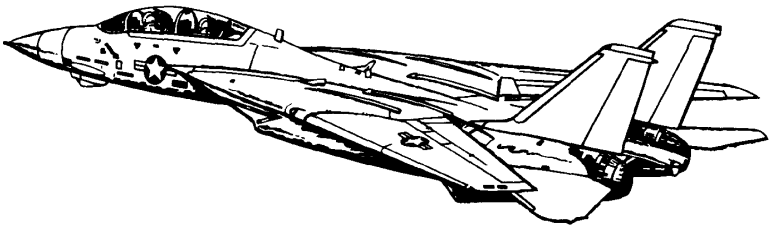
# Pocket Checklist

# F-14A/B AIRCRAFT

**REV: 20220222**



Procedures

Systems

AWG-9
Radar

TCS
LANTIRN

A/G
Weapons

A/A
Weapons

# DISCLAIMER

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# Chapter 1

# PROCEDURES

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## 1.1 START-UP

### 1.1.1 PILOT - PRE-START

| | | |
|---|---|---|
| 1. | **Parking Brake** | **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**<br>• **Warning Lights** ..... checked<br>• **Caution Lights** ..... checked<br>• **Advisory Lights** ..... checked<br>(b) **FIRE DET/EXT**<br>• **L FIRE GO** ..... illuminated<br>• **R FIRE GO** ..... illuminated<br>(c) **INST**<br>• **RPM** ..... 96%<br>• **EGT** ..... 960 C<br>• **FF** ..... 10500 pph<br>• **AOA** ..... 18 ± 5<br>• **Wing Sweep** ..... 45 ± 2.5<br>• **FUEL QTY** ..... 2000 ± 200<br>• **Oxygen QTY** ..... 2 liters<br>• **L&R FF lights** ..... illuminated<br>(d) **OFF** |
| 8. | **Ejection Seat** | Armed |
| 9. | **RIO** | Canopy Closed |
| 10. | **Oxygen** | **ON (FWD)** |
| 11 | **Emergency Wing Sweep** | **OVERSWEEP** |

## 1.1.2 PILOT - ENGINE START

| | | |
|---|---|---|
| 1. | **AIR SOURCE** | **OFF** |
| 2. | **Hydraulics** | (a) **HYD TRANSFER PUMP** ..... **SHUTOFF**<br>(b) **Emerg. Hyd.** ..... **AUTO (LOW)** |
| 3. | **L&R MASTER GEN** | **NORM** |
| 4. | **RIO** | "Ready to Start" |
| 5. | **Right Engine Start-Up** | (a) **Engine Crank** ..... **R**<br>(b) **R Eng N2** ..... 20%<br>(c) **R Throttle** ..... **IDLE**<br>(d) **TIT** ..... < 890 C during start<br>(e) **R GEN CAUTION** ..... extinguished |
| 6. | **Stabilized Parameters** | • **RPM** ..... 62-78%<br>• **TIT** ..... approx 500 C<br>• **Fuel Flow** ..... 950-1400 pph<br>• **NOZ** ..... 5 (100%)<br>• **Oil Pressure** ..... 25-35 psi<br>• **Hyd Pressure** ..... 3000 psi |
| 7. | **Left Engine Start-Up** | (a) **Engine Crank** ..... **L**<br>(b) **L Eng N2** ..... 20%<br>(c) **L Throttle** ..... **IDLE**<br>(d) **TIT** ..... < 890 C during start<br>(e) **L GEN Caution** ..... extinguished |
| 8. | **Stabilized Parameters** | • **RPM** ..... 62-78%<br>• **TIT** ..... approx 500 C<br>• **Fuel Flow** ..... 950-1400 pph<br>• **NOZ** ..... 5 (100%)<br>• **Oil Pressure** ..... 25-35 psi<br>• **Hyd Pressure** ..... 3000 psi |
| 9. | **HYD TRANSFER PUMP** | **NORM** |
| 10. | **HYD PRESSURE** | 3000 psi |
| 11. | **AIR SOURCE** | **BOTH ENG** |
| 12. | **Ground Power** | disconnected |
| 13. | **Compressed Air** | disconnected |

## 1.1.3 PILOT - POST-START

| | | |
|---|---|---|
| 1. | **TO RIO** | "Both Engines Running" |
| 2. | **Displays Control Panel** | • **VDI** ..... **ON**<br>• **HUD** ..... **ON**<br>• **HSD** ..... **ON**<br>• **HDS MODE** ..... **TID** (monitor INS) |
| 3. | **RIO** | **Select Align Quality**<br>• **INS GO NOW:** shortest but least precise alignment<br>• **INS GO COARSE:** does not meet Launch Criteria for AIM-7 / AIM-54<br>• **INS GO MIN WPN LAUNCH:** allows AIM-7 / AIM-54 launch<br>• **INS GO FINE** fine align (8 min) |
| 4. | **ACM Panel** | • **GUN RATE** ..... as required<br>• **SW COOL** ..... **OFF**<br>• **MSL PREP** ..... **OFF**<br>• **Missile MODE/STP** ..... **NORM** |
| 5. | **Gun Rounds** | **Set** |
| 6. | **ANTI-SKID SPOILER BK** | **OFF** |
| 7. | **Emergency Wing Sweep** | (a) **Handle** ..... **AFT**<br>(b) **Angle** ..... Verify 68 deg |
| 8. | **AFCS Panel - SAS STAB AUG** | • **PITCH** ..... **ON**<br>• **ROLL** ..... **ON**<br>• **YAW** ..... **ON** |
| 9. | **WING/EXT TRANS** | **AUTO** |
| 10. | **UHF 1 Function Selector** | **BOTH** |
| 11. | **TACAN Function Selector** | **T/R** |
| 12. | **ARA-63 ICLS RECEIVER** | **ON** |

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

**WARNING**

- **PARKING BRAKE MUST BE ENGAGED DURING ALIGNMENT.**
  Lack of parking brake engagement inhibits INS alignment

## 1.1.4 RIO - PRE-START

| | | |
|---|---|---|
| 1. | **Oxygen** | **ON (FWD)** |
| 2. | **PILOT** | • **Ground Power** ..... connected<br>• **Compressed Air** ..... connected |
| 3. | **ICS** | Comm Check |
| 4. | **Lights** | As required |
| 5. | **LTS Test** | Coordinate with Pilot |
| 6. | **Ejection Seats** | **ARMED** |
| 7. | **Canopy** | **CLOSED** |
| 8. | **TO PILOT** | "Ready to Start" |

## 1.1.5 RIO - POST-START - SHORE

| | | |
|---|---|---|
| 1. | **PILOT** | • **Engines** ..... started<br>• **AIR SOURCE** ..... BOTH ENG |
| 2. | **INS STARTUP** | (a) **LIQUID COOLING** ..... **ON (FWD)**<br>(b) **WCS Switch** ..... **STANDBY**<br>(c) **IR/TV Power** ..... **STBY/IR/TV**<br>(d) **TID/DDD** ..... illuminated after 40 s |
| 3. | **Kneeboard** | Retrieve Coordinates, Elevation, Magnetic Variation from GROUND SETTINGS Page |
| **WARNING** | Input Coords **BEFORE** selecting **GND ALIGN** if using ASH | |
| 4. | **Start INS Align** | (a) **Nav Mode** ..... **GND ALIGN**<br>(b) **CAP**<br>• **Category** ..... **NAV**<br>• **MESSAGE** ..... **OWN AC**<br>(c) **Keyboard**<br>• **CLEAR**, **LAT**, latitude, **ENTER**<br>• **LONG**, longitude, **ENTER**<br>• **ALT**, altitude, **ENTER**<br>(d) **CAP MESSAGE** ..... **MAG HDG VAR**<br>(e) **Keyboard** ..... **HDG**, mag var, **ENTER**<br>(f) **Align Progress** ..... Monitor |
| 5. | **U/VHF Mode** | **T/R G** |

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

**Once Airborne**

| | | |
|---|---|---|
| 20. | **IR/TV Power** | **ON** |
| 21. | **WCS Switch** | **WCS XMT** |

## 1.1.6 RIO - POST-START - CARRIER

| | | |
|---|---|---|
| 1. | **PILOT** | • **Engines** ..... started<br>• **AIR SOURCE** ..... BOTH ENG |
| 2. | **INS STARTUP** | (a) **LIQUID COOLING** ..... **ON (FWD)**<br>(b) **WCS Switch** ..... **STANDBY**<br>(c) **IR/TV Power** ..... **STBY/IR/TV**<br>(d) **TID/DDD** ..... illuminated after 40 s |
| 3. | **Datalink** | (a) **Kneeboard** ..... TACTICAL DL<br>(b) **DL Power** ..... **ON (FWD)** |
| 4. | **Start INS Align** | (a) **DL FREQ** ..... Set<br>(b) **DL Mode** ..... **CAINS/WAYPT**<br>(c) **Nav Mode** ..... **CVA** |
| 5. | **U/VHF Mode** | **T/R G** |
| 6. | **TACAN** | **T/R** |
| 7. | **RWR Panel** | (a) **Display Type** ..... **NORM**<br>(b) **PWR** ..... **ON**<br>(c) **TEST** ..... **SPL**<br>(d) **MODE** ..... **LMT** |
| 8. | **DECM** | **STBY**, then **ACT** |
| 9. | **IFF** | (a) **MASTER** ..... **STBY**<br>(b) **CODE** ..... as required |
| 10. | **Altimeter** | Reset |
| 11. | **CAP** | Enter Data (WP, FP, etc.) |
| 12. | **Displays** | • **DDD** ..... Set<br>• **TID** ..... Set<br>• **Multiple Display Indicator** ..... Set |
| 13. | **Hand Control Panel** | Set |
| 14. | **AN/ALE-39** | Set (as required)<br>• **AUTO (CHAFF)/MAN**<br>• **MAN** |
| 15. | **Flare Mode** | **PILOT** |

| | | |
|---|---|---|
| 16. | **Complete INS Align** | • **Duration Full Fine** ..... 9 min<br>• **Duration ASH** ..... much faster<br><br>(a) **Align Complete** ..... Caret → Diamond<br>(b) **NAV Mode** ..... **INS NAV** |
| 17. | **Datalink** | (a) **DL Mode** ..... **TAC (AFT)**<br>(b) **DL Freq.** ..... **Set** |
| 18. | **Standby ADI** | Erect at least 2 min before T/O |
| 19. | **TO PILOT** | "Ready to Taxi" |
| **Once Airborne** | | |
| 20. | **IR/TV Power** | **ON** |
| 21. | **WCS Switch** | **WCS XMT** |

**WARNING**

- Input Coords **BEFORE** selecting **GND ALIGN** if using ASH. Else alignment can progress too far to correct coordinates by the time they are input.
- **PARKING BRAKE MUST BE ENGAGED DURING ALIGNMENT.** Lack of parking brake engagement inhibits INS alignment

## 1.2 TAKEOFF & LANDING

### 1.2.1 PRE-TAXI

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

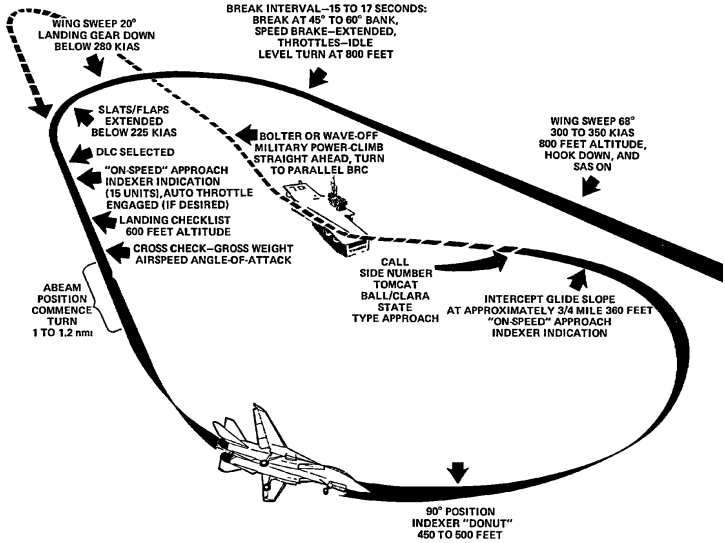
### 1.2.2 TAKEOFF - SHORE

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

## 1.2.3 TAKEOFF - CARRIER

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

## 1.2.4 LANDING - OVERHEAD PATTERN




| | | |
|---|---|---|
| 1. | **Initial Approach** | • **WING SWEEP** ..... **68 deg**<br>• **HOOK** ..... **DOWN**<br>• **SAS** ..... **ON**<br>• **HUD** ..... **LDG**<br>• **Airspeed** ..... **300-350 KIAS**<br>• **Altitude** ..... **800 ft** |
| 2. | **Initial Break** | • **Break Interval** ..... **15-17 s**<br>• **BANK** ..... **45-60 deg**<br>• **SPEED BRAKE** ..... **EXTEND**<br>• **Throttle** ..... **IDLE**<br>• **G** ..... **3-4 G**<br>• **Altitude** ..... **800 ft** |
| 3. | **Break Turn** | • **Wing Sweep** ..... **AUTO** < 280 KIAS<br>• **Landing Gear** ..... **DOWN** < 280 KIAS<br>• **FLAPS** ..... **DOWN** < 225 KIAS |
| 4. | **Downwind** | • **DLC** ..... **Selected** once flaps out<br>• **AOA** ..... **ON-SPEED**<br>• **LANDING CHECKLIST**<br>• **Altitude** ..... descend to **600 ft** |

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

## 1.2.5 LANDING - CHECKLIST

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

## 1.3 IN-FLIGHT

### 1.3.1 AERIAL REFUELING

## 1.3.2 AIRSTART

| | |
|---|---|
| • **Spooldown** | Before significant spooldown<br>(a) **Non-Running ENG** ..... **IDLE** or above<br>If no relight occurs<br>(b) **Non-Running ENG** ..... **OFF** then **IDLE**<br>If still no relight occurs<br>(c) **ENG MODE** ..... **SEC**<br>(d) **Non-Running ENG** ..... **OFF** then **IDLE** |
| • **Cross-Bleed Restart** | With one ENG running, if Spooldown fails<br>(a) **Non-Running ENG** ..... **OFF**<br>(b) **FUEL SHUT OFF** ..... check<br>(c) **Running throttle** ..... 80%+<br>(d) **BACK UP IGNITION** ..... **ON**<br>(e) **ENG CRANK** ..... non-running eng<br>(f) **Non-Running ENG** ..... **IDLE**<br>If no start occurs<br>(g) **Non-Running ENG** ..... **OFF** then **IDLE**<br>If still no start<br>(h) **ENG MODE** ..... **SEC**<br>(i) **Non-Running ENG** ..... **OFF** then **IDLE** |
| • **Windmill Restart** | (a) **Airspeed** ..... >450 kts<br>(b) **Throttle** ..... IDLE or above<br>(c) **BACK UP IGNITION** ..... ON<br>If no relight occurs<br>(d) **Throttle** ..... OFF then IDLE<br>If still no relight<br>(e) **ENG MODE** ..... SEC<br>(f) **Throttle** ..... OFF then IDLE |
| • **Post Restart** | (a) **BACK UP IGNITION** ..... OFF<br>(b) **ENG MODE** ..... PRI |

# Chapter 2

# SYSTEMS



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## 2.1 FLIGHT CONTROL

### 2.1.1 AFCS - SAS

| | |
|---|---|
| • **SAS** | • **Stability Augmentation System**<br>– **Not Fly-by-Wire**<br>– Automatic control surface commands generated by analog computer to improve stability |
| • **Controls** | • **Three individual Switches**<br>– Pitch<br>– Roll<br>– Yaw |
| • **Autopilot Emergency Disengage Paddle** | • **Paddle on Stick**<br>– Disengages Autopilot Modes<br>– Deactivates Pitch, Roll SAS Channels |

### 2.1.2 AFCS - AUTOPILOT

| | |
|---|---|
| • **Attitude Hold** | • **Basic Attitude Hold**<br>– Maintains existing pitch & roll<br>– Attitude can be changed with stick input<br>– If engaged outside limits will automatically move within range<br>• **Limits**<br>– Pitch: 30 deg<br>– Roll: 60 deg<br>• **Engagement**<br>(a) **SAS Switches** ..... **ON (FWD)**<br>(b) **Alt. Hold Mode** ..... **OFF**<br>(c) **VEC/PCD/ACL** ..... **OFF**<br>(d) **Heading Mode** ..... **OFF**<br>(e) **Autopilot Switch** ..... **ENGAGE (FWD)** |

| | |
|---|---|
| • **Altitude Hold** | • **Barometric Altitude Hold**<br>– Maintains current barometric altitude<br>• **Limits**<br>– Vertical velocity: < 100 ft/s<br>• **Engagement**<br>(a) **SAS Switches** ..... **ON (FWD)**<br>(b) **Autopilot Switch** ..... **ENGAGE (FWD)**<br>(c) **Alt. Hold Mode** ..... **ALT (FWD)**<br>(d) **A/P REF Light** .....Wait until appears<br>(e) **NWS Button** .....**Press** |
| • **Heading Hold** | • **Magnetic Heading Hold**<br>– Maintains current magneatic heading<br>• **Limits**<br>– Bank angle < 5 deg<br>• **Engagement**<br>(a) **SAS Switches** ..... **ON (FWD)**<br>(b) **Autopilot Switch** ..... **ENGAGE (FWD)**<br>(c) **Heading Mode** .....**HDG (FWD)** |
| • **Ground Track** | • **Autopilot follows ground track**<br>– Similar to heading hold<br>– Compensates for wind drift<br>– Uses INS data instead of mag. bearing<br>• **Limits**<br>– Bank angle < 5 deg<br>• **Engagement**<br>(a) **SAS Switches** ..... **ON (FWD)**<br>(b) **Autopilot Switch** ..... **ENGAGE (FWD)**<br>(c) **Heading Mode** .....**GT (AFT)**<br>(d) **A/P REF Light** .....Wait until appears<br>(e) **NWS Button** .....**Press** |
| • **VEC/PCD** | • **Vector / Precision Course Direction**<br>– Allows Link 4 controller to remotely direct the aircraft<br>– **Not Modelled in DCS** |
| • **ACL** | • **Automatic Carrier Landing**<br>– See relevant section |

| | |
|---|---|
| • **Autopilot Emergency Disengage Paddle** | • **Paddle on Stick**<br>– **Disengages Autopilot Modes**<br>– **Deactivates Pitch, Roll SAS Channels** |

## 2.1.3 APC / AUTOTHROTTLE

| | |
|---|---|
| • **APC** | • **Approach Power Compensator**<br>– Automatic throttle control<br>– **Maintains ON SPEED AoA** |
| • **Conditions** | Engagement is inhibited / APC is disengaged if conditions not met<br>• **Throttles** ..... 75%-90% RPM<br>• **Landing Gear Handle** ..... **Down**<br>• **Weight on Wheels** ..... **No** |
| • **Engage** | • **Throttle Mode** ..... **AUTO (FWD)** |
| • **Disengage** | **Cage/Seam Button** |

## 2.1.4 ACLS

## 2.1.5 WING-SWEEP

| | |
|---|---|
| • **Overview** | • **In Flight Limited between 20 deg & 68 deg**<br>• **On Ground can Oversweep to 75 deg**<br>• **Hydromechanically Controlled**<br>– Automatically through CADC<br>– Manually with emergency wing-sweep handle<br>• **15 deg/s at 1g loading**<br>• **Mechanically linked to ensure symmetry** |
| • **CADC Modes** | • **AUTO**<br>– CADC controls wing position as function of current Mach via wing-sweep program<br>• **MAN**<br>– Pilot manually chooses desired wing sweep angle with thumb controller<br>• **BOMB**<br>– Sets wing sweep to **55 deg** or further aft |

| | |
|---|---|
| • **Emergency Mode** | • **Emergency Wing-Sweep Handle**<br>– Moved with wing sweep program by spider detent under normal operation<br>– Can be forced out of spider detent and moved manually |
| • **Oversweep** | • **Selected via Emergency Wing-Sweep Handle**<br>(a) **Em. Wing-Sweep** ..... **68 deg**<br>Wait for wing-seal airbags to deflate<br>(b) **HZ TAIL AUTH** ..... **Illuminated**<br>(c) **Em. Wing-Sweep** ..... **75 deg** |
| • **Return to CADC Control** | • **After Emergency Mode / Oversweep**<br>(a) **Em. Wing-Sweep** ..... **Spider Detent**<br>(Fwd on startup)<br>(b) **MASTER RESET** ..... **Press** |

| 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 |

## 2.2 NAVIGATION

### 2.2.1 NAV - OVERVIEW

| Pilot Cockpit Interface | |
|---|---|
| • **HUD** | **H**eads **U**p **D**isplay<br>• Displays WRITE ME information |
| • **VDI** | **V**ertical **D**isplay **I**ndicator<br>• placeholder |
| • **HSD** | **H**orizontal **S**ituation **D**isplay<br>• **NAV Mode** Information<br>– **Diamond** – Current heading<br>– **Chevron** – **TACAN TO** bearing<br>– **+** – **TACAN FROM** bearing<br>– **House** – **ADF** bearing<br>– **RNG** – Range to Waypoint (nm)<br>– **MODE** – **NAV STEER** mode<br>– **W** – Wind heading / speed (kts)<br>– **TAS** – **T**rue **A**ir**S**peed (kts)<br>– **GS** – **G**round**S**peed (kts)<br>• **TID Mode** Information<br>– Overhead View<br>– Waypoint Coordinates |
| • **BDHI** | • placeholder |
| • **Standby Magnetic Compass** | • placeholder |
| • **Tacan Control Panel** | • placeholder |
| • **STEER CMD Selectors** | • placeholder |

### 2.2.2 NAV - INS

| | |
|---|---|
| • **Contributing Sub-systems** | • **IMU** – **I**nertial **M**easurement **U**nit<br>– **4 Gimbals** – No gimbal-lock, corrects platform attitude errors<br>– **2 Gyros** – Source for aircraft attitude data<br>– **3 Accelerometers** – Source for aircraft acceleration data<br>• **CSDC** – **C**omputer **S**ignal **D**ata **C**onverter<br>– Processes sensor signals including IMU data |
| • **CSDC Data Modes** | (a) **INS** – Primary nav mode<br>• **Velocity Data** – IMU<br>• **Pitch/Roll Data** – IMU<br>(b) **IMU/AM** – Backup mode selected by RIO or automatically when CSDC determines IMU velocity data unreliable.<br>• **Velocity Data** – Calculated from true airspeed & stored wind<br>• **Pitch/Roll Data** – IMU<br>(c) **AHRS/AM** – Further degraded mode selected by RIO or automatically when CSDC detects total INS failure<br>• **Heading** – Mag heading & MAG VAR<br>• **Velocity Data** – Calculated from true airspeed & stored wind<br>• **Pitch/Roll Data** – AHRS |

## 2.2.3 NAV - ALIGNMENT

| | |
|---|---|
| • **Ground Align** | (a) |
| • **Carrier Align D/L** | |
| • **Carrier Align Handset** | |
| • **Reinitialization** | |
| • **Automatic Stored Heading** | |
| • **Catapult Align** | |

## 2.2.4 NAV - WAYPOINT

| | |
|---|---|
| • **Reference Point Types** | • **Navigation Waypoint** – Used for navigation. Maximum of 3 stored simultaneously<br>• **Fixed Point (FP)** – Arbitrary point to establish current position relative to external references<br>• **Initial Point (IP)** – Starting point for A/G attack run<br>• **Surface Target (ST)** – Enemy surface target<br>• **Defended Point (DP)** – Area to protect (i.e friendly forces)<br>• **Hostile Area (HA)** – Area with known ground or air hostiles<br>• **Home Base (HB)** – Airfield / CV |

## 2.2.5 NAV - TACAN

## 2.2.6 NAV - VOR/ADF

## 2.3 COMMUNICATION

### 2.3.1 COMMS - OVERVIEW

| | |
|---|---|
| • **ARC-159 UHF 1** | • **Air-to-Air & Air-to-Surface Communication**<br>• **Pilot Controlled**<br>• **Frequency**<br>– **Range** – 225.000 - 399.975 MHz<br>– **Steps** – 25 kHz<br>– **Channels** – 20 |
| • **ARC-182 V/UHF 2** | • **Air-to-Air & Air-to-Surface Communication**<br>• **RIO Controlled**<br>• **Frequency**<br>– **Band 1** – 30 - 88 MHz<br>– **Band 2** – 108 - 156 MHz<br>– **Band 3** – 156 - 174 MHz<br>– **Band 4** – 225 - 399.975 MHz<br>– **Steps** – 25 kHz<br>– **Channels** – 20 |
| • **ARA-50 UHF ADF** | • **UHF Automatic Direction Finder**<br>• **LoS bearing to UHF Transmitter**<br>• **Bearing displayed on BDHI, Pilot HSD**<br>• **5 min Warmup** |
| • **KY-28 Voice Security Equipment** | • **Voice Ciphering**<br>• **Integrated with UHF 1 and V/UHF 2**<br>• **2 min Warmup** |

### 2.3.2 COMMS - ARC-159 UHF 1

| | |
|---|---|
| • **ARC-159 UHF 1** | • **Air-to-Air & Air-to-Surface Communication**<br>• **Pilot Controlled**<br>• **Frequency**<br>– **Range** – 225.000 - 399.975 MHz<br>– **Steps** – 25 kHz<br>– **Channels** – 20 |
| • **VOL Knob** | • **Controls Pilot UHF 1 Audio Level** |
| • **BRT/TEST Knob** | • **Controls Radio FREQ Display**<br>• Turn past max to display **888.888** |
| • **SQL Switch** | • **Toggles radio squelch (noise attenuation)** |

| | |
|---|---|
| • READ Switch | • Displays Frequency of Selected Preset Channel |
| • LOAD Button | • Saves Displayed Frequency to Selected Preset Channel |
| • TONE Button | • Steady 1.020 kHz Test Tone |
| • Mode Selector | • Frequency Selection Method<br>– **GUARD** – 243.000 MHz<br>– **MANUAL** – Manual tuning<br>– **PRESET** – Preset channels |
| • Function Selector | • Selects Transceivers to Energize<br>– **ADF** – Not simulated<br>– **BOTH** – Main & Guard<br>– **MAIN** – Main<br>– **OFF** – Secures UHF 1 radio |
| • CHAN SEL | • Selects from 20 preset Channels |

## 2.3.3 COMMS - ARC-182 V/UHF 2

| | |
|---|---|
| • ARC-182 V/UHF 2 | • Air-to-Air & Air-to-Surface Communication<br>• RIO Controlled<br>• Frequency<br>– **Band 1** – 30 - 88 MHz<br>– **Band 2** – 108 - 156 MHz<br>– **Band 3** – 156 - 174 MHz<br>– **Band 4** – 225 - 399.975 MHz<br>– **Steps** – 25 kHz<br>– **Channels** – 20 |
| • VOL Knob | • Controls RIO UHF 2 Audio Level |
| • BRT/TEST Knob | • Controls Radio FREQ Display |
| • SQL Switch | • Toggles radio squelch (noise attenuation) |

| | |
|---|---|
| • **Mode Selector** | • **Transceiver Settings**<br>– **OFF** – Secures V/UHF radio unless frequency mode set to **243**<br>– **T/R** – Energizes transmitter and main receiver<br>– **T/R & G** – Energizes transmitter, main, and guard receiver<br>– **DF** – Automatic direction finding from 108 - 399.975 MHz<br>– **TEST** – BIT |
| • **CHAN SEL Outer Dial** | • **Selects Frequency Tuning Mode**<br>– **243** – Selects UHF Guard<br>– **MAN** – Manual Select frequency<br>– **G** – Tunes Tranceiver to guard frequecy in last selected band<br>– **PRESET** – Allows selection between 40 preset channels (31-40 are Have Quick and not simulated)<br>– **READ** – Displays frequency of selected preset channel<br>– **LOAD** – Saves displayed frequency to selected preset channel |
| • **CHAN SEL Inner Dial** | • **Selects one of 40 Preset Channels** |

## 2.3.4 COMMS - KY-28 VOICE SECURITY EQUIPMENT

| | |
|---|---|
| • **KY-28 Voice Security Equipment** | • **Voice Ciphering**<br>• **Integrated with UHF 1 and V/UHF 2**<br>• **2 min Warmup** |
| • **ZEROIZE Switch** | • **Lift Guard to Erase Preloaded Codes**<br>• Codes loaded via ground crew |
| • **Power-Mode Switch** | • **Selects Mode**<br>– **P/OFF** – Removes power from system<br>– **C** – Transmit / Receive in secure mode<br>– **DELAY** – Between PTT and trans. |

| | |
|---|---|
| • **Radio-Select Switch** | • **Selects Radio Mode**<br>– **RELAY** – Acts as relay for other stations (not simulated)<br>– **RAD-2** – Secure voice for V/UHF 2<br>– **RAD-1** – Secure voice for UHF 1 |

## 2.3.5 LINK 4 DATALINK - OVERVIEW

| | |
|---|---|
| • **Link 4** | • **Modes** – Mutually exclusive<br>– **Link 4A** – AWACS / Surface Ship<br>– **Link 4C** – Fighter to Fighter<br>• **Data Speed** – up to 5000 bit/s! |
| • **Link 4A** | • **Network** – AWACS / Surface Ship<br>• Additionally used for ACLS |
| • **Link 4C** | • **Network** – Fighter to Fighter<br>– Up to four F-14s<br>– Unique to F-14 |
| • **Basic Operation** | (a) **Power Switch** ..... As Desired<br>• **Link 4A** ..... **ON**<br>• **Link 4C** ..... **AUX**<br>(b) **Mode Switch** ..... **TAC**<br>(c) **Frequency** ..... **Set** |

## 2.3.6 LINK 4 DATALINK - CONTROL PANEL

| | |
|---|---|
| • **Test Switch** | • **Controls Test / Anti-Jam Modes**<br>– **TEST** – Initiates BIT<br>– **NORM** – Normal Operation<br>– **A-J** – Anti-Jam (not simulated) |
| • **Frequency Thumbwheels** | • **Selects Datalink Frequency**<br>– **First Digit** – **Fixed as 3**<br>– **Allowable Range** – 300.0 - 324.9 MHz |
| • **Power Switch** | • **Controls System Power**<br>– **ON** – Enables Link 4A<br>– **OFF** – Disables system<br>– **AUX** – Enables Link 4C |

## 2.3.7 LINK 4 DATALINK - REPLY/ANTENNA PANEL

| | |
|---|---|
| • **ANTENNA Switch** | • **Selects Antenna**<br>– **Shared with UHF 1** – Mutually exclusive<br>– **UHF 1 LWR / DL UPR**<br>– **UHF 1 UPR / DL LWR** |
| • **REPLY Switch** | • **Sets Reply Mode**<br>– **NORM** – Own Aircraft replies to datalink messages<br>– **CANC** – Receive only |
| • **MODE Switch** | • **Controls Overall Mode**<br>– **TAC** – Normal airborne mode<br>– **CAINS/WAYPT** – Enables CV align |
| • **Address Thumbwheels** | • **Sets Two Least Significant Bits of Aircraft D/L Address** |

## 2.4 DEFENSIVE SYSTEMS

### 2.4.1 ALR-67 RWR - CONTROLS / OVERVIEW

| | |
|---|---|
| • **PWR Switch** | • **Set to ON to Operate** |
| • **VOL Knob** | • **Sets RIO Audio Level** |
| • **TEST Switch** | • **Springloaded to Center**<br>• **BIT** – Initiates Build In Test<br>• **SPL** – Holds BIT status page while held |
| • **MODE Switch** | • **Springloaded to Center**<br>• **OFST** – Separates overlapping symbols<br>• **LMT** – Displays 6 highest threats |
| • **DISPLAY TYPE Selector** | • **Changes Priority of Display**<br>– **NORM** – Normal threat symbology<br>– **AI** – Airborne Interceptor prioritized<br>– **AAA** – Anti-aircraft artillery prioritized<br>– **UNK** – Unknown prioritized<br>– **FRIEND** – Friendly threats prioritized<br>• **Indicated by Letter in Display Center** |
| • **Display** | • **Outer Band**<br>– **Critical Band**<br>– Imminent threat to own aircraft<br>– Blinking indicates engaging own aircraft<br>• **Middle Band**<br>– **Lethal Band**<br>– Potentially threatening emitters<br>– Not actively engaging own aircraft<br>• **Inner Band**<br>– **Non-Lethal Band**<br>– Not currently within capability of emitter<br>• **Inner Circle**<br>– **N, I, A, U, F** – Prioritization type<br>– **O** – Offset<br>– **L** – Limit<br>– **B** – BIT Failure<br>– **T** – Thermal overload |

| | |
|---|---|
| • **Alert Tones** | • **Short Tone** – New emitter / emitter moved<br>• **Slow Warbling** – Threat in critical band<br>• **Fast Warbling** – Threat actively engaging own aircraft<br>• **4-Tone Sequence** – New threat capable of silently engaging own aircraft |

## 2.4.2 ALR-67 RWR - THREAT SYMBOLOGY

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

| AIRCRAFT | |
|---|---|
| **14** | F-14A/B |
| **15** | F-15C/E |
| **16** | F-16C |
| **17** | JF-17 |
| **18** | F/A-18C |
| **19** | MiG-19 |
| **21** | MiG-21bis |
| **23** | MiG-23MLD |
| **24** | Su-24M/MR |
| **25** | MiG-25PD |
| **29** | MiG-29A/G/S<br>Su-27<br>Su-33<br>J-11A |
| **30** | Su-30 |
| **31** | MiG-31 |
| **34** | Su-34 |
| **37** | AJS-37 |
| **39** | Su-25TM |
| **50** | A-50 |
| **52** | B-52 |
| **AN** | AN-26B<br>AN-30M |
| **AP** | AH-64D |
| **B1** | B-1B |
| **BE** | Tu-95<br>Tu-142M |
| **BF** | Tu-22M3 |
| **BJ** | Tu-160 |
| **E2** | E-2D |
| **E3** | E-3C |
| **F4** | F-4E |
| **F5** | F-5E |
| **HX** | Ka-27 |
| **IL** | IL-76MD<br>IL-78M |
| **KC** | KC-135 |

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

**AIR DEFENSE**

| | |
|---|---|
| **2** | S-75 TR SNR (SA-2) "Fan Song" |
| **3** | S-125 TR SNR-125 (SA-3) "Low Blow" |
| **6** | Kub SA-6 |
| **7** | HQ-7 TR |
| **8** | OSA (SA-8) |
| **10** | S-300PS 30N6 TR (SA-10) |
| **11** | Buk (SA-11) |
| **12** | S-300V |
| **15** | Tor 9A331 (SA-15) |
| **19** | Tunguska 2C6M (SA-19) |
| **A** | Gepard<br>M-163 Vulcan<br>ZSU-23-4 Shilka |
| **BB** | S-300PS 64H6E SR (SA-10/Big Bird) |
| **BF** | Rapier Blindfire TR |
| **CS** | S-300PS 5N66M SR (SA-10/Clam Shell) |
| **DE** | Sborka (Dog Ear) |
| **FF** | S-125 P-19 SR (SA-3/Flat Face) |
| **GR** | Roland SR |
| **HA** | Hawk SR |
| **HK** | Hawk TR |
| **HQ** | HQ-7 SR |
| **PT** | Patriot |
| **RO** | Roland |
| **RP** | Rapier SR |
| **S** | 1L13 55G6 EWR |
| **SD** | Buk TR (SA-11/Snow Drift) |
| **SN** | PRW-11 (Side Net) |

**MISSILES**

| | |
|---|---|
| **M** | AIM-54<br>AIM-120<br>MICA-EM<br>R-37<br>R-77<br>SD-10 |

**ATC**

| | |
|---|---|
| **T** | Airport ATC Radar |

## 2.4.3 ALE-39 CMS DISPENSER

**Programmer**

- **CHAFF Section**
  - **B QTY** – Number of cartridges to eject in burst
    - **Options** – **1-4** cartridges, **C** continuous, **R** random (4-6 cartridges)
  - **B INTV** – Time in seconds between each cartridge ejection
    - **Options** – **.1, .2, .5, .7, 1** seconds, **R** random
  - **S QTY** – How many salvos of bursts
    - **Options** – **1, 2, 4, 6, 8, 10, 15** salvos
  - **S INT** – Time in seconds between salvos
    - **Options** – **2, 4, 6, 8, 10** seconds

**WARNING** **R** & **C** burst settings have special **INTV** behavior

- **JAMMER Section** – Jammer cartridges not implemented in DCS
- **FLARE Section**
  - **QTY** – Number of cartridges to eject in burst
    - **Options** – **2, 3, 4, 6, 8, 10** cartridges
  - **INTV** – Time in seconds between each cartridge ejection
    - **Options** – **2, 4, 6, 8, 10** seconds

**Control Panel**

- **PWR/MODE Switch**
  - **AUTO (CHAFF) / MAN** – Enables power to system and allows automatic chaff ejection program initiation
  - **MAN** – Enables power to system
  - **OFF** – Disables system

## 2.4.4 ALQ-100 / ALQ-126 DECM

# Chapter 3

# AWG-9 RADAR



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## 3.1 OVERVIEW

### 3.1.1 MAIN MODES - OVERVIEW

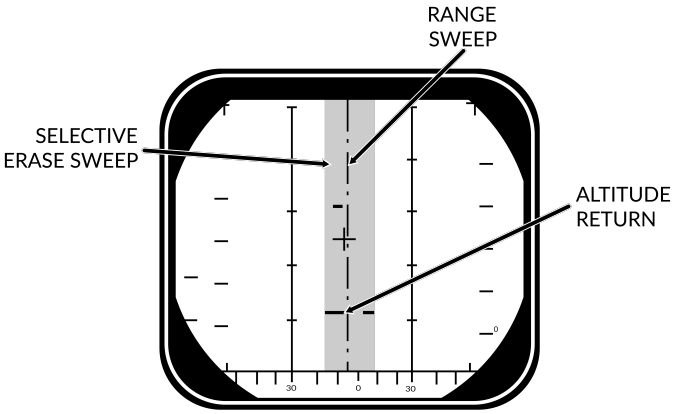
| | Pulse | | Pulse Doppler | | | |
|---|---|---|---|---|---|---|
| | **Pulse Search** | **P-STT** | **PD Search** | **RWS** | **TWS** | **PD-STT** |
| **Range** | 60 nm | 50 nm | 110 nm | 90 nm | 90 nm | 90 nm |
| **AIM-7** | BRSIT | CW | BRSIT | | - | PD |
| **AIM-54** | BRSIT | ACT | BRSIT | | Multi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

### 3.1.2 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**

## 3.2 PULSE MODES

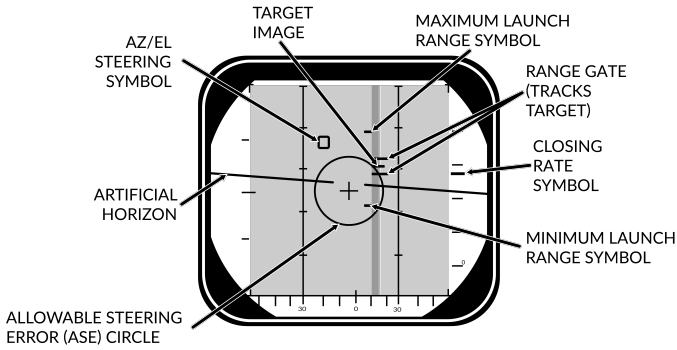
### 3.2.1 PULSE - PULSE SEARCH




SEARCH (±10° SCAN)

| | |
|---|---|
| • **Pulse Search** | **Basic Mode** - AWG-9 does not use pulse doppler filtering<br>• **Advantages**<br>– All aspect target detection<br>– Cannot be notched<br>– Rudimentary ground mapping<br>• **Disadvantages**<br>– Cannot discern ground returns and targets<br>– Lower range |
| • **DDD** | • **Range/Azimuth**<br>• Visual representation of radar and erase sweeps |
| • **TID** | • **No Information from Pulse**<br>• **Cannot guide AIM-54** |

## 3.2.2 PULSE - PSTT

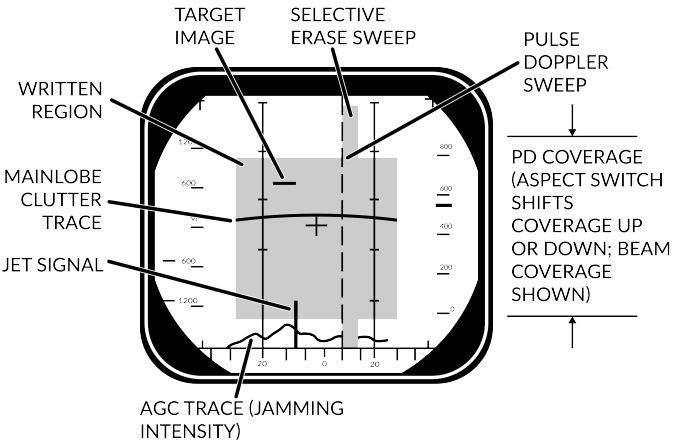



SINGLE TARGET TRACK

| | |
|---|---|
| • **Pulse STT** | Lock Target w/o doppler filtering<br>• **Advantages**<br>– Cannot be notched<br>• **Disadvantages**<br>– Susceptible to ground clutter |
| • **Lock Target** | • **Conditions**<br>– Pulse Search Mode selected<br>– RDR HCU Mode selected<br>• **Lock Target**<br>(a) Hold HCU Half-action<br>(b) Slew to desired Target<br>(c) HCU Full-Action to lock<br>• **Unlock Target**<br>(d) HCU Half-action |
| • **DDD** | • **Track Indications**<br>– ANT TRK light<br>– RDROT light<br>– Tracking gates<br>– Closure rate<br>– Attack Symbology |

## 3.3 PULSE DOPPLER MODES

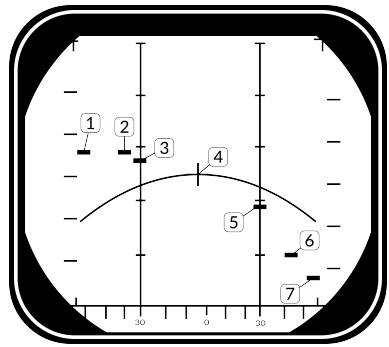
### 3.3.1 PD - PULSE DOPPLER SEARCH




SEARCH (±40° SCAN)

| | |
|---|---|
| • **Pulse Doppler Search** | **"Early Warning" Mode** - Longest Range, cannot display range<br>• **Advantages**<br>– Longest Range<br>– Doppler Filtering<br>– **"Look Down Shoot Down"**<br>• **Disadvantages**<br>– Can be notched<br>– No range information |
| • **DDD** | • **Closure Rate/Azimuth**<br>• Visual representation of radar and erase sweeps |
| • **Doppler Filters** | • **Main Lobe Clutter (MLC) Filter**<br>– **Own GS +/- 133 knots**<br>– Removes main ground return<br>– Source of notching<br>• **Zero Doppler Filter**<br>– **Negative own GS +/- 100 knots**<br>– Removes Radar reflection from ground directly beneath own AC |

| | |
|---|---|
| • **MLC Switch** | • **IN:** Enables MLC filter<br>• **AUTO:** Enables MLC filter if look-up angle less than 3 deg<br>• **OUT:** Disables MLC filter |
| • **Vc Switch** | Changes closure rate DDD scale<br>• **X-4:** -800 to 4000 knots<br>• **NORM:** -200 to 1000 knots<br>• **VID:** -50 to 250 knots |
| • **ASPECT Switch** | Changes closure rate processing scale<br>• **NOSE:** -600 to 1800 knots<br>• **BEAM:** -1200 to 1200 knots<br>• **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 |

### 3.3.2 PD - RWS

| | |
|---|---|
| • **Range While Search** | **FM Ranging**, used for getting good A/A picture before selecting TWS<br>• **FM Ranging**<br>– Pulse Doppler with ranging<br>– TID shows momentary tracks with ranges<br>– Processing reduces max range<br>• **Advantages**<br>– Long Range<br>– Doppler Filtering<br>– **“Look Down Shoot Down”**<br>– Signal Processing<br>• **Disadvantages**<br>– Can be notched |
| • **DDD** | • **Closure Rate/Azimuth**<br>• Visual representation of radar and erase sweeps |
| • **TID** | • **Momentary Tracks**<br>• Max concurrent tracks: 48<br>• **Cannot lock targets from TID** |
| • **Filtering** | **Same as Pulse Doppler Search** |

## 3.3.3 PD - TWS

| | |
|---|---|
| • **Track While Scan** | **Builds Track Files**, high situational awareness, multi-target AIM-54 launch<br>• **Track Files**<br>– AWG-9 builds Trackfiles for contacts<br>– Can launch multiple AIM-54<br>– Processing reduces max range<br>– Can lock targets from TID<br>• **FM Ranging**<br>– Pulse Doppler with ranging<br>– TID shows momentary tracks with ranges<br>– Processing reduces max range<br>• **Advantages**<br>– Doppler Filtering<br>– **Multi-Target AIM-54**<br>• **Disadvantages**<br>– **Lowest Range**<br>– Can be notched |
| • **DDD** | • **Closure Rate/Azimuth**<br>• Visual representation of radar and erase sweeps |
| • **TID** | • **Tracksfiles**<br>• Max concurrent tracks: 24<br>• Max displayed tracks: 18 |
| • **Filtering** | **Same as Pulse Doppler Search** |
| • **Scan Volume** | Trackfiles require update every 2.5 s –><br>• 20 deg 4 bar (if selected)<br>• 40 deg 2 bar (else) |
| • **TID Mode Selector** | • **GND STAB:** Ground Stabilized, True North is up on TID<br>• **A/C STAB:** Aircraft Stabilized<br>• **ATTAK:** same as A/C STAB with superimposed attack steering symbology<br>• **TV:** Displays TCS on TID, dispays LANTIRN on TID if equipped |

| | |
|---|---|
| • **TID Display Selector Buttons** | • **RID DISABLE:** Not simulated<br>• **ALT NUM:** Enables display of track altitudes on left side of track symbols<br>• **SYM ELEM:** Enables display of all supplementary symbology of tracks and waypoints<br>• **DATA LINK:** Enables display of D/L contacts<br>• **JAM STROBE:** Enables display of jam strobes<br>• **NON-ATTK:** enables/disables display of targets not possible to engage (friendlies)<br>• **LAUNCH ZONE:** Enables display of weapon launch zones<br>• **VEL VECTOR:** Enables display of velocity vectors |
| • **TRACK HOLD CLSN Steering Buttons** | • **TRACK HOLD**<br>– Normally: Tracks maintained for 14 s after last observation<br>– Track Hold: maintained for 2 min after last observation<br>• **CLSN Button**<br>– begins collision steering to currently tracked target<br>– enables Steering Centroid if in TWS<br>– LD CLSN presents azimuth steering only<br>– CLSN presents both azimuth and elevation steering |
| • **TWS AUTO / MAN** | • **TWS MAN:** Manual azimuth/elevation control, target designation by RIO<br>• **TWS AUTO:** Automatic prioritization of targets and azimuth elevation control |

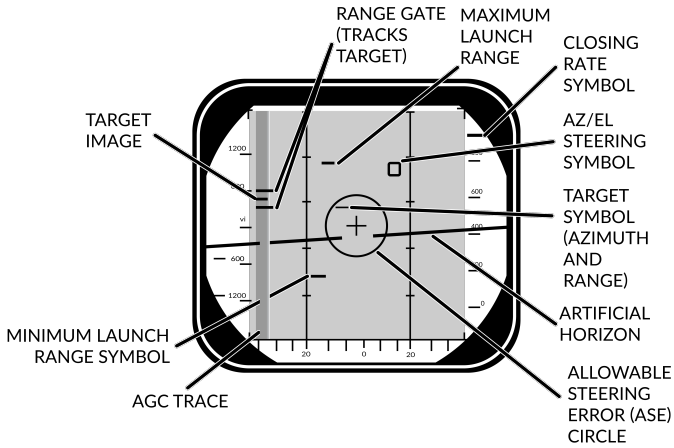
## 3.3.4 PD - TWS MAN

| | |
|---|---|
| • **TWS MAN** | • **Target Selection:** Manual<br>• **Scan Azimuth/Elevation:** Manual |
| • **Target Selection** | • **Conditions**<br>– TWS MAN Radar Mode selected<br>– TID CURSOR TID Mode selected<br>• **Hook Target**<br>(a) Hold HCU Half-Action<br>(b) Slew TID Cursor over desired Tgt<br>(c) HCU Full-Action to select Tgt<br>• **TID Symbology**<br>– Range (**RA**)<br>– Bearing (**BR**)<br>– Altitude (**AL**)<br>– Magnetic course (**MC**)<br>• **Lock Target**<br>(d) Press **PD STT** or **Pulse STT** buttons<br>• **Deselect Target**<br>(e) press HCU Half-Action |
| • **AIM-54 Launch** | • **Automatically selects TWS AUTO**<br>• **Prevents selection of TWS MAN** |

## 3.3.5 PD - TWS AUTO

| | |
|---|---|
| • **TWS AUTO** | • **Target Selection:** prioritizes contacts based off range, aspect, closure<br>• **Scan Azimuth/Elevation:** Geometric center of targets in scan volume |
| • **Centroid / Steering Cues** | • **Steering Centroid**<br>– facilitates steering cues<br>– HUD, VDI, TID, DDD<br>– Appears as **X** on TID<br>– Takes Gimbal limits into account<br>– Weights individual Tracks based on parameters<br>• **Illumination Centroid**<br>– **Not Visible**<br>– Controls azimuth and elevation of scan pattern<br>– Takes scan volume into account |
| • **Pilot Steering Cues** | • **Conditions**<br>– A-A HUD Mode selected<br>– Master Arm ON (UP)<br>– AIM-54 or AIM-7 selected<br>– TWS-AUTO selected |

## 3.3.6 PD - PDSTT




SINGLE TARGET TRACK

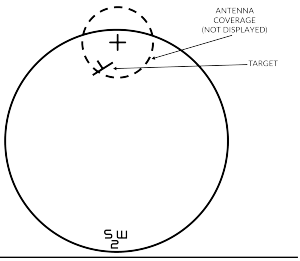
| | |
|---|---|
| • **Pulse Doppler STT** | Lock Target with doppler filtering<br>• **Advantages**<br>– Ground Clutter filtering<br>• **Disadvantages**<br>– Susceptible to notching |
| • **Lock Target** | • **Conditions**<br>– Pulse Doppler Mode selected (PD Search, RWS, TWS)<br>– RDR HCU Mode selected<br>• **Lock Target**<br>(a) Hold HCU Half-action<br>(b) Slew to desired Target<br>(c) HCU Full-Action to lock<br>• **Unlock Target**<br>(d) HCU Half-action |
| • **DDD** | • **Track Indications**<br>– ANT TRK light<br>– RDROT light<br>– Tracking gates<br>– Closure rate<br>– Attack Symbology |

## 3.4 ACM

### 3.4.1 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

### 3.4.2 APX-76 IFF

## 3.5 TACTICAL INFORMATION DISPLAY

### 3.5.1 TID SYMBOLOGY

| | | |
|---|---|---|
| **GENERAL** | | |
| **Center Dot** |  | • **Basic Component of Symbols**<br>– Marks coordinates of symbol |
| **Own AC** |  | • **Symbol representing own aircraft**<br>– Ground Stabilized: Moves<br>– Aircraft Stabilized: Stationary<br>– Outside TID: line drawn from TID center towards symbol |
| **TID Cursor** |  | • **Hook Cursor**<br>– Controlled by **HCU** in **TID mode**<br>• **Half-Action**<br>– Enables display of symbol<br>– Enables HCU stick to move cursor<br>• **Full-Action**<br>– Hooks closest symbol<br>– If no symbol near, cursor dropped at location |
| **TWS Steering Centroid** |  | • **Steering centroid of TWS tracks**<br>– Selected by WCS for weapons engagement |
| **ONBOARD SENSORS** | | **Symbol Above Dot** |
| **Unknown** |  | • **Unknown Sensor Track**<br>• **All Returns in RWS** |
| **Hostile** |  | • **Sensor Track designated Hostile by RIO** |
| **Friend** |  | • **Sensor Track designated Friendly by RIO** |

| | | |
|---|---|---|
| **Angle-Tracked Radar Target** |  | • **Radar Angle Tracking**<br>– Jamming Target |
| **Angle-Tracked Radar Target with Altitude Difference Ranging** |  | • **Radar Angle Tracking**<br>– Jamming Target<br>– Alt. diff. ranging |
| **TCS-Angle Tracked Target** |  | • **TCS Angle Tracking** |
| **TCS-Angle Tracked Target with Altitude Difference Ranging** |  | • **TCS Angle Tracking**<br>– Alt. diff. ranging |
| **D/L TARGETS** | | **Symbol Below Dot** |
| **Unknown** |  | • **D/L Track designated Unknown by Source** |
| **Hostile** |  | • **D/L Track designated Hostile by Source** |
| **Friendly** |  | • **D/L Track designated Friendly by Source** |
| **MANUAL REF POINTS** | | |
| **Home base** |  | • **Waypoint Representing**<br>– Home Base<br>– Carrier<br>– Airfield |
| **Waypoint** |  | • **Nav Waypoint**<br>• **Supplanted by Number**<br>– 1, 2, or 3 |
| **Defended Point** |  | • **Waypoint to Defend** |
| **Fixed Point** |  | • **Generic Waypoint** |
| **Hostile Area** |  | • **Waypoint Indicating Hostile Area** |
| **Surface Target** |  | • **Waypoint Indicating Surface Target** |
| **IP** |  | • **Initial Point**<br>– Waypoint for A/G engagement |

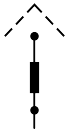
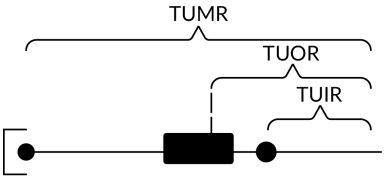
## D/L REF POINTS

| | | |
|---|---|---|
| **Home Base** |  | • **D/L Waypoint Representing Home Base** |
| **Waypoint** |  | • **D/L Generic Waypoint** |
| **Data Link Fixed Point** |  | • **D/L Waypoint Representing Fixed Point** |
| **Surface Target** |  | • **D/L Waypoint Representing a Surface Target** |

## POS SYMB MODIFIERS

| | | |
|---|---|---|
| **Mandatory Attack** |  | • **Additional Symbology on TWS Track**<br>– Horizontal bar through center dot<br>• **Selected by RIO**<br>– Only 1 target can be designated<br>– Guaranteed WCS priority number |
| **Data Link Destroy** |  | • **Additional Symbology on D/L Track**<br>– Horizontal bar through center dot<br>• **Selected by Source**<br>– No effect on WCS prioritization |
| **Do Not Attack** |  | • **Additional Symbology on TWS or D/L Track**<br>– Vertical bar through center dot<br>• **If Set by RIO**<br>– Removes WCS prioritization |
| **Multiple Targets** |  | • **Additional Symbology on TWS or D/L Track**<br>– Horizontal bar on left side of symbol<br>• **Indicates Multiple Targets** |

| | | |
|---|---|---|
| **Data Link Challenge** |  | • **Additional Symbology on D/L Track**<br>– Small **V** with center at center dot<br>• **Command to Visually Identify** |
| **Track Extrapolated** |  | • **Additional Symbology on TWS or D/L Track**<br>– Small **X** with center at center dot<br>• **No Update within 8 seconds**<br>– Track deleted after 14 seconds<br>– Or after 2 min if track hold |
| **Altitude Numerics** |  | • **Altitude to Nearest Ten Thousand**<br>– example: 35000-45000 |
| **Firing Order Numerics** |  | • **Indicates AIM-54 Prioritization**<br>– Numbers 1-6<br>– Only in TWS |
| **Time-to-Impact (TTI)** |  | • **After AIM-54 Launch**<br>– Prioritization replaced with estimated TTI<br>• **Flashes after Pitbull** |
| **Velocity Vector** |  | • **Additional Symbology from center Dot**<br>– Direction represents track heading<br>– Length represents speed<br>• **Varies with Mode**<br>– Ground Stabilized: true heading and ground speed<br>– Aircraft Stabilized: relative heading and velocity |

| | | |
|---|---|---|
| **Launch Zone Vectors** |  |  <br>• **Additional Symbology for AIM-54**<br>– Selected manually by RIO<br>– Or 60 seconds from max launch<br>• **TUMR**<br>– Time-Until-Minimum-Range<br>– Max: 180 seconds, 1.5 inches<br>• **TUOR**<br>– Time-Until-Optimal-Range<br>– Start of bar is 8 seconds from optimum<br>• **TUIR**<br>– Time-Until-In-Range |
| **Jamming Strobe** |  | • **Line from own AC towards Jammer** |
| **Radar Antenna Scan Pattern Azimuth Limits** |  | • **Limits of Current Scan Azimuth**<br>• **Single Line in STT** |
| **Data Link Jamming Strobe** |  | • **Line from D/L point towards Jammer** |
| **Data Link Pointer** |  | • **Additional Symbology on D/L Track**<br>– Circle<br>– Indicates operator concern |

| | | |
|---|---|---|
| **Data Link Priority Kill** |  | • **Additional Symbology on D/L Track**<br>– Square<br>– Indicates target must be destroyed<br>– No effect on WCS prioritization |

## ATTACK DISPLAY SYMBOLOGY

| | | |
|---|---|---|
| **Artificial Horizon** |  | • **Represents Pitch and Roll** |
| **Steering Guidance Symbol** |  | • **Represents Steering Error**<br>– Should be placed as near as possible to center of ASE circle |
| **Allowable Steering Error Circle** |  | • **Indicates Allowable Steering Error for Missile Launch**<br>• **Size Varies with Geometry, Mode, Missile** |
| **Breakaway Indication** |  | • **Appears when Target Range Less than Minimum for Selected Weapon** |

# Chapter 4

# TCS - LANTIRN

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## 4.1 TCS

### 4.1.1 OVERVIEW

## 4.2 LANTIRN

### 4.2.1 OVERVIEW

| | |
|---|---|
| • **LANTIRN** | **L**ow **A**ltitude **N**avigation and **T**argeting **I**nfra-**R**ed for **N**ight<br>• **Only Targeting Pod** – Nav pod was deleted<br>• **Incomplete Integration** – Own control panel, supplants TCS feed |
| • **Master Modes** | • **A/G** – Allows bomb release guidance<br>• **A/A** – Optimized for air targets |
| • **FOV Levels Overview** | • **Wide**<br>– **FOV** – 5.9 deg<br>– **Slew** – 8.5 deg/s<br>• **Narrow**<br>– **FOV** – 1.7 deg<br>– **Slew** – 1.8 deg/s<br>• **Expanded**<br>– **FOV** – 0.8 deg<br>– **Slew** – 0.7 deg/s<br>– **Digital Zoom** – Degraded quality |

### 4.2.2 OVERVIEW - STARTUP

| | | |
|---|---|---|
| 1. | **Power Switch** | **POD** |
| 2. | **Pod Startup Sequence** | • 8 min startup sequence<br>• **MODE Switch** shows **STBY** when complete |
| 3. | **MODE Switch** | **Press** |
| 4. | **Initialization Sequence** | • 30 sec initialization<br>• **MODE Switch** shows **OPER** when ready |
| 5. | **VIDEO Switch** | **FLIR** |
| 6. | **TID MODE** | **TV** |

## 4.2.3 OVERVIEW - POINTING MODES

| | |
|---|---|
| • **Sensor Modes Overview** | • **Contrast Lock**<br>– **Area Track**<br>– **Point Track**<br>• **Q Designation**<br>– **Directional Q** – QSNO / QADL / QHUD<br>– **Location Q** – QWp / QDES |
| • **Directional Q** | • **Do Not Allow Weapon Guidance**<br>• **QSNO**<br>– Pod slaved to **ground 15 nm in front** along own aircraft heading<br>• **QADL**<br>– **Pod slaved to ADL**<br>– In A/A mode<br>• **QHUD**<br>– **Pod slaved to HUD**<br>– In A/G mode |
| • **Location Q** | • **Allow Weapon Guidance**<br>• **QWp**<br>– Pod slaved to WCS waypoint<br>– Cycled with **QWp+** / **QWp-**<br>• **QDES**<br>– **Designate targets for engagement**<br>– **LANTIRN Trigger Second Detent** to designate<br>– Coordinates can be manually added to WCS for navigation |

## 4.2.4 OVERVIEW - LASING/DESIGNATION

| | |
|---|---|
| • **A/G Designation** | (a) **Designate** ..... **Trigger Full-Action**<br>• Laser Fires<br>• Slant Range calculated<br>• Time-to-Go calculated |
| • **Steering Cues** | • **Automatically activated when QDES selected/designated**<br>• QDES remains even if new Q selected<br>• Cues still point towards QDES even if pod at another point |
| • **Manual Lase** | (a) **Lase** ..... **Trigger Half-Action Hold** |
| • **Latched Lase** | • **Effect** – Lases for 60 sec<br>(a) **Activate** ..... **Latch Lase Button Press**<br>(b) **Extend** ..... **Latch Lase Button Press**<br>(c) **Deactivate** ..... **Trigger Half-Action** |
| • **Auto Lase** | • **Effect** – Fires from -10 to +4 sec TIMP<br>(a) **Laser Mode** ..... **Slider AFT Short**<br>(b) **Cycle A/M** ..... **Right 4-Way Depress** |
| • **Laser Notes** | • **Always at current Pod location**<br>• Can point to different location than QDES |

## 4.2.5 CONTROLS - PANEL

| | |
|---|---|
| • **Power Switch** | • **OFF** – Disables power to system<br>• **IMU** – Only powers LANTIRN IMU **(Not Simulated in DCS)**<br>• **POD** – Powers whole system |
| • **MODE Switch** | • **STBY** – Standby<br>• **OPER** – Operational |
| • **LASER Switch** | • **ARM** – Arms laser<br>• **SAFE** – Inhibits laser use |
| • **VIDEO Switch** | • **FLIR** – Displays LANTIRN FLIR on TID<br>• **TCS** – Displays TCS video on TID |
| • **Indicator Light** | • **Indicate Error States** |
| • **IBIT Button** | • **Initiates Build-In-Test** |

## 4.2.6 CONTROLS - STICK

| | |
|---|---|
| • **Master Mode** | • A/G Mode – Side 2-Way FWD<br>• A/A Mode – Side 2-Way AFT |
| • **Slew** | Center Slew Hat |
| • **WHOT/BHOT** | Center Slew Hat Depress |
| • **Contrast Track** | • Point Track – Left 4-Way Up<br>• Area Track – Left 4-Way Down |
| • **Q Select** | • QADL/QHUD – Right 4-Way Up<br>• QDES – Right 4-Way Right<br>• QSNO – Right 4-Way Down |
| • **Declutter** | Right 4-Way Depress |
| • **Zoom Level** | FOV Button |
| • **Cycle Gain Control Mode** | Slider FWD short |
| • **Manual Gain Control** | (a) Slider ..... FWD long<br>(b) Gain ..... Right 4-Way Up/Down<br>Level ..... Right 4-Way Left/Right |
| • **Laser Code** | (a) Slider ..... AFT short<br>(b) Select Digit ..... Right 4-Way Left/Right<br>(c) Change Digit ..... Right 4-Way Up/Down |
| • **Focus Control** | (a) Slider ..... AFT hold<br>(b) Right 4-Way ..... Up/Down |
| • **Manual Lase** | Trigger Half-Action |
| • **Latched Laser** | Latched Laser Fire Button |
| • **Designate QDES** | Trigger Full-Action |

## 4.2.7 DISPLAY

| | |
|---|---|
| • **Top Left** | • **Own Aircraft Datablock**<br>– **Lat** – deg:min.dec<br>– **Long** – deg:min.dec<br>– **ALT** – Altitude (ft)<br>– **KGS** – Knots Ground Speed<br>– **DIVE** – Dive Angle (deg) |
| • **Mid Left** | • **Sensor Mode** – **WHOT** / **BHOT**<br>• **Gain Control** – **Auto** / **Manual** |
| • **Bottom Left** | • **Pod Info Datablock**<br>– **SRA** – Slant Range<br>– **AZ** – Pod LoS Azimuth L/R<br>– **EL** – Pod LoS Elevation<br>– **Time** – UTC Time<br>– **IBIT** – Codes |
| • **Bottom Center** | • **Master Mode** – **A/A** / **A/G**<br>• **Track Mode** – **AREA** / **POINT** / **Q**<br>• **Current Weapon**<br>• **Laser Code**<br>• **L**<br>– **Steady** – Laser Armed<br>– **Flashing** – Laser Firing |
| • **Bottom Right** | • **Q Datablock**<br>– **TTG** – Time-To-Go<br>– **B/R** – Bearing and Range<br>– **ELEV** – Elevation (ft) of Q<br>– **Lat** – deg:min:dec<br>– **Long** – deg:min:dec |
| • **Mid Center** | • **Crosshair**<br>– **Bounding Box** – Indicates currently tracked target in point mode<br>– **Zoom Boxes** – Indicates next zoom levels<br>– **FLIR Pointing Cue** – Shows Pod LoS, screen center indicates straight down |

| | |
|---|---|
| • **Mid Right** | • **Bomb Rlease Cue**<br>– Only shown if current Q is **QDES**, with valid weapon selected<br>– **TREL** – Time to release<br>– **TIMP** – Time to Impact (after release) |
| • **Top Center** | • **Steering Guidance to Q**<br>– Relative bearing L/R to commanded heading |

# Chapter 5

# A/G WEAPONS

## Contents


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## 5.1 SETTINGS

### 5.1.1 A/G WEAPON SETTINGS - OVERVIEW

| | |
|---|---|
| • **WPN TYPE** | • **Selects Weapon Type**<br>– Configures WCS for selected weapon<br>– Refer to Kneeboard for list of mounted weapons<br>– Mk-81 / 82 / 83 have both **L** and **H** option refering to high and low drag |
| • **DLVY MODE** | • **STP-SGL** – Single weapon per press<br>• **STP-PRS** Single pair per press<br>• **RPL-SGL** – QTY of weapons per press<br>• **RPL-PRS** – QTY of pairs per press |
| • **DLVY OPTNS** | • **INTERVAL** – Interval in ms<br>• **QTY** – Number of stores to be released |
| • **MECH FUZE** | • **NOSE** – Arms nose fuze<br>• **SAFE** – Inhibits arming of fuzes<br>• **NOSE/TAIL** – Arms both fuzes |
| • **ELEC FUZE** | • **SAFE** – Inhibits electrical bomb fuzing<br>• **VT** – Sets air-burst mode at preset burst height for compatible stores<br>• **INST** – Sets instantaneous burst mode<br>• **DLY 1** – Sets preset time delay 1<br>• **DLY 2** – Sets preset time delay 2 |
| • **STA SEL** | • **Selects Stations for Employment/Jettison**<br>– Set to **SEL** to activate a pylon<br>– Stations 1 & 8 should be set to **B** for selection<br>– Station 1 & 8 **SW** was used for Sidewinder jettison, is now inoperable |
| • **TANK JETT** | • **Allows Drop Tank Jettison** |
| • **SEL JETT** | • **JETT** – Selective jettison<br>• **SAFE** – Inhibits jettison<br>• **AUX** – Backup mode |
| • **JETT OPTIONS** | • **MER TER** – Jettisons ejector racks<br>• **WPNS** – Jettisons weapons only |

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

### 5.1.2 SELECTIVE ORNANCE JETTISON

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

## 5.2 UNGUIDED

### 5.2.1 M61 GUN

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

## 5.2.2 FFAR / ZUNI ROCKETS

| | | |
|---|---|---|
| 1. | **RIO Conditions** | • **WPN TYP** ..... **LAU-10**<br>• **Attack Mode** ..... **Pilot Attack**<br>• **Deliver Mode** ..... **RPL-SGL**<br>• **Mechanical Fuze** ..... **NOSE**<br>• **Electronic Fuze** ..... **INST**<br>• **Delivery Options** ..... **As Desired**<br>• **Stations** ..... **Armed** |
| 2. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/G**<br>• **WEAPON SELECTOR** ..... **OFF**<br>• **Stations** ..... verify selected<br>• **Wing Sweep** ..... **BOMB** |
| 3. | **Employment** | (a) **Dive** ..... 20-30 deg<br>(b) **Pipper** ..... on target<br>(c) **TRIGGER** ..... **FIRE** |

## 5.2.3 UNGUIDED BOMB - CCIP

| | | |
|---|---|---|
| 1. | **RIO Conditions** | • **WPN TYP** ..... **MK-8X**<br>• **Attack Mode** ..... **Pilot Attack**<br>• **Deliver Mode** ..... **STP-PRS**<br>• **Mechanical Fuze** ..... **NOSE**<br>• **Electronic Fuze** ..... **INST**<br>• **Delivery Options** ..... **As Desired**<br>• **Stations** ..... **Armed** |
| 2. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/G**<br>• **WEAPON SELECTOR** ..... **OFF**<br>• **Stations** ..... verify selected<br>• **Wing Sweep** ..... **BOMB** |
| 3. | **Employment** | (a) **Dive** ..... 40 deg<br>(b) **Pipper** ..... on target<br>(c) **STORE RELEASE** ..... **Press and Hold** |

## 5.2.4 UNGUIDED BOMB - CCRP

| | | |
|---|---|---|
| 1. | **RIO Conditions** | • **WPN TYP** ..... **MK-8X**<br>• **Attack Mode** ..... **Target Attack**<br>• **Deliver Mode** ..... **STP-PRS**<br>• **Mechanical Fuze** ..... **NOSE**<br>• **Electronic Fuze** ..... **INST**<br>• **Delivery Options** ..... **As Desired**<br>• **Stations** ..... **Armed** |
| 2. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/G**<br>• **WEAPON SELECTOR** ..... **OFF**<br>• **Stations** ..... verify selected<br>• **Wing Sweep** ..... **BOMB** |
| 3. | **Designation** | (a) **Slew Diamond** ..... **VSL HI/LO**<br>(b) **Designate** ..... **PAL** |
| 4. | **Employment** | (a) **Flight Path** ..... Straight, Level<br>(b) **Vel Vector** ..... on Bomb Fall Line<br>When Solution Cue meets Velocity Vector<br>(c) **STORE RELEASE** ..... **Press and Hold** |

## 5.3 GUIDED

### 5.3.1 LASER GUIDED BOMB

| | | |
|---|---|---|
| 1. | **LANTIRN PREP** | (a) **Target Pod Power** ..... **POD**<br>• Warm up takes approx. 8 min<br>• Automatically switches to **STANDBY**<br>(b) **Laser Code** ..... as desired<br>• **MUST BE SET ON THE GROUND**<br>• **Default:** 1688<br>(c) **LANTIRN Mode** ..... **OPERATE**<br>• **STANDBY** caution will flash for 30 s<br>• Then switches to **OPER**<br>(d) **VIDEO Switch** ..... **FLIR**<br>(e) **TID Mode** ..... **TV** |
| 2. | **RIO Conditions** | • **WPN TYP** ..... **GBU-XX**<br>• **Attack Mode** ..... **Manual**<br>• **Deliver Mode** ..... **STP-SGL**<br>• **Mechanical Fuze** ..... **NOSE**<br>• **Electronic Fuze** ..... **INST**<br>• **Delivery Options** ..... **As Desired**<br>• **Stations** ..... **Armed** |
| 3. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/G**<br>• **WEAPON SELECTOR** ..... **OFF**<br>• **VDI Mode** ..... **TV**<br>• **Stations** ..... verify selected<br>• **Wing Sweep** ..... **BOMB** |
| 4. | **Slew LANTIRN** | **Refer to LANTIRN Control Section**<br>• **Slave to WYPT** ..... **Left-4-Way RIGHT**<br>• **QSNO (Snowplow)** ..... **S4 HAT Down**<br>• **Toggle FOV** ..... **LANTIRN Toggle FOV**<br>• **Slew** ..... **LANTIRN Stick**<br>• **Area Track** ..... **Left-4-Way UP**<br>• **Point Track** ..... **Left-4-Way Down**<br>• **Undesignate** ..... **LANTIRN Undesignate** |

| | | |
|---|---|---|
| 4. | **Designate** | **Refer to LANTIRN Designation Section**<br>(a) **Designate** ..... **Trigger Full-Action**<br>• Slant Range calculated<br>• Time-to-Go calculated<br><br>**Once Time-to-Realease (TREL) is 0**<br><br>(b) **Auto-Lase** .. If selected: lases 10s to impact<br>(c) **Manual Lase** ..... **Trigger Full-Action**<br>(d) **While Lasing** ..... **L** blinks |
| 5. | **Employment** | **Once Time-to-Realease (TREL) is 0**<br>(a) **STORE RELEASE** ..... **Press and Hold**<br>(b) **Flight Path** ..... Gentle right-hand turn (to prevent masking) |

## 5.3.2 TALD DECOYS

| | | |
|---|---|---|
| 1. | **RIO Conditions** | • **WPN TYP** ..... **TALD**<br>• **Deliver Mode** ..... **STP-SGL**<br>• **Delivery Options** ..... **As Desired**<br>• **Stations** ..... **Armed** |
| 2. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/G**<br>• **WEAPON SELECTOR** ..... **OFF**<br>• **HSD Mode** ..... **TID**<br>• **Stations** ..... verify selected |
| 3. | **Employment** | (a) **Flight Path** ..... High / Fast<br>(b) **RWR** ..... Monitor to locate emitters<br>(c) **STORE RELEASE** ..... **Press and Hold** |

# Chapter 6

# A/A WEAPONS

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## 6.1 M61 GUN

### 6.1.1 M61 GUN - OVERVIEW

| | |
|---|---|
| • **GUN RATE Button** | • **Cycles Gun Rate**<br>– **HIGH** – 6000 rpm<br>– **LOW** – 4000 rpm |
| • **A/A Gun Modes** | • **RTGS**<br>– **Real-Time Gunsight Mode**<br>– Selected automatically with guns<br>– **If No WCS Data Available** displays bullet location at 2000 ft with diamond and 1000 ft with pipper<br>– **If WCS Data Available** pipper displays bullet location at targets current range out to 4000 ft<br>• **MANUAL**<br>– Fixed manual pipper<br>– Adjust with **GUN ELEV** knob<br>– Press **CAGE/SEAM** to select |
| • **CAGE/SEAM Button** | • **Cycles RTGS / MANUAL Gun Modes** |
| • **ROUNDS Knob** | • **Allows selection of remaining gun rounds** |

### 6.1.2 M61 GUN - MANUAL

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **Gun Rate** ..... **HIGH**<br>• **Gunsight Lead** ..... as required<br>• **WEAPON SELECTOR** ..... **GUNS** |
| 2. | **Employment** | (a) **Gun Mode** ..... **MANUAL**<br>(b) **Pipper** ..... on target<br>(c) **Trigger** ..... **FIRE** |

### 6.1.3 M61 GUN - RTGS / NO RADAR

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **Gun Rate** ..... **HIGH**<br>• **WEAPON SELECTOR** ..... **GUNS** |
| 2. | **Employment** | (a) **Gun Mode** ..... **RTGS**<br>(b) **Pipper** ..... on target<br>(c) **Trigger** ..... **FIRE** |

### 6.1.4 M61 GUN - RTGS / RADAR

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **Gun Rate** ..... **HIGH**<br>• **WEAPON SELECTOR** ..... **GUNS** |
| 2. | **Employment** | (a) **Gun Mode** ..... **RTGS**<br>(b) **Radar** ..... **STT**<br>(c) **Pipper** ..... on target<br>(d) **Trigger** ..... **FIRE** |

## 6.2 AIM-9 SIDEWINDER

### 6.2.1 AIM-9 - OVERVIEW

| | |
|---|---|
| • **Missile Preparation** | • **MSL PREP**<br>– AIM-9 seeker must be cooled<br>– Either press **SW COOL** button<br>– Or activation of **ACM** |
| • **Seeker Head Modes** | • **SEAM**<br>– **Sidewinder Expanded Acquisition Mode**<br>– **Double-D search pattern** invisible to pilot<br>– 4.5 sec search time<br>– **Allows AIM-9 to be uncaged and track target**<br>– 40 deg track limit<br>– **Allows WCS to slave AIM-9 to radar track**<br>• **Boresight**<br>– AIM-9 locked to ADL<br>– 2.5 deg FOV<br>– Selected if **MODE/STP** set to **BRSIT**<br>– And **ACM** not active |
| • **MODE/STP Switch** | • **NORM**<br>– Allows **SEAM** seeker mode<br>• **BRSIT**<br>– Forces Boresight seeker mode<br>– Overridden if **ACM** active |
| • **CAGE/SEAM Button** | • **Uncages Seeker**<br>– Starts 4.5 second double-D search<br>– If no IR source found cages again<br>• **Slaves Seeker**<br>– If radar STT locked |

## 6.2.2 AIM-9 - SILENT

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **SW COOL** ..... **ON**<br>• **MODE/STP** ..... **As Desired**<br>• **WEAPON SELECTOR** ..... **SW** |
| 2. | **Employment** | (a) **CAGE/SEAM** ..... **Uncage Seeker**<br>(b) **IR-Lock** ..... **Good Tone**<br>(c) **Trigger** ..... **FIRE** |

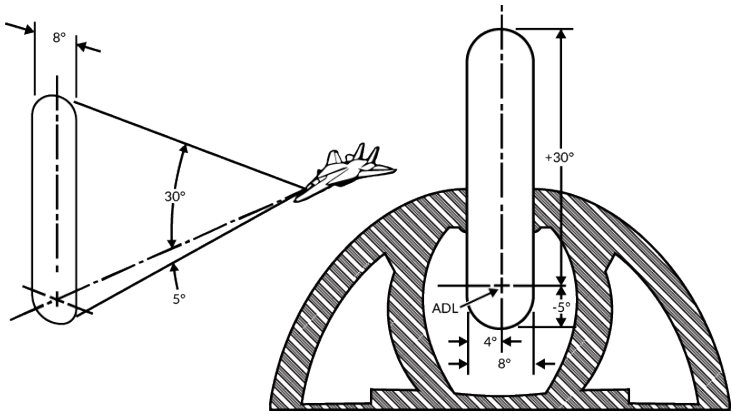
## 6.2.3 AIM-9 - RADAR

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **SW COOL** ..... **ON**<br>• **MODE/STP** ..... **NORM**<br>• **WEAPON SELECTOR** ..... **SW** |
| 2. | **Employment** | (a) **Radar** ..... **STT**<br>(b) **CAGE/SEAM** ..... **Slave Seeker**<br>(c) **IR-LOCK** ..... **Good Tone**<br>(d) **Steering** ..... center T-shaped cue with ASE<br>(e) **Trigger** ..... **FIRE** |

## 6.3 AIM-7 SPARROW

### 6.3.1 AIM-7 - OVERVIEW

| | |
|---|---|
| • **Missile Preparation** | • **MSL PREP**<br>– AIM-7 must be tuned to AWG-9<br>– Either press **MSL PREP** button<br>– Or activation of **ACM** |
| • **Launch Modes** | • **Normal**<br>– Standard operation, STT target designated before launch<br>– AIM-7 uses SARH all the way to target<br>– WCS can use CS or PD for guidance set with **MSL OPTIONS** Switch<br>• **Boresight**<br>– Uses CS flood antenna of AWG-9<br>– Missile will **track strongest return** in Flood area<br>– Automatically activated if STT broken<br>– Selected if **MODE/STP** set to **BRSIT**<br>– **Or if no STT available**<br>– **Shown Below** |
| • **MSL SPD GATE Switch** | • **NOSE QTR**<br>– Standard setting in DCS<br>• **All Others**<br>– Not simulated |
| • **MSL OPTIONS Switch** | • **NORM**<br>– WCS uses dedicated CW antenna for AIM-7 guidance<br>• **SP PD**<br>– WCS uses PD from main flood antenna for AIM-7F/M guidance |
| • **MODE/STP Switch** | • **NORM**<br>– Sets normal launch mode logic<br>• **BRSIT**<br>– Forces Boresight launch mode |




## 6.3.2 AIM-7 - STT

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **MSL PREP** ..... **ON**<br>• **MODE/STP** ..... **NORM**<br>• **WEAPON SELECTOR** ..... **SP** |
| 2. | **RIO Conditions** | • **MSL SPD GATE** ..... **NOSE QTR**<br>• **MSL OPTIONS** ..... **As Desired** |
| 3. | **Employment** | (a) **Radar** ..... **STT**<br>(b) **Steering**<br>• **Target** < 20 deg from ADL<br>• **ASE** center T-shaped cue within<br>(c) **Trigger** ..... **Press and Hold** (until weapon release)<br>(d) **Radar** ..... **Maintain Lock** (until impact) |

## 6.4 AIM-54 PHOENIX

### 6.4.1 AIM-54 - OVERVIEW

| | |
|---|---|
| • **Missile Preparation** | • **Weapon Cooling**<br>– AIM-54 requires liquid cooling<br>– RIO enabled **LIQUID COOLING** switch<br>• **MSL PREP**<br>– AIM-54 must be tuned to AWG-9<br>– Either press **MSL PREP** button<br>– Or activation of **ACM** |
| • **Launch Modes** | • **PDSTT SARH**<br>– AIM-54 uses SARH all the way to target<br>– Faster update rate than TWS<br>– **Slightly increased effective range** as compared to a TWS launch<br>• **TWS SARH/ARH**<br>– Allows **6 AIM-54 launches at 6 targets**<br>– Missile is initially SARH guided<br>– When within AIM-54 seeker range AWG-9 sends activation command<br>– **Not Fire and Forget:** Requires automatic activation command<br>• **ACM Active**<br>– Activated when **BRSIT** selected<br>– Or when **ACM** active with no radar track<br>– Missile commanded active **before launch** |
| • **MSL SPD GATE Switch** | • **NOSE QTR**<br>– Standard setting in DCS<br>• **All Others**<br>– Not simulated |

| | |
|---|---|
| • **MSL OPTIONS Switch** | • **NORM**<br>– Normal guidance (SARH or SARH/ARH)<br>• **PH ACT**<br>– WCS immediately sends AIM-54 activation command on launch<br>– Reverts to SARH if no target detected<br>– **Must be selected before launch** |
| • **TGTS Switch** | • **SMALL** – 6nm activation range<br>• **NORM** – 10nm activation range<br>• **LARGE** – 13nm activation range |
| • **Missile Next Launch Button** | • **Selects Hooked Track as Next Target for AIM-54 TWS Engagement** |
| • **MODE/STP Switch** | • **NORM**<br>– Normal operation<br>• **BRSIT**<br>– Commanded active **before launch**<br>– Missile follows ADL and locks strongest return |
| • **TWS Symbology** | **Refer to TID Symbology Section**<br>• **Pre-Launch**<br>– Prioritization numbers assigned to tracks automatically or manually<br>– Blinking indicates optimal launch parameters<br>• **Post-Launch**<br>– Target prioritization number replaced with TTI<br>– Other prioritization numbers collapsed by one<br>– Tracks under missile attack brightened<br>– **TTI blinks when missile active** |
| • **Launch To Eject (LTE) Time** | • **Normal Operation** – 3-4 seconds<br>• **When in ACM** – 1 second |

## 6.4.2 AIM-54 - PD-STT

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **MSL PREP** ..... **ON**<br>• **MODE/STP** ..... **NORM**<br>• **WEAPON SELECTOR** ..... **PH** |
| 2. | **RIO Conditions** | • **LIQUID COOLING** ..... **ON (FWD)**<br>• **MSL SPD GATE** ..... **NOSE QTR**<br>• **MSL OPTIONS** ..... **As Desired**<br>• **TGTS Switch** ..... **As Desired** |
| 3. | **Employment** | (a) **Radar** ..... **STT**<br>(b) **Steering**<br>• **Target** < 20 deg from ADL<br>• **ASE** center T-shaped cue within<br>(c) **Trigger** ..... **Press and Hold** (until weapon release)<br>(d) **Radar** ..... **Maintain Lock** (until impact) |

## 6.4.3 AIM-54 - TWS / MULTI

| | | |
|---|---|---|
| 1. | **Pilot Conditions** | • **MASTER ARM** ..... **ON**<br>• **HUD** ..... **A/A**<br>• **MSL PREP** ..... **ON**<br>• **MODE/STP** ..... **NORM**<br>• **WEAPON SELECTOR** ..... **PH** |
| 2. | **RIO Conditions** | • **LIQUID COOLING** ..... **ON (FWD)**<br>• **MSL SPD GATE** ..... **NOSE QTR**<br>• **MSL OPTIONS** ..... **As Desired**<br>• **TGTS Switch** ..... **As Desired**<br>• **WCS Mode** ..... **TWS MAN/AUTO** |
| 4. | **Employment** | (a) **Radar** ..... **TWS**<br>(b) **Trigger** ..... **Press and Hold** (until weapon release)<br>(c) **Repeat** ..... for remaining targets<br>(d) **Radar** ..... **Maintain Track** (until active) |