



# Introduction to engineering of Javelin anti-tank close combat missile system



**7**

**Professional Development Hours (PDH) or  
Continuing Education Hours (CE)  
Online PDH or CE course**

# Javelin— Close Combat Missile System, Medium

## Contents

	Page
<b>PREFACE.....</b>	<b>xii</b>
<b>Chapter 1 INTRODUCTION .....</b>	<b>1-1</b>
WEAPON SYSTEM.....	1-1
EQUIPMENT DESCRIPTION AND DATA .....	1-3
COMMAND LAUNCH UNIT .....	1-5
ROUND.....	1-10
MISSILE OPERATION .....	1-13
CAPABILITIES AND FEATURES.....	1-17
<b>Chapter 2 CONTROLS AND OPERATION .....</b>	<b>2-1</b>
CONTROLS AND INDICATORS.....	2-1
COMMAND LAUNCH UNIT STATUS INDICATORS.....	2-6
COMMAND LAUNCH UNIT DISPLAY INDICATORS.....	2-9
PREPARATION FOR FIRING .....	2-11
FIRING POSITIONS.....	2-15
RESTORE TO CARRYING CONFIGURATION.....	2-23
CARRYING TECHNIQUES .....	2-27
<b>Chapter 3 TRAINING PROGRAM .....</b>	<b>3-1</b>
<b>Section I. GENERAL .....</b>	<b>3-1</b>
TRAINING STRATEGY .....	3-1
PREREQUISITES FOR ADDITIONAL SKILL IDENTIFIER .....	3-2
<b>Section II. TRAIN THE TRAINER .....</b>	<b>3-2</b>
TRAIN-THE-TRAINER PROGRAM.....	3-2
PROGRAM AUDIENCE .....	3-3
STANDARDS FOR TRAINERS.....	3-3
RESOURCE REQUIREMENTS .....	3-3
TRAINING SUPPORT PACKAGES .....	3-4
TRAINING DEVICES.....	3-4
BASIC SKILLS TRAINER SETUP OPERATIONS .....	3-6
FIELD TACTICAL TRAINER SETUP OPERATIONS .....	3-8

	GUNNER's SKILL TEST EXECUTION .....	3-9
	<b>Section III. TRAIN THE GUNNER.....</b>	<b>3-9</b>
	CONDUCT OF TRAINING.....	3-9
	PROGRAM EXECUTION .....	3-10
	CENTRALIZED TRAINING.....	3-10
	TRAINING OBJECTIVES .....	3-11
	PRACTICE EXERCISES .....	3-11
	EVALUATION SYSTEM .....	3-11
	SAFETY .....	3-12
	GUNNER QUALIFICATION PROGRAM.....	3-12
	SUSTAINMENT TRAINING.....	3-18
	COLLECTIVE TRAINING .....	3-18
<b>Chapter 4</b>	<b>TACTICAL CONSIDERATIONS .....</b>	<b>4-1</b>
	<b>Section I. ROLE AND FUNDAMENTALS.....</b>	<b>4-1</b>
	ROLE .....	4-1
	CAPABILITIES AND LIMITATIONS .....	4-1
	FUNDAMENTALS OF EMPLOYMENT .....	4-3
	<b>Section II. DEFENSE.....</b>	<b>4-5</b>
	DEFENSIVE OPERATIONS.....	4-5
	MECHANIZED COMPANY DEFENSIVE EMPLOYMENT .....	4-7
	DEFENSE IN DEPTH .....	4-8
	DELAYS AND WITHDRAWALS .....	4-8
	<b>Section III. FIGHTING POSITIONS.....</b>	<b>4-10</b>
	HASTY FIGHTING POSITION .....	4-10
	DELIBERATE FIGHTING POSITION.....	4-12
	<b>Section IV. OTHER TACTICAL OPERATIONS.....</b>	<b>4-16</b>
	OFFENSIVE OPERATIONS.....	4-17
	ANTIARMOR AMBUSH ROLE .....	4-17
	STABILITY AND SUPPORT OPERATIONS .....	4-18
	URBAN COMBAT .....	4-18
	<b>Section V. TARGET ENGAGEMENT TECHNIQUES.....</b>	<b>4-19</b>
	TARGET DETECTION .....	4-19
	TARGET CLASSIFICATION .....	4-23
	TARGET RECOGNITION.....	4-24
	TARGET IDENTIFICATION.....	4-25
	TARGET ENGAGEMENT.....	4-25
	FIRE PLAN .....	4-29
	FIRE CONTROL .....	4-29
<b>Chapter 5</b>	<b>BLOCK 1 IMPROVEMENTS.....</b>	<b>5-1</b>
	INTRODUCTION .....	5-1
	WEAPON SYSTEM (BLOCK 1) .....	5-2
	EQUIPMENT DATA AND DESCRIPTION .....	5-5
	COMMAND LAUNCH UNIT.....	5-7
	COMMAND LAUNCH UNIT STATUS INDICATORS .....	5-24
	COMMAND LAUNCH UNIT DISPLAY INDICATORS.....	5-34
	ROUND.....	5-35

	MISSILE OPERATION .....	5-39
	ROUND CONTROLS .....	5-45
	ROUND INDICATORS .....	5-49
	CAPABILITIES AND FEATURES.....	5-51
<b>APPENDIX A</b>	<b>SAFETY.....</b>	<b>A-1</b>
	BACKBLAST AREA.....	A-1
	ROUND HANDLING .....	A-2
	FIRING FROM ENCLOSURES .....	A-2
	FIGHTING POSITION .....	A-3
	SAFETY PRECAUTIONS FOR THE MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM .....	A-4
	SAFETY PRECAUTIONS FOR THE BATTERY COOLANT UNIT .....	A-4
	SAFETY PRECAUTIONS FOR LIVE ROUNDS .....	A-5
	RISK MANAGEMENT .....	A-5
	ACCIDENT REPORTING.....	A-5
<b>APPENDIX B</b>	<b>STANDARD RANGE CARD .....</b>	<b>B-1</b>
	DESCRIPTION .....	B-1
	GENERAL PROCEDURES .....	B-2
	MARGINAL INFORMATION.....	B-3
	CALCULATE .....	B-4
	SECTOR SKETCH SECTION DEVELOPMENT.....	B-4
	DATA SECTION .....	B-8
	FIELD-EXPEDIENT RANGE CARD.....	B-10
<b>APPENDIX C</b>	<b>IMMEDIATE DECONTAMINATION AND DESTRUCTION PROCEDURES ....</b>	<b>C-1</b>
	DECONTAMINATION PRINCIPLES.....	C-1
	DESTRUCTION GUIDANCE.....	C-2
<b>APPENDIX D</b>	<b>WARNING INDICATORS AND MALFUNCTIONS.....</b>	<b>D-1</b>
	<b>Section I. WARNING INDICATORS .....</b>	<b>D-1</b>
	NIGHT VISION SIGHT NOT COOL .....	D-1
	NIGHT VISION SIGHT FOCUS ADJUSTMENT LIMIT .....	D-2
	COMMAND LAUNCH UNIT BATTERY LOW .....	D-3
	BATTERY COOLANT UNIT LOW .....	D-4
	MISSILE NOT READY .....	D-5
	<b>Section II. MALFUNCTION INDICATORS.....</b>	<b>D-7</b>
	COMMAND LAUNCH UNIT BUILT-IN TEST FAILURE.....	D-7
	MISSILE BUILT-IN TEST FAILURE.....	D-9
	MISFIRE .....	D-9
	HANGFIRE .....	D-11
	GENERAL PRACTICAL EXERCISES FOR WARNINGS AND MALFUNCTIONS .....	D-13
<b>APPENDIX E</b>	<b>FORWARD LOOKING INFRARED .....</b>	<b>E-1</b>
	INTRODUCTION .....	E-1
	ELECTROMAGNETIC SPECTRUM .....	E-1
	INFRARED WAVES .....	E-2
	INFRARED SYSTEMS .....	E-5
	$\Delta T$ .....	E-5



INFRARED IMAGE ADJUSTMENT .....	E-9
FACTORS THAT AFFECT INFRARED TARGET IMAGES AND $\Delta T_s$ .....	E-15
TARGET ACQUISITION .....	E-21
TARGET CLASSIFICATION .....	E-33
TARGET RECOGNITION .....	E-37
<b>Glossary</b> .....	<b>Glossary-1</b>
<b>References</b> .....	<b>References-1</b>
<b>Index</b> .....	<b>Index-1</b>

## Figures

Figure 1-1. Javelin. ....	1-1
Figure 1-2. Basic skills trainer .....	1-2
Figure 1-3. Field tactical trainer. ....	1-2
Figure 1-4. Missile simulation round .....	1-3
Figure 1-5. Javelin backblast safety zones .....	1-5
Figure 1-6. Javelin components .....	1-5
Figure 1-7. Main housing and absorbers .....	1-6
Figure 1-8. Handgrips. ....	1-6
Figure 1-9. Battery compartment. ....	1-7
Figure 1-10. Daysight. ....	1-7
Figure 1-11. Night vision sight lens .....	1-8
Figure 1-12. Detector dewar cooler. ....	1-8
Figure 1-13. Status indicators .....	1-9
Figure 1-14. Eyepiece .....	1-9
Figure 1-15. Test connector, round interface connector, and humidity indicator .....	1-10
Figure 1-16. Launch tube assembly, end caps, and carry handle .....	1-11
Figure 1-17. Shoulder strap and pad .....	1-11
Figure 1-18. Command launch unit interface connector .....	1-12
Figure 1-19. Battery coolant unit .....	1-12
Figure 1-20. Javelin missile. ....	1-13
Figure 1-21. Missile guidance section. ....	1-14
Figure 1-22. Mid-body section. ....	1-15
Figure 1-23. Missile warhead .....	1-15
Figure 1-24. Missile propulsion section. ....	1-16
Figure 1-25. Control actuator section. ....	1-17
Figure 1-26. Top attack mode .....	1-17
Figure 1-27. Top attack flight path .....	1-18
Figure 1-28. Direct attack mode. ....	1-18
Figure 1-29. Direct attack flight path .....	1-19
Figure 2-1. Diopter adjust ring. ....	2-1

Figure 2-2. Power switch positions.....	2-2
Figure 2-3. Power switch—TEST position.....	2-2
Figure 2-4. Left handgrip controls.....	2-3
Figure 2-5. Left handgrip controls—seeker trigger.....	2-4
Figure 2-6. Right handgrip controls.....	2-5
Figure 2-7. Command launch unit display indicators .....	2-6
Figure 2-8. Status indicators—green.....	2-7
Figure 2-9. Status indicators—amber.....	2-8
Figure 2-10. Status indicators—red.....	2-9
Figure 2-11. Day field-of-view stadia.....	2-9
Figure 2-12. Night vision sight stadia comparisons .....	2-10
Figure 2-13. Reticle area versus field-of-view change.....	2-10
Figure 2-14. Track gates .....	2-11
Figure 2-15. Crosshairs .....	2-11
Figure 2-16. Battery compartment.....	2-12
Figure 2-17. Connect the round to the command launch unit.....	2-13
Figure 2-18. Connect the command launch unit to the round.....	2-13
Figure 2-19. Connect the command launch unit to the round.....	2-14
Figure 2-20. Power switch .....	2-14
Figure 2-21. Remove the forward end cap.....	2-15
Figure 2-22. Javelin sitting firing positions.....	2-16
Figure 2-23. Javelin kneeling firing position.....	2-16
Figure 2-24. Gunner sights along the top of the round for obstructions .....	2-17
Figure 2-25. Standing supported firing position.....	2-18
Figure 2-26. Preparing to connect the command launch unit.....	2-19
Figure 2-27. Remove the forward end cap.....	2-19
Figure 2-28. Reaching for forward end cap.....	2-20
Figure 2-29. Placing end cap.....	2-21
Figure 2-30. Placement of forward end cap in prone position.....	2-21
Figure 2-31. Prone supported firing position.....	2-22
Figure 2-32. Correct prone body position.....	2-22
Figure 2-33. Power switch OFF position.....	2-23
Figure 2-34. Replace forward end cap.....	2-24
Figure 2-35. Forward end cap locking pin.....	2-25
Figure 2-36. Disconnect the command launch unit from the round.....	2-26
Figure 2-37. Old battery coolant unit.....	2-26
Figure 2-38. New battery coolant unit.....	2-27
Figure 2-39. Tactical carry technique.....	2-27
Figure 2-40. Short-distance carry techniques .....	2-28
Figure 2-41. Long-distance carry technique.....	2-29
Figure 2-42. Secure the round to the rucksack.....	2-30
Figure 3-1. Basic skills trainer.....	3-4

Figure 3-2. Field tactical trainer. ....	3-5
Figure 4-1. Mutual supporting fire. ....	4-3
Figure 4-2. Overlapping sectors of fire. ....	4-4
Figure 4-3. Javelins positioned in depth. ....	4-5
Figure 4-4. Primary, alternate, and supplementary positions ....	4-7
Figure 4-5. Javelin-equipped mechanized company defense. ....	4-8
Figure 4-6. Withdrawal under enemy pressure. ....	4-9
Figure 4-7. Withdrawal not under pressure. ....	4-9
Figure 4-8. Hasty fighting position. ....	4-10
Figure 4-9. Hasty fighting position. ....	4-11
Figure 4-10. Improved hasty fighting position. ....	4-11
Figure 4-11. Expanded hasty fighting position. ....	4-11
Figure 4-12. Deliberate fighting position. ....	4-13
Figure 4-13. Completed deliberate fighting position. ....	4-14
Figure 4-14. Sketch of the front view of a Javelin defensive fighting position. ....	4-15
Figure 4-15. Front view of a Javelin defensive fighting position. ....	4-15
Figure 4-16. Side view of a Javelin defensive fighting position. ....	4-16
Figure 4-17. Top view of a Javelin defensive fighting position. ....	4-16
Figure 4-18. Javelin supporting offensive operations. ....	4-17
Figure 4-19. Antiarmor ambush. ....	4-18
Figure 4-20. Fields of view. ....	4-20
Figure 4-21. Slow/rapid scan. ....	4-21
Figure 4-22. Detailed search ....	4-22
Figure 4-23. Stationary targets. ....	4-23
Figure 4-24. Target classification features ....	4-24
Figure 4-25. Target classification. ....	4-24
Figure 4-26. Position track gates on target. ....	4-26
Figure 4-27. Track gate adjustment for helicopters—front. ....	4-27
Figure 4-28. Track gate adjustment for helicopters—flank. ....	4-27
Figure 4-29. Track gate adjustment for bunker. ....	4-28
Figure 4-30. Sector of fire. ....	4-30
Figure 4-31. Fire patterns ....	4-31
Figure 5-1. Javelin weapon system. ....	5-1
Figure 5-2. Javelin command launch unit. ....	5-2
Figure 5-3. Javelin command launch unit and accessories. ....	5-2
Figure 5-4. Javelin missile. ....	5-3
Figure 5-5. Basic skills trainer. ....	5-4
Figure 5-6. Field tactical trainer. ....	5-5
Figure 5-7. Missile simulation round. ....	5-5
Figure 5-8. Main housing. ....	5-8
Figure 5-9. Battery compartment. ....	5-9
Figure 5-10. Test connector, round interface connector, and desiccant plug. ....	5-10

Figure 5-11. Video port.....	5-10
Figure 5-12. Elapsed time meter. ....	5-11
Figure 5-13. Daysight. ....	5-11
Figure 5-14. Daysight optical path.....	5-12
Figure 5-15. Example daysight images—clear and rainy.....	5-13
Figure 5-16. Night vision sight.....	5-13
Figure 5-17. Night vision sight fields of view. ....	5-14
Figure 5-18. Detector dewar cooler.....	5-14
Figure 5-19. Flipper mirror positions.....	5-15
Figure 5-20. Night vision sight status display. ....	5-15
Figure 5-21. Eyepiece. ....	5-16
Figure 5-22. Shock absorbers.....	5-17
Figure 5-23. Handgrips.....	5-17
Figure 5-24. Diopter adjust ring.....	5-18
Figure 5-25. Power switch.....	5-19
Figure 5-26. Power switch in the TEST position.....	5-20
Figure 5-27. Left handgrip controls.....	5-21
Figure 5-28. Filter, Focus, and Sight Select switches. ....	5-22
Figure 5-29. Seeker trigger.....	5-22
Figure 5-30. Right handgrip controls.....	5-23
Figure 5-31. Fire trigger.....	5-24
Figure 5-32. Status indicators.....	5-25
Figure 5-33. Light-emitting diode indicators. ....	5-26
Figure 5-34. Video display status indicators.....	5-27
Figure 5-35. Video display status indicators in the command launch unit options section.....	5-27
Figure 5-36. Video display status indicators in the command launch unit status section.....	5-29
Figure 5-37. Video display status indicators in the missile status section.....	5-30
Figure 5-38. Video display indicators in the command launch unit menu section. ....	5-31
Figure 5-39. Text message windows.....	5-33
Figure 5-40. Reticle lines.....	5-34
Figure 5-41. Reticle area versus field-of-view change. ....	5-35
Figure 5-42. Launch tube assembly.....	5-36
Figure 5-43. Command launch unit mounting brackets.....	5-37
Figure 5-44. Battery coolant unit. ....	5-38
Figure 5-45. Javelin missile.....	5-39
Figure 5-46. Seeker field-of-view.....	5-40
Figure 5-47. Guidance section. ....	5-42
Figure 5-48. Warhead section. ....	5-42
Figure 5-49. Mid-body section.....	5-43
Figure 5-50. Propulsion section.....	5-44

Figure 5-51. Control actuator section. ....	5-44
Figure 5-52. Seeker trigger. ....	5-45
Figure 5-53. Sight select switch. ....	5-46
Figure 5-54. Right handgrip controls ....	5-46
Figure 5-55. Attack select switch ....	5-47
Figure 5-56. Missile mode indicators ....	5-47
Figure 5-57. Gate adjust/contrast and brightness switch. ....	5-48
Figure 5-58. Track gate adjustment, down/up. ....	5-48
Figure 5-59. Track gate adjustment, left/right. ....	5-48
Figure 5-60. Fire trigger. ....	5-49
Figure 5-61. Manual release button. ....	5-49
Figure 5-62. Battery coolant unit status indicator. ....	5-50
Figure 5-63. Humidity indicator. ....	5-50
Figure 5-64. Flashing track gates ....	5-51
Figure 5-65. Solid track gates and crosshairs. ....	5-51
Figure 5-66. Top attack mode. ....	5-52
Figure 5-67. Top attack flight paths ....	5-52
Figure 5-68. Direct attack mode. ....	5-53
Figure 5-69. Direct attack flight paths ....	5-53
Figure A-1. Javelin backblast area and surface danger zone. ....	A-3
Figure A-2. Laser-safe eye distance. ....	A-4
Figure A-3. Javelin weapon system batteries. ....	A-5
Figure B-1. Example of DA Form 5517-R. ....	B-2
Figure B-2. Gunner's sector of fire. ....	B-3
Figure B-3. Marginal information. ....	B-3
Figure B-4. Determination of distance between circles. ....	B-4
Figure B-5. Sector sketch. ....	B-5
Figure B-6. Sector of fire and maximum engagement line. ....	B-6
Figure B-7. Avenues of approach. ....	B-6
Figure B-8. Target reference points. ....	B-7
Figure B-9. Dead space. ....	B-8
Figure B-10. Gunner's reference point and firing. ....	B-8
Figure B-11. DA Form 5517-R —data section. ....	B-9
Figure B-12. Example completed DA Form 5517-R. ....	B-10
Figure B-13. Terrain presentation. ....	B-11
Figure B-14. Field-expedient range card showing the terrain. ....	B-11
Figure D-1 Amber NVS NOT COOL indicator—on. ....	D-2
Figure D-2. WFOV or NFOV indicator—flashing. ....	D-3
Figure D-3. CLU BATTERY indicator—on. ....	D-4
Figure D-4. BCU LOW indicator—flashing/on. ....	D-5
Figure D-5. NFOV to seeker FOV sequence. ....	D-6
Figure D-6. MISSILE NOT READY indicator. ....	D-6

Figure D-7. CLU BIT FAILURE indicator. ....	D-8
Figure D-8. MISSILE BIT FAILURE indicator—solid on.....	D-9
Figure D-9. Misfire—with and without warning indicators. ....	D-10
Figure D-10. HANGFIRE indicator. ....	D-12
Figure E-1. Electromagnetic spectrum. ....	E-1
Figure E-2. Infrared band. ....	E-2
Figure E-3. Heat caused by combustion. ....	E-2
Figure E-4. Heat caused by friction. ....	E-3
Figure E-5. Infrared affected by color.....	E-4
Figure E-6. Smooth versus rough surface texture.....	E-5
Figure E-7. Display of infrared levels. ....	E-6
Figure E-8. $\Delta T$ s.....	E-6
Figure E-9. Measurable $\Delta T$ .....	E-7
Figure E-10. Temperatures of objects during 24-hour period. ....	E-7
Figure E-11. $\Delta T$ changes from day to night.....	E-8
Figure E-12. Crossover periods.....	E-8
Figure E-13. Focus adjustments.....	E-9
Figure E-14. Focus on far tree line.....	E-10
Figure E-15. Slow focus adjustment.....	E-10
Figure E-16. Fast focus adjustment. ....	E-11
Figure E-17. Focus direction. ....	E-11
Figure E-18. Night vision sight initial contrast and brightness baseline. ....	E-12
Figure E-19. Return to baseline from an extreme contrast/brightness adjustment.....	E-12
Figure E-20. Properly adjusted contrast and brightness. ....	E-13
Figure E-21. High versus good contrast adjustments. ....	E-13
Figure E-22. Low versus good contrast adjustments. ....	E-14
Figure E-23. High versus good brightness adjustments. ....	E-14
Figure E-24. Low versus good contrast adjustments. ....	E-15
Figure E-25. Day vision sight versus night vision sight operation during high levels of obscuration.....	E-15
Figure E-26. Infrared clutter—background $\Delta T$ pattern matches target $\Delta T$ pattern.....	E-17
Figure E-27. Defeating clutter caused by reflected infrared. ....	E-17
Figure E-28. Effects of man-made clutter on night vision sight target scene. ....	E-18
Figure E-29. Counteracting man-made clutter Step 1—adjust brightness.....	E-19
Figure E-30. Counteracting man-made clutter Step 2—adjust contrast. ....	E-19
Figure E-31. Infrared crossover times. ....	E-20
Figure E-32. Infrared crossover effects. ....	E-20
Figure E-33. Road temperature increases due to friction from vehicle tracks. ....	E-21
Figure E-34. Effects of range on target details.....	E-21
Figure E-35. Target acquisition steps.....	E-22
Figure E-36. Target engagement field-of-view sequence. ....	E-22
Figure E-37. Day field-of-view image and area of coverage. ....	E-23

Figure E-38. Wide field-of-view image and area of coverage.....	E-23
Figure E-39. Narrow field-of-view image and area of coverage. ....	E-24
Figure E-40. Seeker field-of-view image and area of coverage. ....	E-24
Figure E-41. Target acquisition—detection. ....	E-25
Figure E-42. Rapid/slow scan pattern. ....	E-26
Figure E-43. Detailed search.....	E-26
Figure E-44. Dust cloud from moving vehicle.....	E-27
Figure E-45. Image adjustment for defensive position. ....	E-28
Figure E-46. Hot and cold stationary targets. ....	E-28
Figure E-47. Vehicle exhaust. ....	E-29
Figure E-48. Dismounted troops as infrared source.....	E-29
Figure E-49. Image adjustment for detecting hot stationary targets. ....	E-30
Figure E-50. Track and hull signatures.....	E-30
Figure E-51. Engine compartment and gun tube/barrel. ....	E-31
Figure E-52. Backlighting.....	E-31
Figure E-53. Image adjustment for detecting cold, stationary targets. ....	E-32
Figure E-54. Tank in defilade. ....	E-33
Figure E-55. Target acquisition process—classification step.....	E-33
Figure E-56. Classification features—suspension system. ....	E-34
Figure E-57. Classification features—engine compartment location. ....	E-34
Figure E-58. Classification features—gun tube/barrel.....	E-35
Figure E-59. Image adjustments for target classification and recognition.....	E-35
Figure E-60. Classification and recognition features of flank and frontal targets. ....	E-36
Figure E-61. Target acquisition process—recognition step.....	E-37
Figure E-62. Target recognition features.....	E-37
Figure E-62. Target recognition features (continued).....	E-38

## Tables

Table 1-1. Javelin capabilities and features. ....	1-3
Table 1-2. Physical characteristics of the command launch unit.....	1-4
Table 1-3. Physical characteristics of the round.....	1-4
Table 3-1. Javelin 10-day (80-hour) training schedule. ....	3-10
Table 3-2. Sustainment training matrix.....	3-19
Table 3-3. Collective training tasks.....	3-19
Table 4-1. Personnel duties.....	4-6
Table 4-2. Target classification features.....	4-25
Table 4-3. Engagement priority. ....	4-30
Table 4-4. Fire commands and examples. ....	4-32
Table 5-1. Javelin missile and weapon system capabilities and features .....	5-6
Table 5-2. Physical characteristics of the command launch unit.....	5-6



Table 5-3. Physical characteristics of the round.....	5-7
Table C-1. Javelin immediate decontamination procedures. ....	C-1
Table D-1. Gunner corrective actions for NVS NOT COOL indicator. ....	D-2
Table D-2. Gunner corrective action for flashing WFOV and NFOV indicators. ....	D-3
Table D-3. Gunner corrective action for CLU BATTERY LOW indicator. ....	D-4
Table D-4. Gunner corrective action for BCU LOW indicator.....	D-5
Table D-5. Gunner corrective action for MISSILE NOT READY indicator. ....	D-7
Table D-6. Gunner corrective action for CLU BIT FAILURE indicator. ....	D-8
Table D-7. Gunner corrective action for MISSILE BIT FAILURE indicator. ....	D-9
Table D-8. Gunner corrective action for MISSILE MISFIRE indicator.....	D-11
Table D-9. Gunner corrective action for HANGFIRE indicator. ....	D-12
Table E-1. Target recognition features.....	E-38

## Glossary

### Section I. ACRONYMS AND ABBREVIATIONS

AA	avenue of approach
AAR	after-action review
ACU	Army combat uniform
APC	armored personnel carrier
ARNG	Army National Guard
ARNGUS	Army National Guard of the United States
ARTEP	Army Training and Evaluation Program
ASI	additional skill identifier
ASIP	advanced systems improvement program
BCU	battery coolant unit
BDA	battle damage assessment
BFV	Bradley fighting vehicle
BIT	built-in test
BMP	fighting vehicle manufactured by the former Soviet Union
BNCOC	Basic Noncommissioned Officer Course
BST	basic skills trainer
CARC	chemical-agent resistant coating
CBRN	chemical, biological, radiological, nuclear
CD-ROM	compact disk read-only memory
CGP	commander's ground pointer
CLU	command launch unit
CU	control unit
CVI	combat vehicle identification
DDC	detector dewar cooler
DLIC	detachment left in contact
DRC	daily readiness check
EMI	electromagnetic interference
ESAF	electronic safe, arm, and fire
FM	field manual
FNC	fiber nickel cadmium

FOV	field-of-view
FTT	field tactical trainer
FTX	field training exercise
GRP	gunner's reference point
GST	gunner's skill test
GTA	graphic training aid
HE	high-explosive
HMMWV	high-mobility multipurpose wheeled vehicle
I2R	imaging infrared
IAW	in accordance with
IEDK	individual equipment decontamination kit
IFV	Infantry fighting vehicle
IR	infrared
JGC	Javelin Gunner's Course
LD	line of departure
LED	light-emitting diode
LL	left limit
LTA	launch tube assembly
MEL	maximum engagement line
METL	mission-essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations
MILES	multiple integrated laser engagement system
MRE	meals ready-to-eat
MSR	missile simulation round
MTP	mission training plan
NCO	noncommissioned officer
NCOES	Noncommissioned Officer Education System
NFOV	narrow field-of-view
NSN	national stock number
NVG	night vision goggles
NVS	night vision sight
OES	Officer Education System
PE	practice exercise
PMCS	preventive maintenance checks and services
POI	program of instruction
RL	right limit
ROC-V	Recognition of Combat—Vehicles
ROE	rules of engagement
SAAF	small-arms alignment fixture
SBCT	Stryker brigade combat team
SBCU	simulated battery coolant unit
SCLU	simulated command launch unit
SDK	skin decontamination kit
SINCGARS	single-channel ground and airborne radio system
SOP	standing operating procedure
STP	Soldier's training publication
STX	situational training exercise

TDC	Training Device Course
TEWT	tactical exercises without troops
TM	technical manual
TOE	table of organization and equipment
TOW	tube-launched, optically tracked, wire-guided missile
TRP	target reference point
TSC	training support center
USAIS	United States Army Infantry School
USAR	United States Army Reserve
VCR	video camera recorder
WFOV	wide field-of-view

## Section II. DEFINITIONS

$\Delta T$  Delta ( $\Delta$ ) is a Greek letter that stands for change or difference. T stands for temperature.

absorbers	Protect CLU from damage during handling and movement
aft end cap	Protects the round from damage during handling and movement; permanently attached to round.
ATTK SEL	Attack select. Switches between the top attack mode and the direct attack mode.
backlighting	Indirect IR signature that indicates the presence of a target.
basic skills trainer	An indoor/shipboard training device that can train and test the gunner's skills in a wide variety of situations.
battery coolant unit	Provides electrical power and seeker cooling for the missile.
carry handle	Used to lift and carry the round.
CLU interface connector	Provides electrical interface with the round.
CTRS	Contrast. The contrast is adjusted by moving the GATE ADJ/CTRS and BRT switch horizontally (left and right).
daysight	Optical system that works similar to a telescope. Develops a magnified, visible-light target image for the gunner.
desiccant	Used to prevent moisture from gathering in the missile and causing possible missile malfunctions. It is located inside forward end cap.
DFOV	Day field-of-view. The power switch is in the DAY position, the Javelin is in mode. The status indicator located on the CLU display. This appears as a green indicator light when the day FOV is selected.
DIR	Direct attack mode. When the DIR indicator light is lit the direct attack mode is selected.
elapsed time meter	Records total operating hours of CLU. It is located in battery compartment.
electronic safe, arm, and fire	Controls arming and ignition of the missile motors, arming, and detonation of the warhead charges.
eyepiece	Allows viewing of CLU display image. Contains diopter adjust ring that gunner uses to focus CLU display image, eyecup.

face shield absorber	Shields gunner's face from possible launch debris and helps protect CLU from damage during handling and movement.
field tactical trainer	Designed to be used as an outdoor trainer and is equipped with the MILES.
fire trigger	Used to initiate missile firing sequence.
FLTR SEL switch	Filter select. The filter select switch is used to select the night vision sight (NVS) filter. The NVS filter prevents the CLU from being detected by enemy countermeasures.
FOC ADJ switch	Focal adjust. Used to adjust the focus of the CLU display image during NVS (NFOV or WFOV) operation.
forward end cap	Protects the round from damage during handling and movement. It provides environmental and electromagnetic interference (EMI) protection for the missile. It is removed prior to missile firing.
GATE ADJ/CTRS and BRT	Gate adjust/contrast and brightness. It serves two functions depending on whether the CLU display image is from the NVS or the seeker. In the NVS mode the controls adjusts the brightness and contrast. In the seeker mode the controls control the track gates by moving them in or out horizontally and vertically.
humidity indicator	Displays status of relative humidity inside CLU. It is located on right side of CLU. It displays the status of relative humidity inside LTA. Located on the forward end cap.
latch assembly	Latch assembly together with the alignment fork and latch release provides the mechanical interface with the CLU.
launch tube assembly	Serves as a handling container and launch platform for the missile. Provides environmental and electromagnetic interference (EMI) protection for the missile.
left handgrip controls	Consists of focus adjust (FOC ADJ), sight select (SGT SEL), and filter select (FLTR SEL) switches.
lock-on	Simulated seeker lock-on has been commanded.
locking pin	Locks the forward end cap latch in place and prevents movement.
missile simulation round	Simulates the weight and balance of the round and has CLU and BCU connectors.
night vision sight	Optical system that converts an IR target image into a visible-light target image for the gunner.
power switch	Four-position rotary switch used to place the Javelin into operation.
right handgrip controls	Consists of gate adjust (GATE ADJ), contrast and brightness (CTRS and BRT), and attack select (ATTK SEL) switches.
round interface bracket	Round interface bracket together with the alignment pin and round interface catch provide the mechanical interface with round.
round interface connector	Provides electrical interface with the CLU.

seeker trigger	Used to initiate seeker mode of operation and seeker lock-on.
SGT SEL	Sight Select. Is used to select day FOV, WFOV, NFOV, or seeker FOV.
shoulder pad	Provides point of balance and support when round is placed on gunner's shoulder.
shoulder strap	Provides a means of carrying the round. Can be placed on gunner's shoulder or diagonally across chest.

## Chapter 1

# INTRODUCTION

The Javelin surface-attack guided missile and launcher is a fire-and-forget, man-portable medium close combat missile system consisting of a command launch unit (CLU) and a round. The Javelin is operated by an individual Soldier or in crews of two or three. Soldiers can use the Javelin during the day, at night, and during limited visibility conditions.

## WEAPON SYSTEM

1-1. The Javelin weapon system consists of a Javelin, a basic skills trainer (BST), a field tactical trainer (FTT), and a missile simulation round (MSR).

### JAVELIN

1-2. The Javelin is a fire-and-forget, shoulder-fired weapon that consists of a reusable M98A1 CLU and a round. The CLU houses the daysight, night vision sight (NVS), controls, and indicators. The round consists of the missile, the launch tube assembly (LTA) (Figure 1-1), and the battery coolant unit (BCU). The missile contains the guidance section, mid-body section, warhead section, propulsion section, and control actuator section. The LTA serves as the launch platform and carrying container for the missile.

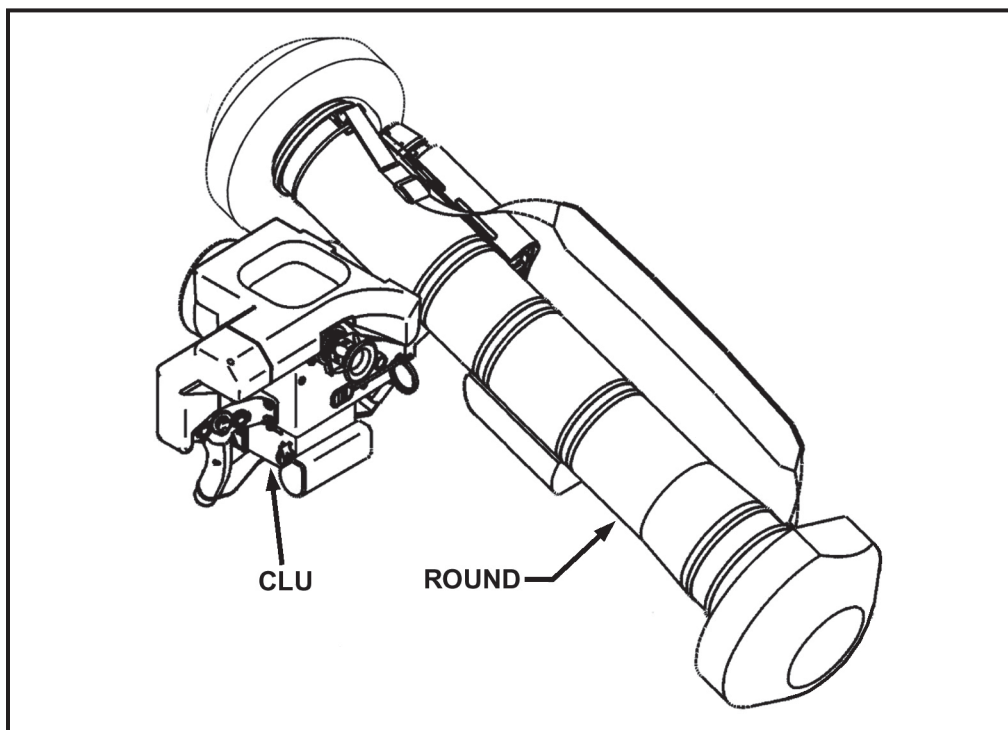


Figure 1-1. Javelin.

## BASIC SKILLS TRAINER

1-3. The BST is an indoor training device that consists of a Soldier station and an instructor station (Figure 1-2). The Soldier station consists of a simulated command launch unit (SCLU) and an MSR. The instructor station has a desktop computer, a monitor, a keyboard, a mouse, an interconnect cable, and a surge suppressor. BST training exercises use real terrain models, actual visible and infrared (IR) imagery, and matching three-dimensional target models for natural target movements. The gunner sees a realistic simulated battlefield environment.

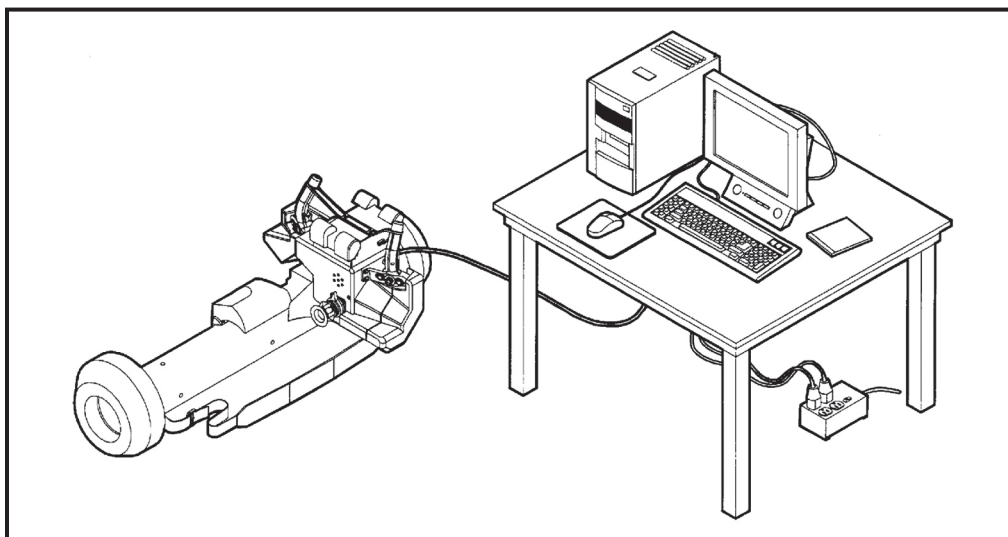


Figure 1-2. Basic skills trainer.

## FIELD TACTICAL TRAINER

1-4. The FTT is an outdoor force-on-force trainer used in conjunction with a tactical CLU and a simulated round. The FTT consists of an instructor station, which is used to monitor the student (Figure 1-3). The simulated round is equipped with a multiple integrated laser engagement system (MILES).

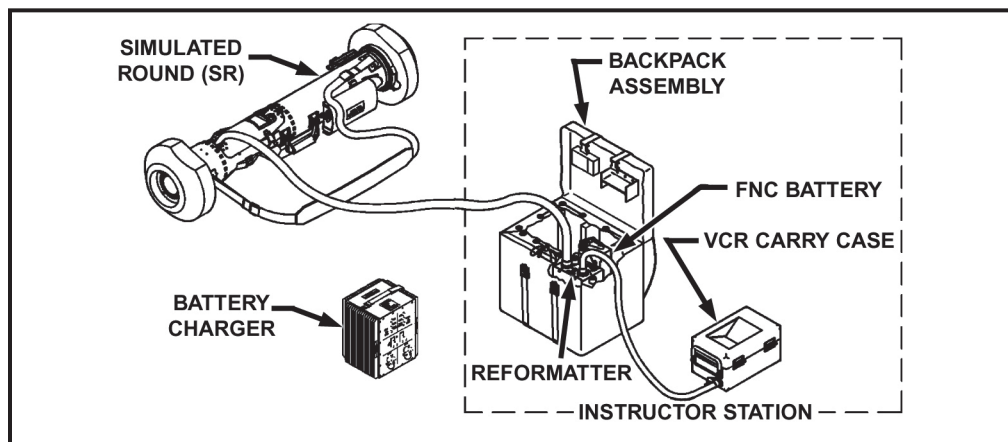
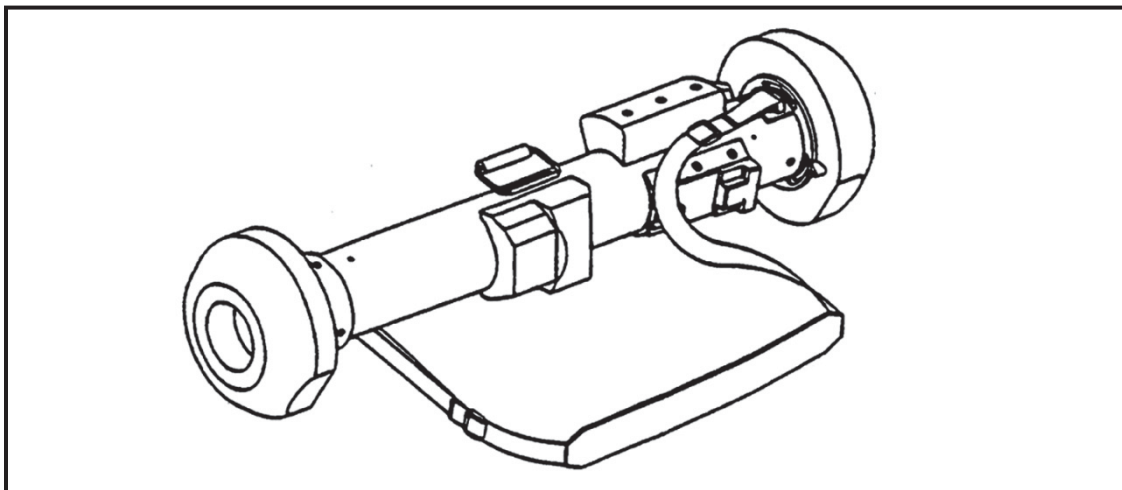


Figure 1-3. Field tactical trainer.



## MISSILE SIMULATION ROUND

1-5. The MSR is a field handling round with a simulated launch tube (Figure 1-4). It replicates the weight and balance of the actual round. The FTT contains no instruments or circuitry and is used to train gunners on how to maintain, handle, and carry the round.



**Figure 1-4. Missile simulation round.**

## EQUIPMENT DESCRIPTION AND DATA

1-6. Tables 1-1 through 1-3 show the Javelin's capabilities and features, the CLU's physical characteristics, and the round's physical characteristics.

**Table 1-1. Javelin capabilities and features.**

Type of System	Fire and forget	
Crew	One- to three-Soldier teams based on table of organization and equipment (TOE)	
Missile Modes	Top attack ( default ) Direct attack	
Ranges	Top attack mode minimum effective engagement	150 m
	Maximum effective engagement range (direct attack and top attack modes)	2,000 m
	Direct attack mode minimum effective engagement range	65 m
Flight Time	About 14 seconds at 2,000 meters	
Backblast Area (See Figure 1-11 and Appendix A for safety factors.)	Primary danger zone extends out 25 m at a 60-degree (cone-shaped) angle.	
	Caution zone extends the cone-shaped area out to 100 m	
Propulsion (Two-Stage Motor)	Launch motor ejects the missile from the LTA	
	Flight motor propels the missile to the target	
Firing From Inside Enclosures	Minimum room length	15 ft
	Minimum room width	12 ft
	Minimum room height	7 ft

**Table 1-2. Physical characteristics of the command launch unit.**

M98A1 CLU	With Battery, Carrying Bag, and Cleaning Kit	
	Weight	14.16 lb (6.42 kg)
	Length	13.71 in (34.82 cm)
	Height	13.34 in (33.88 cm)
	Width	19.65 in (49.91 cm)
	Carrying Bag Only	
Sights	Weight	0.60 lb (0.27 kg)
	Daysight	
	Magnification	4x
	Field-of-view (FOV)	4.80° x 6.40°
	NVS	
	Wide field-of-view (WFOV) magnification	4.2x
	WFOV	4.58° x 6.11°
	Narrow field-of-view (NFOV) magnification	9.2x
Battery	NFOV	2.00° x 3.00° (approximately)
	Battery type	Lithium sulfur dioxide BA-5590/U (Non-rechargeable)
	Number required	1
	NSN	6135-01-036-3495
	Weight	2.2 lb (1.00 kg)
	Life	4.0 hr below 120°F (49°C)
		3.0 hr between 50°F to 120°F (10°C to 49°C)
		1.0 hr between -20°F to 50°F (-49°C to 10°C)
		0.5 hr above 120°F (49°C)

**Table 1-3. Physical characteristics of the round.**

Complete Round (LTA with missile and BCU)	Weight	35.14 lb (15.97 kg)
	Length	47.60 in (120.90 cm)
	Diameter with end caps	11.75 in (29.85 cm)
	Inside diameter	5.52 in (14.00 cm)
BCU	Weight	2.91 lb (1.32 kg)
	Length	8.16 in (20.73 cm)
	Width	4.63 in (11.75 cm)
	Battery	
	Type	Lithium, non-rechargeable
	Life	4 min of BCU time
	Coolant gas	Argon

1-7. Figure 1-5 shows the Javelin backblast danger area. The primary danger area is a 60-degree sector, with the apex of the sector at the aft end of the missile launch motor. For more safety information, see Appendix A.

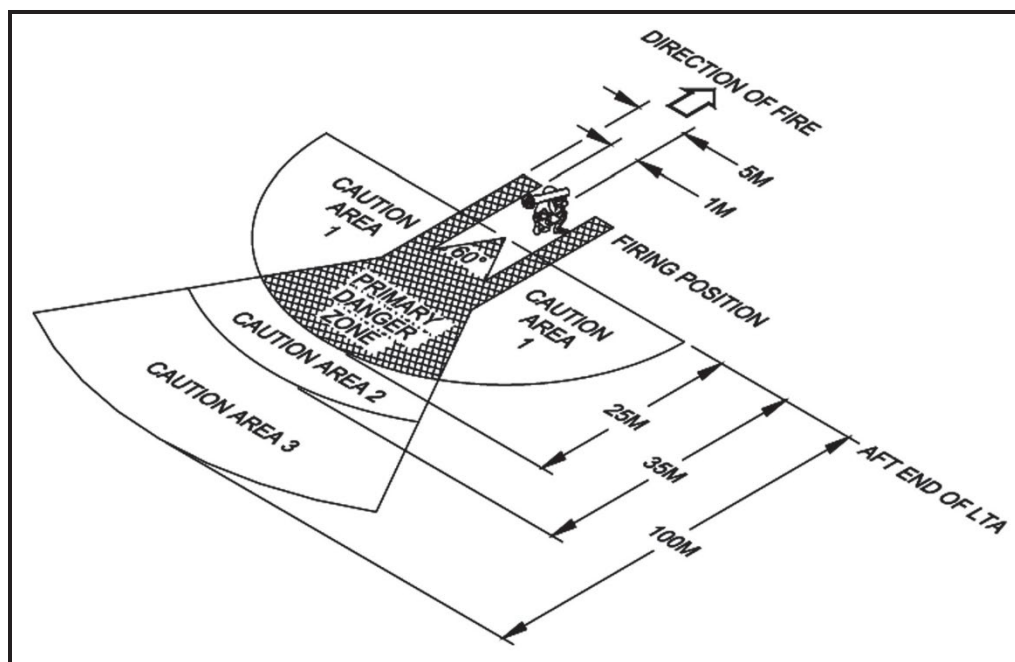


Figure 1-5. Javelin backblast safety zones.

## COMMAND LAUNCH UNIT

1-8. The M98A1 CLU attaches to the LTA, the only reusable portion of the Javelin system (Figure 1-6). It consists of a main housing, shock absorbers, handgrips, battery compartment, daysight, NVS, eyepiece, test connector, and round interface connector.

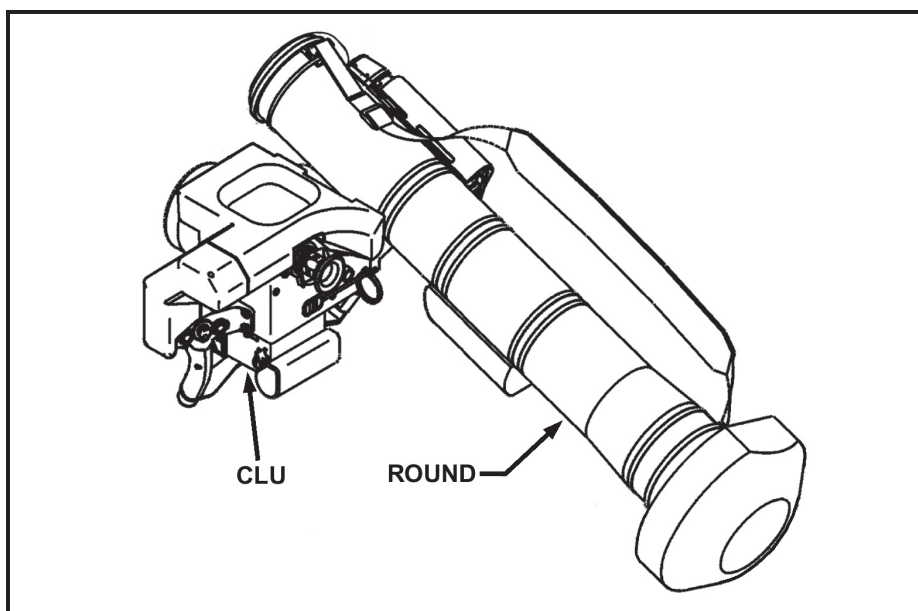


Figure 1-6. Javelin components.

## MAIN HOUSING

1-9. The main housing (body) of the CLU (Figure 1-7) contains the system's electronics, the display, daysight, and NVS.

## ABSORBERS

1-10. The absorbers (Figure 1-7) around the main housing of the CLU help protect the equipment during operation. The absorbers are replaceable. One absorber is a face shield that protects the gunner's face during missile launch.

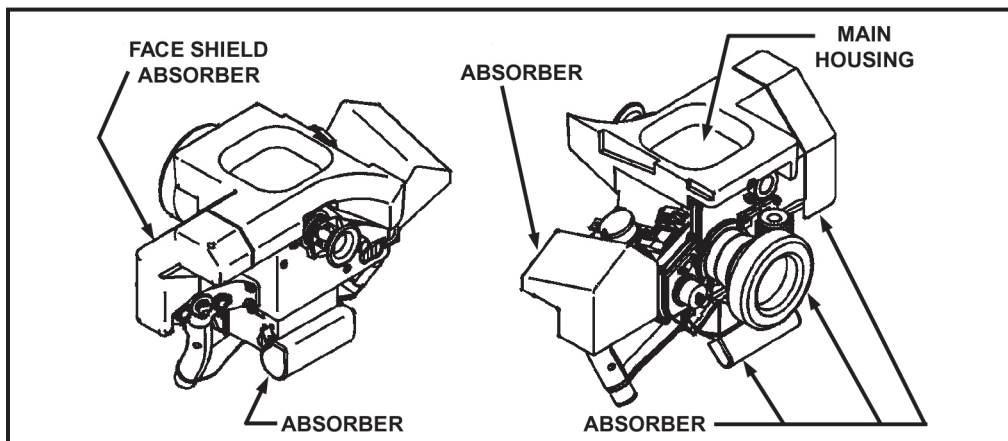


Figure 1-7. Main housing and absorbers.

## HANDGRIPS

1-11. The gunner uses the handgrips attached to the sides of the main housing (Figure 1-8) to hold the CLU. The gunner uses the controls on the handgrips for all Javelin operations.

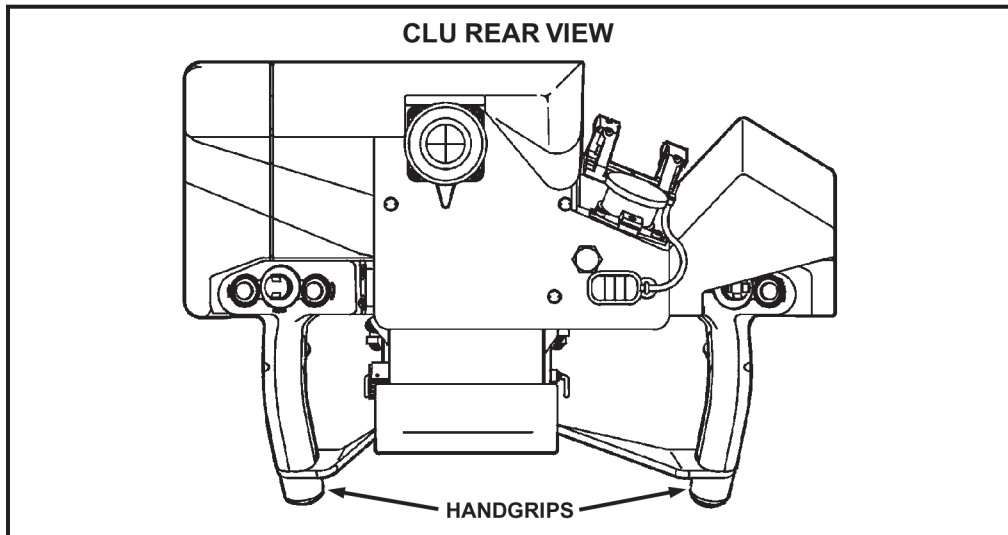


Figure 1-8. Handgrips.

## BATTERY COMPARTMENT

1-12. Located on the bottom of the main housing, the battery compartment (Figure 1-9) houses the nonrechargeable BA-5590/U or the rechargeable BB390A battery (for training use only). The same battery is used in the single-channel ground and airborne radio system (SINCGARS) and can be interchanged with the CLU. A connector on the battery compartment joins to a corresponding connector on the battery. A wire bail holds the detachable battery compartment cover in place.

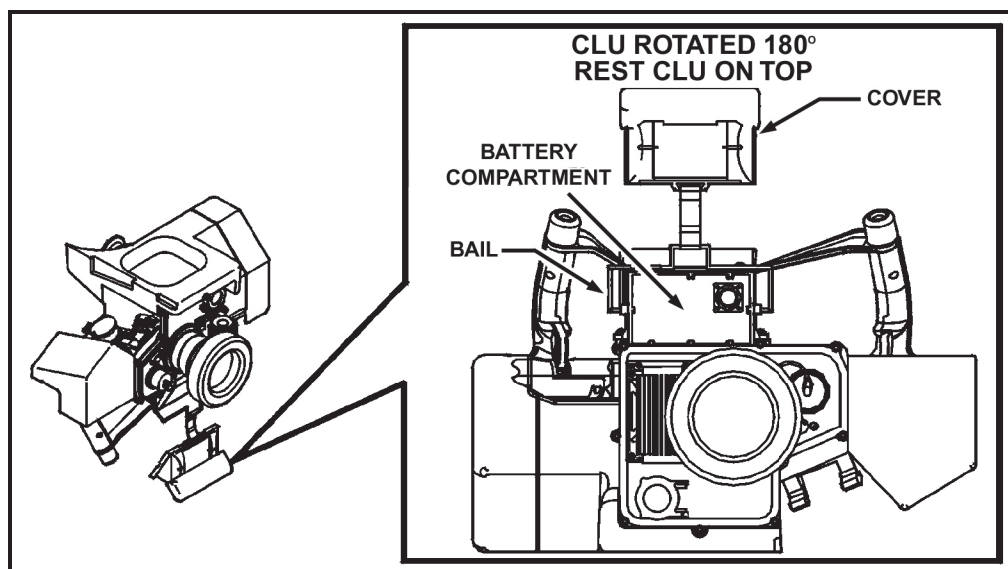


Figure 1-9. Battery compartment.

## DAYSIGHT

1-13. The daysight works much like a telescope and consists of a lens, status indicators, and an eyepiece (Figure 1-10). The daysight—

- Provides the gunner visible light imagery with 4x magnification for target viewing and battlefield surveillance.
- Can be used with the power off for surveillance to conserve battery life.
- Is not affected by IR clutter.

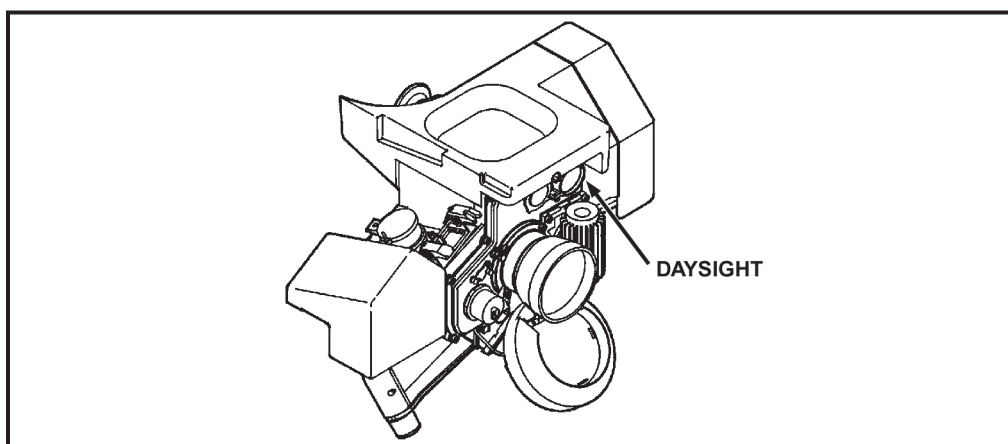
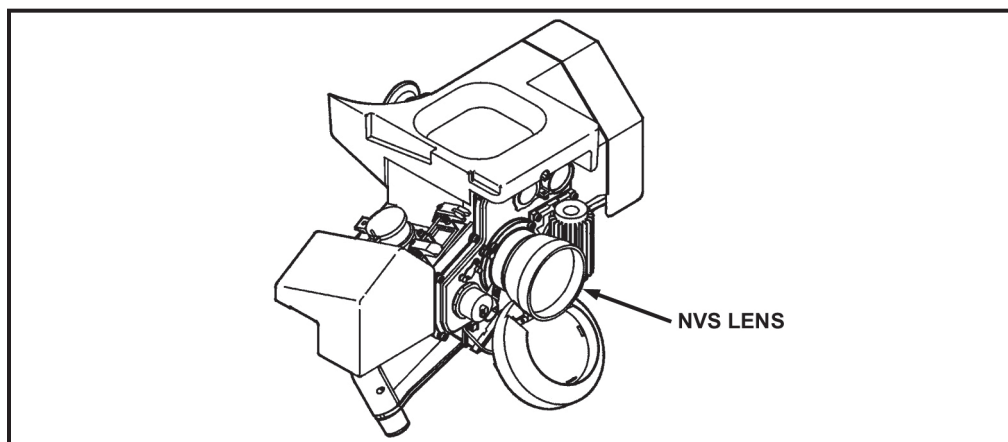


Figure 1-10. Daysight.

## NIGHT VISION SIGHT

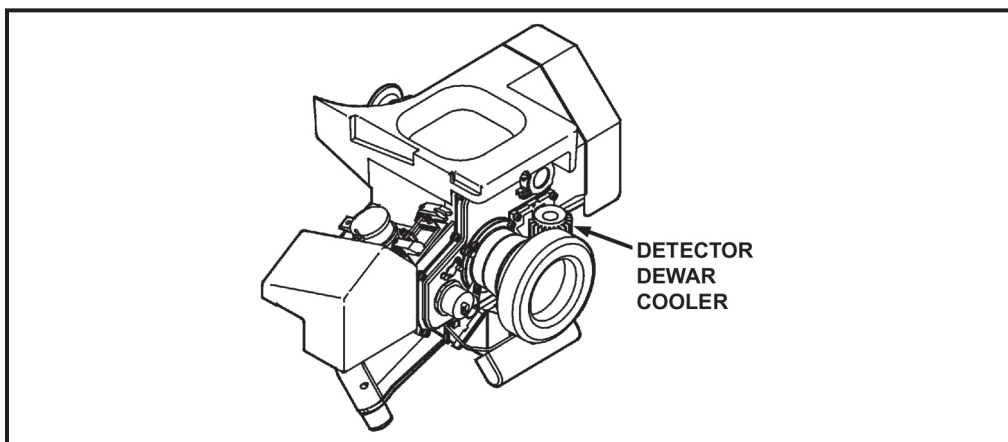
1-14. The NVS is the primary sight used by the gunners (Figure 1-11) during the day or night. This imaging infrared (I2R) system allows the gunner to see during limited visibility conditions, including darkness, obscuration, smoke, fog, inclement weather, and IR clutter. The NVS operates by converting an IR target image to a visible light image for the gunner. The NVS consists of the NVS lens, a detector dewar cooler (DDC), a CLU display, and an eyepiece that provides the gunner with both 4x wide field-of-view (WFOV) and 9x narrow field-of-view (NFOV) magnification for scanning and target detection.



**Figure 1-11. Night vision sight lens.**

### **Detector Dewar Cooler**

1-15. The DDC (Figure 1-12) cools the NVS to the proper operating temperature and converts IR energy to electrical signals. These signals are sent to the CLU display by way of the signal processor to provide the gunner a picture of the target area.

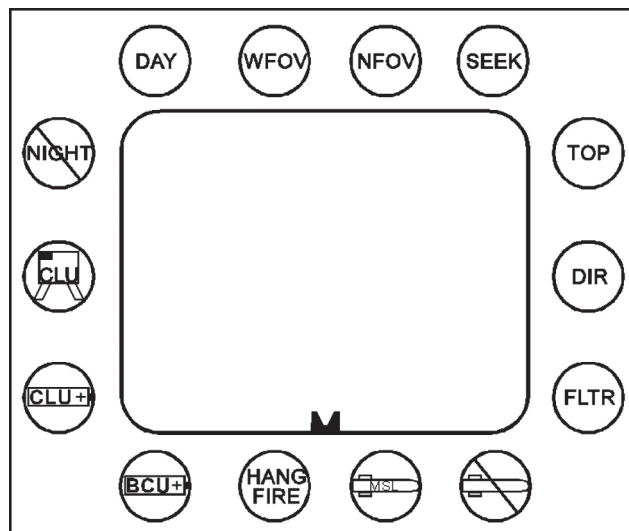


**Figure 1-12. Detector dewar cooler.**

### **Command Launch Unit Display**

1-16. Similar to a miniature television, the CLU display is used to make the WFOV, NFOV, and seeker IR images visible to the gunner.

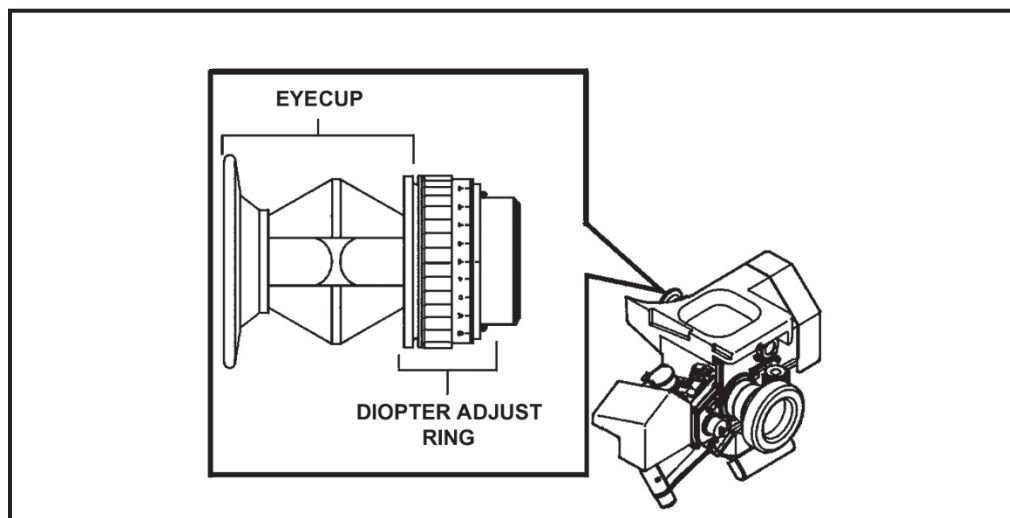
1-17. The green, amber, and red icon indicators (Figure 1-13) that surround the CLU display identify operational modes, conditions, and malfunctions. Visible during day and night use, these indicators provide the gunner with continuous feedback on missile readiness or possible system malfunctions. All indicators will be explained in detail in Chapter 2.



**Figure 1-13. Status indicators.**

### **Eyepiece**

1-18. The eyepiece (Figure 1-14) allows the gunner to see the CLU display. Through the eyepiece, the gunner sees the DAY FOV, WFOV, NFOV, seeker FOV, and the status indicators. The eyepiece consists of a lens assembly, eyecup, and diopter adjust ring.



**Figure 1-14. Eyepiece.**

### **Test Connector**

1-19. The test connector (Figure 1-15) is used to perform field- or higher-level maintenance and to interface with the FTT.

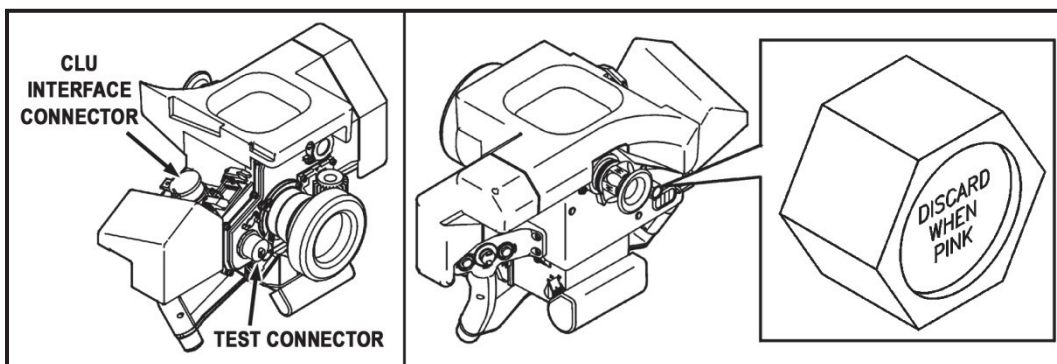
### **Round Interface Connector**

1-20. The round interface connector (Figure 1-15) provides the electrical connection between the CLU and the round.



## Humidity Indicator

1-21. The humidity indicator (Figure 1-15) displays the quality of the air inside the CLU (white or blue within acceptable levels; pink requires maintenance).



**Figure 1-15. Test connector, round interface connector, and humidity indicator.**

## ROUND

1-22. The round consists of the LTA, the BCU, and the missile (Figure 1-16). The LTA interfaces with the CLU and serves both as a handling container and launch platform for the missile. The LTA consists of a launch tube, forward and aft end caps, carry handle, shoulder strap, CLU interface connector, and shoulder pad.

---

**NOTE:** The round has a 10-year shelf life. The only maintenance requirement is stockpile surveillance.

---

## LAUNCH TUBE

1-23. The launch tube houses the missile. It is a single-piece, composite graphite/epoxy design. The launch tube protects the missile from the environment before the missile is launched. All other LTA components mount externally on the tube.

---

**NOTE:** Once the missile is launched, the LTA is discarded.

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## END CAPS

1-24. Two end caps protect the missile from damage during transport and handling.

### Forward End Cap

1-25. The forward end cap (Figure 1-16) protects the seeker dome from moisture, dust, and other elements that could harm it. The forward end cap is removed when preparing for launch. The pressure release valve is used to reduce the pressure in the LTA so the forward end cap can be removed.

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**NOTE:** If the missile is not fired, ensure that the LTA is clear of debris, and replace the forward end cap to protect the seeker dome.

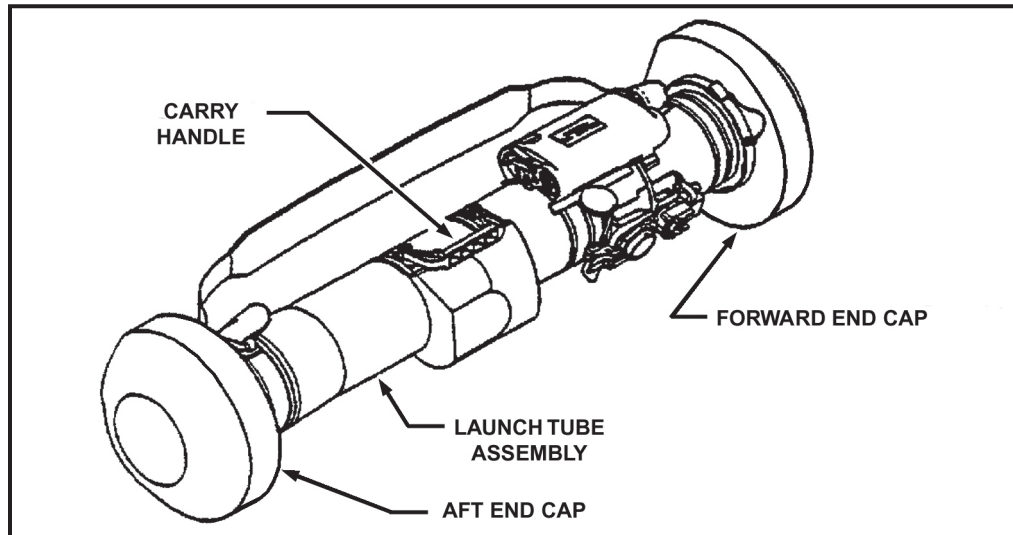
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### Aft End Cap

1-26. The aft end cap (Figure 1-16) is permanently attached to the LTA. The center of the cap is blown out by the launch motor blast during launch.

## CARRY HANDLE

1-27. The carry handle (Figure 1-16) is used to lift and carry the round.



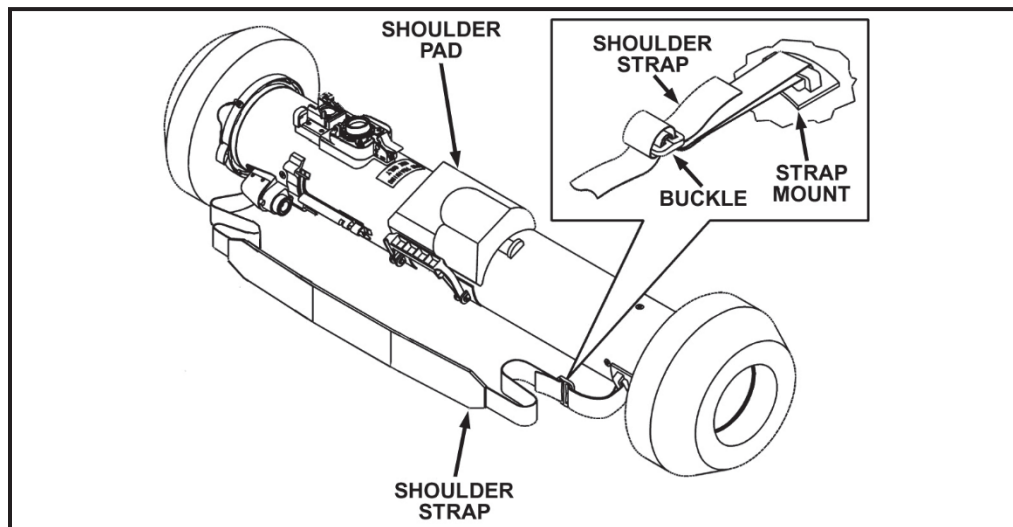
**Figure 1-16. Launch tube assembly, end caps, and carry handle.**

## SHOULDER STRAP

1-28. The adjustable shoulder strap (Figure 1-17) provides a means for carrying the round.

## SHOULDER PAD

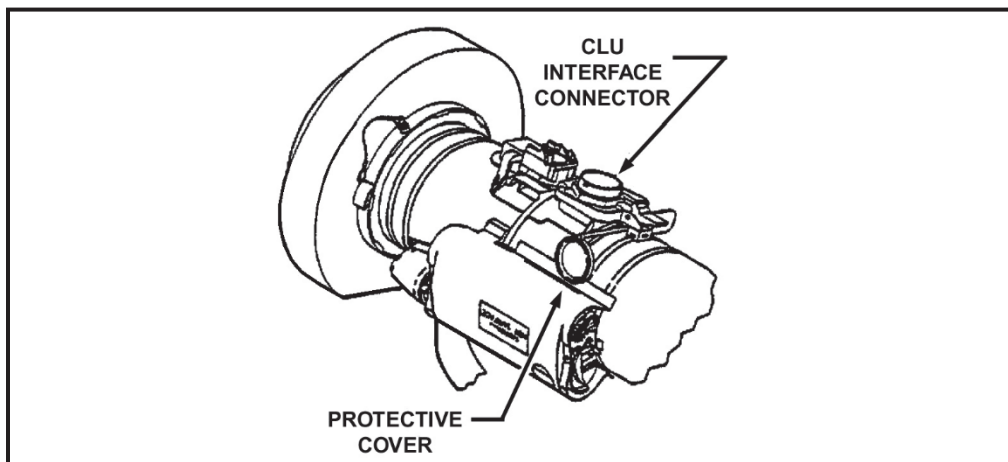
1-29. The shoulder pad (Figure 1-17) provides balance and support when the round is placed on the gunner's shoulder.



**Figure 1-17. Shoulder strap and pad.**

## COMMAND LAUNCH UNIT INTERFACE CONNECTOR

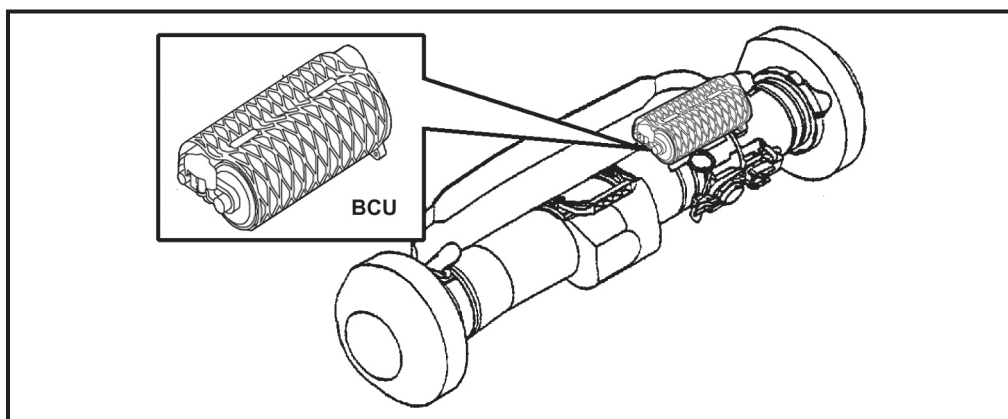
**1-30.** The CLU interface connector (Figure 1-18) provides the electrical interface between the round and CLU. Signals are passed through the connector between the CLU and round, which includes: digital information, power, and seeker image signals.



**Figure 1-18. Command launch unit interface connector.**

## BATTERY COOLANT UNIT

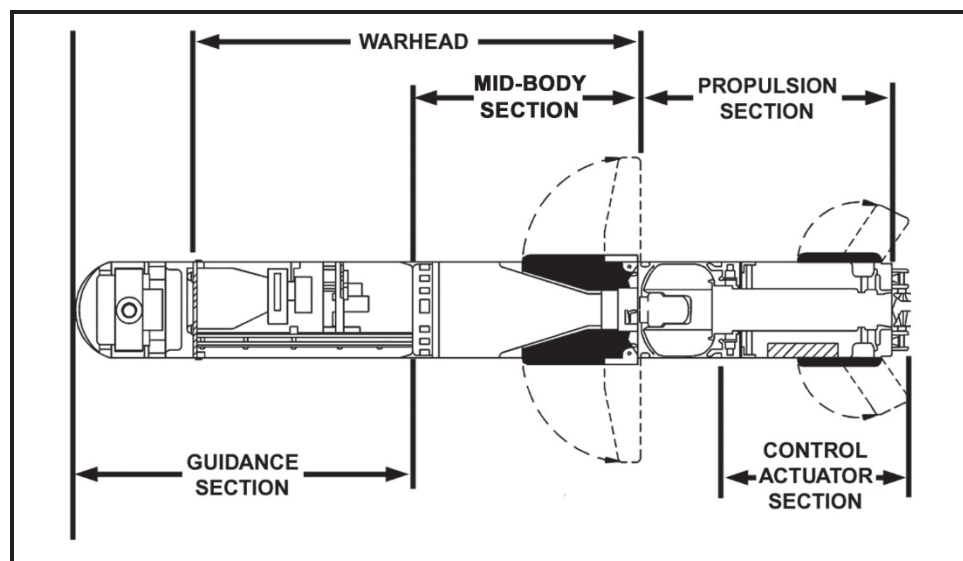
**1-31.** The BCU (Figure 1-19) consists of a battery section and a compressed-gas coolant section. Before missile launch, the battery section powers the missile electronics, and the coolant section cools the missile seeker to its operating temperature. The BCU is a single-use unit with 4 minutes of operating time; it is not rechargeable. Once the missile has been fired, the spent BCU is discarded with the LTA.



**Figure 1-19. Battery coolant unit.**

## MISSILE

**1-32.** The Javelin missile is environmentally sealed in the LTA (Figure 1-20).



**Figure 1-20. Javelin missile.**

## MISSILE OPERATION

1-33. The missile consists of the guidance section, the mid-body section, the warhead, the propulsion section, and the control actuator section (Figure 1-21).

### GUIDANCE SECTION

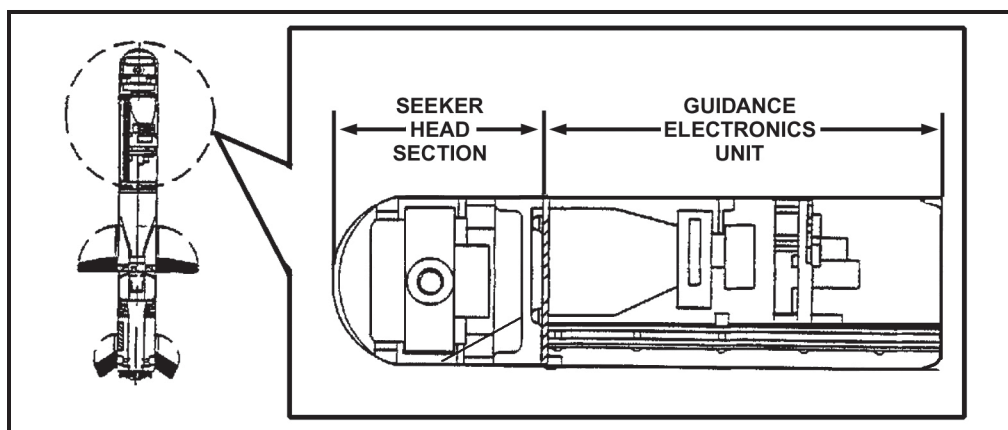
1-34. The guidance section (Figure 1-21) provides target tracking and flight control signals. It is the forward section of the missile and includes the seeker head section and the guidance electronics unit.

#### Seeker Head

1-35. The seeker head section, known as the seeker, contains the missile I2R system and the contact switches used to detonate the warhead. The missile I2R system gives the missile its fire-and-forget capability. During flight to the target, the missile I2R system tracks the target and sends target location information to the onboard guidance electronics unit.

#### Guidance Electronics Unit

1-36. The guidance electronics unit serves two functions. It controls the seeker head so that it *looks* at the target, and it sends signals to the control actuator section to guide the missile to the target during flight.



**Figure 1-21. Missile guidance section.**

## **MID-BODY SECTION**

1-37. The mid-body section includes the missile skin; electronic safe, arm, and fire unit (ESAF); wings; and the main charge of the warhead (Figure 1-22).

### **Missile Skin**

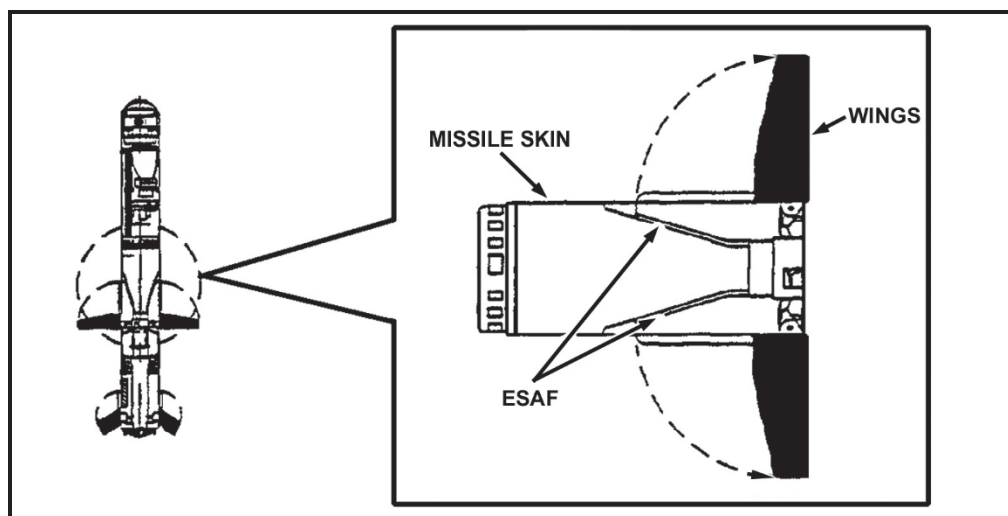
1-38. The missile skin is a structural part of the missile and provides environmental protection for the internal components during flight.

### **Electronic Safe, Arm, and Fire**

1-39. The ESAF is the principal safety device that prevents accidental ignition of the motors and accidental warhead detonation. The ESAF consists of circuits and two detonators (one for the precursor and one for the main charge). The ESAF controls missile launch sequence and warhead detonation. It permits starting the rocket motors in the proper sequence when the gunner pulls the fire trigger and all other firing conditions have been met. When the missile hits the target, the ESAF detonates each warhead charge in sequence.

### **Wings**

1-40. The wings provide lift and keep the missile stabilized during flight. The wings fold into slots in the missile skin when the missile is in the LTA and deploy into flight position after clearing the LTA.



**Figure 1-22. Mid-body section.**

## **WARHEAD SECTION**

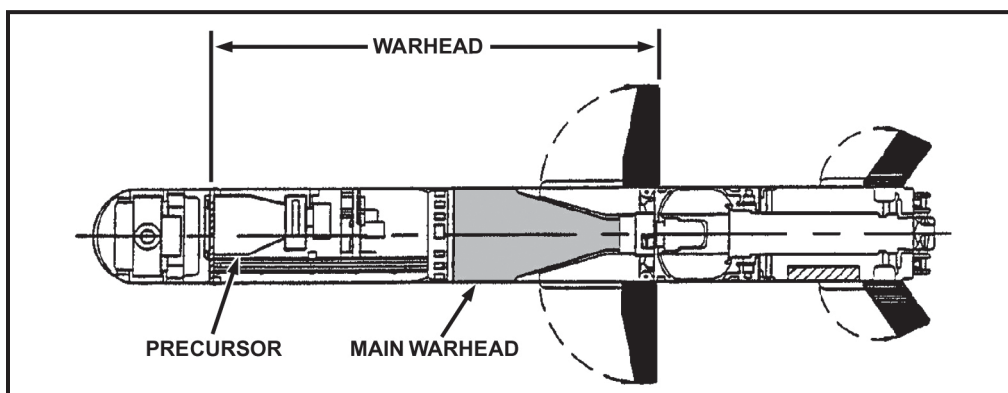
1-41. The Javelin missile uses a dual-charged warhead (Figure 1-23). The warhead has a precursor charge and a main charge.

### **Precursor Charge**

1-42. The precursor charge is a high-explosive (HE) shaped charge. Its purpose is to cause the target's reactive armor to detonate before the main charge reaches the armor. Once the reactive armor is penetrated, the target's main hull is exposed to the warhead's main charge. If the target is not equipped with reactive armor, the precursor charge provides additional explosives to penetrate the main armor.

### **Main Charge**

1-43. The main charge is the second charge of a dual-charge warhead and is also an HE shaped charge. The primary warhead charge is designed to penetrate the target's main armor to achieve a target kill.



**Figure 1-23. Missile warhead.**

## **PROPULSION SECTION**

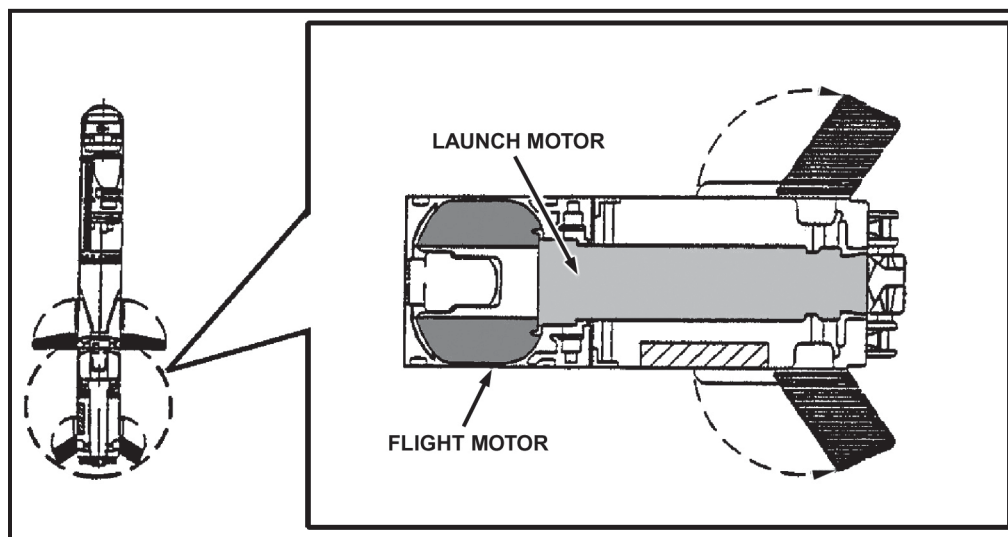
1-44. The propulsion section (Figure 1-24) consists of the launch and flight motors.

## Launch Motor

1-45. The launch motor propels the missile out of the LTA. It provides the initial force to push the missile a safe distance from the gunner before the flight motor ignites to ensure the gunner's safety. The launch motor is completely spent by the time the missile clears the LTA, this accounts for the low signature after launch.

## Flight Motor

1-46. The flight motor powers the missile to the target during flight. It ignites when the missile is a safe distance from the gunner, protecting the gunner from hot exhaust gases generated when the motor fires.



**Figure 1-24. Missile propulsion section.**

## CONTROL ACTUATOR SECTION

1-47. The control actuator section (Figure 1-25) maneuvers the missile during flight and provides internal electrical power. The control actuator section consists of four control fins, four thrust vector control (TVC) vanes, and a thermal battery.

### Control Fins

1-48. The control fins maneuver the missile during flight. The spring-loaded fins automatically deploy and lock into flight position after the missile clears the LTA. During flight, they adjust automatically to guide the missile to the target.

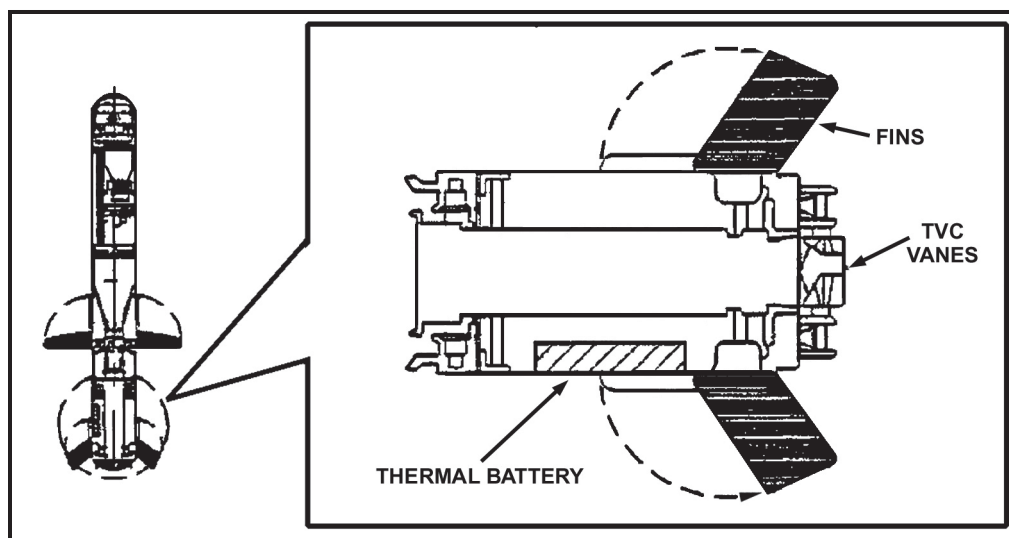
### Thrust Vector Control Vanes

1-49. The TVC vanes aid the control fins in maneuvering the missile during flight by deflecting the flight motor exhaust. This control changes the angle of thrust from the flight motor, resulting in a change to the missile's flight path.

### Thermal Battery

1-50. The thermal battery provides internal electrical power for the missile during flight. It is sealed in the body of the missile.





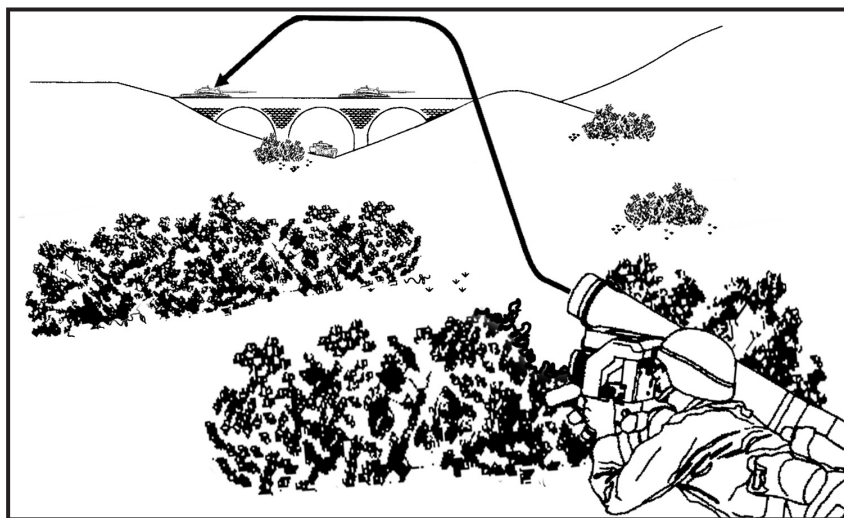
**Figure 1-25. Control actuator section.**

## **CAPABILITIES AND FEATURES**

**1-51.** The missile has two gunner-selectable attack modes: top or direct. Each mode has its own flight path or profile for reaching the target.

### **TOP ATTACK MODE**

**1-52.** The top attack is the default mode when the missile seeker is first activated. In the top attack mode, the missile approaches from above to impact and detonate on the top of the target (Figure 1-26). This capacity allows the gunner to attack a vehicle from the front, rear, or the side and greatly increases the probability of a kill. Vehicles usually have less protection on top. The minimum engagement distance is 150 meters.



**Figure 1-26. Top attack mode.**

**1-53.** The exact profile of the missile flight path depends on the range to the target and is determined automatically by the missile's onboard software). When firing at a 2,000-meter target, the missile reaches a height of about 160 meters above the battlefield (Figure 1-27). If the target is under a protective structure, using the top attack mode will cause the missile to detonate on the structure

instead of on the target. The gunner can select the direct attack mode to counter targets hiding under protective cover.

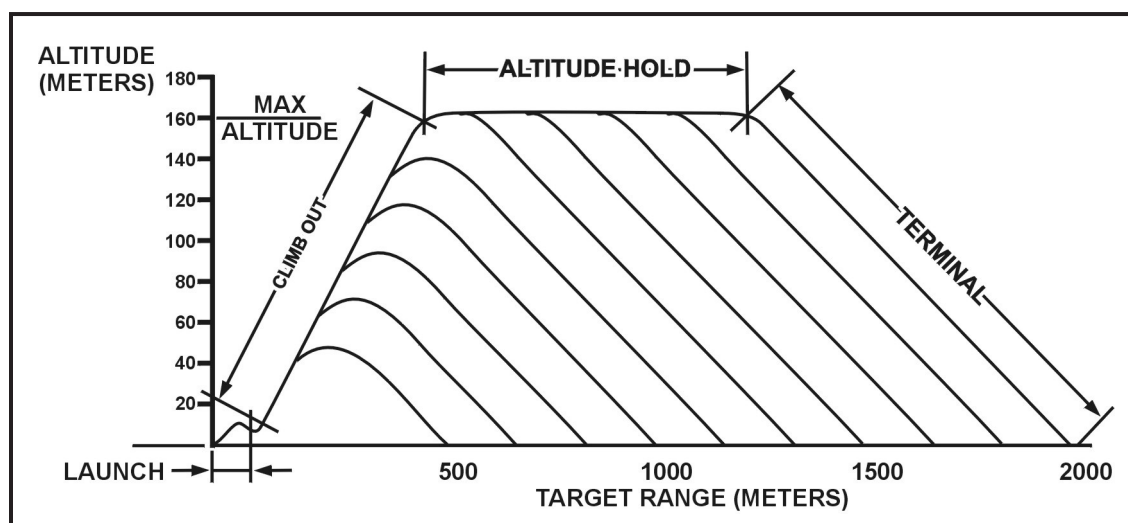


Figure 1-27. Top attack flight path.

## DIRECT ATTACK MODE

1-54. The direct attack mode can be selected only after seeker cooldown and before lock-on. The gunner pushes the attack select (ATTK SEL) switch on the right handgrip to change attack modes. In the direct attack mode, the missile flies on a more direct path to the target. The missile impacts and detonates on the side (front, rear, or flank) of the target (Figure 1-28). The minimum engagement distance is 65 meters.

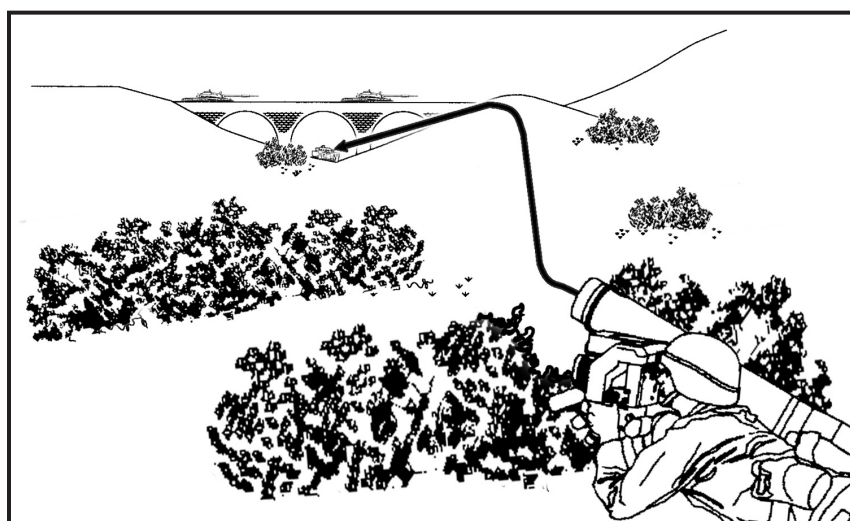


Figure 1-28. Direct attack mode.

1-55. The exact profile of the missile flight path shown in a general configuration in Figure 1-29 depends on the range to the target and is determined automatically by the missile's onboard software. With a 2,000-meter target, the missile reaches a height of about 60 meters above the battlefield. This path allows the missile to reach a target under a protective structure.

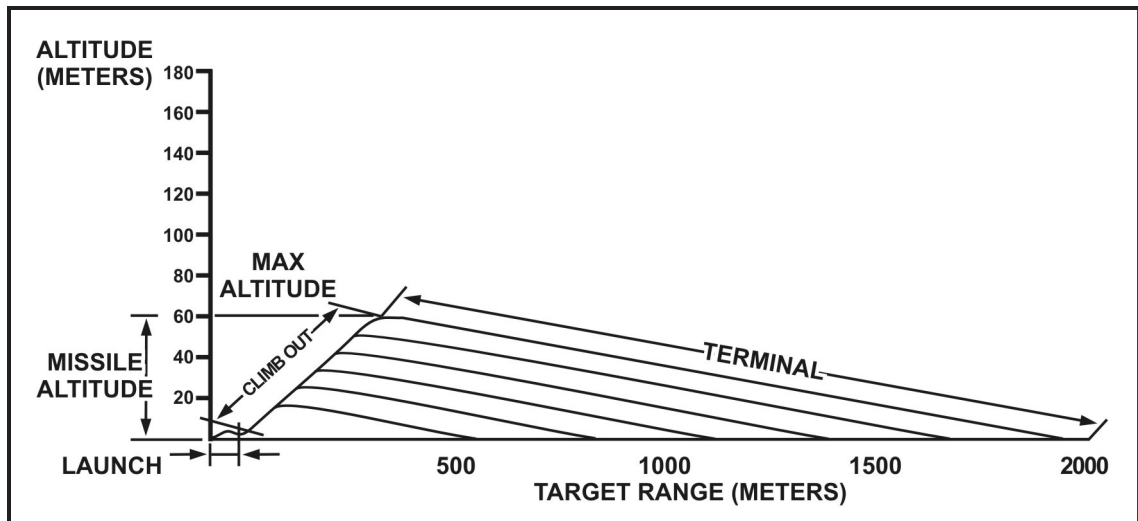


Figure 1-29. Direct attack flight path.



## Chapter 2

# CONTROLS AND OPERATION

This chapter is an overview of the Javelin's controls and indicators, operation of the Javelin, and CLU display indicators.

### CONTROLS AND INDICATORS

2-1. The Javelin controls allow the gunner to perform and monitor all operations. The controls are located on the handgrips except for the diopter adjust ring and the power switch.

#### DIOPTER ADJUST RING

2-2. The diopter adjust ring is located on the CLU eyepiece assembly (Figure 2-1). The gunner uses the diopter adjust ring to adjust the focus of the image. Any gunner with vision correctable to 20/20 can use the CLU to see an in-focus image without using glasses. The alignment mark is located on the eyepiece. Align the number that corresponds with the adjustment. This adjustment is constant on all CLUs.

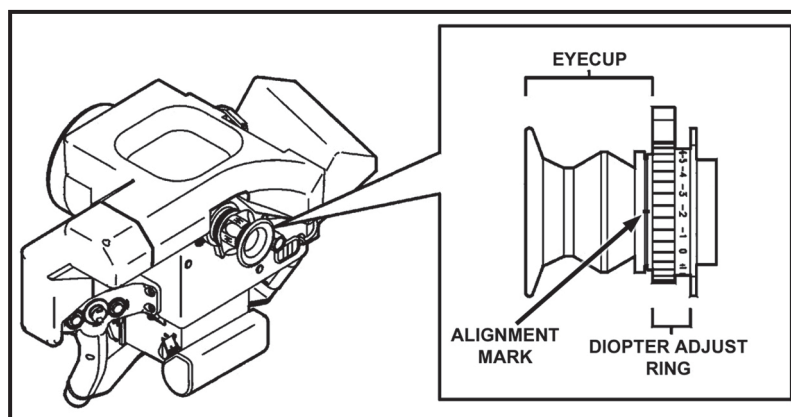
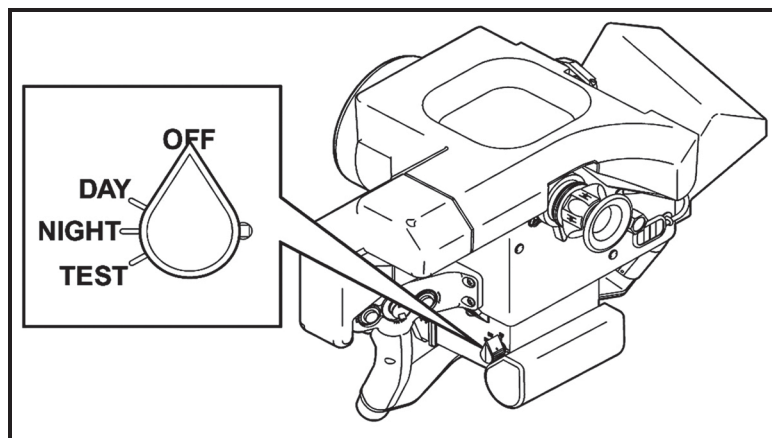


Figure 2-1. Diopter adjust ring.

#### POWER SWITCH

2-3. The power switch is a rotary switch located on the lower rear corner of the left-hand side of the CLU main housing (Figure 2-2). The power switch controls the Javelin's mode of operation and each position brings different components of the Javelin into operation. The power switch has four positions: OFF, DAY, NIGHT, and TEST.



**Figure 2-2. Power switch positions.**

### **OFF Position**

2-4. The Javelin is in the OFF mode when the power switch is in the OFF position. In this mode, no battery power is applied to the Javelin. The day field-of-view (FOV) can be used for surveillance and target detection, but the NVS cannot be used and the seeker cannot be activated. The missile cannot be launched.

### **DAY Position**

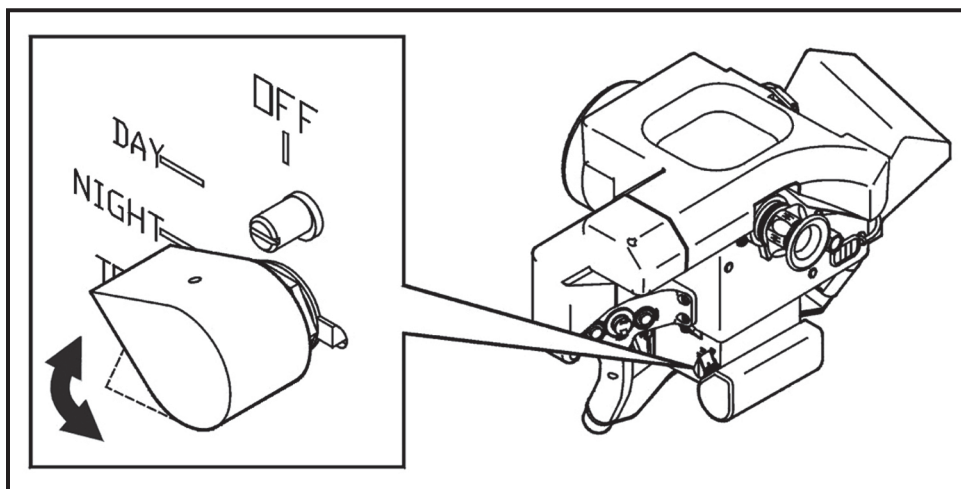
2-5. The Javelin is in the DAY mode when the power switch is in the DAY position. In the day mode, power is applied to the CLU. In the day mode, there is a day FOV but no NVS.

### **NIGHT Position**

2-6. The Javelin is in the NIGHT mode when the power switch is in the NIGHT position. This mode gives the gunner the full Javelin capability. Once the NVS is cooled down (about 2.5 to 3.5 minutes), the gunner selects WFOV, NFOV, and day FOV, which gives him the full missile capability.

### **TEST Position**

2-7. The Javelin enters a built-in test (BIT) routine (Figure 2-3) when the power switch in the TEST position. The power switch is spring-loaded when in the test position. When the gunner moves the power switch to the TEST position, it then returns to the NIGHT position upon release.



**Figure 2-3. Power switch—TEST position.**

## Return to OFF

2-8. Before turning the power switch to OFF, the gunner must leave the power switch at DAY for at least two seconds to allow the flipper mirror time to move to the power switch to the DAY position.

## LEFT HANDGRIP CONTROLS

2-9. The left handgrip (Figure 2-4) has the following controls: the filter select (FLTR) switch, the focus adjust (FOCUS) switch, the sight select (SGT SEL) switch, and the seeker trigger.

### Function of Controls

2-10. These controls are used to assist the gunner in—

- Conducting surveillance.
- Detecting, classifying, and recognizing targets.
- Determining target range.
- Activating the missile seeker.
- Reacquiring the target in seeker FOV.
- Locking the missile seeker onto the target.
- Assessing battle damage.
- Activating system countermeasures.

### Filter Select (FLTR) Switch

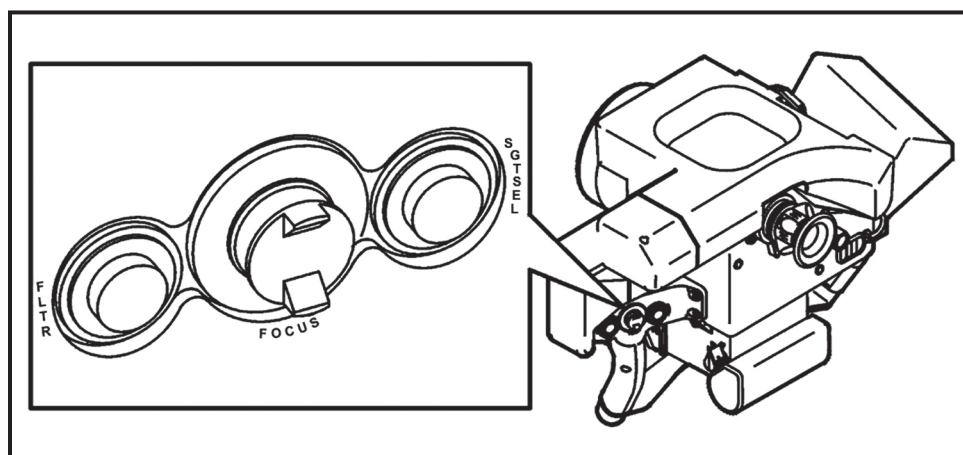
2-11. The FLTR switch (Figure 2-4) is the left switch on the left handgrip. This pushbutton switch is used to select the NVS filter; once initiated, the NVS filter prevents the enemy from detecting the CLU.

### Focus Adjust (FOCUS) Switch

2-12. The FOCUS switch (Figure 2-4) is the center switch on the left handgrip. This switch is a self-centering toggle switch used to focus the image on the CLU display during NVS (WFOV or NFOV) operation.

### Sight Select (SGT SEL) Switch

2-13. The SGT SEL switch (Figure 2-4) is the right switch on the left handgrip. This pushbutton switch is used to select day FOV, WFOV, NFOV, or seeker FOV.

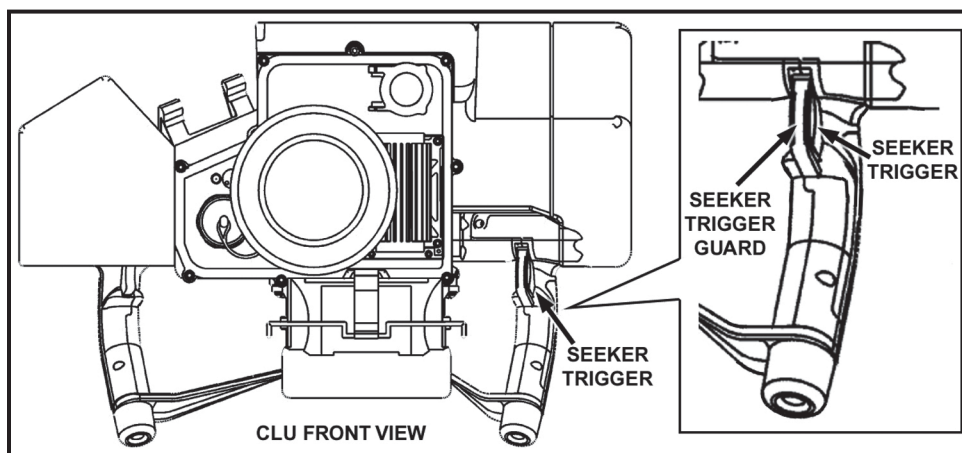


**Figure 2-4. Left handgrip controls.**



## Seeker Trigger

2-14. The seeker trigger (Figure 2-5) is the trigger located on the finger grip (front) side of the left handgrip. This trigger activates the seeker, locks the seeker onto the target, and enables the fire trigger. A trigger guard is provided to protect against accidental activation.



**Figure 2-5. Left handgrip controls—seeker trigger.**

## RIGHT HANDGRIP CONTROLS

2-15. The right handgrip has the following controls: the attack select (ATTK SEL) switch, the gate adjust/contrast and brightness (GATE ADJ/CTRS & BRT) switch, and the fire trigger (Figure 2-6). These controls allow the gunner to—

- Change the attack mode, if necessary.
- Adjust the track gates so the seeker can lock onto the target.
- Adjust NVS contrast and brightness.
- Fire the missile.

### Attack Select (ATTK SEL) Switch

2-16. The ATTK SEL switch (Figure 2-6) is the right switch on the two-switch console on the right handgrip. This pushbutton switch allows the gunner to toggle between the top attack and direct attack modes. The top attack mode is the default attack mode and is automatically selected when the seeker is activated. To change the mode of attack, the gunner must be in the seeker FOV.

### Gate Adjust/Contrast and Brightness (GATE ADJ/CTRS & BRT) Switch

2-17. The GATE ADJ/CTRS & BRT switch (Figure 2-6) is the left switch of the two-switch console on the right handgrip. This self-centering switch moves up, down, left, and right. This switch serves two functions depending on whether the CLU display image is from the NVS or the seeker.

### Night Vision Sight

2-18. When a CLU image is displayed using the NVS (WFOV or NFOV), the gunner uses the GATE ADJ/CTRS & BRT switch to adjust the contrast and brightness of the CLU display image. When the NVS first comes up, both the brightness and contrast are electronically adjusted so that they require minimal adjustment by the gunner.

### Brightness

2-19. Brightness is adjusted by moving the GATE ADJ/CTRS & BRT switch vertically (up and down).



### *Contrast*

2-20. Contrast is adjusted by moving the GATE ADJ/CTRS & BRT switch horizontally (left and right).

### *Seeker*

2-21. When the CLU display shows the seeker (Figure 2-7) FOV, the GATE ADJ/CTRS & BRT switch is used to adjust the size of the track gates (the track gates are the four corners of the open-sided box shown in the seeker FOV).

### *UP and DOWN*

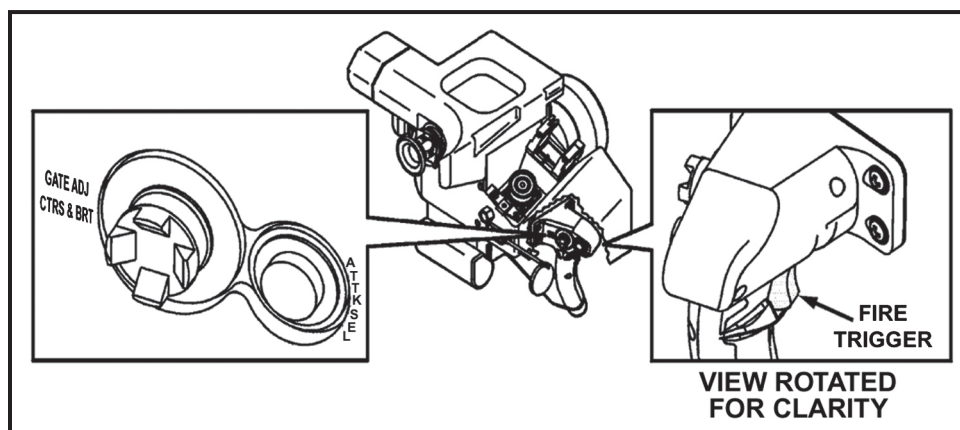
2-22. UP moves the track gates apart vertically; DOWN moves the track gates together vertically.

### *LEFT and RIGHT*

2-23. LEFT moves the track gates together horizontally; RIGHT moves the track gates apart horizontally.

### **Fire Trigger**

2-24. The fire trigger (Figure 2-6) is on the front side of the right handgrip at the index finger level. When the gunner locks the missile onto the target, he squeezes and holds the seeker trigger, and then squeezes the fire trigger to launch the missile.



**Figure 2-6. Right handgrip controls.**

## COMMAND LAUNCH UNIT STATUS INDICATORS

2-25. The CLU status (icon) indicators that appear around the CLU display are never on at the same time during normal operation. The gunner observes the status indicators by looking into the eyepiece. These indicators, coded in colors of green, amber, or red, identify Javelin operational modes, conditions, and malfunctions.

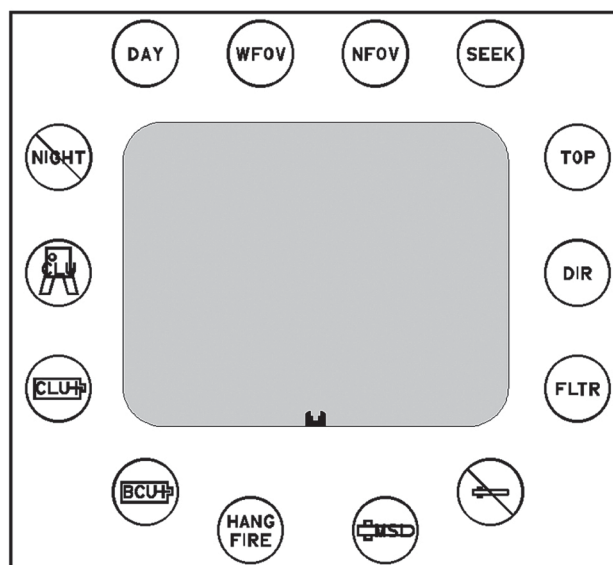


Figure 2-7. Command launch unit display indicators.

### GREEN STATUS INDICATORS

2-26. Green indicators (Figure 2-8) signify that the monitored function is in satisfactory condition and that it is okay to proceed with normal operations.

#### Day (DAY) Indicator

2-27. The DAY indicator is located in the upper left corner of the CLU display. It lights up when the power switch is in the day or night position.

#### Wide Field-of-View (WFOV) Indicator

2-28. The WFOV indicator is located on the upper left side of the CLU display. A steady light indicates that the CLU is in WFOV, and a flashing light indicates that the NVS has reached a focus limit.

#### Narrow Field-of-View (NFOV) Indicator

2-29. The NFOV indicator is located on the upper right side of the CLU display. A steady light indicates that the CLU is in NFOV, and a flashing light indicates that the NVS has reached a focus limit.

#### Seeker (SEEK) Indicator

2-30. The SEEK indicator is located in the upper right corner of the CLU display. It lights up within 3 seconds after squeezing the seeker trigger.

### Top Attack (TOP) Indicator

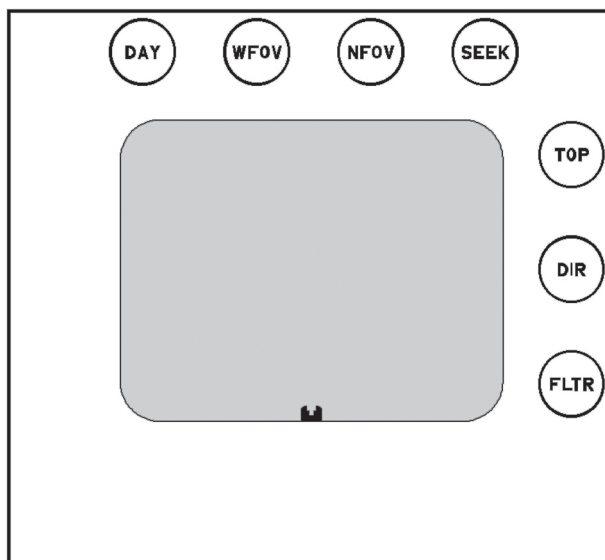
2-31. The TOP indicator is located on the upper right side of the CLU display. It lights up when the missile is in the top attack mode.

### Direct Attack (DIR) Indicator

2-32. The DIR indicator is located on the center right side of the CLU display. It lights up when the missile is in the direct attack mode.

### Filter (FLTR) Indicator

2-33. The FLTR indicator is located on the bottom right side of the status display. It lights up when the NVS filter is selected.



**Figure 2-8. Status indicators—green.**

### AMBER STATUS INDICATORS

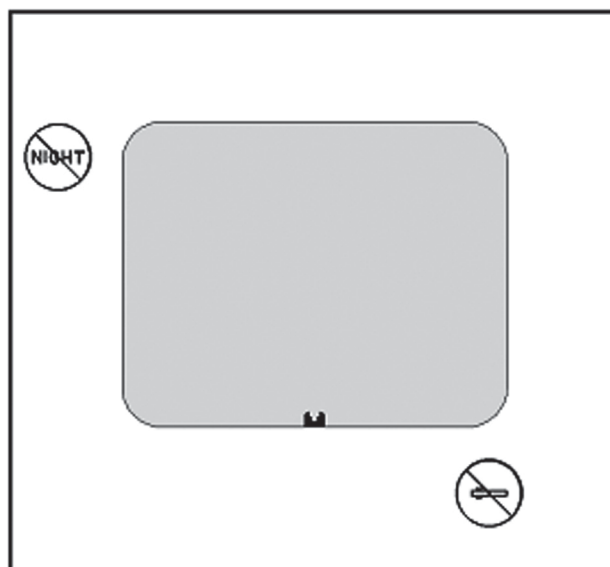
2-34. Amber status indicators (Figure 2-9) become illuminated when a marginal condition exists. It also alerts the gunner to situations where caution, a recheck, or an unexpected delay is necessary.

### NVS NOT COOL Indicator

2-35. The NVS NOT COOL indicator is located on the upper left side of the CLU display. It lights up when the CLU is in the night mode, but the DDC has not cooled to its operating temperature. The indicator goes out when the NVS is cooled to its operating temperature. If the DDC warms up again, this indicator comes back on.

### MISSILE NOT READY Indicator

2-36. The MISSILE NOT READY indicator is located on the bottom right side of the CLU display. A steady light indicates that the missile flight information is not downloaded from the CLU, missile BIT is not complete, or seeker is not cooled; a flashing light indicates that the missile electronics are close to overheating. The missile shuts down within 30 seconds after the flashing starts.



**Figure 2-9. Status indicators—amber.**

## **RED STATUS INDICATORS**

2-37. There are two types of red indicators (Figure 2-10). A flashing red indicator warns the gunner of an emergency condition where action must be taken. A solid red indicator tells the gunner that the Javelin is inoperative and a successful missile launch is not possible until corrective action is taken.

### **MISSILE BIT FAILURE Indicator**

2-38. The MISSILE BIT FAILURE indicator is located on the bottom right side of the CLU display. A steady light indicates that the missile BIT has detected a failure in the missile, and a flashing light indicates a misfire when the gunner squeezes the fire trigger and the missile does not launch.

### **HANGFIRE Indicator**

2-39. The HANGFIRE indicator is located on the bottom left side of the CLU display. The HANGFIRE indicator flashes to indicate a missile hangfire when the gunner squeezes the fire trigger and the missile does not launch.

### **BCU Indicator**

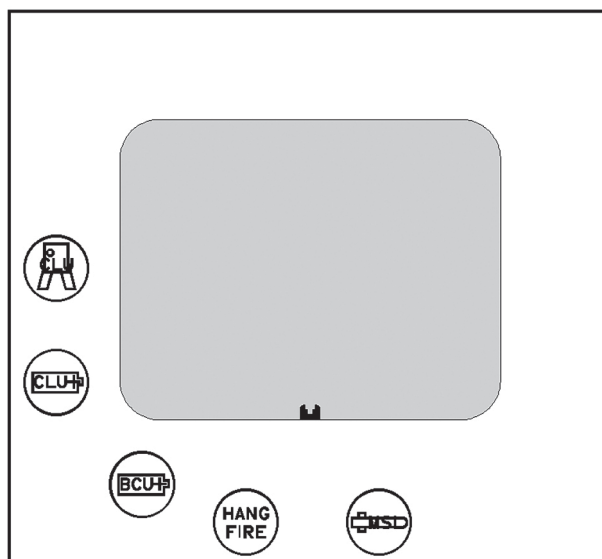
2-40. The BCU indicator is located on the bottom left side of the CLU display. After seeker activation, the BCU indicator flashes to indicate that the BCU has about 30 seconds of operating time remaining, and it illuminates solid red when the BCU is spent.

### **CLU BATTERY Indicator**

2-41. The CLU BATTERY indicator is located on the bottom left side of the CLU display. The indicator lights up to indicate that the CLU battery has about 5 minutes of operating time remaining.

### **CLU BIT FAILURE Indicator**

2-42. The CLU BIT FAILURE indicator is located on the center left side of the CLU display. The CLU BIT FAILURE light comes ON when the CLU has failed an automatic BIT.



**Figure 2-10. Status indicators—red.**

## **COMMAND LAUNCH UNIT DISPLAY INDICATORS**

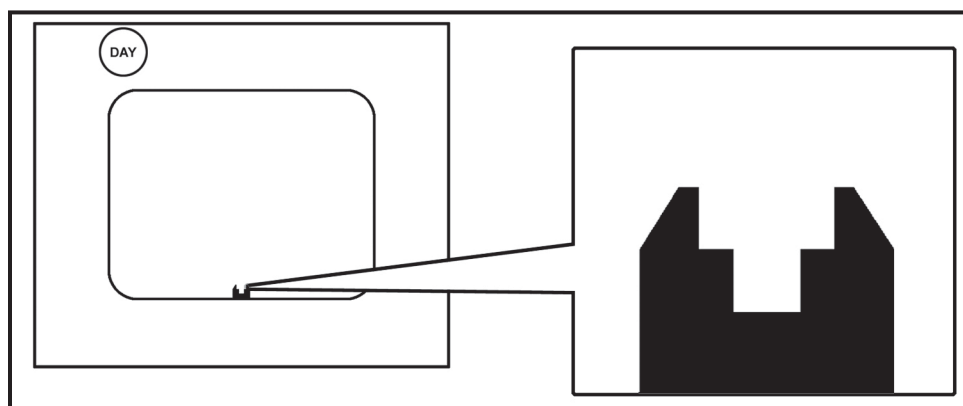
2-43. The CLU display indicators include stadia, reticles, track gates, and crosshairs.

### **STADIA**

2-44. Stadia are seen in all CLU fields of view. They change their appearance, size and location according to the FOV selected. The CLU has three different stadia for each of the three CLU fields of view. The day FOV stadia are seen in all FOVs, but are used only in day FOV. The WFOV and NFOV stadia are present only in their respective fields of view.

### **Day Field-of-View Stadia**

2-45. Day FOV stadia (Figure 2-11) are attached permanently to and appear at the bottom center of the CLU display.



**Figure 2-11. Day field-of-view stadia.**

### **Wide Field-of-View Stadia**

2-46. WFOV stadia consist of two vertical lines centered at the top of the CLU display (Figure 2- 12A). The WFOV stadia are visible only in WFOV.

## Narrow Field-of-View Stadia

2-47. NFOV stadia also consist of two vertical lines centered at the top of the CLU display (Figure 2-12B). The NFOV stadia are visible only in NFOV.

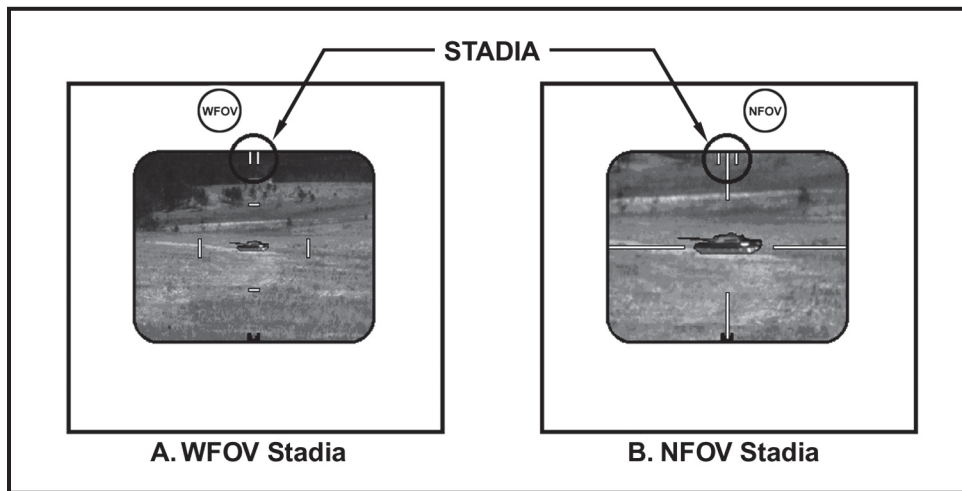


Figure 2-12. Night vision sight stadia comparisons.

## RETICLES

2-48. In WFOV and NFOV, lines appear on the CLU display, and the configuration of lines in the reticles change from WFOV to NFOV, which allows the gunner to identify the FOV just by looking at the display (Figure 2-13).

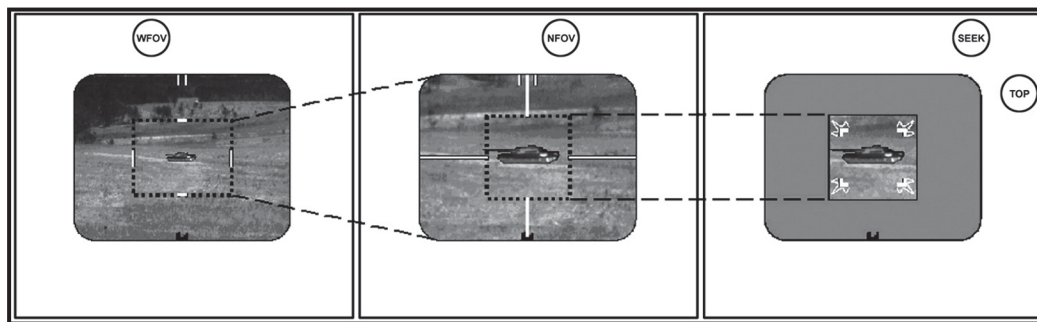
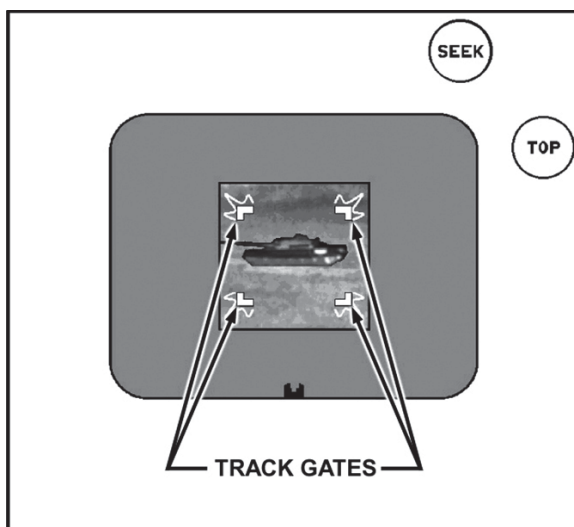


Figure 2-13. Reticle area versus field-of-view change.

## TRACK GATES

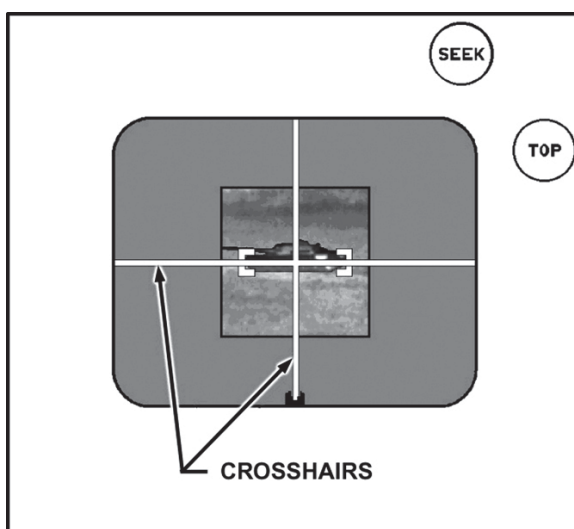
2-49. The track gates (Figure 2-14) are used by the gunner to lock the seeker on target. The gunner activates the seeker and the track gates appear and flash in the CLU display. The track gates are a visual indication the seeker is active but not locked on the target.



**Figure 2-14. Track gates.**

## CROSSHAIRS

2-50. The gunner uses the crosshairs (Figure 2-15) to designate the center of mass, which the seeker locks on. The crosshairs first appear and are flashing when the gunner squeezes and holds the seeker trigger. After the seeker locks on the target, the track gates and crosshairs become solid.



**Figure 2-15. Crosshairs.**

## PREPARATION FOR FIRING

2-51. During preparation, the gunner performs a BIT, inspects the round, and prepares to fire. There are seven steps in preparing the Javelin for firing:

- (1) Prepare the Javelin components.
  - Place the round on the ground with the flat sides of the end caps down.
  - Place the carry bag on the ground on the left side of the round.
- (2) Remove the CLU from the carry bag.
  - Open the carry bag.
  - Grasp the CLU by the handgrip and remove it from the carry bag.

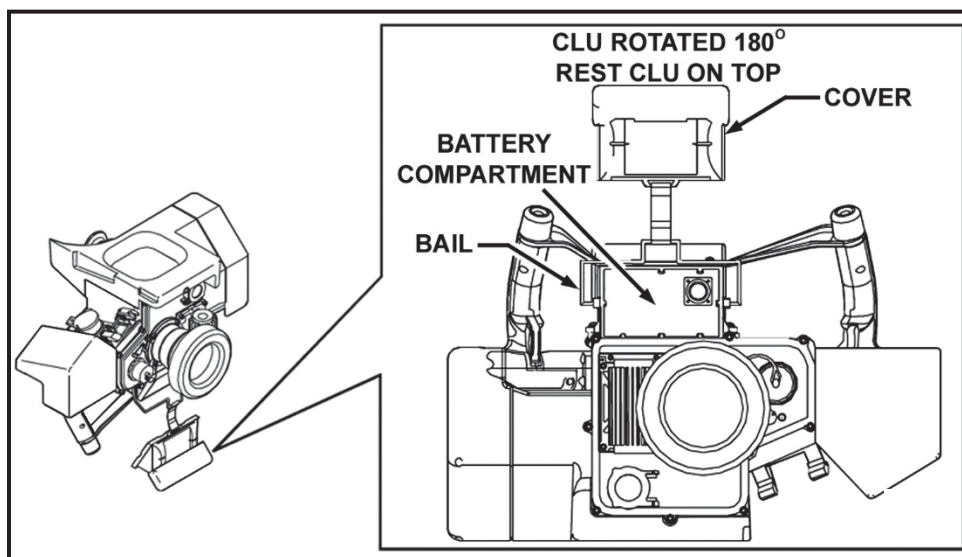
(3) Install the CLU battery (Figure 2-16).

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**NOTE:** The battery compartment is located on the bottom of the CLU.

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- Turn the CLU 180 degrees to reveal the battery compartment.
- The battery compartment cover is held in place by a wire bail. Detach and move the wire bail cover out of the way.
- The compartment is equipped with a battery connector. This connector mates with the corresponding connector on the battery. Align the two connectors and attach.
- Replace the battery compartment cover, and reattach the wire bail.

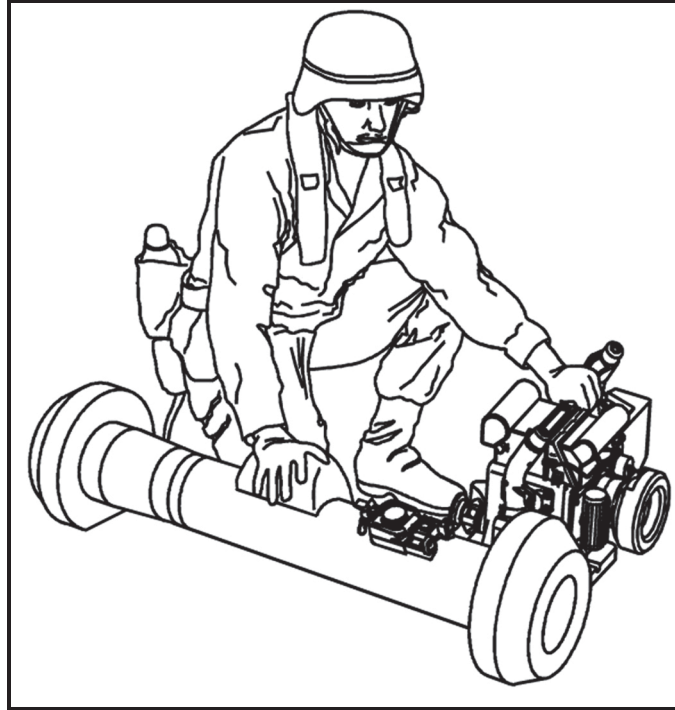


**Figure 2-16. Battery compartment.**

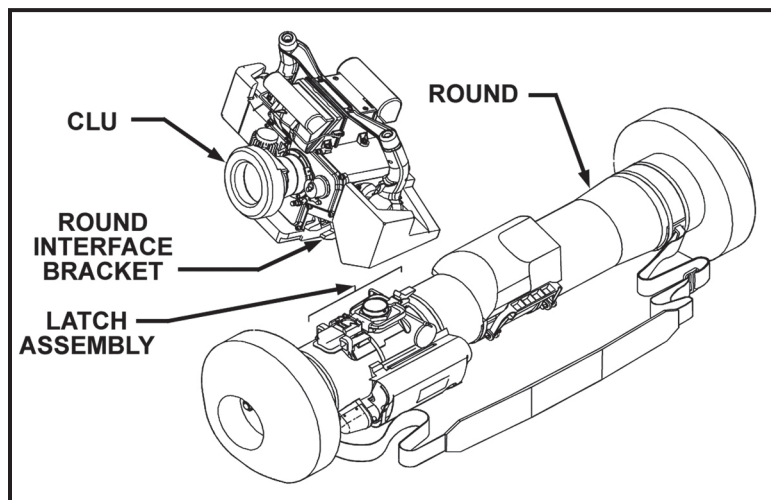
(4) Connect the CLU to the round (Figure 2-17).

- Kneel on the left side of the round, at the forward end, facing forward.
- Remove the protective cover from the CLU and round interface connectors. Pull on the lanyard tab to secure the protective cover against the side of the round and CLU. Position the protective covers so that they do not interfere when the CLU and round are reconnected.
- Grasp the handgrips, and lift the CLU into position over the CLU interface connector. Keep the eyecup pointed toward the aft end of the round (Figure 2-18).
- Place the round interface bracket in the round hooks.



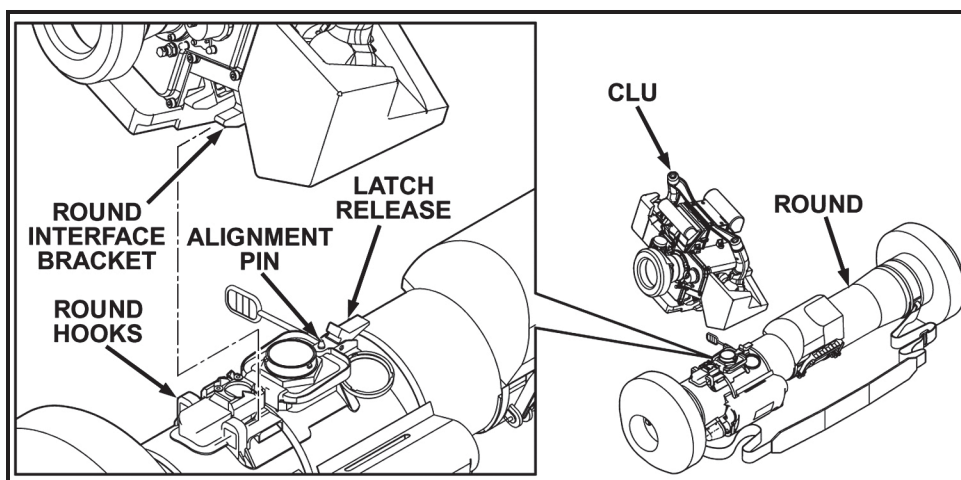


**Figure 2-17. Connect the round to the command launch unit.**



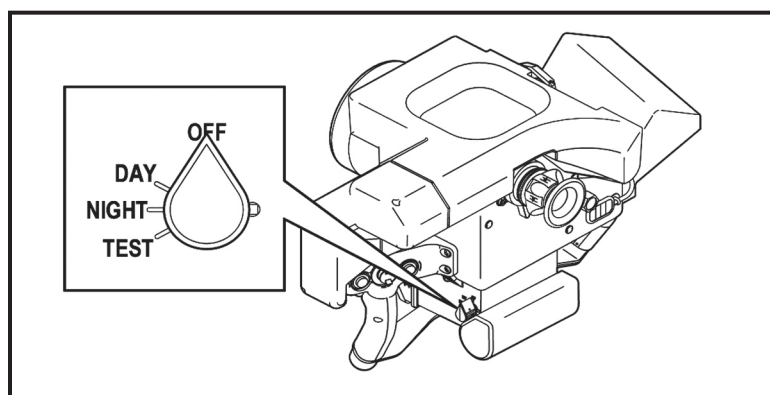
**Figure 2-18. Connect the command launch unit to the round.**

- Slide the CLU toward the latch release and press down on the CLU to engage the CLU and the round interface connectors. When the latch release snaps into place, the CLU and round are connected (Figure 2-19).
- Ensure CLU and round connectivity by rocking the CLU from side to side before attempting to pick up the Javelin.



**Figure 2-19. Connect the command launch unit to the round.**

- (5) Turn the power switch from the OFF position to the NIGHT position (Figure 2-20).



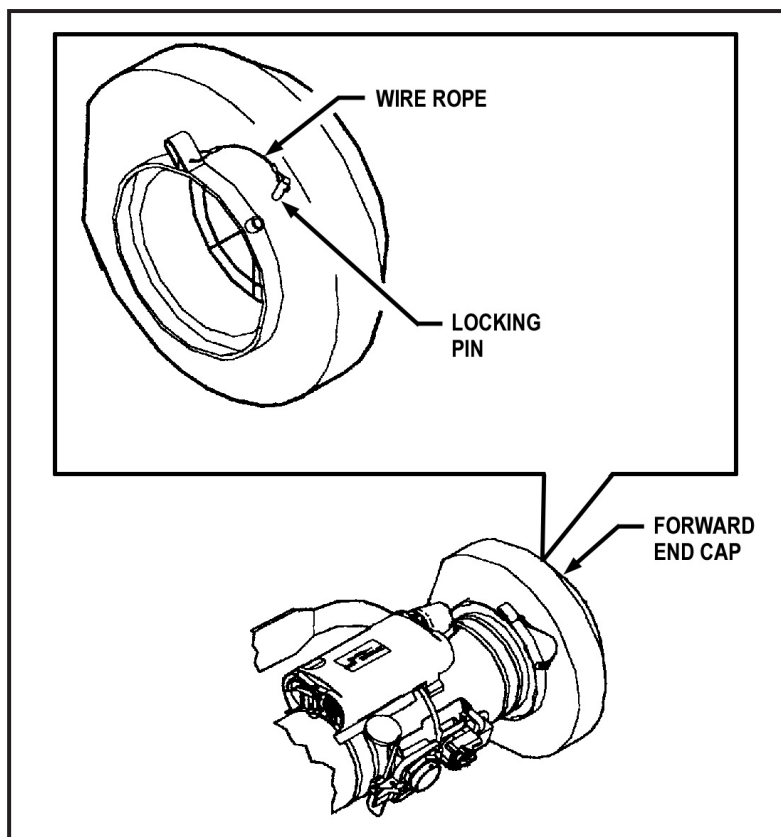
**Figure 2-20. Power switch.**

- (6) Remove the forward end cap (Figure 2-21).
- Remove the locking pin from the forward end cap by pulling straight up on the wire rope.
  - Using the left hand, turn the forward end cap latch release counterclockwise.
  - Grasp the handgrip with the right hand and lift the front end of the Javelin enough to raise the forward end cap off the ground.
  - Slide the forward end cap off the round. If the forward end cap does not come off press the manual release button until the hissing stops. Set the open end of the round on the forward end cap to prevent dirt and debris from obstructing the seeker. When the forward end cap is removed, the gunner must use extreme caution not to damage the seeker or allow foreign material to come in contact with the seeker.

### CAUTION

With the forward end cap removed, the seeker is exposed. Use extreme caution when tipping the Javelin forward to ensure no foreign material comes in contact with the seeker.

- Inspect the open end of the round for dirt and foreign material. Remove any dirt or foreign material that is present.



**Figure 2-21. Remove the forward end cap.**

- (7) Open the lens covers. Ensure the daysight and NVS lens covers are completely open.

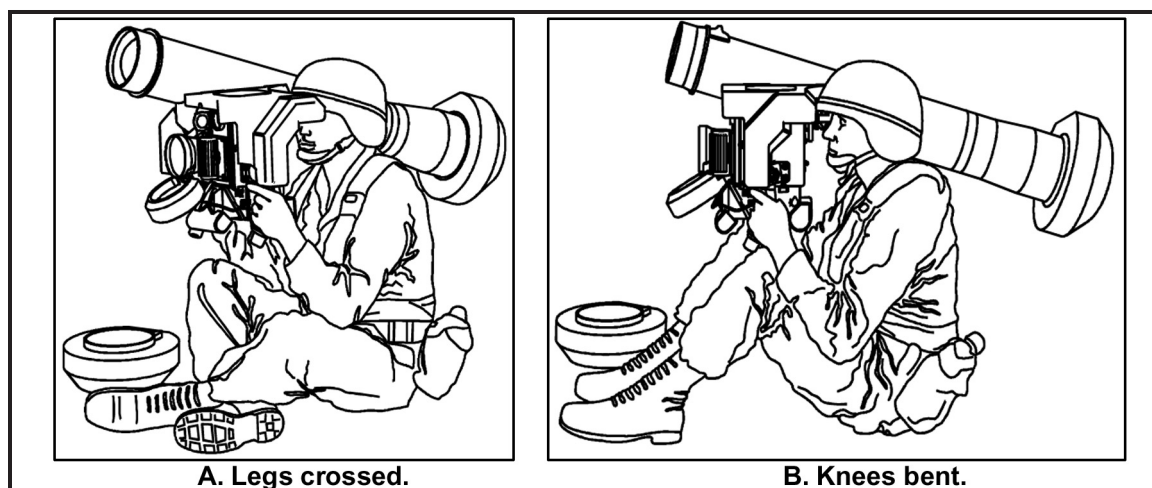
## FIRING POSITIONS

2-52. Firing positions for the Javelin include: sitting (bent knees or legs crossed), the kneeling (using one knee or both knees), standing supported, and the prone supported.

### SITTING POSITION

2-53. To fire the Javelin from the sitting position—

- (1) Sit on the left side of the Javelin facing the direction of fire.
- (2) Check the backblast area.
- (3) Grasp the left handgrip of the CLU with the left hand. Place the right hand under the round near the shoulder pad.
- (4) Lift the Javelin in a single, smooth motion and position the shoulder pad on the right shoulder.
- (5) Assume a comfortable sitting position with legs crossed (Figure 2-22A) or knees bent (Figure 2-23B).



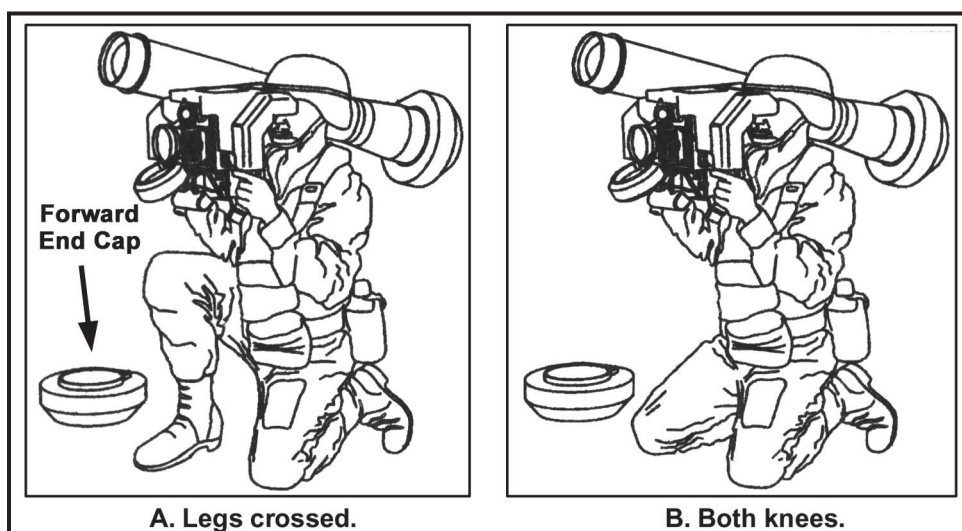
**Figure 2-22. Javelin sitting firing positions.**

- (6) Adjust the body while holding the CLU.
- (7) Check the overhead flight path between the target and the firing position by sighting along the top of the round. The missile must have a clear flight path once launched.
- (8) After assuming the sitting position, ensure the forward end cap is on the ground, in front of and slightly to the right of the right leg or foot. The gunner is prepared.

## **KNEELING POSITION**

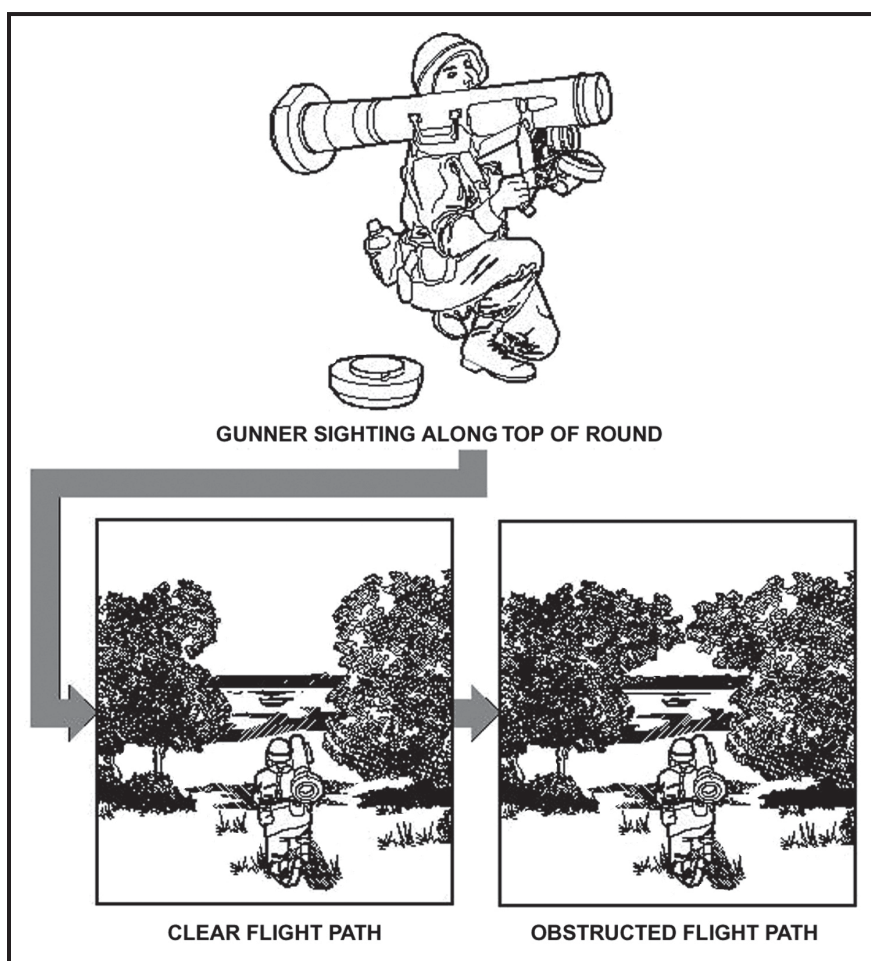
2-54. To fire the Javelin from the kneeling position—

- (1) Kneel on the left side of the Javelin facing the direction of fire.
- (2) Check the backblast area.
- (3) Grasp the left handgrip of the CLU with the left hand. Place the right hand under the round near the shoulder pad.
- (4) Lift the Javelin in a single, smooth motion and position the shoulder pad on the right shoulder.
- (5) Kneel in a comfortable position with one knee (Figure 2-23A) or both knees on the ground (Figure 2-23B).



**Figure 2-23. Javelin kneeling firing position.**

- (6) Hold the CLU by the right handgrip and adjust the body until comfortable with the Javelin.
- (7) Check the overhead flight path between the target and the firing position by sighting along the top of the round. The missile must have a clear flight path once launched (Figure 2-24).



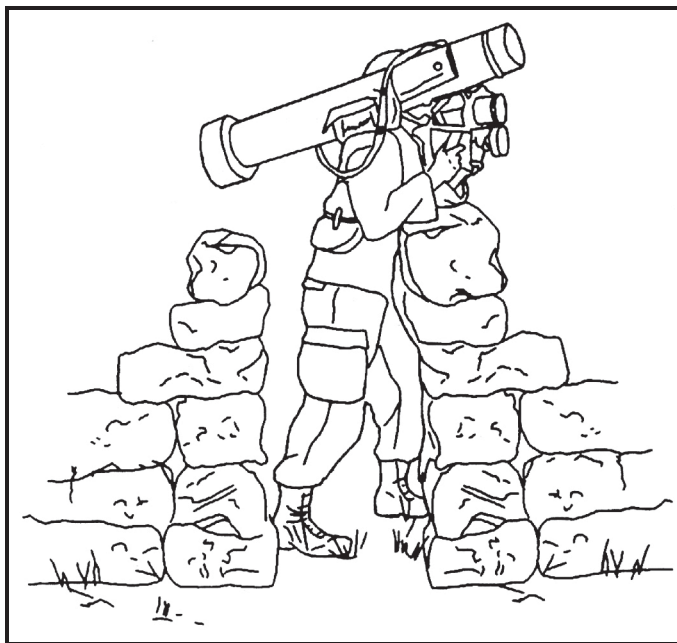
**Figure 2-24. Gunner sights along the top of the round for obstructions.**

- (8) After assuming the kneeling position, ensure the forward end cap is on the ground, in front of and slightly to the right of the right leg or foot.
- (9) The gunner is now prepared to fire the Javelin.

### **STANDING SUPPORTED POSITION**

2-55. To fire the Javelin from the standing supported position—

- (1) Stand on the left side of the Javelin facing the direction of fire. Take up a kneeling position with the right knee on the ground.
- (2) Check the backblast area.
- (3) Grasp the left handgrip of the CLU with the left hand. Place the right hand under the round nearest the shoulder pad.
- (4) Lift the Javelin in a single, smooth motion and position the shoulder pad on the right shoulder.
- (5) From this one knee position, stand up keeping the back straight and the weight balanced. The gunner keeps his balance by standing with the legs spread a comfortable distance apart (Figure 2-25).



**Figure 2-25. Standing supported firing position.**

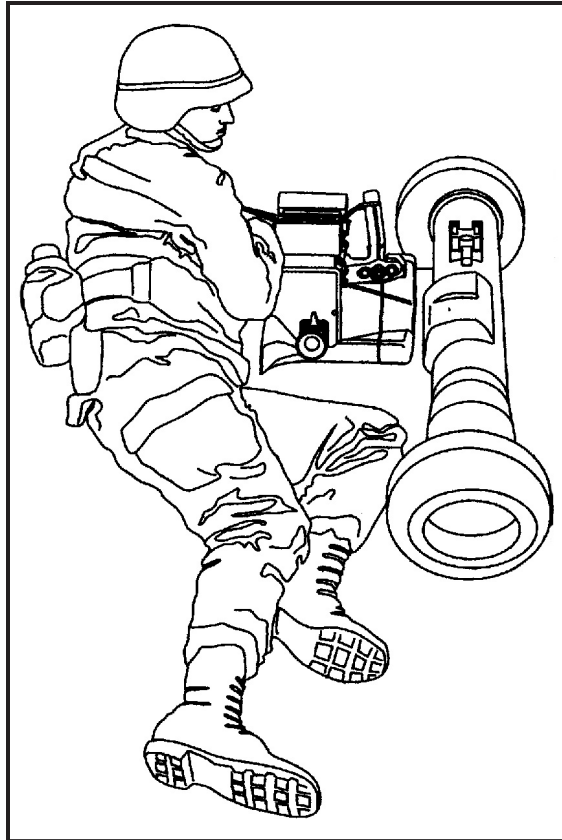
- (6) Move the right hand to the right handgrip of the CLU. Place the elbows on the edge or rim of the fighting position or other steady feature to provide support.
- (7) Adjust the body until the Javelin feels comfortable.
- (8) Check the overhead flight path between the target and the firing position by sighting along the top of the round. The missile must have a clear flight path once launched.
- (9) After assuming a firing position, ensure that the forward end cap is on the ground and slightly to the right of the right leg or foot. The gunner is now prepared to fire the Javelin.

## **PRONE SUPPORTED POSITION**

2-56. To fire the Javelin from the prone supported position—

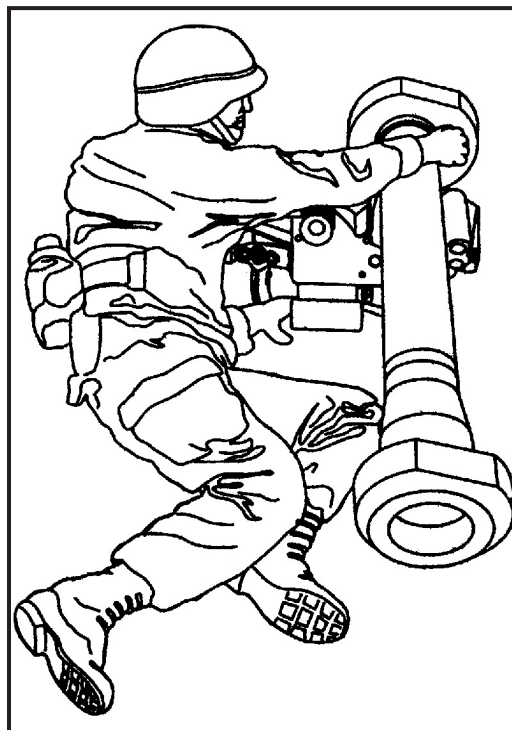
- (1) Set the round on the ground with the flat sides of the end caps face down. The CLU interface connector and latch assembly should be face up.
- (2) Ensure the round points toward the target area.
- (3) Place the carry bag (with CLU) on the left side of the round by the forward end.
- (4) Lay on the left side along the left side of the round next to the carry bag (Figure 2-26). Maintain a low profile to limit observation of movement.
- (5) Remove the CLU from the carry bag.
- (6) Turn the power switch to the NIGHT position.
- (7) Connect the CLU to the round.





**Figure 2-26. Preparing to connect the command launch unit.**

(8) Remove the forward end cap (Figure 2-27).



**Figure 2-27. Remove the forward end cap.**

### CAUTION

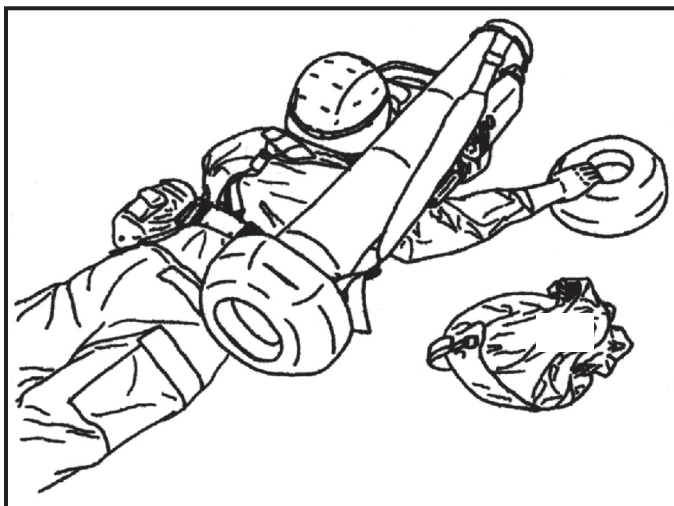
With the forward end cap removed, the seeker is exposed. Use extreme caution when tipping the Javelin forward to ensure no foreign material comes in contact with the seeker.

- (9) Place the forward end cap directly under the open end of the Javelin.
- (10) Open the NVS and daysight lens covers.
- (11) Check the backblast area. Ensure no personnel are located in the primary danger zone or caution areas.
- (12) Position the body so it is parallel with the Javelin with the left hand tightly on the left handgrip. Placing the left hand on left handgrip helps guide the Javelin and maintain control. The right shoulder should be just behind the shoulder pad to balance the weight.
- (13) The gunner tilts his body and the Javelin to the left side and, at the same time, reaches out with the right hand to secure the forward end cap (Figure 2-28).

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**NOTE:** The forward end cap supports the Javelin's weight when in the prone position.

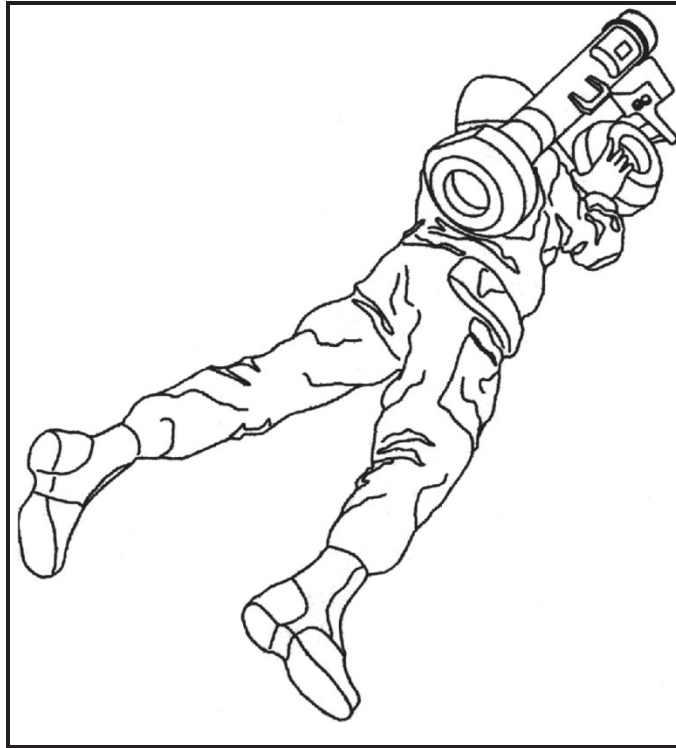
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**Figure 2-28. Reaching for forward end cap.**

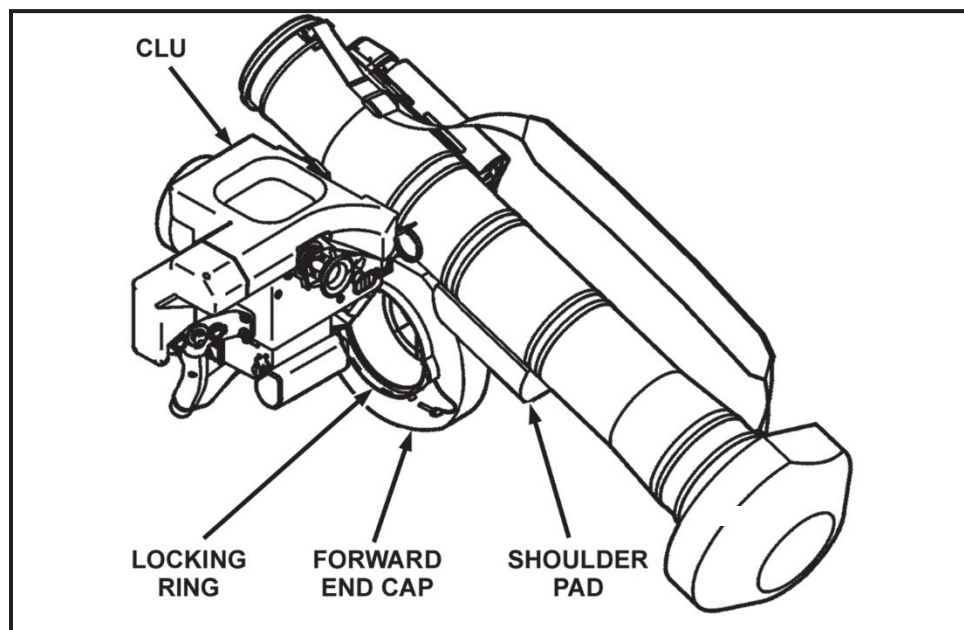
- (14) Grasp the forward end cap; hold it with the inside of the forward end cap facing toward the CLU and the flat side of the forward end cap facing up.
- (15) Place the flat side of the forward end cap against the round shoulder pad (Figure 2-29).





**Figure 2-29. Placing end cap.**

- (16) Slide the forward end cap forward until the forward end cap locking ring contacts the shock absorber on the battery compartment. This wedges the forward end cap into position (Figure 2-30).



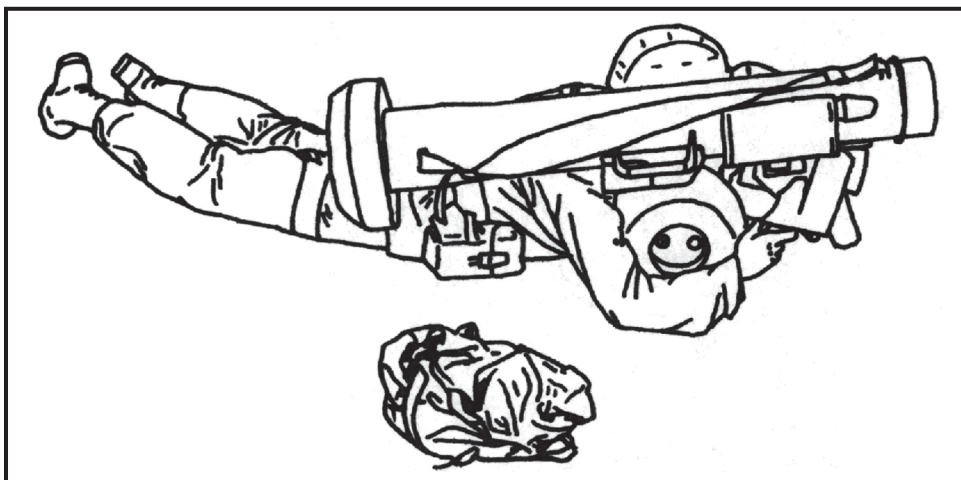
**Figure 2-30. Placement of forward end cap in prone position.**

- (17) Slowly lower the Javelin until it rests on the forward end cap. Slide the body forward so the right shoulder is against the forward end cap.

## PRONE SUPPORTED POSITION CHECK

2-57. To check the prone supported position—

- (1) Ensure reaching the right handgrip switches is possible and easy to operate.
- (2) Ensure the Javelin is supported by the forward end cap and is not resting on the shoulder (Figure 2-31).



**Figure 2-31. Prone supported firing position.**

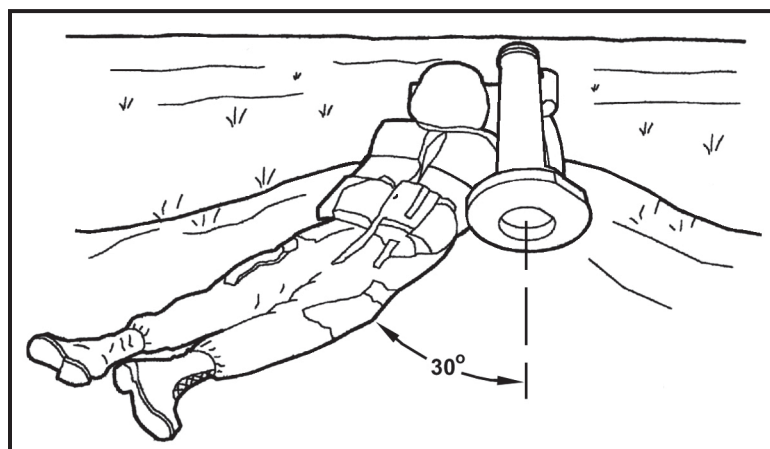
- (3) Pull the Javelin tightly into the body until the forward end cap fits against the right shoulder.

### WARNINGS

**1. Injury will occur if the body is extended into the backblast area. If injured, seek medical help immediately.**

**2. Keep body at a 30-degree angle away from the round when firing from the prone position.**

- (4) Place the body at a 30-degree angle to the length of the round (intended direction of fire) to prevent the legs from extending into the backblast area (Figure 2-32).



**Figure 2-32. Correct prone body position.**

- (5) Check the overhead flight path between the target and the firing position by sighting along the top of the round. The missile must have a clear flight path once launched.
- (6) The gunner is now prepared to fire the Javelin.

## RESTORE TO CARRYING CONFIGURATION

2-58. To restore the Javelin to the carrying configuration, the gunner turns the power switch to the OFF position, places the Javelin on the ground, closes the lens cover, replaces the forward end cap, and disconnects the CLU from the round.

### CAUTION

With the forward end cap removed, the seeker is exposed. Use extreme caution when tipping the Javelin forward to ensure that no foreign material comes in contact with the seeker. Ensure that the LTA is clear of debris before reinstalling the forward end cap.

2-59. If the seeker has been activated, the gunner replaces the BCU by installing a new one, and places the CLU in the carry bag.

## TURN THE POWER SWITCH TO OFF

2-60. The gunner turns the power switch to the DAY position and waits for the flipper mirror to switch to the day sight position (about 2 seconds), then he turns the power switch to OFF (Figure 2-33).

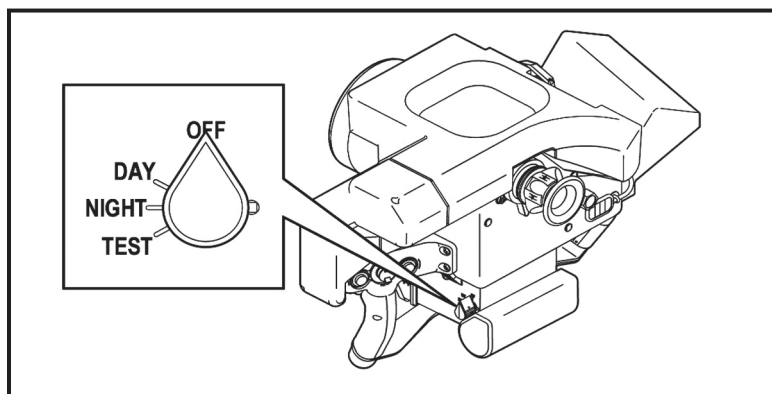


Figure 2-33. Power switch OFF position.

## PLACE THE JAVELIN ON THE GROUND

2-61. When placing the Javelin on the ground, rotate the Javelin so the round rests on the ground and the handgrips of the CLU are pointing skyward.

### CAUTION

With the forward end cap removed, the seeker is exposed. Use extreme caution when tipping the Javelin forward to ensure that no foreign material comes in contact with the seeker.

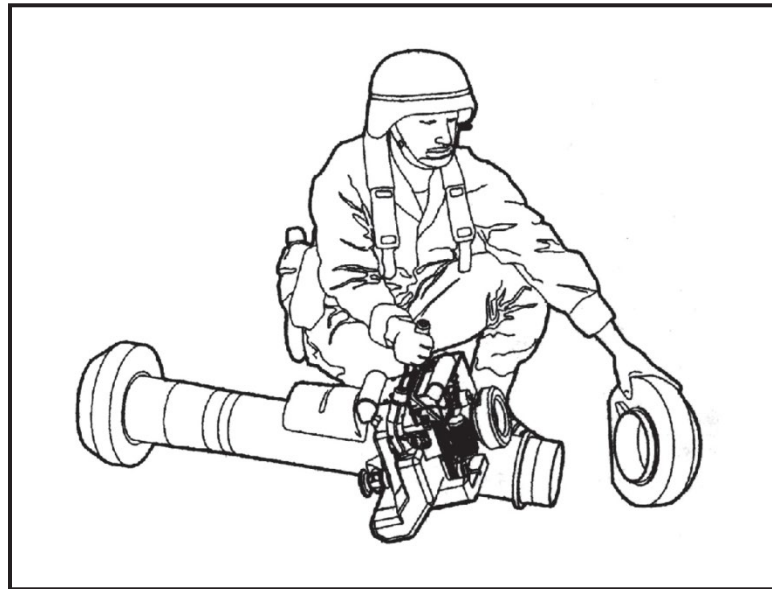
## CLOSE THE COMMAND LAUNCH UNIT LENS COVERS

2-62. Close the DAY sight and NVS lens cover. Ensure the lens covers are firmly seated in place.

## REPLACE THE FORWARD END CAP

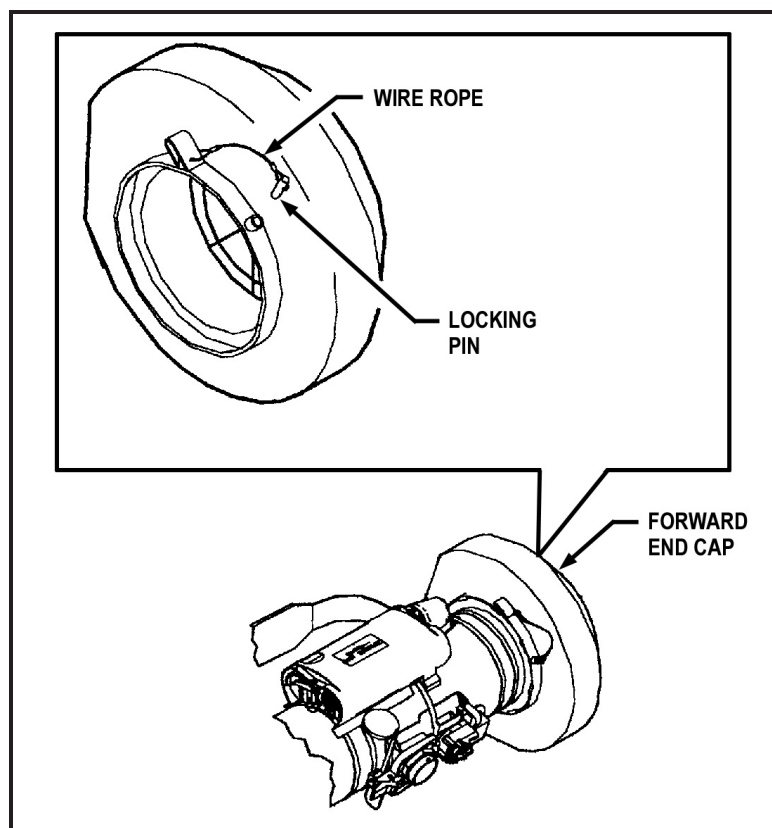
2-63. To replace the forward end cap—

- (1) Grasp the handgrip with the right hand and lift the forward end of the round off the top of the forward end cap (Figure 2-34).
- (2) Check to ensure the forward end cap latch is in the open position.



**Figure 2-34. Replace forward end cap.**

- (3) Align the forward end cap latch handle with the BCU pylon.
- (4) Slide the forward end cap onto the round and turn the latch clockwise to engage the locks.
- (5) Reinstall the locking pin in the hole in the forward end cap (Figure 2-35).

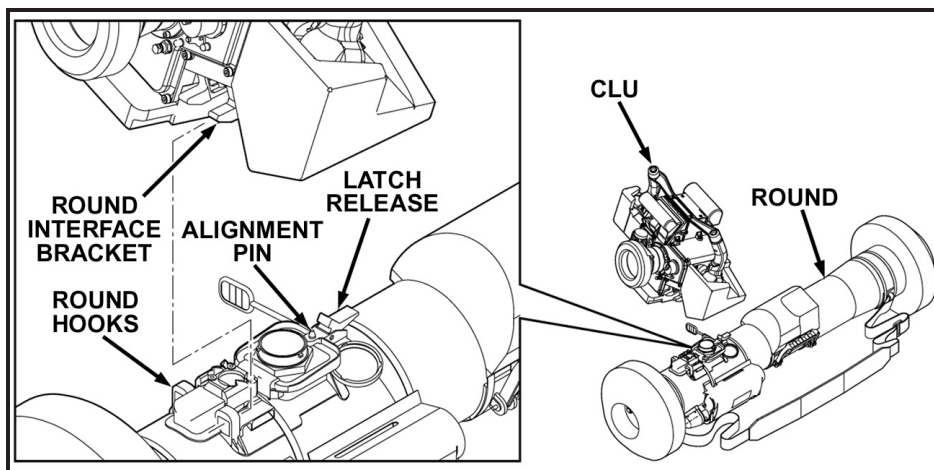


**Figure 2-35. Forward end cap locking pin.**

### **DISCONNECT THE COMMAND LAUNCH UNIT FROM THE ROUND**

2-64. To disconnect the CLU from the round—

- (1) Depress the latch release on the round (Figure 2-36).
- (2) Using the handgrip, lift up and rotate the CLU toward the forward end cap. The CLU rotates away from the round interface connector and the round hooks.
- (3) Reinstall the connector covers on the interface connectors on the CLU and on the round. If the seeker was activated, replace the BCU.
- (4) Place the CLU in the CLU carry bag with the handgrips up and the eyepiece toward the back of the carry bag.



**Figure 2-36. Disconnect the command launch unit from the round.**

### REPLACE THE BATTERY COOLANT UNIT

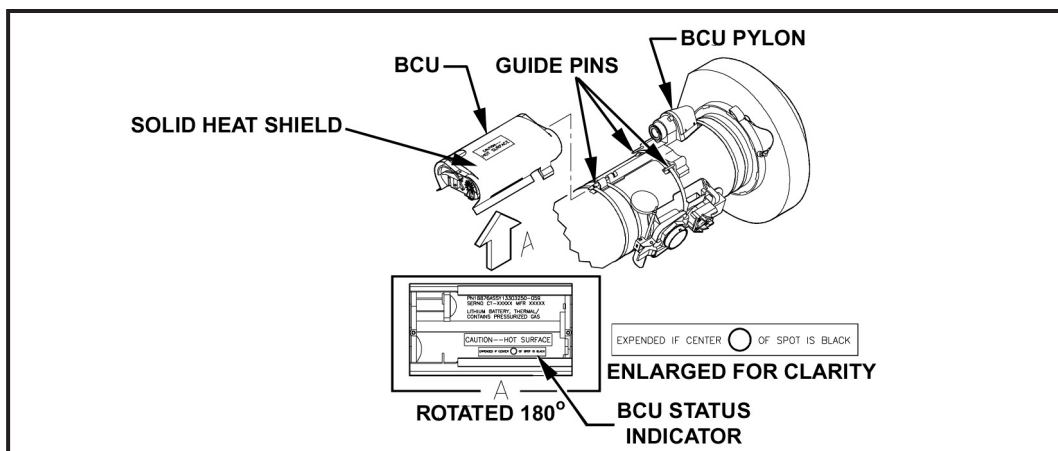
2-65. If the seeker has been activated, replace the BCU. To replace the BCU—

- (1) Remove the expended BCU.
- (2) Kneel on the left side of the round and position the Javelin on the ground so the handgrips point up.
- (3) If BCU has solid heat shield (Figure 2-37)—
  - Lift BCU latch with the thumb.
  - Slide the BCU to the rear to release it from the guide pins.
- (4) If BCU has grilled heat shield (Figure 2-38)—
  - Push down on the BCU latch with the thumb.
  - Grasp the BCU with the opposite hand and slide it to rear to release it from the guide pins.

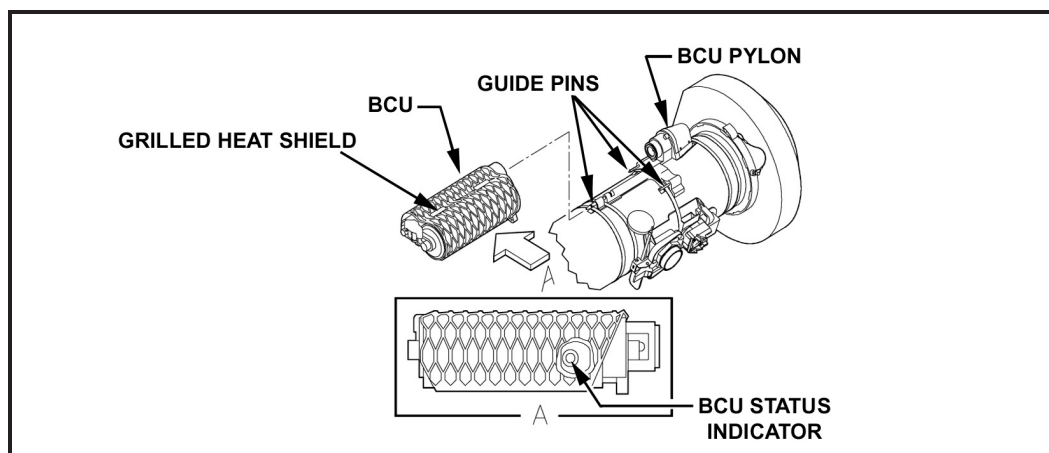
### INSTALL A NEW BATTERY COOLANT UNIT

2-66. To install a new BCU—

- (1) Remove the shipping plug that protects the internal gas bottle.
- (2) Inspect BCU status indicator to ensure the replacement BCU is operational.
- (3) Place BCU on the round's guide pins with the catch to the rear of round, slide the BCU onto the guide pins. Ensure the BCU snaps into place.



**Figure 2-37. Old battery coolant unit.**



**Figure 2-38. New battery coolant unit.**

## **CARRYING TECHNIQUES**

2-67. Three techniques are used for carrying the Javelin. The choice is based on mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC); the situation; and the distance to be traveled.

### **TACTICAL CARRY**

2-68. This technique is used when moving into position, between positions, and when enemy contact is likely (Figure 2-39).

- (1) The CLU and round are connected. Both end caps are secured to the round, and the NVS and day sight lens covers are closed to prevent damage.
- (2) The Javelin is carried on the gunner's right shoulder, balanced on the shoulder pad. The left hand holds the left handgrip, and the right hand is on top of the round.
- (3) The gunner's assigned weapon is slung across the back.
- (4) The round can be cocked to the side so the gunner is able to see. He should not attempt to move while looking through the CLU.



**Figure 2-39. Tactical carry technique.**

## SHORT-DISTANCE CARRY

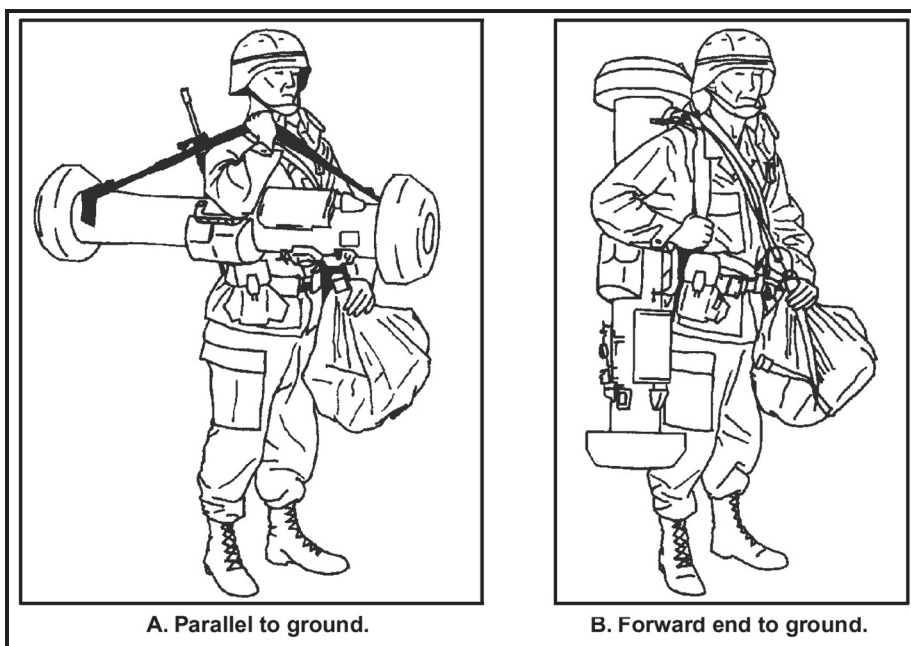
2-69. The short-distance carry technique is used when enemy contact is possible. The rifle is slung over the gunner's left shoulder. The CLU is in the carry bag. The carry bag is carried on the gunner's left side with the shoulder strap over the left shoulder or across the chest. Using the short-distance carry technique, the round can be carried in one of two ways.

### Round Parallel to Ground

2-70. The round is carried on the gunner's right side with the shoulder strap over the right shoulder. The round is parallel to the ground, waist high with the forward end cap pointed in the direction of movement. The gunner's right hand may be placed on the shoulder strap to keep the round from swaying and to help keep the shoulder strap on the shoulder (Figure 2-40A).

### Round Forward End Pointed Down

2-71. The round is carried on the gunner's right side with the shoulder strap over the right shoulder. The forward end cap is pointed down with the round behind the right shoulder, parallel to the gunner's body. The gunner's right hand may be placed on the shoulder strap to help keep the strap on the shoulder (Figure 2-40B).



**Figure 2-40. Short-distance carry techniques.**

## LONG-DISTANCE CARRY

2-72. The long-distance carry technique is used when contact is not likely (Figure 2-41).





**Figure 2-41. Long-distance carry technique.**

### **Command Launch Unit Carry Position**

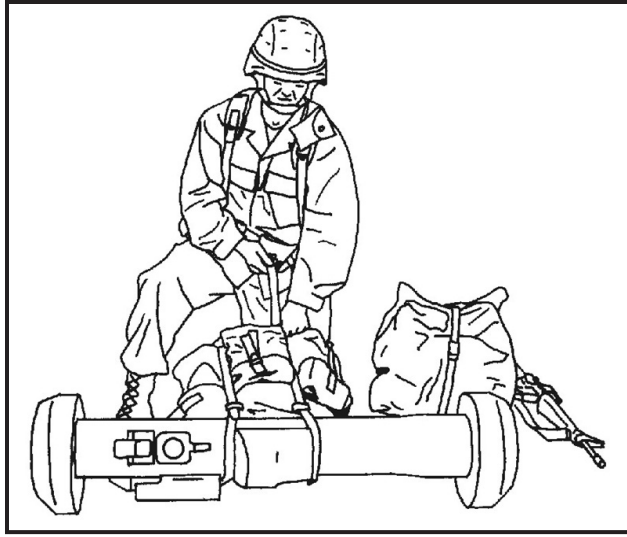
2-73. To carry the CLU—

- (1) Place the CLU in the carry bag.
- (2) Ensure the carry bag is on the gunner's left side with the shoulder strap over the left shoulder or across the chest.
- (3) Use a second strap on the carry bag to fasten the CLU to the gunner's waist. This procedure prevents the carry bag from bouncing when the gunner walks.

### **Stowing the Round on a Rucksack**

2-74. To stow the round on a rucksack—

- (1) Place the rucksack on the ground with the frame face down and the top of the pack facing away.
- (2) Locate the two long web straps extending from the top of the frame and across the front of the pack (Figure 2-42).



**Figure 2-42. Secure the round to the rucksack.**

- (3) Open the straps to form a loop at the top of the rucksack frame.
- (4) Pick up the round and slide it through the strap loops.
- (5) Make sure the BCU is facing forward to prevent damage to it when the rucksack is placed on the ground.
- (6) Tighten the straps by pulling on the ends. Continue until the straps are tight.
- (7) Place the rucksack on the back making sure the round well balanced and evenly distributed