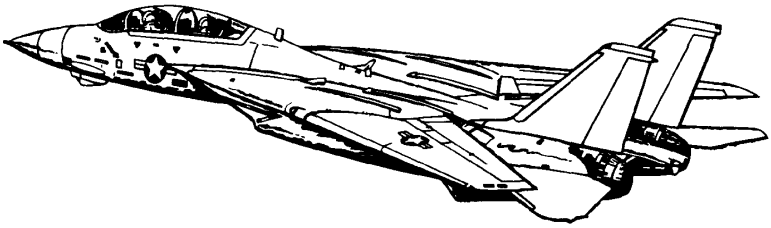
Pocket Checklist

F-14A/B AIRCRAFT

REV: 20210809



Procedures

Systems

AWG-9
Radar

TCS
ALQ-100

LANTIRN

A/G
Weapons

A/A
Weapons

Contents

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** • **Warning Lights** ..... checked • **Caution Lights** ..... checked • **Advisory Lights** ..... checked (b) **FIRE DET/EXT** • **L FIRE GO** ..... illuminated • **R FIRE GO** ..... illuminated (c) **INST** • **RPM** ..... 96% • **EGT** ..... 960 C • **FF** ..... 10500 pph • **AOA** ..... 18 $\pm$ 5 • **Wing Sweep** ..... 45 $\pm$ 2.5 • **FUEL QTY** ..... 2000 $\pm$ 200 • **Oxygen QTY** ..... 2 liters • **L&R FF lights** ..... illuminated (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.	AIR SOURCE	**OFF**
2.	Hydraulics	(a) **HYD TRANSFER PUMP** ..... **SHUTOFF** (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** (b) **R Eng N2** ..... 20% (c) **R Throttle** ..... **IDLE** (d) **TIT** ..... < 890 C during start (e) **R GEN CAUTION** ..... extinguished
6.	Stabilized Parameters	• **RPM** ..... 62-78% • **TIT** ..... approx 500 C • **Fuel Flow** ..... 950-1400 pph • **NOZ** ..... 5 (100%) • **Oil Pressure** ..... 25-35 psi • **Hyd Pressure** ..... 3000 psi
7.	Left Engine Start-Up	(a) **Engine Crank** ..... **L** (b) **L Eng N2** ..... 20% (c) **L Throttle** ..... **IDLE** (d) **TIT** ..... < 890 C during start (e) **L GEN Caution** ..... extinguished
8.	Stabilized Parameters	• **RPM** ..... 62-78% • **TIT** ..... approx 500 C • **Fuel Flow** ..... 950-1400 pph • **NOZ** ..... 5 (100%) • **Oil Pressure** ..... 25-35 psi • **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

1.3 PILOT - POST-START

1.	**TO RIO**	*"Both Engines Running"*
2.	**Displays Control Panel**	• **VDI** ..... **ON** • **HUD** ..... **ON** • **HSD** ..... **ON** • **HDS MODE** ..... **TID** (monitor INS)
3.	**RIO**	**Select Align Quality** • **INS GO NOW:** shortest but least precise alignment • **INS GO COARSE:** does not meet Launch Criteria for AIM-7 / AIM-54 • **INS GO MIN WPN LAUNCH:** allows AIM-7 / AIM-54 launch • **INS GO FINE** fine align (8 min)
4.	**ACM Panel**	• **GUN RATE** ..... as required • **SW COOL** ..... **OFF** • **MSL PREP** ..... **OFF** • **Missile MODE/STP** ..... **NORM**
5.	**Gun Rounds**	**Set**
6.	**ANTI-SKID SPOILER BK**	**OFF**
7.	**Emergency Wing Sweep**	(a) **Handle** ..... **AFT** (b) **Angle** ..... Verify 68 deg
8.	**AFCS Panel - SAS STAB AUG**	• **PITCH** ..... **ON** • **ROLL** ..... **ON** • **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 (b) **Display** ..... 6000 ft (warm up) (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

1.4 RIO - PRE-START

1.	Oxygen	**ON (FWD)**
2.	**PILOT**	• **Ground Power** ..... connected • **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"*

1.5 RIO - POST-START - SHORE

1.	**PILOT**	• **Engines** ..... started • **AIR SOURCE** ..... BOTH ENG
2.	INS STARTUP	(a) **LIQUID COOLING** ..... **ON (FWD)** (b) **WCS Switch** ..... **STANDBY** (c) **IR/TV Power** ..... **STBY/IR/TV** (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** (b) **CAP** • **Category** ..... **NAV** • **MESSAGE** ..... **OWN AC** (c) **Keyboard** • **CLEAR**, **LAT**, latitude, **ENTER** • **LONG**, longitude, **ENTER** • **ALT**, altitude, **ENTER** (d) **CAP MESSAGE** ..... **MAG HDG VAR** (e) **Keyboard** ..... **HDG**, mag var, **ENTER** (f) **Align Progress** ..... Monitor
5.	U/VHF Mode	**T/R G**

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

1.6 RIO - POST-START - CARRIER

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

17.	**Datalink**	(a) **DL Mode** ..... **TAC (AFT)** (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**

1.7 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

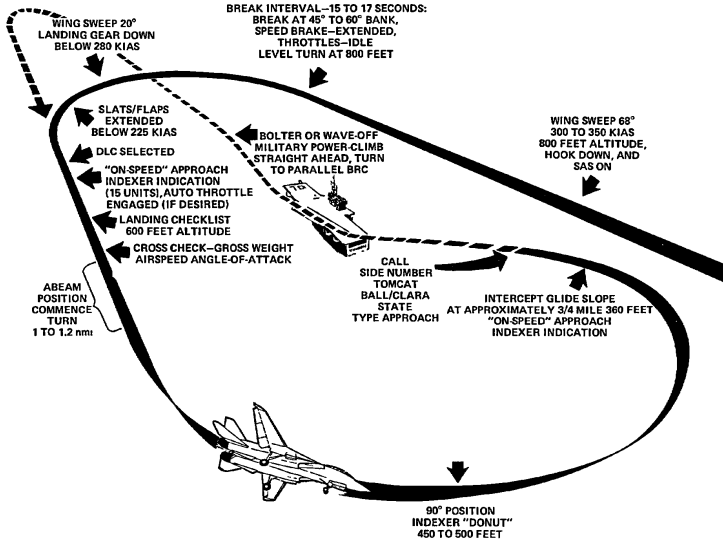
1.8 TAKEOFF - SHORE

		After Lining Up On Runway
1.	**Wing Sweep**	(a) **EM WING SWEEP** ..... **FWD**, then **IN** (b) **MASTER RESET** ..... **PRESS** (c) **Wings** ..... Verify thumb controller (d) **WING SWEEP** ..... **AUTO** (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) (b) **Stick** ..... **Back** at 130 KIAS (c) **Rotation** ..... approx 140 KIAS (d) **GEAR** ..... **UP** < 250 KIAS

1.9 TAKEOFF - CARRIER

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

1.10 LANDING - OVERHEAD PATTERN



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

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

1.11 LANDING - CHECKLIST

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

1.12 AIRSTART

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

2 SYSTEMS

2.6 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 Su-27 Su-33 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 AN-30M
AP	AH-64D
B1	B-1B
BE	Tu-95 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 IL-78M
KC	KC-135

KJ	KJ-2000
M2	Mirage 2000-C Mirage 2000-5
S3	S-3B
SH	SH-60B
TO	Tornado
TR	C-130 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 M-163 Vulcan 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 AIM-120 MICA-EM R-37 R-77 SD-10

ATC

T	Airport ATC Radar

3 AWG-9 RADAR

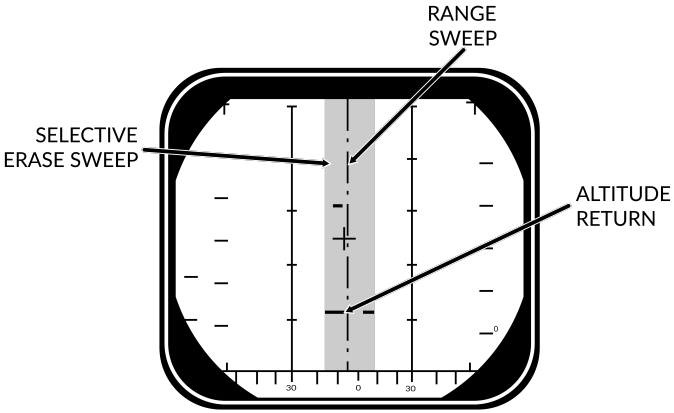
3.1 MAIN MODES - OVERVIEW

	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

3.2 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**

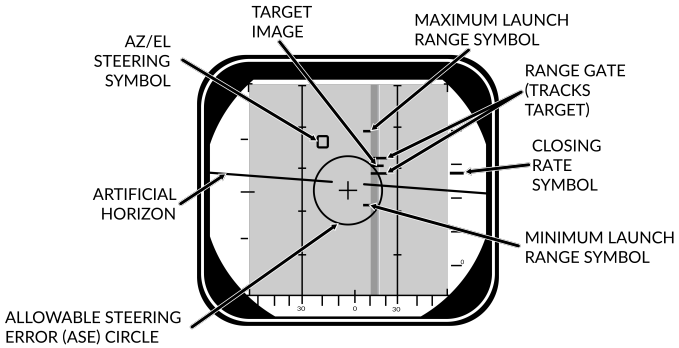
3.3 PULSE MODE - PULSE SEARCH



SEARCH (±10° 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**

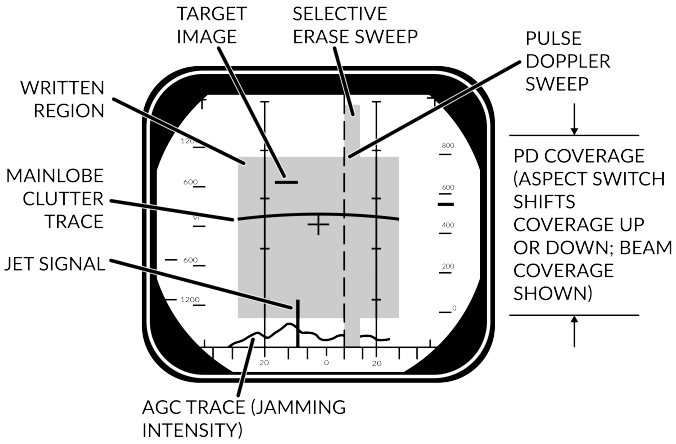
3.4 PULSE MODE - PSTT



SINGLE TARGET TRACK

• **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** (a) Hold HCU Half-action (b) Slew to desired Target (c) HCU Full-Action to lock • **Unlock Target** (d) HCU Half-action
• **DDD**	• **Track Indications** – ANT TRK light – RDROT light – Tracking gates – Closure rate – Attack Symbology

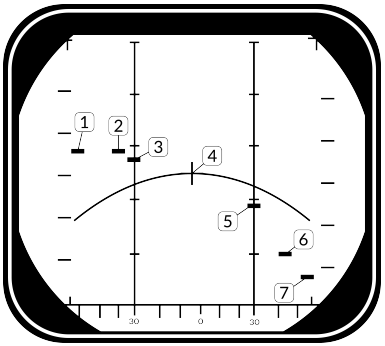
3.5 PULSE DOPPLER MODE - PULSE DOPPLER SEARCH



SEARCH (±40° SCAN)

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

• **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

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

3.7 PULSE DOPPLER MODE - TWS

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

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

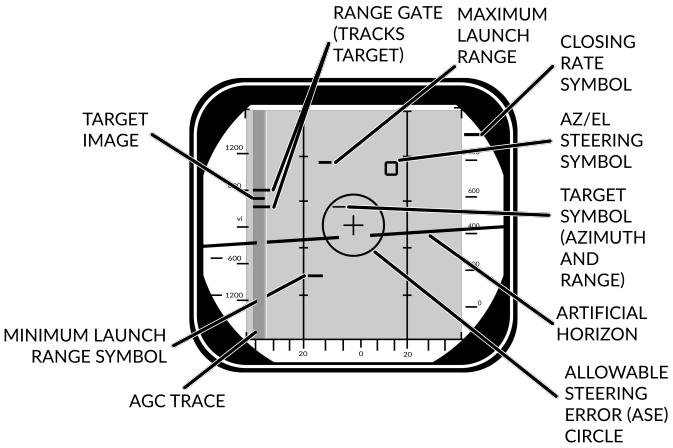
3.8 PULSE DOPPLER MODE - TWS MAN

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

3.9 PULSE DOPPLER MODE - TWS AUTO

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

3.10 PULSE DOPPLER MODE - PDSTT



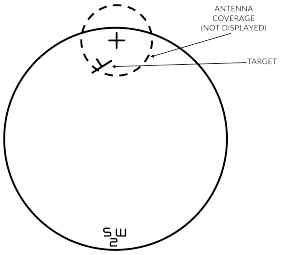
SINGLE TARGET TRACK

• **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** (a) Hold HCU Half-action (b) Slew to desired Target (c) HCU Full-Action to lock • **Unlock Target** (d) 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

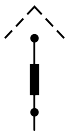
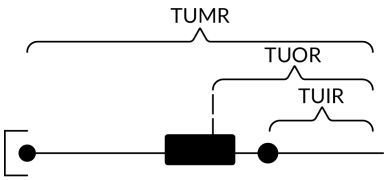
3.12 TID SYMBOLOGY

GENERAL		
Center Dot		• **Basic Component of Symbols** – Marks coordinates of symbol
Own AC		• **Symbol representing own aircraft** – Ground Stabilized: Moves – Aircraft Stabilized: Stationary – Outside TID: line drawn from TID center towards symbol
TID Cursor		• **Hook Cursor** – Controlled by **HCU** in **TID mode** • **Half-Action** – Enables display of symbol – Enables HCU stick to move cursor • **Full-Action** – Hooks closest symbol – If no symbol near, cursor dropped at location
TWS Steering Centroid		• **Steering centroid of TWS tracks** – Selected by WCS for weapons engagement
ONBOARD SENSORS	**Symbol Above Dot**	
Unknown		• **Unknown Sensor Track** • **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** – Jamming Target
Angle-Tracked Radar Target with Altitude Difference Ranging		• **Radar Angle Tracking** – Jamming Target – Alt. diff. ranging
TCS-Angle Tracked Target		• **TCS Angle Tracking**

TCS-Angle Tracked Target with Altitude Difference Ranging		• **TCS Angle Tracking** – 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** – Home Base – Carrier – Airfield
Waypoint		• **Nav Waypoint** • **Supplanted by Number** – 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** – 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** – Horizontal bar through center dot • **Selected by RIO** – Only 1 target can be designated – Guaranteed WCS priority number
Data Link Destroy		• **Additional Symbology on D/L Track** – Horizontal bar through center dot • **Selected by Source** – No effect on WCS prioritization
Do Not Attack		• **Additional Symbology on TWS or D/L Track** – Vertical bar through center dot • **If Set by RIO** – Removes WCS prioritization
Multiple Targets		• **Additional Symbology on TWS or D/L Track** – Horizontal bar on left side of symbol • **Indicates Multiple Targets**
Data Link Challenge		• **Additional Symbology on D/L Track** – Small **V** with center at center dot • **Command to Visually Identify**
Track Extrapolated		• **Additional Symbology on TWS or D/L Track** – Small **X** with center at center dot • **No Update within 8 seconds** – Track deleted after 14 seconds – Or after 2 min if track hold
Altitude Numerics		• **Altitude to Nearest Ten Thousand** – example: 35000-45000
Firing Order Numerics		• **Indicates AIM-54 Prioritization** – Numbers 1-6 – Only in TWS

Time-to-Impact (TTI)		• **After AIM-54 Launch** – Prioritization replaced with estimated TTI • **Flashes after Pitbull**
Velocity Vector		• **Additional Symbology from center Dot** – Direction represents track heading – Length represents speed • **Varies with Mode** – Ground Stabilized: true heading and ground speed – Aircraft Stabilized: relative heading and velocity
Launch Zone Vectors		 • **Additional Symbology 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 Symbology on D/L Track** – Circle – Indicates operator concern
Data Link Priority Kill		• **Additional Symbology on D/L Track** – Square – Indicates target must be destroyed – No effect on WCS prioritization
ATTACK DISPLAY SYMB		
Artificial Horizon		• **Represents Pitch and Roll**
Steering Guidance Symbol		• **Represents Steering Error** – Should be placed as near as possible to center of ASE circle
Allowable Steering Error Circle		• **Indicates Allowable Steering Error for Missile Launch** • **Size Varies with Geometry, Mode, Missile**
Breakaway Indication		• **Appears when Target Range Less than Minimum for Selected Weapon**

4 TCS/ALQ-100

5 LANTIRN

6 A/G WEAPONS

7 A/A WEAPONS

7.1 M61 GUN (MANUAL)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **Gun Rate** ..... **HIGH** • **Gunsight Lead** ..... as required • **WEAPON SELECTOR** ..... **GUNS**
2.	**Gun Mode**	(a) **Gun Mode** ..... **MANUAL** • Press **CAGE/SEAM** to select • No ranging • No lead information
3.	**Employment**	(a) **Pipper** ..... on target (b) **Trigger** ..... **FIRE**

7.2 M61 GUN (RTGS/NO RADAR)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **Gun Rate** ..... **HIGH** • **WEAPON SELECTOR** ..... **GUNS**
2.	**Gun Mode**	(a) **Gun Mode** ..... **RTGS** • Real-Time Gunsight Mode • Selected automatically with guns • No ranging • Diamond ranged for 2000 ft • Pipper ranged for 1000 ft
3.	**Employment**	(a) **Pipper** ..... on target (b) **Trigger** ..... **FIRE**

7.3 M61 GUN (RTGS/RADAR)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **Gun Rate** ..... **HIGH** • **WEAPON SELECTOR** ..... **GUNS**
2.	**Radar Lock**	(a) **Gun Mode** ..... **RTGS** • Real-Time Gunsight Mode • Selected automatically with guns (b) **Radar** ..... **STT** • RIO STT lock • ACM Modes
3.	**Employment**	(a) **Pipper** ..... on target (b) **Trigger** ..... **FIRE**

7.4 AIM-9 SIDEWINDER (SIL)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **SW COOL** ..... **ON** • **WEAPON SELECTOR** ..... **SW**
2.	**IR Lock**	(a) **MODE/STP** ..... as desired • **NORM** – Uncage seeker with **CAGE/SEAM** – 4.5 sec search time – 40 deg track limit • **BRSIT** – Seeker slaved to ADL – 2.5 deg FOV (b) **CAGE/SEAM** ..... press to uncage (if using **NORM**) (c) **Tone** ..... high pitched
3.	**Employment**	(a) **Trigger** ..... **FIRE**

7.5 AIM-9 SIDEWINDER (RADAR)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **SW COOL** ..... **ON** • **WEAPON SELECTOR** ..... **SW**
2.	**Radar/IR Lock**	(a) **MODE/STP** ..... **NORM** • **NORM** – Uncage seeker with **CAGE/SEAM** – 4.5 sec search time – 40 deg track limit • **BRSIT** – Seeker slaved to ADL – 2.5 deg FOV (b) **Radar** ..... **STT** • RIO STT lock • ACM Modes (c) **CAGE/SEAM** ..... press to slave to radar (d) **Tone** ..... high pitched
3.	**Employment**	(a) **Steering** ..... center T-shaped cue with ASE (b) **Trigger** ..... **FIRE**

7.6 AIM-7 SPARROW

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **MSL PREP** ..... **ON** • **WEAPON SELECTOR** ..... **SP**
2.	**RIO Conditions**	(a) **LIQUID COOLING** ..... **ON (FWD)** (b) **MSL SPD GATE** ..... **NOSE QTR** • **NOSE QTR** Standard Operation • **All Others** Not Simulated (c) **MSL OPTIONS** ..... **NORM** • **SP PD** AIM-7 PD launch • **NORM** Normal • **PH ACT** AIM-54 active launch
3.	**Radar Lock**	(a) **MODE/STP** ..... **NORM** • **NORM** – Used for STT engagement – WCS can use CS or PD • **BRSIT** – Boresight flood mode – Tracks strongest return (b) **Radar** ..... **STT** • RIO STT lock • ACM Modes
4.	**Employment**	(a) **Target** .....<20 deg from ADL (b) **Steering** ..... center T-shaped cue with ASE (c) **Trigger** ..... **FIRE** (d) **Radar** ..... **Maintain Lock**

7.7 AIM-54 PHOENIX (SINGLE)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **MSL PREP** ..... **ON** • **WEAPON SELECTOR** ..... **PH**
2.	**RIO Conditions**	(a) **LIQUID COOLING** ..... **ON (FWD)** (b) **MSL SPD GATE** ..... **NOSE QTR** • **NOSE QTR** Standard Operation • **All Others** Not Simulated (c) **MSL OPTIONS** ..... **NORM** • **SP PD** AIM-7 PD launch • **NORM** Normal • **PH ACT** AIM-54 active launch
3.	**Radar Lock**	(a) **MODE/STP** ..... **NORM** • **NORM** – Used for STT engagement – WCS can use CS or PD • **BRSIT** – Boresight flood mode – Tracks strongest return (b) **Radar** ..... **STT** • RIO STT lock • ACM Modes
4.	**Employment**	(a) **Target** ..... <20 deg from ADL (b) **Steering** ..... center T-shaped cue with ASE (c) **Trigger** ..... **Press and Hold** (3-4 seconds) • **TID** ..... TTI appears (d) **Radar** ..... **Maintain Lock**

7.8 AIM-54 PHOENIX (MULTI)

1.	**Conditions**	• **MASTER ARM** ..... **ON** • **HUD** ..... **A/A** • **MSL PREP** ..... **ON** • **WEAPON SELECTOR** ..... **PH**
2.	**RIO Conditions**	(a) **LIQUID COOLING** ..... **ON (FWD)** (b) **MSL SPD GATE** ..... **NOSE QTR** • **NOSE QTR** Standard Operation • **All Others** Not Simulated (c) **MSL OPTIONS** ..... **NORM** • **SP PD** AIM-7 PD launch • **NORM** Normal • **PH ACT** AIM-54 active launch (d) **WCS Mode** ..... **TWS MAN/AUTO**
3.	**Radar Track**	(a) **MODE/STP** ..... **NORM** (b) **Radar** ..... **TWS** • WCS will automatically build trackfiles • Track priorities to the right of contact symbol • **DO NOT STT LOCK**
4.	**Employment**	(a) **Trigger** ..... **Press and Hold** (3-4 seconds) • **TID** ..... TTI appears • **WCS MODE** ... switches to **TWS AUTO** (b) **Trigger** ..... **Press and Hold** (3-4 seconds) • Fires on next highest priority • Repeat for remaining targets (c) **Radar** ..... **Maintain Track** (until active)