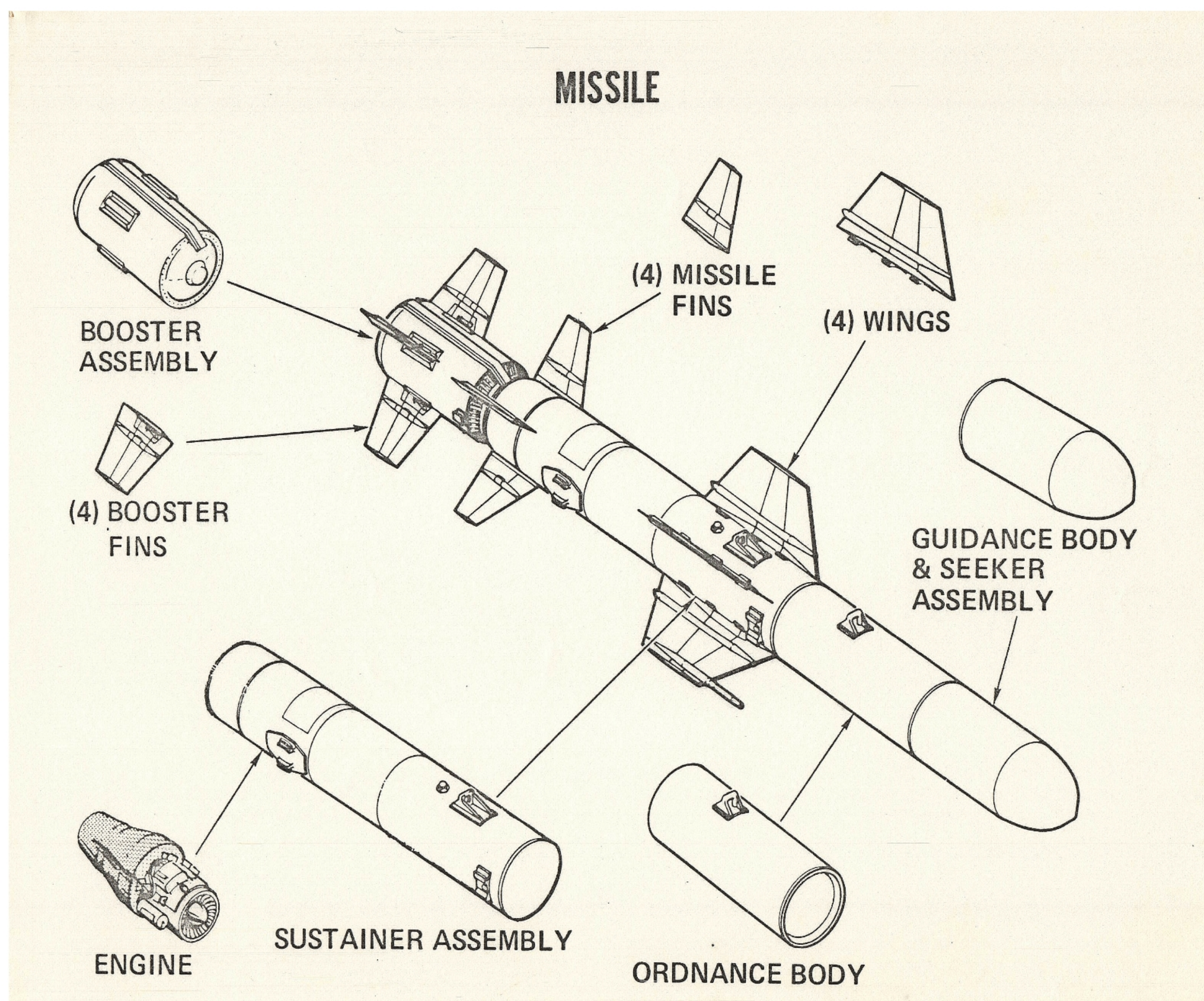


Harpoon Missile Proposal



CONTENTS

HARDWARE

MISSILE

CANISTER LAUNCHER

COMMAND AND LAUNCH SUBSYSTEM

MISSILE SIMULATOR

MISSILE SUBSYSTEM TEST SET

HANDLING EQUIPMENT

INTEGRATED LOGISTICS SUPPORT

SCHEDULES

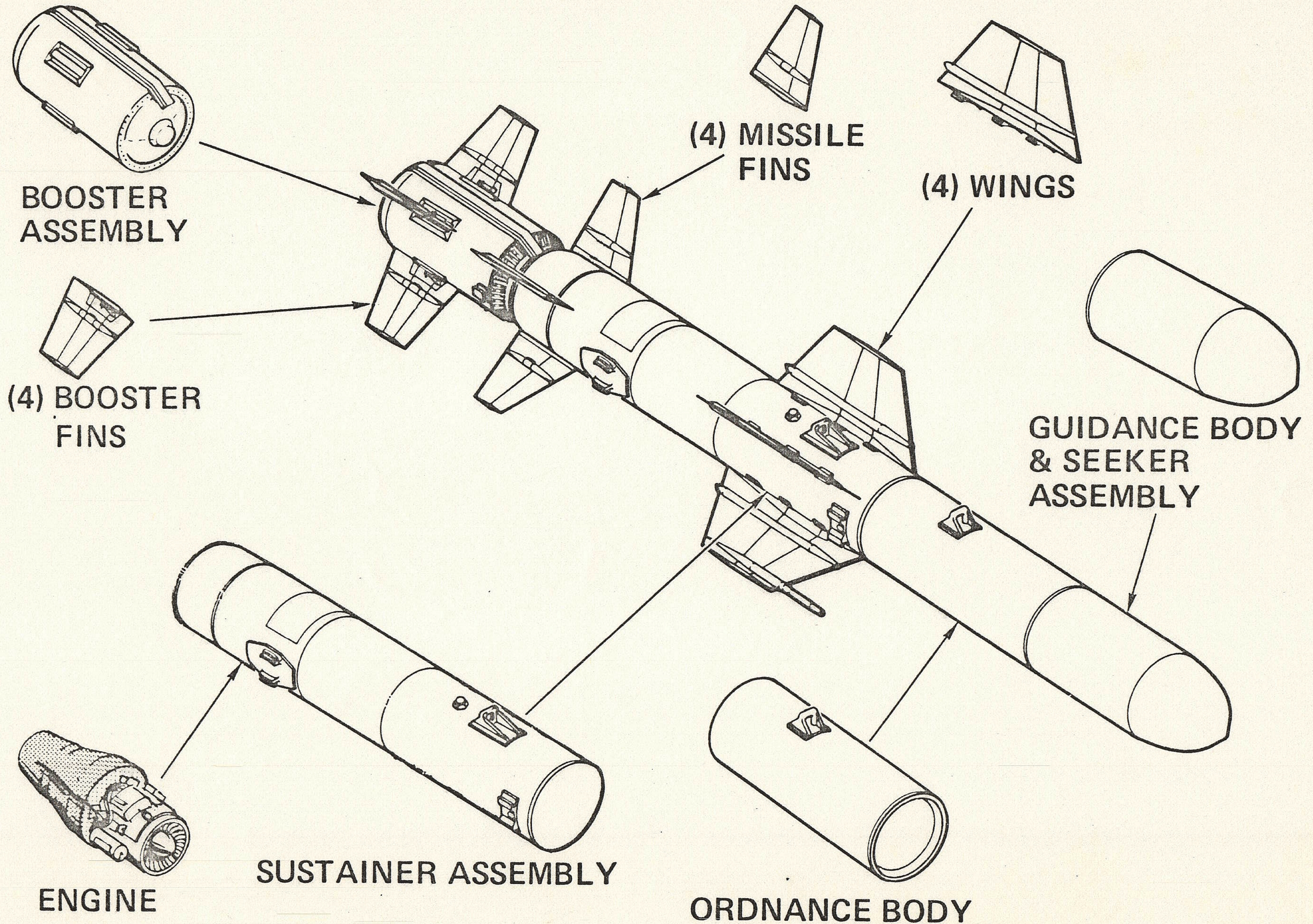
HARPOON WEAPON SYSTEM

MISSILE DESIGN PHASE

COST

KEY ITEMS REQUIRING EARLY COORDINATION

MISSILE



FOUR IDENTICAL CANISTERS

INTERCHANGEABLE SEALED CANISTERS

REUSABLE AFTER MINIMUM REFURBISHMENT

UNIVERSAL DESIGN FOR ALL SHIP APPLICATIONS

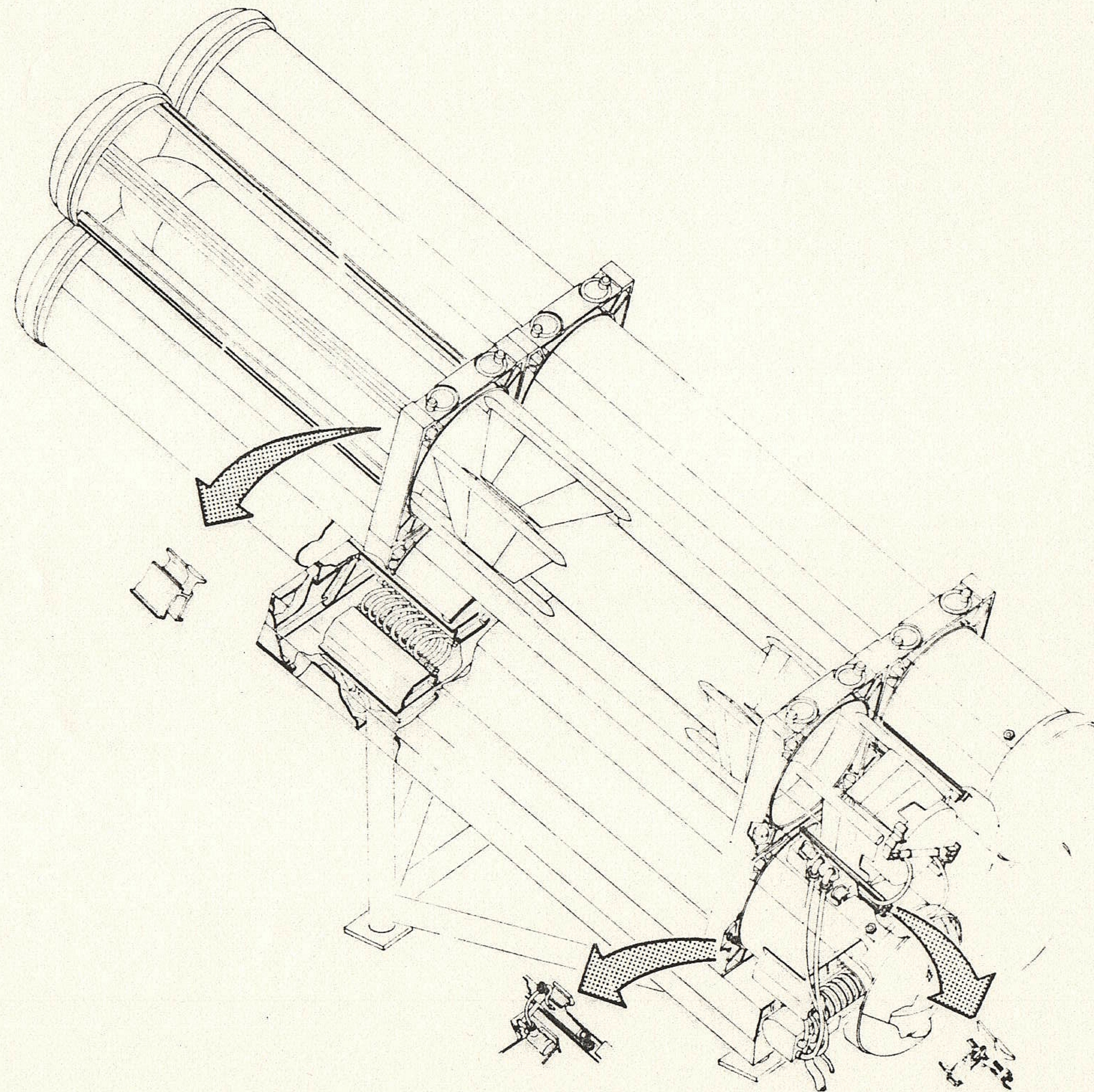
PERMANENTLY DECK-MOUNTED SUPPORT

FIXED ELEVATION (25°) AND TRAIN

CAPABLE OF ACCEPTING 2, 3, OR 4 CANISTERS PROVIDING OPERATIONAL FLEXIBILITY

MINOR VARIATIONS IN TRUSS GEOMETRY FOR ADAPTATION TO ANY SHIP

CANISTER/LAUNCHER



FREE STANDING SYSTEM

CONTROL PANEL PROVIDES CONTROL AND DISPLAY OF LAUNCH FUNCTIONS

DATA CONVERSION UNIT (DCU) CONVERTS INPUT DATA TO PROPER FORMAT

HARPOON DATA PROCESSOR COMPUTES MISSILE ORDERS

INTERFACE DATA REQUIREMENTS

TARGET RANGE AND BEARING

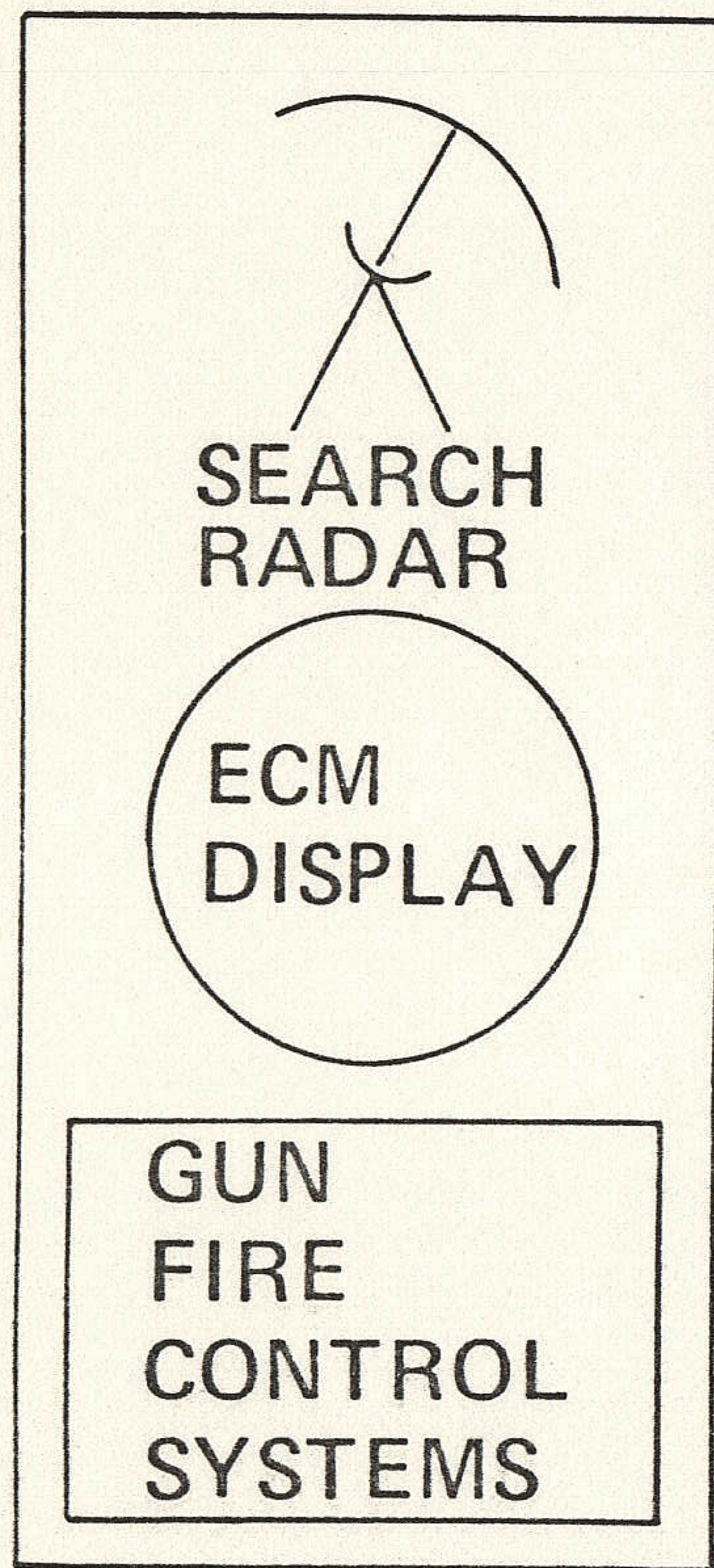
SHIP MOTION (PITCH, ROLL, SPEED, HEADING)

WIND DIRECTION AND VELOCITY

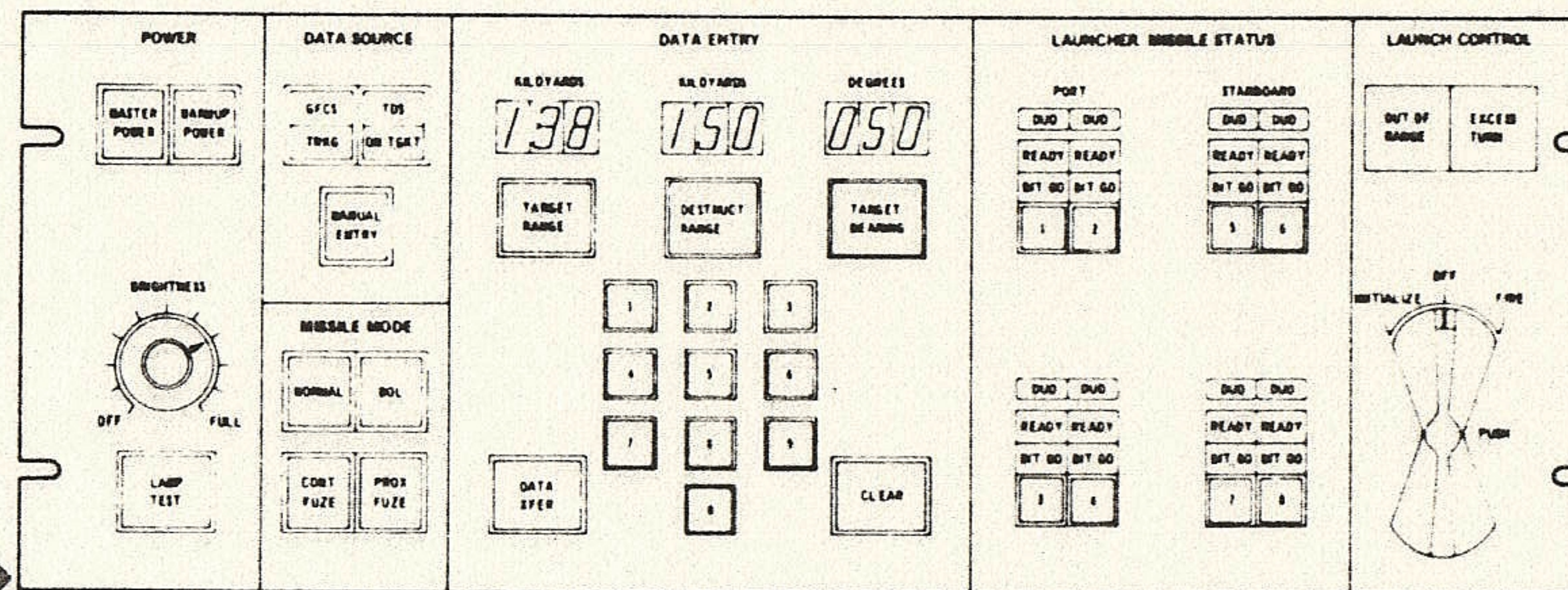
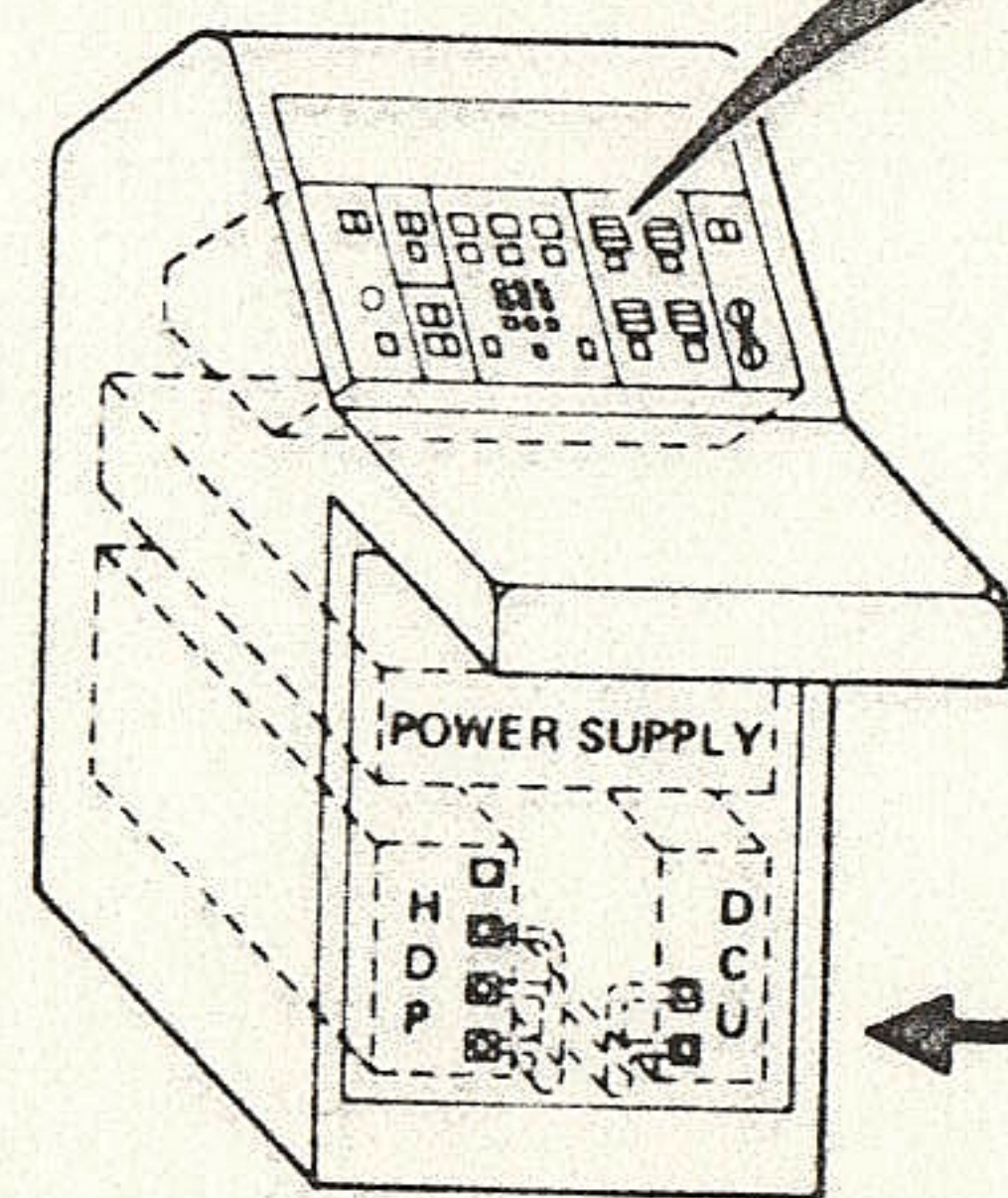
MANUAL DATA ENTRY PROVIDES BACKUP LAUNCH CAPABILITY

COMMAND AND LAUNCH SUBSYSTEM

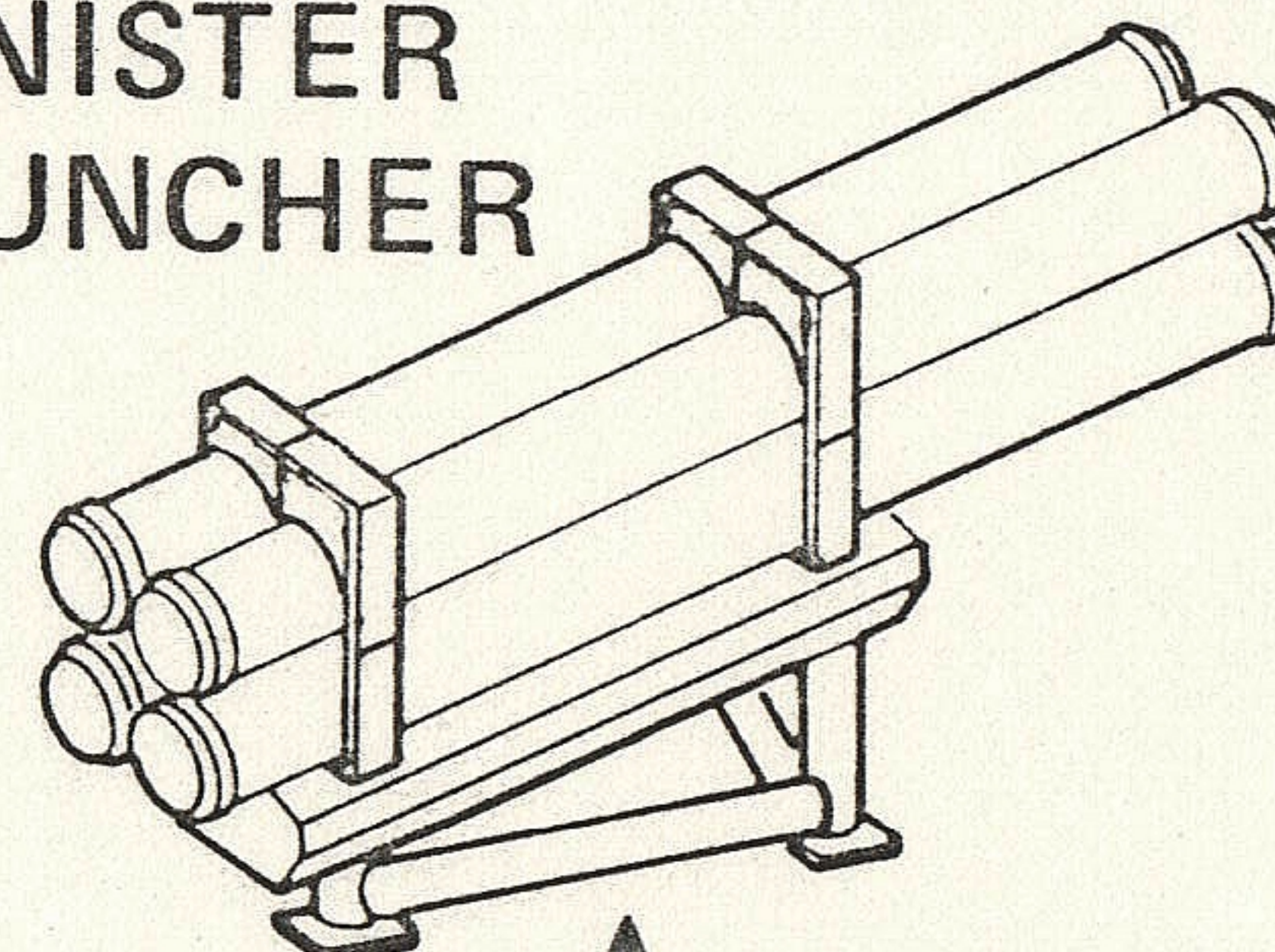
FIRE CONTROL SYSTEMS



CANISTER HARPOON CONTROL CONSOLE



HARPOON CANISTER LAUNCHER



DATA INTERFACE

OTHER TARGETING SOURCES, (SONAR, EW)

SHIP INPUTS (INERTIAL REFERENCE, WIND INDICATION)

CONSTRUCTION

PORTABLE

SELF-CONTAINED, SUITCASE CONCEPT

FUNCTIONS

ELECTRICALLY SIMULATES MISSILE ON LAUNCH PLATFORM (SHIPS OR AIRCRAFT)

LOADS AND STIMULATES MISSILE COMMAND AND LAUNCH SUBSYSTEM

DISPLAYS DIGITAL INITIALIZATION DATA WORDS

USES

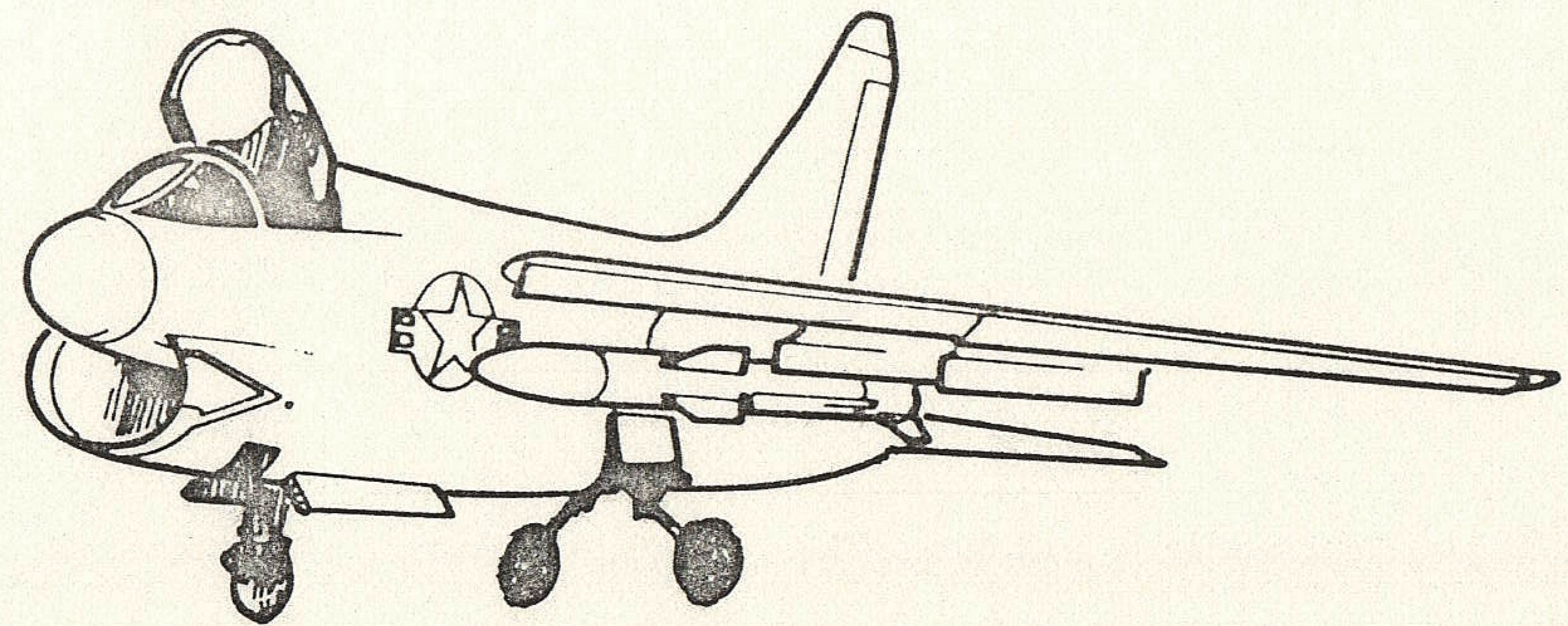
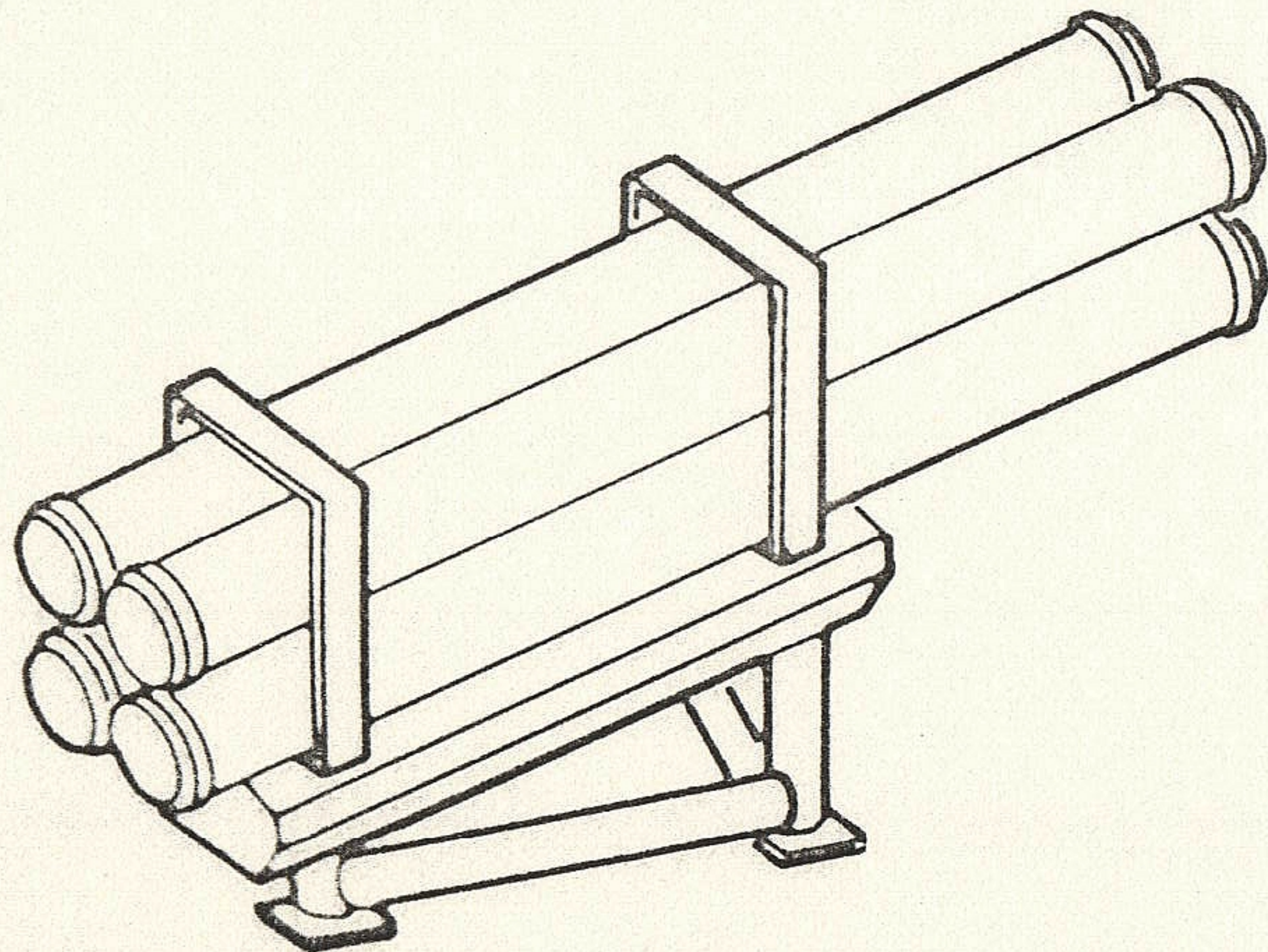
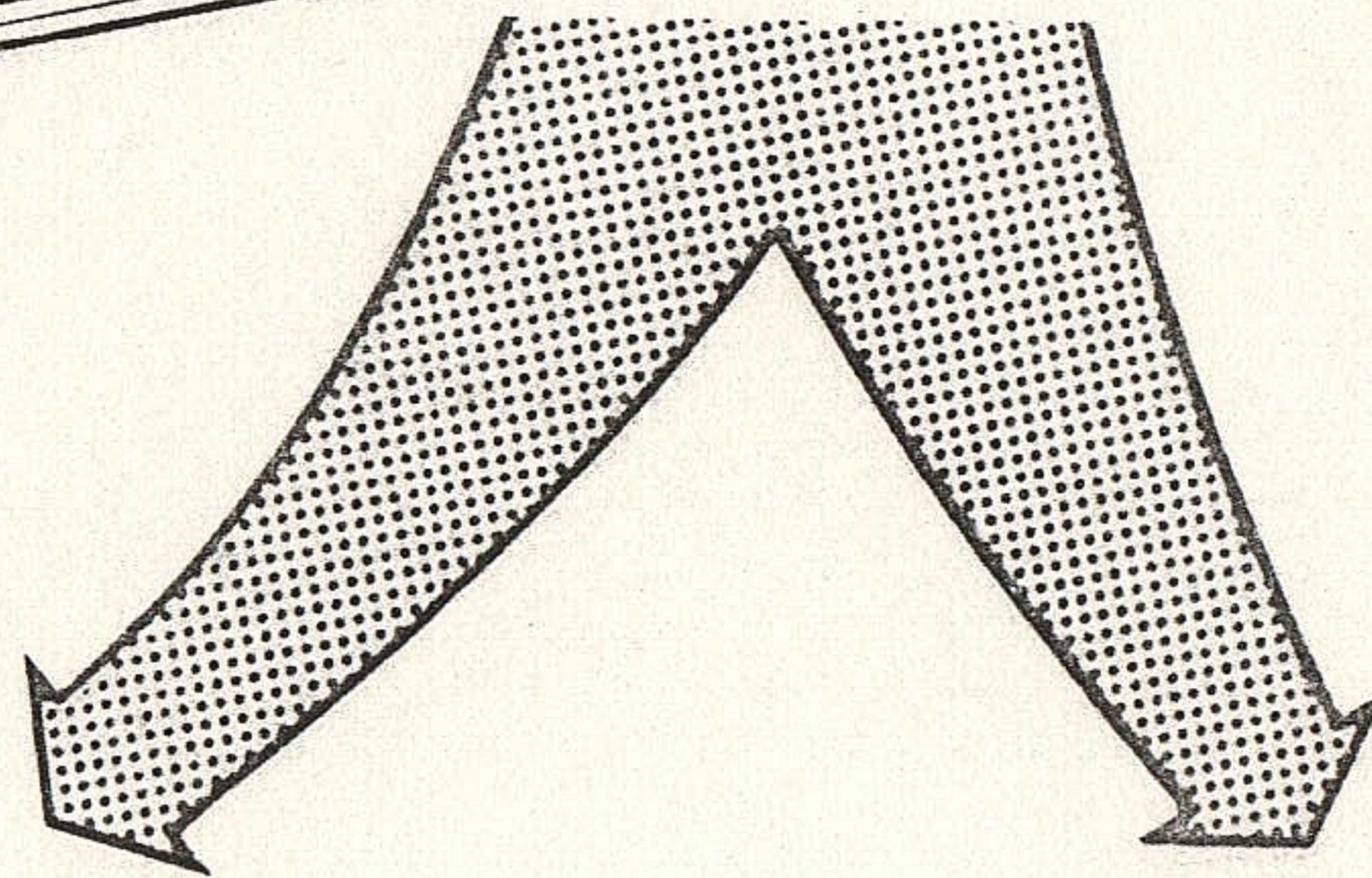
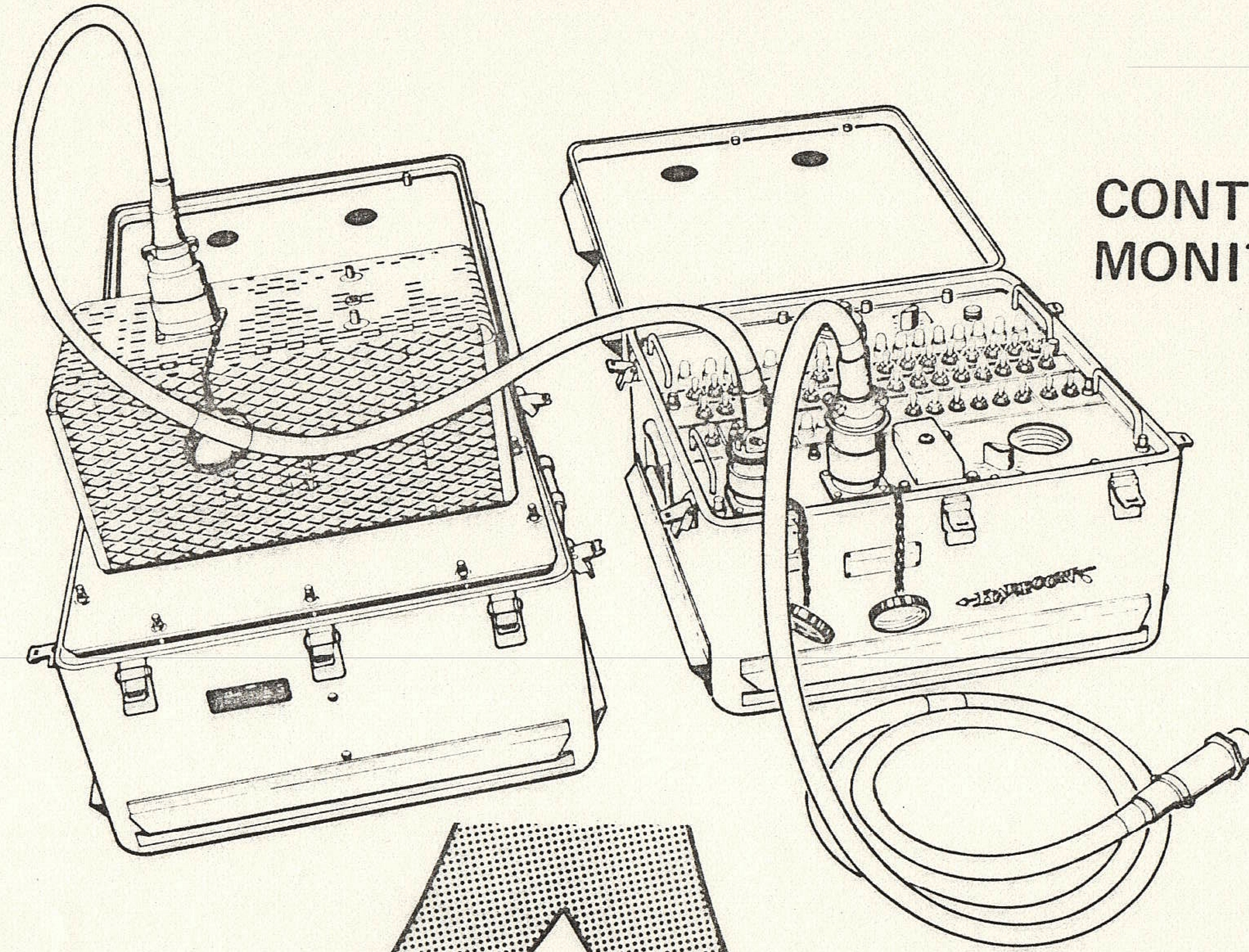
VERIFIES COMMAND AND LAUNCH SUBSYSTEM PERFORMANCE

COMMAND AND LAUNCH SUBSYSTEM FAULT ISOLATION

MISSILE SIMULATOR

SELECTABLE
LOAD BANK
UNIT

CONTROL AND
MONITOR UNIT



CONSTRUCTION

MODULAR CONSTRUCTION

EXTENDIBLE MODULES FACILITATE MAINTENANCE

REQUIRES NO EXTERNAL COOLANT SOURCE

FUNCTIONS

AUTOMATICALLY APPLIES TEST STIMULI (UNDER TEST PROGRAM CONTROL)
AND EVALUATES RESPONSES – GO/NO-GO RESULTS

RECORDS TEST RESULTS ON MAGNETIC TAPE

PRINTS OUT TOLERANCE TEST PARAMETERS

DISPLAYS OPERATORS INPUTS AND TEST COMPUTER RESPONSES

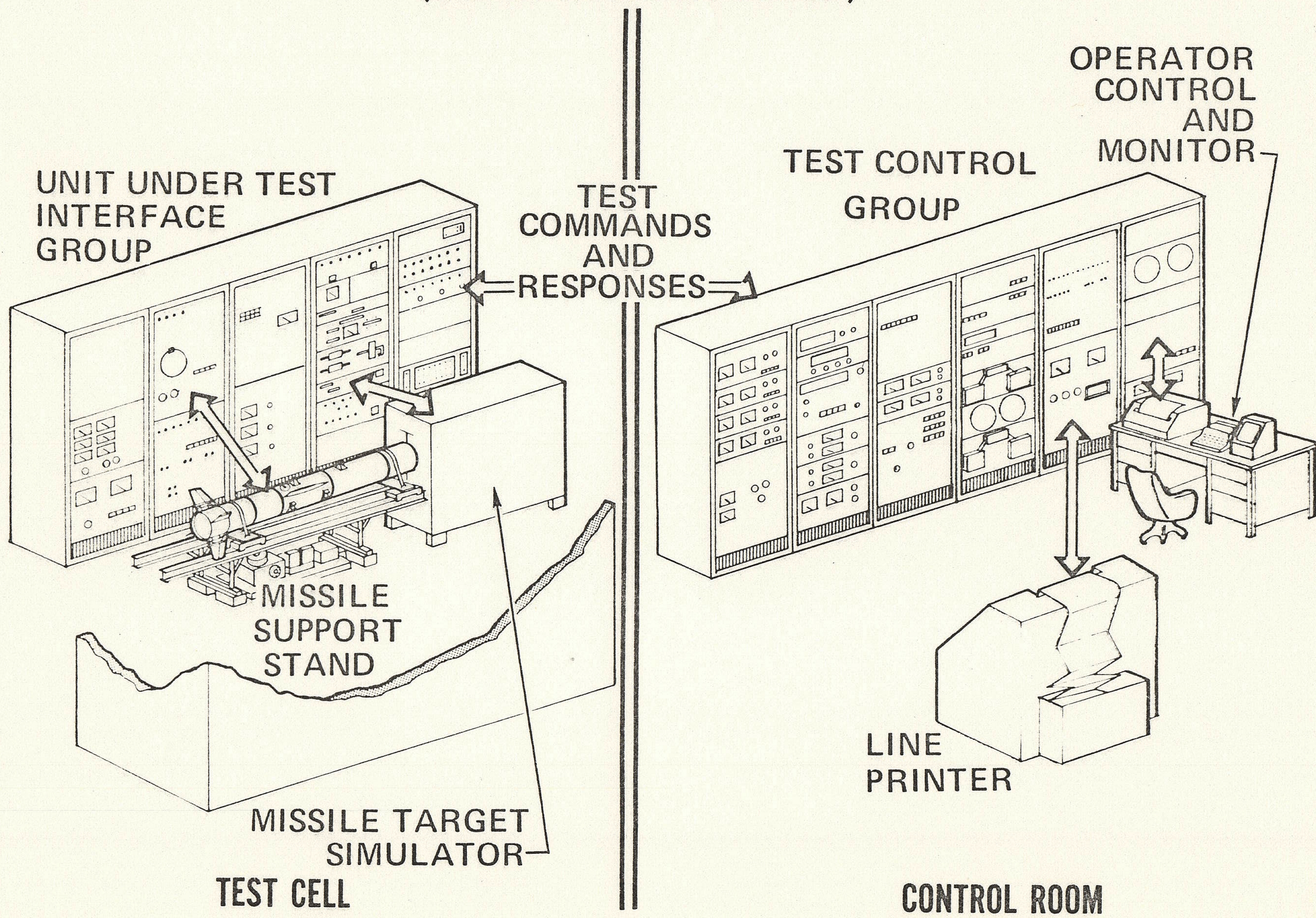
OPERATOR CONTROLS FAULT ISOLATION SUBPROGRAMS

USES

AUTOMATIC PERFORMANCE VERIFICATION OF ALL-UP-ROUND AND/OR MISSILE
SECTION

AUTOMATIC, OPERATOR SELECTED, FAULT ISOLATION TEST CAPABILITY

MISSILE SUBSYSTEM TEST SET (WEAPON STATION APPLICATION)



TITLE	SOURCE	TITLE	SOURCE
MISSILE, HOIST BEAM	CFE ↑ ↓ CFE	CABLE ASSEMBLY	CFE
MISSILE SECTION, HOIST BEAM		BOOSTER TIE DOWN	↑
MISSILE ASSEMBLY/ TEST STAND		SHIPPING CONTAINER	↓
MISSILE SECTION, ASSEMBLY TEST STAND		HOIST/ROTATION BEAM	CFE
RAIL ASSEMBLY		CANISTER SHIPPING CONTAINER	PORT FACILITY OR GFE
RING ASSEMBLY		FORKLIFT, 1.5 TON CRANE, SLING (1.5 TON CAP.) , BOOST HOIST	GFE
BOOSTER/BOATTAIL MATE		FLATBED TRUCK OR TRAILER	CFE
JACK ASSEMBLY		ENGINE HOIST	CFE
BOOSTER INSTALLATION		ENGINE HOIST ADAPTER	CFE
RESTRAINT ASSEMBLY			
BOOSTER TIE DOWN			
STRUT ASSEMBLY			
BOOSTER TIE DOWN			

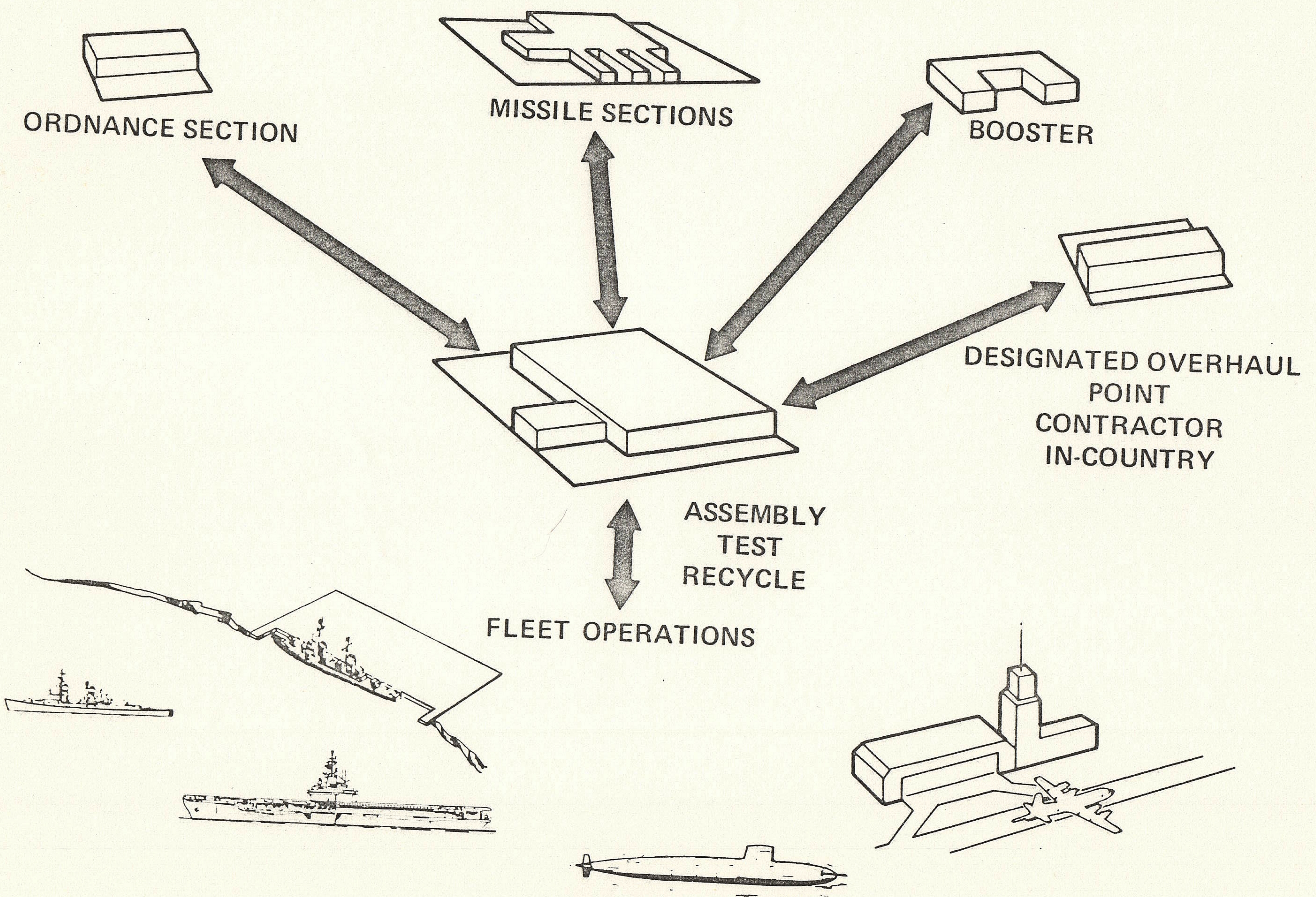
DEFINES LOGISTICS RESOURCE REQUIREMENTS

DEFINES MAINTENANCE AND SUPPORTABILITY REQUIREMENTS

PROVIDES SPARES/REPAIR PARTS, TECHNICAL PUBLICATIONS, TRAINING
FIELD SERVICE SUPPORT

ANALYZES OPERATIONAL FEEDBACK DATA AND REFINES LOGISTICS SUPPORT

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THIS PAGE UNCLASSIFIED
INTEGRATED LOGISTICS SUPPORT



MISSILE DESIGN PHASE SCHEDULE

CALENDAR YEAR	1971	1972	1973
ENGINE CONTRACT	▽		
MISSILE SYSTEM CONTRACT	▽		
ENGINE TESTS		▬	
P-3 SEPARATION TESTS		▬	6 VEHICLES
BLAST TESTS (ASROC)		▬	4 VEHICLES
MISSILE FLIGHT TESTS			▬
TERMINAL GUIDANCE FIRING			▬
			6 VEHICLES
			12 MISSILES

HARPOON BUDGETARY COST PROJECTION

		<u>1972</u> <u>DOLLARS</u>
<u>SHIPBOARD</u>		
MISSILE AND BOOSTER (1)		\$ 230,000
CANISTER LAUNCHER (1)		\$ 70,000
CANISTER (4)	\$ 56,000	
BASE (1)	\$ 14,000	
MISSILE SIMULATOR (1)		\$ 20,000
COMMAND AND LAUNCH (1) (CANISTER LAUNCHER)		\$ 90,000

PROJECTED AVERAGE PRICES FOR HARDWARE DELIVERED 1976-1983

HARPOON BUDGETARY COST PROJECTION

1972
DOLLARS

WEAPON STATION

MISSILE SYSTEM TEST SET (1)

\$1,300,000

HANDLING & EQUIPMENT (1 SET)

\$ 700,000

INTEGRATED LOGISTICS SUPPORT

TRAINING AND DATA *

USE \$1,000,000

SPARES *

USE 10% OF HARDWARE

SHIP INTEGRATION, ENGINEERING SUPPORT AND
SPECIAL REQUIREMENTS. (SUPPORT
CONTRACT REQUIRED)

*

*SPECIFIC REQUIREMENTS TO BE DEFINED.

HARPOON BUDGETARY COST PROJECTION

TOTAL COST
1972 DOLLARS

ONE SHIP SET OF HARDWARE

MISSILES AND BOOSTER	8	(\$230,000)	\$1,840,000
CANISTER LAUNCHER	2	(70,000)	\$ 140,000
MISSILE SIMULATOR	1	(20,000)	\$ 20,000
COMMAND AND LAUNCH	1	(90,000)	<u>\$ 90,000</u>

TOTAL ONE SHIP SET \$2,090,000

ONE WEAPON STATION SET

\$2,000,000

INTEGRATED LOGISTICS SUPPORT

TRAINING AND DATA * \$1,000,000

SPARES * USE 10% OF HARDWARE

SHIP INTEGRATION, ENGINEERING SUPPORT AND
SPECIAL REQUIREMENTS (SUPPORT CONTRACT REQUIRED) *

*SPECIFIC REQUIREMENTS TO BE DEFINED.

ROYAL NETHERLANDS NAVY PLANNING INFORMATION

18 SHIP SETS

2 GUIDED MISSILE FRIGATES

16 STANDARD FRIGATES

ONE SHIP SET

2 CANISTER LAUNCHERS

1 COMMAND AND LAUNCH SYSTEM

1 MISSILE SIMULATOR

16 MISSILES —

8 ON SHIP

8 IN RESERVE

1 WEAPON STATION

INTEGRATED LOGISTICS SUPPORT

HARPOON BUDGETARY COST PROJECTION ROYAL NETHERLANDS NAVY PLANNING INFORMATION

<u>SHIPBOARD</u>			<u>TOTAL COST 1972 DOLLARS</u>
MISSILE AND BOOSTER	312	(\$ 230,000)	\$71,760,000
CANISTER LAUNCHER	36	(\$ 70,000)	\$ 2,520,000
MISSILE SIMULATOR	18	(\$ 20,000)	\$ 360,000
COMMAND AND LAUNCH	18	(\$ 90,000)	\$ 1,620,000
<u>WEAPON STATION</u>	1 SET	(\$2,000,000)	<u>\$ 2,000,000</u>
HARDWARE TOTAL			\$78,260,000
 <u>INTEGRATED LOGISTICS SUPPORT</u>			
TRAINING AND DATA	*		\$ 1,000,000
SPARES	*		USE 10% OF HARDWARE
SHIP INTEGRATION, ENGINEERING SUPPORT AND SPECIAL REQUIREMENTS. (SUPPORT CONTRACT REQUIRED)			*

*SPECIFIC REQUIREMENTS TO BE DEFINED

FUNDING PROFILE ROYAL NETHERLANDS NAVY PLANNING INFORMATION

CALENDAR YEAR	1973	1974	1975	1976	1977	1978	1979	1980	1981	TOTAL
DOLLAR COMMITMENT (MILLIONS OF 1972 DOLLARS)	.7*	15	15	13	13	11	8.6	7	7	\$90.3 M
										\$ 78.3 M
										\$ 1.0 M
										\$ 7.8 M
										\$ 3.2 M
										<u>\$ 90.3 M</u>

*START SHIPBOARD INTEGRATION
 COORDINATE SPECIAL REQUIREMENTS
 ASSIST IN DEVELOPMENT OF OPERATIONAL REQUIREMENTS
 START DEVELOPMENT OF SUPPORT PLAN

KEY ITEMS REQUIRING EARLY COORDINATION

ASSIST IN DEVELOPING OPERATIONAL REQUIREMENTS

SPECIFIC TECHNICAL REQUIREMENTS (OTHER THAN BASELINE)

LAUNCH PLATFORM INTEGRATION, SPECIAL REQUIREMENTS

DEVELOP SUPPORT PLAN