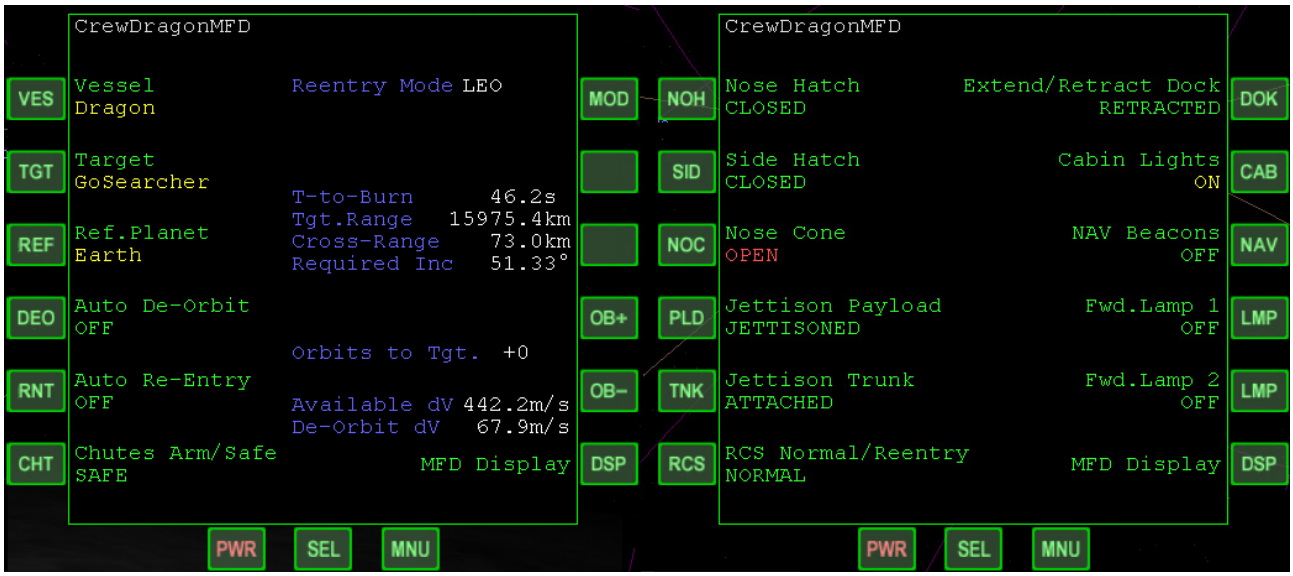
CrewDragonMFD
v.230210

A vessel-specific MFD for "Crew Dragon 2022" add-on.

What does it do?
The MFD has two primary functions: a De-Orbit burn autopilot and a Re-Entry autopilot. It also has a secondary display for spacecraft operations such as hatch opening/closing, jettison trunk, lighting, etc.

It should only be used with the Dragon spacecraft mentioned above (otherwise it may cause unexpected behaviour of your vessel, although code should only allow interaction with "dm2_capsule" class vessels).



Buttons

Autopilots Display
[VES] Select vessel controlled by MFD by name.
Default is focus vessel at scenario start.

[TGT] Select splashdown target by name, or enter NULL for none.
Target can be vessel(landed) or surface base.

[REF] Select reference planet.
Default is major gravitational body at scenario start.

[DEO] Start/Stop the De-Orbit autopilot (LEO mode only)
It will point the spacecraft prograde and make a burn using the forward pointing Main Engine thrusters, targeting the reentry interface at 120km alt., aprox.4000km range to target. Burn commences at 0s on the "Time to Burn" display.
It is possible to start the burn late by turning on the autopilot while "Time to Burn" is negative (no "Sanity Check"!). Time acceleration limited to 10x while active.
NOTE: No orbital plane-change corrections to cross-range error are made.
You should do that manually at a suitable point in the orbit (1/4 orbit away from target).

[RNT] Start/Stop the Re-Entry autopilot.
It will put the spacecraft in re-entry attitude and control bank and roll-reversals to intercept splashdown target. Bank is increased or decreased according to current deceleration vs. calculated required deceleration.
It can usually manage to get within 10km of target.
Maximum cross-range error compensation during reentry ~100km.
Cut off at 15km alt. Time acceleration limited to 10x while active.

[CHT] Arm or Safe Parachutes
Arm parachutes, ready for automatic drogue deployment at 13.7km alt.

[MOD] Switch between reentry modes LEO / GEO / HYPER

LEO	Apogee 200km – 600km	(reentry velocity 7.7km/s)
GEO	Apogee 600km – 40,000km	(reentry velocity 7.8km/s – 10km/s)
HYPER	Apogee 40,000km – Hyperbolic	(reentry velocity 10km/s – 13.5km/s)

GEO / HYPER Auto De-Orbit function not available – use IMFD Base Approach.
IMFD Base Approach reentry parameters are displayed (Alt, ReA, Ant).

[OB+] Add (or remove) extra revolutions before de-orbit burn and re-entry.
[OB-] Display shows updated burn time, range, cross-range error, etc.
Negative values not allowed. Decremented by 1 at each target pass.

[DSP] Switch between the two MFD displays.

<u>Spacecraft Ops. Display</u>
[NOH] Open/Close Nose Hatch

[SID] Open/Close Side Hatch

[NOC] Open/Close Nose Cone (forward pointing Main Engine enabled when Open).

[PLD] Jettison Next Payload

[TNK] Jettison Trunk

[RCS] Switch RCS mode Normal/Reentry (Bank and Yaw RCS are linked together so that the Dragon will rotate about the airspeed vector when a Bank RCS is applied).
Disabled if Auto Reentry is active.

[DOK] Extend/Retract Docking Interface

[CAB] Cabin lighting On/Off (not available in "Glass Cockpit" mode? – bug!)

[NAV] External Navigation Beacons On/Off

[LMP] Forward External Lamp 1 On/Off

[LMP] Forward External Lamp 2 On/Off

[DSP] Switch between the two MFD displays.

Data Display

"Reentry Mode"
Current reentry mode LEO, GEO or HYPER

"Alt." Reentry interface altitude for IMFD Base Approach (GEO/HYPER only)
"ReA."Reentry interface flightpath angle for IMFD Base Approach (GEO/HYPER only)
"Ant." Reentry interface anterior angle for IMFD Base Approach (GEO/HYPER only)

"T-to-Burn"
Number of seconds before De-Orbit burn commences. Activating De-Orbit autopilot while value is negative will start burn immediately (LEO mode only)

"Target Range"
Distance to splashdown target (including any additional orbits).

"Cross Range"
Distance of target from orbital plane. Positive value means target is OrbitNormal+ (North) of groundtrack, negative value is OrbitNormal- (South).

"Required Inc."
Required Equatorial Inclination to exactly intercept target from your current position.

"Orbits to Target"
Number of extra revolutions added to current trajectory.

"Available dV"
Vessel's remaining dV capability.

"De-orbit dV"
Required dV for De-Orbit burn. (LEO mode only)

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