

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
POWER ON not green.	GGG FAULT yellow.			
	ANTENNA FACILITY FAULT red.	Antenna hydraulic pressure below normal.	Select alternate antenna: Press POWER OFF white, press ALTERNATE ANTENNA green, press POWER ON white, and continue countdown.	Same as EXERCISE.
	COMP FAULT yellow and COMPUTER POWER ON not green.	DC POWER SUPPLY circuit breakers tripped.	Reset indicator circuit breakers to ON: Press MAINT (unit 13) yellow, press HOLD MAINT (computer) amber, press CLEAR FAULT (computer), press CYCLE DC ON (computer), press HOLD MAINT (computer) not lighted, and press STBY green.	Same as EXERCISE.
	BREAKER OPEN IN-LINE red (unit 16).	Circuit breakers tripped (unit 16).	RESET to ON.	Same as EXERCISE.

Figure 5-22. POWER ON Not Green (Sheet 1 of 3)

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
	POWER ON (computer) not green. MOTOR GENERATOR ON not green.	MOTOR GENERATOR not running.	Press MOTOR GENERATOR MANUAL START. If selected motor generator does not start, select ALTERNATE GENERATOR as follows: Press MOTOR GENERATOR STOP, set MOTOR GENERATOR SELECTOR to ALTERNATE GENERATOR, press MOTOR GENERATOR MANUAL START green, and verify MOTOR GENERATOR ON indication.	Same as EXERCISE.
	DC POWER-DC READY not green.	AUTOMATIC SEQUENCER switch malfunctioning.	MAINT (unit 13) yellow, press HOLD MAINT (computer) amber, press CYCLE DC OFF amber, press SELECT MANUAL SEQUENCE amber, press CLEAR FAULT, rotate MANUAL SEQUENCE rotary switch clockwise A through M, press HOLD MAINT (computer), and press STBY (unit 13) green.	Same as EXERCISE.

Figure 5-22. POWER ON Not Green (Sheet 2 of 3)

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
	Operations room INTLK OPEN (unit 15) red.	Interlock open on unit 7, 8, 15, 21, or 22.	Secure fasteners, drawers, and swing frames. If operations room INTLK OPEN (unit 15) indication does not extinguish, pull out interlock override.	Same as EXERCISE.
	Antenna terminal INTLK OPEN (unit 15) red.	Interlock open on a unit in antenna terminal.	Select alternate an- tenna: Press POWER OFF white, press ALTERNATE ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.

Figure 5-22. POWER ON Not Green (Sheet 3 of 3)

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
TARGET GATED Not Green and no gated pulse when START GUID X is initiated.		Guidance exerciser did not reset properly.	Press GUID X NOT RDY and RESTART GUID X.	Same as EXERCISE.

Figure 5-23. TARGET GATED Not Green and No Gated Pulse When START GUID X is Initiated

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
MAG RDY not white.		MAG RDY lamp defective.	Press MAG ON and continue countdown. Select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE. Same as EXERCISE.

Figure 5-24. MAG RDY Not White

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
MAG ON not green (before LIFT OFF white).	MAG I not indicating 1.2 to 1.9 MA.		Select alternate antenna: Press POWER OFF white, press ALTERNATE ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.
	MAG I indicating 1.5 to 1.9 MA.		Continue countdown.	Same as EXERCISE.

Figure 5-25. MAG ON Not Green (Before LIFT OFF White)

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
START GUID X not green. (Disregard if after a successful GUID X or a successful launch.)			Select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.

Figure 5-26. START GUID X Not Green

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
RAISE ANT not white.			Continue countdown.	Same as EXERCISE.

Figure 5-27. RAISE ANT Not White

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
ANT RAISE not green.	ANTENNA FACILITY FAULT red, GGS HOLD red, GGS FAULT lighted.	Slow operation of the antenna protective and elevating system (APES).	Notify MLO of antenna status and continue countdown. Select alternate antenna: Press POWER OFF white, press ALTERNATE ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE. Same as EXERCISE.

Figure 5-28. ANT RAISE Not Green

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
MISSILE READY not white.	SELECT LAUNCHER white and SELECT TARGET green.	Defective lamp.	Press ACQ MISSILE.	Same as EXERCISE.
	SELECT LAUNCHER not white.	Open interface.	Press appropriate SELECT LAUNCHER pushbutton.	Same as EXERCISE.
	SELECT TARGET not green.	Open interface.	Refer to T.O. 21-SM68-2J-7-1-1.	On subsequent missiles prior to initiation of raise launcher phase: Press HANDOVER ON yellow, press appropriate SELECT TARGET green, press HANDOVER OFF green, press appropriate SELECT LAUNCHER white, and press ACQ MISSILE white.

Figure 5-29. MISSILE READY Not White

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
ACQ MISSILE not green (in complex only).	GGS HOLD red; TARGET VERIFY green, TARGET GATED green.	Failure to receive loop check COMP signal	Proceed to Figure 3-5 of T.O. 21-SM68-2J-7-1-1	Same as EXERCISE.
	GGS HOLD red, TARGET VERIFY green, TARGET GATED not lighted, no gated pulse.	Failure to acquire missile.	Check for correct address and missile frequency. Check launcher coordinates. Refer to T.O. 21-SM68-2J-7-1-1.	Same as EXERCISE.

Figure 5-30. ACQ MISSILE Not Green

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
LIFT OFF not white.		Defective lamp.	Continue countdown.	Same as EXERCISE.

Figure 5-31. LIFT OFF Not White

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
GUID IN PROGRESS not green		Defective lamp.	Continue countdown.	Same as EXERCISE.

Figure 5-32. GUID IN PROGRESS Not Green

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
GGG FAULT lighted (accompanied by GGS HOLD lighted after ANT RAISE white).	POWER ON not green.	Transients.	Press HOLD RELEASE and continue countdown. Proceed to figure 5-22.	Same as EXERCISE. Same as EXERCISE.
	ANTENNA FACILITY FAULT red (prior to ACQ MISSILE green).	Circuit breaker open in antenna terminal cabinets.	Select alternate antenna: Press POWER OFF white, Press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.
	ANTENNA FACILITY FAULT red (after ACQ MISSILE green).	Circuit breaker open in antenna cabinets.	Recycle, select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.
	CTU ALARM red.	Transients.	Reset CTU, press HOLD RELEASE, and continue countdown.	Same as EXERCISE.

Figure 5-33. GGS FAULT Lighted

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
ABORT red (during GUID X run).			Select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.

Figure 5-34. ABORT Red (During GUID X Run)

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
ABORT red (during missile flight).			Select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.	Same as EXERCISE.

Figure 5-35. ABORT Red (During Missile Flight)

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
MAG I not indicating 1.5 to 1.9 MA.			<p>Increase or decrease as required.</p> <p>Prior to the raise launcher phase, select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.</p> <p>After raise launcher phase, continue countdown if MAG ON green.</p>	Same as EXERCISE.

Figure 5-36. MAG I Not Indicating 1.5 to 1.9 MA

MALFUNCTION INDICATION	TROUBLE INDICATION	POSSIBLE CAUSES	CORRECTIVE ACTION	
			EXERCISE	EWO
Erratic MAG I indication.	More than 10 deflections in a 5-second period on MAG-MOD CUR-VOLT meter.	High voltage arcing.	<p>Decrease or increase until reading is stable between 1.5 to 1.9 MA and continue countdown.</p> <p>If reading cannot be stabilized prior to the raise launcher phase, select alternate antenna: Press POWER OFF white, press alternate ANTENNA FACILITY SELECT green, press POWER ON white, and continue countdown.</p> <p>After raise launcher phase, continue countdown if MAG I reading is stable and MAG ON is green.</p>	Same as EXERCISE.

Figure 5-37. Erratic MAG I Indication

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO/EXERCISE
Annunciator.	None.	Defective lamps.	Replace lamp(s).	None.
Indicators fail to light and horn fails to sound.		No DC voltage.	Check circuit breakers and fuses.	
		Defective annunciator circuitry.	Check circuitry.	
Engine and turbo charger low lube oil pressure.	Yes.	Clogged filter(s).		Bypass engine lube oil filter(s).
		Defective safety circuit(s)/switch(s).	If malfunction occurs during the initial starting procedure, reaccomplish start sequence. If engine is on the line and malfunction occurs, start and parallel standby engine.	Bypass safety circuit(s)/switch(s).
		High lube oil temperature.		(EAFB, BAFB, LAFB, MHAFB) Switch engine lube oil from filters to strainers and set START-RUN switch to START.
Cyclonic separator low level.	Yes.	Defective control valve.	Start and parallel standby engine. Stop malfunctioning engine.	Manually operate control valves.
		Low utility air pressure.	Check utility air system.	Bypass controllers/safety circuit(s).
Engine over-speeds.	Yes.	Defective governor.	Start and parallel standby engine.	Continue launch with remaining generator(s).
Fuel oil day tank low level.	No.	Day tanks not serviced. Defective liquid level indicator.	Service fuel oil day tank.	Service fuel oil day tank.

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 1 of 6)

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO
Generator 1, 2, 3, or 4 air circuit breaker tripped.	Yes.	Safety circuits activated. Defective air circuit breaker.	Start and parallel standby engine.	Verify safety circuits are de-activated. Re-energize generator air circuit breaker.
Launcher 1, 2, or 3 feeder air circuit breaker tripped.	Yes.	Safety circuits activated. Defective air circuit breaker.	Refer to Section IV.	Re-energize launcher feeder air circuit breaker as directed by control center.
Chiller 1, or 2 feeder air circuit breaker tripped.	Yes.	Condenser temperature high or low.	Inform facility personnel of malfunction.	Direct facility personnel to place ice tanks on line (if applicable).
Powerhouse feeder air circuit breaker tripped.	Yes.	Safety circuits activated or defective air circuit breaker.	Refer to emergency procedure (loss of power house feeder AC power).	Re-energize feeder air circuit breaker.
Control center feeder air circuit breaker tripped.	Yes.	Safety circuits activated.	Refer to emergency procedure (loss of control center feeder AC power).	Re-energize feeder air circuit breaker as directed by control center.

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 2 of 6)

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO/EXERCISE
Intake air supply fan circuit breaker tripped.	No.	Defective circuit breaker.	Obtain combustible air from outside source. Refer to emergency procedure. (Loss of power house intake fan).	None.
Exhaust fan(s) circuit breaker tripped.	No.	Defective circuit breaker.	Refer to emergency procedure (loss of power house exhaust fan).	None.
Battery bank low voltage.	No.	Defective rectifier.	Check battery bank and rectifier and set HI-LO charge switch to HI.	Check circuit breaker and fuse. Check battery bank and rectifier and set HI-LO charge switch to HI.
		Defective battery bank.	Check battery bank and rectifier.	
Loss of all DC power (LAFB 724TH/725TH SQDN).	No.	Circuit breaker tripped or blown fuse.	Check fuse/circuit breaker.	Manually operate governor controls.
Loss of all DC power (LAFB, BAFB, EAFB, MHAFB).	Yes.	Defective fuse and circuit breaker.	Refer to emergency procedure (loss of all AC power).	Refer to emergency procedure (loss of all AC power).
Water storage tank low level.	No.	Defective controller.	Set pump HAND-OFF-AUTO switch to HAND.	Set pump HAND-OFF-AUTO switch to HAND.

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 3 of 6)

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO/EXERCISE
Starting air pressure low.	No.	Defective controller. Defective HAND-OFF-AUTO switch.	Bypass controller by manually operating switch.	(EAFB, BAFB, LAFB, MHA FB) Bypass controller by manually operating switch and/or remove shutdown arm from fuel rack.
Engine fails to start automatically (LA FB 724TH/725TH SQDN).	No.	Centrifugal switch stuck closed; TR-3 defective; R-1/SU defective. Starting air valve stuck closed.	Refer to emergency procedure (standby diesel engine manual start, LA FB 724TH/725TH SQDN). Free air valve.	Same. Free air valve.
Engine fails to stop automatically (LA FB 724TH/725TH SQDN).	No.	Loss of DC power. Defective circuitry in engine console.	Shutoff power switch on engine console. Set manual throttle lever to STOP. Set LOAD LIMIT knob on governor to 0.	Shut off power switch on engine console. Set manual throttle lever to STOP. Set LOAD LIMIT knob on governor to 0.
Engine high water temperature (VA FB, EA FB, BA FB, LA FB, MHA FB).	No.	Circulating pump circuit breaker tripped. Restricted supply/return line.	Check circuit breaker. Check supply/return valves.	Same. Same.

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 4 of 6)

Changed 17 January 1964 TOCN-1 (DEN-8)

5-52A

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO/EXERCISE
Engine and turbo high lube oil temperature (VAFB, EAFB, BAFB, LAFB, MHAFB).	Yes.	Defective coolant system. Low lube oil level.	Check temperature controller. Check coolant system pumps/valves. Check lube oil level.	Refer to procedure for low lube oil pressure.

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 4A of 6)

T.O. 21-SM68-1

Section V

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO
Prelube pump fails to operate.	No.	Blown fuse.	Check fuse.	None.
		Circuit breaker tripped.	Check circuit breaker.	
		Defective circuitry.	Check circuitry.	
Prelube circulating pump fails to start (VAFB, EAFB, BAFB, LAFB, MHAFFB).	No.	Reset relay tripped.	Open engine console control panel and press reset relay.	None.
		Blown fuse.	Replace fuse.	
Generator and exciter circuit breaker fails to close/tripped.	Yes.	Defective mechanical linkage.	Start and parallel standby engine. Adjust mechanical linkage.	If time permits, accomplish the following: Adjust mechanical linkage/ replace fuse.
		Blown fuse.	Replace fuse.	
		Defective closing/tripping mechanism.	Replace defective closing/tripping mechanism.	
Loss of utility air pressure (LAFB 724TH/725TH SQDN).	Yes.	Defective controller. Circuit breaker tripped.	Manually switch to starting air pressure.	Refer to emergency procedure (loss of all AC power).
		Defective air drier.	Inform facility personnel of defective air drier.	

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 5 of 6)

MALFUNCTION INDICATION	AFFECT ON COUNTDOWN	PROBABLE CAUSES	CORRECTIVE ACTION	
			ALERT STATUS MONITORING	EWO
No Remote engine speed control on generator panel/engine control console.	No.	Defective governor motor control switch. Governor friction clutch slipping. Open control circuit in governor motor control.	Replace defective governor motor control switch. Adjust friction clutch. Replace fuse(s).	Manually operate governor speed control.
Voltage regulator inoperative (VAFB, EAFB, BAFB, LAFB, MHAFB).	No.	Voltage dividers resistors out of tolerance. Burned/dirty contacts. Defective pre-set rheostat.	Adjust voltage dividers resistors. Clean contacts. Replace pre-set rheostat.	Manually operate exciter field rheostat.
Voltage regulator inoperative (LAFB 724TH/725TH SQDN).	No.	Defective voltage regulator circuit.	Troubleshoot/replace regulator.	Manually operate exciter field rheostat.
Synchroscope inoperative.	No.	Blown fuse.	Replace fuse.	Synchronize using synchronizing indicators.
Synchronizing indicators fail to light.	No.	Defective lamp(s). Open circuit.	Replace lamp(s).	Synchronize using synchroscope.

Figure 5-38. Table of Power House Malfunction Isolation (Sheet 6 of 6)