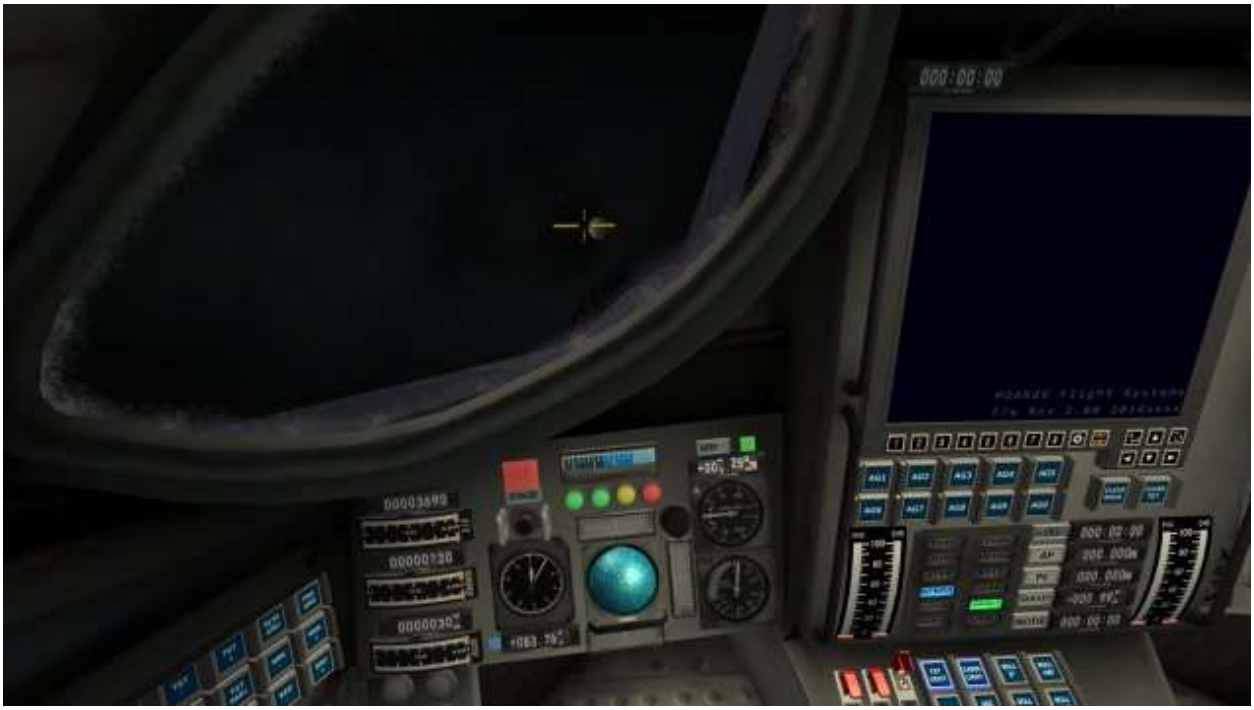
PROJECT GEMINI

MOARdV FLIGHT SYSTEMS FAMILIARIZATION MANUAL



Revision 2.00 20140629

OVERVIEW

The MOARdV Flight Systems Familiarization Manual describes an updated IVA for the FASA Gemini Pod interior. This IVA takes advantage of the RasterPropMonitor mod to provide an enhanced gameplay experience, while keeping a stock-alike feel for Gemini command pod. Many of the functions of a typical flight can be managed from IVA using the MOARdV Flight Systems modification.

The MOARdV Gemini Command Pod uses ModuleManager to replace the Gemini interior. No FASA installation files are altered, so removal of this mod is as simple as deleting the GameData/MOARdV folder.

In addition to updating the Gemini Command Pod IVA, this mod adds RPM compatible cameras to:

- The FASA Gemini Docking Nosecone for improved docking visibility (DockCam)
- The FASA Probe Camera, allowing the probe camera to function as a periscope (ExtCam).

What's new in v2.00

New Features:

- The status lamps now are roundified lamps, to prevent confusion between square buttons and round status lamps.
- New MFD.
- Many buttons have been moved around.
    - The MechJeb panels on the left and right bulkheads have been rearranged to place more buttons towards the front of the panel, making it easier to reach them without having to shift the camera as much.
    - The buttons on the lower and middle pedestal have been rearranged, and many new buttons were added.
- New gauges based on FASA LEM props by DennyTX.
- New numerical displays.

Fixes:

- FlightSystems updates now apply to the Rescue Gemini configuration, as well.
- The Probe Camera "lens" was flipped over (it was upside down).

Notes for people upgrading from v1.xx

Some of the gauges have moved around from their original location, primarily to consolidate related functions, so you might want to skim through this guide.

REQUIREMENTS

To use the MOARdV FS IVA, KSP 0.23.5 or newer is required. In addition, the following mods are required:

- RasterPropMonitor. 0.17 or later is required. The latest version of RasterPropMonitor, as well as its source code, can be found at https://github.com/Mihara/RasterPropMonitor/.
- FASA 3.86 or later is required.
- ModuleManager 2.1.5 (included with RPM) is required.

To fully enjoy the updated Gemini Pod, the following mods are optional, but recommended:

- MechJeb 2.2.1 dev build 254 or newer is strongly recommended to enable various features of the cockpit.
- The SCANsat mod, release 6 or newer, will enable the MAP mode on the multi-function display.

This mod will work without SCANsat and/or MechJeb, but some features will not function.

INSTALLATION

This package should be unzipped into the KSP root directory. The files should end up in GameData/MOARdV/FlightSystems. Installation elsewhere will cause the mod to fail to function. It is recommended to delete the old installation of FlightSystems if you are upgrading.

LICENSE

The models used for the MFD, numeric displays, MechJeb buttons and Action Group buttons are by Alexustas, and available under the terms of CC 3.0 BY-NC-SA.

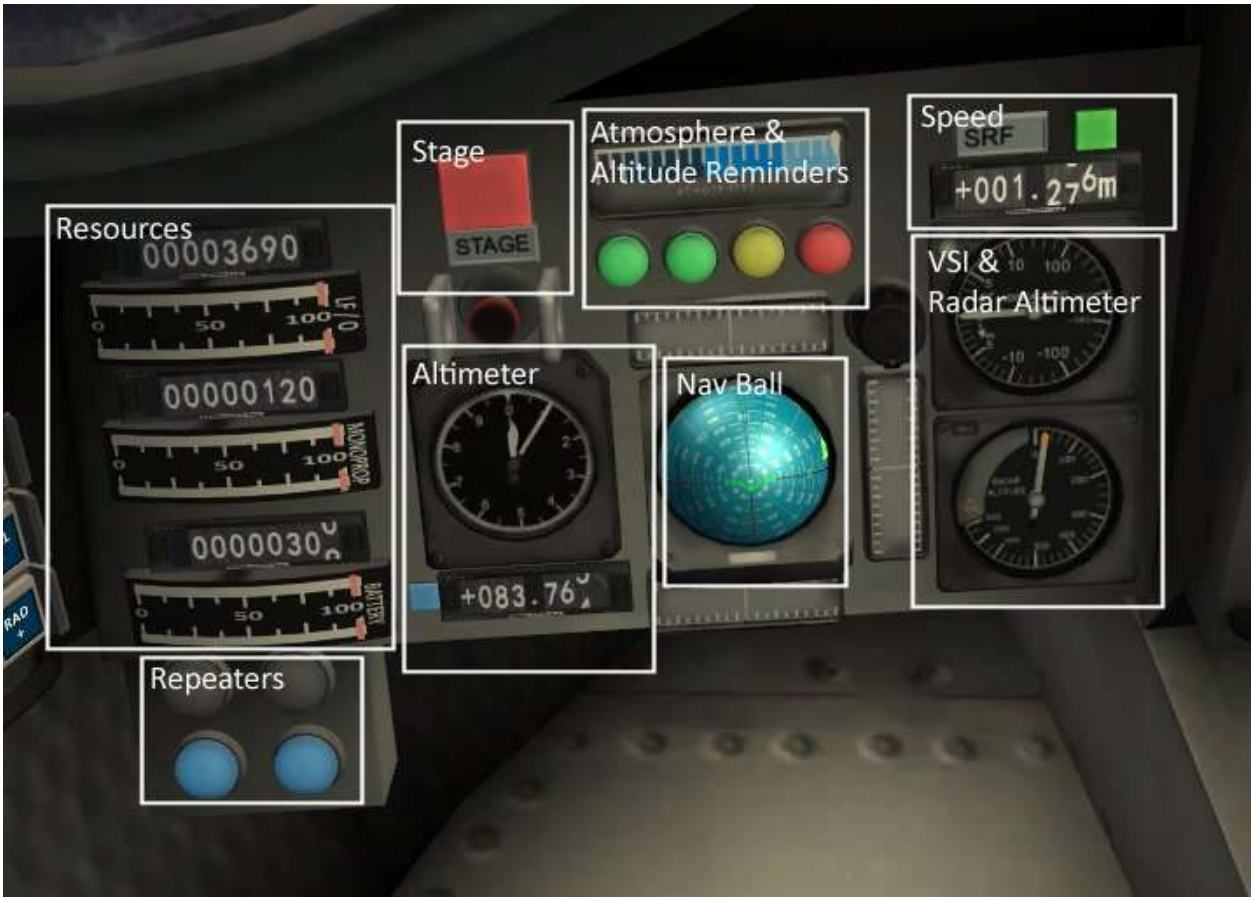
The analog resource and throttle gauges model is by DennyTX, distributed as part of the FASA package, and available under the terms of CC 4.0 BY-NC-SA.

Special thanks to Frizzank for granting me permission to distribute a modified Gemini Command Pod interior config.

FEATURES

With this mod, much of the FASA IVA becomes functional, either providing status information or providing control inputs for the ship. This section is a tour of the features.

Command Pilot Console



The Command Pilot console (left IVA seat) provides an overview of flight status. Many of the flight instruments are found in the original Gemini IVA, but there are some new additions. Most instruments are grouped by function.

Resources: Numeric displays show current Liquid Fuel, Monopropellant, and Electric power. Analog gauges show the amount remaining as a percentage of the total available aboard the spacecraft (the Liquid Fuel gauge also tracks Oxidizer as well). The gauge needles blink red when the corresponding resource is below 10%.

Repeaters: These indicator lamps show the status of (left to right, top to bottom) SAS, RCS, external lights, and landing gear.

Stage: The Big Red Button is what the pilot pushes to go to space, as well as to stage on the way to space. The button dims when staging is unavailable (during time warp, or when staging is otherwise locked).

Altimeter: The analog altimeter gauge shows ASL. The numeric display below it can be switched by pressing the adjacent button. It displays ASL when the button is blue and AGL when the button is green.

Atmosphere & Altitude Reminders: The atmosphere gauge is the standard atmosphere gauge. The altitude reminders light up when the craft's altitude above the ground crosses various thresholds. These lamps are configured (from left to right) at 35km, 15km, 10km, and 1km.

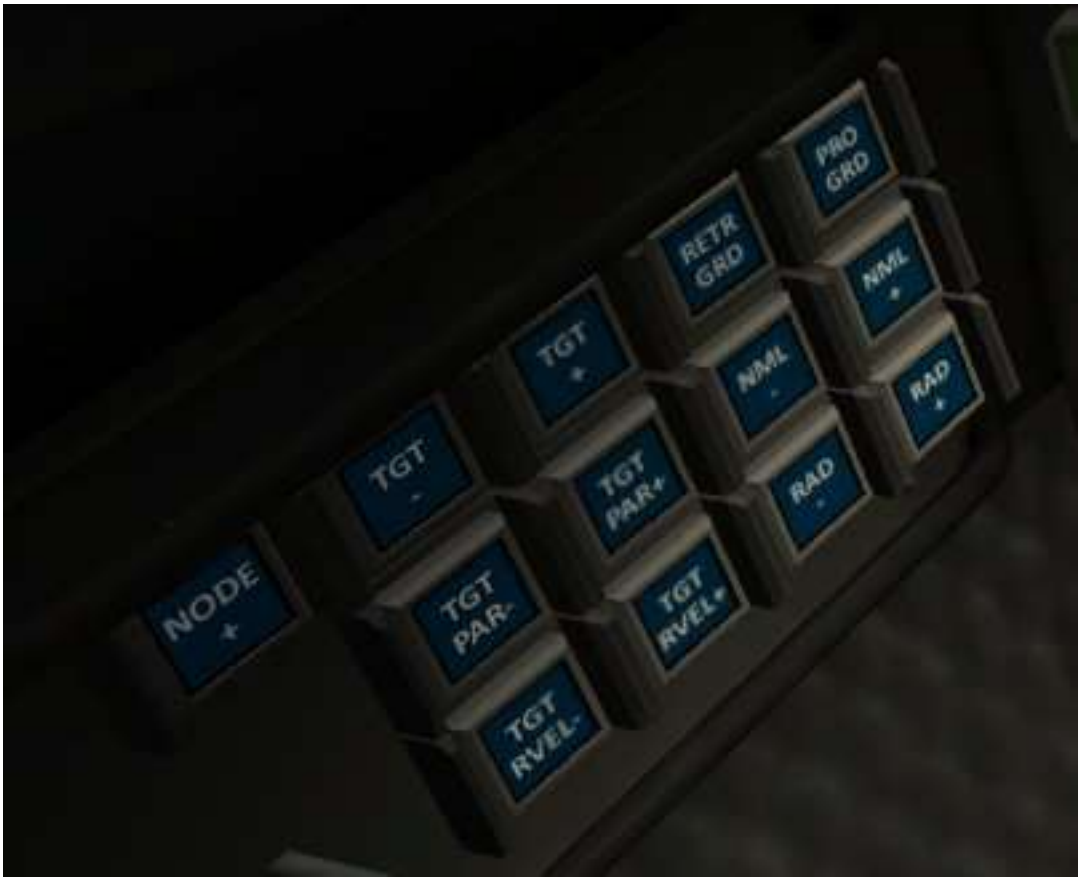
Nav Ball: The well-known stock nav ball.

Speed: This numeric display shows the current speed of the craft, as surface speed, orbital speed, or relative to a target (when applicable). The mode may be switched manually using the adjacent button. It may also switch automatically.

VSI & Radar Altimeter: Stock VSI and radar altimeter gauges.

The Second Pilot (right) console duplicates all of the key features.

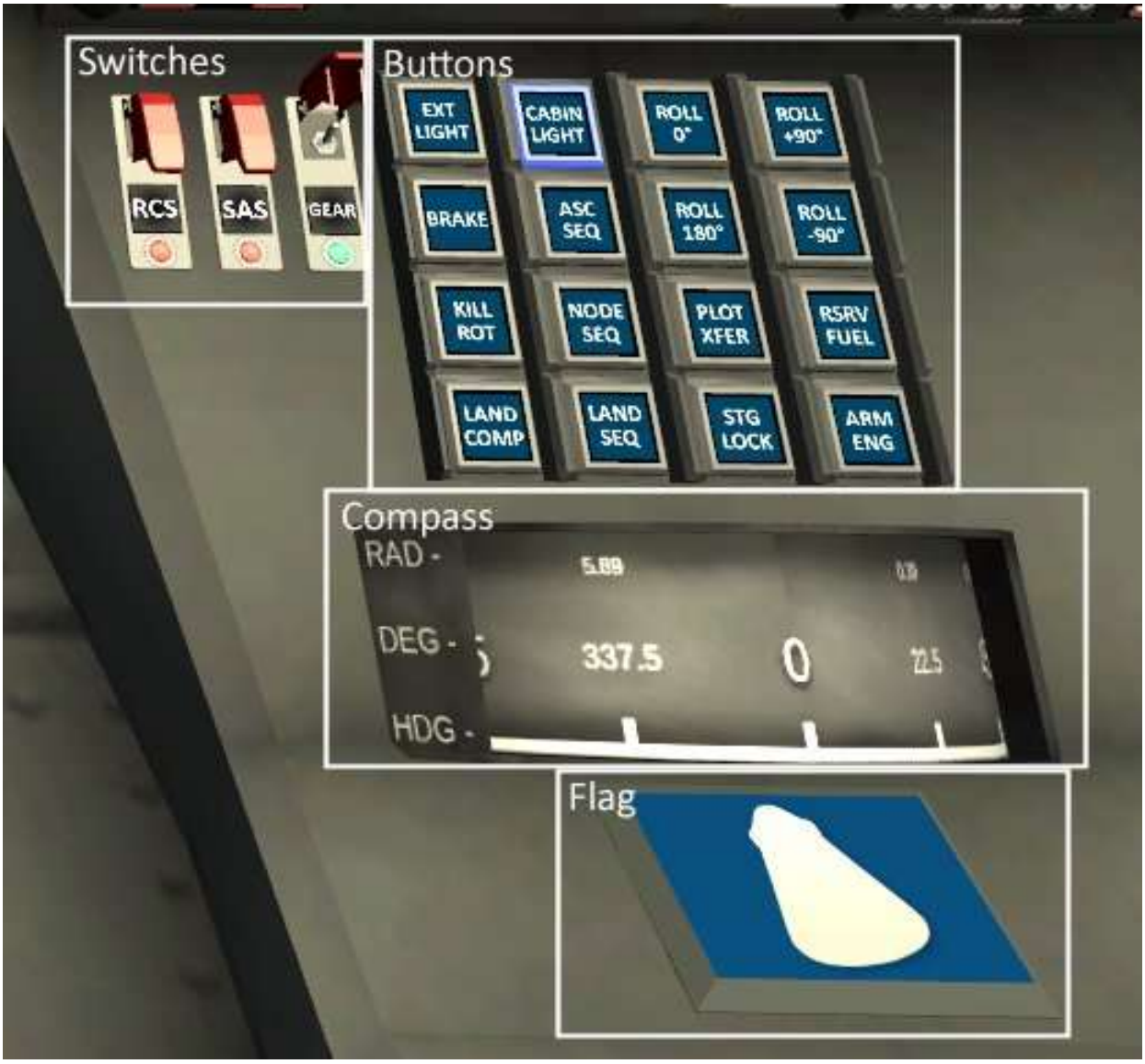
Command Pilot Left Console



Situated on the left bulkhead of the cockpit, the Command Pilot Left Console provides access to the most common in-flight control modes of the MechJeb SmartASS flight computer. On ships that do not have a MechJeb flight computer, these buttons do nothing.

The Second Pilot's seat has a duplicate console on the right bulkhead.

Lower Pedestal Panel



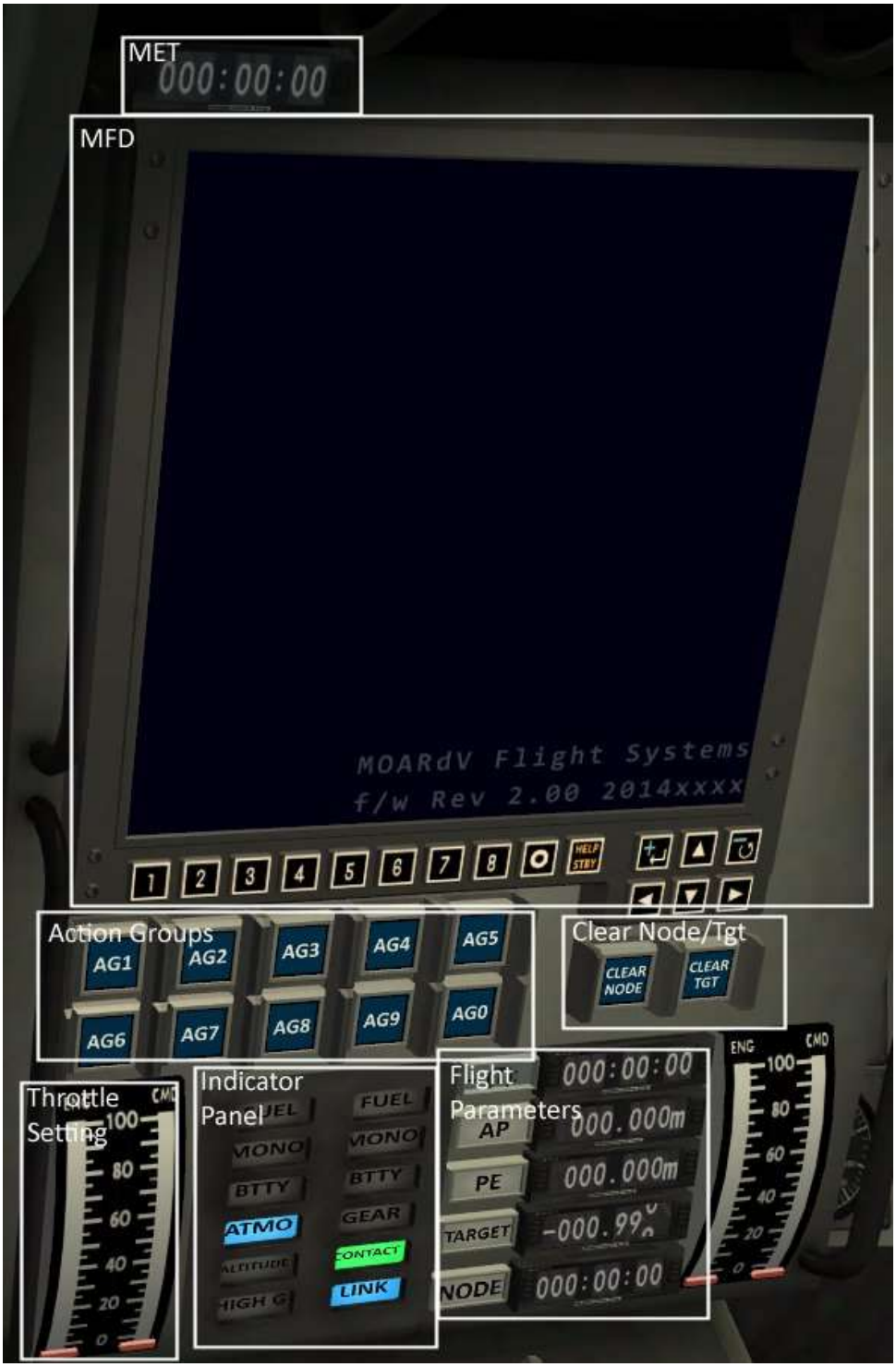
The Lower Pedestal Panel provides various controls and status indicators:

- Flight Control switches for RCS, SAS, and landing gear.
- The primary flight operations button cluster, containing (from left to right, top to bottom):
    - EXT LIGHT: External Lights action group
    - CABIN LIGHT: Gemini cabin interior lighting
    - Roll 0, Roll +90, Roll 180, Roll -90: Enable SmartASS Force Roll with the angle specified on the button; works when MechJeb is installed and SmartASS is engaged.
    - BRAKE: Brakes (for designs incorporating brakes)
    - ASC SEQ: Ascent Sequence (Ascent Guidance) when MechJeb is installed.
    - KILL ROT: MechJeb SmartASS Kill Rot feature (when MJ is installed)
    - NODE SEQ: Node Sequence (Execute Next Node) when MechJeb is installed.

    - PLOT XFER: Plot a Hohmann transfer to the current target when MechJeb is installed.
    - RSRV FUEL: Reserve fuel. Enable fuel flow from any resources that had their flow disabled (by right-clicking on the part and changing the small triangle next to the resource to a red circle). This switch will turn on all reserves of any resource type on the current vessel. To switch a resource back to reserve status, you will have to switch to the external camera and right click the parts.
    - LAND COMP: Enable MechJeb Landing Guidance's aerobrake / landing predictions. This is useful when a landing target is selected, but the landing autopilot is disengaged.
    - LAND SEQ: Landing Sequence (Land at target if a ground target is selected, or Land Somewhere otherwise) when MechJeb is installed.
    - STG LOCK: Lock staging to prevent accidental staging. Same as pressing Alt-L with the default keyboard configuration.
    - ARM ENG: Enables / disables all currently staged engines. When disabling engines, it will also disable all engines that are staged above the current stage.
- **Compass:** Analog backup compass.
- **Flag:** Mission flag plaque.

Aft of the flag plaque are the command pilot and second pilot throttle levers (not pictured).

Main Pedestal Panel



The main Pedestal console consists of the primary Multi-Function Display (MFD) and additional controls.

MET: A numeric display tracking Mission Elapsed Time in hours:minutes:seconds, up to 999 hours, 59 minutes, and 59 seconds.

MFD: The Primary Multi-Function Display, detailed below.

Action Groups: Buttons to toggle action groups 1-10.

Clear Node/Tgt: Buttons to clear all maneuver nodes, and to clear the current target.

Throttle Setting: An indicator to show the current throttle setting (CMD) and engine thrust output (ENG).

Indicator Panel: A cluster of indicator lamps to provide status:

- Row 1, Fuel: Left indicator lights amber at 37.5% fuel remaining. Right indicator flashes red at 10.0% fuel remaining.
- Row 2, Mono: Same as the fuel lamps, but for tracking monopropellant.
- Row 3, Btty: Same as the fuel lamps, but for tracking electrical reserves.
- Row 4, Atmo: Lights blue when atmospheric pressure is above 0.0001. Gear: Flashes amber when the craft is descending and its altitude is below 100m and landing gear are not deployed.
- Row 5, Altitude: Flashes amber when the craft is descending and below 150m altitude. Contact: Lights green when the craft has landed.
- Row 6, High G: Flashes red when G forces are above 3.0. Link: Randomly flashes blue.

Flight Parameters: Numeric displays providing some flight parameters. From top to bottom:

- Time to Apsis: Provides a countdown to the next apsis (periapsis or apoapsis) in the current orbit. The plaque next to it switches to indicate which apsis is next.
- AP: Indicates the altitude of the apoapsis. The plaque lights yellow to indicate an encounter exists (entering / exiting a SoI).
- PE: Indicates the altitude of the periapsis. The plaque lights yellow to indicate a suborbital trajectory.
- TARGET: Indicates distance from the current target. The plaque lights blue when a target exists.
- NODE: Indicates time to the next maneuver node. The plaque lights blue when there is a valid node.

Primary Multi-Function Display Modes

The Multi-Function Display has multiple modes for displaying information during various phases of flight. These modes are accessed by pressing the labeled buttons 1-8 and “Help/Stby” located on the bottom of the display. The buttons on the lower right side of the display are “soft buttons” that are enabled only in certain modes. The button beween the “8” button and the “Help/Stby” button is the “Home” button.

1 – Flight Status

When the MFD is in Flight Mode, it displays information relevant to launch, landing, and orbital operations.

2 – Primary Flight Display

When the MFD is in Primary Flight Display Mode it displays an enhanced navball, along with some flight information.

3 – Orbit Display

When the MFD is in Orbit Display Mode, the MFD displays a schematic representation of the vessel's orbit, along with the orbited body and its atmosphere, when applicable. Additional orbital information is drawn when appropriate.

4 – Docking Camera

The Docking Camera Mode displays a view through DockCam1 (typically the Gemini Docking Port nose). The docking camera supports a high zoom. Zoom can be controlled pressing the "+" and "-" soft buttons. A target tracking icon can be toggled by pressing the "Home" button. When a target is being tracked, this page displays the current distance, the projected closest approach distance and time, the relative speed, and axis-specific distances and velocities. In addition, cross hairs near the middle indicate whether the target is in front of the vessel (when green) or behind the vessel (when red).

5 – External Camera 1/2

This mode switches between up to two external cameras, ExtCam1 and ExtCam2. These cameras support full pan (left/right and up/down) in addition to zoom. The camera can be returned to its "home" position by pressing the "Home" button.

6 – SCANsat Map

When SCANsat is installed, this page will display a map of the currently-orbited body. This map can be zoomed by pressing the "+" and "-" keys. The map display mode can be changed by pressing the "Home" button.

7 – Navigation Target Select

Button 7 display the Navigation menu. This menu allows the crew to select a target, as well as to undock.

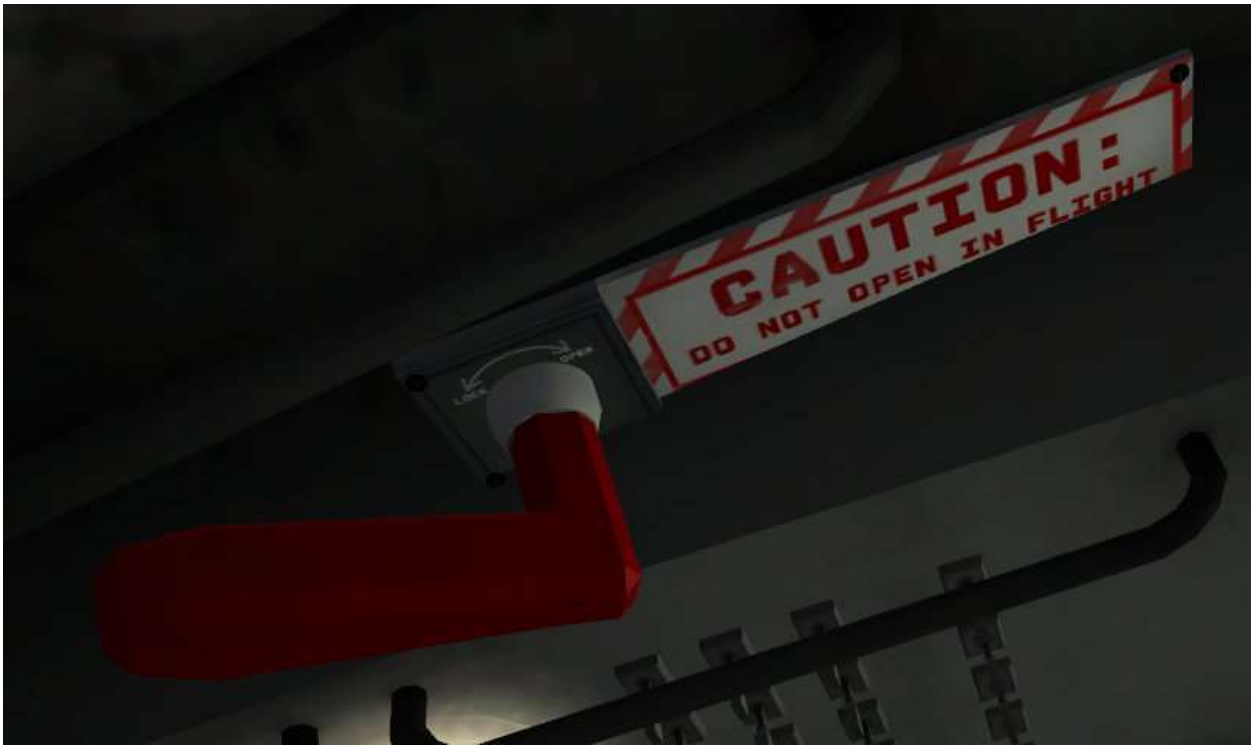
8 – Autopilot

When the MechJeb mod is installed, the Autopilot provides a menu for controlling the MechJeb SmartASS feature, along with a few other functions. Many of these functions are available on the Command Pilot Left Console and the Main Pedestal Panel for ease of access.

Home/Stby

This button switches between Standby Mode (with the display dimmed) and Help, which lists which pages are accessed by which keys.

Hatch Handle



Located on the Command Pilot's hatch is the Crew Egress Handle. Double-clicking this handle sends the current Kerbal into EVA.

REVISION HISTORY

17 January 2014: Manual Version 1.0, MOARdV Flight Systems f/w Version 1.0 20140117. Initial version.

19 January 2014: Manual Version 1.01, MOARdV Flight Systems f/w Version 1.0 20140119. Updated some MFD mode descriptions.

21 January 2014: Second pass over documentation, add note about Probe Camera functionality.

5 April 2014: Manual Version 2.00, MOARdV Flight Systems f/w Version 2.00 2014xxxx. Added missing config for Gemini Rescue configuration. Fixed probe camera orientation. Replaced square button prop with round button for indicator lamps. Added lots of buttons. Updated MFD pages. Moved things around.

29 June 2014: Second pass over documentation, RPM 0.17 compatible release.