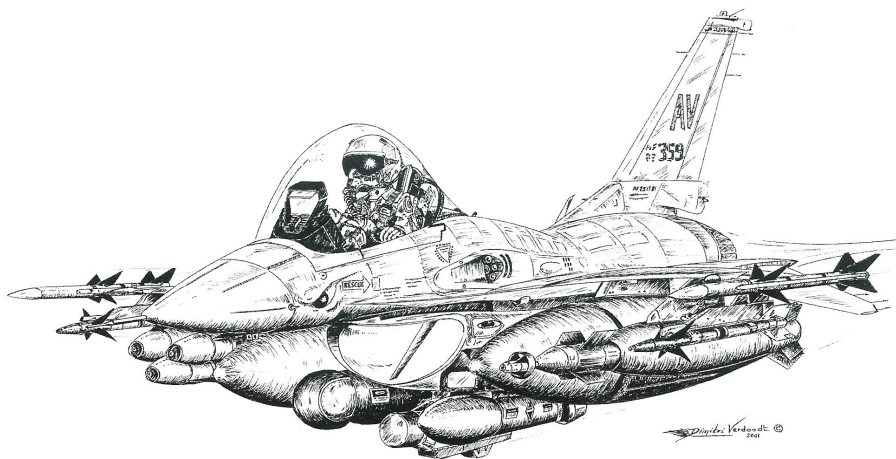




F-16

Block 50 (GE129)

Checklists - Avionic Volume

Not suited for Real Operations
Made for FALCON BMS 4.32

CONTENTS

1. Contents
2. DTC Settings / UHF Backup radio ops / Emergency radio ops
3. UHF/VHF Normal radio operation
4. UHF/VHF Frequency List (Mission Specific)
5. EWS operation
6. EWS In-flight Programming (Mission specific)
7. Steerpoint assignation list / Air to Air TACAN
8. Markpoints
9. IDM (Improved data Modem)
10. Air to Air Datalink
11. Air to Ground Datalink
12. Receiving Data through the IDM
13. Advanced targeting Pod operation (Air to Air)
14. Advanced targeting Pod operation (Air to Ground)
15. AN/AAQ-13 TFR operation
16. AN/APG-68 Radar
17. APG-68 AA Radar: RWS – SAM – TTS – STT
18. APG-68 AA Radar: TWS – TWS bugged
19. APG-68 AA Radar: Spotlight - LRS – VSR – ACM
20. HMCS – HMCS & AIM-9 Bore – HMCS & ACM bore.
21. APG-68 AG Radar – GM
22. APG-68 AG Radar: GMT – SEA
23. blank

FOREWORD

This volume is intended as an inflight quick reference aid relevant to avionic in BMS only.

DTC SETTING

Pilots are required to program their DTC during flight planning. DTC programming allows each pilot to set the following cockpit & system settings that are mission specific:

1. Target Waypoints
2. EWS programming
3. MFD Slot modes
4. Preset UHF & VHF radio frequencies
5. Pre planned Threats
6. Lines steerpoints (for Feba – patrol area,...)

Refer to BMS1F-16-AMLU-34-1-1 for instruction on how to set the DTC during flight planning.

On system power up, all the pilot has to do is load the DTE from OSB #7 of the main menu MFD.

UHF BACKUP Radio Operation

Note:

Prior to engine start, you only have access to Backup mode with the ELEC switch in BATT. If communication with your flight is needed, you will use the backup UHF channels – preflight briefing is critical. VHF is not available as there is no Backup VHF.

C&I switch	Backup
UHF Function knob	BOTH
COM1 Volume	Adjust
COM1 Mode	SQ (Squelsh)
UHF Channel knob	Set on Prebriefed channel
Push To Talk	Depress Throttle COM Switch AFT (UHF)

Emergency Radio Operation

Note:

In case of emergencies, the quickest way to communicate is to flip any of the radio to GUARD. GUARD is constantly monitored by every flight member (as long as the UHF radio is set to BOTH)

1. On UHF 243.0 (**Recommended** : UHF has a dedicated Guard receiver)

COM1 Mode switch	GD (Guard)
Push To Talk	Depress Throttle COM Switch AFT (UHF)
2. On VHF 121.5 (**Not recommended** – VHF has no dedicated guard receiver and transmission on VHF guard will be heard only by those monitoring VHF Guard)

COM2 Mode switch	GD (Guard)
Push To Talk	Depress Throttle COM Switch FWD (VHF)

UHF/VHF Normal Radio Operation

Note:

Standard procedure is to use preset channels (also called buttons) as much as possible. Preset 1 to 14 should not be changed and used to communicate with the AI. Presets 15 to 20 are open and can be used to input UHF Tower frequencies (departure & arrival & alternate) and/or MP intra-flight frequencies (VHF)

Use VHF for intra flight comms (wingmen), UHF for extra flight comms (Twr)

1. C&I switch
2. UHF Function knob
3. UHF Mode knob
4. COM1/2 Volume
5. COM1/2 Mode
6. COM1 override mode

UFC
BOTH
PRESET
Adjust
SQ (Squelch)

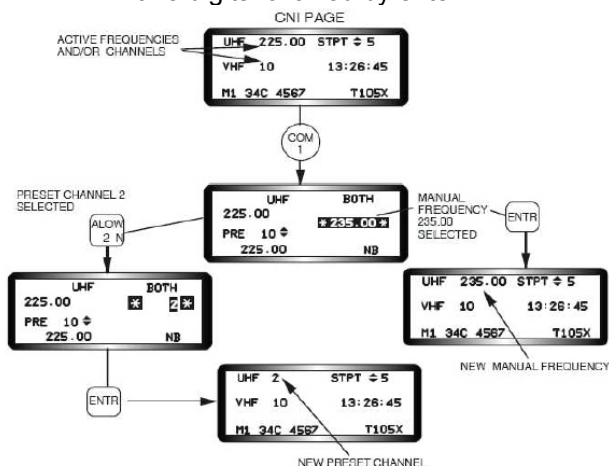
Enter the UHF Preset (2 digits) in the DED scratchpad followed by the ENTER

Or enter the desired frequency (no preset) with 5 digits followed by enter

7. COM2 override mode

Enter the VHF Preset (2 digits) in the DED scratchpad followed by the ENTER

Or enter the desired frequency (no preset) with 5 digits followed by enter



8. To communicate on UHF
9. To communicate on VHF

Depress Throttle COM Switch AFT (UHF)
Depress Throttle COM Switch FWD (VHF)

UHF/VHF Frequency List

Refer to Navigation volume Korea and Balkan to check the airport Tower, Tacan and ILS frequencies.

Refer also to the F4 airport charts for approach plates, SID and airport diagrams.

CH	Agency - UHF - VHF
1	Flight 1 – 297.50 – 138.05
2	Flight 2 – 381.30 – 138.10
3	Flight 3 – 275.8 – 138.20
4	Flight 4 – 294.7 – 126.20
5	Flight 5 – 279.6 – 134.25
6	Package 1 – 349.00 – 133.15
7	Package 2 – 377.10 – 132.35
8	Package 3 – 292.20 – 126.15
9	Package 4 – 264.60 – 132.875
10	Package 5 – 286.40 – 132.325
11	From Package – 354.40 – 132.575
12	Proximity – 269.10 – 121.20
13	Team – 307.30 – 119 .50
14	Broadcast/Guard – 377.20 – 121.10
15	
16	
17	
18	
19	
20	

Complete the above table with your mission specific radio frequencies
It is recommended to assign only presets 15 to 19 – leave presets 1 to 14 unchanged as they are required to communicate properly with the AI.
Team frequency can be changed if required for 2 opposite teams missions.

EWS

Note:

The EWS can be set through the DTC programming at preflight and may be reprogrammed in flight through the UFC by LIST # 7.

Please refer to BMS1F-16-AMLU-34-1-1 for instructions on EWS.

EWS Program

6 programs are available for the countermeasure system:

Pgr 1 to 4 are released on **CMS up** according to which one is selected on the CMDS (PGRM knob)

Pgr 5 is on the **slap switch** (above throttle gate)

Pgr 6 is on **CMS left**.

Without flipping any knob you have then access at all times to three different programs to counter a threat.

EWS Mode

EWS has 5 distinct modes.

STBY: is set to allow manual prog through the UFC.

MAN: Manual launch of the selected sequence.

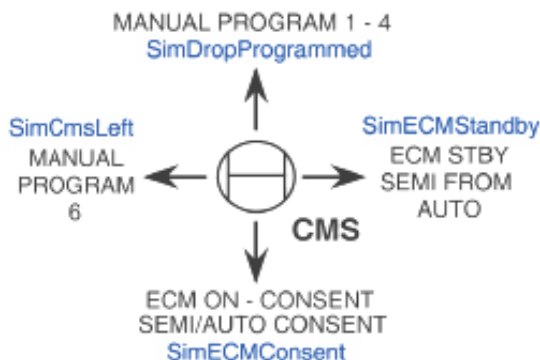
SEMI: Betty prompt pilot to release with COUNTER. Only one program released.

AUTO: Auto release selected program as long as threat remains active.

Once consent is given it is assumed valid till cancelled by CMS aft.

BYP: Bypass mode. Release only 1 chaff and 1 flare (useful when running low of bundles.)

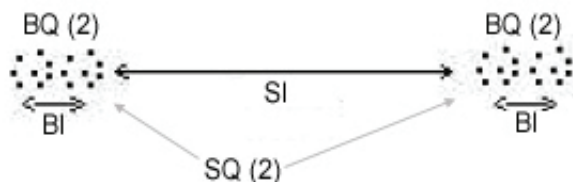
HOTAS CMS Switch Program



EWS IN FLIGHT PROGRAMMING

In case you need to reprogram the EWS in flight, it's done through the UFC: LIST - #7. The programming is possible only when the Mode knob is in STBY.

BQ: Burst Quantity; **BI:** Burst Interval; **SQ:** Salvo Quantity; **SI:** Salvo Interval.



- | | | |
|-----------------|------------------------------------|---------------------|
| 1. EWS mode | STBY | |
| 2. ICP page | Select LIST - #7 | |
| 3. PGR Select | Select PGR 1 – 4 | |
| 4. Chaff rule | Enter PGR mode | |
| | SET BQ | SEQ |
| | SET BI | ICP Num + ICP ENTER |
| | SET SQ | |
| | SET SI | |
| 5. Flare rule | Enter PGR mode | SEQ |
| | SET BQ | ICP Num + ICP ENTER |
| | SET BI | |
| | SET SQ | |
| | SET SI | |
| 6. Next Program | Redo the same for the next program | |
| 7. ICP | Return to master page | RTN |
| 8. EWS mode | Return to MAN or SEMI or AUTO | |

FILL IN YOUR CURRENT EWS SETTINGS:

Note:

BINGO: set the Bingo level for chaff & flares

FDBK: Enable/Disable the CHAFF-FLARES VMU message upon release.

REQCTR: Enable/Disable the COUNTER VMU message

STEERPOINTS ASSIGNATION LIST

The F-16 navigation computer are able to store 100 steerpoints (1 to 99)
Each steerpoint can be manually edited through the STPT or DEST (LIST #1) pages.

STPT	Assigation
1 – 24	Target Steerpoints (Preplanned Flight route)
25	Default Bullseye
26 – 30	Available for 5 Ownship mark points (Small yellow x)
31 – 50	LINES steerpoints (4 groups of 5 stpts)
51 – 55	Open
56 – 70	Preplanned threats
71 – 80	Available for DataLinked steerpoints (Large yellow X)
81 – 99	Open

AIR TO AIR TACAN

Aircraft set on AA tacan 63 channels apart are getting DME range from each others. Only KC-10 AA tacan is able to provide bearing information plus DME range. Usually Y band is used for AA tacan, but any band will do.

- | | |
|------------------|--|
| 1. UFC | Select T-ILS #1 page |
| 2. TACAN Mode | Set T/R AA (dobber right (SEQ)) |
| 3. Tacan Band | Set required band (input 0 in scratchpad to toggle band) |
| 4. Tacan channel | Set 63 apart : (at or above 64, add 63 – below 64, subtract 63) |
| 5. DED | Check DME reading in lower right corner |
| 6. HSI | Select Tacan mode & Check DME reading (bearing pointer rotating at 30°/sec unless KC-10) |

Ai always use SET AA tacan channels:

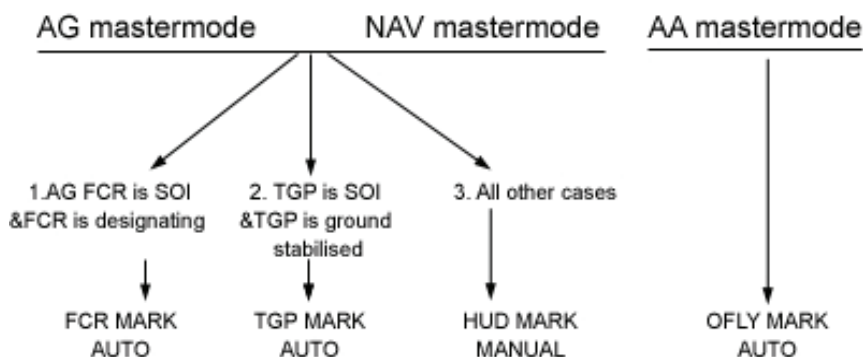
First flight in a package always use: 12, 22, 75, 85 (lead to #4)

Second flight uses the same sequence, but incremented by 1: 13, 23, 76, 86
Up to 5 flights can be supported.

Humans can set any patterns they want – to brief in flight planning

MARKPOINTS

Depending on Master modes and the conditions when the MARK page is entered, markpoints may be automatically made in STPT #26:



Owship markpoints are stored in STPT 26-30. 5 markpoints can be saved before the 6th overrides the 1st. Owship markpoints are displayed on the MFDs with large X cross.

1. FCR markpoints:

To record a FCR markpoint automatically on entering mark page, you have to set AG mastermode, AG FCR SOI and AG FCR designating prior to entering MARK page. In that case, MARK is done automatically.

To make a manual FCR mark, DCS right to FCR mark in the MARK page, designate with AG FCR and hit TMS up to record the mark.

2. TGP markpoints:

To record a TGP markpoint automatically on entering mark page, you have to set AG mastermode, TGP SOI and ground stabilized prior to entering MARK page. In that case, MARK is done automatically.

To make a manual TGP mark, DCS right to TGP mark in the MARK page, ground stabilize the TGP and hit TMS up to record the mark.

3. OFLY markpoints:

OFLY markpoints are automatically stored when entering the mark page if the master mode is AA. To make a manual OFLY mark, DCS right to OFLY in the MARK page and hit TMS up to record the mark.

4. HUD markpoints:

HUD markpoints are never automatic. When HUD mark is selected, the HUD is made SOI and a mark pipper appears alongside the FPM. Pipper can be moved with cursors to the desired mark position. Pipper is then ground stabilized with TMS up. A further TMS up records the mark.

IDM (IMPROVED DATA MODEM)

Datalink is independent of aircraft master mode – in Falcon; it will be mostly used in a multi player environment.

Air to Air datalink is implemented in three different modes of operation: Demand (DMD), Assign (ASGN) and Continuous (CONT):

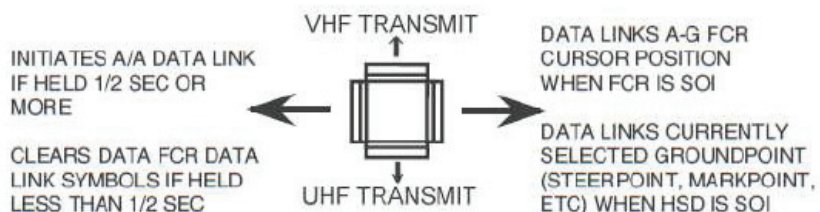
- **DMD** : Ask a one shot Situational Awareness (wingmen position, altitude, speed and heading and TOI if present) update
- **ASGN**: Assign a TOI to another flight member.
- **CONT**: Establish a Continuous Situational Awareness update (wingmen position, altitude, speed and heading and TOI if present). Update received in DMD or ASGN are displayed for 8 seconds, and refreshed every 8 seconds in CONT mode.

Air to Air datalink is possible with 7 others aircraft #2 to #8 addresses inputted in the Air to Air Dlink page (LIST ENTER SEQ) of the DED. Your flight members are inputted by default. If you need to add other aircraft in your **package**, use the remaining empty slot address (ie. #21, #31 to communicate with the leader of flight #2 and #3).

Air to Ground datalink allows sending Air to Ground radar cursor position, currently selected steerpoint (markpoint, steerpoint of interest) to other aircraft in your package. Dlink steerpoints are stored in waypoints #71 to 80 if FILL option is set to ALL.

Addresses receiving the dlink information are set in the Air to Ground Dlink page (LIST ENTER) XMIT. To send data to all members of a flight, input the general flight address (#20, #30, ...) To send data to a specific aircraft, input it's own address in XMIT (#21, #22, #13,...)

Datalink requests are done with the Radioswitch left and Right as illustrated below: Air to Air datalink is on the LEFT side, Air to Ground datalink is on the RIGHT side:



AIR TO AIR DATALINK

AA Datalink sends and receives ownship position, flight member position, altitude, airspeed and heading as well as the target of interest if there is a bugged contact on the AA FCR and the AA FCR is displayed.

COMM switch LEFT for less than 0.5sec declutters the FCR of DLINK symbols.

- | | |
|---------------------|---|
| 1. DL Switch | Check ON |
| 2. DL addresses | Check ownship and intraflight address in DED AA page (LIST ENTER SEQ) |
| 3. MFD Control page | Check ADLINK selected |

DMD mode:

4. Verify DL Mode Check A-A FCR OSB #6 for DMD mode
5. Depress COMM switch LEFT for >0.5sec
6. Verify DMD mnemonic highlighted for 2 seconds
7. Verify data received in HSD or AA FCR

DMD mode request current positions, altitude and heading to all datalink addresses (usually your flight)

ASGN mode:

You can assign a target regardless of the datalink mode (DMD, CONT) You have to select a specific datalink address to ASSIGN the TOI.

4. Select radar contact to assign (TOI) in AA FCR radar
5. Select recipient with AA FCR OSB #7 to #10
6. Check Assigned Slot (AA FCR OSB #7 to #10) XMIT status
7. Check ASSIGN in HUD for 8 seconds
8. Check recipient radar cursor position on HSD and/or FCR
9. Repeat steps to assign another TOI to another flight member

No need to depress COMM switch left to assign. Selecting the recipient through the MFD FCR OSB is sufficient. The recipient MFD OSB will show XMIT

Note that you can assign a target to yourself (#1) the same way.

CONT mode:

4. Verify DL Mode Check A-A FCR OSB #6 for CONT mode
5. Depress COMM switch LEFT for >0.5sec to initiate the CONT loop.
6. Unselect CONT mode with OSB #6 to stop the loop

CONT mode initiates continuous datalink for all flight members. During CONT mode, ASGN remains of course possible to any specific datalink addresses.

Only 1 member use CONT mode (flight lead)...Refer to prebriefed procedures.

AIR TO GROUND DATALINK

- | | |
|--|--|
| 1. DL Switch | Check ON |
| 2. DL addresses | Input recipient address (general or specific) in DED AG Dlink page (LIST ENTER) in the XMIT field. |
| <i>Input "20" for all members of flight #2 for instance. Specific address can also be input if you want to send AG data to only one aircraft</i> | |
| 3. FILL | Check ALL in UFC DL page |
| <i>When FILL is set to ALL, the DLINK steerpoints are stored in STPT #71-80.</i> | |
| 4. MFD Control page | Check GDLINK selected |

Sending the selected steerpoint (markpoints are steerpoints)

5. Set the HSD as SOI with DMS aft
 6. Select the steerpoint on the HSD with TMS forward or select the steerpoint of interest through the UFC
 7. Depress COMM switch RIGHT to send data.
 8. Verify HSD OSB #6 highlighted XMIT and call Steerpoint on Victor (VHF)
- Data link steerpoints and markpoint appear as a small x on the HSD.
Ownship markpoints as a larger X.*

Sending the AG cursor position:

5. Set the FCR in GM/GMT or SEA
 6. Set FCR as SOI
 7. Position the radar cursor at desired location
 8. Depress COMM switch RIGHT to send data.
 9. Verify HSD OSB #6 highlighted XMIT and call Radar cursor on Victor (VHF)
- Data link AG radar cursors appear as a yellow asterisk.*

RECEIVING DATA THROUGH THE IDM

Pilots receiving data through the IDM are warned visually by a HUD warning message and aurally by the VMS DATA message.

Receiving Data in AA CONT mode

No specific steps required as the CONT mode is automatic as long as the host sends data

Receiving position updates from flight (ASGN/DMD) and/or AA target:

Check ASSIGN in HUD and VMS DATA sound

Check flight member positions and data on HSD and FCR if applicable

Data remains displayed for 8 seconds

4 AA targets can be displayed.

Receiving a Steerpoint/Markpoint

Check MKRT DATA in HUD and VMS DATA sound

Check data linked steerpoint (small X) in HSD

Data linked points are stored in steerpoints # 71 to 80 on an incremental basis

Select Steerpoint (71-80) through the UFC to set as active waypoint.

Data linked steerpoints remain memorized unless a 11th data linked steerpoint overwrite position # 71

Receiving AG radar cursor

Check CURSOR DATA in HUD and VMS DATA sound

Check data linked cursor (yellow asterisk with member id) in HSD and AG FCR.

Check FCR in GM/GMT or SEA mode

Data remains displayed for 13 seconds with the sender ID

ADVANCED TARGETING POD OPERATION

Note:

- The TGP needs cooling before use. Cooling starts when the TGP is powered with the RIGHT HDPT switch. TGP will display NOT TIMED OUT while cooling. It requires 20 to 25 minutes before being operational.
- Recommended MFD slots are **FCR/WPN/-** (LEFT) and **HSD/TGP/SMS** (RIGHT)– See DTC settings
- There are three track modes available for the TGP:
Point track: Suitable for automatic tracking of vehicle or aircraft
Area track : Suitable for large structure targeting (building, bridge,...)
Computed Rate: Degraded automatic tracking when a mask condition exists.
- The TGP mode is master mode dependant TGP AG mode is not available in AA/MRM/DGFT master mode – TGP AA mode is not available in AG mastermode.

Air to Air mode:

TGP can be used in A-A to identify and track target without the radar. AA TGP is slaved to FCR if a target is tracked – if no target is tracked, the AA TGP is boresighted at 0° azimuth and -3° elevation. Once TGP is POINT tracking a target, it becomes independent of FCR. The A-A TGP is perfectly suited to identify target at medium range

1. Hardpoint power Check RIGHT HDPT ON
2. Master ARM ARM (or SIM)
3. TGP Ops mode Select A-A (TGP OSB #1)
4. Bug target on A-A FCR
5. Switch SOI to TGP with DMS down
6. Commands a POINT track with TMS forward
Change FOV with pinky and Display polarity (WHOT – BHOT – TV) with TMS left as required
7. If POINT track is lost, TMS aft to re-slave the TGP to the FCR.

ADVANCED TARGETING POD OPERATION (Cont)

Air to Ground mode:

TGP is used in Air to Ground mode to identify and track target for general purpose bombing or Air to ground missile firing.

1. Hardpoint power Check RIGHT HDPT ON
2. Master ARM ARM (or SIM)
3. LASER switch ON (if required for LGB)
4. TGP Ops mode Select A-G (TGP OSB #1)
5. Designate target on GM FCR if required
6. Switch SOI to TGP with DMS down
7. Ground stabilize the TGP in AREA TRACK with TMS forward
8. Refine the TGP cursor on the desired target.
Change FOV and Display polarity as required
9. Command POINT track with TMS forward if required (for vehicles)
Remain in AREA track for larger structure
10. Follow weapon release cue for CCRP LGB bombing or Fire AGM-65
(refer to weapon checklist volume)

Post release for LGB:

11. Command a gentle turn away from the target if possible.
12. Monitor Time to IMPACT countdown
13. Check Laser firing (flashing L) prior to impact according to UFC settings.

After impact

14. Break AREA track with TMS AFT to return TGP to FCR LOS
15. Laser switch OFF

Note

OSB 19 of the TGP page displays the North pointer and the coordinates of the cursors.

AN/AAQ-13 TFR OPERATION

Note

The TFR system emits radio waves that are detectable by opposing forces. According to the tactical situation, use the NORM mode (OSB #20) or the LPI (Low Probability of Intercept mode - OSB #19). LPI emits forward only and less often.

- | | | |
|--|-------------------------------|-------------|
| 1. RF Switch | Check NORM position | |
| 2. RALT switch | Check ON | |
| 3. MFD | Access TFR page | |
| 4. Ground clearance | Set as required | OSB 6 to 10 |
| 5. Ride type | Set as required | OSB 2 |
| 6. TFR mode | Select NORM/LPI | OSB 20/19 |
| 7. TFR master | Enable | OSB 4 |
| 8. Let Down | | |
| AP Light | Check AP enabled | |
| Flight controls | Keep hands on flight controls | |
| 9. Taking control | | |
| When TFR is enabled, the pilot can override the AP to execute small headings corrections by depressing the AP override switch (paddle) on the stick. | | |
| 10. Monitoring TFR | | |
| In bad weather or at night, monitor closely the TFR MFD should a TFR failure occur. | | |
| 11. Disconnecting TFR | | |
| TFR master | Disable | OSB 4 |
| (or) RF Switch | Silent | |

Note:

SOFT/MED/HARD settings determine how many G the AP is allowed to pull.

VLC is Very Low Clearance (100 feet). Activate only over extremely flat terrain or over water.

Setting the TFR to NORM but disabled will provide advisory message in the HUD & TFR MFD (FLY UP – OBSTACLES, ...). Useful when hand flying the jet at low level

AN/APG-68 RADAR

Available radar modes:

Air to Air

- CRM:**
(Combined radar modes)

RWS: Range While Search
↓
↓
↓
↓
↓
↓ TMS RIGHT > 1sec
TWS: Track While Scan

SAM: Situational Awareness Mode
↓ TMS UP
↓ TMS UP with two targets bugged
TTS: Two Target SAM
STT: Single Target Track (one bugged target)
- LRS (ULS):** Long Range Scan

VS (VRS): Velocity Search

via OSB2
via OSB2

- ACM:** (Air Combat Mode)

SLEW (OSB2)
HUD (TMS right : 30x20 – first TMS down: reject lock and 30x20 NO RAD.)
BORE (TMS UP)
VERTICAL (OSB2 or Second TMS down 10x60RAD)

Air to Ground:

- GM:** Ground Mapping (EXP, DBS1, DBS2)
- GMT:** Ground Moving Target (EXP)
- SEA:** Anti Ship (EXP)
- AGR:** Air to Ground Ranging (used internally for AG delivery)

Note:

The AA radar is a B scope display and can look 120° azimuth x 120° elevation in front of the aircraft. Scanning the full cone is not possible and sub zones need to be set with the azimuth (60, 30, 25, 10°), bar scan (1 bar = 4.9° in the vertical, 2 bars = 4.9+2.2+4.9°= 12°, 4 bars = 26.2°. The higher the setting, the longest the scan takes), range (5 to 160Nm) and antenna elevation.

The AG radar is a Pie Scope and elevation is fixed. In expanded FOV modes, azimuth can be slewed.

AN/APG-68 RADAR - AIR TO AIR: RWS

Range While Search: **Suited for Primary Search.**
 RWS → (bug TMS up) → SAM → (lock TMS up) → STT

RWS	Detection probability 2/5
Range Settings	5 to 160 NM (effective till 80Nm)
Azimuth & Bar Scan	1, 2, 4 bar & 20, 60 & 120° azimuth
Ant Elevation	Pilot input (red values= negative)

AN/APG-68 RADAR - AIR TO AIR: SAM (bugged RWS)

Situational Awareness Mode: Special RWS sub mode.
Suited when info is requested for one target or weapon deployment.

SAM	Detection probability 3/5. One contact displayed with relevant info: (heading – airspeed – closure – aspect)
Range Settings	5 to 160 NM (effective till 80Nm)
Azimuth & Bar Scan	automatic - set between bugged target & cursor
Ant Elevation	Pilot input (red values= negative)
DLZ	Displayed if AA mode selected

AN/APG-68 RADAR - AIR TO AIR: TTS (Two Target Sam)

Situation Awareness Mode on 2 targets. Enters when 2 bugs are set in SAM.
Suited when info/wpn deployment is requested for two targets.

TTS	Detection probability 3/5
First bugged target	primary target
Second bugged tgt	secondary target
TMS right < 1sec	Step bug between primary and secondary
1 st and 2 nd tgt > 10Nm	Azimuth & bar: 50°/3bar, Radar still searching
1 st and 2 nd tgt < 10Nm	Search suspended and radar ping pong btw 1 st & 2 nd
bugged tgt < 3Nm	Radar drop track on 2 nd and enter STT on the bugged target

AN/APG-68 RADAR - AIR TO AIR: STT (locked SAM)

Single Target Track: **Suited for attacking a target (BVR).**
 Beware Target will RWR spikes from you

STT	Detection probability 5/5
	Only one contact displayed - full info
Azimuth - Bar	Fixed 2° / 1 bar
DLZ	Displayed if AA mode selected
NCTR	Enabled.
RANGE	Auto

NCTR will try to classify target. Best results inside 25Nm and in front of target. If NCTR fails to classify, UNKN will be displayed

AN/APG-68 RADAR – AIR TO AIR : TWS (track files)

Track While Scan: **Suited for surveillance and group sorting**
 RWS or SAM → (TMS right >1s) TWS → (TMS right>1s) RWS/SAM
 TWS → (bug TMS up) → TWS → (lock TMS up) → STT

TWS	Detection probability 3/5 (no bugged tgt) Max 10 targets all with relevant info Slower than RWS
Range Settings	5 to 80 NM (effective)
Azimuth& Bar Scan	Centred on cursor : 120°/2 bar – 50°/3 bar – 20°/4 bar
Ant Elevation	Pilot input (red values= negative)
NCTR	Enabled (70% capabilities from STT)
Expand	Possible to 4x Scrollable.
Red track	No radar hit on track, extrapolate in red for 13 sec
Flashing Red track	Last 5 seconds before track is dumped
TMS right < 1sec	Bugs next closer target
TMS UP	Manual bug a search target

EXP mode will allow to zoom in around a formation of target to allow better sorting.

AN/APG-68 RADAR – AIR TO AIR : TWS (bugged target)

TWS	Detection probability 4/5 (bugged tgt) One target with full info – all other targets with same info as non bugged target.
Range Settings	5 to 80 NM (effective)
Azimuth & Bar Scan	Fixed 50° , 3 bar
Ant Elevation	Centred on target – if antenna elev is tilted it will happen once the bug is dropped..
NCTR	Enabled (70% capabilities from STT)
Expand	Possible to 4x.
TMS right < 1sec	Bugs next higher priority target
TMS UP	Enters STT with extrapolated targets for 13 seconds

In TWS with a bugged target, you get more information but you increase the detection probability. Browse through TWS tracks with TMS right for less than a second. When locking the target from TWS bugged target, radar is switched to STT mode.

AN/APG-68 RADAR – AIR TO AIR : SPOTLIGHT

Spotlight Scan: **Suited for overriding TWS priority in azimuth and elevation.** If a group is suspected outside the TWS scan limit

Spotlight	Entered by depressing (&hold) TMS aft or TMS up > 1 sec.
Azimuth & Elev	10° / 4 bars centred on cursors and ANT elev – both slewable
TMS release	radar attempts to acquire and track the target within the cursor when TMS is released. Then reverts to whatever mode it was on before SPOTLIGHT

AN/APG-68 RADAR – AIR TO AIR : LRS

Long Range Scan: **Suited for long range large aircraft search during BARCAPS or DCA missions.** Soonest detection allows to plan the correct intercept early on.

LRS	Detection probability 4/5
	Same as RWS but more powerful and slower
Best Range	Between 80 and 160 Nm.

AN/APG-68 RADAR – AIR TO AIR : VSR

Velocity Search: **Suited for fishing out high closure speed, high aspect bogeys. It (Highest closure = Hostile)**
VS → (Lock TMS up) → STT

VSR	Detection probability 2/5
	No Range info - replaced by Speed.
Target at Top	is target approaching at highest closure rate.

AN/APG-68 RADAR – AIR TO AIR : ACM

Air Combat Modes : **Suited for Dogfights or Snap defence**

ACM	Detection probability 5/5 (when locked)
Range	Max 10 Nm
Lock	Auto Lock unless NORAD
Radar	OFF when selected
4 Sub modes	(TMS or OSB)
HUD	HUD area : 20° x 30° 4B scan - Merge
VERTICAL	Lift Line: 10° x 60° Turning dogfight
BORE	Boresight: 5° x 5° Pick target by pointing the boresight cross in the HUD.
SLEW	Manual Scan (5° x 5°) by slewing the cursor. 4B scan

HMCS – Helmet Mounted Cueing System

HMCS allows Off-boresight Air to Air operations. Air to Ground operations are not implemented yet.

HMCS power	HMCS panel, ON/OFF & brightness control
HUD blanking	LIST 0 RCL (HMCS DED page) – M-sel HUD BLNK
Cockpit blanking	LIST 0 RCL (HMCS DED page) – M-sel CKPT BLNK

Note:

HUD & COCKPIT blanking will prevent full or part of the info to be displayed when looking at the HUD or looking inside the cockpit.

Declutter	LIST 0 RCL (HMCS DED page) Position asterisks around DECLUTTER Toggle through the 3 levels by hitting any KP key. LVL1: Full declutter, no info except targeting LVL2: Medium: Speed, G, masterarm, targeting LVL3: No declutter: All navigation and targeting info
Hands-on blanking	DMS aft > 0.5sec will blank HMCS regardless of HUD or COCKPIT blanking. To enable HMCS symbology, depress DMS aft > 0.5sec again.

HMCS – AIM-9(X) OPERATION

Select AIM-9 BORE	Missile LOS slaved to HMCS aiming cross LOS
Uncage AIM-9	Enlarged msl diamond displayed on HMCS
Select AIM-9 SLAVE	Missile LOS slaved to FCR LOS & msl diamond is displayed on the HMCS.

Note:

Cursor enable switch can be held depressed to toggle MSL BORE/SLAVE. When BORE, HMCS will indicate SRM-V or MRM-V – when SLAVE, HMCS will indicate SRM-S or MRM-S depending on type of MSL selected.

HMCS – ACM BORE

Select ACM BORE NORAD:	Radar slaved to HMCS aiming cross LOS
HOLD TMS UP	Boresight Ellipse displayed in HMCS at FCR LOS
target	Place within the HMCS BORE ellipse
Release TMS	Radar is commanded to radiate and attempts to acquire a target in the HMCS BORE ellipse

AN/APG-68 RADAR – AIR TO GROUND

- STT (SPR)** Sighting Point Rotary. Can be: STP (NAV) – TGT (AG) – OA1 or OA2 if Offset aim points data are entered in the system.
SPR can be changed through OSB 10 or TMS right.
The cursor is set on the currently selected steerpoint of interest.
The radar is ground stabilized and cursors are free to move.
Best suited for preplanned strike.
- SP** SNOWFLOW
Radar scan ahead regardless of any SOI and is not ground stabilized! Pilot needs first to ground stabilize the cursors with TMS up, then use Cursor enable switch to be able to move the cursors around. The point under the cursor becomes a pseudo steerpoint and all avionic symbology refers to that point (useful for Mark points for instance)
Best suited for avoiding overflying radar contacts, attacking target of opportunity, or placing missile attack IP for unknown target positions
- FREEZE** Freeze the radar picture, displays GPS coordinates and bearing and range of the cursor position.
Best suited to attack a non moving target with radar OFF.
- CZ** CURSOR ZERO
To replace the cursor in the centre of the display.

AN/APG-68 RADAR – AIR TO GROUND: GM

Ground Map : **Display non moving structures.**
Preferred mode is STP

NORM	Normal Field Of View
EXP	4x FOV – Same resolution
DBS1	4x FOX – 8x resolution
DBS2	8x FOV – 64x resolution

Note:

Use Offset aimpoints in the SPR when flying VRP, VIP attacks.
DBS modes used in conjunction with radar gain allows to pick target precisely.

Use EXP and DBS1 from 40 Nm and DBS2 from 20Nm. Reduce the azimuth scan of the radar to increase refresh rate.

AN/APG-68 RADAR – AIR TO GROUND: GMT

Ground Moving Target : **Display moving units.**
Preferred mode is SP.

NORM	Normal Field Of View
EXP	4x FOV – Same resolution
DBS	Not available

Note:

GMT can be used for navigating at low level by avoiding radar contacts. Useful to stay out of SHORAD and MANPAD range. When used with radar gain, GMT can display roads along which units move. If used with SP mode, make sure you ground stabilize the cursor and depress the cursor enable switch to be able to slew the cursors. Use CZ when you want to replace cursor midrange up ahead.

AN/APG-68 RADAR – AIR TO GROUND: SEA

Sea Mode : **Suited for Anti-Ship missions**
Preferred mode is STP or SP.

Note:

SEA is the same as GMT mode but optimized for water overflight (minimizing ground clutter)

**PAGE INTENTIONALLY LEFT BLANK
USE FOR NOTES**