Chapter 4 – DMS: Complete Reference Document

For consultation when drafting Chapter 4 (DMS) into the LaTeX guide

2026-01-06

Purpose

Standalone reference for drafting Chapter 4 (DMS) into the LaTeX guide. **Not for direct integration**; consult when writing.

Scope

Structure, writing principles, Dash-34 cross-references, and example content for each section.

Contents

1 Avoiding Overlap Between Chapters 2 and 4

1.1 Role of Chapter 2 – HOTAS Fundamentals

Chapter 2 remains **conceptual and generic**, applicable to all three switches (TMS, DMS, CMS).

1.1.1 2.1 Sensor of Interest (SOI) and display logic

- Define SOI in abstract terms (which displays can be SOI, how the SOI symbol appears, HUD/MFDS/TGP/HAD/HSD relationship).
- Explain "display logic" without tying it to a specific switch.
- Use generic examples ("if left MFD is SOI, its OSBs respond; if HUD is SOI, certain HOTAS act on HUD") but do **not** list DMS actions systematically.

1.1.2 2.2 Short vs long presses and timing

- Define "short press", "long press", "long (hold)", "short, repeated".
- Do not list specific effects such as "DMS Up long does X" – that belongs in switch-specific chapters.

1.1.3 2.3 Master modes and context-sensitive behaviour

- Explain NAV / A-A / A-G / DGFT as contexts.
- Show that the same hats produce different effects per mode, in general terms, without detailing TMS/DMS/CMS.

1.1.4 2.4 Overview of TMS, DMS and CMS

- For DMS: 1–2 sentences of general role ("selects Sensor of Interest (SOI) and manages MFDS/HUD formats across all master modes").
- One line in table-summary: `Switch | Location | General role | Detailed chapter` → "see Chapter 4 for full DMS behaviour".
- Do not enter specific combinations of up/down/left/right.

1.2 Role of Chapter 4 – DMS

Chapter 4 assumes the reader has read Chapter 2 and focuses on **concrete implementation** of SOI and MFDS mechanics.

- **4.1**: Takes the SOI concept from 2.1 and shows how **DMS controls SOI** display-by-display (HUD, MFDS, TGP, HSD, HAD), grounded in Dash-34 rules.
- **4.2**: Details how DMS performs **MFDS format selection and SWAP**, anchored to Dash-34 2.1.6.x sections.
- **4.3**: Shows how the same SOI/format selection mechanism manifests in A-A and A-G contexts (FCR/TGP/HSD/HAD/WPN).
- **4.4**: Records real differences between blocks/variants.

Result:

- Chapter 2 = "general physics" (concepts common to all hats).
- Chapter 4 = "DMS engineering" (how DMS specifically uses SOI and MFDS to implement that physics).

2 Chapter 4 – Detailed Structure (Option B Renamed)

2.1 4.1 Concept and Sensor of Interest (SOI)

2.1.1 4.1.1 SOI definition and scope across displays

Intent Restate SOI concisely, now explicitly anchoring to MFDS SOI (Dash-34 2.1.6.3) and HUD SOI.

Key points

- SOI is the display or page that receives pilot inputs.
- Any page that can be SOI (FCR, TGP, HSD, HAD, WPN, HUD) is part of the "DMS game".
- The same SOI concept applies across NAV, A-A, and A-G.

Dash-34 references

- `\dashref{2.1.6.3}` – MFDS SOI description.
- `\dashref{2.1.7.5.4}` – HUD SOI symbology.
- `\dashref{2.1.1.2.3}` – General SOI concept.

Sample opening sentence

> Sensor of Interest (SOI) identifies which display or sensor page is currently in focus and will receive pilot inputs from hands-on controls and MFDS bezel buttons. In Falcon BMS, SOI can reside on the left or right MFDS, on the HUD, or on sensor-driven pages such as FCR, TGP, HSD, and HAD.

2.1.2 4.1.2 Role of the DMS in SOI selection

Intent Explain at high level how DMS up/down/left/right move SOI between HUD and MFDS, and between pages, according to the MFDS SOI rules in the Dash-34.

Key points

- DMS Up typically assigns SOI to the HUD (if the current HUD mode supports SOI).
- DMS Down returns SOI from HUD to a MFDS page or cycles SOI between left and right MFDs.
- DMS Left and Right move SOI laterally between pages.
- Behaviour depends on which pages are currently displayed and which are SOI-eligible.
- **Emphasis:** DMS does not generate tracking, weapon logic, or SPI. It only decides which display is in control.

Dash-34 references

- `\dashref{2.1.5}` – HOTAS hands-on controls.
- `\dashref{2.1.6.3}` – MFDS SOI mechanics.
- `\dashref{2.1.6.9}`, `\dashref{2.1.6.10}` – OFF/BLANK behaviour.
- `\dashref{2.1.7.5.4}` – HUD SOI.

Sample paragraph

> The DMS is the primary hands-on control for selecting which display or page is SOI and for moving SOI between HUD and MFDS pages. DMS Up assigns SOI to the HUD when the current HUD mode supports SOI; DMS Down returns SOI from HUD to a MFDS page or cycles between left and right MFDs. DMS Left and Right move SOI laterally between pages and select which MFDS format is primary. The key distinction: DMS controls which display is in focus; TMS and sensor logic control what that display does with targets and weapons.

2.1.3 4.1.3 Example SOI flow (overview)

Intent Provide a short example showing SOI transitions in a typical mission phase; detailed flows belong to Chapter 6.

Key points

- Example: NAV HSD → A-G FCR → TGP → WPN page.
- Show the DMS role at each transition.
- Do not detail TMS steps, SPI logic, or weapon employment.
- Keep it to 4–6 steps.

Sample flow

1. HSD on the left MFD is SOI in NAV; the pilot uses MFDS controls to manage range and clutter.
2. The pilot selects A-G master mode and uses DMS to move SOI from HSD to the FCR A-G page.
3. After the FCR acquires an area of interest, the pilot uses DMS to shift SOI to the TGP page for precision aiming.
4. When ready to adjust weapon parameters, the pilot uses DMS to move SOI to the WPN or SMS page.

Dash-34 references

- `\dashref{2.1.6.18}` – HSD page.
- `\dashref{2.1.6.19}` – FCR page.
- `\dashref{2.1.6.25}` – TGP page.
- `\dashref{2.1.6.21}` – SMS/WPN page.

Note Cross-reference Chapter 6 for detailed training flows and step-by-step sequences.

2.2 4.2 DMS in MFDS format selection and SWAP

2.2.1 4.2.1 MFDS format selection and cycling

Intent Describe how DMS interacts with MFDS format selection – which page is "primary" on each MFD.

Key points

- The MFDS supports multiple formats per side (FCR, HSD, TGP, SMS/WPN, HAD).
- When an MFD is SOI, DMS Left and Right can cycle between available formats on that side.
- This is a hands-on alternative to using MFDS bezel buttons or the ICP.
- The pilot can quickly step between format pairs (for example, FCR and HSD, or TGP and WPN) without leaving the stick or throttle.
- Available formats depend on configuration, loaded stores, and mission phase.

Dash-34 references

- `\dashref{2.1.6.2}` – Typical MFDS functions.
- `\dashref{2.1.6.9}`, `\dashref{2.1.6.10}` – OFF/BLANK behaviour and format interactions.
- `\dashref{2.1.6.21}` – SMS/WPN page.
- `\dashref{2.1.6.18}` – HSD format specifics.

Sample paragraph

> The MFDS supports multiple formats on each MFD, such as FCR, HSD, TGP, SMS/WPN, and HAD, and one format is considered primary on each side at any given time. When a MFDS page is SOI, DMS Left or Right commands step the pilot through available formats on that side. This allows the pilot to quickly toggle between critical format pairs, for example FCR and HSD for general awareness or TGP and WPN for targeting, while keeping hands on the stick and throttle. The exact format sequences and availability depend on current aircraft configuration, loaded munitions, and master mode.

2.2.2 4.2.2 SWAP and display management

Intent Explain the SWAP mechanism and how DMS coordinates with it.

Key points

- SWAP can exchange content between left and right MFDs, or between HUD and MFDS (variant-dependent).
- DMS determines which display is SOI when SWAP is invoked.
- After SWAP, SOI typically remains on the same logical page, even though it may have moved physically from left to right or vice versa.
- This consistent SOI–SWAP relationship is essential for predictable hands-on workflow.
- Use official terminology: "SWAP", "format selection", rather than vague terms like "display allocation".

Dash-34 references

- `\dashref{2.1.6.9}` – SWAP displays.
- `\dashref{2.1.6.10}` – BLANK format.

Sample paragraph

> In addition to format selection, the MFDS provides a SWAP mechanism that can exchange content between the left and right MFDs or between HUD and MFDS, depending on aircraft variant and configuration. The DMS works with SWAP by maintaining SOI on the page during and after the exchange, ensuring that the pilot retains control over the intended page even though its physical location has changed. This consistent relationship between SOI, formats, and SWAP is essential for maintaining a smooth hands-on workflow in both Air-to-Air and Air-to-Ground operations.

2.2.3 4.2.3 HSD control via SOI and MFDS functions

Intent Clarify that DMS only **selects** HSD as SOI; the HSD's own controls implement zoom, declutter, and related functions.

Key points

- The HSD offers range control, declutter, expand, cursor-based measurements, and Link 16 overlays.
- None of these functions are performed by the DMS itself.
- DMS makes HSD eligible to receive inputs by setting it as SOI.
- Once HSD is SOI, its dedicated MFDS buttons and cursor controls implement zoom, declutter, and other functions.
- Separation: DMS is the "SOI selector"; HSD is the "SA workhorse".

Dash-34 references

- `\dashref{2.1.6.18}` – Full HSD description (range rings, range scale, expand, control page).
- `\dashref{2.1.6.18.7}` – HSD Expand.
- `\dashref{2.1.6.18.8}` – HSD Control Page (CNTL).

Sample paragraph

> The Horizontal Situation Display (HSD) is a key Situational Awareness page offering range control, declutter, expansion, cursor-based measurements, and Link 16 or IDM overlays. These functions are not performed by the DMS directly. Instead, the DMS decides whether the HSD is SOI; once HSD is SOI, its dedicated MFDS buttons and cursor controls implement zoom, declutter, and other functions. Treating DMS as the SOI selector and HSD as the SA workhorse helps avoid confusion: DMS enables HSD to receive input, but does not change what HSD displays or computes.

2.3 4.3 DMS in sensor and weapon context

2.3.1 4.3.1 SOI changes between FCR, TGP, HSD and HUD in Air-to-Air

Intent Show how DMS moves SOI between typical Air-to-Air pages as the situation evolves.

Key points

- Typical SOI candidates in A-A: FCR A-A page, HSD, HUD.
- DMS provides a fast way to move SOI between these pages.
- The pilot might start with HSD for the tactical picture, then shift SOI to FCR for target acquisition, and finally place SOI on HUD for intercept and weapons employment.
- DMS up/down/left/right only move SOI; they do not lock targets, perform IFF, or change radar modes.
- TMS inputs and FCR logic govern target actions, as described in the Dash-34 radar sections.
- Keep the separation clear: DMS is for display/SOI control; TMS is for sensor/target control.

Dash-34 references

- `\dashref{2.3.1}` – FCR A-A modes.
- `\dashref{2.1.6.18}` – HSD.
- `\dashref{2.1.7.5}` – HUD symbology.

Sample paragraph

> In Air-to-Air operations, typical SOI candidates include the FCR A-A page, the HSD, and the HUD. The DMS provides a fast way to move SOI between these pages as the tactical picture evolves. For example, the pilot might start with HSD as SOI for initial picture building, then shift SOI to the FCR for target acquisition, and finally place SOI on the HUD during an intercept or weapons employment phase. Throughout this process, DMS up, down, left, and right commands only determine which page is in control; they do not lock targets, perform IFF interrogations, or command radar modes. Those actions are governed by TMS inputs and FCR logic, keeping the division of labour clear.

2.3.2 4.3.2 SOI changes between FCR, TGP, HSD, HAD and WPN in Air-to-Ground

Intent Show typical Air-to-Ground SOI choreography and the DMS role in each transition.

Key points

- Typical SOI candidates in A-G: FCR A-G, TGP, HSD, HAD (for HARM-equipped aircraft), WPN or SMS pages.
- DMS enables quick SOI movement between these pages without looking down at MFDS or ICP.

- A typical sequence might be: HSD SOI for ground picture, FCR A-G SOI for area mapping, TGP SOI for precision aiming, WPN SOI for weapon monitoring.
- Each transition is SOI-only; SPI generation, aimpoint designation, and weapon parameters remain separate functions.

Dash-34 references

- `\dashref{2.1.6.19}` – FCR page.
- `\dashref{2.1.6.22}` – HAD page.
- `\dashref{2.1.6.21}` – SMS/WPN page.

Sample paragraph

> In Air-to-Ground operations, the FCR A-G page, TGP page, HSD, HAD (for HARM-equipped aircraft), and WPN or SMS pages all compete for SOI at different phases of an attack. The DMS enables the pilot to move SOI between these pages without looking down to the MFDS bezel or ICP, maintaining a hands-on workflow. A typical sequence might involve starting with HSD SOI for understanding the ground picture, switching SOI to the FCR A-G for area mapping, then moving SOI to the TGP for precision aiming, and finally shifting SOI to the WPN page to monitor weapon status and terminal cues. At each step, the DMS is only deciding who is SOI; creation and movement of SPI, designation of aimpoints, and weapon release remain functions of TMS, ICP, and the underlying sensor or weapon logic.

2.3.3 4.3.3 DMS with HARM – HAD page as SOI

Intent Explain the DMS role when the HARM Attack Display (HAD) is SOI.

Key points

- The HAD page becomes a central SOI candidate when employing AGM-88 HARM.
- DMS moves SOI to and from the HAD page.
- HAD allows pilot control of emitter selection, table filters, and other HARM-specific functions.
- DMS does not change HARM modes or launch parameters by itself.
- DMS only makes HAD eligible to receive input.
- Clear distinction: DMS means "HAD is now in focus"; HARM logic and TMS govern what is done with HARM.

Dash-34 references

- `\dashref{2.1.6.22}` – HAD page.
- HARM-specific weapon chapter.

Sample paragraph

> When employing the AGM-88 HARM, the HARM Attack Display (HAD) page becomes a central SOI candidate on one of the MFDs. The DMS is used to move SOI to and from the HAD page, allowing the pilot to control emitter selection, table filters, and other HARM-specific functions exposed on the HAD. In this context, DMS commands do not change HARM modes or launch parameters by themselves; they only determine whether the HAD page is in focus and can receive pilot input. This distinction is essential when building DMS tables: the State column describes which page is SOI, for example A-G – HAD SOI, while the HARM chapter and TMS tables document actual engagement procedures.

2.3.4 4.3.4 DMS with IAMs and other weapon-driven MFDS pages (SMS/WPN)

Intent Explain the DMS role with Inertially Aided Munitions (IAM) and other advanced weapon pages.

Key points

- IAMs (JDAM, JSOW, WCMD, SPICE) and other weapons expose SMS or WPN pages.
- These pages show weapon status, release indications, and cueing.
- DMS brings WPN or SMS pages to SOI at the appropriate time in the attack flow.
- The pilot can modify release options or monitor cues without leaving hands-on controls.
- DMS does not compute release solutions or modify weapon internal states.
- SPI generation, steerpoint management, and weapon programming are handled by ICP, SMS/WPN logic, TMS, and other HOTAS functions.
- DMS tables should focus on which page combinations are SOI-capable, not replicate weapon employment procedures.

Dash-34 references

- `\dashref{2.1.6.21}` – SMS/WPN page.
- Relevant weapon chapters (IAM, SPICE, etc.).

Sample paragraph

> For Inertially Aided Munitions (IAMs) such as JDAM, JSOW, and WCMD, and for other advanced weapons, the SMS or WPN pages on the MFDS expose weapon-specific status, release indications, and cueing. The DMS is responsible for bringing these WPN or SMS pages to SOI at the appropriate time in the attack flow, so that the pilot can modify release options or monitor cues without leaving hands-on controls. Again, DMS itself does not compute release solutions or modify weapon internal states; it only selects which MFDS page is in focus. SPI generation, steerpoint management, and weapon programming are handled by ICP, SMS/WPN logic, and indirectly by TMS and other HOTAS functions. DMS tables for IAMs should therefore focus on which combinations of pages and modes are SOI-capable, not replicate weapon employment procedures.

2.4 4.4 DMS – Block and variant notes

Intent Record real block and variant differences in DMS-relevant areas (MFDS page availability, SOI-capable displays).

Key points

- DMS behaviour is largely consistent across F-16CM/DM Block 40/42/50/52/52+ and MLU in BMS.
- Differences arise mainly from which MFDS pages are available (HAD, advanced HSD, Link 16).
- Cockpit layout changes may affect SWAP and related controls.
- Document only real differences in MFDS page availability or SOI-capable displays as described in the Dash-34.
- Do not duplicate behaviour that is identical across blocks.
- Cross-reference Appendix A and MFDS sections where behaviour is variant-dependent.

Dash-34 references

- `\dashref{2.1.6}` – General MFDS.
- Appendix A of the guide – Block and variant overview.

Sample structure

- **Block 50/52:** HAD available, advanced HSD, Link 16 display.
- **Block 40/42:** Baseline HSD/FCR, no HAD or Link 16.
- **MLU variants:** Similar to Block 50/52, with local modifications.

3 Two Critical Focus Points (for entire Chapter 4)

3.1 Focus Point 1: DMS Does Not Perform Tactical Functions

DMS does **not**:

- Lock targets, generate SPI, create MARKPOINTS, or command weapon release.
- Command radar modes, arm weapons, or change weapon parameters.
- Change sensor state or perform IFF interrogations.

These are responsibilities of:

- **TMS** (target designation and sensor control).
- **WPN/SMS logic** (weapon state and release conditions).
- **FCR/TGP/HAD** (sensor functions and aimpoint generation).
- **MARK page / ICP** (waypoint and markpoint recording).

DMS role: Decide who is SOI and which MFDS format is primary.
Training note: Every DMS table row should make this clear in the Effect / Nuance column.

3.2 Focus Point 2: NAV / A-A / A-G Are Contexts, Not Different DMS Implementations

In **all** modes, DMS uses the **same** basic mechanics:

- Move SOI between HUD and MFDS.
- Select MFDS formats on each side.
- Optionally invoke SWAP.

What **changes** between contexts:

- Which sensors and pages typically become SOI.
- How those pages behave internally.
- Tactical workflow and timing.

What **does not change**:

- The DMS itself; it does not become a different switch in NAV versus A-A versus A-G.

The chapter structure reflects this: Section 4.3 shows how the same SOI and format mechanism applies to different page combinations, not that DMS fundamentally changes.

4 Cross-Reference Summary

Key Dash-34 sections for Chapter 4 content are summarized in Table 1.

Topic	**Dash-34 Section**
HOTAS general	`\dashref{2.1.5}`
MFDS and SOI overview	`\dashref{2.1.6.2}`, `\dashref{2.1.6.3}`
MFD format / OFF / BLANK	`\dashref{2.1.6.9}`, `\dashref{2.1.6.10}`
SMS / WPN page	`\dashref{2.1.6.21}`
FCR page	`\dashref{2.1.6.19}`
TGP page	`\dashref{2.1.6.25}`
HSD page	`\dashref{2.1.6.18}`
HAD page	`\dashref{2.1.6.22}`
HUD SOI	`\dashref{2.1.7.5.4}`
A-A FCR modes	`\dashref{2.3.1}`

Table 1: Dash-34 sections most relevant to Chapter 4 (DMS).

5 Writing Checklist for Chapter 4

Use this checklist to validate coverage when drafting Chapter 4 content:

1. Intro (4.1.1) anchors SOI to Dash-34 2.1.6.3 and 2.1.7.5.4.
2. Section 4.1.2 explains DMS up, down, left, and right in terms of SOI and MFDS pages.
3. Section 4.1.2 explicitly states that DMS does not generate tracking, SPI, or weapons logic.
4. Section 4.1.3 example is short (4–6 steps) and does not detail TMS or weapon employment.
5. Section 4.2.1 uses the terminology "format selection" and "cycling" as in the Dash-34.
6. Section 4.2.2 uses the term "SWAP" and explains HUD/MFD variant behaviour.
7. Section 4.2.3 clearly separates "DMS makes HSD eligible (SOI)" from "HSD's controls perform zoom and declutter".
8. Section 4.3.1 lists A-A SOI candidates and makes the TMS/DMS separation clear.
9. Section 4.3.2 shows a typical A-G SOI flow without detailing SPI or weapon logic.
10. Section 4.3.3 mentions the HAD and uses the official page name.
11. Section 4.3.4 references SMS/WPN pages by their official names and avoids vague labels such as "complex weapons".
12. Section 4.4 documents only real block and variant differences, not speculative ones.
13. Every section emphasizes: "DMS controls SOI and format; other systems control sensors and tactics".
14. Cross-references to Chapter 2 (foundational concepts) and Chapter 6 (training flows) are included where helpful.

End of Reference Document