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AN/SLQ-32(V) OPERATOR'S HANDBOOK
Volume 1

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This volume is the first in a series addressing the role of the operator in Electronic Warfare in the AEGIS Combat Direction System. It describes the AN/SLQ-32 Electronic Warfare system, provides a complete set of abbreviations and acronyms specific to the AN/SLQ-32, describes each display format, and describes the function and operation of each control.

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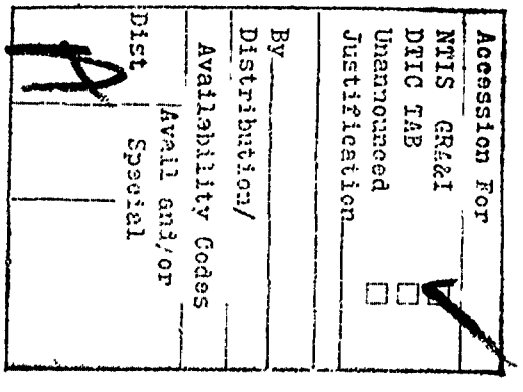
This volume is the first in a series addressing the role of the operator in Electronic Warfare in the AEGIS Combat Direction System. It describes the AN/SLQ-32 Electronic Warfare system, provides a complete set of abbreviations and acronyms specific to the AN/SLQ-32, describes each display format, and describes the function and operation of each control. The second volume provides a series of illustrations which guide the user through the console functions and operations available to him except for activation of Active Electronic Counter Measures (AECM).

Although these documents are in direct support of the AEGIS Program, they have wider utility in that they can be used to support other efforts concerned with AN/SLQ-32 training, system checkout, test and evaluation, orientation, software development, etc., and, therefore, are being made available to other AN/SLQ-32 installations. They represent a coordinated and cooperative effort of the Human Factors Engineering Branch (Code 8231) of the Naval Ocean Systems Center (NOSC), in San Diego, California, and the AEGIS Combat Systems Operational Support Group at the Applied Physics Laboratory, in Laurel, Maryland.

All comments and requests for additional copies should be addressed to: AEGIS Shipbuilding Project Office, PMS 400F, Naval Sea Systems Command, Department of the Navy, Washington DC 20360.



VOLUME I

TABLE OF CONTENTS

I. INTRODUCTION

This handbook is intended to be a familiarization and learning aid to operators of the AEGIS Combat System AN/SLQ-32 Electronic Warfare System. Although this manual was developed by Naval Ocean Systems Center (NOSC) and members of the AEGIS Combat System Operational Support Group (CSOSG) for use by AEGIS EW personnel, it may be used in conjunction with other AN/SLQ-32 systems. It is anticipated that NOSC (Code 8231)/CSOSG will provide correction sheets as required.

Those not familiar with the AN/SLQ-32 Electronic Warfare System will find this manual serves as an indoctrination to system operations. Other personnel within the Combat Information Center (CIC) team may also find it useful for this purpose. AN/SLQ-32 operators who have received training in this system can use this manual to aid in maintaining or increasing their proficiency for operating the system. This manual can also be used to augment shipboard EW Personnel Qualification Standards (PQS).

Since actual display illustrations are incorporated into this manual, it is not mandatory that the user have access to an AN/SLQ-32 system. However, if a system is available, the manual can be used as a guide to its operation by merely following the Operator Action indicated on each sheet, thereby allowing the user to gain experience on the equipment without requiring a supervisor in attendance.

This manual is designed to supplement other materials; it is not intended to replace or serve as a Technical Manual. It does not eliminate the need for an AN/SLQ-32 operator to attend EW Operator School.

II. AN/SLQ-32 SYSTEM DESCRIPTION

Today, with the capability of various platforms to carry and launch multiple Anti-Ship Cruise Missiles (ASCMs), the need has arisen for an Electronic Warfare System aboard surface ships to meet this threat. The AN/SLQ-32 is designed for this purpose. Its primary mission is ownship defense against the ASCM threat.

Three variants were developed:

- The AN/SLQ-32(V)1, Fig. 1, is a basic ESM suite with Band 3 coverage only. It provides detection, identification, and bearing of radar-guided ASCMs and their associated threat platforms. The (V)1 is normally deployed on small auxiliaries and small Amphibious ships (LKA, LSD, LST).
- The AN/SLQ-32(V)2, Fig. 2, possesses the (V)1's capabilities, plus extended frequency coverage (Bands 1 and 2) to aid in the detection and identification of navigation radars, IFF transponders, etc. The (V)2 is normally deployed on DDGs, FFs, FFGs, and SPRUANCE Class destroyers. It is also scheduled for installation on a new 270-foot class of Coast Guard Medium Endurance Cutters (MEC 270).
- The AN/SLQ-32(V)3, Fig. 3, is basically the (V)2 suite with the addition of a modular Active Electronic Countermeasures (AECM) subsystem. It can combat missile and associated threat platforms through the use of jamming or deception techniques which disrupt the targeting information necessary for a missile attack. A Quick Reaction (QR) mode is also a feature of the (V)3. In this mode of operation, the AN/SLQ-32(V)3 will initiate AECM against pre-launch target acquisition "pop up" radars. The (V)3 is normally deployed on Cruisers, large Auxiliaries (AOE, AOR), and Amphibious (LHA, LCC, LPD) ships.

All variants of the AN/SLQ-32 possess the hardware necessary for the control and firing of chaff.

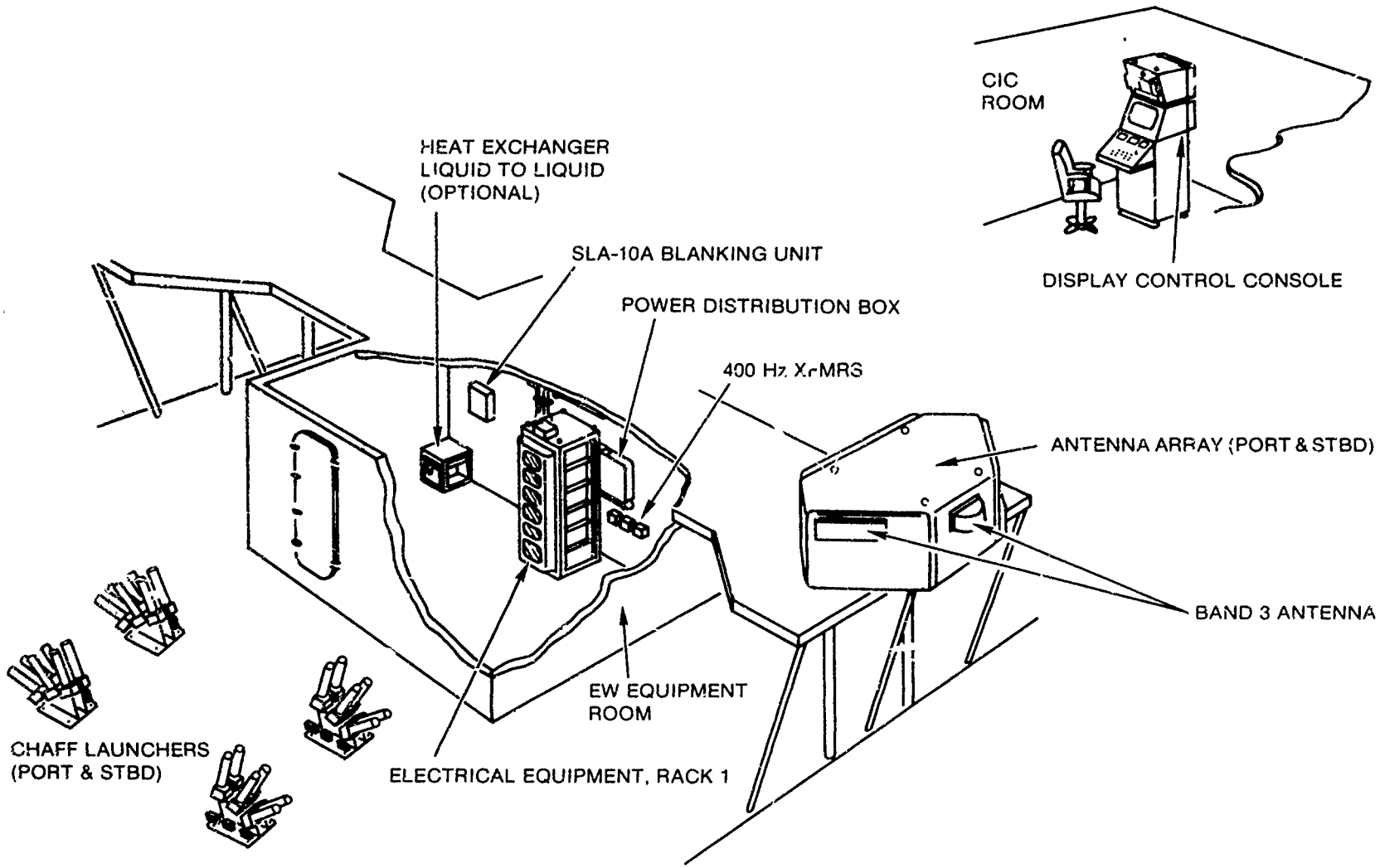


FIGURE 1. AN/SLQ-32(V)1 EQUIPMENT LAYOUT

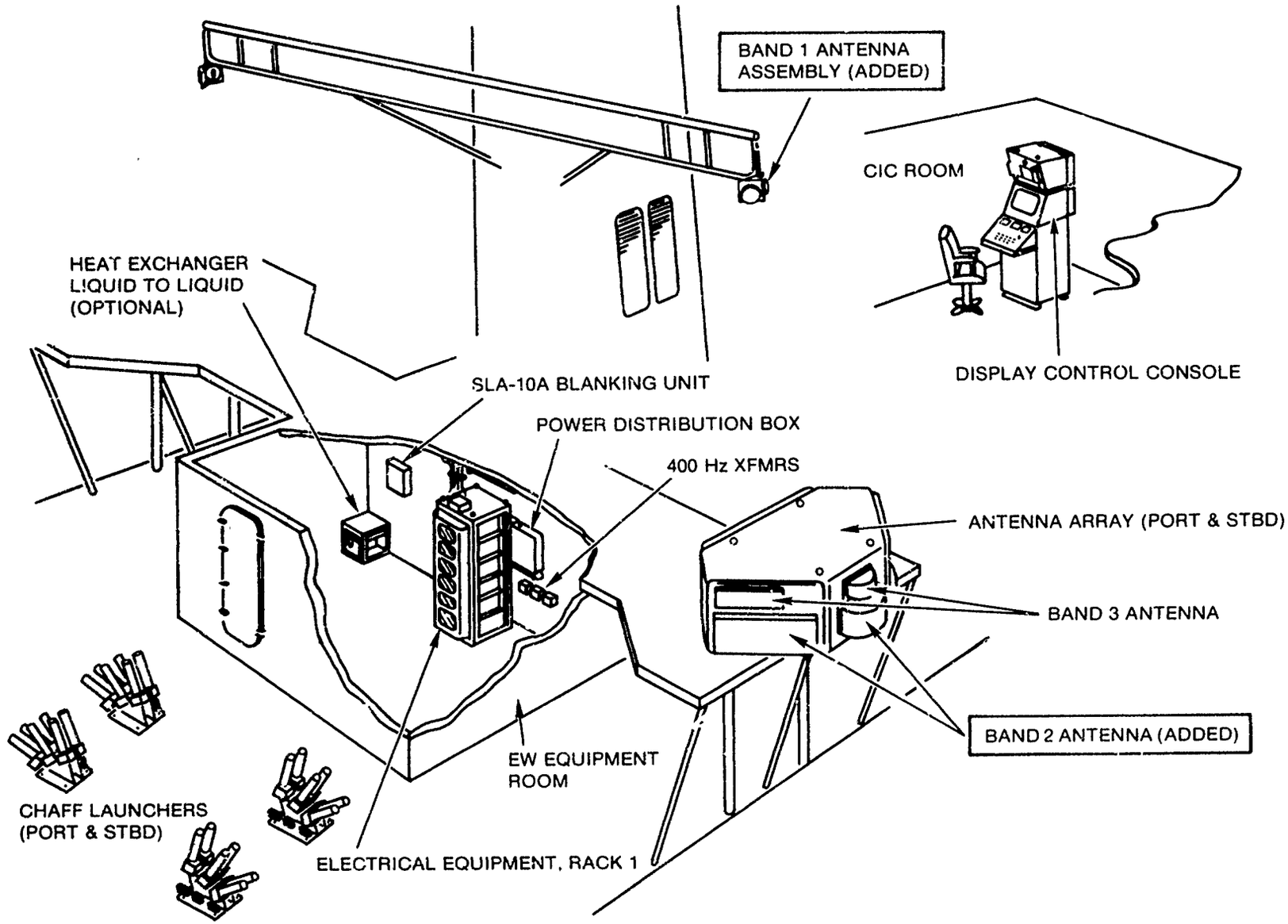


FIGURE 2. AN/SLQ-32(V)2 EQUIPMENT LAYOUT

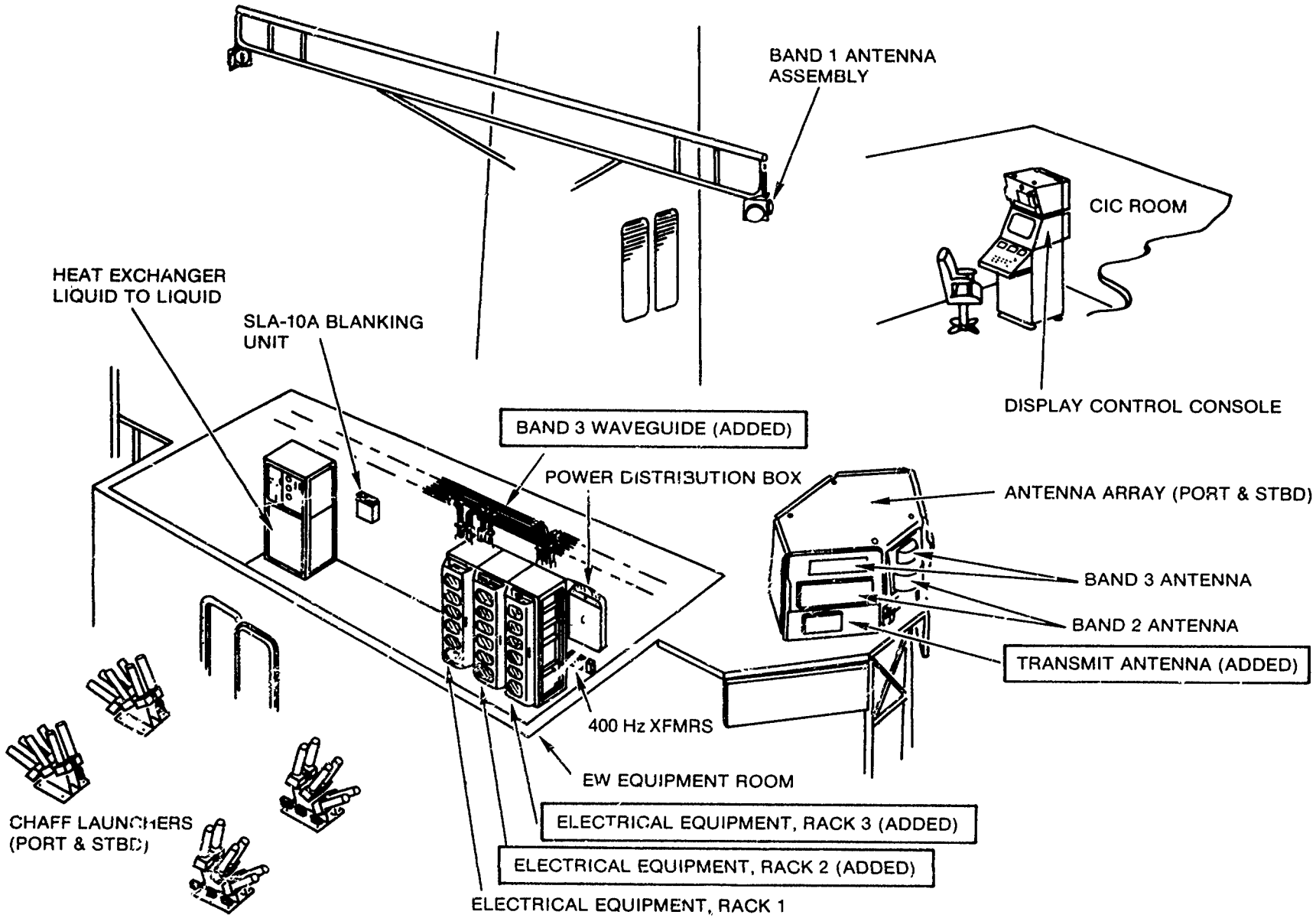


FIGURE 3. AN/SLQ-32(V)3 EQUIPMENT LAYOUT

III. CONSOLE -- GENERAL DESCRIPTION

The Display Control Console (DCC), Fig. 4, is physically identical for all variants, although some functions are not used on all variants. The (V)1 DCC makes use of only those functions necessary for Band 3 system operation; the (V)2 DCC for Band 1, 2, and 3 operation; and the (V)3 DCC for all three bands plus AECM operation. It contains all of the controls necessary for the tactical operation of the AN/SLQ-32 system.

Communications with other intra-ship CIC units are implemented through the use of "push to talk" intercoms located on the DCC voice panel.

Extensive diagnostic programs, Built-In Test (BIT), and review of the system data base are also functions of the DCC.

1. CARTRIDGE TAPE TRANSPORT
2. SYSTEM POWER CONTROL
3. CONSOLE BREAKER
4. CRT MONITOR ASSEMBLY
5. INTERLOCK STATUS INDICATORS
6. OVERLOAD STATUS INDICATORS
7. AECM CONTROL GROUP
8. CHAFF LAUNCHER CONTROL GROUP
9. UPPER OPERATOR PANEL CONTROLS
10. FIXED ACTION BUTTON (FAB) CONTROL GROUP
11. KEYBOARD CONTROL GROUP
12. AUDIO CONTROL GROUP
13. BIT STATUS INDICATORS
14. CONTRAST CONTROL
15. BRIGHTNESS CONTROL
16. CONSOLE ILLUMINATION CONTROL
17. BATTLE SHORT CONTROL
18. PROGRAM LOAD CONTROL
19. UPPER FLOOD LAMP
20. SPEAKER

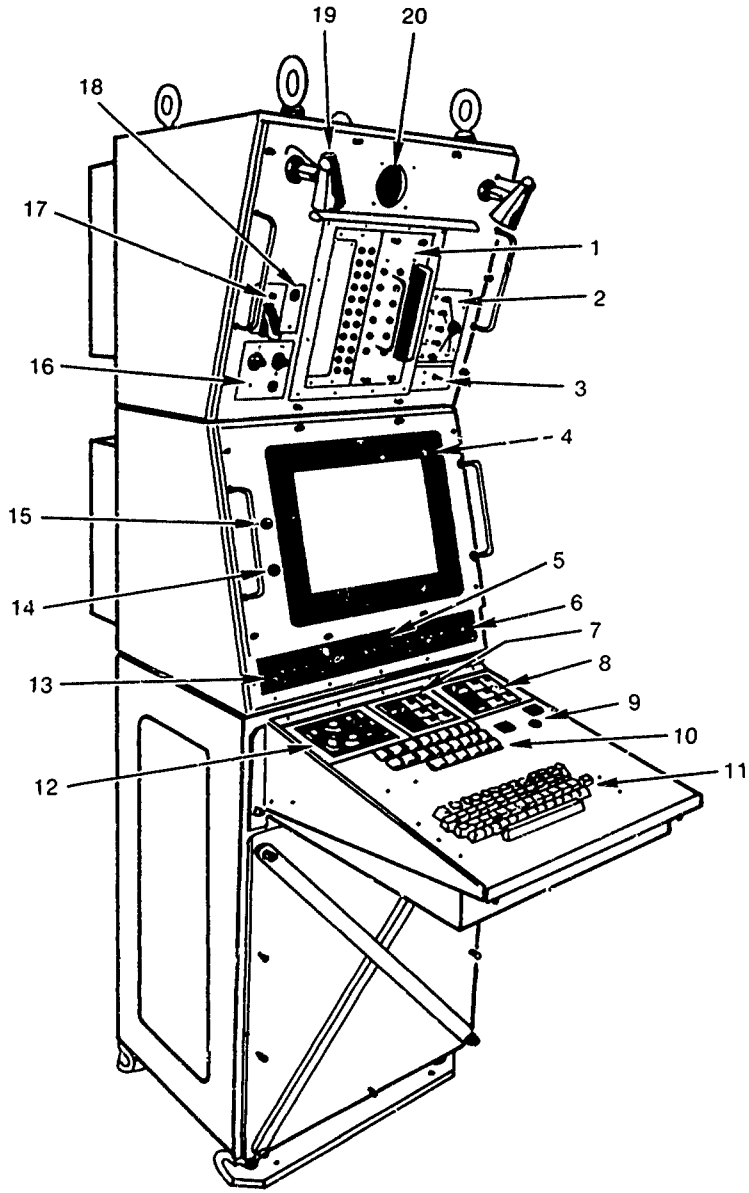


FIGURE 4. DCC FRONT PANEL LOCATOR

IV. CONSOLE FUNCTIONAL DESCRIPTION

1. Cartridge Tape Transport (CTT)

The Cartridge Tape Transport (Fig. 5, panel 1) is a magnetic tape transport assembly which allows loading of the operational and diagnostic programs into the computer.

2. System Power Control

The SYSTEM POWER switch (Fig. 5, panel 2) has five positions:

CAUTION: To prevent damage to the equipment, do not set the SYSTEM POWER switch to AECM ON before the computer program has been loaded.

a. OFF - All primary power to the system is disconnected at the power control relays in the power distribution boxes and at the DCC.

b. ANT. SERVO - Places the antennas in the stow position when powering down. Not applicable to V(1) or V(2).

c. ESM 60 Hz and ESM 400 Hz - Applies 60 Hz and 400 Hz to the ESM portion of the system.

d. AECM STBY - Applies 60 Hz and 400 Hz to the standby portion of the AECM system. Not applicable to V(1) or V(2).

e. AECM ON - Applies 60 Hz and 400 Hz to the remainder of the AECM system. A 2-minute warm-up period is still required for the High Voltage Power Supplies. Not applicable to V(1) or V(2).

3. Console Breaker

The CONSOLE BREAKER (Fig. 5, panel 3) is a two-position on/off switch type circuit breaker that provides 115 VAC, three-phase, 400 Hz input power, with 4-ampere overload protection, to the console. In the OFF

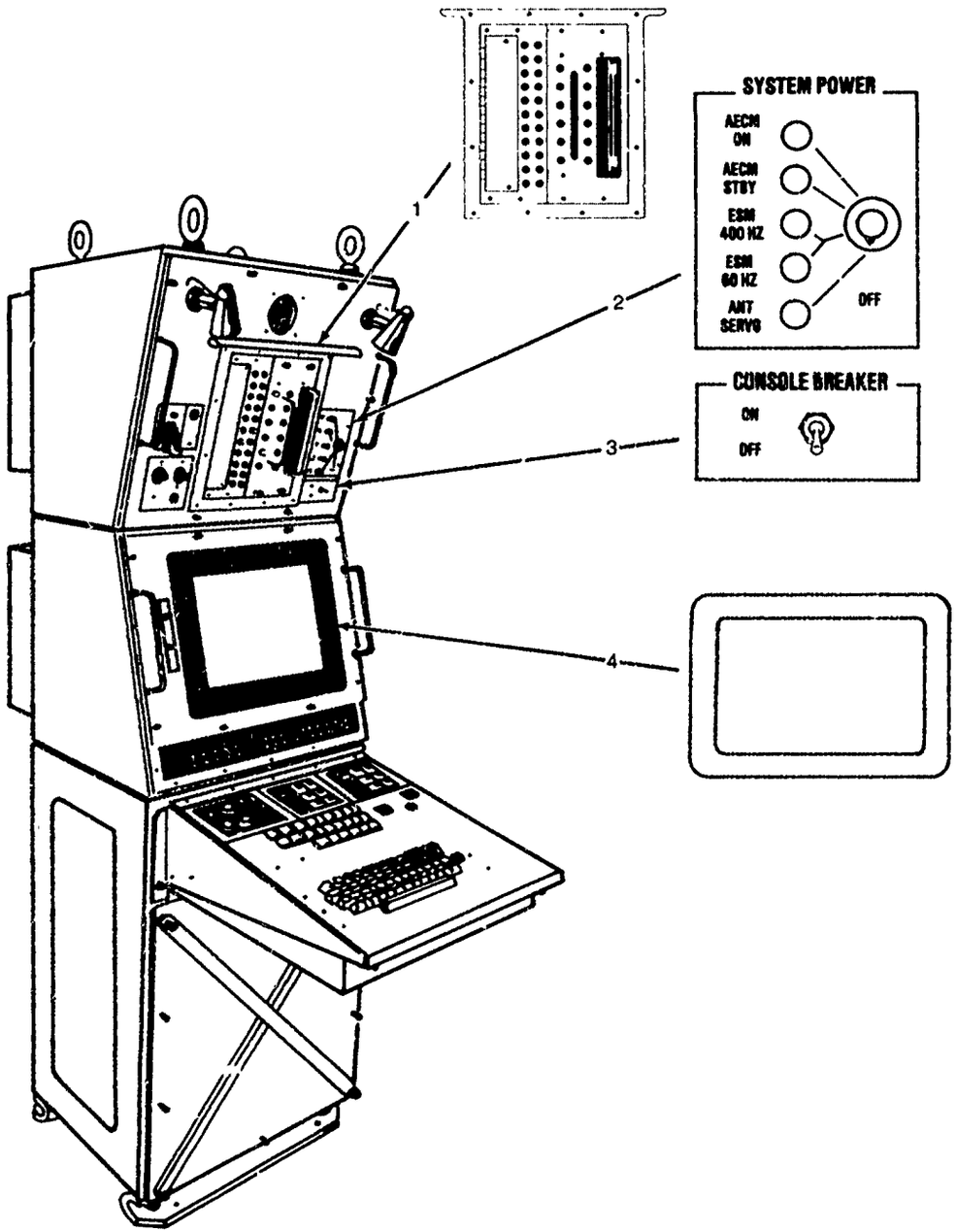


FIGURE 5. DCC FRONT PANEL LOCATOR

position, input power is disconnected from the console; however, the SYSTEM POWER switch is operative for the rest of the system. In the ON position, input power is provided via every position (except OFF) of the SYSTEM POWER switch. In the event that the circuit breaker is tripped, it must be momentarily set to OFF for resetting before it can be effectively placed in the ON position.

4. CRT Monitor Assembly

The CRT monitor (Fig. 5, panel 4) is a self-refreshed, addressable raster scan, 8x10-inch cathode ray tube (CRT), which is under control of the computer. A contrast control and brightness control are provided for making operator adjustment for optimum display. The monitor is switchable between a tabular and polar display format.

a. Tabular Format - The tabular format (Fig. 6) consists of 36 rows and 80 columns for the listing of tabular data across the entire monitor viewing field. Rows and columns 0 through 2 are reserved for Alert Pending (A/P) indications. Rows 2 through 33 are used exclusively for the display of tabular data. Row 35 contains the prompting sequence area (columns 0 through 63) and a data entry area (columns 64 through 79). The data entry area echoes the keyboard entries to allow operator verification prior to pressing the RETURN key to activate carriage return and data entry. Figure 7 is a typical DCC CRT tabular display.

b. Polar Format - The polar format (Fig. 8) consists of a polar display of three concentric circles with radii of 3-3/4, 3, and 1-1/8 inches, plus a small ownship center circle, all of which are offset slightly to the right of the display. From the center of the concentric circles, radial lines are provided every 30 degrees beginning with zero degrees at the top of the display. The radial lines are labeled with the

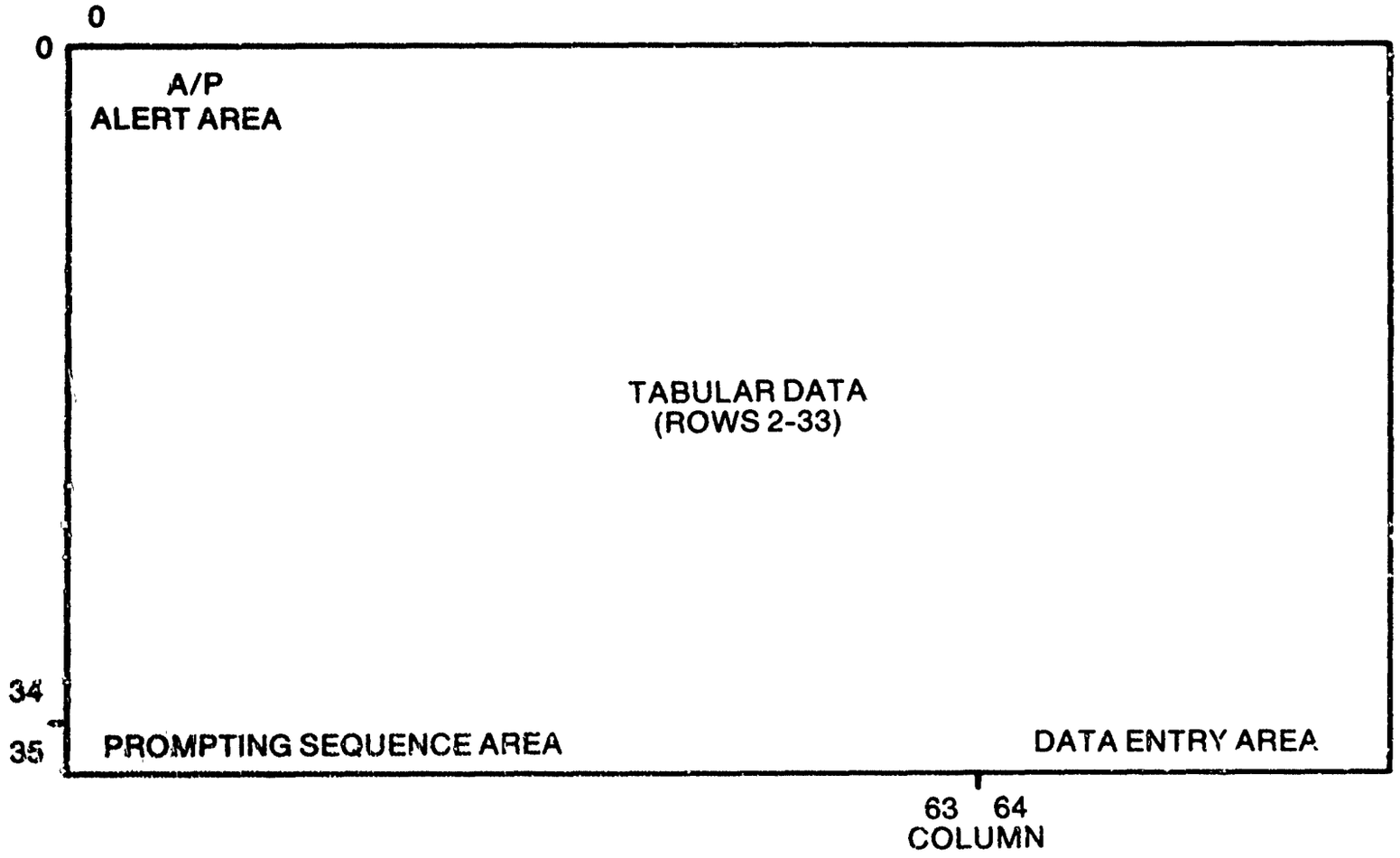


FIGURE 6. DCC CRT TABULAR DISPLAY

A/P

INDEX	NAME	TL	LIB	MI	FREQ	PRF		SCAN		ECM	PLATFORMS
2934	HIBALL	3	OL*	Y	09340	09600	CMPX	P:06500	STD	063	
TR	HOS SUB				09140			P:06500			

001	SIXX	002	BAKFIR	003	FONG	004	FANG	005	BADGER	006	FITTER
007	EAGLE	008	FISH	009	SAIL	010	CANOE	011	TREE	012	BIRDEE
013	PATROL	014	BOAT	015	CAVE	016	MUSH	017	SITE	018	HAWK
019	SS SUB	020	WALL	021	OSA	022	DOWAL	023	SNAKE	024	CROW
025	SEANAT										

ENTER PRF TOL IN %

1

FIGURE 7. TYPICAL DCC CRT TABULAR DISPLAY

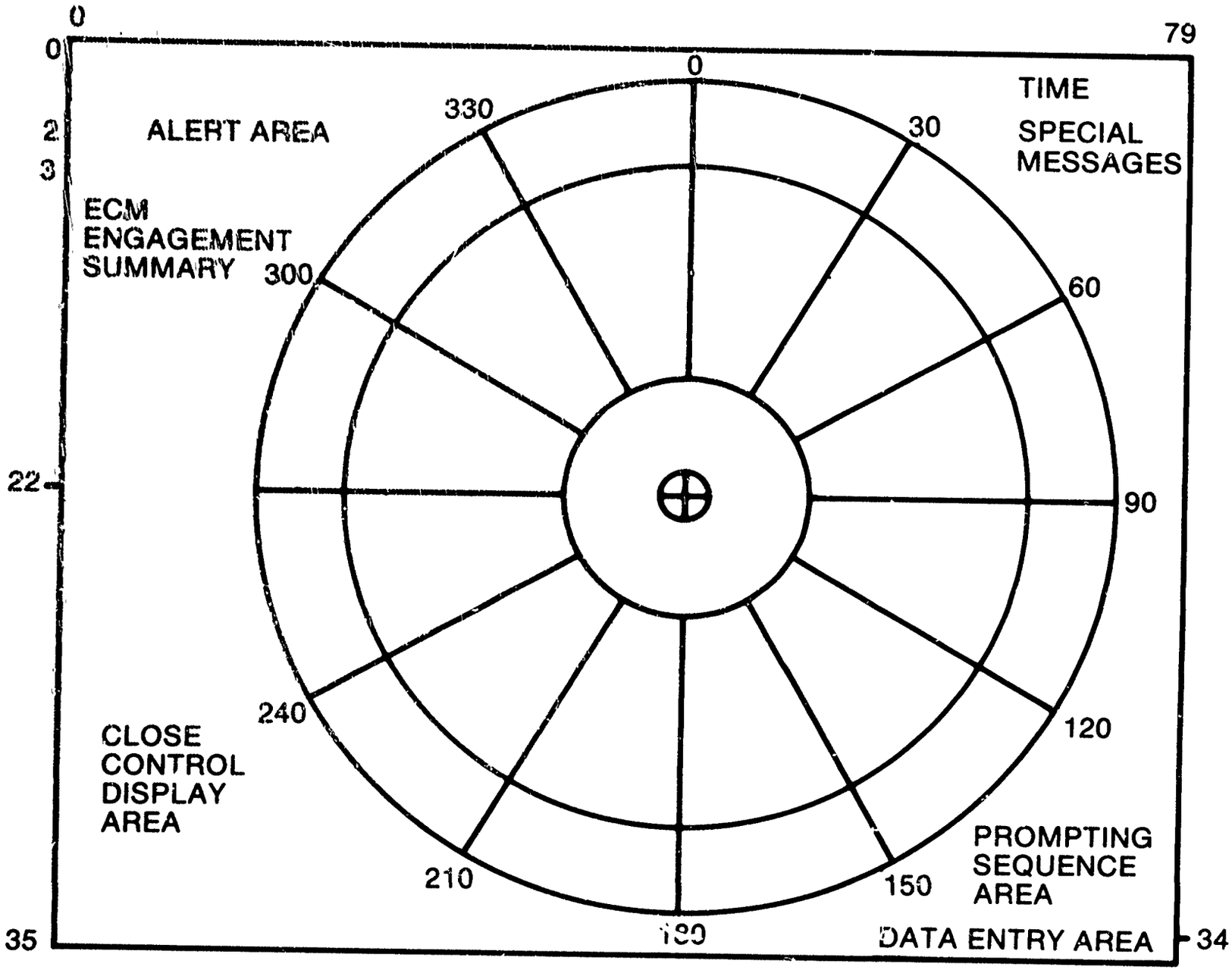


FIGURE 8. DCC CRT POLAR DISPLAY

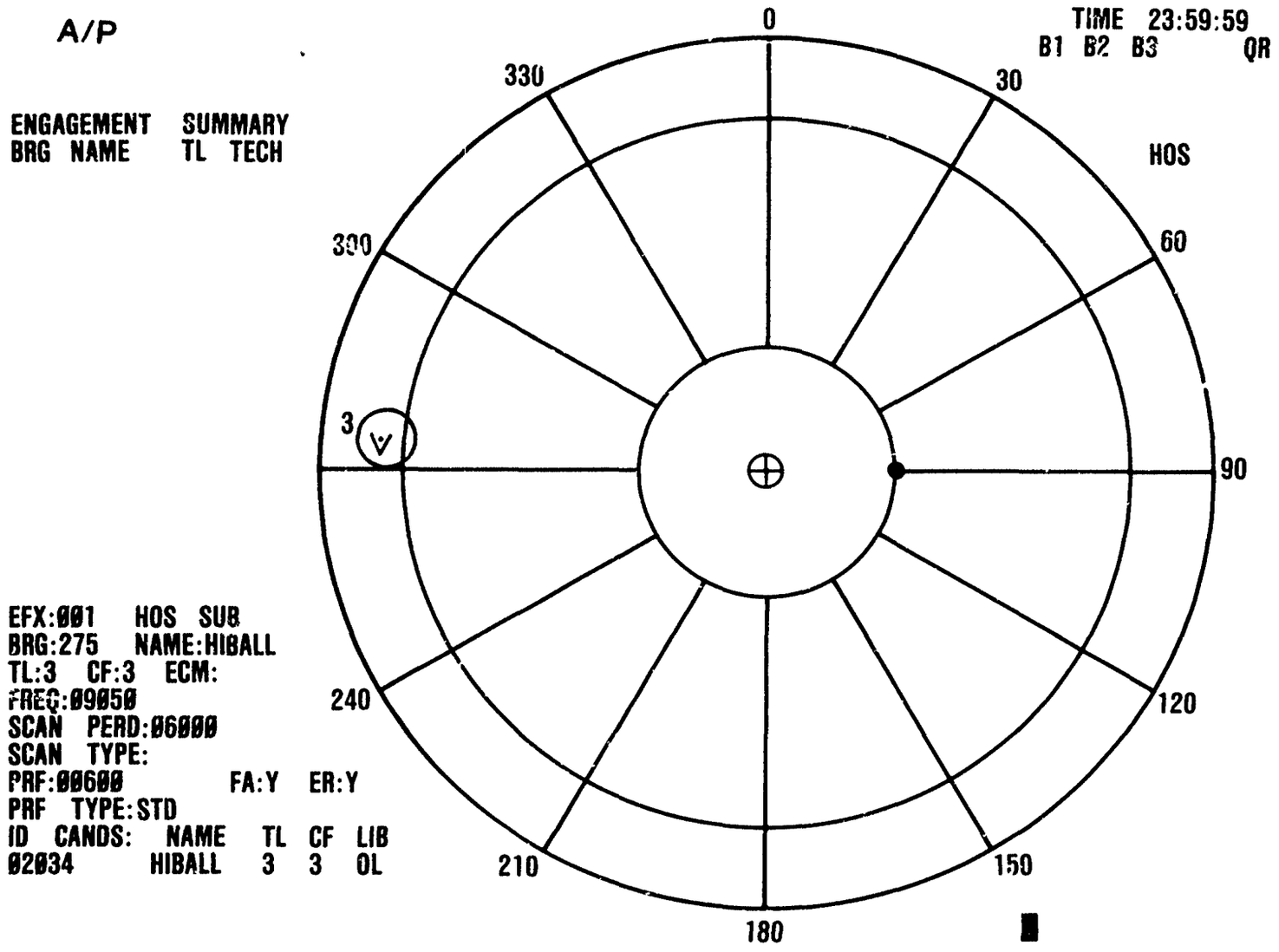


FIGURE 9. TYPICAL DCC CRT POLAR DISPLAY

appropriate value in degrees, with the exception of 270 degrees. All items described above are displayed at one-half brightness. Figure 9 is a typical DCC CRT Polar Display.

(1) Polar Display - The area between the two outermost circles is reserved for the display of hostile and unknown platforms, excluding missiles. The middle concentric ring is used for the display of missiles and unknown emitters having missile-like characteristics (assumed missiles). The innermost area displays the ownship symbol at the center, all friendlies, and the ownship heading dot. The ownship heading dot moves on the 1-1/8-inch circle to indicate the ship's heading, while operating in the TRU BRG (true bearing) mode. While operating in the REL BRG (relative bearing) mode, the ownship heading dot remains at the top of the 1-1/8-inch circle (zero degrees); however, the bearing in the Close Control Area and the Engagement Summary remains in true.

(2) Alert Area - The upper left portion of the display is used for visually alerting the operator to system faults and/or emitter activity.

(3) ECM Engagement Summary - The middle left portion of the display provides bearing and engagement data for up to sixteen engaged emitters or groups. (V)1 and (V)2 have a similar display titled THREAT SUMMARY with no ECM column.

(4) Close Control Display Area - The lower left portion of the display is used for the display of amplifying information about the emitter under close control.

(5) Time/Special Messages Area - The upper right portion of the display is used to display the time of day in hours, minutes, and seconds (24-hour clock), and special messages, e.g., Bands enabled, Tactical Bias factor, and QR activation.

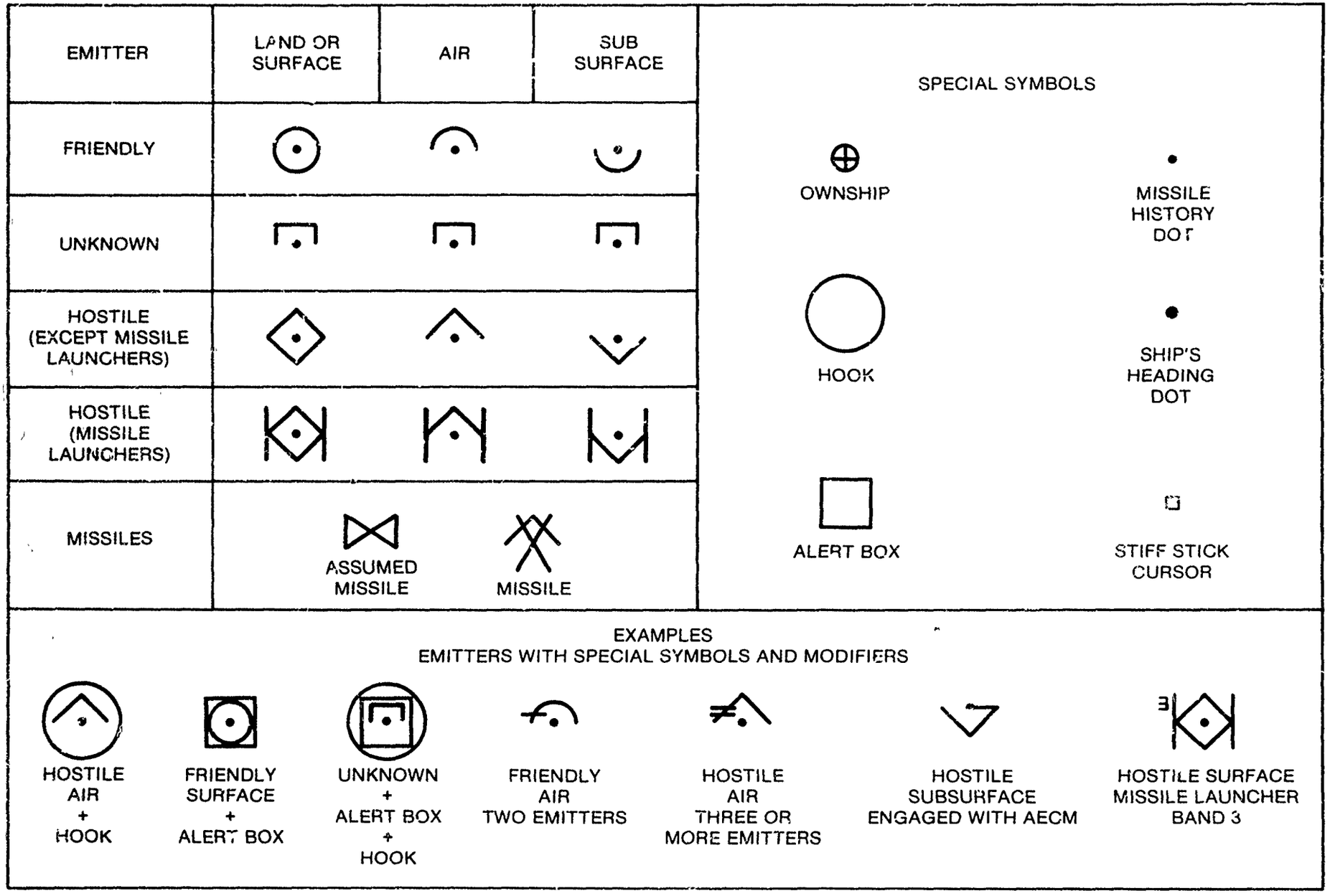


FIGURE 10. AN/SLQ-32 SYMBOLOGY

(6) Prompting Sequence/Data Entry Area - The lower right portion of the display, except for the very bottom line, displays computer-generated prompts. The bottom line echoes the alphanumeric keyboard entries to allow operator verification of data prior to RETURN (carriage return) activation.

Figure 10 presents the AN/SLQ-32(V) Symbology. Note that the symbol for an unknown emitter is the same for all platform categories.

5. Interlock Status Indicators

The INTERLOCK group (Fig. 11, panel 5) consists of eight amber LED indicators. Each one illuminates to indicate that the corresponding interlock circuit is open. The condition causing the open interlock circuit must be corrected before the system can be operated normally. However, the impact on system operation is dependent on the specific interlocks which are open. The following is a description of each indicator:

a. Port and Starboard Chaff - The PF, PA, SF, and SA CHAFF indicators illuminate in the event that the corresponding port or starboard chaff launcher is remotely safed. Setting the chaff launcher to the safe status is accomplished by switching the two-position arming toggle switch on the launcher to the safe position. This switch must be manually returned to the ARM position to ready the chaff launcher for operation and extinguish the corresponding port chaff or starboard chaff indicator. The BATTLESHORT switch will not override the safe switch at the chaff launcher.

b. Port and Starboard Antenna Pedestal - The corresponding PORT PED/STBD PED indicator illuminates when the servo is disabled, rendering the corresponding antenna array stationary, in the event that either of

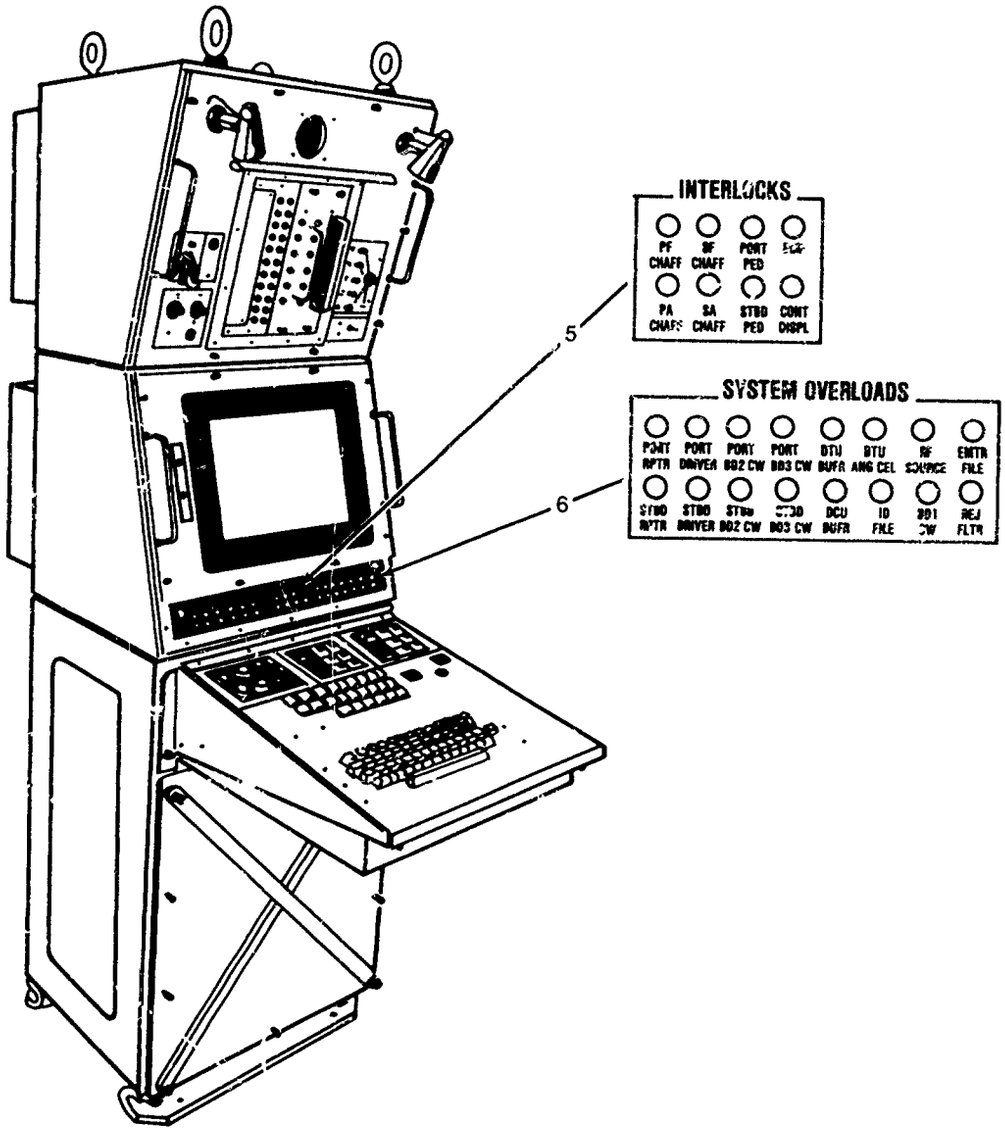


FIGURE 11. DCC FRONT PANEL LOCATOR

the following conditions exists: either of the antenna doors is open, opening the door interlock switch; or the servo power amplifier thermal switch is open, due to overheating.

c. Control Display - The CONT DISPL indicator illuminates in the event that the monitor display assembly is extended outward on its rack slides, opening an interlock switch. The interlock switch illuminates the DISPL indicator and disconnects high voltage from the display chassis.

d. Electronic Countermeasures - The ECM indicator illuminates in the event that any interconnecting cable is removed from the high voltage power supplies, or the cover from any of the high voltage power supplies is removed. When any of these conditions exist, affected power supplies are turned off. The ECM indicator is extinguished when all cables and covers are in place.

6. Overload Status Indicators

The SYSTEM OVERLOAD group (Fig. 11, panel 6) consists of sixteen amber LED indicators. The indicator group is divided into the following categories of one or more indicators:

a. ECM Overload - The applicable indicator(s) blink on and off at 10-second intervals, in the event that an overload condition is detected.

b. Continuous Wave Degrade Status - The applicable continuous wave (CW) degrade indicator illuminates in the event that an instantaneous frequency measurement (IFM) filter is in use or the system is unable to reject CW signals. Upon returning to the normal condition after such CW interference, the indicator extinguishes.

7. AECM Control Group

The AECM control group (Fig. 12, panel 7) provides for operator control of ECM. The FABs allow for rapid entry of specific commands into the computer when operating in the semiautomatic mode, and for overriding computer actions when operating in the automatic mode. The following is a description for the function of each AECM pushbutton:

a. MODE - The MODE FAB is a two-position switch providing switching between the AUTO (automatic) and SEMI (semiautomatic) modes of operation. The split indicator illuminates in the mode selected.

b. ENGAGE - Engagement of an emitter under close control with a computer-recommended jamming technique is accomplished by momentarily pressing the ENGAGE FAB. If the symbol represents an emitter other than a Band 3 hostile emitter, illegal action is displayed to the operator in the data entry area. Once engaged, an engagement modifier symbol appears on the display across the applicable emitter symbol, and the emitter is listed in the engagement summary area. Engagement continues until either the HOLD or TERM FAB is pressed while the symbol is under close control, or the computer re-allocates resources due to a new, higher priority threat emitter.

c. ALTN TECH - Momentarily pressing the ALTN TECH FAB changes the technique being employed against a Band 3 threat emitter under close control, to an alternate computer-selected technique. When ECM resources are not immediately available, the computer appropriates resources from lower priority threats, otherwise the function is the same as for the ENGAGE FAB. Once the ALTN TECH mode is selected, pressing the ALTN TECH FAB alternates between ALT 1 and ALT 2. The primary mode is re-attained by pressing ENGAGE.

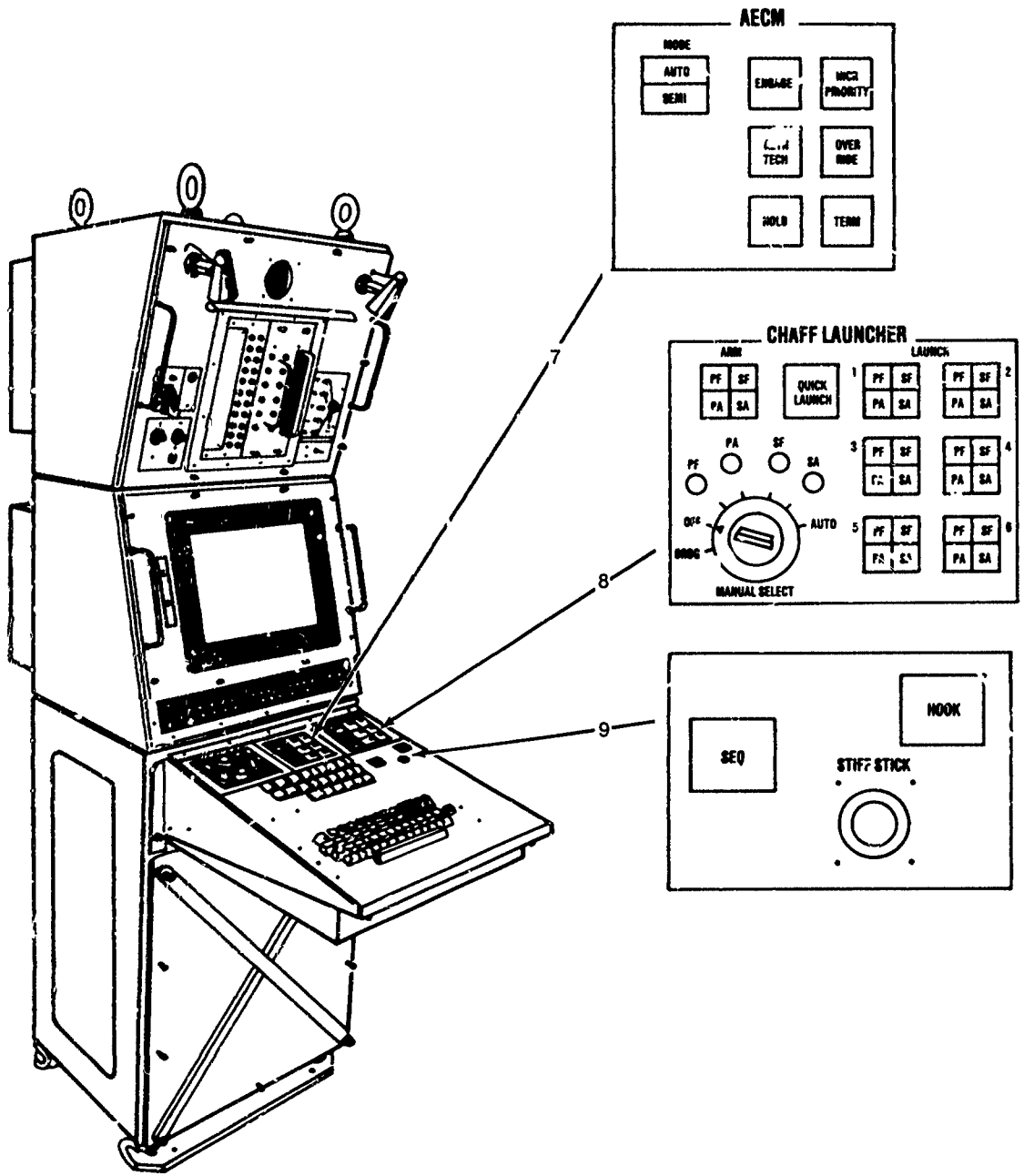


FIGURE 12. DCC BULLNOSE LOCATOR

d. HOLD - Momentarily pressing the HOLD FAB initiates one of the following actions: If a Band 3 emitter symbol is not in close control, all current and future ECM engagements are temporarily halted, but tracking continues. If a Band 3 emitter symbol is under close control and if a Band 3 emitter is under ECM engagement, the particular engagement is halted, but tracking continues. The engagement can be resumed by momentarily pressing the ENGAGE FAB.

e. INCR PRIORITY - Momentarily pressing the INCR PRIORITY FAB commands the computer to regard the designated Band 3 emitter as a high threat with top priority. The computer selects the appropriate technique and engages the emitter. Since this emitter has the highest priority, the computer appropriates ECM resources from other active threats, if required.

f. OVERRIDE - Momentarily pressing the OVERRIDE FAB provides the capability to:

(1) Maintain an indefinite engagement of QR emitters.

(2) Permit continued engagement of missiles which have been declared inactive.

g. TERM - Momentarily pressing the TERM FAB terminates ECM engagement for the emitter associated with the symbol under close control. Other engaged emitters not under close control are not affected.

8. Chaff Launcher Control Group

The chaff launcher control group (Fig. 12, panel 8) provides the controls and indicators for deployment of super rapid blooming offboard chaff (SRBOC). Included in this group are the ARM, QUICK LAUNCH, and LAUNCH FABs and the MANUAL SELECT switch and indicators.

a. MANUAL SELECT Switch - The MANUAL SELECT switch applies power to any of the chaff launchers, trans-

fers control of chaff launching to the bridge, or allows the DPU/CPU to automatically determine the quadrant from which chaff is launched.

b. ARM Switch - The ARM switch is used for launching of chaff. A switchguard covers the ARM switch to lessen the chance of accidental launching. When launching, the ARM switch is pressed simultaneously with one of the six LAUNCH switches or the QUICK LAUNCH FAB.

c. QUICK LAUNCH Switch - The QUICK LAUNCH switch is not implemented.

d. LAUNCH Switches - The six LAUNCH switch/indicators are used to inform the operator which launch tubes are armed and ready and, when pressed simultaneously with the ARM switch, will launch chaff. Each FAB has a split indicator with markings for port forward (PF), starboard forward (SF), port aft (PA), and starboard aft (SA) launchers. When a launch tube is armed and ready, the appropriate indicator illuminates. Port indicators illuminate in red and starboard indicators in green.

9. Upper Operator Panel Controls

a. SEQUENCE - The SEQUENCE FAB (Fig. 12, panel 9) permits the operator to:

(1) Respond to alert messages (A/P) concerning emitter activity and system faults.

(2) Place emitters in the Engagement Summary [V(3)] and Threat Summary [V(1), V(2)] under Close Control.

b. STIFF STICK - This control (Fig. 12, panel 9) is an unlabeled stiff-stick switch that is spring-loaded to center, and toggles in any direction. It moves the cursor on the display in the direction that the stiff stick is moved.

c. HOOK - Momentarily pressing the HOOK FAB (Fig. 12, panel 9) places the emitter symbol, designated by the cursor, under Close Control. It also displays the HOOK symbol around the designated platform symbol. As part of the Close Control display, the CRT presents a list of one or more emitters associated with the hooked symbol in the lower left corner of the polar format display.

10. Fixed Action Button (FAB) Control Group

The Fixed Action Button Control Group (Fig. 13, Panel 10) consists of 22 FABs, eight of which are not used at this time. Each FAB has its own particular function. The following is a description of the functions of these FABs:

- ALERT INHIBIT - Pressing the ALERT INHIBIT FAB prevents the audio and visual alerts through a round-robin sequence of: (1) Inhibit Friendly Alerts; (2) Inhibit all but System Faults; (3) No Alert Inhibits.

- ANAL - Pressing the ANAL FAB allows the operator to initiate a sequence of operations to perform any one of the following functions: Specify the search limits of the Band 1 receiver; review or specify the ESM tactical environment; review the contents of the system main and on-line library; review or specify a Quick Reaction response.

- DESIG ID - Pressing the DESIG ID FAB with an emitter in Close Control allows the operator to initiate a sequence of operations to override the system-determined identification of that emitter. To restore the system-determined identification of the emitter, the operator performs the ID RE-SEARCH action.

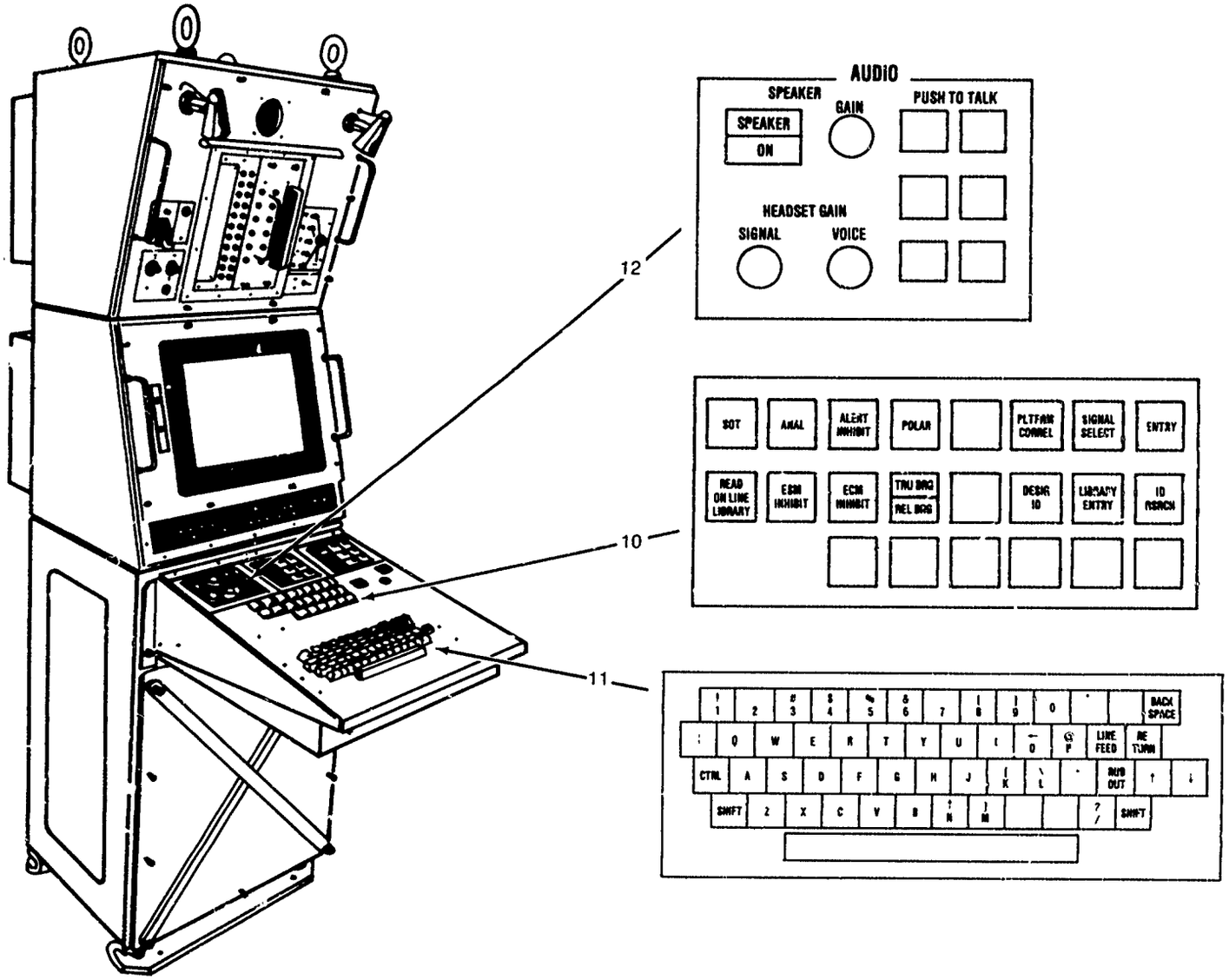


FIGURE 13. DCC BULLNOSE LOCATOR

- ECM INHIBIT - Pressing the ECM INHIBIT FAB allows the operator to initiate a sequence of operations to prevent ECM transmissions into azimuth sectors which he specifies. Up to three sectors may be inhibited simultaneously.

- ENTRY - Pressing the ENTRY FAB allows the operator to initiate a sequence of operations to perform the following functions for an emitter under Close Control: Enter or modify PRF and/or scan data; select or delete ID candidates; transfer the emitter to the on-line library; initiate long-term scan analysis for Band 1 emitters.

- ESM INHIBIT - Pressing the ESM INHIBIT FAB allows the operator to initiate a sequence of operations to inhibit display of specific emitters (FRIEND, UNKNOWN, HOSTILE/NON-MISSILE) in specific azimuth sectors. Up to three sectors may be inhibited simultaneously.

- ID RSRCH - Momentarily pressing the ID RSRCH FAB initiates an ID search of the on-line and main libraries for the emitter under close control. When completed, the message ID RSRCH CMPLT appears in the data entry area and the ID candidate list in the Close Control area of the polar display is updated, if applicable.

- LIBRARY ENTRY - Pressing the LIBRARY ENTRY FAB allows the operator to initiate a sequence of operations to create, delete, duplicate, or modify an emitter in the on-line library. Whenever the LIBRARY ENTRY FAB is activated the tabular format is displayed on the CRT.

- PLTFRM CORREL - Pressing the PLTFRM CORREL FAB allows the operator to review all emitters, their associated emitter candidates, and platforms within a nine-degree sector of an operator-selected emitter.

- POLAR - Momentarily pressing the POLAR FAB changes a tabular display on the CRT to a polar display.

- READ ON-LINE LIBRARY - Pressing the READ ON-LINE LIBRARY FAB allows the operator to initiate a sequence of operations which causes a prerecorded on-line library to be read from a cartridge into the computer memory. Space for up to three different on-line libraries exists on the cartridge. Any one of these on-line libraries may be selected by the operator.

- SIGNAL SELECT - Momentarily pressing the SIGNAL SELECT FAB connects the audio from the angle cell containing the emitter under Close Control to the speaker and headset for operator audio analysis. If no emitter is in Close Control, an Illegal Action alert is displayed in the data entry area of the monitor.

- SOT - Momentarily pressing the SOT FAB initiates a prompting sequence which permits the operator to deactivate background testing, enable or disable Band 1, 2, or 3 receiver testing, and reset bit monitor.

- TRU BRG/REL BRG - Momentarily pressing the TRU BRG/REL BRG FAB selects either the true bearing or relative bearing format for the polar display. The split indicator illuminates green for true bearing and red for relative bearing. In the relative bearing format, ECM and ESM inhibited sectors are not displayed but are still active, missile history dots are erased, and all bearings displayed in the Engagement Summary and the Close Control Area remain in true.

11. Keyboard Control Group

The keyboard control group (Figure 13, panel 11) is an alphanumeric typewriter keyboard for entry of data or commands into the computer. It provides the communications link between the operator and the computer, and is used in conjunction with the CRT display. As a general rule the computer displays operator prompts in a designated area on the CRT. In response, the operator types in the requested data or command.

As each character is typed on the keyboard, it is echoed in a designated Data Entry area on the display, which permits the verification of the data before they are entered into the computer. A cursor is displayed on the monitor in the space where the next character will appear.

a. Special Keys - The following is a description of each special key on the keyboard:

(1) BACKSPACE - This key moves the cursor back one space for each actuation.

(2) COMMA - This key performs the same function as RETURN, that is, COMMA enters into the computer the data which have been typed on the keyboard and which are displayed in the Data Entry area of the CRT.

(3) RETURN - This key enters into the computer the data which have been typed on the keyboard and which are displayed in the Data Entry areas of the CRT. The displayed data are erased as they are entered into the computer.

(4) ↑↓ - These two keys roll the information displayed on the CRT either up or down (as indicated by the direction of the arrow). They are used whenever the word MORE is displayed at the bottom of a listing, indicating that more data exist than can be displayed on a single page.

(5) RUB OUT - This key functions exactly like the BACKSPACE key. It moves the cursor back one space for each actuation. Previously typed characters can be erased by backspacing/rubbing out to the desired point.

(6) SHIFT - This key is used in combination with others to enable and disable the QR response; to enable and disable Bands 1, 2, and 3; and to re-initialize the computer.

(7) SPACE - The SPACE bar moves the cursor one space to the right.

(8) CTRL - The CONTROL key is not used.

(9) [ ] - The BRACE symbols are not used.

12. Audio Control Group

This control group (Fig. 13, panel 12) controls the audio signals to the speaker or headphones. The following is a description of the individual controls:

a. SPEAKER ON - This FAB is an alternate-action switch and split indicator which turns the speaker on or off. The translucent letters ON are illuminated in white when the speaker is turned on.

b. SPEAKER GAIN - This control is a variable resistor which controls the speaker volume.

c. HEADSET GAIN - The HEADSET GAIN consists of two variable resistor controls. The SIGNAL control adjusts the gain of the audio of the signal under close control. The VOICE control adjusts the gain of the intercom.

d. PUSH TO TALK - This group consists of six FAB switches for communicating with stations within the ship. When a station is selected, the pushbutton is illuminated with the name of that station. A foot-switch is used to provide "push to talk" control for the operator.

13. BIT STATUS Indicators

The BIT STATUS monitor group (Fig. 14, panel 13) consists of 16 red LED indicators. The BIT circuits are monitored by the Background System Operability Test (BSOT), which is resident in the operational program and is performed continuously. When a fault is detected, the corresponding BIT STATUS indicator is illuminated, an alert sounds, and the Alert Pending (A/P) symbol appears in the upper left corner of the monitor. When sequenced to by the operator, an alert message appears in the upper left corner of the CRT indicating which SRU has failed and providing information to assist in fault isolation. The BIT STATUS indicator labeled CONT DISPL cannot be sequenced to. When lit, this indicator means there is no communication between the console and the computer.

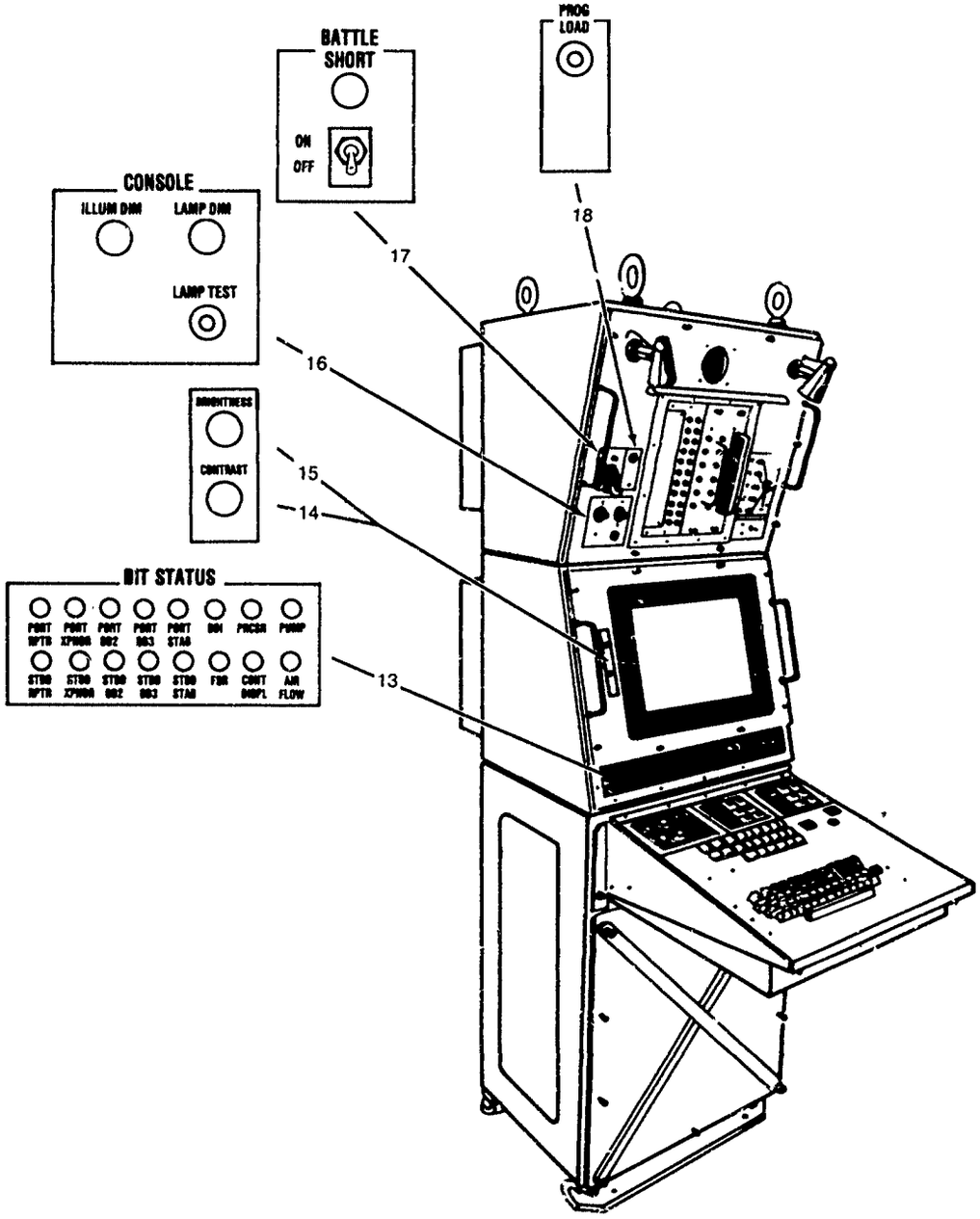


FIGURE 14. DCC FRONT PANEL LOCATOR

14. Contrast Control

This control (Fig. 14, panel 14) is used to vary the contrast of the DCC CRT.

15. Brightness Control

This control (Fig. 14, panel 15) is used to vary the brightness of the DCC CRT.

16. Console Illumination Controls

These controls (Fig. 14, panel 16) consist of the following for console and indicator illumination:

a. ILLUM DIM - The ILLUM DIM control is a variable resistor which varies the brightness of the two upper console floodlamps. The fully counterclockwise position is OFF, and the fully clockwise position provides the brightest illumination.

b. LAMP DIM - The LAMP DIM control is a variable resistor control which varies the brightness of all console indicator illumination, except the upper console floodlamps. The fully counterclockwise position is OFF, and the fully clockwise position provides the brightest illumination.

c. LAMP TEST - The LAMP TEST switch is a pushbutton switch, used to verify the operability of all DCC indicator lamps and FAB indicators, with the exception of the CHAFF LAUNCHER power indicators. Before performing the lamp test, the LAMP DIM control (see above) must be adjusted clockwise. The lamp test is initiated by pressing and holding the LAMP TEST switch. Each lamp is illuminated in an automatic sequence beginning at the upper left and progressing to the lower right of the DCC. When the sequence is completed and all indicators are illuminated, each indicator is extinguished in the same automatic sequence, beginning at the upper left of the DCC.

17. BATTLESHORT Control

The BATTLESHORT switch (Fig. 14, panel 17) is a two-position toggle switch with a switch guard that retains the switch in the OFF or normal position. The switch guard must be lifted to set the switch to ON. In the ON position, control power is applied to the battleshort relays in the distribution box and the BATTLESHORT indicator illuminates. These relays, when energized, effectively by-pass the thermal switches and safety interlocks, with the exception of the chaff interlock. BATTLESHORT provides for system operation under emergency conditions, reducing the possibility of automatic shutdown due to an overheated condition or activation of interlocks.

18. PROGRAM LOAD Control

The PROGRAM LOAD button (Fig. 14, panel 18), when pressed, will initiate the loading of the program from the tape into the DPU via the cartridge tape transport.

V. ABBREVIATIONS/ACRONYMS

A1	Alternate Technique 1
A2	Alternate Technique 2
ACQ	Acquisition
AECM	Active Electronic Countermeasures
AEF	Active Emitter File
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
ALTN	Alternate
ANAL	Analysis
ANGCEL	Angle Cell
ANT	Antenna
AOA	Angle Of Arrival
A/P	Alert Pending
ASCM	Anti-Ship Cruise Missile
ASSOC	Associated
AUTO	Automatic
B2DFR PA	Band 2 Direction Finding Receiver Port Aft
B2DFR PF	Band 2 Direction Finding Receiver Port Forward
B2DFR SA	Band 2 Direction Finding Receiver Starboard Aft
B2DFR SF	Band 2 Direction Finding Receiver Starboard Forward
B2ENCD P	Band 2 Encoder Port
B2ENCD S	Band 2 Encoder Starboard
B3DFR PA	Band 3 Direction Finding Receiver Port Aft
B3DFR PF	Band 3 Direction Finding Receiver Port Forward
B3DFR SA	Band 3 Direction Finding Receiver Starboard Aft
B3DFR SF	Band 3 Direction Finding Receiver Starboard Forward
B3ENCD P	Band 3 Encoder Port
B3ENCD S	Band 3 Encoder Starboard
BD1 or B1	Band 1
BD2 or B2	Band 2
BFL	Beam Forming Lens
BIT	Built-In Test
BIT	Binary Digit
BRDG	Bridge
BRG	Bearing
BSOT	Background System Operability Test
BUFR	Buffer
CAND	Candidates
CAT	Category
CF	Confidence Factor
CFR	Coarse Frequency Receiver
CIC	Combat Information Center
CIR	Circular
CMPLT	Complete
CMPX	Complex
CON	Conical
CONF	Confidence
CONT	Control
CORREL	Correlate
CPU	Central Processing Unit
CPX	Complex
CRT	Cathode Ray Tube
CTRL	Control
CTT	Console Tape Transport
CVR	Crystal Video Receiver
CW	Continuous Wave
DCC	Display Control Console
DCU	Digital Control Unit
DEG	Degree
DEL	Delete
DESIG	Designate
DF	Direction Finding
DFC	Directional Frequency Correlator
DFC/DTU	Directional Frequency Correlator/ Digital Tracking Unit
DFR	Direction Finding Receiver
D.H.M.S.	Date, Hour, Minutes, Seconds

DISPL	Display
DOCT	Doctrine
DPU	Data Processing Unit
DPUL	Data Processing Unit Loading
DTU	Digital Tracking Unit
EC	Emitter Count
ECM	Electronic Countermeasures
ECCM	Electronic Counter-Countermeasures
EDP	Electronic Data Processing
EFM	Emitter File Memory
EFX	Emitter File Index
E.G.	For Example
EMI	Electromagnetic Interference
EMTR	Emitter
EN	Emitter Number
ENV	Environment
ER	Error
ESM	Electronic Support Measures
EW	Early Warning
EW	Electronic Warfare
EWS	Electronic Warfare Suite; Electronic Warfare System; Electronic Warfare Supervisor
FA	False Alarm
FAB	Fixed Action Button
FLTR	Filter
FND	Friendly
FOR ID	Forced Identification
FREQ	Frequency
FSR	Frequency Select Receiver
GHZ	Gigahertz
HOS	Hostile
HVSEQ	High Voltage Sequence
HVPS	High Voltage Power Supply
HZ	Hertz
ID	Identification
ID CANDS	ID Candidates
IFF	Identification Friend or Foe
IFM	Instantaneous Frequency Measurement
IFM CFR	Instantaneous Frequency Measurement Coarse Frequency Receiver
IFM MUX	Instantaneous Frequency Measurement Multiplexer
ILLUM	Illumination
INCR	Increase
INHIB	Inhibit
INSTAL	Installation
IR	Infrared
JIT	Jittered
KHZ	Kilohertz
LDR	Leader
LED	Light Emitting Diode
LIB	Library
LND	Land
MHZ	Megahertz
MI	Multi-Installation
MN	Main Library
MS	Milliseconds
MSL	Missile
MULT	Multiple
MULTI	Multiple
MUX	Multiplexer

N	No
NA	Non- or Not Applicable
NEU	Neutral
NMI	Nautical Mile
NTDS	Navy Tactical Data System
OL	On-Line
P	Primary
P	Period
PA	Port Aft
PARAM	Parameter
PD	Pulse Doppler
PD	Parameter Derivation
PED	Pedestal
PERD	Period
PF	Port Forward
PGP	Pulse Group
PLGP	Pulse Group
PLTFRM	Platform
PPI	Plan Position Indicator
PPS	Pulses Per Second
PQS	Personnel Qualification Standard
PRCSR	Processor
PRF	Pulse Repetition Frequency
PRI	Pulse Repetition Interval
PROG	Program
QR	Quick Reaction
R	Rate
RBOC	Rapid Blooming Offboard Chaff
RCVR	Receiver
REJ	Reject
REL	Relative
RESRCH	Research
REV	Review
RF	Radio Frequency
RFI	Radio Frequency Interference
RPTR	Repeater
RSRCH	Research
RSTABP	Port Stabilizer
RSTABS	Starboard Stabilizer
SA	Starboard Aft
SCN	Scan
SDT	System Diagnostic Test
SEC	Sector
SEL	Select
SEMI	Semi-Automatic
SEQ	Sequence
SF	Starboard Forward
SIOC	Serial Input/Output Controller
SOT	System Operability Test
SPEC	Specification
SRBOC	Super Rapid Blooming Offboard Chaff
SRCH	Search
SRU	Ship Replaceable Unit
STAB	Stabilizer
STAG	Staggered
STBD	Starboard
STD	Steady
STD DEV	Standard Deviation
STG	Staggered
SUB	Submarine
SUR	Surface

TACT	Tactical
TDS	Tactical Data System
TECH	Technique
TERM	Terminate
TGU	Technique Generator Unit
TL	Threat Level
TOA	Time of Arrival
TOL	Tolerance
TR	Targeting Radar
TRU	True
TTI	Time To Impact
TWT	Traveling-Wave Tube
UNK	Unknown
(V)	Variant
XFER	Transfer
XFMR	Transformer
XPNDR	Transponder
XPONDERP	Port Transponder
XPONDERS	Starboard Transponder
Y	Yes

VI. INDEX