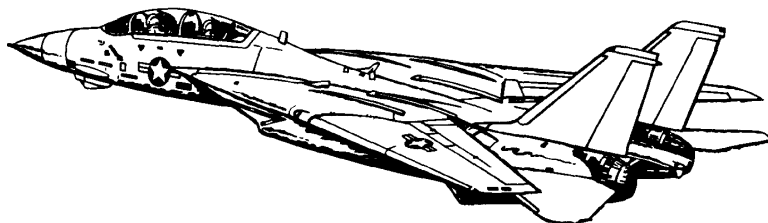


# Pocket Checklist

## F-14A/B AIRCRAFT

REV: 20210822



Procedures

Systems

AWG-9  
Radar

TCS  
LANTIRN

A/G  
Weapons

A/A  
Weapons




## Contents

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<b>1</b>	<b>PROCEDURES</b>	<b>1</b>
1.1	PILOT - PRE-START . . . . .	1
1.2	PILOT - ENGINE START . . . . .	2
1.3	PILOT - POST-START . . . . .	3
1.4	RIO - PRE-START . . . . .	5
1.5	RIO - POST-START - SHORE . . . . .	5
1.6	RIO - POST-START - CARRIER . . . . .	7
1.7	PRE-TAXI . . . . .	9
1.8	TAKEOFF - SHORE . . . . .	9
1.9	TAKEOFF - CARRIER . . . . .	10
1.10	LANDING - OVERHEAD PATTERN . . . . .	11
1.11	LANDING - CHECKLIST . . . . .	12
1.12	AIRSTART . . . . .	13
<b>2</b>	<b>SYSTEMS</b>	<b>15</b>
2.1	AFCS - SAS . . . . .	15
2.2	AFCS - AUTOPILOT . . . . .	15
2.3	APC / AUTOTHROTTLE . . . . .	17
2.4	ACLS . . . . .	17
2.5	WING-SWEEP . . . . .	17
2.6	NAVIGATION . . . . .	18
2.7	COMMUNICATION . . . . .	18
2.8	DATALINK / IFF . . . . .	18
2.9	ALR-67 RWR - OVERVIEW . . . . .	19
2.10	ALR-67 RWR - THREAT SYMBOLOGY . . . . .	21
2.11	ALE-39 COUNTERMEASURES DISPENSER . . . . .	23
2.12	ALQ-100 / ALQ-126 DECM . . . . .	23
<b>3</b>	<b>AWG-9 RADAR</b>	<b>25</b>
3.1	MAIN MODES - OVERVIEW . . . . .	25
3.2	MAIN MODES . . . . .	25
3.3	PULSE MODE - PULSE SEARCH . . . . .	26
3.4	PULSE MODE - PSTT . . . . .	27

3.5	PULSE DOPPLER MODE - PULSE DOPPLER SEARCH . . . . .	28
3.6	PULSE DOPPLER MODE - RWS . . . . .	30
3.7	PULSE DOPPLER MODE - TWS . . . . .	31
3.8	PULSE DOPPLER MODE - TWS MAN . . . . .	33
3.9	PULSE DOPPLER MODE - TWS AUTO . . . . .	34
3.10	PULSE DOPPLER MODE - PDSTT . . . . .	35
3.11	ACM MODES - OVERVIEW . . . . .	36
3.12	TID SYMBOLOGY . . . . .	37
<b>4</b>	<b>TCS / ALQ-100</b>	<b>43</b>
4.1	OVERVIEW . . . . .	43
<b>5</b>	<b>LANTIRN</b>	<b>45</b>
5.1	OVERVIEW . . . . .	45
5.2	CONTROL PANEL . . . . .	45
5.3	CONTROL STICK . . . . .	45
5.4	STARTUP . . . . .	46
5.5	DISPLAY . . . . .	46
<b>6</b>	<b>A/G WEAPONS</b>	<b>49</b>
6.1	A/G WEAPON SETTINGS - OVERVIEW . . . . .	49
6.2	SELECTIVE ORNANCE JETTISON . . . . .	50
6.3	M61 GUN . . . . .	50
6.4	FFAR / ZUNI ROCKETS . . . . .	51
6.5	UNGUIDED BOMB - CCIP . . . . .	51
6.6	UNGUIDED BOMB - CCRP . . . . .	52
6.7	LASER GUIDED BOMB . . . . .	53
6.8	TALD DECOYS . . . . .	54
<b>7</b>	<b>A/A WEAPONS</b>	<b>55</b>
7.1	M61 GUN - OVERVIEW . . . . .	55
7.2	M61 GUN - MANUAL . . . . .	55
7.3	M61 GUN - RTGS / NO RADAR . . . . .	56
7.4	M61 GUN - RTGS / RADAR . . . . .	56
7.5	AIM-9 SIDEWINDER - OVERVIEW . . . . .	57
7.6	AIM-9 SIDEWINDER - SILENT . . . . .	58
7.7	AIM-9 SIDEWINDER - RADAR . . . . .	58



7.8	AIM-7 SPARROW - OVERVIEW . . . . .	59
7.9	AIM-7 SPARROW - STT . . . . .	60
7.10	AIM-54 PHOENIX - OVERVIEW . . . . .	61
7.11	AIM-54 PHOENIX - PD-STT . . . . .	63
7.12	AIM-54 PHOENIX - TWS / MULTI . . . . .	63



## 1 PROCEDURES

## 1.1 PILOT - PRE-START

1.	Parking Break	ENGAGED
2.	Ground Power	connected
3.	Compressed Air	connected
4.	ICS	HOT MIC
5.	TO RIO	"Begin Start-Up"
6.	ICS	Comm Check
7.	MASTER TEST Selector	(a) LTS <ul style="list-style-type: none"> <li>Warning Lights ..... checked</li> <li>Caution Lights ..... checked</li> <li>Advisory Lights ..... checked</li> </ul> (b) FIRE DET/EXT <ul style="list-style-type: none"> <li>L FIRE GO ..... illuminated</li> <li>R FIRE GO ..... illuminated</li> </ul> (c) INST <ul style="list-style-type: none"> <li>RPM ..... 96%</li> <li>EGT ..... 960 C</li> <li>FF ..... 10500 pph</li> <li>AOA ..... <math>18 \pm 5</math></li> <li>Wing Sweep ..... <math>45 \pm 2.5</math></li> <li>FUEL QTY ..... <math>2000 \pm 200</math></li> <li>Oxygen QTY ..... 2 liters</li> <li>L&amp;R FF lights ..... illuminated</li> </ul> (d) OFF
8.	Ejection Seat	Armed
9.	RIO	Canopy Closed
10.	Oxygen	ON (FWD)
11.	Emergency Wing Sweep	OVERSWEEP

## 1.2 PILOT - ENGINE START

1.	<b>AIR SOURCE</b>	<b>OFF</b>
2.	<b>Hydraulics</b>	(a) <b>HYD TRANSFER PUMP</b> ..... <b>SHUTOFF</b> (b) <b>Emerg. Hyd.</b> ..... <b>AUTO (LOW)</b>
3.	<b>L&amp;R MASTER GEN</b>	<b>NORM</b>
4.	<b>RIO</b>	<i>"Ready to Start"</i>
5.	<b>Right Engine Start-Up</b>	(a) <b>Engine Crank</b> ..... <b>R</b> (b) <b>R Eng N2</b> ..... 20% (c) <b>R Throttle</b> ..... <b>IDLE</b> (d) <b>TIT</b> ..... < 890 C during start (e) <b>R GEN CAUTION</b> ..... extinguished
6.	<b>Stabilized Parameters</b>	<ul style="list-style-type: none"> <li>• <b>RPM</b> ..... 62-78%</li> <li>• <b>TIT</b> ..... approx 500 C</li> <li>• <b>Fuel Flow</b> ..... 950-1400 pph</li> <li>• <b>NOZ</b> ..... 5 (100%)</li> <li>• <b>Oil Pressure</b> ..... 25-35 psi</li> <li>• <b>Hyd Pressure</b> ..... 3000 psi</li> </ul>
7.	<b>Left Engine Start-Up</b>	(a) <b>Engine Crank</b> ..... <b>L</b> (b) <b>L Eng N2</b> ..... 20% (c) <b>L Throttle</b> ..... <b>IDLE</b> (d) <b>TIT</b> ..... < 890 C during start (e) <b>L GEN Caution</b> ..... extinguished
8.	<b>Stabilized Parameters</b>	<ul style="list-style-type: none"> <li>• <b>RPM</b> ..... 62-78%</li> <li>• <b>TIT</b> ..... approx 500 C</li> <li>• <b>Fuel Flow</b> ..... 950-1400 pph</li> <li>• <b>NOZ</b> ..... 5 (100%)</li> <li>• <b>Oil Pressure</b> ..... 25-35 psi</li> <li>• <b>Hyd Pressure</b> ..... 3000 psi</li> </ul>
9.	<b>HYD TRANSFER PUMP</b>	<b>NORM</b>
10.	<b>HYD PRESSURE</b>	3000 psi
11.	<b>AIR SOURCE</b>	<b>BOTH ENG</b>
12.	<b>Ground Power</b>	disconnected
13.	<b>Compressed Air</b>	disconnected



## 1.3 PILOT - POST-START

1.	<b>TO RIO</b>	<i>"Both Engines Running"</i>
2.	<b>Displays Control Panel</b>	<ul style="list-style-type: none"> <li>• VDI ..... <b>ON</b></li> <li>• HUD ..... <b>ON</b></li> <li>• HSD ..... <b>ON</b></li> <li>• HDS MODE ..... <b>TID</b> (monitor INS)</li> </ul>
3.	<b>RIO</b>	<b>Select Align Quality</b> <ul style="list-style-type: none"> <li>• <b>INS GO NOW:</b> shortest but least precise alignment</li> <li>• <b>INS GO COARSE:</b> does not meet Launch Criteria for AIM-7 / AIM-54</li> <li>• <b>INS GO MIN WPN LAUNCH:</b> allows AIM-7 / AIM-54 launch</li> <li>• <b>INS GO FINE</b> fine align (8 min)</li> </ul>
4.	<b>ACM Panel</b>	<ul style="list-style-type: none"> <li>• <b>GUN RATE</b> ..... as required</li> <li>• <b>SW COOL</b> ..... <b>OFF</b></li> <li>• <b>MSL PREP</b> ..... <b>OFF</b></li> <li>• <b>Missile MODE/STP</b> ..... <b>NORM</b></li> </ul>
5.	<b>Gun Rounds</b>	<b>Set</b>
6.	<b>ANTI-SKID SPOILER BK</b>	<b>OFF</b>
7.	<b>Emergency Wing Sweep</b>	(a) <b>Handle</b> ..... <b>AFT</b> (b) <b>Angle</b> ..... Verify 68 deg
8.	<b>AFCS Panel - SAS STAB AUG</b>	<ul style="list-style-type: none"> <li>• <b>PITCH</b> ..... <b>ON</b></li> <li>• <b>ROLL</b> ..... <b>ON</b></li> <li>• <b>YAW</b> ..... <b>ON</b></li> </ul>
9.	<b>WING/EXT TRANS</b>	<b>AUTO</b>
10.	<b>UHF 1 Function Selector</b>	<b>BOTH</b>
11.	<b>TACAN Function Selector</b>	<b>T/R</b>
12.	<b>ARA-63 ICLS RECEIVER</b>	<b>ON</b>

13. Radar Altimeter	(a) <b>Control Knob</b> ..... one click CW to turn on (b) <b>Display</b> ..... 6000 ft (warm up) (c) <b>Display</b> ..... 0 ft (ready)
14. Standby ADI	erect at least 2 min before T/O
15. KY-28 Crypt. Key	<b>Set</b> (refer to GROUND SETTINGS kb)
16. RIO	set D/L frequency
17. Lights	As desired

## 1.4 RIO - PRE-START

1. <b>Oxygen</b>	<b>ON (FWD)</b>
2. <b>PILOT</b>	<ul style="list-style-type: none"> <li>• <b>Ground Power</b> ..... connected</li> <li>• <b>Compressed Air</b> ..... connected</li> </ul>
3. <b>ICS</b>	Comm Check
4. <b>Lights</b>	As required
5. <b>LTS Test</b>	Coordinate with Pilot
6. <b>Ejection Seats</b>	<b>ARMED</b>
7. <b>Canopy</b>	<b>CLOSED</b>
8. <b>TO PILOT</b>	<i>"Ready to Start"</i>

## 1.5 RIO - POST-START - SHORE

1. <b>PILOT</b>	<ul style="list-style-type: none"> <li>• <b>Engines</b> ..... started</li> <li>• <b>AIR SOURCE</b> ..... BOTH ENG</li> </ul>
2. <b>INS STARTUP</b>	(a) <b>LIQUID COOLING</b> ..... <b>ON (FWD)</b> (b) <b>WCS Switch</b> ..... <b>STANDBY</b> (c) <b>IR/TV Power</b> ..... <b>STBY/IR/TV</b> (d) <b>TID/DDD</b> ..... illuminated after 40 s
3. <b>Kneeboard</b>	Retrieve Coordinates, Elevation, Magnetic Variation from GROUND SETTINGS Page

**WARNING** Input Coords **BEFORE** selecting **GND ALIGN** if using ASH

4. <b>Start INS Align</b>	(a) <b>Nav Mode</b> ..... <b>GND ALIGN</b> (b) <b>CAP</b> <ul style="list-style-type: none"> <li>• <b>Category</b> ..... <b>NAV</b></li> <li>• <b>MESSAGE</b> ..... <b>OWN AC</b></li> </ul> (c) <b>Keyboard</b> <ul style="list-style-type: none"> <li>• <b>CLEAR</b>, LAT, latitude, <b>ENTER</b></li> <li>• <b>LONG</b>, longitude, <b>ENTER</b></li> <li>• <b>ALT</b>, altitude, <b>ENTER</b></li> </ul> (d) <b>CAP MESSAGE</b> ..... <b>MAG HDG VAR</b> (e) <b>Keyboard</b> ..... <b>HDG</b> , mag var, <b>ENTER</b> (f) <b>Align Progress</b> ..... Monitor
5. <b>U/VHF Mode</b>	<b>T/R G</b>

6. <b>Datalink</b>	(a) <b>Kneeboard</b> ..... TACTICAL DL (b) <b>DL Power</b> ..... ON (FWD) (c) <b>DL Mode</b> ..... TAC (AFT) (d) <b>DL Freq.</b> ..... Set
7. <b>TACAN</b>	T/R
8. <b>RWR Panel</b>	(a) <b>Display Type</b> ..... NORM (b) <b>PWR</b> ..... ON (c) <b>TEST</b> ..... SPL (d) <b>MODE</b> ..... LMT
9. <b>DECM</b>	STBY, then ACT
10. <b>IFF</b>	(a) <b>MASTER</b> ..... STBY (b) <b>CODE</b> ..... as required
11. <b>Altimeter</b>	Reset
12. <b>CAP</b>	Enter Data (WP, FP, <i>etc.</i> )
13. <b>Displays</b>	• <b>DDD</b> ..... Set • <b>TID</b> ..... Set • <b>Multiple Display Indicator</b> ..... Set
14. <b>Hand Control Panel</b>	Set
15. <b>AN/ALE-39</b>	Set (as required) • <b>AUTO (CHAFF)/MAN</b> • <b>MAN</b>
16. <b>Flare Mode</b>	PILOT
17. <b>Complete INS Align</b>	• <b>Duration Full Fine</b> ..... 8 min • <b>Duration ASH</b> ..... much faster  (a) <b>Align Complete</b> ..... Caret → Diamond (b) <b>NAV Mode</b> ..... INS NAV
18. <b>Standby ADI</b>	Erect at least 2 min before T/O
19. <b>TO PILOT</b>	"Ready to Taxi"
<b>Once Airborne</b>	
20. <b>IR/TV Power</b>	ON
21. <b>WCS Switch</b>	WCS XMT

## 1.6 RIO - POST-START - CARRIER

1. <b>PILOT</b>	<ul style="list-style-type: none"> <li>Engines ..... started</li> <li>AIR SOURCE ..... BOTH ENG</li> </ul>
2. <b>INS STARTUP</b>	(a) LIQUID COOLING ..... ON (FWD) (b) WCS Switch ..... STANDBY (c) IR/TV Power ..... STBY/IR/TV (d) TID/DDD ..... illuminated after 40 s
3. <b>Datalink</b>	(a) Kneeboard ..... TACTICAL DL (b) DL Power ..... ON (FWD)
4. <b>Start INS Align</b>	(a) DL FREQ ..... Set (b) DL Mode ..... CAINS/WAYPT (c) Nav Mode ..... CVA
5. <b>U/VHF Mode</b>	T/R G
6. <b>TACAN</b>	T/R
7. <b>RWR Panel</b>	(a) Display Type ..... NORM (b) PWR ..... ON (c) TEST ..... SPL (d) MODE ..... LMT
8. <b>DECM</b>	STBY, then ACT
9. <b>IFF</b>	(a) MASTER ..... STBY (b) CODE ..... as required
10. <b>Altimeter</b>	Reset
11. <b>CAP</b>	Enter Data (WP, FP, etc.)
12. <b>Displays</b>	<ul style="list-style-type: none"> <li>DDD ..... Set</li> <li>TID ..... Set</li> <li>Multiple Display Indicator ..... Set</li> </ul>
13. <b>Hand Control Panel</b>	Set
14. <b>AN/ALE-39</b>	Set (as required) <ul style="list-style-type: none"> <li>AUTO (CHAFF)/MAN</li> <li>MAN</li> </ul>
15. <b>Flare Mode</b>	PILOT
16. <b>Complete INS Align</b>	<ul style="list-style-type: none"> <li>Duration Full Fine ..... 9 min</li> <li>Duration ASH ..... much faster</li> </ul> (a) Align Complete ..... Caret → Diamond (b) NAV Mode ..... INS NAV

- |                        |   |
|------------------------|---|
| 17. <b>Datalink</b>    | (a) <b>DL Mode</b> ..... TAC (AFT)<br>(b) <b>DL Freq.</b> ..... Set |
| 18. <b>Standby ADI</b> | Erect at least 2 min before T/O                                     |
| 19. <b>TO PILOT</b>    | <i>"Ready to Taxi"</i>  |

**Once Airborne**

- |                        |                |
|------------------------|----------------|
| 20. <b>IR/TV Power</b> | <b>ON</b>      |
| 21. <b>WCS Switch</b>  | <b>WCS XMT</b> |

## 1.7 PRE-TAXI

1. <b>ANTI-SKID SPOILER BK</b>	<b>OFF</b>
2. <b>HOOK BYPASS</b>	As Required
3. <b>Nose Strut</b>	<b>RETRACTED</b>
4. <b>HUD MODE</b>	<b>TO</b>
5. <b>Parking Brake</b>	<b>Released (IN)</b>
6. <b>NWS</b>	<b>ENGAGED</b>
7. <b>Path</b>	verify clear

## 1.8 TAKEOFF - SHORE

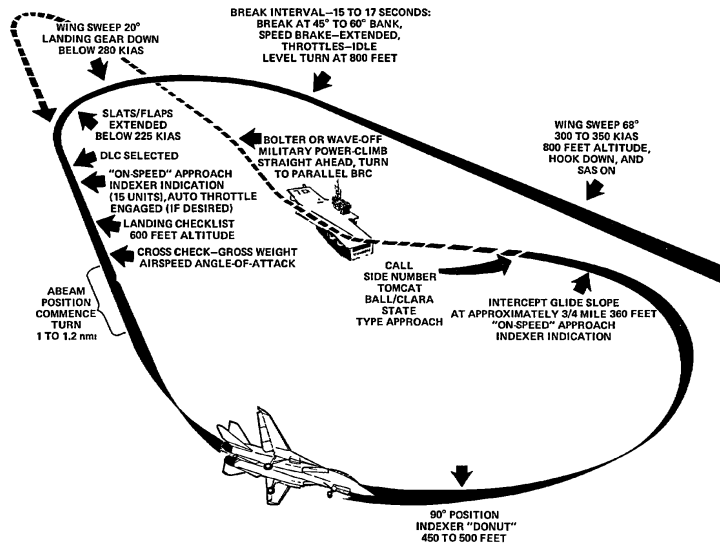
After Lining Up On Runway	
1. <b>Wing Sweep</b>	(a) <b>EM WING SWEEP</b> ..... <b>FWD</b> , then <b>IN</b> (b) <b>MASTER RESET</b> ..... <b>PRESS</b> (c) <b>Wings</b> ..... Verify thumb controller (d) <b>WING SWEEP</b> ..... <b>AUTO</b> (e) <b>Wings</b> ..... Verify at 20 deg
2. <b>ANTI SKID SPOILER BK</b>	<b>BOTH (UP)</b>
3. <b>FLAPS</b>	<b>UP</b>
4. <b>Trim</b>	0 deg
5. <b>NWS</b>	<b>DISENGAGED</b>
6. <b>Takeoff</b>	(a) <b>Throttle</b> ..... <b>MIL</b> (90% RPM) (b) <b>Stick</b> ..... <b>Back</b> at 130 KIAS (c) <b>Rotation</b> ..... approx 140 KIAS (d) <b>GEAR</b> ..... <b>UP</b> < 250 KIAS

## 1.9 TAKEOFF - CARRIER

Lineup	<ul style="list-style-type: none"> <li>• Wait behind JBD until Catapult is clear</li> <li>• Follow Taxi Directors Instructions to line up on Catapult</li> </ul>
1. Wing Sweep	(a) <b>EM WING SWEEP</b> ..... <b>FWD</b> , then <b>IN</b> (b) <b>MASTER RESET</b> ..... <b>PRESS</b> (c) <b>Wings</b> ..... Verify thumb controller (d) <b>WING SWEEP</b> ..... <b>AUTO</b> (e) <b>Wings</b> ..... Verify at 20 deg
2. FLAPS	<b>DOWN</b>
3. Launch Bar Preparation	(a) <b>Nose Strut</b> ..... <b>KNEEL</b> when directed (b) <b>Throttle</b> ..... <b>UP</b> when directed (c) <b>Taxi</b> ..... launch bar into shuttle (d) <b>Throttle</b> ..... <b>IDLE</b> when directed
4. Trim	2-3 deg nose up
5. Speed Brakes	<b>IN</b>
6. Final Checks	(a) <b>Throttle</b> ..... <b>MIL</b> when directed (b) <b>Control Wipeout</b> <ul style="list-style-type: none"> <li>• Stick Full Forward</li> <li>• Stick Full Aft</li> <li>• Stick Full Left</li> <li>• Stick Full Right</li> <li>• Rudder Full Left</li> <li>• Rudder Full Right</li> </ul> (c) <b>Eng. Inst.</b> ..... <b>Checked</b> (d) <b>Caution/Warnings</b> ..... <b>None</b>
7. Catapult Shot	(a) <b>Salute</b> ..... <b>CAT SHOT</b> (b) <b>Gear</b> ..... <b>UP</b> < 250 KIAS (c) <b>Flaps</b> ..... <b>UP</b> < 225 KIAS
8. Clearing Turn	



## 1.10 LANDING - OVERHEAD PATTERN



1. Initial Approach	<ul style="list-style-type: none"> <li>• WING SWEEP ..... 68 deg</li> <li>• HOOK ..... DOWN</li> <li>• SAS ..... ON</li> <li>• HUD ..... LDG</li> <li>• Airspeed ..... 300-350 KIAS</li> <li>• Altitude ..... 800 ft</li> </ul>
2. Initial Break	<ul style="list-style-type: none"> <li>• Break Interval ..... 15-17 s</li> <li>• BANK ..... 45-60 deg</li> <li>• SPEED BRAKE ..... EXTEND</li> <li>• Throttle ..... IDLE</li> <li>• G ..... 3-4 G</li> <li>• Altitude ..... 800 ft</li> </ul>
3. Break Turn	<ul style="list-style-type: none"> <li>• Wing Sweep ..... AUTO &lt; 280 KIAS</li> <li>• Landing Gear ..... DOWN &lt; 280 KIAS</li> <li>• FLAPS ..... DOWN &lt; 225 KIAS</li> </ul>
4. Downwind	<ul style="list-style-type: none"> <li>• DLC ..... Selected once flaps out</li> <li>• AOA ..... ON-SPEED</li> <li>• LANDING CHECKLIST</li> <li>• Altitude ..... descend to 600 ft</li> </ul>

5. <b>Final Turn</b>	180 Deg Position • Abeam Pos. .... 1-1.2 nmi 90 Deg Position • AOA ..... DONUT • Altitude ..... 400-500 ft
6. <b>Intercept Glideslope</b>	• Distance ..... 3/4 Mile • Altitude ..... 360 ft • AOA ..... ON-SPEED

### 1.11 LANDING - CHECKLIST

1. <b>Wing Sweep</b>	20 deg AUTO
2. <b>Wheels</b>	• Lights ..... 3 DOWN • Transition Light ..... OUT
3. <b>SAS</b>	ON
4. <b>FLAPS</b>	DOWN
5. <b>DLC</b>	Checked
6. <b>Hook</b>	• HOOK ..... DOWN • Transition Light ..... OUT
7. <b>Harness</b>	Locked
8. <b>Speedbrakes</b>	EXT
9. <b>Brakes</b>	Check
10. <b>Fuel</b>	Check

## 1.12 AIRSTART

<ul style="list-style-type: none"> <li>• <b>Spooldown</b></li> </ul>	<p>Before significant spooldown</p> <p>(a) <b>Non-Running ENG</b> .... <b>IDLE</b> or above</p> <p>If no relight occurs</p> <p>(b) <b>Non-Running ENG</b> ... <b>OFF</b> then <b>IDLE</b></p> <p>If still no relight occurs</p> <p>(c) <b>ENG MODE</b> ..... <b>SEC</b></p> <p>(d) <b>Non-Running ENG</b> ... <b>OFF</b> then <b>IDLE</b></p>
<ul style="list-style-type: none"> <li>• <b>Cross-Bleed Restart</b></li> </ul>	<p>With one ENG running, if Spooldown fails</p> <p>(a) <b>Non-Running ENG</b> ..... <b>OFF</b></p> <p>(b) <b>FUEL SHUT OFF</b> ..... check</p> <p>(c) <b>Running throttle</b> ..... 80%+</p> <p>(d) <b>BACK UP IGNITION</b> ..... <b>ON</b></p> <p>(e) <b>ENG CRANK</b> ..... non-running eng</p> <p>(f) <b>Non-Running ENG</b> ..... <b>IDLE</b></p> <p>If no start occurs</p> <p>(g) <b>Non-Running ENG</b> ... <b>OFF</b> then <b>IDLE</b></p> <p>If still no start</p> <p>(h) <b>ENG MODE</b> ..... <b>SEC</b></p> <p>(i) <b>Non-Running ENG</b> ... <b>OFF</b> then <b>IDLE</b></p>
<ul style="list-style-type: none"> <li>• <b>Windmill Restart</b></li> </ul>	<p>(a) <b>Airspeed</b> ..... &gt;450 kts</p> <p>(b) <b>Throttle</b> ..... <b>IDLE</b> or above</p> <p>(c) <b>BACK UP IGNITION</b> ..... <b>ON</b></p> <p>If no relight occurs</p> <p>(d) <b>Throttle</b> ..... <b>OFF</b> then <b>IDLE</b></p> <p>If still no relight</p> <p>(e) <b>ENG MODE</b> ..... <b>SEC</b></p> <p>(f) <b>Throttle</b> ..... <b>OFF</b> then <b>IDLE</b></p>
<ul style="list-style-type: none"> <li>• <b>Post Restart</b></li> </ul>	<p>(a) <b>BACK UP IGNITION</b> ..... <b>OFF</b></p> <p>(b) <b>ENG MODE</b> ..... <b>PRI</b></p>



## 2 SYSTEMS

### 2.1 AFCS - SAS

<ul style="list-style-type: none"> <li><b>SAS</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Stability Augmentation System</b> <ul style="list-style-type: none"> <li>– Not Fly-by-Wire</li> <li>– Automatic control surface commands generated by analog computer to improve stability</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li><b>Controls</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Three individual Switches</b> <ul style="list-style-type: none"> <li>– Pitch</li> <li>– Roll</li> <li>– Yaw</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li><b>Autopilot Emergency Disengage Paddle</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Paddle on Stick</b> <ul style="list-style-type: none"> <li>– Disengages Autopilot Modes</li> <li>– Deactivates Pitch, Roll SAS Channels</li> </ul> </li> </ul>

### 2.2 AFCS - AUTOPILOT

<ul style="list-style-type: none"> <li><b>Attitude Hold</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Basic Attitude Hold</b> <ul style="list-style-type: none"> <li>– Maintains existing pitch &amp; roll</li> <li>– Attitude can be changed with stick input</li> <li>– If engaged outside limits will automatically move within range</li> </ul> </li> <li><b>Limits</b> <ul style="list-style-type: none"> <li>– Pitch: 30 deg</li> <li>– Roll: 60 deg</li> </ul> </li> <li><b>Engagement</b> <ul style="list-style-type: none"> <li>(a) <b>SAS Switches</b> ..... ON (FWD)</li> <li>(b) <b>Alt. Hold Mode</b> ..... OFF</li> <li>(c) <b>VEC/PCD/ACL</b> ..... OFF</li> <li>(d) <b>Heading Mode</b> ..... OFF</li> <li>(e) <b>Autopilot Switch</b> ..... ENGAGE (FWD)</li> </ul> </li> </ul>
--	--

<ul style="list-style-type: none"> <li>• <b>Altitude Hold</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Barometric Altitude Hold</b> <ul style="list-style-type: none"> <li>– Maintains current barometric altitude</li> </ul> </li> <li>• <b>Limits</b> <ul style="list-style-type: none"> <li>– Vertical velocity: &lt; 100 ft/s</li> </ul> </li> <li>• <b>Engagement</b> <ul style="list-style-type: none"> <li>(a) <b>SAS Switches</b> ..... ON (FWD)</li> <li>(b) <b>Autopilot Switch</b> ..... ENGAGE (FWD)</li> <li>(c) <b>Alt. Hold Mode</b> ..... ALT (FWD)</li> <li>(d) <b>A/P REF Light</b> ..... Wait until appears</li> <li>(e) <b>NWS Button</b> ..... Press</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Heading Hold</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Magnetic Heading Hold</b> <ul style="list-style-type: none"> <li>– Maintains current magnetic heading</li> </ul> </li> <li>• <b>Limits</b> <ul style="list-style-type: none"> <li>– Bank angle &lt; 5 deg</li> </ul> </li> <li>• <b>Engagement</b> <ul style="list-style-type: none"> <li>(a) <b>SAS Switches</b> ..... ON (FWD)</li> <li>(b) <b>Autopilot Switch</b> ..... ENGAGE (FWD)</li> <li>(c) <b>Heading Mode</b> ..... HDG (FWD)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Ground Track</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Autopilot follows ground track</b> <ul style="list-style-type: none"> <li>– Similar to heading hold</li> <li>– Compensates for wind drift</li> <li>– Uses INS data instead of mag. bearing</li> </ul> </li> <li>• <b>Limits</b> <ul style="list-style-type: none"> <li>– Bank angle &lt; 5 deg</li> </ul> </li> <li>• <b>Engagement</b> <ul style="list-style-type: none"> <li>(a) <b>SAS Switches</b> ..... ON (FWD)</li> <li>(b) <b>Autopilot Switch</b> ..... ENGAGE (FWD)</li> <li>(c) <b>Heading Mode</b> ..... GT (AFT)</li> <li>(d) <b>A/P REF Light</b> ..... Wait until appears</li> <li>(e) <b>NWS Button</b> ..... Press</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>VEC/PCD</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Datalink Vector / Precision Course Direction</b> <ul style="list-style-type: none"> <li>– Allows Link 4 controller to remotely direct the aircraft</li> <li>– <b>Not Modelled in DCS</b></li> </ul> </li> </ul>

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• <b>ACL</b></li> </ul>                                  | <ul style="list-style-type: none"> <li>• <b>Automatic Carrier Landing</b> <ul style="list-style-type: none"> <li>– See relevant section</li> </ul> </li> </ul>   |
| <ul style="list-style-type: none"> <li>• <b>Autopilot Emergency Disengage Paddle</b></li> </ul> | <ul style="list-style-type: none"> <li>• <b>Paddle on Stick</b> <ul style="list-style-type: none"> <li>– Disengages Autopilot Modes</li> <li>– Deactivates Pitch, Roll SAS Channels</li> </ul> </li> </ul> |

### 2.3 APC / AUTOTHROTTLE

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• <b>APC</b></li> </ul>        | <ul style="list-style-type: none"> <li>• <b>Approach Power Compensator</b> <ul style="list-style-type: none"> <li>– Automatic throttle control</li> <li>– <b>Maintains ON SPEED AoA</b></li> </ul> </li> </ul>   |
| <ul style="list-style-type: none"> <li>• <b>Conditions</b></li> </ul> | <p>Engagement is inhibited / APC is disengaged if conditions not met</p> <ul style="list-style-type: none"> <li>• <b>Throttles</b> ..... 75%-90% RPM</li> <li>• <b>Landing Gear Handle</b> ..... <b>Down</b></li> <li>• <b>Weight on Wheels</b> ..... <b>No</b></li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>Engage</b></li> </ul>     | <ul style="list-style-type: none"> <li>• <b>Throttle Mode</b> ..... <b>AUTO (FWD)</b></li> </ul>   |
| <ul style="list-style-type: none"> <li>• <b>Disengage</b></li> </ul>  | <ul style="list-style-type: none"> <li>• <b>Cage/Seam Button</b></li> </ul>  |

### 2.4 ACLS

### 2.5 WING-SWEEP

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• <b>Overview</b></li> </ul>   | <ul style="list-style-type: none"> <li>• <b>In Flight Limited between 20 deg &amp; 68 deg</b></li> <li>• <b>On Ground can Oversweep to 75 deg</b></li> <li>• <b>Hydromechanically Controlled</b> <ul style="list-style-type: none"> <li>– Automatically through CADC</li> <li>– Manually with emergency wing-sweep handle</li> </ul> </li> <li>• <b>15 deg/s at 1g loading</b></li> <li>• <b>Mechanically linked to ensure symmetry</b></li> </ul>                               |
| <ul style="list-style-type: none"> <li>• <b>CADC Modes</b></li> </ul> | <ul style="list-style-type: none"> <li>• <b>AUTO</b> <ul style="list-style-type: none"> <li>– CADC controls wing position as function of current Mach via wing-sweep program</li> </ul> </li> <li>• <b>MAN</b> <ul style="list-style-type: none"> <li>– Pilot manually chooses desired wing sweep angle with thumb controller</li> </ul> </li> <li>• <b>BOMB</b> <ul style="list-style-type: none"> <li>– Sets wing sweep to <b>55 deg</b> or further aft</li> </ul> </li> </ul> |

<ul style="list-style-type: none"> <li>Emergency Mode</li> </ul>	<ul style="list-style-type: none"> <li>Emergency Wing-Sweep Handle           <ul style="list-style-type: none"> <li>Moved with wing sweep program by spider detent under normal operation</li> <li>Can be forced out of spider detent and moved manually</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Oversweep</li> </ul>	<ul style="list-style-type: none"> <li>Selected via Emergency Wing-Sweep Handle           <ul style="list-style-type: none"> <li>(a) Em. Wing-Sweep ..... 68 deg Wait for wing-seal airbags to deflate</li> <li>(b) HZ TAIL AUTH ..... Illuminated</li> <li>(c) Em. Wing-Sweep ..... 75 deg</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Return to CAD Control</li> </ul>	<ul style="list-style-type: none"> <li>After Emergency Mode / Oversweep           <ul style="list-style-type: none"> <li>(a) Em. Wing-Sweep ..... Spider Detent (Fwd on startup)</li> <li>(b) MASTER RESET ..... Press</li> </ul> </li> </ul>

Indicated Mach	Max Forward Wing Position
0.4	20 deg
0.7	25 deg
0.8	50 deg
0.9	60 deg
1.0	68 deg

## 2.6 NAVIGATION

## 2.7 COMMUNICATION

## 2.8 DATALINK / IFF



## 2.9 ALR-67 RWR - OVERVIEW

• <b>PWR Switch</b>	• <b>Set to ON to Operate</b>
• <b>VOL Knob</b>	• <b>Sets RIO Audio Level</b>
• <b>TEST Switch</b>	<ul style="list-style-type: none"> <li>• <b>Springloaded to Center</b></li> <li>• <b>BIT</b> – Initiates Build In Test</li> <li>• <b>SPL</b> – Holds BIT status page while held</li> </ul>
• <b>MODE Switch</b>	<ul style="list-style-type: none"> <li>• <b>Springloaded to Center</b></li> <li>• <b>OFST</b> – Separates overlapping symbols</li> <li>• <b>LMT</b> – Displays 6 highest threats</li> </ul>
• <b>DISPLAY TYPE Selector</b>	<ul style="list-style-type: none"> <li>• <b>Changes Priority of Display</b> <ul style="list-style-type: none"> <li>– <b>NORM</b> – Normal threat symbology</li> <li>– <b>AI</b> – Airborne Interceptor prioritized</li> <li>– <b>AAA</b> – Anti-aircraft artillery prioritized</li> <li>– <b>UNK</b> – Unknown prioritized</li> <li>– <b>FRIEND</b> – Friendly threats prioritized</li> </ul> </li> <li>• <b>Indicated by Letter in Display Center</b></li> </ul>
• <b>Display</b>	<ul style="list-style-type: none"> <li>• <b>Outer Band</b> <ul style="list-style-type: none"> <li>– <b>Critical Band</b></li> <li>– Imminent threat to own aircraft</li> <li>– Blinking indicates engaging own aircraft</li> </ul> </li> <li>• <b>Middle Band</b> <ul style="list-style-type: none"> <li>– <b>Lethal Band</b></li> <li>– Potentially threatening emitters</li> <li>– Not actively engaging own aircraft</li> </ul> </li> <li>• <b>Inner Band</b> <ul style="list-style-type: none"> <li>– <b>Non-Lethal Band</b></li> <li>– Not currently within capability of emitter</li> </ul> </li> <li>• <b>Inner Circle</b> <ul style="list-style-type: none"> <li>– <b>N, I, A, U, or F</b> – Prioritization type</li> <li>– <b>O</b> – Offset</li> <li>– <b>L</b> – Limit</li> <li>– <b>B</b> – BIT Failure</li> <li>– <b>T</b> – Thermal overload</li> </ul> </li> </ul>

- **Alert Tones**

- **Short Tone** – New emitter / emitter moved
  - **Slow Warbling** – Threat in critical band
  - **Fast Warbling** – Threat actively engaging own aircraft
  - **4-Tone Sequence** – New threat capable of silently engaging own aircraft
-

## 2.10 ALR-67 RWR - THREAT SYMBOLOGY

## SHIPS

<b>AB</b>	Arleigh Burke
<b>AK</b>	Admiral Kuznetsov
<b>GR</b>	Grisha 5 (Albatros)
<b>HP</b>	Oliver Hazard Perry
<b>J2</b>	Type 054A Frigate, "Jiangkai II class"
<b>KK</b>	Krivak 3 (Rezky)
<b>KV</b>	Kirov (Pyotr Velikiy)
<b>L1</b>	Type 052B Destroyer, "Luyang I class"
<b>L2</b>	Type 052C Destroyer, "Luyang II class"
<b>N</b>	<i>Ship with Nav Radar</i>
<b>NE</b>	Neustrashimy
<b>NZ</b>	Nimitz (Vinson, Stennis)
<b>SV</b>	Slava (Moscow)
<b>TC</b>	Ticonderoga
<b>TT</b>	Tarantul 3 (Molniya)
<b>TW</b>	Tarawa
<b>YU</b>	Type 071 Amphibious Transport Dock, "Yuzhao class"

## AIRCRAFT

<b>14</b>	F-14A/B
<b>15</b>	F-15C/E
<b>16</b>	F-16C
<b>17</b>	JF-17
<b>18</b>	F/A-18C
<b>19</b>	MiG-19

<b>21</b>	MiG-21bis
<b>23</b>	MiG-23MLD
<b>24</b>	Su-24M/MR
<b>25</b>	MiG-25PD
<b>29</b>	MiG-29A/G/S Su-27 Su-33 J-11A
<b>30</b>	Su-30
<b>31</b>	MiG-31
<b>34</b>	Su-34
<b>37</b>	AJS-37
<b>39</b>	Su-25TM
<b>50</b>	A-50
<b>52</b>	B-52
<b>AN</b>	AN-26B AN-30M
<b>AP</b>	AH-64D
<b>B1</b>	B-1B
<b>BE</b>	Tu-95 Tu-142M
<b>BF</b>	Tu-22M3
<b>BJ</b>	Tu-160
<b>E2</b>	E-2D
<b>E3</b>	E-3C
<b>F4</b>	F-4E
<b>F5</b>	F-5E
<b>HX</b>	Ka-27
<b>IL</b>	IL-76MD IL-78M
<b>KC</b>	KC-135

<b>KJ</b>	KJ-2000
<b>M2</b>	Mirage 2000-C Mirage 2000-5
<b>S3</b>	S-3B
<b>SH</b>	SH-60B
<b>TO</b>	Tornado
<b>TR</b>	C-130 C-17A

**AIR DEFENSE**

<b>2</b>	S-75 TR SNR (SA-2) "Fan Song"
<b>3</b>	S-125 TR SNR-125 (SA-3) "Low Blow"
<b>6</b>	Kub SA-6
<b>7</b>	HQ-7 TR
<b>8</b>	OSA (SA-8)
<b>10</b>	S-300PS 30N6 TR (SA-10)
<b>11</b>	Buk (SA-11)
<b>12</b>	S-300V
<b>15</b>	Tor 9A331 (SA-15)
<b>19</b>	Tunguska 2C6M (SA-19)
<b>A</b>	Gepard M-163 Vulcan ZSU-23-4 Shilka
<b>BB</b>	S-300PS 64H6E SR (SA-10/Big Bird)
<b>BF</b>	Rapier Blindfire TR
<b>CS</b>	S-300PS 5N66M SR (SA-10/Clam Shell)
<b>DE</b>	Sborka (Dog Ear)
<b>FF</b>	S-125 P-19 SR (SA-3/Flat Face)
<b>GR</b>	Roland SR

<b>HA</b>	Hawk SR
<b>HK</b>	Hawk TR
<b>HQ</b>	HQ-7 SR
<b>PT</b>	Patriot
<b>RO</b>	Roland
<b>RP</b>	Rapier SR
<b>S</b>	1L13 55G6 EWR
<b>SD</b>	Buk TR (SA-11/Snow Drift)
<b>SN</b>	PRW-11 (Side Net)

**MISSILES**

<b>M</b>	AIM-54 AIM-120 MICA-EM R-37 R-77 SD-10
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**ATC**

<b>T</b>	Airport ATC Radar
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2.11 **ALE-39 COUNTERMEASURES DISPENSER**

2.12 **ALQ-100 / ALQ-126 DECM**



### 3 AWG-9 RADAR

#### 3.1 MAIN MODES - OVERVIEW

	Pulse		Pulse Doppler			
	Pulse Search	P-STT	PD Search	RWS	TWS	PD-STT
<b>Range</b>	60 nm	50 nm	110 nm	90 nm	90 nm	90 nm
<b>AIM-7</b>	BRSIT	CW	BRSIT		-	PD
<b>AIM-54</b>	BRSIT	ACT	BRSIT		Multi TGT	PD/ACT

#### 3.2 MAIN MODES

- Pulse**

- Basic Pulse w/o doppler filtering**

- Cannot be notched
- Ground Clutter
- Rudimentary Ground mapping

- Pulse Sub-Modes**

- Pulse Search
- Pulse-STT

- Pulse Doppler**

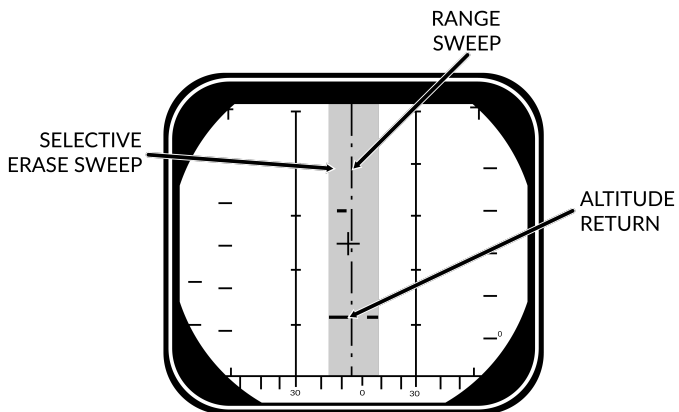
- Doppler filter → no ground returns**

- Susceptible to notching
- No ground clutter
- Greater range
- Advanced sub modes
- AIM-54 Guidance

- Pulse Doppler Sub-Modes**

- PD Search
- RWS
- TWS
- PD-STT

### 3.3 PULSE MODE - PULSE SEARCH



SEARCH ( $\pm 10^\circ$  SCAN)

- Pulse Search**

**Basic Mode** - AWG-9 does not use pulse doppler filtering

- Advantages**

- All aspect target detection
- Cannot be notched
- Rudimentary ground mapping

- Disadvantages**

- Cannot discern ground returns and targets
- Lower range

- DDD**

- Range/Azimuth**

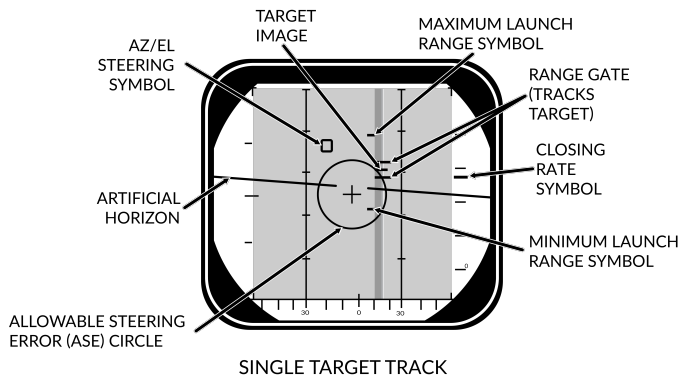
- Visual representation of radar and erase sweeps

- TID**

- **No Information from Pulse**
- **Cannot guide AIM-54**



### 3.4 PULSE MODE - PSTT



- Pulse STT**

Lock Target w/o doppler filtering

- Advantages**

- Cannot be notched

- Disadvantages**

- Susceptible to ground clutter

- Lock Target**

- Conditions**

- Pulse Search Mode selected
- RDR HCU Mode selected

- Lock Target**

- Hold HCU Half-action
- Slew to desired Target
- HCU Full-Action to lock

- Unlock Target**

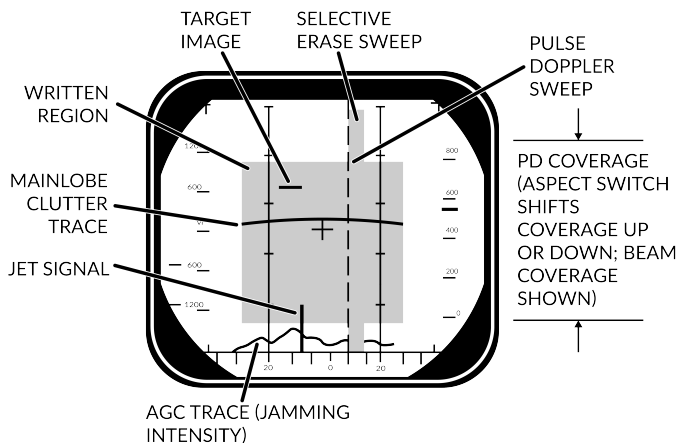
- HCU Half-action

- DDD**

- Track Indications**

- ANT TRK light
- RDROT light
- Tracking gates
- Closure rate
- Attack Symbology

### 3.5 PULSE DOPPLER MODE - PULSE DOPPLER SEARCH



SEARCH ( $\pm 40^\circ$  SCAN)

<ul style="list-style-type: none"> <li><b>Pulse Doppler Search</b></li> </ul>	<p><b>“Early Warning” Mode</b> - Longest Range, cannot display range</p> <ul style="list-style-type: none"> <li><b>Advantages</b> <ul style="list-style-type: none"> <li>– Longest Range</li> <li>– Doppler Filtering</li> <li>– <b>“Look Down Shoot Down”</b></li> </ul> </li> <li><b>Disadvantages</b> <ul style="list-style-type: none"> <li>– Can be notched</li> <li>– No range information</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li><b>DDD</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Closure Rate/Azimuth</b></li> <li>Visual representation of radar and erase sweeps</li> </ul>
<ul style="list-style-type: none"> <li><b>Doppler Filters</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Main Lobe Clutter (MLC) Filter</b> <ul style="list-style-type: none"> <li>– Own GS <math>\pm 133</math> knots</li> <li>– Removes main ground return</li> <li>– Source of notching</li> </ul> </li> <li><b>Zero Doppler Filter</b> <ul style="list-style-type: none"> <li>– Negative own GS <math>\pm 100</math> knots</li> <li>– Removes Radar reflection from ground directly beneath own AC</li> </ul> </li> </ul>

- **MLC Switch**

- **IN:** Enables MLC filter
- **AUTO:** Enables MLC filter if look-up angle less than 3 deg
- **OUT:** Disables MLC filter

- **Vc Switch**

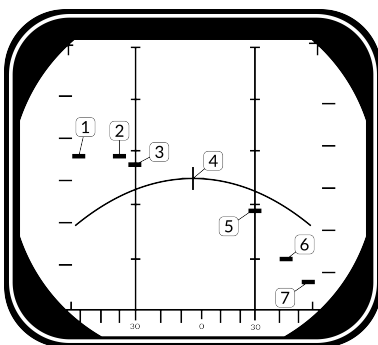
Changes closure rate DDD scale

- **X-4:** -800 to 4000 knots
- **NORM:** -200 to 1000 knots
- **VID:** -50 to 250 knots

- **ASPECT Switch**

Changes closure rate processing scale

- **NOSE:** -600 to 1800 knots
- **BEAM:** -1200 to 1200 knots
- **TAIL:** -1800 to 600 knots



	Look Angle	Line of Sight Rate	Target Heading
1	60 deg	1490	180 deg
2	45 deg	1500	120 deg
3	30 deg	1428	100 deg
4	0 deg	1200	90 deg
5	30 deg	672	80 deg
6	45 deg	210	60 deg
7	60 deg	-300	0 deg

## 3.6 PULSE DOPPLER MODE - RWS

<ul style="list-style-type: none"> <li>• <b>Range While Search</b></li> </ul>	<p><b>FM Ranging</b>, used for getting good A/A picture before selecting TWS</p> <ul style="list-style-type: none"> <li>• <b>FM Ranging</b> <ul style="list-style-type: none"> <li>– Pulse Doppler with ranging</li> <li>– TID shows momentary tracks with ranges</li> <li>– Processing reduces max range</li> </ul> </li> <li>• <b>Advantages</b> <ul style="list-style-type: none"> <li>– Long Range</li> <li>– Doppler Filtering</li> <li>– “<b>Look Down Shoot Down</b>”</li> <li>– Signal Processing</li> </ul> </li> <li>• <b>Disadvantages</b> <ul style="list-style-type: none"> <li>– Can be notched</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>DDD</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Closure Rate/Azimuth</b></li> <li>• Visual representation of radar and erase sweeps</li> </ul>
<ul style="list-style-type: none"> <li>• <b>TID</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Momentary Tracks</b></li> <li>• Max concurrent tracks: 48</li> <li>• <b>Cannot lock targets from TID</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Filtering</b></li> </ul>	<p>Same as Pulse Doppler Search</p>

## 3.7 PULSE DOPPLER MODE - TWS

<ul style="list-style-type: none"> <li>• <b>Track While Scan</b></li> </ul>	<p><b>Builds Track Files</b>, high situational awareness, multi-target AIM-54 launch</p> <ul style="list-style-type: none"> <li>• <b>Track Files</b> <ul style="list-style-type: none"> <li>– AWG-9 builds Trackfiles for contacts</li> <li>– Can launch multiple AIM-54</li> <li>– Processing reduces max range</li> <li>– Can lock targets from TID</li> </ul> </li> <li>• <b>FM Ranging</b> <ul style="list-style-type: none"> <li>– Pulse Doppler with ranging</li> <li>– TID shows momentary tracks with ranges</li> <li>– Processing reduces max range</li> </ul> </li> <li>• <b>Advantages</b> <ul style="list-style-type: none"> <li>– Doppler Filtering</li> <li>– <b>Multi-Target AIM-54</b></li> </ul> </li> <li>• <b>Disadvantages</b> <ul style="list-style-type: none"> <li>– <b>Lowest Range</b></li> <li>– Can be notched</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>DDD</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Closure Rate/Azimuth</b></li> <li>• Visual representation of radar and erase sweeps</li> </ul>
<ul style="list-style-type: none"> <li>• <b>TID</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Tracksfiles</b></li> <li>• Max concurrent tracks: 24</li> <li>• Max displayed tracks: 18</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Filtering</b></li> </ul>	<p><b>Same as Pulse Doppler Search</b></p>
<ul style="list-style-type: none"> <li>• <b>Scan Volume</b></li> </ul>	<p>Trackfiles require update every 2.5 s -&gt;</p> <ul style="list-style-type: none"> <li>• 20 deg 4 bar (if selected)</li> <li>• 40 deg 2 bar (else)</li> </ul>
<ul style="list-style-type: none"> <li>• <b>TID Mode Selector</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>GND STAB:</b> Ground Stabilized, True North is up on TID</li> <li>• <b>A/C STAB:</b> Aircraft Stabilized</li> <li>• <b>ATTAK:</b> same as A/C STAB with superimposed attack steering symbology</li> <li>• <b>TV:</b> Displays TCS on TID, displays LANTIRN on TID if equipped</li> </ul>

<ul style="list-style-type: none"> <li>TID Display Selector Buttons</li> </ul>	<ul style="list-style-type: none"> <li><b>RID DISABLE:</b> Not simulated</li> <li><b>ALT NUM:</b> Enables display of track altitudes on left side of track symbols</li> <li><b>SYM ELEM:</b> Enables display of all supplementary symbology of tracks and waypoints</li> <li><b>DATA LINK:</b> Enables display of D/L contacts</li> <li><b>JAM STROBE:</b> Enables display of jam strobes</li> <li><b>NON-ATTK:</b> enables/disables display of targets not possible to engage (friendlies)</li> <li><b>LAUNCH ZONE:</b> Enables display of weapon launch zones</li> <li><b>VEL VECTOR:</b> Enables display of velocity vectors</li> </ul>
<ul style="list-style-type: none"> <li>TRACK HOLD &amp; CLSN Steering Buttons</li> </ul>	<ul style="list-style-type: none"> <li><b>TRACK HOLD</b> <ul style="list-style-type: none"> <li>– Normally: Tracks maintained for 14 s after last observation</li> <li>– Track Hold: maintained for 2 min after last observation</li> </ul> </li> <li><b>CLSN Button</b> <ul style="list-style-type: none"> <li>– begins collision steering to currently tracked target</li> <li>– enables Steering Centroid if in TWS</li> <li>– LD CLSN presents azimuth steering only</li> <li>– CLSN presents both azimuth and elevation steering</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>TWS AUTO / MAN</li> </ul>	<ul style="list-style-type: none"> <li><b>TWS MAN:</b> Manual azimuth/elevation control, target designation by RIO</li> <li><b>TWS AUTO:</b> Automatic prioritization of targets and azimuth elevation control</li> </ul>

## 3.8 PULSE DOPPLER MODE - TWS MAN

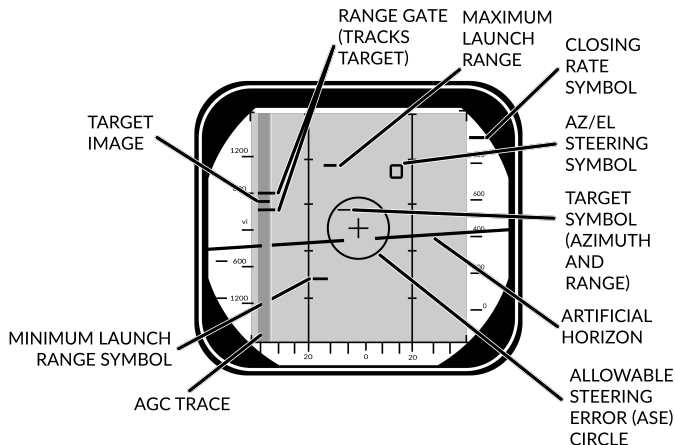
<ul style="list-style-type: none"><li>• <b>TWS MAN</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Target Selection:</b> Manual</li><li>• <b>Scan Azimuth/Elevation:</b> Manual</li></ul>
<ul style="list-style-type: none"><li>• <b>Target Selection</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Conditions</b><ul style="list-style-type: none"><li>– TWS MAN Radar Mode selected</li><li>– TID CURSOR TID Mode selected</li></ul></li><li>• <b>Hook Target</b><ul style="list-style-type: none"><li>(a) Hold HCU Half-Action</li><li>(b) Slew TID Cursor over desired Tgt</li><li>(c) HCU Full-Action to select Tgt</li></ul></li><li>• <b>TID Symbology</b><ul style="list-style-type: none"><li>– Range (<b>RA</b>)</li><li>– Bearing (<b>BR</b>)</li><li>– Altitude (<b>AL</b>)</li><li>– Magnetic course (<b>MC</b>)</li></ul></li><li>• <b>Lock Target</b><ul style="list-style-type: none"><li>(d) Press <b>PD STT</b> or <b>Pulse STT</b> buttons</li></ul></li><li>• <b>Deselect Target</b><ul style="list-style-type: none"><li>(e) press HCU Half-Action</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>AIM-54 Launch</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Automatically selects TWS AUTO</b></li><li>• <b>Prevents selection of TWS MAN</b></li></ul>

## 3.9 PULSE DOPPLER MODE - TWS AUTO

<ul style="list-style-type: none"> <li>• <b>TWS AUTO</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Target Selection:</b> prioritizes contacts based off range, aspect, closure</li> <li>• <b>Scan Azimuth/Elevation:</b> Geometric center of targets in scan volume</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Centroid / Steering Cues</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Steering Centroid</b> <ul style="list-style-type: none"> <li>– facilitates steering cues</li> <li>– HUD, VDI, TID, DDD</li> <li>– Appears as <b>X</b> on TID</li> <li>– Takes Gimbal limits into account</li> <li>– Weights individual Tracks based on parameters</li> </ul> </li> <li>• <b>Illumination Centroid</b> <ul style="list-style-type: none"> <li>– <b>Not Visible</b></li> <li>– Controls azimuth and elevation of scan pattern</li> <li>– Takes scan volume into account</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Pilot Steering Cues</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Conditions</b> <ul style="list-style-type: none"> <li>– A-A HUD Mode selected</li> <li>– Master Arm ON (UP)</li> <li>– AIM-54 or AIM-7 selected</li> <li>– TWS-AUTO selected</li> </ul> </li> </ul>



## 3.10 PULSE DOPPLER MODE - PDSTT



SINGLE TARGET TRACK

- Pulse Doppler STT**

Lock Target with doppler filtering

- Advantages**

- Ground Clutter filtering

- Disadvantages**

- Susceptible to notching

- Lock Target**

- Conditions**

- Pulse Doppler Mode selected (PD Search, RWS, TWS)
- RDR HCU Mode selected

- Lock Target**

- Hold HCU Half-action
- Slew to desired Target
- HCU Full-Action to lock

- Unlock Target**

- HCU Half-action

- DDD**

- Track Indications**

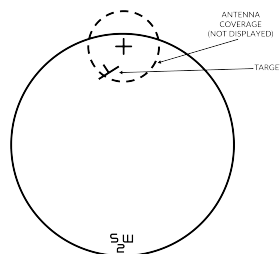
- ANT TRK light
- RDROT light
- Tracking gates
- Closure rate
- Attack Symbology

## 3.11 ACM MODES - OVERVIEW

	PLM	VSL	PAL	MRL
Range	5 nm	5 nm	15 nm	5 nm
Description	Boresight	Vertical	Horizontal	RIO
Weapons	Gun + All Missiles			

- PLM

- Pilot Lockon Mode
- Highest Priority ACM
- Search Pattern
  - Small Boresight
  - Range: 5 nm



- VSL

- Vertical Scan Lockon
- HI Search Pattern
  - Width: 5 deg
  - Vertical: +15 to +55 deg
  - Range: 5 nm
- LO Search Pattern
  - Width: 5 deg
  - Vertical: -15 to +25 deg
  - Range: 5 nm
- RIO/PILOT Controlled

- PAL




- Pilot Automatic Lockon
- Search Pattern
  - Width: +/- 20 deg
  - Vertical: 8-bar
  - Range: 15 nm

- MRL





- Manual Rapid Lockon
- RIO Controlled
- Search Pattern
  - HCU Controlled
  - Range: 5 nm







## 3.12 TID SYMBOLOGY

## GENERAL








Center Dot	.	<ul style="list-style-type: none"> <li>• <b>Basic Component of Symbols</b> <ul style="list-style-type: none"> <li>– Marks coordinates of symbol</li> </ul> </li> </ul>
Own AC		<ul style="list-style-type: none"> <li>• <b>Symbol representing own aircraft</b> <ul style="list-style-type: none"> <li>– Ground Stabilized: Moves</li> <li>– Aircraft Stabilized: Stationary</li> <li>– Outside TID: line drawn from TID center towards symbol</li> </ul> </li> </ul>
TID Cursor		<ul style="list-style-type: none"> <li>• <b>Hook Cursor</b> <ul style="list-style-type: none"> <li>– Controlled by HCU in TID mode</li> </ul> </li> <li>• <b>Half-Action</b> <ul style="list-style-type: none"> <li>– Enables display of symbol</li> <li>– Enables HCU stick to move cursor</li> </ul> </li> <li>• <b>Full-Action</b> <ul style="list-style-type: none"> <li>– Hooks closest symbol</li> <li>– If no symbol near, cursor dropped at location</li> </ul> </li> </ul>
TWS Steering Centroid		<ul style="list-style-type: none"> <li>• <b>Steering centroid of TWS tracks</b> <ul style="list-style-type: none"> <li>– Selected by WCS for weapons engagement</li> </ul> </li> </ul>

## ONBOARD SENSORS

		Symbol Above Dot
Unknown		<ul style="list-style-type: none"> <li>• <b>Unknown Sensor Track</b></li> <li>• <b>All Returns in RWS</b></li> </ul>
Hostile		<ul style="list-style-type: none"> <li>• <b>Sensor Track designated Hostile by RIO</b></li> </ul>
Friend		<ul style="list-style-type: none"> <li>• <b>Sensor Track designated Friendly by RIO</b></li> </ul>
Angle-Tracked Radar Target		<ul style="list-style-type: none"> <li>• <b>Radar Angle Tracking</b> <ul style="list-style-type: none"> <li>– Jamming Target</li> </ul> </li> </ul>








Angle-Track Radar Target with Altitude Difference Ranging		<ul style="list-style-type: none"> <li>• Radar Angle Tracking               <ul style="list-style-type: none"> <li>– Jamming Target</li> <li>– Alt. diff. ranging</li> </ul> </li> </ul>
TCS-Angle Tracked Target		<ul style="list-style-type: none"> <li>• TCS Angle Tracking</li> </ul>
TCS-Angle Tracked Target with Altitude Difference Ranging		<ul style="list-style-type: none"> <li>• TCS Angle Tracking               <ul style="list-style-type: none"> <li>– Alt. diff. ranging</li> </ul> </li> </ul>
<b>D/L TARGETS</b>		<b>Symbol Below Dot</b>
Unknown		<ul style="list-style-type: none"> <li>• D/L Track designated Unknown by Source</li> </ul>
Hostile		<ul style="list-style-type: none"> <li>• D/L Track designated Hostile by Source</li> </ul>
Friendly		<ul style="list-style-type: none"> <li>• D/L Track designated Friendly by Source</li> </ul>







**MANUAL REF POINTS**

Home base		<ul style="list-style-type: none"> <li>• Waypoint Representing               <ul style="list-style-type: none"> <li>– Home Base</li> <li>– Carrier</li> <li>– Airfield</li> </ul> </li> </ul>
Waypoint		<ul style="list-style-type: none"> <li>• Nav Waypoint</li> <li>• Supplanted by Number               <ul style="list-style-type: none"> <li>– 1, 2, or 3</li> </ul> </li> </ul>
Defended Point		<ul style="list-style-type: none"> <li>• Waypoint to Defend</li> </ul>
Fixed Point		<ul style="list-style-type: none"> <li>• Generic Waypoint</li> </ul>
Hostile Area		<ul style="list-style-type: none"> <li>• Waypoint Indicating Hostile Area</li> </ul>
Surface Target		<ul style="list-style-type: none"> <li>• Waypoint Indicating Surface Target</li> </ul>
IP		<ul style="list-style-type: none"> <li>• Initial Point               <ul style="list-style-type: none"> <li>– Waypoint for A/G engagement</li> </ul> </li> </ul>

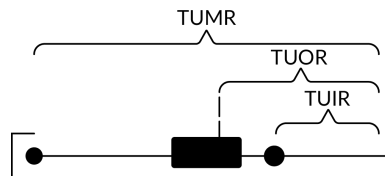
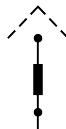
**D/L REF POINTS**

Home Base		<ul style="list-style-type: none"> <li>• D/L Waypoint Representing Home Base</li> </ul>
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Waypoint		<ul style="list-style-type: none"> <li>• D/L Generic Waypoint</li> </ul>
Data Link Fixed Point		<ul style="list-style-type: none"> <li>• D/L Waypoint Representing Fixed Point</li> </ul>
Surface Target		<ul style="list-style-type: none"> <li>• D/L Waypoint Representing a Surface Target</li> </ul>
<b>POS SYMB MODIFIERS</b>		
Mandatory Attack		<ul style="list-style-type: none"> <li>• Additional Symbology on TWS Track <ul style="list-style-type: none"> <li>– Horizontal bar through center dot</li> </ul> </li> <li>• Selected by RIO <ul style="list-style-type: none"> <li>– Only 1 target can be designated</li> <li>– Guaranteed WCS priority number</li> </ul> </li> </ul>
Data Link Destroy		<ul style="list-style-type: none"> <li>• Additional Symbology on D/L Track <ul style="list-style-type: none"> <li>– Horizontal bar through center dot</li> </ul> </li> <li>• Selected by Source <ul style="list-style-type: none"> <li>– No effect on WCS prioritization</li> </ul> </li> </ul>
Do Not Attack		<ul style="list-style-type: none"> <li>• Additional Symbology on TWS or D/L Track <ul style="list-style-type: none"> <li>– Vertical bar through center dot</li> </ul> </li> <li>• If Set by RIO <ul style="list-style-type: none"> <li>– Removes WCS prioritization</li> </ul> </li> </ul>
Multiple Targets		<ul style="list-style-type: none"> <li>• Additional Symbology on TWS or D/L Track <ul style="list-style-type: none"> <li>– Horizontal bar on left side of symbol</li> </ul> </li> <li>• Indicates Multiple Targets</li> </ul>

Data Link Challenge		<ul style="list-style-type: none"> <li>• <b>Additional Symbolology on D/L Track</b> <ul style="list-style-type: none"> <li>– Small <b>V</b> with center at center dot</li> </ul> </li> <li>• <b>Command to Visually Identify</b></li> </ul>
Track Extrapolated		<ul style="list-style-type: none"> <li>• <b>Additional Symbolology on TWS or D/L Track</b> <ul style="list-style-type: none"> <li>– Small <b>X</b> with center at center dot</li> </ul> </li> <li>• <b>No Update within 8 seconds</b> <ul style="list-style-type: none"> <li>– Track deleted after 14 seconds</li> <li>– Or after 2 min if track hold</li> </ul> </li> </ul>
Altitude Numerics		<ul style="list-style-type: none"> <li>• <b>Altitude to Nearest Ten Thousand</b> <ul style="list-style-type: none"> <li>– example: 35000-45000</li> </ul> </li> </ul>
Firing Order Numerics		<ul style="list-style-type: none"> <li>• <b>Indicates AIM-54 Prioritization</b> <ul style="list-style-type: none"> <li>– Numbers 1-6</li> <li>– Only in TWS</li> </ul> </li> </ul>
Time-to-Impact (TTI)		<ul style="list-style-type: none"> <li>• <b>After AIM-54 Launch</b> <ul style="list-style-type: none"> <li>– Prioritization replaced with estimated TTI</li> </ul> </li> <li>• <b>Flashes after Pitbull</b></li> </ul>
Velocity Vector		<ul style="list-style-type: none"> <li>• <b>Additional Symbolology from center Dot</b> <ul style="list-style-type: none"> <li>– Direction represents track heading</li> <li>– Length represents speed</li> </ul> </li> <li>• <b>Varies with Mode</b> <ul style="list-style-type: none"> <li>– Ground Stabilized: true heading and ground speed</li> <li>– Aircraft Stabilized: relative heading and velocity</li> </ul> </li> </ul>

**Launch Zone Vectors**



• **Additional Symbolology for AIM-54**

- Selected manually by RIO
- Or 60 seconds from max launch

• **TUMR**

- Time-Until-Minimum-Range
- Max: 180 seconds, 1.5 inches

• **TUOR**

- Time-Until-Optimal-Range
- Start of bar is 8 seconds from optimum

• **TUIR**

- Time-Until-In-Range

**Jamming Strobe**



• **Line from own AC towards Jammer**

**Radar Antenna Scan Pattern Azimuth Limits**



• **Limits of Current Scan Azimuth**  
• **Single Line in STT**

**Data Link Jamming Strobe**



• **Line from D/L point towards Jammer**

**Data Link Pointer**



• **Additional Symbolology on D/L Track**

- Circle
- Indicates operator concern





**Data Link Priority Kill**



• **Additional Symbolology on D/L Track**

- Square
- Indicates target must be destroyed
- No effect on WCS prioritization

## ATTACK DISPLAY SYMBOLOGY

Artificial Horizon		<ul style="list-style-type: none"><li>• Represents Pitch and Roll</li></ul>
Steering Guidance Symbol		<ul style="list-style-type: none"><li>• Represents Steering Error<ul style="list-style-type: none"><li>– Should be placed as near as possible to center of ASE circle</li></ul></li></ul>
Allowable Steering Error Circle		<ul style="list-style-type: none"><li>• Indicates Allowable Steering Error for Missile Launch</li><li>• Size Varies with Geometry, Mode, Missile</li></ul>
Breakaway Indication		<ul style="list-style-type: none"><li>• Appears when Target Range Less than Minimum for Selected Weapon</li></ul>



**4 TCS / ALQ-100**

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**4.1 OVERVIEW**

TCS - LANTIRN

## 5 LANTIRN

### 5.1 OVERVIEW

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><b>Startup</b></li> </ul> | <p>(a) <b>Power Switch</b> ..... <b>POD</b></p> <p>8 min startup sequence, <b>MODE Switch</b> shows <b>STBY</b> when complete</p> <p>(b) <b>Mode Switch</b> ..... <b>Press</b></p> <p>30 sec initialization, <b>MODE Switch</b> shows <b>OPER</b> when ready</p> <p>(c) <b>VIDEO Switch</b> ..... <b>FLIR</b></p> <p>(d) <b>TID MODE</b> ..... <b>TV</b></p> |
|--|--|

### 5.2 CONTROL PANEL

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li><b>Power Switch</b></li> </ul>     | <ul style="list-style-type: none"> <li><b>OFF</b> – Disables power to system</li> <li><b>IMU</b> – Only powers LANTIRN IMU             <ul style="list-style-type: none"> <li>– <b>Not Simulated in DCS</b></li> </ul> </li> <li><b>POD</b> – Powers whole system</li> </ul> |
| <ul style="list-style-type: none"> <li><b>MODE Switch</b></li> </ul>      | <ul style="list-style-type: none"> <li><b>STBY</b> – Standby</li> <li><b>OPER</b> – Operational</li> </ul>   |
| <ul style="list-style-type: none"> <li><b>LASER Switch</b></li> </ul>     | <ul style="list-style-type: none"> <li><b>ARM</b> – Arms laser             <ul style="list-style-type: none"> <li>– Indicated by <b>LASER ARMED</b> light</li> </ul> </li> <li><b>SAFE</b> – Inhibits laser use</li> </ul>   |
| <ul style="list-style-type: none"> <li><b>VIDEO Switch</b></li> </ul>     | <ul style="list-style-type: none"> <li><b>FLIR</b> – Displays LANTIRN FLIR on TID</li> <li><b>TCS</b> – Displays TCS video on TID</li> </ul>   |
| <ul style="list-style-type: none"> <li><b>Indicator Lights</b></li> </ul> | <ul style="list-style-type: none"> <li><b>Indicate Error States</b></li> </ul>   |
| <ul style="list-style-type: none"> <li><b>IBIT Button</b></li> </ul>      | <ul style="list-style-type: none"> <li><b>Initiates Build-In-Test</b></li> </ul>   |

### 5.3 CONTROL STICK

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><b>Master Mode</b></li> </ul> | <ul style="list-style-type: none"> <li><b>A/G Mode</b> – Side 2-Way FWD</li> <li><b>A/A Mode</b> – Side 2-Way AFT</li> </ul> |
| <ul style="list-style-type: none"> <li><b>Slew</b></li> </ul>        | <p>Center Slew Hat</p>   |

• <b>WHOT/BHOT</b>	Center Slew Hat Depress
• <b>Tracking Mode</b>	<ul style="list-style-type: none"> <li>• Point Track – Left 4-Way Up</li> <li>• Area Track – Left 4-Way Down</li> </ul>
• <b>Zoom Level</b>	FOV Button

## 5.4 **DISPLAY**

• <b>Top Left</b>	<ul style="list-style-type: none"> <li>• <b>Own Aircraft Datablock</b> <ul style="list-style-type: none"> <li>– Lat – deg:min.dec</li> <li>– Long – deg:min.dec</li> <li>– ALT – Altitude (ft)</li> <li>– KGS – Knots Ground Speed</li> <li>– DIVE – Dive Angle (deg)</li> </ul> </li> </ul>
• <b>Mid Left</b>	<ul style="list-style-type: none"> <li>• <b>Sensor Mode – WHOT / BHOT</b></li> <li>• <b>Gain Control – Auto / Manual</b></li> </ul>
• <b>Bottom Left</b>	<ul style="list-style-type: none"> <li>• <b>Pod Info Datablock</b> <ul style="list-style-type: none"> <li>– SRA – Slant Range</li> <li>– AZ – Pod LoS Azimuth L/R</li> <li>– EL – Pod LoS Elevation</li> <li>– Time – UTC Time</li> <li>– IBIT – Codes</li> </ul> </li> </ul>
• <b>Bottom Center</b>	<ul style="list-style-type: none"> <li>• <b>Master Mode – A/A / A/G</b></li> <li>• <b>Track Mode – AREA / POINT / Q</b></li> <li>• <b>Current Weapon</b></li> <li>• <b>Laser Code</b></li> <li>• <b>L</b> <ul style="list-style-type: none"> <li>– <b>Steady</b> – Laser Armed</li> <li>– <b>Flashing</b> – Laser Firing</li> </ul> </li> </ul>
• <b>Bottom Right</b>	<ul style="list-style-type: none"> <li>• <b>Q Datablock</b> <ul style="list-style-type: none"> <li>– TTG – Time-To-Go</li> <li>– B/R – Bearing and Range</li> <li>– ELEV – Elevation (ft) of Q</li> <li>– Lat – deg:min:dec</li> <li>– Long – deg:min:dec</li> </ul> </li> </ul>

- **Mid Center**

- **Crosshair**

- **Bounding Box** – Indicates currently tracked target in point mode
- **Zoom Boxes** – Indicates next zoom levels
- **FLIR Pointing Cue** – Shows Pod LoS, screen center indicates straight down

- **Mid Right**

- **Bomb Release Cue**

- Only shown if current Q is **QDES**, with valid weapon selected
- **TREL** – Time to release
- **TIMP** – Time to Impact (after release)

- **Top Center**

- **Steering Guidance to Q**

- Relative bearing L/R to commanded heading



## 6 A/G WEAPONS

### 6.1 A/G WEAPON SETTINGS - OVERVIEW

• <b>WPN TYPE</b>	<ul style="list-style-type: none"> <li>• <b>Selects Weapon Type</b> <ul style="list-style-type: none"> <li>– Configures WCS for selected weapon</li> <li>– Refer to Kneeboard for list of mounted weapons</li> <li>– Mk-81 / 82 / 83 have both <b>L</b> and <b>H</b> option referring to high and low drag</li> </ul> </li> </ul>
• <b>DLVY MODE</b>	<ul style="list-style-type: none"> <li>• <b>STP-SGL</b> – Single weapon per press</li> <li>• <b>STP-PRS</b> Single pair per press</li> <li>• <b>RPL-SGL</b> – QTY of weapons per press</li> <li>• <b>RPL-PRS</b> – QTY of pairs per press</li> </ul>
• <b>DLVY OPTNS</b>	<ul style="list-style-type: none"> <li>• <b>INTERVAL</b> – Interval in ms</li> <li>• <b>QTY</b> – Number of stores to be released</li> </ul>
• <b>MECH FUZE</b>	<ul style="list-style-type: none"> <li>• <b>NOSE</b> – Arms nose fuze</li> <li>• <b>SAFE</b> – Inhibits arming of fuzes</li> <li>• <b>NOSE/TAIL</b> – Arms both fuzes</li> </ul>
• <b>ELEC FUZE</b>	<ul style="list-style-type: none"> <li>• <b>SAFE</b> – Inhibits electrical bomb fuzing</li> <li>• <b>VT</b> – Sets air-burst mode at preset burst height for compatible stores</li> <li>• <b>INST</b> – Sets instantaneous burst mode</li> <li>• <b>DLY 1</b> – Sets preset time delay 1</li> <li>• <b>DLY 2</b> – Sets preset time delay 2</li> </ul>
• <b>STA SEL</b>	<ul style="list-style-type: none"> <li>• <b>Selects Stations for Employment/Jettison</b> <ul style="list-style-type: none"> <li>– Set to <b>SEL</b> to activate a pylon</li> <li>– Stations 1 &amp; 8 should be set to <b>B</b> for selection</li> <li>– Station 1 &amp; 8 <b>SW</b> was used for Sidewinder jettison, is now inoperable</li> </ul> </li> </ul>
• <b>TANK JETT</b>	<ul style="list-style-type: none"> <li>• <b>Allows Drop Tank Jettison</b></li> </ul>
• <b>SEL JETT</b>	<ul style="list-style-type: none"> <li>• <b>JETT</b> – Selective jettison</li> <li>• <b>SAFE</b> – Inhibits jettison</li> <li>• <b>AUX</b> – Backup mode</li> </ul>
• <b>JETT OPTIONS</b>	<ul style="list-style-type: none"> <li>• <b>MER TER</b> – Jettisons ejector racks</li> <li>• <b>WPNS</b> – Jettisons weapons only</li> </ul>

- **ATTK MODE**
- **CCMPTR TGT**
  - **Computer Target** – Similar to CCRP
- **CMPTR IP**
  - **Computer initial point**
  - Extended **CMPTR TGT** mode using known IP
  - For use when target hard to spot visually but close to landmark
- **CMPTR PLT**
  - **Computer Pilot** – similar to CCIP
- **MAN**
  - **Manual** – HUD displays pipper
  - Backup mode
- **D/L BOMB**
  - **Data-Link Bomb** – Automatic mode steered by D/L cues
  - **Not Implemented in DCS**

## 6.2 SELECTIVE ORNANCE JETTISON

1. <b>Pilot Conditions</b>	• <b>MASTER ARM</b> ..... <b>ON</b>
2. <b>RIO Conditions</b>	• <b>Desired Stations</b> ..... <b>Selected</b> • <b>JETT OPTIONS</b> ..... <b>As Desired</b>
3. <b>Jettison</b>	(a) <b>SEL JETT Guard</b> ..... <b>Flipped</b> (b) <b>SEL JETT Switch</b> ..... <b>JETT</b>

## 6.3 M61 GUN

1. <b>Pilot Conditions</b>	• <b>MASTER ARM</b> ..... <b>ON</b> • <b>HUD</b> ..... <b>A/G</b> • <b>WEAPON SELECTOR</b> ..... <b>GUNS</b> • <b>Wing Sweep</b> ..... <b>BOMB</b>
2. <b>Employment</b>	(a) <b>Dive</b> ..... 20-30 deg (b) <b>Pipper</b> ..... on target (c) <b>TRIGGER</b> ..... <b>FIRE</b>
• <b>Note: TCS</b>	• TCS slaved to radar impact point • Rio can select <b>NAR</b> or <b>WIDE</b>



**6.4 FFAR / ZUNI ROCKETS**

1. <b>RIO Conditions</b>	<ul style="list-style-type: none"> <li>• WPN TYP ..... LAU-10</li> <li>• Attack Mode ..... Pilot Attack</li> <li>• Deliver Mode ..... RPL-SGL</li> <li>• Mechanical Fuze ..... NOSE</li> <li>• Electronic Fuze ..... INST</li> <li>• Delivery Options ..... As Desired</li> <li>• Stations ..... Armed</li> </ul>
2. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/G</li> <li>• WEAPON SELECTOR ..... OFF</li> <li>• Stations ..... verify selected</li> <li>• Wing Sweep ..... BOMB</li> </ul>
3. <b>Employment</b>	(a) Dive ..... 20-30 deg (b) Pipper ..... on target (c) TRIGGER ..... FIRE

**6.5 UNGUIDED BOMB - CCIP**

1. <b>RIO Conditions</b>	<ul style="list-style-type: none"> <li>• WPN TYP ..... MK-8X</li> <li>• Attack Mode ..... Pilot Attack</li> <li>• Deliver Mode ..... STP-PRS</li> <li>• Mechanical Fuze ..... NOSE</li> <li>• Electronic Fuze ..... INST</li> <li>• Delivery Options ..... As Desired</li> <li>• Stations ..... Armed</li> </ul>
2. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/G</li> <li>• WEAPON SELECTOR ..... OFF</li> <li>• Stations ..... verify selected</li> <li>• Wing Sweep ..... BOMB</li> </ul>
3. <b>Employment</b>	(a) Dive ..... 40 deg (b) Pipper ..... on target (c) STORE RELEASE ..... Press and Hold

## 6.6 UNGUIDED BOMB - CCRP

1. <b>RIO Conditions</b>	<ul style="list-style-type: none"> <li>• WPN TYP ..... MK-8X</li> <li>• Attack Mode ..... Target Attack</li> <li>• Deliver Mode ..... STP-PRS</li> <li>• Mechanical Fuze ..... NOSE</li> <li>• Electronic Fuze ..... INST</li> <li>• Delivery Options ..... As Desired</li> <li>• Stations ..... Armed</li> </ul>
2. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/G</li> <li>• WEAPON SELECTOR ..... OFF</li> <li>• Stations ..... verify selected</li> <li>• Wing Sweep ..... BOMB</li> </ul>
3. <b>Designation</b>	(a) Slew Diamond ..... VSL HI/LO (b) Designate ..... PAL
4. <b>Employment</b>	(a) Flight Path ..... Straight, Level (b) Vel Vector ..... on Bomb Fall Line  When Solution Cue meets Velocity Vector  (c) STORE RELEASE ..... Press and Hold

## 6.7 LASER GUIDED BOMB

1. <b>LANTIRN PREP</b>	<p>(a) <b>Target Pod Power</b> ..... <b>POD</b></p> <ul style="list-style-type: none"> <li>• Warm up takes approx. 8 min</li> <li>• Automatically switches to <b>STANDBY</b></li> </ul> <p>(b) <b>Laser Code</b> ..... as desired</p> <ul style="list-style-type: none"> <li>• <b>MUST BE SET ON THE GROUND</b></li> <li>• Default: 1688</li> </ul> <p>(c) <b>LANTIRN Mode</b> ..... <b>OPERATE</b></p> <ul style="list-style-type: none"> <li>• <b>STANDBY</b> caution will flash for 30 s</li> <li>• Then switches to <b>OPER</b></li> </ul> <p>(d) <b>VIDEO Switch</b> ..... <b>FLIR</b></p> <p>(e) <b>TID Mode</b> ..... <b>TV</b></p>
2. <b>RIO Conditions</b>	<ul style="list-style-type: none"> <li>• <b>WPN TYP</b> ..... <b>GBU-XX</b></li> <li>• <b>Attack Mode</b> ..... <b>Manual</b></li> <li>• <b>Deliver Mode</b> ..... <b>STP-SGL</b></li> <li>• <b>Mechanical Fuze</b> ..... <b>NOSE</b></li> <li>• <b>Electronic Fuze</b> ..... <b>INST</b></li> <li>• <b>Delivery Options</b> ..... <b>As Desired</b></li> <li>• <b>Stations</b> ..... <b>Armed</b></li> </ul>
3. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• <b>MASTER ARM</b> ..... <b>ON</b></li> <li>• <b>HUD</b> ..... <b>A/G</b></li> <li>• <b>WEAPON SELECTOR</b> ..... <b>OFF</b></li> <li>• <b>VDI Mode</b> ..... <b>TV</b></li> <li>• <b>Stations</b> ..... verify selected</li> <li>• <b>Wing Sweep</b> ..... <b>BOMB</b></li> </ul>
4. <b>Slew LANTIRN</b>	<ul style="list-style-type: none"> <li>• <b>Slave to WYPT</b> ..... <b>Left-4-Way RIGHT</b></li> <li>• <b>QSNO (Snowplow)</b> ..... <b>S4 HAT Down</b></li> <li>• <b>Toggle FOV</b> ..... <b>LANTIRN Toggle FOV</b></li> <li>• <b>Slew</b> ..... <b>LANTIRN Stick</b></li> <li>• <b>Area Track</b> ..... <b>Left-4-Way UP</b></li> <li>• <b>Point Track</b> ..... <b>Left-4-Way Down</b></li> <li>• <b>Undesignate</b> ..... <b>LANTIRN Undesignate</b></li> </ul>

4. **Designate**(a) **Designate** ..... **Trigger Full-Action**

- Time-to-Go calculated
- Slant Range calculated

**Once Time-to-Realease (TREL) is 0**

- (b) **Auto-Lase** ... If selected: lases 10s to impact
- (c) **Manual Lase** ..... **Trigger Full-Action**
- (d) **While Lasing** ..... **L** blinks

5. **Employment****Once Time-to-Realease (TREL) is 0**

- (a) **STORE RELEASE** ..... **Press and Hold**
- (b) **Flight Path** ..... Gentle right-hand turn  
(to prevent masking)

6.8 **TALD DECOYS**1. **RIO Conditions**

- **WPN TYP** ..... **TALD**
- **Deliver Mode** ..... **STP-SGL**
- **Delivery Options** ..... **As Desired**
- **Stations** ..... **Armed**

2. **Pilot Conditions**

- **MASTER ARM** ..... **ON**
- **HUD** ..... **A/G**
- **WEAPON SELECTOR** ..... **OFF**
- **HSD Mode** ..... **TID**
- **Stations** ..... verify selected

3. **Employment**

- (a) **Flight Path** ..... High / Fast
- (b) **RWR** ..... Monitor to locate emitters
- (c) **STORE RELEASE** ..... **Press and Hold**

## 7 A/A WEAPONS

### 7.1 M61 GUN - OVERVIEW

<ul style="list-style-type: none"> <li><b>GUN RATE Button</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Cycles Gun Rate</b> <ul style="list-style-type: none"> <li><b>HIGH</b> – 6000 rpm</li> <li><b>LOW</b> – 4000 rpm</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li><b>A/A Gun Modes</b></li> </ul>	<ul style="list-style-type: none"> <li><b>RTGS</b> <ul style="list-style-type: none"> <li><b>Real-Time Gunsight Mode</b> <ul style="list-style-type: none"> <li>Selected automatically with guns</li> <li><b>If No WCS Data Available</b> displays bullet location at 2000 ft with diamond and 1000 ft with pipper</li> <li><b>If WCS Data Available</b> pipper displays bullet location at targets current range out to 4000 ft</li> </ul> </li> </ul> </li> <li><b>MANUAL</b> <ul style="list-style-type: none"> <li>Fixed manual pipper</li> <li>Adjust with <b>GUN ELEV</b> knob</li> <li>Press <b>CAGE/SEAM</b> to select</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li><b>CAGE/SEAM Button</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Cycles RTGS / MANUAL Gun Modes</b></li> </ul>
<ul style="list-style-type: none"> <li><b>ROUNDS Knob</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Allows selection of remaining gun rounds</b></li> </ul>

### 7.2 M61 GUN - MANUAL

1. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li><b>MASTER ARM</b> ..... <b>ON</b></li> <li><b>HUD</b> ..... <b>A/A</b></li> <li><b>Gun Rate</b> ..... <b>HIGH</b></li> <li><b>Gunsight Lead</b> ..... as required</li> <li><b>WEAPON SELECTOR</b> ..... <b>GUNS</b></li> </ul>
2. <b>Employment</b>	<ul style="list-style-type: none"> <li>(a) <b>Gun Mode</b> ..... <b>MANUAL</b></li> <li>(b) <b>Pipper</b> ..... on target</li> <li>(c) <b>Trigger</b> ..... <b>FIRE</b></li> </ul>

## 7.3 M61 GUN - RTGS / NO RADAR

1. Pilot Conditions	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• Gun Rate ..... HIGH</li> <li>• WEAPON SELECTOR ..... GUNS</li> </ul>
2. Employment	(a) Gun Mode ..... RTGS (b) Pipper ..... on target (c) Trigger ..... FIRE

## 7.4 M61 GUN - RTGS / RADAR

1. Pilot Conditions	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• Gun Rate ..... HIGH</li> <li>• WEAPON SELECTOR ..... GUNS</li> </ul>
2. Employment	(a) Gun Mode ..... RTGS (b) Radar ..... STT (c) Pipper ..... on target (d) Trigger ..... FIRE

## 7.5 AIM-9 SIDEWINDER - OVERVIEW

<ul style="list-style-type: none"><li>• <b>Missile Preparation</b></li></ul>	<ul style="list-style-type: none"><li>• <b>MSL PREP</b><ul style="list-style-type: none"><li>– AIM-9 seeker must be cooled</li><li>– Either press <b>SW COOL</b> button</li><li>– Or activation of <b>ACM</b></li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>Seeker Head Modes</b></li></ul>	<ul style="list-style-type: none"><li>• <b>SEAM</b><ul style="list-style-type: none"><li>– <b>Sidewinder Expanded Acquisition Mode</b></li><li>– <b>Double-D search pattern</b> invisible to pilot</li><li>– 4.5 sec search time</li><li>– <b>Allows AIM-9 to be uncaged and track target</b></li><li>– 40 deg track limit</li><li>– <b>Allows WCS to slave AIM-9 to radar track</b></li></ul></li><li>• <b>Boresight</b><ul style="list-style-type: none"><li>– AIM-9 locked to ADL</li><li>– 2.5 deg FOV</li><li>– Selected if <b>MODE/STP</b> set to <b>BRSIT</b></li><li>– And <b>ACM</b> not active</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>MODE/STP Switch</b></li></ul>	<ul style="list-style-type: none"><li>• <b>NORM</b><ul style="list-style-type: none"><li>– Allows <b>SEAM</b> seeker mode</li></ul></li><li>• <b>BRSIT</b><ul style="list-style-type: none"><li>– Forces Boresight seeker mode</li><li>– Overridden if <b>ACM</b> active</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>CAGE/SEAM Button</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Uncages Seeker</b><ul style="list-style-type: none"><li>– Starts 4.5 second search</li><li>– If no IR source found cages again</li></ul></li><li>• <b>Slaves Seeker</b><ul style="list-style-type: none"><li>– If radar STT locked</li></ul></li></ul>

7.6 **AIM-9 SIDEWINDER - SILENT**

1. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• SW COOL ..... ON</li> <li>• MODE/STP ..... As Desired</li> <li>• WEAPON SELECTOR ..... SW</li> </ul>
2. <b>Employment</b>	(a) CAGE/SEAM ..... Uncage Seeker (b) IR-Lock ..... Good Tone (c) Trigger ..... FIRE

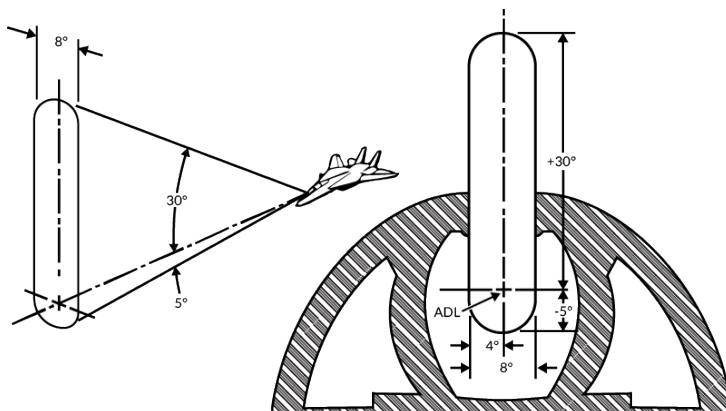
7.7 **AIM-9 SIDEWINDER - RADAR**

1. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• SW COOL ..... ON</li> <li>• MODE/STP ..... NORM</li> <li>• WEAPON SELECTOR ..... SW</li> </ul>
2. <b>Employment</b>	(a) Radar ..... STT (b) CAGE/SEAM ..... Slave Seeker (c) IR-LOCK ..... Good Tone (d) Steering ..... center T-shaped cue with ASE (e) Trigger ..... FIRE



## 7.8 AIM-7 SPARROW - OVERVIEW

<ul style="list-style-type: none"> <li>• <b>Missile Preparation</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>MSL PREP</b> <ul style="list-style-type: none"> <li>– AIM-7 must be tuned to AWG-9</li> <li>– Either press <b>MSL PREP</b> button</li> <li>– Or activation of <b>ACM</b></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Launch Modes</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Normal</b> <ul style="list-style-type: none"> <li>– Standard operation, STT target designated before launch</li> <li>– AIM-7 uses SARH all the way to target</li> <li>– WCS can use CS or PD for guidance set with <b>MSL OPTIONS</b> Switch</li> </ul> </li> <li>• <b>Boresight</b> <ul style="list-style-type: none"> <li>– Uses CS flood antenna of AWG-9</li> <li>– Missile will <b>track strongest return</b> in Flood area</li> <li>– Automatically activated if STT broken</li> <li>– Selected if <b>MODE/STP</b> set to <b>BRSIT</b></li> <li>– <b>Or if no STT available</b></li> <li>– <b>Shown Below</b></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>MSL SPD GATE Switch</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>NOSE QTR</b> <ul style="list-style-type: none"> <li>– Standard setting in DCS</li> </ul> </li> <li>• <b>All Others</b> <ul style="list-style-type: none"> <li>– Not simulated</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>MSL OPTIONS Switch</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>NORM</b> <ul style="list-style-type: none"> <li>– WCS uses dedicated CW antenna for AIM-7 guidance</li> </ul> </li> <li>• <b>SP PD</b> <ul style="list-style-type: none"> <li>– WCS uses PD from main flood antenna for AIM-7F/M guidance</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>MODE/STP Switch</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>NORM</b> <ul style="list-style-type: none"> <li>– Sets normal launch mode logic</li> </ul> </li> <li>• <b>BRSIT</b> <ul style="list-style-type: none"> <li>– Forces Boresight launch mode</li> </ul> </li> </ul>



## 7.9 AIM-7 SPARROW - STT

1. <b>Pilot Conditions</b>	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• MSL PREP ..... ON</li> <li>• MODE/STP ..... NORM</li> <li>• WEAPON SELECTOR ..... SP</li> </ul>
2. <b>RIO Conditions</b>	<ul style="list-style-type: none"> <li>• MSL SPD GATE ..... NOSE QTR</li> <li>• MSL OPTIONS ..... As Desired</li> </ul>
3. <b>Employment</b>	<p>(a) Radar ..... STT</p> <p>(b) Steering</p> <ul style="list-style-type: none"> <li>• Target &lt; 20 deg from ADL</li> <li>• ASE center T-shaped cue within</li> </ul> <p>(c) Trigger ..... <b>Press and Hold</b> (until weapon release)</p> <p>(d) Radar ..... <b>Maintain Lock</b> (until impact)</p>

## 7.10 AIM-54 PHOENIX - OVERVIEW

- **Missile Preparation**

- **Weapon Cooling**

- AIM-54 requires liquid cooling
- RIO enabled **LIQUID COOLING** switch

- **MSL PREP**

- AIM-54 must be tuned to AWG-9
- Either press **MSL PREP** button
- Or activation of **ACM**

- **Launch Modes**

- **PDSTT SARH**

- AIM-54 uses SARH all the way to target
- Faster update rate than TWS
- **Slightly increased effective range** as compared to a TWS launch

- **TWS SARH/ARH**

- Allows **6 AIM-54 launches at 6 targets**
- Missile is initially SARH guided
- When within AIM-54 seeker range AWG-9 sends activation command
- **Not Fire and Forget:** Requires automatic activation command

- **ACM Active**

- Activated when **BRSIT** selected
- Or when **ACM** active with no radar track
- Missile commanded active **before launch**

- **MSL SPD GATE Switch**

- **NOSE QTR**

- Standard setting in DCS

- **All Others**

- Not simulated

- **MSL OPTIONS Switch**

- **NORM**

- Normal guidance (SARH or SARH/ARH)

- **PH ACT**

- WCS immediately sends AIM-54 activation command on launch
- Reverts to SARH if no target detected
- **Must be selected before launch**

<ul style="list-style-type: none"> <li>• <b>TGTS</b> <b>Switch</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>SMALL</b> – 6nm activation range</li> <li>• <b>NORM</b> – 10nm activation range</li> <li>• <b>LARGE</b> – 13nm activation range</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Missile Next</b> <b>Launch Button</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Selects Hooked Track as Next Target for AIM-54 TWS Engagement</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>MODE/STP</b> <b>Switch</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>NORM</b> <ul style="list-style-type: none"> <li>– Normal operation</li> </ul> </li> <li>• <b>BRSIT</b> <ul style="list-style-type: none"> <li>– Commanded active <b>before launch</b></li> <li>– Missile follows ADL and locks strongest return</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>TWS Symbology</b></li> </ul>	<p><b>Refer to TID Symbology Section</b></p> <ul style="list-style-type: none"> <li>• <b>Pre-Launch</b> <ul style="list-style-type: none"> <li>– Prioritization numbers assigned to tracks automatically or manually</li> <li>– Blinking indicates optimal launch parameters</li> </ul> </li> <li>• <b>Post-Launch</b> <ul style="list-style-type: none"> <li>– Target prioritization number replaced with TTI</li> <li>– Other prioritization numbers collapsed by one</li> <li>– Tracks under missile attack brightened</li> <li>– <b>TTI blinks when missile active</b></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Launch To Eject (LTE) Time</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Normal Operation</b> – 3-4 seconds</li> <li>• <b>When in ACM</b> – 1 second</li> </ul>

## 7.11 AIM-54 PHOENIX - PD-STT

1. Pilot Conditions	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• MSL PREP ..... ON</li> <li>• MODE/STP ..... NORM</li> <li>• WEAPON SELECTOR ..... PH</li> </ul>
2. RIO Conditions	<ul style="list-style-type: none"> <li>• LIQUID COOLING ..... ON (FWD)</li> <li>• MSL SPD GATE ..... NOSE QTR</li> <li>• MSL OPTIONS ..... As Desired</li> <li>• TGT Switch ..... As Desired</li> </ul>
3. Employment	<p>(a) Radar ..... STT</p> <p>(b) Steering</p> <ul style="list-style-type: none"> <li>• Target &lt; 20 deg from ADL</li> <li>• ASE center T-shaped cue within</li> </ul> <p>(c) Trigger ..... Press and Hold (until weapon release)</p> <p>(d) Radar ..... Maintain Lock (until impact)</p>

## 7.12 AIM-54 PHOENIX - TWS / MULTI

1. Pilot Conditions	<ul style="list-style-type: none"> <li>• MASTER ARM ..... ON</li> <li>• HUD ..... A/A</li> <li>• MSL PREP ..... ON</li> <li>• MODE/STP ..... NORM</li> <li>• WEAPON SELECTOR ..... PH</li> </ul>
2. RIO Conditions	<ul style="list-style-type: none"> <li>• LIQUID COOLING ..... ON (FWD)</li> <li>• MSL SPD GATE ..... NOSE QTR</li> <li>• MSL OPTIONS ..... As Desired</li> <li>• TGT Switch ..... As Desired</li> <li>• WCS Mode ..... TWS MAN/AUTO</li> </ul>
4. Employment	<p>(a) Radar ..... TWS</p> <p>(b) Trigger ..... Press and Hold (until weapon release)</p> <p>(c) Repeat ..... for remaining targets</p> <p>(d) Radar ..... Maintain Track (until active)</p>



