

TECHNICAL MANUAL

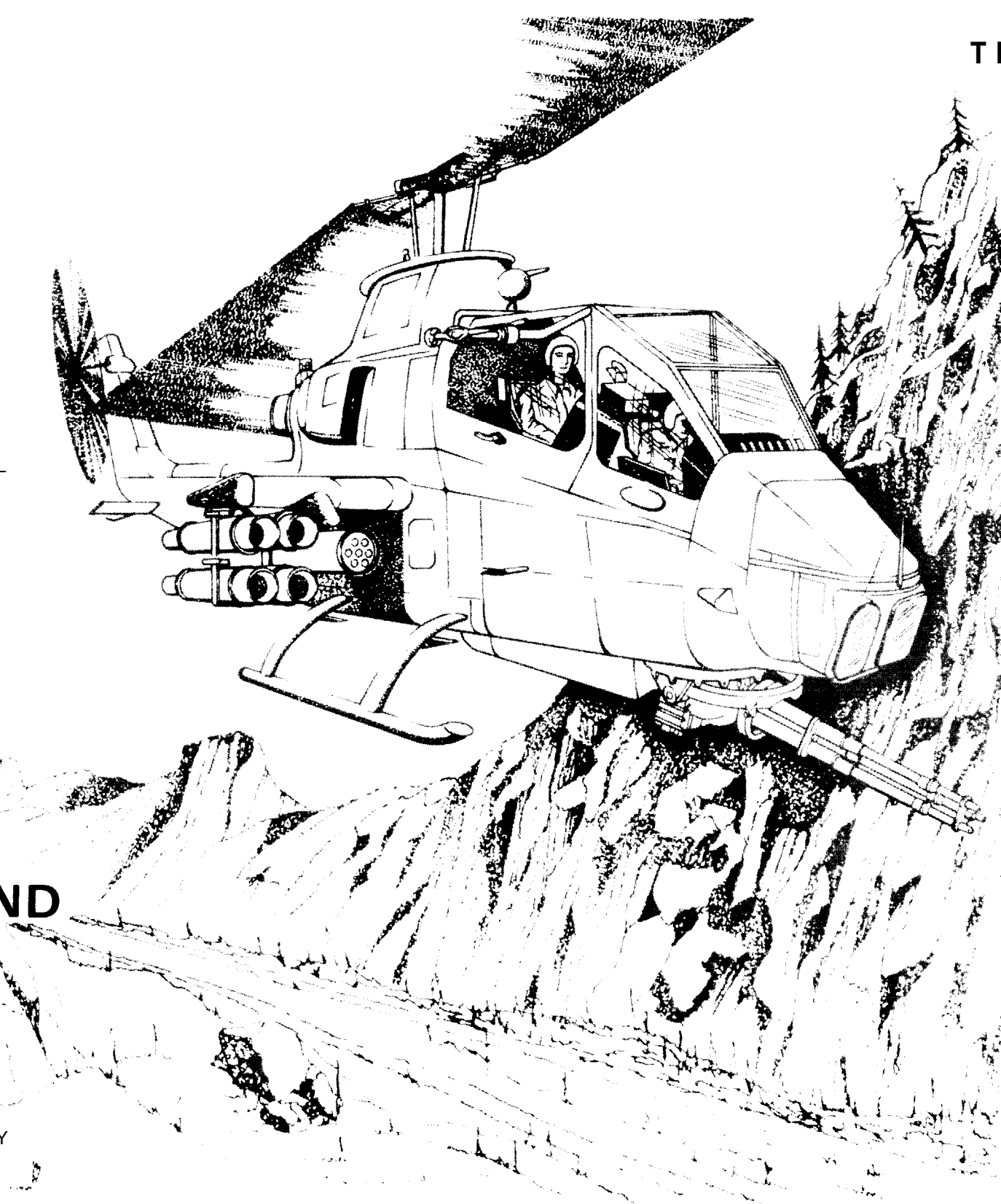
TROUBLESHOOTING INSTRUCTION

AVIATION UNIT MAINTENANCE (AVUM) LEVEL
AND
INTERMEDIATE MAINTENANCE (AVIM) LEVEL

AH-1S (MC)
INTEGRATED ARMAMENT AND
FIRE CONTROL SYSTEM

HEADQUARTERS, DEPARTMENT OF THE ARMY
15 JUNE 1983

This copy is a reprint which includes current
pages from Changes 1 through 3.



INTRODUCTION

HEAD UP DISPLAY SUBSYSTEM
(HUDS)

FIRE CONTROL COMPUTER
(FCC)

AIR DATA SUBSYSTEM (ADS)

ROCKET MANAGEMENT
SUBSYSTEM (RMS)

UNIVERSAL TURRET
SUBSYSTEM (UTS)

HELMET SIGHT SYSTEM (HSS)

TOW MISSILE SUBSYSTEM

ARMAMENT POWER

JETTISON

AVUM/AVIM Troubleshooting Manual
AH1F (MC) AND AH1F (MCN) INTEGRATED ARMAMENT SYSTEM

REPORT ING ERRORS AND RECOMMENDING IMPROVEMENTS.

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, or the DA Form 2028-2 located in the back of this manual direct to:

Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MP , 4300 Goodfellow Blvd.,
St. Louis Mo. 63120-1798.

A reply will be furnished to you.

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HOW TO USE THIS MANUAL.

This troubleshooting manual is as easy to use as a road map. You must leave a given location (problem) and proceed along a desired route (troubleshooting) and arrive at your destination (solution).

Keep in mind that this manual assumes that "ONLY ONE PROBLEM EXISTS AT A TIME." However, a problem may appear in many ways. For example, a symbol is missing, out of shape, inverted, indicator pointer incorrect, lamp out, etc. Also, the problem may be discovered in several ways, such as pilot/gunner writeup, during maintenance, operational check, etc. In some cases there may be several symptom. indications) for a single problem.

The technician must be able to quickly find the particular portion of the manual that contains the needed information.

The front cover, index, table of contents, Maintenance Action Precise Symptom list, and text (highlighted with a box) provide information for major topic and subtopic breakdown and some locations.

Troubleshooting is designed to promote rapid fault isolation. This allows you to quickly remedy the problem and return the helicopter to operational status. Quick turnaround, with accurate solution, is the essence of troubleshooting.

The troubleshooting is test and fault-isolation oriented and the data will get you directly from the symptom to the proper solution using minimum information. It divides troubleshooting into three major steps:

1. Recreate or maintain the condition that led you or the operator to the problem.
2. Find needed information by referring to the Maintenance Action Precise System (MAPS) list, table of content, front cover, etc.
3. Accomplish troubleshooting using logic trees, wiring diagrams, reference data, etc.

If these troubleshooting procedures are not successful, references are provided that will allow the troubleshooting to be continued within the appropriate subsystem manual (see paragraph 1-1). The logic tree, when used with built-in-test (BIT) troubleshooting, will lead you to the faulty part or wiring with a high degree of certainty.

Entry into Logic Trees. Logic trees are designed to be entered directly from a specific location in the operational check. The operational check sets all switches, circuit breakers, etc. in the proper position for that logic tree. In some cases a logic tree is entered directly from another logic tree. A logic tree entered directly from another logic tree shall be

considered a continuation of the first logic tree. In the block which sends the user to a referenced logic tree, all additional switches, circuit breakers, etc. must be pre-positioned to be compatible with the referenced logic tree. If the referenced logic tree is in another chapter, instructions are given to work the referenced logic tree (including the operational check called out in the referenced logic tree) and then perform the operational check of the originating logic tree chapter.

Example:

Set PLT ORIDE switch to PLT ORIDE .

Set MASTER ARM switch to OFF.

Accomplish paragraph 8-15.

Then go to paragraph 2-2.

Trouble Discovered by Operator. Read the problem statement (write-up), in the aircraft form, very carefully and whenever possible debrief the operator (flight crew) to get a general idea of the problem.

1. Determine which subsystem has a fault.
2. Find symptom description in the MAPS list which correlates the symptom to a precise troubleshooting procedure.

3. Perform the subsystem operational check to verify the fault.

Trouble discovered by Technician. When the trouble is found during normal maintenance, your choices for finding the appropriate data are as follows:

1. Use the MAPS list (this manual) to find the required troubleshooting data and operational check.
2. Use troubleshooting procedures within the subsystem manual being used to perform the maintenance.
3. Use troubleshooting data in other subsystem manual (s).

NOTE

Some logic trees in this manual cannot be reached from the 'operational check. If a defined symptom does not appear during the operational check, refer directly to the MAPS and comply with the action specified for that symptom.

Logic Tree. The Logic Tree assumes that ONLY ONE PROBLEM EXISTS AT A TIME. It is a programmed method that involves user-logic tree interaction. The user is given a particular instruction, then is asked a YES-NO question about the result of his or her action. Based on

HOW TO USE THIS MANUAL (CONTINUED).

the answer, the user is directed to another block of instruction. Faults that occur on a rare or random basis are excluded and the technician may elect to refer to another troubleshooting aid such as a simplified circuit or wiring diagram.

Large logic trees. Large logic trees are broken into logical segments which can be entered from the operational procedure and identified as a separate MAPS. This isolates systems using switches, circuit breakers, etc. and are broken into separate parts (A, B, C, etc).

Each logic tree with its locator illustrations stand alone and are broken into smaller page size segments with single flow arrows. A block "Go to paragraph_" directs the continuation of the logic.

Each continuation of the logic tree has locator illustrations on the facing page identifying items on that portion of the logic tree. Each continuation has the same format as a regular logic tree except that the initial setup, tools, personnel and references are not repeated.

A total electrical schematic for the MAPS problem is included with the starting logic tree. Each continuing subparagraph has only the portion of the total electrical schematic applicable to the logic tree in this paragraph.

Verification of Symptom.

When a particular symptom is found, reverify that the symptom is present before proceeding to the repair action procedure. This precludes unnecessary maintenance in the event an erroneous symptom occurs.

Verification of Repair.

Under certain circumstances, a fault may be exhibited during the accomplishment of the Operational Check in one chapter and the troubleshooting and repair logic tree for that fault in another chapter. Also, some logic trees refer to another chapter or logic tree within another chapter for continuation of troubleshooting. After location and repair of the fault, rerun the operational check in which the fault appeared.

CHAPTER 6

UNIVERSAL TURRET SUBSYSTEM (UTS) TROUBLESHOOTING

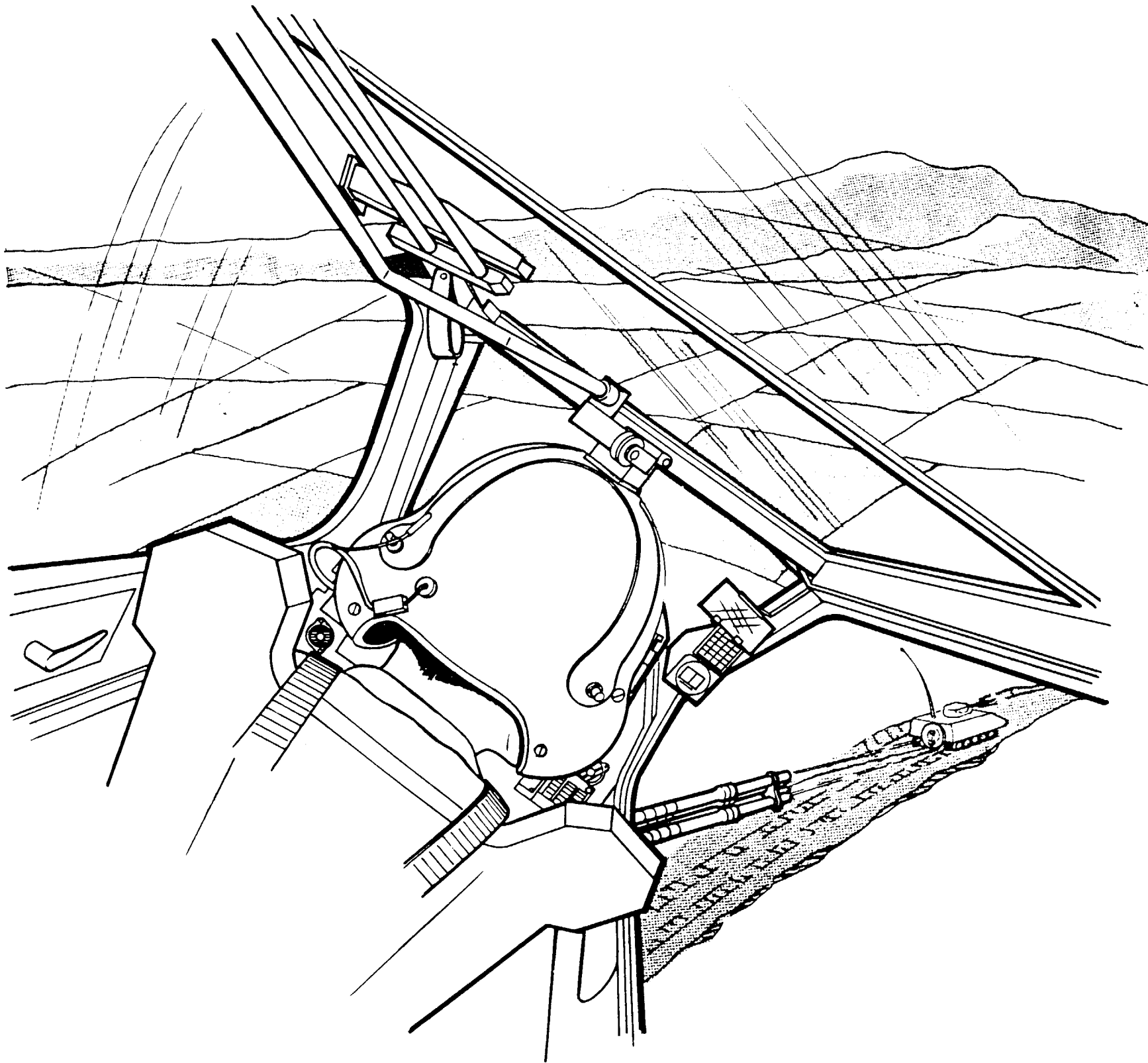
OVERVIEW

This chapter contains the UTS operational check and logic tree troubleshooting procedures.

If a fault occurs during the operational check, stop the check, leave switches and circuit breakers in position, and refer to MAPS in Chapter 1 for that symptom. The MAPS will refer to a specific troubleshooting or repair procedure for that fault.

WARNING

Turn off all electrical power when removing equipment or disconnecting electrical connectors unless otherwise noted in the procedures.



6-1. UTS PRE-OPERATIONAL CHECK
SETUP .

INITIAL SETUP

Applicable Configuration
A11

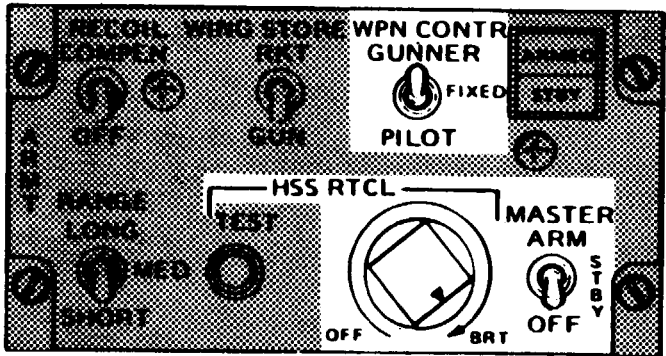
Personnel Required
68J (2)

a. Open (OFF) all circuit
breakers on AC/ARMT circuit
breaker panel.

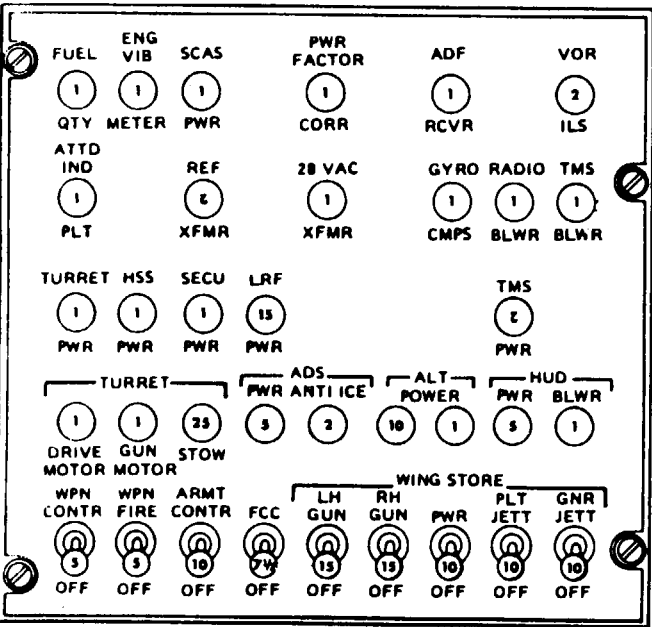
b. Open all circuit breakers
on DC circuit breaker panel.

c. Set pilot ARMT control
panel switches:

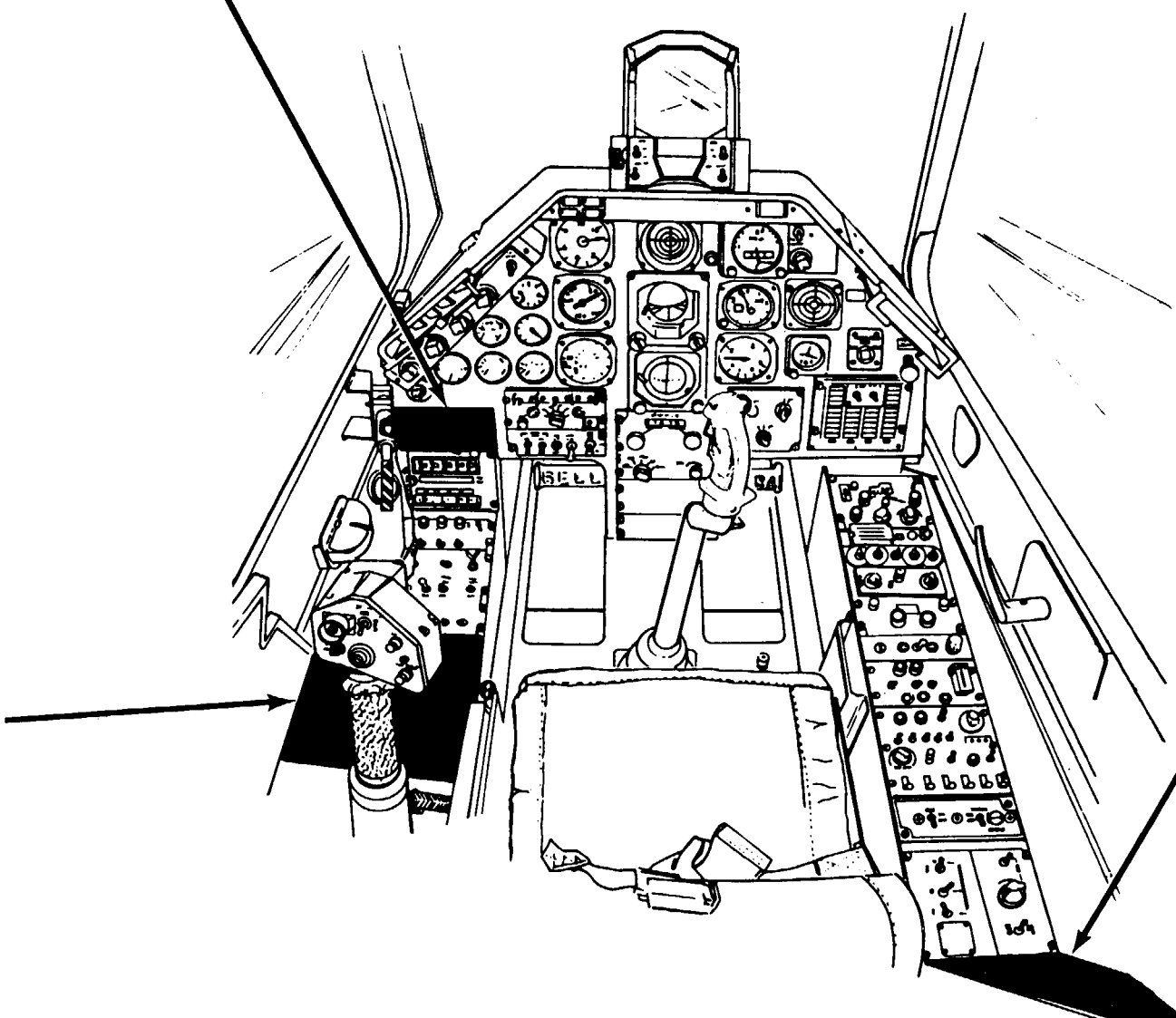
- (1) MASTER ARM to OFF.
- (2) WPN CONTR to GUNNER.
- (3) HSS RTCL to BRT.



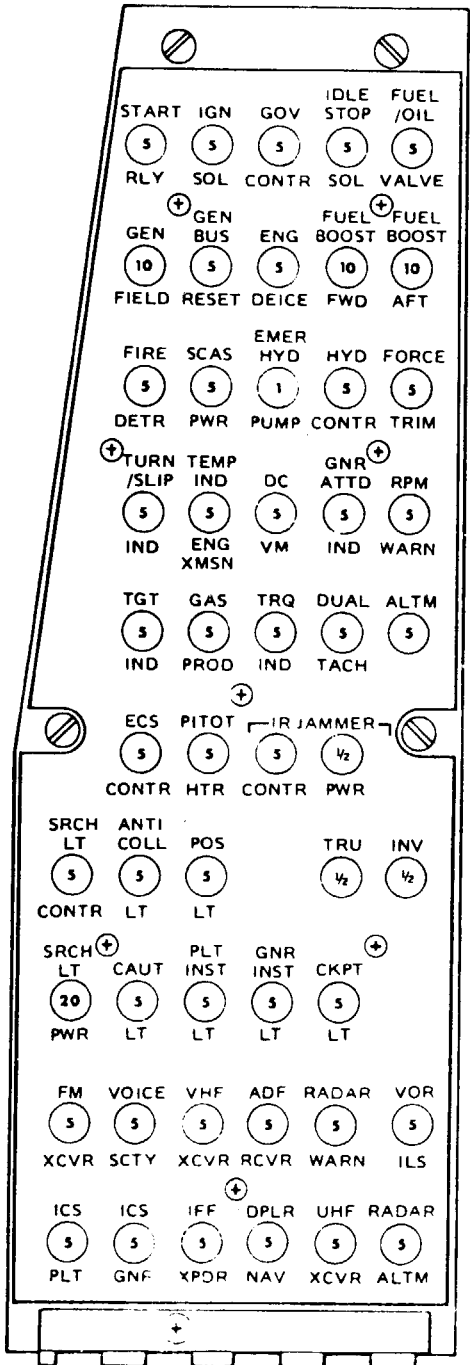
PILOT ARMT CONTROL PANEL



AC/ARMT CIRCUIT BREAKER PANEL



PILOT STATION



DC CIRCUIT BREAKER PANEL

6-1. UTS PRE-OPERATIONAL CHECK
SETUP (CONTINUED).

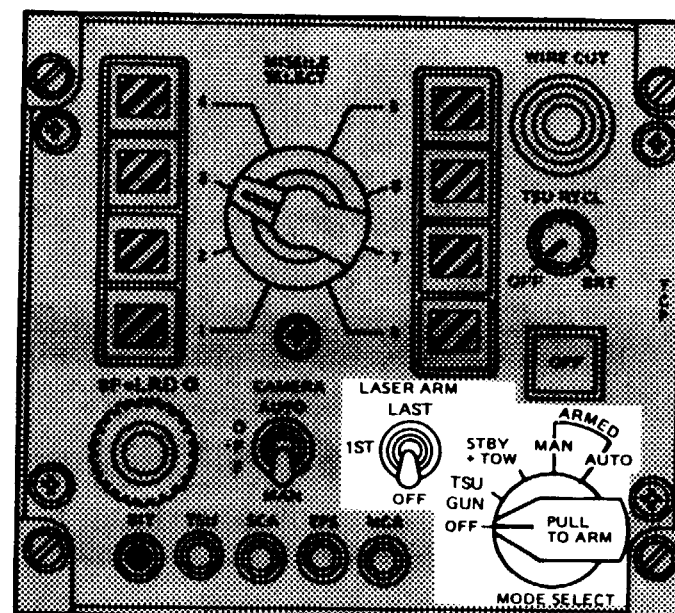
d. Set TCP (TOW control panel) switches:

- (1) LASER ARM to OFF.
- (2) MODE SELECT to OFF.

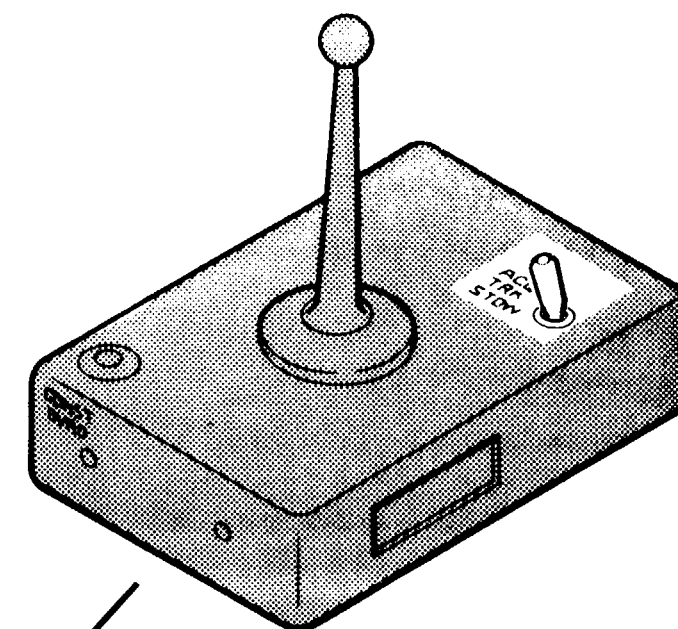
e. Set ACQ/TRK/STOW switch on sight hand control to STOW.

f. Set gunner armament control panel switches:

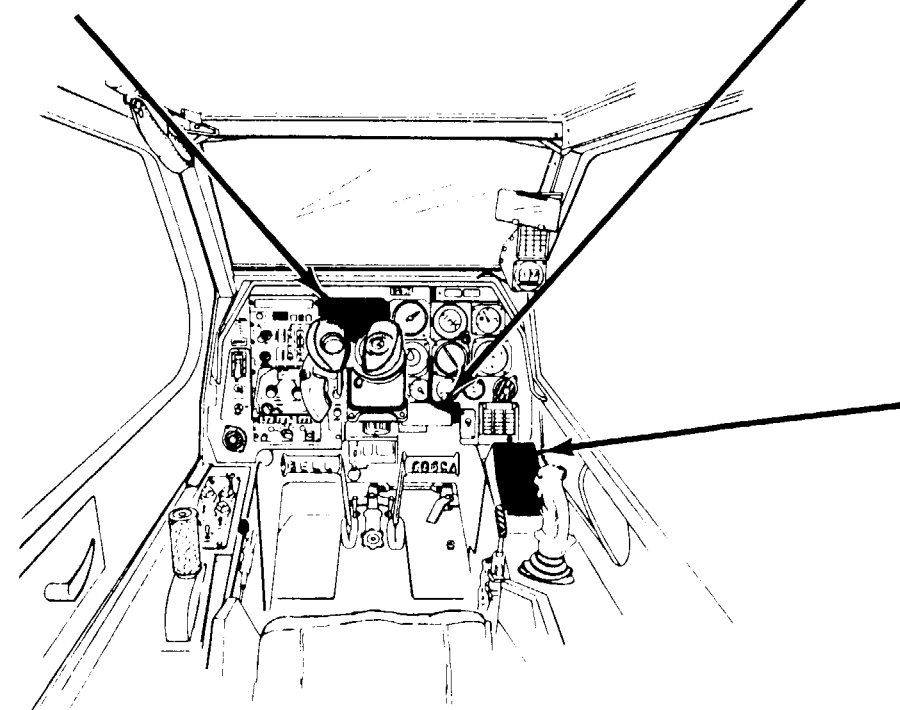
- (1) LASER SAFE/TURRET DEPR LIMIT to LASER SAFE/TURRET DEPR LIMIT.
- (2) TSU/GUN SLEW RATE HIGH.
- (3) TUR SLEW to GND TEST.
- (4) PLT ORIDE to OFF.
- (5) HSS RTCL to BRT.



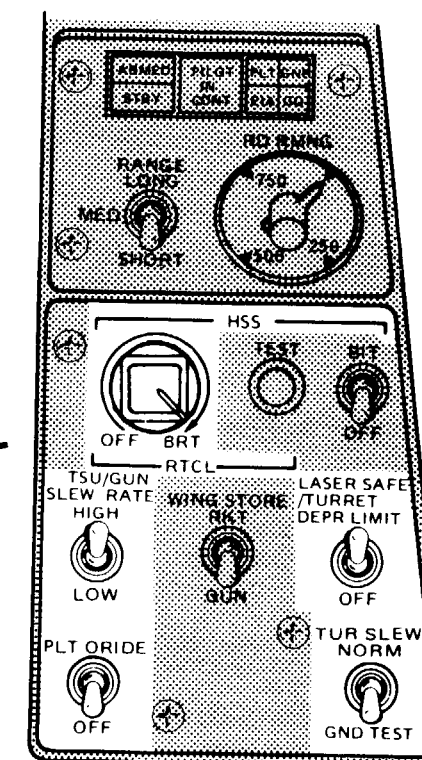
TCP (TOW CONTROL PANEL)



SIGHT HAND CONTROL



GUNNER STATION



GUNNER ARMAMENT CONTROL PANEL

6-2. UTS OPERATIONAL CHECK.

NOTE

Complete PRE-OPERATIONAL CHECK SETUP , paragraph 6-1, before continuing with operational check.

INITIAL SETUP

Applicable Configuration
All

Tools/Test and Support
Equipment
Digital Voltmeter

Multimeter

Helmet with XM 136 Sight-
Installed (2)

TSEM (Tow System Evaluation
Missile) or TOW Missile
Present Simulator (Local
Manufacture)

Tool Set, A/C Armament
Repairman

Ground Power Unit

Test Set, Electronic
System, M137

Equipment Condition
Gun Safed/Barricade Erected
(TM 9-1090-206-20-1/30)

Ammunition Feed System
Installed (TM 9-1090-206-20-1)

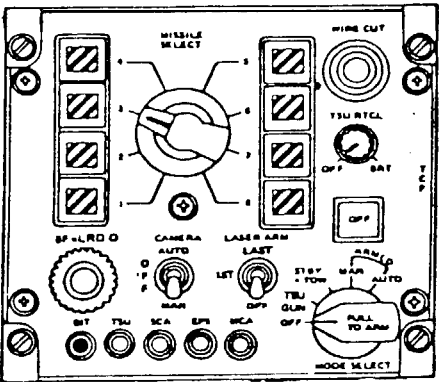
Personnel Required
68J (3)

References
TM 9-1090-206-20-1/30
TM 9-1425-473-34
TM 55-1520-236-10
TM 55-1520-236-23

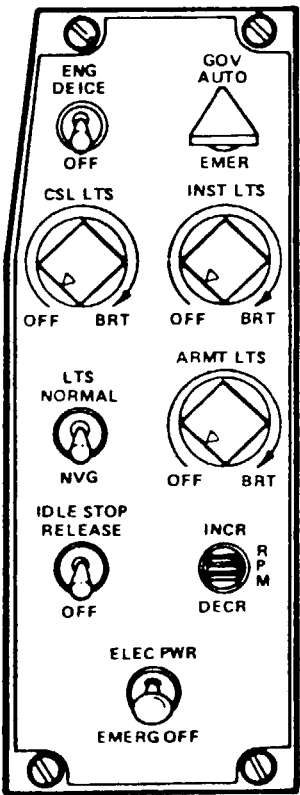
Access Panels
Battery Compartment -
Removed

External Power Door -
Open

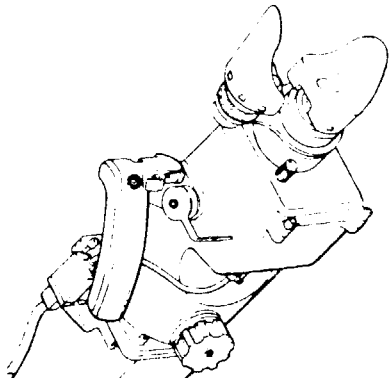
Ammo Compartment Door -
Open



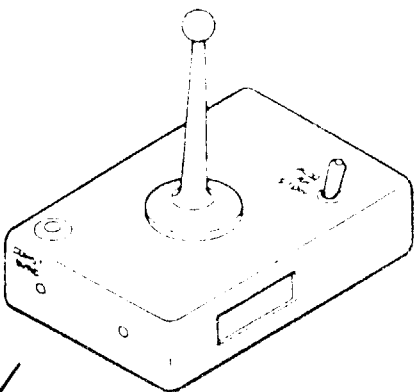
TCP (TOW CONTROL PANEL)



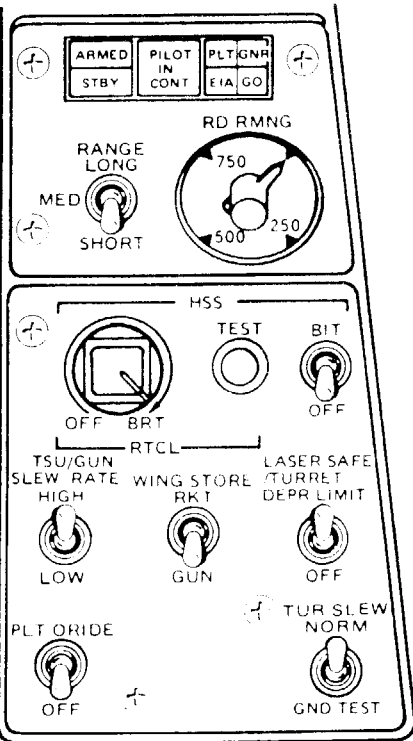
GUNNER MISCELLANEOUS CONTROL PANEL



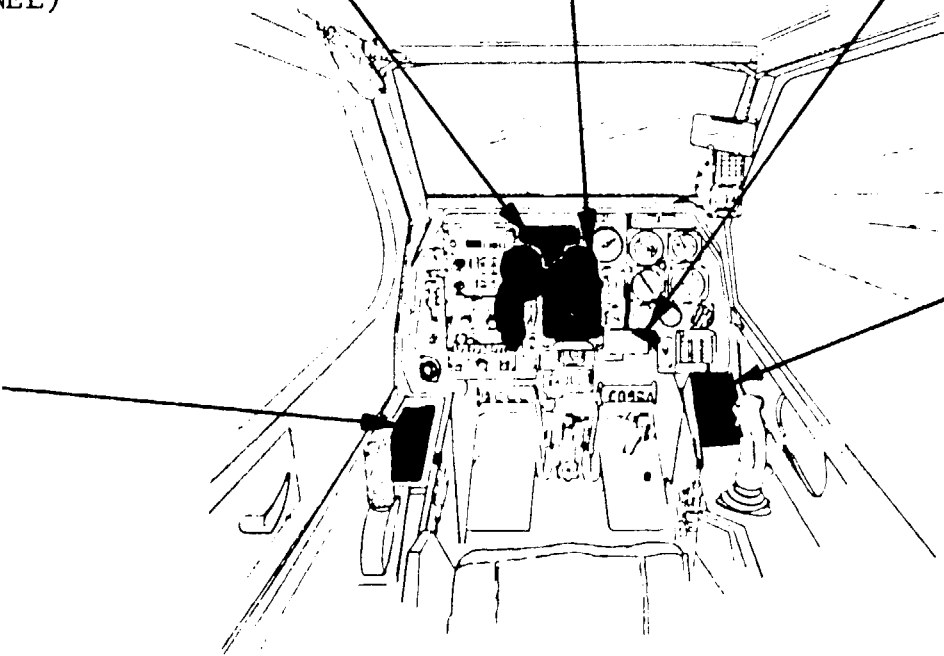
TELESCOPIC SIGHT
UNIT (TSU)



SIGHT HAND CONTROL



GUNNER ARMAMENT CONTROL PANEL



GUNNER STATION