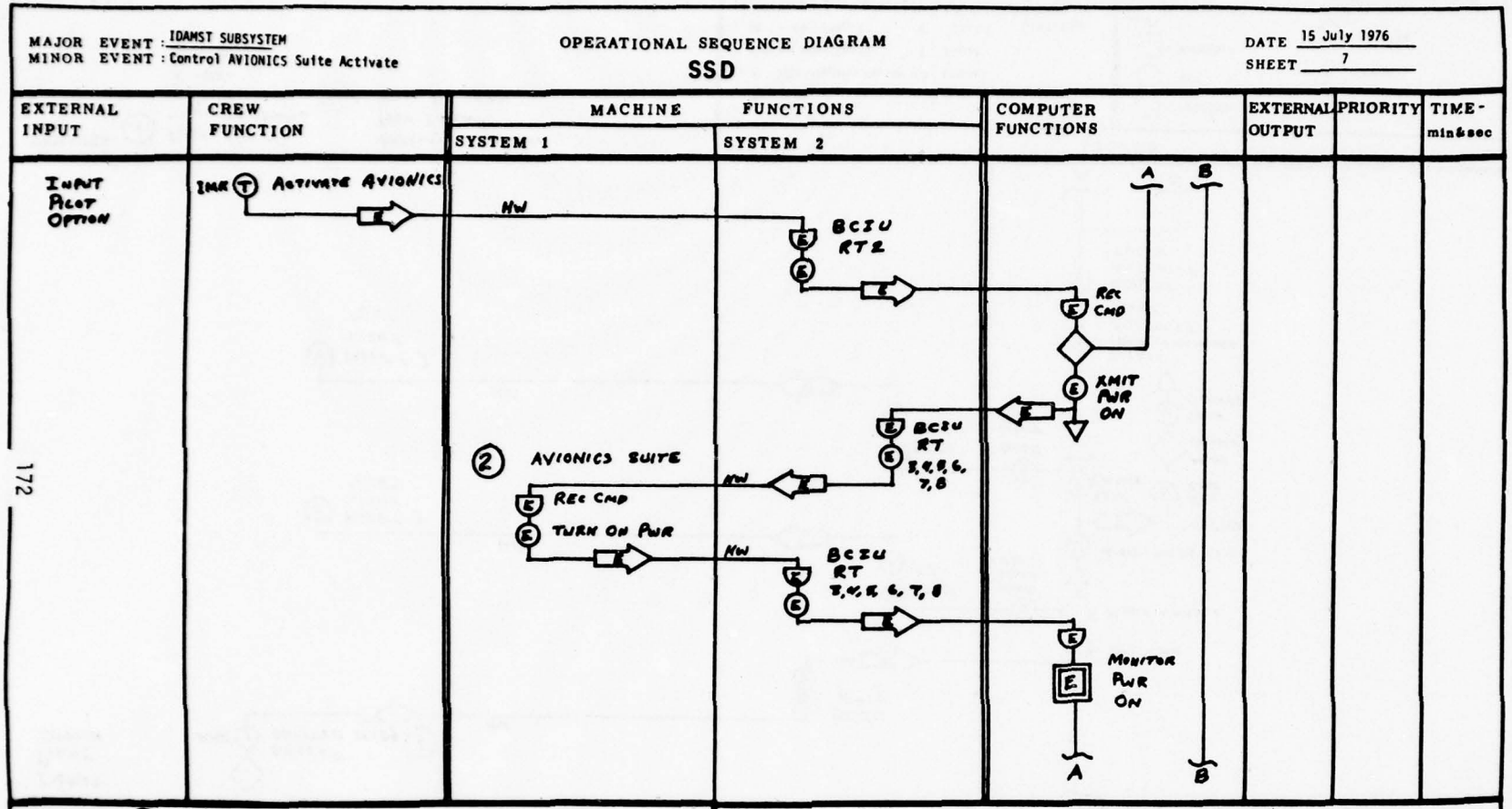
double symbol denotes continuous/automatic

HRT-2 Jun 76

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Control AVIONICS Suite Activate

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 7



172

REMARKS: (2)

Radar Set	VHF/AM Radio	ILS
Radar Altimeter	VHH/FM Radio	LF ADF
INS	Intercom 4	SKE
Omega	Secure Voice	Radar Beacon
Public Address System	IFF	TACAN
HF/SSB Radio	UHF Radio	Infrared Detection
	UHF/ADF	ESM/Passive Radar

HRT - 2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

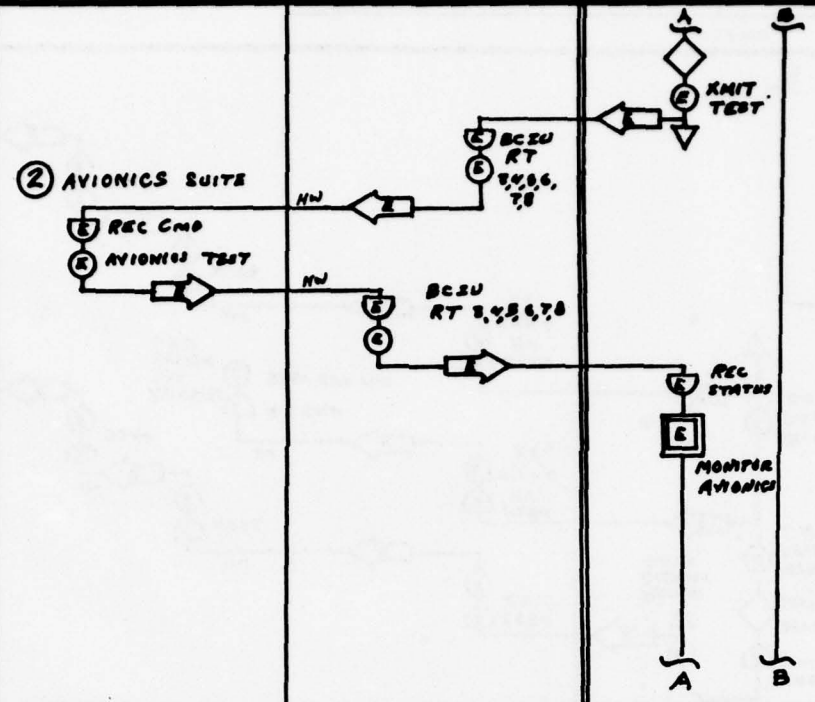
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Control AVIONICS Suite Activate

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 8

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



173

REMARKS: (2)

Radar Set	VHF/AM Radio	ILS
Radar Altimeter	VHH/FM Radio	LF ADF
INS	Intercom 4	SKE
Omega	Secure Voice	Radar Beacon
Public Address System	IFF	TACAN
HF/SSB Radio	UHF Radio	Infrared Detection
	UHF/ADF	ESM/Passive Radar

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

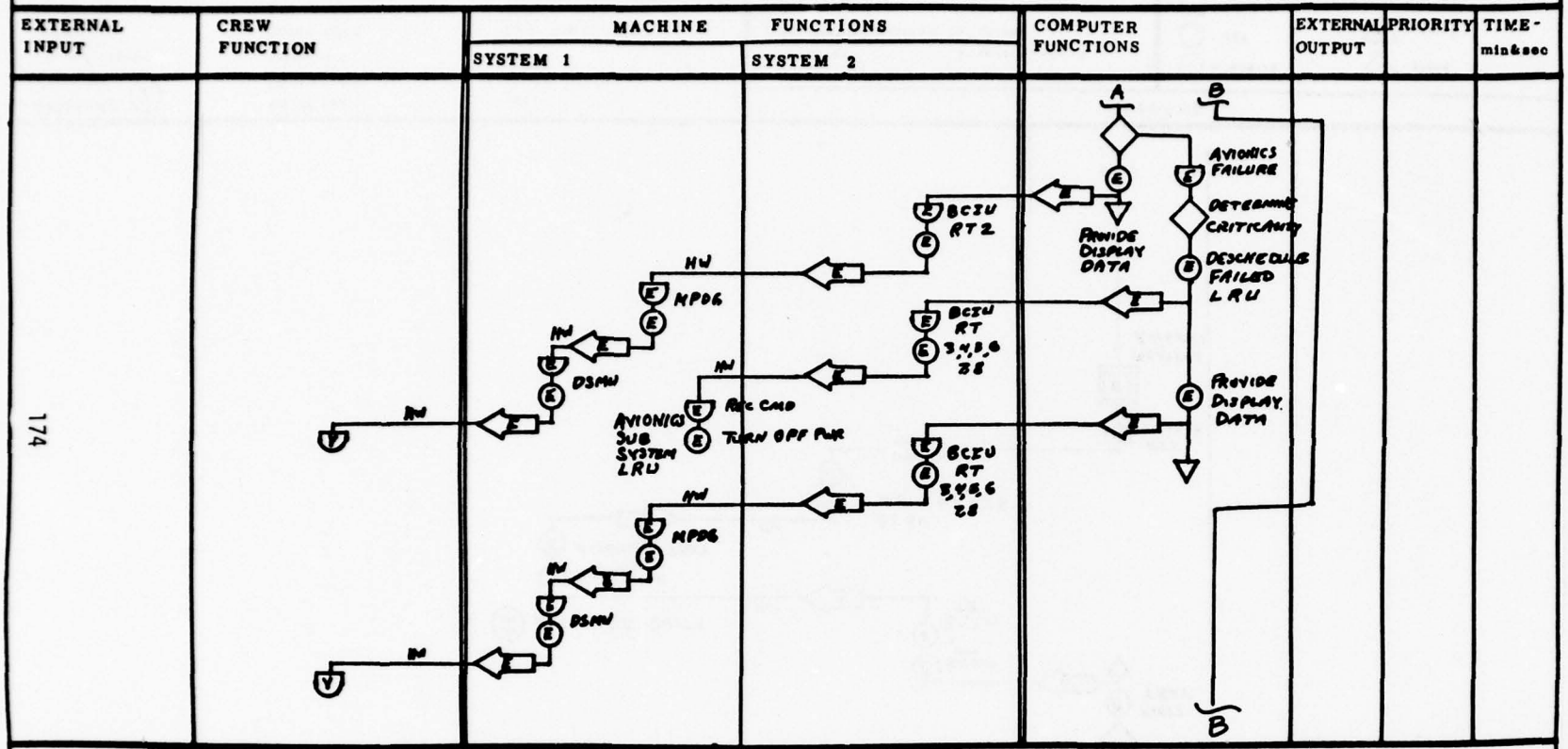
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Control AVIONICS Suite Activate

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 9



174

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

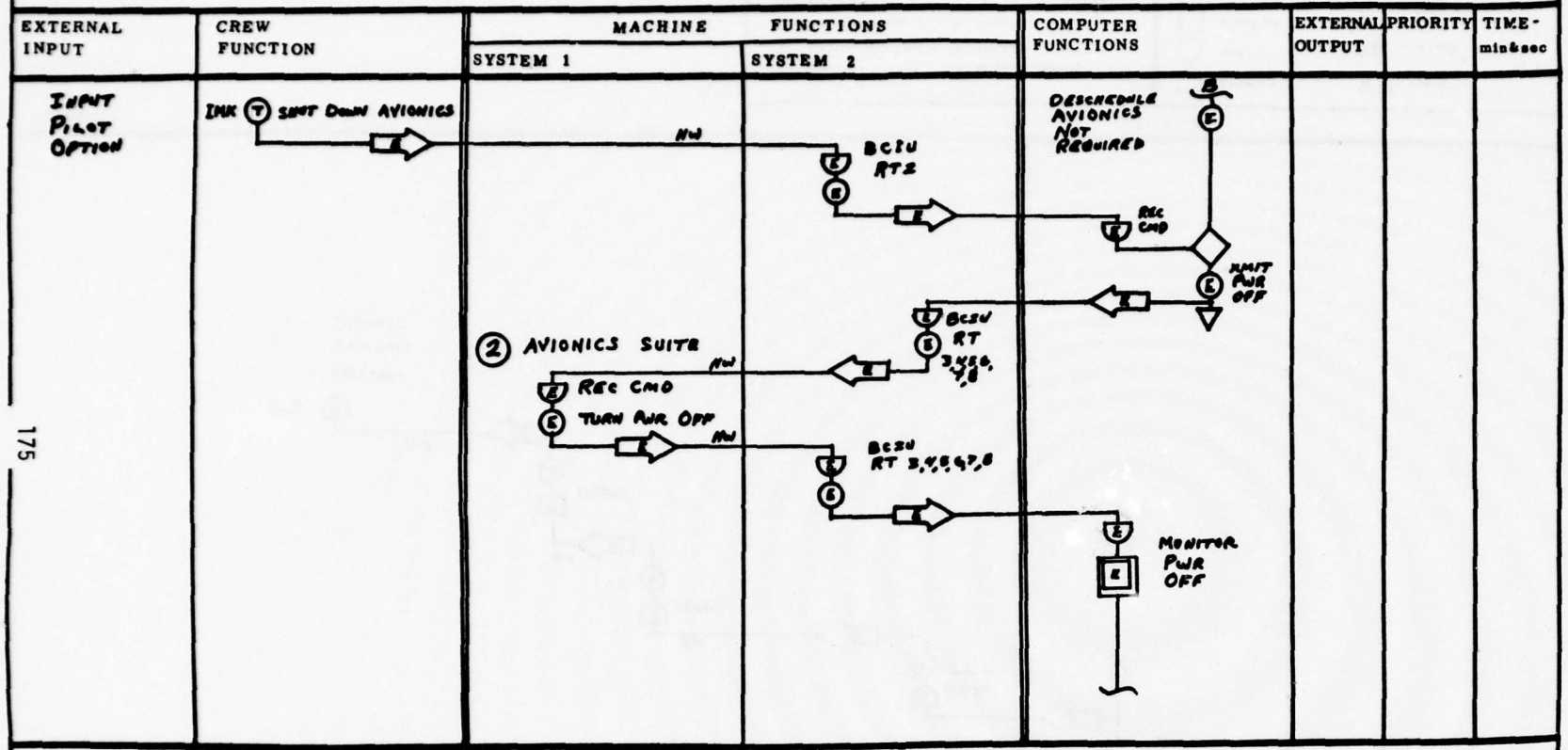
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Control AVIONICS Suite Activate

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 10



175

REMARKS: (2)

Radar Set	VHF/AM Radio	ILS
Radar Altimeter	VHH/FM Radio	LF ADF
INS	Intercom 4	SKE
Omega	Secure Voice	Radar Beacon
Public Address System	IFF	TACAN
HF/SSB Radio	UHF Radio	Infrared Detection
	UHF/ADF	ESM/Passive Radar

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

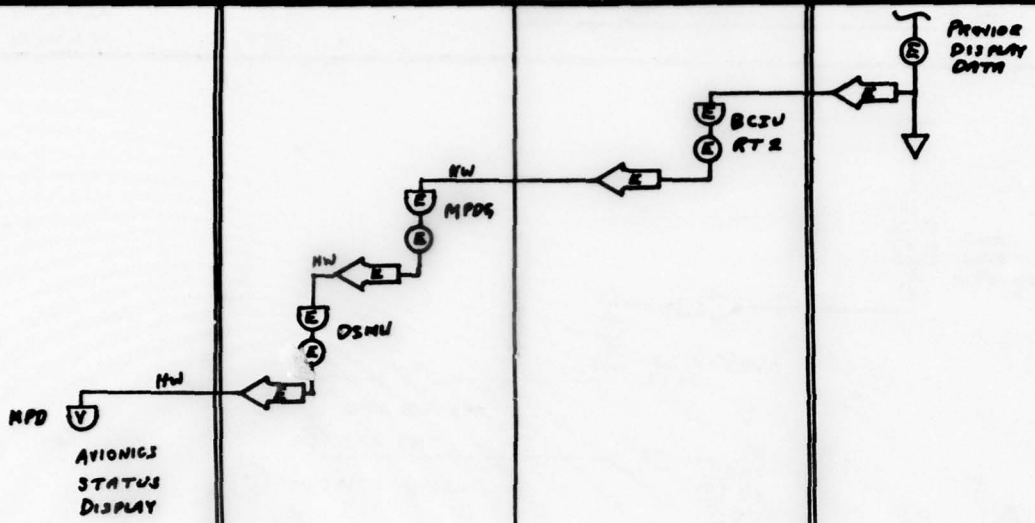
double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Provide Display Data

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 11

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

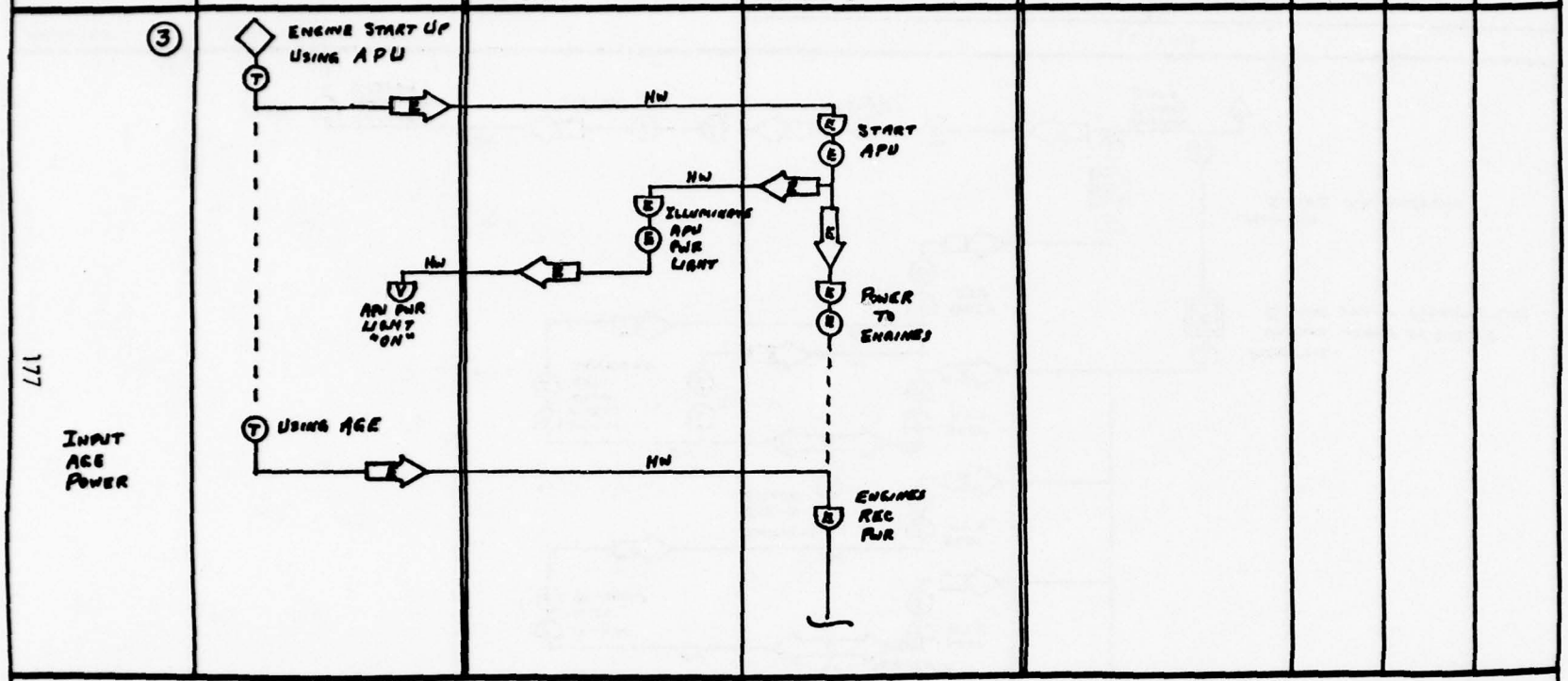
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Engine Start Up

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 12



REMARKS:
③ REPEAT ENGINE START UP SEQUENCE FOR ENGINES 2, 3 AND 4

APU - AUXILIARY POWER UNIT

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

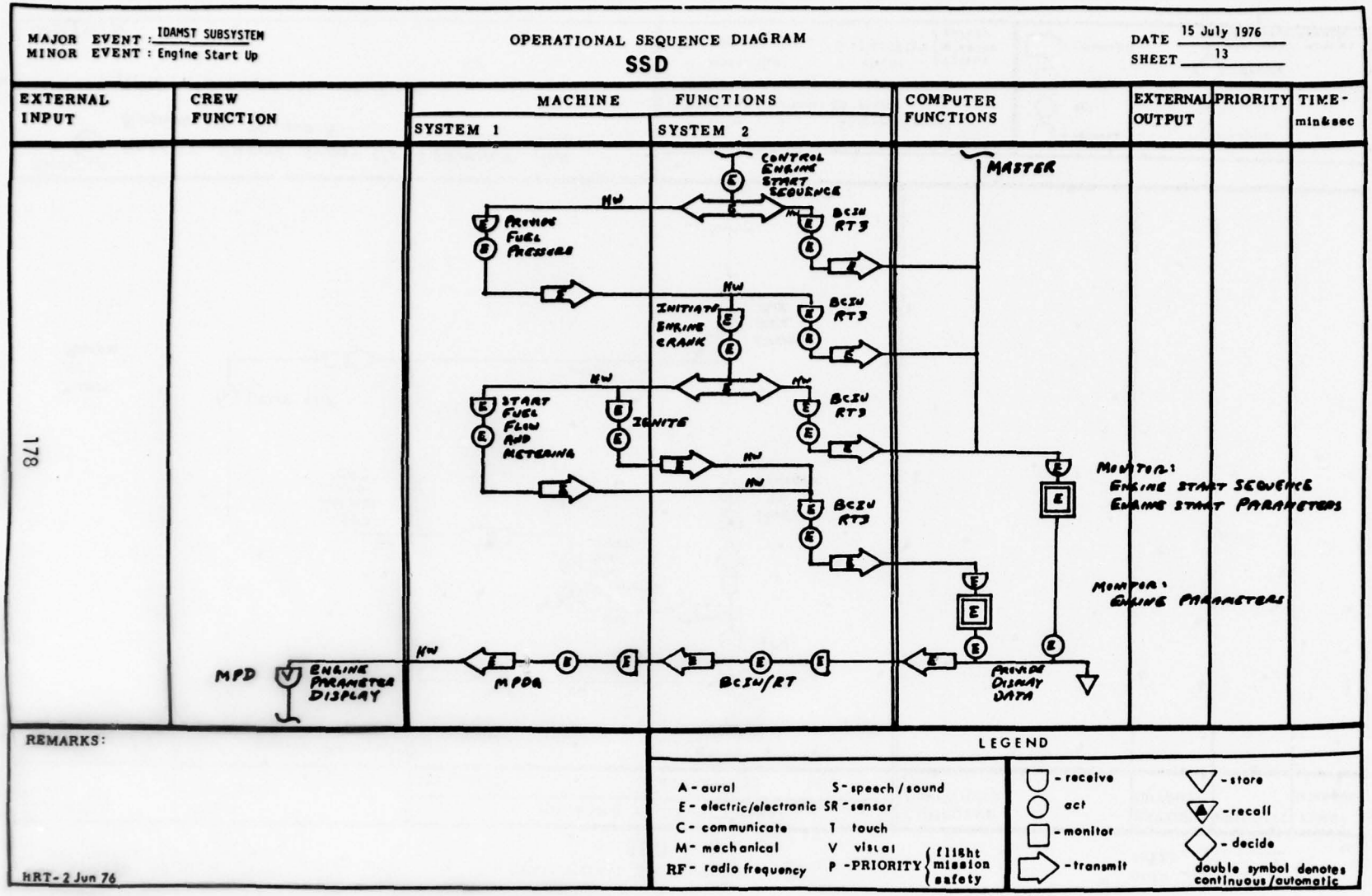
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Engine Start Up

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 13



REMARKS:

HRT - 2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

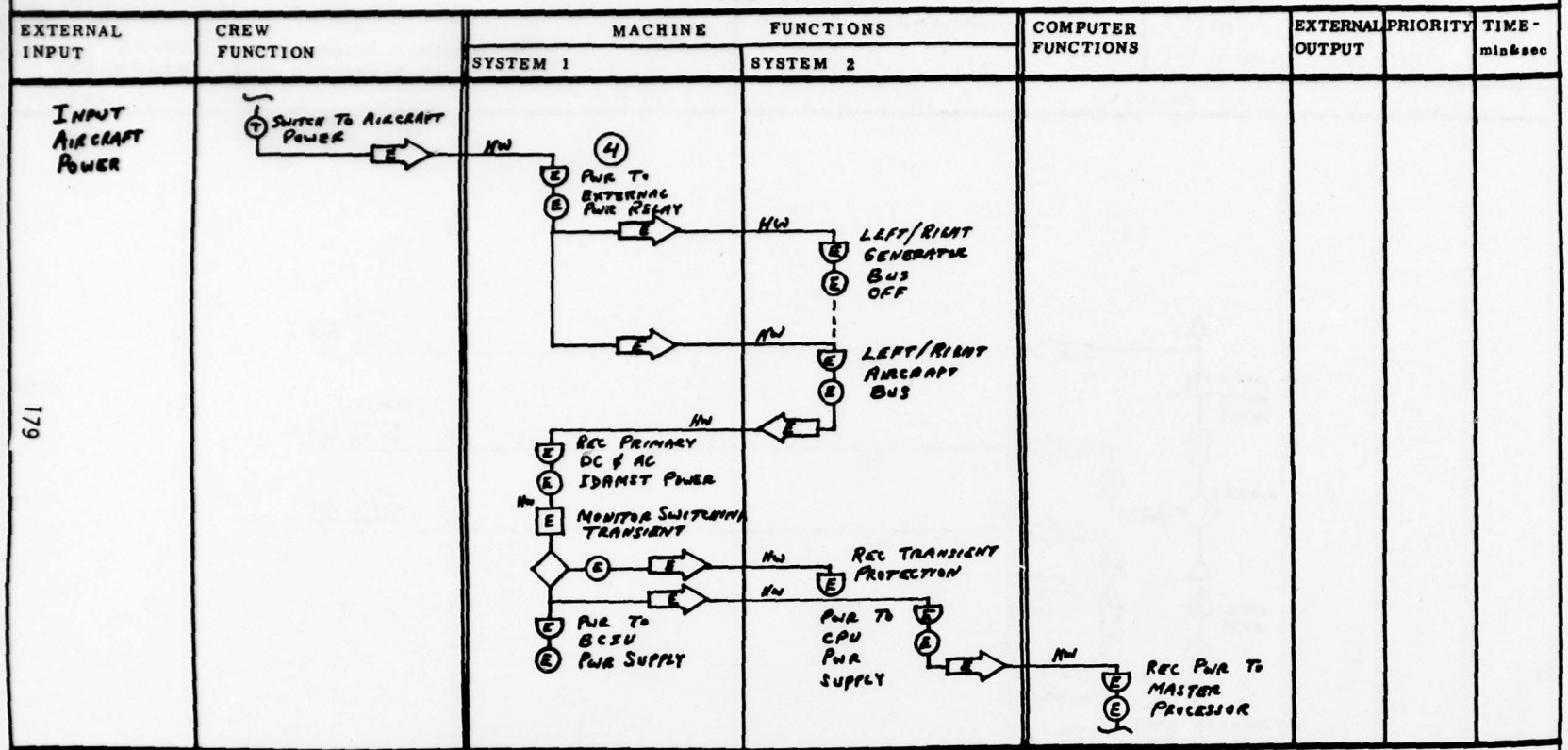
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Aircraft Power Change Over

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 14



179

REMARKS:
(4) REPEAT THIS SEQUENCE FOR POWER TO AUXILIARY POWER RELAY (ENGINE NO. 4)

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

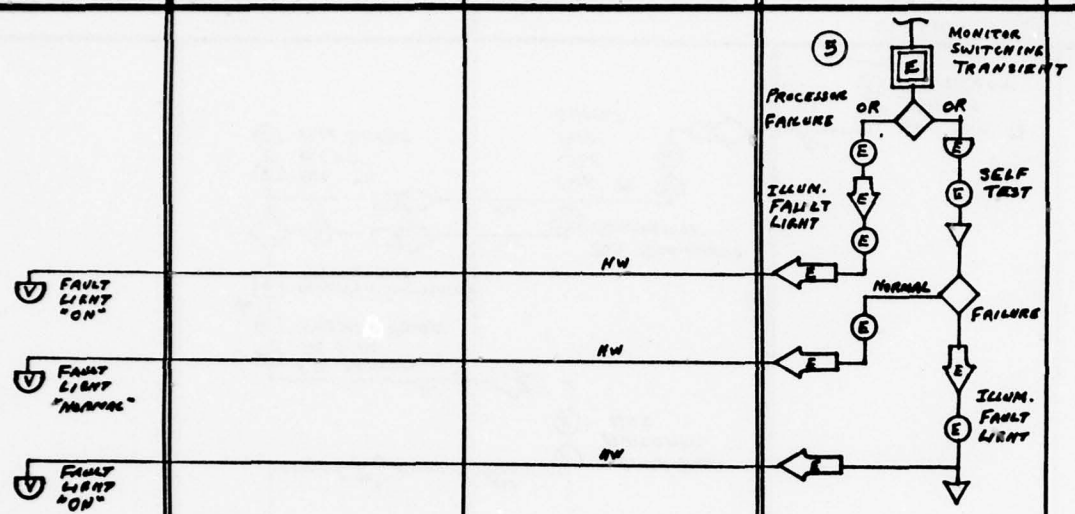
HRT-2 Jun 76

MAJOR EVENT IDAMST SUBSYSTEM
MINOR EVENT Aircraft Power Change Over

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 15

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



180

REMARKS:

(5) REPEAT THIS SEQUENCE FOR REMOTE AND MONITOR PROCESSORS

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

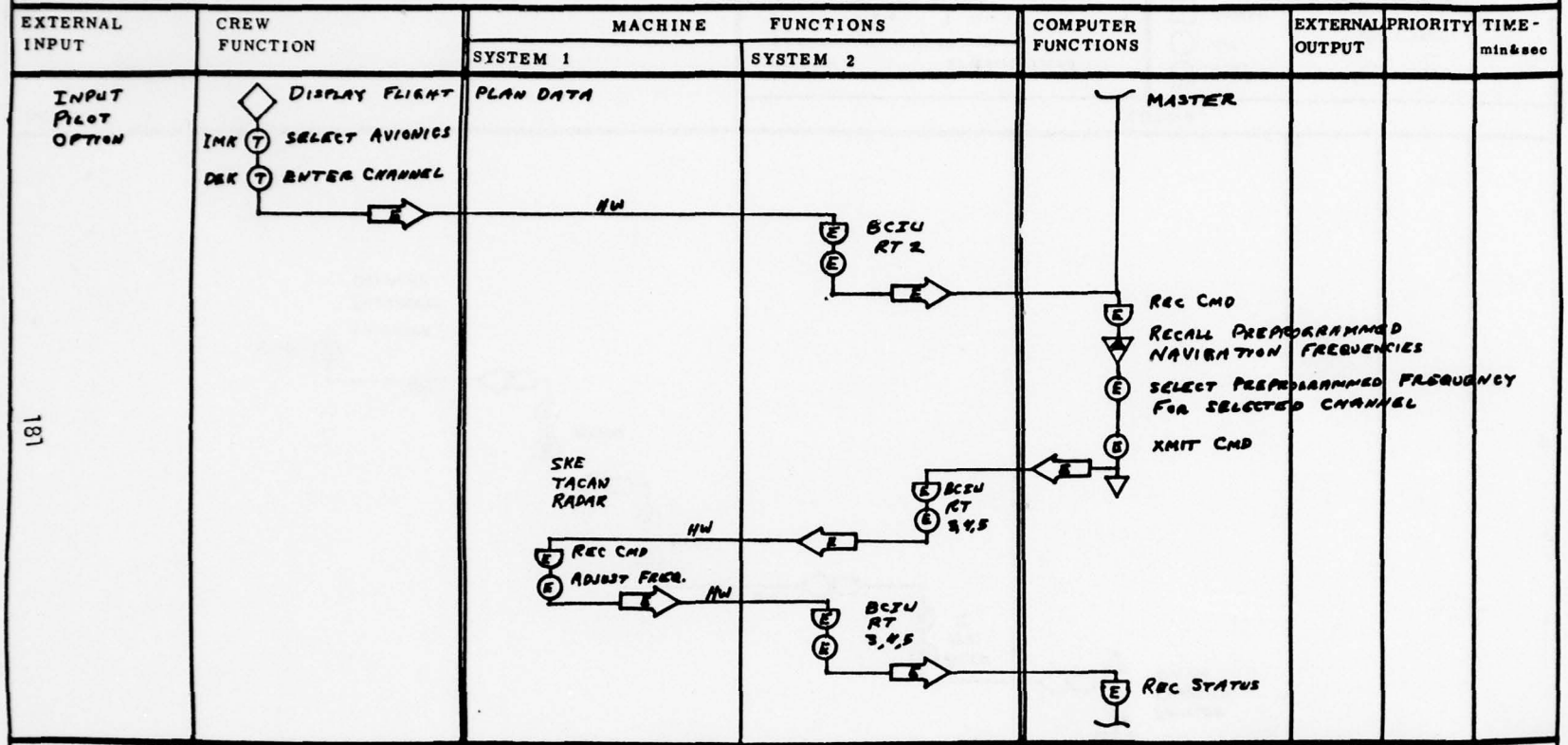
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Control Programmed Frequencies

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 16



181

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

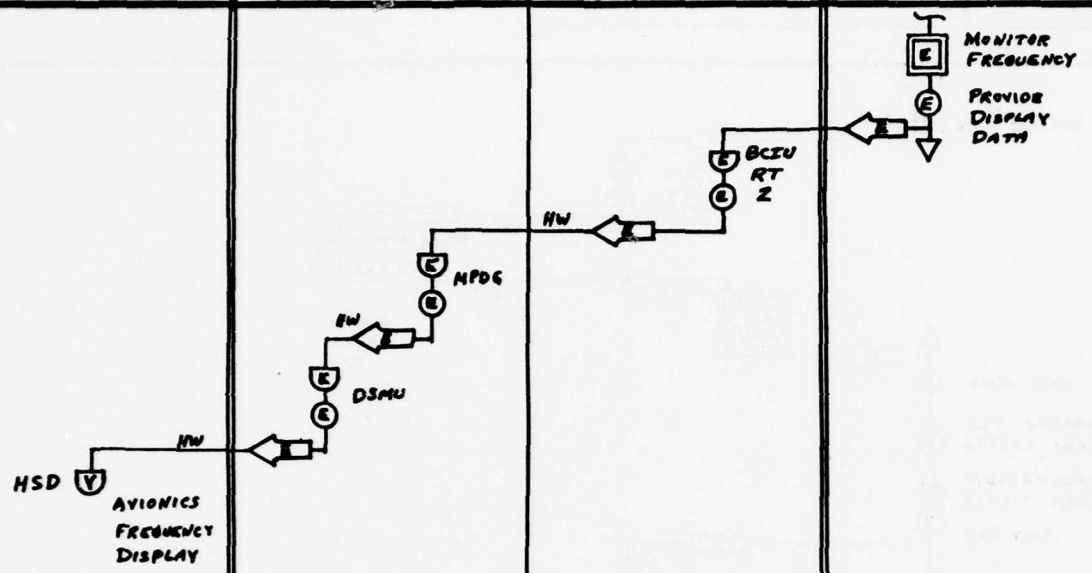
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Control Programmed Frequencies

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 17

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



182

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

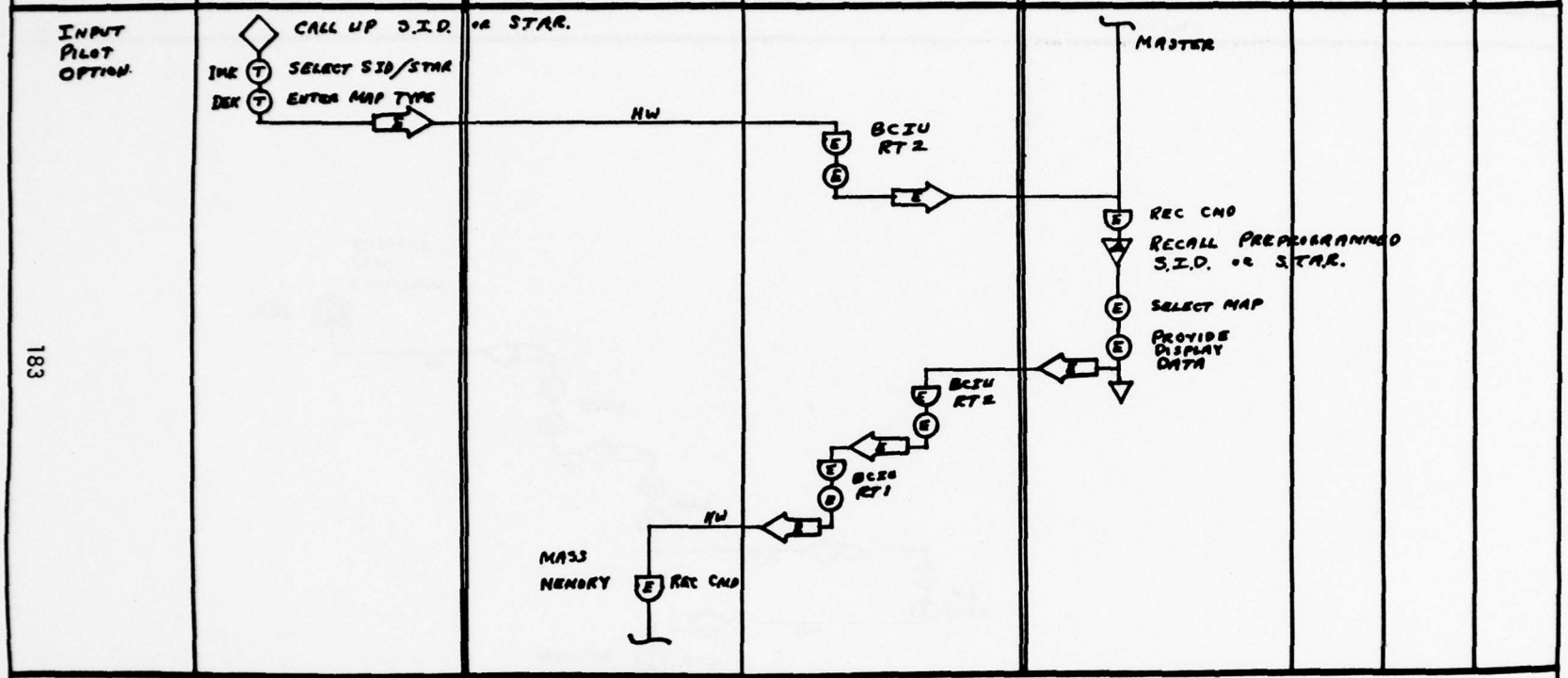
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Call Up SID/STAR

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 18



183

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

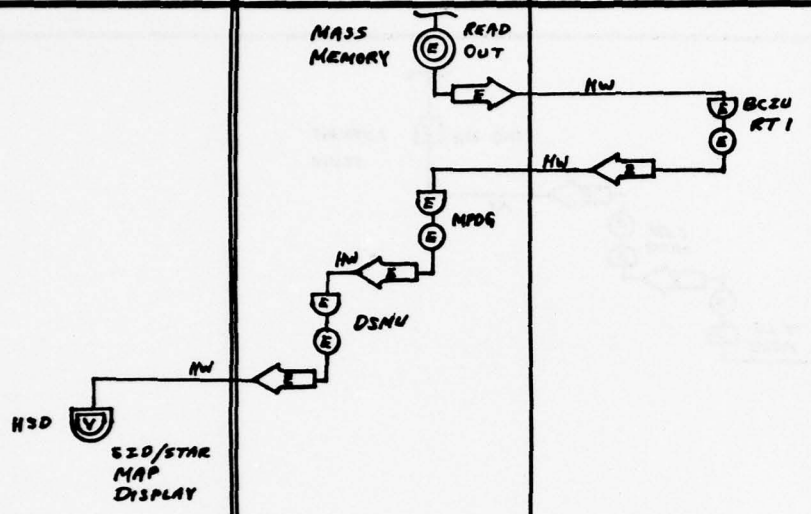
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Call Up SID/STAR

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 19

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



REMARKS:

HRT - 2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety }

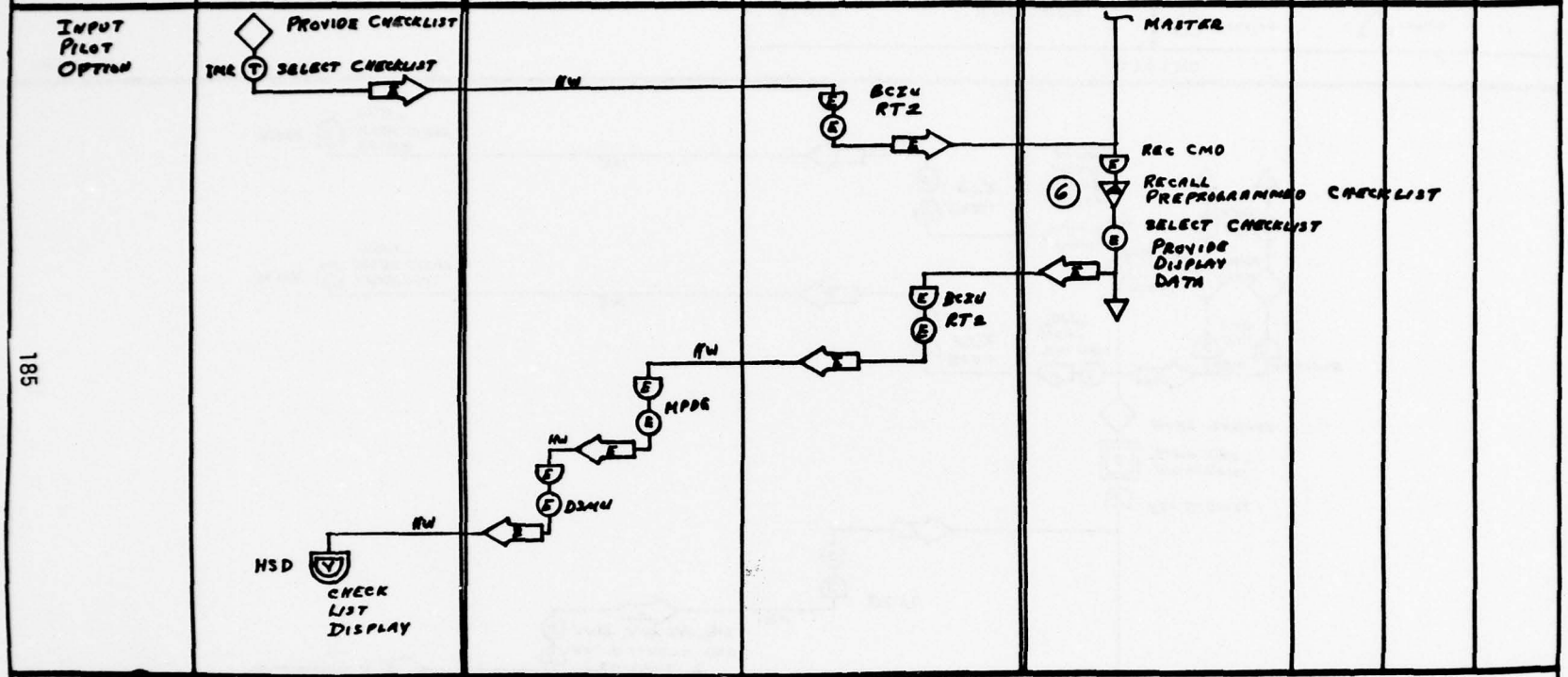
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Provide Check Lists

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 20



185

REMARKS: (6)

Before Starting Engines	Prepare for Contact	Through Flight Starting Engine
Starting Engines	Post Air Refueling	Through Flight Before Taxi
Before Taxi	Before Landing	Through Flight Taxi
Taxi	After Landing	Through Flight Before Take-Off
Before Take-Off	Engine Shutdown	Through FLight Line Up
Line Up	Before Leaving Aircraft	Through Flight Combat Offload
After Take-Off & Climb	20 Minute Warning	Engine Out Approach
Cruise	10 Minute Warning	6 Minute Warning
Rendezvous	Slow Down	Go-Around
HRT-2 Jun 76	Descent	Engine Failure
	Through Flight Before	Starting Engine

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

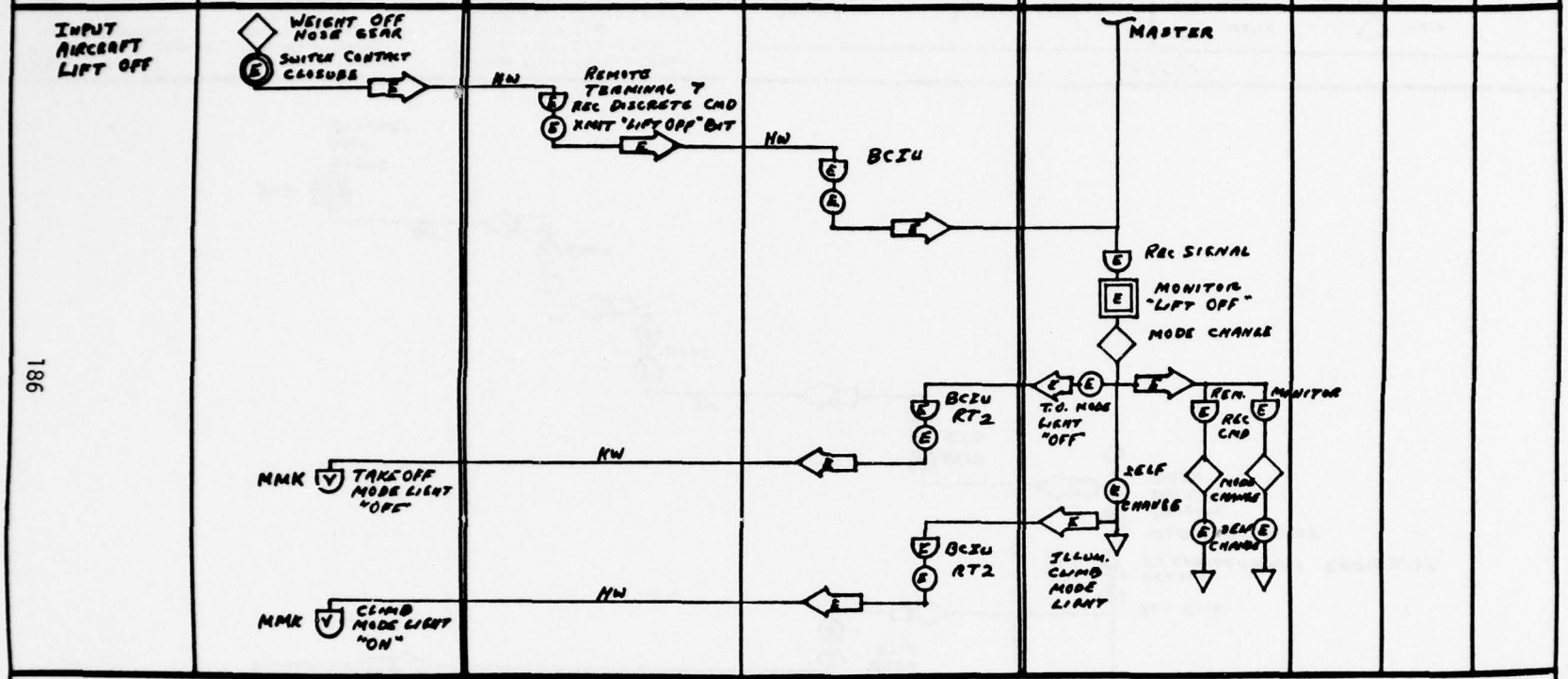
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Take-Off to Climb Master Mode Change

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 21



186

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

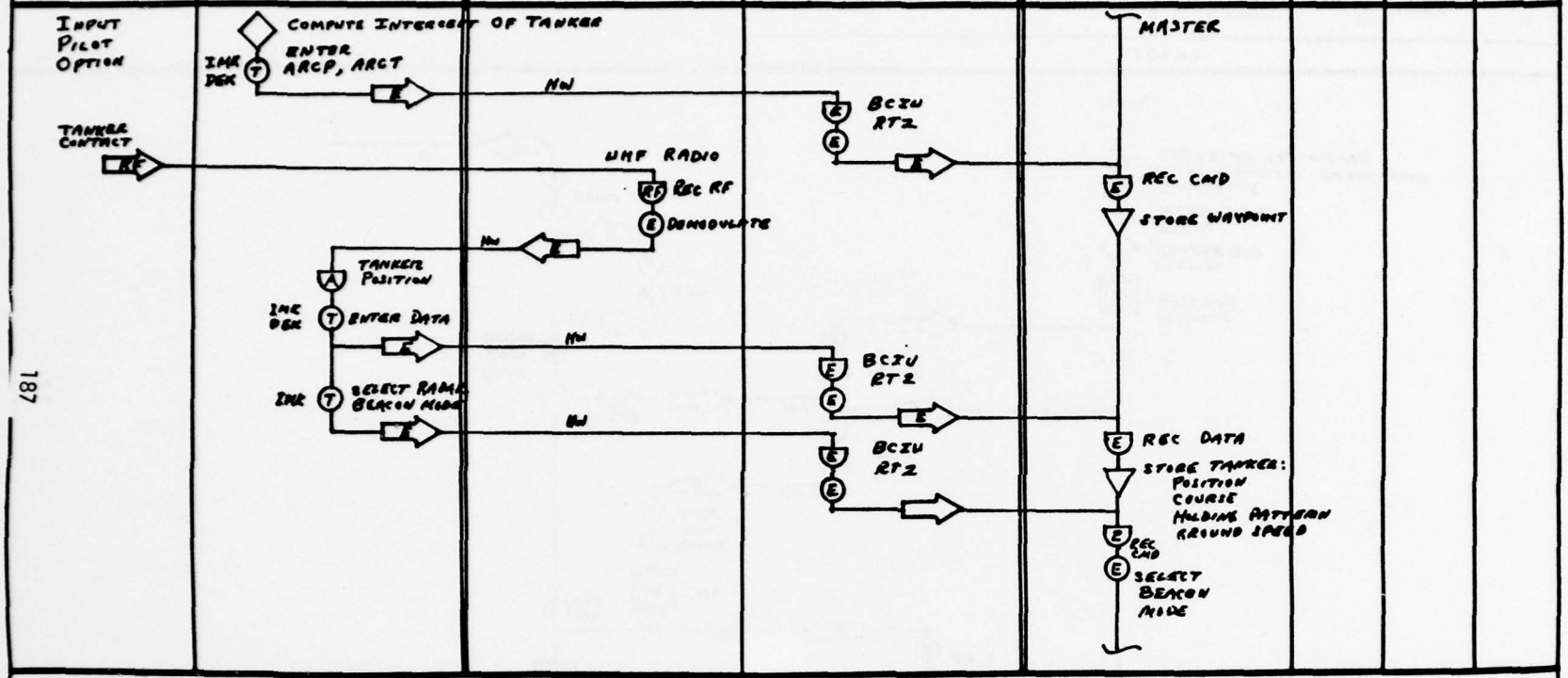
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Intercept of Tanker

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 22



REMARKS:
ARCP - Air Refueling Control Point
ARCT - Air Refueling Control Time

HRT - 2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T - touch
V - visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

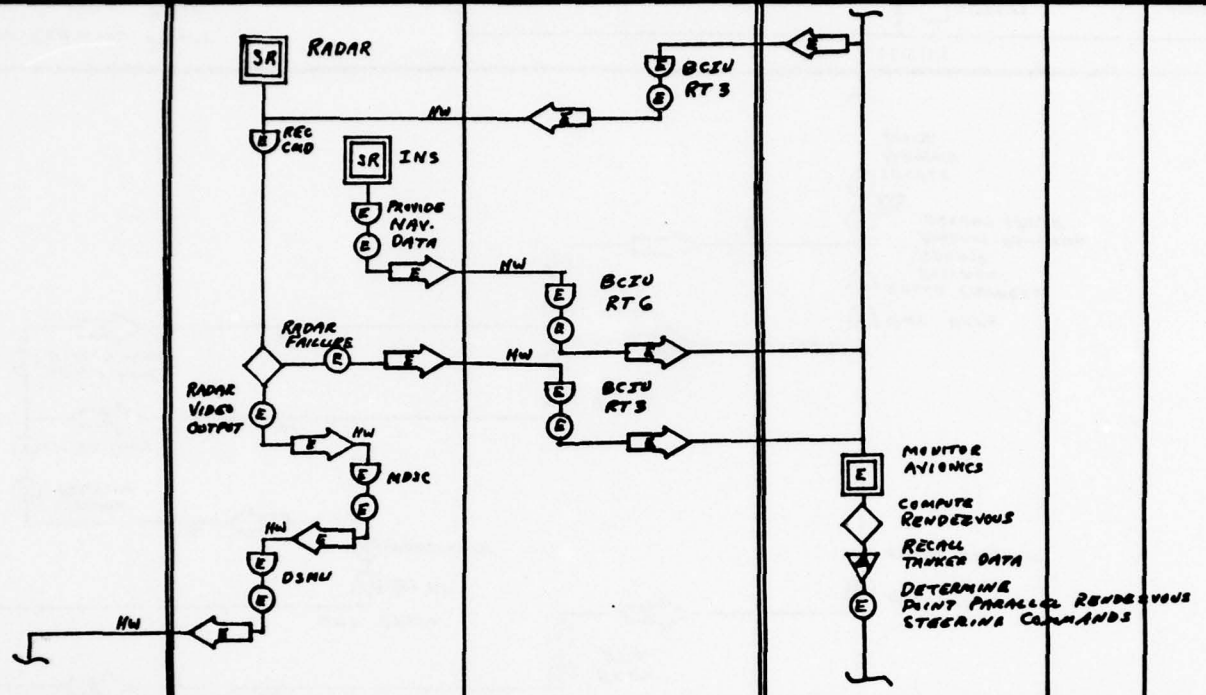
double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Intercept of Tanker

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 23

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS SYSTEM 1	MACHINE FUNCTIONS SYSTEM 2	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec



188

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

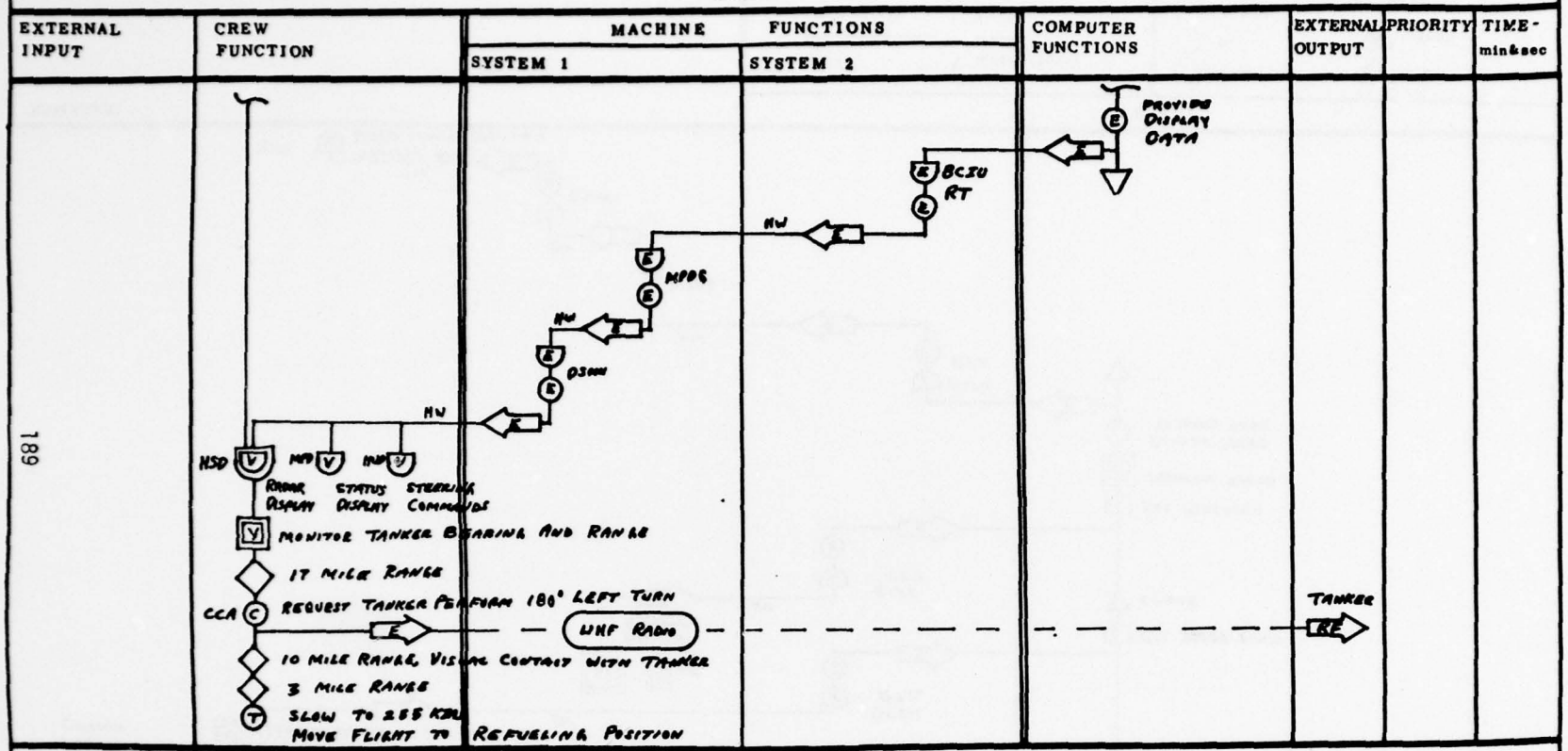
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Intercept of Tanker

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 24



189

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

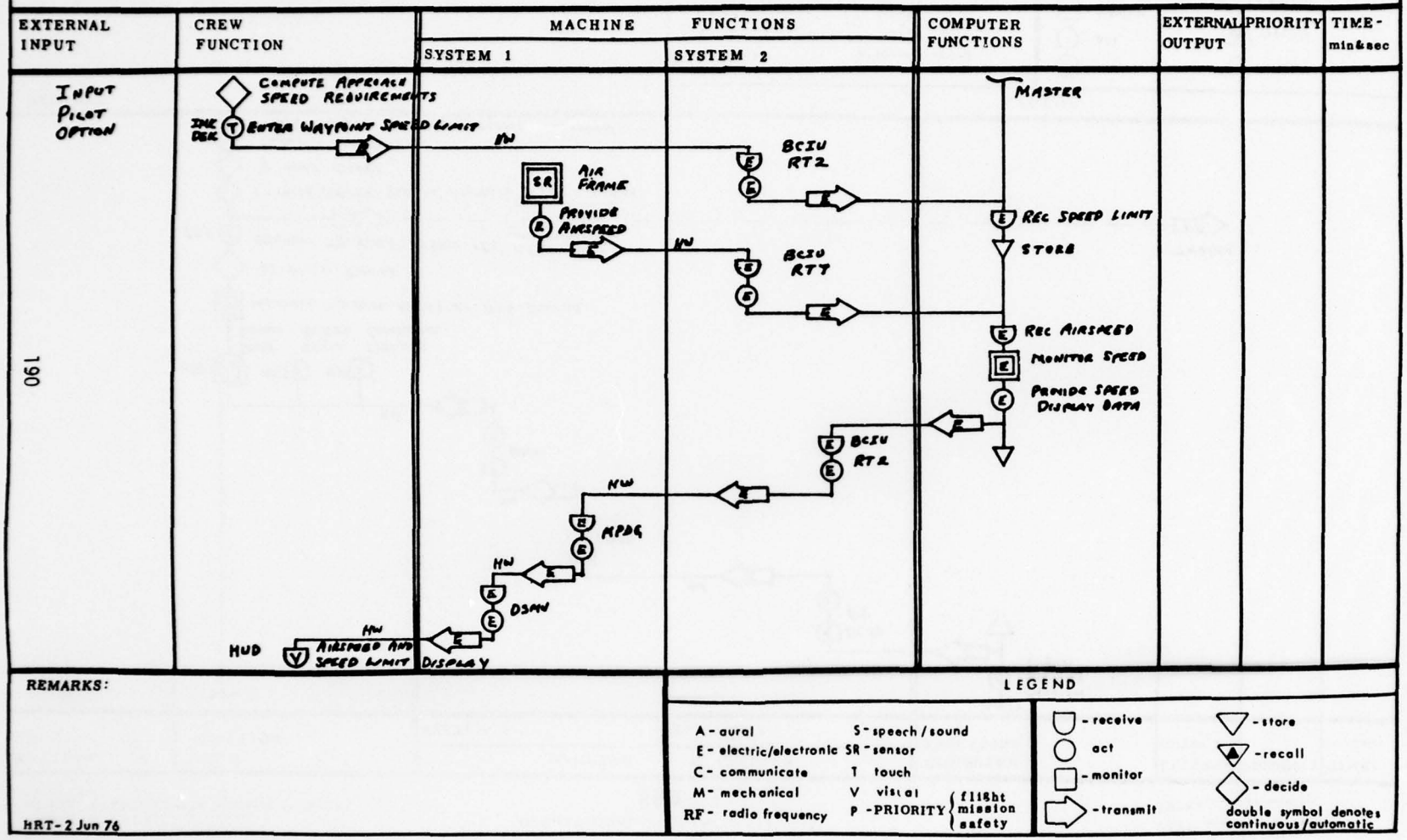
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Approach Speed Requirements

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 25



REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

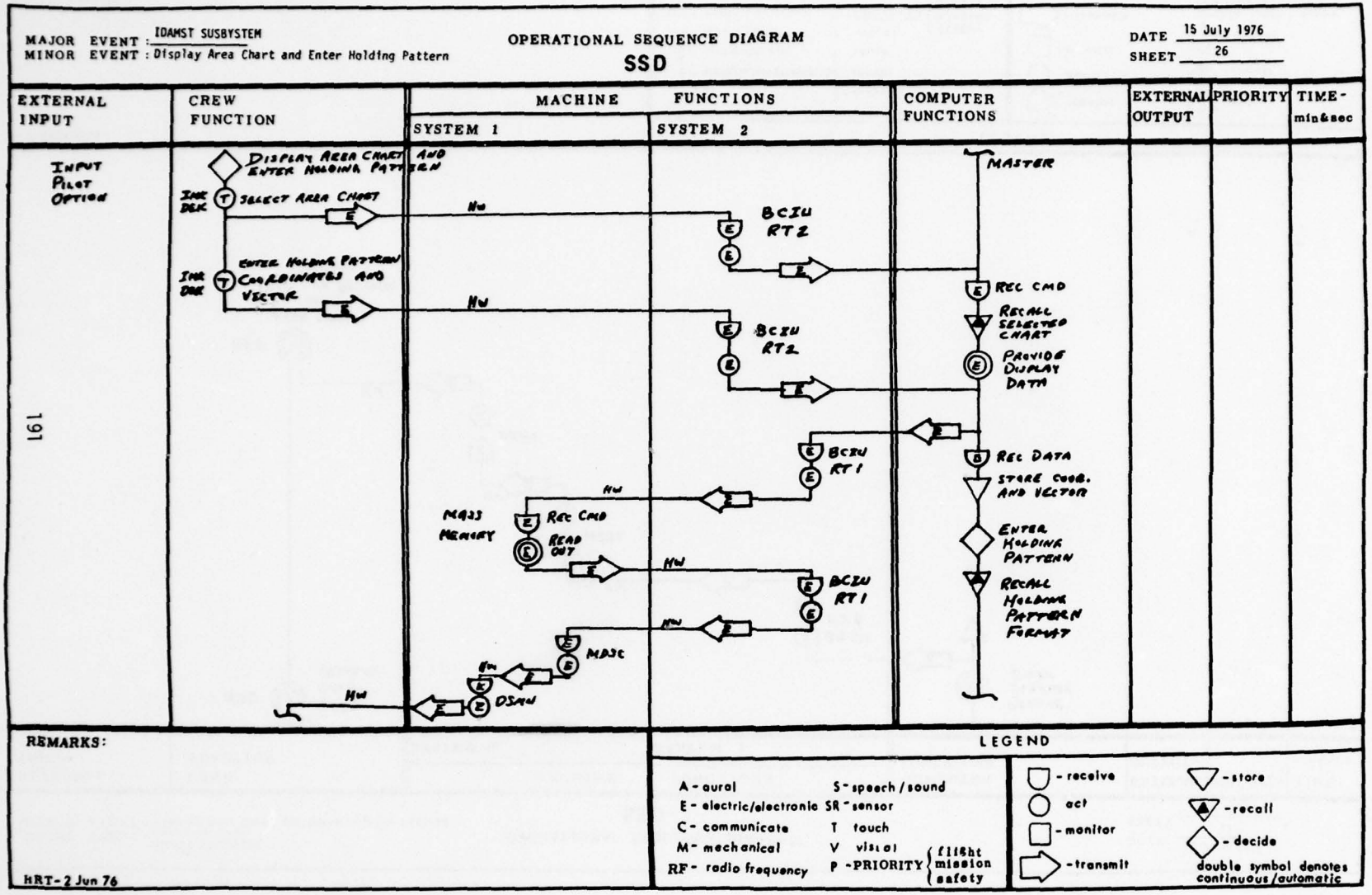
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAHST SUBSYSTEM
MINOR EVENT : Display Area Chart and Enter Holding Pattern

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 26



191

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

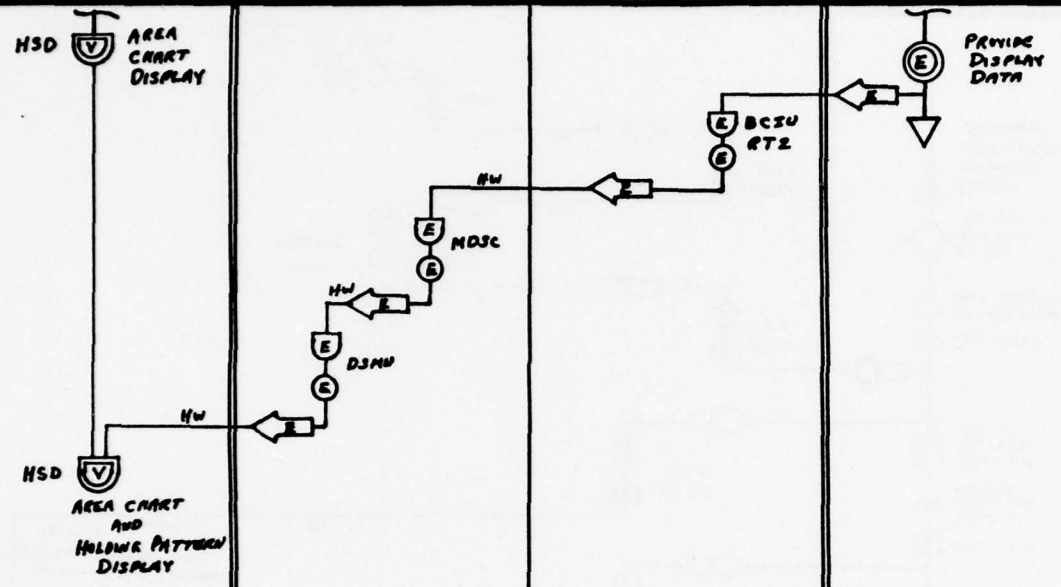
double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Display Area Chart and Enter Holding Pattern

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 27

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS		COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec
		SYSTEM 1	SYSTEM 2				



192

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

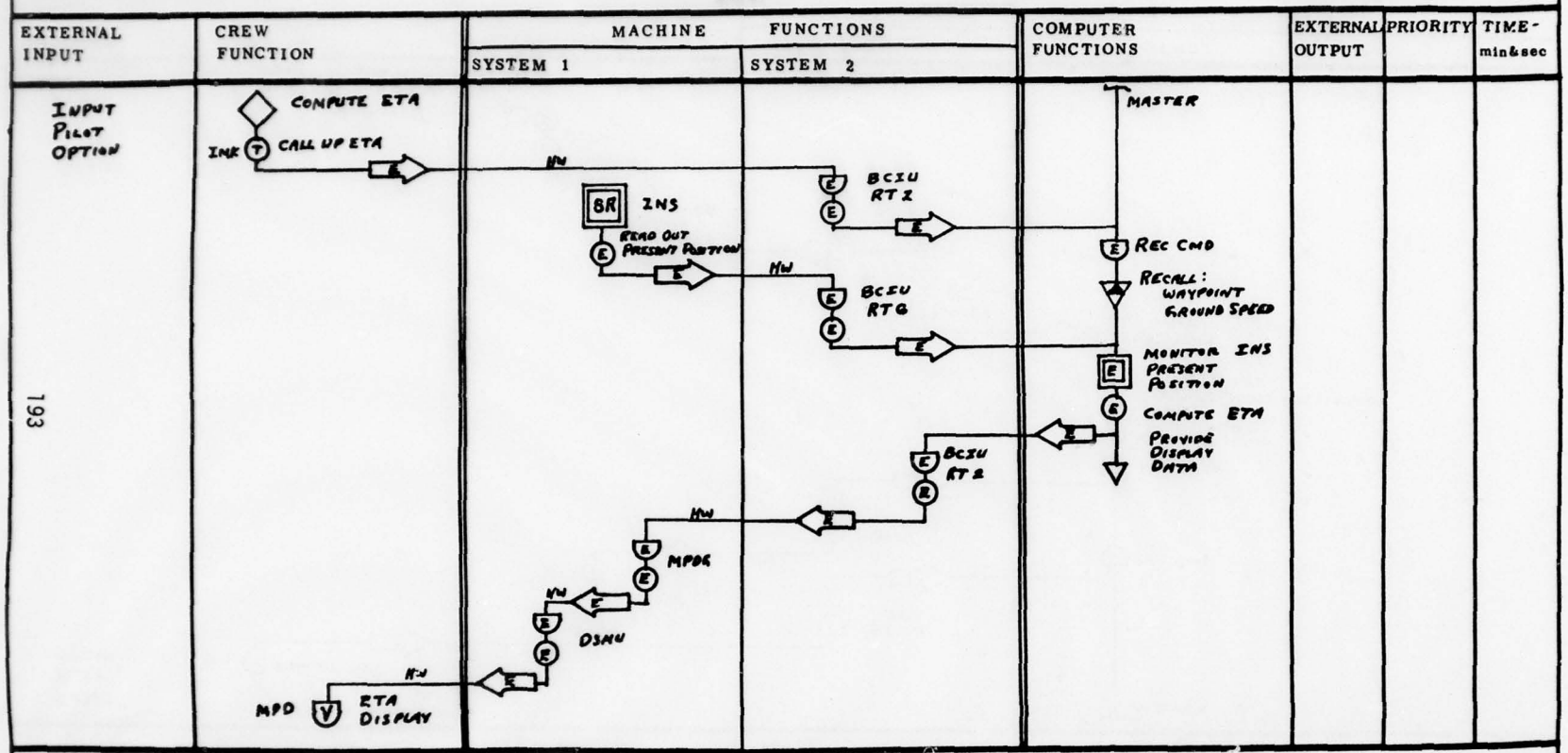
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute ETA

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 28



193

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
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RF - radio frequency
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T touch
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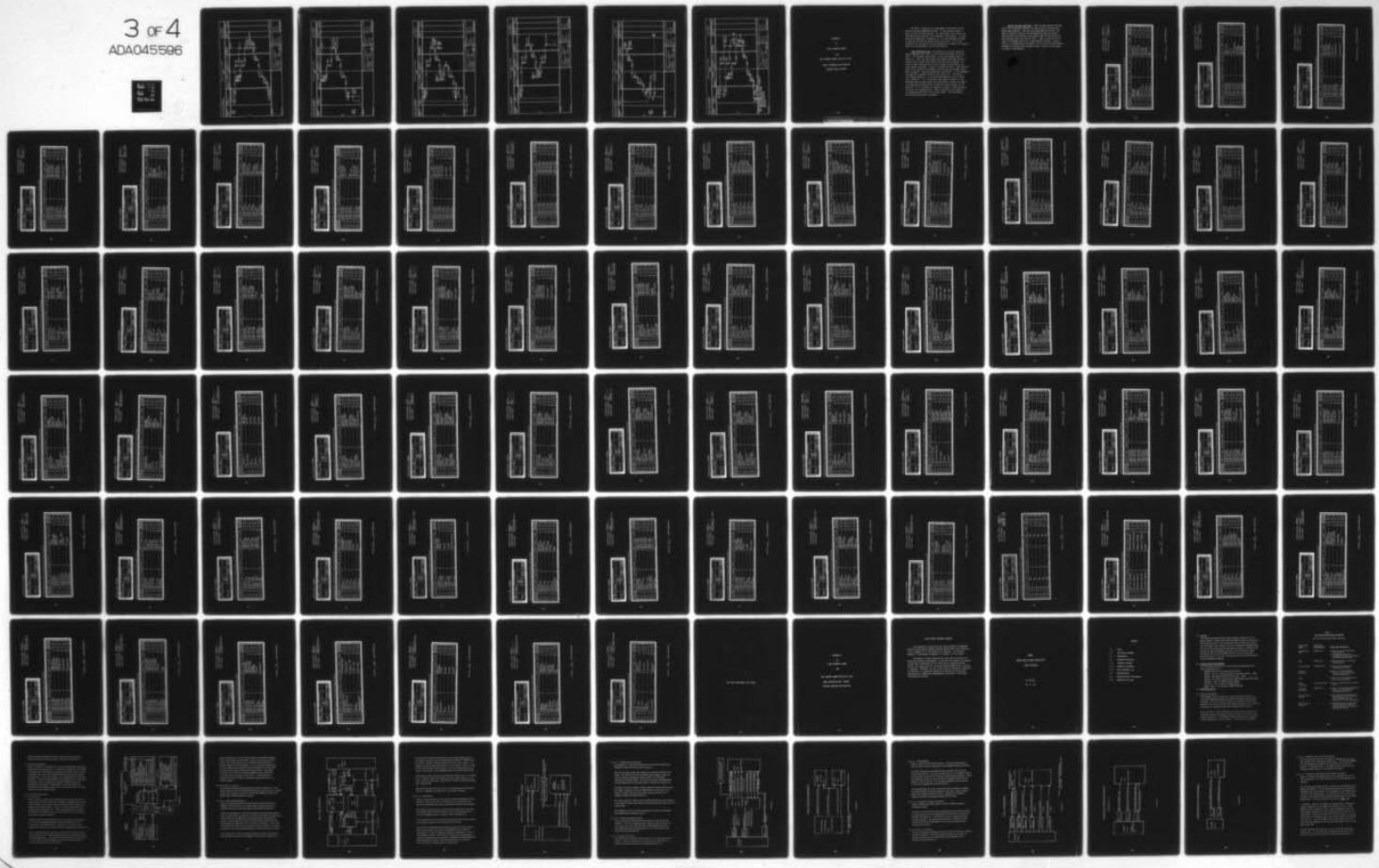
- store
- recall
- decide

double symbol denotes continuous/automatic

AD-A045 596 DOUGLAS AIRCRAFT CO LONG BEACH CA GOVERNMENT AVIONIC--ETC F/G 1/3
SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)
JUL 77 A CHAMBERLAIN, F J DILLON, F H KISHI F33615-76-C-1297
UNCLASSIFIED MDC-J7271-VOL-2 AFAL-TR-76-209-VOL-2 NL

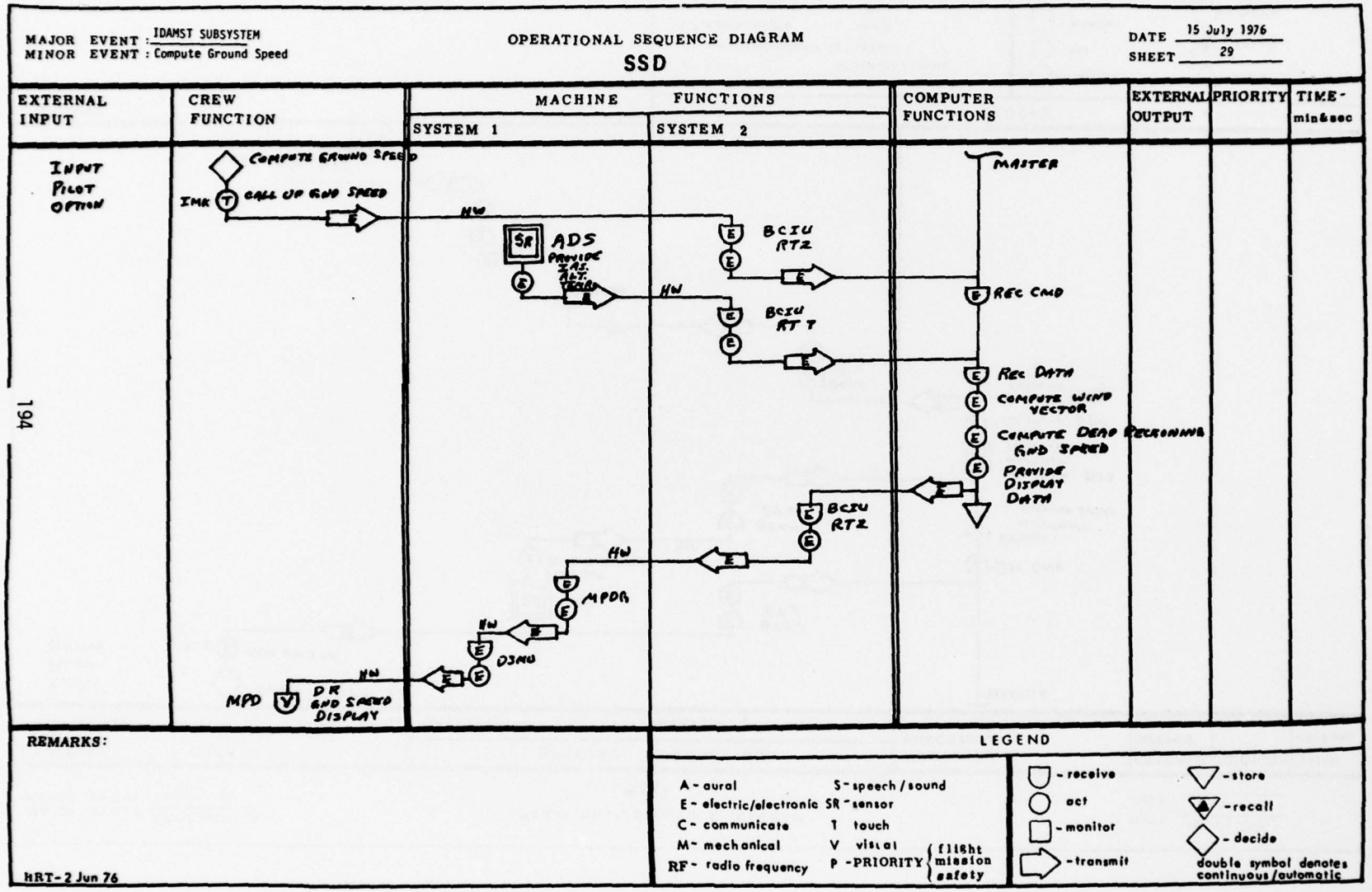
3 OF 4
ADA045596



MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Ground Speed

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 29



REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
C - communicate
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RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

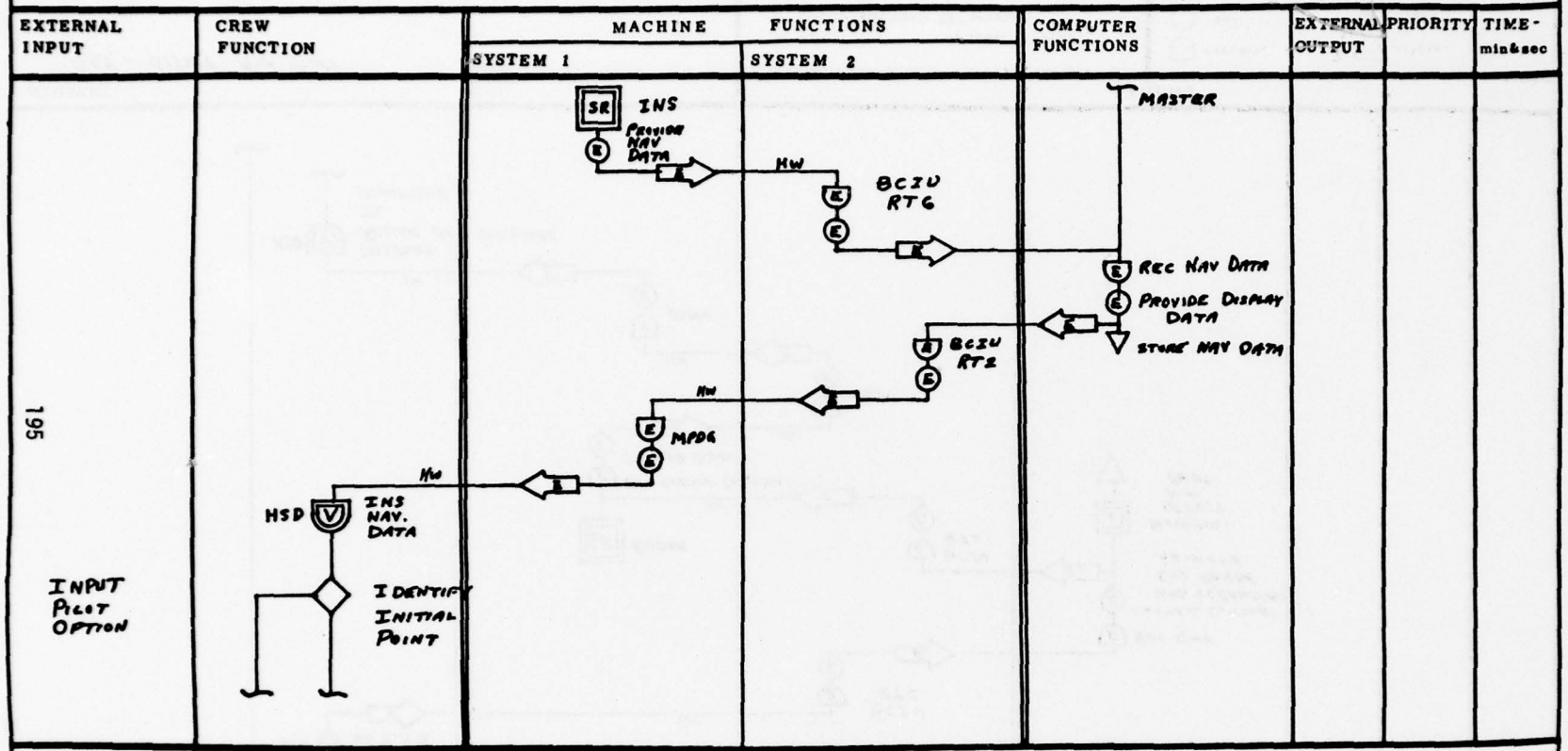
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute CARP

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 30



REMARKS:

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
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V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

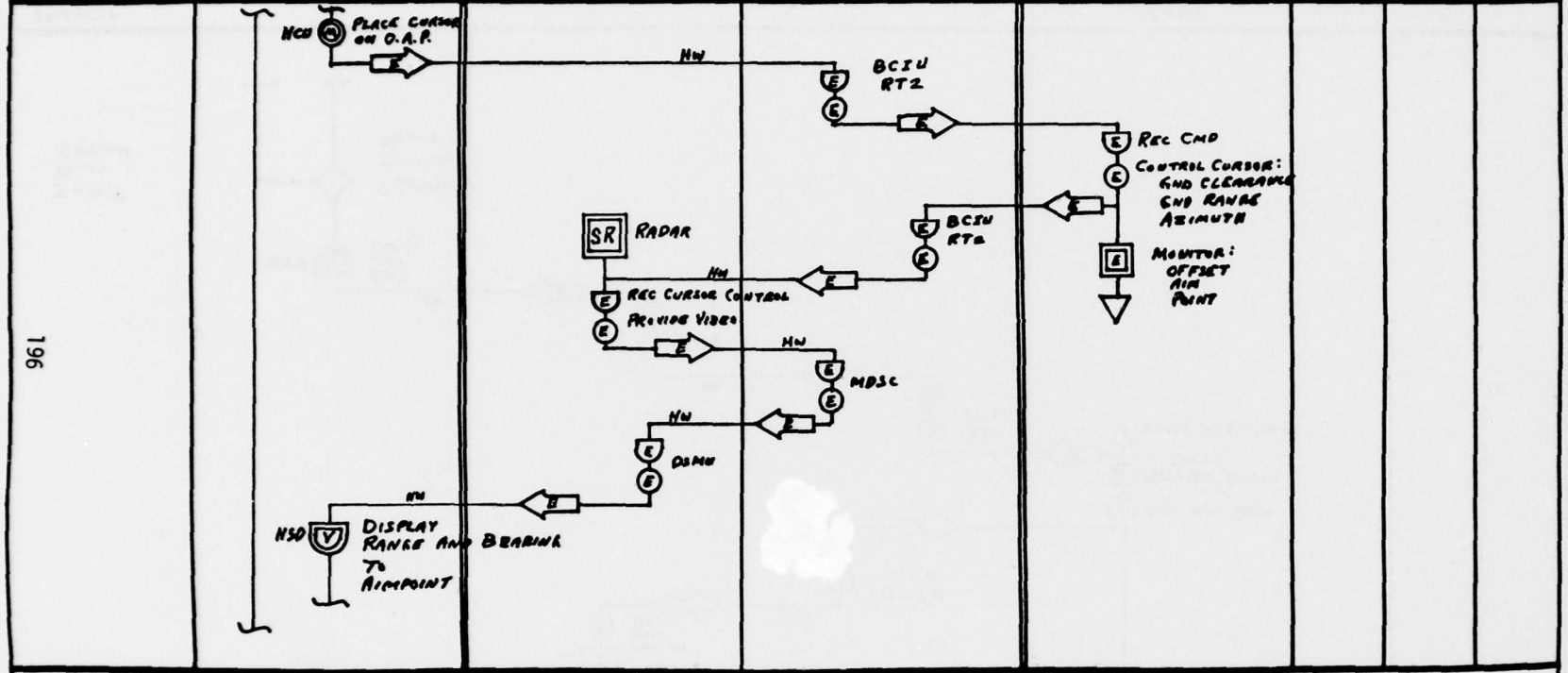
double symbol denotes continuous / automatic

hRT-2 Jun 76

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute CARP

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 31



REMARKS:

O.A.P. - OFFSET AIM POINT

LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency
S - speech / sound
SR - sensor
T touch
V visual
P - PRIORITY { flight / mission / safety

- receive
- act
- monitor
- transmit
- store
- recall
- decide

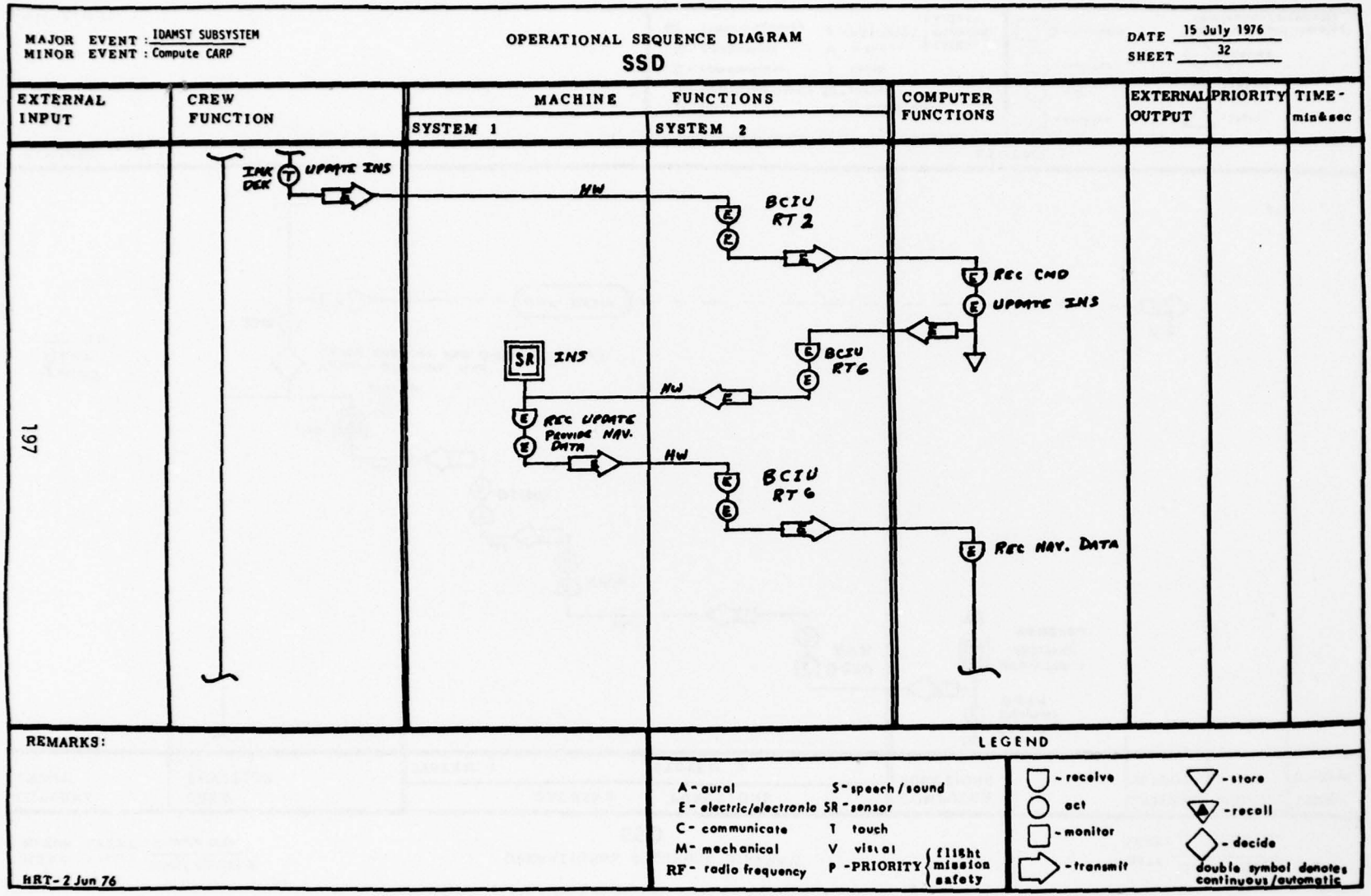
double symbol denotes continuous / automatic

HRT - 2 Jun 76

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute CARP

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 32



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REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
E - electric/electronic
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P - PRIORITY { flight / mission / safety

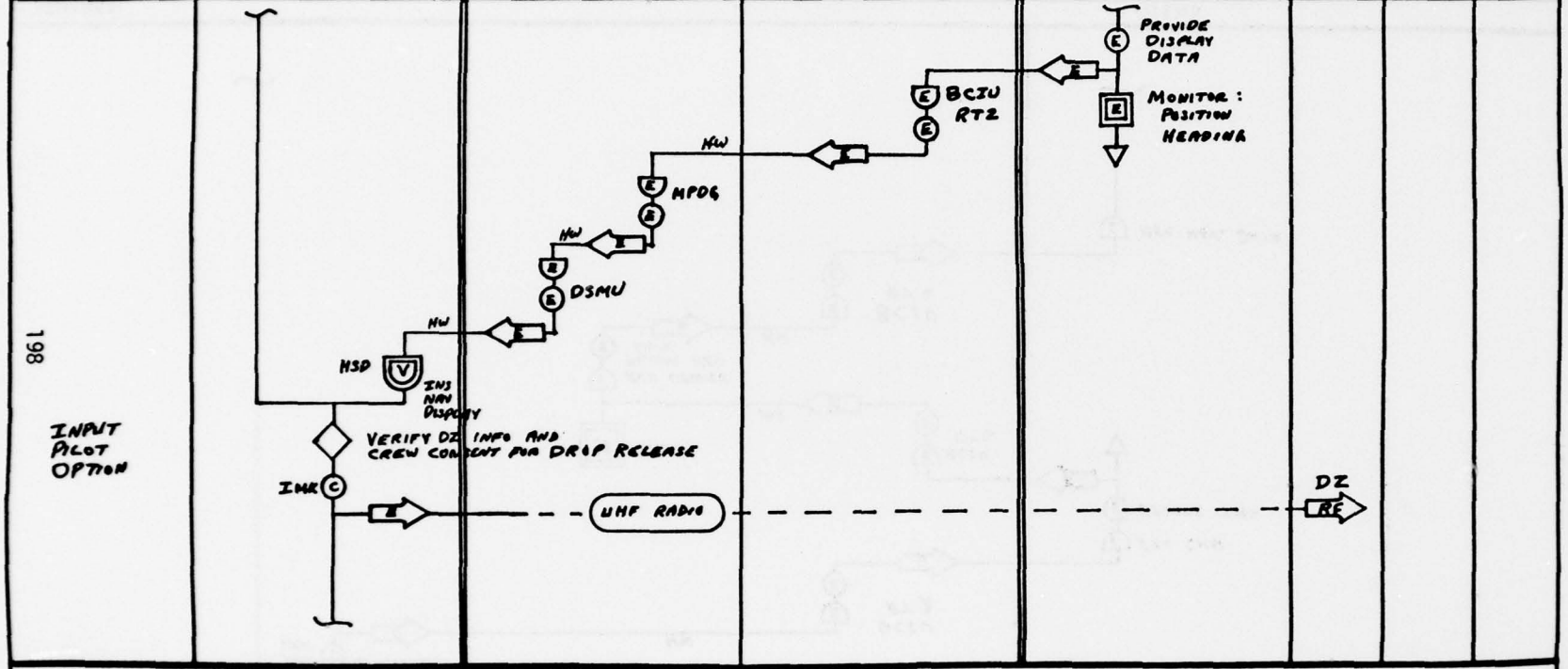
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous/automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute CARP

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 33



198

REMARKS:

HRT-2 Jun 76

LEGEND

A - aural
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T touch
V visual
P - PRIORITY { flight / mission / safety

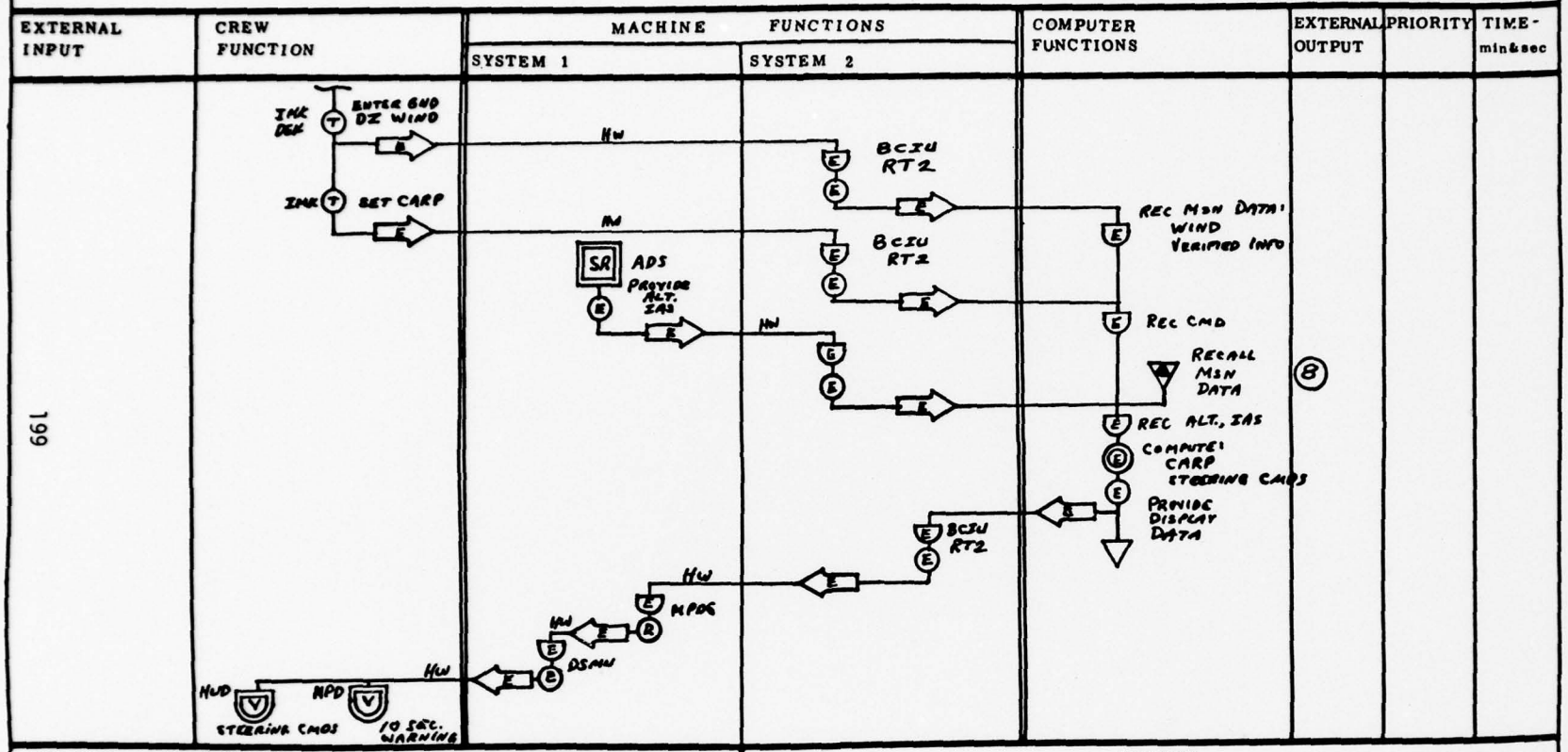
- receive
- act
- monitor
- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute CARP _

OPERATIONAL SEQUENCE DIAGRAM
SSD

DATE 15 July 1976
SHEET 34



REMARKS:
(8) MISSION DATA:
RANGE AND BEARING FROM AIMPOINT TO IMPACT POINT
RANGE AND BEARING FROM AIRCRAFT TO AIMPOINT
DESIRED COURSE THROUGH DZ
PARACHUTE BALLISTICS
IMPACT POINT ALTITUDE
DZ WINDS

HRT-2 Jun 76

LEGEND

A - aural
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RF - radio frequency
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- transmit
- store
- recall
- decide

double symbol denotes continuous / automatic

APPENDIX C

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST INTEGRATED MULTI-FUNCTION

KEYBOARD SAMPLE MESSAGES

The IMFK is visualized as a programmable alpha-numeric display combined with some pushbutton switches. In some display systems it would be called the menu selector. The alpha-numeric part involves ten lines that are 30 characters long, arranged in three columns. The side switches are named key 1 through key 10. The top 8 switches are named as shown and are used for specific function selection. All of the switches are of the push-on, push-off appearance as viewed by the operator. There are to be two panels, one for each operator.

Master Mode Operations. The selection of any master mode push button immediately puts a set of ten 20 character messages on the two IMFK's. For instance, pushing PREFLT, brings the messages shown in Figure C-1. Note that the avionics and computers have been previously turned on and a mission tape loaded to get this set of messages. An arrow is shown indicating that K1 must be pushed on and pushed off to check computer activation. Avionics is handled similarly. When the arrow moves to K3, pushing K3 on displays a set of stutus and setpoint statements on the MPD. These may be modified using the DEK. If the statements are acceptable, pushing K3 off moves the arrow to K4. This process can continue through K9. As the arrow moves opposite to K10, the key K10 is pushed on. If it is desired to skip pages 2 through 5 in the preflight checklist which mainly deal with aircraft systems, the number 6 is entered on the DEK and K10 is pushed off moving to page 6 of the checklist. If it is desired to continue on to page 2, simply operating K10 to off will accomplish this. There is provision for 10 pages of 10 messages each for each of the 9 master modes. Thus 900 messages must be stored exclusive of the MPD's.

Specific Function Operations. There are three specific function (brute force) operations possible, any one of which can override any master mode selection. These are the Systems Specific Function, the Checklist Specific Function, and Reconfiguration Specific Function. These functions are selected by the switches over the IMFK except for Reconfiguration which uses the PCP switch. There is provision for 60 pages of 10 messages each for all three specific functions. Some of these are cross-paginations and repeats, so that 530 of the 600 possible messages are assigned using 30 pages of data. Details of these pages are shown in this Appendix.

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P1
PAGE NAME TURN-ON

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMPUTERS ACTIVATED					CHK HUD STDBY RET			← K6
K2 →	AVIONICS ACTIVATED					CHK HUD CRUISE IMG			← K7
K3 →	INS ALIGN MSG ON MPD					CHK HUD SPEC IMG			← K8
K4 →	LAT LONG MSG ON MPD					CHK HUD APPR IMG			← K9
K5 →	MAG VAR MSG ON MPD					SKP PGS 2 - 5			← K10

FIGURE C-1 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P2
PAGE NAME COMM SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHG HF/SSB MSG ON MPD					CHK SEC VOICE			← K6
K2 →	CHG VHF/AM MSG ON MPD					CHK PA SYS			← K7
K3 →	CHG VHF/FM MSG ON MPD					CHK INTERPHONE			← K8
K4 →	CHG UHF/#1 MSG ON MPD					SET TACAN MSG ON MPD			← K9
K5 →	CHG UHF/#2 MSG ON MPD					SET RADAR MSG ON MPD			← K10

FIGURE C-2 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P3
PAGE NAME NAV SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK TACAN MSG ON MPD					CHK AHRS MSG ON MPD			← K6
K2 →	CHK ILS #1 MSG ON MPD					CHK OMEGA MSG ON MPD			← K7
K3 →	CHK ILS #2 MSG ON MPD					SELECT SID			← K8
K4 →	CHK ADF HF MSG ON MPD					FUTURE NAV			← K9
K5 →	CHK ADF MSG ON MPD					FUTURE NAV			← K10

FIGURE C-4 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P5
PAGE NAME POS SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK RADAR MSG ON MPD					CHG BARO ALT MSG ON MPD			← K6
K2 →	CHK R ALTS MSG ON MPD					CHK AIR DATA MSG ON MPD			← K7
K3 →	CHK R BCN MSG ON MPD					CHK DFCS MSG ON MPD			← K8
K4 →	CHK SKE MSG ON MPD					FUTURE POS			← K9
K5 →	CHK IFF MSG ON MPD					FUTURE POS			← K10

FIGURE C-4 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P4
PAGE NAME DISPL. CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK HSD NORTH UP					CHK STDBY INS			← K6
K2 →	CHK HSD TRACK UP					ENG START MSG ON MPD			← K7
K3 →	CHK MPD 1 MSG ON MPD					CHK SURF. DISPL			← K8
K4 →	CHK MPD 2 MSG ON MPD					SPARE			← K9
K5 →	CHK MPD 3 MSG ON MPD					SPARE			← K10

FIGURE C-5 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P6
PAGE NAME SYS. CHK 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK FUEL MSG ON MPD					CHK ELECTR MSG ON MPD			← K6
K2 →	CHK LOX MSG ON MPD					CHK RAT MSG ON MPD			← K7
K3 →	CHK HYDR. MSG ON MPD					CHK A/R DOOR			← K8
K4 →	CHK WING CONFIG.					CHK PRESS MSG ON MPD			← K9
K5 →	CHK TRIM MSG ON MPD					CHK ANTI/SKID			← K10

FIGURE C-6 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P7
PAGE NAME SYS. CHK 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK DE ICE MSG ON MPD					CHK ALL DR MSG ON MPD			← K6
K2 →	CHK PITOT MSG ON MPD					CHK PNEU			← K7
K3 →	CHK DEFOG MSG ON MPD					CHK ENG CONT			← K8
K4 →	CHK E/R MSG ON MPD					CHK. SW. SET MSG ON MPD			← K9
K5 →	CHK TH REV MSG ON MPD					RETURN TO P K			← K10

FIGURE C-7 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P8
PAGE NAME MISSION

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	DISPL DATE MSG ON MPD					DISPL FUEL MSG ON MPD			← K6
K2 →	DISPL TIME MSG ON MPD					CHK CONTR MSG ON MPD			← K7
K3 →	DISPL DATA MSG ON MPD					CHK BRAKES			← K8
K4 →	DISPL STAT MSG ON MPD					CHK PRESS			← K9
K5 →	DISPL CG MSG ON MPD					CHK LIGHTS			← K10

FIGURE C-8 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P9
PAGE NAME WAYPOINT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK W/P #1 MSG ON MPD					CHK W/P #6 MSG ON MPD			← K6
K2 →	CHK W/P #2 MSG ON MPD					CHK W/P #7 MSG ON MPD			← K7
K3 →	CHK W/P #3 MSG ON MPD					CHK W/P #8 MSG ON MPD			← K8
K4 →	CHK W/P #4 MSG ON MPD					CHK W/P #9 MSG ON MPD			← K9
K5 →	CHK W/P #5 MSG ON MPD					CHK W/P #10 MSG ON MPD			← K10

FIGURE C-9 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P10
PAGE NAME RUNWAY

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK LENGTH MSG ON MPD					CHK GR WT MSG ON MPD			← K6
K2 →	CHK RW HDG MSG ON MPD					CHK TEMP MSG ON MPD			← K7
K3 →	CHK RCR MSG ON MPD					DISPL ATT ON HUD			← K8
K4 →	CHK WIND MSG ON MPD					DISPL SID ON HSD			← K9
K5 →	CHK RW SLP MSG ON MPD					INS GO MSG ON MPD			← K10

FIGURE C-10 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P11
PAGE NAME FINAL SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					READ IAS MSG ON MPD			← K6
K2 →	TCN CHG MSG ON MPD					READ TA S MSG ON MPD			← K7
K3 →	CMD HDG MSG ON MPD					READ GND SPD MSG ON MPD			← K8
K4 →	ALT SET MSG ON MPD					READ GND SPD MSG ON MPD			← K9
K5 →	IFF CHG MSG ON MPD					MONITOR THRUST			← K10

FIGURE C-11 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P12
PAGE NAME THRUST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	THRUST MON. ON HUD					CHK HI LIFT MSG ON MPD			← K6
K2 →	CRIT. VAR. ON HUD					CLIMB PROF ON DISPL			← K7
K3 →	CHK ACCEL ON HUD					DISPL SID ON HSD			← K8
K4 →	CHK ROTAT ON HUD					ANTI-SKID OFF			← K9
K5 →	CHK T/O ON HUD					CLIMB			← K10

FIGURE C-12 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P13
PAGE NAME CHK & W/P

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	ANTI SKID ON MSG ON MPD					ADD W/P MSG ON MPD			← K6
K2 →	GEAR UP MSG ON MPD					DELETE W/P MSG ON MPD			← K7
K3 →	FLAPS UP MSG ON MPD					CLIMB ALONE			← K8
K4 →	CHK M WARN MSG ON MPD					CLIMB SKE			← K9
K5 →	SELECT W/P ENTER NO. & K5					SPARE			← K10

FIGURE C-13 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P14
PAGE NAME CLIMB ALONE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					AUTO HDG MSG ON MPD			← K6
K2 →	TCN CHG MSG ON MPD					ATT HOLD MSG ON MPD			← K7
K3 →	IFF CHG MSG ON MPD					CRS CHG MSG ON MPD			← K8
K4 →	WX RADAR ON HSD					ATT DISPL ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK			← K10

FIGURE C-14 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P15
PAGE NAME CLIMB SKE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					SKE ON HSD			← K6
K2 →	TCN CHG MSG ON MPD					ATT HOLD MSG ON MPD			← K7
K3 →	IFF CHG MSG ON MPD					CRS CHG MSG ON MPD			← K8
K4 →	WX RADAR ON HSD					ATT DISPL. ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK			← K10

FIGURE C-15 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P21
PAGE NAME CHK & W/P

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK M WARN MSG ON MPD					ADD W/P MSG ON MPD			← K6
K2 →	CHK DEFOG MSG ON MPD					DELETE W/P MSG ON MPD			← K7
K3 →	CHK DE ICE MSG ON MPD					CRUISE ALO			← K8
K4 →	CHK PITOT MSG ON MPD					CRUISE SKE			← K9
K5 →	SELECT W/P MSG ON MPD					CRUISE GPS			← K10

FIGURE C-16 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P22
PAGE NAME CRUISE ALONE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					AUTO HDG MSG ON MPD			← K6
K2 →	TCN CHG MSG ON MPD					CRS. HOLD MSG ON MPD			← K7
K3 →	IFF /BEAC MSG ON MPD					CHK PRESS MSG ON MPD			← K8
K4 →	RADAR ON HSD					ALT/ATT ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK			← K10

FIGURE C-17 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P23
PAGE NAME CRUISE SKE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					SKE DATA ON HSD			← K6
K2 →	TCN CHG MSG ON MPD					CRS. HOLD MSG ON MPD			← K7
K3 →	IFF /BEAC MSG ON MPD					CHK PRESS MSG ON MPD			← K8
K4 →	RADAR ON HSD					ALT/ATT ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK.			← K10

FIGURE C-18 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P24
PAGE NAME CRUISE GPS

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					GPS DATA ON HSD			← K6
K2 →	TCN CHG MSG ON MPD					CRS HOLD MSG ON MPD			← K7
K3 →	IFF /BEAC MSG ON MPD					CHK PRESS MSG ON MPD			← K8
K4 →	RADAR ON HSD					ALT/ATT ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK.			← K10

FIGURE C -19 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE RE FUEL
PAGE NUMBER P31
PAGE NAME CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					CHK M WARN MSG ON MPD			← K6
K2 →	CHK BEACON MSG ON MPD					DFCS STAT MSG ON MPD			← K7
K3 →	CHK A/R DR MSG ON MPD					CHK VALVES MSG ON MPD			← K8
K4 →	CHK TRIM MSG ON MPD					SPARE			← K9
K5 →	CHK SPEED MSG ON MPD					LOAD			← K10

FIGURE C-20 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE RE FUEL
PAGE NUMBER P32
PAGE NAME LOAD

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					CHK M WARN MSG ON MPD			← K6
K2 →	CHK BEACON MSG ON MPD					DFCS STAT MSG ON MPD			← K7
K3 →	SKE DATA ON HSD					CHK VALVES MSG ON MPD			← K8
K4 →	FUEL STAT MSG ON MPD					RETURN TO REF CHK			← K9
K5 →	SPARE					RETURN TO CRUISE			← K10

FIGURE C-21 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P41
PAGE NAME CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK M WARN MSG ON MPD					DROP TIME MSG ON MPD			← K6
K2 →	CHK HI LIFT MSG ON MPD					DOORS STAT MSG ON MPD			← K7
K3 →	CHK ALTVEL ON HUD					IFF/BEAC MSG ON MPD			← K8
K4 →	CHK PRESS MSG ON MPD					SPARE			← K9
K5 →	CHK ESM MSG ON MPD					SET CARP			← K10

FIGURE C-22 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P42
PAGE NAME CARP.

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CARP LA/LG MSG ON MPD					ALT/VEL MSG ON MPD			← K6
K2 →	D2 DIMENS MSG ON MPD					TEMP/PRESS MSG ON MPD			← K7
K3 →	PARCT VEL MSG ON MPD					DROP ALONE			← K8
K4 →	PARCT RATE MSG ON MPD					DROP SKE			← K9
K5 →	OFFSET MSG ON MPD					DROP LAPES			← K10

FIGURE C-23 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P43
PAGE NAME DROP ALONE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					DROP TIME MSG ON MPD			← K6
K2 →	CARP DATA ON HSD					CHK HI LIFT MSG ON MPD			← K7
K3 →	RADAR DATA ON HSD					LOAD STAT MSG ON MPD			← K8
K4 →	NAV DATA ON HSD					ALT/ATT ON HUD			← K9
K5 →	ATTACK CHK MSG ON MPD					RET TO CHK			← K10

FIGURE C-24 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P44
PAGE NAME DROP SKE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					SKE DATA ON HSD			← K6
K2 →	CARP DATA ON HSD					AUTO HDG MSG ON MPD			← K7
K3 →	RADAR DATA ON HSD					LOAD STAT MSG ON MPD			← K8
K4 →	NAV DATA ON HSD					ALT/ATT ON HUD			← K9
K5 →	ATTACK CHK MSG ON MPD					RET TO CHK			← K10

FIGURE C-25 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P45
PAGE NAME LAPES

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					CHK TRIM MSG ON MPD			← K6
K2 →	CARP DATA ON HSD					HI LIFT STATUS *DISPLAY*			← K7
K3 →	RADAR DATA ON HSD					LOAD STAT MSG ON MPD			← K8
K4 →	RADAR ALT ON HUD					ALT/ATT ON HUD			← K9
K5 →	SPARE					RET TO CHK			← K10

FIGURE C-26 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P51
PAGE NAME CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK MASTER WARN MSG ON MPD					PLANNED DESC.			← K6
K2 →	CHK WING CONFIG DISPLAY					RAPID DESC			← K7
K3 →	CHK ENG					NORMAL DESC			← K8
K4 →	SET W/P MSG ON MPD					PREC DESC			← K9
K5 →	PRESS MSG ON MPD					STOL DESC			← K10

FIGURE C-27 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P52
PAGE NAME PLANNED DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD			← K6
K2 →	DESC. ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	NAV HSD DISPLAY					ENGINE MSG ON MPD			← K8
K4 →	DESC. TIMING MSG ON MPD					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-28 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P53
PAGE NAME RAPID DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD			← K6
K2 →	CMD ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	NAV HSD DISPLAY					ENGINE MSG ON MPD			← K8
K4 →	DESC. TIMING MSG ON MPD					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-29 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P54
PAGE NAME NORMAL DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD			← K6
K2 →	DESC. ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	VOR/ILS HSD DISPLAY					ENGINE MSG ON MPD			← K8
K4 →	LANDING TIMING MSG ON MPD					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-30 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P55
PAGE NAME PRECISION DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD			← K6
K2 →	PREC. ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	VOR/ILS HSD DISPLAY					ENGINE MSG ON MPD			← K8
K4 →	LANDING TIMING MSG ON MPD					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-31 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P56
PAGE NAME STOL DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD			← K6
K2 →	STOL ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	NAV HSD DISPLAY					ENGINE MSG ON MPD			← K8
K4 →	LANDING TIMING MSG ON MPD					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-32 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P57
PAGE NAME RADAR DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD			← K6
K2 →	ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	SPARE					ENGINE MSG ON MPD			← K8
K4 →	SPARE					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-33 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P61
PAGE NAME ALL APPROACHES

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	NORMAL					SET W/P MSG ON MPD			← K6
K2 →	PRECISION					SPARE			← K7
K3 →	STOL					SPARE			← K8
K4 →	RADAR					SPARE			← K9
K5 →	ABORT					SPARE			← K10

FIGURE C-34 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P62
PAGE NAME NORMAL

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD			← K6
K2 →	ALT CMD ON HUD					RADAR DATA ON HSD			← K7
K3 →	NAV DATA ON HSD					FLAP STAT MSG ON MPD			← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD			← K9
K5 →	ABORT					RETURN TO ALL			← K10

FIGURE C-35 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P63
PAGE NAME PRECISION

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD			← K6
K2 →	PREC. ALT ON HUD					RADAR DATA ON HSD			← K7
K3 →	VOR/ILS ON HSD					FLAP STAT MSG ON MPD			← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD			← K9
K5 →	ABORT					RETURN TO ALL			← K10

FIGURE C-36 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P64
PAGE NAME STOL

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD			← K6
K2 →	STOL ALT ON HUD					RADAR DATA ON HSD			← K7
K3 →	NAV DAT ON HSD					FLAP STAT MSG ON MPD			← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD			← K9
K5 →	ABORT					RETURN TO ALL			← K10

FIGURE C-37 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P65
PAGE NAME RADAR

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD			← K6
K2 →	ALT ON HUD					RADAR DATA ON HSD			← K7
K3 →	RADAR DATA ON HSD					FLAP STAT MSG ON MPD			← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD			← K9
K5 →	ABORT					RETURN TO ALL			← K10

FIGURE C-38 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P66
PAGE NAME ABORT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD			← K6
K2 →	ALT CMD HUD					RADAR DATA ON HSD			← K7
K3 →	SAME DATA ON HSD					FLAP STAT MSG ON MPD			← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD			← K9
K5 →	SPARE					RETURN TO ALL			← K10

FIGURE C-39 - IMFK MESSAGES

MASTER MODE KEYBOARD

MASTER MODE APPR/LAND
PAGE NUMBER P71
PAGE NAME TAXI

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK ANTI-SKID					CHK WING CONFIG			← K6
K2 →	CHK AIR VENTS					CHK TH REV			← K7
K3 →	CHK LIGHTS					CHK TRIM			← K8
K4 →	CHK PITOT					CHK BEACON			← K9
K5 →	CHK DE ICE					DISPL SID ON HSD			← K10

FIGURE S-40 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE POST FLT
PAGE NUMBER P72
PAGE NAME PARK

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK

K1 →	CHK ALL DOORS		SHUT DOWN AVIONICS	← K6
K2 →	CHK ENGINES OFF		SHUT DOWN COMP DISPL	← K7
K3 →	CHK PRESS		USE MANUAL CHK LIST	← K8
K4 →	SPARE		TURN OFF BATTERIES	← K9
K5 →	SPARE		PREFLIGHT CHK REQUIRED	← K10

FIGURE C-41 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P81
PAGE NAME TURN-ON

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMPUTERS ACTIVATED					CHK HUD STDBY RET			← K6
K2 →	AVIONICS ACTIVATED					CHK HUD CRUISE IMG			← K7
K3 →	INS ALIGN MSG ON MPD					CHK HUD SPEC IMG			← K8
K4 →	LAT LONG MSG ON MPD					CHK HUD APPR IMG			← K9
K5 →	MAG VAR MSG ON MPD					SKP PGS 2 - 5			← K10

FIGURE C-42 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P82
PAGE NAME COMM-SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHG HF/SSB MSG ON MPD					CHK SEC VOICE			← K6
K2 →	CHG VHF/AM MSG ON MPD					CHK PA SYS			← K7
K3 →	CHG VHF/FM MSG ON MPD					CHK INTERPHONE			← K8
K4 →	CHG UHF/#1 MSG ON MPD					SET TACAN MSG ON MPD			← K9
K5 →	CHG UHF/#2 MSG ON MPD					SET RADAR MSG ON MPD			← K10

FIGURE C-43 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P83
PAGE NAME NAV-SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK TACAN MSG ON MPD					CHK AHRS MSG ON MPD			← K6
K2 →	CHK ILS #1 MSG ON MPD					CHK OMEGA MSG ON MPD			← K7
K3 →	CHK ILS #2 MSG ON MPD					SELECT SID			← K8
K4 →	CHK ADF HF MSG ON MPD					FUTURE NAV			← K9
K5 →	CHK ADF MSG ON MPD					FUTURE NAV			← K10

FIGURE C-44 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P84
PAGE NAME POS-SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK RADAR MSG ON MPD					CHG BARO ALT MSG ON MPD			← K6
K2 →	CHK R ALTS MSG ON MPD					CHK AIR DATA MSG ON MPD			← K7
K3 →	CHK R BCN MSG ON MPD					CHK DFCS MSG ON MPD			← K8
K4 →	CHK SKE MSG ON MPD					FUTURE POS			← K9
K5 →	CHK IFF MSG ON MPD					FUTURE POS			← K10

FIGURE C-45 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P85
PAGE NAME DISPL. CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK HSD NORTH UP					CHK STDBY INS			← K6
K2 →	CHK HSD TRACK UP					ENGINE START MSG ON MPD			← K7
K3 →	CHK MPD 1 MSG ON MPD					CHK SURF. DISPL			← K8
K4 →	CHK MPD 2 MSG ON MPD					SPARE			← K9
K5 →	CHK MPD 3 MSG ON MPD					SPARE			← K10

FIGURE C-46 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B1
PAGE NAME BRUTEFORCE NAV 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	VOR/ILS (2) GO TO PB2					INS GO TO PB2			← K6
K2 →	TACAN GO TO PB2					OMEGA GO TO PB2			← K7
K3 →	ADF/BCN (2) GO TO PB2					DOPPLER GO TO PB2			← K8
K4 →	SIF GO TO PB2					AREA NAV GO TO PB2			← K9
K5 →	BEACON GO TO PB2					PAR GO TO PB2			← K10

FIGURE C-47 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B2

PAGE NAME BRUTEFORCE NAV 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	POWER IMFK + DEK					MDA/DH IMFK + DEK			← K6
K2 →	COURSE SET IMFK + DEK					AIR TO AIR IMFK + DEK			← K7
K3 →	STA. IDENT IMFK + DEK					A-A RECV IMFK + DEK			← K8
K4 →	FREQ. /CHAN. IMFK + DEK					STA. ELEV. IMFK + DEK.			← K9
K5 →	BACK CRS IMFK + DEK					RET TO NAV.			← K10

FIGURE C-48 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B3
PAGE NAME BRUTEFORCE COMM 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	UHF #1 GO TO PB 4					INTERPHONE GO TO PB4			← K6
K2 →	UHF #2 GO TO PB4					P.A. SYS GO TO PB4			← K7
K3 →	VHF/AM TO TO PB4					SEC VOICE GO TO PB4			← K8
K4 →	VHF/FM GO TO PB4					SPARE			← K9
K5 →	HF/SSB GO TO PB4					SPARE			← K10

FIGURE C-49 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B4
PAGE NAME BRUTE FORCE COMM 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	POWER IMFK + DEK					FREQ/CHAN IMFK + DEK			← K6
K2 →	GUARD/XMIT IMFK + DEK					SPARE			← K7
K3 →	SQUELCH IMFK + DEK					SPARE			← K8
K4 →	XMIT/RECV IMFK + DEK					SPARE			← K9
K5 →	ADF IMFK + DEK					RETURN TO COM			← K10

FIGURE C-50 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B5
PAGE NAME BRUTEFORCE C/D 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	HUD-P* GO TO PB6					HUD-CP* GO TO PB6			← K6
K2 →	HSD-P GO TO PB6					HSD-CP GO TO PB6			← K7
K3 →	MPD-1 GO TO PB6					MPD - 3 GO TO PB6			← K8
K4 →	MPD-2 GO TO PB6					SPARE			← K9
K5 →	FORMAT MOD GO TO PB6					SPARE			← K10

FIGURE C-51 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B6
PAGE NAME BRUTEFORCE C/D 2

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK

K1 →	EAS/MACH IMFK + HUD	FLT. PATH IMFK + HUD	← K6
K2 →	GND SPD IMFK + HUD	PITCH LADR IMFK + HUD	← K7
K3 →	TAS IMFK + HUD	ANG ATTACK IMFK + HUD	← K8
K4 →	ENERG MGMT IMFK + DISPL.	VERT. VEL. IMFK + HUD	← K9
K5 →	FLT DIR. IMFK + HUD	RET TO C/D	← K10

FIGURE C-52 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B7
PAGE NAME BRUTEFORCE CARGO

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK

K1 →	CHK M WARN MSG ON MPD	DROP TIME MSG ON MPD	← K6
K2 →	CHK HI LIFT MSG ON MPD	DOORS STAT MSG ON MPD	← K7
K3 →	CHK ALTVEL ON HUD	SPARE	← K8
K4 →	CHK PRESS MSG ON MPD	SPARE	← K9
K5 →	CHK ESM MSG ON MPD	SET CARP	← K10

FIGURE C-53 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B8
PAGE NAME BRUTEFORCE SYST 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK FUEL MSG ON MPD					CHK ELECTR MSG ON MPD			← K6
K2 →	CHK LOX MSG ON MPD					CHK RAT MSG ON MPD			← K7
K3 →	CHK HYDR. MSG ON MPD					CHK A/R DOOR			← K8
K4 →	CHK WING CONFIG.					CHK PRESS MSG ON MPD			← K9
K5 →	CHK TRIM MSG ON MPD					CHK ANTI/SKID			← K10

FIGURE C-54 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B9
PAGE NAME BRUTEFORCE SYST 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK DE ICE MSG ON MPD					CHK ALL DR MSG ON MPD			← K6
K2 →	CHK PITOT MSG ON MPD					CHK PNEU			← K7
K3 →	CHK DEFOG MSG ON MPD					ENG FAIL MSG ON MPD			← K8
K4 →	CHK E/R MSG ON MPD					CHK. SW. SET MSG ON MPD			← K9
K5 →	CHK TH REV MSG ON MPD					RETURN TO P K			← K10

FIGURE C-55 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	RE CONFIG
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-BIO
PAGE NAME BRUTEFORC UBR

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	TBD					TBD			← K6
K2 →	TBD					TBD			← K7
K3 →	TBD					TBD			← K8
K4 →	TBD					TBD			← K9
K5 →	TBD					TBD			← K10

FIGURE C-56 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B11
PAGE NAME BRUTEFORCE CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	RUNWAY CHKLIST					DESCEND CHKLIST			← K6
K2 →	CLIMB CHKLIST					APPROACH CHKLIST			← K7
K3 →	CRUISE CHKLIST					PREFLT CHKLIST			← K8
K4 →	REFUEL CHKLIST					POST FLT CHKLIST			← K9
K5 →	AIR DROP CHKLIST					SPARE			← K10

FIGURE C-57 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B12
PAGE NAME RUNWAY CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					READ IAS MSG ON MPD			← K6
K2 →	TCN CHG MSG ON MPD					READ TAS MSG ON MPD			← K7
K3 →	CMD HDG MSG ON MPD					READ GND SPD MSG ON MPD			← K8
K4 →	ALT SET MSG ON MPD					READ GND SPD MSG ON MPD			← K9
K5 →	IFF CHG MSG ON MPD					MONITOR THRUS T			← K10

FIGURE C-58 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B13
PAGE NAME CLIMB CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	ANTI SKID ON MSG ON MPD					ADD W/P MSG ON MPD			← K6
K2 →	GEAR UP MSG ON MPD					DELETE W/P MSG ON MPD			← K7
K3 →	FLAPS UP MSG ON MPD					CLIMB ALONE			← K8
K4 →	CHK M WARN MSG ON MPD					CLIMB SKE			← K9
K5 →	SELECT W/P ENTER NO. & K5					SPARE			← K10

FIGURE C-59 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B14
PAGE NAME CRUISE CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK M WARN MSG ON MPD					ADD W/P MSG ON MPD			← K6
K2 →	CHK DEFOG MSG ON MPD					DELETE W/P MSG ON MPD			← K7
K3 →	CHK DE ICE MSG ON MPD					CRUISE ALO			← K8
K4 →	CHK PITOT MSG ON MPD					CRUISE SKE			← K9
K5 →	SELECT W/P MSG ON MPD					CRUISE GPS			← K10

FIGURE C-60 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B15
PAGE NAME REFUEL CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					CHK M WARN MSG ON MPD			← K6
K2 →	CHK BEACON MSG ON MPD					DFCS STAT MSG ON MPD			← K7
K3 →	CHK A/R DR MSG ON MPD					CHK VALVES MSG ON MPD			← K8
K4 →	CHK TRIM MSG ON MPD					SPARE			← K9
K5 →	CHK SPEED MSG ON MPD					LOAD			← K10

FIGURE C-61 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B16

PAGE NAME AIR DROP CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK M WARN MSG ON MPD					DROP TIME MSG ON MPD			← K6
K2 →	CHK HI LIFT MSG ON MPD					DOORS STAT MSG ON MPD			← K7
K3 →	CHK ALTVEL ON HUD					IFF/BEAC MSG ON MPD			← K8
K4 →	CHK PRESS MSG ON MPD					SPARE			← K9
K5 →	CHK ESM MSG ON MPD					SET CARP			← K10

FIGURE C-62 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B17
PAGE NAME DESCEND CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK MASTER WARN MSG ON MPD					PLANNED DESC.			← K6
K2 →	CHK WING CONFIG DISPLAY					RAPID DESC			← K7
K3 →	CHK ENG					NORMAL DESC			← K8
K4 →	SET W/P MSG ON MPD					PREC DESC			← K9
K5 →	PRESSURIZATION MSG ON MPD					STOL DESC			← K10

FIGURE C-63 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B18
PAGE NAME APPROACH CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	NORMAL					SET W/P MSG ON MPD			← K6
K2 →	PRECISION					SPARE			← K7
K3 →	STOL					SPARE			← K8
K4 →	RADAR					SPARE			← K9
K5 →	ABORT					SPARE			← K10

FIGURE C-64 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B19

PAGE NAME PREFLIGHT CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMPUTERS ACTIVATED					CHK HUD STDBY RET			← K6
K2 →	AVIONICS ACTIVATED					CHK HUD CRUISE IMG			← K7
K3 →	INS ALIGN MSG ON MPD					CHK HUD SPEC IMG			← K8
K4 →	LAT LONG MSG ON MPD					CHK HUD APPR IMG			← K9
K5 →	MAG VAR MSG ON MPD					SKP PGS 2 - 5			← K10

FIGURE C-65 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B20

PAGE NAME POST FLIGHT CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CHK ANTI-SKID					CHK WING CONFIG			← K6
K2 →	CHK AIR VENTS					CHK TH REV			← K7
K3 →	CHK LIGHTS					CHK TRIM			← K8
K4 →	CHK PITOT					CHK BEACON			← K9
K5 →	CHK DE ICE					DISPL SID ON HSD			← K10

FIGURE C-66 - IMFK MESSAGES

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APPENDIX D

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST AVIONICS/FLIGHT CONTROL

SOFTWARE INTERFACE SPECIFICATION

FLIGHT CONTROL SOFTWARE INTERFACE

The contractor is required by this task to propose a recommended Avionics-Flight Control Software Interface specification using the guidelines of Appendix "K" of the contract as a baseline. The resulting document is incorporated as Appendix D in Volume II of this report.

The Douglas C-15 AMST characteristics were used as the basis for determining interface requirements. At the time the document was proposed, no production configuration of the Flight Control Subsystem had been defined, and indeed, none will not by the time the IDAMST Phase I contract is completed. Therefore, the specification must be regarded as preliminary. The interface is a conservative approach to maintaining flight safety independently of IDAMST with consideration of the special flight modes associated with the AMST.

IDAMST

IDAMST/FLIGHT CONTROL SYSTEM (FCS)

SIGNAL INTERFACE

PRELIMINARY

MAY 14, 1976

CONTENTS

1.0 SCOPE

This specification defines the signal interface between the C-15 Flight Control System (FCS) and the IDAMST Avionics equipments. The signal interface is an assignment of the required input sensor data and output command data to the FCS utilizing the IDAMST Data bus or aircraft wiring as the transmission medium. Included in the interface is the presentation of signal sources and their routing between the FCS and the IDAMST Avionics since an individual parameter may, or may not, be assigned to both systems using the same transmission medium.

2.0 APPLICABLE DOCUMENTS.

The following documents form a part of this specification to the extent specified herein.

IDAMST Avionics RT Assignment Drawing
ARINC - 561, Air Transport Inertial Navigation System - (INS)
ARINC - 569, Heading and Attitude Sensor - (HAS)
ARINC - 575, Mark 3 Sub-Sonic Air Data Systems (DIGITAL)-(DADS)
AN/ARN - 108, Instrument Landing System
AN/APN - 194(v), Radar Altimeter System
ARINC - 407-1, Arinc Synchro Signal Practices

3.0 REQUIREMENTS

3.1 Interface Definition.

The IDAMST Avionics System uses sensor data to compute the command outputs and display information for different application functions. The inter-and intra-data communications between the IDAMST core elements and the application equipment is accomplished by means of a redundant digital data multiplexed bus system.

The C-15 FCS is a dual redundant, fail safe, digital computer configuration utilizing redundant computations with in-line and cross-channel monitoring. The IDAMST sensor equipment list applicable to FCS utilization is listed in Table 1. The common information

TABLE 1.

FCS RELATED IDAMST SENSORS

(Does not include FCS Unique Sensors)

Equipment Item	Applicable Specification	Equipment Utilization
Carousel IV INS	ARINC-561	• Source of Aircraft Primary Inertial Data. • Computation of Inertial Navigation Display Parameters and Steering Commands.
HAS	ARINC-569	• Alternate Source of Aircraft Inertial Data.
ILS Receiver	AN/ARN-108	• Source of Localizer and Glideslope Deviation.
TACAN Receiver		• Source of TACAN Station Course, Course Deviation, and Station Distance.
VOR		• Source of VOR Station Course and Course Deviation.
Radio Altimeter	AN/APN-194(v)	• Source of Height above Ground Level.
Air Data Computer	ARINC-575	• Source of Computed Atmospheric Data for Aircraft Flight Instruments and FCS.
Ground Sense Relays	-	• Provides Discrete Information Regarding Aircraft Weight on Nose Landing Gear for Equipment Interlock Functions.
Flap Position Switches	-	• Provides Discrete Information of Flap Position relative to Fixed Positions for Equipment Interlock Functions.

shared between the IDAMST Avionics system and the separately configured FCS is the subject of this "Interface" specification.

3.1.1 Interface Diagrams.

Figures 1 through 9 illustrate the required FCS/IDAMST equipment signal interface configuration. The interface configuration is choosen to maintain the FCS redundancy concept for the flight critical modes of stability and control augmentation (SCAS) and automatic coupled ILS approaches. The basic premise is to maintain the FCS fail-safe capability. To this end the IDAMST Bus configuration is considered functionally to be two separately engageable single channels as opposed to a dual channel configuration. Thus the IDAMST Bus monitoring and reconfiguration scheme is not relied upon to provide the requisite FCS signal duality.

3.1.2 Interface Discussion

3.1.2.1 Overview.

Figure 1 gives an overview of the FCS input and output equipment assignment to aircraft wiring and to IDAMST multiplex bus communication methods. The sensor inputs and FGS command outputs are divided into 4 Signal Groups. Group 1 are FCS outputs that are to be displayed to the flight crew. These parameters must be transmitted via the multiplexed data bus since this is the only access to the cockpit electronic displays.

Group 2 includes FCS parameters that are available on the data bus as a result of independent IDAMST requirements and which are required also for FCS functions. However, the FCS associated functions are not the flight critical SCAS or landing approach functions.

Group 3 contains those parametere considered FCS Flight critical. Also included are FCS unique signals which have no function in other IDAMST applications. The sources of FCS flight critical data which are also shared by other IDAMST functions are shown routed to appropriate Remote Terminals (RT's).

FCS IDAMST INTERFACE - CONFIGURATION 1A

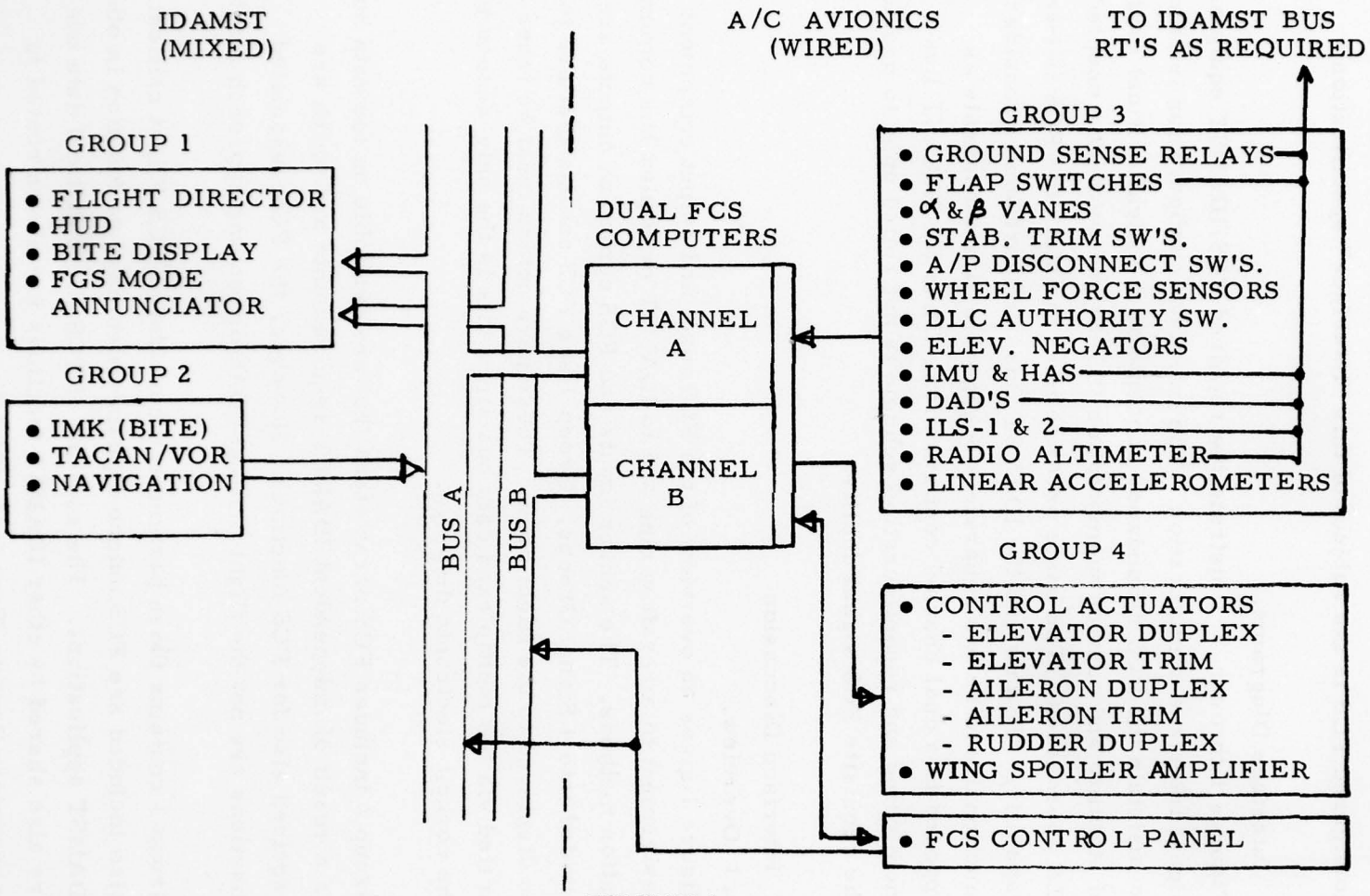


FIGURE 1.

Group 4 contain the Aircraft control surface commands computed by the FCS (except also included is the FCS aural warning system input). The control surface servo actuator electronics will be included within the FCS computers, or an electronics adapter box. Group 4 equipment parameters while functionally are FCS outputs do actually have signals flowing in both directions. All signal interfaces to the FCS from both the IDAMST bus and the direct aircraft wiring are analog or discrete d.c. voltages with the exception of aircraft attitude and heading signals which are a.c. synchro signals.

3.1.2.2 Group 3 Interfaces

The following subparagraphs discuss the Group 3 Interfaces. This group contains the hybrid FCS/IDAMST signal sources in which a single signal source routes a parameter to both the IDAMST Avionics Bus and the FCS hardwired input terminals.

3.1.2.2.1 IMU and HAS Interface

Figure 2 schematically indicates the signal division between the IDAMST Avionics System, the Flight Control System and the two equipment sources of aircraft attitude and heading information.

Both the CAROUSEL IV INS and the ARINC 569 Heading and Attitude Sensor system (HAS) provide two or more electrically isolated sources of pitch (θ) and roll (ϕ) attitude information and a single heading source. These signal sources are wired directly to the FCS and to the IDAMST RT Numbers 6 and 8 as shown in Figure 2. This signal division will not allow a fault in either the FCS or IDAMS T systems to affect the Pitch and Roll information received by the other system.

The primary and auxillary attitude validity discretes from both the INS and HAS are wired to the IDAMST RT's and FCS respectively.

IMU & HAS INTERFACE

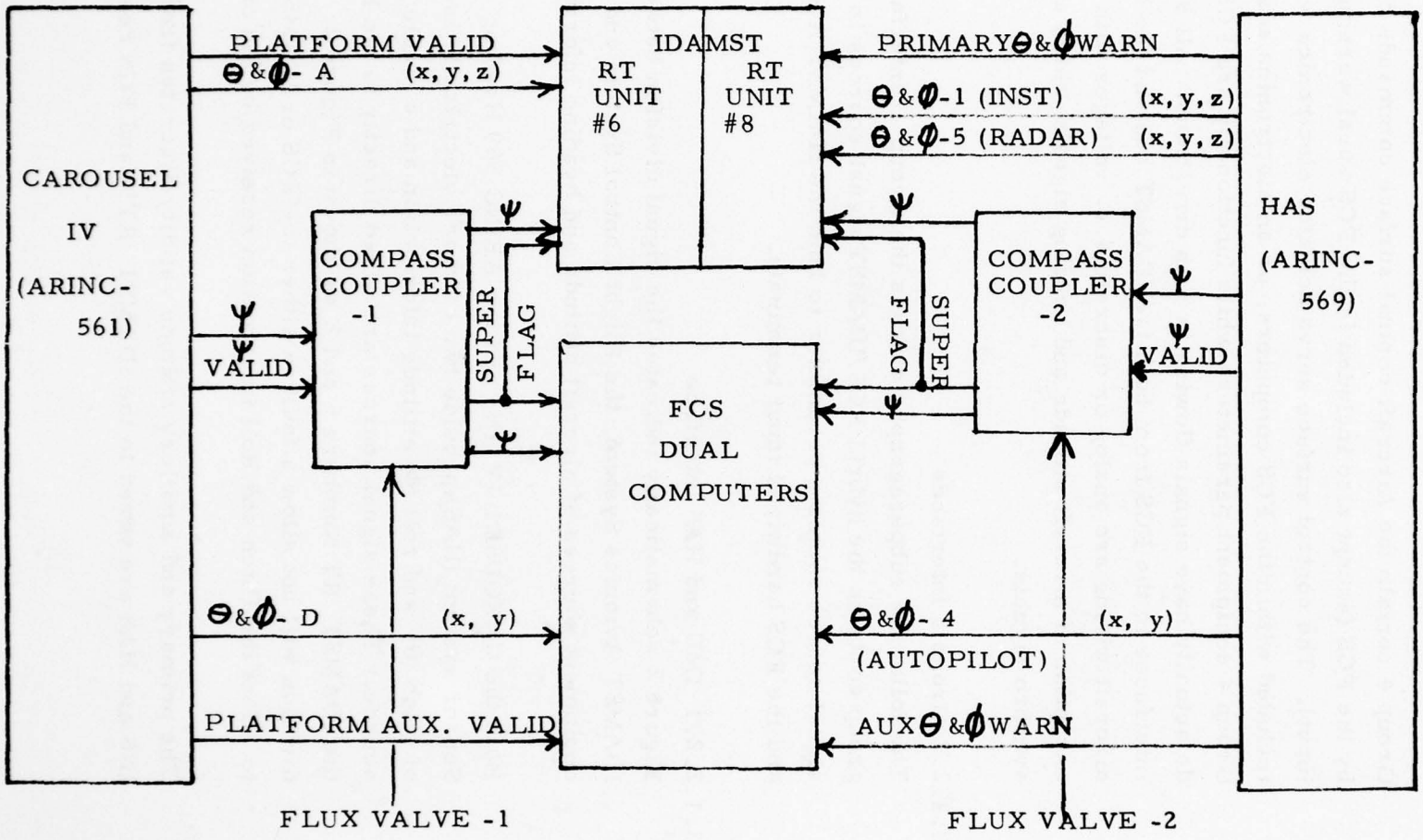


FIGURE 2.

The aircraft heading information from each of the attitude sources is routed to compass couplers where the gyro azimuth is updated with the earth's magnetic heading obtained from Flux valve inputs. The updated (slaved) heading information in each compass coupler is split into two electrically isolated sources. The two heading sources are routed, exclusively, to the IDAMST Remote Terminals and the FCS.

The heading validity signal from the INS and HAS sources is combined in the compass coupler with internal coupler validity signals to produce a super flag discrete voltage which is routed to both the IDAMST RT's and the FCS.

Notice that the FCS uses only the x-y leg voltages from the synchro sources. IDAMST is provided all x-y-z synchro voltages.

3.1.2.2.2 ILS Interface

Figure 3 shows the ILS receiver interface with the IDAMST Avionics and FCS. Only one receiver is shown but the second receiver is interfaced identically except for the Remote Terminal unit numbers.

The 14 NAV radio frequency select discrete signal wires from both the CAPT's and FO's NAV frequency select on the FGS panel are wired to IDAMST Remote Terminals 6 and 8 respectively.

From each ILS receiver the low-level glideslope and localizer deviation and flag voltages are wired directly to the FCS.

The high-level glideslope and localizer deviation and flag voltages from each receiver are wired to an IDAMST remote terminal; terminal No. 6 for the Captain's radios and terminal No. 8 for the First Officer's radio. These RT's are fitted with analog voltage interface modules for these signals. In addition to the deviation and flag voltages the marker beacon lamp discretes are wired to a discrete interface module on the associated RT.

ILS INTERFACE

(SAME FOR BOTH -1 & -2 RECEIVERS)

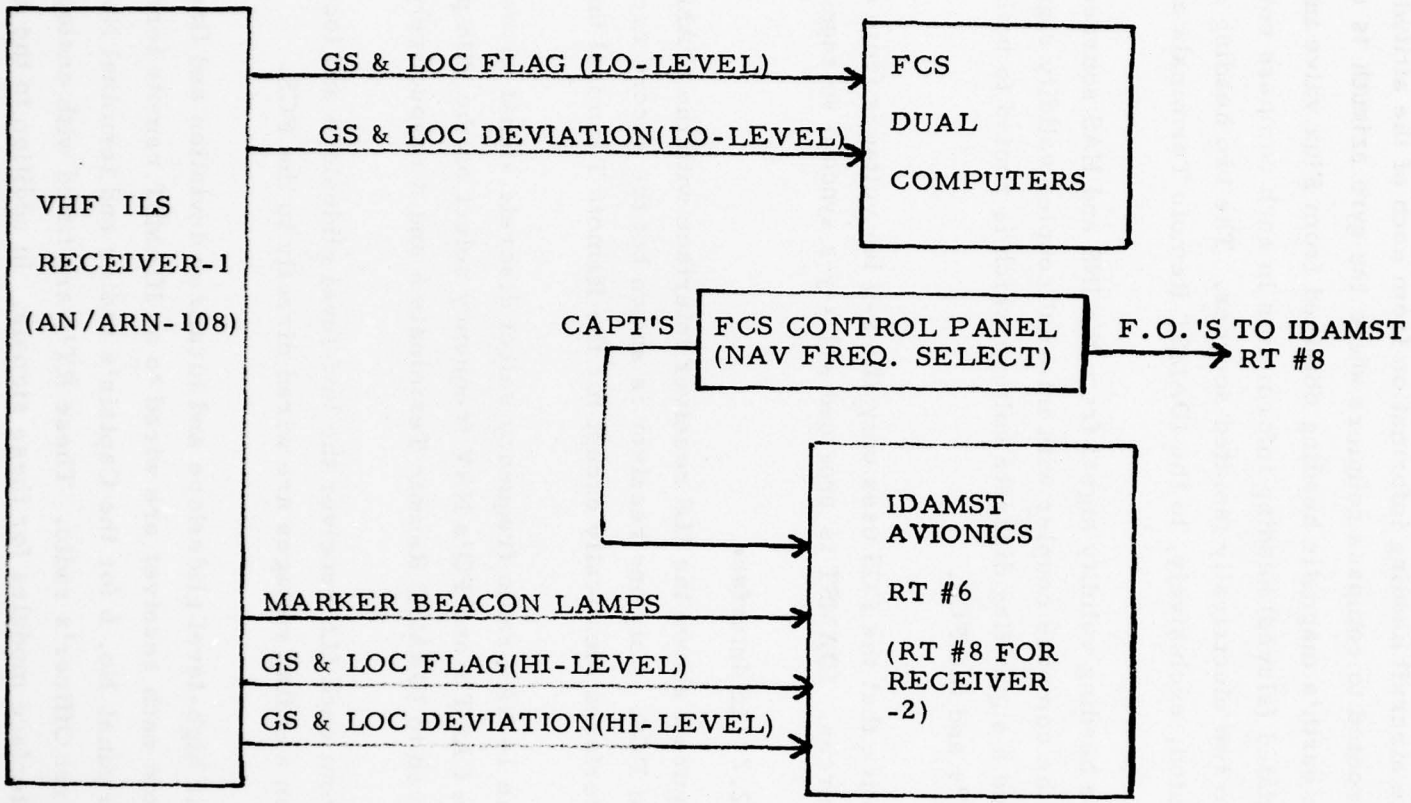


FIGURE 3.

3.1.2.2.3 Digital Air Data System

The Digital Air Data System (DADS) is interfaced to the FCS and IDAMST Avionics Bus as shown in Figure 4.

The FCS Air Data inputs and outputs are connected directly to the DADS. The FCS is wired to the DADS analog voltage outputs for Vertical Speed, Indicated Air Speed, Mach, and the signal reference dc voltage output. The FCS receives the DADS digitally encoded altitude from the DADS Number 3 digital data output bus.

The FCS receives the DADS air data validity voltages directly from the DADS. However, the same DADS discrete line drivers also input to a single ended discrete input interface module on the IDAMST Remote Terminal Number 7.

The FCS sends IAS, MACH, and ALTITUDE HOLD discrete voltages to the DADS whenever the DADS is to provide these parameters on the output lines.

The IDAMST receives air data parameters from the DADS digital data output buses Numbers 1 and 2.

3.1.2.2.4 Radio Altimeter Interface

Figure 5 shows the Radio Altimeter Interface with the FCS and IDAMST. The two dc analog voltage outputs of the altimeter R/T are routed one each to the FCS and to the IDAMST RT Number The single Altimeter Valid discrete is "T'd" and routed to both the FCS and the IDAMST RT.

3.1.2.3 Group 2 Interfaces

The FCS Group 2 interfaces (Ref. Figure 1), are specified in this section. All the parameters in Group 2 arrive at the FCS as dc analog or discrete voltages from the IDAMST data bus.

DADS' INTERFACE

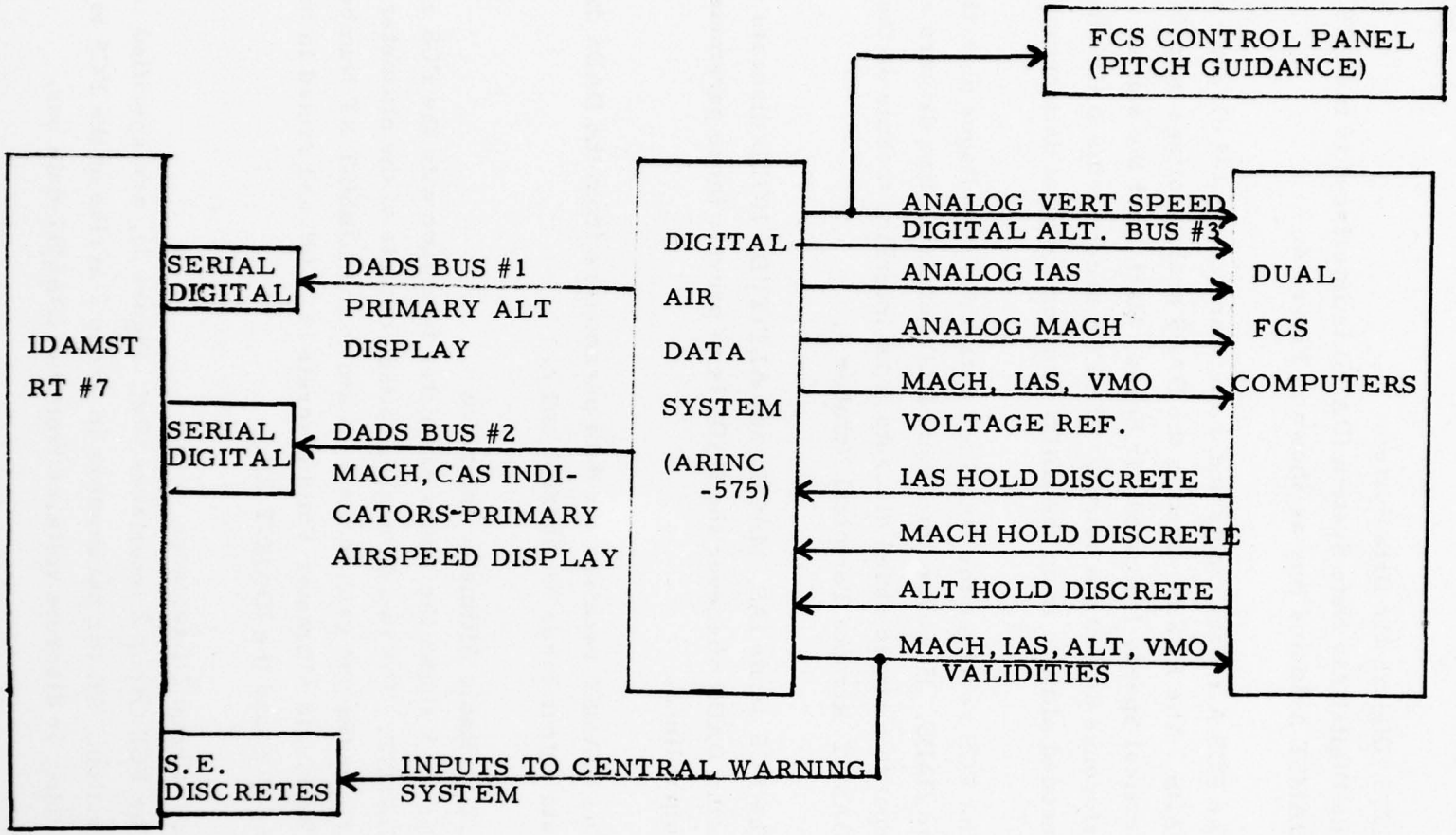
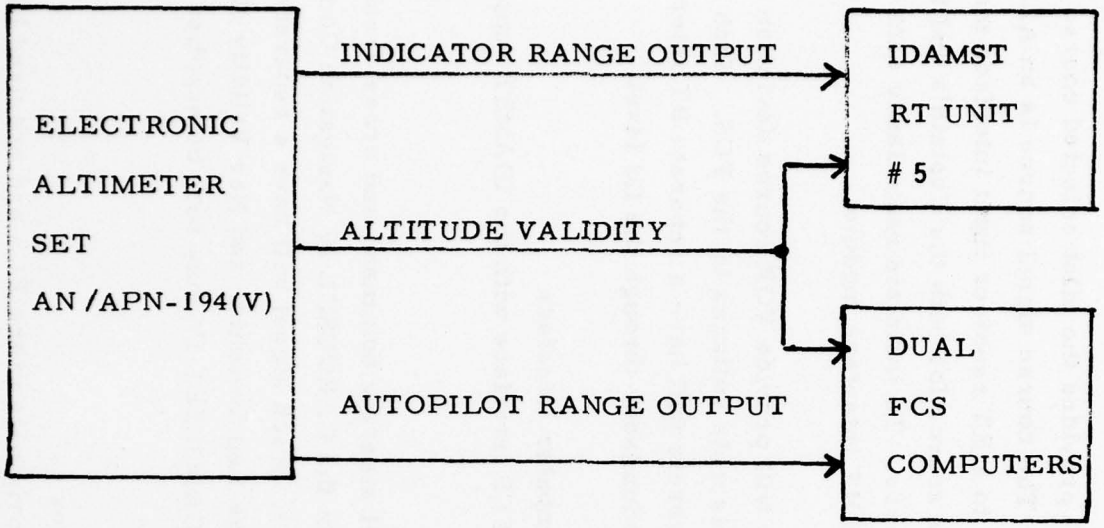


FIGURE 4.

RADIO ALTIMETER INTERFACE



Note: Second altimeter is interfaced identically except it is wired to Remote Terminal #7.

FIGURE 5.

3.1.2.3.1 VOR Interface

Figure 6 shows the FCS VOR interface. The FCS communicates with the VOR receivers indirectly via the IDAMST Digital Data Bus.

The FCS control panel provides the pilot selected course radial to the VOR receiver. The course signal source is an ARINC synchro-resolver and is wired to a RT resolver input interface module. There is a separate resolver source for both the Captain's and the First Officer's radio receivers. To maintain redundancy each resolver is wired to a separate RT interface module.

The IDAMST data bus will provide VOR course deviation dc analog and VOR validity dc discrete voltages to the FCS. Each deviation signal and validity discrete will have a separate RT interface module to maintain redundancy through the IM level.

3.1.2.3.2 Navigation Computer Interface

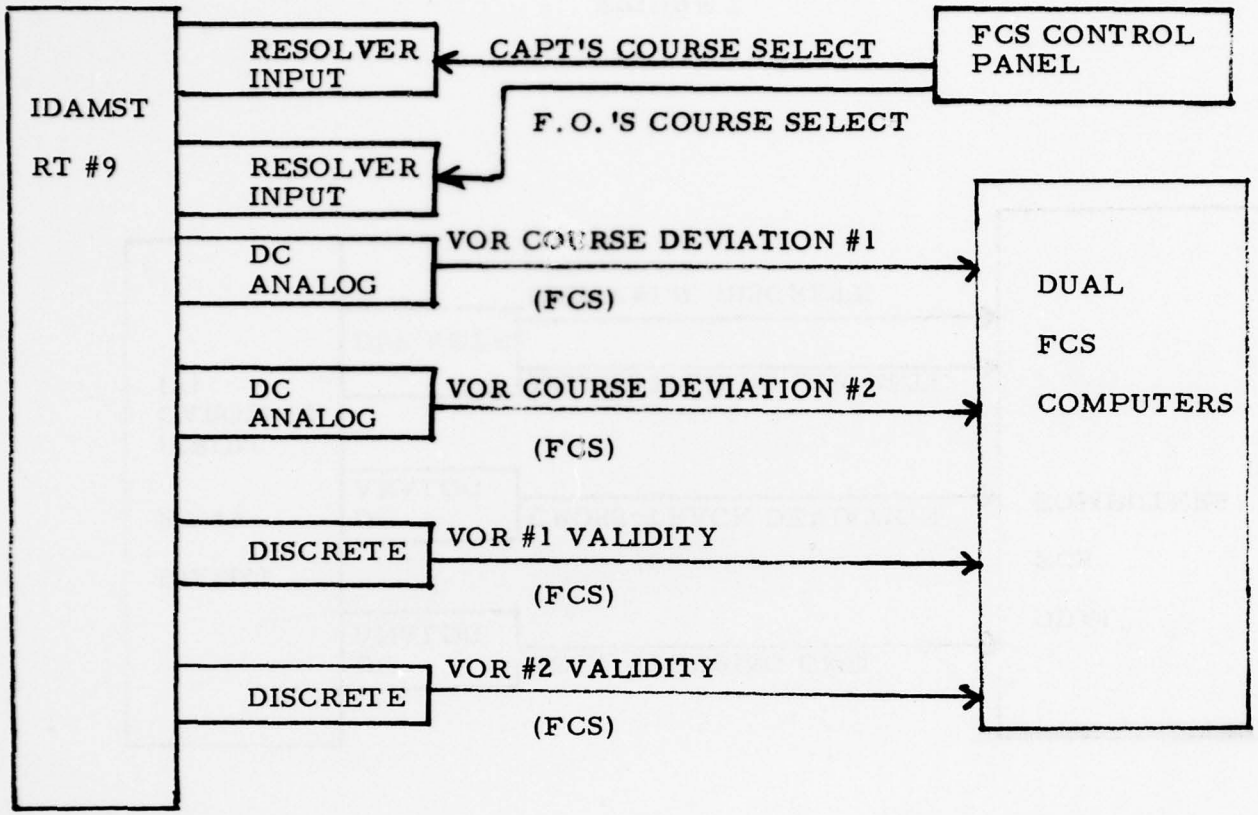
Figure 7 depicts the FCS interface with the IDAMST supplied navigation signals.

The FCS receives roll steering command and cross-track deviation dc analog signals from the CAROUSEL IV Navigation Computer via IDAMST RT Number 9. Each signal will have a separate Analog Interface Module. The Leg Switching and Nav Validity discretes originating from the CAROUSEL IV may both be supplied from a common Discrete IM.

3.1.2.4 Group 1 Interfaces

Group 1 parameters originate in the FCS and are used by the IDAMST electronic displays. The FCS signals originate as dc analog or discrete signals and are transferred to the IDAMST Bus by Remote Terminal Number 9.

VOR INTERFACE



NOTE: VOR TUNING IDENTICAL TO ILS TUNING. - SEE ILS INTERFACE

FIGURE 6.

NAVIGATION COMPUTER INTERFACE

(CAROUSEL IV)

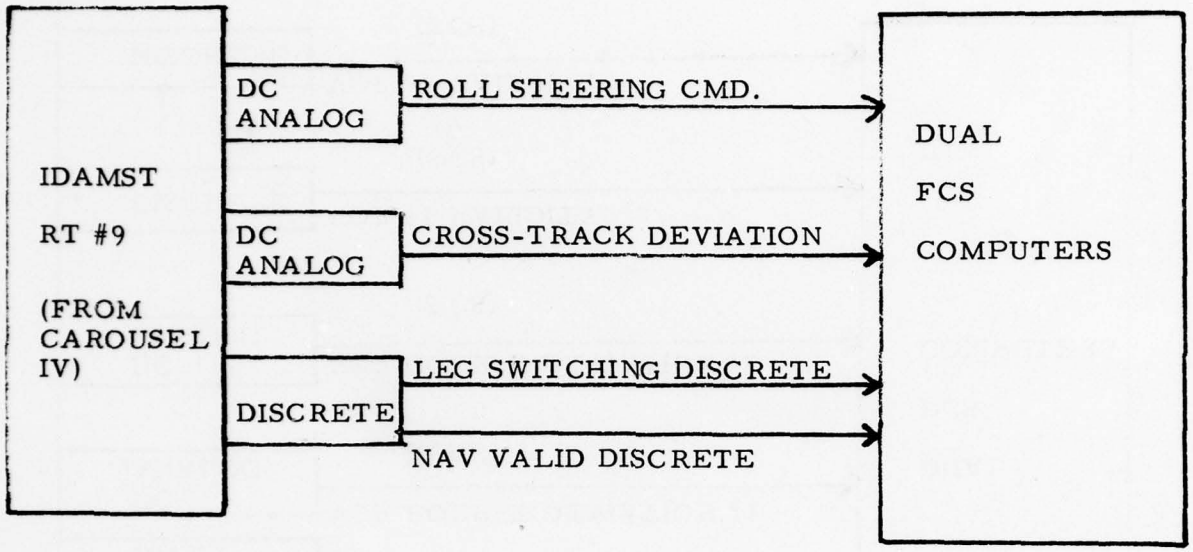


FIGURE 7.

FLIGHT DIRECTOR & HUD INTERFACE

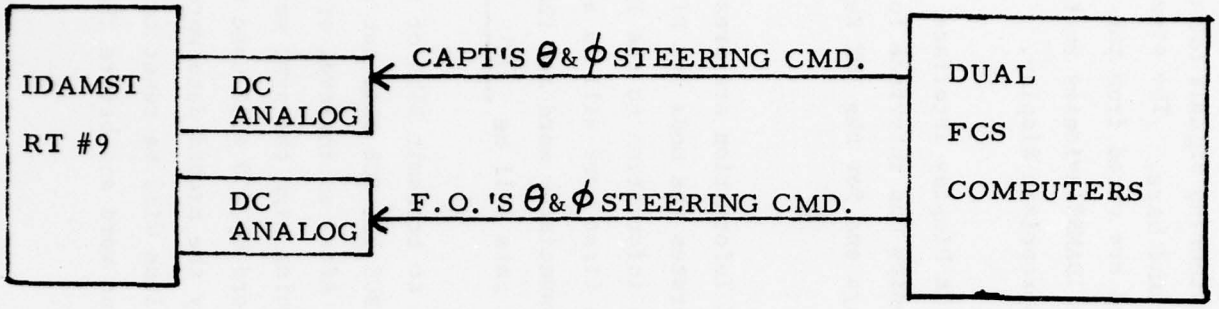


FIGURE 8.

3.1.2.4.1 Flight Director and HUD Interface

The FCS generates pitch and roll steering signals for use by the ADI and HUD Pitch and Roll command bars. The steering commands for both displays are identical and are wired from the FCS to a single d.c. Interface Module. The IDAMST Avionics must route the steering command signals to the appropriate display.

3.1.2.4.2 FGS Mode Annunciator and BITE Display Interface

Figure 9 indicates the IDAMST Avionics bus interface for the FCS Mode Annunciation, the BITE displays and for the IMK Keyboard BITE commands.

The FCS Mode Annunciation and BITE Information are presented on the IDAMST CRT displays. The FCS generates the mode and BITE display information and will transmit this information to the IDAMST system as three 16-bit serial words. The first word will be a sync word followed by the second FCS Mode Annunciator word and the third BITE display word. The serial data bit rate will be TBD MHz.

In operation, when the FCS desires to transmit BITE or Mode Annunciation information to the IDAMST BUS the FCS will set a "DATA COMING" line to a nominal 28 VDC, After an interval of 150 $\pm$ 50 micro-seconds following the line going high the sync word will be transmitted. Following the sync word by 150 $\pm$ 50 usec will be the first data word followed in turn by the second data word in another 150 $\pm$ 50 usec. The "DATA COMING" line will be reset to zero anytime after the beginning of the sync word and before the end of the second data word.

The MSB of either data word set to a "1" will signify the valid display word. In all serial data transmissions all three words will be sent but only one data word will have the MSB set to "1".

AD-A045 596 DOUGLAS AIRCRAFT CO LONG BEACH CA GOVERNMENT AVIONIC--ETC F/G 1/3
SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)
JUL 77 A CHAMBERLAIN, F J DILLON, F H KISHI F33615-76-C-1297

UNCLASSIFIED MDC-J7271-VOL-2 AFAL-TR-76-209-VOL-2 NL

4 OF 4
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Each data word will be binary encoded with a particular display message. Table 2 gives the data word binary code for each particular display message.

3.1.2.4.3 IMK BITE Commands to FCS Interface

The IMK/FCS interface, as shown in Figure 9, is performed through 5 d.c. discrete voltage lines.

As presently envisioned, the FCS BITE will be initiated either by a specific "EXECUTE FCS BITE" entered from the IMK or by an automatic FCS BITE EXECUTE command generated as a portion of the total IDAMST Self-Test.

In either case, the FCS will have more than one BITE mode. One mode will exercise the entire FCS system including the surface actuators, if safe to do so from a personnel standpoint. Another mode would exercise the FCS system minus the aircraft control surface actuators. There may be additional FCS BITE modes.

The FCS will be commanded to execute its BITE routine by a momentary interrupt discrete. However, before the interrupt line is pulsed the four discrete data lines must be set to indicate to the FCS which BITE mode to execute. After the FCS computer receives the "EXECUTE BITE" interrupt it will read the 4 data lines to determine which routine to perform.

The encoding of the discrete data lines is given in Table 3.

3.2 CHARACTERISTICS

TABLE 2.

SERIAL DATA WORD MESSAGE ENCODING

(FCS Mode Annunciation & BITE Display)

16-Bit Binary Code		DISPLAY MESSAGE
MSB	LSB	

TABLE 3

FCS BITE MODE DATA LINE ENCODING

DATA LINES 1 2 3 4	BITE EXECUTION MODE

The DAC or A/D associated with the IM shall have a ± 10 VDC signal range and a conversion resolution of 10 magnitude bits plus 1 sign bit (11 bits total). The DAC and A/D conversion time shall be 150 usec maximum. The linearity of the gain amplifier plus digital conversion shall be ± 1 LSB full scale.

- The a.c. analog input IM shall be a d.c. IM with a floating demodulator front end. The a.c. input IM shall be provided on a.c. phase reference voltage from the interfaced signal source equipment. The demodulated signal polarity shall be (+) for a.c. inputs in phase with the reference voltage.

  The maximum a.c. signal range shall be 0-13 vrms, 400 Hz. The reference voltage shall be 26 vrms, 400 Hz.

  Input impedance shall be ≥10K.

- The a.c. resolver input IM shall accept ARINC-407 resolver signals for development of the sin θ and cos θ functions by the IDAMST Avionics. The resolver IM shall provide the required 26 vrms, 400 Hz excitation to the interfaced equipment resolver. The IM shall use the resolver excitation voltage as the demodulator phase reference. Voltage phasing and mechanical shaft rotation shall be as specified in ARINC-407.

  The IM shall convert the sine and cosine resolver signals with an accuracy sufficient for the IDAMST avionics to differentiate mechanical shaft rotation to within one degree.

3.2.1 Interface Module Requirements

All the FCS signals interfacing with the IDAMST Multiplex bus remote terminals have their signals conditioned by an associated Interface Module. The FCS/IDAMST interface requires the following IM types:

1) D.C. Analog Input (to IDAMST System)
2) D.C. Analog Output (from IDAMST System)
3) D.C. Single Ended Discrete Input
4) D.C. Single Ended Discrete Output
5) A.C. Analog Input
6) A.C. Resolver Input

The Interface Modules, in addition to satisfying the Remote Terminal requirements, must be able to operate with the following signal characteristics:

- Both the single-ended discrete input and output voltages will be: HIGH 27.5 ± 1.0 VDC
  LOW 1.0 ± 1.0 VDC

  The source and load impedance will be TTL compatible with source = 500Ω
  load $\leq$ 100K

- The DC analog input and output modules shall contain a gain adjusting, isolation amplifier to accept signal ranges from -30 to + 30 VDC. The gain amplifier will scale the entire analog signal range from, or to, a standard $\pm$ 10 VDC range for use with a Digital-to-Analog or Analog-to-Digital converter with Output or Input IM's respectively. The gain amplifier shall have an input impedance $\geq$ 50K with an output impedance $\leq$ 200 ohms.

3.2.2 Parameter Data Rates

The FCS computers will run with a fundamental frame rate of 20 sps. Therefore, the analog dc radio and navigation Group 2 parameters (REF: Figure 1) shall be updated by the IDAMST avionics at a sampling rate of 20 Hz minimum. In the event that the FCS is run as a multi-rate program the Group 2 FCS inputs would probably be sampled at some rate less than 20 Hz. However, IDAMST shall provide these parameters at the required 20 Hz irregardless.

The FCS will provide the IDAMST Group 1 parameters at an update rate equal to the FCS fundamental frame rate of 20 Hz. The HUD and Flight Director parameters will be updated at 20 Hz. The BITE and MODE ANNUNCIATOR serial sync plus data words will be output at 20 Hz. However, IDAMST must interrogate the "DATA COMING" line and the MSB of each data word to determine if the serial data is to be used to update the displays.

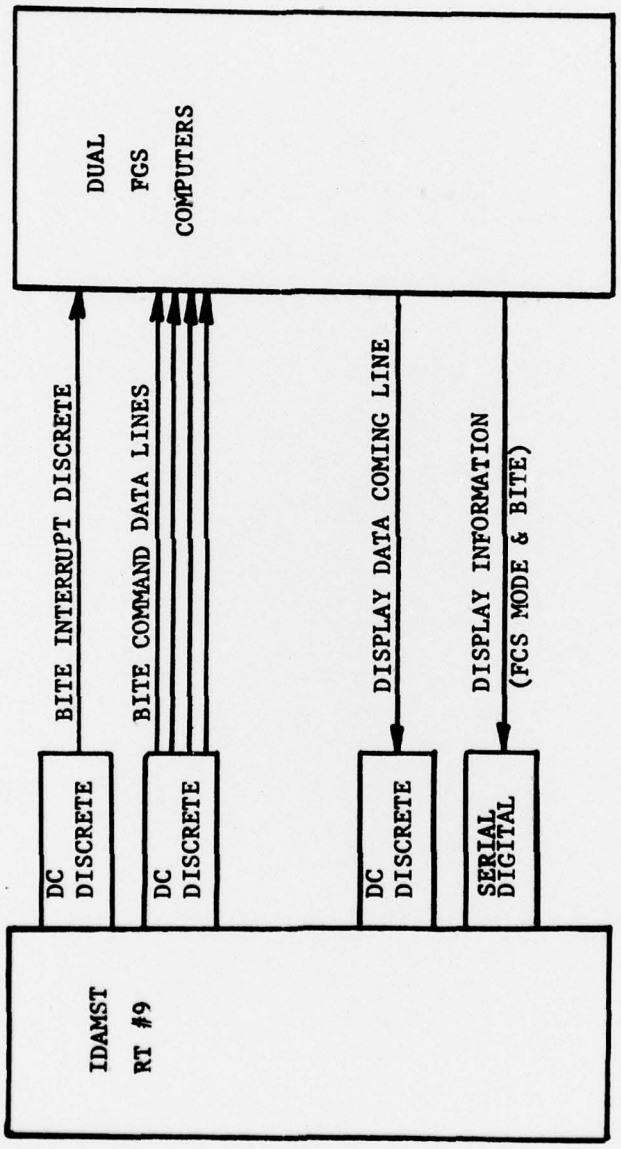

FIGURE 9.

*U.S.Government Printing Office: 1977 — 757-001/84