

TMS, DMS and CMS Usage Guide for Falcon BMS 4.38.1

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0.1 DMS Left/Right: Multifunction Display Format Cycling

0.1.1 Concept

The DMS Left and DMS Right commands are fundamentally orthogonal to the DMS Up and DMS Down controls described in Sections ?? and ??. Whereas DMS Up and DMS Down select *which display* (HUD, Left MFD or Right MFD) becomes the Sensor of Interest (SOI), DMS Left and DMS Right cycle through different *format pages* displayed on *each MFD*, independently of which display is currently designated as SOI — **even if the HUD is the actual SOI, DMS Left/Right will actuate on each MFD.**

Definition of Format Cycling: Each MFD can display up to three different format pages, pre-configured during mission planning via the Data Transfer Cartridge (DTC) or directly by the pilot, in-flight. These three format pages are designated as PRIMARY, SECONDARY, and TERTIARY (see section 0.1.2). DMS Left and DMS Right allow the pilot to cycle through these slots, advancing to the next format page with each button press.

0.1.1.1 Format Cycling and SOI Selection — Distinctions

The critical distinction is this: DMS Up/Down operates on the **display selection axis** (designation of which display is SOI), whereas DMS Left/Right operates on the **format pages axis** (which page is shown on an MFD). A pilot can simultaneously manage both axes:

- Press DMS Down to transfer SOI from the Left MFD to the Right MFD (changes which display receives HOTAS commands).
- Press DMS Right to cycle the Right MFD to a different format page (changes what is displayed, independent of SOI).

This orthogonality is operationally powerful: the pilot can organize the MFD for increased situational awareness while simultaneously managing which display receives HOTAS inputs — which display is SOI. So, pressing DMS Right changes the Right MFD format even if it is not SOI; the same applies to the Left MFD by pressing DMS Left.

The two mechanisms (SOI definition and MFD format cycling) do not interfere with each other and DMS Right/Left is not restricted by the current Master Mode.

Beyond that, DMS Left and DMS Right are **completely independent** from each other. DMS Left controls the Left MFD *only*; DMS Right controls the Right MFD *only*: pressing DMS Right won't, for instance, go back to the previous left MFD format.

DMS LEFT → LEFT MFD

DMS RIGHT → RIGHT MFD

In summary, **both MFD cycle independently and DMS Left/Right pressings don't affect SOI designation**, this is accomplished by DMS Up/Down. This independence allows the pilot to organize a visual workspace suited to the mission, so they never have to “choose” which display to look at or which to control; both are available simultaneously via independent mechanisms.

0.1.2 MFD Configuration

0.1.2.1 Display Format Configuration via DTC

Each Master Mode (A-A, A-G, NAV) and also DGFT and MSL OVRD has its own independent three-slot configuration, as preset in the DTC. When the pilot switches Master Modes in-flight, the avionics automatically load the format configuration for that mode and display the chosen format. Every press of DMS Left/Right will act upon the new set of three-slot formats.

The formats can also be reconfigured by the pilot in flight, by pressing again the OSB corresponding to the actual format being displayed. See Dash-34 § 2.1.6.2 for a comprehensive explanation.

Below is a list of every possible display pages currently present in Falcon BMS that could be configured as an MFD format, either through the DTC or by the pilot in-flight. Note that not all of them can be SOI. When selecting, in any MFD, a format that can't be designated SOI, the *SOI is automatically transferred to the other MFD*.

Table 1: Falcon BMS Possible MFD Formats

Acronym	Full Name	Definition	Can be SOI
FCR	Fire Control Radar	Provides air-to-air and air-to-ground radar detection, tracking, and targeting data with multiple search and track modes for weapons employment	YES
HSD	Horizontal Situation Display	Presents tactical navigation, situational awareness, and positioning information on a moving map display for mission planning	YES
TGP	Targeting Pod	Displays targeting pod imagery for target acquisition, tracking, identification, and laser designation of targets	YES
WPN	Weapon Management	Shows weapons status, aircraft ordnance configuration, and munitions management for air-to-ground missions	YES
HAD	HARM Attack Display	Provides detection and targeting information from air defense radar sources for anti-radiation warfare missions	YES
FLIR	Forward Looking Infrared Navigation Pod	Displays thermal imaging data for navigation, target detection, and low-level flight operations in degraded visibility	NO
TFR	Terrain Following Radar Navigation Pod	Presents terrain elevation and clearance data for automated low-level navigation and terrain avoidance	NO
SMS	Stores Management System	Displays current weapons configuration, loadout, and stores management parameters and status information	NO

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Acronym	Full Name	Definition	Can be SOI
TCN	TACAN Format	Shows TACAN navigation aid position and bearing information for tactical air navigation and station keeping	NO
DTE	Data Transfer Equipment	Provides interface and status for external data link communications with ground stations and other aircraft	NO
FLCS	Digital Flight Control System	Displays flight control system parameters, status, and diagnostics for aircraft control system monitoring	NO
TEST	Test Format	Provides system test and diagnostic pages for built-in test (BIT) functions and aircraft system verification	NO
BLANK	Blank Format	Displays an empty/blank page with no symbology or information for display configuration flexibility	NO

0.1.2.2 DTC Customization in Falcon BMS:

During mission planning in Falcon BMS (2D map screen) the pilot can access the DTC configuration by pressing its corresponding button on the right side bar (see User Manual §§ 5.1 and 9.3.4.2 for extensive explanations on DTC use in-game). In the MODES tab of the DTC configuration menu (see User Manual § 5.1.4 for extensive explanations on how to set the formats), the pilot can assign any valid format to the three available slots of all supported modes (A-A, A-G, NAV, DGFT and MSL OVRD), and define the format (not necessarily the PRIMARY one) that will be firstly displayed on both MFD when entering that specific Master Mode in-flight.

All modifications to the DTC must be saved and loaded in the 2D map screen before taking off for any mission, as stated in the User Manual §§ 5.1.1, 5.1.9 e 9.4. These customizations are then stored in the DTC and loaded automatically when the pilot takes off. They persist for the duration of the flight, unless the pilot changes them in-flight through the OSB buttons.

0.1.2.3 Primary, Secondary, and Tertiary format pages

The PRIMARY, SECONDARY, and TERTIARY format pages configured by the pilot are accessed by pressing the corresponding button on the bottom row of each MFD. Each format page corresponds to one of the three central buttons in the lower OSB row of each MFD:

- **OSB 14 (left button):** PRIMARY slot
- **OSB 13 (center button):** SECONDARY slot
- **OSB 12 (right button):** TERTIARY slot

The diagram below illustrates the OSB layout in the F-16 MFD:

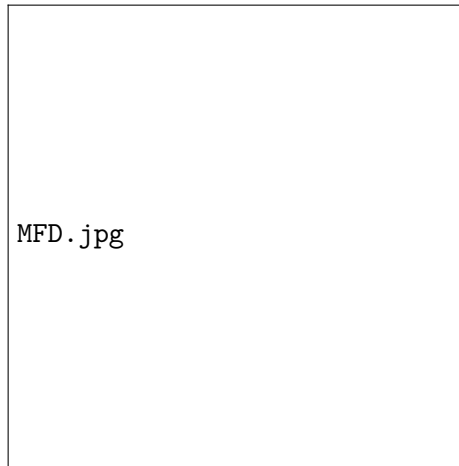


Figure 1: F-16 MFD Representation. Adapted from an AI-generated image by Perplexity AI. Free to use and modify per Perplexity Terms of Service, Section 2.3.1 (<https://www.perplexity.ai/hub/legal/perplexity-api-terms-of-service>).

The three-slot architecture provides mission planning flexibility. During mission planning in the BMS Briefing, the pilot pre-configures which format pages are most useful for a given Master Mode. For instance, in air-to-air mode, the pilot might configure:

- PRIMARY (OSB 14) = FCR (Fire Control Radar page)
- SECONDARY (OSB 13) = HSD (Horizontal Situation Display)
- TERTIARY (OSB 12) = TGP (Targeting Pod page, for auxiliary visual cues)

With three slots, the pilot can quickly access the most relevant pages via DMS Left/Right presses. This is especially important in time-critical engagements.

0.1.2.4 Format Cycling Mechanism: The Wrap-Around Sequence

Cycling Direction: DMS Left and DMS Right advance through format slots in an anti-clockwise direction relative to the OSB button layout. For the Left MFD:

- DMS Left press 1: PRIMARY (OSB 14) → SECONDARY (OSB 13)
- DMS Left press 2: SECONDARY (OSB 13) → TERTIARY (OSB 12)
- DMS Left press 3: TERTIARY (OSB 12) → PRIMARY (OSB 14) [wrap-around]
- DMS Left press 4: PRIMARY → SECONDARY again [cycle repeats]

The same cyclic sequence applies to DMS Right for the Right MFD. The direction is consistent and predictable, allowing pilots to develop muscle memory.

Wrap-Around Behavior: After cycling through TERTIARY, the next DMS press returns to PRIMARY, creating an infinite loop. There is no “off” state or “hold” position. The cycling is continuous and wrap-around is instantaneous. If a slot is configured as BLANK (unused), cycling skips it automatically and advances to the next occupied slot (see Section ??).

Press Type: Short Press (Tap Only): DMS Left/Right respond to **short press only** (tap). There is no long-press or continuous-hold variant. A single tap advances to the next format; holding the button does *not* cycle continuously. This behavior is consistent across all Master Modes and all configurations. If the pilot needs to cycle through multiple slots, separate taps are required.

Example Scenario: A pilot in air-to-air mode has customized the Left MFD as FCR/HSD/TGP. Initially, the Left MFD displays FCR (PRIMARY). The pilot wants to check the tactical picture on HSD. The pilot presses DMS Left once. The Left MFD now displays HSD (SECONDARY). The pilot presses DMS Left again. The Left MFD now displays TGP (TERTIARY). The pilot decides to return to FCR. The pilot presses DMS Left once more. The Left MFD displays FCR again (wrap-around from TERTIARY back to PRIMARY). The SOI designation, if Left MFD was SOI, remains unchanged throughout these cycling operations.

0.1.3 Cycling Constraints and Edge Cases

BLANK Format Skipping: If one or more format slots are configured as BLANK (meaning no format is assigned to that slot, either by choice or by default), DMS Left/Right pressings will automatically skip the BLANK format slot and advance to the next non-BLANK format slot.

Non-SOI-Candidate Formats: Some format pages are *not valid* candidates for SOI designation. For example, the SMS (Stores Management System) format is not a valid SOI candidate. If a pilot customizes an MFD to include SMS in one of the three slots, and that specific MFD was SOI before cycling formats, SOI will automatically transfer to the other MFD.

Format Persistence Across Master Mode Change: When the pilot changes Master Mode, the displayed formats on both MFD reset to the preferred formats of the actual chosen mode. There is *no carryover* of the previously viewed slot.

0.1.4 DMS Left/Right Usage Table

The table below summarizes DMS Left and DMS Right behavior across all Master Modes. Because format cycling is *identical* in all modes, the table shows a single row for each DMS direction, applicable to every Master Mode: A-A (including DGFT and MSL OVRD), A-G and NAV.

Each table entry specifies:

- **State:** The operational context (Master Mode).
- **Direction:** The physical direction for pressing the CMS hat (Left or Right).
- **Action:** The press type (Short, Long, Long Hold).
- **Function:** What the DMS command activates or controls.
- **Effect / Nuance:** The resulting system behavior, including tactics and constraints.
- **Dash34:** Reference section in the Dash-34 manual.
- **Training:** Recommended BMS training missions for hands-on practice.

Training Mission Selection Rationale: To demonstrate the operational utility of DMS Left/Right without overloading the HOTAS table, one representative mission was selected from each Master Mode (NAV, A-A, and A-G). The selection prioritized missions requiring frequent alternation between MFD formats during critical tactical phases. These three missions span the full spectrum of scenarios where DMS Left/Right provides measurable operational advantage over OSB-based navigation.

Notwithstanding the decision to present only three representative training missions, any complex mission involving A-A and A-G weapons employment will benefit from the application of DMS Left/Right.

Table 2: DMS Left/Right Format Cycling Across All Master Modes

State	Dir	Act	Function	Effect / Nuance	Dash34	Train
A-A, A-G, NAV	Left	Short	Cycle Left MFD format	DMS Left cycles the Left MFD through its configured 3-slot sequence: PRIMARY → SECONDARY → TERTIARY → PRIMARY (wrap-around). If BLANK slots are present, they are skipped automatically. Each press advances one step; no continuous cycling on hold. SOI designation of any valid display is unaffected.	2.1.1.2.1, 2.1.6.3	TRN 8 (TFR/FLIR), TRN 28 (SEAD-EW), TRN 18 (BAR-CAP)
A-A, A-G, NAV	Right	Short	Cycle Right MFD format	DMS Right cycles the Right MFD through its configured 3-slot sequence: PRIMARY → SECONDARY → TERTIARY → PRIMARY (wrap-around). If BLANK slots are present, they are skipped automatically. Each press advances one step; no continuous cycling on hold. SOI designation of any valid display is unaffected.	2.1.1.2.1, 2.1.6.3	TRN 8 (TFR/FLIR), TRN 28 (SEAD-EW), TRN 18 (BAR-CAP)