Research Product 85-09

M60A3 Tank Procedure Guides

ARI Field Unit at Fort Knox, Kentucky
Training Research Laboratory

February 1985
M60A3 TANK PROCEDURE GUIDES

This research product presents M60A3 Procedure Guides which are designed to aid experienced tank crewmen and gunners to remember and perform pre- and post-operation procedures for the M60A3 battle tank. One of the notable innovations of the Procedures is the abbreviated algorithmic format for presenting task information. Also, separate booklets were developed for tank commander and gunner tasks. And both booklets were designed to be reduced and inserted into plastic binders. These innovations were intended to make the Procedure Guides easy to use and rugged enough to withstand the rigors of the tank environment.
Research Product 85-09

M60A3 Tank Procedure Guides

John E. Morrison

ARI Field Unit at Fort Knox, Kentucky
Donald F. Haggard, Chief

Training Research Laboratory
Harold F. O'Neil, Jr., Director

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
5001 Eisenhower Avenue, Alexandria, Virginia 22333-5600

Office, Deputy Chief of Staff for Personnel
Department of the Army

February 1985

Army Project Number
2Q283743A794

Education and Training

Approved for public release; distribution unlimited.
ARI Research Reports and Technical Reports are intended for sponsors of R&D tasks and for other research and military agencies. Any findings ready for implementation at the time of publication are presented in the last part of the Brief. Upon completion of a major phase of the task, formal recommendations for official action normally are conveyed to appropriate military agencies by briefing or Disposition Form.
The Army Research Institute (ARI) Field Unit at Fort Knox, Kentucky, is engaged in research and development on armor training and performance problems related to armor weapon systems. One such problem is that the armor crewman must perform a number of lengthy and complex procedures to prepare the M60A3 battle tank for operation and to power the tank down after operation. Although the M60A3 Operator's Manual (TM 9-2350-253-10) provides complete documentation on these procedural tasks, the TM is a less than ideal job performance aid for the armor crewman who is familiar with the tasks. The Procedure Guides presented herein provide appropriate and convenient aids to help experienced armor crewmen remember and perform procedures for the M60A3 tank.

The M60A3 Procedure Guides were developed along the lines of the M1 Procedure Guides which incorporate a number of innovations. One of the more notable innovations is the abbreviated task information presented in an algorithmic format. Also, the booklets are specific to either tank commander or gunner tasks. And both booklets can be reduced and inserted into plastic ring binders. These innovations were designed to make the Procedure Guides easy to use and rugged enough to withstand the rigors of the tank environment.

The armor community has demonstrated considerable interest in the Procedure Guides. Both the M1 and M60A3 Procedure Guides have been adopted by the Armor School for distribution to armor units worldwide. Furthermore, the development methodology and format of these armor documents were used by the Fort Benning Field Unit to produce Procedure Guides for the Infantry Fighting Vehicle.

EDGAR M. JOHNSON
Technical Director
## M60A3 TANK PROCEDURE GUIDES

### CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERVIEW</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>Development</td>
<td>1</td>
</tr>
<tr>
<td>Features</td>
<td>1</td>
</tr>
<tr>
<td>How to Use</td>
<td>2</td>
</tr>
<tr>
<td>APPENDIX A. TANK COMMANDER PROCEDURE GUIDES</td>
<td>A-1</td>
</tr>
<tr>
<td>B. GUNNER PROCEDURE GUIDES</td>
<td>B-1</td>
</tr>
</tbody>
</table>
OVERVIEW

Background

To prepare the M60A3 battle tank for operation and to power down after operation, armor crewmen have to perform a number of procedural tasks. Although the M60A3 Operator's Manual (TM 9-2350-253-10) presents complete documentation on these tasks, it provides a less than ideal job performance aid for experienced armor crewmen. Some of the problems with the TM include:

- Excessive detail: The procedures are described at an inappropriate level of detail for the experienced performer.
- Large size: The TM is large and cumbersome to use.
- One per tank: Because only one TM is issued per tank, it is unavailable to three of the four crewmen during pre- and post-operations checks.

The M60A3 Procedure Guides were designed to address these problems by providing position-specific job aids that are convenient and complete.

Development

Eighteen tank commander and 15 gunner procedures were chosen to be included in the Procedure Guides. The format for the M60A3 Guides was taken from Procedure Guides previously developed for the M1 tank.1,2 All task information was derived from the TM in order to make the Guides compatible with the TM.

Features

Some of the more notable features of the M60A3 Procedure Guides are listed below:

- "Part . . . action" format: Task information is abridged by casting each step in this format.
- Algorithmic conventions: Flowchart symbols are used to describe branch points in more complex tasks.
- Notes/cautions/warnings: These items which concern task performance, safety, or system integrity are identified at appropriate points in the procedure.

---


• Identification of common subprocedures: To avoid duplication of information, common subprocedures are identified and presented as separate procedures.

• Convenient, rugged packaging: The guides are designed to be reduced to a smaller (4¾" x 7") format and inserted in plastic covered ring binders.

• Separate booklets: Separate Procedure Guides are provided for tank commander and gunner tasks.

• Preventive Maintenance Checks and Services (PMCS): PMCS tasks are presented in the appropriate books, and the tank commander book also has a master checklist.

How To Use

The Procedure Guides are designed to complement the TM, not to replace it. The TM is still the most appropriate reference for the details of equipment operation. And the TM should be used for initial training of procedures. The Procedure Guides should be introduced only after soldiers are reasonably familiar with the equipment and task terminology. Additional training on the Procedure Guides themselves is also required to acquaint soldiers with its algorithmic style and abbreviations.
GENERAL INFORMATION

This booklet contains M60A3 tank commander procedures guides. Each guide is for a single pre-operation, post-operation, or during operation activity. Each guide is matched to TM 9-2350-253-10 (Operator's Manual for Tank, Combat, Full-Tracked: 105-MM Gun, M60A3).

PURPOSE OF PROCEDURE GUIDES

The guides in this booklet will not take the place of the M60A3 Operator's Manual or M60A3 training materials. The guides will aid you in remembering long or difficult sets of procedures. In short, the guides will help to "jog your memory."

USE OF THIS BOOKLET

The Table of Contents (on the next page) lists the procedure guides in this booklet. Each guide gives you a step-by-step outline for completing an activity. The following instructions will help you to better use each guide.

1. Some steps within a procedure are followed by a page number. On that page you will find a detailed breakdown of the step.

2. Some of the procedure guides include a question(s). Each question is stated inside a diamond shape. Your "yes" or "no" to the question will show you which path to follow.

3. Some paths lead to an instruction to go to a particular step number within a procedure. The step number is given within a circle.

4. Some steps within a procedure guide are followed by a box. In the box you will find more information on the step or a caution/warning.

5. Certain steps within a procedure guide require that a knob or switch be turned to a certain position. In some cases, that position might be written like the symbol to the left. The symbol means that a light should also come on.

6. Master check-off lists of all before, during, and after operations preventative maintenance checks and services (PMCS) performed by crewmembers are included as an aid in your supervision of these activities.

7. At the beginning of each procedure, the TM page number reference for the procedure is given under the task name. These references will help you if you need more information to complete the task.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMANDER'S PERISCOPE M36E1</strong></td>
<td></td>
</tr>
<tr>
<td>Installing Commander's Periscope M36E1</td>
<td>1</td>
</tr>
<tr>
<td>Operating Commander's Periscope M36E1</td>
<td>2</td>
</tr>
<tr>
<td>Removing Commander's Periscope M36E1</td>
<td>4</td>
</tr>
<tr>
<td><strong>LASER RANGEFINDER (LRF)</strong></td>
<td></td>
</tr>
<tr>
<td>Operating Laser RangeFinder (LRF)</td>
<td>6</td>
</tr>
<tr>
<td>Laser RangeFinder Self-Test</td>
<td>8</td>
</tr>
<tr>
<td>Ranging and Logic Table</td>
<td>14</td>
</tr>
<tr>
<td>LRF Firing Test</td>
<td>15</td>
</tr>
<tr>
<td>Boresighting Laser RangeFinder (LRF)</td>
<td>16</td>
</tr>
<tr>
<td><strong>COMMANDER'S MACHINE GUN</strong></td>
<td></td>
</tr>
<tr>
<td>Clearing Caliber .50 Machine Gun</td>
<td>19</td>
</tr>
<tr>
<td>Installing Caliber .50 Machine Gun</td>
<td>21</td>
</tr>
<tr>
<td>Testing Caliber .50 Machine Gun Firing Circuit</td>
<td>23</td>
</tr>
<tr>
<td>Boresighting Caliber .50 Machine Gun</td>
<td>25</td>
</tr>
<tr>
<td>Zeroing Caliber .50 Machine Gun</td>
<td>29</td>
</tr>
<tr>
<td>Removing Caliber .50 Machine Gun</td>
<td>32</td>
</tr>
<tr>
<td>Preparing to Fire Procedure</td>
<td>33</td>
</tr>
<tr>
<td><strong>PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)</strong></td>
<td></td>
</tr>
<tr>
<td>During Operations PMCS</td>
<td>38</td>
</tr>
<tr>
<td>Master Check-Off List — Before Operations PMCS</td>
<td>40</td>
</tr>
<tr>
<td>Master Check-Off List — During Operations PMCS</td>
<td>42</td>
</tr>
<tr>
<td>Master Check-Off List — After Operations PMCS</td>
<td>43</td>
</tr>
<tr>
<td><strong>PICTURES</strong></td>
<td></td>
</tr>
<tr>
<td>Laser RangeFinder Receiver-Transmitter</td>
<td>45</td>
</tr>
<tr>
<td>Networks Box</td>
<td>46</td>
</tr>
<tr>
<td>Ammunition Select Unit</td>
<td>47</td>
</tr>
</tbody>
</table>
INSTALLING COMMANDER'S PERISCOPE M36E1
(TM page 3-122)

LINK ASSEMBLY MUST BE DISCONNECTED FROM PERISCOPE AND ATTACHED TO STOWAGE HANGER BEFORE INSTALLING PERISCOPE DAYLIGHT BODY

1. Daylight body ........ Slide into position carefully

2. Daylight body latches .... Engage

3. Passive elbow ........ Slide into position carefully

4. Passive elbow latches .... Engage

Support daylight body with one hand

Support passive elbow with one hand

5. Two electrical connectors .... Connect to rear of daylight body

6. Quick-disconnect clamp .... Disconnect from stowage hanger / connect to periscope elevation arm

7. Stowage hanger ........ Place in cupola ceiling stowage clip
1. MASTER BATTERY .......... ON
2. CUPOLA POWER .......... ON
3. Ballistic shield cover .... Open
4. Headrests ................. Adjust
5. Daylight body eyepiece .... Obtain image
6. Diopter ring ............... Rotate to sharpen image
7. Lamp housing of light .... Connect to slot on daylight body
8. Light source control knob .. Adjust reticle brightness
9. IS LRF TO BE USED ?
   YES → 9a. Laser filter .... Remove from telescope filter box
   NO → 9b. Laser filter .... Insert in eyeshield groove
   NO → GO TO 10
OPERATE PASSIVE ELBOW ONLY UNDER LOW LIGHT CONDITIONS OR WITH BALLISTIC SHIELD COVER CLOSED

10. Passive elbow shutter lever. Move to the left
11. RETICLE control. Adjust reticle brightness
12. TUBE control. Adjust tube brightness
13. Dioptr ring. Focus background
14. Focus ring. Focus target image
15. Tube control. Readjust for clearest image

Opens shutter and activates power switch
Use lowest possible intensity
REMOVING COMMANDER'S PERISCOPE M36E1

(TM page 3-122)

1. Cal .50 machine gun .... Elevate to upper limit
2. Quick-disconnect clamp ... Disconnect from periscope elevation arm
3. Elevation arm ........ Move toward rear of cupola
4. Quick-disconnect clamp ... Connect to stowage hanger

LINK ASSEMBLY MUST BE DISCONNECTED FROM PERISCOPE AND ATTACHED TO STOWAGE HANGER BEFORE REMOVING M36 PERISCOPE DAYLIGHT BODY.

5. Two electrical connectors ... Disconnect from rear of daylight body
6. Lamp housing ........ Disconnect from daylight body (dovetail slot)
7. Lamp housing ........ Connect to light source control (dovetail slot)
8. M30 instrument light .... Disconnect from passive elbow
9. Passive elbow latches ... Release

Support passive elbow with one hand

GO TO 10
GO TO 10
10. Passive elbow ........ Lower carefully

11. Daylight body latches .... Release

12. Daylight body ........ Lower carefully

Support daylight body with one hand
OPERATING LASER RANGEFINDER (LRP)
(TM page 2-246)

LIMIT SUSTAINED RANGING RATE TO THREE PER MINUTE OR SIX PER TWO MINUTES WITH THREE-MINUTE INTERVALS BETWEEN EACH TWO MINUTE RANGING PERIOD.

DO NOT LEAN AGAINST RECEIVER-TRANSMITTER WHEN VIEWING THROUGH EYEPiece OR LASING.

MAKE SURE BLISTER COVER IS LOCKED IN THE OPEN POSITION WHEN RANGING.

1. MODE ................. TEST
2. MASTER BATTERY ......... ON (driver)
3. POWER ................. ON (gunner)
4. Headrest ............... Adjust

Use serrated knob to release and lock

GO TO 5
5. Blister cover ........... Lock in open position
6. Eyepiece ............... Sight image
7. Diopter ring ........... Adjust until image is sharp and clear
8. RETICLE BRIGHTNESS Adjust reticle brightness
9. 6X/12X switch ........ Select appropriate power
10. Rubber eye shield .... Pull off
11. Laser filter ........... Remove from stowage bracket/snap over eyepiece
12. Rubber eye shield .... Replace
LASER RANGEFINDER SELF-TEST
(TM page 2-248)

1. MODE ............... TEST
2. MASTER BATTERY .... ON
3. POWER ............... ON (gunner)
4. MANUAL/RANGEFINDER .... RANGEFINDER (gunner)
5. LIGHT/DIM/TEST .... TEST
6. Control panel indicators .... All should illuminate
7. RANGE (METERS) .... Should display 8888
8. RETURNS ............. Should display 8
9. LIGHT/DIM/TEST .... LIGHT or DIM
10. Control panel indicators ... The following should illuminate: RANGE, RESET, FEED, BATL RNG, LAST, TEST

GO TO 11
11. RANGE (METERS) Should display 0000
12. RETURNS Should display 0

DO NOT PRESS RANGE SWITCH OR THUMB SWITCHES ON GUNNER'S CONTROL HANDLES WHILE MODE SWITCH IS IN ON OR AUTO, LASER WILL FIRE.

13. MODE ON
14. MODE AUTO
15. RANGE indicator Should flash within 4 seconds
16. MANUAL/RANGEFINDER MANUAL (gunner)
17. RANGE indicator Should not flash
18. MANUAL/RANGEFINDER RANGEFINDER (gunner)
19. MODE TEST
20. EMER POWER ON (gunner)
21. Indicators on electronics Should remain on unit

GO TO 22
22. EMER POWER ......... XMTR TEST (gunner)
23. Indicators on electronics ...... Should remain on unit
24. EMER POWER ......... OFF (gunner)
25. RANGE pushbutton .......... Depress/Hold
26. RANGE (METERS) ........... Should display 0002
27. MALF ................. Should illuminate
28. RANGE ................ Release
29. BATL RNG ................. Depress
30. LRF panel ............... Perform logic test

DO NOT LOOK INTO LRF EYEPiece WHEN FIRING LASER INTO THE BLISTER DOOR.

31. Blister door .......... Assure closed
32. Blister door pin .......... Assure installed
33. EMER POWER .......... XMTR TEST (gunner)
34. MODE ................. ON

GO TO 35
35. RANGE indicator ........ Should flash within 4 seconds

36. RANGE pushbutton .......... Press/Release

37. Selector lights .......... LAST should illuminate

38. RETURNS ................. Should display 0

39. RANGE (METERS) ........... Should display 9995 (+15)

40. SEL light ................. Should be on

41. GO light ................. Should be off

42. IS SELF-TEST COMPLETED SUCCESSFULLY?
   YES

                                          NO

42a. LRF ................. Report as non-operational

GO TO 43
IS AUTHORIZED LASING AREA AVAILABLE?

YES → 43a. LRF ............ Report as operational

NO

PERFORM FOLLOWING STEPS ONLY IN AN AUTHORIZED LASING AREA. MAKE SURE APPROPRIATE FILTERS HAVE BEEN INSTALLED IN SIGHTS. DO NOT FIRE AT REFLECTIVE SURFACES OR WHEN PERSONNEL WITHIN 20° OF LASER LINE OF SIGHT. BEFORE FIRING, WARN PERSONNEL NOT TO LOOK AT TARGET OR IN THE DIRECTION OF THE BEAM.

43a. Target ............... Clear area/1200 meters

44. EMER POWER .......... XMTR TEST (gunner)

46. MODE ................. ON

DO NOT LEAN OR PUSH AGAINST RECEIVER-TRANSMITTER WHEN VIEWING THROUGH EYE-PIECE OR LASING.

GO TO 47
47. LRF reticle .......... Lay on target
48. LRF panel .......... Perform firing test—

Use LRF Firing
Test Table (page 15)

IF TARGET RANGE IS NOT OBTAINED DURING
LRF TEST, MAKE SURE THAT LRF AND GUNNER'S
RETICLES ARE ON THE SAME POINT. IF NOT
REBORESIGHT THE SYSTEM AT EARLIEST
OPPORTUNITY.

49. EMER POWER .......... OFF—

50. MODE ................ TEST—
### Ranging and Logic Table

<table>
<thead>
<tr>
<th>Step</th>
<th>Press and Release</th>
<th>Selector Lights</th>
<th>RETURNS Display</th>
<th>RANGE (METERS) Display (+.15)*</th>
<th>SEL Light</th>
<th>GO Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RESET</td>
<td>LAST</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>RANCE</td>
<td>LAST</td>
<td>1</td>
<td>850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>3</td>
<td>BATL RNG</td>
<td>LAST</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>4</td>
<td>RANCE</td>
<td>LAST</td>
<td>1</td>
<td>850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>LAST</td>
<td>1</td>
<td>850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>LAST</td>
<td>1</td>
<td>850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>7</td>
<td>RANCE</td>
<td>LAST</td>
<td>2</td>
<td>1850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>8</td>
<td>RANCE</td>
<td>LAST</td>
<td>3</td>
<td>2850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>9</td>
<td>RANCE</td>
<td>LAST</td>
<td>4</td>
<td>2850</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>850</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1850</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>12</td>
<td>LAST</td>
<td>LAST</td>
<td>4</td>
<td>2850</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>14</td>
<td>FEED</td>
<td>2</td>
<td>4</td>
<td>1850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>15</td>
<td>RESET</td>
<td>LAST</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>17</td>
<td>RANCE</td>
<td>2</td>
<td>1</td>
<td>9995**</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>18</td>
<td>FEED</td>
<td>2</td>
<td>1</td>
<td>9995</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>19</td>
<td>RANCE</td>
<td>2</td>
<td>2</td>
<td>1850</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>20</td>
<td>FEED</td>
<td>2</td>
<td>2</td>
<td>1850</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>21</td>
<td>Range***</td>
<td>LAST</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>22</td>
<td>RESET</td>
<td>LAST</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

*Last digit of range display must always be 0 or 5

**If RANGE (METERS) displays 0000, go back to step 15.

***Set ELEV/TRAV POWER switch to ON position and range from gunner's handles. Set ELEV/TRAV POWER switch to OFF position.
**LRF Firing Test**

<table>
<thead>
<tr>
<th>Step</th>
<th>Press and Release</th>
<th>Selector Lights</th>
<th>RETURNS Display</th>
<th>RANGE (METERS) Display (+ 15)**</th>
<th>SEL Light</th>
<th>GO Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RESET</td>
<td>LAST</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0000</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>RANGE</td>
<td>2</td>
<td>1</td>
<td>9995*</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Target Range****</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>5</td>
<td>FEED</td>
<td>1</td>
<td>1</td>
<td>Target Range</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>6</td>
<td>Range***</td>
<td>LAST</td>
<td>1</td>
<td>Target Range</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

*If RANGE (METERS) displays 0000, press RESET and repeat test sequence.

**Last digit of range display must always be 0 or 5.

***Set ELEV/TRAV POWER switch to ON position and range from gunner's station.
Set ELEV/TRAV POWER switch to OFF position.

****If RANGE (METERS) displays 9995, set EMER POWER to OFF and repeat steps 1-4.
BORESIGHTING LASER RANGEFINDER (LRF)

(TM page 2-350)

DO NOT VIEW LASER BEAM THROUGH DEVICE
NOT FILTERED FOR LASER LIGHT. FIRE
LASER IN AUTHORIZED LASING AREA ONLY.

1. Laser filter . . . . . . . Install on eyepiece
2. RETICLE BRIGHTNESS . . . Rotate until reticle is
   just visible
3. MANUAL/RANGEFINDER . . . RANGEFINDER
4. MODE . . . . . . . . . . . . . ON
5. BATL RNG . . . . . . . Press

DO NOT LEAN OR PUSH AGAINST RECEIVER-TRANSMITTER
WHEN VIEWING THROUGH EYEPiece OR LASING.

6. 6X/12X . . . . . . . . . . . . . 12X
7. Eyepiece . . . . . . . . . . . . Sight target

GO TO 8
8. DEFLECTION AND ELEVATION controls

9. BORESIGHTING WITH MUZZLE BORESIGHT DEVICE
   NO \rightarrow 9a. Muzzle crossthreads. Assure on target aiming point

   YES \rightarrow GO TO 11

10. Periscope reticle
    YES \rightarrow GO TO 15

11. Slip scales
    Set on 4 and 4

12. RANGE
    Press

13. 1 or 2 pushbuttons
    Press if necessary

14. INDICATE PROPER RANGE
    NO \rightarrow GO TO 7

   YES \rightarrow GO TO 15

   Lay reticle from left to right and from low to high without overtravel
15. FEED . . . . . . . . . . . Press

16. MODE . . . . . . . . . . . TEST

17. Laser filter . . . . . . . . Remove from eyepiece/replace in holder

18. BORESIGHTING WITH MUZZLE BORESIGHT DEVICE?
   YES \rightarrow 18a. Periscope reticle . . Assure on target aiming point
   NO

19. ARE CROSSHATCHES STILL ON TARGET AIMING POINT?
   NO \rightarrow 19a. Control handles . . Relay main gun on target
   19b. DEFLECTION and . . Lay reticle on aiming point
   19c. Slip scales . . . . Set on 4 and 4
   YES
CLEARING CALIBER .50 MACHINE GUN
(TM page 2-337)

1. GUN SAFETY . . . . . . . . . . . . OFF
2. CUPOLA POWER . . . . . . . . . . . OFF
3. Machine gun safety . . . . . . . . . S
4. Cradle access door . . . . . . . . . Prop open
5. Machine gun cover . . . . . . . . . Open
6. Ammunition . . . . . . . . . . . . Remove

7. IS BOLT FORWARD ?
   YES 7a. Machine gun safety . P
       7b. Bolt . . . . . . . . . . Pull to rear
       7c. Machine gun safety . S
   NO GO TO 8

Secure with hold/close latch
Sear must engage before releasing

GO TO 8
8. Is Chamber Empty?
   - NO → 8a. Stuck or ruptured cartridges .... Remove
   - YES → GO TO 9

9. Machine gun safety ...... F
10. Charger handle ....... Pull back and hold
11. Manual trigger handle .... Pull
12. Bolt ............... Release forward slowly
13. Machine gun cover .... Close
14. Cradle access door .... Close

Use TM 9-1005-231-10
Maintain tension on charger handle
Installing Caliber .50 Machine Gun

(TM page 3-122)

Link assembly must be connected to stowage... hanger before installing cal .50 machine gun.

1. Machine gun .......... Clear (page 19)
2. Rear mounting pin .... Remove
3. Machine gun cradle ... Elevate
5. Rear mounting pin .... Secure gun in cradle
6. Solenoid lead connector ... Connect to end plate

7. Is fixed feed chute lined with mg feedway?
   NO \       \ 7a. Organizational ... Notify
   YES \        \ maintenance

8. Cradle access door .... Open

GO TO 9
9. Barrel .............. Insert/rotate 1/4 turn
10. Cradle access door ....... Close
11. Quick-disconnect clamp .... Disconnect from stowage/hanger/connect to periscope elevation arm
12. Stowage hanger ........... Place in cupola ceiling stowage clip
13. Cal .50 firing circuit ....... Test (page 23)
TESTING CALIBER .50 MACHINE GUN FIRING CIRCUIT
(TM page 3-121)

1. Machine gun ............... Clear (page 19)

2. MASTER BATTERY ............ ON

3. CUPOLA POWER ............... ON

4. GUN SAFETY .................. ON

5. Dummy ammo ................. Load
or
Last round sensing switch .... Depress

6. LAST ROUND OVERRIDE ...... OFF

7. IS GUN READY LIGHT ON? 
   NO 7a. LAST ROUND OVERRIDE 
   YES 

   GO TO 8

   GO TO 8
8. Machine gun safety...
9. Charger handle.
10. Firing trigger.

II. DOES BOLT CLOSE?

YES

NO

IIa. Organizational maintenance

12. GUN SAFETY OFF
13. Machine gun safety OFF
14. CUPOLA POWER OFF

A-27
14. Center of barrel ............ Aline on target aiming point  
15. AZIMUTH LOCK .............. Push up  
16. Azimuth adjustment knob .... Adjust azimuth precisely if necessary  
17. Machine gun/cupola ........... Do not move  
18. M36E1 Periscope .............. Install (page 1)  
19. M36E1 Periscope .............. Prepare for operation (page 2)  
20. Daylight body eyepiece ....... Sight target/disengage  
21. Daylight body elevation ....... Aline boresight cross on target aiming point  
22. Slip scales of daylight body ... Set on 4 and 4  

23. LOW LIGHT CONDITIONS? 
   NO  GO TO 27  
   YES  

24. Searchlight ................. Light target momentarily if necessary  
25. Passive body eyepiece ....... Sight target/disengage  

Use manual controls
26. Passive body elevation and deflection knobs  ...  Aline reticle on aiming point
27. Slip scales of passive elbow  ...  Set on 4 and 4
28. Daylight body reticle  ...  Verify still on target aiming point

**LINK ASSEMBLY MUST BE DISCONNECTED FROM PERISCOPE AND ATTACHED TO STOWAGE HANGER BEFORE ASSEMBLING CAL .50 MACHINE GUN.**

29. Cal .50 machine gun  ...  Elevate to upper limit
30. Quick-disconnect clamp  ...  Disconnect from periscope elevation arm
31. Elevation arm  ...  Move toward rear of cupola
32. Quick-disconnect clamp  ...  Connect to stowage hanger
33. M36E1 Periscope  ...  Remove (page 4)
34. Cover  ...  Open
35. Bolt locks  ...  Depress
36. Bolt assembly  ...  Slide into barrel extension assembly
37. Hand  ...  Remove from lever assembly
38. Bolt assembly  ...  Slide forward

**Hold lever and ejector assemblies to the left**

**Force cartridge ejector to the left**

GO TO 39
39. Sear assembly guide rails .... Aline with grooves in receiver
40. Sear assembly ....... Slide forward
41. Bolt buffer group ....... Install
42. Backplate group ....... Aline with grooves in receiver
43. Backplate group ....... Slide downward
44. Machine gun cover ....... Close
45. Cradle access door ....... Close
46. Cradle cover ....... Close
47. Bolt ....... Place forward
48. Safety ....... F
49. M36E1 Periscope ....... Install (page 1)
50. Quick-disconnect clamp ....... Disconnect from stowage hanger/ connect to elevation arm assembly
51. Stowage hanger ....... Place in cupola ceiling stowage clip

Detent should engage
Rotate rod 1/4 turn in either direction in receiver to secure
Depress lock and raise latch
Should lock and latch
ZERGING CALIBER .50 MACHINE GUN
(TM page 2-397)

1. Machine gun ............... Boresight (page 29)
2. Aiming point ............... Right angle/500 meters
3. Daylight body eyepiece .... Sight target
4. Cupola traversing and elevating controls 
   Lay periscope reticle on aiming point
   Use 500 meter crosshair
5. Machine gun cover ........... Unlatch and open
   Hold with hold-open latch on cradle access door
6. BOLT FORWARD?
   YES
   6a. Safety ............... F
   6b. Charger handle .... Pull to rear
   6c. Trigger extension .... Pull handle
   6d. Bolt ............... Close slowly
   Maintain tension on charger handle
   GO TO 7
7. Ammo belt ................. Place in feed tray
   Open side of links down
8. Machine gun cover .......... Close
   GO TO 9
SAFETY MUST BE IN F BEFORE CHARGING WEAPON. CHARGING IN S MAY CAUSE THE WEAPON TO FIRE ACCIDENTALLY.

9. Safety ............ Assure in F

10. Charger handle ....... Pull to rear

11. Trigger switch .......... Fire 10-20 round burst

12. [Flowchart diagram with decision points and actions]

13. [Flowchart diagram with decision points and actions]

Sear must be engaged before releasing

GO TO 14

Daylight body ... Adjust reticle to center of strike area

GO TO 14

Adjust reticle to center of strike area
14. DUSK CONDITIONS?
   YES  14a. Searchlight . . . . Illuminate target area
   NO    14b. Daylight eyepiece . Assure daylight
           body reticle is still on target

          14c. Passive elbow eyepiece
          14d. Passive elbow boresight adjustment knobs
               Sight target
               Adjust reticle to center of strike area

          GO TO 15

15. Trigger switch . . . . . . Fire 10-20 round burst

16. IS CENTER OF STRIKE AREA WITH 24 INCHES
    OF AIMING POINT?
    NO  GO TO 12
    YES
REMOVING CALIBER .50 MACHINE GUN
(TM page 3-122)

1. Machine gun ............... Clear (page 19)
2. CUPOLA POWER ............ OFF
3. Machine gun ............... Elevate
4. Solenoid lead connector ... Disconnect from end plate
5. Cradle access doors ...... Open
6. Barrel ..................... Rotate 1/4 turn/remove
7. Machine gun ............... Elevate

---

To disconnect solenoid lead connector
Press down on barrel latches
So that gun can slide under TC's periscope

---

LINK ASSEMBLY MUST BE CONNECTED TO STOWAGE HANGER BEFORE REMOVAL OF CAL .50 MACHINE GUN.

8. Quick-disconnect clamp ... Disconnect from elevation arm
9. Elevation arm ............. Move toward rear of cupola
10. Quick-disconnect clamp ... Connect to stowage hanger
11. Rear mounting pin ......... Remove
12. Machine gun ............... Slide from cradle
PREPARING TO FIRE, PROCEDURE
(TM page 2-400)

COMMAND: PREPARE TO FIRE

1. Exterior lenses and vision devices ............... Clean
2. Cupola ballistic periscope shield .......... Check operation
3. MASTER BATTERY .................. ON (driver)
4. Instrument lights ................. Check
5. LRF .................................. Check for MALF light

COMMAND: CHECK FIRING SWITCHES

6. MAIN GUN ........................ ON (gunner)
7. Engine .......................... Start (driver)
8. 105-mm gun safety switch ....... In FIRE (loader)
9. Circuit tester ....................... Insert (loader)
10. TC .................................. Announces: ON THE WAY

GO TO 11
11. TC's control handle ...... Check trigger

12. Gunner's control handles ... Check triggers (gunner)
13. MAIN GUN .............. OFF (gunner)

14. MACHINE GUN .............. ON (gunner)

15. Coaxial machine gun ....... Cock (loader)
16. TC .......................... Announces: ON THE WAY
17. TC's control handle ...... Check trigger

18. Gunner's control handles... Check triggers (gunner)

COMMAND: CHECK GUN CONTROLS

19. Gunner .................. Announces: POWER
20. Turret .................... Unlock (loader)

21. ELEV/TRAV POWER ........ ON (gunner)

22. Gun/turret ............... Elevate/traverse using TC power controls

GO TO 23
23. ELEV/TRAV POWER ........ OFF (gunner)

MAKE SURE THAT CREW IS READY AND NO PERSONNEL OR OBSTRUCTIONS ARE IN SURROUNDING AREA

COMMAND: CHECK GUN STABILIZATION

24. STAB ELECTRONICS ........ ON

25. POWER PACK BLOWER MOTOR ... ON

26. ELEV/TRAV POWER ........ ON (gunner)

27. POWER on selector assembly ... ON (gunner)

28. STAB ................. ON (gunner)

29. Gunner ............... Announces: TURRET STABILIZED

30. TRAV and/or EL BALANCE .... Rotate to null drift (gunner)

31. Gunner's control handles ... Check function (gunner)

32. TC palm switch ............ Activate override

GO TO 33

Wait 15 seconds

System is operational when green STAB indicator lights
33. TC control handles . . . . . . Check function
34. STAB SHUT-OFF . . . . . . . Depress
35. POWER on selector assembly . . OFF (gunner)
36. Gunner . . . . . . . . . . . . . Announces: STABILIZATION OFF

COMMAND: CHECK FIRE CONTROL

37. CUPOLA POWER . . . . . . . . ON
38. GUN SAFETY . . . . . . . . . . ON
39. Cal .50 machine gun . . . . . Check operation
40. XM21 computer . . . . . . . . . Perform self-test (gunner)
41. 105-mm gun . . . . . . . . . . Prepare for boresighting (loader)
42. LRF . . . . . . . . . . . . . . . . Perform self-test (page 8)
43. Gunner's telescope and . . . . . Boresight (gunner)
    periscope
44. LRF . . . . . . . . . . . . . . . . Boresight (page 14)
45. Ammo switch . . . . . . . . . . Select appropriate ammo (gunner)

GO TO

46
46. MOVING/STATIONARY .... Select appropriate setting (gunner)
47. Computer ............... Enter ballistic data (gunner)
48. Cal .50 machine gun ...... Boresight (page 18)
49. 7.62-mm machine gun ...... Load (loader)
50. 105-mm gun .............. Load (loader)
51. Cal .50 machine gun ...... Load

COMMAND: REPORT

52. Gunner/Driver/Loader .... Announce: READY
DURING OPERATIONS PMCS
(TM page 2-105)

1. Commander's seat ... Check operation/adjustment
2. Amplifier AM-1780/VRC ... Turn on
3. MONITOR ............... INT ONLY
4. VOLUME ................. Adjust
5. Radio/intercom ........ Check operation
6. Azimuth lock .......... Check operation
7. Azimuth interlock ...... Check operation
8. Azimuth lock .......... Unlock
9. Manual traversing handle ... Traverse cupola right/left
   Check that cupola traverses smoothly
10. Azimuth lock .......... Lock
11. Elevating handle ...... Depress/elevate Cal .50
   Check that machine gun elevates smoothly
12. TC control handles .... Check operation

GO TO 13
13. Gunner control handles . . . . Traverse turret (gunner) counterclockwise

14. TC control handles . . . . . Override gunner and traverse turret clockwise

15. M36E1 Periscope ballistic shield . . Assure open

16. M36E1 Periscope window . . . . Clean

- Depress palm switch
- Use cleaning compound and lens tissue
<table>
<thead>
<tr>
<th>System</th>
<th>Location</th>
<th>Equipment Bar</th>
<th>Torsion Bar</th>
<th>External Fire Extinguisher</th>
<th>Safety Wire-Mile Lead Seals</th>
<th>Hatches</th>
<th>Hold-Open Locking Handles</th>
<th>Turret Lock</th>
<th>Travel Lock</th>
<th>Elevation Handle</th>
<th>Traverse Handle</th>
<th>Driver's Seat</th>
<th>Driver's Hatch</th>
<th>Driver's Escape Hatch</th>
<th>Plunger Bolts</th>
<th>Manual Control Lever</th>
<th>Dump Lever</th>
<th>Backrest</th>
<th>Three Cylinders</th>
<th>Lead Seal</th>
<th>Shifting Lever</th>
<th>Pressure Gauge</th>
<th>Brake Pedal</th>
<th>Master Cylinder</th>
<th>Power Plant Wiring</th>
<th>Indicator Lamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing Parts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean/Clear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A-43
<table>
<thead>
<tr>
<th>Location</th>
<th>System</th>
<th>Equipment</th>
<th>Adjustment</th>
<th>Clean/Clear</th>
<th>Damage</th>
<th>In Place</th>
<th>Leaks</th>
<th>Level</th>
<th>Missing Parts</th>
<th>Operation</th>
<th>Pressure</th>
<th>Secure</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hull</td>
<td>Air Cleaner Housings and Doors</td>
<td>Door</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door Fasteners</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Housing</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door Hinges</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drain Plug</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inspection Plugs</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top Deck Grille Doors</td>
<td>Top Deck Grille Doors</td>
<td>Top Deck Grille Doors</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine and Transmission Oil Level</td>
<td>Engine Oil (Stopped)</td>
<td>Engine Oil (Stopped)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine and Transmission Oil Level</td>
<td>Transmission Oil (Stopped)</td>
<td>Transmission Oil (Stopped)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine and Transmission Oil Coolers</td>
<td>Engine Oil (Idling)</td>
<td>Engine Oil (Idling)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine and Transmission Oil Coolers</td>
<td>Transmission Oil (Idling)</td>
<td>Transmission Oil (Idling)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Elbows, Hoses, and Clamps</td>
<td>Screens</td>
<td>Screens</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Elbows, Hoses, and Clamps</td>
<td>Coolers</td>
<td>Coolers</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Elbows, Hoses, and Clamps</td>
<td>Intake Hose</td>
<td>Intake Hose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Elbows, Hoses, and Clamps</td>
<td>Outlet Hose</td>
<td>Outlet Hose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Blower Motors</td>
<td>Intake Hose Elbow</td>
<td>Intake Hose Elbow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Blower Motors</td>
<td>Outlet Hose Elbow</td>
<td>Outlet Hose Elbow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Blower Motors</td>
<td>Intake Hose Clamps</td>
<td>Intake Hose Clamps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Blower Motors</td>
<td>Outlet Hose Clamps</td>
<td>Outlet Hose Clamps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restriction Indicators</td>
<td>Air Cleaner Blower Motors</td>
<td>Air Cleaner Blower Motors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restriction Indicators</td>
<td>Restriction Indicators</td>
<td>Restriction Indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restriction Indicators</td>
<td>Pipe Plug</td>
<td>Pipe Plug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restriction Indicators</td>
<td>Window</td>
<td>Window</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restriction Indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Tank Commander Master Check-Off List During Operations

**Driver's Station**

<table>
<thead>
<tr>
<th>Location</th>
<th>System</th>
<th>Equipment</th>
<th>Adjustment</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Idle Speed/</td>
<td>Engine Speed at Idle</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accelerator Control</td>
<td>Accelerator Control</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine Speed After Acceleration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gages</td>
<td>Power Plant Warning Light</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Battery - Generator</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine Oil Pressure</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engine Oil Temperature</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transmission Oil Pressure</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>Steering Control</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shifting Control</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brake Pedal</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Loader's Station</td>
<td>Ammunition Stowage Racks/Ammunition Ready Racks</td>
<td>Stowage Rack Tubes and Retainers</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ready Rack Locks</td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cushioning Pads</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Commander's Station</td>
<td>Seat</td>
<td>Seat</td>
<td>X X X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intercom/Radio</td>
<td>Intercom/Radio</td>
<td>X X X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cupola Azimuth and Elevation Controls</td>
<td>Azimuth Lock</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Azimuth Interlock</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manual Traversing Handle</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manual Elevating Handle</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turret Power Controls</td>
<td>Palm Switch</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control Handles</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TC's Periscope</td>
<td>Outside Window</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
# TANK COMMANDER MASTER CHECK-OFF LIST

**AFTER OPERATIONS PMCS**

*(TM page 2-110)*

<table>
<thead>
<tr>
<th>Location</th>
<th>System</th>
<th>Equipment</th>
<th>Chipping/Peeling Damage</th>
<th>Heat</th>
<th>In Place</th>
<th>Leaks</th>
<th>Missing Parts</th>
<th>Seated</th>
<th>Secure</th>
<th>Wear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior/Track</td>
<td>Rear Grille Doors</td>
<td>Rear Grille Doors</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Final Drive</td>
<td>Final Drive/Sprocket Bottom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mounting Studs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Drive Hubs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sprockets</td>
<td>Sprockets</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roadwheels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roadwheels and Hubs</td>
<td>Mounting Holes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hubs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inside Wheel Rims</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roadwheel Arms</td>
<td>Roadwheel Arms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shock Absorbers</td>
<td>Shock Absorbers</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track Support Rollers and Hubs</td>
<td>Track Support Rollers</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support Roller Hubs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track End Connectors and Wedges</td>
<td>End Connectors</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bolts</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wedges</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track Center Guides</td>
<td>Track Center Guides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track Pads</td>
<td>Track Pads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track Adjusting Links</td>
<td>Link Assembly</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cotter Pin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Track Shoes</td>
<td>Pins</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shoes</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compensating Idler Wheels and Hubs</td>
<td>Inside Wheel Rims</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hub</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>System</td>
<td>Equipment</td>
<td>Adjustment</td>
<td>Clean/Clear</td>
<td>Drainage</td>
<td>In Place</td>
<td>Leaks</td>
<td>Operation</td>
<td>Pressure</td>
<td>Secure</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------</td>
<td>------------------------</td>
<td>------------</td>
<td>-------------</td>
<td>----------</td>
<td>----------</td>
<td>-------</td>
<td>-----------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>Gunner's Station</td>
<td>Seat</td>
<td>Seat</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fire Control</td>
<td>Scale</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quadrant/Light</td>
<td>Index</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Source Control</td>
<td>Level Vial Cover</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level Vial</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Light Source Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Azimuth Indicator</td>
<td>Glass Cover</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rheostat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turret Power Controls</td>
<td>Hydraulic Fluid</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydraulic Power</td>
<td>Accumulator Pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control Handles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gunner's Sights</td>
<td>Periscope Window</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telescope Lens</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROCEEDURE GUIDES
M60A3 TANK

July 1982

PREPARED BY THE U.S. ARMY RESEARCH INSTITUTE
FOR THE
BEHAVIORAL AND SOCIAL SCIENCES
GENERAL INFORMATION

This booklet contains M60A3 gunner procedures guides. Each guide is for a single pre-operation, post-operation, or during operation activity. Each guide is matched to TM 9-2350-253-10 (Operator's Manual for Tank, Combat, Full-Tracked: 105-MM Gun, M60A3).

PURPOSE OF PROCEDURE GUIDES

The guides in this booklet will not take the place of the M60A3 Operator's Manual or M60A3 training materials. The guides will aid you in remembering long or difficult sets of procedures. In short, the guides will help to "jog your memory."

USE OF THIS BOOKLET

The Table of Contents (on the next page) lists the procedure guides in this booklet. Each guide gives you a step-by-step outline for completing an activity. The following instructions will help you to better use each guide.

1. Some steps within a procedure are followed by a page number. On that page you will find a detailed breakdown of the step.

2. Some of the procedure guides include a question(s). Each question is stated inside a diamond shape. Your "yes" or "no" to the question will show you which path to follow.

3. Some paths lead to an instruction to go to a particular step number within a procedure. The step number is given within a circle.

4. Some steps within a procedure guide are followed by a box. In the box you will find more information on the step or a caution/warning.

5. Certain steps within a procedure guide require that a knob or switch be turned to a certain position. In some cases, that position might be written like the symbol to the left. The symbol means that a light should also come on.

6. At the beginning of each procedure, the TM page number reference for the procedure is given under the task name. These references will help you if you need more information to complete the task.

7. Two procedures are listed for boresighting with a boresighting device (taken from TRADOC Training Text 17-12-1) and without such a device (procedure in the Operator's Manual). Note that if a boresighting device is used, the zeroing procedure is not performed.
# TABLE OF CONTENTS

## GUNNER'S OPTICS
- Operating Tank Thermal Sight (TTS) .............................................. 1  
- Operating Telescope M105D .......................................................... 6

## Computer System
- Computer Self-Test ........................................................................... 9  
- Operational Response Test:  
  - Rate Tachometer and Lead Circuitry ........................................ 14  
  - Wind Sensor Test ........................................................................ 21

## Main Gun
- Boresighting with Muzzle Boresight Device .................................... 24  
- Boresighting without Muzzle Boresight Device .................................. 32
  - Zeroing 105-MM Gun .................................................................... 43

## Coaxial Machine Gun
- Testing 7.62-MM Machine Gun Firing Circuit .................................... 53  
- Boresighting 7.62-MM Machine Gun .................................................. 55  
- Zeroing 7.62-MM Machine Gun ......................................................... 57

## Preparing to Fire
- Preparing to Fire Procedure ............................................................. 59

## Preventative Maintenance Checks and Services (PMCS)
- Before Operations PMCS ................................................................. 64
- During Operations PMCS ................................................................. 65

## Pictures
- Gunner's Control Unit ..................................................................... 67
- Gunner's Switch Box/Stabilization Control Selector .......................... 68  
- Ammunition Select Unit ................................................................ 69
OPERATING TANK THERMAL SIGHT (TTS)
(TM PAGE 2-236)

THE INFRARED OPTICS OF THE GUNNER'S
PERISCOPE CONTAIN ANTIREFLECTIVE
COATING WHICH IS SLIGHTLY RADIO-
ACTIVE, DO NOT SWALLOW OR INHALE.

1. PMCS ........................ Assure complete (crew)

2. MASTER BATTERY .............. ON (driver)

3. MODE on LRF ................. TEST (TC)

4. POWER on gunner's control unit ........................ ON

To prevent accidental firing of LRF

Lift cover switch

ALWAYS LEAVE 4CB1 (CIRCUIT BREAKER) ON TTS POWER CONVERTER SET TO ON.

5. MODE on TTS ................. STBY

GO TO 6
6. COOL indicator ........ Will light until thermal
detector has cooled (< 15 mins)

THERMAL CHANNEL DISPLAY MAY BE
USED BEFORE BITE DISPLAY COOL LAMP
GOES OUT, BUT SYSTEM OPERATES BEST
AFTER COMPLETE COOLDOWN.

7. Ballistic shield ........ Open
cover

Press pushbutton
to open/release
to lock

Pull down lever
to adjust/release
to lock

8. Daylight channel ..... Adjust
headrest

9. Unity power window ..... Assure view is sharp
and clear

10. RTCL control ........ Adjust until unity power
reticle is visible

eyepiece

11. Daylight channel ..... Obtain image
eyepiece

12. Diopter ring .......... Rotate to sharpen image

13. RTCL control ........ Adjust until daylight
channel reticle is visible

GO TO
14
14. Filter selector lever .... Select desired filter color
15. Filter selector lever .... Lock in place
16. COOL indicator .... Assure off
17. MODE on TTS .... ON
18. BITE test switch .... LAMP TEST
19. BITE lamps .... All should light
20. BITE test switch .... SYS TEST
21. BITE lamps .... None should light
22. **IS CABLE LAMP ON?**
   - NO → 22a. Cable connectors ... Check
   - YES → GO TO 23

Lever must point forward to prevent parallax
Push up to selected band color
23. ARE ANY LAMPS ON?

NO \rightarrow 23a. Organizational... Notify maintenance

YES

24. THERMAL CHANNEL... NAR
FIELD OF VIEW

25. GUNNER/CMDR... GUNNER (TC)

26. TTS eyepiece... Select target

27. BRIGHT/CONTRAST... Adjust for normal viewing controls

28. THERMAL CHANNEL... Adjust until view is sharp and clear
RANGE FOCUS

29. POLARITY switch... Move up or down for clearest view

30. WHT/BLK HOT... Should alternate when POLARITY switch is moved indicators

31. RTCL control... Adjust brightness of NAR FOV reticle, if necessary

Position depends on scene, temperature, and weather

GO TO 32
32. THERMAL CHANNEL     WIDE
FIELD OF VIEW

33. BRIGHT/CONTRAST      Readjust if necessary
controls

34. WFOV indicator          Assure on

35. RTCL control           Adjust brightness of WIDE
                           FOV reticle, if necessary

36. Commander's display     Should have same image (TC)
eyepiece                as gunner's display

37. GUNNER/CMR            CMDR (TC)

38. BRIGHT                 Should control brightness (TC)

39. CONTRAST               Should control contrast (TC)

40. POLARITY               Should interchange light (TC)
                           and dark portions of image

41. GUNNER/CMR            GUNNER (TC)

42. MODE on TTS            STBY
OPERATING TELESCOPE M105D
(TM PAGE 2-225)

1. Telescope/headrest ........ Adjust

2. Eyepiece ............... Sight target

3. Dioptr ring ............... Rotate until view becomes sharp and clear

4. IS VEHICLE POWER AVAILABLE?
   NO
   YES

4a. M50 instrument ........ Disconnect from light housing stowage slots

4b. M50 instrument ........ Connect to top of light housing telescope

4c. M50 instrument ........ Adjust reticle light rheostat brightness

GO TO 5
5. MASTER BATTERY ............ ON (driver)

6. Lamp housing on ............ Disconnect from storage slots
   light source control

7. Lamp housing ............... Connect to top of telescope

8. Light source control ........ Adjust reticle brightness
   rheostat

9. ARE FILTERS REQUIRED ?
   YES 9a. Laser filters or daylight filters . . . . Remove from filter box
   NO 9b. Laser filters or daylight filters . . . . Snap over telescope eyepiece

GO TO 10
10. **IS HEAT-T, HEP, or APDS AMMO TO BE USED?**
   - **YES** → 10a. Reticle selector ... Select corresponding reticle
   - **NO**

11. **IS FSDS AMMO TO BE USED?**
   - **YES** → 11a. Reticle selector ... Select APDS reticle
   - **NO**

12. **IS APER-T TO BE USED?**
   - **YES** → 12a. Reticle selector ... Select HEAT-T reticle
   - **NO**
     - 12b. Aiming data ... Convert range
COMPUTER SELF-TEST
(TM PAGE 2-254)

THE 105-MM GUN MAY MOVE WHEN ELEV/TRAV POWER SWITCH IS ON AND LAMP/NORMAL/SYSTEM SWITCH IS SET IN OR OUT OF SYSTEM OIL LAMP.

DO NOT PERFORM LRF SYSTEM SELF-TESTS WHILE PERFORMING COMPUTER SELF-TEST.

1. MODE on LRF .......... TEST (TC)

2. MASTER BATTERY ....... ON (driver)

3. POWER on gunner's control unit

4. LIGHTS ............... Vary brightness
Panel lights should vary smoothly from dim to bright

5. LIGHTS ............... Adjust to normal brightness

GO TO 6
6. DIM/BRIGHT controls on ammo select units
   Vary brightness

7. HEAT ammo switch
   Assure in H456 position

8. LAMP/NORMAL/SYSTEM

9. SELF TEST and SENSOR FAIL indicators
   All should illuminate

10. MANUAL/RANGEFINDER
     MANUAL

11. LAMP/NORMAL/SYSTEM
     SYSTEM

12. OK indicator
    Should illuminate

13. STATIONARY or MOVING indicators on ammo select units
    Assure that one or the other indicator is illuminated

14. MOVING/STATIONARY switch on either unit
    GO TO 15

Indicators should vary smoothly in brightness
15. MOVING/STATIONARY switch on gunner's unit
   - STATIONARY

16. MOVING/STATIONARY switch on commander's unit
   - MOVING

17. MOVING/STATIONARY switch on gunner's unit
   - STATIONARY

18. MOVING/STATIONARY switch on commander's unit
   - MOVING

19. Gunner's ammo select unit switches
   Depress each of the four in sequence

20. Commander's ammo select unit switches
   Depress each of the four in sequence

21. MANUAL/RANGEFINDER
   RANGEFINDER

STATIONARY should illuminate on both units
MOVING should illuminate on both units
STATIONARY should illuminate on both units
MOVING should illuminate on both units
Pressed switch should be brighter than other three on both units
Pressed switch should be brighter than other three on both units
WIND SENSOR MUST BE INSTALLED AND OPERABLE FOR A COMPLETE TEST. THE WIND SENSOR FAIL INDICATOR WILL LIGHT IF MANUAL WIND IS SELECTED OR IF WIND SENSOR IS NOT INSTALLED AND PROPERLY CONNECTED.

22. Ammo select unit ........... Select ammo type

23. LAMP/NORMAL/SYSTEM ....... SYSTEM

24. OK indicator ............... Should illuminate

25. RANGE (METERS) ........... Should indicate 1850 ± 15

26. RETURN .................. Should indicate 2
27. Does fail light illuminate or lamp not come on?
   NO

27a. Cables ........................................ Check
27b. Indicators .................................... Recheck

27c. Does fail light illuminate or lamp not come on?
   NO

27d. Indicated system .............................. Fails self-test

28. Has every type of ammo been checked?
   NO

   GO TO 20

   YES

   GO TO 28
OPERATIONAL RESPONSE TEST:
(TM PAGE 2-258)

RATE TACHOMETER AND LEAD CIRCUITRY

1. MODE on LRF ............. TEST (TC)

2. MASTER BATTERY ............. ON (driver)

3. POWER on gunner's ............. ON
   control unit

4. MANUAL/RANGEFINDER ......... MANUAL

5. RANGE METERS X100 ......... 20

6. CROSSWIND AUTO/MANUAL ......... MANUAL

7. CROSSWIND MPH ............. 0 MPH

8. MOVING/STATIONARY .......... STATIONARY

9. HEAT switch ............ Depress
   Heat switch should become brighter than other three

GO TO 10
10. Obstructions . . . . . . . Clear from tank and surrounding area

MAKE SURE CREW IS IN SAFE POSITION BEFORE OPERATING GUN ELEVATING AND TURRET TRAVERSING CONTROLS.

11. Gun tube . . . . . . . . . . Release from travel lock

12. Travel lock . . . . . . . . . . Stow

13. Turret . . . . . . . . . . . . . . Unlock

14. Engine . . . . . . . . . . . . . . Start (driver) —— Set speed at 800-900 rpm

MAKE SURE MANUAL TRAVERSING HANDLE LOCKING LEVER IS IN DETENT POSITION.

15. ELEV/TRAV POWER . . . . . . ON

16. Turret hydraulic . . . . . . Should run until accumulator pressure gage reads 1175-1275 psi

power pack motor

GO TO 17
16

17. Does motor operate continuously? Pressure exceed 1300 PSI, or motor sound abnormal?
   YES → 17a. Organizational ... Notify maintenance
   NO →

18. RTCL control ... Adjust until reticle is visible
19. Turret ... Hold steady
20. Palm switch ... Depress/hold
21. Thumb switch ... Momentarily depress
22. Reticle ... Should not move
23. Gunner's palm switch ... Release/depress
24. Turret ... Slew turret to the right at medium speed
25. Thumb switch ... Momentarily depress
26. Reticle ... Should jump to the left

GO TO 27
27. Palm switch ................. Release
28. Reticule .................. Should jump to the right
29. Palm switch ................. Depress/hold
30. Turret .................... Slew turret to the left at medium speed
31. Thumb switch ............... Momentarily depress
32. Reticule .................. Should jump to the right
33. Palm switch ................. Release
34. Reticule .................. Should jump to the left

35. TC's reticle/controls been checked? NO 35a. TC's control handle use to control deflection/elevation
    YES  GO TO 36

GO TO 19
36. HAVE RETICLES/CONTROLS BEEN CHECKED IN STAB MODE?
   YES →  GO TO 50
   NO → MOving/Stationary switch on gunner's unit

37. MOving/stationary switch on gunner's unit → MOVING

MOVING should illuminate on both units

WHEN STABILIZATION SYSTEM IF FIRST ENGAGED, TURRET OR GUN MOVEMENT MAY OCCUR. DURING STABILIZED OPERATIONS, MOVEMENT OF THE GUNNER'S CONTROL HANDLES WILL CAUSE TURRET AND GUN MOVEMENT EVEN THOUGH THE PALM SWITCHES ARE NOT DEPRESSED.

38. STAB ELECTRONICS → ON (TC)
39. POWER PACK BLOWER MOTOR → ON (TC)
GO TO 40
40. POWER on Stabilization control selector

41. Gunner Announces: STAB

42. STAB

43. STAB SHUT-OFF Should be on

Indicators at TC and loader's stations

**Wait 15 seconds**

**System is operational when green STAB indicator lights**

---

**DO NOT OPERATE STABILIZATION SYSTEM UNLESS POWER PACK BLOWER MOTOR COMES ON,**

**A DRIFT RATE OF 2 MILS/MIN IS ACCEPTABLE AFTER ADJUSTING BOTH TRAV BALANCE AND ELEV BALANCE KNOBS.**

44. TRAV BALANCE knob

Rotates clockwise until drift occurs/note position

**GO TO 45**
45. TRAV BALANCE knob
   Rotate counterclockwise until drift occurs/note position

46. TRAV BALANCE knob
   Set halfway between first and second position

47. ELEV BALANCE knob
   Rotate clockwise until drift occurs/note position

48. ELEV BALANCE knob
   Rotate counterclockwise until drift occurs/note position

49. ELEV BALANCE knob
   Set halfway between first and second position

50. POWER on stabilization control selector
    OFF

GO TO 19
OPERATIONAL RESPONSE TEST:
(TM PAGE 2-276)

WIND SENSOR TEST

1. MODE on LRF ...... TEST (TC)
2. MASTER BATTERY ...... ON (driver)
3. POWER on gunner's control unit
4. ELEV/TRAV POWER ...... ON
5. MOVING/STATIONARY ...... STATIONARY
6. Ammo select unit ...... HEP/WP
7. MANUAL/RANGEFINDER ...... MANUAL
8. RANGE METERS X100 ...... 30
9. CROSSWIND AUTO/MANUAL ...... MANUAL

GO TO 10
10. CROSSWIND MPH ................. 0 MPH
11. Tank .......................... Position in left-to-right crosswind
12. Gunner's control ............... Lay vertical bar of 8 X daylight reticle on distant target
13. CROSSWIND MPH ............... 5 MPH from the left
14. Reticle ........................ Should move to the right
15. CROSSWIND MPH ............... 0 MPH
16. Reticle ........................ Should return to aiming point
17. CROSSWIND AUTO/ MANUAL .... AUTO
18. Reticle ........................ Should move to the right
19. CROSSWIND AUTO/ MANUAL .... MANUAL
20. Reticle ........................ Should return to aiming point

GO TO 21
MAKE SURE SURROUNDING AREA IS CLEAR FOR 360° OF TURRET TRAVERSE

21. Turret ............... Traverse 180°
22. Gunner's control handles Lay vertical bar of 8X daylight reticle on distant target
23. CROSSWIND MPH ............... 5 MPH from the right
24. Reticle ............... Should move to the left
25. CROSSWIND MPH ............... 0 MPH
26. Reticle ............... Should return to aiming point
27. CROSSWIND AUTO/ MANUAL ............... AUTO
28. Reticle ............... Should move to the left
29. CROSSWIND AUTO/ MANUAL ............... AUTO
30. Reticle ............... Should return to aiming point
BORESIGHTING WITH MUZZLE BORESIGHT DEVICE

(TT 17-12-1)

Prepare

1. ELEV/TRAV POWER ............ ON

2. Tank position ............... Level

3. All weapons ................. Clear

4. Main gun breech ............. Open

5. Engine ....................... Assure off

6. Target ....................... 1200 meters

7. Ballistic drive coupling lever

8. Filter select lever ........... Locked into position

9. POWER on gunner's control unit

10. Laser rangefinder .......... Self-test (TC)

GO TO 11

Lever must point forward, away from gunner
11. Computer ............... Self-test (page 9)

12. ON A LASER-SAFE RANGE?
   NO → 12a. MODE on LRF ............. TEST
   YES

12b. RANGE (METERS) X100 .... Manually index range

13. MODE on LRF ..............

14. Gunner's control handles ... Lay reticle on target

15. Thumb switches .......... Depress

16. RANGE (METERS) ........... Should display known range (TC)

17. GO light ................. Should be illuminated (TC)

18. MODE ................. TEST

19. NORMAL/BORESIGHT ....... BORESIGHT

20. Azimuth/elevation zero knobs . Assure on 0

GO TO 21
21. CROSSWIND AUTO/MANUAL .......... MANUAL
22. CROSSWIND knob ............ Assure on 0
23. Boresight device ............ Insert

**Adjust Daylight Channel of TTS**

24. Gunner's control handles .... Lay reticle aiming dot on target aiming point
25. Boresight eyepiece .......... Sight target (TC)
26. Gunner's control handles .... Traverse and elevate as directed by TC to lay boresight dot on target aiming point

27. Boresight knobs ............. Adjust so that reticle aiming dot is again on target aiming point
28. Gunner's control handles .... Traverse and elevate off the target/re-lay reticle on target aiming point

29. **BORESGHT DOT ON TARGET AIMING POINT?**
    
    NO ➞ 29a. Any fault .......... Correct

    YES ➞ GO TO 30

    **Assure plunger is at 12 o'clock position**

    **Last movement of gun must be up**

    **Assure knobs are seated after adjusting**

    **Finish with upward movement**

B-29
30. Boresight scales ........ Set on 4 and 4
31. Boresight device ........ Remove/rotate 180°/reinstall
32. Gunner's control handles ... Traverse and elevate off
the target/re- Lay reticle
on target aiming point

33. IS
BORESIGHT

33. DOT ON TARGET
AIMING POINT

33. YES

GO TO 42

34. NO

34. Boresight eyepiece ........ Sight target (TC)

35. Gunner's control handles ... Traverse and elevate as
directed by TC to lay
boresight dot on target
aiming point

36. Boresight knobs ............ Adjust so that reticle
aiming dot is again on
target aiming point

37. Gunner ...................... Announce boresight
knob readings

Last movement of
gun must be up

GO TO 38
38. Is elevation reading >1 mil from 4 or deflection reading >.5 mil from 4?
   NO

38a. Boresight device ...... Turn in to maintenance
   38b. Another device ...... Install

39. Boresight knobs ...... Rotate halfway back to 4
40. Manual controls ...... Re-apply reticle aiming dot on target aiming point
41. Boresight scales ...... Set on 4 and 4
42. Boresight device ...... Remove

Assure aiming dot does not move.
Adjust the M105D Telescope

43. M105D Telescope ........ Prepare for operation (Page 6)
44. Reticle selector ........ Move to full-left or full-right position
45. Boresight knobs ........ Adjust boresight cross on target aiming point
46. Boresight scales ........ Set on 3 and 3

Adjust the Laser Rangefinder (LRF)

47. BATL RNG ............... Press
48. Gunner's sight ........... Assure on target aiming point
49. 6X/12X switch ........... 12X
50. LRF boresight knobs ....... Adjust reticle on target aiming point
51. Boresight scales ........ Set on 4 and 4

Apply Computer Correction Factors

52. COMMON ZERO ............ 0/0 (azimuth/elevation)

GO TO 53
61. GUNNER/CDR ............... GUNNER (TC)
62. COOL indicator ............ Assure off
63. MODE .................... ON
64. THERMAL CHANNEL FIELD OF VIEW
65. THERMAL CHANNEL RANGE FOCUS
66. BRIGHT/CONTRAST controls ... Adjust for normal scene
67. POLARITY switch ........... Set for best image
68. RTCL control .............. Adjust until reticle is just visible
69. Thermal channel eyepiece ... Sight target
70. THERMAL CHANNEL BORESIGHT EL/AZ
   Lay reticle aiming dot on target aiming point
71. Boresight scales .......... Set on 4 and 4
72. Zeroing procedure .......... Do not perform

Assure aiming dot does not move
BORESIGHTING WITHOUT MUZZLE BORESIGHT DEVICE

(1M PAGE 2-345)

Preliminary Procedure

1. Tank ............... Level ground

2. Cross-threads ....... Place on muzzle end of gun tube
- Threads should be directly over witness marks

3. Target ............... 1200 meters

4. Breechblock crank stop .... Assure rearward

**BREECHBLOCK OPERATING HANDLE IS UNDER SPRING TENSION UNTIL BREECHBLOCK IS FULLY OPENED AND LOCKED BY EXTRACTORS.**

5. Breechblock operating handle .... Pull rearward/down
- Depress plunger

**FAILURE TO RETURN OPERATING HANDLE TO LATCHED POSITION MAY CAUSE INJURY TO PERSONNEL OR DAMAGE TO CLOSING MECHANISM WHEN BREECHBLOCK IS CLOSED.**

6. Operating handle ........ Return to latched position

GO TO 7
7. Breech ............... Close

Trip extractors using empty case or wooden block

KEEP HANDS CLEAR OF BREECH.

8. Firing pin spring ...... Release

Depress and move plunger to the right

9. Spring retainer ...... Remove

Turn counterclockwise until lug aligns with grooves

10. Firing pin/retractor ...... Remove

Pry out with screwdriver blade

guide/retractor

11. MASTER BATTERY ...... ON (driver)

12. POWER on gunner's control unit

IF THERE IS APPARENT RETICLE MOTION DURING BORESIGHTING, INCREASE ENGINE RPM OR TURN ENGINE OFF.

GO TO 13
13. LRF self-test ........ Perform (TC)
14. Computer self-test .... Perform (page 9)
15. MODE on LRF ......... TEST
16. NORMAL/BORESIGHT .... BORESIGHT
17. Right section of ...... Place over firing pin hole
M17A1 binocular
18. Manual traversing and elevating controls ... Lay axis of gun on target aiming point
19. TTS ................. Prepare for operation (page 6)
20. LASING RANGE AVAILABLE ?
   YES  GO TO 30
   NO  Manual Range Procedure
21. MANUAL/RANGEFINDER .... MANUAL
   GO TO 22
22. MODE on LRF

23. RANGE (METERS) Should display 0000

24. RANGE METERS X100 Dial to target distance

25. RETICLE BRIGHTNESS Adjust until reticle is just visible

26. 6X/12X 12X

27. DEFLECTION and ELEVATION Lay reticle on target aiming point and ELEVATION

28. Slip scales Set on 4 and 4

29. Reticle/crosstreads Assure on target aiming point

M105D Telescope Boresight Procedure

30. M105D Telescope Prepare for operation (page 6)

TELESCOPE MUST BE BORESIGHTED AT 1200 METERS ONLY.

31. Eyepiece Sight

GO TO 32
32. Reticle selector ........ Choose appropriate reticle
33. Locking levers ........ Unlock telescope boresight knobs
34. Boresight knobs ........ Lay boresight cross on target aiming point
35. Slip scales ............. Set on 3 and 3
36. Locking levers ........ Lock telescope boresight knobs
37. Boresight cross/ crosstreads Assure on target aiming point

Laser Rangefinder (LRF) Procedure

DO NOT VIEW LASER BEAM THROUGH DEVICES NOT FILTERED FOR LASER LIGHT. FIRE LASER IN AUTHORIZED LASING AREA ONLY.
39. Laser filter ........ Install on receiver-transmitter eyepiece
40. RETICLE BRIGHTNESS .... Adjust until reticle is just visible
41. MANUAL/RANGEFINDER .... RANGEFINDER
42. MODE ................. ON
43. BATL RNG ............. PRESS

DO NOT LEAN OR PUSH AGAINST RECEIVER-TRANSmitter WHEN VIEWING THROUGH EYEPIECE OR LASING.

44. 6X/12X ................ 12X
45. LRF eyepiece ........... Sight target
46. DEFLECTION and ELEVATION ... Lay reticle on target
   controls 
   aiming point
47. Slip scales ............. Set on 4 and 4

GO TO 48
48. RANGE ................. Press

49. 1 or 2 pushbutton .... Push to select first or second return if necessary

DOES

RANGE (METERS) NO

GO TO 45

50. INDICATE PROPER TARGET RANGE

YES

51. FEED ................. Press

52. MODE ................. TEST

53. Laser filter ........... Remove from eyepiece/replace in holder

GO TO 54

GO will light
TTS Procedure

54. ARE CROSSTHREADS AND RETICLE ON AIMING POINT?

YES

NO

54a. Manual controls .... Relay gun

54b. DEFLECTION and .... Readjust reticle ELEVATION controls

54c. Slip scales ....... Set on 4 and 4

54d. Reticle/crosstreads .... Assure on same aiming point

GO TO 55

55. MODE ............... STBY

56. GUNNER/CMDR ......... GUNNER

57. Ballistic shield cover .... Open

Press push-button actuator and push handle forward

POWER GOES TO TTS RETICLE LAMPS WHEN POWER ON GUNNER'S CONTROL UNIT IS SET TO ON.
58. RTCL control ........ Adjust until reticle is just visible
59. Eyepiece ........... Sight target
60. Diopter ring .......... Adjust for best reticle focus
61. DAY CHANNEL BORESIGHT .... Lay reticle on target aiming point
   EL/AZ knobs
62. Slip scales .......... Set on EL4 and AZ4

Are crosstreads and reticle on aiming point? NO

63a. Manual controls .... Relay gun
63b. DAY CHANNEL BORESIGHT ... Readjust reticle
   EL/AZ knobs
63c. Slip scales .......... Set on EL4 and AZ4
63d. Reticle/crosstreads ... Assure on target aiming point

GO TO 64

Lay reticle from low to high and from left to right without overtravel
64. COOL indicator . . . . . . . Assure out
65. THERMAL CHANNEL FIELD OF VIEW . . . . . . NAR
66. THERMAL CHANNEL RANGE FOCUS . . Adjust for sharpest view
67. BRIGHT/CONTRAST . . . . . . . . . . Adjust for normal scene
68. POLARITY . . . . . . . . . . Set for best image
69. RTCL . . . . . . . . . . Adjust until reticle is just visible
70. Eyepiece . . . . . . . . . . Sight target
71. THERMAL CHANNEL BORESIGHT EL/AZ knobs . Lay reticle on target aiming point
72. Slip scales . . . . . . . . . . Set on EL4 and AZ4

**Diagram:***

```
73. ARE CROSSTHREADS AND RETICLE ON AIMING POINT?
```

- **NO**
    - 73b. THERMAL CHANNEL . . . . Readjust reticle BORESIGHT EL/AZ knobs
    - 73c. Slip scales . . . . . . . . Set on EL4 and AZ4
    - 73d. Reticle/crossthreads . . . Assure on target aiming point

- **GO TO 74**
74. Retractor guide/firing . . . Install
    pin retractor

75. Firing pin spring retainer . . Install

76. Zeroing procedure . . . . Perform (page 43)
ZERGING 105-MM GUN
(TM PAGE 2-373)

DO NOT DISTURB KNOB ADJUSTMENT OF TTS 8X DAYLIGHT CHANNEL, TTS THERMAL CHANNEL, OR LASER R-T UNIT, EXCEPT DURING BORESIGHTING.

1. 105-mm gun ............... Bor sight (page 32)

2. MASTER BATTERY ........... ON (driver)

3. Target .................. Right angle/1200 meters

4. REMAINING TUBE LIFE .... Rotate to computed value

5. AIR TEMP/ALTITUDE ....... Rotate to estimated values

6. APDS AMMO knob .......... Set on type of ammo to be used

7. HEAT AMMO knob .......... Assure in M456 position

8. Engine .................... Start/maintain speed at 800-900 rpm (driver)

GO TO 9
9. POWER on gunner's control unit

10. ELEV/TRAV POWER

11. MODE on TTS

12. GUNNER/CMRD

13. RTCL control
   Adjust until daylight channel reticle is just visible

14. BRIGHT/DIM
   Adjust for adequate brightness in both channels

15. LIGHTS
   Adjust brightness of panel lights

16. MOVING/STATIONARY
   STATIONARY

17. AZ/EL COMMON ZERO
   Rotate from 3 to 0 without overtravel

18. AZ/EL ZEROING
   Only for types rounds being zeroed, rotate from 3 to 0 without overtravel

19. NORMAL/BORESIGHT
   NORMAL

GO TO 20
Operating Procedure

DO NOT LEAN OR PUSH AGAINST RECEIVER-TRANSMITTER WHEN VIEWING THROUGH EYEPIECE OR LASING.

20. IN AN AUTHORIZED LASING AREA?
   YES
   NO → 20a. MANUAL/RANGEFINDER . . . MANUAL

20a. MANUAL/RANGEFINDER . . . MANUAL

20b. MODE on LRF . . . . . . . TEST

20c. RANGE (METERS) X100 . . . Dial target range

GO TO 26

21. 6X/12X on LRF . . . . . . . . . 12X

22. LRF eyepiece . . . . . . . . . Sight target

23. TC's control handle . . . . Lay reticle on target aiming point

24. MANUAL/RANGEFINDER . . . . RANGEFINDER

GO TO 25

Lay from left to right and low to high without overtravel
25. RESET ........................................ Press/release

26. Laser safety filters ........ Attach to eyepieces of TTS/
M105D telescope/LRF

27. MODE on LRF .................. AUTO

DO NOT VIEW LASER BEAM THROUGH
ANY UNFILTERED DEVICE. FIRE LASER
IN AUTHORIZED LASING AREA ONLY.

28. RANGE ...................... Press/release

29. GO light .................... Assure on

30. IS INDICATED RANGE CORRECT?

NO ➔ GO TO 21

YES ➔ GO TO 31
31. **MODE on LRF**  

32. **Laser filters**  

Remove from TTS, telescope, and LRF/replace in holders

**IF ELECTRICAL POWER IS INTERRUPTED DURING REST OF PROCEDURE, REPEAT STEPS 20-32.**

33. **Ammo select switch**  

Select appropriate ammunition

34. **105-mm gun**  

Load (loader)

Make sure all rounds are from same lot

35. **Turret manual elevation and traversing handles**  

Lay daylight reticle on target aiming point

Lay reticle from left to right and from low to high without overtravel

36. **Was laser ranging used?**

Yes → **R-T RETICLE ON TARGET?**

Yes → **GO TO 37**  

No → **GO TO 35**  

No → **GO TO 35**
37. BLOWER ............... ON (TC)
38. MAIN GUN ............. ON

IF RETICLE MOVES MORE THAN 0.1 MIL IN TWO SECONDS DUE TO WIND GUSTS, DELAY FIRING UNTIL WIND IS STEADY.

39. Trigger on manual elevating handle
    Fire three-round shot group

40. Rounds ................ Must be within 0.5 mil from one another

41. BLOWER ............... OFF (TC)
42. ELEV/TRAV POWER ........ OFF

43. Hydraulic pressure .... Open for 10 seconds/close selector valve

44. Manual elevation ....... Recharge accumulator

45. CROSSWIND AUTO/MANUAL .... MANUAL
46. CROSSWIND MPH .......... 0 mph

GO TO 48
47. Manual elevating . . . . . . . Re-lay daylight reticle on
and traversing handles target aiming point

WHEN ZEROING FSDS AMMO, USE THE
1200 METER AIMING DOT OF THE
TELESCOPE APDS-T RETICLE.

48. Telescope elevation and Unlock
                . . . . . . . . . deflection locks

49. Reticle selector lever . . . . Choose appropriate telescope
                . . . . . . . . . reticle

50. Telescope eyepiece . . . . . . Sight target

51. Elevation and deflection . . Lay telescope reticle on
                . . . . . . . . . boresight knobs
target aiming point

52. Elevation and deflection . . Relock
                . . . . . . . . . locks

53. Boresight scales . . . . . . Do not slip

54. AZ/EL ZEROING CONTROLS . . Lay daylight reticle on
                . . . . . . . . . center of shot group

Lay from left to right and low to high without overtravel

Lay from left to right and low to high without overtravel

GO TO 55
IS TELESCOPE RETICLE STILL ON AIMING POINT?

55. YES ➔ 55b. AZ/EL ZEROING CONTROLS
   ➔ 55a. Manual controls

55b. Relay telescope reticle on center of shot group
55a. Relay telescope reticle on target aiming point

56. AZ/EL ZEROING CONTROL ➔ Record on computer door settings
57. AUTO/MANUAL ➔ AUTO

58. Gunner's manual controls ➔ Re-logy daylight reticle on target aiming point
59. BLOWER ➔ ON (TC)
60. Trigger on manual elevation handle ➔ Fire one round

GO TO 61
61. ROUND WITHIN 24 INCHES OF AIMING POINT
   NO → 61a. Trigger ........... Fire another round
   YES → 61b.
   IS ROUND WITHIN 24 INCHES OF AIMING POINT?
   YES → GO TO 62
   NO
   61c. Organizational ........ Notify maintenance

62. Manual controls .......... Re-ly daylight reticle on target aiming point

63. Telescope elevation and ... Unlock deflection locking levers

64. Reticle selector lever .... Choose appropriate reticle

65. Telescope eyepiece ....... Sight target

GO TO 66
66. ELEVATION and DEFLECTION ... Lay known target range
boresight knobs
line on target aiming point
67. Elevation and deflection ... Relock
locking levers
68. Telescope boresight .... Record for each type of
scale readings ammunition
69. Scales ............... Do not slip

70. HAS EVERY TYPE OF AMMO BEEN ZEREOED?

NO 70a. Remaining ammo types ... Select one

YES 33

71. Telescope elevation .... Unlock
and deflection locking
levers
72. Boresight knobs ...... Rotate to 5, then to 3
73. Elevation and deflection ... Relock
locking levers
74. Scales ............... Do not slip
1. Machine gun
2. MASTER BATTERY
3. ELEV/TRAV POWER
4. MAIN GUN
5. MACHINE GUN
6. Machine gun safety
7. Gunner's triggers
   Alternately depress left/right
8. Clicks heard
   YES → 8a. Organizational maintenance
   NO → 9
   Notify

(LOADER)
(DRIVER)
9. MANUAL ELEVATION CONTROL . . . . Depress trigger

IS CLICK HEARD

10. NO → 10a. Organizational . . . . Notify maintenance

YES

10a. Listen for click

11. TC's trigger . . . . . . . . . . . . . . Depress

IS CLICK HEARD

12. NO → 12a. Organizational . . . . Notify maintenance

YES

12a. Listen for click

13. ELEV/TRAV POWER . . . . . . . OFF

14. MACHINE GUN . . . . . . . . . OFF

15. MASTER BATTERY . . . . . . . . OFF
BORESIGHTING 7.62-MM MACHINE GUN

(TM PAGE 2-360)

1. Machine gun
   Clear

2. Buffer
   Slide up and off
   Depress release catch

3. Cover/feed tray
   Raise
   Push in on cover latches

4. Charger handle
   Pull back

5. Operating rod and bolt
   Pull out

6. Preliminary boresighting
   Perform (Page 32)
   procedure

7. Front adjustment nut
   Loosen

8. M17A1 binocular
   Sight through machine
gun barrel bore
   Use adjustment knobs on machine-
gun mount

9. Center of barrel
   Aline of target aiming
   point
   Turn additional
   1/3 turn after
tension is felt

10. Adjustment nut
    Tighten

GO TO 11
11. IS GUN STILL ON TARGET AIMING POINT? NO → GO TO 7
   YES

12. TTS ..................... Prepare for operation (Page 1)

13. UNITY RETICLE BORESIGHT  .... Aline aiming circle center
    EL and AZ on aiming point

14. 17Al binocular ............. Remove

15. Operating rod and bolt ...... Push in

16. Charger handle ............. Pull back

17. Feed tray/cover ............. Lower

18. Drive spring ............... Push in

19. Buffer ..................... Slide down

20. Charger handle ............. Pull back to check operation

Catch will lock
ZEROING 7.62-MM MACHINE GUN
(TM PAGE 2-393)

1. Target ............... 800 Meters
2. MODE ................. STBY
3. Unity power window .... Sight target
4. RTCL control ........ Adjust until reticle is barely visible
5. MANUAL/RANGEFINDER .... MANUAL
6. RANGE METERS X100 .... Rotate to target distance
7. Ammo select unit .... HEP/WP
8. Unity power window .... Sight target
9. Manual traversing and elevation handles .... Lay target in center of aiming circle
10. Machine gun .......... Load/charge
11. UNITY RETICLE EL and AZ .... Move aiming circle to center of strike area
12. Manual traversing and elevation handles .... Relay target in center of aiming circle

Do not disturb lay of gun

GO TO 13
13. DOES STRIKE AREA BRACKET TARGET?

- NO
- YES

GO TO 31.
PREPARING TO FIRE PROCEDURE

1. Interior periscope and telescope sights
   Clean
   Check operation

2. Ballistic shield
   Check

3. Master Battery
   Check
   (driver)

4. Instrument lights
   Check
   (driver)

5. Main Gun
   Start
   (loader)

6. 105-mm gun safety switch
   In FIRE
   (loader)

7. Circuit tester
   Insert
   Check trigger
   (TC)

8. Gunner's control handles
   Announces: ON THE WAY

9. Gunner

10. TC (loader)

GO TO 11
12. Gunner's control handle ... Check trigger

13. Gunner ... Announces: ON THE WAY

14. Manual elevating control ... Check trigger

15. MAIN GUN ... OFF

16. MACHINE GUN ... ON

17. Coaxial machine gun ... Cock

18. TC's control handle ... Check trigger (TC)

19. Gunner ... Announces: ON THE WAY

20. Gunner's control handles ... Check triggers

COMMAND: CHECK GUN CONTROLS

21. Gunner ... Announces: POWER

22. Oil in turret control ... Check system

GO TO 23

Loader announces NO FIRE if circuit tester does not light
23. Turret ............ Unlock (loader)

24. ELEV/TRAV POWER ......... ON

25. Gun/turret ............ Elevate/traverse using gunner power controls

26. Magnetic brake/elevation ... Check shutoff valve

27. Azimuth indicator ........ Check for accuracy/slippage

28. ELEV/TRAV POWER ......... OFF

29. Elevation quadrant ........ Check by use of gunner's quadrant

MAKE SURE THAT CREW IS READY AND NO PERSONNEL OR OBSTRUCTIONS ARE IN SURROUNDING AREA.

COMMAND: CHECK GUN STABILIZATION

30. STAB ELECTRONICS ........ ON (TC)

31. POWER PACK BLOWER MOTOR .... ON (TC)

GO TO 32
32. ELEV/TRAV POWER ............... ON 
33. POWER on selector assembly .... ON 
34. STAB ......................... ON 
   Wait 15 seconds
   System is operational when green STAB indicator lights
35. Gunner ......................... Announces: TURRET STABILIZED
36. TRAV and/or EL BALANCE ....... Rotate to null drift
37. Gunner's control handles ..... Check function
38. TC's control handles .......... Activate override/check function (TC)
39. STAB SHUT-OFF ............... Depress (TC)
40. POWER on selector assembly ... OFF
41. Gunner ......................... Announces: STABILIZATION OFF

COMMAND: CHECK FIRE CONTROL

42. CUPOLA POWER ................. ON (TC)
43. GUN SAFETY ..................... ON (TC)

GO TO

44
44. Cal .50 machine gun ........ Check operation (TC)
45. XM21 computer ............... Perform self-test (Page 9)
46. 105-mm gun .................. Prepare for boresighting (loader)
47. LRF .......................... Perform self-test (TC)
48. Gunner's telescope and periscope
49. LRF .......................... Boresight (TC)
50. Ammo switch ................... Select appropriate ammo
51. MOVING/STATIONARY .......... Select appropriate setting
52. Computer ...................... Enter ballistic data
53. Cal .50 machine gun ........... Boresight (TC)
54. 7.62-mm machine gun .......... Load (loader)
55. 105-mm gun ................... Load (loader)
56. Cal .50 machine gun .......... Load (TC)

COMMAND: REPORT

57. Gunner/Driver/Loader ....... Announce: READY
BEFORE OPERATIONS PNCS
(TM PAGE 2-87)

1. Travel lock ...... Unlock/stow (loader)
2. Turret lock ...... Check operation/leave (loader)
in unlocked position

MAKE SURE CREW IS IN SAFE POSITION BEFORE OPERATING MANUAL TRAVERSING AND ELEVATING HANDLES

3. Manual elevating handle ... Elevate/depress main gun

4. Manual traversing handle ... Traverse turret left/right

Check for smooth movement
Check for smooth movement
DURING OPERATIONS PMGS

(TM PAGE 2-105)

1. Gunner's seat ........... Check if missing
2. Gunner's seat ........... Check operation/adjustment
3. Radio/intercom ........... Check operation
4. Fire control elevation .... Check if scale and index
   quadrant are readable
5. Level vial cover ........ Check for free movement
6. Level vial .............. Check if broken
7. Light source control .... Check if light goes from
   bright to dim

8. FIRE CONTROL QUADRANT TO BE USED?
   YES
   NO 8a. Level vial cover .... Close

9. Azimuth indicator ........ Check if cover is broken

10. Rheostat ............... Turn clockwise
    Light should go from dim to bright

GO TO 11
11. Turret hydraulic system ... Check for leaks

12. Hydraulic pressure gage ... Should read between 900 and 1200 psi during hydraulic operations

13. Gunner control handles ... Traverse turret counterclockwise

14. TC control handles ... Override gunner and traverse turret clockwise (TC)

15. TTS ballistic shield ... Assure open

16. TTS window/outside lens ... Check/clean

Use cleaning compound and lens tissue