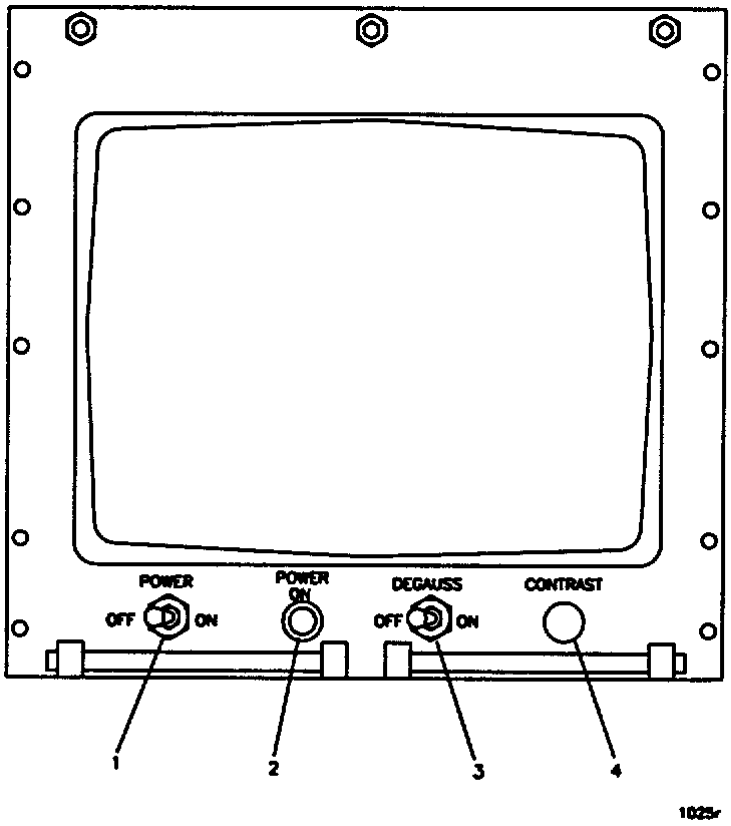
Table 5-1. ARF Number to Common Name Cross Reference (Continued)

ARF #	REFERENCE UNIT (COMMON NAME)	ACRONYM/ABBREVIATION
ARF 043	PRIMARY ALERT SYSTEM SPEAKER SAC	PAS SPEAKER SAC
ARF 044	VOICE CONTROL PANEL SPEAKER RIGHT	VCP SPEAKER RIGHT
ARF 045	HIGHER AUTHORITY VISUAL DISPLAY UNIT RIGHT	HA VDU RIGHT
ARF 046	WEAPON SYSTEM VISUAL DISPLAY UNIT RIGHT	WS VDU RIGHT
ARF 047	COOPERATIVE LAUNCH SWITCH CENTER	CLS CENTER
ARF 048	HEADSET JACK RIGHT	
ARF 049	VOICE CONTROL PANEL RIGHT	VCP RIGHT
ARF 050	LAUNCH ENABLE PANEL	LEP
ARF 051	MASTER ALARM RESET SWITCH RIGHT	MAR RIGHT
ARF 052	WORK SHELF RIGHT	
ARF 053	OPERATOR INPUT DEVICE RIGHT A1 - KEYBOARD RIGHT A2 - TRACKBOARD RIGHT	OID RIGHT
ARF 054	COOPERATIVE LAUNCH SWITCH RIGHT	CLS RIGHT
ARF 055	SECURE VOICE PANEL	SVP
ARF 056	FLOPPY DISK DRIVE	FDD
ARF 057	POWER CONTROL AND DISTRIBUTION UNIT	PCDU
ARF 058	CODER-DECODER ASSEMBLY A1 - SECURE DATA UNIT A2 - POWER SUPPLY	CDA SDU
ARF 059	ADAPTER PANEL (VDU) RIGHT	
ARF 060	SPEAKER PANEL RIGHT AND HANDSET JACK RIGHT	
ARF 061	BUS BAR RIGHT	
ARF 062	DIAGNOSTIC PORT AND OID CABLE MOUNTING BRACKET RIGHT	
ARF 063	VCCP REPEATER ASSEMBLY	
ARF 064	VCP I/O BOX (FOR REPEATER ASSY)	
ARF 065	TV ENCLOSURE (CSE)	
ARF 066		
ARF 067		
ARF 068		
ARF 069		

Table 5-1. ARF Number to Common Name Cross Reference (Continued)

ARF #	REFERENCE UNIT (COMMON NAME)	ACRONYM/ABBREVIATION
ARF 070	FACILITY ALARM PROTECTION ASSEMBLY & DOOR PUSHBUTTON PROTECTION ASSEMBLY	FAPA & DPPA
ARF 071		
ARF 072		
ARF 073		
ARF 074		
ARF 075		
ARF 076		
ARF 077		
ARF 078		
ARF 079		
ARF 080	WSP BREAK-0UT ADAPTER	WSP BOA
ARF 081		
ARF 082		
ARF 083		
ARF 084		
ARF 085		
ARF 086		
ARF 087		
ARF 088		
ARF 089		
ARF 090	JACK BOX	
ARF 091	JACK BOX	
ARF 092		
ARF 093		
ARF 094		
ARF 095		
ARF 096		
ARF 097		
ARF 098		
ARF 099		
ARF 100		

5-2.2. Visual Display Unit. (ARFs 005 (HA left), 006 (WS left), 045 (HA right), 046 (WS right)) The VDUs (Figure 5-2) provide the principal display medium for the missile combat crew member (MCCM). Four identical VDUs are located on the console, two at each workstation. The Higher Authority (HA) VDUs are on the left side of each console workstation, while the Weapon System (WS) VDUs are located on the right. The VDUs are high resolution, color, hardened monitors with a screen diagonal of approximately 15 inches. All MCCM VDU adjustment controls are on the front panel of the units. Only one workstation VDU can be interacted with at a time. VDU interaction is selected through a switch located on the workstation keyboard. Interaction with the WS VDU display provides for monitoring status of LCFs and LFs, initiating commands, and performing remote targeting operations and other command and control functions.



SOURCE: T.O. 21M-LGM30G-1-22

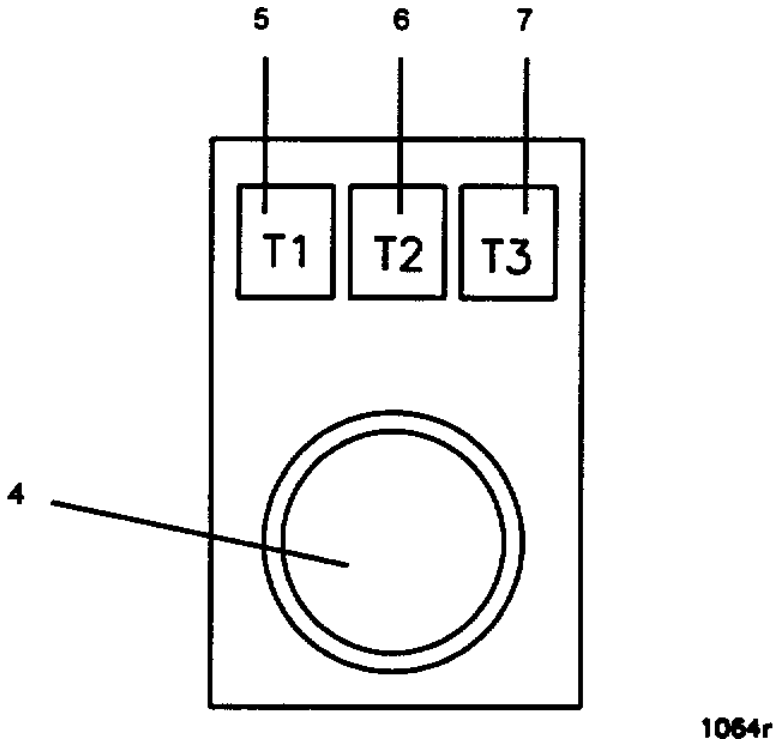
NO.	CONTROL/INDICATOR	FUNCTION
1	POWER ON/OFF Switch	Allows operator to turn power on and off.
2	POWER ON Indicator (Green)	Indicates POWER switch is in ON position.
3	DEGAUSS	Allows operator to manually restore color purity.
4	CONTRAST Control	Adjusts display for the desired ratio of black-to-white image.

Figure 5-2. Visual Display Unit

5-2.3. Operator Input Devices. (Figure 5-3/ARFs 013 (left), 053 (right)). An OID (Figure 5-3) is located at each workstation. Each workstation OID provides operator interface with the WSP or rapid message processor (RMP). Each OID also provides interaction with the corresponding VDU (HA VDU when connected with RMP, and WS VDU when connected to WSP). The OID at each workstation can be connected to only one processor at a time (RMP or WSP). Connection is selected through a switch on the OID. Each OID is composed of a trackball assembly and keyboard.

5-2.3.1. Trackball Assembly. (013A1 (left), 053A1 (right)). The trackball assembly (Figure 5-3) consists of a trackball with three function keys (buttons). The trackball is used to move the pointer cursor which is displayed on the selected VDU. The keys are used as a selection device to bring up status on the VDU, to select items on menus, to select items to edit, and to acknowledge alarms. The trackball is located on the right side of the keyboard. There is one trackball for each workstation.

5-2.3.2. Keyboard. (013A2 (left), 053A1 (right)). The keyboard is used to generate key codes. The keys are used for generating onscreen characters, commanding special functions, or initiating external processes. A switch on the keyboard is used for establishing connectivity between the OID and either processor. The interwindow areas of the appropriate VDU screen will be blue when a processor is connected and grey when not connected. The keyboard contains controls which duplicate the trackball control capabilities, and can be activated whether or not the trackball is operational. Barriers surround selected critical keys to reduce the possibility of inadvertent activation.



SOURCE T.O. 21M-LGM30G-1-22

Figure 5-3. Operator Input Device (Sheet 1 of 6)

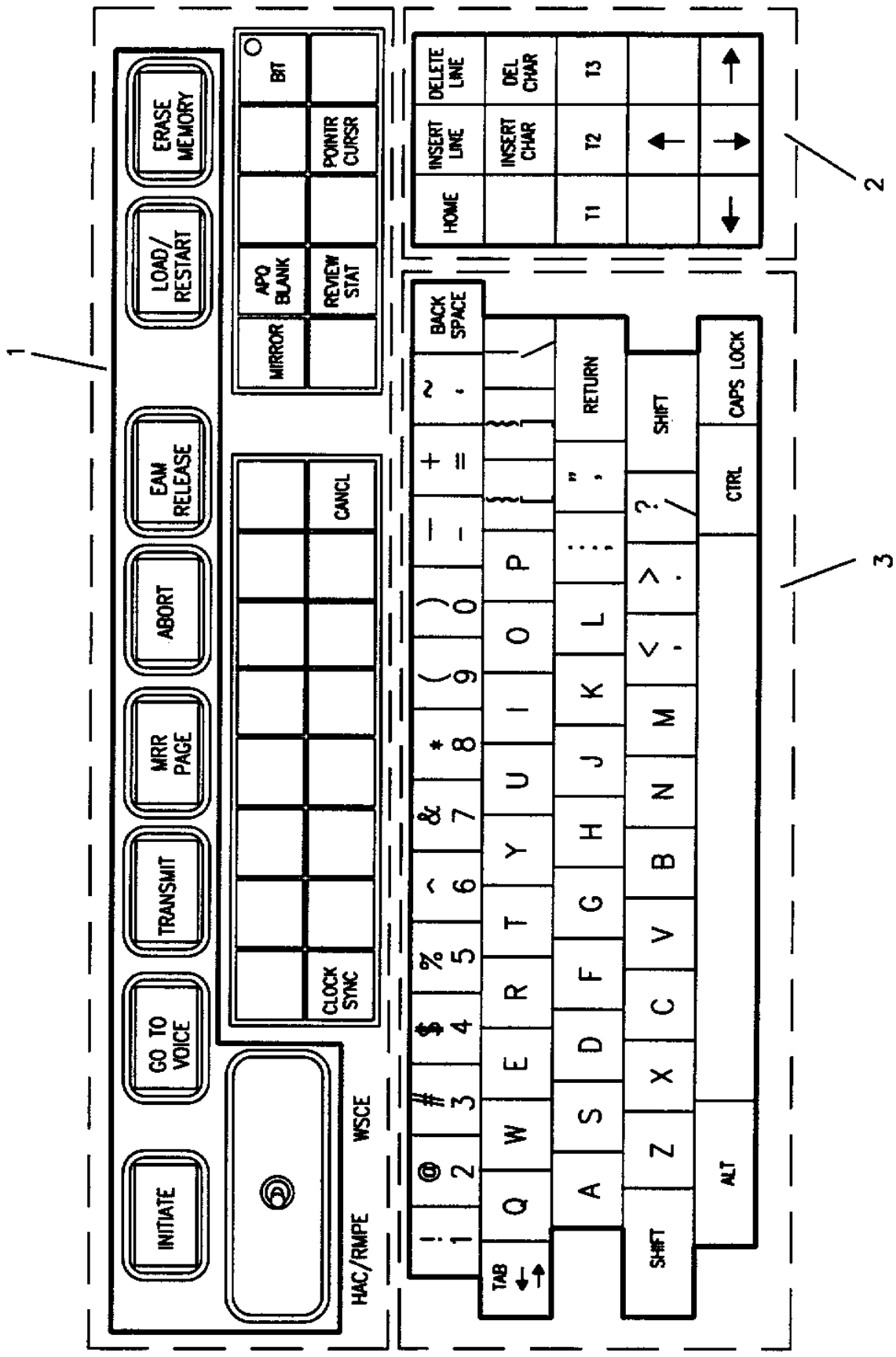


Figure 5-3. Operator Input Device (Sheet 2 of 6)

NO.	CONTROL/INDICATOR	FUNCTION
		NOTE
	Keys are applicable to both WS and HA unless otherwise stated under function column.	
1	**Function Keys**	
	INITIATE (Guarded H/W)	Instructs the system to begin a specified process. For HA only, this key is available only when a task is being worked on in the Work Area.
	GO TO VOICE (Guarded H/W)	Puts the current activity on hold if active. Opens an APQ entry and presents voice EAM template (HA only).
	TRANSMIT (Guarded H/W)	Message is transmitted and control of the HA system is returned to the message processor (HA only).
	MRR PAGE (Guarded H/W)	Displays either the first or second page of the message in the message release register. This key acts as a toggle (HA only).
	ABORT (Guarded H/W)	Returns control of the HA system to the message processor without transmitting the message (HA only).
	EAM RELEASE (Guarded H/W)	Requests the release of EAM data from the RMP to the WSP (WS only).
	Shift+LOAD/ RESTART (Guarded H/W)	Load/Restart by itself, has not effect. Shift + LOAD/ RESTART initiates WS Load and Restart sequences (WS only).
	Shift+ERASE MEMORY (Guarded H/W)	ERASE by itself, has not effect. Shift + ERASE initiates overwriting of memory of BS/L and WSP (WS only).
	HAC/RMPE - WSCE TOGGLE SWITCH (Guarded H/W)	When HAC/RMPE is selected, connects the keyboard to the RMP (allows actions to be performed on HA). When WSCE is selected, connects the keyboard to the WSP (allows actions to be performed on the WS).
	CLOCK SYNC	At a designated time, when synchronization is to occur, CLOCK SYNC function key is pressed, and a green ROUTINE alarm is generated to indicate that synchronization was successfully performed.
	CANCL (Cancel)	Active in the work area, pop-up menus and in the data entry window. In the work area, initiation of the CANCEL function key exists a task and clears the display. Data entered and/or changes made are not saved. If at the level of the task that did not previously exist in the APQ, the new APW entry is deleted. For pop-up menus, the CANCEL function key completely exists all pop-up menus. For WS only, if the task previously existed in the APQ, and is at its top level, the task is released. It exits a task and clears the template. Data entered an/or changes made are not saved.

Figure 5-3. Operator Input Device (Sheet 3 of 6)

NO.	CONTROL/INDICATOR	FUNCTION
1	(Continued)	
	MIRROR	Replaces the MCCM's work area with the contents of the other MCCM's work area (HA only) or replaces the entire display with the contents of the other MCCM's display (WS only). The MCCM exits the HA MIRROR mode by pressing any key (except the WS and HA selection toggle switch) or exits the WS MIRROR mode by pressing the MIRROR mode function key.
	APQ BLANK	(HA only). Enables the MCCM to blank out the task data in the APQ for security reasons. The MCCM restores the APQ data to the screen and exits the APQ blank mode by reselecting the APQ BLANK function.
	BIT	Initiates built-in test (BIT) for keyboard: when pressed, LED goes on to indicate BIT is activated. LED flashes 3 - 5 Hz if fault is detected; LED goes off if BIT shows no keyboard faults.
	REVIEW STAT	(HA only) Enables an MCCM to view system prompt and status messages that appear in the system prompt and status area at the bottom of the screen. The system prompt and status areas are normally blank. When a system prompt is generated and the prompt area is blank, the prompt is displayed in the comment/prompt area of both VDUs without any MCCM action. When a system prompt is displayed and the MCCM presses the REVIEW STATUS function key, the status and prompt area is cleared and returns to its normally blank state or the next system prompt that was queued is displayed.
	POINTER CURSR	Toggles arrow keys control to either pointer cursor or text cursor. When POINTER CURSOR key is ON, arrow keys control pointer cursor. When POINTER CURSOR is OFF, arrow keys control text cursor.
2	**Keypad Keys**	
	HOME	Moves text cursor to first unprotected character position of first field of window where cursor is active. For HA only it adds one blank line in the voice EAM template.
		NOTE
INSERT keys move existing test to right and down. If insufficient character spaces remain at the end of the field, shifted characters which exceed the field length will be deleted.		
	INSERT LINE	Inserts a blank line where the cursor is placed and moves existing lines down. Cursor can be placed anywhere on line.
	DELETE LINE	Deletes the entire line where cursor is placed and moves existing lines up. Cursor can be placed anywhere on the line.

Figure 5-3. Operator Input Device (Sheet 4 of 6)

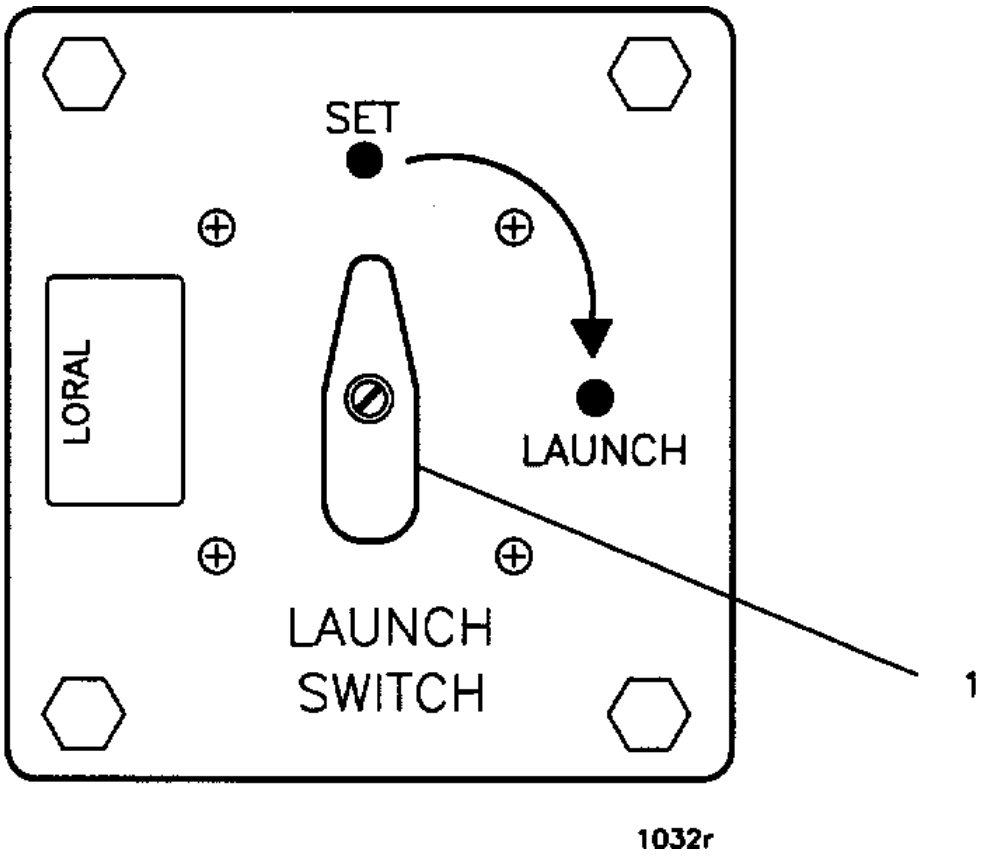
NO.	CONTROL/INDICATOR	FUNCTION
2	(Continued)	
	INSERT CHAR	Inserts one character space where the cursor is placed and shifts remaining text to right. Cursor does not move. For unprotected fields, inserting character before end of field causes character at end of field to be deleted. For free text, line wrap occurs for any character at end of line.
	DELETE CHAR	Deletes the character where the cursor is placed and shifts the text one character to the left. For unprotected fields, a blank fills the right end of the field. For free text fields, reverse line wrap occurs.
		NOTE
Arrow keys assigned is affected by POINTER CURSOR key. When POINTER CURSOR key is ON, arrow keys control the pointer cursor. When POINTER CURSOR key is OFF, arrow key control text cursor. In text cursor control, arrow keys can move text cursor only within (not between) editable (unprotected) fields. Left and right arrow keys do not wrap to the beginning or end of the next line.		
	UP arrow	Moves active cursor one character space up.
	DOWN arrow	Moves active cursor one character space down.
	LEFT arrow	Moves active cursor one character space left.
	RIGHT arrow	Moves active cursor one character space right.
	Function key T1	Emulates pressing the left trackball button.
	Function key T2	Emulates pressing the middle trackball button.
	Function key T3	Emulates pressing the right trackball button.
3	**Alpha/Numeric** Keys	
	TAB	Moves the text cursor to the next data entry field. At end of window, moves text cursor to first character of first editable field, even if first field was not in view when TAB was pressed.
	Shift + TAB	Moves the text cursor to the first character of the previous data entry field.
	Alpha	Lower case alphabetic character (e.g., a)
	Shift + alpha key	Upper case alphabetic character (e.g., A)
	Numeric	Corresponding number (e.g., 1)
	Shift + numeric	Corresponding special character (e.g., !)
	Backspace	Deletes characters to the left of the cursor and moves text line and text cursor to the left one character space.

Figure 5-3. Operator Input Device (Sheet 5 of 6)

NO.	CONTROL/INDICATOR	FUNCTION
3	(Continued)	
	Return	During free text input, adds a blank line to the line below the text cursor. Also moves any existing text to the right of the cursor to the newly created blank line, in addition to moving the text cursor to the first character cell of the new line. If text cursor is at last line of free text, the cursor does not move.
	CAPS LOCK	When pressed, calls only capital letters. Does not call special characters such as !, @, etc. CAP LOCK LED is on when in caps lock position.
	Space Bar	Moves the text cursor to the right one character space if spaces remain on line; moves cursor to next line at end of line. If text cursor is at the end of an unprotected field, space bar overwrites a blank over the last character cell of the unprotected field. Does not move cursor to next field.
	ALT	Inoperative.
	CTRL	Inoperative.
4	Trackball	Used to move the pointer cursor which is displayed on the selected VDU. Rotating the ball results in movement of the pointer cursor on the selected VDU in a comparable direction.
5	T1 pushbutton	Used to select highlighted items, detailed status, items from menus and submenus; acknowledge alarms (category and item acknowledge only). Used for Flight/Squadron Status toggling (WS only); expand/ contract APQ and checklists (WS only); TO checklist entry checkoff (WS only); Line-by-line scroll through the APQ, TO checklist (WS only), and work area templates.
6	T2 pushbutton	Used for page-by-page scroll through the APQ, TO checklists (WS only), and work area displays. Used to exit one level of menus back to the previous menu.
7	T3 pushbutton	Used in correlation with cursor position to scroll to the top or bottom of the APQ, T.O. Checklist (WS only), or Work Area. Used to exit any series of menus back to the top level without selection of a menu item.

Figure 5-3. Operator Input Device (Sheet 6 of 6)

5-2.4. Cooperative Launch Switches. (Figure 5-4/ARFs 007 (left), 054 (right). The CLSs are used in the conjunction with the LCP to provide two-person/four-hand operation during launch operations. Concurrent actuation of the three CLSs and the launch switch on the LCP is necessary for initiation of an execute launch command.

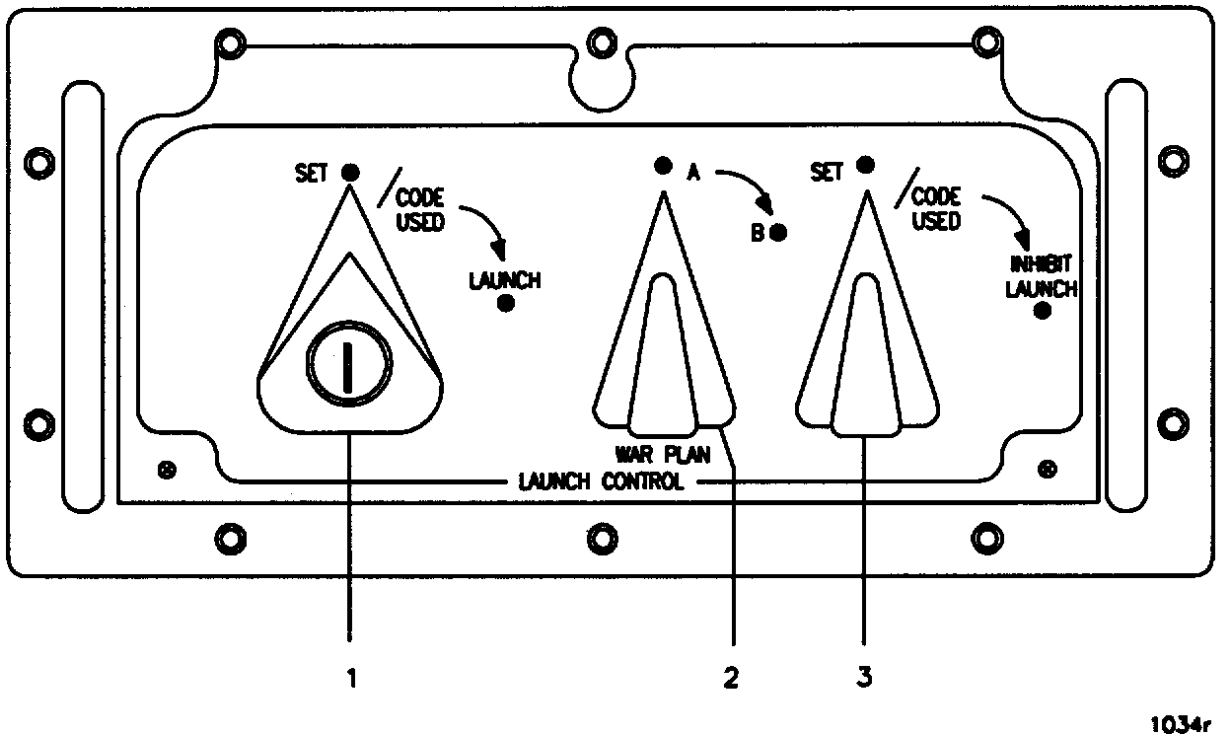


SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	Launch Switch	Used in conjunction with the LAUNCH control panel to initiate execute launch command. All switches must be actuated within 2 seconds of each other in order to obtain an execute launch command.

Figure 5-4. Cooperative Launch Switch

5-2.5. Launch Control Panel. (Figure 5-5/ARF 010). The LCP provides the initiating point for execute launch, inhibit and test commands. Mechanical code units provide the secure launch and inhibit codes. Concurrent actuation of the Cooperative Launch Switches (CLSs) is necessary for initiation of an execute launch command.

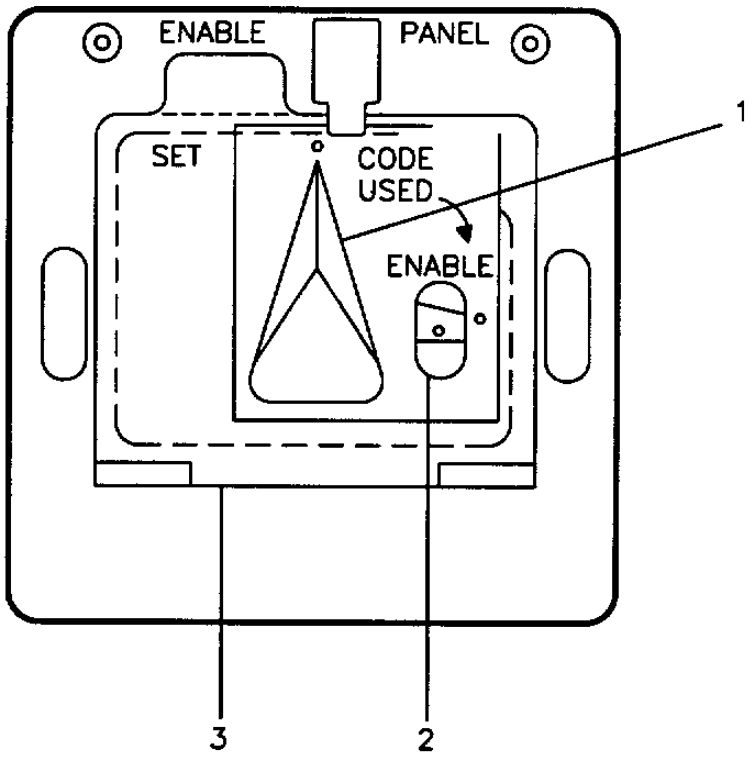


SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	Launch Switch	Initiates execute launch command when operated in conjunction with cooperative launch switches. All switches must be actuated within 2 seconds of each other in order to obtain an execute launch command. When the switch has been used it will only return to the Code Used position.
2	WAR PLAN Switch	Inoperative.
3	INHIBIT LAUNCH Switch	Used to initiate command. Causes enabled LFs to enter disenable commanded state with 5 minute timer. Causes LFs in launch commanded mode to enter launch inhibited mode with 5 minute timer. LFs will return to disenabled state when timers run out if no additional execute launch commands are received. Also used to test inhibit capability when LFs are in disenable state. When the switch has been used it will only return to the Code Used position.

Figure 5-5. Launch Control Panel

5-2.6. Launch Enable Panel. (Figure 5-6/ARF 050). The LEP is a mechanical code unit the output of which is combined with a received unlock code and, if applicable, the stored translate code which provides the enable command secure code when actuated. The secure code is included in an enable command upon successful cooperative enabling procedures.

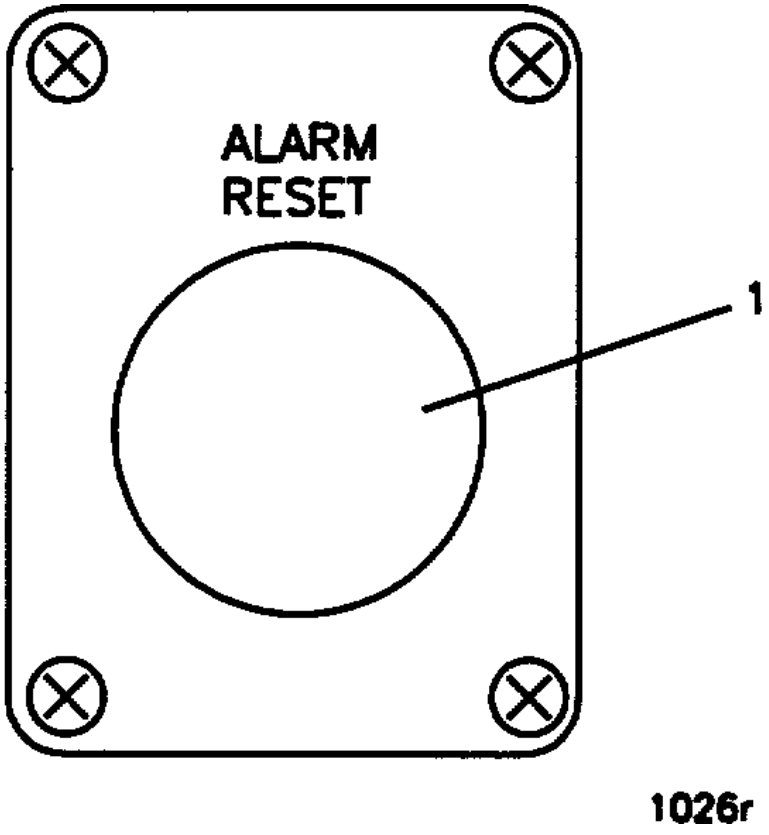


SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	ENABLE Switch	When set to ENABLE (latch hold) secure code is available from mechanical code unit for combining by the WSP with contents of unlock code and, if applicable, stored translate code. The combined code word is then used for enable command transmission.
2	ENABLE Switch Latch	Holds ENABLE switch in ENABLE position. When pressed, releases ENABLE switch from latch hold, allowing switch to return to CODE USED position.
3	Protective Cover	Protects switches from being moved and provides a place for Tamper Detection Indicator (TDI) seals to be installed.

Figure 5-6. Launch Enable Panel

5.2.7. Master Alarm Reset. (Figure 5-7/ARFs 011 (left), 051 (right)). The master alarm reset pushbutton provides alarm acknowledgment capabilities for the weapon system, HA communications, and facility alarms. When the pushbutton is pressed, audio and visual alarms shown on either VDU and the audio alarm associated with the AAP are cleared. There are two master alarm reset pushbuttons, one per workstation.



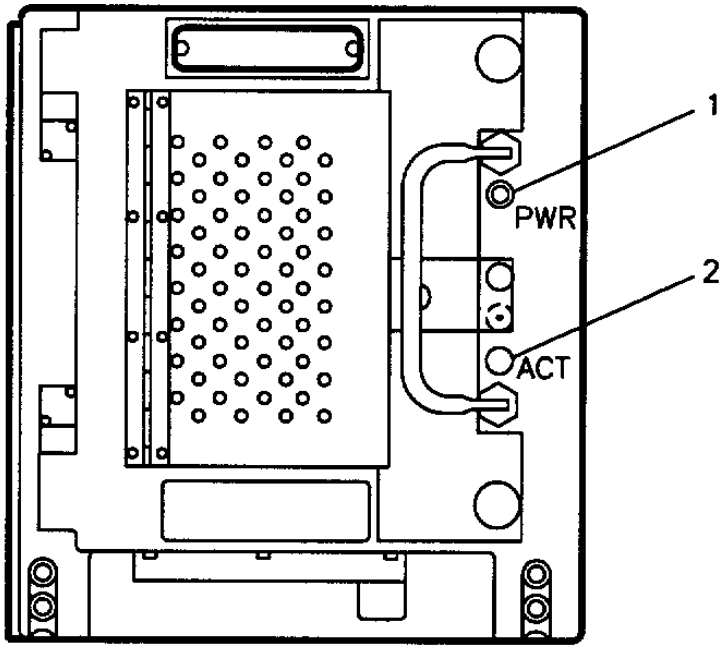
SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	Master Alarm Reset (MAR) Switch	Allows the MCCM to acknowledge WS, HA, and facility alarms from either work station. When pressed, audio and visual alarms on the VDUs and audio alarms from the AAP are halted with the following exceptions: The CRITICAL alarm associated with the critical alerts is not reset until that alarm has been active for at least five seconds. The LEDs on the AAP are not reset and the audible fire alarm within the LCC is not silenced.

Figure 5-7. Master Alarm Reset

5-2.8. Weapon System Processor. (ARF 033). The WSP is located in the lower center bay of the console. The WSP is a general purpose digital computer. The function of the WSP is to control the flow of data within and through the LCC. Operator-initiated messages are processed by the WSP, sent to the secure data unit for encryption, and returned to the WSP for transmission. Incoming LCC and LF messages received by the WSP are decrypted by the secure data unit, stored by the WSP, and processed for possible status display. the WSP interrogates its designated LFs in a round-robin sequence. The WSP also controls and sequences target and execution plan calculations and remote data change operations.

5-2.9. Bulk Storage/Loader. (Figure 5-9/ARF 014). The BS/L is used for initial load of the processor memory and for reloads in the event of main memory upset or other fault causing a restart. It provides a secondary memory function for the weapon system programs and databases. The BS/L contains a removable, nonvolatile, readable and writable medium. It is composed of a storage enclosure and removable disk cartridge. The BS/L is used continually for nonvolatile storage of weapon system states and program data.

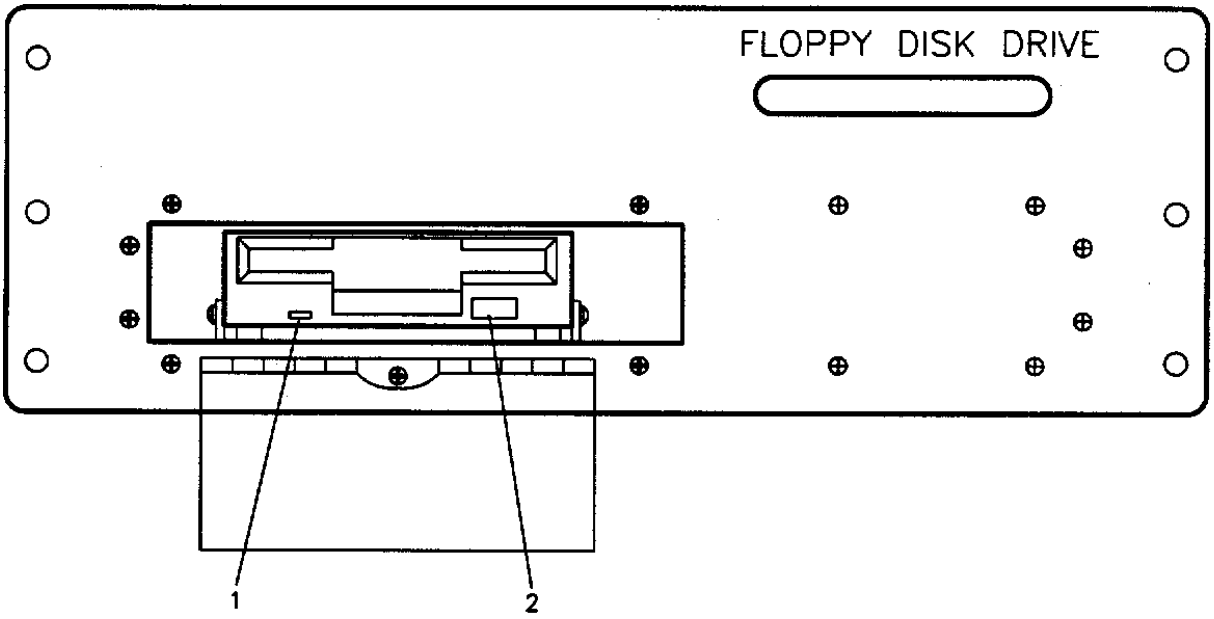


SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	PWR Indicator (Green)	Indicates power is applied to BS/L.
2	ACT Indicator (amber)	Comes on when disk drive is reading or writing.

Figure 5-8. Bulk Storage/Loader

5.2.10. Floppy Disk Drive. (Figure 5-9/ARF 056). The FDD is used to provide removable read/write storage for non-critical WSP functions. The FDD is also used to download diagnostic data. Floppy disks are used to load the Source T.O. data base and to archive the crew log on a periodic basis. Floppy disks may be used to reload the targeting and other data files and to transfer data files from one LCC to another. The FDD is a single 3.5-inch 1.44 Mbytes drive.



SOURCE: T.O. 21M-LGM30G-1-22

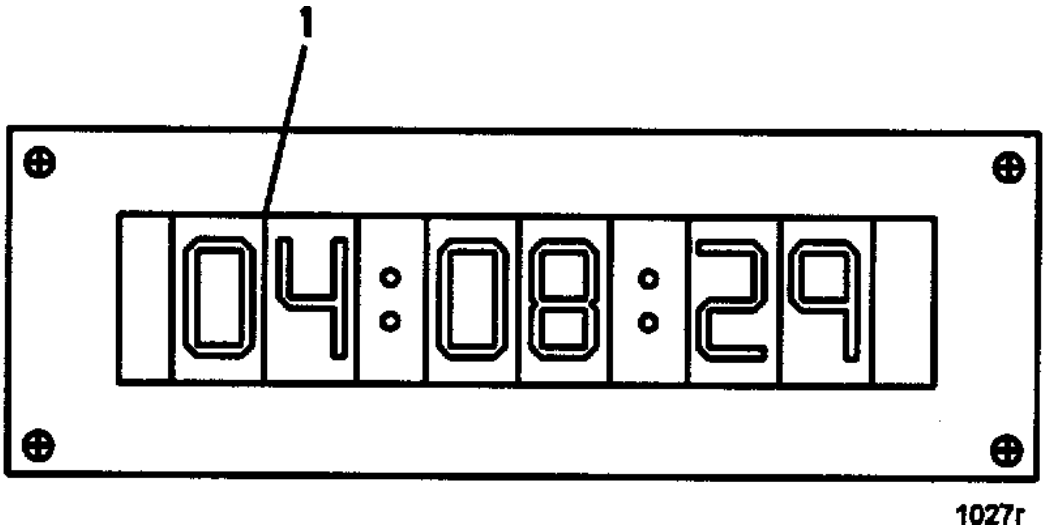
NO.	CONTROL/INDICATOR	FUNCTION
1	Busy Indicator (Green)	Comes on when disk drive is reading or writing.
2	Eject Pushbutton	Ejects floppy diskette from drive.

Figure 5-9. Floppy Disk Drive

5-2.11. Time-of-Day Clock. (Figure 5-10/ARF023). The TODC is located in the upper center bay of the console. It provides a time-of day display viewable by either operator. The TODC displays the time in military format, is accurate to at least one second within a 24-hour period, and will remain functional during loss of primary power.

5-2.12. Auxiliary Alarm Panel. (Figure 5-11/ARF 031). The AAP provides controls and indicators from facilities-related subsystems. These include fire alarms, LCEB equipment failure indicator, security controls and indicators, and LCEB power failure indicators. The AAP relates to the WSP as follows: one APQ entry is used to indicate the status of the last detected facilities event. The ROUTINE audio and visual alarms are used to indicate a facilities alarm. A new alarm causes the appropriate indicators on the AAP to flash. The ACK pushbutton on the AAP acknowledges visual alarm indicators on the AAP. Upon acknowledgment, indicators remain on until condition clears.

5-2.13. Printer. (Figure 5-12/ARF 032). The printer is located in the center of the console. The printer provides a hard copy printout of data from the WSP, RMP, or RMP backup. Only the RMP backup can access the printer even if the WSP is non-operational. The printer is a dot-matrix thermal type printer providing 80 characters/line and 66 lines per page at 11 characters per inch printing capability.



SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	LEDs	LEDs display time of day in military format, accurate to at least 1 second within a 24 hour period.

Figure 5-10. Time-of-Day Clock

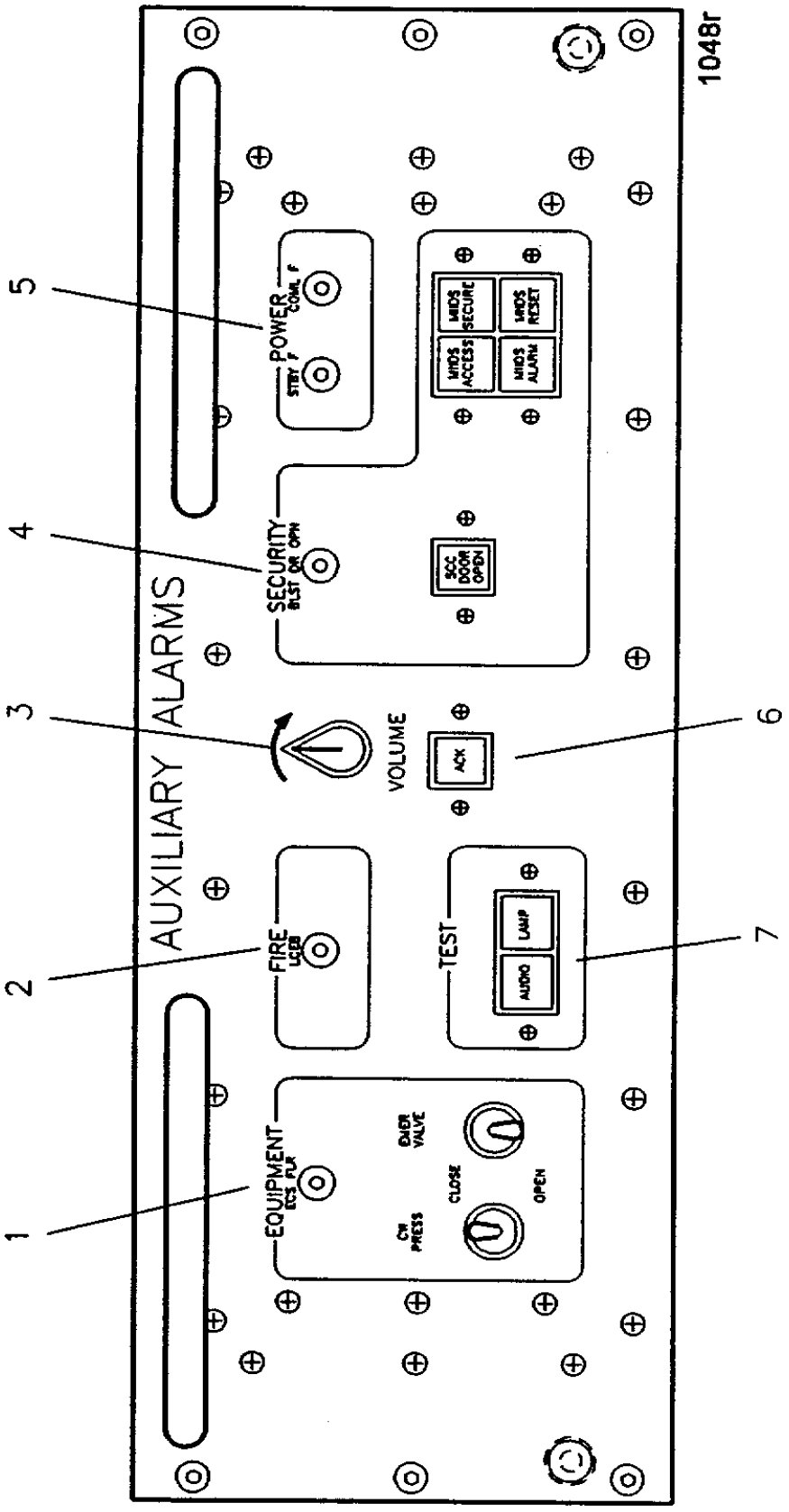


Figure 5-11. Auxiliary Alarm Panel (Sheet 1 of 3)

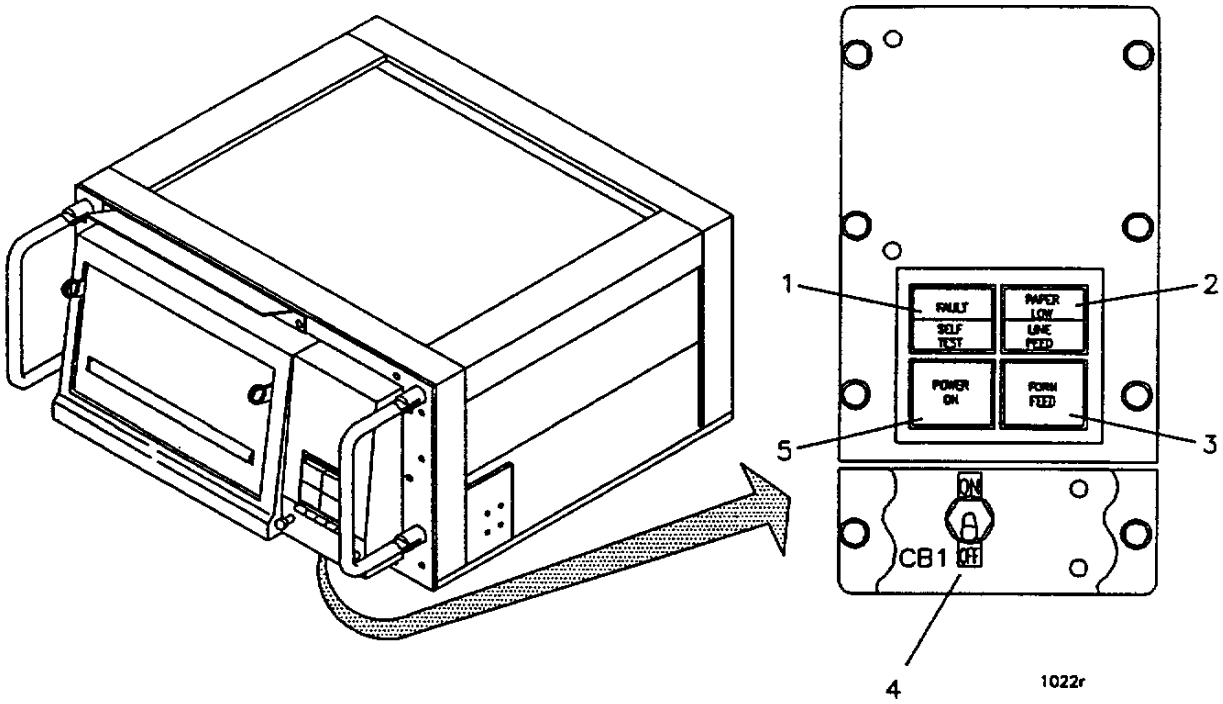
NO.	CONTROL/INDICATOR	FUNCTION
1	EQUIPMENT	
	ECS FLR Indicator (Yellow)	**[3] [5]** Flashes on receipt of environmental control system or sump pump malfunction signal. When ACK pushbutton is pressed, light remains on steadily. Light goes out when fault is corrected **[1]** Inoperative.
	CW PRESS Switch	**[3] [5]** OPEN position used to pressurize water tank for LCC usage during extended isolation. CLOSE (normal position) position turns off pressurization **[1]** Inoperative.
	EMER VALVE Switch	**[3] [5]** CLOSE position used to close LCC water, sewage, and toilet vent switch emergency shutoff valves. OPEN position resets valves for normal flow **[1]** Inoperative.
2	FIRE - LCEB Indicator (Red)	**[3] [5]** Flashes on receipt of fire signal from LCEB. When ACK pushbutton is pressed, light remains on steadily. Light goes out when fault is corrected **[1]** Inoperative.
3	VOLUME Control	Controls volume for speaker for audio alarms associated with the AAP. Alarm is still audible at minimum volume setting.
4	SECURITY	
	BLST DR OPN Indicator (Yellow)	**[3] [5]** Flashes when elevator shaft blast door pins are unlocked (not fully extended into latch pin portals). When ACK pushbutton is pressed, light remains on steadily. Light goes out when door is closed and locked **[1]** Inoperative.
	SCC OPEN DOOR Pushbutton	Opens door between security room (room 101) and elevator room (room 102).
	MIIDS ACCESS Pushbutton (Green)	When pressed, selects access mode of operation and causes MIIDS SECURE pushbutton to go off. Intrusion alarms are inhibited from reporting and alarm conditions cannot be acknowledged or reset.
	MIIDS SECURE Pushbutton (Green)	When pressed, selects secure mode of operation and causes MIIDS ACCESS pushbutton to go off.
	MIIDS ALARM Pushbutton (Yellow)	Comes on when in secure mode and unauthorized activity is detected in protected areas. When pressed, indicator goes off. If activity ceases before acknowledgment, all pushbuttons except MIIDS SECURE go off as alarm is acknowledged.
	MIIDS RESET Pushbutton (Green)	Flashes when MIIDS ALARM pushbutton is pressed if activity has continued in protected area. When pressed, all pushbuttons except MIIDS SECURE go off.

Figure 5-11. Auxiliary Alarm Panel (Sheet 2 of 3)

NO.	CONTROL/INDICATOR	FUNCTION
5	POWER	
	STBY F Indicator (Yellow)	**[3] [5]** Flashes when standby power malfunction occurs. When ACK pushbutton is pressed, light remains on steadily. Light goes out when fault is corrected **[1]** Inoperative.
	COML F Indicator (Yellow)	**[3] [5]** Flashes when commercial power is out of tolerance. Warning light resets automatically when MPP transfers from standby power to commercial power **[1]** Inoperative.
6	ACK Pushbutton	When pressed, acknowledges facility alarms, causing alarm indicators to remain on steadily. Also silences audible alarms (only if WSP is inoperable). (Unacknowledged alarms flash.)
7	TEST	
	AUDIO Pushbutton	Press to test speaker.
	LAMP Pushbutton	Press to test lamps and alarm circuitry. ECS FLR, LCEB FIRE, BLST DR OPN, STBY F, and COML F indicators flash until acknowledged by pressing the ACK pushbutton. MIIDS ACCESS, MIIDS SECURE, and MIIDS RESET pushbuttons come on and MIIDS ALARM pushbutton flashes until release of the LAMP pushbutton. FACILITIES ALARM and LCEB FIRE alarms occur on the WS VDUs.

SOURCE: T.O. 21M-LGM30G-1-22

Figure 5-11. Auxiliary Alarm Panel (Sheet 3 of 3)



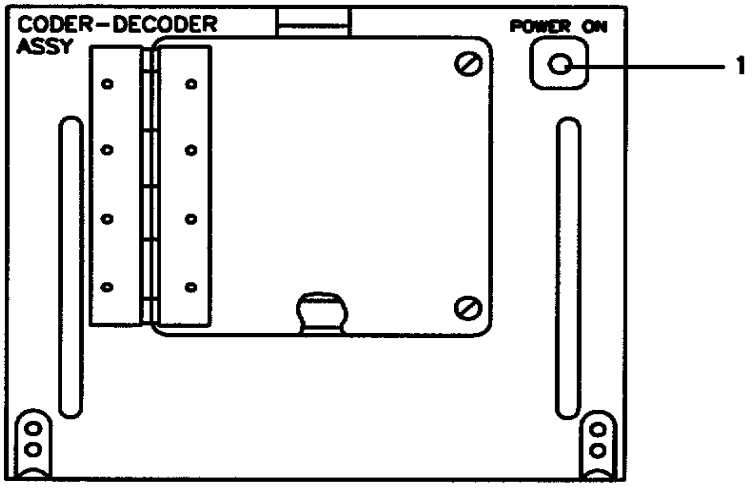
SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	FAULT/SELF TEST Switch/Indicator (red, white)	When pressed, advances paper 20 lines and prints out a test pattern. Comes on red when printer detects an internal fault such as: power fault, out of paper, printhead over/under temperature, or motor error. Comes on white until self test completed
2	PAPER LOW/LINE FEED Switch/Indicator (amber, white)	Comes on amber when paper is out. When pressed, paper advances one character line and comes on white.
3	FORM FEED Switch (white)	When pressed, advances paper 20 lines. If switch is pressed and held, printer continuously form feeds the paper, and switch will remain on.
4	CB1 ON/OFF Circuit Breaker	Controls input power to printer and acts as circuit breaker.
5	POWER ON Switch/Indicator (Green)	Indicates CB1 is in the ON position and power is applied to the printer.

Figure 5-12. Printer

5-2.14. Coder-Decoder Assembly. (Figure 5-13/ARF058). The CDA contains the Secure Data Unit (SDU) which provides encryption and decryption of messages at the LCC. The encryption and decryption are both performed by the SDU within the CDA and are controlled by the WSP.

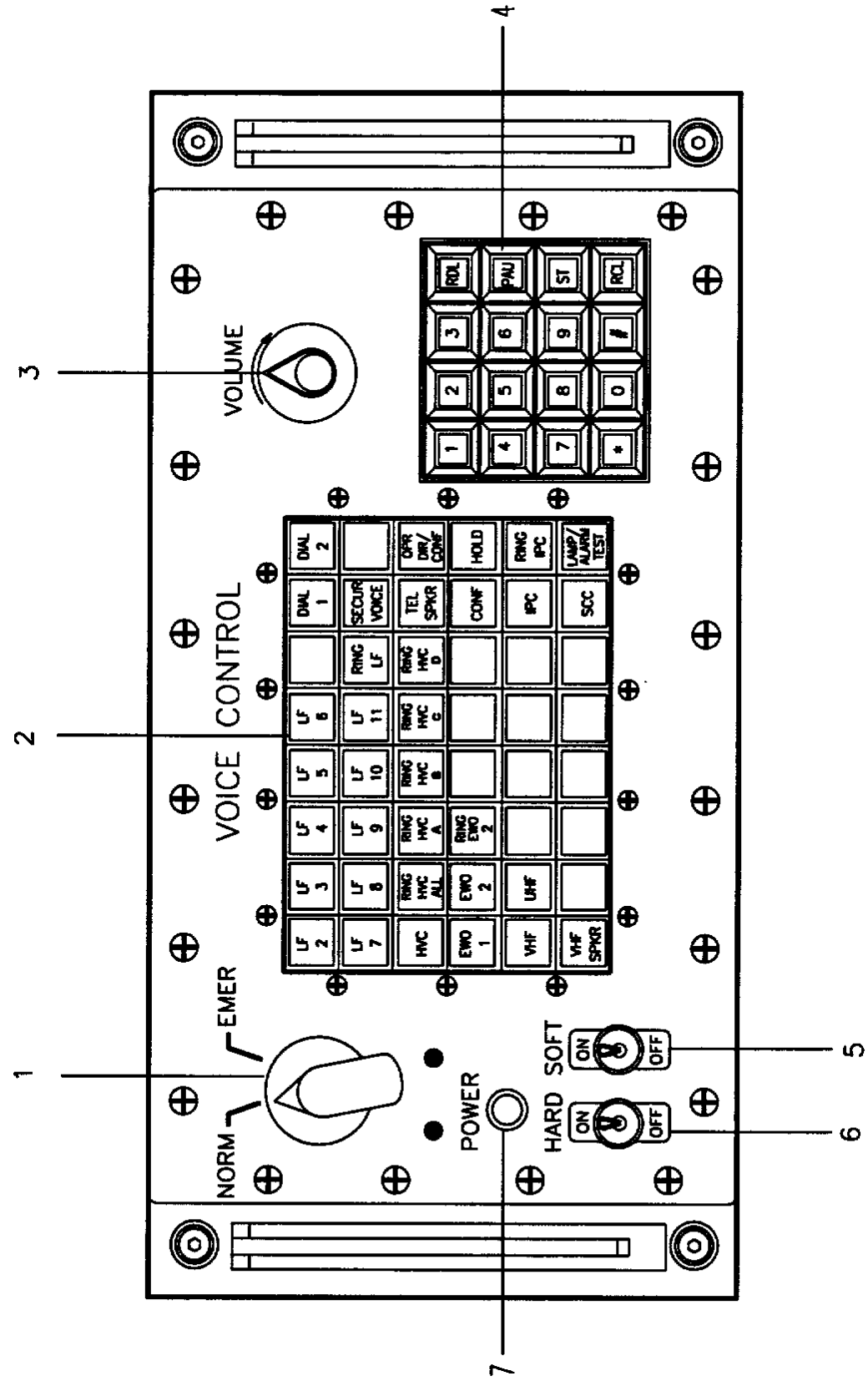
5-2.15. Voice Control Panel. (Figure 5-14/ARFs 009 (left), 049 (right)). The VCP is used to control the voice communications between the LCC and other LCCs, higher authority communications posts, and LFs, as well as providing connectivity to commercial telephone lines. It allows for manual input of telephone numbers (connected to the existing telephone system) and for specific functions (redial, memory, hold and conferencing) to be used individually or in combination with other keys. There are two VCPs on the console, one per workstation. The VCP is located directly under the VDUs on each side of the console. The VCP front panel contains the necessary controls and indicators for the MCCM to select the communication mode and destination. The VCP is partitioned electrically into hard and soft sections. These sections have separate power supplies and circuit breakers. The normal/emergency switch isolates the hard side from the soft side.



SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	POWER ON Indicator (red)	Indicates power is applied to CDA.

Figure 5-13. Coder-Decoder Assembly



SOURCE T.O. 21M-LGM30G-1-22

TYPICAL

Figure 5-14. Voice Control Panel (Sheet 1 of 4)

NO.	CONTROL/INDICATOR	FUNCTION
1	NORM/EMER Switch	Usually set to NORM position. Set to EMER position post-nuclear event. EMER position isolates the survivable electronics from the non-survivable circuits to preclude a soft electronics failure from adversely affecting mission critical communications on UHF and HVC.
2	Switch Matrix	
	LF (2 -11) Selector Pushbutton	Flash, accompanied by ringing, for incoming calls or illuminate steadily for outgoing calls between LF and LCC. When pressed, allow receipt and transmission by way of SIN telephone to selected LF.
	DIAL (1 - 2) Selector Pushbutton	Used to select soft interflight/base telephone lines for sending or receiving. When any LF (2-11) selector pushbutton is also pressed, permits phone patch between the LF and selected dial line. Dial line 1 is shared by the IPD modem and the secure telephone. The secure telephone has automatic priority over the DIAL1 and the IPD modem. DIAL1 has priority over the IPD modem. DIAL1 or DIAL2 must be cleared and reselected between calls.
	RING LF Pushbutton	Enables the ring generator for signalling an LF over the SIN telephone lines. If continuously pressed for more than 20 seconds, causes an LF diesel remote start/stop signal to be sent to LF MPP.
	SECUR VOICE Pushbutton	Connects the secure phone unit to dial line 1. If SECUR VOICE is selected, DIAL1 comes on when the secure telephone is off hook.
	HVC Pushbutton	Flashes, accompanied by ringing on incoming call. When pressed, terminates ringing and allows use of circuit. Circuit provides party line connection with any combination of the other four squadron LCCs which also have HVC selected.
	RING HVC ALL Pushbutton	Used to ring all other LCCs in squadron simultaneously.
	RING HVC (A - D) Pushbuttons	Used to ring corresponding LCC. Pushbutton labeling is site specific.
	TEL SPKR Pushbutton	Connects the speaker with the circuit currently selected by the operator. Pushbutton has three states. Connects speaker to the (1) direct bridge, (2) conference bridge (flashes), or (3) off.
	OPR DIR/CONF Pushbutton	Pushbutton has 3 states. Connects the operator to the (1) direct bridge (steady illumination), (2) conference bridge (flashes), or (3) off. Direct bridge is used for talking with one party. Conference bridge is used in conjunction with the CONF pushbutton when talking with more than one party.
	EWO 1 Pushbutton	**SCPs**: flashes accompanied by ringing for incoming calls from Wing CP. When pressed, allows use of circuit or rings Wing CP.

Figure 5-14. Voice Control Panel (Sheet 2 of 4)

NO.	CONTROL/INDICATOR	FUNCTION
2	(Continued)	
	EWO 2 Pushbutton	**SCPs**: flashes for incoming calls, accompanied by ringing. When pressed, allows use of circuit and RING EWO 2 pushbutton.
	RING EWO 2	**SCPs**: Used to ring all SCPs on EWO 2 circuit.
	CONF Pushbutton	Connects a party or parties on the direct bridge to the conference bridge. Up to five lines can be conference at a time.
	HOLD Pushbutton	When activated, inhibits transmission or receipt of audio on selected line until the line is reselected. Any voice channel is taken off hold by reselecting the channel.
	VHF Pushbutton	Flashes, accompanied by alarm, for incoming transmission. When pressed, light becomes steady. Must be pressed for transmission over VHF.
	UHF Pushbutton	Flashes, accompanied by increase in speaker sound level and audio alarm, when traffic is being received on the monitored UHF radio channel or when the SQUELCH ON/OFF switch is in the OFF position. When pressed, light becomes steady and increased speaker level is maintained. Must be pressed for transmission over UHF.
	IPC Pushbutton	Connects LCC interphone with LCC interphone (jack box).
	RING IPC Pushbutton	Rings the jack boxes in the launch control equipment and launch control support buildings (LCEB and LCSB).
	VHF SPKR Pushbutton	Connects VHF radio audio level to speaker for reception.
	SCC Pushbutton	On outgoing call, causes the wall phone in security control center to ring until phone is answered or pushbutton is released. On incoming call, pushbutton flashes and ringing sounds until pushbutton is pressed. Pushbutton must be pressed to allow use of intercommunications.
	LAMP/ALARM TEST Pushbutton	When pressed, causes audible alarm to sound, the switch matrix keys to light except for RING LF, RING HVC ALL, RING EWO2, CONF, HOLD, RING IPC, certain spares, and LAMP/ALARM TEST pushbuttons, and audible alarms associated with incoming calls to sound. Test functions terminate when key is released. If only the HARD circuit breaker is ON, lamps driven by the non-survivable circuitry will not illuminate. If only the SOFT circuit breaker is on, lamps driven by the survivable circuitry will not illuminate.
3	VOLUME Control	Used to vary the volume of message transmitted over speaker.

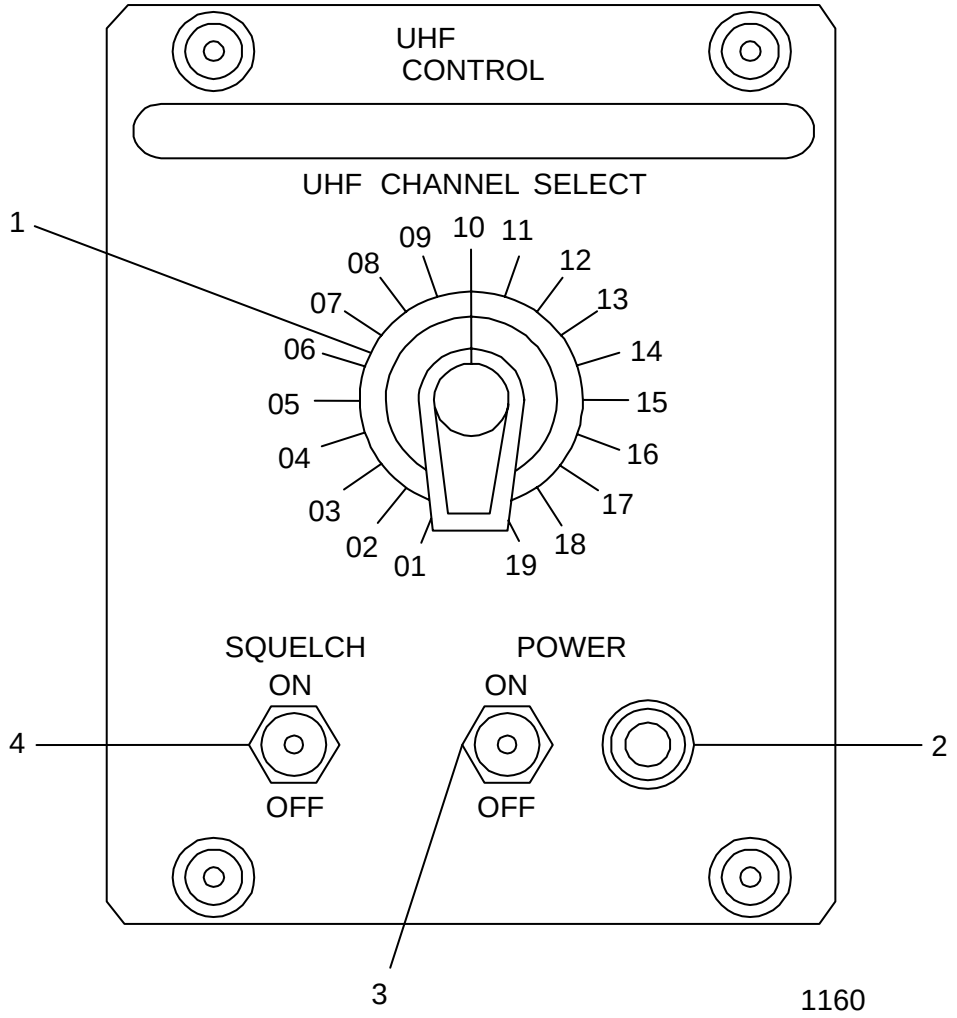
Figure 5-14. Voice Control Panel (Sheet 3 of 4)

NO.	CONTROL/INDICATOR	FUNCTION
4	Keypad	
	RDL	Redials the last number dialed.
	PAU	Inserts a four-second pause into any number dialed.
	ST	Used to store phone numbers in device.
	#	Used to clear or initialize dialer.
	RCL	Used to access stored numbers for autodialing function.
5	SOFT ON/OFF Circuit Breaker	Applies power to soft side of VCP.
6	HARD ON/OFF Circuit Breaker	Applies power to hard side of VCP.
7	POWER Indicator (green)	Indicates power is applied to VCP

Figure 5-14. Voice Control Panel (Sheet 4 of 4)

5-2.16. UHF Control Panel. (Figure 5-15/ARF 030). The UHF Control Panel (UCP) provides for control, channel selection, alarm indications, test functions and higher authority voice communications via the UHF frequency band. The UHF radio system is a hardened radio system.

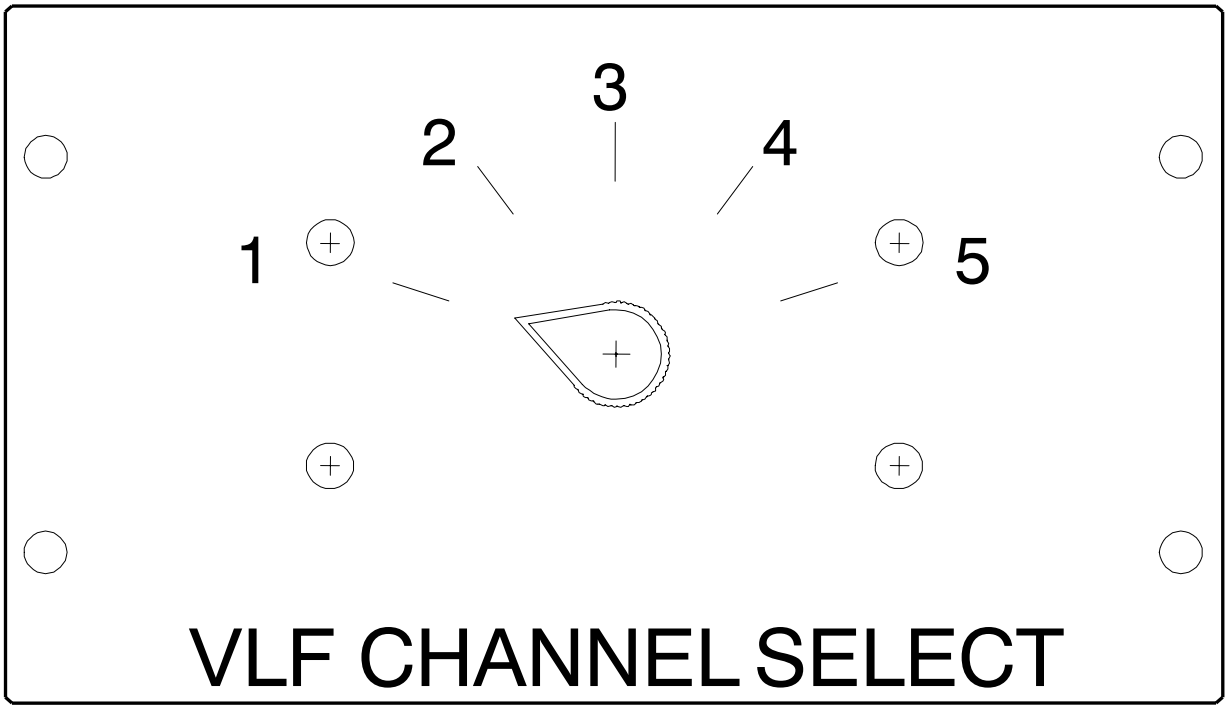
5-2.17. Console HA Equipment. HA equipment within the console includes the VLF radio control assembly, RMP, RMPB, Journal Message Loader (JML), and the HA VDUs. The VLF radio control assembly (Figure 5-15A/ARF 025) contains a five-position switch that provides the operator with VLF/LF channel selection for link 1. Link 2 scans remaining channels. The RMP, RMPB, and JML are described in the following paragraphs.



SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	UHF CHANNEL SELECT Switch	Selects appropriate channel.
2	POWER Indicator (green)	Indicates POWER is applied to UHF radio.
3	POWER ON/OFF Switch	Allows operator to turn power to UHF radio on and off. Power must be supplied from the UCP circuit breaker on the console PCDU in order to shut off UHF radio power.
4	SQUELCH ON/OFF Switch	Enables/disables squelch function on the radio.

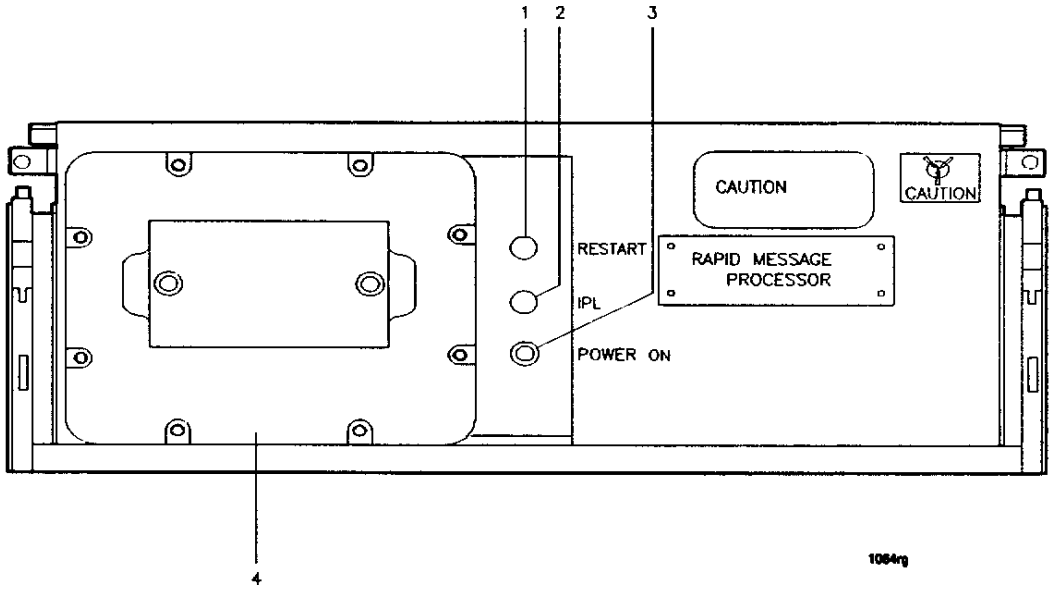
Figure 5-15. UHF Control Panel



SOURCE: T.O. 21M-LGM30F-1-23

Figure 5-15A. VLF Radio Control Assembly

5-2.17.1. Rapid Message Processor. (Figure 5-16/ ARF 034). The RMP and the RMPB enables the MCC to monitor and control the HA communications systems directly from the console. The RMP and RMPB are housed in separate drawers that are located in the console. Each console workstation has an HA communications VDU. Both the operator's keyboard and trackball input devices are normally connected to the WSP for weapon systems operations, and can be switched to the RMP for communications operations. Outgoing messages can be composed, stored, and transmitted over multiple communications systems. Incoming messages are processed and displayed on the VDU. The RMP processes decoded Emergency Action Messages (EAMs), Force Direction Messages (FDMs), and Non-Action Messages (NAMs); the RMP also signals the crew that a message has been received and, when commanded, displays the message. Duplicate messages received over more than one communications system are automatically eliminated. Communications alarms are also displayed, and the resulting operator responses are initiated from the console.

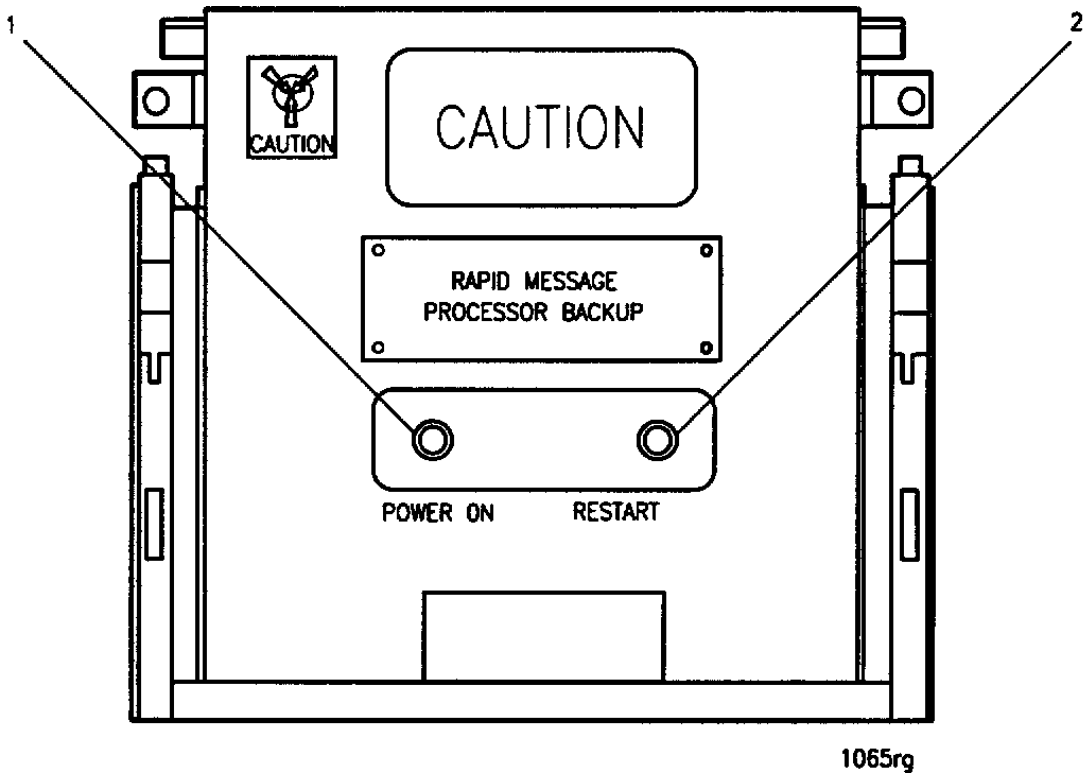


0G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	RESTART Pushbutton	When pressed, simultaneously restarts all internal processors and loads the Message Processor (MP) computer program.
2	IPL Pushbutton	Resets the message processor and loads the MP computer program.
3	POWER ON Indicator	Comes on when the power supply is functioning properly.
4	Journal Memory Loader	Used to store data and load operating programs. Shown with door closed. See Figure 5-18.

Figure 5-16. Rapid Message Processor

5-2.17.2. Rapid Message Processor Backup. (Figure 5-17/ARF 016). The RMPB provides an independent means for message reception and storage. All incoming messages routed to the RMP are also routed to the RMPB. The RMPB interfaces with the weapon system printer through the WSP rather than the VDU. Messages processed by the RMPB can be printed when commanded by the operator. The equipment will store messages for a specific period in the first-in-first-out manner. Once the printer function has been enabled, the stored messages are printed; and then each message as it is received is printed, guaranteeing message reception.

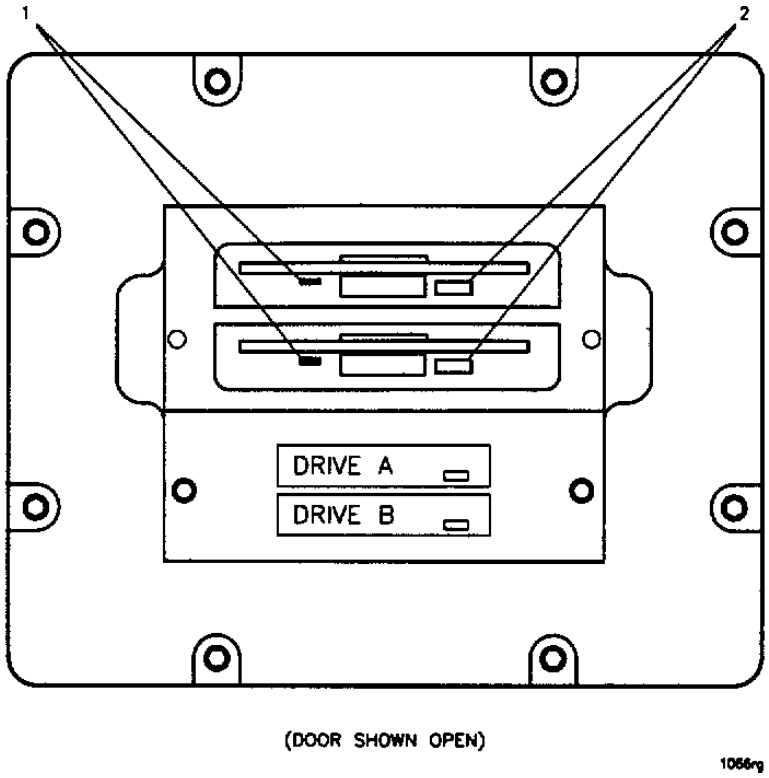


SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	POWER ON Indicator	Comes on when the power supply is functioning properly.
2	RESTART Pushbutton	When pressed, simultaneously restarts Communications Integrator Backup (CIB) processor.

Figure 5-17. Rapid Message Processor Backup

5-2.17.3. Journal Memory Loader. (Figure 5-18). The JML is a magnetic-media read/write device which utilizes two 3.5-inch floppy disks with a capacity of 1.4 Mbytes each. It is the means by which data are loaded to, and downloaded from the RMP processor. Access to the JML is located on the front face of the RMP.

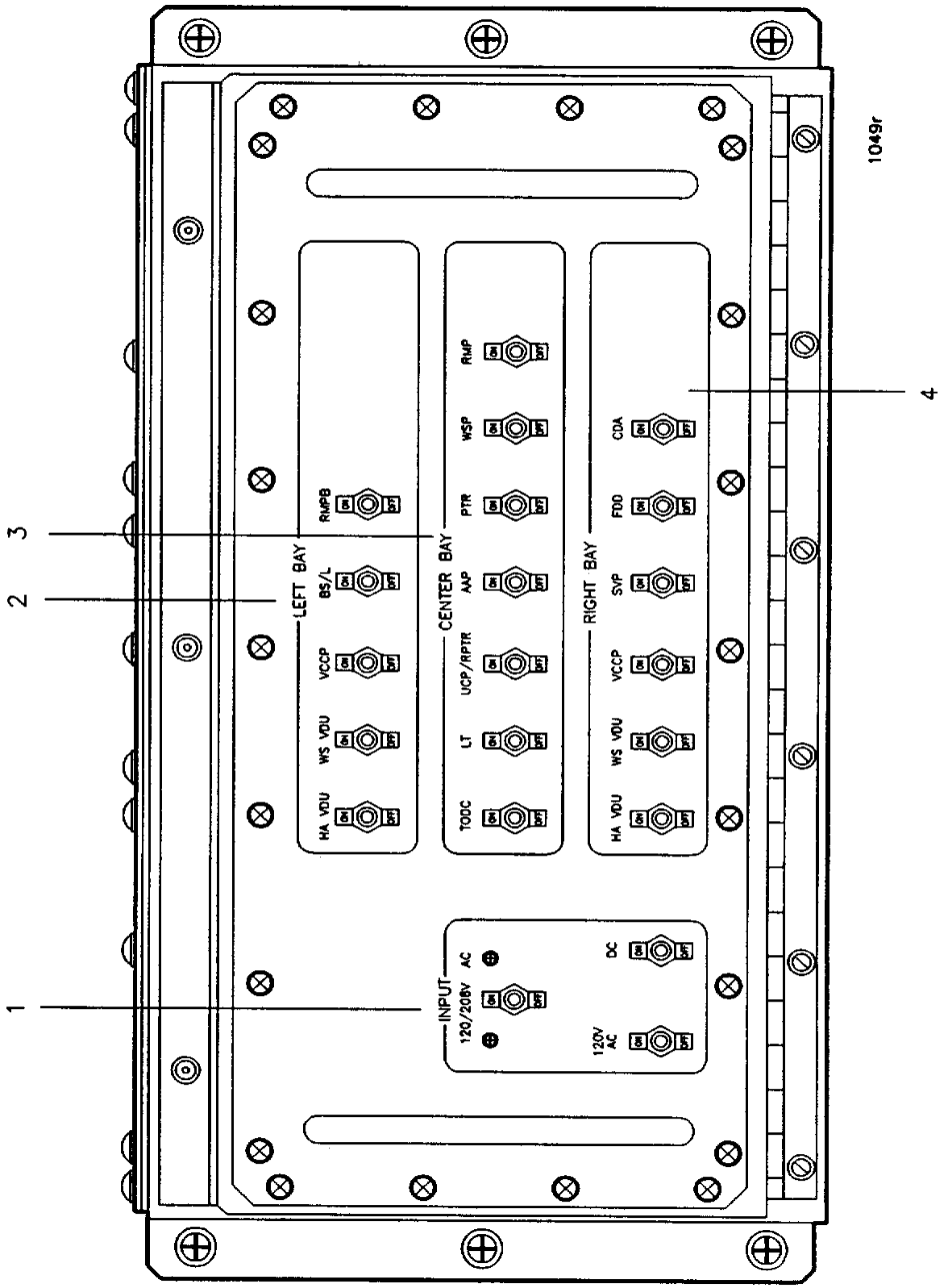


SOURCE: T.O. 21M-LGM30G-1-22

NO.	CONTROL/INDICATOR	FUNCTION
1	Busy Indicator (green LED)	Comes on when data is written onto the floppy disk or read from the floppy disk.
2	Eject Pushbutton	Ejects floppy disk from drive.

Figure 5-18. Journal Memory Loader

5-2.18. <u>Console Power Control and Distribution Unit</u>. (Figure 5-19/ARF 057). The Console Power Control and Distribution Unit (PCDU) accepts input power from LCC sources and distributes it to console components. Circuit breakers are grouped by input, left bay, center bay and right bay. Input circuit breakers include 120/208V AC, 120V AC and DC. Right bay, center bay and left bay groupings contain circuit breakers for console components within respective portions of the console.



SOURCE T.O. 21M-LGM30G-1-22

Figure 5-19. Console Power Control and Distribution Unit (Sheet 1 of 3)

NO.	CONTROL/INDICATOR	FUNCTION
1	INPUT Circuit Breakers	
	120/208V AC	Applies and removes 120/208V 400 Hz power to console equipment, and provides electrical circuit protection.
	120V AC	Applies and removes 120V 60 Hz power to console equipment, and provides electrical circuit protection.
	DC	Applies and removes DC Hz power to console equipment, and electrical circuit protection.
2	LEFT BAY Circuit Breakers	
	HA VDU	Applies and removes power to left bay HA VDU, and provides electrical circuit protection.
	WS VDU	Applies and removes power to left bay WS VDU, and provides electrical circuit protection.
	VCCP	Applies and removes power to left bay VCP, and provides electrical circuit protection.
	BS/L	Applies and removes power to BS/L, and provides electrical circuit protection.
	RMPB	Applies and removes power to RMPB, and provides electrical circuit protection.
3	CENTER BAY Circuit Breakers	
	TODC	Applies and removes power to the time-of-day clock, and provides electrical protection.
	LT	Applies and removes power to light, and provides electrical circuit protection.
	UCP/RPTR	Applies and removes power to UHF, control panel and repeater and provides electrical circuit protection.
	AAP	Applies and removes power to AAP, and provides electrical circuit protection.
	PTR	Applies and removes power to printer, and provide electrical protection.
	WSP	Applies and removes power to WSP, and provides electrical circuit protection.
	RMP	Applies and removes power to RMP, and provides electrical circuit protection.

Figure 5-19. Console Power Control and Distribution Unit (Sheet 2 of 3)

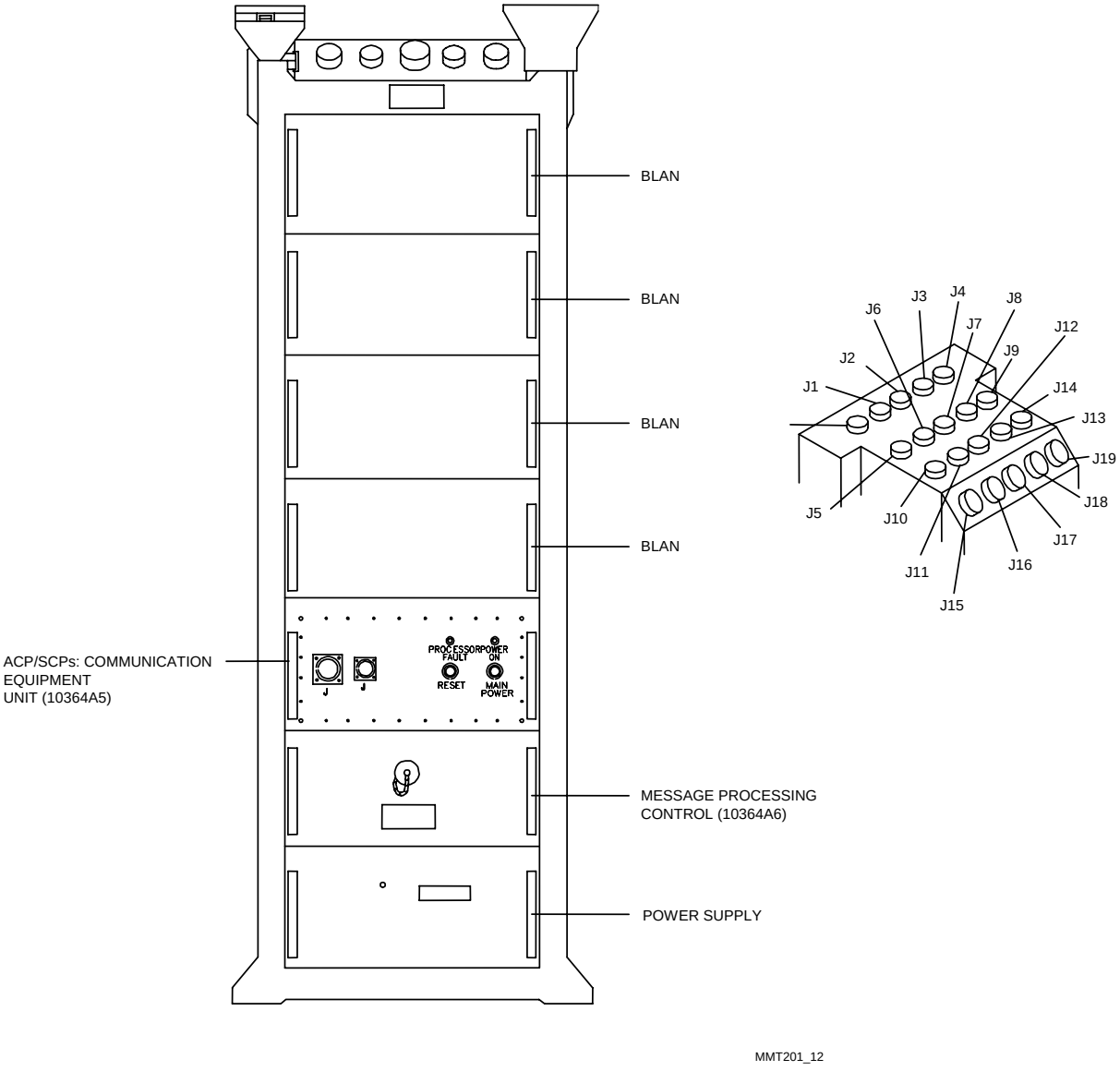
NO.	CONTROL/INDICATOR	FUNCTION
4	RIGHT BAY Circuit Breakers	
	HA VDU	Applies and removes power to right bay HA VDU, and provides electrical circuit protection.
	WS VDU	Applies and removes power to right bay WS VDU, and provides electrical circuit protection.
	VCCP	Applies and removes power to right bay VCP, and provides electrical circuit protection.
	SVP	Applies and removes power to Secure Voice Panel (SVP), and provides electrical circuit protection.
	FDD	Applies and removes power to FDD, and provides electrical circuit protection.
	CDA	Applies and removes power to CDA, and provides electrical circuit protection.

Figure 5-19. Console Power Control and Distribution Unit (Sheet 3 of 3)

5-2.19. Command Message Processing Group. (Figure 5-20/URD 10364). The CMPG rack contains a message processing control drawer, and a power supply, SCPs: The CMPG rack includes a Communications Equipment Interface Unit.

5-2.19.1. Message Processing Control. (10364A6). The message processing control drawer demodulates incoming digital diphase data to digital data for processing by the WSP. It also receives digital data from the WSP and modulates to digital diphase data for transmission on outgoing lines.

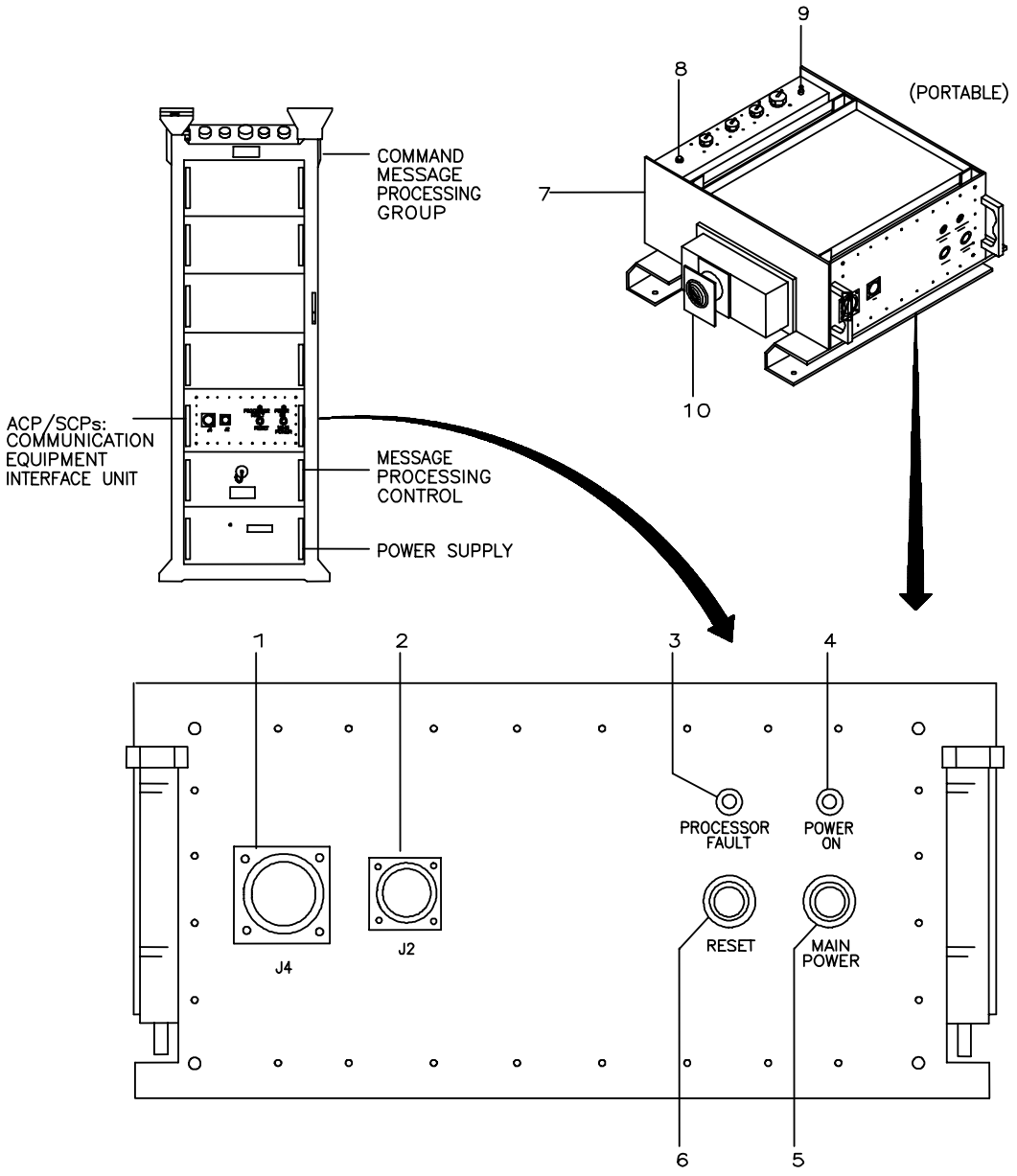
5-2.19.2. Power Supply. (10364A7). The power supply drawer converts 208V 400 Hz power input to the regulated dc voltages required by the rack.



SOURCE T.O. 21M-LGM30G-1-22

Figure 5-20. Command Message Processing Group

5-2.20. Communication Equipment Interface Unit. (Figure 5-21/URD 10364A5). The CEIU collects squadron data and transfers it to the Data Collector (DC) at the MSB. In the event of extended downtime of the SCP, a portable IPD terminal can be installed in a PLCC. Maintenance installs a portable electrical equipment cabinet, cables, and a CEIU. After installation of the CEIU, the MCC performs a startup procedure.



SOURCE: T.O. 21M-LGM30G-1-22

Figure 5-21. SCPs/ACPs/Portable: Communication Equipment Interface Unit (Sheet 1 of 2)

NO.	CONTROL/INDICATOR	FUNCTION
1	Connector (J4)	Provides connection for test adapter during drawer maintenance.
2	Connector (J2)	Provides connection for hand held terminal during drawer maintenance.
3	Process Fault Indicator (Red)	Comes on and stays on when processor fault condition exists. Comes on for approximately 30 seconds when CEIU power is applied or when reset switch is pressed. Flashes when CEIU cannot establish a telephone link.
4	Power on Indicator (Green)	When illuminated, indicates power is applied to CEIU.
5	Main Power Circuit Breaker	Controls power to CEIU.
6	Reset Pushbutton	When pressed, initiates CEIU hardware reset sequence. All data in the CEIU memory buffer will be lost.
7	Portable Electronic Equipment Cabinet	Provides power and signal interface when a CEIU is installed in a PLCC.
8	CB1 120V 60 Hz Circuit Breaker	Controls power to electronic equipment cabinet and to CEIU.
9	S1 Dial Line 1/Dial Line 2 Switch	Selects dial line for CEIU output data.
10	Blower Fan	Provides cooling air for the CEIU.

Figure 5-21. SCPs/ACPs/Portable: Communication Equipment Interface Unit (Sheet 2 of 2)

5-2.21. Digital Data Group. (Figure 5-22/URD 303). The DDG provides facilities for voice communication, termination of command lines, and monitoring of missile away status. The DDG contains a digital data transmitter, two digital data receivers, an audio frequency amplifier, a station alert ringing unit, and a missile away indicator drawer. The digital data group serves as the signal conditioning interface between the squadron hardened cable, SIN systems, and the LCC command control system.

5-2.21.1. Digital Data Transmitter. (303A1). The Digital Data Transmitter provides impedance matching and low voltage protection for command transmit lines.

5-2.21.2. Digital Data Receiver. (303A2). Provides impedance matching, low-voltage protection equalization, and amplification for command/status receive lines.

5-2.21.3. Audio Frequency Amplifier. (303A4). The audio frequency amplifier provides amplification and impedance matching for 2-way, 4-wire telephone circuits of HVC.

5-2.21.4. Station Alerting Ringing Unit. (303A5). The station alerting ringing unit detects receipt of all-ring and 1400 Hz ring signals, generates ringing signals for HVC subnetwork and couples SIN for transmission to the LF. Different versions of the drawer are provided to detect 1700 Hz, 2500 Hz, and 3100 Hz signals.

5-2.21.5. Missile Away Indicator Drawer. (Figure 5-23/303A6). The missile away indicator drawer monitors missile away status of a flight of missiles. Missile away status for the LFs is displayed on the WS VDUs.

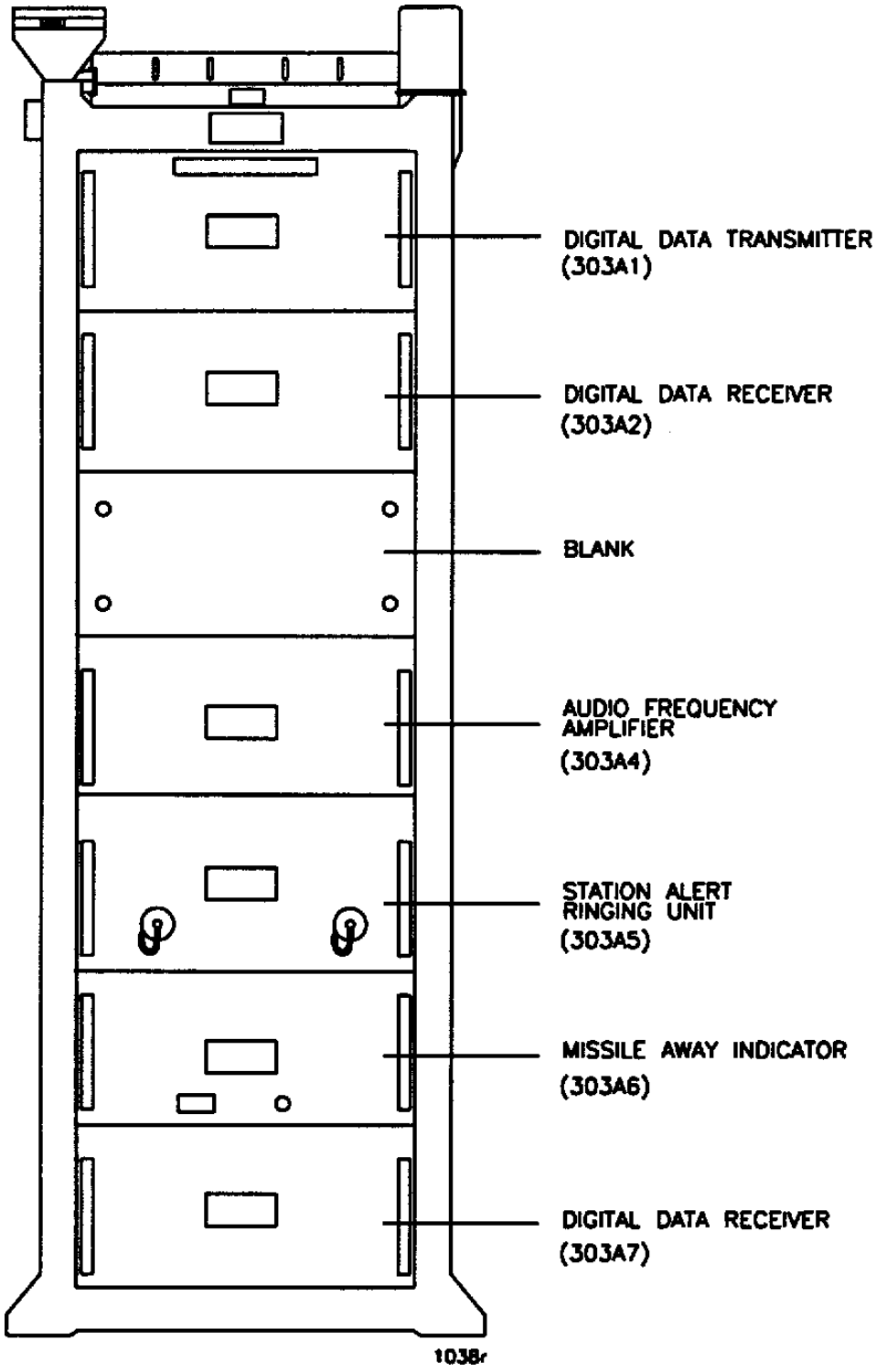
5-2.21.6. Digital Data Receiver. (303A7). Provides low-voltage protection, amplification, and isolation for SIN receive lines.

5-2.22. Power Supply Group. (Figure 5-24/URD 301). The power supply group is an electronic equipment rack that contains a battery charger, two regulated dc power supplies, and two circuit breaker panels.

5-2.22.1. 48 Amp DC Power Supply. (301A1). Provides 48 amp dc power to Command Message Processing Group and the Digital Data Group.

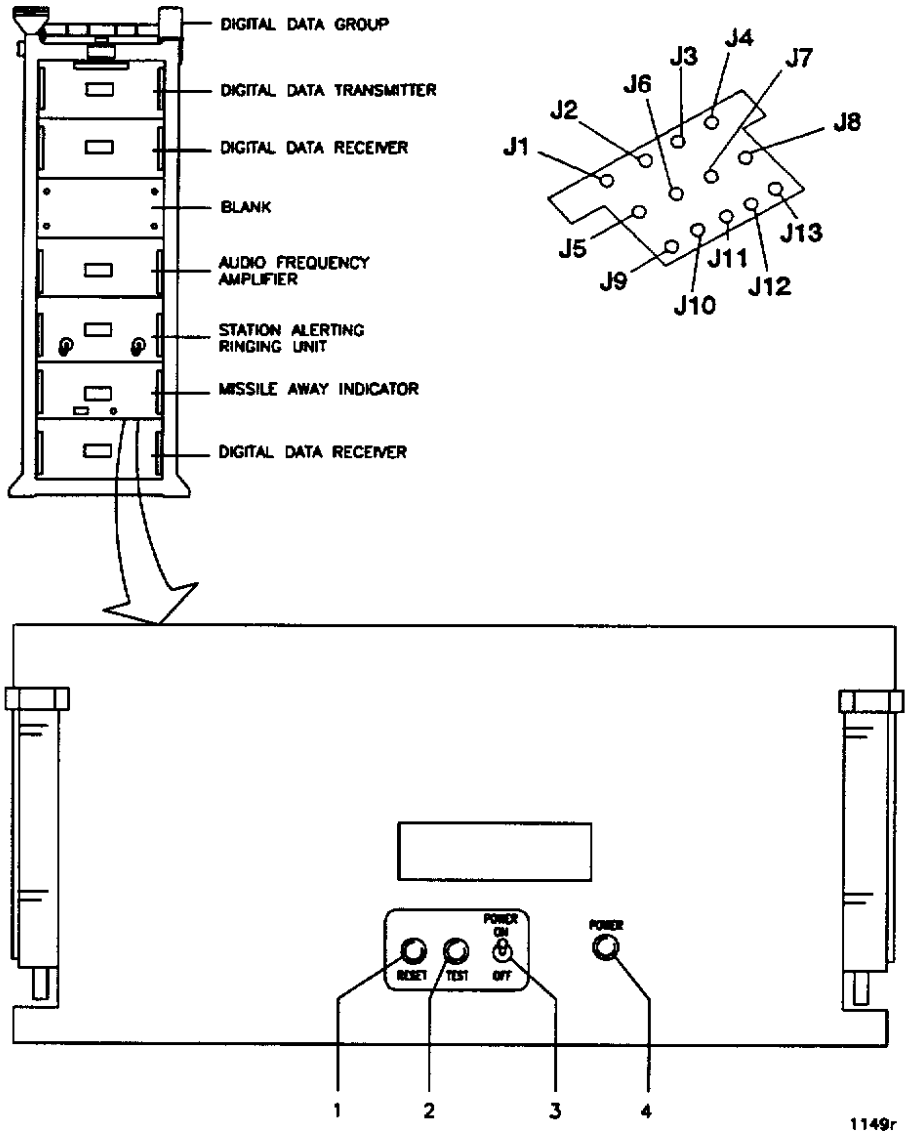
5-2.22.2. 12 Amp DC Power Supply. (301A2). Provides 12 amp dc power to communications control.

5-2.23. Distribution Box. (Figure 5-25/URD 364). The Distribution Box is wall mounted adjacent to the Power Supply Group. The box contains a 60 cycle ac power panel and 400/60 Hz ac power panel. The 60 cycle ac power panel controls the power from the 60 Hz alternator to its respective loads. This panel contains breakers for emergency lights, the Console, UHF Radio, CMPG and various EWO communications equipment. The 400/60 Hz power panel contains circuit breakers for the EHF system, Console, CMPG, and AFSATCOM receiver/transmitter. SCPs: The 60 cycle ac power panel also contains a breaker for CEIU.



Source: T.O. 21M-LGM30G-1-22

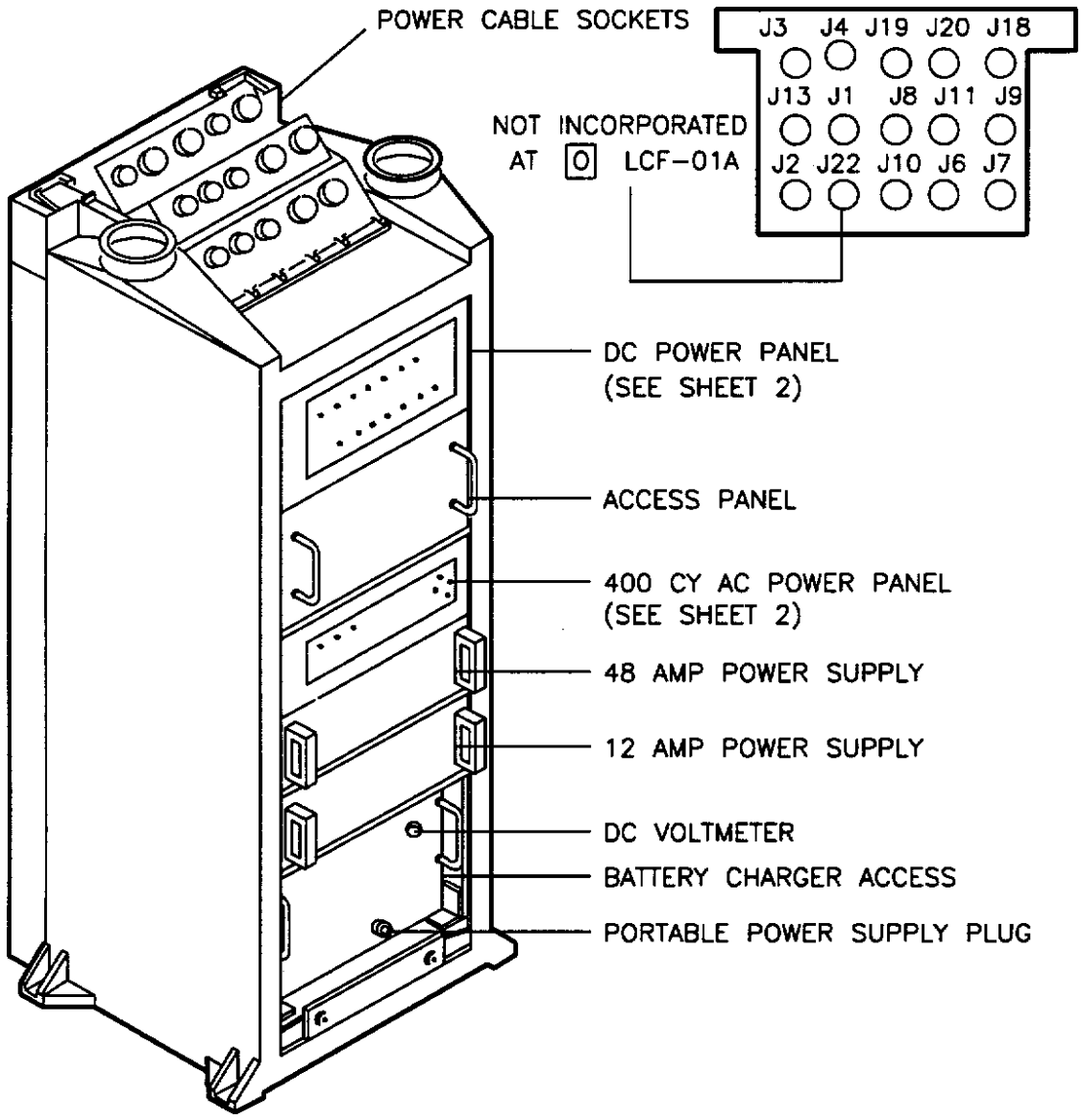
Figure 5-22. Digital Data Group



SOURCE: T.O. 21M-LGM30G-1-22

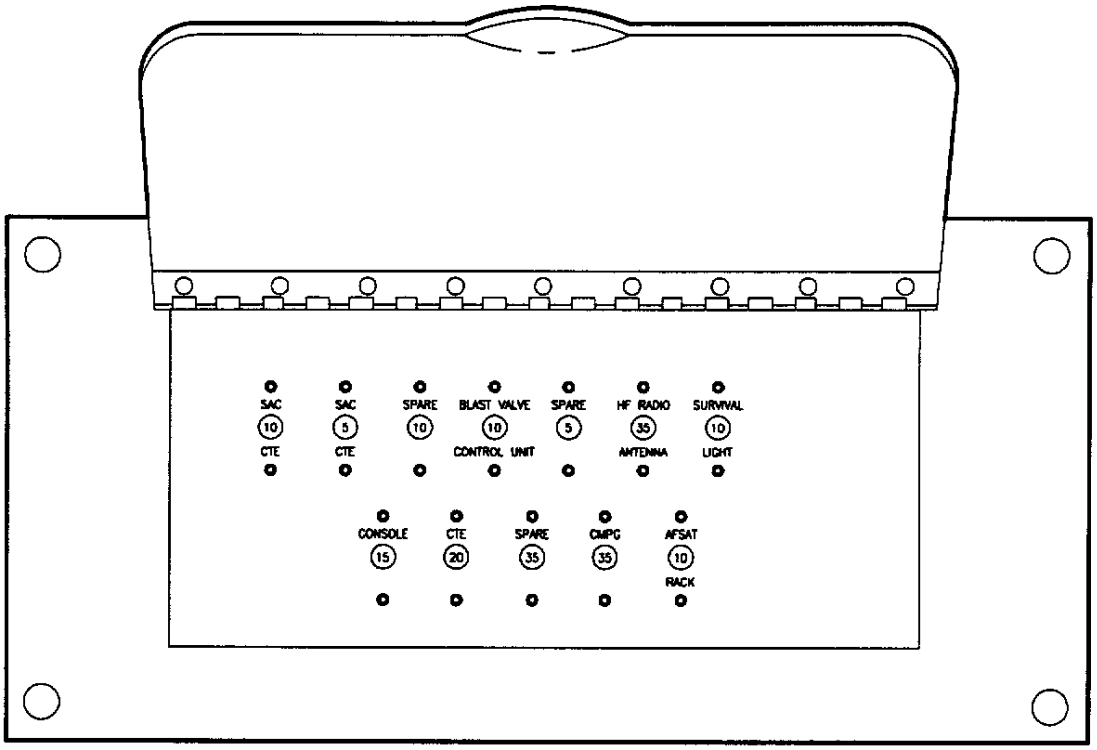
NO.	CONTROL/INDICATOR	FUNCTION
1	Missile Away RESET Pushbutton	Deactivates missile away (MSLA) indication test circuit.
2	Missile Away TEST Pushbutton	Activates MSLA indication in FLIGHT/SQUADRON STATUS display on WS VDU for test.
3	POWER ON/OFF Switch	Applies power and provides circuit protection to missile away indicator circuit.
4	POWER Indicator (green)	Indicates POWER switch is in ON position.

Figure 5-23. Missile Away Indicator



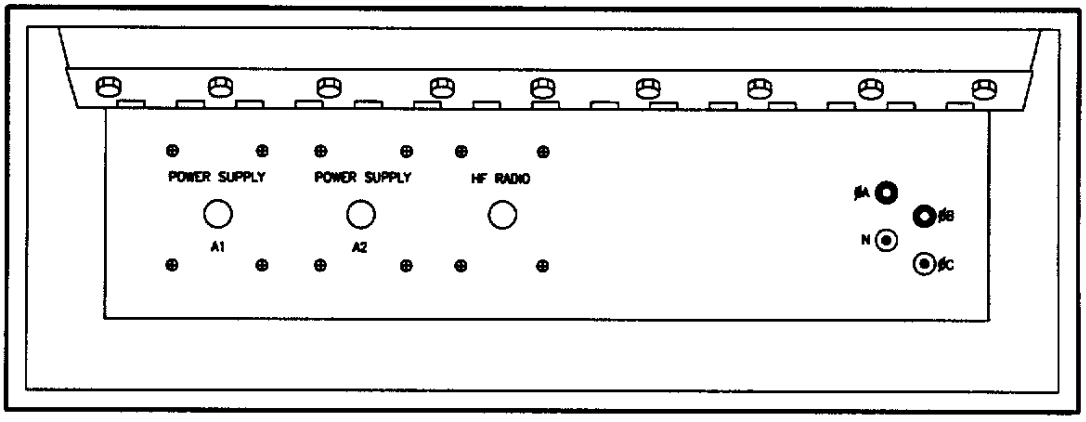
SOURCE: T.O. 21M-LGM30G-1-22

Figure 5-24. Power Supply Group (Sheet 1 of 2)



DC POWER PANEL

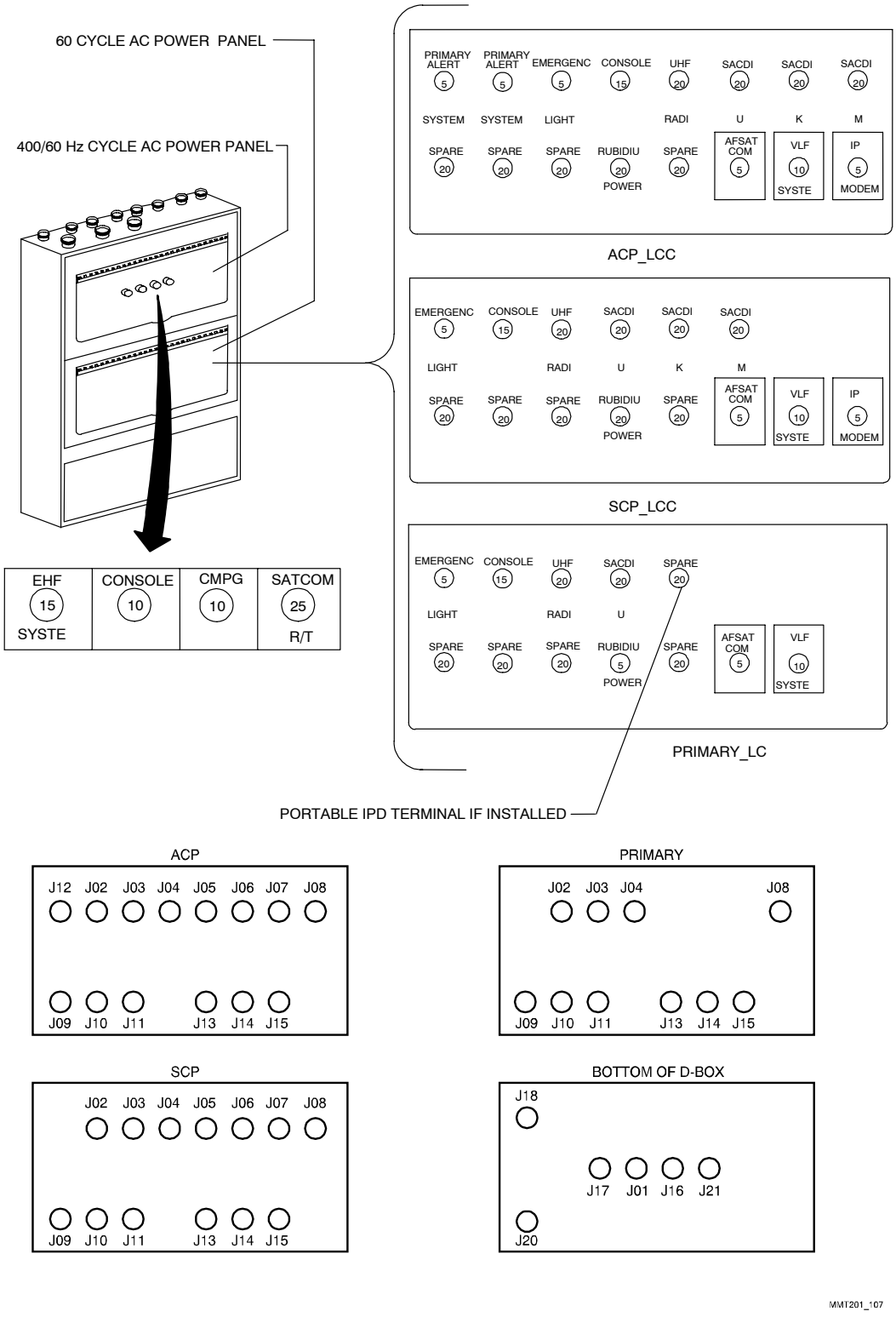
1285r



400 CY AC POWER PANEL

1072r

Figure 5-24. Power Supply Group (Sheet 2 of 2)



SOURCE: T.O. 21M-LGM30G-2-11

Figure 5-25. Distribution Box

5-3. LF OPERATIONAL GROUND EQUIPMENT.

5-3.1. Programmer Group. (Figure A 1201/URD 403). See Figure 5-26. Provides central controlling interface between command and status system at LCF and guidance control system at LF.

5-3.1.1. Audio Frequency Detector. (403A2). Provides low voltage protection, equalization, amplification, isolation, and detection of SIN incoming signals.

5-3.1.2. [3] Audio Frequency Detector-Repeater. (403A2). Used at one LF only (LF N-10). Provides amplification and retransmission of HVC signals in addition to the functions performed by Audio Frequency Detector drawer.

5-3.1.3. Digital Data Receiver-Transmitter. (403A3). Provides impedance matching, equalization, low voltage protection, and receiver amplification for command and status lines. Also provides impedance matching for SIN lines.

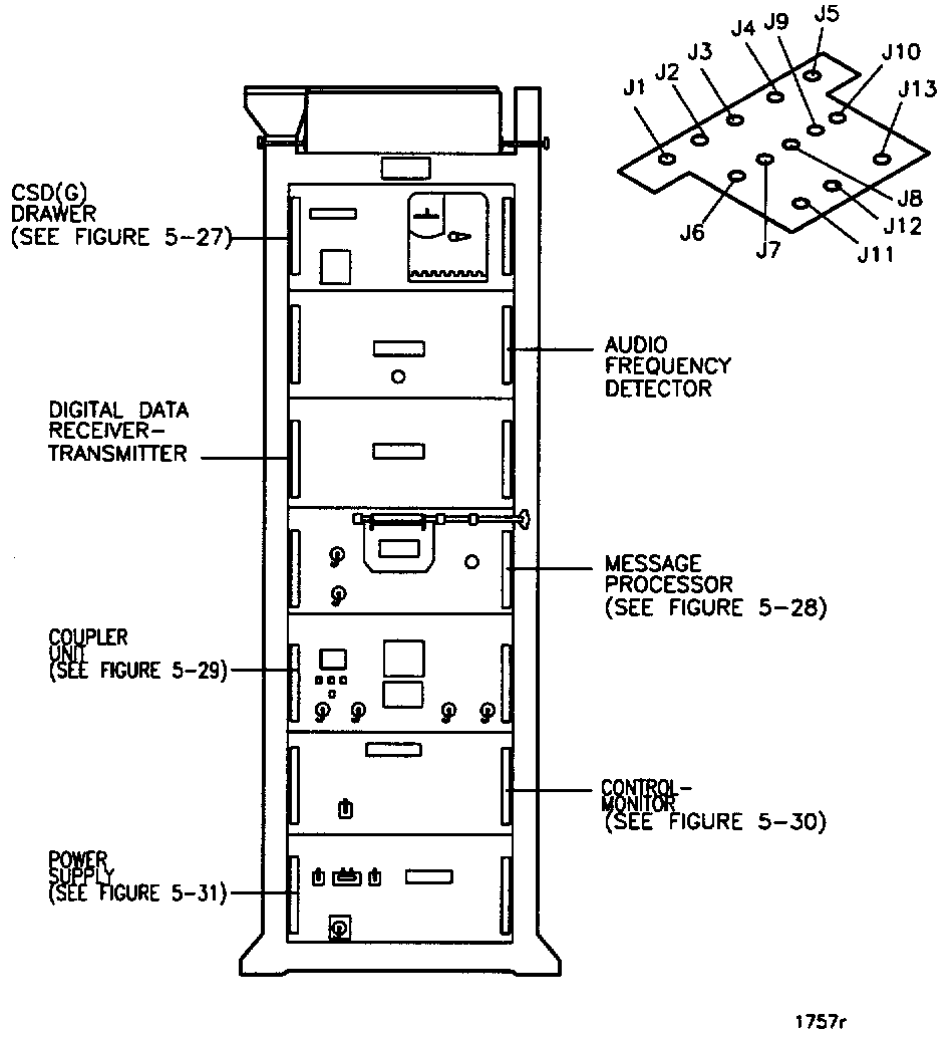
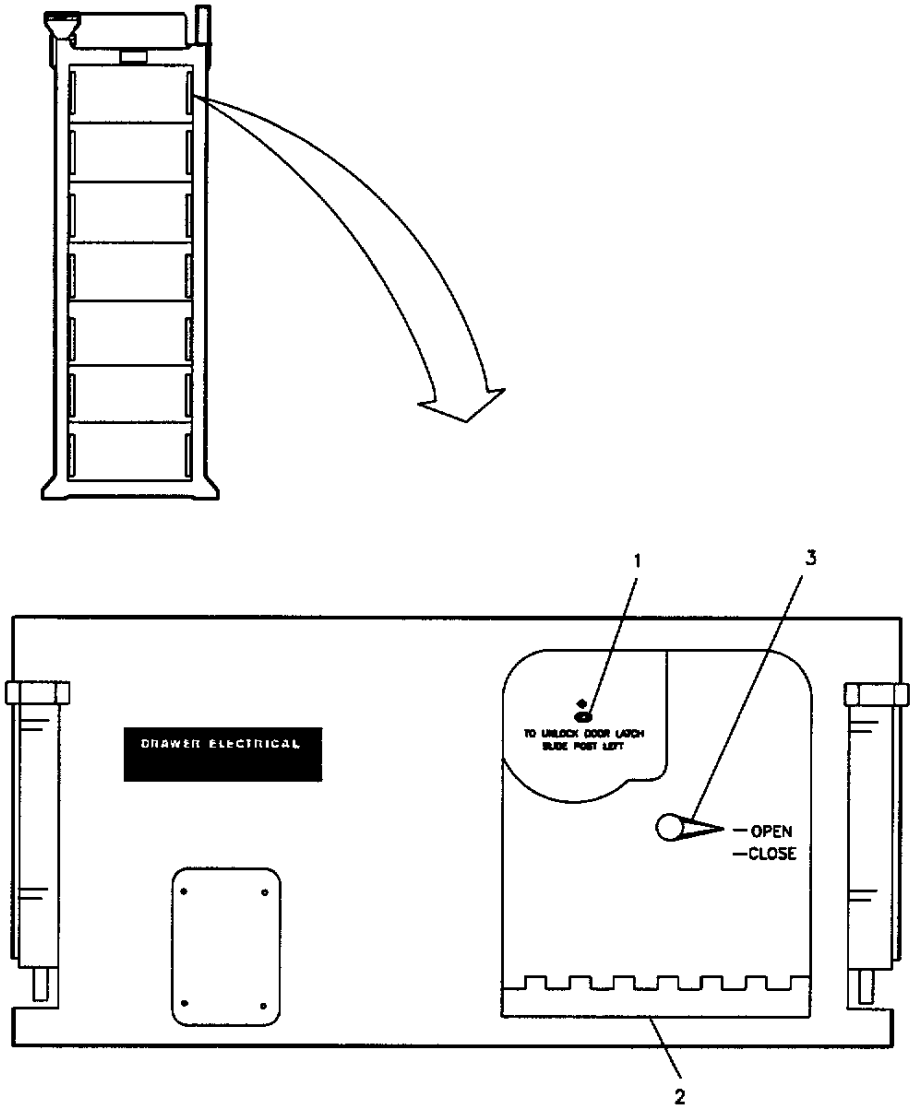


Figure 5-26. Programmer Group

5-3.1.4. CSD (G) Drawer. (Figure A 1268/URD 403A1) See Figure 5-27. Contains interface wiring and provides enclosure for the Command Signal Decoder-Ground (CSD-G).

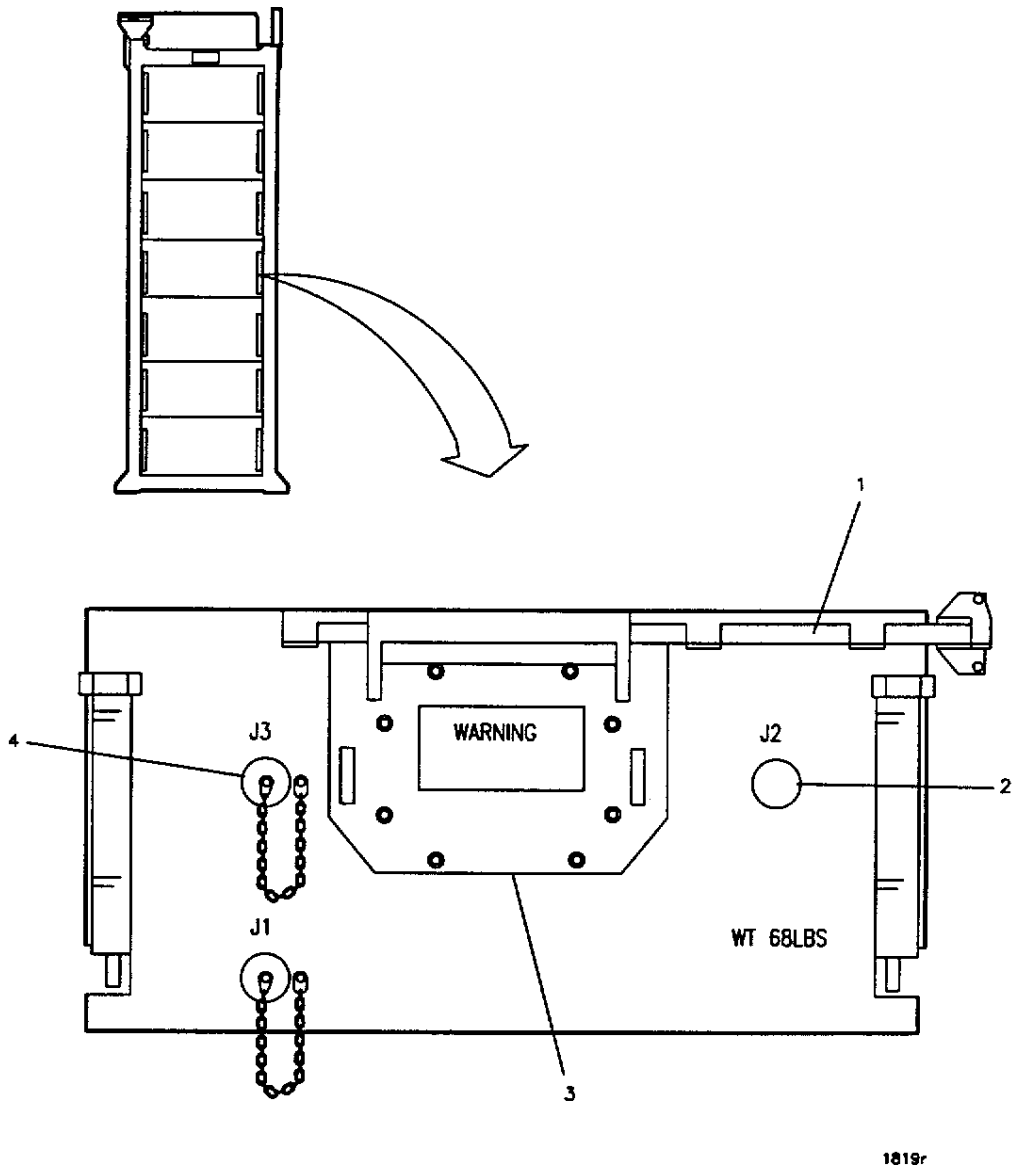


SOURCE: T.O. 21M-LGM30G-2-12-2

NO.	CONTROL/INDICATOR	FUNCTION
1	Door Latch Post	When moved to left, unlocks Decoder Access Door Latch.
2	Decoder Access Door	Provides access to CSD(G).
3	Door Unlocking Knob	At OPEN, enables opening Decoder Access Door; at CLOSED, retains door in latch position.

Figure 5-27. CSD(G) Drawer

5-3.1.5. Message Processor. (403A4) See Figure 5-28. Performs message processing on all messages received and transmitted at the LF.

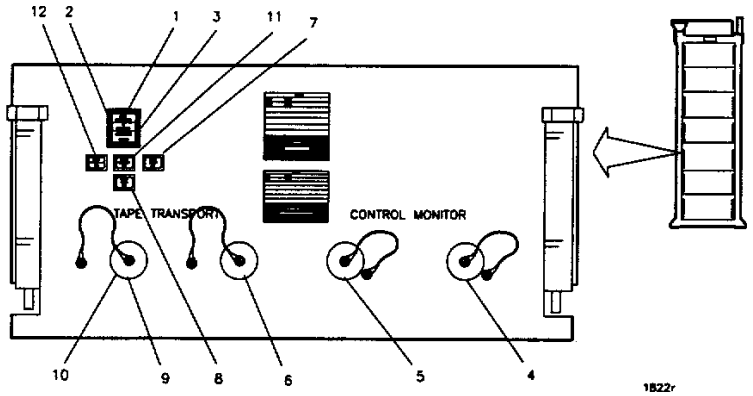


SOURCE: T.O. 21M-LGM30G-2-12-2

NO.	CONTROL/INDICATOR	FUNCTION
1	Locking Bar	Prevents unauthorized access to SDU keying variable.
2	J2 Receptacle	Receives Site Tailoring Plug.
3	SDU Access Door	Provides access to SDU keying variable.
4	J3 Receptacle	Receives Fault Locating Indicator Plug.

Figure 5-28. Message Processor

5-3.1.6 Guidance Control Coupler Unit. (Figure A 13004/URD 403A5). Acts as the signal conversion interface between the DCU and the electronic ground system. See Figure 5-29

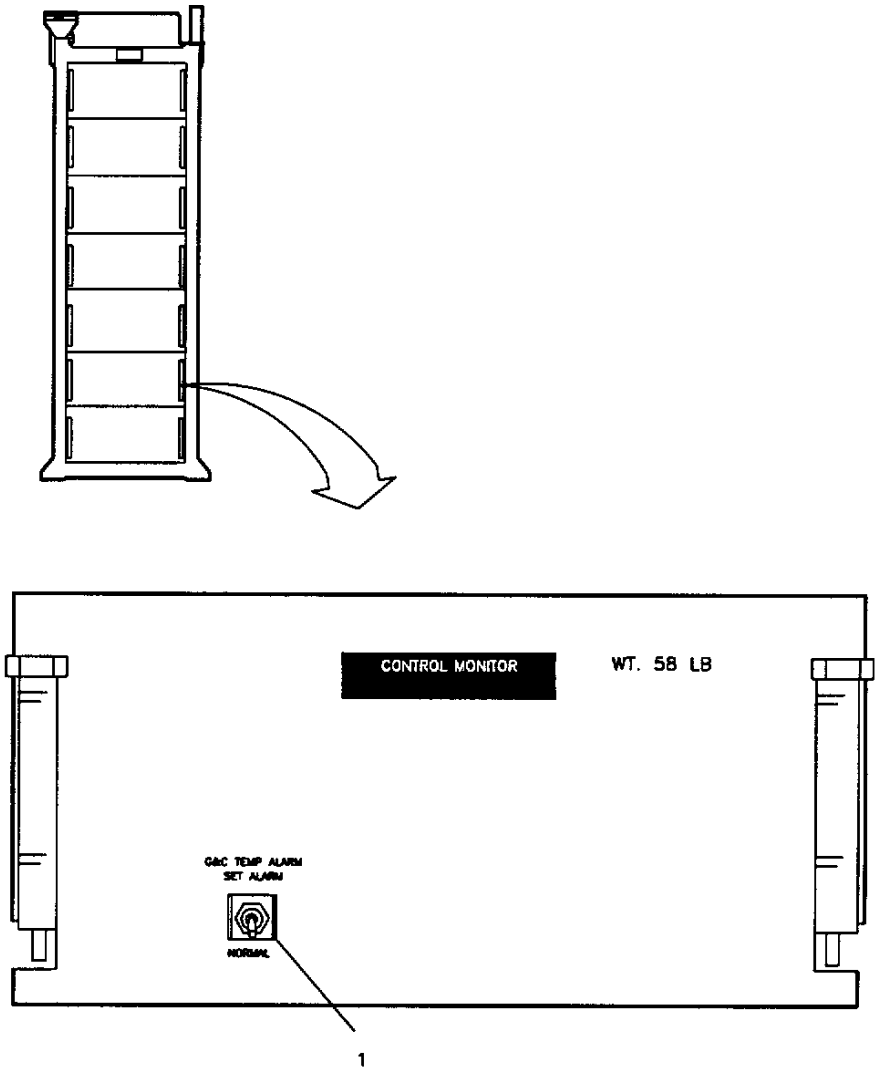


SOURCE: T.O. 21M-LGM30G-2-12-2

NO.	CONTROL/INDICATOR	FUNCTION
1	FILL INTERLOCK Indicator	Indicates an unsuccessful attempt to penetrate DCU memory has occurred and DCU will not accept data during fill mode.
2	28V POWER ON Indicator	Indicates 28V DC power has been applied to Coupler Unit.
3	GYRO START POWER Indicator	Indicates Gyro start power (at approximately 41.5V DC) is applied to MGS.
4	CONTROL-MONITOR J4(P-11) Receptacle	Interconnects Coupler Unit to C-MON (signal source).
5	CONTROL-MONITOR J3(P-10) Receptacle	Interconnects Coupler Unit to C-MON (signal source).
6	TAPE TRANSPORT J2(P-9) Receptacle	Interconnects Coupler Unit to CTU (signal source).
7	SCS TEST Switch-Indicator	When pressed, issues an instruction signal to DCU to perform SCS test during next SCNT. Indicator comes on when switch is pressed.
8	G&C SHUT DOWN Switch	When pressed, initiates power removal from MGS. Switch does not have an indicator lamp.
9	Shorting Plug	When installed, shorts receptacle J1(P-8) pin connections.
10	TAPE TRANSPORT J1(P-8) Receptacle	Interconnects Coupler Unit to CTU (signal source).
11	G&C POWER ON Switch-Indicator	When pressed, initiates application of power to MGS. Indicator comes on when switch is pressed.
12	COMPUTE/IDLE Switch-Indicator	When pressed commands Coupler Unit to enter compute mode or idle mode (alternate action); illumination of split indicator displays commanded mode.

Figure 5-29. Coupler Unit

5-3.1.7. Control-Monitor. (403A6) See Figure 5-30. Provides decoding of inputs from DCU. Provides control of LF ordnance arming and safing, ordnance firing, and missile Stage 1 ignition. Monitors no-go and alarm status and initiates no-go shutdown.

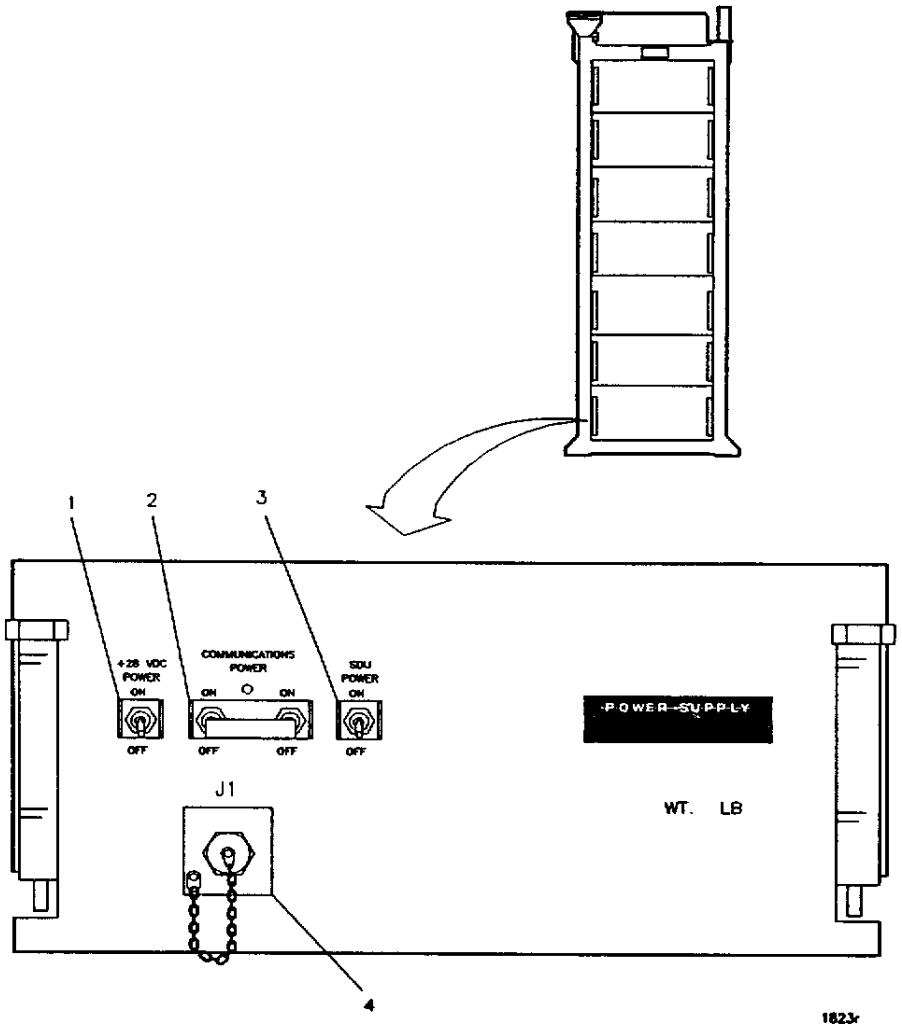


SOURCE: T.O. 21M-LGM30G-2-12-2

NOMENCLATURE	FUNCTION
G&C TEMP ALARM-SET ALARM/NORMAL Switch	At SET ALARM, inhibits G&C temperature no-go to permit maintenance on G&C Liquid Cooler without causing shutdown; also used during site startup. At NORMAL, permits normal reporting of, and site reaction to, G&C temperature deviations sensed by G&C Liquid Cooler.

Figure 5-30. Control-Monitor

5-3.1.8. Power Supply. (403A7) See Figure 5-31. Converts 120/208V, 400 Hz, 3 phase power to regulated voltages and filters incoming +28V DC for use in programmer group.



SOURCE: T.O. 21M-LGM30G-2-12-2

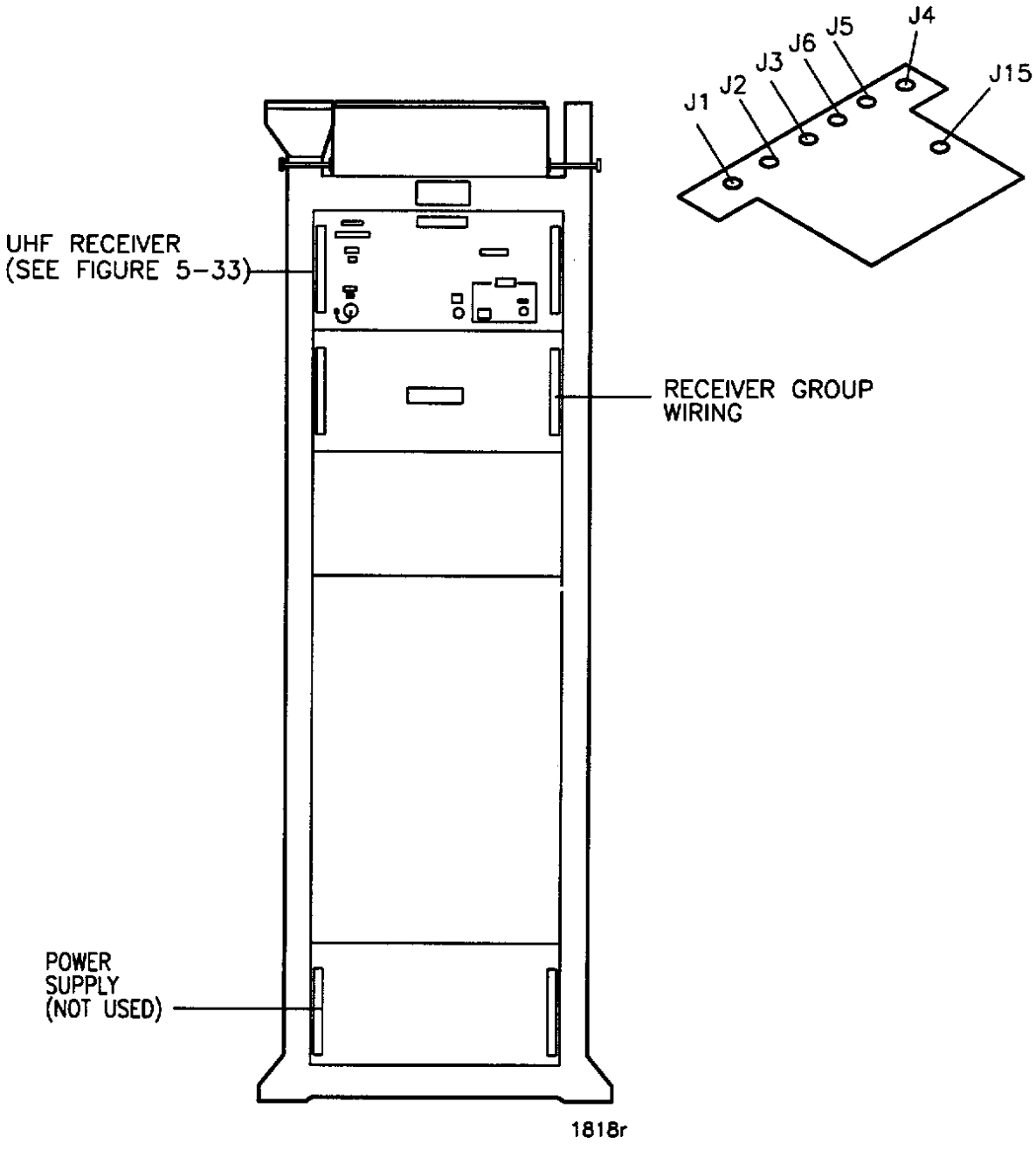
NO.	CONTROL/INDICATOR	FUNCTION
1	+28V DC POWER ON/OFF Switch	Control +28V volt power (from 12-amp power supply) to A5 and A6 drawers.
2	COMMUNICATIONS POWER-ON/OFF Switch	Control internally produced voltages and -28 volts to A2, A3 and A4 drawers.
3	SDU POWER ON/OFF Switch	Controls +6 volts to SDU.
4	J1 Test Receptacle	Used when measuring voltage output of Programmer Group Power Supply.

Figure 5-31. Programmer Group Power Supply

5-3.2. <u>UHF Radio Receiver Group</u>. (Figure A 1473/URD 1475). Receives and processes ALCC UHF radio commands. See Figure 5-32.

5-3.2.1. ALCC Receiver Group Wiring. (1475A2). Provides interface wiring.

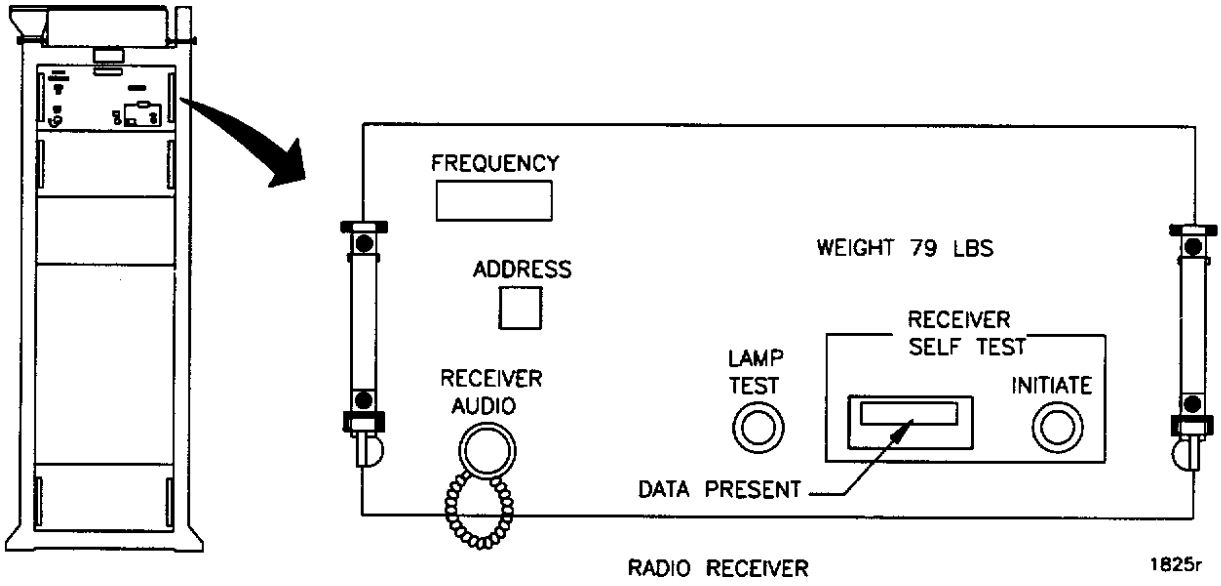
5-3.2.2. Power Supply. (1475A7). Not used.



SOURCE: T.O. 21M-LGM30G-2-12-2

Figure 5-32. UHF Radio Receiver Group

5-3.2.3. UHF Receiver. (1475A1). See Figure 5-33. Processes ALCC UHF radio commands and converts messages to diphase.



SOURCE: T.O. 21M-LGM30G-2-12-2

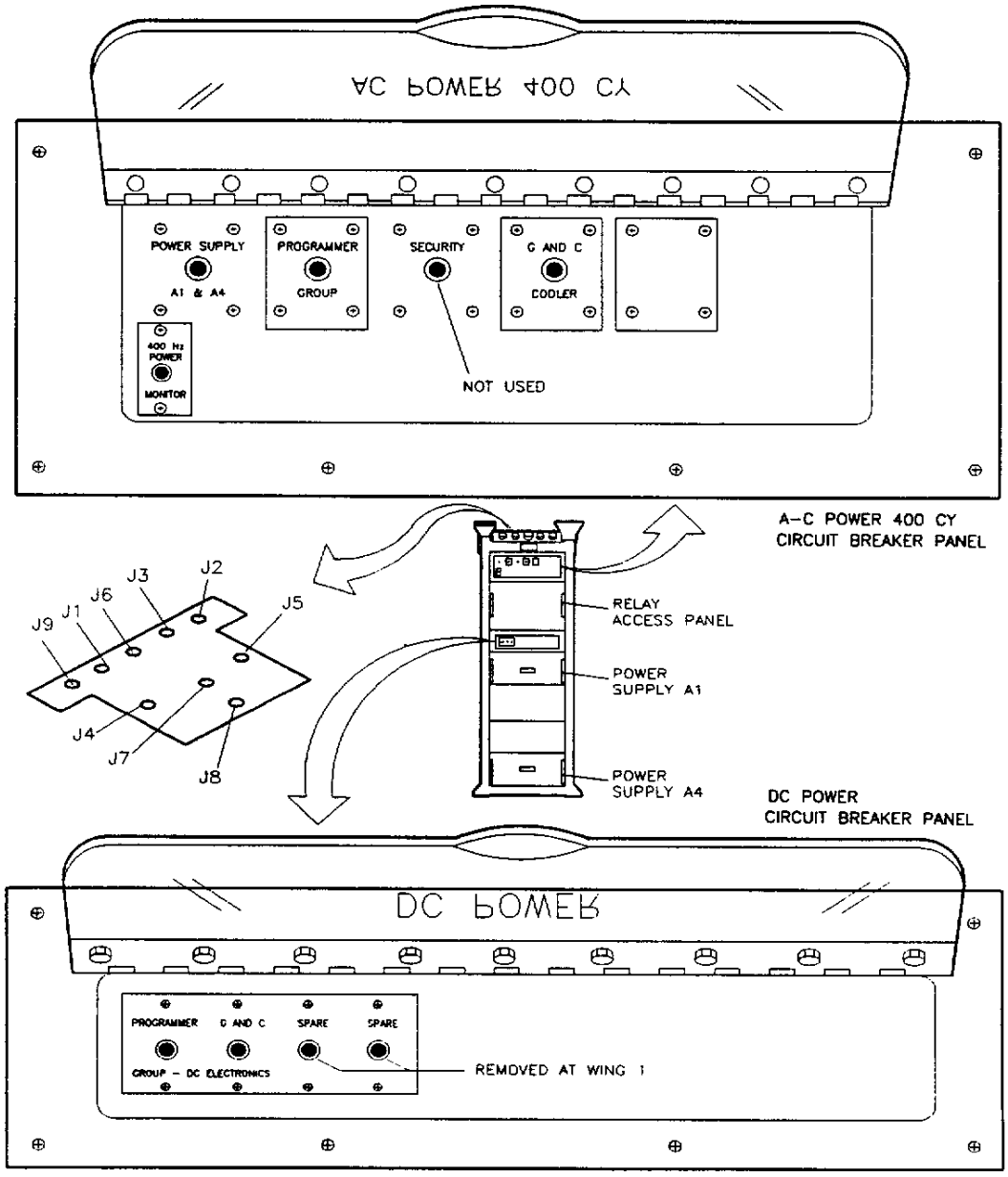
INDICATOR	ACTIVATED WHEN
DATA PRESENT	Radio receiver successfully completes self-test during a lamp test, or data present from an incoming UHF signal.
CONTROL	**FUNCTION**
INITIATE	Starts radio receiver self-test.
LAMP TEST	When pressed lights the DATA PRESENT indictor.
LABEL	
RECEIVER AUDIO	Connector for headset.
ADDRESS	Indicates squadron receiver group address.
FREQUENCY	Indicates receiver group UHF receiving frequency.

Figure 5-33. UHF Receiver

5-3.3. <u>Power Supply Group</u>. (Figure A1284/URD 406) See Figure 5-34. Contains 12 amp and 36 amp DC power supplies and the circuit breakers for 28V DC and 400 Hz power.

5-3.3.1. Power Supply (36 Amp). (406A1). Converts 120/208V, 400 Hz, 3 phase power to 28V DC for G&C power.

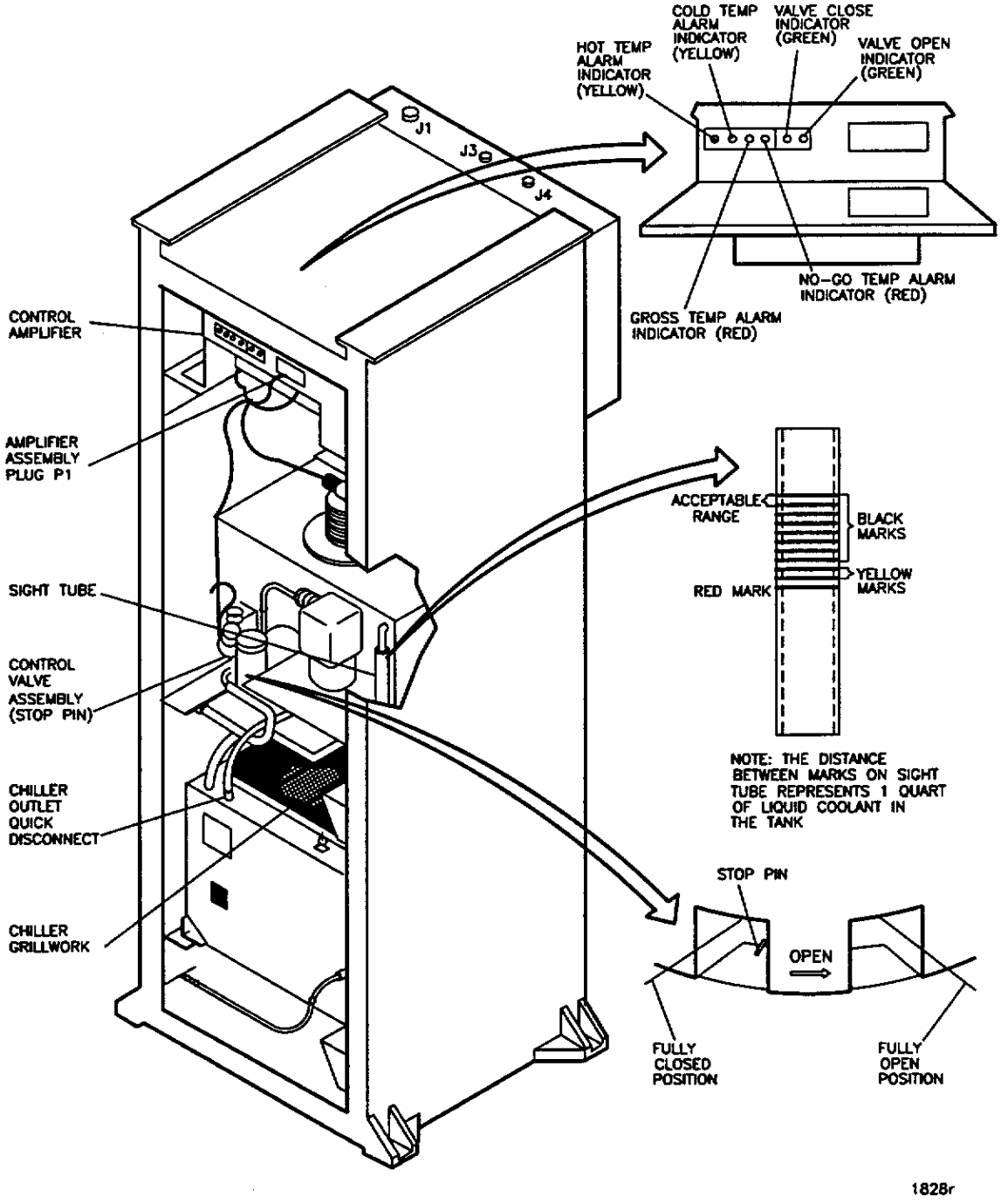
5-3.3.2. Power Supply (12 Amp). (406A4). Converts 120/208V, 400 Hz, 3 phase power to 28V DC for Programmer Group power.



SOURCE: T.O. 21M-LGM30G-2-11

Figure 5-34. LF Power Supply Group

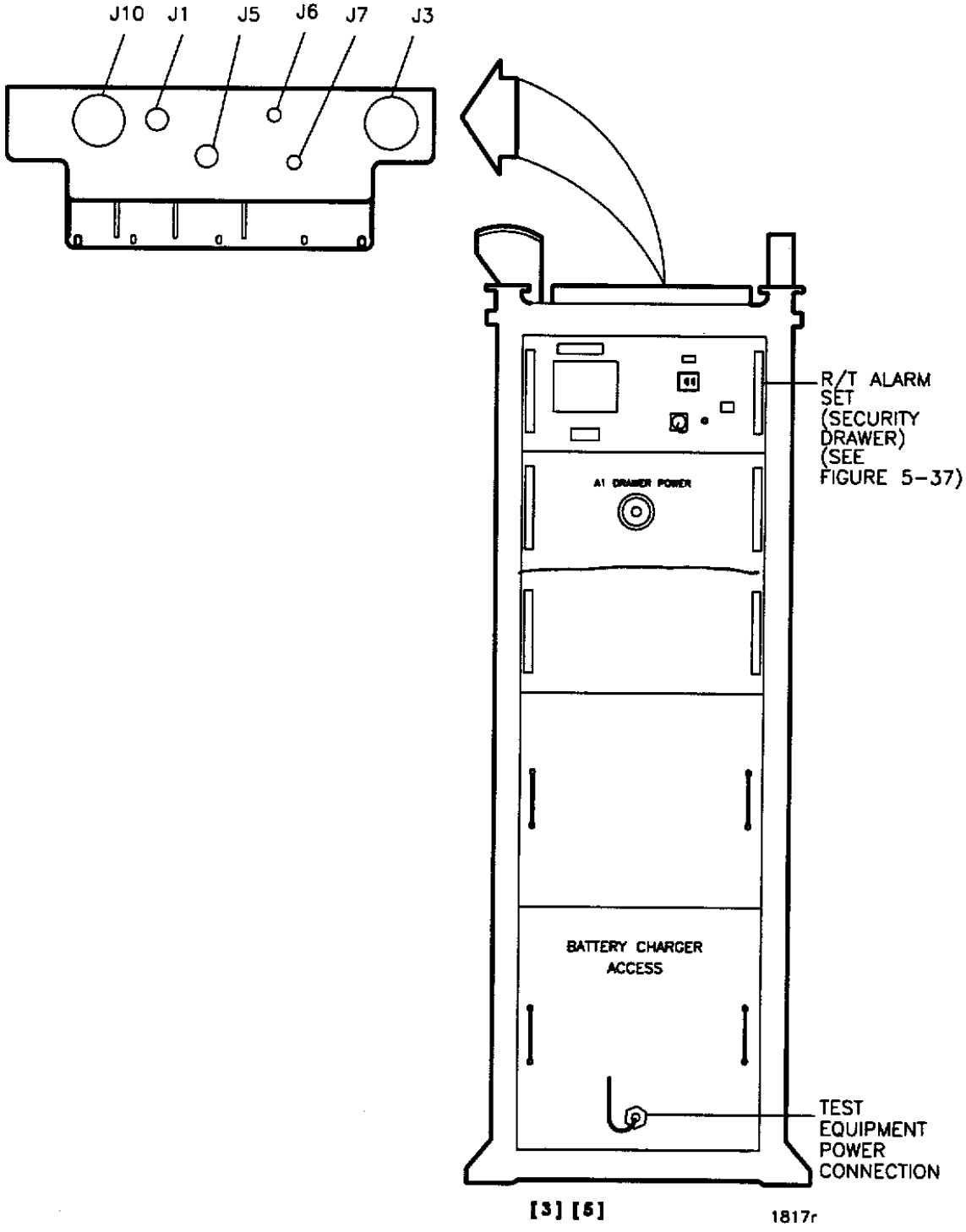
5-3.4. <u>Guidance Section Liquid Cooler.</u> (Figure A 1214/URD 413). Provides liquid coolant at proper temperature and flow rate to maintain MGS at correct operating temperature. Provides MGS temperature alarm and no-go status to programmer group if temperature becomes excessive. See Figure 5-35.



SOURCE: T.O. 21M-LGM30G-1-22

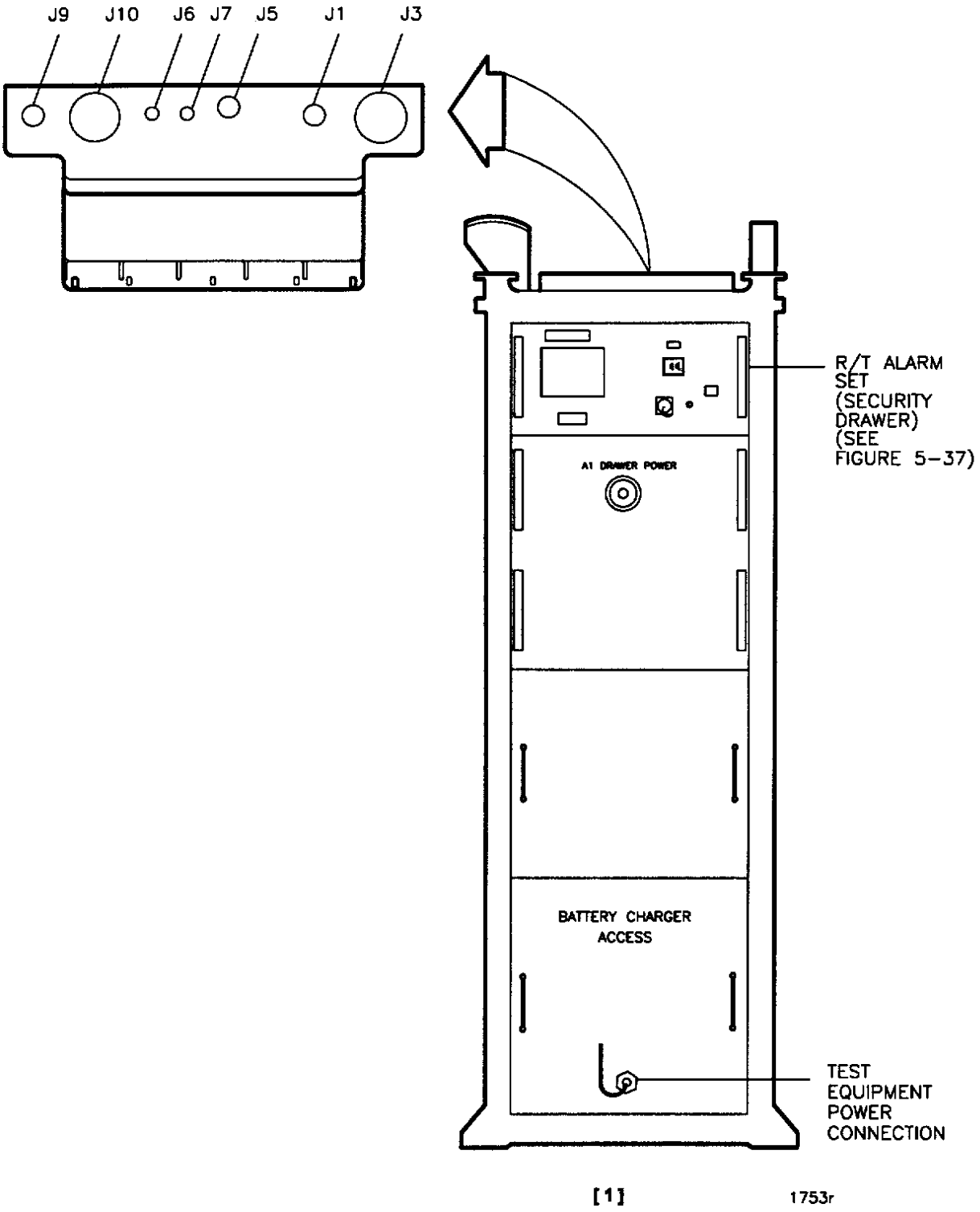
Figure 5-35. Guidance Section Liquid Cooler

5-3.5. <u>Battery Charger, Alarm Set Group</u>. (Figure A 1379/URD 475). Provides charging current to the storage battery set and power to OGE and the missile. See Figure 5-36.



SOURCE: T.O. 21M-LGM30G-2-12-2

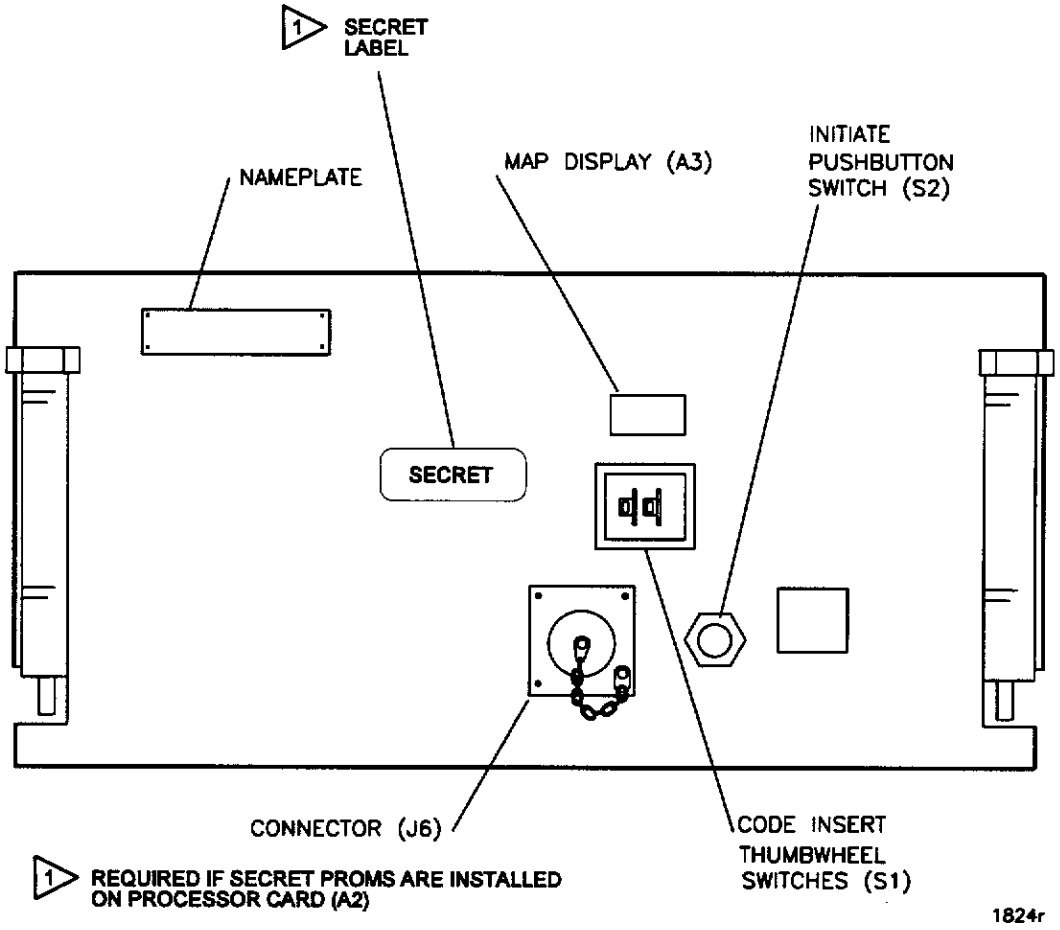
Figure 5-36. Battery Charger-Alarm Set Group (Sheet 1 of 2)



SOURCE: T.O. 21M-LGM30G-2-12-2

Figure 5-36. Battery Charger-Alarm Set Group (Sheet 2 of 2)

5-3.5.1. IMPSS Receiver/Transmitter Alarm Set. (Figure A 1514/URD 475A1) See Figure 5-37. An electrical drawer which contains the receiver, transmitter, DC power and all logic circuitry for the Improved Minuteman Physical Security System (IMPSS). A Maintenance Assist Panel (MAP), located on the R/T alarm set drawer, is used for troubleshooting the security system. The R/T alarm set processor continuously monitors IZ and OZ systems and alarm set drawer for faults and alarms. The processor contains a file that stores the faults and alarms which are used to pin point the problem area during troubleshooting. Access to these files is through the MAP.



SOURCE: T.O. 21M-LGM30F-2-4-3

NO.	CONTROL/INDICATOR	FUNCTION
S1	Thumbwheel Switches	Used to select appropriate function codes for manually initiated tests and for maintenance assessed functions.
S2	Initiate Switch	Used to insert the code from the thumbwheel switches into the processor and to change the MAP displays.
A3	MAP display	Displays store alarm and fault history data.

Figure 5-37. IMPSS R/T Alarm Set Drawer

5-3.6. Distribution Box. (Figure A 1337/URD 432). Provides power and signal distribution interface between OGE and AVE. See Figure 5-38.

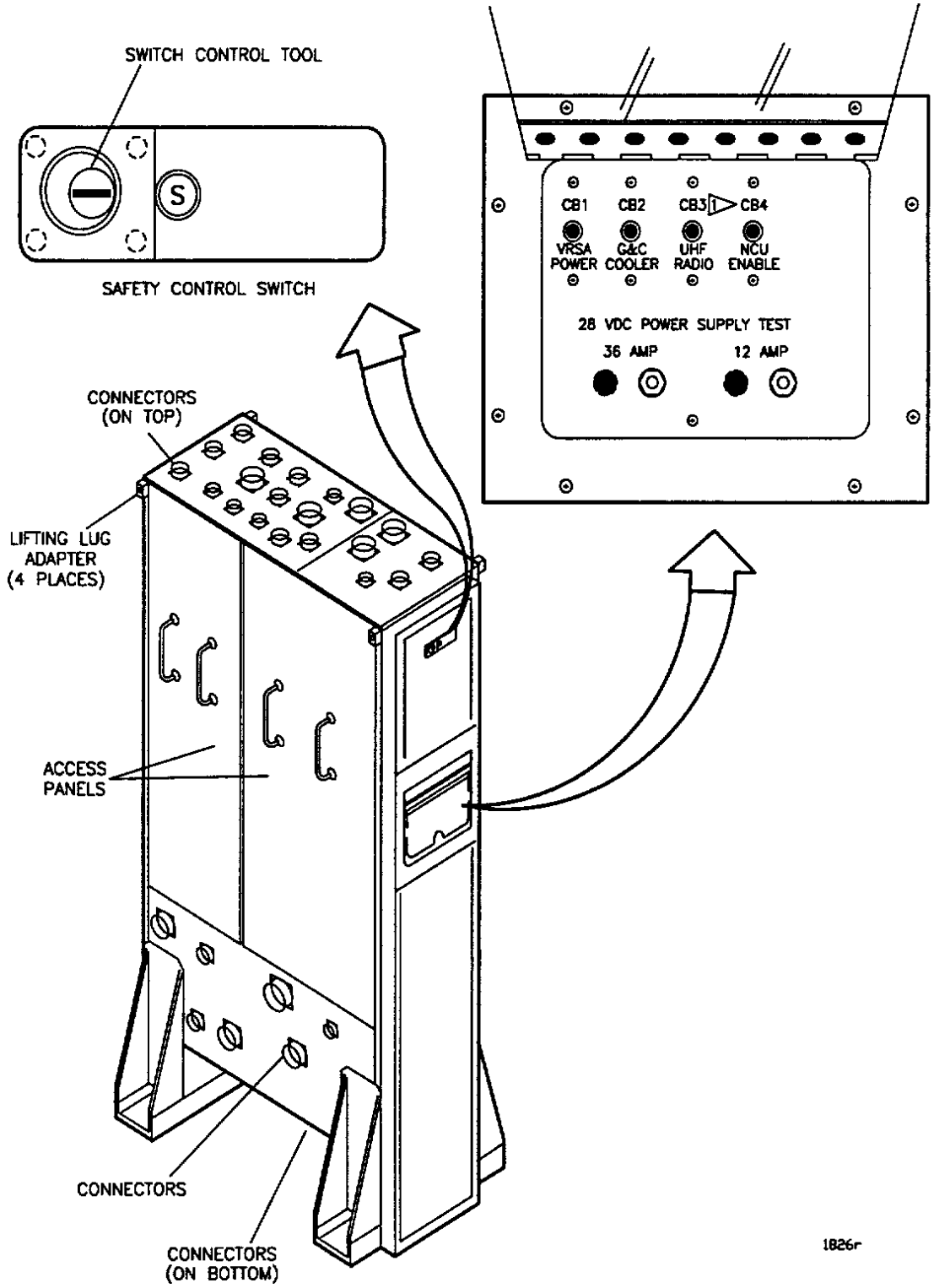


Figure 5-38. LF Distribution Box (Sheet 1 of 2)

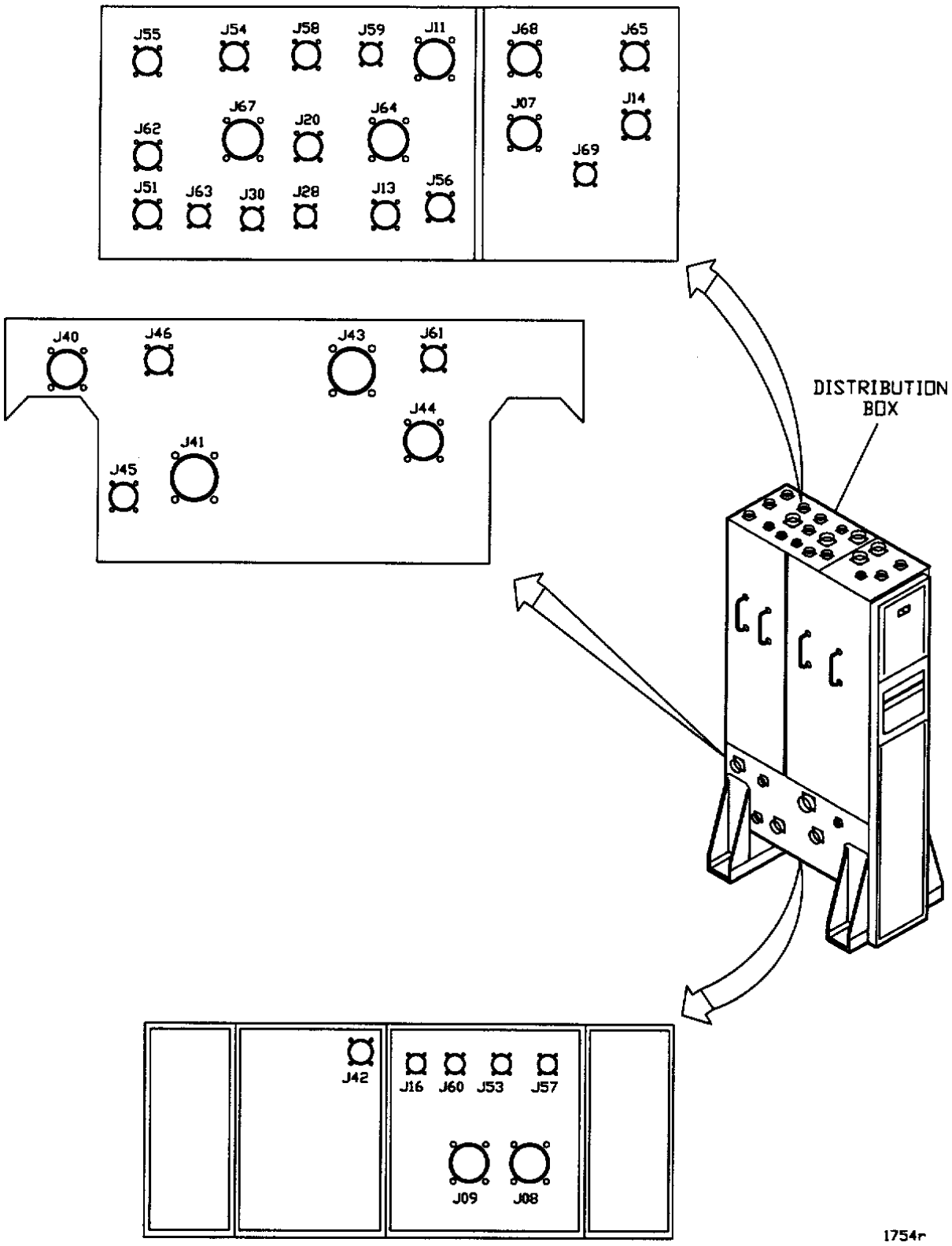


Figure 5-38. LF Distribution Box (Sheet 2 of 2)

SECTION VI - MESSAGE FORMATS

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LIST OF ILLUSTRATIONS

LIST OF TABLES

6-1. SCOPE. This section discusses message format and processing of commands and interrogations issued by the LCF and the responses provided by the LF. Message processing at the LCF is essentially under the control of the Weapon System Processor (WSP) which has been loaded with the Console Operations Program (COP). At the LF, the Digital Computer Unit (DCU) located in the missile guidance set performs a similar activity. Figures 6-1 and 6-2 are overviews of signal flow at the LCF and LF respectively.

6-2. CABLE MESSAGES. All command and status data between the LCF and LF are normally transmitted over the hardened inter-site cable system. The exception is the LF ALCC Access or UHF radio mode type of message transmission. This subject is discussed later in this section.

6-2.1. Cable Communication System. The Minuteman cable communication system uses a digital diphase signal of 1300 bits/second for squadron monitoring and launch control functions. The system employs a message flooding technique where a node (LCF or LF) transmits or retransmits messages to the nodes connected to it. This process continues until the entire squadron is flooded with the same message. Due to "bit burning", part of the 56 bit preamble is burned off at each node; however, there are enough preamble bits that even after 10 retransmissions, the last receiving node will receive a complete message. When a critical line is seized and message sync is detected before eight bits have been retransmitted, the LF EGS will delay retransmission of sync and data until at least 8 bits (marks) have been added.

6-2.2. Cable Message Structure. All cable messages consist of a preamble of 56 bits followed by the data message of 56 bits. There is a filler bit between each 56 bit message to assure that complete messages are recognized by receiving equipment. A message bit may be either a zero (space) or one (mark). A "zero" is a cycle of 1300 bps symmetrical square wave. A "one" is a cycle of 1300 bps with a 180 degree phase reversal during the second half of the bit. The first three bits of the data message consist of cable/unique sync. The sync consists of a single cycle of 433-1/3 Hz symmetrical square wave.

6-2.3. Cable Message Format. Figure 6-3 shows the format and contents of all messages. The DCU uses only bits 8 through 55 to perform its processing functions. Bits 7 through 54 are normally cryptographically protected and require processing by the Secure Data Unit (SDU).

6-3. UHF RADIO MESSAGES. The LF will accept UHF radio messages from the ALCC whenever the criteria specified in Figure 6-4 are met. ALCC provides an alternate means of retargeting and controlling launch functions. The commands, which are transmitted in clear text, are PLC-A1 and -A2, PLC-B, enable, execute launch command, automatic, and inhibit.

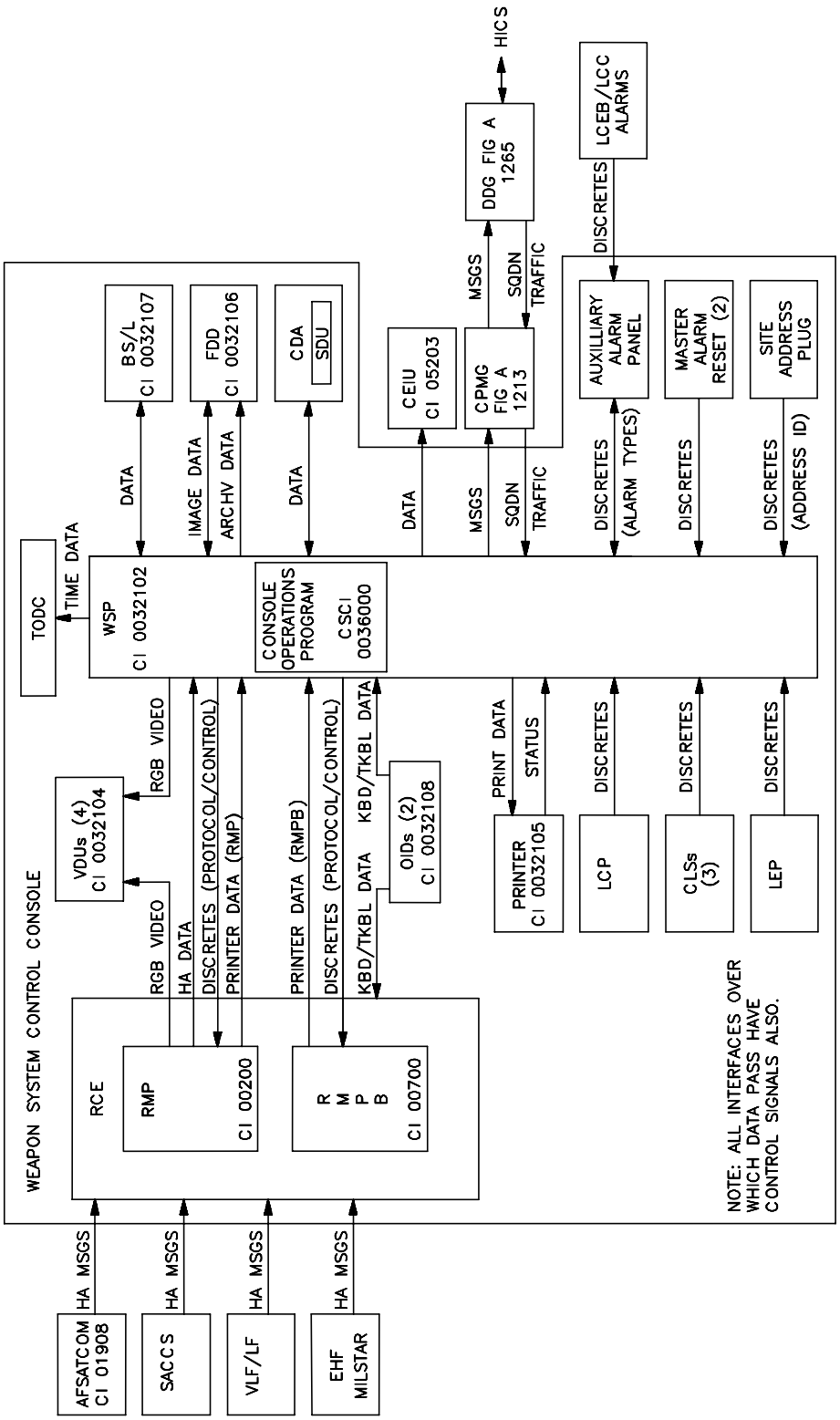
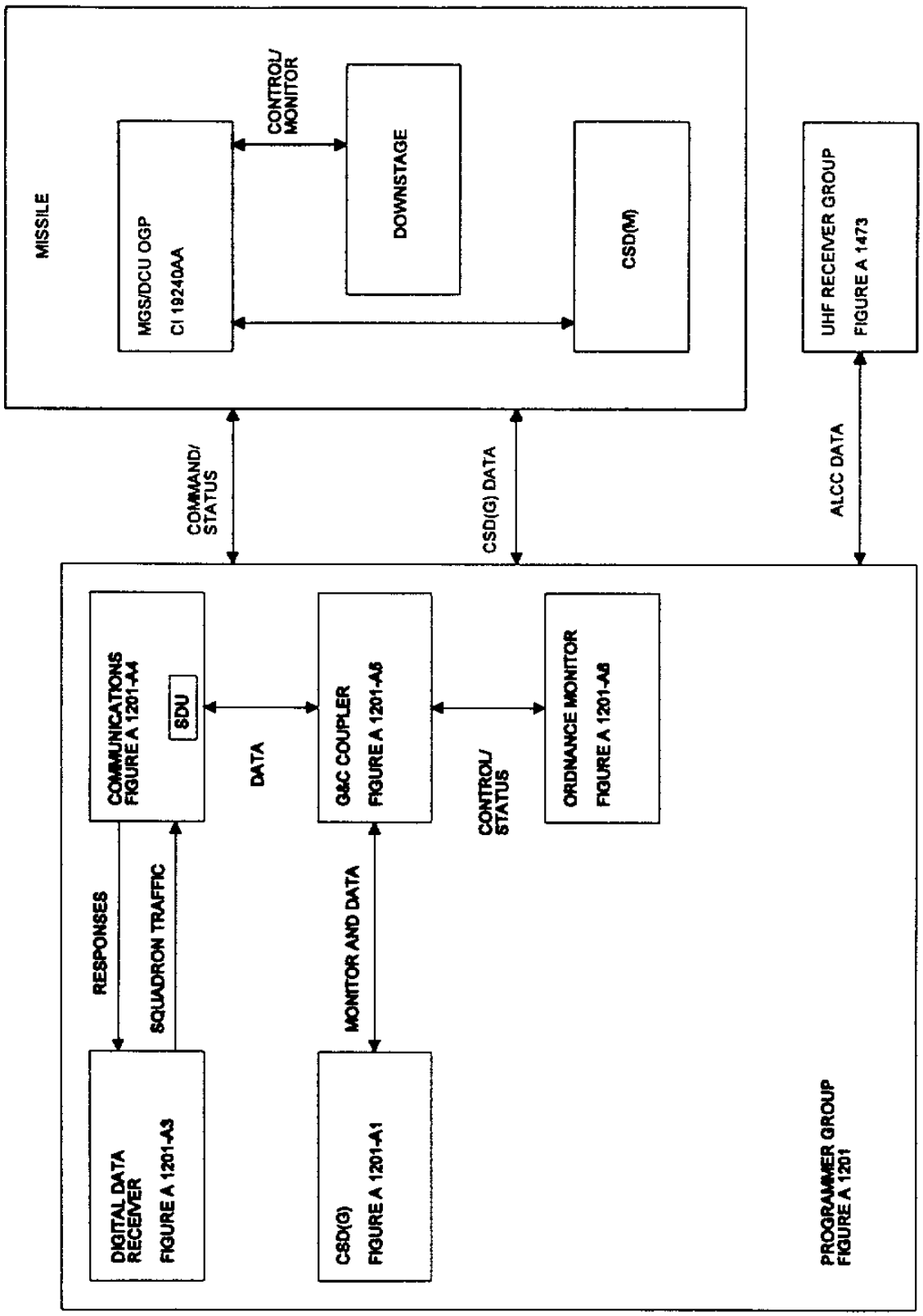
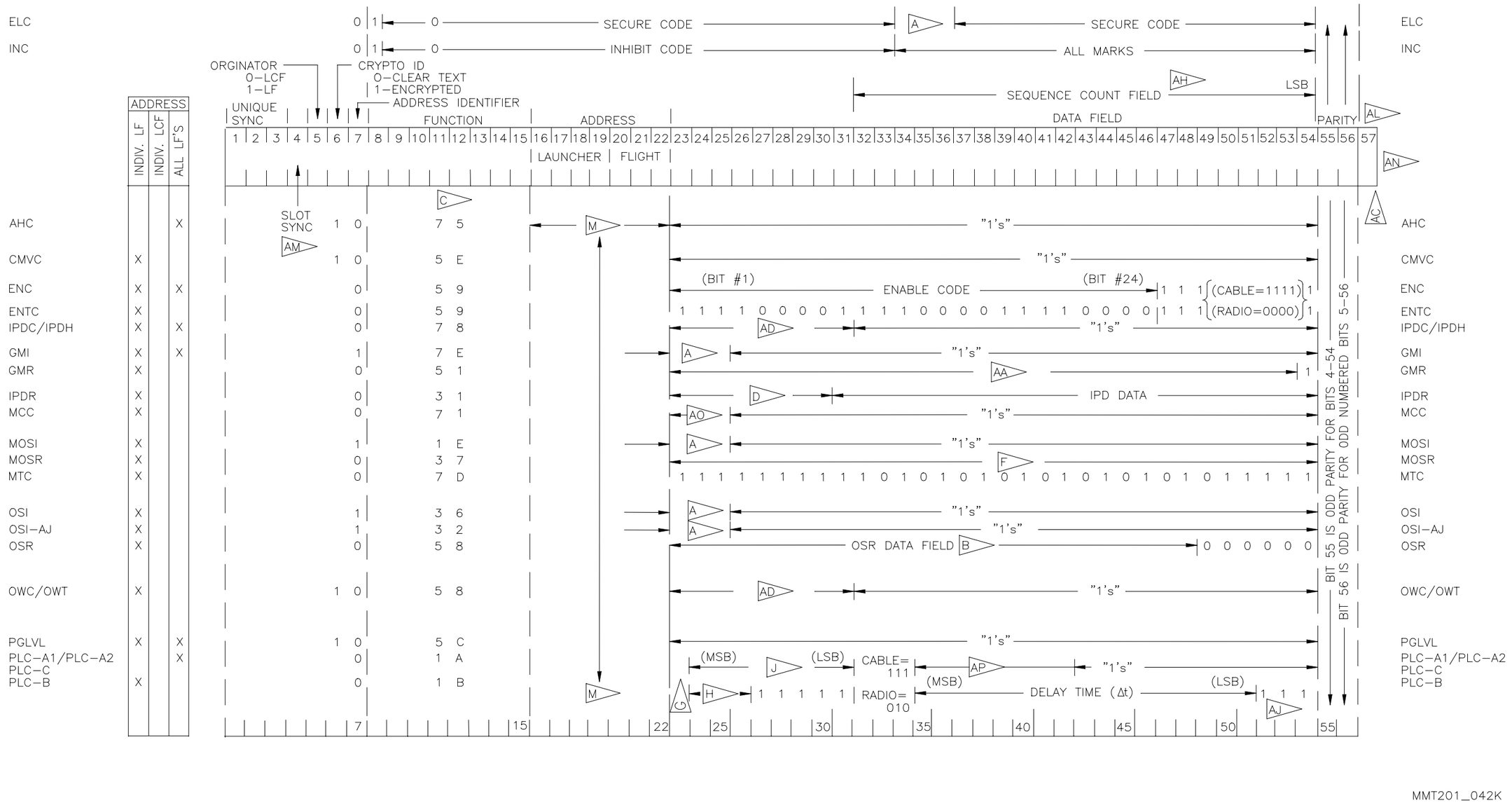


Figure 6-1. LCC Signal Flow Diagram



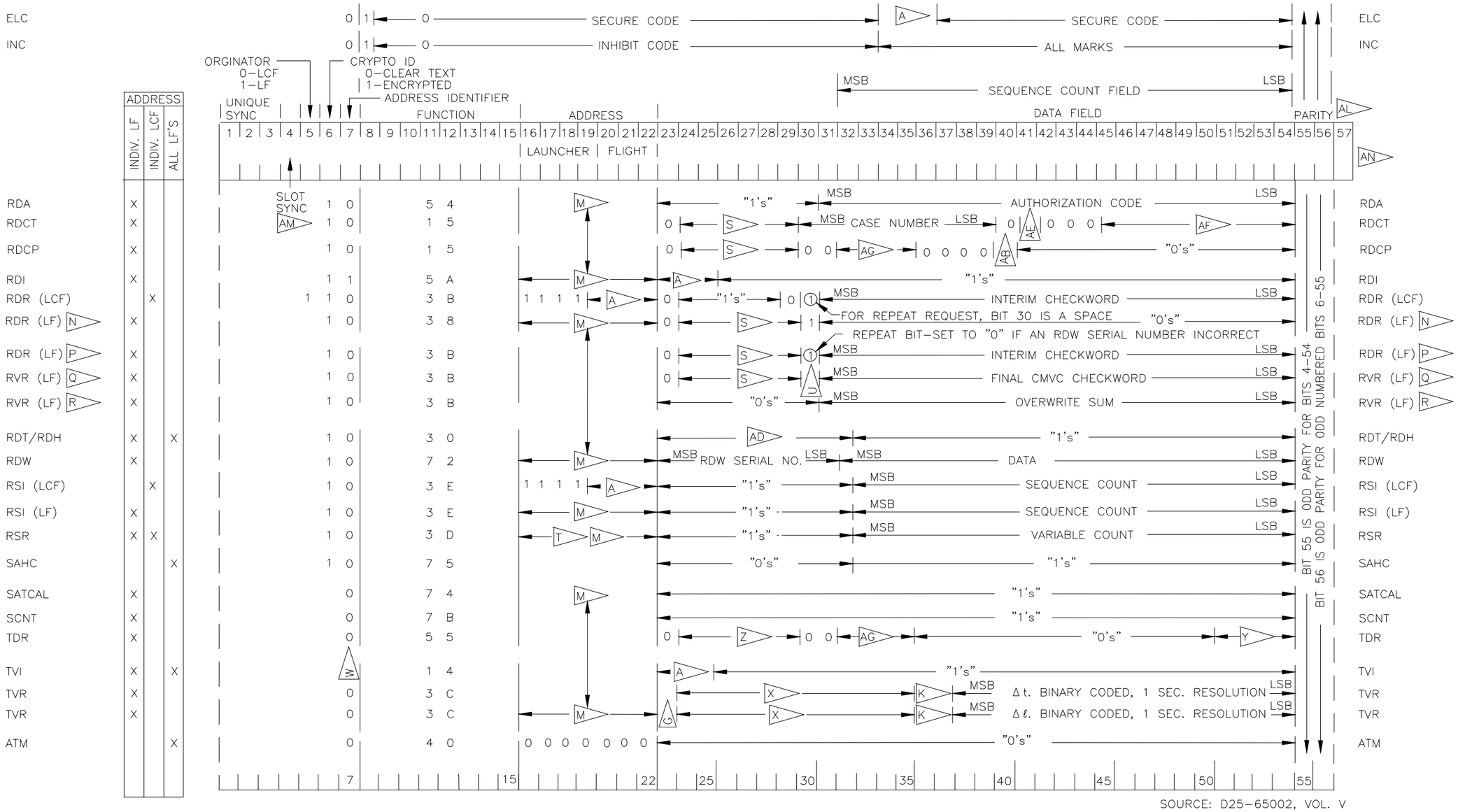
SOURCE: ICD D25-65000, VOLUME VIII

Figure 6-2. LF Signal Flow Diagram



MMT201_042K

Figure 6-3. Message Formats (Sheet 1 of 3)



MMT201_043K

Figure 6-3. Message Formats (Sheet 2 of 3)

A LCF/LCP NO.

RDR (LCF) RSI (LCF) RSR T	MSG BITS 22	21	20
OSI. OSI–AJ, RDI MOSI, TVI GMI	25	24	23
ELC	34	35	36
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1

B

	OSR DATA FIELD		
	LF STATUS INFORMATION	BITS/CODES	
LF READINESS MODES		23 24 25	
	STANDBY NO–GO *	0 0 0	Z
	STRATEGIC ALERT	1 0 0	Z
	SATCAL (PSAT CAL)	0 1 0	Z
	CALIBRATE (IMU CAL, PHI CAL)	1 1 0	Z
	RESTART	0 0 1	Z
	ALIGNMENT	1 0 1	Z
	WARHEAD ALARM	0 1 1	Y
	LF NO–GO	1 1 1	Y
		26	
	ALARM FAULT	1	X/Y
ENABLE STATUS		27 28 29	
	DISENABLE COMMANDED	0 0 0	Z
	COMPUTER BUSY	1 0 0	Y
	ENABLED STATE	0 0 1	Z
	INHIBIT TEST	1 0 1	Z
	DISENABLED STATE	1 1 1	Y/Z
LAUNCH MODE		30 31	
	LAUNCH INHIBITED	0 0	Z
	LAUNCH COMMANDED	1 0	Z
	LAUNCH–IN–PROCESS	0 1	Z
	NORMAL	1 1	Y/Z
		32	
	IMPROPER COMMAND	1	Z
		33 34 35	
	RADIO DATQ PRESENT	1	X/Y
	TEST COMPLETED	1	X/Y/Z
	TGT DATA CHANGED*	1	Z
		36 37 38	
	INNER ZONE VIOL.	1	X/Y
	OUTER ZONE VIOL.	1	X/Y
	RADIO MODE	1	X/Y
		39 40 41	
	ANTI–JAM	1	X/Y
	SDU ALARM	1	X/Y
		42 43	
	RDC NOT IN PROCESS	0 0	Y/Z
	RDT ACCEPTED	1 0	Z
	RDC IN PROCESS	1 1	Z
		44 45 46 47	
	OSI/OSI–AJ NOT VALIDATED	1	Z
	AHC ACCEPTED	1	Z
	PRIMARY PWR. FAILURE	1	X/Y
	IPDR DISABLED	1	Z
		48	
	PIGA LEVELING	1	Z

* OSR STATUS CONTAINING BOTH STANDBY NO–GO AND TGT DATA CHANGE IS DECODED AS "OVERWRITE IN PROCESS"

X = GENERATED BY EGS
Y = GENERATED BY EGS AND REPORTED IN ASR
Z = GENERATED BY DCU

AO CALIBRATE COMMAND

EGS BITS	23	24	25
PHI CAL	0	0	0
IMU CAL 1	0	0	1
IMU CAL 2	0	1	0
SPARE	0	1	1
SPARE	1	0	0
SPARE	1	0	1
SPARE	1	1	0
USE PROGRAM DATA ID	1	1	1

NOTE: NOT IMPLEMENTED IN COP

AP EXECUTION OPTION FIELD 2
EGGS BITS 35, 36, 37, 38, 39, 40, 41, 42

FOR PLC–A
EXECUTION OPTION FIELD 2
CONTAINS ALL ONES

FOR PLC–C
EXECUTION OPTION FIELD 2
CONTAINS EXECUTUON PLAN
NUMBER 51 THROUGH 98 IN BCD

NUMBER 99 OR GREATER ARE INVALID

NOTE: PLC–C NOT IMPLEMENTED IN COP

C

CONVERSION TABLE									
HEX	BINARY				HEX	BINARY			
0	0	0	0	0	8	1	0	0	0
1	0	0	0	1	9	1	0	0	1
2	0	0	1	0	A	1	0	1	0
3	0	0	1	1	B	1	0	1	1
4	0	1	0	0	C	1	1	0	0
5	0	1	0	1	D	1	1	0	1
6	0	1	1	0	E	1	1	1	0
7	0	1	1	1	F	1	1	1	1

D IPD WORD IDENTIFIER

OCTAL IDENTIFIER E	MSG BITS 23	24	25	26	27	28	29	30
001	0	0	0	0	0	0	0	1
002	0	0	0	0	0	0	1	0
003	0	0	0	0	0	0	1	1
375	1	1	1	1	1	1	0	1
376	1	1	1	1	1	1	1	0
377	1	1	1	1	1	1	1	1

E IPD FAULT DATA WORDS

OCTAL IDENTIFIER	FAULT DATA WORD
014	1
015	2
016	3
017	4
020	5
021	6
022	7
023	8
024	9 (SPARE)
025	10 (SPARE)

ANY FDW IN THIS FIELD WILL BE PRINTED IF LF IS IN STANDBY NO–GO.

NOTE: SPARES NOT ALLOWED BY COP

F

IF BIT 23 IS A SPACE (MOSR WORD 1), MOSR BITS 11 THROUGH 41 ARE IDENTIFIED BY MESSAGE BITS 24 THROUGH 54 RESPECTIVELY.

IF BIT 23 IS A MARK (MOSR WORD 2), MOSR BITS 42 THROUGH 72 ARE IDENTIFIED BY MESSAGE BITS 24 THROUGH 54 RESPECTIVELY.

G
1 = CEP
0 = MRT

H MSG BITS

TARGET NUMBER	24	25	26	PLC–B
NO. 1	1	0	0	TARGET ID'S NOT USED
NO. 2	0	1	0	
NO. 3	1	1	0	
NO. 4	0	0	1	
NO. 5	1	0	1	
NO. 6	0	1	1	
NO. 7	1	1	1	
NO. 8	0	0	0	

J

EXECUTE OPTION 0–49 IN BCD (PLC–A1) OR 51–98 IN BCD (PLC–A2)

K TARGET NO.

MSG BITS	36	37
NO. 1	1	0
NO. 2	0	1
NO. 3	1	1
NO. 4	0	0

"00" ALSO SET FOR PREDETERMINED AZIMUTH.

M ADDRESS

LF NO.	MSG BITS 16	17	18	19
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
ALL	1	1	1	1

FLT NO.	MSG BITS 20	21	22
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
ALL	0	1	1
OFF	1	1	1

N

LF RDR IN RESPONSE TO AN RDI FOLLOWING RDC

P

LF RDR IN RESPONSE TO AN RDI, INTERIM CHECKSUM WORD SET TO ZERO IN INITIAL RDR AFTER RDC.

Q

LF RVR IN RESPONSE TO AN OSI FOLLOWING RDT OR CMV

R

LF RVR CONTAINING OVERWRITE SUM

S TARGET/EXECUTION PLAN/BUFFER IDENTITY

MSG BITS	24	25	26	27	28	29
PROGRAM DATA BUFFER *	0	0	0	0	0	1
TGT #1	0	0	0	0	1	0
TGT #2	0	0	0	1	0	0
TGT #3	0	0	1	0	0	0
TGT #4	0	1	0	0	0	0
EX PLAN SET	1	0	0	0	0	0
OVERWRITE REPLY **	0	0	0	0	0	0

* PROGRAM DATA BUFFER NOT USED IN RDR/RVR
** IN RVR DURING OVERWRITE IN PROCESS

T

IF ADDRESSED TO AN LCF FROM AN LCF, MSG BITS 16 TO 19 ARE "1's" AND BITS 20 TO 22 ARE PER A

U

AUTHORIZATION STATUS OF THE DATA SET
"1" = UNAUTHORIZED
"0" = AUTHORIZED

V

NOT USED

W

1 = INDIV. ADD
0 = ALL CALL

X EXECUTION OPTION NO.

THOUSANDS & HUNDREDS DIGITS	MSG BITS 24 25 26 27 28 29	TENS & UNITS DIGITS LESS 50	MSG BITS 30 31 32 33 34 35
00	0 0 0 0 0 0	00	*
01	0 0 0 0 0 1	01	0 0 0 0 0 1
02	0 0 0 0 1 0	02	0 0 0 0 1 0
		48	1 1 0 0 0 0
49	1 1 0 0 0 1	49	
50 TO 62	INVALID	TO 62	INVALID
63	**	63	**

* ALL ZEROS INDICATE NO TARGET SELECTED; I.E., TARGET ZERO AND OVERRIDES TARGET DATA IN BITS 36 AND 37.

** ALL MARKS INDICATE ONE OF THE FOLLOWING:
A. IF NOT TARGETED BY A PLC–A, (PLC–B TARGETED).
B. IF PLC–A TARGETED, BUT THE EXECUTION PLAN HAS BEEN SUBSEQUENTLY CHANGED, UNLESS IT IS CURRENTLY REPORTING ALL ZEROS.
C. LF HAS EXPERIENCED A COMMANDED RESTART OR MASTER RESET.

Y PLC–A EFFECTIVITY

MSG BITS	51	52	53	54
TARGET SET	4	3	2	1

"1" IF TARGET SET WAS SUCCESSFULLY RDC'D AFTER THE INDICATED EXECUTION PLAN SET WAS RDC'D

"0" IF EXECUTTION PLAN SET WAS SUCCESSFULLY RDC'D AFTER THE INDICATED TARGET SET WAS RDC'D

Z AUTHORIZATION FOR:
TGT SET/EX. PLAN SET/PROG. DATA BUFFER

MSG BITS	24	25	26	27	28	29
PROG. DATA BUFFER *						0
TGT SET NO. 1 UNAUTHORIZED					1	
TGT SET NO. 2 UNAUTHORIZED				1		
TGT SET NO. 3 UNAUTHORIZED			1			
TGT SET NO. 4 UNAUTHORIZED		1				
EX PLAN SET UNAUTHORIZED	1					

* ALWAYS AUTHORIZED

AA FAULT STATUS FIELD

MESSAGE BIT SET TO A MARK	FAULT NO.	MESSAGE BIT SET TO A MARK	FAULT NO.	MESSAGE BIT SET TO A MARK	FAULT NO.
23	1	34	12	44	22
24	2	35	13	45	23
25	3	36	14	46	24
26	4	37	15	47	25
27	5	38	16	48	26
28	6	39	17	49	27
29	7	40	18	50	28
30	8	41	19	51	29
31	9	42	20	52	30
32	10	43	21	53	31
33	11				

AB
NOT USED BY OGP

AC
FILLER BIT ON LCC INITIATED MESSAGES

AD
BITS 23 THROUGH 31 ARE ALL 0's FOR IPDC, OWC, AND RDT.
BITS 23 THROUGH 31 ARE ALL 1's FOR IPDH, OWT, AND RDH.

AE
BIT 41 IS THE GYRO DATA COMPENSATION INDICATOR.

"1" GRYO DATA COMPEN–SATION USED FOR TARGET SET SELECTED BY THIS RDC.
"0" GYRO DATA CONFIGURATION NOT USED.

AF
GYRO DATA CONFIGURATION.
IF BIT 41 IS A ONE, BITS 45 THROUGH 54 CONTAIN THE RDCT MGS NUMBER. IF BIT 41 IS A ZERO, BITS 45 THROUGH 54 ARE ALL ZEROS.

AG RDCP BUFFER IDENTIFICATION

MSG BITS	32	33	34	35
MISSILE TEST – SEGMENT 1	0	0	0	1
MISSILE TEST – SEGMENT 2	0	0	1	0
PHI CAL	0	0	1	1
IMU CAL SEGMENT 1	0	1	0	0
IMU CAL SEGMENT 2	0	1	0	1
PSAT CAL	0	1	1	0
LF MEMORY OVERWRITE	0	1	1	1
SPARE	1	0	0	0
LOCAL	1	0	0	1
SPARE	1	0	1	0
SPARE	1	0	1	1
SPARE	1 THROUGH 1	1	1	1

AH
THE 23 BIT LCF SEQUENCE COUNT HAS BEEN HALF – ADDED TO EGS MESSAGE BITS 32 – 54 OF COMMANDS AND INTERROGATIONS THAT ARE ENCRYPTED.

AJ
IF ALCC INITIATED, BITS 52 – 54 ARE PART OF Δt WHICH WILL ALWAYS BE EITHER ZERO OR INFINITE HOLD.

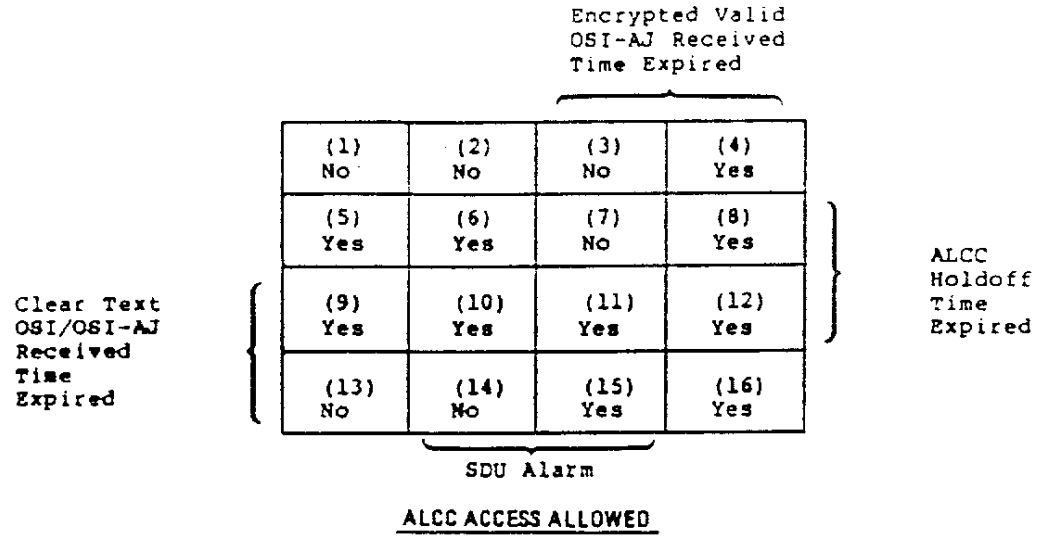
AL
AFTER CHECKING PARITY, THE LF EGS SETS BIT 55 A MARK IF ENCRYPTED, AND A SPACE IF CLEAR TEXT, BEFORE TRANS–FERRING 48 BITS OF DATA TO DCU.

AM
SLOT SYNC (BIT 4) IS NORMALLY A "ONE" AND IS CHANGED TO "ZERO" ONLY FOR THE FIRST MESSAGE TRANSMITTED BY THE LCF USING THE SLOT NO. 1.

AN
BITS 8 THROUGH 55 ARE SHIFTED TO THE DCU AND REDESIGNATED AS DCU TRANSFER BITS 1 THROUGH 48. BITS 7 THROUGH 54 ARE ENCRYPTED/ DECRYPTED BY THE SDU.

MMT201_048K

Figure 6-3. Message Formats (Sheet 3 of 3)

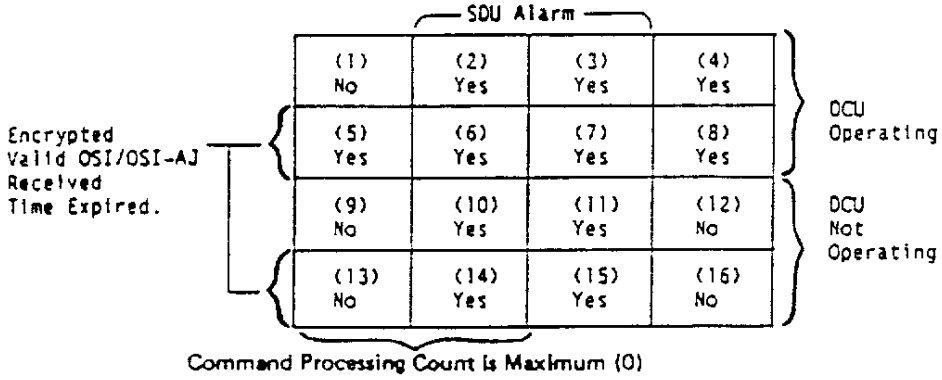


ALCC ACCESS ALLOWED

NOTE 1: WITH BLOCKS (1) THROUGH (16): "YES" MEANS ALCC ACCESS IS ALLOWED. "NO" MEANS ALCC ACCESS IS NOT ALLOWED.

NOTE 2: TRANSITION FROM YES TO NO OR NO TO YES SHALL OCCUR WITHIN FIVE SECONDS AFTER OCCURRENCE OF A STATE CHANGE.

NOTE 3: ALCC ACCESS = (ENCRYPTED VALID OSI/OSI-AJ RECEIVED TIME EXPIRED CLEAR TEXT OSI/OSI-AJ RECEIVED TIME EXPIRED) + (ALCC HOLD-OFF TIME EXPIRED · ENCRYPTED VALID OSI/OSI-AJ RECEIVED TIME NOT EXPIRED) + (SDU ALARM · ENCRYPTED VALID OSI/OSI-AJ RECEIVED TIME EXPIRED).



CLEAR TEXT ALLOWED

NOTE 1: WITHIN BLOCKS MARKED (1) THROUGH (8): "YES" MEANS CLEAR TEXT IS ALLOWED, "NO" MEANS CLEAR TEXT IS NOT ALLOWED.

NOTE 2: CLEAR TEXT ALLOWED = SDU ALARM + ENCRYPTED VALID OSI/OSI-AJ RECEIVED TIME EXPIRED + COMMAND PROCESSING COUNT IS NOT AT COUNT 3.

NOTE 3: ENCRYPTED VALID (AND NON-VALID) OSI's/OSI-AJ's WILL BE ALLOWED AS LONG AS THE EQUIPMENT IS CAPABLE OF ENCRYPTED OPERATION.

NOTE 4: ENCRYPTED COMMANDS AND RDC MESSAGES, EXCEPT RDI'S, WILL BE PROCESSED, IF, AND ONLY IF, THE COMMAND PROCESSING COUNT IS AT COUNT THREE (3). THE COMMAND PROCESSING COUNT IS RESET WHEN TEN (10) ENCRYPTED NON-VALID OSI'S/OSI-AJ'S ARE RECEIVED OR WHEN THE ENCRYPTED VALID OSI/OSI-AJ RECEIVED TIME EXPIRES. THE COMMAND PROCESSING COUNT WILL NOT RESET JUST BECAUSE THE SDU ALARM IS TRUE.

NOTE 5: TRANSITION FROM YES TO NO OR NO TO YES WILL OCCUR WITHIN FIVE (5) SECONDS AFTER OCCURRENCE OF A STATE CHANGE.

REF: ICD D25-66000, VOLUME IX

Figure 6-4. ALCC Access/Clear Text Criteria

6-3.1. UHF Message Processing. The UHF radio receiver in the launch facility receives the ALCC message through the UHF antenna and demodulates the RF input. When the receiver detects the two-tone pair of squadron audio address tones assigned to its squadron, it allows the data following the tones to be processed. The data is demodulated to 1300 Hz diphase data and transferred to the message processor (URD 403A4) as a seventh cable input line. If ALCC access allowed is true, the message will be processed in the message processor drawer exactly like a cable message except for the radio sync (six zeroes and a one) requirement for special handling for Minuteman ALCC messages. The message is then retransmitted on the cable system and also transferred to the DCU. The DCU must receive two identical copies of a PLC or ENC in addition to the other acceptance rules before it will begin processing these commands. The other commands follow the same acceptance rules which apply to cable messages.

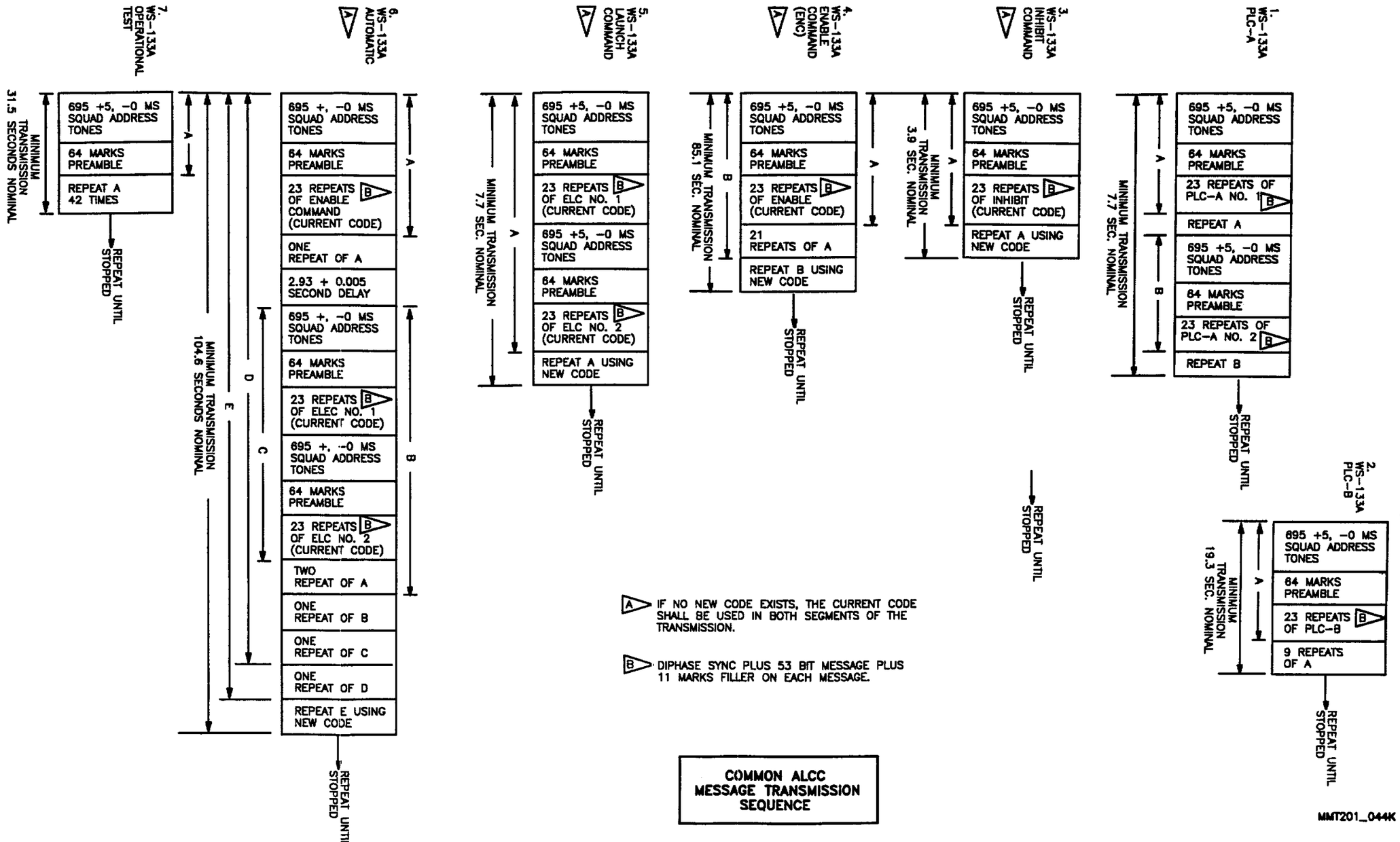
6-3.2. ALCC Test Message. To test the UHF radio, the ALCC can transmit an ALCC Test Message (ATM) which consists of the proper squadron address tones followed by 64 (Common) or 76 (Minuteman) marks and repeated 42 times. The receiver processes the message and provides a radio data present indication to the status register. If ALCC access allowed is not true and the message did not contain sync, the message processor disregards the message. Radio data present is reported back to the LCF in the next operational status reply.

6-3.3. Message Formats. (See Figure 6-5.) The message transmission sequences from the common ALCC transmits unique sync (same as cable messages) followed by a one and three zeroes. The transmission sequence for coded messages (ENC, ELC, and INC) supplies both the old and new code so that ALCCs can function during code change operations. Except for the sync difference, format of ALCC messages is identical to cable messages.

6-4. MESSAGE PROCESSING.

6-4.1. Message Authentication. Table 6-1 shows the message bits used for authentication of specific messages. If the LF fails to authenticate an LCF message, the message will be discarded. The LCF, upon recognizing a lack of responses from the LF, will issue clear text messages. If the LF responds to the clear text message, that LF will be registered as LF Not Authenticated.

6-4.2. Message Acceptance. When the LF receives a message, the MGS and EGS will process the message in accordance with the validity criteria given in Table 6-2. The LF must be in a specific mode or state prior to accepting a message. Table 6-3 is the validity matrix showing the acceptance criteria programmed into the DCU.



SOURCE: C-2250

Figure 6-5. ALCC Message Transmission Sequence

Table 6-1. Message Authentication and Validation

MESSAGE TYPE	EGS AUTHENTICATION BITS (REF. FIGURE 6-3 FOR THESE EGS BITS)
PGLC	23-54
RSR	23-31
PLC-A	32-54
PLC-B	27-34 FOR ALL PLC-Bs AND 52-54 IF LCF ORIGINATED
PLC-C	32-34 AND 43-54
ENC/ENTC	47-54
AHC/SAHC	23-54
MCC	26-54
CMVC	23-54
SATCAL	23-54
MTC	23-54
SCNT	23-54
RDA	23-30
RDC	23-29 AND 41-54
RDH/RDT	23-54
ALL INTERROGATIONS	26-31
IPDC/IPDH	23-54
OWC/OWT	23-54
ATM	16-54

SOURCE: ICD 25-65000, VOL IX

Table 6-2. Command and Interrogation Validity Matrix (Remote Communications

MODE/STATE	COMMAND/INTERROGATION																											
	AHC/SAHC	ATM	RSR	ROT	ROH	RDA	RDI	RDW	RDC	CMVC	SCNT	IPDC	IPDH	SATCC	OWC	OWT	MOSI	ENTC	TVI	OSI & OSI-AJ	MTC	MCC (IMU, PHI)	PLC-B	PLC-A	ENC	INC	ELC	PGLC
REMOTE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LAUNCH IN PROCESS	X	X	X	X	X	X	X	X		X						X		X	X									X
LAUNCH COMMANDED	X	X	X	X	X	X	X	X		X						X		X	X							X	X	X
LAUNCH INHIBITED	X	X	X	X	X	X	X	X		X						X		X	X								X	X
NO LAUNCH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DISENABLED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
ENABLED	X	X	X	X	X	X	X	X	X	X	X			X		X		X	X		X	X	X		X	X	X	X
DISENABLE COMMANDED	X	X	X	X	X	X	X	X	X	X	X			X		X		X	X		X	X	X			X	X	X
STRATEGIC ALERT (BIASING)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
STRATEGIC ALERT (PIGA LEVELING)	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X			X	X	X	X	X	
CALIBRATION (IMU, PHI)	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X			X	X	X	X	X	X
ALIGN (INITIAL, RESTART OR RETARGET)	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X			X	X	X	X	X	X
MISSILE TEST																												
STANDBY NO-GO	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)		X	(3)	X		X	X	(4)	X						
CALIBRATION (PSAT)	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X			X	X	X	X	X	X
ROC NOT IN PROCESS	X	X	X				X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ROC IN PROCESS	X	X	X	X	X		X	X			X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
ROT ACCEPTED	X	X	X	(1)	X	X	(2)				X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X

(1) COMMAND ACCEPTANCE OPTIONAL

SOURCE: D25-65000, VOLUME IX

(2) WILL BE ACCEPTED FOR CRYPTO SYNC FUNCTIONS AND LCF ADDRESS PROCESSING ONLY

(3) WILL BE ACCEPTED IF THE SYSTEM IS IN OVERWRITE IN PROCESS

(4) WILL BE ACCEPTED IF THE SYSTEM IS NOT IN OVERWRITE IN PROCESS

(5) WILL BE ACCEPTED AFTER LD1 HAS BEEN SELECTED

Table 6-3. DCU Final Acceptance and Response

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC. UNLESS OTHERWISE STATED	
ELC	Infinite hold not set. ELC Code checks pass. LCF number is not one that caused LCM if in LI or LCM.	NL, EN	NL to LCM	
		NL, DEC	NL, DEC to LCM, EN	
		LI	LI to LIP	
		LCM	LCM to LIP	
INC	INC Code Checks passed	NL, DISEN	INH TST in OSR for 5.05 ± 0.05 min.	
		NL, EN	NL, EN to NL, DEC then to NL, DISEN in 5.05 ± 0.05 min.	
		LCM	LCM to LI then to NL, DISEN in 5.05 + 0.05 min.	
ENC	The CSD(M) code change mode is not in process, the CSD(M) reset command is not true and the CSD(M) is home as determined by the CSD(M) computer home monitor, unless a repeatable CSD(M) penetration or a reset is in-process due to Circumvention Reset. ENC code checks passed.	None	DISEN to EN <10 sec.	
PLC-B	If the system is in or about to enter PIGA leveling or MOSR data indicates the GCA failure #1 MOSR is TRUE, the new delta Azimuth angle is less than or equal to target offset angle 2 and is greater than or equal to target offset angle 1. The target must be authorized and not in RDC.	SA	SA to Aln Target Data Changed (TDC) in <4 sec	Time to SA Variable. TVR sent to next OSI or OSI-AJ per priority (see OSI)
		IMU Cal/Phi Cal	Tgt Data Changed	
		Aln	Tgt Data Changed	
		Restart	Tgt Data Changed	
		PSAT Cal	Tgt Data Changed	

LEGEND: NL No Launch; EN Enabled; LCM Launch Commanded; DEC Disenable Commanded; LI Launch Inhibited; Aln Alignment

SOURCE: ICD D25-65000, VOL. IX

Table 6-3. DCU Final Acceptance and Response (Continued)

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC UNLESS OTHERWISE STATED
PLC-A	Same as PLC-B. EX plan set must have been authorized and EX plan must have been authorized since target selected was authorized. The following conditions must be satisfied:	Same as PLC-B. A PLC-A sequence consists of a PLC-A1 followed by a PLC-A2.	Same as PLC-B
(1) PLC-A1 will EX Opt of 00 thru 49. (2) PLC-A2 will have EX Opt of 51 thru 98. (3) PLC-A2 will be rejected if not preceded by PLC-A1. (4) PLC-A1 will be rejected if followed by another PLC-A1. (5) PLC-A1 will be rejected if followed by a PLC-B. (6) PLC-A1 & PLC-A2 will be from the same communication link. (7) PLC-A with EX Opt 50 or 99 and greater will be rejected.			
SCNT	$\geq$ 40.09 seconds since last start SCNT code issued. Overwrite in-process is false.	None	LIP and test completed set for one OSR in response to first OSI or OSI-AJ more than 40.09 seconds since acceptance of SCNT command

Table 6-3. DCU Final Acceptance and Response (Continued)

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC UNLESS OTHERWISE STATED
PLC-C	Same as PLC-B. Also EX plan set must be authorized and EX plan must have been authorized since target selected was authorized. The following conditions must be satisfied:	Same as PLC-B	Same as PLC-B
(1) Execute Option Field 1 will have EX Opt of 00 thru 49. (2) Execute Option Field 2 will have EX Opt of 51 thru 98. (3) EX Opt 50 or 99 and greater will be rejected.			
CLIP	Spare		
RDCT	Last PLC did not select RDC target. If RDC command contains MGS serial number, it matches the 10 least significant bits of MGS number filled into DCU memory by MGS parameter tape. Overwrite in-process is false.	Individually addressed	RDC not-in-process to RDCIP. RDR sent to next RDI.
RDCP	Program data ID is valid. Overwrite is Not-In-Process. A previously received MCC, MTC or SATCC is not currently being processed.	Individually addressed or all call	RDC not-in-process. TDR sent to any RDI when RDC not-in-process. TDR sent upon acceptance of RDCP command in response to OSI/OSI-AJ priority rules.
RDW	The serial number is 240, one less than the last RDW or the initial number of the current block.	None	No Change
RDA	The CMVC has been calculated. The RDA code checks pass.	None	RDT accepted to RDC not-in-process.
RDH	None	RDCIP	RDC in-process to RDC not-in-process.
		RDT accepted	RDT accepted to RDC not-in-process.

Table 6-3. DCU Final Acceptance and Response (Continued)

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC. UNLESS OTHERWISE STATED
MCC	GCA failure #1 MOSR bit not set, GCA/Platform Indexing Advised MOSR bit not set, and low level seismic MOSR bit not set. No hostile environment is detected. At least 12 bias cycles completed following either platform slew during return to target sequence or entry to stragetic alert biasing from strategic alert PIGA leveling. A previously received MCC, MTC or SATCC is not currently being processed.	None	SA to IMU cal or Phi cal in < 3 minutes then < 5 hours to SA. If use of “Program Buffer” is specified in MCC and IMU calibration 1, IMU calibration 2, or Phi cal was transmitted in the last RDCP message, then the calibrate specified by the last accepted RDCP command will be performed, otherwise the appropriate calibrate specified in MCC will be performed.
	Overwrite in-process is false.	SBNG	SBNG to Aln in 4 seconds then 0.5 to 2.0 hours to SA.
	Overwrite in-process is true.	SBNG	Critical no-go
MTC	At least 30 minutes since performance of missile test in remote. No SCNT is being performed. SCS is not armed and is not in the process of being reset. The CSD(G) is home. P/G monitor failure is false. SCS test command is false. CSD(M) penetration not in process. CSD(M) is home. Low level seismic MOSR bit is not set. No hostile environment is detected. A previously received MCC or SATCC is not currently being processed. Overwrite in-process is false.	None	No response for up to 4 minutes, then test completed, normally in less than 38 seconds.
ENTC	The CSD(M) is home as determined by the CSD(M) computer home monitor. CSD(M) code change mode is not in-process. CSD(M) reset command is not true. ENTC code checks passed.	None	Test completed < 10 seconds for one OSR.

Table 6-3. DCU Final Acceptance and Response (Continued)

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC UNLESS OTHERWISE STATED
RDT	None	RDCIP. If all-call was addressed, then all-call was indicated in RDC entry command.	RDCIP to RDT accepted. For RDCT, RVR sent to first and second OSI or OSI-AJ following CMVC per priority (see OSI).
SATCC	GCA failure #1 MOSR bit not set, GCP/Platform indexing advised MOSR bit not set or low level seismic MOSR bit not set. No hostile environment is detected. At least 12 bias cycles completed following platform slew during return to target sequence or entry to stragetic alert biasing from strategic alert PIGA leveling. A previously received MCC or MTC is not currently being processed.	SA (Non-PIGA leveling) (LF addressed)	SA to SAT cal in 3 minutes then 5.7 hours to SA.
	GCA failure #1 MOSR bit set and/or GCA/Platform indexing advised MOSR bit set.	SA (Non-PIGA leveling) (LF addressed)	SA to Align in 6 seconds then ≈ 0.5 to 2.0 hours to SA.
	None	SA (PIGA leveling) (LF addressed)	SA (Non-PIGA leveling) in < 3 minutes.
RSR	The last reply from this LF was RSI. Ten consecutive OSIs or OSI-AJs have not validated. Contiguously received messages with the same address are considered as one message.	None	None
AHC	None	None	AHC accepted - set for 5.05 $\pm$ 0.05 minutes in OSR.
RDI	None, except message must validate.	None	RDR is reply during RDCIP. TDR is reply during RDC not-in-process.
MOSI	None	Not standby no-go.	MOSR(s) are reply.
		Standby no-go.	MOSR(s) are reply.
TVI	None	LF Addressed	TVR is reply. TDR sent to next OSI or OSI-AJs per priority (see OSI).

Table 6-3. DCU Final Acceptance and Response (Continued)

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC UNLESS OTHERWISE STATED
		All call	TVR and TDR sent to next OSIs or OSI-AJs per priority (see OSI).
SAHC	Will not be accepted when hold-off time is less than 5.0 (-.0, +0.1) minutes or when ALCC access is allowed.	None	AHC accepted not reported in OSR.
PGLC	Valid PIGA biases exist.	Alignment or restart	PIGA leveling is set in OSR upon entry to PIGA leveling.
	None	SA (Non-PIGA leveling) or PSAT calibration, PHI calibration or IMU calibration.	PIGA leveling set in OSR upon entry to PIGA leveling.
CMVC	Checksum not being balanced following RDC abort. Overwrite In-Process is false.	None	RVR sent to first and second OSI or OSI-AJ following completion of CMVC for each data set per priority for responses (see OSI). OSR sent before start of next CMVC calculation or RDCT data set.
IPDC		LF addressed or all call	Set IPDR disabled status false in the OSR and issue gyro data word IPDR and autoindexing per OSI priority.
		LF addressed Standby no-go	Set IPDR disabled status false in the OSR and transmit gyro data group, autoindexing group and no-go group followed by any biasing or IMU calibration data that remains to be transmitted.
IPDH	Overwrite in-process is false.	None	Set IPDR disable status true in the OSI.

Table 6-3. DCU Final Acceptance and Response (Continued)

ADDITION COMMAND COMMAND ACCEPTANCE RULES		GOVERNING MODE/STATE/ADDRESS ACCEPTANCE CONDITIONS (IN ADDITION TO TABLE 6-2 AND FIGURE 6-3)	RESPONSE DUE TO COMMAND WITHIN 2.2 SEC. UNLESS OTHERWISE STATED
OWC	None	Standby no-go	Overwrite in-process. RVR sent to first and second OSI or OSI-AJ following completion of overwrite per OSI priority (see OSI). RVR contains overwrite sum number.
	One or more of the following MOSR printouts are set: 21, 27, 30, 39, 50, 51, 52, 54, 55, 56, 62, 63, 66, 68, 69 and 70.	Strategic alert	Strategic alert to standby no-go and overwrite in-process. RVR sent to first and second OSI following completion of overwrite per OSI priority (see OSI).
OWT	Overwrite completed successfully.	Standby no-go	Critical no-go
OSI/ OSI-AJ	None except for crypto sync updating and the message must validate.	None	The response will be with the message indicated by the first condition satisfied in Table 6-4.

6-4.3. LF Response Priorities. To ensure that the same type of response message; e.g., OSR; is not continually transmitted, the DCU will determine the priority of responses. Table 6-4 defines the OSI response priorities to commands/interrogations from the LCF.

6-4.4. Message Encryption and Decryption. To provide secure digital message transmission between facilities, the messages are encrypted by the transmitting facility prior to transmission. The message encryption is accomplished by the secure data unit (SDU) located at each LCF and LF. At the LCF the SDU is part of the Coder/Decoder Assembly (CDA). Received encrypted messages requiring local processing are first sent to the SDU for decryption and then processed. Each SDU is provided with special code words contained in a removable assembly called a keying variable. The keying variables used in a squadron are unique to the squadron and an identical message encrypted in one squadron will differ from and not be usable in another squadron. The basic encryption/decryption process is illustrated in Figure 6-6. Encryption message format is shown in Figure 6-7.

6-4.4.1. Encryption Control. Control of message encryption at the LCF is provided by the SDU option selection on the Communications Grid (Reference Figure 1-25), a Detailed LCC Status VDU screen selectable by the operator. With the selection of the NORMAL mode (ENCR option), all messages are transmitted encrypted. However, if an LF fails to respond to three encrypted OSIs, the WSP will interrogate that LF with a clear text OSI. In subsequent round robins the WSP will then sequentially transmit one encrypted and one clear text OSI until the LF again responds to encrypted OSIs. With the selection of the CLEAR TEXT mode (CLR option), encryption control depends upon whether the LCF is in an SDU alarm condition or not. If the LCF is not in an SDU alarm condition, all-call messages are transmitted in both encrypted and clear text if any LF is registered as unable to process encrypted messages due to either a faulty SDU or LF out of sync condition. Individually addressed messages for LFs registered as unable to process encrypted messages are transmitted in clear text. All other messages are transmitted encrypted. With the selection of the CODE CHANGE mode (CODE option), message processing is the same as in the NORMAL mode except that OSIs are immediately sent alternately encrypted and clear text to LFs which fail to respond to encrypted OSIs. In all cases, the following messages shall be transmitted encrypted only:

AHC	OWT	RDC	RDR	RSI
CMVC	PGLVL	RDH	RDT	RSR
OWC	RDA	RDI	RDW	SAHC

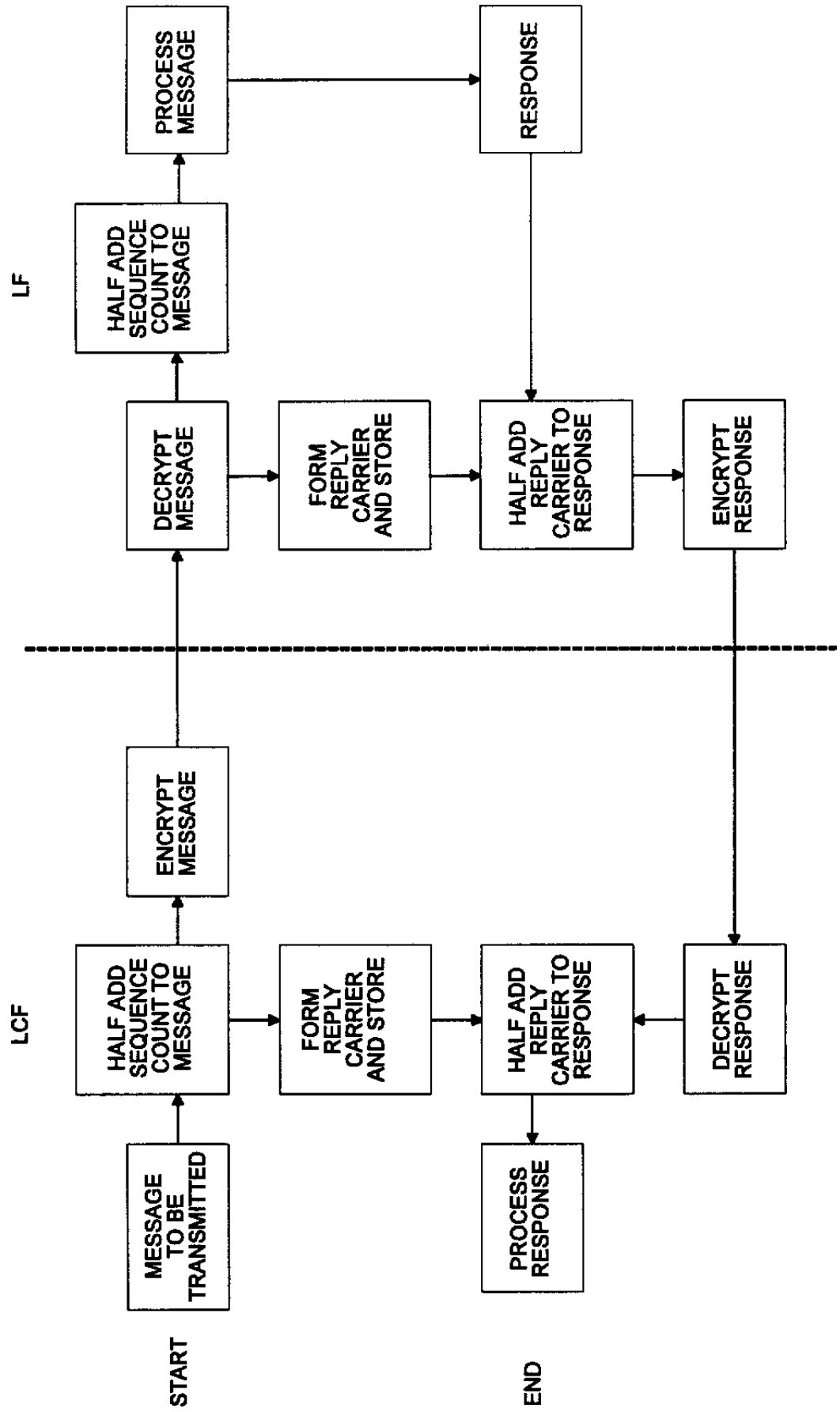
Table 6-4. OSI Response Priorities

REPLY TYPE		
1	GMR	Receipt of an Addressed OSI or OSI-AJ when GMR fault change is set and an OSR has been transmitted since last GMR (Figure A 1201 function).
2	RSI	First encrypted addressed OSI or OSI-AJ following either a Local-to-Remote Transition or following entry to Initial Alignment.
3	RVR	First and second encrypted OSI or OSI-AJ following completion of a CMVC Calculation during RDT Accepted Mode or during the Remote CMVC processing, with the exception that an OSR be output before starting CMVC of the next data set. During RDCT, an RDA or RDH command or the occurrence of an RDC abort will inhibit this response, if pending, upon command acceptance during the RDT Accepted Mode. Also, an RDC command will inhibit this response, if pending, upon command acceptance during Remote CMVC processing. First and second encrypted OSI or OSI-AJ following the completion of Overwrite Sum calculation during Overwrite-In-Process.
4	OSR	Receipt of an OSI or OSI-AJ when one or more of the following conditions exist:
	a.	First OSI or OSI-AJ more than 40.09 seconds after issuing the Start SCN Test.
	b.	Last interrogation response was not an OSR with the following exceptions.
		1. RDR response to RDI.
		2. MOSR No. 1 response to MOSI received when previous interrogation reply was an OSR.
		3. TVR response to an addressed TVI received when previous interrogation reply was an OSR.
	c.	Entry to standby no-go.
	d.	RDC is aborted during the RDC in process mode or during the RDT accepted mode since last response for any of the following causes:
		1. RDH is accepted
		2. RDT is received with incomplete data set
		3. Receipt of too many RDWs
		4. Loss of crypto sync
		5. Remote to local transition
	e.	Occurrence of either Initial or Restart Alignment.
	f.	Before starting CMVC calculation of the next RDCT data set.
5	TVR	First OSI or OSI-AJ following any of the following conditions, provided an addressed TVI is not accepted before the OSI/OSI-AJ.

Table 6-4. OSI Response Priorities (Continued)

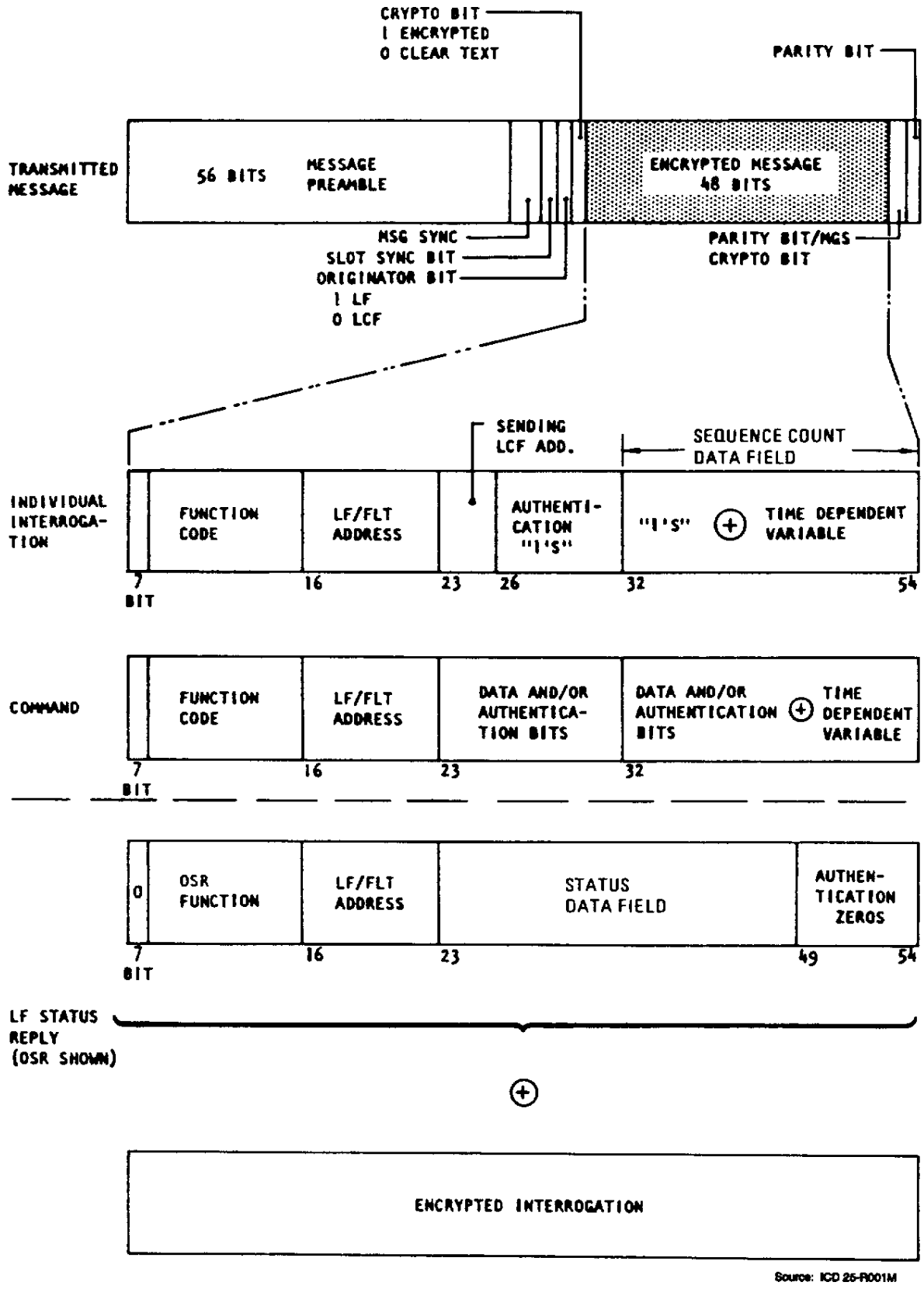
REPLY TYPE		
	a.	Occurrence of Initial or Restart Alignment.
	b.	Acceptance/rejection of any authenticated PLC-A sequence/PLC-B/PLC-C.
	c.	Acceptance of all-call TVI.
	d.	Occurrence of a HAF error.
6	TDR	First OSI or OSI-AJ following any one of these conditions, provided a TDR was not issued in response to an RDI prior to the OSI/OSI-AJ.
	a.	Accepted addressed TVI.
	b.	Accepted all-call TVI.
	c.	Occurrence of either Initial or Restart Alignment.
	d.	Abort of an RDCT operation during RDC in process or RDT accepted mode.
	e.	Acceptance of an RDCP command.
7	MOSR	Receipt of an OSI or OSI-AJ when one or more of the following conditions exist.
		Respond with MOSR Word #1, provided a MOSI was not received before the OSI or OSI-AJ, for any of the following conditions:
	a.	Any MOSR status change (since the last transmitted MOSR).
	b.	The occurrence of either Initial or Restart Alignment.
	c.	Transition from Local to Remote.
		Respond with MOSR Word #2 for the following conditions:
	a.	Any MOSR status change not previously reported in a transmitted MOSR.
	b.	Occurrence of either Initial or Restart Alignment.
	c.	Acceptance of an MOSI.
	d.	Transition from Local to Remote.
8	RSI	Receipt of an OSI or OSI-AJ with an incorrect sequence number (not validated) when the No Validation Count is maximum.
9	IPDR	Receipt of an OSI or OSI-AJ when either of the following conditions exist:
	a.	When IPDR Transmission is enabled, as indicated by the IPDR Disabled OSR bit, and IPDR data is available.
	b.	Following entry to Standby No-Go or following acceptance of an addressed IPDC in Standby No-Go and issuance of the Gyro Data Word and Auto Indexing IPDRs until all FDWs and Bias or IMU Calibration data have been transmitted, irrespective of other remote operations and mode changes, except entry to enable states.
10	OSR	Receipt of an OSI or OSI-AJ when none of the above conditions exist.
11	ASR	If no response from DCU within 230 ms since transfer of addressed OSI/OSI-AJ, G&C Coupler issues Auxiliary Status Enable (ASE) to EGS which the EGS will use to insert computer busy status in the ASR.

SOURCE: D25-65000, VOL IX



SOURCE: T.O. 21M-LGM30G-2-1-7

Figure 6-6. Encryption/Decryption of Addressed Interrogations



Source: ICD 25-R001M

Figure 6-7. Encrypted Message Formats

6-4.4.2. Crypto Synchronization. Added variability of encrypted messages is provided with the use of a variable number called the sequence count. The sequence count is half-added to the message prior to being encrypted by the SDU. Since the sequence count changes frequently, identical messages with a different sequence count will appear differently when encrypted, thus achieving variability in encrypted messages. Because sequence count usage forms an integral part of the total cryptographic scheme, the sequence count is maintained at every LCF and LF. Receiving facilities when processing decrypted messages must half-add the same sequence count contained in the received message in order to recover the original message. Thus all facilities must be operating with the same sequence count for continued communications. The process which ensures all LCFs and LFs are using the same sequence count is called crypto synchronization.

6-4.4.3. Sequence Count. The sequence count is a seven digit decimal number which is incremented by one approximately every 40 seconds. A sequence count can be entered at the LCF by selecting the sequence count option under LCC Control on the main VDU menu (Reference Figure 1-20). If a time slot is selected and the LCF is out of sync for 80 seconds the WSP will accept a prestored count located in the WSP memory. If no time slot is selected the WSP will accept the manual sequence count. If a manual sequence count is used, only a sequence count rounded off to the nearest ten thousand can be entered. After a manual or stored sequence count load the WSP considers itself to be in crypto synchronization for the next 40 seconds. After 40 seconds the normal crypto synchronization maintenance will be performed.

6-4.4.4. Maintaining Crypto Synchronization. Figures 6-8 and 6-9 illustrate the method by which the LCF and LF (DCU) stay in crypto synchronization. LCFs and LFs sequence counts are normally updated when received encrypted OSIs are processed. Since the sequence count is added to an encrypted message, the receiving facility can extract the sequence count from the encrypted OSI and compare it to its own sequence count. If the received sequence count is one greater than its own, the receiving facility will increment its sequence count by one. If the received sequence count is not equal to or one greater than the receiving facility sequence count, then a sequence count disagreement is registered by the receiving facility and its sequence count remains unchanged. If the receiving facility was an LF, it will also report the sequence count disagreement in its next OSR. An LCF will increment its sequence count by one if its sequence count has not changed in the previous 40 seconds. An LCF or LF will also update its sequence count if it performs a crypto resynchronization.

6-4.4.5. Crypto Resynchronization. An LCF or LF will consider itself in an out-of-sync condition whenever the number of registered sequence count disagreements (except from LCFs registered as down or clear text) reach established out-of-sync thresholds. A facility which transitions from an in-sync to an out-of-sync condition will attempt resynchronization with a resync inquiry (RSI) message. At the time when the out-of-sync facility normally starts transmitting, it will transmit an RSI instead of its normal transmission. An in-sync LCF will respond to the RSI by transmitting a Resync Reply (RSR). The RSR contains the

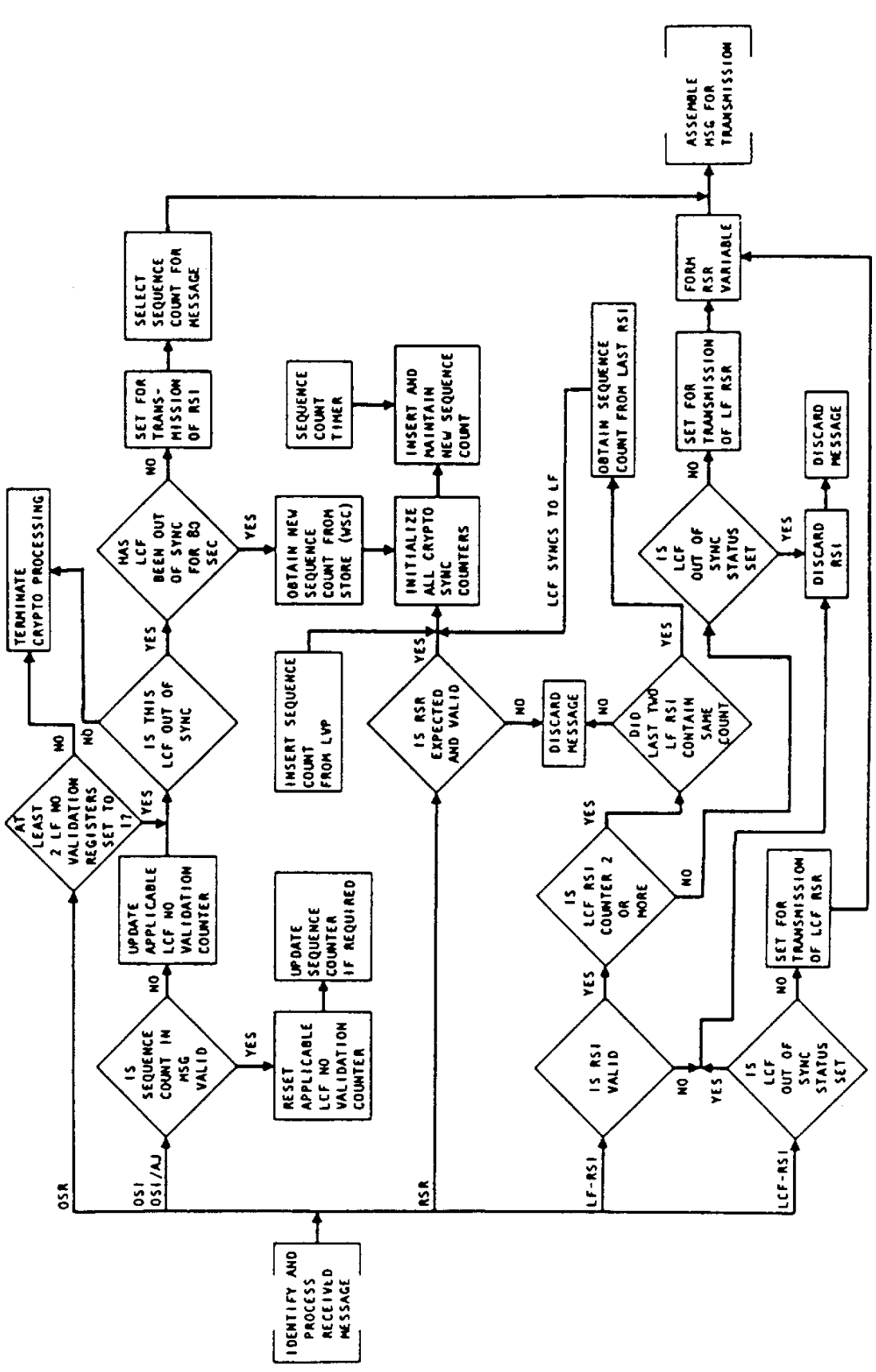
current sequence count in use, and this is used by the inquiring facility to change its sequence count to the current count.

6-4.4.6. LF Clear Text Processing. During normal operation an LF accepts only encrypted messages, except for execute launch and inhibit commands which are accepted if received either clear text or encrypted. An LF will accept clear text messages using the criteria shown in Figure 6-4. When clear text processing is allowed, the LF will process both clear text and encrypted messages.

6-5. LCF INITIATED COMMANDS. Most messages that originate at the LCF are selected by a sequence of operator actions at the Weapon System Control Console (WSCC) and initiated by depressing the INITIATE key on the OID keyboard. The operator actions range from turning and holding switches (Reference Figure 5-5 LCP, Figure 5-4 CLS, Figure 5-6 LEP) to selecting a series of menu options (Reference Figure 1-20) displayed on a WS VDU. Table 6-5 summarizes the actions taken for each of the commands. All messages must pass the acceptance checks specified in Tables 6-1, 6-2 and 6-3.

6-5.1. Execute Launch Command (ELC). The ELC is issued from an LCF to cause missiles to sequence from an enabled or disenable commanded state to a launch commanded state provided that the targeted delta t is not infinite hold; or to sequence a missile from the launch commanded to the launch in process mode. The command is initiated at the LCP in cooperation with the three cooperative launch switches and contains the secure code extracted from MCUs A&B in the LCP. The ELC requires a cooperative effort from both combat crew members in that the launch switch on the LCP and the three coop launch switches must be activated within 2 seconds of each other. The ELC is formatted by the WSP and transmitted in multiple copies (32) throughout the time slot. At the LF the programmer group recognizes the exclusion bits (8 and 11) and transfers the message to the DCU.

6-5.1.1. DCU Acceptance Checks. Upon recognition of the exclusion bits (8 and 11) configuration for a critical command, the DCU will compare the last 24 bits of the secure code to the prestored inhibit command code 2. If they do not compare, the DCU will assume the command is an ELC, and will verify that the missile is in a mode in which an ELC is valid. The DCU then verifies that the current target delta t is finite and that the LCP identifier in the ELC is one of the authorized codes. The second half of the ELC secure word will be combined with the P-plug word 2 and the R code word 2 (dependent on the LCP identifier). The result will be compared to a like operation performed on the first half of the ELC code, P-plug word 1 and R code word 1 and if they compare, the ELC will be accepted. If any of the checks fail, improper command will be set in the OSR for 5.05 (+0.05) minutes and the ELC will be rejected.



SOURCE: T.O. 21M-LGM30G-2-1-7

Figure 6-8. Basic LCF Crypto Synchronization Decision Logic

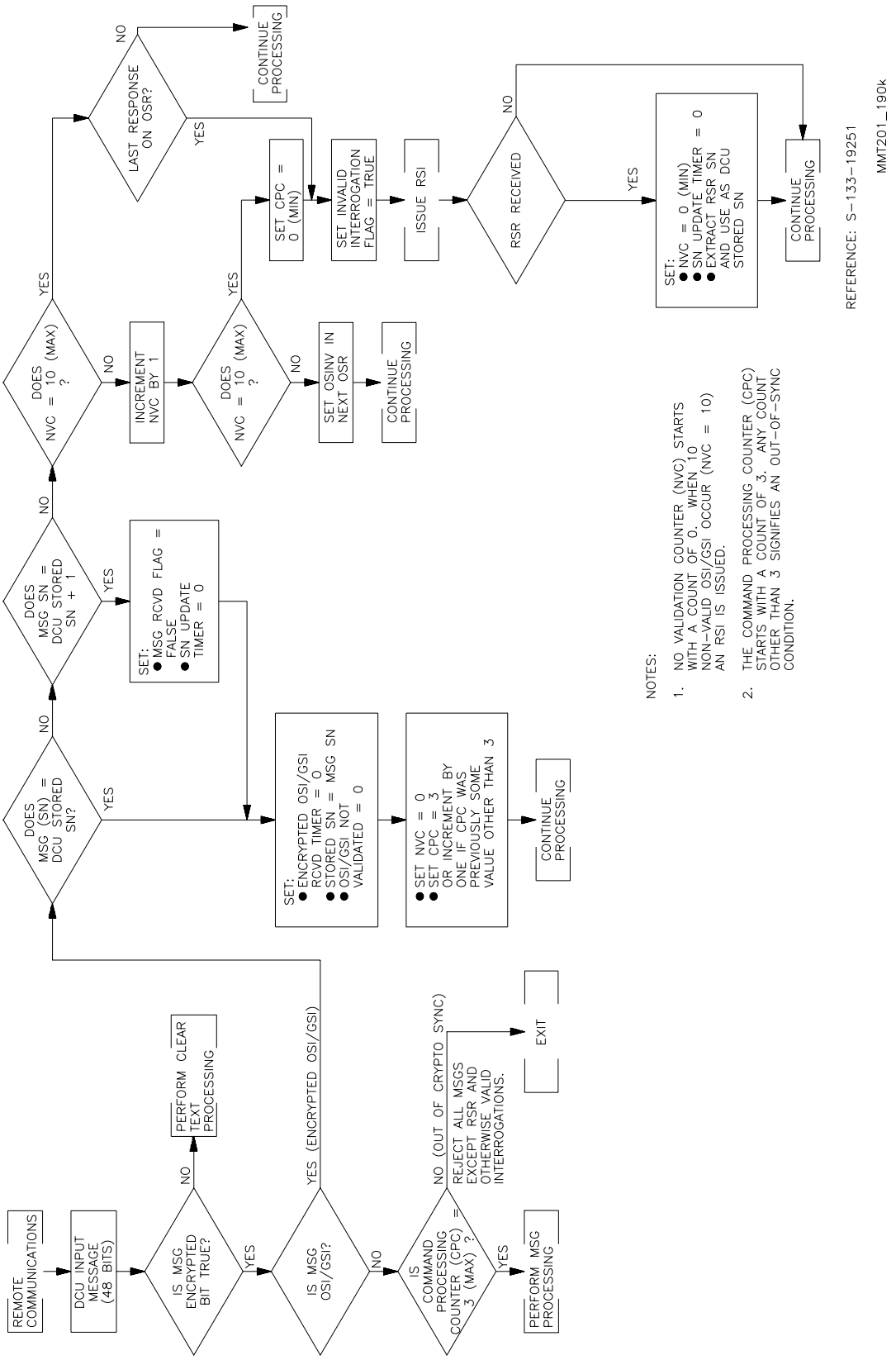


Figure 6-9. Basic DCU Crypto Synchronization Decision Logic

Table 6-5. Initiating LF Commands

CMMD	NAME	MAIN MENU	SUBMENUs	Address, Template, or Await	Init Key	Text Ref
AHCs AHC SAHC	Airborne Holdoff Commands Airborne LCC Holdoff Cmmd Short Arbrn LCC Hldoff Cmmd	LF CTRL	HOLDOFF AHC SAHC	 Await Await	 Init Init	 para 6-5.11 para 6-5.12
CALs IMUCAL 1 IMUCAL 2 PHICAL SATCAL	Calibrate commands IMU Calibrate 1 IMU Calibrate 2 PHI Calibrate Self Align Technique Calibrate	LF CTRL	CALIBRATION IMU CAL 1 IMU CAL 2 PHI CAL SAT CAL	 Address Address Address Address	 Init Init Init Init	 para 6-5.6 para 6-5.6 para 6-5.6 para 6-5.10
CMVC	Computer Memory Verification Chk	INTERR	CMVC	Address	Init	para 6-5.18
ELC	Execute Launch Command	Turn LAUNCH SWITCH on Launch Control Panel, plus three Cooperative Launch Switches at the same time.				para 6-5.1
ENC	Enable Commands (COOP ENB required)	LAUNCH	ALL CALL ENABLE SELECTIVE ENBL	Template Template	Init Init	para 6-5.3 para 6-5.3
ENTC	Enable Test	LF TEST	ENTC	Address	Init	para 6-5.8
GMI	Ground Maintenance Interrog	INTERR	GMI	Address	Init	para 6-6.5
INC	Inhibit Command	Turn INHIBIT LAUNCH switch on Launch Control Panel.				para 6-5.2
IPDs IPDC IPDH	IMU Performance Data commands IPD command IPD halt	LF CTRL	IMU PERFORMANCE DATA IPDC IPDH	 Address Address	 Init Init	 para 6-5.13 para 6-5.14
LFSEQ	LF Test Sequence	LF TEST	LF TEST SEQ	Address	Init	para 6-5.25
MOSI	Missile Operational Status Interrog	INTERR	MOSI	Address	Init	para 6-6.3
MTS1	Missile Test Segment 1	LF TEST	MSL TEST 1	Address	Init	para 6-5.7
MTS2	Missile Test Segment 2	LF TEST	MSL TEST 2	Address	Init	para 6-5.7
MTSEQ	Missile Test Sequence	LF TEST	MSL TEST SEQ	Address	Init	para 6-5.26
OSI	Operational Status Interrog	INTERR	OSI	Address	Init	para 6-6.1
OWCs OW SEQ OWC OWT	Overwrite commands LF overwrite sequence Overwrite command Overwrite terminate command	LF CTRL	OVERWRITE LF OW SEQ OWC OWT	 Address Address Address	 Init Init Init	 para 6-5.27 para 6-5.16 para 6-5.17
PGLs PGLC PGLH	PIGA Leveling commands PIGA Leveling command PIGA Leveling halt command	LF CTRL	PIGA LEVELING PGLC PGLH	 Address Address	 Init Init	para 6-5.15
PLC-A	Preparatory Launch Cmmd - A	LAUNCH	PLC-A	Template	Init	para 6-5.4

Table 6-5. Initiating LF Commands (Continued)

CMMD	NAME	MAIN MENU	SUBMENUs	Address, Template, or Await	Init Key	Text Ref
PLC-A	Preparatory Launch Command - A	TARGET-ING	PLC-A	Template	Init	para 6-5.4
PLC-B	Preparatory Launch Cmmd - B	LAUNCH	PLC-B	Template	Init	para 6-5.5
PLC-B	Preparatory Launch Command - B	TARGET-ING	PLC-B	Template	Init	para 6-5.5
PLS	Pre-Launch Sequence Cmmnd (2 or 3 of PLC-A, ENB, PLC-B)	LAUNCH	PRE LAUNCH SEQ	Template	Init	para 6-5.28
RDCPs	RDC Program commands for IMU CAL 1 for IMU CAL 2 for PHI CAL for SAT CAL for OWC for SCNT for MT Segment 1 for MT Segment 2 for Local Communications	LF CTRL	RDCP LIST RDCP IMU CAL 1 RDCP IMU CAL 2 RDCP PHI CAL RDCP SAT CAL RDCP OWC RDCP SCNT RDCP MSL TEST 1 RDCP MSL TEST 2 RDCP LOCAL COMM	 Address Address Address Address Address Address Address Address Address	 Init Init Init Init Init Init Init Init Init	para 6-5.19
RDC	Remote Data Cmmnd - Targeting	Bring Active Stack into the Work Area via TARGETING /STACKS /ACTIVE menu sequence. INITIATE from General Menu in the Work Area.				para 6-5.19
RDH	Remote Data Halt	TARGET-ING	RDH ALL CALL SPECIFIC SITE	 Await Address	 Init Init	para 6-5.21
RMR	Remote Missile Restart	LF CTRL	RMR	Address	Init	para 6-5.6
RSA	Restart Alignment	LF CTRL	RSA	Address	Init	para 6-5.10
SCNT	Sensitive Command Network Test	LF TEST	SCNT	Address	Init	para 6-5.9
TVI	Target Verification Interrog	INTERR	TVI	Address	Init	para 6-6.2

NOTES:

1. "Address" indicates that the address grid will appear. Initiate after choosing address(es).
2. "Template" indicates that a data entry template will appear. Initiate after entering data.
3. "Await" indicates that the particular data entry template "Awaiting Operator Action" will appear. Initiate any time thereafter.

6-5.1.2. DCU Processing. Upon acceptance of the ELC when in the enabled-no launch mode the DCU will enter the launch commanded mode and update the system status and OSR accordingly. The launch commanded timer is initialized and decremented at 180 msec intervals. The CSD(G) penetration code is derived from the ELC message. Upon acceptance of an INC, the DCU will enter the launch inhibited mode. If a second vote ELC is accepted, the DCU enters the launch in process mode. The launch commanded mode will be terminated upon (1) detection of the local mode on the multiplexer input, (2) detection of the CSD(M) not armed, (3) entry into restart, (4) entry Into standby no-go, (5) run out of the one vote launch commanded timer (enter TCD), (6) acceptance of an INC (enter launch inhibited mode), or (7) acceptance of a second vote ELC (enter LIP). Refer to section II for launch sequence processing.

6-5.2. Inhibit Command (INC). The INC is issued from an LCF to the entire squadron in order to initiate termination of the enabled mode or the launch commanded mode. The command is initiated at the LCP and is formatted by the WSP and transmitted in multiple copies (32) throughout the time slot. The secure code for the INC is extracted from MCU-C in the LCP. At the LF, the programmer group recognizes the exclusion bits (8 and 11) configuration and transfers the message to the DCU.

6-5.2.1. DCU Message Acceptance. Upon recognition of a command message with the exclusion bits set, the DCU compares the last 24 bits of the secure code to the prestored INC code. If it compares, INC processing will continue. If it does not compare, the message will be processed as though it were an ELC. In either case failure of an acceptance test criteria will cause improper command to be reported in the OSR for 5 minutes.

6-5.2.2. DCU Message Processing. Processing of an INC by the DCU is a function of the operating mode. If the DCU is in the disenabled-no launch mode, inhibit test will be set in the OSR. If in the enabled-no launch mode, the DCU shall enter the disenable commanded mode. Disenable commanded is set in the OSR and the disenable commanded timer 5.05 (+0.05) minutes is initialized. The disenable commanded mode will be exited upon (1) expiration of the disenable commanded timer (enter disenabled state), (2) acceptance of an ELC (enter launch commanded mode), (3) entry into standby no-go, (4) entry into restart (enter disenabled mode), (5) detection of the CSD(M) not armed (enter disenabled processing), (6) entry into local communications mode (enter disenabled state).

If in the launch commanded mode, launch inhibited is set in the OSR and the launch inhibited timer 5.05 (+0.05) minutes is initialized. If a second vote ELC is accepted, the launch in process mode is entered. The launch inhibited mode will be terminated upon (1) run out of the launch inhibited timer (initiate disenabled-no launch mode), (2) detection of local mode on the multiplexer (initiate disenabled-no launch mode), (3) detection of the CSD(M) not armed (initiate disenabled-no launch mode), (4) entry into restart (initiate disenabled-no launch mode), (5) entry into standby no-go, (6) acceptance of a second vote ELC (initiate LIP mode).

6-5.3. Enable Command (ENC). The ENC is issued from an LCF to cause arming of the CSD(M) at selected missiles. The ENC is selected from the LAUNCH menu, requires actions at the OID by both crew members and actions at the Enable Panel; the ENC is either all-call or individually addressed. Successful initiation of the ENC requires the cooperation of the operators at both of the WS workstations. The system generates six random alphabetic characters using the 32-bit Cooperative Enable Counter, the SDU secondary keying variable, and the Unlock Code. Half of the characters are displayed in the Data Entry Area on each workstation VDU, and the operator at each workstation must enter his/her three characters correctly from the keyboard on the OID when the data entry template appears in the Data Entry Area window. This must be accomplished within a time determined by AFSPC and read from the BS/L by COP. Upon successful completion of the cooperative enable, the ENC is formatted by the WSP and transmitted in multiple copies (32) throughout the time slot. At the LF, the programmer group recognizes the ENC function code and sets CSD(M) drive enable to the A6 drawer and transfers the message to the DCU.

6-5.3.1. DCU Acceptance Checks. Upon recognition of an ENC function code, the DCU compares the code word in the message to a prestored test code. If they do not compare, the command is processed as an ENC. The DCU verifies the CSD(M) code change is not in process and that the CSD(M) computer home monitor is true or the CSD(M) penetration repeat required indicator is true.

6-5.3.2. DCU Processing. Upon acceptance of the ENC, the DCU examines the message address and originator. If the ENC is all-call addressed or ALCC originated, the ENC contained secure code is used as the CSD(M) penetration code. If the ENC is individually addressed, the secure code contained in the message will be combined with the prestored B-code to derive the penetration code. The DCU will use the penetration code to control the issuance of character output codes to the PG to step the CSD(M) to the armed position. CSD(M) drive enable is monitored and a failure reported if it is detected false. SCS tests inhibit will be set true and the CSD(M) armed monitor checked for a true condition after completion of the penetration sequence. If the CSD(M) arms IPD disable is set true and system status is set to the enabled state.

6-5.4. Preparatory Launch Command-A (PLC-A). The PLC-A is issued by an LCF to simultaneously cause all missiles in the squadron to select a prescribed execution plan. The PLC-A command results in a two message sequence consisting of PLC-A1 and PLC-A2. This message is selected from the LAUNCH or TARGETING menus (Reference Figure 1-20) and initiated by depressing the INITIATE key on the OID. PLC-A1 specifies one of the fifty 48 bit execution plan segments. PLC-A2 then selects one execution from the segment. Execute option code for PLC-A1 must be 00 through 49 inclusive and for PLC-A2 must be between 51 through 98 Inclusive. PLC-A1 and -A2 thus selects one of 2400 (50X48) possible execution plans.

6-5.4.1. DCU Acceptance Checks. PLC-A shall be rejected for one of the following:

a. Execution plan set is not authorized. Delta t will be set to ∞ and TDC bit set.

b. PLC-A2 not preceded by PLC-A1.

c. PLC-A1 followed by another PLC-A1.

d. PLC-A1 followed by PLC-B.

e. PLC-A1 and PLC-A2 not from same communication link, i.e., radio/cable.

f. PLC-A execute option is 50 or 99.

g. Execution plan selects an unauthorized or non-valid target set.

h. The new target azimuth is greater than the MRT range from the present target and GCA is not available for azimuth reference or the system is in strategic alert PIGA leveling mode.

i. The new target azimuth is greater than 10 degrees from the present target and the PLC-A was received during seismic, DCU circumvention, C/R detection, or after a PGLC is accepted, but before entering PIGA leveling mode.

6-5.4.2. DCU Processing. Upon acceptance of the PLC-A, the DCU updates the target number, delta time value, execution plan number and CEP/MRT status. Target data changed is set, a TVR priority established for OSI response, and R/V fuzing is initiated.

If the new delta azimuth angle is zero, CEP is set in the TVR. If the system is in alignment, IMU calibration, or PSAT calibration mode and the return to target sequence not yet started, CEP is set in the TVR and the platform will be slewed to the new target. If the system is in alignment, IMU calibration or PSAT calibration, the return to target sequence has been started or completed, and CEP is specified in the PLC-A, CEP is set in the TVR and the operating mode extended to include the platform slew to the new target. If in any of the aforementioned modes and the return to target sequence has started or completed and MRT is specified and the new delta azimuth angle does not exceed the MRT range, MRT is set in the OSR. If, however, the new delta azimuth angle exceeds the MRT range, CEP is set in the TVR and the operating mode will be extended to include the platform slew to the new target. If the system is in the strategic alert mode, the GCA is available, and CEP is specified, CEP is set in the TVR and retargeting alignment is initiated. If in strategic alert with MRT specified, and the new delta azimuth angle does not exceed the MRT range, MRT is set in the TVR. If, however, the new delta azimuth angle exceeds the MRT range, CEP will be set in the TVR and retarget alignment initiated. If in strategic alert and the GCA is not available, MRT is set in the TVR.

6-5.5. Preparatory Launch Command-B (PLC-B). The PLC-B is issued from an LCF to a selected LF to establish new war plan data for a specific missile. The PLC-B contains data for the required target set, missile launch delay time (delta t) and CEP/MRT option. The message is selected from the LAUNCH or TARGETING menus (Reference Figure 1-20) and is initiated by depressing the INITIATE key at the OID; the PLC-B is individually addressed. The WSP formats the message after verifying that the delta t time is between 0 and 9:59:59 hours or infinite. An operator error notification will occur if this criterion is violated. The PLC-B is transmitted 32 times in the time slot. At the LF, the programmer group recognizes the LF address and transfers the PLC-B to the DCU.

6-5.5.1. DCU Acceptance Checks. Upon recognition of the PLC-B function code, the DCU verifies the proper address and valid operating mode. The target set number must be 1, 2, 3, or 4 and the target set must be authorized for use. The absolute value of the target azimuth angle for the target selected must not be greater than 270 degrees. If the GCA failure No. 1 is set, the new delta azimuth angle must be within the MRT range from the present target.

6-5.5.2. DCU Processing. If a PLC-B is accepted, the processing will be the same as that defined for a PLC-A except that the execution plan number in the TVR shall be all 1s.

6-5.6. Preparatory Launch Command - C (PLC-C). The PLC-C is issued from an LCC to the entire squadron. If the DCU receives a correct PLC-C it will select the target, the appropriate IN/OUT option, and timing plan from the data set stored in the DCU via RDCT, and it will enter a CEP/MRT option. Presently, the PLC-C is not available from the COP in the LCC. It is an option that is available with GRP that may be implemented in a future AM System COP upgrade.

6-5.6.1. DCU Acceptance Checks. A PLC-C will only be accepted if the selected target set is authorized for use and the execution plan data set has been authorized after the particular target has been authorized.

6-5.6.2. DCU Processing. Bit 23 will indicate whether the change indicated by the PLC-C is to be accomplished with Minimum Reaction Time (MRT) or if it is permissible for the missile to obtain the minimum Circular Error Probability (CEP) by realigning the inertial measurement unit. A “zero” indicates MRT; a “one” indicates CEP.

EGS bits 24 through 31 will contain the first part of the execution option (thousands and hundreds digits - 00 thru 49) in BCD. EGS bits 35 through 42 will contain the second part of the execution option (tens and units digits - 51 through 98) in BCD.

Bit 32 through 34 and 43 through 54 are authentication bits.

6-5.7. Missile Calibrate Command (MCC). This command is sent to an individual LF and is used to command IMU calibration (IMU CAL 1 or IMU CAL 2) or PHI calibration (PHI

CAL), depending on what program ID is selected in the TDR. This command will cause a restart from standby no-go to alignment when Remote Missile Restart (RMR) is selected. Receipt of this command during overwrite in-process will cause AVE critical no-go. IMU CAL 1, IMU CAL 2, PHI CAL, and RMR are individually or group addressed commands selected from the LF CTRL menu (Reference Figure 1-20) and initiated by depressing the INITIATE key at the OID; they are formatted by the WSP, and transmitted by the CMPG in the first half of the time slot. Before the commands are transmitted, WSP software ensures that the correct buffer segment is loaded and authorized at the LF, and causes it to be loaded (via RDCP) if it is not. At the LF the programmer group recognizes the function code and transfers the message to the DCU.

6-5.7.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication, and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.7.2. DCU Processing. Upon message acceptance, the DCU will process the MCC as described in Section II.

6-5.8. Missile Test Command (MTC). This message is sent to an individual LF to command the DCU to perform missile test. The missile test will test those functions not normally exercised sufficiently to permit recognition and isolation of malfunctions which prevent a successful launch and flight. Missile test will be performed in accordance with Figure 2-44. Hydraulic and electronic power on time will not exceed 18.5 seconds. No interrogations or commands will be accepted while the system is in this mode of operation.

6-5.8.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication, and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.8.2. DCU Processing. Upon message acceptance, the DCU will process the MTC as described in Section II.

6-5.9. Enable Test Command (ENTC). The ENTC is issued to an individual LF to verify the capability of the AVE and OGE to step the CSD(M) through 24 steps. The ENTC is selected from the LF TEST menu (Reference Figure 1-20) and is initiated by depressing the INITIATE key at the OID. The ENTC is formatted by the WSP and transmitted in 32 multiple copies throughout the time slot. At the LF the programmer group recognizes the ENC function code (ENC and ENTC have identical function codes) and transfers the ENTC to the DCU. At the same time the PG sends CSD(M) drive enable to the A6 drawer.

6-5.9.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication, and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.9.2. DCU Processing. Upon message acceptance, the DCU will process the ENTC as described in Section II.

6-5.10. Sensitive Command Network Test (SCNT). The SCNT is issued from an LCF to a selected LF to cause a test of ground and airborne functions which are not tested during other routine operations. The SCNT is selected from the LF TEST menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID, and is individually addressed. The message is formatted by the WSP and transmitted in the first half of the time slot. At the LF, the PG recognizes the function code and address and transfers the SCNT message to the DCU.

6-5.10.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication, and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.10.2. DCU Processing. Upon message acceptance, the DCU will process the SCNT as described in Section II.

6-5.11. Self Alignment Technique Calibrate Command (SAT CAL). The SAT CAL is issued from an LCF to an individual LF to cause the MGS to calibrate the parameters used to relate gyrocompass azimuth measurements to platform and target coordinates. The SAT CAL is selected from the LF CTRL menu (via SAT CAL) (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID, formatted by the WSP, and transmitted in the first half of the time slot. WSP software ensures that the correct program segment for the desired action is present at the LF before transmitting the SAT CAL. The SAT CAL is also transmitted when the Restart Alignment (RSA) command is selected from the LF CTRL menu.

6-5.11.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication, and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.11.2. DCU Processing. DCU processing in response to an accepted SAT CAL is a function of the state of GCA failure no. 1 and GCA/platform indexing advised MOSR bits.

a. If GCA failure no. 1 and GCA/platform indexing advised MOSR bits are both false, the DCU will initiate the PSAT calibration sequence.

b. If either the GCA failure no. 1 or the GCA/platform indexing advised MOSR bits are true, the DCU will initiate the commanded restart alignment sequence.

See Section II for further details on SAT CAL.

6-5.12. ALCC Holdoff Command (AHC). The AHC is issued from an LCF to all the LFs in the squadron to re-initialize the ALCC holdoff timer in the MGS. Run out of that time will allow ALCC access and enable the LF to receive and process radio messages. The timer is normally continually reset during routine operations. When AHC is issued, the LCFs also reset an ALCC holdoff time which is then synchronized to the MGS timer. The WSP provides a 10 minute and a 2 minute alarm when the timer is about to expire. AHC is selected via the LF CTRL menu (Reference Figure 1-20), is initiated by depressing the INITIATE key at the OID and is transmitted in encrypted form only. The message is formatted by the WSP and transmitted in the first half of the time slot. At the LF, the AHC all-call address is recognized by the PG, and the message is transferred to the MGS.

6-5.12.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.12.2. DCU Processing. Upon acceptance of an AHC, the ALCC holdoff timer is reset and AHC accepted will be reported in the OSR for 5.05 (+ 0.05) minutes. Figure 6-4 defines the conditions for allowing ALCC access.

6-5.13. Short ALCC Holdoff Command (SAHC). The short ALCC hold-off command is sent by an LCF and is used to set the hold-off timer to 5 minutes to allow faster access to the ALCC. Expiration of the five minute timer permits ALCC entry. The ALCC alarm timer in an LCF is not activated for a SAHC, and the AHC accepted bit is not set in the OSR for a SAHC. SAHC is selected via the LF CTRL menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID.

6-5.13.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.13.2. DCU Processing. If the existing time remaining on the ALCC holdoff timer is less than 5 minutes, the SAHC is not accepted. Otherwise, timer is reset to 5 minutes.

6-5.14. IMU Performance Data Enable Command (IPDC). The IPDC is issued from an LCF either to an individual LF or to the squadron to allow the LF to report IPDR data to the LCF or to an individual LF in Standby No-Go to elicit fault data word responses. IPDC is selected via the LF CTRL menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID and is transmitted by the CMPG in the first half of the time slot.

6-5.14.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.14.2. DCU Processing. Upon acceptance of the IPDC the DCU sets the IPD disable indicator false.

6-5.15. IMU Performance Data Halt Command (IPDH). The IPDH is issued from an LCF to an individual LF or the entire squadron to disable reporting of IPDR data to the LCF. The IPDH is selected from the LF CTRL menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID. The message is formatted by the WSP and transmitted in the first half of the time slot.

6-5.15.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.15.2. DCU Processing. Upon acceptance of an IPDH command the DCU will set the IPD disable indicator true.

6-5.16. PIGA Leveling Command (PGLVL). The PGLVL (transmitted in encrypted form only) is issued from an LCF to an individual LF or the entire squadron to command the MGS to transition from the SA biasing, alignment, or calibration mode to the SA PIGA leveling mode which is a mode designed for launch readiness under hostile conditions. The PGLVL is selected (via PGLC) from the LF CTRL menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID, formatted by the WSP, and transmitted by the CMPG in the first half of the time slot. At the LF, the PG recognizes the message address and transfers the PGLVL to the DCU which will perform acceptance checks. The PGLVL procedure can be halted by initiating the PGLH command at the OID LF CTRL menu (Reference Figure 1-20).

6-5.16.1. DCU Acceptance Checks.

a. System is in SA biasing, alignment or calibration mode.

b. PGLVL allowed condition is true.

6-5.16.2. DCU Processing.

a. If the DCU is executing alignment, the DCU will complete the required alignment bias cycle(s) and return to strategic alert PIGA leveling.

b. When the system is in SA biasing, the DCU will enter SA PIGA leveling, set the PIGA leveling indicator, and set PIGA leveling in the OSR.

c. If the DCU is executing a calibration (IMU, PHI or PSAT), the DCU will exit the calibrate routine and return to strategic alert PIGA leveling.

6-5.17. Overwrite Command (OWC). The OWC is issued from an LCF (encrypted only) to an individual LF to cause the DCU to overwrite the secure data and all RDC locations in the DCU. OWC is selected from the LF CTRL menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID. It is formatted by the WSP and transmitted in the first half of the time slot.

6-5.17.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met. Also, this command will be accepted in standby no-go or strategic alert mode disenabled state with one or more of the following specific MOSR alarms true set:

MOSR #	DESCRIPTION
21	F/C Power Failure
27	Computer Failure
30	Nuclear Event Detector Failure
39	GYRO Speed Control Failure
50	GCA Failure No. 1
51	GCA Failure No. 2
52	GCA Failure No. 3
54	LAI Check Failure
55	PHI Calibration Failure
56	Precision Time Failure
62	Stage III LITVC Pressure Failure
63	Platform Pressure Failure
66	R/S Fuzing Error
68	PSRE Pressure Propellant Alarm
69	GYRO Bias Shift Failure
70	Gravity Residual/PIGA Leveling Failure

6-5.17.2. DCU Processing. This routine will overwrite secure data memory locations and all RDC data set locations with a predetermined pattern one time and its one's complement one time. Upon completion of the overwrite sequence, an eight digit octal word will be reported to the LCC in two RVRs to successive OSIs or OSI-AJs. If the overwrite is successful, the number is $(01234567)_8$.

6-5.18. Overwrite Terminate Command (OWT). The OWT command is issued from an LCF to an individual LF after a remote LF overwrite attempt (OWC) has been successful as evidenced by the correct overwrite sum response, which is provided by an RVR issued by the LF. The OWT is selected from the LF CTRL menu (Reference Figure 1-20) and is initiated by depressing the INITIATE key at the OID. The message is formatted by the WSP and transmitted in the first half of the time slot. At the LF the PG recognizes the LF address and transfers the message to the DCU.

6-5.18.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.18.2. DCU Processing. When criteria for overwrite terminate exists, the ground program will store the standard penetration codes into dedicated memory locations if the overwrite was successful and a critical no-go will be entered. If the overwrite process was not successful, the command will be rejected.

6-5.19. Computer Memory Verification Check (CMVC). The CMVC is issued from an LCC to an individual LF to cause the MGS to calculate five CMVC sums of the computer memory. The five sums provide a check of the RDCT memory for the execution plan data set and the four target data sets. The CMVC is individually addressed, is selected from the INTERR menu (Reference Figure 1-20), and is initiated by depressing the INITIATE key at the OID. The CMVC is formatted by the WSP and is transmitted in encrypted form only in the first half of the time slot. At the LF, the PG recognizes the LF address and transfers the message to the DCU.

6-5.19.1. DCU Acceptance Checks. A CMVC will be rejected if overwrite in-process is true, CMVC is in process, or RDC is in process.

6-5.19.2. DCU Processing. If the acceptance checks pass, the DCU will begin the CMVC calculations. The execution plan set shall be processed first or last, and the target set data will be calculated in the order 1, 2, 3, and 4. When the calculation for each RDCT data set is completed, the calculation for the next set will not be initiated until the RVRs from the previous data set, an OSR and any pending TVR, TDR, and/or MOSR replies have been transmitted (see Table 6-4 for OSI response priorities). After each data set slot CMVC calculation is complete the DCU will report the CMVC in two RVR messages.

6-5.19.3. CMVC Processing. The CMVC processing will be terminated:

a. When the CMVC calculations for all five RDCT data sets are completed.

b. Upon initiation of RDCT.

c. Upon entry to crypto out of sync mode.

d. Upon entering TCD.

e. Upon transitioning to local mode.

f. Upon entering initial alignment, restart alignment, or overwrite in-process.

6-5.20. Remote Data Change (RDC). The RDC is issued from an LCF to an individual LF to provide secure transmission of data. All RDC transmissions must be in the encrypted mode. There are two forms of RDC, Remote Data Change Target (RDCT) and Remote Data Change Program (RDCP).

a. RDCT - provides for the transmission of selected target constants and execution plan sets to an LF. The transmission of RDCT normally requires two LCFs, an active and a monitor. Under emergency sole survivor conditions a single LCF can perform RDCT operation. The function of the monitor LCF is to verify the data transmitted. The transfer is initiated by both the active and monitor LCFs building the appropriate active and monitor stacks with the applicable case numbers. The active LCF calls the active stack into the Work Area (via TARGETING/STACK menus (Reference Figure 1-20), and initiates the RDCT command by selecting INITIATE from the work area menu. The WSP then begins to transmit the RDC data.

b. RDCP - The command is selected from the LF CTRL menu (Reference Figure 1-20), the data identification for the RDCP is entered via a sub-menu, and the command is initiated by depressing the INITIATE key at the OID. RDCP may be addressed to a single LF or to multiple LFs and may include the program PHI calibration (RDCP PHI CAL), IMU calibration (RDCP IMU CAL 1 or 2), missile test (RDCP MSL TEST 1 or 2), SAT calibration (RDCP SAT CAL), local communications (RDCP LOCAL COMM), or LF overwrite (RDCP OWC). The IMU calibration and missile test programs are each in two independent segments.

c. For RDCT the RDC is followed by an RDI/RDR sequence which prepares the DCU for receipt of the RDW and acknowledges to the LCF that the LF is ready.

6-5.20.1. DCU Acceptance Checks. An RDC will be rejected if overwrite is in process. If the RDC is identified as an RDCT, it must be individually addressed. If the RDC identifies a target data set, the target set to be changed must not have been selected by the last PLC; and if the RDC contains an MGS number, it must match the 10 least significant bits of the MGS number filled in DCU memory by the DCU complete load file.

If the RDC is identified as an RDCP, the program data buffer is already stored at the LF not currently in use. The LF will not enter RDC mode and remain in RDC not in-process.

6-5.20.2. DCU Processing.

a. Upon acceptance of an RDCT the DCU will enter the remote data change mode and set the RDC IN PROCESS indicator. The checksum inhibit indicator is set true before the first remote data word is stored in write-protected memory. The data set to be changed is set unauthorized in the TDR RDC data set status. If the set to be changed is the execution plan set and the system is not on the predetermined target, the execution plan number will be set to all ones in the TVR. The execution plan or target data set undergoing change will be identified for subsequent use in an RDR. The initial value of the serial number for the data set undergoing change will be 240 for an execution or target set.

b. Upon acceptance of an RDCP the DCU will not enter RDC mode and RDC in-process shall remain false. The program data ID shall be set to the program which is selected by the RDCP. The program ID shall be reported in the TDR.

6-5.21. Remote Data Word (RDW). The RDW is the text of the RDC which is transmitted by an LCF to an LF in order to transfer execution plan or target data from the BS/L to the DCU. The RDW is issued automatically by the WSP in blocks of normally 6 word lengths with each block followed by an RDI/RDR sequence to confirm the data. At the LF the PG recognizes only the LF address and transfers the RDW to the DCU.

6-5.21.1. DCU Acceptance Checks. The RDW is accepted by the DCU if in the RDC mode. An individual LF address only will be accepted.

6-5.21.2. DCU Processing. The DCU will extract the RDW serial number and proceed as follows:

a. For RDCT the repeat bit will be 0 set in the next RDR if the RDW serial number is out of sequence and not equal to the start of the current block.

b. Function c., d. and e. below will be performed only if the serial number is: (1) 240, if the first word of the first RDC block is being transmitted, (2) one less than the last accepted serial number or (3) the initial serial number of the current block (repeat).

c. The serial number is decremented by one for each RDW accepted.

d. The 24 bit RDC data located in transfer bits 24 through 47 will be stored into predetermined write-protected memory locations for the data set undergoing RDC in the order of reception. If too many data words are received, the extra words will be rejected, and the RDC operation terminated with the data set unauthorized. Enable write set and enable write reset character output codes will be issued to activate the enable write switch only during that portion of time devoted to the transfer of data to write-protected memory.

e. Perform the CMVC calculation for the data word received.

6-5.22. Remote Data Halt Command (RDH). The RDH is issued from an LCF to individual or multiple LFs to terminate or abort RDC operations at the target LFs and participating LCFs. The RDH may be initiated automatically by the active or monitor WSP or manually by the LCF operator. For manual initiation the operator selects the RDH via the TARGETING menu (Reference Figure 1-20), and initiates it by depressing the INITIATE key at the OID.

a. The active WSP will automatically initiate the RDH:

(1) If the anti-jam mode is entered prior to the RDT.

(2) If the monitor LCC fails to respond to the RDCT.

(3) If the LF fails to respond with a proper RDR following transmission of the RDC for RDCT.

(4) If the CMVC computed at the active LCC does not agree with the LF CMVC.

(5) If a 12 word block checkword failed four consecutive times.

(6) If the LF does not report RDT accepted after three RDT transmissions.

(7) If an RDC Not-In-Process status is not received in the first OSR received from the target LF after an RDA or RDH sequence, or if no OSR is received from the target LF within 65 slots after an RDA or RDH sequence.

(8) If the RDA response time is exceeded.

(9) If an incorrect RDC status change occurs during RDC.

(10) If the LF did not respond to three RDA/RDI transmissions with TDR status.

(11) If there is no TDR response to RDH for RDCP.

(12) If the operator deletes or puts on hold the corresponding APQ entry.

b. The monitor WSP will automatically initiate the RDH:

(1) If the computer CMVC does not agree with the LF CMVC.

(2) If the recalculation is unsuccessful.

(3) If RDWs are not received at the monitor in a 65 time slot period.

(4) If the LF does not report TDR status after three RDA/RDI transmissions.

(5) If an incorrect RDC status change occurs during RDC.

(6) If an RDC Not-In-Process status is not received in the first OSR received from the target LF after an RDA or RDH sequence, or if no OSR is received from the target LF within 65 slots after an RDA or RDH sequence.

(7) If the operator deletes or puts on hold the corresponding APQ entry.

6-5.22.1. DCU Acceptance Checks. An all-call RDH will be rejected.

6-5.22.2. DCU Processing. Upon acceptance of an RDH:

a. Write-protected memory is balanced and the checksum inhibit indicator will be false set.

b. The RDC operation will be terminated and the data set will remain unauthorized.

c. If a target data set was being processed, the target azimuth angle value for this target data set will be set to an absolute value greater than 270 degrees.

d. RDC not in process will be set in the next OSR.

6-5.23. Remote Data Terminate (RDT). The RDT command is issued from the active RDC LCC to the target LF to indicate completion of the RDC transfer and to cause the LF to issue two RVRs with the final CMVC sum. The RDT is automatically initiated by the WSP after successful transfer of the last block of data. At the LF, the proper address causes the PG to transfer the message to the DCU.

6-5.23.1. DCU Acceptance Checks. The DCU will reject an all-call RDT.

6-5.23.2. DCU Processing. Upon acceptance of an RDT, the DCU checks the number of data words received for the current RDC operation.

a. If a complete data set was not received, the memory checksum will be balanced and enabled and the RDC aborted with the data set status remaining unauthorized.

b. If a complete data set was received, RDT accepted status will be reported in the next OSR. The DCU completes the data set checksum. The CMVC checkword and the RDC data set identification will be reported in two RVRs in response to two OSIs (see Table 6-4 for OSI response priorities).

6-5.24. Remote Data Authorized (RDA). The RDA is issued by the monitor RDC LCC to the target LF to authorize use of the RDC data set after the monitor LCC has verified agreement with its own and the LFs CMVC. The RDA is automatically initiated by the WSP. At the LF the PG responds to the proper address by transferring the message to the DCU.

6-5.24.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-5.24.2. DCU Processing. For an RDCT sequence, the DCU checks RDA transfer bits 24 through 47 for the authorization code. The authorization code is compared to the CMVC checkword half added with the first successful block check value for this RDCT. If these values do not compare identically, the RDA is rejected and RDT accepted will continue to be reported in the OSR.

If both values are identical, the RDC operation will be terminated and RDC not in process will be set in the next OSR. The TDR status will be updated to indicate the authorization status of the data set just changed. If the data set changed was a target set, it will be authorized for use only by a PLC-B until the subsequent execution plan set is changed and authorized. In the interim, the PLC-A/PLC-C effectivity bit associated with the target set in the TDR will be 1 set to indicate PLC-A/PLC-C not effective. If the data set changed was the execution plan set, it will be authorized for use and the PLC-A/PLC-C effectivity bits for all four target sets will be 0 set in the TDR to indicate PLC-A/PLC-C is effective.

6-5.25. LF Test Sequence. When an LF Test Sequence command (LF TEST SEQ) is selected from the LF TEST menu (Reference Figure 1-20) and initiated via the INITIATE key on the OID, the WSP software automatically generates ENTC, MTC, and SCNT commands to be transmitted to the addressed LF(s). The commands are transmitted sequentially (each test waits for the previous one to complete), with any required RDCP occurring automatically. If more than one LF is addressed, the LFs are tested sequentially, the tests not starting at one LF until all tests have completed at the previous LF.

6-5.25.1. DCU Message Acceptance. The DCU accepts messages in the sequence exactly as it accepts the individual messages.

6-5.25.2. DCU Processing. The DCU processes messages in the sequence exactly as it processes the individual messages.

6-5.26. LF Overwrite Sequence. When an LF Overwrite Sequence command (LF OW SEQ) is selected from the LF CTRL menu (Reference Figure 1-20) and initiated via the INITIATE key on the OID, the WSP software automatically generates RDCP for the OWC, the OWC command, and (upon completion) the OWT command. The commands are transmitted sequentially (each one waits for the previous one to complete). Only one LF may be addressed with the LF Overwrite Sequence.

6-5.26.1. DCU Message Acceptance. The DCU accepts messages in the sequence exactly as it accepts the individual messages.

6-5.26.2. DCU Processing. The DCU processes messages in the sequence exactly as it processes the individual messages.

6-5.27. Pre-Launch Sequence. A sequence consisting of any two, or the complete set, of the commands PLC-A, ENC, and PLC-B Stack (in that order) is called a pre-launch sequence. Upon receipt of a new BS/L, the operator must define the default value of the pre-launch sequence by selecting the PRE LAUNCH SEQ DEF option from the LAUNCH menu. After definition, the default value is maintained through all restarts, until changed by the operator, and becomes the sequence presented when the operator chooses the PRE LAUNCH SEQ task from the LAUNCH menu (Reference Figure 1-20). The template associated with the pre-launch sequence permits the definition to be temporarily changed by the operator before initiation of the command. Following initiation, the WSP software automatically generates the chosen commands (including the cooperative enable procedures if ENC is a member of the sequence) and transmits the sequence as a stack (that is, each command is transmitted as rapidly as time-slot usage will permit, without waiting for responses from earlier commands).

6-5.27.1. DCU Message Acceptance. The DCU accepts messages in the sequence exactly as it accepts the individual messages.

6-5.27.2. DCU Processing. The DCU processes messages in the sequence exactly as it processes the individual messages.

6-6. LCF INITIATED INTERROGATIONS.

6-6.1. Operational Status Interrogation (OSI/OSI-AJ). The OSI is automatically initiated by a primary LCC to solicit status replies from the individually addressed LFs. The WSP sequences through all the LFs for which it has primary responsibility, issuing two OSIs per time slot in the absence of other message requirements. Manually initiated OSIs are selected via the INTERR menu (Reference Figure 1-20), and are initiated by depressing the INITIATE key at the OID. Manually initiated OSIs are given the priority of other manually-initiated messages and are normally transmitted in the first half of the time slot. At the LF, the PG recognizes the OSI as an interrogation and transfers it to the DCU regardless of the address unless a GMR is to be transmitted. If a GMR is to be transmitted by the PG, it will zero the LF address field before transferring the message to the DCU (see Table 6-4).

6-6.1.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-6.1.2. DCU Processing. Upon acceptance of an authenticated, encrypted OSI, the DCU will examine the sequence count number in EGS bits 32 through 54 and compare it to the stored sequence number.

a. If the received sequence count is one greater than the stored sequence count, the stored count will be advanced by one, the no validation counter will be reset, and the sequence number update timer will be reset.

b. If the received sequence count is equal to the stored count, the no validation counter will be reset.

c. If the received sequence count is not equal to or one greater than the stored count, the no validation counter will be incremented by one.

If the OSI/OSI-AJ is addressed to this LF:

a. If the no validation counter is not reset (i.e., paragraph c. above) OSI not validated will be set in the OSR.

b. Respond to the OSI/OSI-AJ with a reply message in accordance with the priority rules of Table 6-4.

6-6.2. Target Verification Interrogation (TVI). A TVI is issued from an LCF to an individual or group of LFs to solicit a TVR to verify the current execution plan data and to determine target set authorization status. The TVI is selected from the INTERR menu (Reference Figure 1-20), initiated by depressing the INITIATE key at the OID, formatted by the WSP, and transmitted in the first half of the time slot. An individually addressed TVI will elicit an immediate TVR (in the same half time slot). An all-call TVI will elicit a TVR in response to a subsequent OSI. At the LF, the PG will transfer the TVI to the DCU based upon recognition of the response identifier bit.

6-6.2.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-6.2.2. DCU Processing. Upon acceptance of an individually addressed TVI, the DCU will prepare and transmit an immediate TVR containing the current targeting information. If the TVI is all-call, the DCU will establish priorities for a TVR for response to a subsequent OSI.

6-6.3. Missile Operational Status Interrogation (MOSI). The MOSI is an individually addressed interrogation issued from an LCF to elicit MOSRs from the LF. The MOSI is selected from the INTERR menu (Reference Figure 1-20), initiated by depressing the INITIATE key at the OID, formatted by the WSP, and transmitted in the first half of the time slot. At the LF, the PG transfers the message to the DCU upon recognition of the response identifier bit.

6-6.3.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-6.3.2. DCU Processing. Upon acceptance of an addressed MOSI, the DCU will respond with an immediate MOSR word 1 to the MOSI and MOSR word 2 in response to a subsequent OSI.

6-6.4. Resync Inquiry (RSI). An RSI will be issued by an LCF (automatically by the WSP) in response to a detected out of crypto sync condition, i.e., the number of sequence count disagreements has reached a predetermined threshold. The RSI is issued to solicit an RSR from another LCF in order to enable the initiating LCF to reestablish sync. An RSI may also be initiated by an LF. The RSI will contain the inquiring facility's current sequence count which will be used by the responding LCF to generate an RSR which will include a logical combination with the correct sequence count.

6-6.4.1. DCU Acceptance Checks. The LF EGS rejects this message and does not transfer it to the DCU.

6-6.4.2. DCU Processing. DCU does not process an LCF generated RSI.

6-6.5. Ground Maintenance Interrogation (GMI). The GMI is a manually initiated, individually or all-call addressed interrogation issued in order to solicit a GMR from the LF ground equipment. The GMI is selected from the INTERR menu (Reference Figure 1-20) and is initiated by depressing the INITIATE key at the OID. The message is formatted by the WSP and transmitted in the first half of the time slot. The expected GMR to the GMI will be received in response to a subsequent OSI. At the LF, receipt of an addressed GMI will cause a fault change memory to be set in the programmer group which will cause a GMR to be transmitted in response to a subsequent OSI. The GMI will be transferred to the DCU by the PG upon recognition of the proper response identifier bit; however, the DCU will not recognize the message and will reject the messages.

6-6.5.1. DCU Acceptance Checks. The DCU will not recognize the function code and reject the message.

6-6.5.2. DCU Processing. The DCU will not process a GMI message.

6-6.6. Remote Data Interrogation (RDI). The RDI is automatically issued by the WSP to maintain operational control during RDC operations and for status monitoring during non-RDC.

a. An RDI is transmitted by the monitor LCF to the target LF following an RDC command to solicit an RDR indicating RDC command acceptance.

b. An RDI is transmitted by the active LCF to the target LF after transmission of a predetermined quantity of data words (RDW) for RDCT operations. The RDI solicits an RDR containing a checkword to be used in validating the previously transmitted data block.

c. An RDI is transmitted after an RDH during RDCT operations and after an RDA for RDCT operations to solicit an RDR.

d. An RDI transmitted to an LF after it has exited the RDC mode will elicit a TDR.

6-6.6.1. DCU Acceptance Checks. The message must pass the standard acceptance checks on function codes, address, authentication and mode/state validity. In addition, the acceptance rules of Table 6-3 must be met.

6-6.6.2. DCU Processing. If in the RDC in process mode, a data check value will be computed summing all data words received during the current RDW block. The acceptance of an RDI defines the end of a block of RDWs. If this is the first RDI received for the current RDC operation, the data check value will be zero. The data check value will be reported in an RDR. The RDR with the updated data check value and the RDC data set identification will be issued in immediate response to the RDI.

6-7. LCF RESPONSES AND DISPLAYS.

6-7.1. Resync Reply (RSR). The RSR is the only time an LCF will reply to an inquiry from an LF or another LCF. The RSR is issued in response to an RSI to enable the inquiring facility to reestablish crypto synchronization. The first in sync LCF scheduled to transmit after receiving an RSI will issue an RSR which will contain a logical combination of the correct sequence count and the sequence count contained in the RSI. The inquiring facility will use the RSR to derive the correct sequence count and reestablish crypto synchronization.

6-7.2. Console Displays. The status of any LF within the squadron can be visually displayed in the Flight/Squadron Status Window (Reference Figure 1-19) on either WS VDU by selecting the flight (Reference Flight Selection Box in Figure 1-19) containing the LF. Some of the status will be as a result of responses from the LF while other indications will be derived by the LCF COP based on a lack of response from an LF. Table 6-6 defines, for each condition, the corresponding display in the Flight/Squadron Status Window, as well as associated alarms and Crew Log entries (which appear in the Detailed LF Status display (Reference Figure 1-23).

In addition, when an LF status change is detected, an operator notification is displayed in the Work Area interwindow area, saying BANNER ALARM - RESPONSE TIMER: XXX, where XXX is the LF ID. This notification can only be cleared by displaying the corresponding LF Status display. Until it is cleared, the operator will be reminded of its presence through the Green Routing alarm tone (beep-beep-beep) at 1 minute intervals.

6-8. LF RESPONSES. (See Figure 6-3 for message formats.) Changes in status are displayed in alarms, APQ entries, and status windows on the WS VDU (Reference Figure 1-19). Detailed status for an LF can be requested either by selecting any entry in the corresponding column of the FLIGHT STATUS display, or by selecting the desired LF FAULT/STATUS entry (if it exists) in the APQ.

6-8.1. Operational Status Reply (OSR). The OSR is the normal LF reply to an OSI but it may be preempted by a higher priority reply as shown on Table 6-4. The OSR provides the LCF with the detailed ground and missile status at the LF. Table 6-6 identifies the LCF displays and crew log entries corresponding to the OSR status items. The WSP operator can display the crew log (Reference Figure 1-26) in the Work Area (Reference Figure 1-19) of the VDU and print the crew log from this Work Area. In the case where the DCU does not reply to an OSI, the programmer group will generate an ASR containing ground status information. If the DCU had set auxiliary status enable, the PG will insert computer busy in the ASR; otherwise it will insert computer no-go. The contents of the OSR are crew logged and stored at the LCF.

6-8.2. Target Verification Reply (TVR). The TVR is initiated by the DCU in response to a TVI or an OSI when a TVR response priority has been set (see Table 6-4). The TVR contains a 4 bit target code identifying the current target, and prior to LC or LIP a 17 bit delta-t field identifying the programmed launch delay. During LC or LIP the 17 bit delta-t field identifies the time remaining to first stage ignition. The contents of the TVR are crew logged and stored at the LCF. The targeting data associated with an LF are displayed on the TGT line of the Detailed LF Status display (Reference Figure 1-23).

6-8.3. Missile Operational Status Reply (MOSR). MOSR words are issued by the DCU in response to an OSI whenever a new fault is detected or an existing fault changes states. MOSR word 1 is transmitted upon acceptance of an MOSI, and MOSR word 2 is transmitted in response to an OSI/OSI-AJ in accordance with the priority rules of Table 6-4. MOSR word 1 contains missile test related status. See Table 6-8 for MOSR crew log and display descriptions and latch/unlatch conditions. The data contained in MOSRs are displayed on the MOSR line of the Detailed LF Status display (Reference Figure 1-23).

6-8.4. Ground Maintenance Reply (GMR). The GMR is sent to an LCF from an LF in response to an OSI received when a fault data change has been recorded in the programmer group provided that an OSR has been transmitted since the last GMR. See Table 6-4. The fault data change is set in response to a GMI or a programmer group detected fault change. When an addressed GMI is received, the Programmer Group will set the GMI received bit true in its fault memory. This will result in a GMR in response to

the next addressed OSI. When the next addressed OSI is received, the PG will set the address bits to zero prior to sending the OSI to the DCU. The DCU will not accept the OSI as a valid message and will not respond with any type of message; however, the PG will transmit a GMR and also reset the GMI received bit. See Table 6-9 for a description of GMRs. The data contained in GMRs are displayed on the GMR line of the Detailed LF Status display (Reference Figure 1-23).

Table 6-6. Status, Displays, and Alarms Matrix

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
OSR Reported Conditions							
AHC RECEIVED	r:AHC RECEIVED					GREEN-P	ALCC HOLDOFF COMMAND ACCEPTED
AJ	r:AJ				AJ	YELLOW-P	MISSILE IN ANTI-JAM MODE
ALGN	r:ALGN	ALGN				GREEN-P	ALIGNMENT
CAL	r:CAL	CAL				YELLOW-P	IMU CALIBRATION
DCBSY	r:DCBSY					GREEN-P	COMPUTER BUSY
DENC	r:DENC		DENC			YELLOW-ALL	DISENABLE COMMANDED
DISEN	r:DISEN					GREEN-PS	DISENABLED STATE (NORMAL)
ELC	r:ELC		ELC			RED-ALL	LAUNCH COMMANDED
EN	r:EN		EN			RED-ALL	ENABLED STATE
ILC	r:ILC		ILC			YELLOW-ALL	LAUNCH INHIBITED
INT	r:INT		INT			GREEN-PS	INHIBIT TEST
IPCMD	r:IPCMD				STAT	YELLOW-ALL	IMPROPER COMMAND
IPDDS	r:IPDDS				STAT	YELLOW-P	IPD DISABLED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
OSR Reported Conditions (Continued)							
IZ	r:IZ			IZ		YELLOW-PS	INNER ZONE VIOLATION
LFALM	r:LFALM						LF ALARM FAULT
LFNG	r:LFNG	LFNG				YELLOW-P	LF NO-GO
LIP [1 >	r:LIP [1 >		LIP			RED-ALL	LAUNCH IN PROCESS
OSINV	r:OSINV				FAU	YELLOW-P	OSI INVALID
OWIP	r:OWIP				STAT	GREEN-P	OVERWRITE IN PROCESS
OZ	r:OZ			OZ		YELLOW-P	OUTER ZONE VIOLATED
PGLV	r:PGLV	PGLV				YELLOW-P	PIGA LEVELING
PSAT	r:PSAT	PSAT				YELLOW-P	SAT CALIBRATION
POWFL	r:POWFL				FAU	YELLOW-P	PRIMARY POWER FAILURE
RADDT	r:RADDT				STAT	GREEN-P	RADIO DATA PRESENT
RAMO [1 >	r:RAMO [1 >		RAMO			RED-ALL	RADIO MODE
RDC	r:RDC				RDC	GREEN-PS	RDC IN PROCESS
RDTAC	r:RDTAC					GREEN-PS	RDT ACCEPTED
REST	r:REST	REST				YELLOW-P	RESTART
SALRT	r:SALRT					GREEN-P	STRATEGIC ALERT
SBNG	r:SBNG	SBNG				YELLOW-P	STANDBY NO-GO
SDFLT	r:SDFLT				FAU	YELLOW-P	LF SDU FAULT
TEST [2 >	r:TEST				STAT	GREEN-PS	TEST COMPLETED
TGTCH	r:TGTCH				STAT	GREEN-PS	TARGET DATA CHANGE
WALM	r:WALM				WALM	YELLOW-PS	WARHEAD ALARM

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
AFI LIST CHANGE	r:AFI LIST CHANGE					YELLOW-I	AFI CHANGE SELECTED FROM COMMUNICATIONS GRID
AHC 0 MIN WG [3 >						RED-ALL	ALCC TIMER EXPIRED
AHC 2 MIN WG [3 >						RED-ALL	ALCC TIMER 2-MINUTE WARNING
AHC 10 MIN WG [3 >						YELLOW-ALL	ALCC TIMER 10-MINUTE WARNING
AHC MSG TR [3 >						GREEN-ALL	ALCC HOLDOFF COMMAND RECEIVED
ALARMS TEST FAIL-BLACK DISCRETE [3 >	r:ALARMS TEST FAIL-BLACK DISCRETE					YELLOW-I	BLACK DISCRETE TEST FAILURE DURING ALARMS TEST
ALARMS TEST FAILURE	r:ALARMS TEST FAILURE					YELLOW-I	ALARMS TEST FAILURE
ALL LNLOST	r:ALL LNLOST [4 >					YELLOW-I	ALL INPUT LINES LOST - NO TONES PRESENT
ASSUME RESPx TOTAL xxxxx [5 >	r:RESPx TOTAL xxxxx					YELLOW-I	AUXILIARY RESPONSIBILITY ASSUMED/DROPPED. x = LCC
AUX TAKEOVER AUTOMATIC							ATOV ON SELECTED FROM COMMUNI-CATIONS GRID
AUX TAKEOVER MANUAL							ATOV OFF SELECTED FROM COMMUNI-CATIONS GRID
AUX TAKEOVER MODE CHANGE							CHANGE IN ATOV STATUS SELECTED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
BDI/12 01 000000xx	r:BDI/12 01 [4 >					YELLOW-I	RMB32B DETECTED RECEIVE DATA ERROR
BDI/12 02 000000xx	r:BDI/12 02 [4 >					YELLOW-I	RMB32B DETECTED TRANSMIT DMA ERROR
BDI/12 03	r:BDI/12 03 [4 >					YELLOW-I	RMB32B DETECTED TRANSMIT DMA TIMEOUT
BDI/14 01	r:BDI/14 01 [4 >					YELLOW-I	CDA BDI RESET DISCRETE LOOPBACK FAILURE
BDI/21 01 0000xxxx	r:BDI/21 01 [4 >					YELLOW-I	BDI CARD: DIAGNOSTIC 0 FAILURE (not all lines 0)
BDI/21 02 0000xxxx	r:BDI/21 02 [4 >					YELLOW-I	BDI CARD: DIAGNOSTIC 1 FAILURE (not all lines 1)
BDI/21 03 0000xxxx	r:BDI/21 03 [4 >					YELLOW-I	BDI CARD: AUDIO ALARM CODE 0 (reset) NOT SET PROPERLY
BDI/21 04 0000xxxx	r:BDI/21 04 [4 >					YELLOW-I	BDI CARD: AUDIO ALARM CODE 15 (silence) NOT SET PROPERLY
BDI/21 05	r:BDI/21 05 [4 >					YELLOW-I	BDI CARD: BYTE ERROR DETECTED (BDI report on received input)
BDI/21 06	r:BDI/21 06 [4 >					YELLOW-I	BDI CARD: FRAME ERROR DETECTED (BDI report on received input)
BDI/21 08	r:BDI/21 08 [4 >					YELLOW-I	BDI CARD: CLEAR INTERFACE ERROR

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
BDI/21 09	r:BDI/21 09 [4 >					YELLOW-I	BDI CARD: NO NORMAL DATA AFTER DIAGNOSTIC READ
BDI/FF 01	r:BDI/FF 01 [4 >					YELLOW-I	COP DETECTED BDI DATA OUT-OF-SYNC
BDI/FF FF	r:BDI/FF FF [4 >					YELLOW-I	BDI INTERFACE: COPY TIMEOUT ON REQUESTED DATA
BS/L/35 02	r:BS/L/35 02 [4 >					YELLOW-I	BS/L TEST FAILURE
BS/L CMSC FAILURE	r:BS/L CMSC FAILURE					YELLOW-I	BS/L VALIDATION FAILURE
BS/L DISK FAILURE	r:BS/L DISK FAILURE					YELLOW-I	BS/L DISK FAILURE
BSL EPP AUTH FAILURE						YELLOW-I	BS/L EPP AUTHORIZATION FAILURE
BSL OTP AUTH FAILURE						YELLOW-I	BS/L OTP AUTHORIZATION FAILURE
BS/L FAILURE	r:BS/L FAILURE [4 >					YELLOW-I	BS/L FAILURE
CAL RECEIVED [6 >						GREEN-P	CALIBRATION COMMAND RECEIVED-SYSTEM FOLLOW
CASE ### GENERATION FAILED [3 >						YELLOW-I	TARGET OR EXECUTION PLAN CONSTANTS NOT AVAILABLE FOR THIS CASE ### = CASE #
CDA/IPD TEST FAIL-CDA LOOPBACK	r:CDA/IPD TEST FAIL-CDA LOOPBACK					YELLOW-I	CDA LOOPBACK TEST FAILURE DURING CDA/IPD TEST

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
CDA/IPD TEST FAIL-SDU BIT PATTERN	r:CDA/IPD TEST FAIL-SDU BIT PATTERN					YELLOW-I	SDU BIT PATTERN TEST FAILURE DURING CDA/IPD TEST
CES			CES			YELLOW-ALL	COMMITTED EXECUTED SORTIE
CIRCUMVENTION RESTART [3 >							RESTART DUE TO NED TEST OR NUCLEAR EVENT
CLIPA RECEIVED						GREEN-P	CLIPA COMMAND RECEIVED-SYSTEM FOLLOW
CLIPD RECEIVED						GREEN-P	CLIPD COMMAND RECEIVED-SYSTEM FOLLOW
CLR BY OPR [7 >							INDICATION CLEARED BY SHOW SET STATUS ONLY OPTION OF LF OR LCC STATUS POP-UP MENU
CMD W/O COOP [3 >						YELLOW-I	ENC OR ELC ASSEMBLED W/O COOP PROCESSING
CMPG/12 01 000000xx	CMPG/12 01 [4 >					YELLOW-I	CMPG CARD INTERFACE: RMB32B DETECTED RECEIVE DATA ERROR
CMPG/12 02 000000xx	r:CMPG/12 02					YELLOW-I	CMPG CARD INTERFACE: RMB32B DETECTED TRANSMIT DMA ERROR
CMPG/12 03	r:CMPG/12 03 [4 >					YELLOW-I	CMPG: RMB32B DETECTED TRANSMIT DMA TIMEOUT

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
CMPG/12 11 000000xx	r:CMPG/12 11 [4 >					YELLOW-I	CMPG CARD INTERFACE: RMB32B DETECTED STATUS DATA ERROR
CMPG/14 01	r:CMPG/14 01 [4 >					YELLOW-I	CMPG CDA DISCRETE LOOPBACK FAILURE
CMPG/26 0A	r:CMPG/26 0A [4 >					YELLOW-I	COP TIMEOUT ON TRANSMIT OF DATA
CMPG/26 0B	r:CMPG/26 0B [4 >					YELLOW-I	INVALID TONE PRESENT ORDER RECEIVED
CMPG/26 0C	r:CMPG/26 0C [4 >					YELLOW-I	INVALID NO DATA ORDER RECEIVED
CMPG/26 0D	r:CMPG/26 0D [4 >					YELLOW-I	INVALID DATA ORDER RECEIVED
CMPG/26 0E	R:CMPG/26 0E [4 >					YELLOW-I	CMPG INTERFACE: COP TIMEOUT ON TRANSMIT OF DATA DUE TO TIMING ERROR
CMPG/26 01						YELLOW-I	CMPG LOOPBACK SERIAL I/O FAILURE (FRONT)
CMPG/26 02						YELLOW-I	CMPG LOOPBACK FAILURE (BACK)
CMPG/26 03						YELLOW-I	CMPG DIAGNOSTIC HIGH FAILURE
CMPG/26 04						YELLOW-I	CMPG DIAGNOSTIC LOW FAILURE
CMPG/26 05	r:CMPG/26 05 [4 >					YELLOW-I	INVALID TRANSMIT ORDER RECEIVED
CMPG/26 06	r:CMPG/26 06 [4 >					YELLOW-I	INVALID RECEIVE ORDER RECEIVED
CMPG/26 08/LNSE TST NG 0000xxxx	r:CMPG/26 08/LNSE TST NG [4 >					YELLOW-I	CMPG LINE SEIZE TEST FAILURE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
CMPG/26 09	r:CMPG/26 09 [4 >					YELLOW-I	CMPG CARD: FRAME ERROR DETECTED
CMPG/26 0F	r:CMPG/26 OF [4 >					YELLOW-I	CMPG CARD: INVALID CONTROL DATA RECEIVED
CMPG/26 FF						YELLOW-I	CMPG CARD: CRITICAL COMM TIMING FAULT
CMPG/27 0E						YELLOW-I	COP TIMEOUT ON TRANSMIT OF DATA DUE TO TIMING ERROR
CMPG/51 07	r:CMPG/51 07 [4 >					YELLOW-I	INVALID DATA PRESENT ORDER RECEIVED
CMPG FAILURE						YELLOW-I	CMPG CARD FAILURE
CMPG/FF FF	r:CMPG/FF FF [4 >					YELLOW-I	COP TIMEOUT ON RECEIPT OF CMPG DATA
CMVC MSG TR RDR TGT AUTH (1) (2)						GREEN-P	(1) TARGET NUMBER OR EXECUTION PLAN (2) 8-DIGIT CMVC NUMBER
CMVC MSG TR RDR TGT UNAUTH (1) (2)						GREEN-P	(1) TARGET NUMBER OR EXECUTION PLAN (2) 8-DIGIT CMVC NUMBER
CMVC RECEIVED						GREEN-P	CMVC COMMAND RECEIVED-SYSTEM FOLLOW
COMM ANALYSIS [3 >							COMM ANALYSIS INITIATED
COMM AVSD 30	r:COMM AVSD 30 [4 >					YELLOW-I	COMM ADVISED-30 (30 IN LAST HOUR-NOT 200)

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
COMM AVSD 200	r:COMM AVSD 200 [4 >					YELLOW-I	COMM ADVISED COUNT = 200
COMM FAIL 2	r:COMM FAIL 2 [4 >					YELLOW-I	ALL TRANSMIT LINES LOST
COMM FAIL 3	r:COMM FAIL 3 [4 >					YELLOW-I	TRANSMIT LINE LOST
COMM FAIL 4	r:COMM FAIL 4 [4 >					YELLOW-I	TRANSMITTER JAMMED
COMM FAIL 5	r:COMM FAIL 5 [4 >					YELLOW-I	TRANSMITTER LINE JAMMED
COMM FAIL 6						YELLOW-I	INPUT DATA FAULT
COMM FAIL 7	r:COMM FAIL 7 [4 >					YELLOW-I	LOSS OF TONE INTERRUPT
COMM FAIL 8	r:COMM FAIL 8 [4 >					YELLOW-I	TONE INTERRUPT DURING LINE LOCKOUT
COMM FAIL 9	r:COMM FAIL 9 [4 >					YELLOW-I	NET TRAFFIC IN NORMAL MODE
COMM FAIL 10	r:COMM FAIL 10 [4 >					YELLOW-I	TRANSMIT MONITOR FAILURE-23 MS AFTER RCV LINE LO
COP DB AUTH FAIL						YELLOW-I	DATABASE AUTHORIZATION FAILED
COP INITIATED RESTART [3 >							SOFTWARE OR OPERATOR INITIATED RESTART
CRYPTO CLEAR							ENCRYPTION MODE CHANGED
CRYPTO CODE CHANGE							ENCRYPTION MODE CHANGED
CRYPTO ENCRYPTED							ENCRYPTION MODE CHANGED
CT SG IN LNS X	r:CT SG IN LNS X [4 >					YELLOW-I	CONTINUOUS SIGNAL ON INPUT LINES. X = input line

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
DISK WRITE PROTECTED						YELLOW-I	FLOPPY DISK IS WRITE PROTECTED
DNLOAD DIAG DATA [3 >							DNLOAD DIAG DATA TASK SELECTED
ELC ATT DUR INC [3 >						YELLOW-I	ELC ATTEMPTED DURING INC PROCESSING
ELC CD NOT OBTN [3 >						YELLOW-I	INVALID ELC ATTEMPT - ELC SECURE CODE NOT OBTAINED
ELC MSG TR [3 >						RED-ALL	LAUNCH COMMANDED (KEY TURN)
ELC RECEIVED [8 >						RED-ALL	ELC MESSAGE RECEIVED-SYSTEM FOLLOW
ENB SW NOT TRND						YELLOW-I	ENABLE SWITCH NOT TURNED
ENC						YELLOW-I	ENABLE COMMANDED
ENC ATTEMPT FAILED [9 >						YELLOW-I	NO LF RESPONSE WITHIN TIME LIMIT FOLLOWING TRANSMISSION OF ENC
ENC MSG TR [3 >						GREEN-ALL	ENABLE COMMAND TRANSMITTED
ENC RECEIVED						RED-ALL	ENC COMMAND RECEIVED-SYSTEM FOLLOW
EN SEC CODE NOT OBTAINED [3 >						YELLOW-I	ENABLE SECURE CODE NOT OBTAINED
EPP AUTH FAIL						YELLOW-I	EPP AUTHENTICATION FAILURE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
EPP CASE MISMATCH						YELLOW-I	INCORRECT WING NUMBER AND/OR FLIGHT LETTER
EPP CASE NUMBER IS NOT IN RANGE XXX [3 >						YELLOW-I	EPP CASE NUMBER IS NOT 500-599 XXX = CASE NUMBER
EPP CASE NUMBER IS NOT NUMERIC XXX [3 >						YELLOW-I	EPP CASE NUMBER IS NOT NUMERIC XXX = CASE NUMBER
EPP MA INACTIVE [3 >						YELLOW-I	EO GENERATION TERMINATED W/EPP/MA INACTIVE
EXEC CHAR DATA INVALID [3 >						YELLOW-I	EO GENERATION TERMINATED W/EXEC DATA INVALID
EXEC OPTION GEN							EXECUTION OPTION GENERATED
FACILITY ALARM [3 >						YELLOW-I	FACILITIES ALARM
FAULT DATA ID bb WRD aaaaaaa							IPDR FAULT DATA CONTENTS. b = id, a = word contents
FDD/11 01 000000xx	r:FDD/11 01 [4 >					YELLOW-I	RMB32A DETECTED RECEIVE DATA ERROR
FDD/11 02 000000xx	r:FDD/11 02 [4 >					YELLOW-I	RMB32A DETECTED TRANSMIT DMA ERROR
FDD/11 03	r:FDD/11 03 [4 >					YELLOW-I	RMB32A DETECTED TRANSMIT DMA TIMEOUT
FDD/11 04 000000xx	r:FDD/11 04 [4 >					YELLOW-I	RMB32A DETECTED RECEIVE DMA ERROR

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
FDD/11 05	r:FDD/11 05 [4 >					YELLOW-I	RMB32A DETECTED RECEIVE DMA TIMEOUT
FDD/34 01 01	r:FDD/34 01 01					YELLOW-I	FDD: FILE NOT FOUND/NOT OPEN
FDD/34 01 02/ DISK FULL [3 >						YELLOW-I	FDD DISK FULL (DOWNLOAD)
FDD/34 01 03	r:FDD/34 01 03					YELLOW-I	FDD: INVALID MEDIA (not DOS format)
FDD/34 01 04	r:FDD/34 01 04 [3 >					YELLOW-I	FDD: DISK ERROR (READ/WRITE)
FDD/34 01 06/DISK WRITE PROTECTED						YELLOW-I	FDD: DISK WRITE PROTECTED (UP/DNLOAD)
FDD/34 01 07/FDD NOT READY [3 >						YELLOW-I	FDD: NOT READY (FOR UP/DNLOAD-NO DISK, DOOR OPEN)
FDD/34 01 08	r:FDD/34 01 08					YELLOW-I	FDD: VERIFY ERROR
FDD/34 01 09						YELLOW-I	FDD: END OF FILE
FDD/34 01 0B						YELLOW-I	FDD: TRY TO RE-READ/RE-WRITE@ FILE START
FDD/34 01 0C						YELLOW-I	FDD: ATTEMPT TO WRITE TO ROOT DIRECTORY
FDD/34 01 0D						YELLOW-I	FDD: FILE TO BE OVERWRITTEN (EXISTS)
FDD/34 01 0F	r:FDD/34 01 0F					YELLOW-I	FDD: INVALID FILE NAME
FDD/34 01 1F	r:FDD/34 01 1F					YELLOW-I	FDD: INVALID COMMAND OR HOST DATA FIELD ERROR
FDD/34 01 10	r:FDD/34 01 10 [4 >					YELLOW-I	FDD: PROM CHECKSUM FAILURE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
FDD/34 01 11	r:FDD/34 01 11 [4 >					YELLOW-I	FDD: RAM TEST FAILURE
FDD/34 01 12	r:FDD/34 01 12 [4 >					YELLOW-I	FDD: SUBASSEMBLY HARDWARE FAULT
FDD/34 01 20	r:FDD/34 01 20 [4 >					YELLOW-I	FDD: RECEIVE ERROR (CRC, ILLEGAL CMD)
FDD/FF FF 01	r:FDD/FF FF 01 [4 >					YELLOW-I	COP DETECTED TIMEOUT ON READ
FDD/FF FF 02	r:FDD/FF FF 02 [4 >					YELLOW-1	COP DETECTED TIMEOUT ON WRITE
FDD BUSY [3 >							FLOPPY DISK DRIVE BUSY
FDD INITIATE FAILED [3 >							DISK DID NOT INITIALIZE CORRECTLY
FDD TEST FAILURE [4 >						YELLOW-1	FDD TEST FAILURE/TEST SUCCESSFUL AFTER A FAILURE
FDM DB NOT AUTH [4 >						YELLOW-1	FDM DATABASE AUTHENTICATION FAILURE (BS/L CMSC FAILURE
FDM VALIDATION CURRENTLY UNAVAILABLE [4 >						YELLOW-I	FDM DATABASE AUTHENTICATION FAILURE (MEMORY CMSC FAILURE)
FLOPPY DISK ACCESS ERROR/INVALID DATA TYPE FOR DISK [3 >							FLOPPY DISK CANNOT BE ACCESSED
FLOPPY DISK FULL [3 >							FLOPPY DISK FULL (DNLOAD)

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
GMI RECEIVED						GREEN-P	GMI COMMAND RECEIVED-SYSTEM FOLLOW
GMR nn	GMR r:nn				[10 >	YELLOW-P	GMR DATA (nn = GMR #)
GYRO CHANGE GYRO aaaa						GREEN-I	NEW GYRO DATA RECEIVED aaaa = GYRO NUMBER
GYRO INVAL [3 >						YELLOW-I	MGS SERIAL NUMBERS DO NOT AGREE
IMPROPER IZ TRANSITION						YELLOW-I	IMPROPER IZ TRANSITION DURING SCNT
IMPROPER OZ TRANSITION						YELLOW-I	IMPROPER OZ TRANSITION DURING SCNT
IMUCAL 1 RECEIVED [6 >						GREEN-P	IMUCAL1 COMMAND RECEIVED-SYSTEM FOLLOW
IMUCAL 2 RECEIVED [6 >						GREEN-P	IMUCAL2 COMMAND RECEIVED-SYSTEM FOLLOW
INC ATT DUR ELC [3 >						YELLOW-I	INVALID INHIBIT ATTEMPT DURING LAUNCH
INC ATTEMPT FAILED						YELLOW-I	INHIBIT ATTEMPT FAILED
INC CD NOT OBTN [3 >						YELLOW-I	INVALID INHIBIT ATTEMPT-SECURE CD NOT OBTND
INC INITIATED [3 >						YELLOW-I	INHIBIT COMMAND INITIATION
INC MSG TR [3 >						GREEN-ALL	INHIBIT COMMAND RECEIVED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
INC RECEIVED						GREEN-ALL	INC COMMAND RECEIVED-SYSTEM FOLLOW
INPUT LNLOST xyy	r:INPUT LNLOST xyy [4 >					YELLOW-I [11 >	INPUT LINE LOST-NO TONE PRESENT. x = FLIGHT # yy = SORTIE/LF #
INSERT NEXT DIST						YELLOW-I	FLOPPY DISK READ-INSERT NEXT DISK (UP/DNLOAD)
INVAL HA DATA						YELLOW-I	INVALID HIGHER AUTHORITY DATA
INVALID DATA TYPE FOR DISK [3 >						YELLOW-I	WRONG DATA ON FLOPPY FOR THIS UPLOAD OR DOWNLOAD
INVALID ENBL COUNT [3 >						RED-I	INVALID ENABLE COUNT
INVALID ENBL COUNT EXC						RED-I	INVALID ENBL COUNT EXCEEDED
INVALID EXEC CHARACTER(S) [3 >						YELLOW-I	EO GENERATION COMPLETED WITH INVALID EXEC CHARS
INVALID SEQUENCE FOR DISK [3 >						YELLOW-I	FLOPPY DISK INSERTED OUT OF SEQUENCE (UP/DNLOAD)
INVALID SIOP [3 >						YELLOW-I	SIOP REVISION CODE MISMATCH
IPD/3E 01 00000000	r:IPD/3E 01					YELLOW-I	IPD LOOPBACK TEST FAILURE
IPD/3E 02	r:IPD/3E 02					YELLOW-I	IPD INTERFACE: MODEM DISCONNECT

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
IPD/FF FF	r:IPD/FF FF					YELLOW-I	COP TIMEOUT ON RECEIPT OF CDA/IPD DATA
IPDC RECEIVED						GREEN-P	IPDC COMMAND RECEIVED-SYSTEM FOLLOW
IPDH RECEIVED						GREEN-P	IPDH COMMAND RECEIVED-SYSTEM FOLLOW
LAU TIMER EXPIR [3 >						YELLOW-I	INVALID LAUNCH INITIATED-LAUNCH TIMER EXPIRATION
LCC axx CLRT [12 >	r:LCC axx CLRT [4 >					YELLOW-ALL	LCC CLEAR TEXT axx = LCC
LCC axx DOWN [12 >	r:LCC axx DOWN					YELLOW-ALL	LCC DOWN axx = LCC
LCC axx OOSYNC REM bbbbbbb LOC ccccccc	r:LCC axx OOSYNC REM bbbbbbb LOC ccccccc [4 >					YELLOW-I	LCC OUT OF CRYPTO SYNC axx = > LCC bbbbbbb = > remote seq count ccccccc = > local seq count
LCEB FIRE [3 >						FIRE-I	LCEB FIRE ALARM
LCP/11 01	r:LCP/11 01 [4 >					YELLOW-I	LCP CARD INTERFACE: RMB32A DETECTED RECEIVE DATA ERROR (NO PARITY)
LCP/14 01 01	r:LCP/14 01 01 [4 >					YELLOW-I	LCP CARD INTERFACE: CDA LCP DIAGNOSTIC DISCRETE LOOPBACK FAILURE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
LCP/14 01 02	r:LCP/14 01 02 [4 >					YELLOW-I	LCP CARD INTERFACE: CDA LCP READ SWITCHES DISCRETE LOOPBACK FAILURE
LCP/14 01 03	r:LCP/14 01 03 [4 >					YELLOW-I	LCP CARD INTERFACE: CDA LCP READ ALL DISCRETE LOOPBACK FAILURE
LCP/23 01/BK WR TST NG 000xxxxx	r:LCP/23 01/ BK WR TST NG [4 >					YELLOW-I	LCP BREAKWIRE TEST DIAGNOSTIC HIGH FAILURE
LCP/23 02/BK WR TST NG 000xxxxx	r:LCP/23 02/ BK WR TST NG [4 >					YELLOW-1	LCP BREAKWIRE TEST DIAGNOSTIC LOW FAILURE
LCP/23 03	r:LOC/23 03 [4 >					YELLOW-I	LCP DATA OUT OF SYNC
LCP/23 04	r:LCP/23 04					YELLOW-I	LCP CODE DISSIPATED
LCP/23 05	r:LCP/23 05 [4 >					YELLOW-I	CLS: CLS TAMPER CONTINUITY LOOP FAILURE
LCP/23 06	r:LCP/23 06					YELLOW-I	LCP: CLEAR INTERFACE ERROR
LCP/23 07	r:LCP/23 07					YELLOW-I	LCP CARD: EXTRANEOUS INPUT
LCP/23 08	r:LCP/23 08					YELLOW-I	LCP BREAKWIRE TEST READ SWITCHES FAILURE
LCP/FF FF	r:LCP/FF FF [4 >					YELLOW-I	COP DETECTED TIMEOUT ON RECEIPT OF LCP DATA
LEP/11 01 000000xx	r:LEP/11 01 [4 >					YELLOW-I	RMB32A DETECTED RECEIVE DATA ERROR (NO PARITY)

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
LEP/14 01 01	r:LEP/14 01 01 [4 >					YELLOW-I	LEP CDA DIAGNOSTIC DISCRETE LOOPBACK FAILURE
LEP/14 01 02	r:LEP/14 01 02 [4 >					YELLOW-I	LEP CDA READ DISCRETE LOOPBACK FAILURE
LEP/38 01 00000000	r:LEP/38 01 [4 >					YELLOW-I	LEP BREAKWIRE TEST DIAGNOSTIC HIGH FAILURE
LEP/38 02 0000000x	r:LEP/38 02 [4 >					YELLOW-I	LEP BREAKWIRE TEST DIAGNOSTIC LOW FAILURE
LEP/38 03	r:LEP/38 03 [4 >					YELLOW-I	LEP DATA OUT OF SYNC
LEP/38 04	r:LEP/38 04 [4 >					RED-I	LEP: J CODE DISSIPATED
LEP/38 05	r:LEP/38 05 [4 >					YELLOW-I	LEP CARD: CLEAR INTERFACE ERROR
LEP/FF FF	r:LEP/FF FF [4 >					YELLOW-I	COP DETECTED TIMEOUT ON RECEIPT OF LEP DATA
LFDN	r:LFDN	LFDN				YELLOW-ALL	LF DOWN
LFNA	r:LFNA				LFNA	YELLOW-ALL	LF NOT AUTHENTICATED
LFNI	r:LFNI				FAU	YELLOW-PS	LF NOT INTERROGATED
LFOS	r:LFOS				LFOS	YELLOW-ALL	LF OUT OF CRYPTO SYNC
MA EPP DB NOT AUTHORIZED						YELLOW-I	MA EPP DB FAILS AUTHENTICATION ON STARTUP
MAN COMM MON [3 >						YELLOW-I	PERIODIC COMM SUMMARY DISPLAY AVAILABLE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
MAX CMDS EXCEEDED [3 >							32 COMMANDS ALREADY ACTIVE FOR LF: CSR IS INCOMPLETE
MESSAGE DATA INVALID [3 >						YELLOW-I	EAM DATA ANALYSIS COMPLETE WITH VALIDATION ERROR
MESSAGE MAP DATA INVALID [3 >						YELLOW-I	EO GENERATION TERMINATED W/MESSAGE MAP INVALID
MESSAGE TYPE INVALID [3 >						YELLOW-I	EO GENERATION TERMINATED W/MESSAGE TYPE INVALID
MMD	r:MMD				FAU	YELLOW-P	MISSING MOSR DATA
MOSR1 nn	MOSR1 r:nn				FAU	YELLOW-P	MOSR WORD 1 DATA nn = mosr #
MOSR2 nn	MOSR2 r:nn				FAU	YELLOW-P	MOSR WORD 2 DATA nn = mosr#
MSLA	r:MSLA	MSLA				YELLOW [11 >	MISSILE AWAY BREAKWIRE
MTC RECEIVED [6 >						GREEN-P	MTC COMMAND RECEIVED-SYSTEM FOLLOW
MTS1 RECEIVED [6 >						GREEN-P	MTS1 COMMAND RECEIVED-SYSTEM FOLLOW
MTS2 RECEIVED [6 >						GREEN-P	MTS2 COMMAND RECEIVED-SYSTEM FOLLOW
NED-PS/14 01 01	r:NED-PS/14 01 01 [4 >					YELLOW-I	NED INTERFACE: TEST DISCRETE LOOPBACK FAILURE
NED-PS/14 01 02	r:NED-PS/14 01 02 [4 >					YELLOW-I	NED INTERFACE: RESET DISCRETE LOOPBACK FAILURE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
NED-PS/14 01 03	r:NED-PS/14 01 03 [4 >					YELLOW-I	PRINTER SWITCH RESET DISCRETE LOOPBACK FAILURE
NED-PS/14 01 04	r:NED-PS/14 01 04 [4 >					YELLOW-I	PRINTER SWITCH ACTIVATION DISCRETE LOOPBACK FAILURE
NED-PS/23 01 01/PTR SW NOT NORM	r:NED-PS/28 01 01/PTR SW NOT NORM					YELLOW-I	INCORRECT PRINTER SWITCH STATE, STAYED IN RMPB
NED-PS/28 01 02/PTR SW NOT BKUP	r:NED-PS/28 01 02/PTR SW NOT BKUP					YELLOW-I	INCORRECT PRINTER SWITCH STATE, STAYED IN WSP
NO CURRENT SIOP [3 >						YELLOW-I	EO GENERATION TERMINATED W/NO CURRENT SIOP
NO EP SELECTED [3 >						YELLOW-I	EO GENERATION TERMINATED W/NO EP SELECTED
NO VALID EXEC CHARS [3 >						YELLOW-I	EO GENERATION TERMINATED W/NO VALID EXEC CHARS
OGP AUTH FAIL [3 >						YELLOW-I	OGP OFFLOAD AUTHENTICATION FAILURE
OID TEST FAILURE	r:OID TEST FAILURE					YELLOW-I	OID TEST INITIATION FAILURE/ SUCCESSFUL AFTER A FAILURE
OID/11 01 000000xx or OID/12 01 000000xx	r:OID/11 01 or r:OID/12 01 [4 >					YELLOW-I	RMB32 RECEIVE DATA ERROR
OID/31 01 or OID/32 01 [13 >	r:OID/31 01 or r:OID/32 01 [4 >					YELLOW-I	ILLEGAL OID DATA TYPE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
OID/31 02 or OID/32 02	r:OID/31 02 or r:OID/32 02 [4 >					YELLOW-I	DISPLACEMENT VALUE ERROR ON OID
OID/31 03 or OID/32 03 [13 >	r:OID/31 03 or r:OID/32 03 [4 >					YELLOW-I	COP DETECTED FRAME ERROR ON OID
OID/31 04 or OID/32 04 [13 >	r:OID/31 04 or r:OID/32 04 [4 >					YELLOW-I	UNEXPECTED DATA RECEIVED FROM OID
OSI SEQ CNT DISAGREEMENT							SEQUENCE COUNT a01 DISAGREEMENT (a=LCC)
OTP AUTH FAIL						YELLOW-I	OTP AUTHENTICATION FAILURE
OTP CASE NUMBER IS NOT NUMERIC XXX [3 >						YELLOW-I	OTP CASE NUMBER IS NOT NUMERIC XXX = CASE NUMBER
OTP CASE NUMBER IS NOT IN RANGE XXX [3 >						YELLOW-I	OTP CASE NUMBER IS NOT IN 1 - 20 OR 100 - 499 XXX = CASE NUMBER
OTP DB AUTH FAIL						YELLOW-I	OTP DATA BASE AUTHENTICATION FAILURE
OTP/EPP NOT AUTHENTICATED [3 >						YELLOW-I	CONSTANTS GENERATION FAILURE OTP/EPP NOT AUTH
OWC RECEIVED						GREEN-P	OWC COMMAND RECEIVED-SYSTEM FOLLOW
OWT RECEIVED						GREEN-P	OWT COMMAND RECEIVED-SYSTEM FOLLOW

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
PGLC RECEIVED						GREEN-P	PGLC COMMAND RECEIVED-SYSTEM FOLLOW
PGLH RECEIVED						GREEN-P	PGLH COMMAND RECEIVED-SYSTEM FOLLOW
PHICAL RECEIVED [6 >						GREEN-P	PHICAL COMMAND RECEIVED-SYSTEM FOLLOW
PLCA MSG TR [3 >						GREEN-ALL	PLC-A MESSAGE RECEIVED
PLC-A RECEIVED						GREEN-ALL	PLC-A COMMAND RECEIVED-SYSTEM FOLLOW
PLC-B RECEIVED						GREEN-ALL	PLC-B COMMAND RECEIVED-SYSTEM FOLLOW
PLC DATA MISSING [3 >						YELLOW-I	EO GENERATION TERMINATED W/PLC DATA MISSING
POWER ON RESTART COP AM VER XXXX [3 >							OCCURS WHEN POWER IS FIRST APPLIED TO SYSTEM XXXX = VERSION NUMBER
PRINT QUEUE FULL						YELLOW-I	WS PRINT REQUEST QUEUE FULL
PRINTER SWITCH CHANGE							PRINTER SWITCH POSITION CHANGED
PRINTER TEST FAILURE	r:PRINTER TEST FAILURE					YELLOW-I	PRINTER TEST INITIATION FAILURE
PTR/12 01 000000xx	r:PTR/12 01 [4 >					YELLOW-I	PRINTER INTERFACE: RMB32B RECEIVE DATA ERROR

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
PTR/12 02 000000xx	r:PTR/12 02 [4 >					YELLOW-I	PRINTER INTERFACE: RMB32B TRANSMIT DMA ERROR
PTR/12 03	r:PTR/12 03 [4 >					YELLOW-I	PRINTER INTERFACE: RMB32B TRANSMIT DMA TIMEOUT
PTR/33 01 02/ PRINTER DOOR OPEN	r:PTR/33 01 02/ PRINTER DOOR OPEN [4 >					YELLOW-I	PRINTER DOOR OPEN
PTR/33 01 04	r:PTR/33 01 04 [4 >					YELLOW-I	PRINTER MALFUNCTION
PTR/33 01 08	r:PTR/33 01 08 [4 >					YELLOW-I	PRINTER OFFLINE
PTR/33 01 10/ PRINTER PAPER FAULT	r:PTR/33 01 10/PRINTER PAPER FAULT [4 >					YELLOW-I	PRINTER PAPER FAULT
PTR/33 01 20	r:PTR/33 01 20 [4 >					YELLOW-I	PRINTER PARITY ERROR
PTR/FF FF	r:PTR/FF FF [4 >					YELLOW-I	PRINTER INTERFACE: COP DETECTED TIMEOUT
PTR SW-BKUP OR PTR SW-NORM							PRINTER SWITCH POSITION CHANGED
RDC	r:RDC					GREEN-PS	RDC IN PROCESS
RDC ERR 1 [3 >						YELLOW-AM	RDC HALTED DUE TO SDU ALARM OR OTHER TRANSMISSION ERROR
RDC ERR 2 [3 >						YELLOW-AM	RDH RECEIVED
RDC ERR 3 [3 >						YELLOW-A	MONITOR LCC DOES NOT RESPOND TO RDCT (STACK TASK)

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
RDC ERR 4 [3 > [14 >						YELLOW-A	TARGET LF DOES NOT RESPOND TO RDCT
RDC ERR 5 [3 >						YELLOW-A	12 WORD BLOCK CHECKWORD FAILED 4 TIMES
RDC ERR 6 [3 >						YELLOW-A	TARGET LF DOES NOT RESPOND TO 3 RDT ATTEMPTS
RDC ERR 7 [3 >						YELLOW-M	MONITOR LCC AND LF CMVC DISAGREE
RDC ERR 8 [3 >						YELLOW-M	NO RDWs XMITTED FROM LCC IN 65 SLOTS (STACK TASK)
RDC ERR 10 [3 >						YELLOW-AM	BAD RDC S/C CHANGE - RDTAC TO RDCIP
RDC ERR 11 [3 >						YELLOW-A	RDA RESPONSE TIME EXCEEDED
RDC ERR 13 [3 >						YELLOW-AM	RDC NOT IN PROCESS NOT REPORTED AFTER SUCCESSFUL RDA/RDH SEQUENCE (STACK TASK)
RDC ERR 14 [3 >						YELLOW-AM	AJ MODE ENTERED PRIOR TO RDT
RDC ERR 15 [3 >						YELLOW-AM	NO TDR IN RESPONSE TO RDH (EXPECTED WHEN INDIVIDUAL RDH XMITTED IN AJ-STACK TASK)
RDC ERR 50 [3 >						YELLOW-AM	CONSTANT GENERATION ERROR DURING RDC

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
RDC ERR 53 [3 >						YELLOW-AM	MCCM INITIATED RDH (STACK TASK)
RDC ERR 55 [3 >						YELLOW-AM	OSR WITH RDC-NOT IN PROCESS STATUS RECEIVED PRIOR TO RDA (STACK TASK)
RDC ERR 56 [3 >						YELLOW-AM	APQ ENTRY DELETED OR STACK ABORTED
RDC ERR 57 [3 >						YELLOW-AM	APQ ENTRY PLACED ON HOLD
RDC ERR 59						YELLOW-AM	AUTOMATIC RDH FOLLOWING A RESTART
RDC ERR 60						GREEN-AM	LCC OUT OF CRYPTO SYNC
RDC NOT TR SYSTEM ERR 22 [3 > [15 >						YELLOW-A	SDU FAULT AT LOCAL LCC (ACTIVE STACK RDCP* * = BUFFER NAME)
RDC NOT TR SYSTEM ERR 24 [3 > [15 >						YELLOW-A	AJ TRANSMISSION MODE SELECTED
RDC NOT TR SYSTEM ERR 25 [3 > [15 >						YELLOW-A	CODE CHANGE ENCRYPTION MODE SELECTED
RDC NOT TR SYSTEM ERR 31 [3 > [15 >						YELLOW-A	AUTO PLC-B FAILED TRANSMISSION
RDC NOT TR SYSTEM ERR 32 [3 > [15 >						YELLOW-A	LCC OUT OF CRYPTO SYNC
RDC SOLE [3 >						RED-ALL	RDC INITIATED IN SOLE SURVIVOR MODE

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
RDCT FCID aaaa [3 >							RDCT TRANSMITTED (aaaa = GYRO NUMBER)
RDCT [SOLE] aaaa [3 >						RED-ALL	RDCT TRANSMITTED IN SOLE SURVIVOR (aaaa = GYRO NUMBER)
RDCT SOLE RECVD [3 >							RDCT RECEIVED IN SOLE SURVIVOR
RDCT SOLE SURVIVOR TRANSMITTED [3 >						RED-P	SOLE SURVIVOR RDCT TRANSMITTED
RDH RECEIVED						GREEN-ALL	RDH COMMAND RECEIVED-SYSTEM FOLLOW
RESYNC OLD:aaaaaaa NEW:bbbbbbb						GREEN-P	SEQUENCE COUNT RESYNC OCCURRED a = OLD SEQUENCE COUNT b = NEW SEQUENCE COUNT
RLAU						GREEN-I	NO LAUNCH (RESET FROM LCMD, INH, LIP)
RMP/11 01 000000xx	r:RMP/11 01					YELLOW-I	RMB32A DETECTED RECEIVE ERROR
RMP/11 11 000000xx	r:RMP/11 11					YELLOW-I	RMB32A DETECTED RECEIVE ERROR PRINTER LINE
RMP/41 01	r:RMP/41 01 [4 >					YELLOW-I	FRAME CHECKSUM ERROR
RMP/41 02	r: RMP/41 02 [4 >					YELLOW-I	OUT OF SEQUENCE FRAME RECEIVED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
RMP/41 03/HA KEEP ALIVE	r:RMP/41 03/HA KEEP ALIVE [4 >					YELLOW-I	HA KEEP ALIVE FAILURE/RECOVERY-INTERFACE KEEP ALIVE TIMEOUT
RMP/41 04/INVAL HA DATA 000000xx	r:RMP/41 04/INVAL HA DATA [4 >					YELLOW-I	INVALID HAC DATA TYPE RECEIVED
RMP/41 05	r:RMP/41 05 [4 >					YELLOW-I	HAC TEST FAILURE: KEEP ALIVE TIMEOUT
RMP/41 06	r:RMP/41 06 [4 >					YELLOW-I	HAC TEST FAILURE: EAM ALARM NOT RECEIVED
RMP/41 07	r:RMP/41 07 [4 >					YELLOW-I	HAC TEST FAILURE: NON-EAM ALARM NOT RECEIVED
RMP/41 08	r:RMP/41 08					YELLOW-I	ROUTINE ALARM NOT RECEIVED
RMP/41 09	r:RMP/41 09					YELLOW-I	BAD TEST DATA NOT RECEIVED
RMP/41 0A	r:RMP/41 0A					YELLOW-I	UNEXPECTED PRINT REQUEST RECEIVED
RMP/41 0B	r:RMP/41 0B					YELLOW-I	HAC TEST FAILURE: LCC TEST COMMAND FAULT
RMP SUBSYS TEST FAILURE [4 >	r:RMP SUBSYS TEST FAILURE					YELLOW-I	RMP SUBSYS TEST FAILURE/TEST SUCCESSFUL AFTER A FAILURE
RMP SUBSYSTEM TEST FAILURE	r:RMP SUBSYSTEM TEST FAILURE					YELLOW-I	RMP SUBSYSTEM TEST FAILURE
RMPB/12 01 000000xx	r:RMPB/12 01					YELLOW-I	RMB32B DETECTED RECEIVE ERROR
RMPB/42 01	r:RMPB/42 01					YELLOW-I	RMPB EAM ALARM NOT RECEIVED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
RMPB/42 02	r:RMPB/42 02					YELLOW-I	RMPB ROUTING ALARM NOT RECEIVED
RMPT/42 03	r:RMPB/42 03					YELLOW-I	UNEXPECTED PRINT REQUEST RECEIVED
RMPB SUBSYSTEM TEST FAILURE							RMP BACKUP SUBSYSTEM TEST FAILURE
RMR						GREEN-P	REMOTE MISSILE RESTART
RMR RECEIVED [6 >						GREEN-P	RMR COMMAND RECEIVED-SYSTEM FOLLOW
RSA							RESTART ALIGNMENT
RSA RECEIVED [6 > [16 >						GREEN-P	RSA COMMAND RECEIVED-SYSTEM FOLLOW
SAHC MSG TR [3 >						RED-ALL	SHORT ALCC HOLDOFF COMMAND RECEIVED
SAHC RECEIVED						RED-ALL	SAHC COMMAND RECEIVED-SYSTEM FOLLOW
SATCAL RECEIVED [6 > [16 >						GREEN-P	SATCAL COMMAND RECEIVED-SYSTEM FOLLOW
SCNT RECEIVED						GREEN-PS	SCNT COMMAND RECEIVED-SYSTEM FOLLOW
SDU/14 01	r:SDU/14 01 [4 >					YELLOW-I	CDA/SDU INTERFACE LOOPBACK FAILED, ENCRYPTION
SDU/14 02	r:SDU/14 02 [4 >					YELLOW-I	CDA/SDU INTERFACE LOOPBACK FAILED, DECRYPTION

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
SDU/14 03	r:SDU/14 03 [4 >					YELLOW-I	CDA/SDU INTERFACE LOOPBACK FAILED, TIMEOUT
SDU/14 04	r:SDU/14 04 [4 >					YELLOW-I	CDA/SDU PATTERN ENC/DEC TEST FAILED, NON-HICS KEY
SDU/14 05	r:SDU/14 05 [4 >					YELLOW-I	CDA/SDU PATTERN ENC/DEC TEST FAILED, HICS KEY
SDU/14 06 0000xxxx	r:SDU/14 06 [4 >					YELOW-I	SDU COMMAND ERROR (RETURNED SDU MODE 1/2 STATUS INCORRECT)
SDU/14 07	r:SDU/14 07 [4 >					YELLOW-I	SDU OPERATION FAILED
SDU/14 08 0000xxxx	r:SDU/14 08 [4 >					YELLOW-I	SDU DATA READY LINE STATUS INCORRECT
SDU/3D 01/CRYPTO ALARM	r:SDU/3D 01/CRYPTO ALARM [4 >					YELLOW-I	SDU ALARM
SDU/3D 03/0000000X CRYPTO TST NG	r:SDU/3D 03/CRYPTO TST NG [4 >					YELLOW-I	SDU ALARM TEST FAILURE X = 0 TIMEOUT X = 1 SDU ALARM ERROR X = 2 DATA READY ERROR X = 3 SDU ALARM AND DATA READY ERROR
SDU/FF FF	r:SDU/FF FF [4 >					YELLOW-I	COP TIMEOUT ON RECEIPT OF SDU DATA
SE CNT NECC [3 >						YELLOW-I	MANUAL SEQUENCE COUNT LOAD REQUIRED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
SE CNT OVFL [3 >	r:SE CNT OVFL						SEQUENCE COUNT OVERFLOW
SE CNT RUNAWAY						YELLOW-I	SEQUENCE COUNT RUNAWAY
SELECTIVE UNLOCK CODE DEACTIVATED							SELECTIVE SET UNLOCK DEACTIVATED
SIOP CODE UPDATED [3 >						GREEN-I	SIOP REV ID UPDATED
SIOP REV INVALID [3 >						YELLOW-I	SIOP REVISION MISMATCH
SLOT SEL CHANGE							CHANGE IN SELECTED TIME SLOTS
SLT VCx	r:SLT VCx					YELLOW-ALL	SLOT(S) VACANT X = VACANT TIMESLOT
SLOT SYNC RECEIVED	r:SLOT SYNC RECEIVED [4 >					YELLOW-I	SLOT SYNC RECEIVED WHEN SLOT 1 SELECTED
SOFTWARE DETECTED RESTART COP VERSION XXXX ERROR CODE [3 >							RESTART DUE TO NON-RECOVERABLE SOFTWARE ERROR XXXX = VERSION NUMBER
START COMM [3 >							START COMM ANALYSIS
STOP COMM [3 >							STOP COMM ANALYSIS
STD WD SYNC OLD=nnnnnnn NEW=nnnnnnn						GREEN-I	STORED WORD SYNCHRONIZATION PERFORMED nnnnnnn=SEQUENCE COUNT

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
STRATEGIC OPTIONS EXACT MATCH [3 >						GREEN-I	EO GENERATION COMPLETE WITH EXACT SO MATCH FOR EO
STRATEGIC OPTION SUBSET MATCH [3 >						GREEN-I	EO GENERATION COMPLETE WITH SUBSET SO MATCH FOR EO
SWITCH RELEASED						YELLOW-I	INVALID LAUNCH OR INHIBIT COMMAND ATTEMPT-SW REL

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
TDR TGT AUTH (1) PLC (2) BUF ID AUTH (3)							(1) E IF EP AUTHORIZED 4 IF TARGET 4 AUTHORIZED 3 IF TARGET 3 AUTHORIZED 2 IF TARGET 2 AUTHORIZED 1 IF TARGET 1 AUTHORIZED 0 IF TARGET NOT AUTHORIZED (2) 4 IF PCBO 3 IF PCBO 2 IF PCBO 1 IF PCBO 0 IF NOT PCBO (3) RDCP PROGRAM BUFFER: NO PROG SEG MSL TEST 1 MSL TEST 2 IMU CAL 1 IMU CAL 2 SAT CAL PHI CAL LOCAL COMM OWC PCBO: PLC-A CAPABILITY BY ORDER
FILE AUTH [3 >						GREEN-I	T.O. DB LOAD AUTH
FILE UNAUTH						GREEN-I	T.O. DB LOAD UNAUTH
UPLOAD AUTHENTICATION FAILED [3 >						YELLOW-P	T.O. QA NUMBER MISMATCH

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
TODC/11 03 000000XX	r:TODC/11 03 [4 >					YELLOW-I	RMB32A DETECTED TRANSMIT DMA ERROR ON TOD CLOCK
TODC/11 04	r:TODC/11 04					YELLOW-I	RMB32A DETECTED TRANSMIT DMA TIMEOUT ON TOD CLOCK
TOD OUT OF SYNC						YELLOW-I	TIME OF DAY OUT OD SYNC
TRANSLATE CODE ACTIVATED							TRANSLATE CODE OPTION ACTIVATED
TRANSLATE CODE DEACTIVATED							TRANSLATE CODE OPTION DEACTIVATED
TRANSLATE CODE VERIFICATION COMPLETE							TRANSLATE CODE OPTION VERIFIED
TRANSMIT MODE CHANGE							TRANSMIT MODE CHANGED
TRANSMISSIO N FAILED [3 >						YELLOW-I	MESSAGE NOT TRANSMITTED
TVI RECEIVED						GREEN-ALL	TVI COMMAND RECEIVED-SYSTEM FOLLOW

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
TVR (1) (2) (3) (4) (5)							(1) CEP OR MRT (2) PLC-A OR 6363 (3) TARGET (4) DELAY TIME OR TIME TO LIFT OFF (5) LF TARGETED BY PLC-B (IF 6363 IS DISPLAYED IN ITEM 2) OR INVALID TARGET NUMBER (IF MISSILE HAS GONE THROUGH STARTUP)
UNAUTH EAM DATA RECVD [3 >	r:UNAUTH EAM DATA RECVD					YELLOW-I	UNAUTHORIZED EAM DATA RECEIVED
UNEXPECTED HA BKUP PRINT RCVD						YELLOW-I	UNEXPECTED HA BACKUP PRINT DATA RECEIVED
UNLOCK CODE ACTIVE							ACTIVE UNLOCK CODE PRESENT
UNLOCK CODE ACTIVE SELECTIVE							SELECTIVE UNLOCK CODE ACTIVE
UNLOCK CODE ACTIVE UNIVERSAL							UNIVERSAL UNLOCK CODE ACTIVE
UNLOCK CODE INACTIVE							NO ACTIVE UNLOCK CODE PRESENT
UNLOCK CODE MISMATCH [3 >						YELLOW-I	EAM DATA ANALYSIS COMPLETE WITH UNLOCK CODE MISMATCH
UPLOAD/ DOWNLOAD FAILURE [3 >							UPLOAD OR DOWNLOAD FAILED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
VALIDATED [3 >						GREEN-I	EAM DATA ANALYSIS COMPLETE W/O ERROR
VDU/11 02 000000xx or VDU/12 02 000000xx [17 >	r:VDU/11 02 or r:VDU/12 02 [4 >					YELLOW-I	VDU CONTROLLER INTERFACE: RMB 32 DETECTED TRANSMIT DMA ERROR DETECTED ON VDU
VDU/11 03 or VDU/12 03 [17 >	r:VDU/11 03 or r:VDU/12 03 [4 >					YELLOW-I	VDU CONTROLLER INTERFACE: RMB32 DETECTED TRANSMIT DMA TIMEOUT DETECTED ON VDU
VDU/24 01 or VDU/25 01 [17 >	r:VDU/24 01 or r:VDU/25 01 [4 >					YELLOW-I	VDU CONTROLLER: ERROR DETECTED ON VDU
WATCHDOG RESTART [3 >							RESTART DUE TO WATCHDOG TIMER EXPIRED
WSP INITIATED RESTART [3 >							RESTART DUE TO HARDWARE ERROR
N/A						GREEN-I	EAM DATA ANALYSIS COMPLETE
N/A						YELLOW-I	EAM DATA ANALYSIS COMPLETE WITH ERRORS
N/A						YELLOW-I	EAM DATA EVALUATION TERMINATED
N/A						NON-EAM-I	FDMs RECEIVED
N/A						YELLOW-I	FLOPPY DISK INSERTED OUT OF SEQUENCE
N/A						YELLOW-I	FLOPPY DISK READ-INSERT NEXT DISK

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
Non-OSR Reported Conditions (Continued)							
N/A						GREEN-I	MCCM REMINDER TASK ALARM CLOCK
N/A						GREEN-I	NO LAUNCH
N/A						CRIT ALT	TRANSLATE CODE OPTION SELECTION

P - Primary LCC

S - Secondary LCC

I - Internal to LCC

A - RDC Active LCC

M - RDCT Monitor LCC

[1 > - Indication is displayed only at primary LCC if LF is undergoing an SCNT.

[2 > - Green ROUTINE alarm is filtered at primary and secondary LCC during enable test and missile test.

[3 > - CSR and/or CREW LOG entry. No detailed status entry.

[4 > - CLR in STATE column of LCC STATUS display.

[5 > - Crew log entry only. Update provided in LCC summary status and LCC STATUS display header.

[6 > - Indication is based on the command identification and the current buffer stored at the LF as follows:

COMMAND RECEIVED	BUFFER	INDICATION
CAL	Local_Sup	RMR RECEIVED
	IMU1	IMUCAL1 RECEIVED
	IMU2	IMUCAL2 RECEIVED
	PHICAL	PHICAL RECEIVED
	Other than above or not available	CAL RECEIVED
SATCAL	SATCAL	SATCAL RECEIVED
	Local_Sup	RSA RECEIVED
	Other than above or not available	SATCAL RECEIVED
MTC	MTS1	MTS1 RECEIVED
	MTS2	MTS2 RECEIVED
	Other than above or not available	MTC RECEIVED

Table 6-6. Status, Displays, and Alarms Matrix (Continued)

CREW LOG/LF OR LCC STATUS DISPLAY SET	CREW LOG/LF OR LCC STATUS DISPLAY RESET	FLIGHT STATUS DISPLAY				ALARMS AND INTEREST LEVEL	STATUS INFORMATION
		ALERT	LAUNCH	SECURITY	FAU/STAT		
[7 >	- For ELC ATTEMPT FAILURE, crew log will indicate "CLR BY OPR: LAU TIMER EXPIR" even though the ELC failure was due to INC ATT DUR ELC, SWITCH RELEASED, or ELC CODE NOT OBTN. For INC ATTEMPT FAILURE, crew log will indicate "CLR BY OPR: ELC ATT DUR INC" even though the INC FAILURE was due to SWITCH RELEASED or INC CD NOT OBTN.						
[8 >	- ELC indication is only displayed following transmission of an enable command or after an LF reports enabled status.						
[9 >	- A spurious ENC ATTEMPT FAILED indication may be crewlogged following a valid ENC MSG TR.						
[10 >	- FAU or STAT is displayed dependent on report.						
[11 >	- Parent LCC.						
[12 >	- "DN" displayed in LCC summary status display.						
[13 >	- OID/X1XX refers to the left workstation and OID/X2XX refers to the right workstation.						
[14>	- Indication may be the result of an SDU alarm.						
[15>	- Indication may appear in either the transmission or data portion of a CSR.						
[16 >	- May indicate PGLH was received.						
[17 >	- VDU X1XX or X4XX refers to the left workstation. VDU X2XX or X5XX refers to right workstation.						

Table 6-7. LCC Status Indications

Indication	Description
AHC 0 MIN WG	ALCC Timer Expired.
AHC 2 MIN WG	ALCC Timer Two-Minute Warning.
AHC 10 MIN WG	ALCC Timer Ten-Minute Warning.
AHC MSG TR	ALCC Holdoff Command Transmitted.
ALARMS TEST FAILURE	Alarms Test Failure.
ALARMS TEST FAIL - BLACK DISCRETE	Black Discrete Test Passed after a Failure During Alarms Test.
ALL LNLOST	All Input Lines Lost.
BDI/12 01 000000XX	RMB32B Detected Receive Data Error. Bits 0-7 = RMB32B Returned Status.
BDI/12 02 000000XX	RMB32B Detected Transmit Direct Memory Access (DMA) Error. Bits 0-7 = RMB32B Returned Status.
BDI/12 03	RMB32B Detected Transmit DMA Timeout.
BDI/14 01	Coder/Decoder Assembly (CDA) BDI Reset Discrete Loopback Failure.
BDI/21 01 0000XXXX	Diagnostic 0 Failure (not all lines 0). XXXX = Black Discrete Returned Status. Bit 0 = Site Add Com Rpt. Bits 1-10 = Missile Away Lines. Bit 11 = Data Bits 18-19 Cum Rpt. Bits 12-14 = Audio Alarm Code Conf. Data. Bit 15 = Bits 24-39 Cum Rpt.
BDI/21 02 0000XXXX	Diagnostic 1 Failure (not all lines 0). XXXX = Black Discrete Returned Status. Bit 0 = Site Add Com Rpt. Bits 1-10 = Missile Away Lines. Bit 11 = Data Bits 18-19 Cum Rpt. Bits 12-14 = Audio Alarm Code Conf. Data. Bit 15 = Bits 24-39 Cum Rpt.
BDI/21 03 0000XXXX	Audio Alarm Code 0 (reset) Not Set Properly. XXXX = Black Discrete Returned Status. Bits 8-10 = Exp Audio Alarm Code Conf. Data. Bits 0-2 = Act. Audio Alarm Code Conf. Data.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
BDI/21 04 0000XXXX	Audio Alarm Code 15 (silence) Not Set Properly. XXXX = Black Discrete Returned Status. Bits 8-10 = Exp Audio Alarm Code Conf. Data. Bits 0-2 = Act. Audio Alarm Code Conf. Data.
BDI/21 05	Byte Error Detected (BDI report on received input).
BDI/21 06	Frame Error Detected (BDI report on received input).
BDI/21 08	Clear Interface Error.
BDI/21 09	No Normal Data After Diagnostic Read.
BDI/FF 01	COP Detected BDI Data Out-of-Sync.
BDI/FF FF	COP Timeout on Requested Data.
BS/L/35 02	BS/L Test Failure.
BS/L FAILURE	BS/L Failure.
CASE NUMBER IS NOT IN RANGE XXX	OTP Case Number Is Not 1 - 20 Or 100 - 499 XXX = Case Number.
CDA/IPD TEST FAIL - CDA LOOPBACK	CDA Loopback Test Failure During CDA/IPD Test.
CDA/IPD TEST FAIL - SDU BIT PATTERN	SDU Bit Pattern Test Failure During CDA/IPD Test.
CHG SIOP REV ID	SIOP Revision Code Mismatch.
CMD W/O COOP	ENC or ELC Assembled W/O Coop Processing.
CMPG/12 01 000000XX	RMB32B Detected Receive Data Error. Bits 0-7 = RMB32B Returned Status.
CMPG/12 02 000000XX	RMB32B Detected Transmit DMA Error. Bits 0-7 = RMB32B Returned Status.
CMPG/12 03	RMB32B Detected Transmit DMA Timeout.
CMPG/12 11 000000XX	RMB32B Detected Status Data Error. Bits 0-7 = RMB32B Returned Status.
CMPG/14 01	CDA Discrete Loopback Failure.
CMPG/26 01	RMB32 Loopback (Front) Serial I/O Failure.
CMPG/26 02	CMPG Loopback (Back) Failure.
CMPG/26 03	Diagnostic High Failure.
CMPG/26 04	Diagnostic Low Failure.
CMPG/26 05	Invalid Transmit Status Order Received.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
CMPG/26 06	Invalid Receive Status Order Received.
CMPG/26 08/LN SE TST NG 0000XXXX	Line Seize Test Failure. XXXX = Line Failed Status.
CMPG/26 09	Frame Error Detected.
CMPG/26 0A	COP Timeout on Transmit of Data.
CMPG/26 0B	Invalid Tone Present Order Received.
CMPG/26 0C	Invalid No Data Order Received.
CMPG/26 0D	Invalid Data Order Received.
CMPG/26 OE	COP Timeout on Transmit of Data Due to Timing Error.
CMPG/26 0F	Invalid Control Data Received.
CMPG/51 07	Invalid Data Present Order Received.
CMPG/FF FF	COP Timeout on Receipt of CMPG Data.
COMM AVSD 200	Comm Advised Count = 200.
COMM AVSD 30	Comm Advised Count = 30.
COMM FAIL 2	All Transmit Lines Lost.
COMM FAIL 3	Transmit Line Lost.
COMM FAIL 4	Transmitter Jammed.
COMM FAIL 5	Transmit Line Jammed.
COMM FAIL 6	Input Data Fault.
COMM FAIL 7	Loss-of-Tone Interrupt.
COMM FAIL 8	Tone Interrupt During Line Lockout.
COMM FAIL 9	Net Traffic.
COMM FAIL 10	Transmit Monitor Fault.
CRYPTO CLEAR	Clear Text Selected.
CRYPTO CODE CHANGE	Code Change Selected.
CRYPTO ENCRYPTED	Crypto Encrypted.
CT SG IN LNS X	Continuous Signal on Input Line. X = Input Line #.
ELC ATT DUR INC	ELC Attempted During INC Processing.
ELC CD NOT OBTN	Invalid ELC Attempt - ELC Secure Code Not Obtained.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
ELC MSG TR	Launch Commanded (key turn).
ELC SW REL	Invalid Launch Command Attempt - SW REL.
ENC ATTEMPT FAILED	No LF Response Within Time Limit Following Transmission of ENC.
ENC MSG TR	Enable Command Received.
EN SEC CODE NOT OBTAINED	Enable Secure Code Not Obtained.
EPP AUTH FAIL	EPP Authentication Failure.
EPP CASE NUMBER IS NOT IN RANGE XXX	EPP Case Number Is Not 500 - 599 XXX = Case Number.
EPP CASE NUMBER IS NOT NUMERIC XXX	EPP Case Number Is Not Numeric XXX = Case Number.
FACILITY ALARM. SEE AAP.	Facilities Alarm.
FDD/11 01 000000XX	RMB32A Detected Receive Data Error. Bits 0-7 = RMB32A Returned Status.
FDD/11 02 000000XX	RMB32A Detected Transmit DMA Error. Bits 0-7 = RMB32A Returned Status.
FDD/11 03	RMB32A Detected Transmit DMA Timeout.
FDD/11 04 000000XX	RMB32A Detected Receive DMA Error. Bits 0-7 = RMB32A Returned Status.
FDD/11 05	RMB32A Detected Receive DMA Timeout.
FDD/34 01 01	File Not Found/Not Open.
FDD/34 01 02/DISK FULL	Disk Full.
FDD/34 01 03	Invalid Media (not DOS format).
FDD/34 01 04	Disk Error.
FDD/34 01 06/DISK WRITE PROTECTED	Disk Write Protected.
FDD/34 01 07/FDD NOT READY	Drive Not Ready (no disk or door open).
FDD/34 01 08	Verify Error.
FDD/34 01 09	End of File.
FDD/34 01 10	PROM Checksum Failure.
FDD/34 01 11	RAM Test Failure.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
FDD/34 01 12	Subassembly Hardware Fault.
FDD/34 01 20	Receive Error (CRC or illegal command).
FDD/34 01 0B	Try to Re-read/Re-write @ File Start.
FDD/34 01 0C	Attempt To Write to Root Directory.
FDD/34 01 0D	File To Be Overwritten.
FDD/34 01 0F	Invalid File Name.
FDD/34 01 1F	Invalid Command or Host Data Field Error.
FDD/FF FF 01	COP Detected Timeout on Read.
FDD/FF FF 02	COP Detected Timeout on Write.
FDD TEST FAILURE	FDD Test Failure.
HAC/RMPE SUBSYSTEMS TEST FAILED	HA Subsystem Test Failure.
INC ATT DUR ELC	Invalid Inhibit Attempt During Launch.
INC CD NOT OBTN	Invalid Inhibit Attempt - Secure CD Not Obtained.
INC INITIATED	Inhibit Command Initiation.
INPUT LNLOST X	Input Line Lost - No Tone Present. X = Input Line #.
INSERT NEXT DISK	Floppy Disk Read - Insert Next Disk.
INVAL HA DATA	Invalid Higher Authority Data.
INVALID ENBL COUNT	Invalid Enable Count.
INVALID DATA TYPE FOR DISK	Wrong Data on Floppy for Download.
INVALID DATA TYPE FOR DISK	Wrong Data on Floppy for Upload.
INVALID SEQUENCE FOR DISK	Floppy Disk Inserted Out of Sequence.
IPD/3E 01	Loopback Test Failure.
IPD/3E 02	Modem Disconnect.
IPD/FF FF	COP Timeout on Receipt of CDA/IPD Data.
J CODE NOT OBTN	J Code Not Obtained.
LAU TIMER EXPIR	Invalid Launch Initiated - Launch Timer Expiration.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
LCC axx CLRT	Lcc Clear Text. axx = LCC
LCC axx DOWN	LCC Down. axx = LCC.
LCC axx OOSYNC REM bbbbbbb LOC ccccccc	LCC Out-of-Sync. axx = LCC. bbbbbbb = Remote Sequence Count. ccccccc = Local Sequence Count.
LCEB FIRE	LCEB Fire.
LCP/11 01 000000XX	RMB32A Detected Receive Data Error (no parity). Bits 0-7 = RMB32A Returned Status.
LCP/14 01 01	CDA LCP Diagnostic Discrete Loopback Failure.
LCP/14 01 02	CDA LCP Read Switches Discrete Loopback Failure.
LCP/14 01 03	CDA LCP Read All Discrete Loopback Failure.
LCP/23 01/BK WR TST NG 000XXXXX	LCP Breakwire Test Diagnostic High Failure. XXXXX = LCP Returned Status. Bits 0-9 = Switch Settings (0-9). Bits 10-13 = Diagnostic Bits (10-13). Bit 14 = Switch Initiate Bit (14). Bit 15 = System Indicator Bit (15). Bit 16 = Secur Codes Cum Rpt (16-63).
LCP/23 02/BK WR TST NG 000XXXXX	LCP Breakwire Test Diagnostic Low Failure. XXXXX = LCP Returned Status. Bits 0-9 = Switch Settings (0-9). Bits 10-13 = Diagnostic Bits (10-13). Bit 14 = Switch Initiate Bit (14). Bit 15 = System Indicator Bit (15). Bit 16 = Secur Codes Cum Rpt (16-63).
LCP/23 03	LCP Data Out-of-Sync.
LCP/23 04	LCP Code Dissipated.
LCP/23 05	CLS Tamper Continuity Loop Failure.
LCP/23 06	Clear Interface Error.
LCP/23 07	LCP Extraneous Input.
LCP/23 08	LCP Breakwire Test Read Switches Failure.
LCP/FF FF	COP Detected Timeout on Receipt of LCP Data.
LEP/11 01 000000XX	RMB32A Detected Receive Data Error (no parity). Bits 0-7 = RMB32A Returned Status.
LEP/14 01 01	LEP CDA Diagnostic Discrete Loopback Failure.
LEP/14 01 02	LEP CDA Read Discrete Loopback Failure.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
LEP/38 01 0000000X	LEP Breakwire Test Diagnostic High Failure. X = LEP Returned Status. Bit 0 = MCU Code Cum Rpt (0-23). Bit 1 = Code Dissipated (24). Bit 2 = LEP Switch Activation (25). Bit 3 = Filler Bit.
LEP/38 02 0000000X	LEP Breakwire Test Diagnostic Low Failure. X = LEP Returned Status. Bit 0 = MCU Code Cum Rpt (0-23). Bit 1 = Code Dissipated (24). Bit 2 = LEP Switch Activation (25). Bit 3 = Filler Bit.
LEP/38 03	LEP Data Out-of-Sync.
LEP/38 04	J Code Dissipated.
LEP/38 05	Clear Interface Error.
LEP/FF FF	COP Detected Timeout on Receipt of LEP Data.
MAN COMM MON	Periodic Comm Summary Display Available.
MAX CMDS EXCEEDED	CSR Is Incomplete.
NED-PS/14 01 01	Test Discrete Loopback Failure.
NED-PS/14 01 02	Reset Discrete Loopback Failure.
NED-PS/14 01 03	Printer Switch Reset Discrete Loopback Failure.
NED-PS/14 01 04	Printer Switch Activation Discrete Loopback Failure.
NED-PS/28 01 01/PTR SW NOT NORM	Incorrect Printer Switch State, Stayed in the Rapid Message Processor Backup (RMPB).
NED-PS/28 01 02/PTR SW NOT BKUP	Incorrect Printer Switch State, Stayed in WSP.
NED TEST FAILURE	NED Initiation Test Failure.
OGP AUTH FAIL	OGP Offload Authentication Failure.
OID/11 01 000000XX	RMB32 Receive Data Error for OID Left. Bit 0-7 = RMB32 Returned Status.
OID/12 01 000000XX	RMB32 Receive Data Error for OID Right. Bit 0-7 = RMB32 Returned Status.
OID/31 01	Illegal OID Data Type OID Left.
OID/31 02	OID Displacement Value Error on OID Left.
OID/31 03	COP Detected Frame Error on OID Left.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
OID/31 04	Unexpected Data Received from OID Left.
OID/32 01	Illegal OID Data Type OID Right.
OID/32 02	OID Displacement Value Error on OID Right.
OID/32 03	Cop Detected Frame Error on OID Right.
OID/32 04	Unexpected Data Received From OID Right.
OID TEST FAILURE	OID Test Initiation Failure.
OTP AUTH FAIL	OTP Program Code Authentication Failure.
OTP CASE NUMBER IS NOT NUMERIC XXX	OTP Case Number Is Not Numeric XXX = Case Number.
OTP DB AUTH FAIL	OTP Database Authentication Failure.
OTP/EPP NOT AUTH	Constants Generation Failure.
PRINT QUEUE FULL	WS Print Request Queue Full.
PRINTER TEST FAILURE	Printer Test Initiation Failure. Request Not Transmitted to the Printer.
PTR/12 01 000000XX	RMB32B Receive Data Error. Bits 0-7 = RMB32B Returned Status.
PTR/12 02 000000XX	RMB32B Transmit DMA Error. Bits 0-7 = RMB32B Returned Status.
PTR/12 03	RMB32B Transmit DMA Timeout.
PTR/33 01 02/PRINTER DOOR OPEN	Printer Door Open.
PTR/33 01 04	Printer Malfunction.
PTR/33 01 08	Printer Off-line.
PTR/33 01 10/PRINTER PAPER FAULT	Printer Paper Fault.
PTR/33 01 20	Printer Parity Error.
PTR/FF FF	COP Detected Timeout.
RDC	RDC In Process.
RDC ERR 1	RDC Halted Due to SDU Alarm or Other Transmission Error.
RDC ERR 2	RDH Received.
RDC ERR 3	Monitor LCC Does Not Respond to RDCT.
RDC ERR 4	RDR Not Received - RDCP Change Halted.
RDC ERR 5	12-Word Block Checkword Failed 4 Times.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
RESP xxxxx TOTAL xxxx	Auxiliary Responsibility Assumed/dropped. x = LCC.
RESYNC OLD: NEW:	Sequence Count Resync Occurred.
RLAU	No Launch (Reset From LCMD, INH, LIP).
RMP/11 01 000000XX	RMB32A Detected Receive Error. Bits 0-7 = Received Data Type.
RMP/11 11 000000XX	RMB32A Detected Receive Error Printer Line. Bits 0-7 = Received Data Type.
RMP/41 01	Frame Checksum Error.
RMP/41 02	Out-of-Sequence Frame Received.
RMP/41 03/HA KEEP ALIVE	Interface Keep Alive Timeout.
RMP/41 04/INVAL HA DATA 000000XX	Invalid HAC Data Type Received. Bits 0-7 = Received Data Type.
RMP/41 05	Keep Alive Timeout.
RMP/41 06	EAM Alarm Not Received.
RMP/41 07	Non-EAM Alarm Not Received.
RMP/41 08	Routine Alarm Not Received.
RMP/41 09	Bad Test Data Not Received.
RMP/41 0A	Unexpected Print Request Received.
RMP SUBSYSTEM TEST FAILURE	HA Subsystem Test Failure.
RMP/ZZ ZZ/INVAL HA DATA	Invalid HA Data Type.
RMPB/12 01 000000XX	RMB32B Detected Receive Error. Bits 0-7 = RMB32B Returned Status.
RMPB/42 01	RMPB EAM Alarm Not Received.
RMPB/42 02	RMPB Routine Alarm Not Received.
RMPB/42 03	Unexpected Print Request Received.
SDU/14 01	CDA/SDU Interface Encryption Loopback Failed.
SDU/14 02	CDA/SDU Interface Decryption Loopback Failed.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
SDU/14 03	CDA/SDU Interface Timeout Loopback Failed.
SDU/14 04	CDA/SDU Pattern Encrypt/Decrypt Test Failed, Non-HICS Key.
SDU/14 05	CDA/SDU Pattern Encrypt/Decrypt Test Failed, HICS Key.
SDU/14 06 0000XXXX	SDU Command Error. XXXX = CDA/IPD Returned Status. Bit 0 = SDU Alarm Bit. Bits 1-2 = SDU Mode. Bit 3 = Operation Result. Bits 8-10 = SDU Control. Bit 11 = Self Test Bit.
SDU/14 07	SDU Operation Failed.
SDU/14 08 0000XXXX	SDU Data Ready Line Status Incorrect. XXXX = CDA/IPD Returned Status.
SDU/3D 01/CRYPTO ALARM	SDU Alarm.
SDU/3D 03/CRYPTO TST NG 0000000X	SDU Alarm Test Failure. Bit 0 = Timeout. Bit 1 = SDU Alarm Error. Bit 2 = Data Ready Error. Bit 3 = Data Ready and SDU Alarm Error.
SDU/FF FF	COP Timeout on Receipt of SDU Data.
SDU COMMAND ERROR WITH CDA/IPD	SDU Command Error.
SE CNT NECC	Manual Sequence Count Load Required.
SE CNT OVFL	Sequence Count Overflow.
SE CNT RNAWAY	Sequence Count Larger Than Stored Count.
SIOP REV INVALID	SIOP Revision Mismatch.
SLOT SYNC RECVD	Slot Synchronization Received When Slot Selected.
SLT VC (1)	Slot vacant. (1) = Time Slot Vacant.
STD WD SYNC OLD = nnnnnnn NEW = nnnnnnn	Stored Word Synchronization Performed. n = Sequence Count.
TO DB AUTH	T.O. DB Load Authorization.
TO DB UNAUTH	T.O. DB LOAD Unauthorization.
TO DB QA NUM MISMATCH	T.O. QA Number Mismatch.

Table 6-7. LCC Status Indications (Continued)

Indication	Description
TODC/11 03 000000XX	RMB32A Detected Transmit DMA Error on TODC. Bits 0-7 = RMB32A Returned Status.
TODC/11 04	RMB32A Detected Transmit DMA Timeout on TODC.
TRANSLATE CODE OPTION	Translate Code Option Selection.
TRANSMISSION FAILED	Message Not Transmitted.
UNAUTH EAM DATA RECVD	Unauthorized EAM Data Received.
UNEXPECTED HA BKUP PRINT RCVD	Unexpected HA Bkup Print Data Received.
UNEXPECTED HAC/B DATA RECEIVED	Receipt of HAC or HACB Print After Inhibiting Those Requests.
VDU/11 02 000000XX	RMB32 Detected Transmit DMA Error on WS VDU Left. Bits 0-7 = RMB32 Returned Status.
VDU/11 03	RMB32 Detected Transmit DMA Timeout on WS VDU Left.
VDU/12 02 000000XX	RMB32 Detected Transmit DMA Error on HA VDU Right. Bits 0-7 = RMB32 Returned Status.
VDU/12 03	RMB32 Detected Transmit DMA Timeout on HA VDU Right.
VDU/24 01	Error Detected on WS VDU Left.
VDU/25 01	Error Detected on WS VDU Right.
VDU TEST FAILURE	VDU Test Initiation Failure.
WSCE I/O FAULT	WS Keep Alive Failure.
WSCE LINK FAILURE	WS Link Failure.
XXXX RECEIVED	XXXX Command Received - System Follow.

Source: T.O. 21M-LGM30G-2-1-7

Table 6-8. MOSR Descriptions

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
11 through 18	23, 25 through 31	Spare (0-Set)		
19	32	CSD(G) Test Failure	CSD(G) 19th bit monitor is false or CSD(G) home monitor is true in CSD(G) test	Successful CSD(G) test
20	33	Ground Ordnance Discrete Test Failure	Failure detected in ground ordnance discrete test	Successful ground ordnance discrete test
21	34	F/C Power Failure	F/C power turn on failure in missile test	Successful F/C power turn on in missile test
22	35	PSRE Control Failure	PSRE control failure in PSRE control test	Successful PSRE control test
23	36	Downstage Discrete Failure	Downstage discrete failure in missile ordnance discrete test	Successful downstage discrete portion of missile ordnance discrete test
24	37	R/S Discrete Failure	R/S discrete failure in missile ordnance discrete test	Successful R/S discrete portion of missile ordnance discrete test
25	38	PSRE Control Failure	PSRE control failure in PSRE control test	Successful PSRE control test
26	39	Control & Discrete Failure	Failure in missile ordnance discrete test	Successful missile ordnance discrete test
27	40	Computer Failure	a. Computer failure in ground ordnance discrete test. b. Computer failure in chaff motor speed command and response. c. Computer failure in flight control ground power turn-on test, stage I nozzles null and stage II injectors closed position control. d. Computer failure in missile ordnance discrete test. e. Computer failure in PSRE control test	No computer failure(s) detected during missile test

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
27 (Cont)	40	Computer Failure	f. Computer failure in downstage control system test. g. Computer failure in nuclear event detectors test. h. DCU CPU subtest failure. I. DCU memory subtest failure. j. Computer failure in critical lead disconnect test. k. Executive processing failures. l. DCU CPU subtest failure during status monitoring. m. Inadvertent RDA processing. n. Inadvertent RDC termination. o. Inadvertent R/S fuzing Initiation.	
28	41	Downstage Control Failure	Failure in control system test	Successful control system test
29	42	Stage II Roll Control Failure	Stage II roll valve failure in control system test	Successful stage II roll control test
30	43	Nuclear Event Detector Failure	Unsuccessful nuclear event test in missile test	Successful nuclear event test in missile test
31	44	Stage III Roll Control Failure	Stage III roll valve failure in control system test	Successful stage III roll control test
32 through 38	45 through 51	Spare (0-Set)		
39	52	Gyro Speed Control Failure	Three consecutive XY or YZ gyro speed control voltage check failures in strategic alert biasing	Three consecutive XY or YZ gyro speed control voltage checks in strategic alert biasing

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
40	53	Calibration Inhibited	MCC or SATCC was rejected because 12 bias cycles had not been completed following either platform slew during a return to target sequence or entry to SA biasing from the SA PIGA leveling	a. Completion of 12th bias cycle following either (1) platform slew during return to target sequence or (2) entry to stragetic alert biasing from strategic alert PIGA leveling. b. Retarget alignment with a platform repositioning sequence. c. Entry to strategic alert PIGA leveling.
41	54	Computer Battery Failure/Off	a. The battery flag discrete is in true state. b. Computer backup battery voltage below the low limit.	The battery flag discrete is in false state and the computer memory backup battery voltage is at or above the limit
42	24	Circumvention Reset Alarm	Alarm true state is detected on the circumvention reset indicator	Transmittal of MOSR. Unlatched upon transmittal of the MOSR word if a new fault change is not detected in the same MOSR word prior to unlatching.
43	25	LCF Address Time Expired	LCF address time expired	LCF address time not expired
44	26	CSD(M) Control Failure	a. CSD(M) failure during enable test. b. CSD(M) off home during home check. c. CSD(M) not armed when in armed state. d. Failed to arm CSD(M) during CSD(M) code change mode.	Successful enable test
45	27	CSD(M) Drive Enable Failure	a. CSD(M) drive enable false during Circumvention Reset (C/R) test. b. CSD(M) drive enable true during CSD(M) enable check. c. CSD(M) drive enable false during CSD(M) penetration.	a. Successful CSD(M) drive enable check. b. Successful CSD(M) drive enable check during C/R test.

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
46	28	Programmer Group Failure	a. R/S ground power on - not in fuzing. b. R/S ground power off - during fuzing. c. P/G failure in C/R test. d. C.O. code interface test failure.	Successful P/G check in C/R test
47	29	G&C Coupler Control Monitor Failure	a. Enable write not reset. b Character output code interface test failure. c. Coupler failure in C/R test. d. No-go test failure in SCNT. e. Critical Status Override (CSO) true during CSO off check. f. CSO test failure in SCNT. g. Multiplexer check failure. h. Keep alive test failure in SCNT. I. Critical lead disconnect subtest failure in missile test.	a. Successful coupler test during SCNT. b. Successful CLD test and C/R test during missile test.
48	30	Low Level Seismic	Low level seismic criteria exceeded in strategic alert biasing	a. Entry to PIGA leveling. b. Benign environment verified during low level seismic verification. c. Hostile/benign environment can not be verified during low level seismic verification. d. Exit from initial, restart or retarget alignment to SAB.
49	31	UHF Radio Test Failure	ALCC test message not received in SCNT	Successful UHF radio test in SCNT

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
50	32	GCA Failure No. 1	a. GI-T1-B torquing pulse accumulation failure. b. Delta phi 3 check failure in PSAT (repeat). c. GCA slew timer runout. d. Filter failure counter runout. e. G/C scale factor check failure in PSAT. f. Large angle shift test failure. g. Second PHI_2 check failure. h. Gyrocompass stability check failure. I. Multiple null offset corrections required. j. GC rotor on test failure.	Master reset when not in standby no-go
51	33	GCA Failure No. 2	a. GCA mass unbalance failure in PSAT. b. Alpha mu check failure in PSAT. c. First time PHI_3 check failure in PSAT.	a. Entry to PSAT. b. Successful repeat PHI_3 check.
52	34	GCA Failure No. 3	Gyrocompass bias stability check failure	Successful gyrocompass bias stability check
53	35	PSAT Calibration Advised	a. System startup. b. Bad IMU write in PSAT perturbation sequence. c. Bad IMU read or data in PSAT perfurbation sequence.	a. Successful PHI_3 check in PSAT with good IMU read and data. b Note 1.
54	36	LAI Check Failure	LAI true set check failure	Transmittal of MOSR (Note 3)
55	37	PHI Calibration Advised	a. System startup. b. Unsuccessful phi calibration.	a. Successful phi calibration. b. Note 2.
56	38	Precision Time Failure	a. Gross tau failure. b. Fine tau failure.	Transmittal of MOSR (Note 3)

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
57	39	IMU Servo Failure	a. Platform loss of control check failure. b. Third consecutive LAI check failure or good IMU read/good IMU data failure in data accumulation. c. Platform slew timer runout. d. Platform leveling timer runout. e. Platform servo response test failure. f. DCU and MGSC communication failure. g. Failure to select XY-YZ gyro caging pickoff ADC spare channel in nuclear event detectors test. h. PIGA/Platform/GCA mode check failure in CLD test during missile test. i. Bad IMU write, Bad IMU Read, or Bad IMU Data in PSAT perturbation sequence.	XY-YZ gyro caging pickoff ADC spare channel selected correctly in nuclear event detectors test and PIGA/Platform/ GCA Mode check successful in CLD test during missile test.
58	40	Coarse Zeta Alignment Failure	Delta zeta failure in alignment	
59	41	GCA/Platform Indexing Advised	a. Large angle shift test failure. b. Multiple null offset corrections required.	
60	42	SCS Armed	True state detected on SCS armed discrete	Transmittal of MOSR (Note 3)
61	43	CSD(M) Code Change Mode	CSD(M) code change mode is entered	Transmittal of MOSR and code change mode exited
62	44	Stage III LITVC Pressure Failure	Pressure failure. False state detected on Stage III monitor discrete.	Transmittal of MOSR (Note 3)

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
63	45	Platform Pressure Failure	Failure. False state detected on platform pressure monitor discrete.	Transmittal of MOSR (Note 3)
64	46	Checksum Failure	Periodic or secure checksum failure	Successful periodic checksum
65	47	Phi Calibration Advised	a. System startup. b. Unsuccessful phi calibration.	a. Successful phi calibration. b. Note 2.
66	48	R/S Fuzing Failure	Improper RS Fuzing	Successful RS Fuzing
67	49	IMU Calibration Failure	Delta RL check failure in IMU calibration (subfunction 1 or subfunction 2)	Successful delta RL check (subfunction 1 or subfunction 2)
68	50	PSRE Pressure Propellant Alarm	Propellant alarm 16 consecutive false states detected on PSRE pressure switch monitor	Transmittal of MOSR (Note 3)
69	51	Gyro Bias Shift	Gyro bias check failure	Successful fine gyro bias check
70	52	Gravity Residual/ PIGA Leveling Failure	a. Delta PIGA bias check failure. b. Platform attitude error check failure. c. Cumulative LAI check failures/velocity observable data rejections since PIGA leveling entry has reached sixty.	a. Successful delta PIGA bias check. b. Successful platform attitude error check. c. Successful delta RL check in IMU calibration subfunction 1.

Table 6-8. MOSR Descriptions (Continued)

MOSR PRINT OUT NO.	EGS MESSAGE BIT	NAME	LATCH	UNLATCH
71	53	Absolute PIGA Bias Failure	a. Absolute PIGA bias check fails. b. Restart alignment is initiated from SBNG without valid PIGA biases and high level seismic or NEP occurrence is detected prior to establishing valid PIGA bias. c. High level seismic or NEP occurs prior to the PIGA bias check during E1 bias cycle in initial alignment. d. If high level seismic occurs and initial conditions for PIGA leveling are not met.	
72	54	IMU Calibration Advised	a. System startup. b. Absolute PIGA bias check failure. c. Delta PIGA bias check failure. d. Entry to IMU calibration subfunction 1.	a. Successful delta RL check in IMU calibration subfunction 2. b. Note 2.

Note: All MOSRs are unlatched by initial alignment or commanded restart unless specifically stated otherwise.

Note 1: This MOSR is not unlatched by initial alignment or commanded restart.
Note 2: This MOSR is unlatched upon transmittal of the MOSR word if the fault condition is no longer present and a new fault change is not detected in the same MOSR word prior to unlatching.
Note 3: This MOSR is unlatched upon transmittal of the MOSR word if a new fault change is not detected in the same MOSR word prior to unlatching.

Table 6-9. GMR Descriptions

MSG BIT	GMR NO.	DESCRIPTION
23	1	Spare - Alarm.
24	2	Primary Power Failure/Battery Charger Failure - Alarm. GMR #2 reporting indicates that either the DC motor brushes have dropped and the LF motor-generator is operating on DC or the motor-generator voltage sensing relay K8 has detected LF battery voltage below 33 volts.
25	3	Standby Power On-Line-Alarm. GMR #3 indicates standby diesel is providing AC power and commercial power has been disconnected.
26	4	Battery Plus Side Fault-Alarm. GMR #4 reporting indicates that the A1K9 relay in the D-box has detected excessive current flow in the NCU power return lines caused by a fault from the positive side of the LF batteries to the LF ground.
27	5	Standby Power Failure-Alarm. GMR #5 reporting indicates that the LF MPP has detected a fault in the standby power generating/switching equipment and has activated the standby power failure relay in the LF interconnect box. Fault may be caused by a failure of the diesel to start, a failure to pickup the load, activation of a safety circuit after the diesel starts, or a failure in the automatic switching unit.
28	6	OGP Spare - No-Go.
29	7	R/V Warhead Safety - No-Go. GMR #7 reporting indicates that the programmer group has detected an open circuit in the R/V warhead safety monitor loop and has sequenced an LF shutdown.
30	8	R/V AFS No-Go - No-Go. GMR #8 reporting indicates that the programmer group has detected an open circuit in the R/V arming and fuzing safety loop and has sequenced an LF shutdown.
31	9	Missile Ordnance Not Safe - No-Go. GMR #9 reporting indicates that the programmer group has detected an open circuit in the loop that monitors the safe position of the missile ordnance safing devices and has sequenced an LF shutdown.
32	10	AVE No-Go - No-Go. GMR #10 reporting indicates that the guidance and control coupler has issued an AVE no-go signal to the programmer group and the programmer group has sequenced an LF shutdown. The AVE no-go signal may be initiated by the coupler due to a loss of normal and restart keep alive codes or by the DCU via character output codes to the coupler.
33	11	Ordnance Fault-Alarm/No-Go. GMR #11 reporting indicates that the programmer group has detected a ground ordnance fault character output issued by the DCU. The fault will be issued as a no-go if ground ordnance power is detected on when it should not be or if the CSD(G) 19th bit monitor remains true after missile test. The fault will be issued as an alarm accompanied by MOSR 20 and standby no-go indications as a result of ground ordnance discretes test failure during missile test. When issued as a no-go, the programmer group will sequence an LF shutdown.

Table 6-9. GMR Descriptions (Continued)

MSG BIT	GMR NO.	DESCRIPTION
34	12	NCU Overrun-Alarm. GMR #12 reporting indicates that the programmer group has detected an open contact of the A1K11 relay in the distribution box. The A1K11 relay is normally held energized by 18V power supplied through CB4 on the D-box. If NCU power is applied to the missile for a continuous period in excess of 22 seconds A1K10 energizes causing a high current fault to trip CB4 allowing A1K11 to open and report GMR #12. This fault prevents subsequent application of ground NCU power for missile test or launch.
35	13	Spare-Alarm.
36	14	SCS Not Safe-Alarm. GMR #14 reporting indicates that the programmer group has detected an open circuit in the SCS safe monitor loop.
37	15	Spare - Alarm. (SELM: SELM READY STATUS)
38	16	Spare - Alarm.
39	17	Programmer Group Fault-Alarm. GMR #17 reporting indicates that the programmer group fault monitor flip-flop in the A4 drawer is set at the conclusion of SCNT and its alarm/no-go monitoring capability is degraded.
40	18	CSD(G) No-Go or Alarm-Alarm/No-Go. A GMR #18 alarm reporting indicates that the programmer group has detected a CSD(G) off home condition. A GMR #18 no-go reporting indicates that the programmer group has detected a CSD(G) armed condition with the critical status override signal not true from the coupler and the programmer group has sequenced an LF shutdown.
41	19	Launch Enable Switch Not Safe - No-Go. A GMR #19 reporting indicates that the programmer group has detected the launch enable switch off the safe position and the CSD(G) is reset.
42	20	Circumvention Reset Fault-Alarm. A GMR #20 reporting indicates that the radiation detector in the 1201-A6 drawer has exceeded its threshold and issued an output. Under normal non-hostile operating conditions this would be due to a fault in the detection circuitry.
43	21	UHF Radio Fault-Alarm. GMR #21 reporting indicates that the programmer group did not receive the correct response from the UHF radio group during SCNT.
44	22	Message Processing Fault-Alarm. GMR #22 reporting indicates that the programmer group has detected a failure of one of the following message structure tests during transfer to the MGS and has terminated processing of that message: a) Initiator bit 5 is a space; b) Clear text allowed is false, crypto identifier bit 6 is a mark, and bit 55 is a space; c) clear text allowed is true, crypto identifier bit 6 is a space and bit 55 is a mark; d) clear text allowed is true, crypto identifier bit 6 is a mark and bit 55 is a space.
45	23	Message Retransmission Fault-Alarm. GMR #23 reporting indicates that the programmer group has detected an absence of tone on a transmit line during message transmission or retransmission.
46	24	Line Lost-Alarm. GMR #24 reporting indicates that the programmer group has detected an absence of tone on at least one input line for a continuous period of 26 ($\pm$5) seconds.
47	25	Temperature Abnormal, Guidance and Control-Alarm/No-Go. GMR #25 reporting as an alarm indicates that the Figure A 1214 G&C cooler has detected an out-of-tolerance resistance reading on the MGS thermistor. Nominal MGS temperature is 70.2 to 72.2°F and the alarm is set for an excursion beyond $\pm$ 0.5°F. GMR #25 reporting as a no-go indicates that the Figure A 1214 has detected an MGS temperature in excess of 90°F and the programmer group has sequenced an LF shutdown.

Table 6-9. GMR Descriptions (Continued)

MSG BIT	GMR NO.	DESCRIPTION
48	26	Equipment Inlet Air Temperature-Alarm. GMR #26 reporting that the ECS temperature monitor in the rack cooling air inlet has detected an out-of-tolerance temperature of the conditioned air.
49	27	Equipment Inlet Air Flow Abnormal-Alarm. GMR #27 reporting indicates that the ECS flow sensor in the duct to the equipment racks has detected a reduced air flow.
50	28	Launcher Temperature/Flow Abnormal-Alarm. GMR #28 reporting indicates that the ECS has detected a temperature condition in the launch tube outside of the range 60 - 80°F or a reduced air flow to the launch tube is detected.
51	29	Launch Tube Flooded-Alarm. GMR #29 reporting indicates that the water level in the launch tube sump has reached the high level sensor. A low level sensor activates the sump pump to remove the water before it reaches the high level sensor. GMR #29 indicates that the sump pump is unable to keep up with the rising water.
52	30	Missile Suspension System Pressure Fault-Alarm. GMR #30 reporting indicates that the pressure sensors in the suspension system liquid springs subsystem has detected a loss of pressure below tolerance limits.
53	31	Spare - Alarm (SELM: TCD GO STATUS)
54	32	GMR Identifier. GMR #32 does not report but is set to a mark in the message to identify it as a GMR.

Source: D25-65002, VOL V

6-8.5. Resync Inquiry (RSI). The RSI is sent by the DCU in response to an OSI when it has determined that it is out of crypto synchronization. The out of sync condition is determined if: (1) 240 (+ or - 5) seconds have elapsed since receiving a validated syncing message with a sequence count equal to or one greater than the stored count, or (2) 10 non-validated syncing messages are received non-contiguously, or if received contiguously, with adjacent messages having different LF addresses, without receiving a validating syncing message.

The DCU will also issue an RSI upon entry to remote and entry to initial alignment.

The RSI will contain the current LF value of the sequence count which will be saved by the DCU to use in extracting the new sequence count from the responding RSR.

6-8.6. IMU Performance Data Reply (IPDR). The IPDR message is sent to the LCF in response to OSI/OSI-AJs to provide performance data on the inertial measurement unit or to provide detailed fault data. The IPDR is transmitted in response to an OSI when data is available and data transmission is enabled. Data transmission is enabled as a function of initial alignment, entrance to standby no-go, or upon acceptance of an IPDC. Data transmission is disabled when the CSD(M) is armed or upon acceptance of an IPDH command. When standby no-go is entered or upon acceptance of a LF addressed IPDC while in SBNG, Fault Data Words (FDW) will be sent in IPDRs regardless of the state of the IPDR enabled indicator. Bias data will be sent in IPDRs periodically and following a bias cycle alarm or no-go. Bits 31 through 54 of the IPDR define IMU performance data or missile test failure data. Bits 23 through 30 contain a unique bit pattern to identify the system performance data word being transmitted.

6-8.7. Target Data Reply (TDR). The TDR is initiated by the DCU to report the authorization status for each of the five RDC data sets and the program data buffer, the buffer ID, and PLC-A/PLC-C effectivity status for each of the four target sets. The TDR is initiated by the DCU in response to an RDI during RDC not in process mode and to an OSI per the Table 6-4 priority rules following any of the following:

a. Acceptance of an addressed TVI.

b. Acceptance of an all-call TVI (after the TVR).

c. Occurrence of initial or restart alignment.

d. Acceptance of an RDCP command.

e. Abort of an RDCT during RDC In Process or RDT Accepted Mode.

6-8.8. Remote Data Reply (RDR). The RDR messages are generated by the target LF and the monitor LCF during RDCT operations. The RDR contains interim checkwords which confirm successful transfer of RDW data. Confirming RDR must be received before RDWs are transmitted for RDCT. RDRs following a block of RDWs must contain proper checksums before remote data change is allowed to continue or successfully terminate for RDCT. See Section VII for overall RDCT flow and timing diagrams. The RDR is sent by an LF in response to an RDI:

a. After acceptance of an RDCT to verify entrance into the RDC mode. The repeat bit in the RDR will be 1 set and the interim checkword will be zero.

b. Following transmission of a predetermined quantity of data words (RDW) for RDCT. The RDR contains the interim checkword and repeat bit (0 set if an RDW serial number is incorrect), and the RDC data set selected by the RDC entry command.

6-8.5. Resync Inquiry (RSI). The RSI is sent by the DCU in response to an OSI when it has determined that it is out of crypto synchronization. The out of sync condition is determined if: (1) 240 (+ or - 5) seconds have elapsed since receiving a validated syncing message with a sequence count equal to or one greater than the stored count, or (2) 10 non-validated syncing messages are received non-contiguously, or if received contiguously, with adjacent messages having different LF addresses, without receiving a validating syncing message.

The DCU will also issue an RSI upon entry to remote and entry to initial alignment.

The RSI will contain the current LF value of the sequence count which will be saved by the DCU to use in extracting the new sequence count from the responding RSR.

6-8.6. IMU Performance Data Reply (IPDR). The IPDR message is sent to the LCF in response to OSI/OSI-AJs to provide performance data on the inertial measurement unit or to provide detailed fault data. The IPDR is transmitted in response to an OSI when data is available and data transmission is enabled. Data transmission is enabled as a function of initial alignment, entrance to standby no-go, or upon acceptance of an IPDC. Data transmission is disabled when the CSD(M) is armed or upon acceptance of an IPDH command. When standby no-go is entered or upon acceptance of a MOSI while in SBNG, Fault Data Words (FDW) will be sent in IPDRs regardless of the state of the IPDR enabled indicator. Bias data will be sent in IPDRs periodically and following a bias cycle alarm or no-go. Bits 31 through 54 of the IPDR define IMU performance data or missile test failure data. Bits 23 through 30 contain a unique bit pattern to identify the system performance data word being transmitted.

6-8.7. Target Data Reply (TDR). The TDR is initiated by the DCU to report the authorization status for each of the five RDC data sets and the program data buffer, the buffer ID, and PLC-A effectivity status for each of the four target sets selected by each of the execution plan sets. The TDR is initiated by the DCU in response to an OSI per the Table 6-4 priority rules following any of the following:

a. Acceptance of an addressed TVI.

b. Acceptance of an all-call TVI (after the TVR).

c. Occurrence of initial or restart alignment.

d. Rejection of a command which initiates program data that is not contained in and authorized for use in the program data buffer.

e. Completion of the ITSC check.

f. Abort of an all-call RDCP operation.

g. Rejection of an RDCP command with the all-call allowed bit indicating all-call which selects program data that is already in the PDB and authorized.

h. Issued in response to an addressed RDI which followed an RDH and RDC sequence was not in process.

6-8.8. Remote Data Reply (RDR). The RDR messages are generated by the target LF and the monitor LCF during RDCT operations and by the focus LF during individually addressed RDCP operations. The RDR contains interim checkwords which confirm successful transfer of RDW data. Confirming RDR must be received before RDWs are transmitted for RDCT and individually addressed RDCP. RDRs following a block of RDWs must contain proper checksums before remote data change is allowed to continue or successfully terminate for RDCT and individually addressed RDCP. In non-RDC mode, the RDR is generated by an addressed LF in response to a CMVC and subsequent OSI and contains sum check data for each of the target and execution option sets. If the addressed LF has performed an overwrite, the RDRs will contain the overwrite sum check. The RDR and RVR contain the same function code and differ only in that the RDR contains interim checkwords and the RVR contains final checkwords or overwrite sums. See Section VIII for overall RDCT/RDCP flow and timing diagrams. The RDR is sent by an LF in response to an RDI:

a. After acceptance of an RDCT or an individually addressed RDCP to verify entrance into the RDC mode. The repeat bit in the RDR will be 1 set and the interim checkword will be zero.

b. Following transmission of a predetermined quantity of data words (RDW) for RDCT or individually addressed RDCP. The RDR contains the interim checkword and repeat bit (0 set if an RDW serial number is incorrect), and the last RDC data set selected by the RDC entry command.

SECTION VII - TIMING DIAGRAMS

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

7-1. SCOPE. This section defines and describes the timing constraints of the communications systems. For timing constraints of LF sequences refer to Section 2.

7-2. COMMUNICATION SYSTEM TIMING. The communications system uses digital diphase messages for status monitoring and launch control functions. A Minuteman squadron consists of 55 nodes (5 LCFs and 50 LFs) connected by an intrasquadron communication network. There are two communication modes used in the cable system; normal and anti-jam. During normal operation, each LF is interrogated once every 40 seconds. Therefore, status from all 50 LFs in the squadron is received within 40 seconds and this time is referred to as a "round-robin". The issuance of commands from any LCF will increase the round-robin time since LFs will respond only to interrogations. During the anti-jam mode, each LF will be interrogated once every 80 seconds. If a large number of commands are issued by LCFs during anti-jam, there is a possibility that "loss of communication" indications may occur randomly. The following paragraphs describe the method used to assure communication between all facilities (nodes).

7-2.1. Communication System Time Slots. Figures 7-1 and 7-2 illustrate the time slot mechanization used for system timing. The time slot system prevents transmission of messages by two or more nodes (LCFs) simultaneously and establishes a time sharing communication network. Time sharing is based on a network data rate of 1300 bits per second (bps). Figure 7-3 shows the relationship between digital diphase and a "mark" bit and "space" bit. Messages have been established to be 56 bits in length and by having each LCF assigned a dedicated time period of 2,048 bits in length provides optimum time for messages between an LCF and LF. This time period is called a time slot and five time slots comprise a time frame of 10,240 bits in length. Each LCF is normally assigned one time slot but is capable of using more time slots when conditions warrant such usage. Each LCF transmits only during its assigned time slot thereby eliminating interference with transmission by other LCFs. The LFs are not assigned time slots and only transmit after receiving an individually addressed message requiring a response. Refer to Section VI for more details on LF response priorities.

7-2.2. Launch Related Commands Operation. (See Figure 7-1.) Launch related commands consist of multiple message transmission in which the major part of the time slot is used for transmission of the preamble and 32 copies of the command. The launch related commands are: ELC, PLC-A sequence, PLC-B, ENC and INC. The ENTC message is treated as a launch related command since the function code is identical to an ENC. Transmission of a PLC-A sequence consists of a preamble followed by 16 PLC-A1's and 16 PLC-A2's.

7-2.3. Communications System Anti-Jam Mode. (See Figure 7-2.) The anti-jam mode of operation uses multiple message transmission and transmits a variable number of messages. Start of transmission has an intentional delay uncertainty of from 0 to 128 bits. The delay is followed by transmission of the preamble and 30 copies of launch-related messages, or 8 to 10 non-launch related messages. Transmission of a PLC-A sequence will consist of a preamble followed by 15 PLC-A1s and 15 PLC-A2s.

7-2.4. WSP-CMPG Serial Data Transfer. (See Figures 7-4 and 7-5.)

7-2.4.1. WSP Serial Channels - General. Operation of the CMPG-WSP serial channels is under control of the COP. The interface between the COP and CMPG provides for the transfer of command and status data between the COP and the Launch Facilities. The COP interfaces to the CMPG via the CMPG interface component of the WSP. The interface between the COP and CMPG interface consists of one discrete and three serial data channels. The discrete is the CMPG interface card reset. The three serial channels are the Cable Receive Data, the Transmit CMPG Data, and the Status Data. The Transmit CMPG Data serial channel is used to pass control and data to the CMPG interface from the COP. The Cable Receive Data serial channel carries messages to the COP from the CMPG interface. The Status Data serial channel is used to pass the status data to the COP from the CMPG interface, i.e., channel status sampled at the prescribed times for COP to perform communications analysis (see Figure 7-9 T1, T4, T10). Slot timing is maintained by COP through the use of time-stamped indications from the CMPG interface. COP uses these time-stamped indications to calculate future transmit times. The CMPG interface card directly controls the input/output serial interface by enabling the channels and providing gated timing signals to synchronize the data transfer between the CMPG and the WSP. Each WSP serial channel has three signal lines as follows:

a. A clock-type signal is supplied by the CMPG to each WSP serial channel which is used to synchronize the data being transferred to and from the CMPG.

b. A timing signal enabled by the WSP to the CMPG to transfer the desired number of bits of data.

c. A data line that carries the binary information across the WSP/CMPG interface.

7-2.4.2. WSP Input Serial Channel. The WSP input serial channel provides the receive serial data to the WSP from the CMPG. The WSP input serial channel timing is illustrated in Figure 7-4.

7-2.4.3. WSP Output Serial Channel. The WSP output serial channel provides the transmit data serial output to the CMPG. The WSP output serial channel which interfaces with the CMPG is illustrated in Figure 7-5.

7-2.5. Cable Data Input. The cable data receive serial input is a channel dedicated to incoming squadron traffic. It is through this interface that the WSP receives other LCFs commands/ interrogations and the LF reply messages. Local timing is synchronized with timing extracted from incoming cable data. Upon detection of cable sync by the CMPG, 53 bits of data and one filler bit are transferred to the WSP at 1300 bits per second. The timing diagram for cable message receive sequence is shown in Figure 7-6. During message reception, the CMPG monitors for the presence of digital diphase data. Should there be premature termination of an incoming message, the CMPG senses the loss of the digital diphase signal and issues a No Data interrupt to the WSP. Upon recognition of the No Data interrupt, the WSP drops the selected line and performs appropriate line lockouts. Figure 7-7 diagrams events associated with loss of input data. Figure 7-8 diagrams events associated with failure to receive cable sync within the allowable time.

7-2.6. Transmit Data Output. The transmit data serial output channel is used to transfer COP originated messages from the WSP to the CMPG for transmission on the cable network. The data on this channel consists of the preamble followed by:

a. A single encrypted or clear text message in the normal mode of operation (non-AJ).

b. Multiple messages, except PLC-A1/PLC-A2, in the normal mode of operation. With the possible exception of the slot sync bit and parity bits, all multiple messages are identical.

c. Multiple identical messages in the AJ mode, except PLC-A1/PLC-A2.

7-2.6.1. Message Structure. Refer to Section VI for a detailed discussion of message format. The 56th bit of each message is followed by a filler bit, a single space. The preamble consists of 56 marks. A message is composed of several parts:

a. The first 3 bit positions are used for the cable sync signal. The cable sync signal consists of a single cycle of 433-1/3 Hz symmetrical square wave.

b. Bit 4 is used as the slot sync indicator. The slot sync signal is only issued by the LCF operating in the first half of time slot "one", and only with the first message (subsequent message transmitted in time slot "one" shall not contain slot sync). Slot sync is designated by a "zero" (space) in bit 4. In the AJ mode of operation, bit 4 is always a "1" (mark).

c. Bit 5 designates the message originator. A "zero" designates LCF originator (except for LCF RDR), and "one" designates an LF originator or an LCF RDR.

d. Bit 6 is the crypto identifier. A "one" in bit 6 indicates message bits 7-54 are encrypted. A "zero" indicates a clear text message.

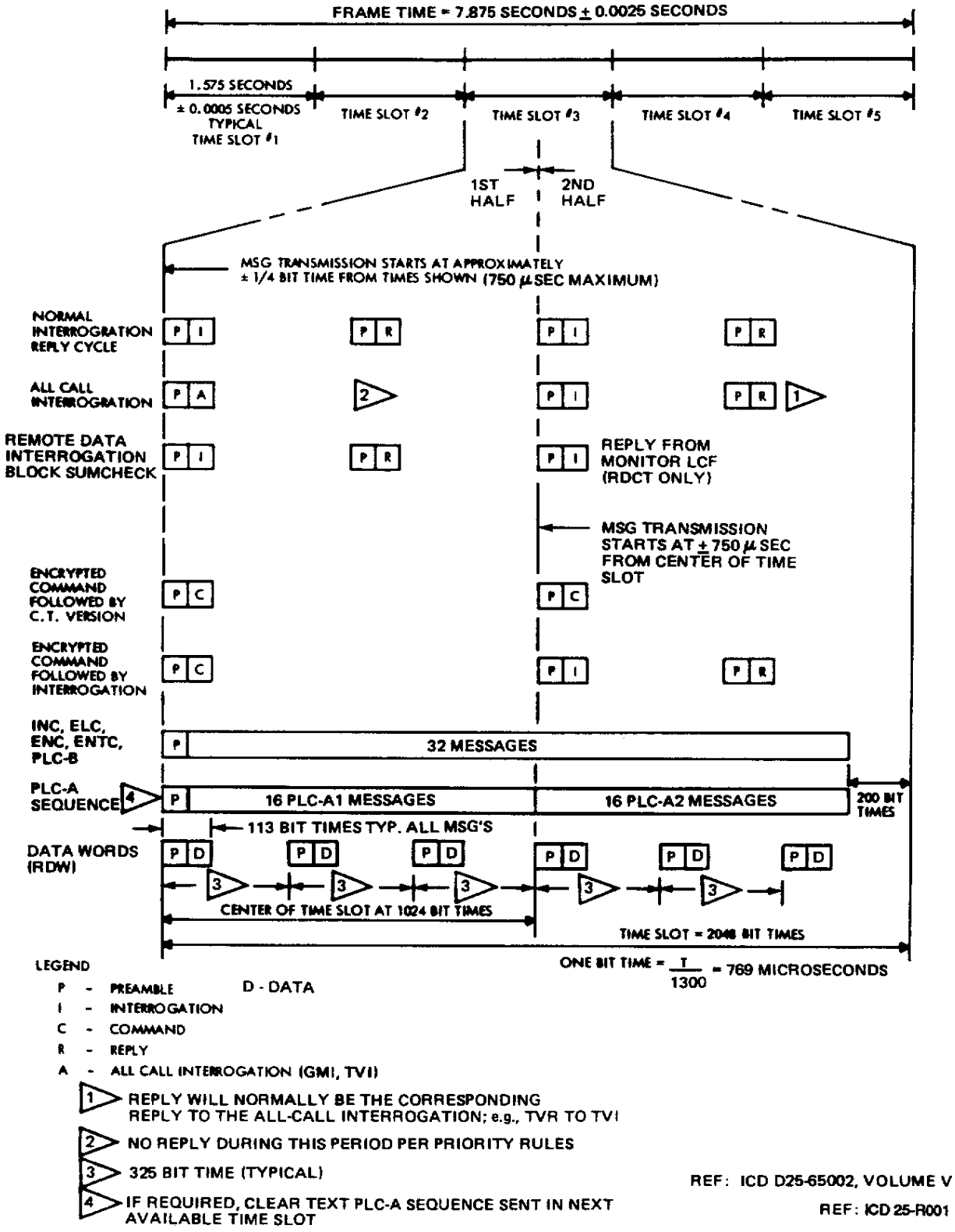


Figure 7-1. Basic Communication System Message Timing-Normal Mode

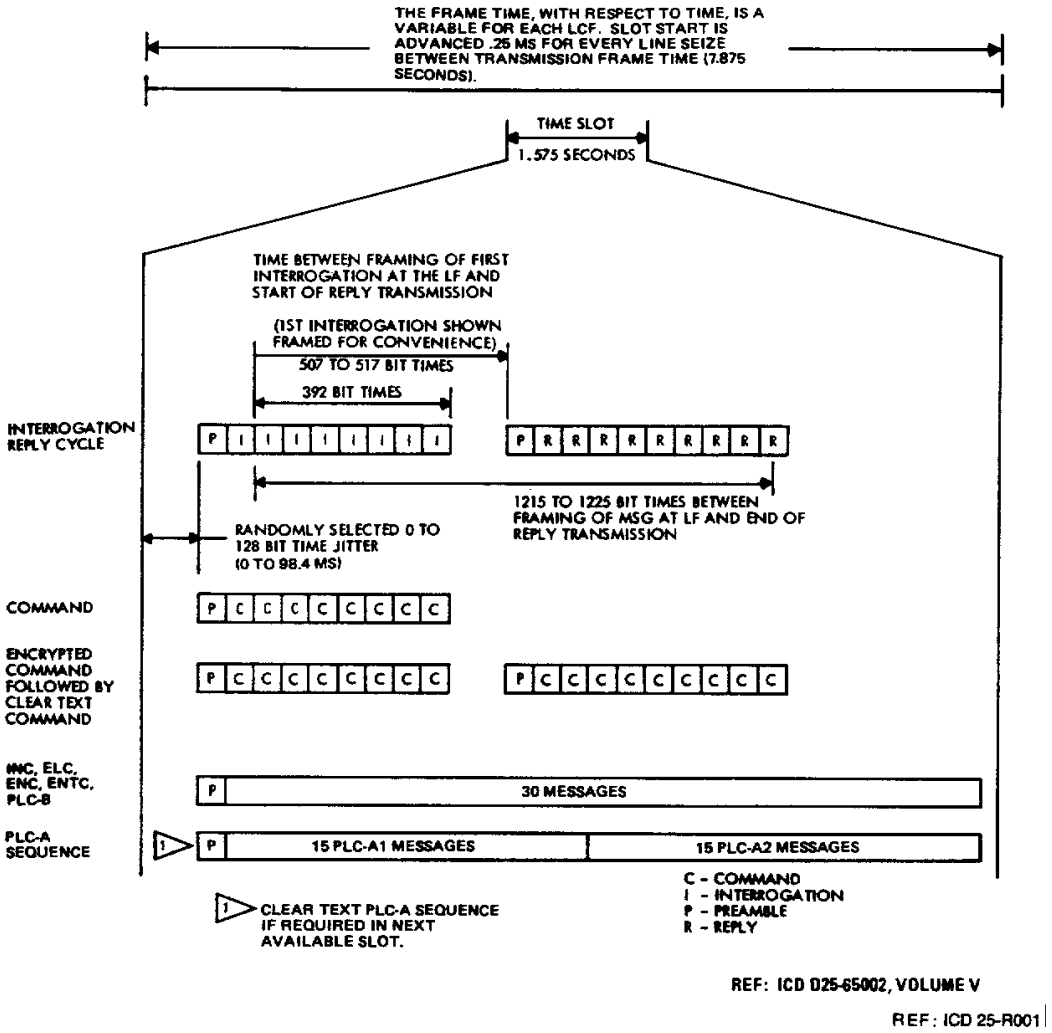


Figure 7-2. Basic Communication System Message Timing-Anti-Jam

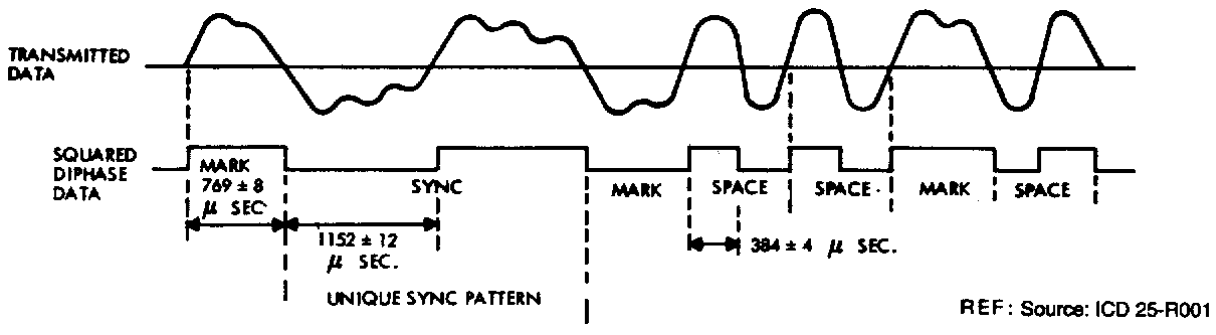


Figure 7-3. Communications System Diphase Timing

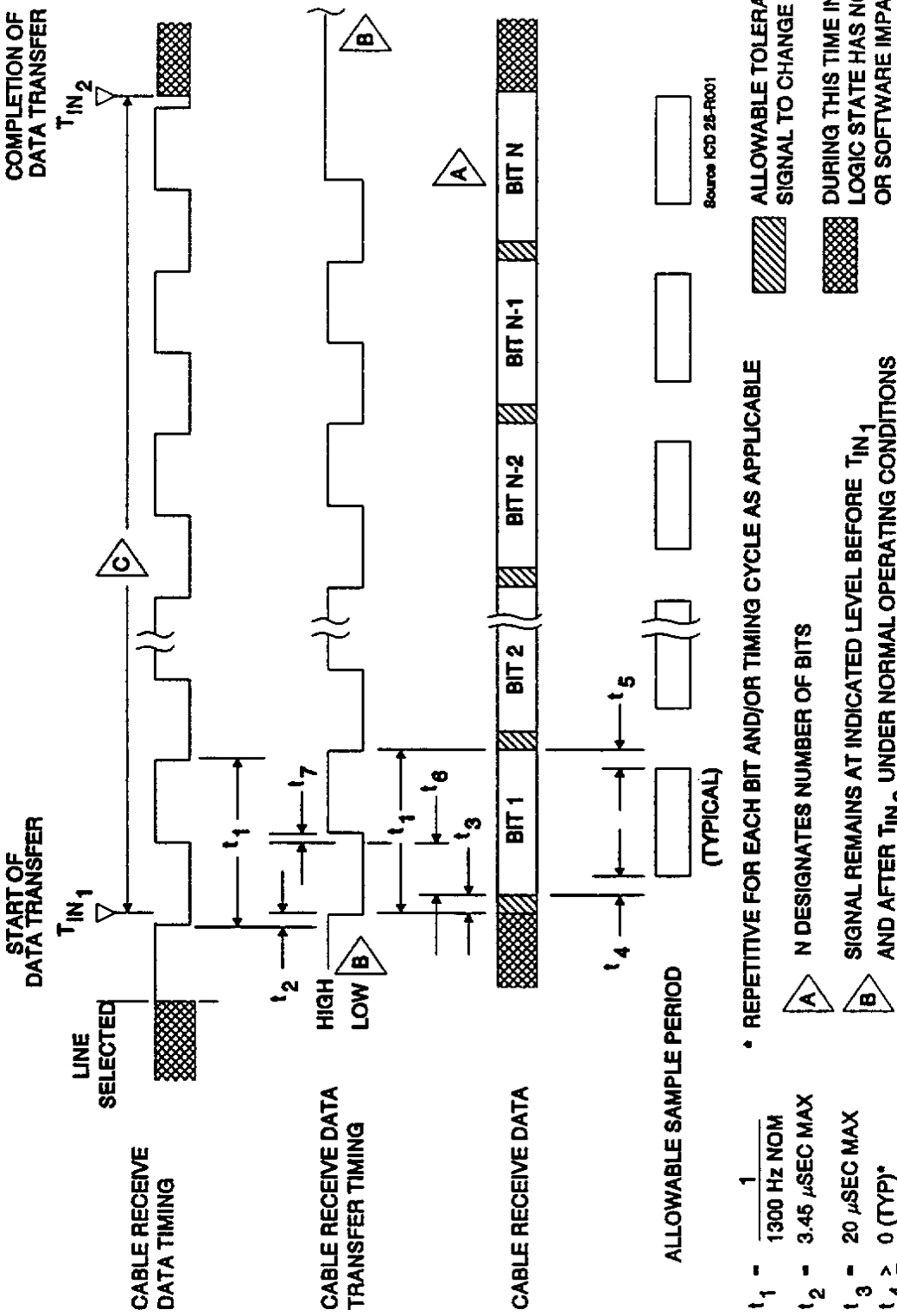


Figure 7-4. WSP-CMPG Cable Receive Data Serial Timing

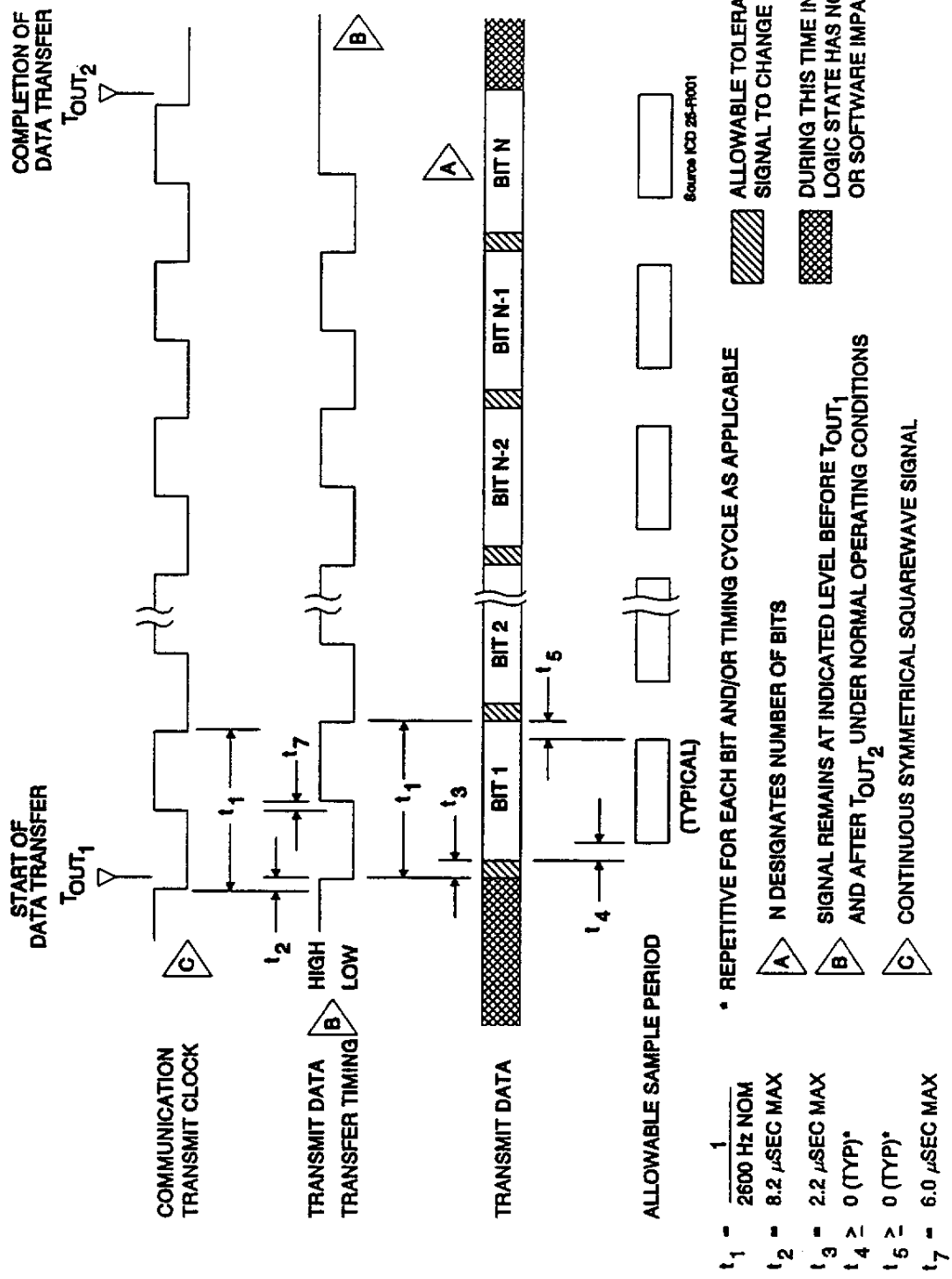


Figure 7-5. WSP-CMPG Transmit Data Serial Timing

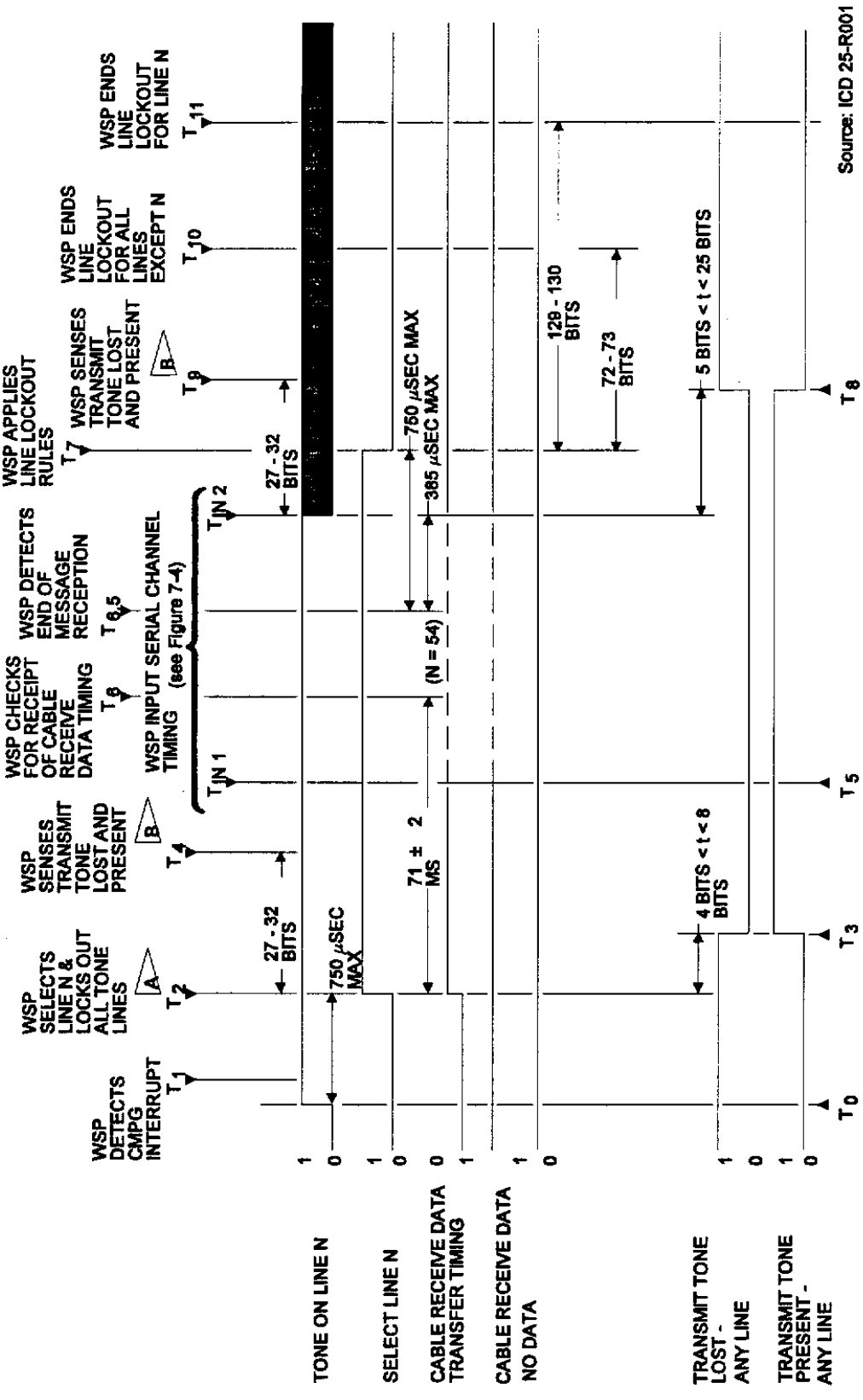


Figure 7-6. LCF Cable Data Input Timing

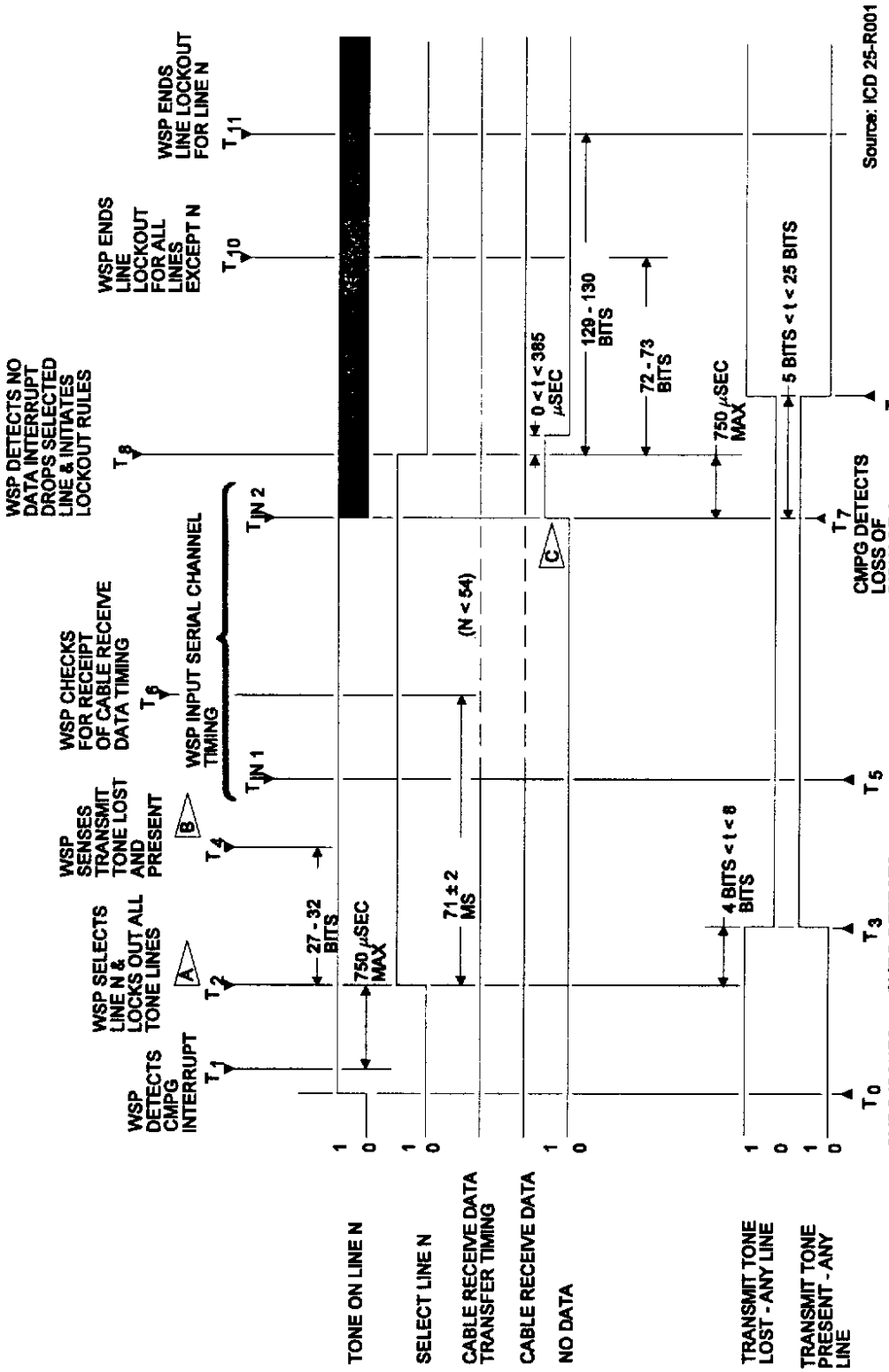


Figure 7-7. WSP-CMPG Loss of Cable Input Timing

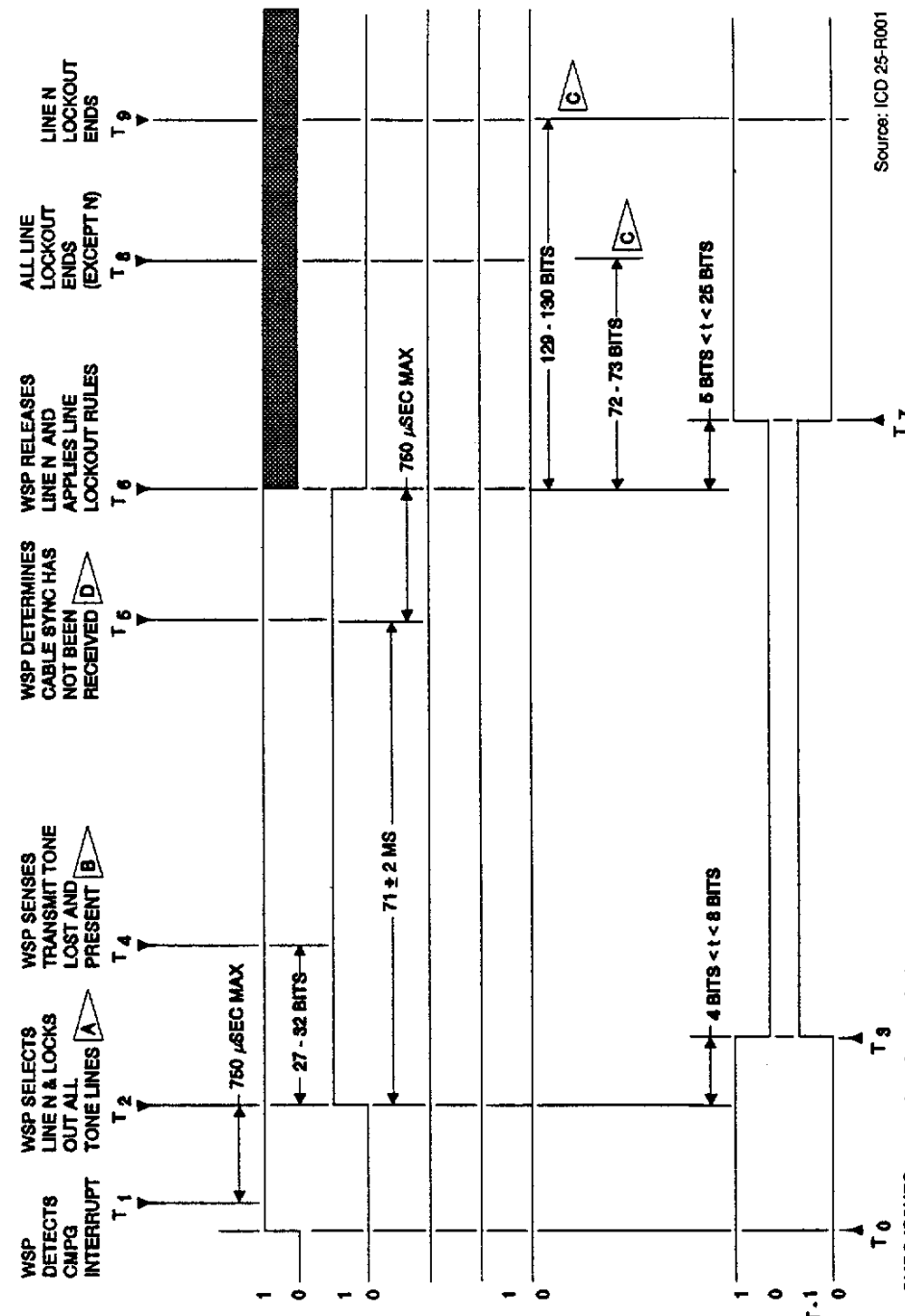


Figure 7-8. WSP-CMPG Cable Data Input Timing – No Cable Sync

e. Bits 7-54 contain function code, address and data information.

f. Bits 55 and 56 are used for error recognition to reduce the chance of processing erroneous messages. Bit 55 provides odd parity for bits 4-54, and bit 56 provides odd parity for all odd numbered bits from 5 to 55 inclusively.

g. Bit 57 is a filler bit and is used to assure that complete messages are recognized by receiving equipment.

7-2.6.2. Message Timing. The Minuteman data transmission system uses a digital diphase signal at 1300 bps. A "zero" is represented by a cycle of 1300 bps symmetrical square wave signal (with no phase reversal). A "one" is represented by a cycle of 1300 bps signal with a 180^{o} phase reversal during the second half of the bit (thus a group of "ones" appear as a 650 bps symmetrical square wave). The transmit data signal can be viewed as nonreturn to zero data at a 2600 bps data rate. Thus two successive bits of transmit data signal are used to define each bit of 1300 bps digital diphase signal, and 6 transmit data bits are used to define the cable sync signal. The relationship between the transmit data signal and squared diphase is:

Transmit Data	Squared Diphase
10	Mark (one)
11	Space (zero)
100 100	Cable Sync

The phase of the digital diphase signal is dependent on the preceding signal (either a data bit or cable sync). The preamble and cable sync at the beginning of a transmission always have the same relationship. If a multiple message transmission operation is taking place, subsequent cable sync and message waveforms following the first message are dependent on message content. Figure 7-9 is a timing diagram for WSP transmit data serial output channel.

7-2.7. SDU Data Input/Output Transfer. Figures 7-10 and 7-11 illustrate timing related to SDU data input/output transfer timing. The diagrams depict timing on three of the eight functional lines at the SDU/WSP interface. These functional lines are as follows:

a. SDU Data In. A serial input which the COP uses to transfer serial data into the SDU at 99.84 kilobits per second.

b. SDU Data Shift Pulse. A timing input to the SDU at 99.84 kilohertz which the WSP uses to synchronize the shifting of serial data into and out of the SDU. Serial data word length is 48 bits.

c. SDU Data Out. The SDU serial output which the COP uses to extract serial data from the SDU at 99.84 kilobits per second. This interface will also be active during transfer of data into the SDU.

7-2.8. DCU Input Timing. (See Figure 7-12.)

7-2.8.1. EGS Message Transfer Timing. Following the transfer of an incoming message from the EGS to the DCU, the DCU will respond within 100 ms of receipt of the last bit of data sent by the EGS with a CME pulse. The CME pulse allows subsequent messages to be sent to, and accepted by, the DCU. In the event the CME pulse is not received by the EGS, no further received messages will be transferred to the DCU for a minimum period of 191 ms from the start of the preceding transmission to the DCU. Once the EGS timer expires or the CME pulse true-to-false transition is received, the EGS is free to send the next complete message to the DCU at any time.

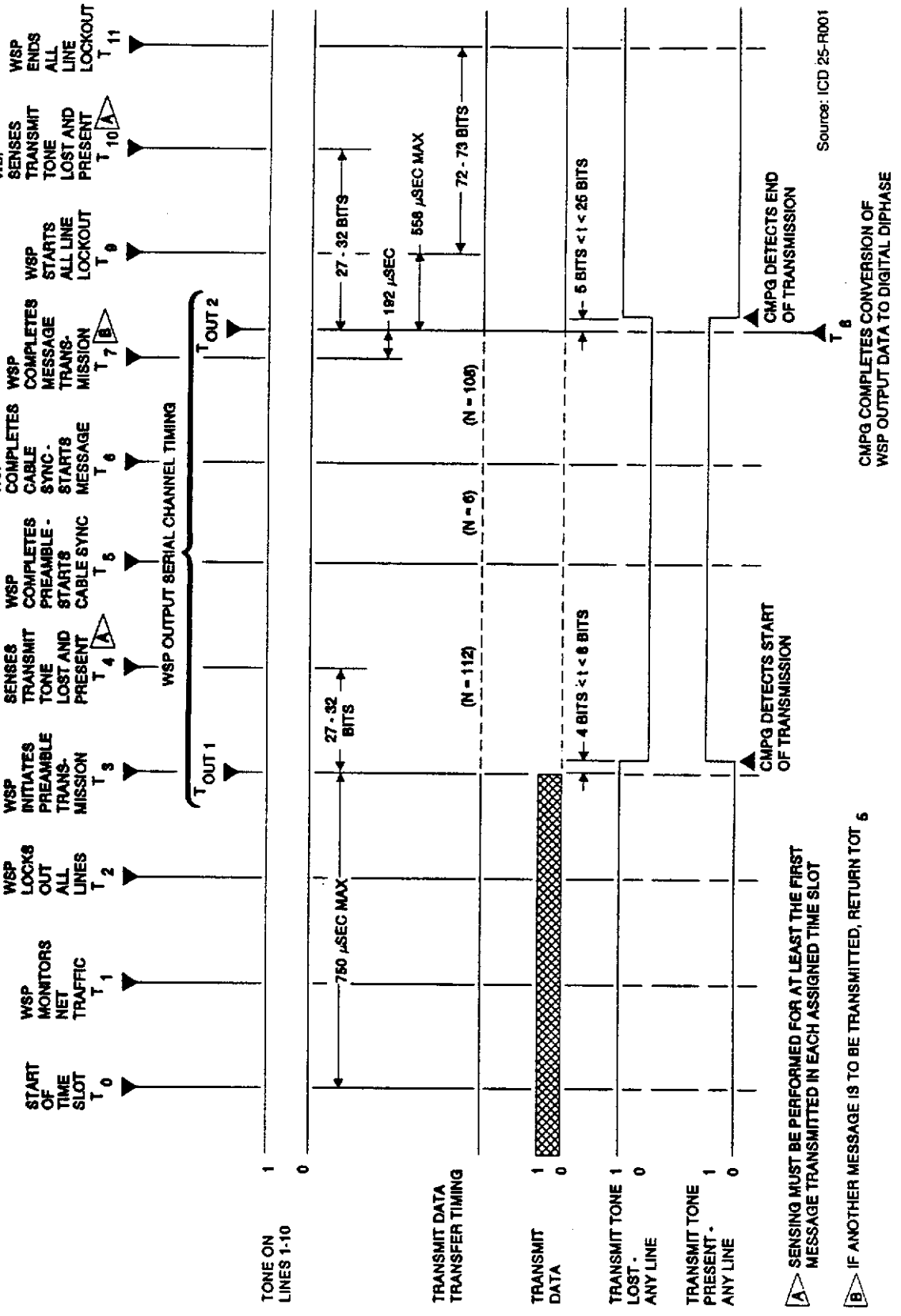


Figure 7-9. WSP-CMPG Transmit Data Channel Ouput Timing

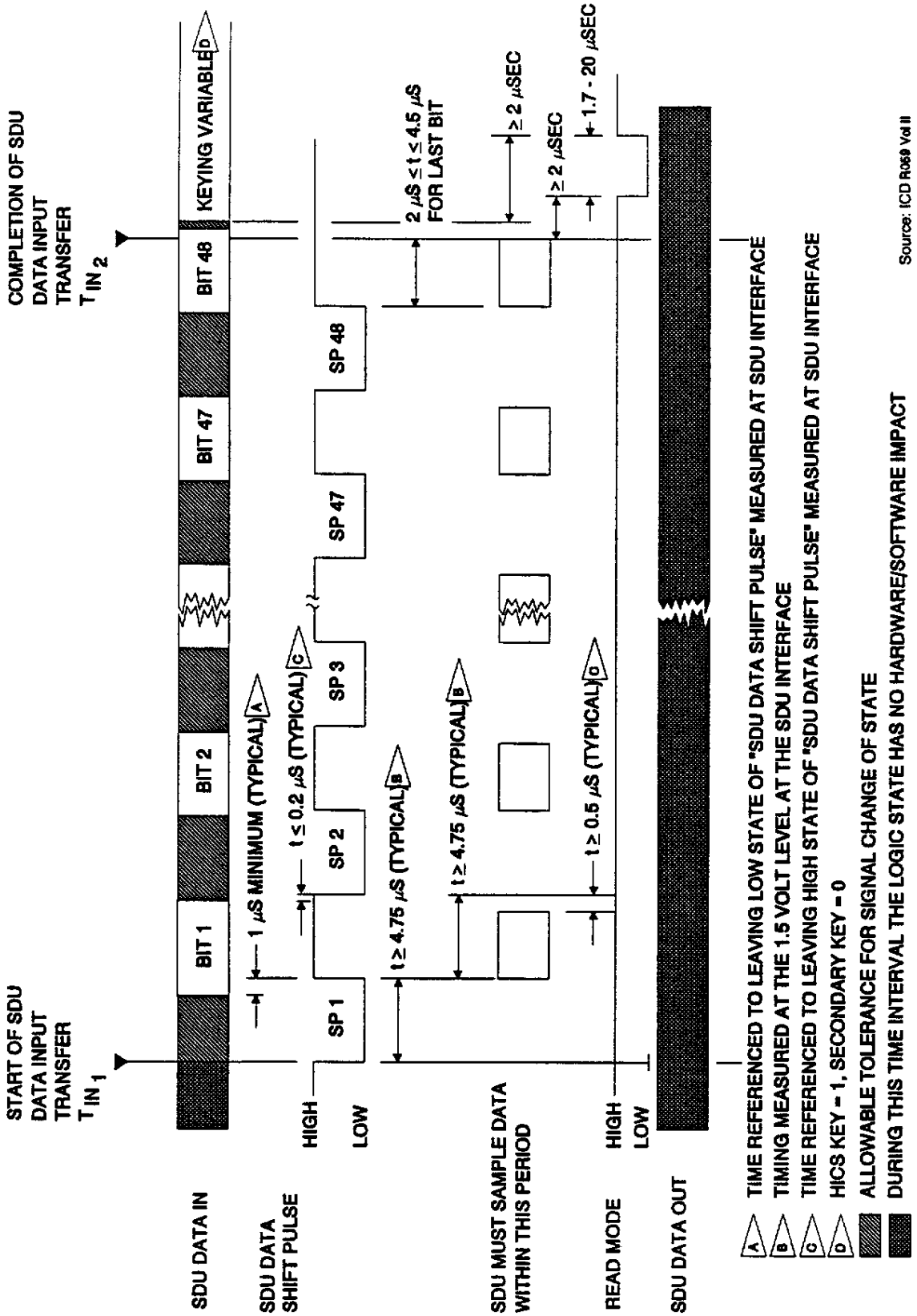


Figure 7-10. SDU Data Input Transfer Timing

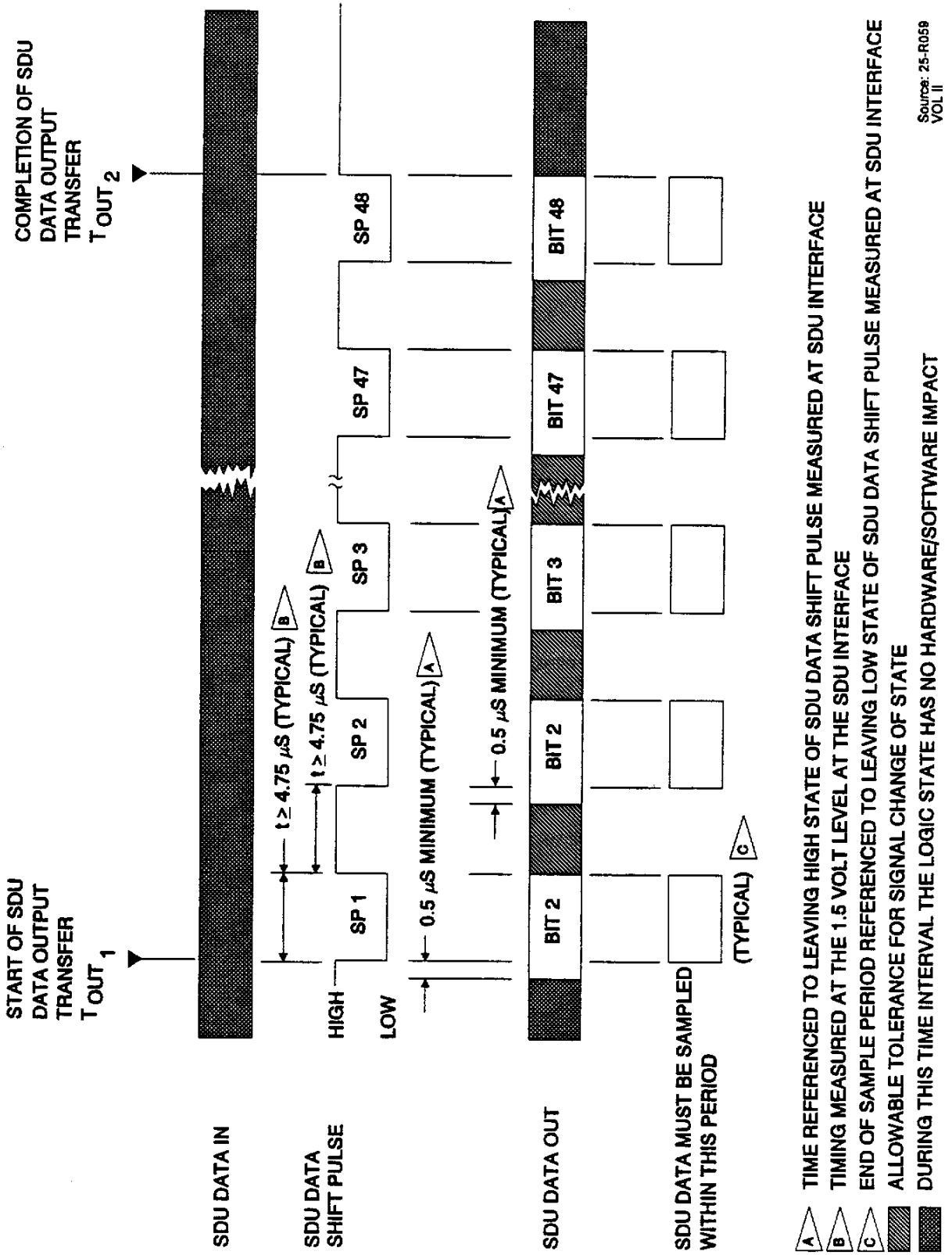


Figure 7-11. SDU Data Output Transfer Timing

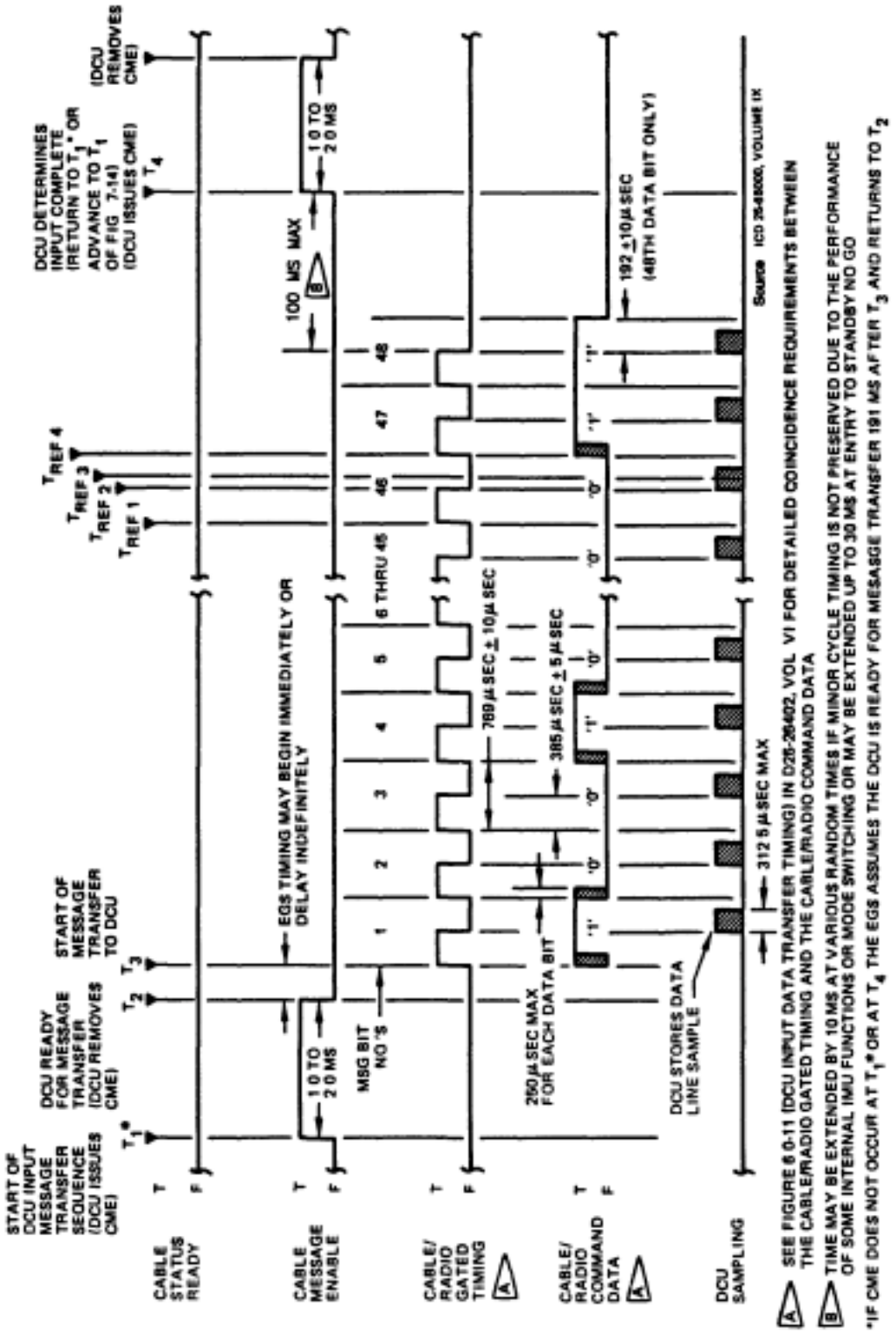


Figure 7-12. DCU Input Timing

7-2.8.2. DCU Message Timing. The message rate to the DCU is 1300 bps which is determined by the cable/radio gated timing pulse. The EGS provides data transitions on the cable/radio command data line within 250 microseconds of the false-to-true transition of the cable/radio gated timing pulse. The input message is shifted into the DCU input buffer (C-Loop). When the C-Loop has received a 48 bit message, the input is inhibited until the occurrence of a CME pulse true-to-false transition. The cable/radio gated timing pulses are sampled by a decrementing bit counter initialized at 47 (U-Loop). When the U-Loop reaches a negative count, it automatically inhibits additional message bits from entering the C-Loop.

7-2.8.3. DCU Message Processing. The DCU checks at a 90 ±10 ms rate for a complete 48 bit message transfer. When a 48 bit message transfer has been completed, the DCU will issue a CME and process the message.

7-2.8.4. EGS Input Timing. When the EGS is shifting data to the DCU, the EGS must stop sending timing pulses to the DCU within 300 microseconds after the false-to-true transition of a CME pulse. At the trailing edge of the CME pulse, the EGS may begin sending a new message or delay indefinitely before sending a message to the DCU.

7-2.8.5. DCU Input Message Transfer (Extra Timing Pulses). During DCU input timing, it is possible that the DCU may receive more than 48 timing pulses. If this occurs, the input of message bits into the C-Loop after the 48th bit is inhibited by the U-Loop. The DCU will always accept the first 48 bits sent after a CME is sent to the EGS. If extra bits precede the actual message, they will be used as the first bits of the message.

7-2.8.6. DCU Input Timing - Incomplete Message Transfer. (See Figure 7-13.) Every 90 ±10 ms the DCU checks for a complete 48 bit message transfer. If the transfer is complete, a CME pulse is issued and the DCU is then ready to accept a new message. If the transfer is not complete and all received messages have been processed, the computer checks to determine if cable/radio gated timing pulses are being transmitted from the EGS to the DCU. If they are, it means a message transfer is in process. If they are not, and one to forty-seven timing pulses have been detected: (1) the received data bits will be rejected, (2) a CME pulse will be issued within 190 ms of the receipt of the last received cable/radio gated timing pulse, and (3) the DCU is then ready to accept the next message.

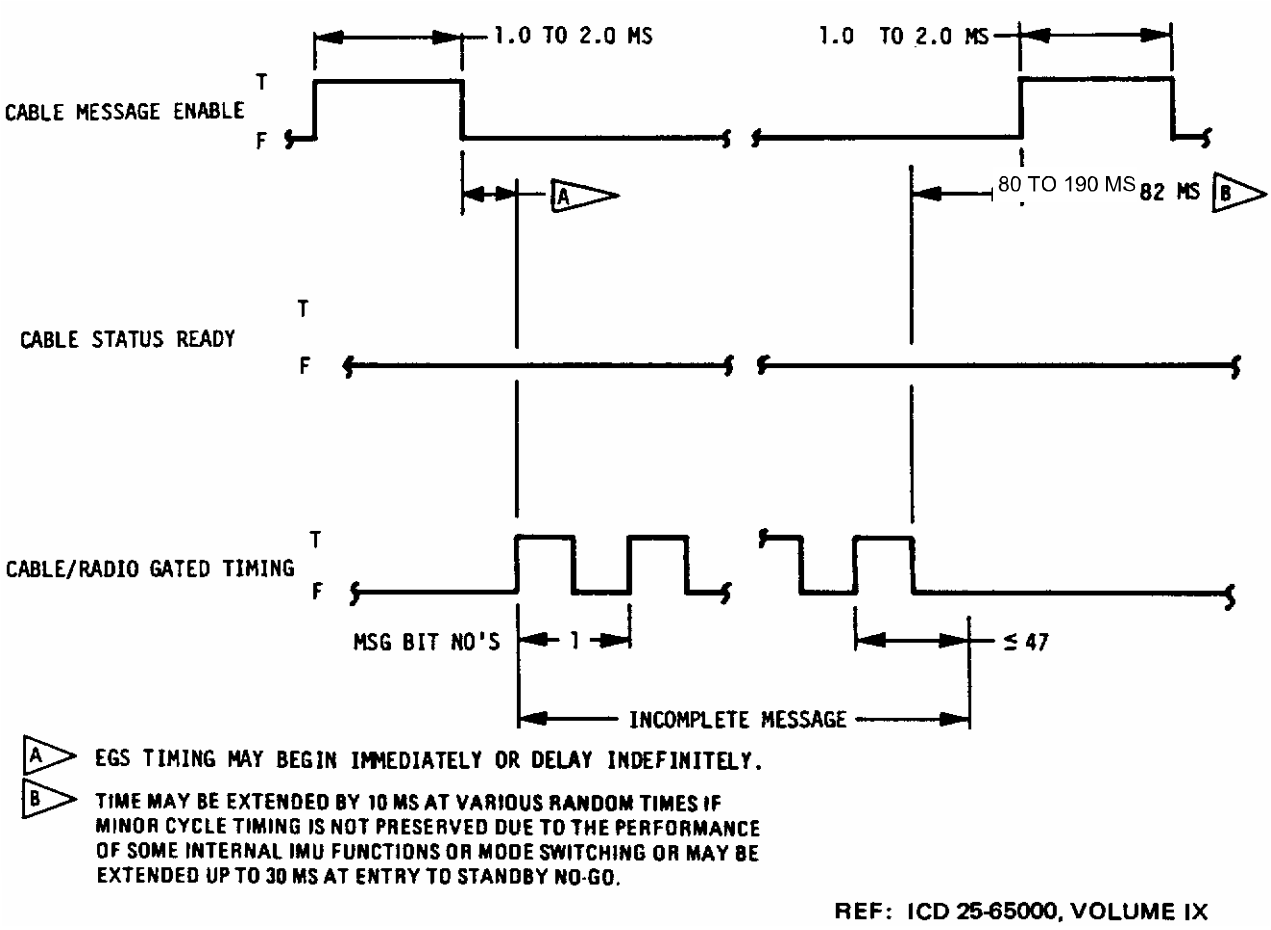


Figure 7-13. DCU Input Timing (Incomplete Message Transfer)

7-2.9. <u>DCU Output Timing</u>. (See Figure 7-14.) An output message is formed in response to an individually addressed interrogation message. An output CME pulse (T_1) is generated 1.2 to 44 ms after issuance of the received message CME pulse (T_0) and is accompanied by a cable status ready signal. The occurrence of the output CME and CSR signals indicates that data has been placed in the DCU output buffer and is ready for transfer. Cable/radio gated timing (C/RGT) is initiated within 3 ms of the true-to-false transition of the CME pulse.

a. Forty-nine timing pulses are sent to the DCU by the EGS and the EGS samples the first 48 data bits at the true-to-false transition of the timing pulses. Subsequent to the 47th timing pulse, the CSR line goes false as shown in Figure 7-14. The DCU data line must be false prior to EGS sampling during the 48th and 49th C/RGT pulse periods as shown in the figure.

b. Within 100 ms after the initiation of the output CME pulse, a second CME pulse (T_2) is generated, which indicates re-establishment of the DCU and the EGS in the input mode.

c. The first output bit is set at the interface at the time CSR is set true. The EGS samples the interface within a time frame of 134 microseconds prior to the true-to-false transition of C/RGT until 80 microseconds after this transition. The DCU updates the interface no sooner than 315.4 microseconds and no later than 625 microseconds after this true-to-false transition of C/RGT.

7-2.9.1. DCU Output Timing - Incomplete Message Transfer. (See Figure 7-15.) While a message is being transferred from the DCU to the EGS, it is possible that the required number of timing pulses may not be transmitted to the DCU, or the DCU may not detect the required number of timing pulses. In either case, a partial message is left in the EGS. To prevent remaining in the output mode following an incomplete transfer, the DCU will issue a CME pulse and turn off the CSR signal 36 to 100 ms following the initiation of the CME pulse at T_1.

7-2.9.2. DCU Output Data Sampling. The 1300 bps Cable/Radio Gated Timing (C/RGT) line is sampled by the DCU every 2.9 microseconds except from the time the transition from the True state to the False state is detected until the C-Loop in the DCU begins shifting by one bit. The detection of a False to True transition of the C/RGT line sets up the DCU for the detection of the True to False transition. Detection of the True to False transition then inhibits further sampling of the C/RGT line. Every 312.5 microseconds, the DCU checks to determine if a True to False transition of the C/RGT line has been detected. If it has, the C-Loop in the DCU begins shifting by one bit. At the next 312.5 microsecond point, the shift is complete and an output data bit is shifted from the C-Loop into the output buffer where it is available for sampling by the EGS.

7-2.10. DCU/EGS Message Traffic. Figure 7-16 illustrates isolated addressed interrogations [A] and isolated commands or non-addressed interrogations [B] along with resulting Cable Message Enable (CME) pulses and Cable Status Ready (CSR) signals. When message traffic is light, messages will be isolated as shown at [A] and [B] in the Figure. However, the DCU is also capable of accepting a high message rate for OSI/OSI-AJ, TVI, MOSI, INC, ELC, SCNT, PLC-A, PLC-B, MCC, MTC, SATCC, AHC, ENC, ENTC, RSR, IPDC, IPDH, RDI, RDC, RDA, RDH, RDT, PGLC, CMVC, RDW, OWT, and OWC messages as shown in [C] through [H] in Figure 7-16. In the Figure, note that some messages can be ignored. Each example begins with a quiet system.

a. Following the transmission of an addressed interrogation from the EGS to the DCU, a second message will not be transmitted during the time period in which a reply is expected (270 ms maximum). Conditions which cannot exist are shown in Figure 7-16, [I] and [J].

b. Replies can occur every 90 ±10 ms if addressed interrogations are received every 90 ±10 ms during the DCU input cycles. The CME and CSR associated with a reply will occur between 39 and 134 ms after the leading edge of the CME associated with the addressed interrogation which caused the reply. In addition to the other constraints, the following also apply:

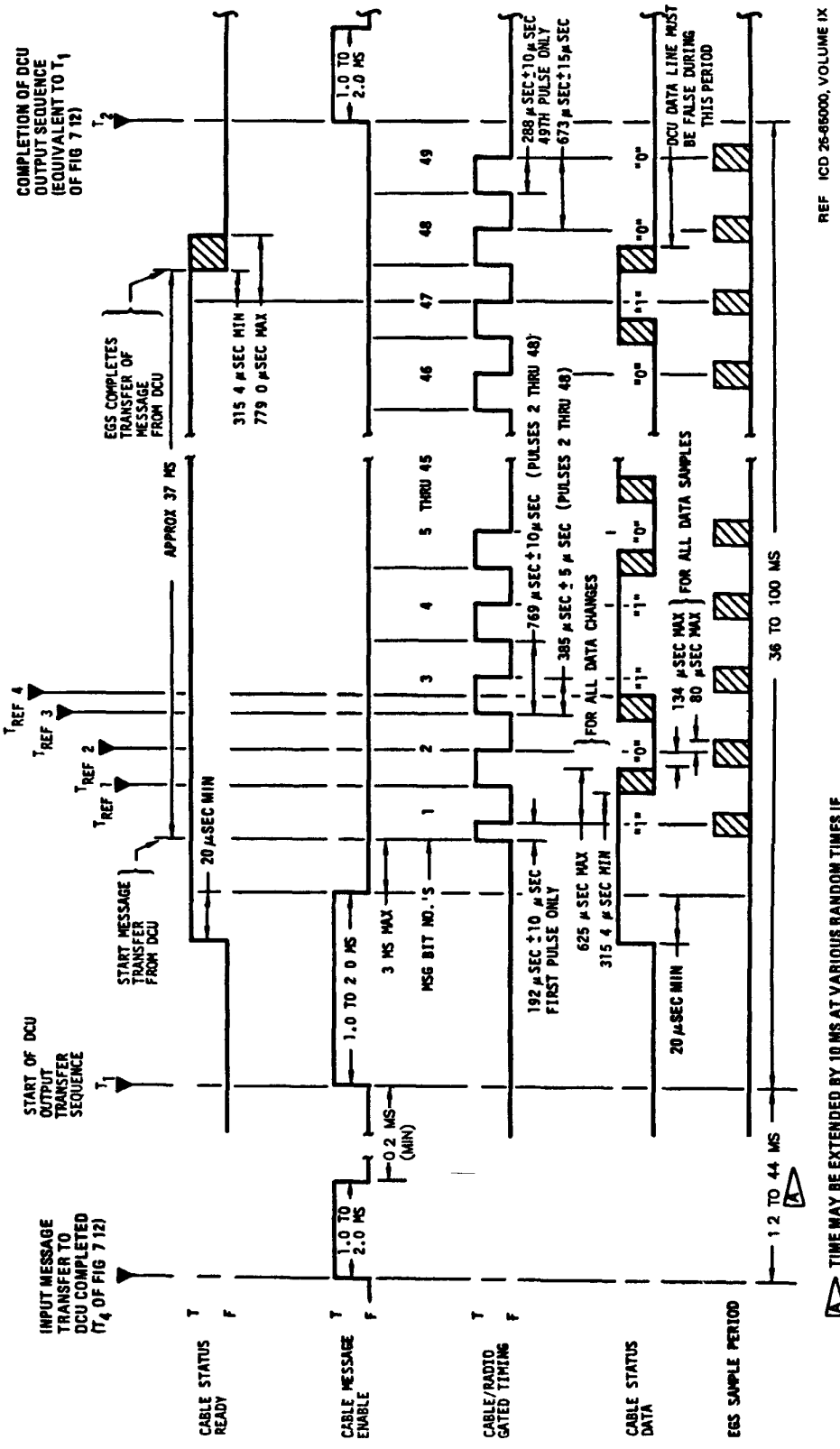
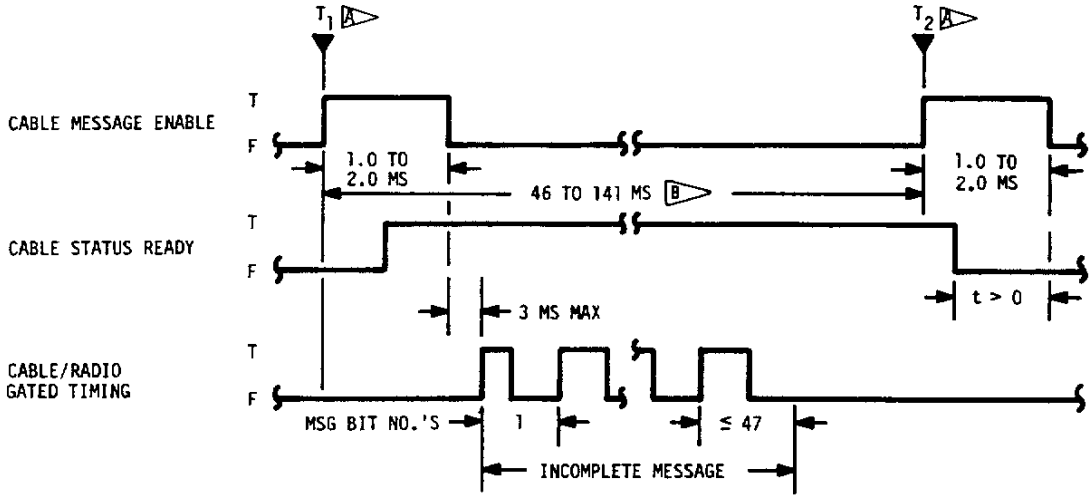


Figure 7-14. DCU Output Timing



A REF. FIGURE 7-14

B TIME MAY BE EXTENDED BY 10 MS AT VARIOUS RANDOM TIMES IF MINOR CYCLE TIMING IS NOT PRESERVED DUE TO THE PERFORMANCE OF SOME INTERNAL IMU FUNCTIONS OR MODE SWITCHING OR MAY BE EXTENDED UP TO 30 MS AT ENTRY TO STANDBY NO-GO.

Source: ICD 25-65000, VOLUME IX

Figure 7-15. DCU Output Timing (Incomplete Message Transfer)

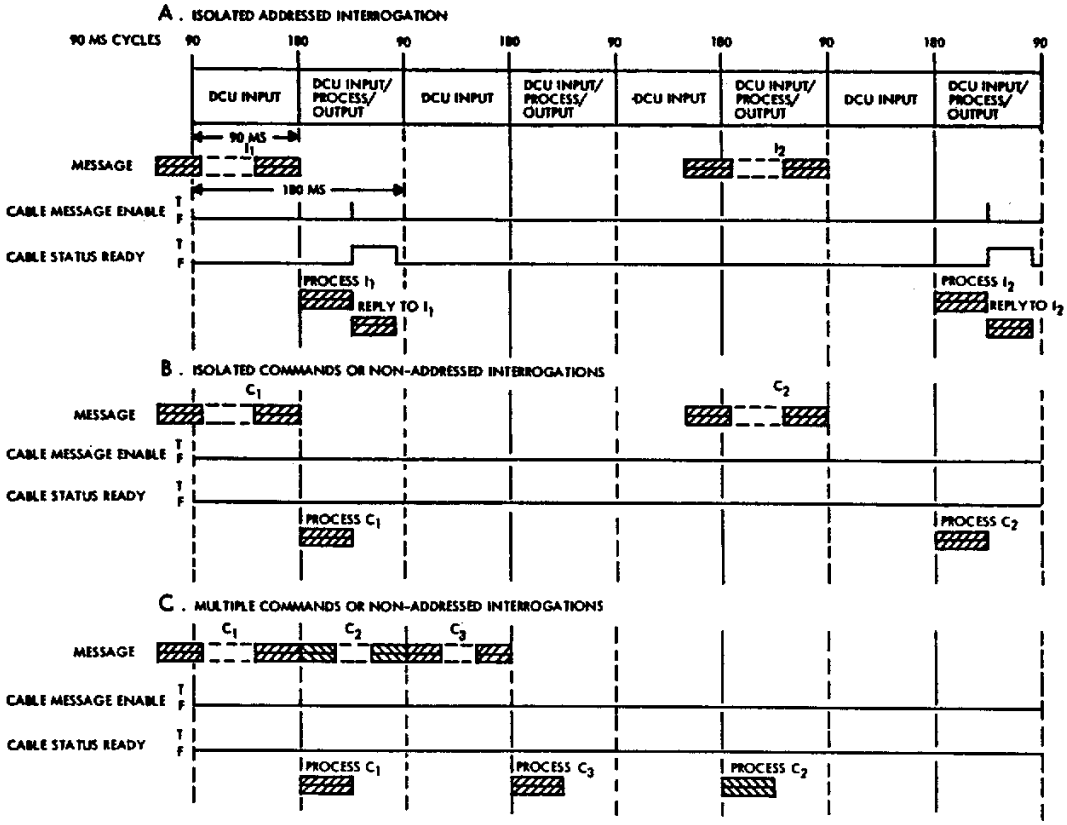
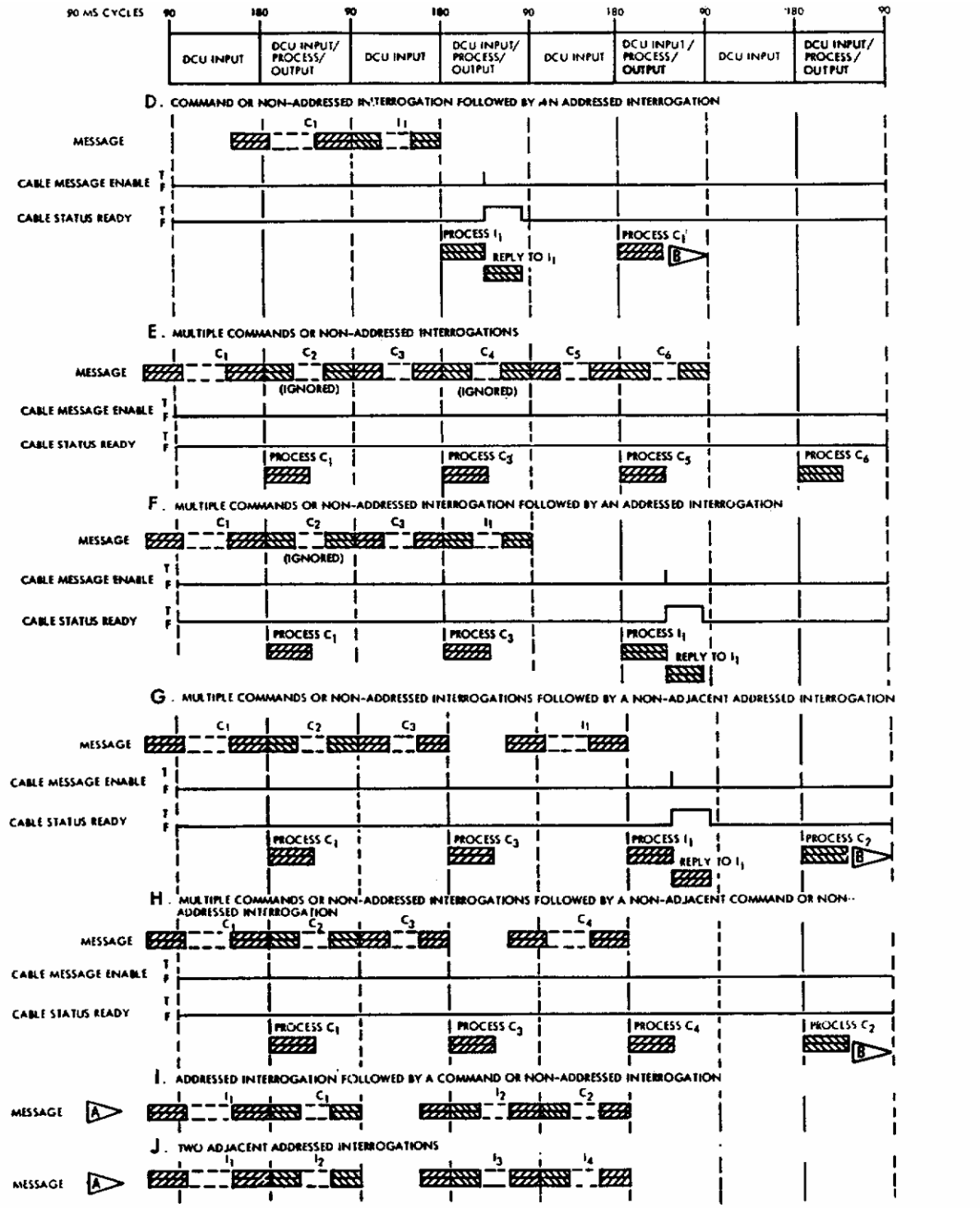


Figure 7-16. DCU/EGS Message Traffic (Sheet 1 of 2)



A This sequence cannot occur as a result of EGS hardware design.

B Message will not be processed if operating in encrypted mode and previous message was an interrogation containing an updated sequence number

Source: ICD 25-65000, VOLUME IX

Figure 7-16. DCU/EGS Message Traffic (Sheet 2 of 2)

(1) During light message traffic (fewer than 5 messages per second), all messages except ENC and ENTC will be fully processed within 224 ms of receipt of the last bit of the message.

(2) Upon receipt of a valid individual addressed OSI/OSI-AJ, TVI, MOSI, or RDI, the DCU processes the message within 224 ms, including turn-on of the cable status ready signal, signifying availability of the reply.

(3) If the message is a non-addressed OSI/OSI-AJ it is fully processed within 224 ms. However, the DCU will not reply to a non-addressed OSI/OSI-AJ.

(4) The ENC or ENTC require 10 seconds to be fully processed. While the ENC or ENTC is being processed, other commands and interrogations will be processed.

(5) When two messages have been received, and the first had not been processed, the last received message will be processed first.

7-2.11. RDC Operation (RDCT/RDCP).

7-2.11.1. RDC Time Slot Operation. The commands, interrogation and data messages for the remote data change function utilize the time slots in a unique manner. A typical RDC message sequence is shown in Section VIII.

7-2.11.2. RDC Operation - DCU. A typical RDCT operation is shown in Figure FO 7-17. The RDC operation (RDCT/RDCP) starts at time T_0 in a non-RDC mode. When the RDC command is received, it is processed by the DCU to verify that the validation and acceptance criteria have been met. If the RDC command is accepted, the DCU will enter the RDC In Process mode. For an RDCT, the DCU response to an RDI will be an RDR. A data block, consisting of a predetermined number of RDW's, is received by the DCU followed by an RDI. The DCU performs the CMVC calculation as each RDW is stored. The DCU will then respond with an RDR at time T_8, containing an interim checkword which contains the least significant 24 bits of the arithmetic sum of the data bits in the data words accepted in the preceding data block. If a data block is repeated, the last value received for a data word will be used in the interim checkword calculation. The RDW-RDI-RDR cycle is repeated until all data is transferred and received.

a. Upon acceptance of an RDT during an RDCT operation, the DCU updates the RVR with the final checkword (CMVC). OSR's will contain "RDT Accepted" status. Once the CMVC is available, the next two OSIs or OSI-AJs will be answered subject to the response priority rules, with an RVR containing the final checkword (CMVC result). When the RDA message is received and validated, subsequent OSRs will contain the "RDC Not In Process" status if the RDA is accepted or will continue to contain "RDT

Accepted" status if the RDA is rejected. To be acceptable, the RDA must satisfy the validation and acceptance criteria and the 24 bit code must be the "half added" sum of the CMVC code and the first successful interim block checkword of the data set.

b. The only normal exits occur when for RDCT the DCU accepts the RDA command and the data set is authorized for use. After taking an error exit, the DCU will insure that the data set undergoing change remains. The only commanded error exit is via the RDH command. The DCU will initiate an error exit if:

(1) Crypto Sync is lost.

(2) An RDT is accepted before the data set is complete.

(3) Too many data words are received.

(4) Local Mode is entered.

(5) Overwrite In Process is entered.

d. The DCU will always report "RDC Not In Process" in the OSR following an RDC error exit.

7-2.12. AM Lockout Rules. To prevent system "ringing"; that is, the continual retransmission of messages within the squadron; line lockout rules are incorporated in the communication network. The lockout rules also prevent a jammer from gaining control of the communication network.

7-2.12.1. LF Line Seize. When tone is detected on an incoming line, that line will be seized and will remain seized. Line seize will be terminated upon occurrence of one of the following:

a. Message sync has not been detected within 88 to 90 bit times (67.6 to 69.2 ms).

b. The received signal loses diphase characteristics.

c. Tone on line has been lost for 3 to 15 milliseconds.

d. A complete message (53 bits following 3 bits of cable sync or 49 bits following 7 bits of radio sync) has been received and processed on messages received on a non-parent line (lines connected to another LF).

e. 320 to 368 milliseconds has elapsed and bit 56 of the last message has been processed on continuous diphase data received on the parent line (line connected to the LCF).

7-2.12.2. LF Line Lockout Rules. When a line is seized, all other incoming receive lines are locked out to inhibit receipt of redundant diphase data. When the seized line is released, additional lockout times will be applied as follows:

a. All incoming lines shall be locked out for 72 to 73 bit times (55 to 56 ms).

b. The line that was seized shall be locked out for an additional 57 bit times (44 ms).

c. All receive lines will be locked out for 56 milliseconds after transmission of locally initiated messages.

7-2.12.3. LCF Line Lockout Rules. Subsequent to the inputting of the Tone on Line Discretes, the WSP examines each line in sequence starting from the next line from the line which was last seized. A line will not be examined if it is in last line lockout. The first line on which tone detected is seized and gated to the demodulator in the CMPG. All other lines are then locked out. When the CMPG detects the cable sync signal on the selected line, the message bits are clocked into the WSP.

The WSP controls message reception at the LCF. There are ten Tone on Line signals which are monitored for presence of tone by the WSP. Upon detection of tone, the WSP employs line communication rules listed in the paragraph above to select a line.

The WSP inhibits message reception in the CMPG under specific circumstances. Subsequent to tone detection and line selection, all lines are inhibited from initiating another Tone Present Indication until message reception completes and locked out lines are released. The line lockout rules are:

a. When the CMPG has detected sync and transferred 54 bits of data to the WSP, the nine unselected lines are locked out for an additional 72 to 73 bit times. The selected line will be locked out for an additional 129 to 130 bit times.

b. If the WSP has not received message reception timing within 71 $\pm$ 2 ms of occurrence of the line selection, the WSP will release the selected line and apply the lockouts as stated in a.

c. If the CMPG detects the loss of digital diphase during message reception, it will transmit the No Data interrupt to the WSP. The WSP will also determine that a No Data condition exists if tone on a seized line is lost prior to receipt of the last

message bit. In either case the WSP will release the selected line and apply lockouts as stated in a.

d. Upon completion of transmission of a locally initiated message, all lines are locked out for 72 to 73 bit times.

e. During a WSP start-up or restart, all lines will be locked out for a minimum of 200 milliseconds.

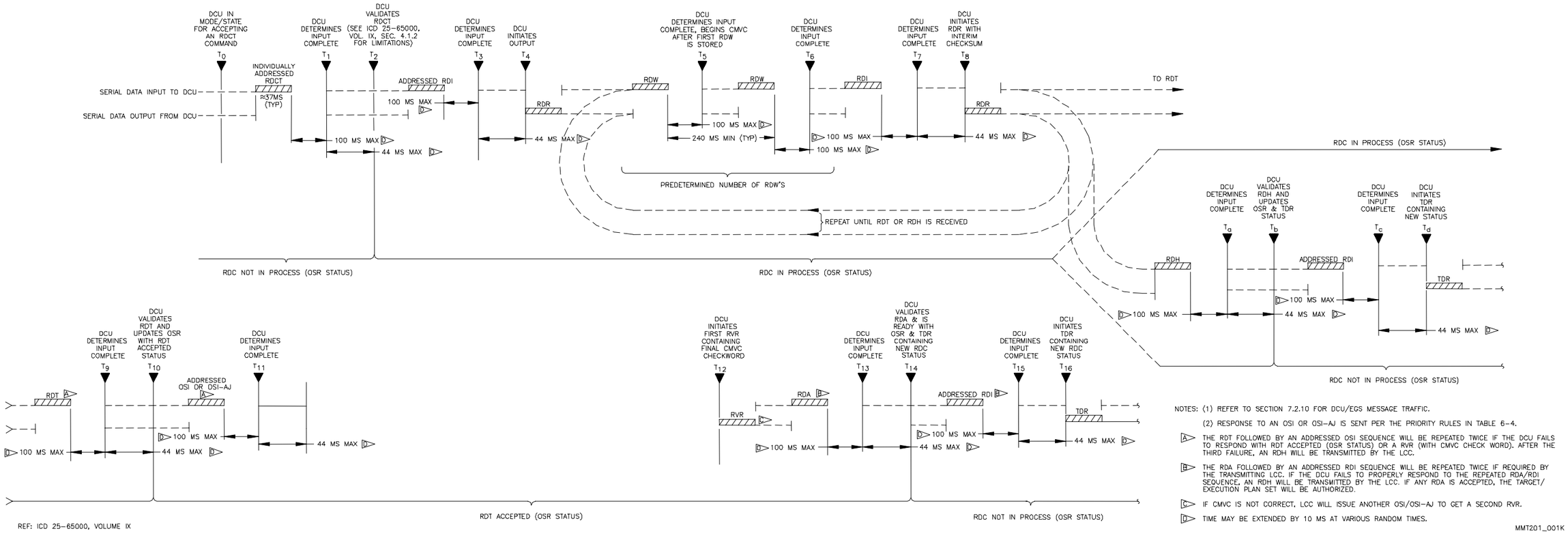


Figure 7-17. Typical RDCT Operation

SECTION VIII - SYSTEM FLOWS

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LIST OF ILLUSTRATIONS

8-1. SCOPE. This section provides LCF and LF flow diagrams of command and status signals.

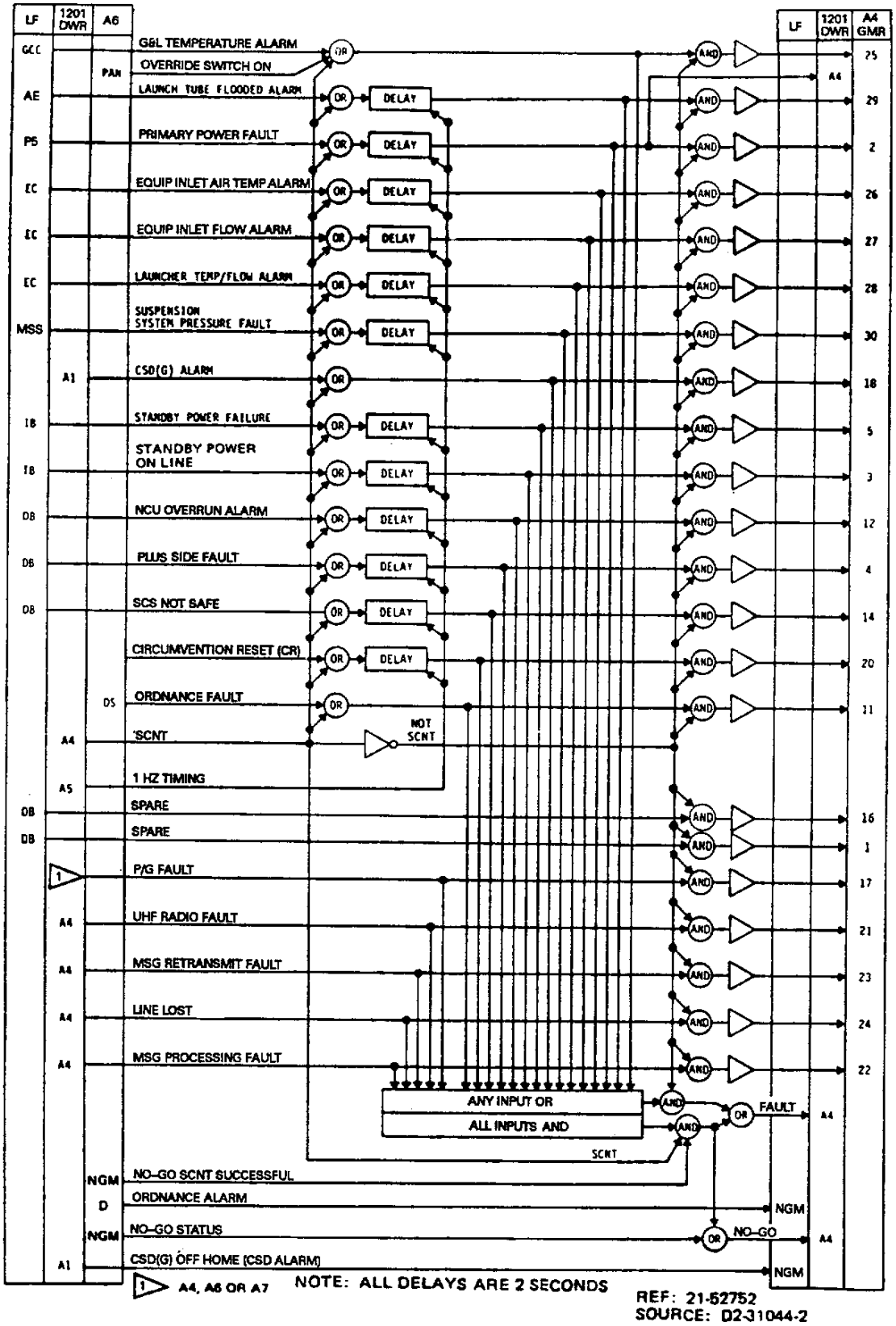
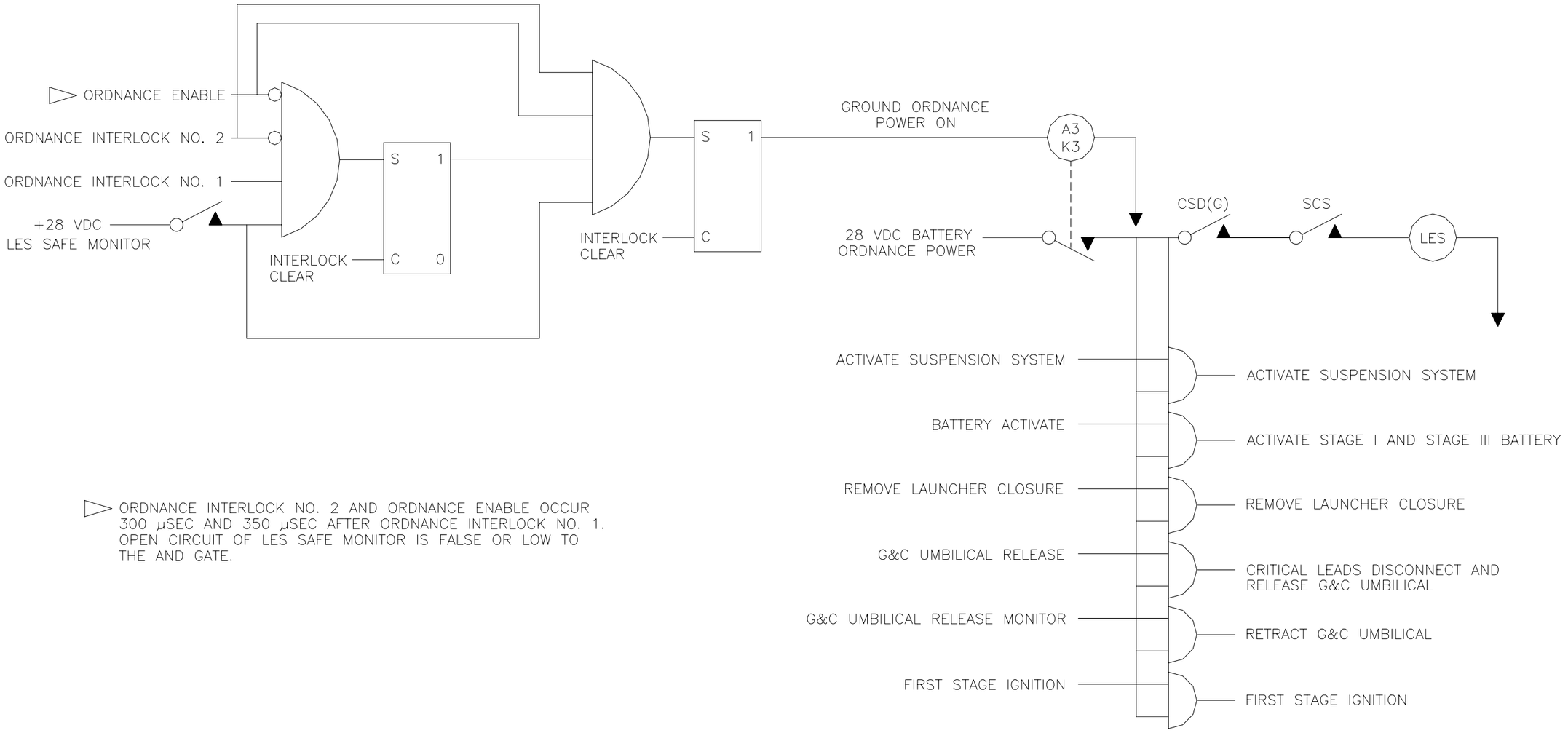


Figure 8-1. Alarm Monitor Block Diagram - Ordnance Monitor (1201 A6)



ORDNANCE INTERLOCK NO. 2 AND ORDNANCE ENABLE OCCUR 300 µSEC AND 350 µSEC AFTER ORDNANCE INTERLOCK NO. 1. OPEN CIRCUIT OF LES SAFE MONITOR IS FALSE OR LOW TO THE AND GATE.

REF: 21–52752

MMT201_068K

Figure 8-2. Ordnance Interlock and Ground Ordnance Power Application

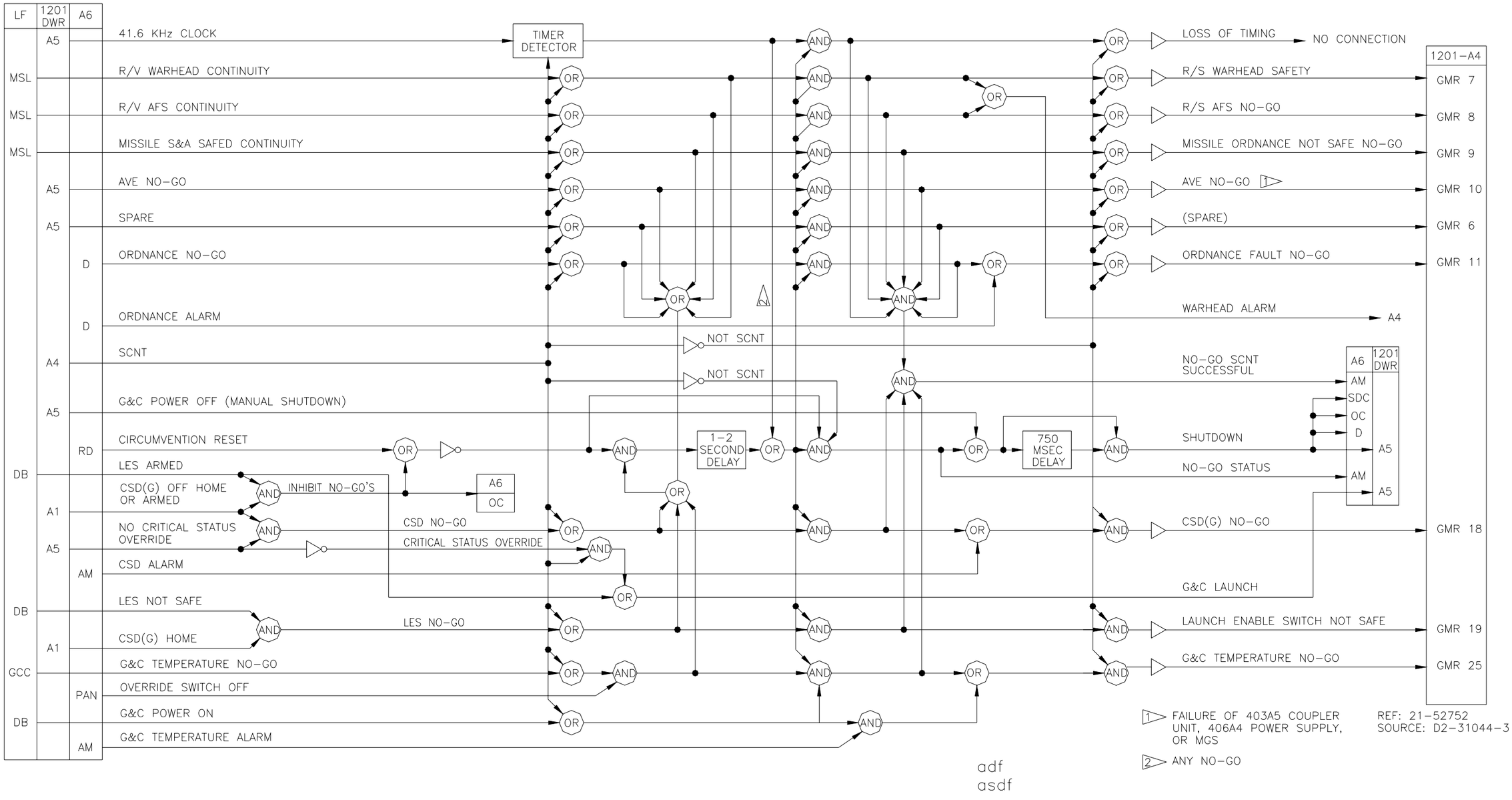


Figure 8-3. No-Go Monitor Block Diagram – Ordnance Monitor (1201 A6)

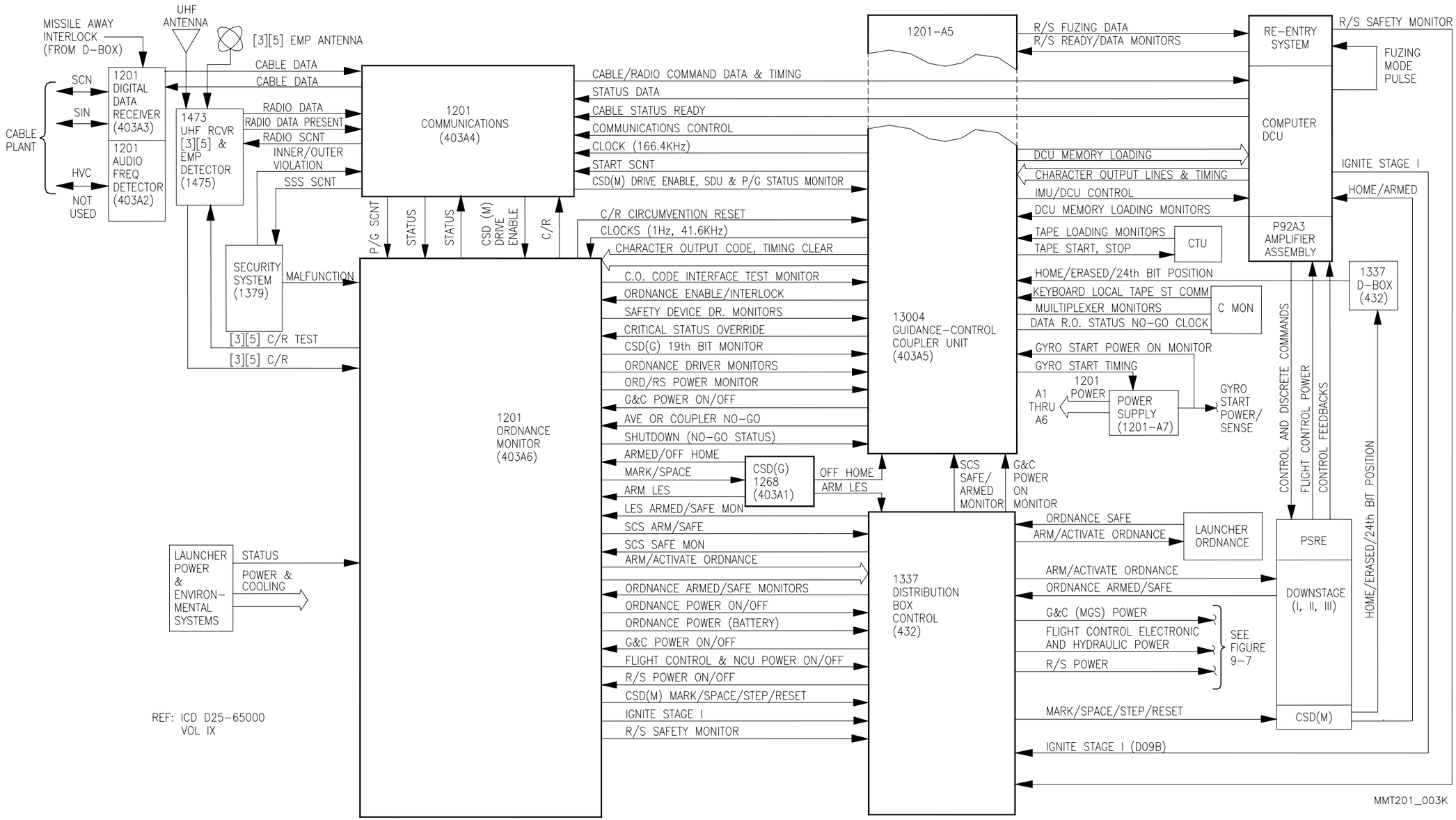


Figure 8-4. LF System Interface Diagram

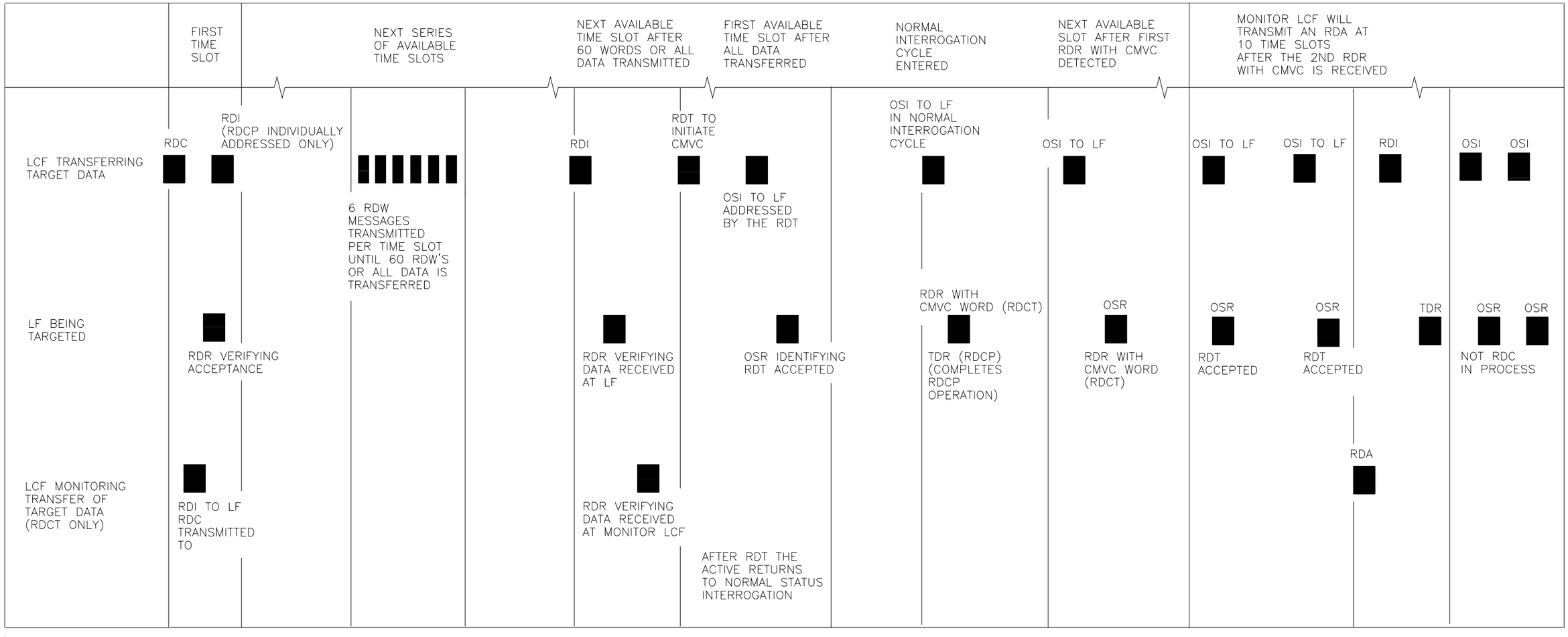


Figure 8-5. RDC Message Sequence

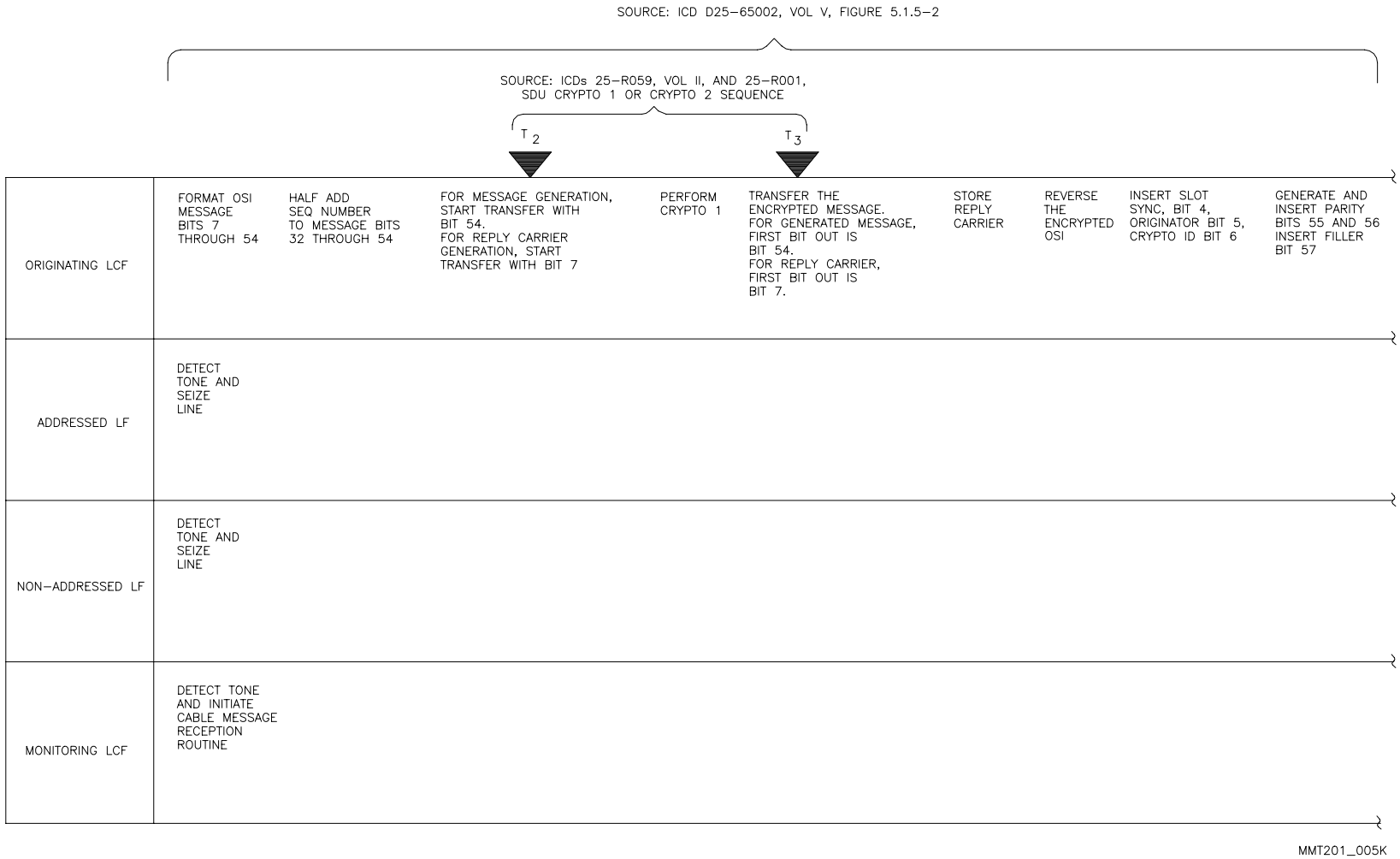


Figure 8-6. OSI/OSR Event Sequence Diagram (Sheet 1 of 6)

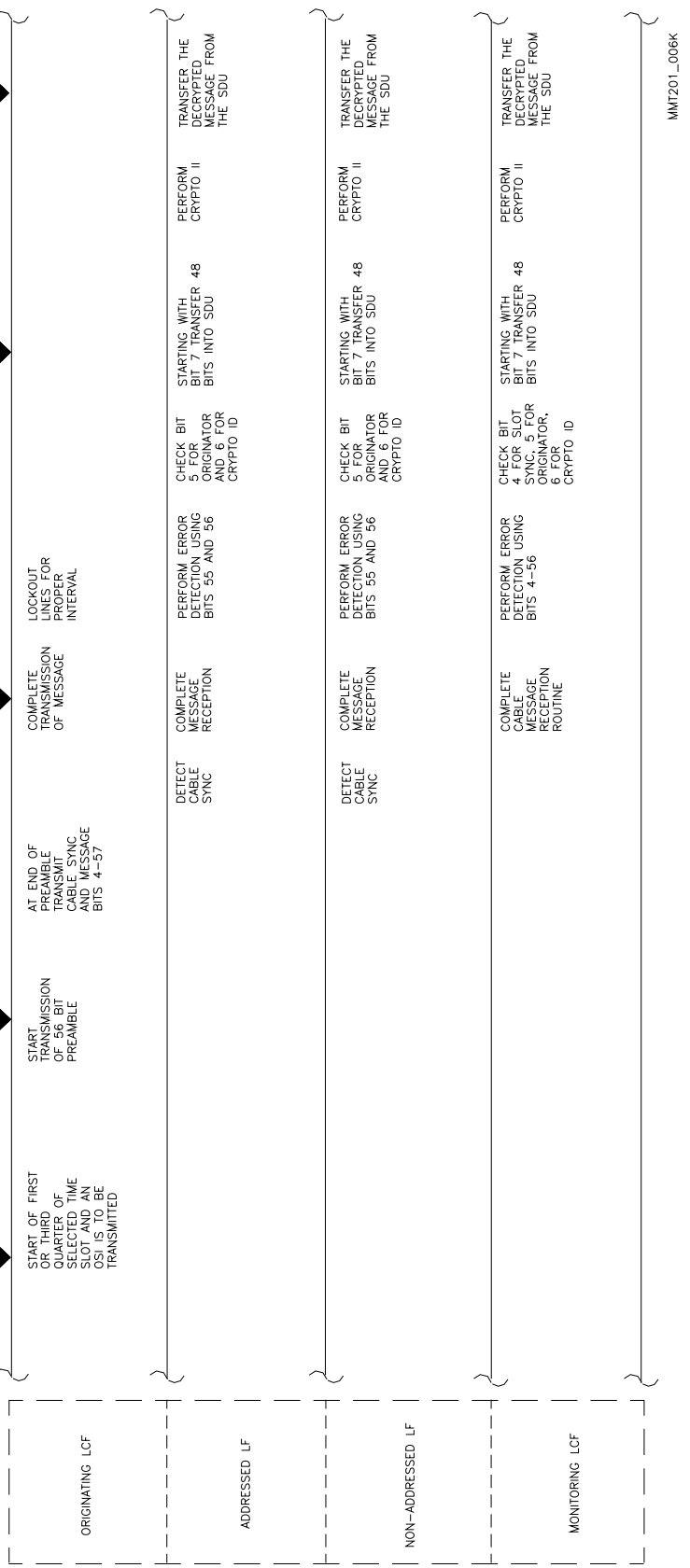


Figure 8-6. OSI/OSR Event Sequence Diagram (Sheet 2 of 6)

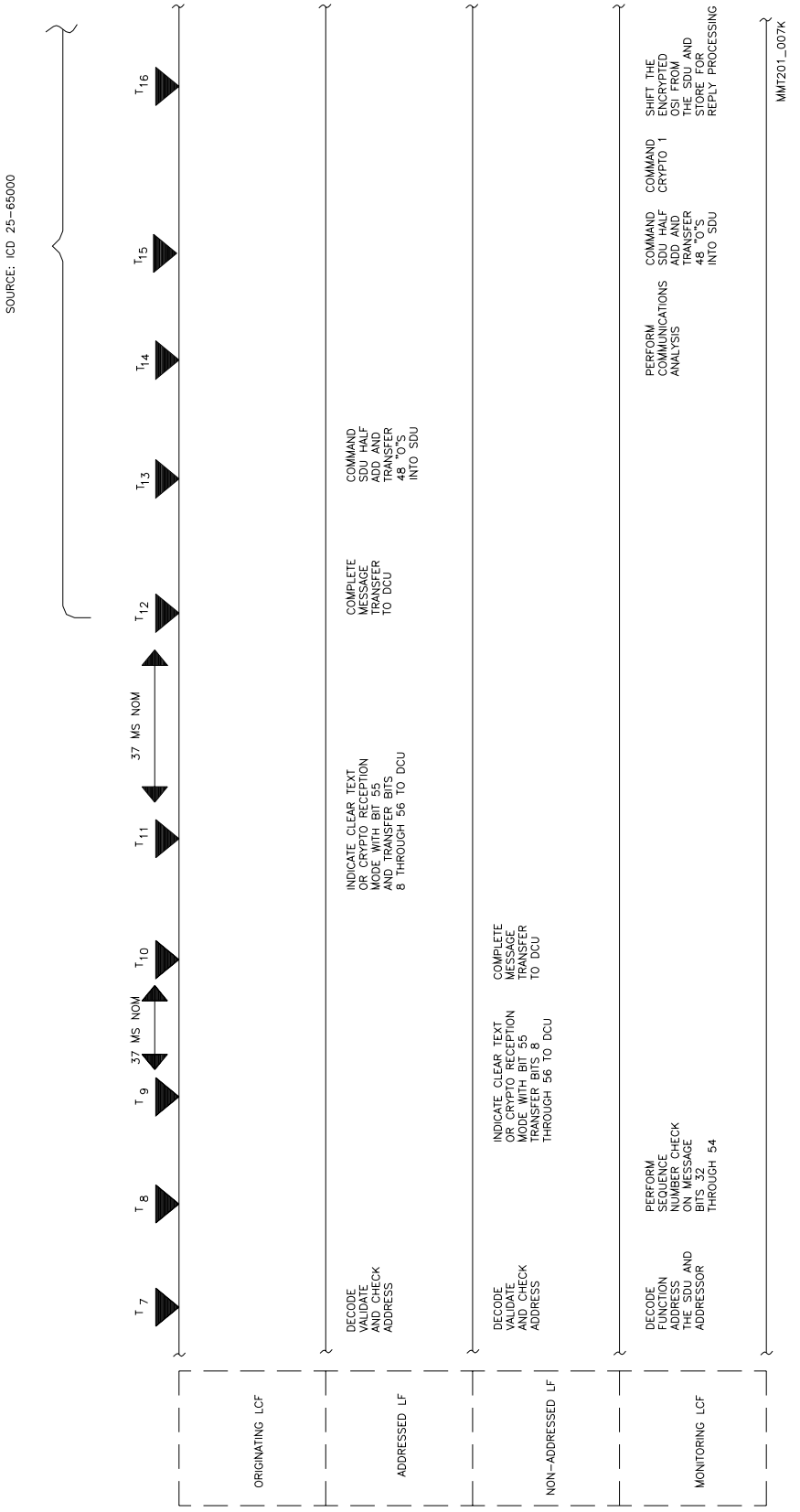


Figure 8-6. OSI/OSR Event Sequence Diagram (Sheet 3 of 6)

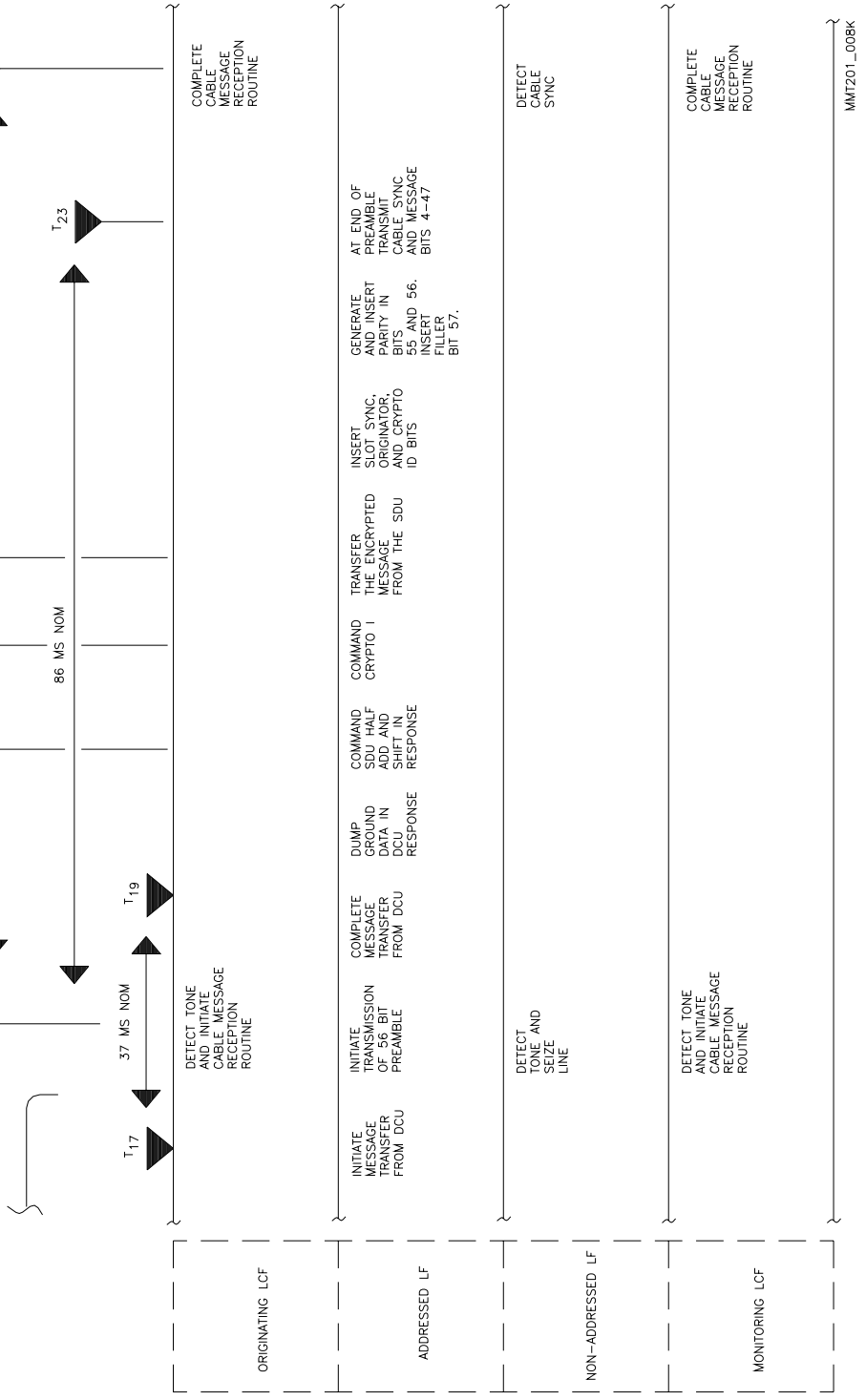


Figure 8-6. OSI/OSR Event Sequence Diagram (Sheet 4 of 6)

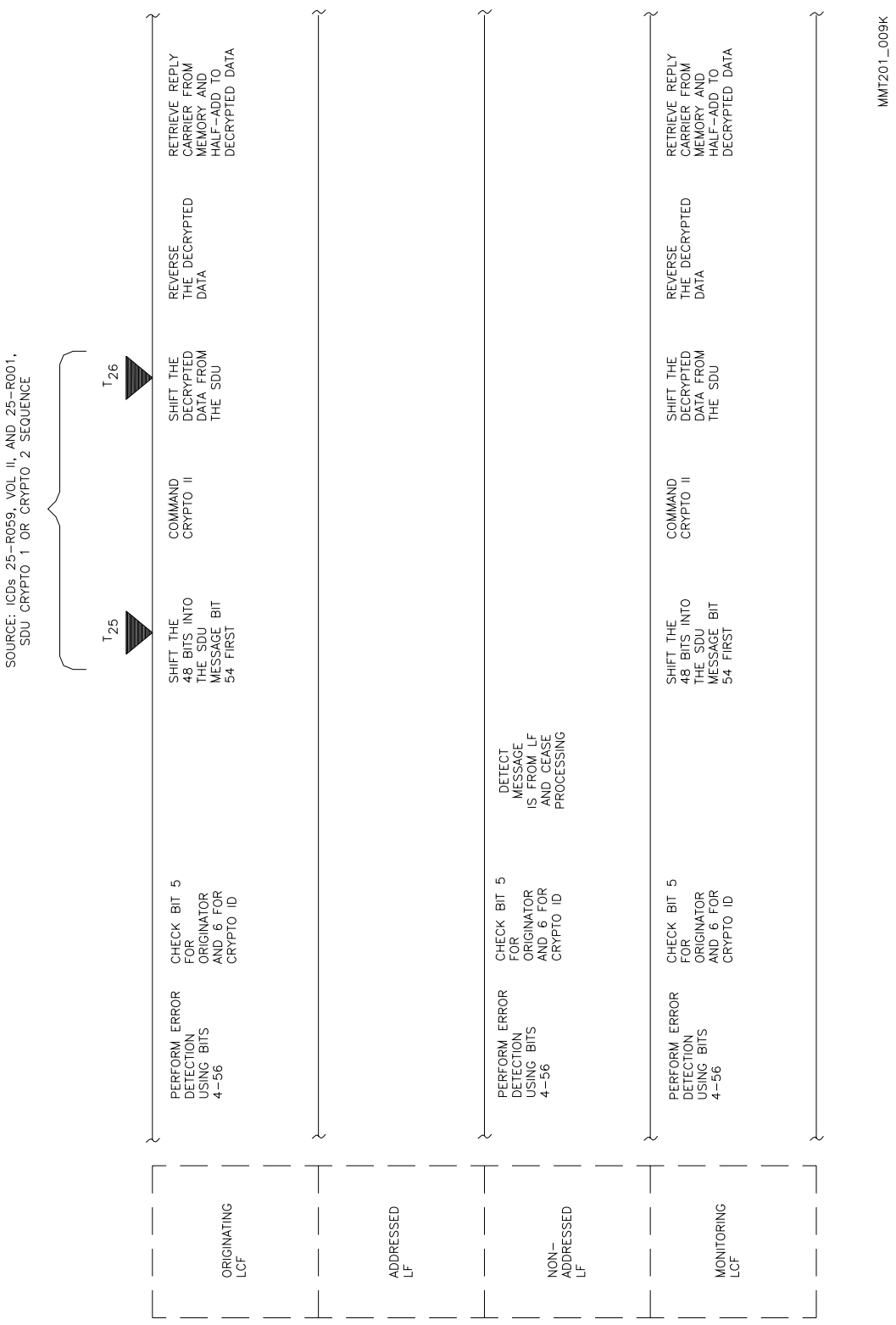


Figure 8-6. OSI/OSR Event Sequence Diagram (Sheet 5 of 6)

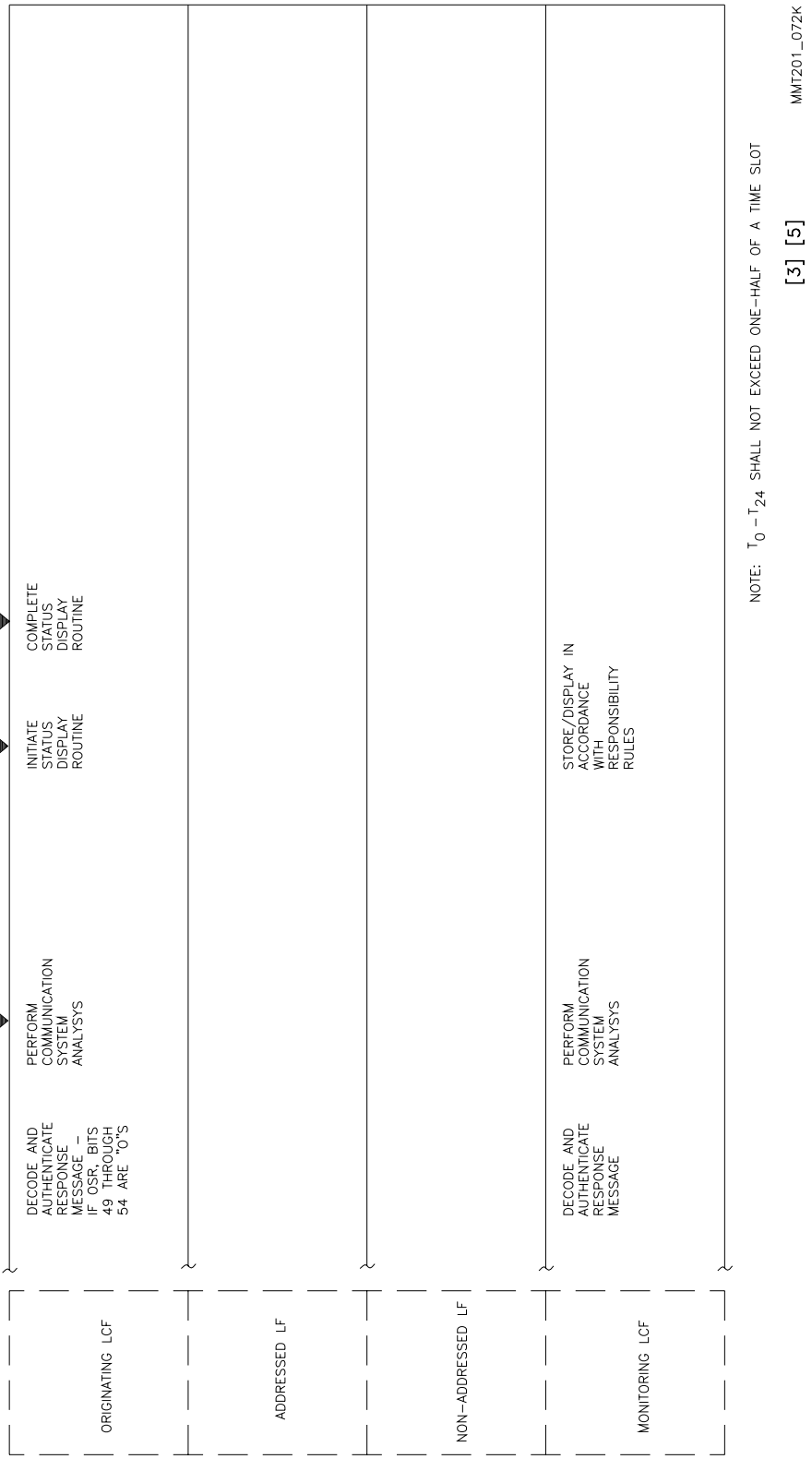
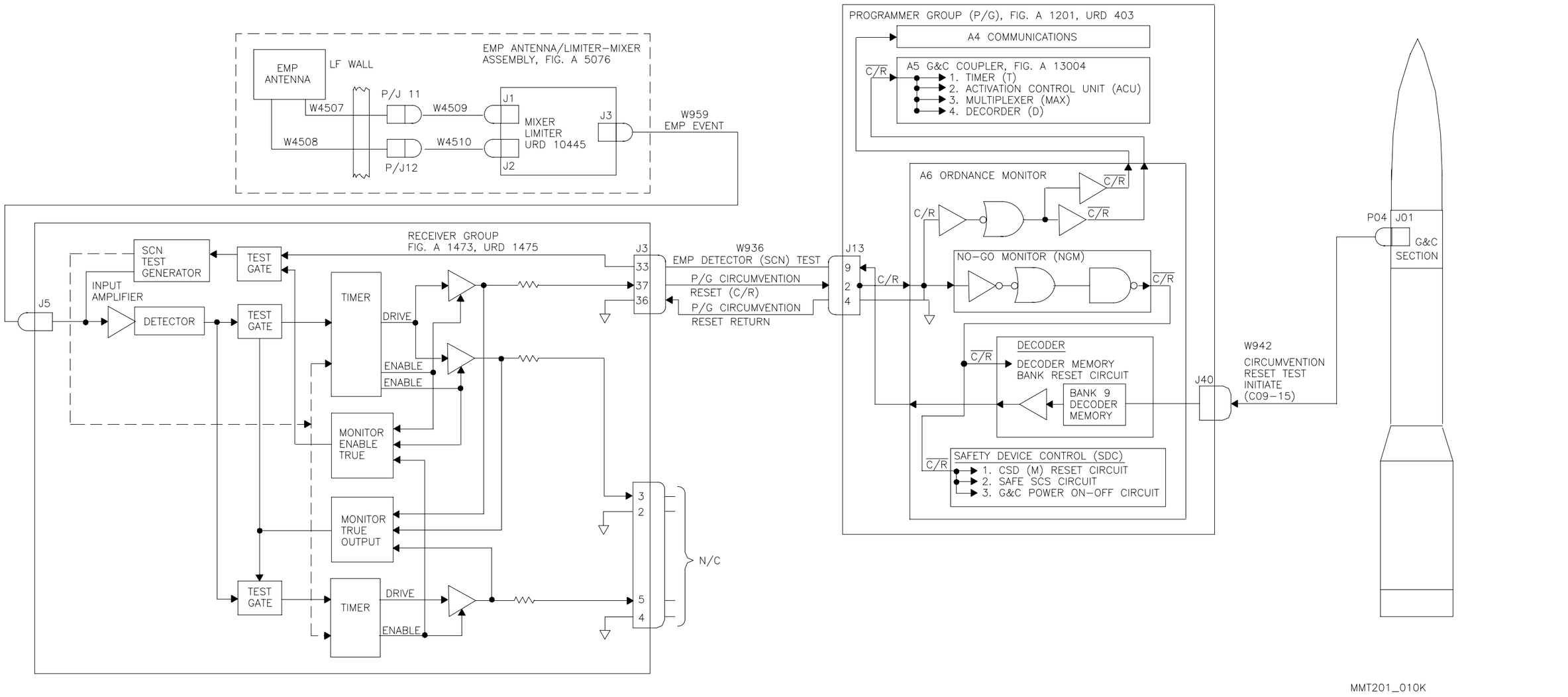


Figure 8-6. OSI/OSR Event Sequence Diagram (Sheet 6 of 6)



[3] [5]

Figure 8-7. Circumvention Reset System Block Diagram (Sheet 1 of 2)

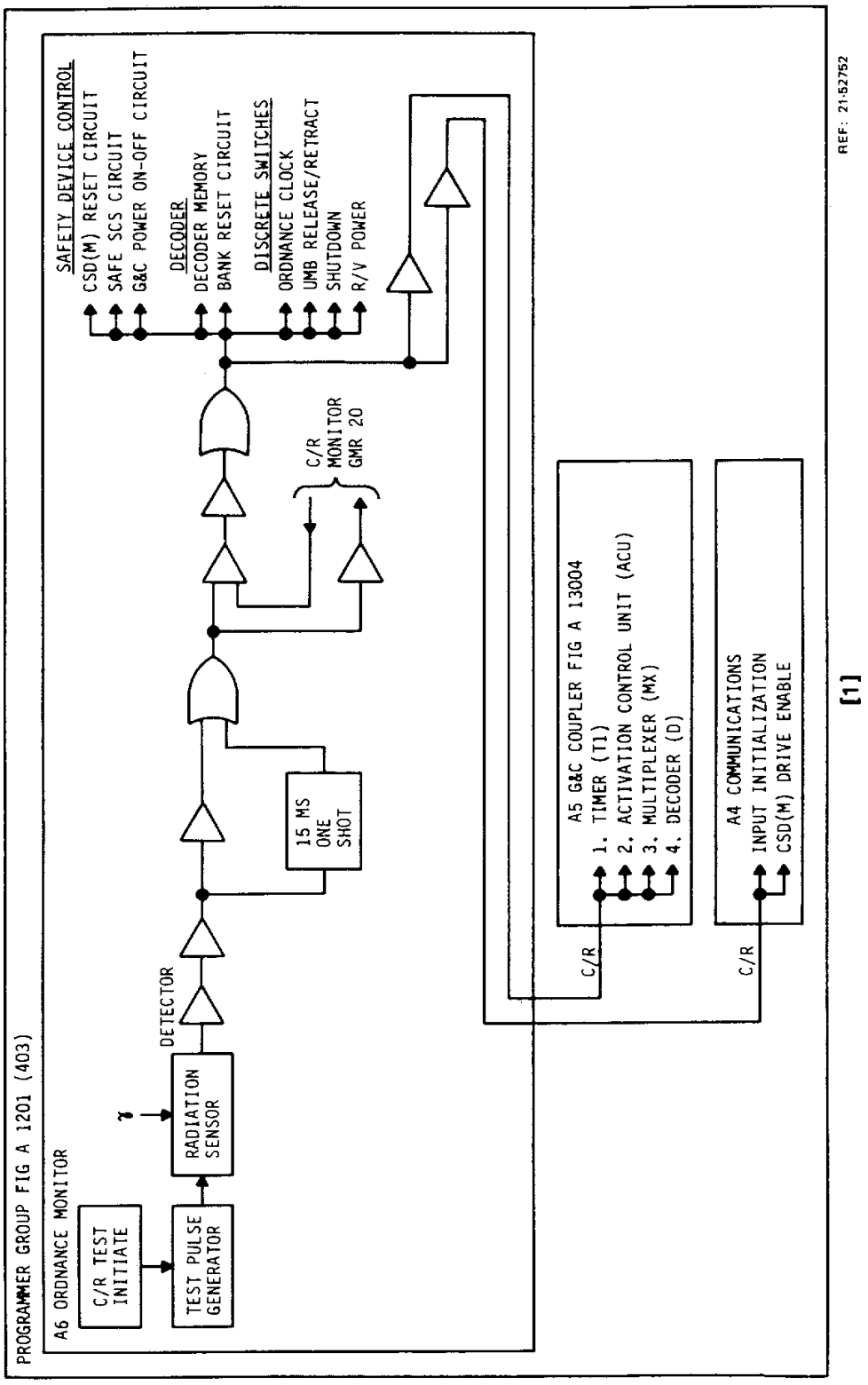


Figure 8-7. Circumvention Reset System Block Diagram (Sheet 2 of 2)

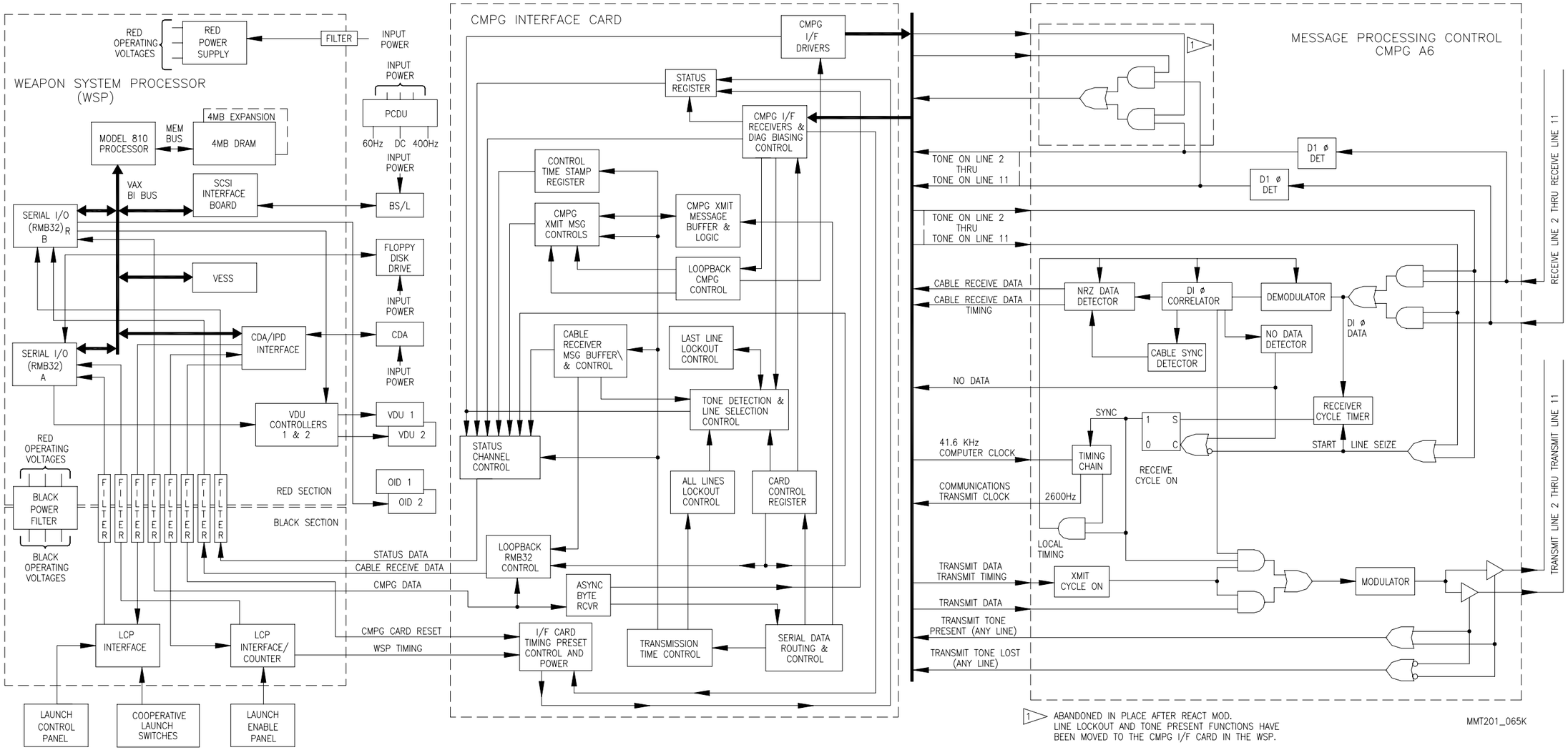


Figure 8-8. LCF Digital Communications Block Diagram

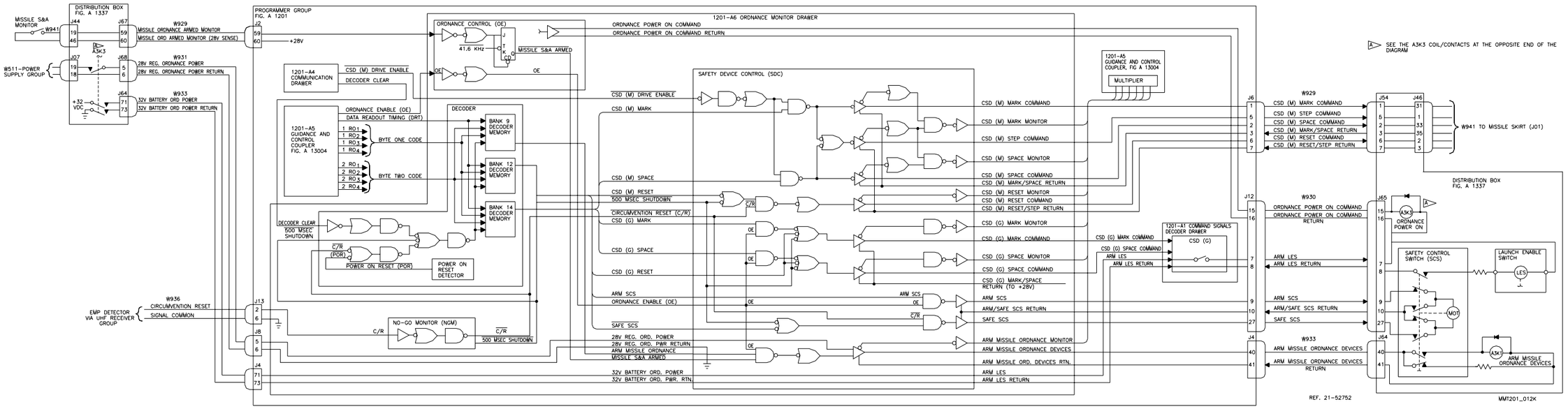


Figure 8-9. SCS, LES, CSD(G), and CSD(M) Control and Monitor Diagram

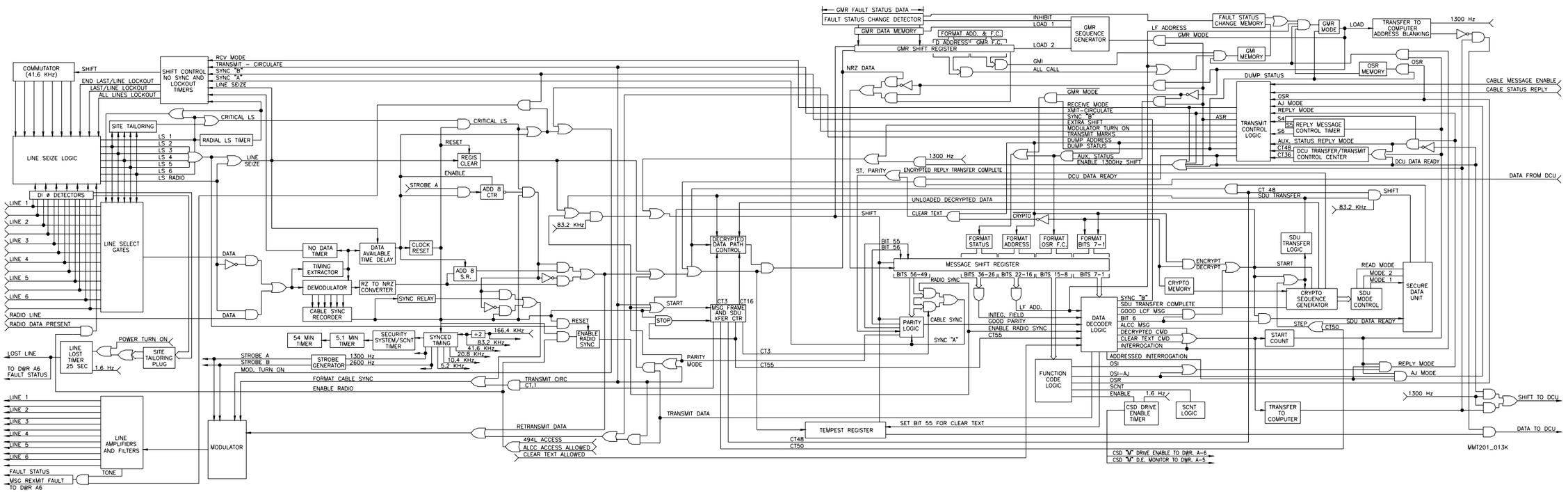


Figure 8-10. Message Processor (403A4) Functional Block Diagram

SECTION IX - SCHEMATICS

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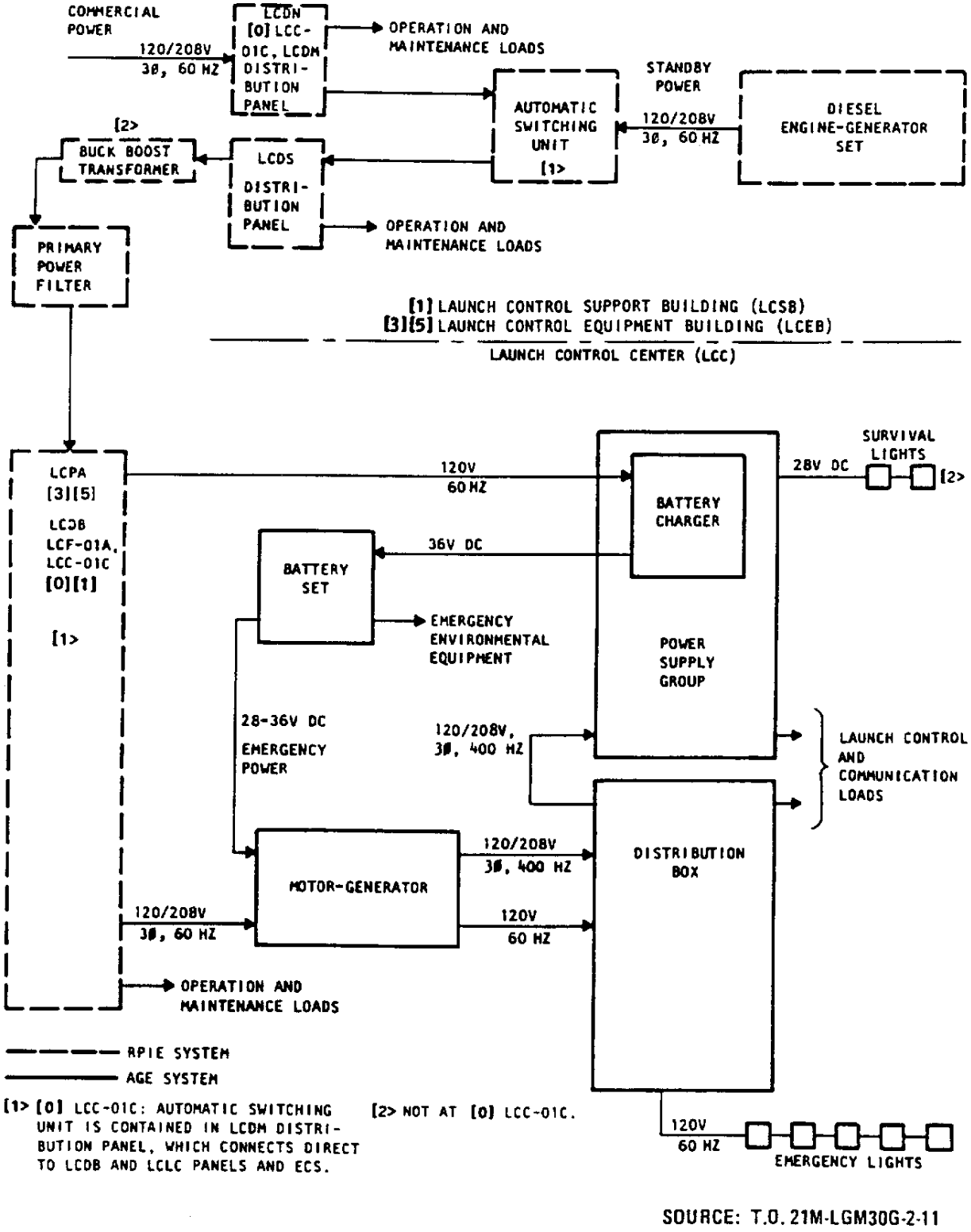
LIST OF ILLUSTRATIONS

9-1. SCOPE. This section consists of block diagrams and schematics of selected elements of the Wings I, III and V ground and flight systems.



SOURCE: T.O. 21M-LGM30G-2-11

Figure 9-1. LCC Power System Block Diagram

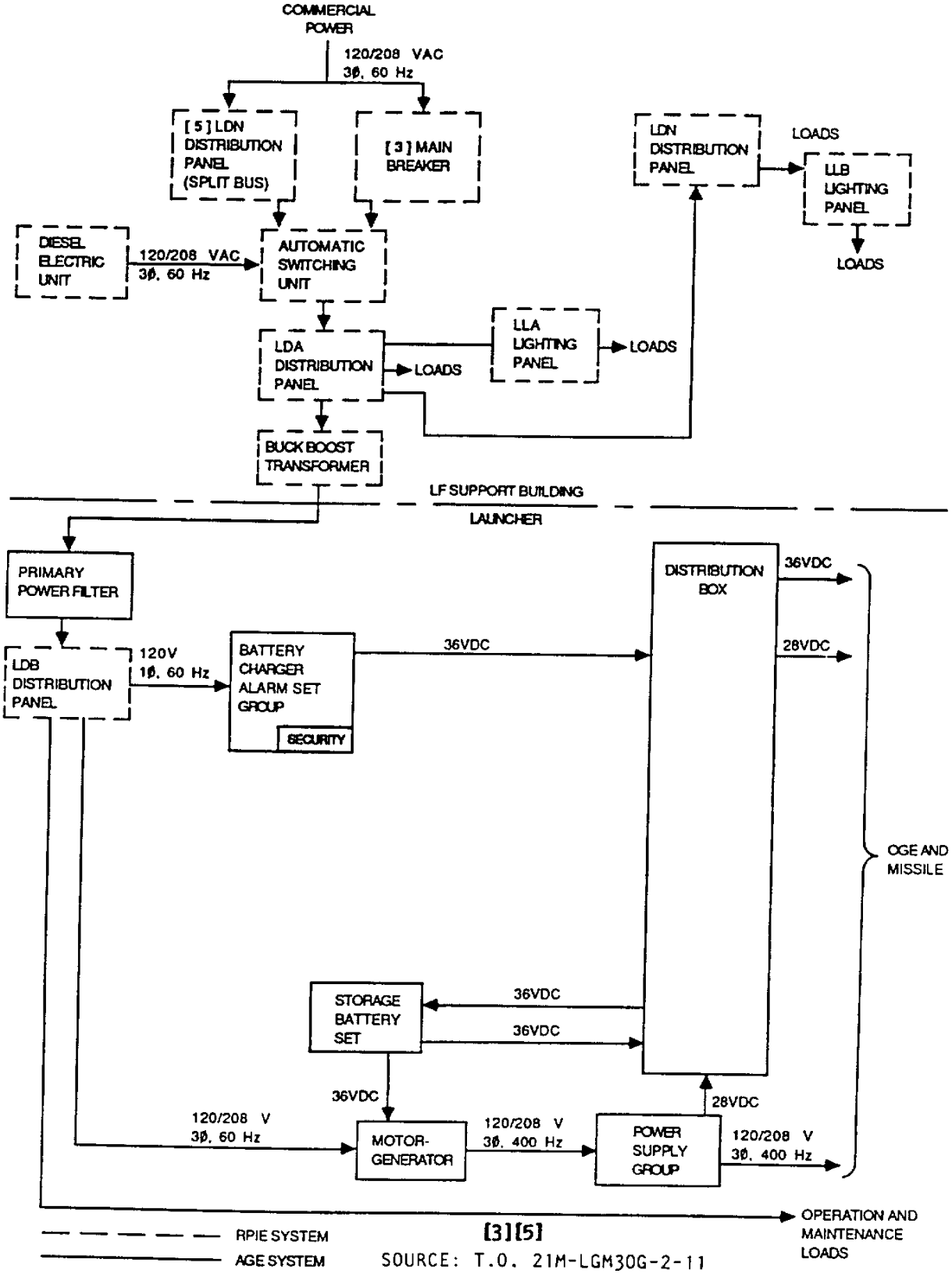
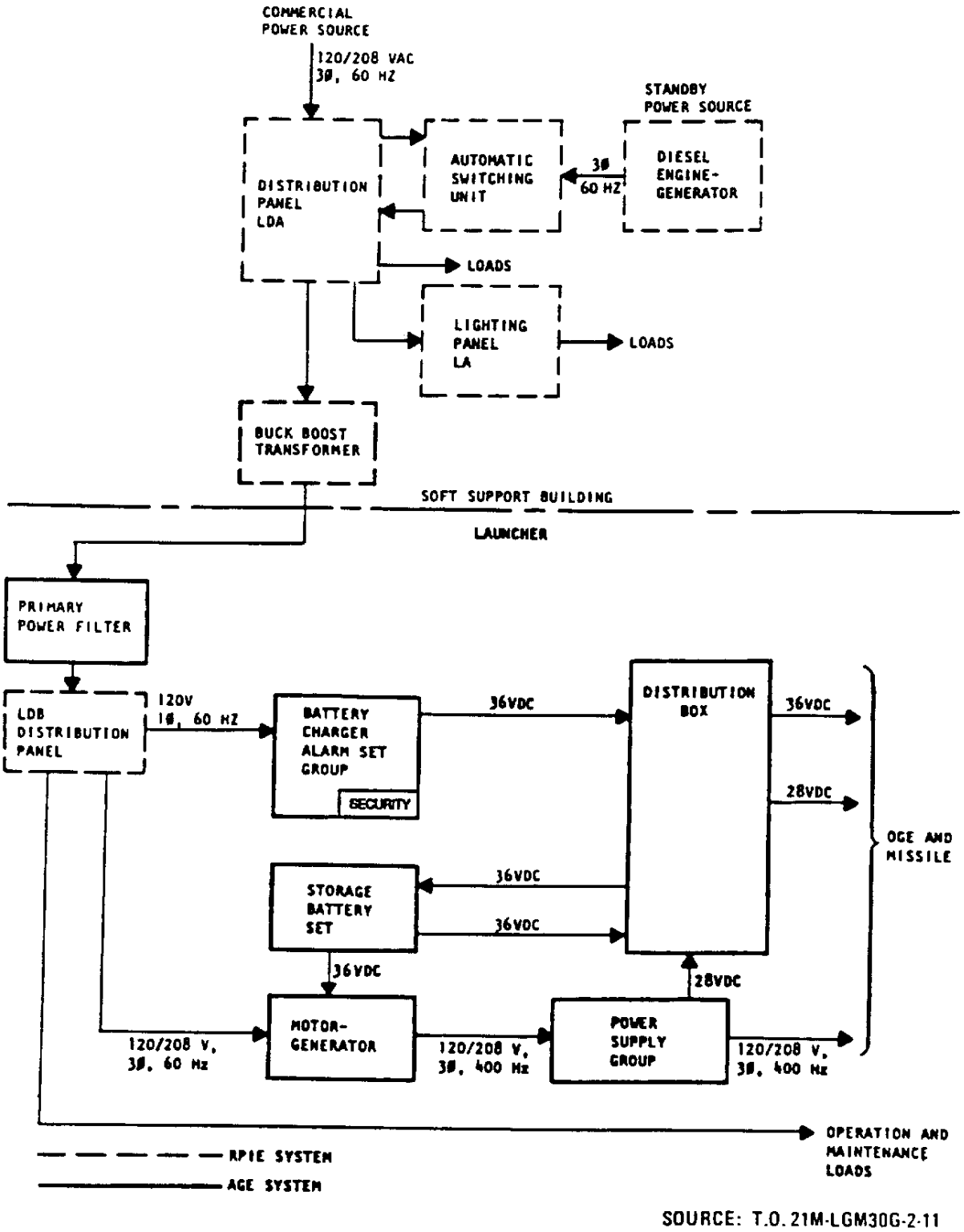


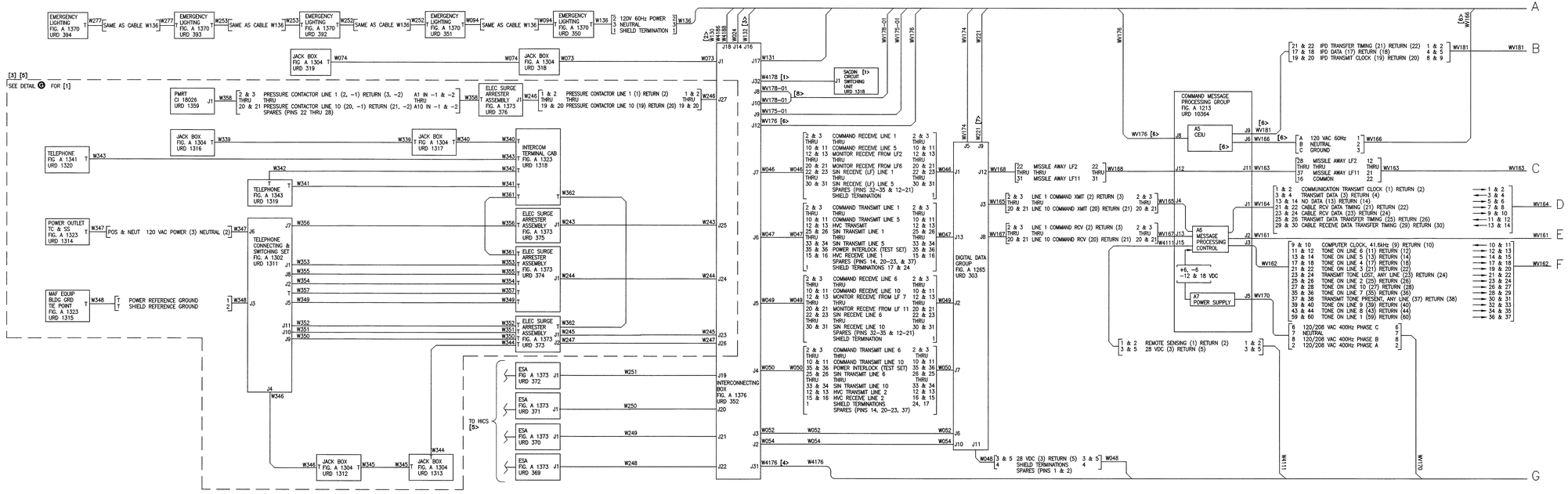
Figure 9-2. LF Power System Block Diagram (Sheet 1 of 2)



SOURCE: T.O. 21M-LGM30G-2-11

[1]

Figure 9-2. LF Power System Block Diagram (Sheet 2 of 2)



[1> CABLE W4178 AND SACDIN CIRCUIT SWITCHING UNIT INSTALLED IN [1] FLIGHTS B, C, D, F, I, J, L, M [3] FLIGHTS E & H AND [5] FLIGHTS D, E, L

[2> CABLE W130 REPLACED BY CABLE W4186 IN [1] FLIGHT F, [3] FLIGHT I AND [5] FLIGHT E; REPLACED BY CABLE W4188 IN [1] FLIGHTS G & K AND IN [5] FLIGHT I

[3> W132 INSTALLED IN [1] FLIGHTS A, B, C, G, I, K, L, M, [3] FLIGHTS C, E, I, M, AND [5] FLIGHTS A, I, O, P, S, T

[4> NOT INSTALLED IN ACPs/SCPs ([1] FLIGHTS A, G, K; [3] FLIGHTS C, I, M, OR [5] FLIGHTS A, I, O)

[5> FLIGHT UNIQUE ASSIGNMENTS FOR:

COMMAND TRANSMIT / RECEIVE
SIN TRANSMIT / RECEIVE
PRESSURE INDICATOR
HVC TRANSMIT / RECEIVE
HIJTE RELAY
MBCP RELAY
EWO

[6> WV166, WV176, AND WV181 INSTALLED IN SCPs/ACPs [1] FLIGHTS A, G, K, AND [3] FLIGHTS C, I, M, AND [5] FLIGHTS A, I, O, T

[7> W221 INSTALLED IN ACP/SCP [1] FLIGHTS A, G, K, [3] FLIGHTS C, I, M, AND [5] FLIGHTS A, I, O, T

[8> ILLUSTRATED AS IMPLEMENTED

NOTE: CABLES COMMON TO ALL FLIGHTS EXCEPT AS NOTED.

REF: T.O. 21M–LGM30F–2–21–8
T.O. 21M–LGM30G–2–21–3

WMT201_014K

Figure 9-3. MAF Intrasite Signals and Cabling (Sheet 1 of 4)

[1> CABLE W130 REPLACED BY CABLE W4186 IN [1] FLIGHT F, [3] FLIGHT I AND [5] FLIGHT E; REPLACED BY CABLE W4188 IN [1] FLIGHTS G & K AND [5] FLIGHTS I

[2> W132 INSTALLED IN [1] FLIGHTS A, B, C, G, I, K, L, M, [3] FLIGHTS C, E, I, M, AND [5] FLIGHTS A, I, O, P, S, T

[3> NOT INSTALLED IN ACP/SCPs ([1] FLIGHTS A, G, K, [3] FLIGHT C, I, M, OR [5] FLIGHTS A, I, O)

[4> WV166 AND WV181 INSTALLED IN ACP/SCPs [1] FLIGHTS A, G, K, [3] FLIGHTS C, I, M, AND [5] FLIGHTS A, I, O, T. WV188 INSTALLED IN ALL FLIGHTS EXCEPT ACPs/SCPs

[5> W221 INSTALLED IN ACP/SCPs [1] FLIGHTS A, G, K, [3] FLIGHTS C, I, M, AND [5] FLIGHTS A, I, O, T

NOTES:

1. FOR MORE DETAILED MAF CABLING DATA, REFER TO BOEING DRAWING 21-57488, T.O. 21M-LGM30F-2-21-8.
2. NUMBERING BEFORE AND AFTER INDIVIDUAL SIGNAL NOMENCLATURES INDICATE PLUG/JACK PIN NUMBERS OR TERMINAL BOARD AND TERMINAL NUMBERS ON CORRESPONDING ENDS OF THE CABLE.
3. CABLES COMMON TO ALL FLIGHTS EXCEPT AS NOTED.

REF: T.O. 21M-LGM30F-2-21-8
T.O. 21M-LGM30G-2-21-3

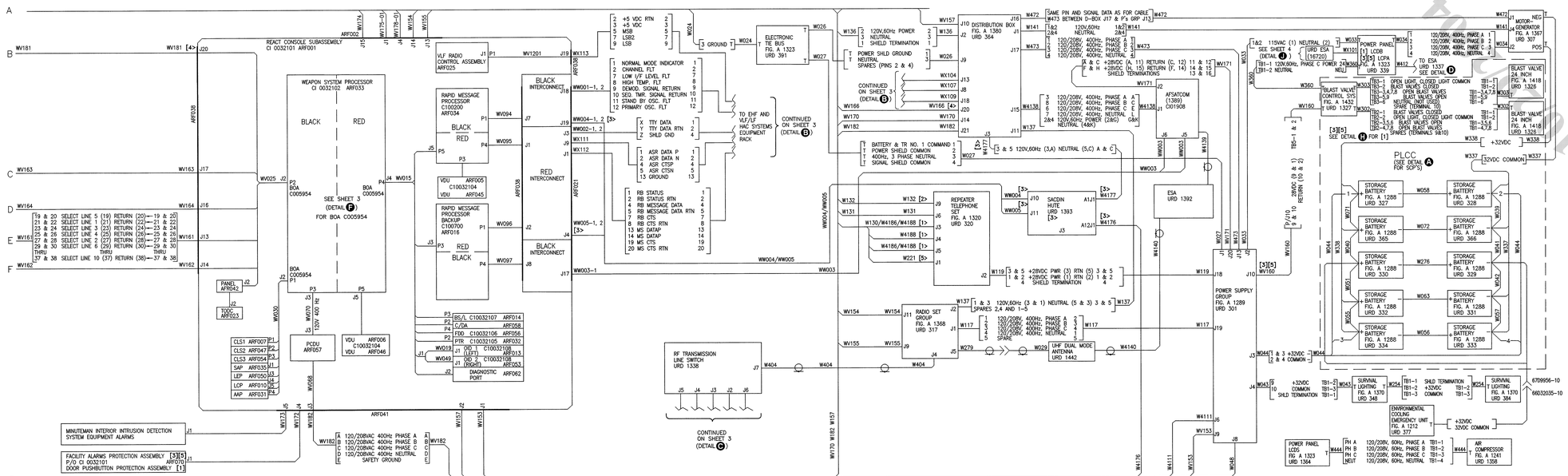
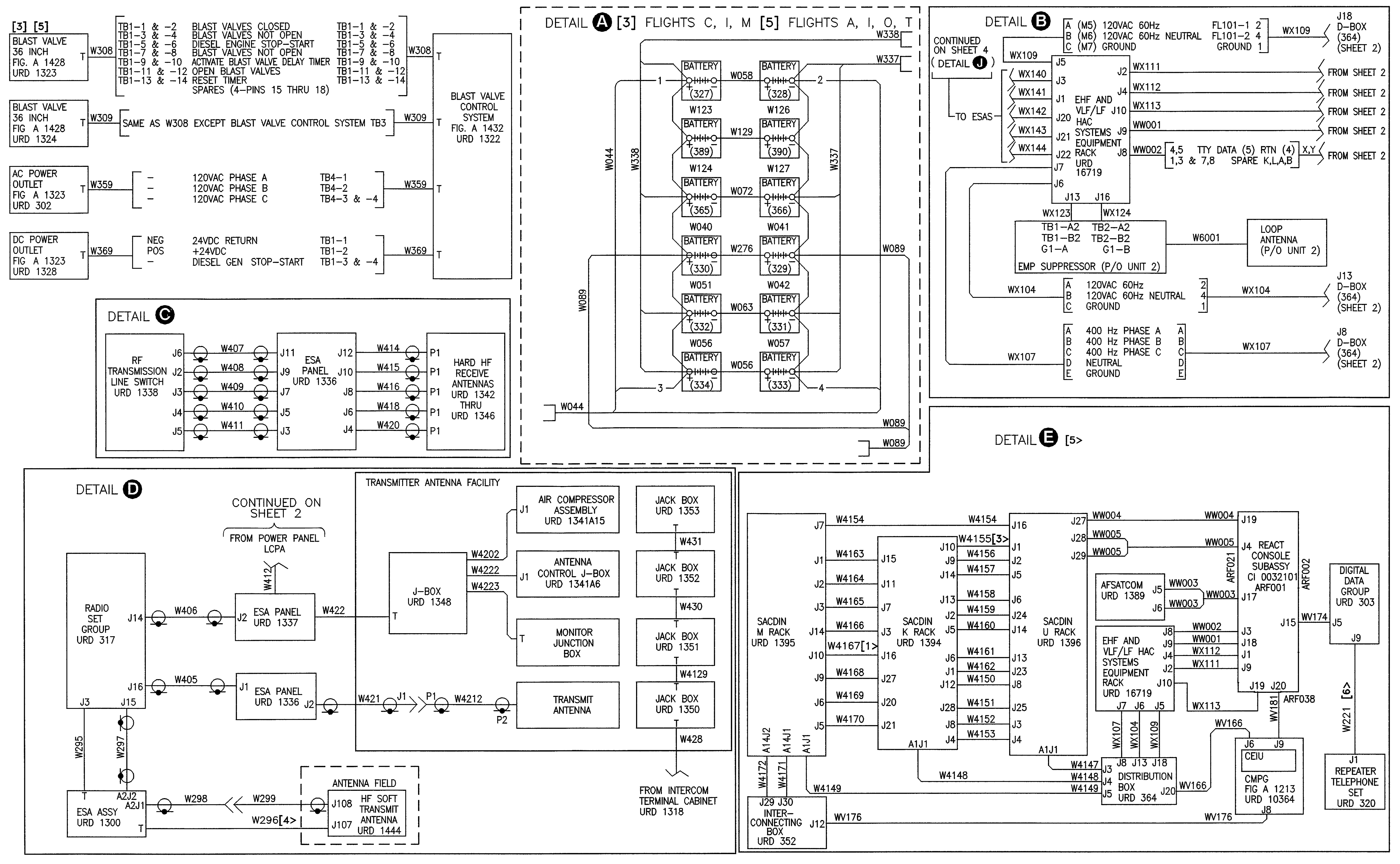


Figure 9-3. MAF Intrasite Signals and Cabling (Sheet 2 of 4)



DPK CONN. J-PIN	TEST POINT J-#	A-M SYSTEM SIGNALS
1 001	1 001	LCP MCU BIT-01A
1 002	1 002	LCP MCU BIT-08A
1 003	1 003	LCP MCU BIT-09A
1 005	1 004	LEP CODE DISSIPATED S
1 006	1 005	LCP BIT 06 RETURN A
1 007	1 006	LCP BIT 05 RETURN A
1 008	1 007	LCP BIT 04 RETURN A
1 009	1 008	LCP BIT 03 RETURN A
1 010	1 009	LCP BIT 02 RETURN A
1 011	1 010	LCP BIT 01 RETURN A
1 013	1 011	LEP MCU BIT 01
1 014	1 012	LCP MCU BIT-10A
1 015	1 013	LCP MCU BIT-11A
1 016	1 014	LCP MCU BIT-12A
1 017	1 015	LCP MCU BIT-13A
1 018	1 016	LEP SWITCH
1 019	1 017	LCP BIT 08 RETURN A
1 020	1 018	LCP BIT 09 RETURN A
1 021	1 019	LCP BIT 10 RETURN A
1 022	1 020	LCP BIT 11 RETURN A
1 023	1 021	LCP BIT 12 RETURN A
1 024	1 022	LCP BIT 13 RETURN A
1 025	1 023	LCP BIT 14 RETURN A
1 026	1 024	LEP MCU BIT 02
1 027	1 025	LEP MCU BIT 03
1 028	1 026	LCP MCU BIT-14A
1 029	1 027	LCP MCU BIT-15A
1 030	1 028	LCP MCU BIT-16A
1 033	1 030	LCP SIGNAL COMMON A
1 035	1 032	LCP INJ/CE A
1 036	1 033	LCP COH/CE A
1 037	1 034	LCP CODE DISSIPATED A
1 038	1 035	LCP BIT 15 RETURN A
1 040	1 036	LEP MCU BIT 04
1 041	1 037	LCP MCU BIT-17A
1 042	1 038	LCP MCU BIT-18A
1 043	1 039	LCP MCU BIT-19A
1 044	1 040	LCP MCU BIT-20A
1 046	1 042	LEP SWITCH R
1 053	1 049	LEP MCU BIT 05
1 054	1 050	LEP MCU BIT 06
1 055	1 051	LCP MCU BIT-21A
1 056	1 052	LCP MCU BIT-22A
1 057	1 053	LCP MCU BIT-23A
1 058	1 054	LCP MCU BIT-24A
1 060	1 055	LEP CODE DISSIPATED RETURN
1 068	1 057	LEP MCU BIT 07
1 069	1 058	LEP MCU BIT 08
1 070	1 059	LCP MCU BIT-25A
1 071	1 060	LCP MCU BIT-26A
1 072	1 061	LCP MCU BIT-27A
1 073	1 062	LCP MCU BIT-28A
1 074	1 063	LEP COMMON
1 081	1 064	LCP CODE DISSIPATED RETURN
1 082	1 065	LEP MCU BIT 09
1 083	1 066	LEP MCU BIT 10
1 084	1 067	LCP MCU BIT-29A
1 085	1 068	LCP MCU BIT-30A
1 086	1 069	LCP MCU BIT-31A
1 087	1 070	LCP MCU BIT-32A
1 090	1 071	AAP FIRE ALARM LCEB +
1 091	1 072	AAP FACILITY ALARM SUMMARY NOT
1 092	1 073	AAP AUDIO ALARM BIT 04 (MSB)
1 093	1 074	AAP AUDIO ALARM CODE BIT 03
1 094	1 075	SAP SITE ADDRESS PLUG PULLUP +5VDC

DPK CONN. J-PIN	TEST POINT J-#	A-M SYSTEM SIGNALS
1 097	1 076	LEP MCU BIT 11
1 098	1 077	LEP MCU BIT 12
1 099	1 078	LCP MCU BIT-33A
1 100	1 079	LCP MCU BIT-34A
1 101	1 080	LCP MCU BIT-35A
1 102	1 081	LCP MCU BIT-36A
1 103	1 082	AAP FIRE ALARM LCSB NOT
1 104	1 083	AAP ALARM ACKNOWLEDGE +
1 105	1 084	AAP FIRE ALARM LCEB NOT
1 106	1 085	AAP FACILITY ALARM SUMMARY +
1 107	1 086	AAP AUDIO ALARM BIT 04 NOT
1 108	1 087	AAP AUDIO ALARM BIT 02 +
1 109	1 088	SAP WING BIT 03 MSB
1 111	1 089	LEP MCU BIT 13
1 112	1 090	LEP MCU BIT 14
1 113	1 091	LCP MCU BIT-37A
1 114	1 092	LCP MCU BIT-38A
1 115	1 093	LCP MCU BIT-39A
1 116	1 094	LCP MCU BIT-40A
1 118	1 095	AAP ALARM ACKNOWLEDGE NOT
1 122	1 096	AAP AUDIO ALARM BIT 03 NOT
1 123	1 097	SAP WING BIT 02
1 124	1 098	SAP WING BIT 01
1 126	1 099	LEP MCU BIT 15
1 127	1 100	LEP MCU BIT 16
1 128	1 101	LCP MCU BIT-41A
1 129	1 102	LCP MCU BIT-42A
1 130	1 103	LCP MCU BIT-43A
1 131	1 104	LCP MCU BIT-44A
1 132	1 105	AAP FIRE ALARM LCSB +
1 137	1 106	AAP AUDIO ALARM BIT 02 NOT
1 138	1 107	SAP SQUAD BIT 02
1 139	1 108	SAP SQUAD BIT 01
1 140	1 109	LEP MCU BIT 17
1 141	1 110	LEP MCU BIT 18
1 142	1 111	LCP MCU BIT-45A
1 143	1 112	LCP MCU BIT-46A
1 144	1 113	LCP MCU BIT-47A
1 145	1 114	LCP MCU BIT-48A
1 148	1 115	CLS CLS3 CONTINUITY B
1 149	1 116	CLS CLS1 CONTINUITY A
1 150	1 117	CLS CLS3 COH/CS RETURN
1 152	1 118	AAP AUDIO ALARM BIT 01 + (LSB)
1 153	1 119	SAP LCC BIT 03
1 155	1 120	LEP MCU BIT 19
1 156	1 121	LEP MCU BIT 20
1 157	1 122	LCP MCU BIT-49A
1 158	1 123	LCP MCU BIT-50A
1 159	1 124	LCP MCU BIT-51A
1 160	1 125	LCP MCU BIT-52A
1 162	1 126	CLS CLS2 COH/CS
1 163	1 127	CLS CLS2 CONTINUITY B
1 164	1 128	CLS CLS1 CONTINUITY B
1 165	1 129	CLS CLS2 COH/CS RETURN
1 167	1 130	SAP LCC BIT 02
1 168	1 131	SAP LCC BIT 01 (LSB)
1 169	1 132	LEP MCU BIT 21
1 170	1 133	LEP MCU BIT 22
1 171	1 134	LCP MCU BIT-53A
1 172	1 135	LCP MCU BIT-54A
1 173	1 136	LCP MCU BIT-55A
1 174	1 137	LCP MCU BIT-56A
1 176	1 138	CLS CLS3 COH/CS
1 177	1 139	CLS CLS1 COH/CS
1 178	1 140	CLS CLS3 CONTINUITY A
1 179	1 141	CLS CLS2 CONTINUITY A
1 180	1 142	CLS CLS1 COH/CS RETURN
1 181	1 143	AAP AUDIO ALARM BIT 01 NOT
1 182	1 144	SAP SITE ADDRESS PLUG GROUND
1 184	1 145	LEP MCU BIT 23
1 185	1 146	LEP MCU BIT 24

DPK CONN. J-PIN	TEST POINT J-#	A-M SYSTEM SIGNALS
2 001	2 001	MAR MASTER ALARM RESET RIGHT
2 002	2 002	MAR MASTER ALARM RESET RIGHT RETURN
2 003	2 003	MAR MASTER ALARM RESET LEFT
2 004	2 004	MAR MASTER ALARM RESET LEFT RETURN
2 015	2 015	CMPG MISSILE AWAY LF 02
2 017	2 017	CMPG MISSILE AWAY LF 03
2 019	2 019	CMPG MISSILE AWAY LF 04
2 021	2 021	CMPG MISSILE AWAY LF 05
2 023	2 023	CMPG MISSILE AWAY LF 06
2 025	2 025	CMPG MISSILE AWAY LF 07
2 027	2 027	CMPG MISSILE AWAY LF 08
2 029	2 029	CMPG MISSILE AWAY LF 09
2 031	2 031	CMPG MISSILE AWAY LF 10
2 033	2 033	CMPG MISSILE AWAY LF 11
2 035	2 035	CMPG IPD TRANSMIT TIMING
2 036	2 036	CMPG IPD TRANSMIT TIMING RETURN
2 037	2 037	CMPG IPD TRANSMIT CLOCK
2 038	2 038	CMPG IPD TRANSMIT CLOCK RETURN
2 039	2 039	CMPG IPD DATA
2 040	2 040	CMPG IPD DATA RETURN
2 041	2 041	TODC SERIAL TODC L RXD NOT
2 042	2 042	TODC SERIAL TODC H RXD +
2 043	2 043	CMPG SELECT LINE 01
2 044	2 044	CMPG SELECT LINE 01 RETURN
2 045	2 045	CMPG SELECT LINE 02
2 046	2 046	CMPG SELECT LINE 02 RETURN
2 047	2 047	CMPG SELECT LINE 03
2 048	2 048	CMPG SELECT LINE 03 RETURN
2 049	2 049	CMPG SELECT LINE 04
2 050	2 050	CMPG SELECT LINE 04 RETURN
2 051	2 051	CMPG SELECT LINE 05
2 052	2 052	CMPG SELECT LINE 05 RETURN
2 053	2 053	CMPG SELECT LINE 06
2 054	2 054	CMPG SELECT LINE 06 RETURN
2 055	2 055	CMPG SELECT LINE 07
2 056	2 056	CMPG SELECT LINE 07 RETURN
2 057	2 057	CMPG SELECT LINE 08
2 058	2 058	CMPG SELECT LINE 08 RETURN
2 059	2 059	CMPG SELECT LINE 09
2 060	2 060	CMPG SELECT LINE 09 RETURN
2 061	2 061	CMPG SELECT LINE 10
2 062	2 062	CMPG SELECT LINE 10 RETURN
2 063	2 063	CMPG TRANSMIT TONE LOST ANY LINE
2 064	2 064	CMPG TRANSMIT TONE LOST ANY LINE RETURN
2 065	2 065	CMPG TRANSMIT TONE PRESENT ANY LINE
2 066	2 066	CMPG TRANSMIT LINE PRESENT ANY LINE RETURN
2 067	2 067	CMPG COMPUTER CLOCK
2 068	2 068	CMPG COMPUTER CLOCK RETURN
2 069	2 069	CMPG TONE ON LINE 01
2 070	2 070	CMPG TONE ON LINE 01 RETURN
2 071	2 071	CMPG TONE ON LINE 02
2 072	2 072	CMPG TONE ON LINE 02 RETURN
2 073	2 073	CMPG TONE ON LINE 03
2 074	2 074	CMPG TONE ON LINE 03 RETURN
2 075	2 075	CMPG TONE ON LINE 04
2 076	2 076	CMPG TONE ON LINE 04 RETURN
2 077	2 077	CMPG TONE ON LINE 05
2 078	2 078	CMPG TONE ON LINE 05 RETURN
2 079	2 079	CMPG TONE ON LINE 06
2 080	2 080	CMPG TONE ON LINE 06 RETURN
2 081	2 081	CMPG TONE ON LINE 07
2 082	2 082	CMPG TONE ON LINE 07 RETURN
2 083	2 083	CMPG TONE ON LINE 08
2 084	2 084	CMPG TONE ON LINE 08 RETURN
2 085	2 085	CMPG TONE ON LINE 09
2 086	2 086	CMPG TONE ON LINE 09 RETURN
2 087	2 087	CMPG TONE ON LINE 10
2 088	2 088	CMPG TONE ON LINE 10 RETURN

DPK CONN. J-PIN	TEST POINT J-#	A-M SYSTEM SIGNALS
2 089	2 089	CMPG CABLE RECEIVE DATA
2 090	2 090	CMPG CABLE RECEIVE DATA RETURN
2 091	2 091	CMPG CABLE RECEIVE DATA TIMING
2 092	2 092	CMPG CABLE RECEIVE DATA TIMING RETURN
2 093	2 093	CMPG NO DATA
2 094	2 094	CMPG NO DATA RETURN
2 095	2 095	CMPG COMMUNICATIONS TRANSMIT CLOCK
2 096	2 096	CMPG COMMUNICATIONS TRANSMIT CLOCK RETURN
2 097	2 097	CMPG CABLE RECEIVE DATA TRANSFER TIMING
2 098	2 098	CMPG CABLE RECEIVE DATA TRANSFER TIMING RETURN
2 099	2 099	CMPG TRANSMIT DATA
2 100	2 100	CMPG TRANSMIT DATA RETURN
2 101	2 101	CMPG TRANSMIT DATA TRANSFER TIMING
2 102	2 102	CMPG TRANSMIT DATA TRANSFER TIMING RETURN

DPK CONN. J-PIN	A-M SYSTEM SIGNALS
3 039	120 VAC, 400Hz, PHASE A
3 041	CHASSIS GROUND
3 043	NEUTRAL

DPK CONN. J-PIN	A-M SYSTEM SIGNALS	
5 005	COMPOSITE BLUE VIDEO	VDU 4
5 006	COMPOSITE GREEN VIDEO	VDU 4
5 007	COMPOSITE RED VIDEO	VDU 4
5 008	COMPOSITE BLUE VIDEO	VDU 2
5 009	COMPOSITE GREEN VIDEO	VDU 2
5 010	COMPOSITE RED VIDEO	VDU 2

DPK CONN. J-PIN	TEST POINT J-#	A-M SYSTEM SIGNALS
4 001	4 001	FDD TRANSMIT CLOCK (TXC)+
4 002	4 002	FDD TRANSMIT CLOCK (TXC)-
4 003	4 003	FDD RECEIVE CLOCK (RXC)-
4 004	4 004	FDD RECEIVE CLOCK (RXC)+
4 005	4 005	RMP EAM DATA RELEASE
4 006	4 006	RMP EAM DATA RELEASE RETURN
4 007	4 007	RMP WSP DATA +
4 008	4 008	RMP WSP DATA -
4 009	4 009	RMP ACKNOWLEDGE
4 010	4 010	RMP ACKNOWLEDGE RETURN
4 011	4 011	RMP NOT ACKNOWLEDGE
4 012	4 012	RMP NOT ACKNOWLEDGE RETURN
4 013	4 013	RMP EAM ALARM RESET
4 014	4 014	RMP NON EAM ALARM RESET
4 015	4 015	RMP NON EAM ALARM RESET RETURN
4 016	4 016	RMP ROUTINE ALARM RESET
4 017	4 017	RMP ROUTINE ALARM RESET RETURN
4 018	4 018	RMP LCC TEST
4 019	4 019	RMP LCC TEST RETURN
4 020	4 020	RMP PRINTER DATA +
4 021	4 021	RMP PRINTER DATA -
4 022	4 022	RMP CLOCK TOD SYNC
4 023	4 023	RMP CLOCK TOD SYNC RETURN
4 024	4 024	RMP CLEAR TO SEND
4 025	4 025	RMP CLEAR TO SEND RETURN
4 026	4 026	RMPB PRINT DATA +
4 027	4 027	RMPB EAM ALARM RESET RETURN
4 028	4 028	RMPB PRINT COMMAND
4 029	4 029	RMPB PRINT COMMAND RETURN
4 030	4 030	RMPB INHIBIT ALARM
4 031	4 031	RMPB INHIBIT ALARM RETURN
4 032	4 032	RMPB ROUTINE ALARM
4 033	4 033	RMPB ROUTINE ALARM RETURN
4 034	4 034	RMPB EAM ALARM
4 035	4 035	RMPB EAM ALARM RETURN
4 036	4 036	RMPB CLEAR TO SEND
4 037	4 037	RMPB CLEAR TO SEND RETURN
4 038	4 038	FDD TRANSMITTED DATA (TXD) +
4 039	4 039	FDD TRANSMITTED DATA (TXD) -
4 040	4 040	RMPB PRINT DATA -
4 041	4 041	FDD RECEIVED DATA (RXD)+
4 042	4 042	FDD RECEIVED DATA (RXD)-
4 043	4 043	BS/L SCSI DB0 GD
4 044	4 044	BS/L SCSI DB0
4 045	4 045	BS/L SCSI DB1 GD
4 046	4 046	BS/L SCSI DB1
4 047	4 047	BS/L SCSI DB2 GD
4 048	4 048	BS/L SCSI DB2
4 049	4 049	BS/L SCSI DB3 GD
4 050	4 050	BS/L SCSI DB3
4 051	4 051	BS/L SCSI DB4 GD
4 052	4 052	BS/L SCSI DB4
4 053	4 053	BS/L SCSI DB5 GD
4 054	4 054	BS/L SCSI DB5
4 055	4 055	BS/L SCSI DB6 GD
4 056	4 056	BS/L SCSI DB6
4 057	4 057	BS/L SCSI DB7 GD
4 058	4 058	BS/L SCSI DB7
4 059	4 059	BS/L SCSI DBP GD
4 060	4 060	BS/L SCSI DBP
4 061	4 061	BS/L SCSI I/O GD
4 062	4 062	BS/L SCSI I/O
4 063	4 063	BS/L SCSI MSG GD
4 064	4 064	BS/L SCSI MSG
4 065	4 065	BS/L SCSI REQ GD
4 066	4 066	BS/L SCSI REQ
4 067	4 067	BS/L SCSI RESET GD
4 068	4 068	BS/L SCSI RESET
4 069	4 069	BS/L SCSI GROUND
4 070	4 070	BS/L SCSI SEL GD
4 071	4 071	BS/L SCSI SEL

DPK CONN. J-PIN	TEST POINT J-#	A-M SYSTEM SIGNALS
4 072	4 072	BS/L SCSI ATN GD
4 073	4 073	BS/L SCSI ATN
4 074	4 074	BS/L SCSI BSY GD
4 075	4 075	BS/L SCSI BSY
4 076	4 076	BS/L SCSI C/D GD
4 077	4 077	BS/L SCSI C/D
4 078	4 078	BS/L SCSI ACK GD
4 079	4 079	BS/L SCSI ACK
4 080	4 080	PTR PRINTER STATUS RECEIVED DATA (RXD)A+
4 081	4 081	PTR PRINTER STATUS RECEIVED DATA (RXD)A-
4 082	4 082	OID OID2 RECEIVED DATA (RXD)A+
4 083	4 083	OID OID2 RECEIVED DATA (RXD)A-
4 084	4 084	OID OID1 PWSCCR ACTIVE (CTS)A+
4 085	4 085	OID OID1 PWSCCR ACTIVE (CTS)A-
4 086	4 086	PTR PRINT READY (CTS)+
4 087	4 087	PRT PRINT READY (CTS)-
4 088	4 088	PTR PRINTER TRANSMITTED DATA (TXD)A+
4 089	4 089	PTR PRINTER TRANSMITTED DATA (TXD)A-
4 090	4 090	OID OID1 RECEIVED DATA (RXD)A+
4 091	4 091	OID OID1 RECEIVED DATA (RXD)A-
4 092	4 092	OID OID2 PWSCCR ACTIVE (CTS)A+
4 093	4 093	OID OID2 PWSCCR ACTIVE (CTS)A-
4 095	4 094	OID OID1 +5 VDC A
4 097	4 095	OID OID2 +5 VDC A
4 100	4 096	NED NEDB -
4 101	4 097	NED NEDB +
4 102	4 098	NED NEDP -
4 103	4 099	NED NEDP +
4 125	4 100	OID OID1 +5 VDC RETURN
4 127	4 101	OID OID2 +5 VDC RETURN
4 157	4 102	DP EMSC DIAG PORT RXD H
4 158	4 103	DP EMSC DIAG PORT RXD L
4 163	4 104	CDA SDU READ MODE RETURN
4 164	4 105	CDA SDU READ MODE
4 165	4 106	CDA SDU MODE 1 DECRYPT
4 166	4 107	CDA SDU MODE 1 DECRYPT RETURN
4 167	4 108	CDA SDU DATA RDY RETURN
4 168	4 109	CDA SDU READY
4 169	4 110	CDA SDU DATA IN
4 170	4 111	CDA SDU DATA IN RETURN
4 171	4 112	DP EMSC DIAG PORT TXD RETURN
4 172	4 113	DP EMCS DIAG PORT TXD
4 178	4 114	CDA SDU MODE 2 ENCRYPT RETURN
4 179	4 115	CDA SDU MODE 2 ENCRYPT
4 180	4 116	CDA SDU DATA SHIFT PULSE
4 181	4 117	CDA SDU DATA SHIFT PULSE RETURN
4 182	4 118	CDA SDU DATA OUT RETURN
4 183	4 119	CDA SDU DATA OUT
4 184	4 120	CDA SDU ALARM
4 185	4 121	CDA SDU ALARM RETURN

DETAIL F

[1> W4167 NOT IN [1] FLIGHT K, [3] FLIGHTS C OR M AND [5] FLIGHT I

[2> URD IN [1] FLIGHTS G AND K, [3] FLIGHTS C AND I, AND [5] FLIGHT I

[3> W4155 NOT INSTALLED IN [1] FLIGHTS A AND G, AND [3] FLIGHTS C AND M

[4> [5] ONLY

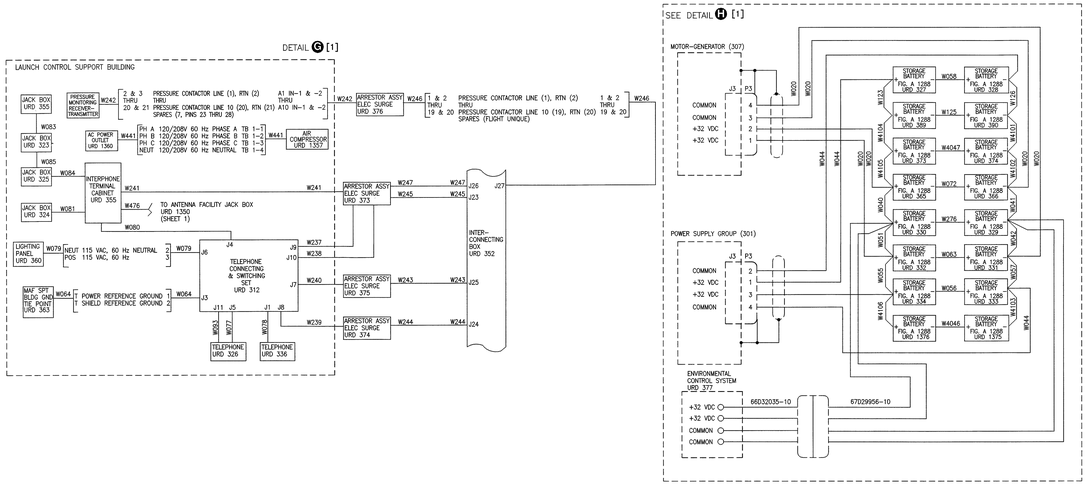
[5> APPLICABLE TO MBCP (SCP/ACP) SITES ONLY [1] FLIGHTS A, G, K, [3] FLIGHTS C, I, M, OR [5] FLIGHTS A, I, O

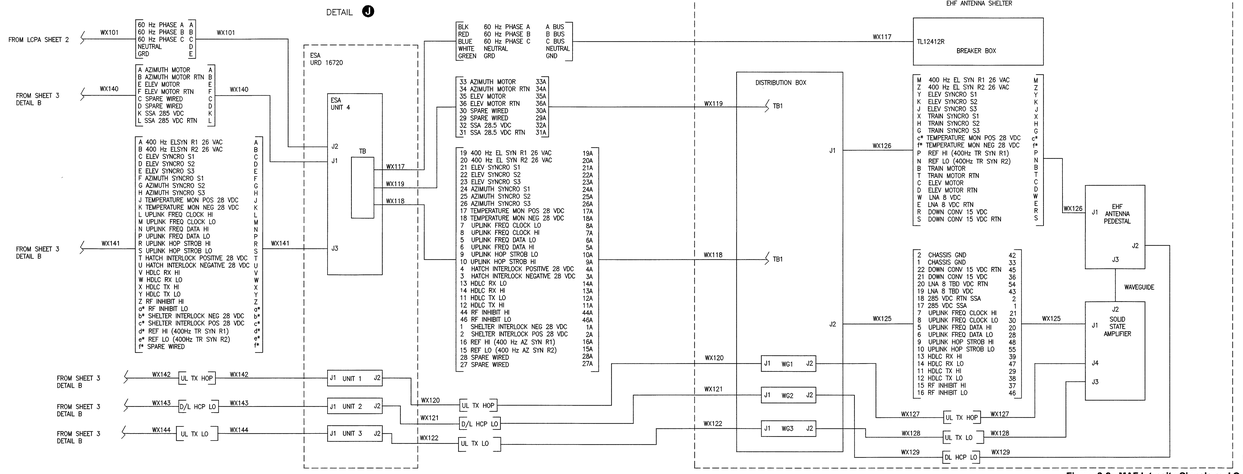
[6> W221 INSTALLED IN ACP/SCPs [1] FLIGHTS A, G, K, [3] FLIGHTS C, I, M, AND [5] FLIGHTS A, I, O, T

REF: T.O. 21M-LGM30F-2-21-8
T.O. 21M-LGM30G-2-21-3

MMT201_016K

Figure 9-3. MAF Intrasite Signals and Cabling (Sheet 3 of 4)





MM7201_017K

Figure 9-3. MAF Intrasite Signals and Cabling (Sheet 4 of 4)

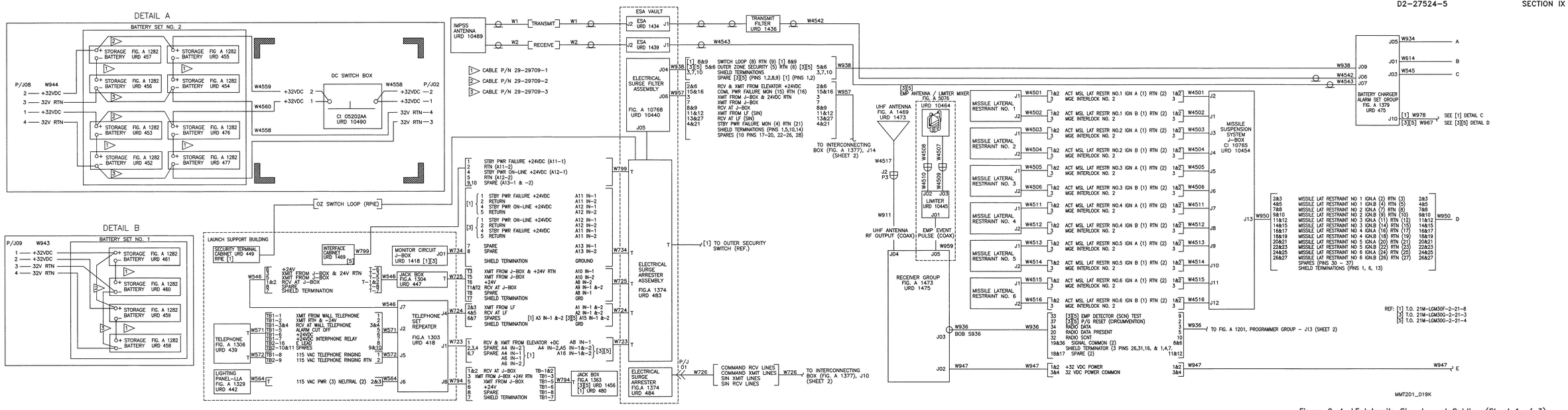


Figure 9-4. LF Intrasite Signals and Cabling (Sheet 1 of 3)

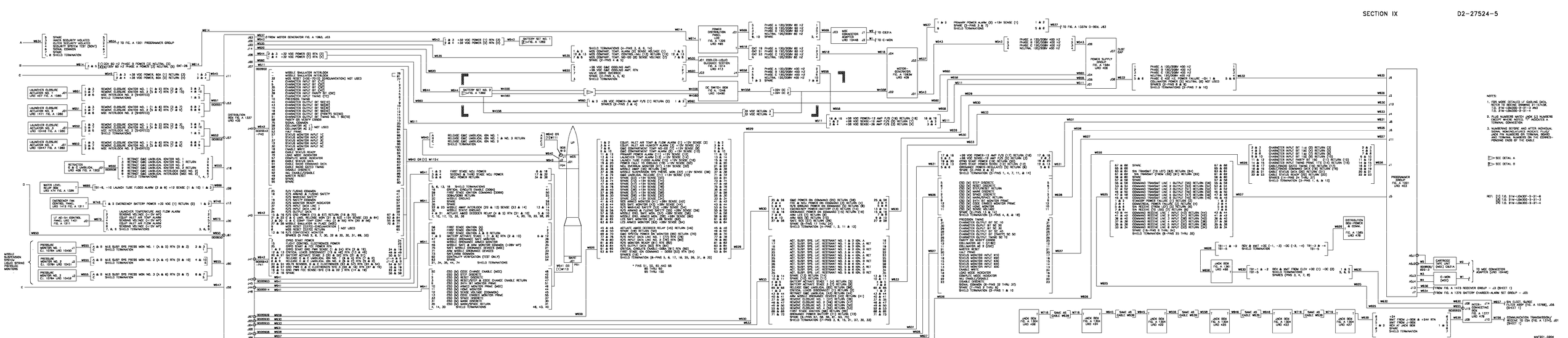


Figure 9-4. LF Intraside Signals and Cabling (Sheet 2 of 3)

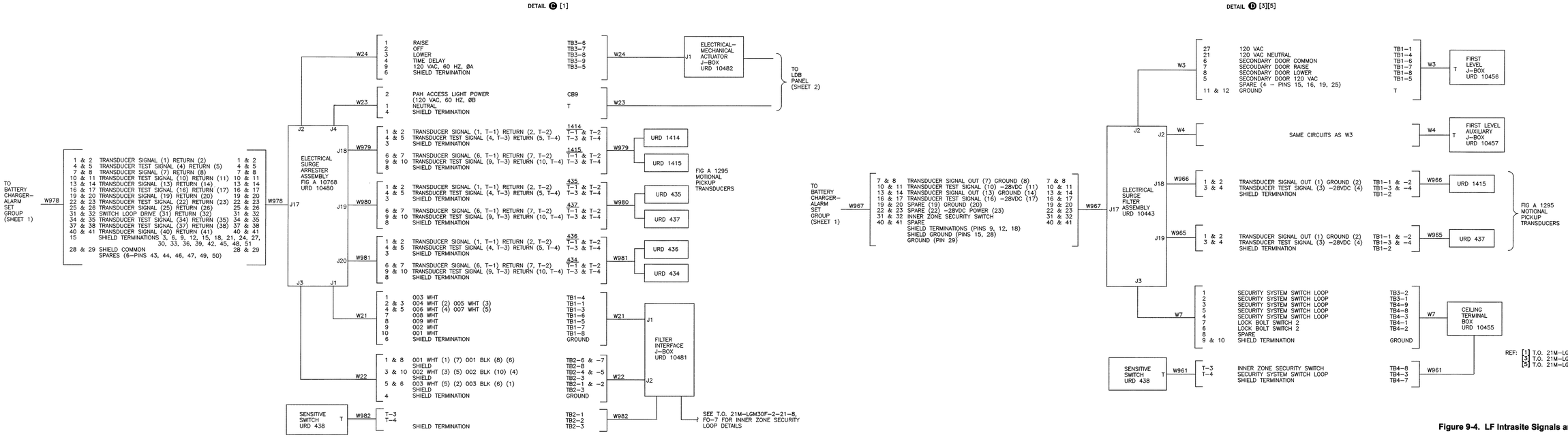


Figure 9-4. LF Intrasite Signals and Cabling (Sheet 3 of 3)

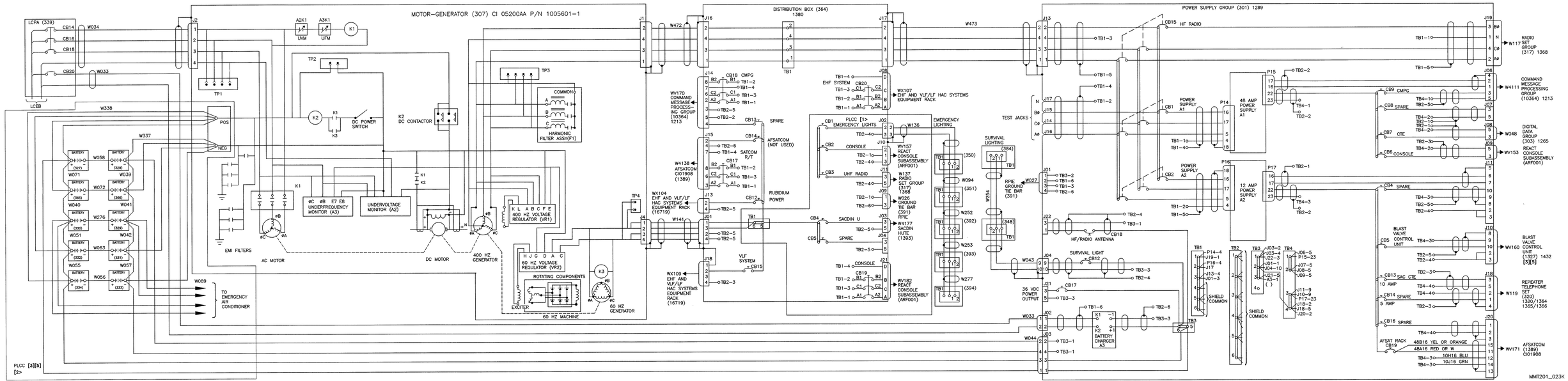
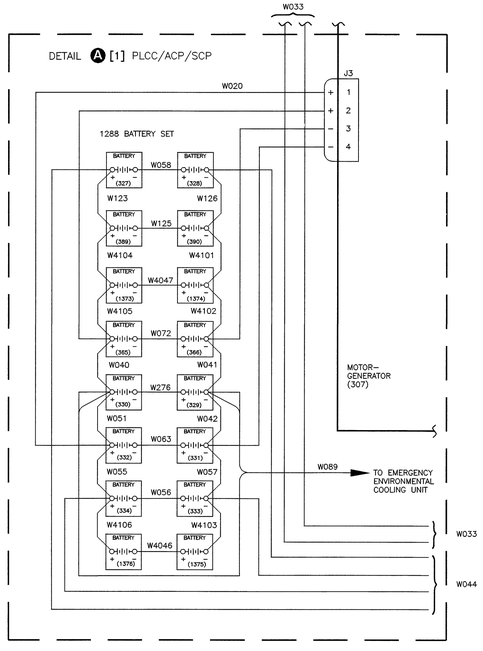
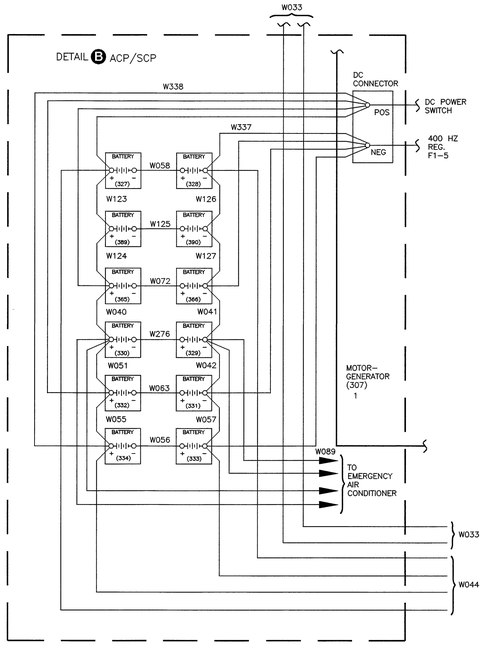
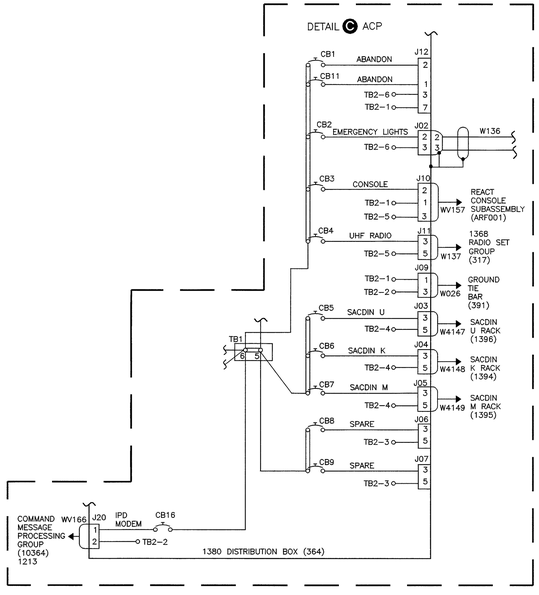
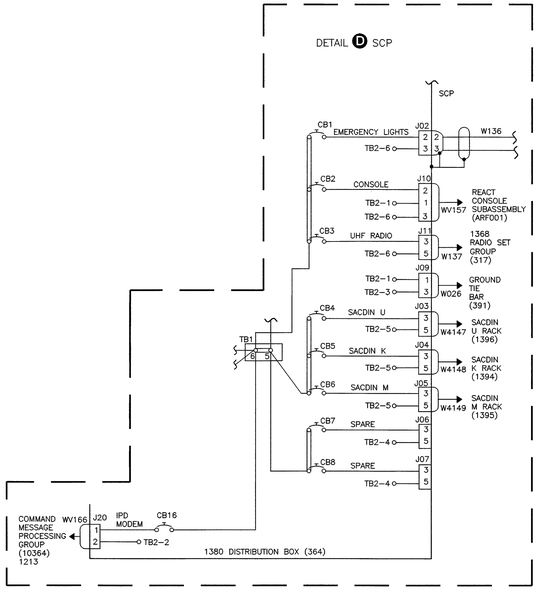


Figure 9-5. LCC Power System Schematic (Sheet 1 of 2)







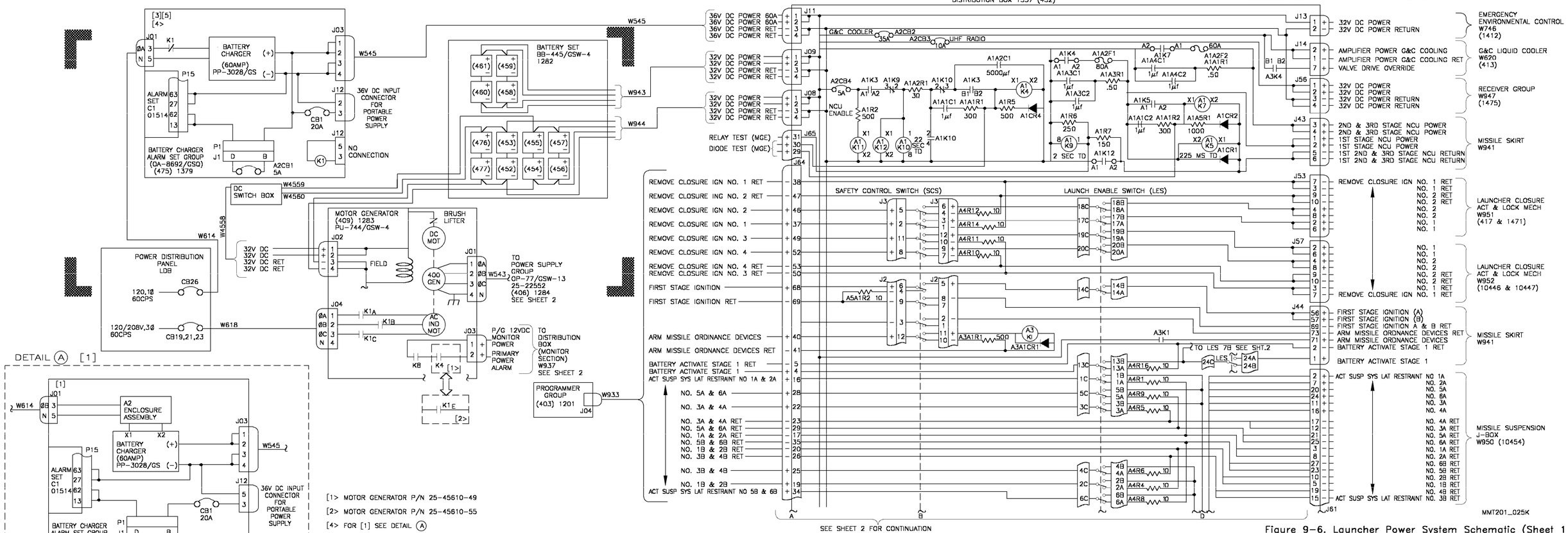


[1> SEE DETAIL D FOR SCP
AND DETAIL C FOR ACP
[2> SEE DETAIL B FOR SCP
AND DETAIL A FOR [1] PLCC/ACP/SCP
SOURCE: T.O. 21M-LGM30G-2-11

NOTE: NUMBERS IN PARENTHESIS ARE UNIT REFERENCE DESIGNATIONS AND OTHER NUMBERS ARE FIGURE A/CI NUMBERS.

MMT201_024K

Figure 9-5. LCC Power System Schematic (Sheet 2 of 2)



DETAIL (A) [1]

[1> MOTOR GENERATOR P/N 25-45610-49

[2> MOTOR GENERATOR P/N 25-45610-55

[4> FOR [1] SEE DETAIL (A)

Figure 9-6. Launcher Power System Schematic (Sheet 1 of 2)

Figure 9-6. Launcher Power System Schematic (Sheet 2 of 2)

NOTES:

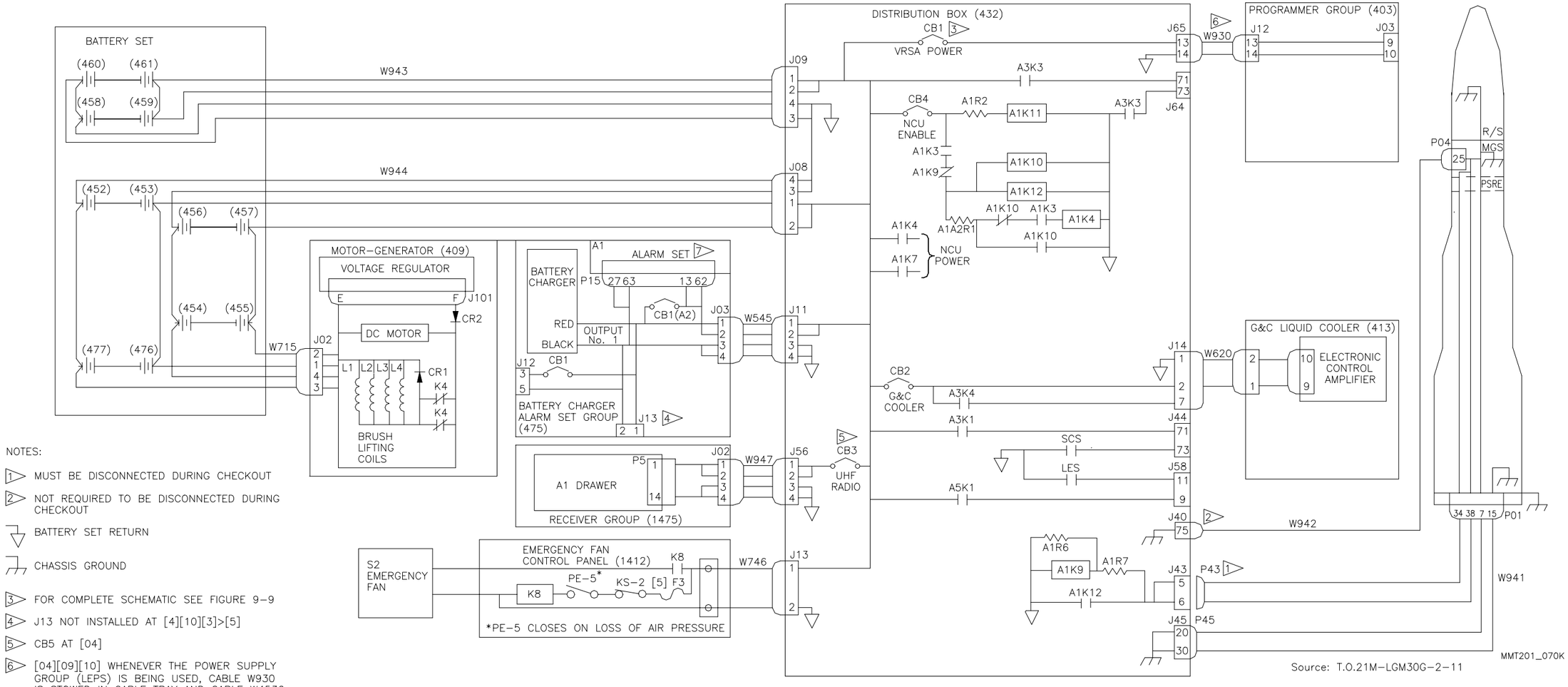
1. CIRCUITS ARE SHOWN IN STRATEGIC ALERT CONFIGURATION.
2. ALL SWITCHES ARE SHOWN IN THE SAFE POSITION.
3. BATTERY SET NO. 1 SUPPLIES A MINIMUM OF 28 VDC FOR:
   A. MISSILE HYDRAULIC TEST AND LAUNCH GROUND POWER
   B. ORDNANCE GROUND POWER.
4. THE ORDNANCE DEVICES ARE SCHEMATIC REPRESENTATIONS ONLY. SEE THE REFERENCE DATA FOR A COMPLETE CIRCUIT DESCRIPTION.

1 NOT CONNECTED IN D-BOX

REFERENCE: 21-52747
AVE SYSTEM DIAGRAM

MM7201_037a

Figure 9-7. Ave Ordnance and Power Interconnectivity



NOTES:

1. MUST BE DISCONNECTED DURING CHECKOUT
2. NOT REQUIRED TO BE DISCONNECTED DURING CHECKOUT
3. FOR COMPLETE SCHEMATIC SEE FIGURE 9-9
4. J13 NOT INSTALLED AT [4][10][3]>[5]
5. CB5 AT [04]
6. [04][09][10] WHENEVER THE POWER SUPPLY GROUP (LEPS) IS BEING USED, CABLE W930 IS STOWED IN CABLE TRAY AND CABLE W4536 IS USED.
7. [1][3]>[5] ALARM SET POWER IS FROM BATTERY CHARGER OUTPUT.

BATTERY SET RETURN

CHASSIS GROUND

Figure 9-8. Power Fault-to-Ground Schematic

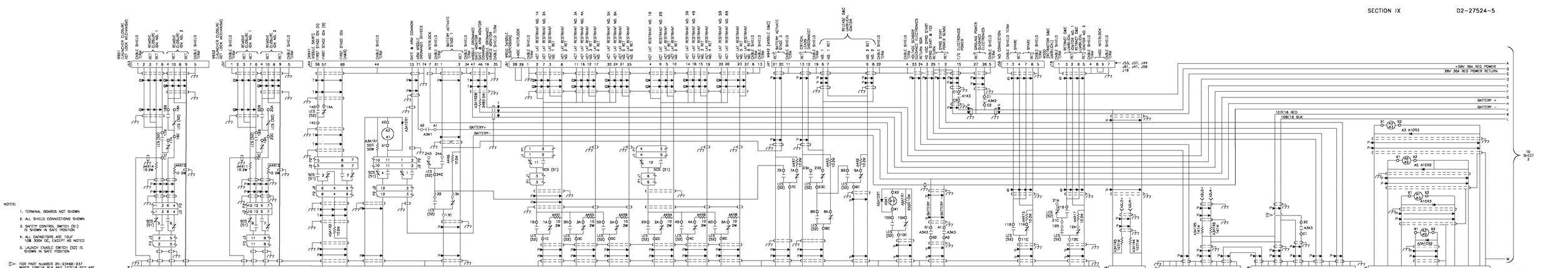


Figure 9-9. LF Distribution Box Schematic (Sheet 1 of 3)

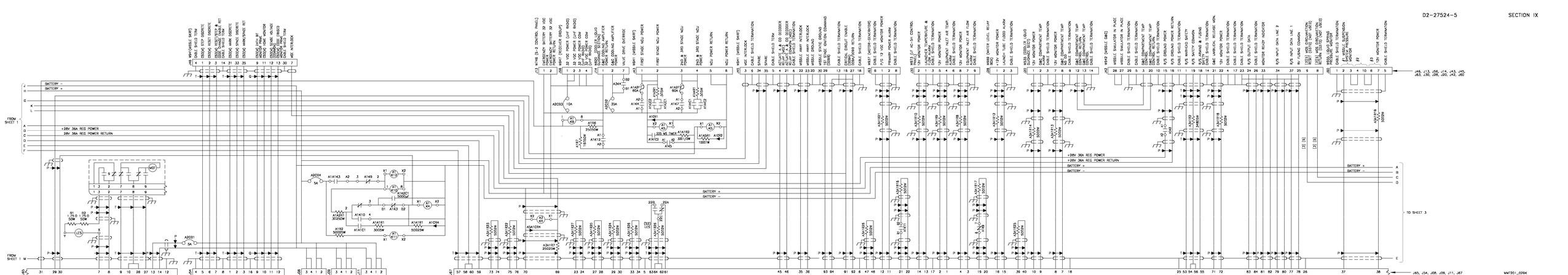


Figure 9-9. LF Distribution Box Schematic (Sheet 2 of 3)

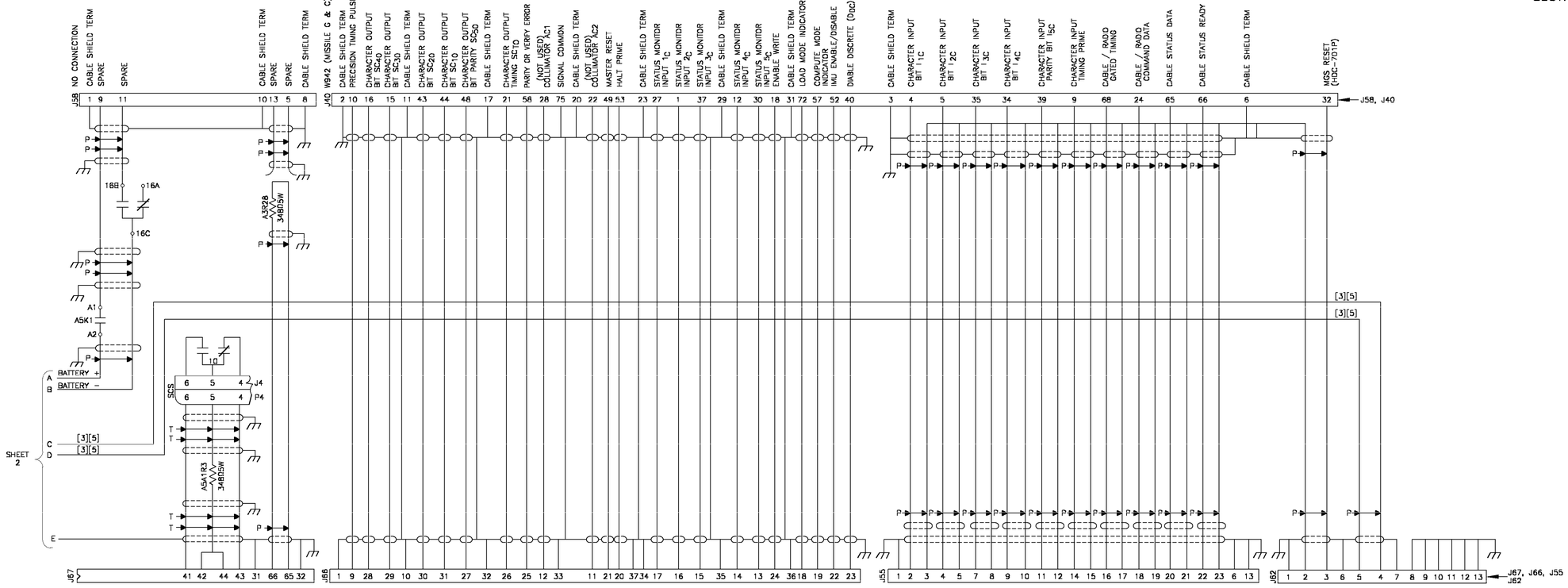


Figure 9-9. LF Distribution Box Schematic (Sheet 3 of 3)

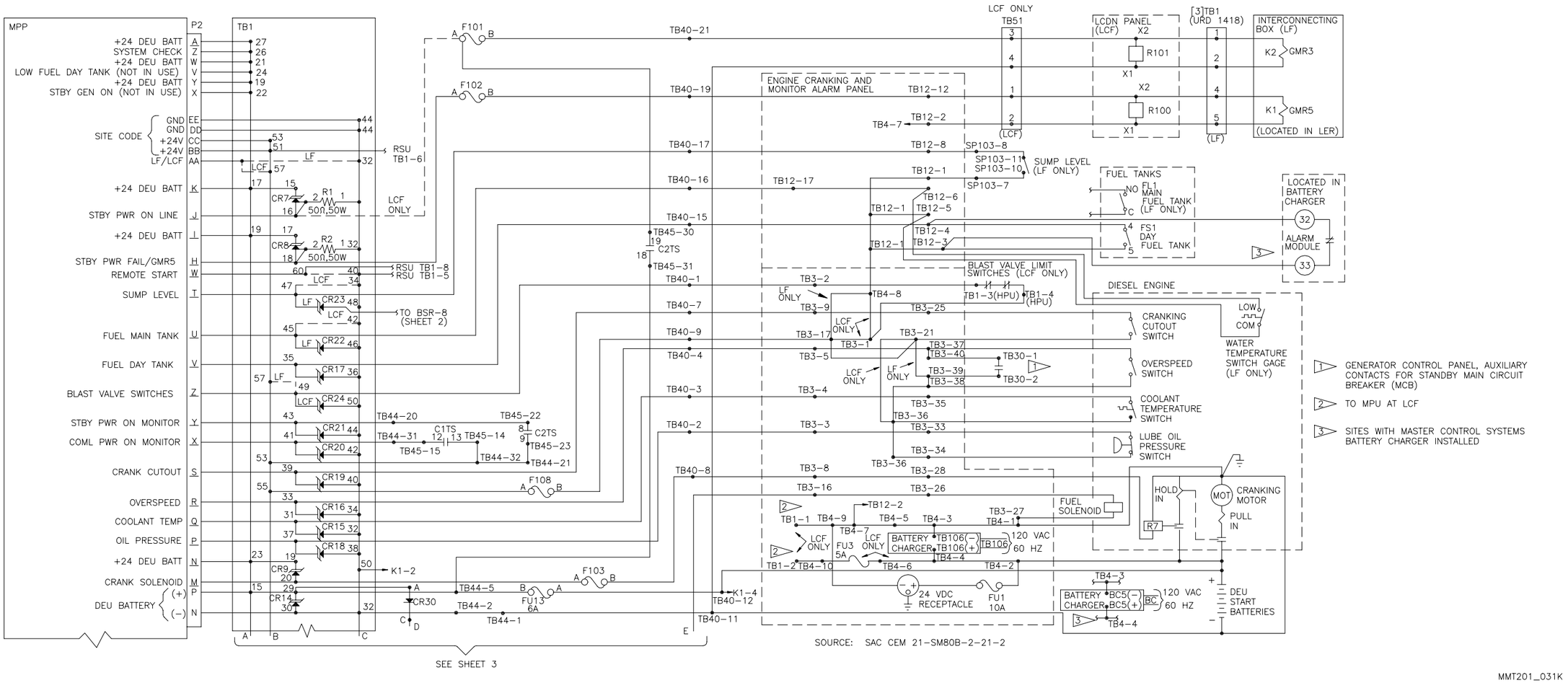


Figure 9-10. LCEB and LFSB Power Generation System Schematic (Sheet 1 of 3)

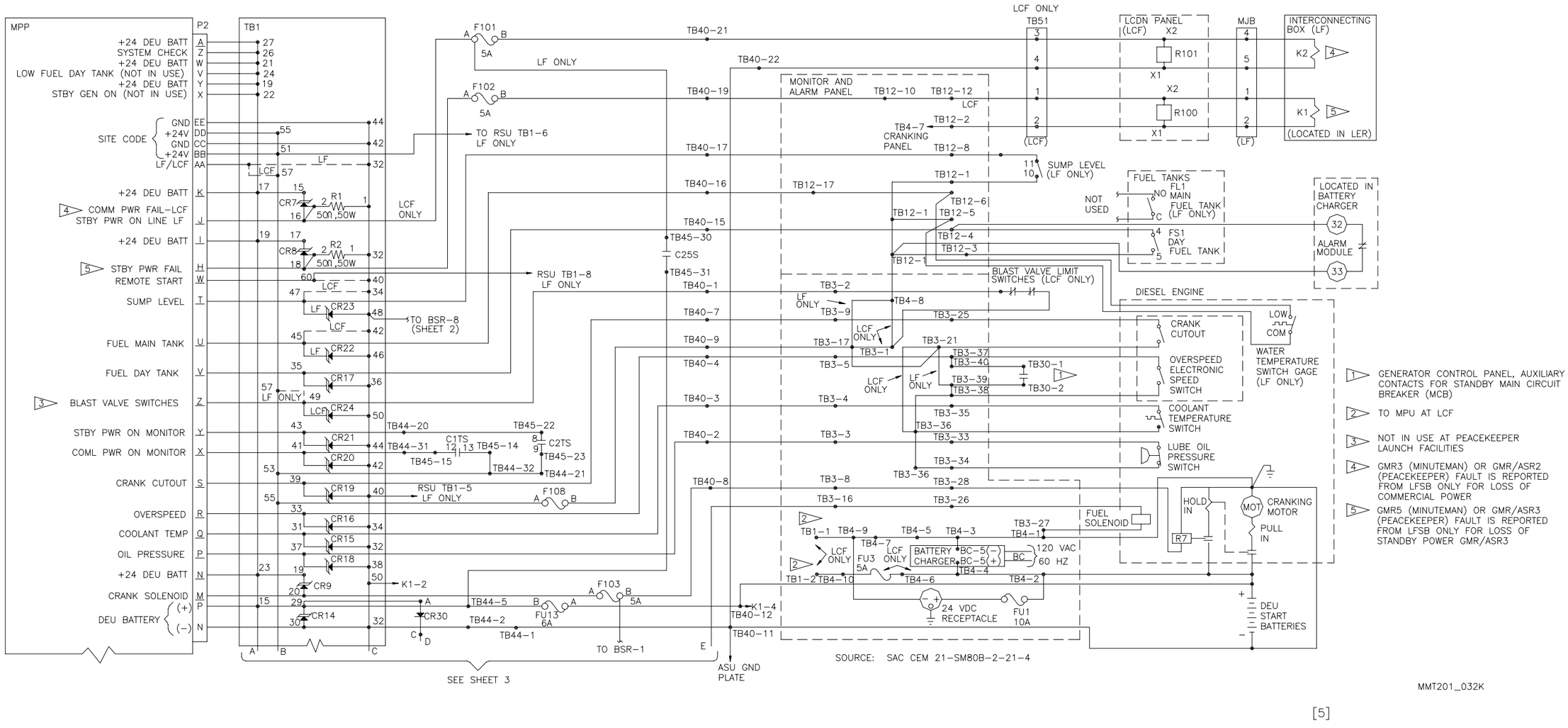


Figure 9-10. LCEB and LFSB Power Generation System Schematic (Sheet 2 of 3)

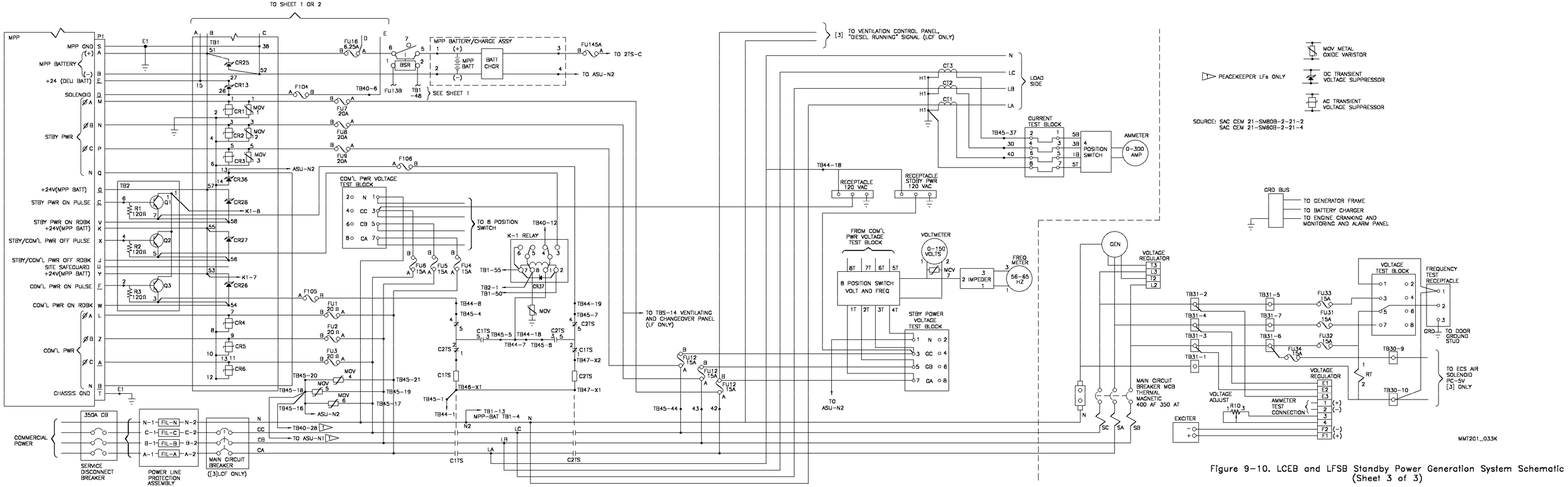


Figure 9-10. LCEB and LFSB Standby Power Generation System Schematic (Sheet 3 of 3)

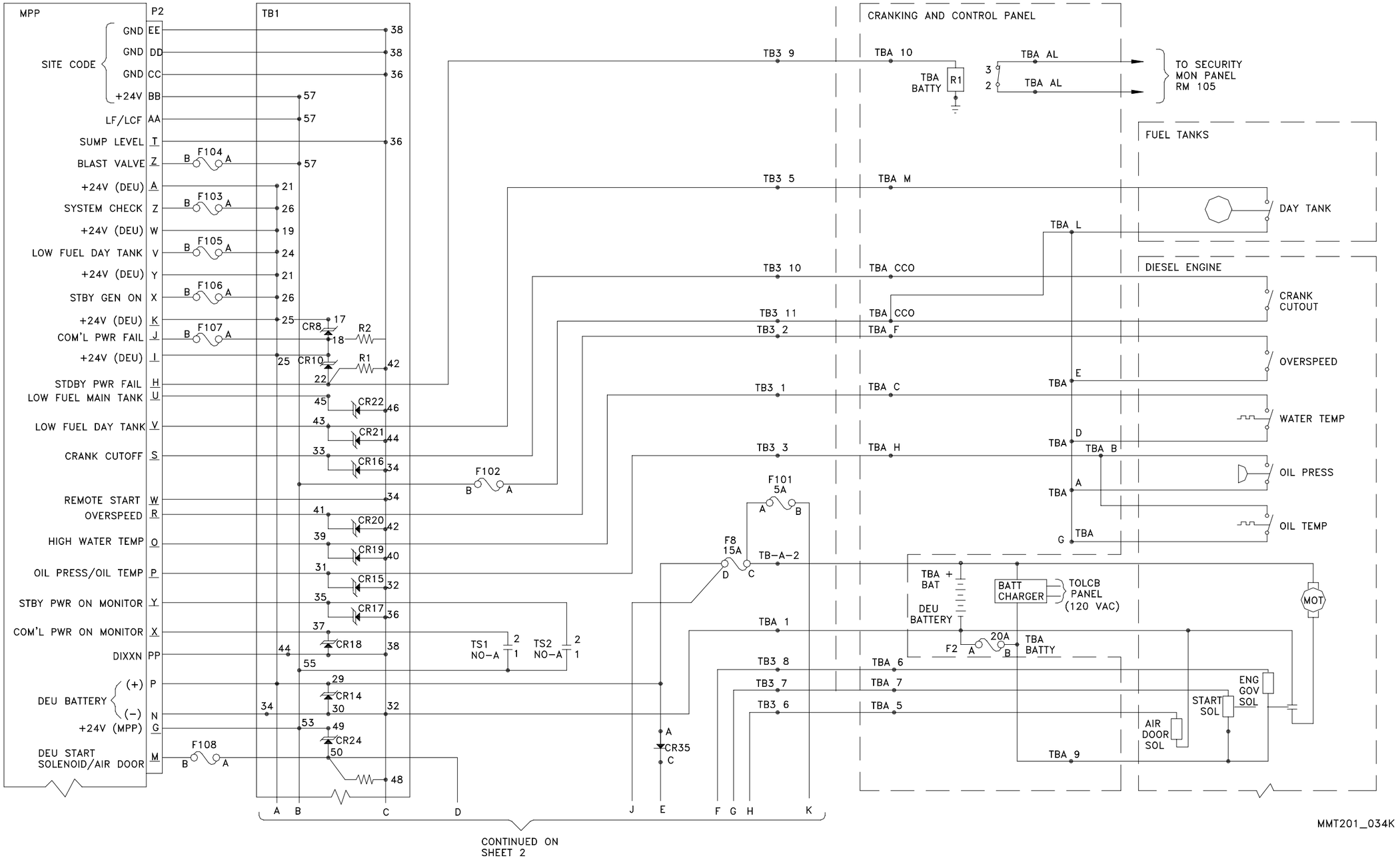


Figure 9-11. [1] LCF Power Generation and Distribution Schematic (Sheet 1 of 2)

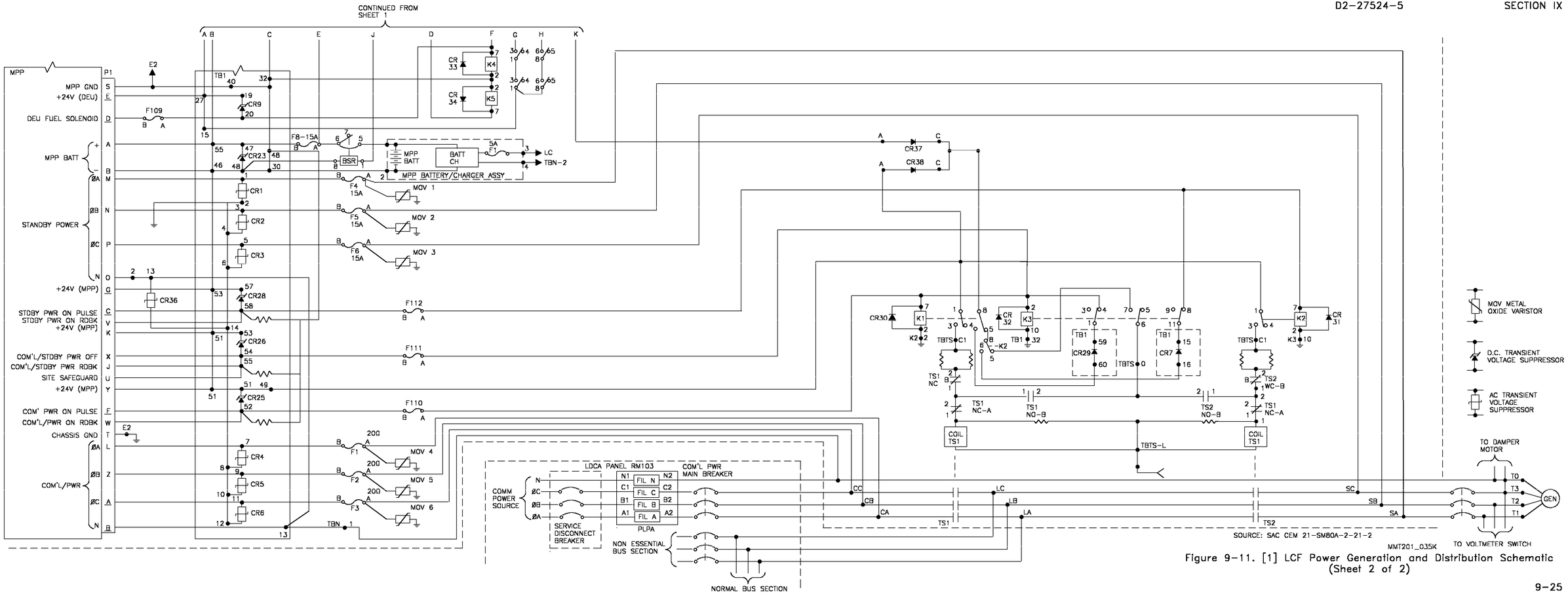


Figure 9-11. [1] LCF Power Generation and Distribution Schematic (Sheet 2 of 2)

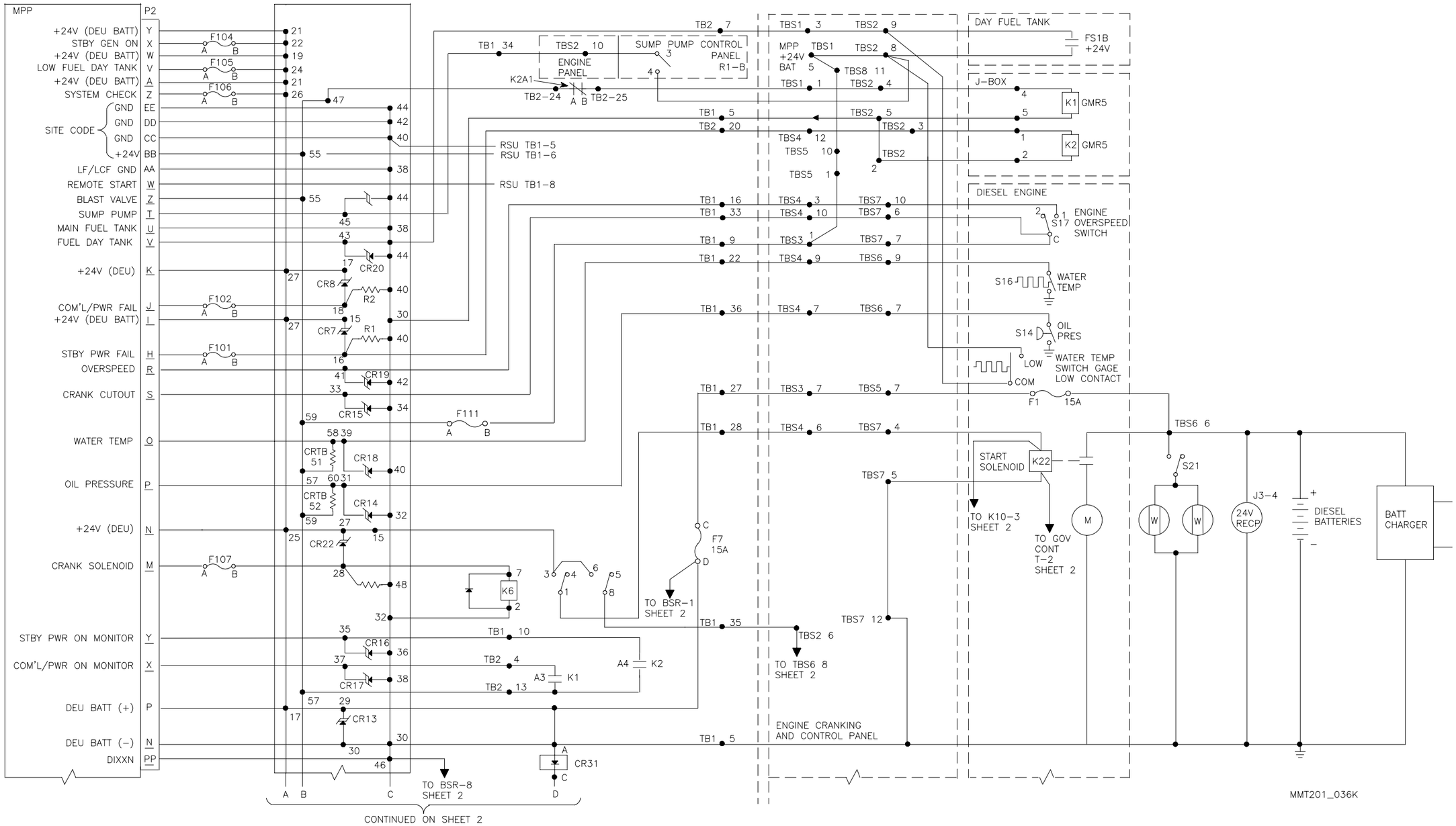


Figure 9-12. LFSB Power Generation and Distribution Schematic (Sheet 1 of 2)

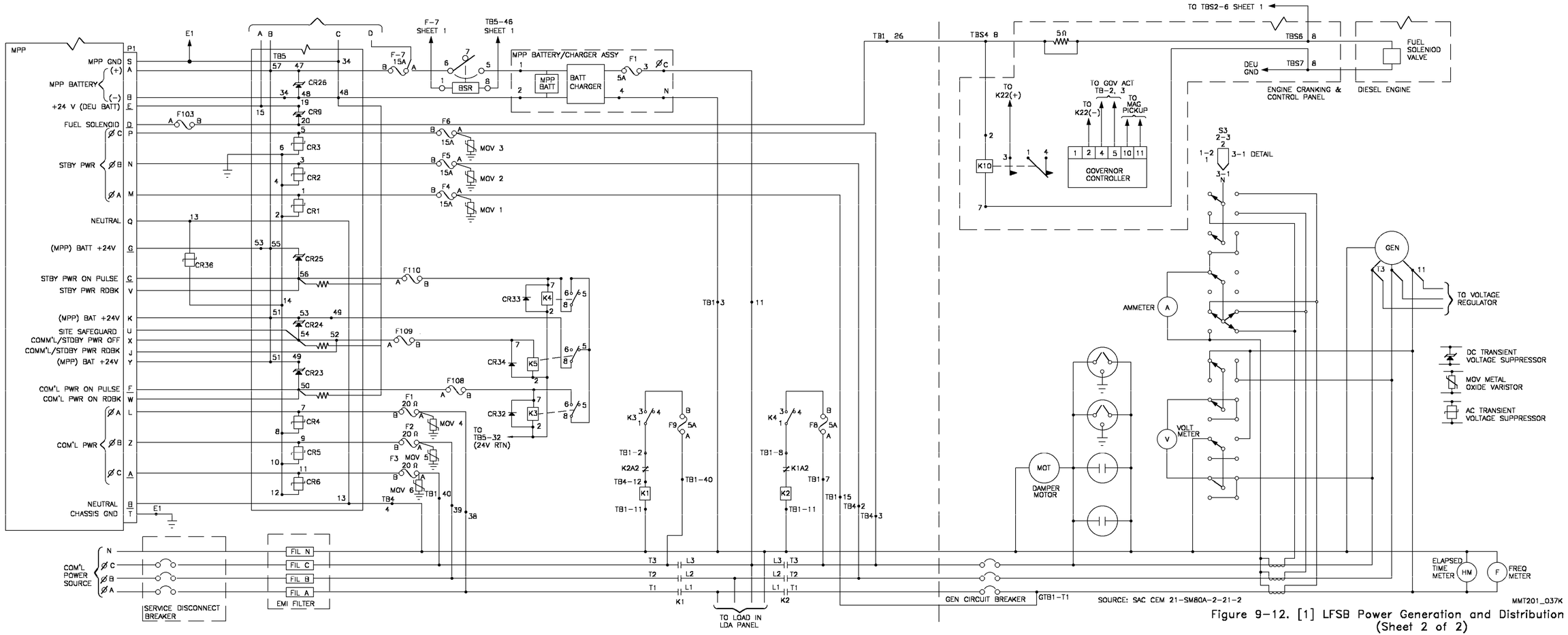
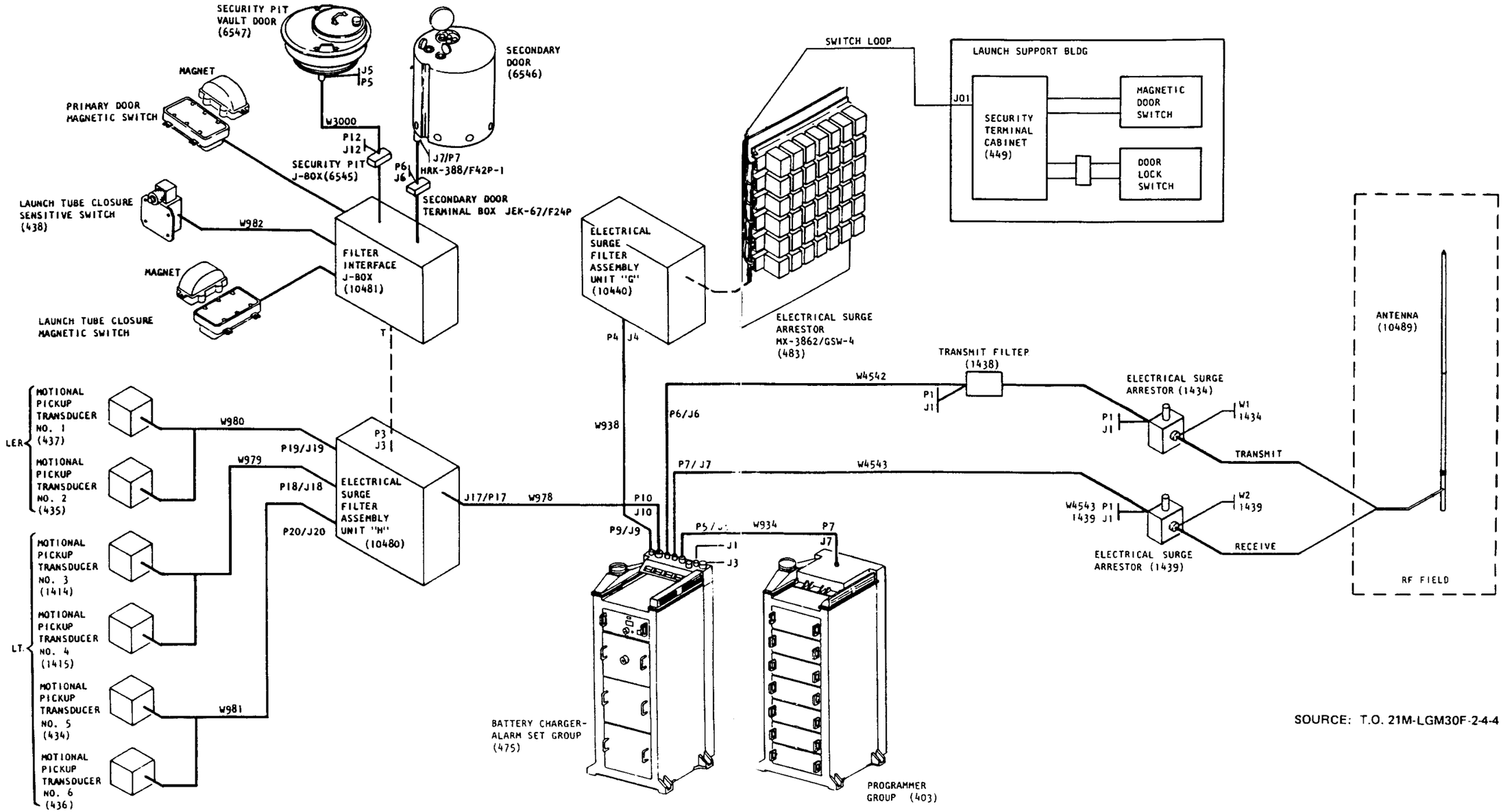


Figure 9-12. [1] LFSB Power Generation and Distribution Schematic (Sheet 2 of 2)



SOURCE: T.O. 21M-LGM30F-2-4-4

Figure 9-13. [1] Security System Cabling Diagram

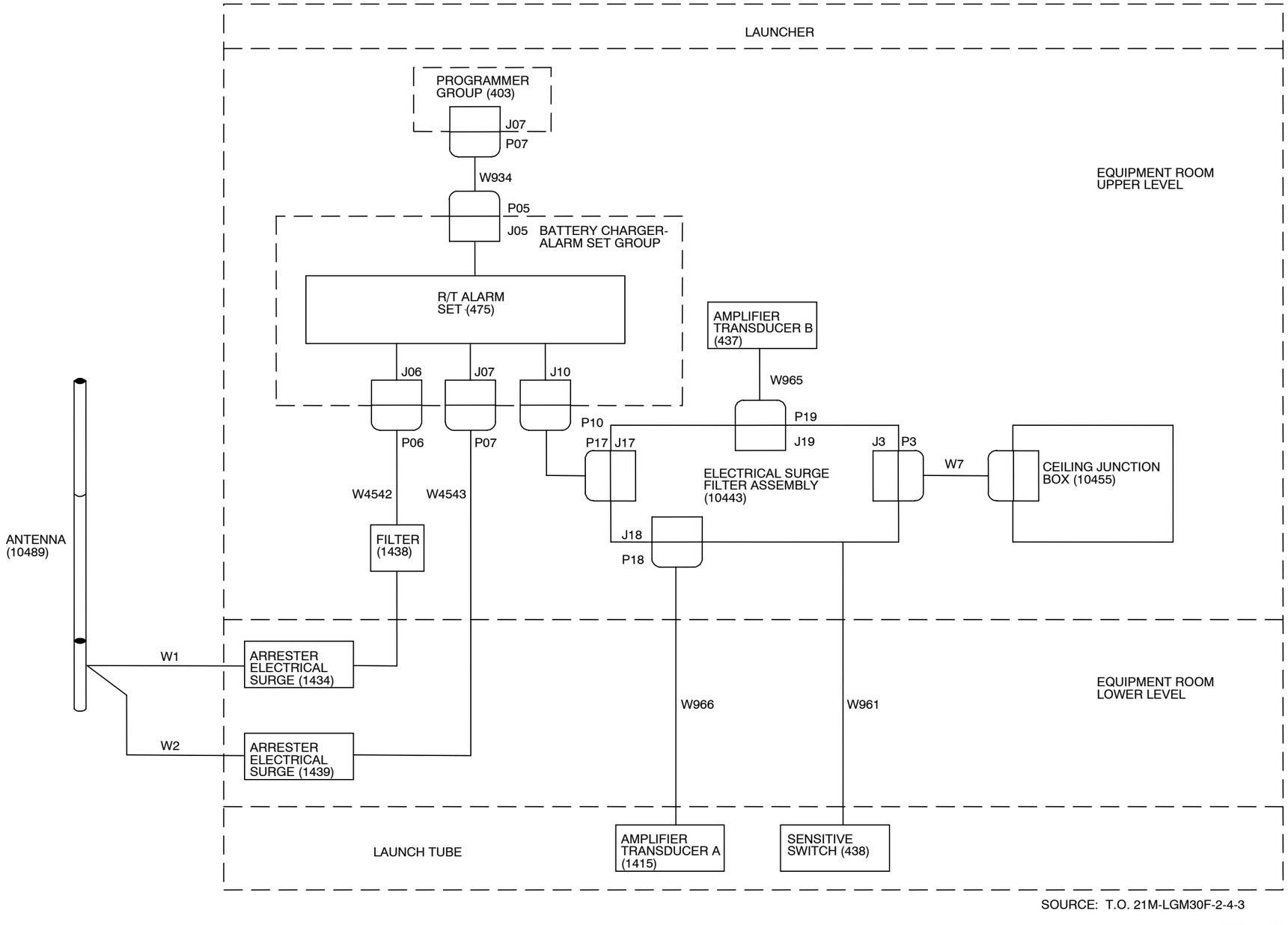
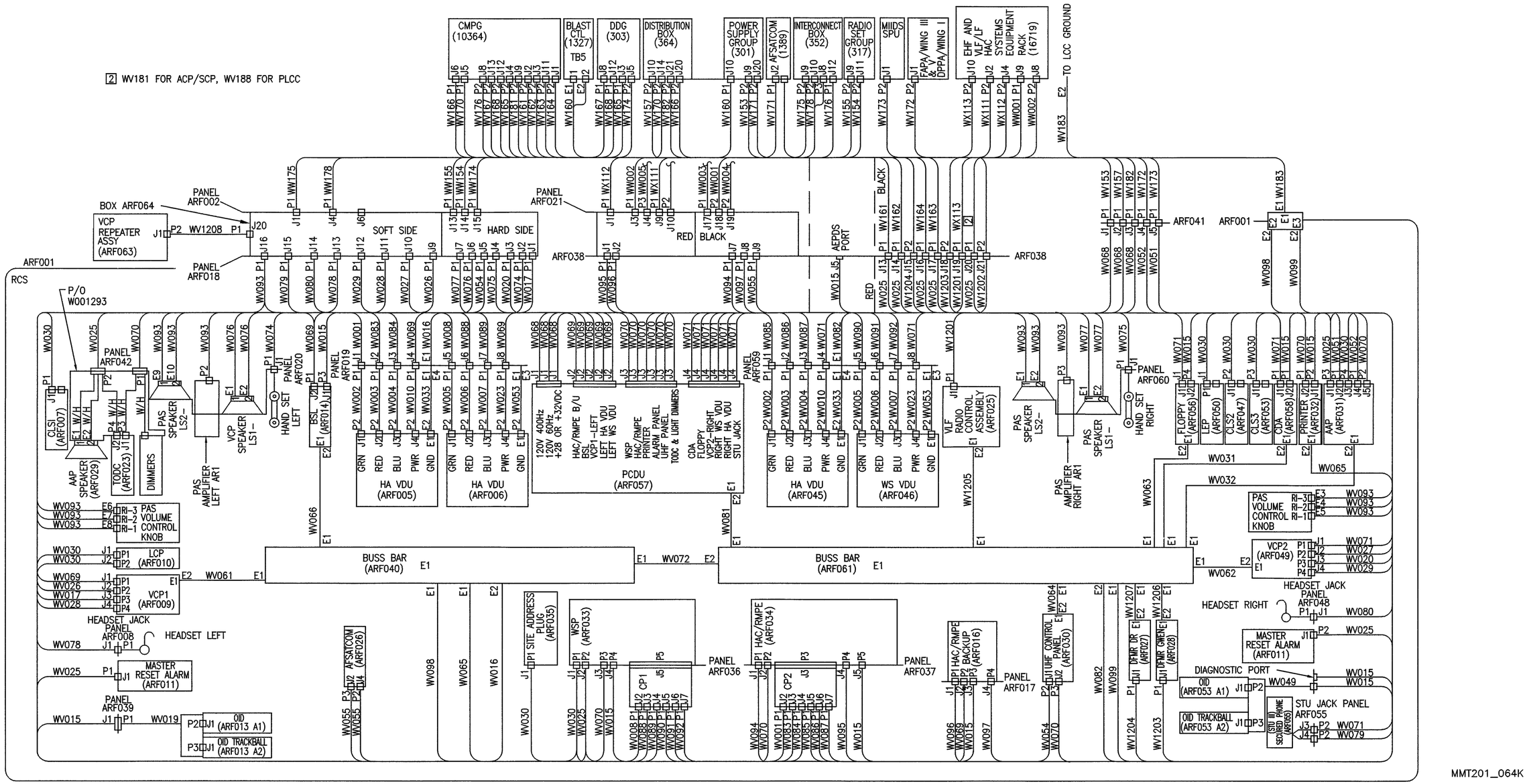


Figure 9-14. [3][5] Launch Facility Security System Cabling Diagram



MMT201_064K

Figure 9-15. LCC Console Aerial Cable Diagram

SECTION X - TEST POINTS

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LIST OF TABLES

10-1. SCOPE. This section contains LCF and LF equipment rack test points.

Table 10-1. LF Equipment Rack Test Points

PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A2, DETECTOR AUDIO FREQUENCY	
J1 (TEST) PIN NUMBER	**NOMENCLATURE**
A & B	SIN Receive Output (LCF)
L & M	SIN Transmit Output (LCF)
P & R	SIN Transmit Input (Spare)
S & T	SIN (Transmit Input (LSB)
W & X	HVC Transmit No. 1
Y & Z	HVC Transmit No. 2
AA & BB	SIN Receive Input (LCF)
CC & DD	HVC Receive No. 2
EE & FF	HVC Receive No. 1
PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A4, MESSAGE PROCESSOR	
BOA SA4/J1AM) J1 PIN NUMBER	**NOMENCLATURE**
B & C	Digital Diphase Receive Line 1
D & E	Digital Diphase Receive Line 2
F & G	Digital Diphase Receive Line 3
H & K	Digital Diphase Receive Line 4
L & M	Digital Diphase Receive Line 5
N & P	Digital Diphase Receive Line 6
T & U	Speed-Up Timing
V & W	83.2 KHz Timing
X & Y	Digital Diphase Received
z	Line Seize
a	Bit 55 Altered
b	Digital Diphase Transmit
c	Receive Mode

Table 10-1. LF Equipment Rack Test Points (Continued)

PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A4, MESSAGE PROCESSOR (CONTINUED)	
J2 PIN NUMBER	**NOMENCLATURE**
A	Ground, 0 VDC - (Jumpered in code plug to address bits requiring logical 0's)
B & C	Address Bit 1
D & E	Address Bit 2
F & G	Address Bit 3
H & J	Address Bit 4
K & L	Address Bit 5
M & N	Address Bit 6
P & R	Address Bit 7
S	Tone Detector 6 Output
T	Tone Detector 5 Output
U	Tone Detector 4 Output
V	Tone Detector 3 Output
W	Tone Detector 2 Output
X	Tone Detector 1 Output
g, h, i, j, k, m, n, p, y	+5 VDC (Jumber in Code Plug to Address Bits Requiring Logical 1's, and to any unused line loss or critical line detected pins)
q	LF Address Decoded
r	Jumpered in Code Plug from Pin q
s	Line 3 Seized
t	Line 4 Seized
u	Line 5 Seized
v	Critical Line Seized (Jumpered in Code Plug if requiring from Pins GG, s, t, u, or w)
w	Line 6 Seized
AA	Line Loss (Jumpered in Code Plug from Pin S unless line 6 unused)
BB	Line Loss (Jumpered in Code Plug from Pin T unless line 5 unused)
CC	Line Loss (Jumpered in Code Plug from Pin U unless line 4 unused)

Table 10-1. LF Equipment Rack Test Points (Continued)

PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A4, MESSAGE PROCESSOR (CONTINUED)	
J2 PIN NUMBER	**NOMENCLATURE**
DD	Line Loss (Jumpered in Code Plug from Pin V unless line 3 unused)
EE	Line Loss (Jumpered in code Plug from Pin W unless line 2 unused)
FF	Line Loss (Jumpered in code Plug from Pin X unless line 1 unused)
GG	Line 2 Seized
HH	Critical Line Detected (Jumpered in Code Plug if Required from Pins GG, s, t, u, or w)
J3 PIN NUMBER	**NOMENCLATURE**
1	+ 10V Test
2	+28 VDC Input
3	Enter Fault
4	+28 VDC Return
5	2600 Hz Clock
6	Shift
7	Transfer Enable
8	GRD Signal
9	GMR Status Data
10	Fault Status Change
11	SELM Input
12	SELM Input
PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A5, G&C COUPLER, FIGURE A 13004	
J1 PIN NUMBER	**NOMENCLATURE**
V	Character Input I1
U	Character Input I2
T	Character Input I3
S	Character Input I4

Table 10-1. LF Equipment Rack Test Points (Continued)

PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A5, G&C COUPLER, FIGURE A 13004 (CONTINUED)	
J1 PIN NUMBER	**NOMENCLATURE**
R	Character Input I5
P	Character Input Timing Prime I6
M	Signal Common
BOA SELECT 806/822 J2 PIN NUMBER	**NOMENCLATURE**
A	SCTO (C.O) MON Timing)
B	SC10 (C.O. MON 1)
C	SC20 (C.O. MON 2)
D	GRD
E	Stop Tape
F	Tape Start
G	Parity Error
H	Programmed Stop
J	Enabled Write Off
K	Enabled Write On
L	Tape Compute
M	Computer Verify
N	Computer Fill
R	Telemetry Turn On
S	SC30 (C.O. MON 3)
T	SC40 (C.O. MON 4)
U	SC50 (C.O. MON 5)
J3 PIN NUMBER	**NOMENCLATURE**
a	Multiplexer X5c
b	Multiplexer X4c
c	Multiplexer X3c
d	Multiplexer X2c

Table 10-1. LF Equipment Rack Test Points (Continued)

PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A5, G&C COUPLER, FIGURE A 13004 (CONTINUED)	
J3 PIN NUMBER	**NOMENCLATURE**
e	Multiplexer X1c
f	Multiplexer Test
g	Multiplexer Control (MXD)
h	Multiplexer Control (MXC)
i	Multiplexer Control (MXB)
j	Multiplexer Control (MXA)
m	Local
n	Tape Start
p	Keyboard Output 8 (KO8)
q	Keyboard Output 4 (KO4)
r	Keyboard Output 2 (KO2)
s	Keyboard Output 1 (KO1)
t	Keyboard Output Timing (KOT)
u	Compute Mode Indicator (KCC)
v	Programmed Stop Prime (ET')
w	Tape Parity Error Prime
y	Verify (VK)
z	Load Mode Indicator (LK)
V	C/O First or Second Character
W	Shutdown Timer
X	Critical Status Override (CSO)
Y	Coupler Test
Z	P/G Monitor Fault (PGMF)
AA	Data Readout Bit # 4 (DR04)
BB	Data Readout Bit # 3 (DR03)
CC	Data Readout Bit # 2 (DR02)
DD	Data Readout Bit # 1 (DR01)
EE	Data Readout Timing (DROT)
GG	Clock C09 (4.16 KHz)
HH	Signal Common

Table 10-1. LF Equipment Rack Test Points (Continued)

PROGRAMMER GROUP FIGURE A 1201 (URD 403) DRAWER A5, G&C COUPLER, FIGURE A 13004 (CONTINUED)	
J4 PIN NUMBER	**NOMENCLATURE**
q	Coupler No-Go
r	AVE No-Go
t	R/S Ground Power monitor
u	CSD (G) Space
v	CSD (M) Home Monitor
w	CSD (M) 24th Bit Monitor
x	CSD (G) Mark
y	CSD (M) Reset Monitor
z	Any Ordnance Driver On
AA	CSD (M) Space
BB	CSD (M) Mark
CC	CSD (M) Drive Enable
DD	Enable Write
EE	Disable Discretes
FF	Startup
GG	Mode Control BM
HH	Mode Control AM
DRAWER A7, POWER SUPPLY	
J1 PIN NUMBER	**NOMENCLATURE**
1	+28 VDC
2	-12V
3	-6 VDC
4	+6 VDC
5	+5 VDC
6	+12V
7, 8, 9	Ground
10 & 11	+ 17 VDC (11) Return (10)
12 & 13	+70 VDC (13) Return (12)
14	-28 VDC

Table 10-2. LCF Equipment Rack Test Points

COMMAND MESSAGE PROCESSING GROUP FIGURE A 1213 (URD 10364) DRAWER A6, MESSAGE PROCESSING CONTROL	
(BOA SA6/J1AM) J1 PIN NUMBER	**NOMENCLATURE**
A	RX Line 1 High
B	RX Line 1 Low
C	RX Line 2 High
D	RX Line 2 Low
E	RX Line 3 High
F	RX Line 3 Low
G	RX Line 4 High
H	RX Line 4 Low
J	RX Line 5 High
K	RX Line 5 Low
L	RX Line 6 High
M	RX Line 6 Low
N	RX Line 7 High
P	RX Line 7 Low
R	RX Line 8 High
S	RX Line 8 Low
T	RX Line 9 High
U	RX Line 9 Low
V	RX Line 10 High
W	RX Line 10 Low
X	----------
Y	Band Pass Filter Output
Z	Ground