



FLY J SIM DASH 8 Q400 MANUAL

For X-Plane Flight Simulator version 9.67+

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DASH 8 Q400



Created by: Fly J Sim

Distribution by: Armchair Aviation

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Manual version 1.15 for Q400 V1.13

This manual may be updated periodically, for the latest version please check
http://armchairaviation.com/Store/manualStorage/FJS-Dash_8_Q400_Manual.pdf

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DASH 8 Q400



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DASH 8 Q400



INSTALLATION:

Reference the installation.txt file in the file you have downloaded as well.

Upon download of this aircraft you will receive the aircraft folder in .zip format. To install the aircraft simply unzip the "Dash 8 Q400" folder and place it in the aircraft folder in your x-plane installation. The file path should be:

X-Plane9/Aircraft/

Note, do not place the Gizmo folder inside your Aircraft folder.

You may place the aircraft file in any sub folder in the aircraft folder that you may wish to use.

This aircraft requires the use of the plugin Gizmo in order to function properly. If you do not have Gizmo yet, you can download and install it following the instructions here (The plugin and support files are also included in the download, simply follow the instructions on the website below):

<http://www.x-plugins.com/gizmo/installing>

You will know that Gizmo has been installed correctly if you are able to close out of the Load & Balance manager. If you cannot do this Gizmo is not installed correctly. Double check your installation and look over our [support forums to help](#).

NOTE: If you follow the instructions to install gizmo and it is not working, please try removing all existing plugins from your plugins folder and re launching the sim. Sometimes Gizmo conflicts with other plugins. Gizmo support forums are located here:

<http://forums.x-pilot.com/index.php?board=108.0>

ATTENTION!: There is a chance you already have Gizmo installed. If you previously purchased an aircraft from X-Aviation, Gizmo may already be installed. You can however, reinstall it without breaking anything. Just make sure you don't have two installed as this will break everything.

For additional assistance, please visit our support forums at:

<http://forums.armchairaviation.com>

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VERSION 1.1 CHANGE LOG

- Updated Vmo Cue and Vstall Cue graphics.
- Changed aileron deflection time limit to zero. Did this because they are not hydraulically controlled.
- Reversed the action on the pitch_mode autopilot wheel. Down is up and up is down now.
- Updated colors of the Artificial Horizon.
- Updated the VSI tape graphic.
- Changed the way the TUNE knob works. Now works with 4 commands, which work similar to how the 3d panel TUNE knobs would work. No more Scrolling up or down.
- Added ADF1 and ADF2 to the ARCDU.
- Added MFD1 & 2 SelectorKnob Functionality for NAV, SYS, DOORS, and ENG.
- Adjusted Fuel Tank center position.
- Adjusted Fuel transfer switch logic
- Added logic for fuel imbalance annunciation. When fuel in each tank differs by 600lbs, all fuel annuns turn yellow.
- Fixed hash marks on altitude tap.
- Updated el_horizon-3.png
- Fixed issues with “Hot and High” takeoffs.
- Added logic for engine failures.
- Added de-rated takeoff power options. Buttons for this are on the Engine Control Panel.
- Added Max Takeoff Power (MTOP) button to allow for max takeoff power, which gives you 106% TRQ.
- Added the option to change the change the Baro setting between IN and HPA, you can do this by clicking next to the Baro setting on the PFD.
- Changed the RadAlt Indicator. The box only shows up when at or under 2500ft Rad Alt like it should.
- Fixed the Alt Select Bug and indicator, they now change to yellow when closing in onto your preselected altitude as they should. Along with this you now will see Alt*.
- Added in code to stop the screens from displays dark when switching to the Q400 from another add-on. This normally left you in the dark wondering where the light switches were, but not anymore.
- Engine intake switches will only turn the inlet heater on now if there is hydraulic pressure, on top of normal 15°C rule.
- Added RMI to the PFD as well as associated DME. You can switch between VOR ADF and FMS on two needles using the panel under the FMC.
- Added Weight and Balance Manager as a popup with many settings.
- Added door animation which can be toggled from the DOORS MFD screen.
- APU now uses fuel when turned on, drawing from the left tank.
- Adjusted the roll effect from P-factor and Torque by adding roll stability.
- Separated the High and low rez into two different folders. This allows you to save about ¾ the file size.

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AIRPLANE GENERAL INFORMATION.

The Dash 8 Q400 is a high wing airplane manufactured by Bombardier Aerospace in Toronto, Canada at the Downsview Airport. It is powered by two 5071 shaft horsepower PW150A turboprop engines. Each engine drives a six bladed propeller. It is approved for operations to a maximum altitude of 25,000 feet.

On most airlines the Dash is allocated with 70 to 78 seats, and a crew of 4, two pilots and two flight attendants.

The Dash line of aircraft has been in production since 1983, starting with the Dash 100 series. The 400 series entered service in 2000 and was a significant improvement over the previous version not only in the number of seats it carried but also in speed and noise suppression technology (ANVS). The Q400 is one of the fastest turboprop aircraft in service, only out matched by few and not by much.

As of January 2011 344 dash 8 Q400s have been delivered and more are still being made, making it more successful than any other Dash series aircraft.

Some of the major airlines that currently operate the Q400 are:

Flybe

Horizon Air

Porter

Qantas Link

MTOW – 64,500 lbs.

Max Fuel Capacity – 11724 lbs.

Max Operating Altitude – 25,000 feet

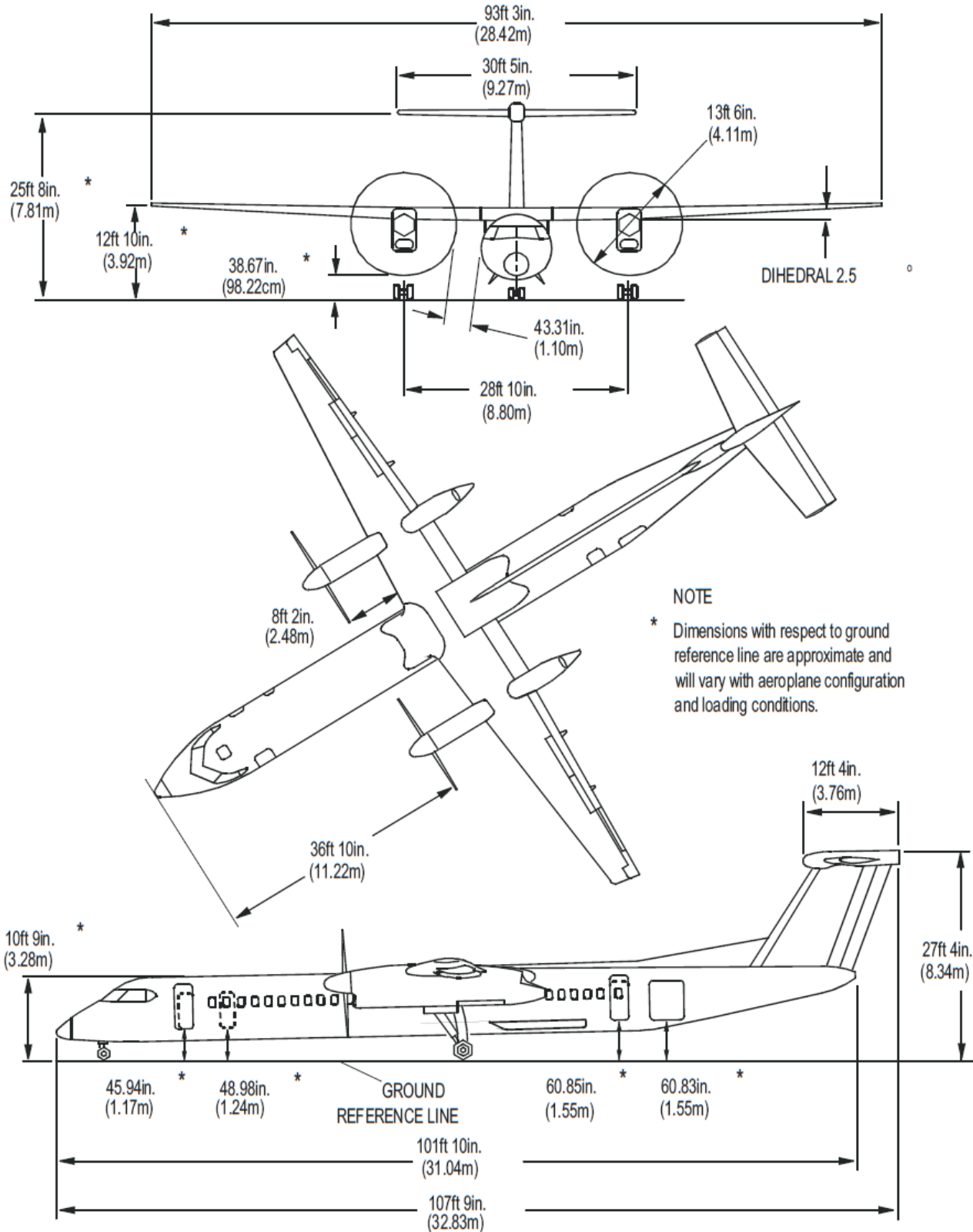
Range – 1500 nm

Cruise speed – 360 TAS

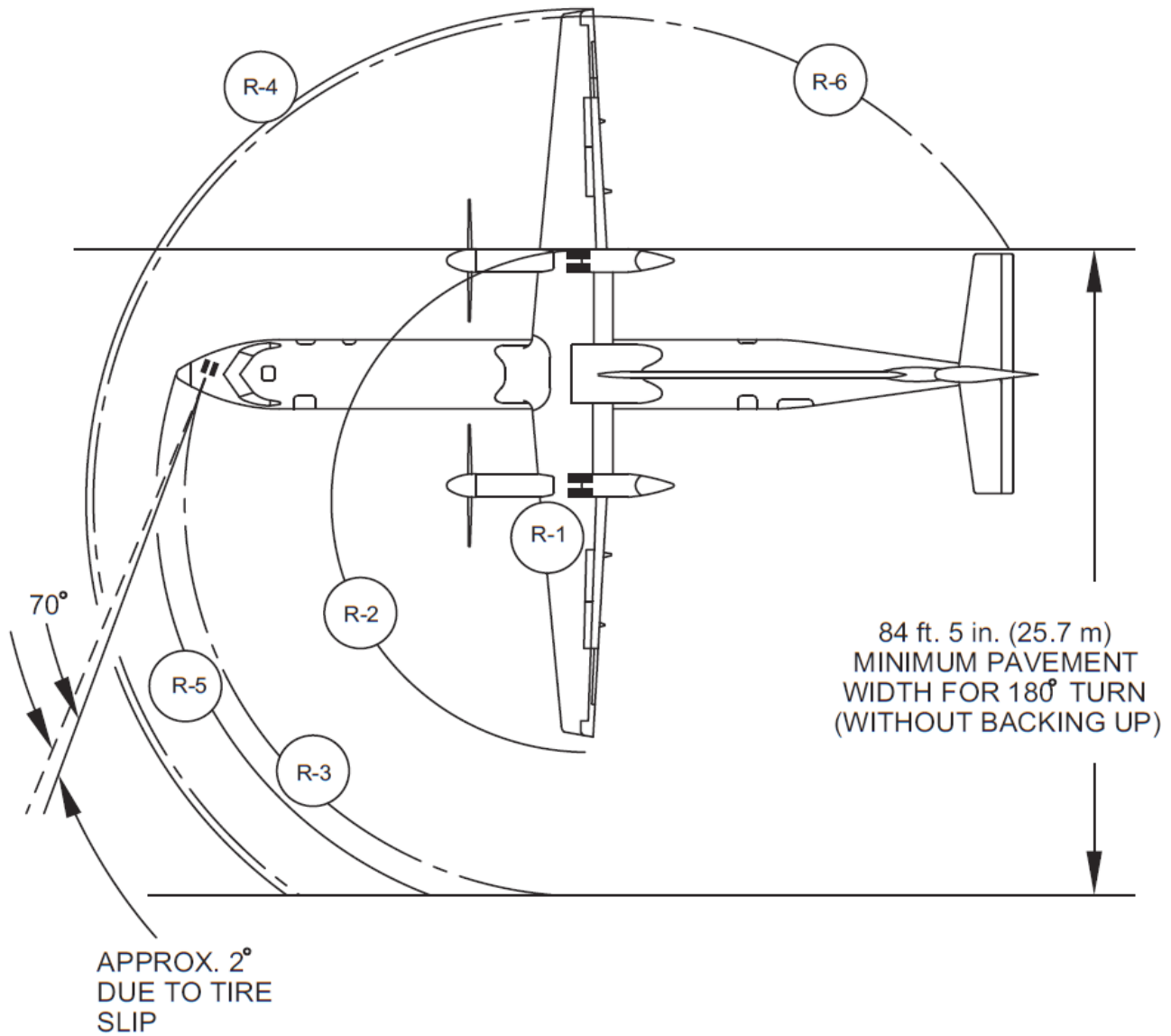
PAX- 70 to 78 seats.

Real world cost- ~27 million dollars (US)

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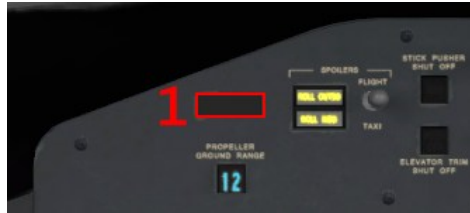


ITEM	RADIUS
R-1 INNER GEAR	4 ft. 9 in. (1.52 m)
R-2 OUTER GEAR	33 ft. 10 in. (10.32 m)
R-3 NOSE GEAR	50 ft. 7 in. (15.41 m)
R-4 WING TIP	64 ft. 9 in. (19.74 m)
R-5 NOSE	54 ft. 10 in. (16.73 m)
R-6 ELEVATOR TIP	62 ft. 9 in. (19.13 m)

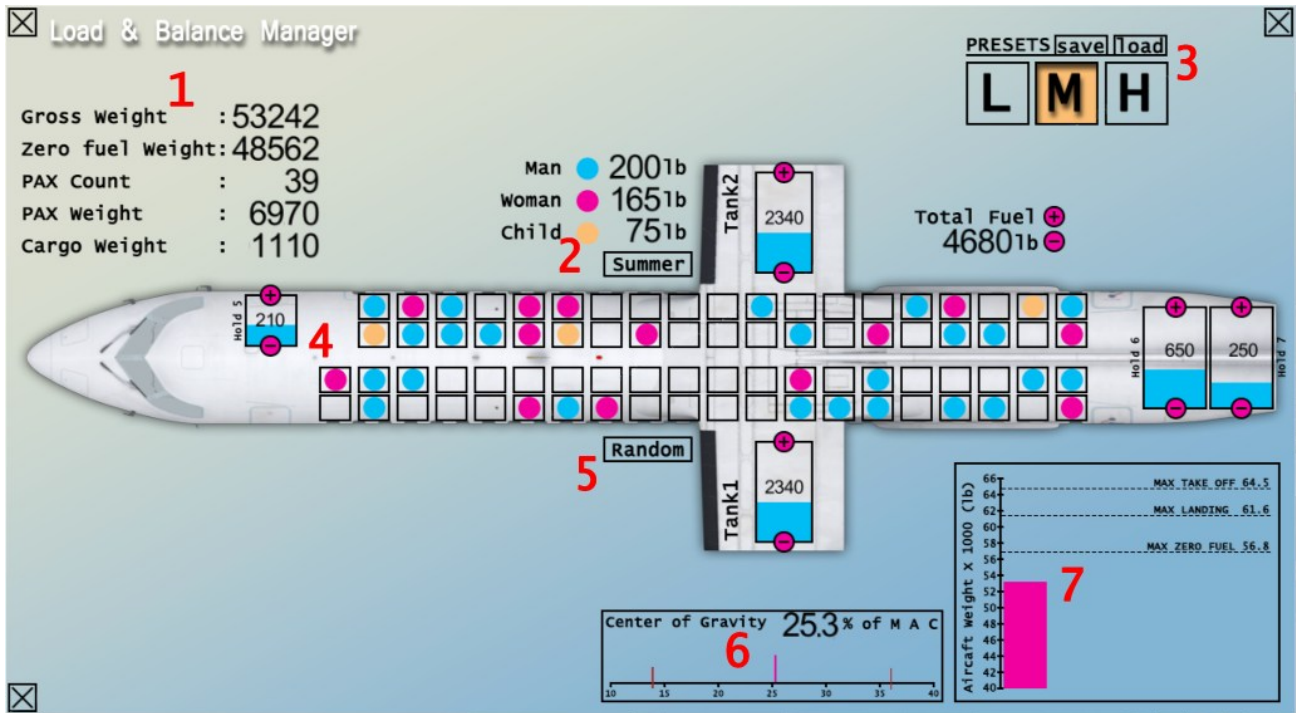
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Load & Balance Screen

The Load & Balance Manager screen is open by default when you load the Q400 up. It can be dismissed by the Xes in the corners and opened again by pressing the blank grey area above the Ground Rang indicator on the Glareshield.



1: Toggles the Load and Balance Manager screen



1. This area shows the weights in pounds of the items on the left. It also shows the number of PAX(passengers) are in the current load.
2. This area shows the weights for Man, woman and Child. These are the standard weights and are used to calculate the load in the seats. You can change these from summer and winter by selecting the toggle box.
3. This area allows you to see which preset you are working with. You can load, and save the preset you have. Selecting from L(light), M(medium), and H(heavy) loads presets, then pressing load, will load that saved preset for that category. You can then change the settings below and hit Save to save it to that category.

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4. This area is where you input directly the weights for many items that will be loaded onto the Q400. You have 78 seats, which each seat can be toggled between empty, man, woman and child. There are 3 cargo holds which you can use the Plus and Minus buttons to increase or decrease the amount in them. You also have two fuel tanks to set weights on, and alternatively you can set weights in both of them next to the total fuel area.
5. Pressing this Random button will randomly set up the seat configuration.
6. This is the Center of Gravity indicator. It is shown as a percentage of the M.A.C, which stands for mean aerodynamic chord. This will dynamically change based on the seating arrangement, cargo hold loads and fuel weights you have selected. The numerical indicator will turn red if it goes out of range. You should never attempt to take off if you are out of the CG range.
7. This area is your visual Gross weight indicator. This will dynamically change as you load the aircraft.



DASH 8 Q400



CUSTOM COMMANDS

We have been asked a few times to implement a few custom commands for various items out of the 3d cockpit. I have added a few for this update. If there is any command not yet available that you would like added, please let us know.

For any of those not familiar with Commands, they are basically values you can setup to a keyboard shortcut or joystick button that allows you to do things you couldn't already be able to do with the normal X-Plane set of commands.

These Commands are found under FJS/Com/xxxxx

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1. SPEED LIMITATIONS

TYPE OF SPEED LIMITATIONS	LIMITING SPEED
V_{MCG} <ul style="list-style-type: none"> - FLAPS 15° - FLAPS 10° - FLAPS 5° - FLAPS 0° 	89 KCAS 89 KCAS 89 KCAS 101 KCAS
V_{MCA} <ul style="list-style-type: none"> - FLAPS 15° - FLAPS 10° - FLAPS 5° - FLAPS 0° 	91 KCAS 95 KCAS 98 KCAS 113 KCAS
V_{MCL} <ul style="list-style-type: none"> - FLAPS 35° - FLAPS 15° - FLAPS 10° - FLAPS 5° 	92 KCAS 96 KCAS 99 KCAS 100 KCAS
V_{MO} <ul style="list-style-type: none"> - 0 – 8000 ft - at 10000 ft - at 18000 ft - at 20000 ft - at 25000 ft - at 27000 ft 	245 KIAS 282 KIAS 286 KIAS 275 KIAS 248 KIAS 238 KIAS
V_{FE} <ul style="list-style-type: none"> - FLAPS 5° - FLAPS 10° - FLAPS 15° - FLAPS 35° 	200 KIAS 181 KIAS 172 KIAS 158 KIAS
V_{LO}	200 KIAS
V_{LE}	215 KIAS
V_{RA}	210 KIAS
$V_{MAX\ TIRE}$	182 KIAS
V_A	204 KIAS

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PRE-PLANNING TABLE (TRIPFUEL/TRIPTIME)

Blue is the default load in X-Plane and what you would expect if you change nothing.

DIST SAD- NM	ISA - 20°C			ISA			ISA +20°C		
	FL	Triptime (hr:min)	Tripfuel (lbs.)	FL	Triptime (hr:min)	Tripfuel (lbs.)	FL	Triptime (hr:min)	Tripfuel (lbs.)
50	60	:18	700	60	:18	702	60	:17	702
75	120	:23	966	120	:23	972	100	:22	961
100	170	:28	1192	150	:27	1195	130	:27	1166
125	180	:33	1406	170	:32	1401	150	:32	1357
150	190	:38	1617	180	:37	1606	160	:37	1549
175	190	:43	1806	190	:42	1800	170	:42	1742
200	210	:47	1995	200	:46	1991	180	:47	1936
225	220	:52	2167	210	:51	2167	190	:52	2116
250	230	:57	2339	220	:56	2341	200	:57	2295
275	240	1:02	2495	230	1:01	2486	210	1:02	2462
300	250	1:07	2651	250	1:06	2631	220	1:07	2627
325	^	1:12	2829	^	1:11	2801	230	1:12	2785
350	^	1:16	3005	^	1:15	2970	230	1:17	2941
375	^	1:20	3183	^	1:20	3139	230	1:22	3097
400	^	1:24	3359	^	1:24	3307	240	1:27	3254
425	^	1:28	3537	^	1:29	3476	240	1:32	3408
450	^	1:32	3716	^	1:33	3645	240	1:37	3562
475	^	1:37	3894	^	1:38	3815	240	1:42	3716
500		1:41	4072		1:42	3982	250	1:48	3868
525		1:46	4250		1:47	4151	^	1:52	4026
550		1:50	4429		1:51	4321	^	1:57	4182
575		1:54	4607		1:56	4490	^	2:02	4341
600		1:59	4785		2:00	4660	^	2:07	4497
625		2:04	4963		2:04	4829		2:12	4653
650		2:08	5141		2:08	4998		2:17	4809
675		2:12	5320		2:13	5168		2:22	4965
700		2:16	5496		2:17	5335		2:27	5122
725		2:21	5669		2:22	5502		2:32	5276
750		2:25	5843		2:26	5669		2:36	5427
775		2:30	6017		2:30	5837		2:41	5581
800		2:34	6191		2:35	6002		2:46	5733
825		2:39	6365		2:40	6169		2:51	5887
850		2:43	6538		2:44	6336		2:56	6039
875		2:48	6712		2:48	6503		3:00	6191
900		2:51	6884		2:52	6668		3:05	6343
925		2:55	7058		2:56	6835		3:10	6494

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950		2:59	7231		3:00	7000		3:15	6646
975		3:04	7405		3:05	7168		3:20	6798
1000		3:08	7577		3:09	7333		3:24	6950
1025		3:12	7748		3:14	7500		3:29	7102
1050		3:15	7920		3:18	7665		3:33	7251
1075		3:20	8094		3:23	7830		3:38	7403
1100		3:25	8265		3:27	7995		3:42	7553
1125		3:30	8437		3:31	8162		3:47	7704
1150		3:34	8609		3:36	8327		3:52	7854
1175		3:39	8780		3:40	8492		3:57	8006
1200		3:43	8951		3:44	8657		4:01	8155
1225		3:47	9123		3:49	8824		4:06	8305
1250		3:51	9293		3:53	8989		4:10	8455
1275		3:56	9464		3:57	9154		4:15	8604
1300		4:00	9634		4:01	9312		4:20	8754
1325		4:05	9803		4:06	9484		4:24	8903
1350		4:09	9975		4:09	9649		4:29	9053
1375		4:14	10144		4:13	9814		4:34	9203
1400		4:18	10314		4:18	9979		4:38	9352

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REF SPEEDS

- V1 = Single engine safety speed
- VR = Rotate speed. Where aircraft is rotated to 10° pitch to take-off
- V2 = Two engine safety speed
- VFRI = Flap safety speed (Must be above flap safety speed to retract the flaps)
- VCLIMB = Speed at which aircraft will achieve maximum climb gradient once the flaps are retracted
- VREF = Apart from short-term fluctuations, the speed on the final approach must not be below VREF. It is defined as 1.23 times the stalling speed in one 'g' flight (VS-1g). In real terms it provides a margin of 20-30kts above the stall speed. Be aware the Dash's airspeed can be unstable in windy conditions, and +/- 20 KTs can be seen on the speed tape. In commercial terms we therefore apply a few knots for the wife and kids! Known as VAPP, most pilots will fly between 5-10 Knots above VREF depending on the conditions. This speed is never bugged though. You are therefore looking for crossing the threshold at VREF. Once you flare for landing the touch-down speed will reduce to 5 knots below VREF.
- VFRI = Used in case of a go-around. Flap safety speed (Must be above flap safety speed to retract the flaps) Note there is no VFRI for flap 35 on a go-around.

The following is a set of speeds based on weight to be referred to.

[Blue is the default load in X-Plane and what you would expect if you change nothing.](#)

Take-Off Weight = 39600 lbs.

	15°	10°	5°	0°
V1/VR	100	104	108	
V2	105	110	115	
VFRI	107	110	116	
VCLIMB				130

Take-Off Weight = 41800 lbs.

	15°	10°	5°	0°
V1/VR	100	104	108	
V2	105	110	114	
VFRI	107	110	118	
VCLIMB				130

Landing Weight = 39600 lbs.

	35°	15°	10°	5°	0°
VREF	101	105	108	114	124
VFRI		107	110	116	

Landing Weight = 41800 lbs.

	35°	15°	10°	5°	0°
VREF	101	105	109	117	128
VFRI		107	110	118	

Take-Off Weight = 40700 lbs.

	15°	10°	5°	0°
V1/VR	100	104	108	
V2	105	110	115	
VFRI	107	110	117	
VCLIMB				130

Take-Off Weight = 42900 lbs.

	15°	10°	5°	0°
V1/VR	100	104	108	
V2	104	110	114	
VFRI	108	110	119	
VCLIMB				130

Landing Weight = 40700 lbs.

	35°	15°	10°	5°	0°
VREF	101	105	108	115	127
VFRI		107	110	117	

Landing Weight = 42900 lbs.

	35°	15°	10°	5°	0°
VREF	101	105	110	118	129
VFRI		108	110	119	

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Take-Off Weight = 44000 lbs.

	15°	10°	5°	0°
V ₁ /V _R	100	104	108	
V ₂	104	109	114	
V _{FRI}	109	112	120	
V _{CLIMB}				131

Landing Weight = 44000 lbs.

	35°	15°	10°	5°	0°
V _{REF}	102	107	112	120	131
V _{FRI}		109	112	120	

Take-Off Weight = 45100 lbs.

	15°	10°	5°	0°
V ₁ /V _R	100	104	108	
V ₂	104	109	113	
V _{FRI}	110	114	122	
V _{CLIMB}				133

Landing Weight = 45100 lbs.

	35°	15°	10°	5°	0°
V _{REF}	103	108	113	122	133
V _{FRI}		110	114	122	

Take-Off Weight = 46200 lbs.

	15°	10°	5°	0°
V ₁ /V _R	100	104	109	
V ₂	103	109	114	
V _{FRI}	112	115	123	
V _{CLIMB}				134

Landing Weight = 46200 lbs.

	35°	15°	10°	5°	0°
V _{REF}	104	109	115	124	134
V _{FRI}		112	115	123	

Take-Off Weight = 47300 lbs.

	15°	10°	5°	0°
V ₁ /V _R	100	104	111	
V ₂	103	108	116	
V _{FRI}	113	117	125	
V _{CLIMB}				135

Landing Weight = 47300 lbs.

	35°	15°	10°	5°	0°
V _{REF}	106	110	116	125	135
V _{FRI}		113	117	125	

Take-Off Weight = 48400 lbs.

	15°	10°	5°	0°
V ₁ /V _R	101	104	113	
V ₂	104	109	117	
V _{FRI}	115	118	126	
V _{CLIMB}				137

Landing Weight = 48400 lbs.

	35°	15°	10°	5°	0°
V _{REF}	107	112	117	126	137
V _{FRI}		115	118	126	

Take-Off Weight = 49500 lbs.

	15°	10°	5°	0°
V ₁ /V _R	102	106	114	
V ₂	105	110	118	
V _{FRI}	116	119	127	
V _{CLIMB}				139

Landing Weight = 49500 lbs.

	35°	15°	10°	5°	0°
V _{REF}	108	113	118	127	139
V _{FRI}		116	119	127	

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Take-Off Weight = 50600 lbs.

	15°	10°	5°	0°
V ₁ /V _R	104	107	116	
V ₂	107	111	120	
V _{FRI}	117	121	129	
V _{CLIMB}				140

Landing Weight = 50600 lbs.

	35°	15°	10°	5°	0°
V _{REF}	109	114	120	129	140
V _{FRI}		117	121	129	

Take-Off Weight = 51700 lbs.

	15°	10°	5°	0°
V ₁ /V _R	105	109	117	
V ₂	108	112	121	
V _{FRI}	119	122	130	
V _{CLIMB}				141

Landing Weight = 51700 lbs.

	35°	15°	10°	5°	0°
V _{REF}	110	115	121	130	142
V _{FRI}		119	122	130	

Take-Off Weight = 52800 lbs.

	15°	10°	5°	0°
V ₁ /V _R	107	110	119	
V ₂	109	113	122	
V _{FRI}	120	123	132	
V _{CLIMB}				143

Landing Weight = 52800 lbs.

	35°	15°	10°	5°	0°
V _{REF}	112	117	122	132	143
V _{FRI}		120	123	132	

Take-Off Weight = 53900 lbs.

	15°	10°	5°	0°
V ₁ /V _R	108	112	120	
V ₂	110	114	124	
V _{FRI}	121	125	133	
V _{CLIMB}				144

Landing Weight = 53900 lbs.

	35°	15°	10°	5°	0°
V _{REF}	113	118	124	133	145
V _{FRI}		121	125	133	

Take-Off Weight = 55000 lbs.

	15°	10°	5°	0°
V ₁ /V _R	109	113	122	
V ₂	111	116	125	
V _{FRI}	123	126	134	
V _{CLIMB}				146

Landing Weight = 55000 lbs.

	35°	15°	10°	5°	0°
V _{REF}	114	119	125	134	146
V _{FRI}		123	126	134	

Take-Off Weight = 56100 lbs.

	15°	10°	5°	0°
V ₁ /V _R	111	114	123	
V ₂	112	117	126	
V _{FRI}	124	127	136	
V _{CLIMB}				147

Landing Weight = 56100 lbs.

	35°	15°	10°	5°	0°
V _{REF}	115	120	126	136	147
V _{FRI}		124	127	136	

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Take-Off Weight = 57200 lbs.

	15°	10°	5°	0°
V ₁ /V _R	112	116	125	
V ₂	113	118	127	
V _{FRI}	125	128	137	
V _{CLIMB}				148

Landing Weight = 57200 lbs.

	35°	15°	10°	5°	0°
V _{REF}	116	121	127	137	149
V _{FRI}		125	128	137	

Take-Off Weight = 58300 lbs.

	15°	10°	5°	0°
V ₁ /V _R	113	117	126	
V ₂	115	119	129	
V _{FRI}	125	130	138	
V _{CLIMB}				150

Landing Weight = 58300 lbs.

	35°	15°	10°	5°	0°
V _{REF}	117	123	129	138	150
V _{FRI}		125	130	138	

Take-Off Weight = 59400 lbs.

	15°	10°	5°	0°
V ₁ /V _R	114	119	128	
V ₂	116	120	130	
V _{FRI}	128	131	140	
V _{CLIMB}				151

Landing Weight = 59400 lbs.

	35°	15°	10°	5°	0°
V _{REF}	118	124	130	139	152
V _{FRI}		128	131	140	

Take-Off Weight = 60500 lbs.

	15°	10°	5°	0°
V ₁ /V _R	116	120	129	
V ₂	117	121	131	
V _{FRI}	129	133	141	
V _{CLIMB}				153

Landing Weight = 60500 lbs.

	35°	15°	10°	5°	0°
V _{REF}	119	125	131	141	153
V _{FRI}		129	133	141	

Take-Off Weight = 61600 lbs.

	15°	10°	5°	0°
V ₁ /V _R	117	121	131	
V ₂	118	122	132	
V _{FRI}	130	134	142	
V _{CLIMB}				154

Landing Weight = 61600 lbs.

	35°	15°	10°	5°	0°
V _{REF}	120	126	132	142	155
V _{FRI}		130	134	142	

Take-Off Weight = 62700 lbs.

	15°	10°	5°	0°
V ₁ /V _R	118	123	132	
V ₂	119	124	133	
V _{FRI}	131	135	143	
V _{CLIMB}				155

Landing Weight = 62700 lbs.

	35°	15°	10°	5°	0°
V _{REF}	122	128	134	143	155
V _{FRI}		131	135	143	

NOT TO BE USED FOR REAL WORLD OPERATIONS

Take-Off Weight = 63800 lbs.

	15°	10°	5°	0°
V ₁ /V _R	119	124	134	
V ₂	120	125	135	
V _{FRI}	132	136	145	
V _{CLIMB}				157

Take-Off Weight = 64500 lbs.

	15°	10°	5°	0°
V ₁ /V _R	120	125	134	
V ₂	120	125	135	
V _{FRI}	133	137	146	
V _{CLIMB}				158

Landing Weight = 63800 lbs.

	35°	15°	10°	5°	0°
V _{REF}	122	130	136	145	157
V _{FRI}		132	136	145	

Landing Weight = 64500 lbs.

	35°	15°	10°	5°	0°
V _{REF}	123	129	136	145	158
V _{FRI}		133	137	146	

NOT TO BE USED FOR REAL WORLD OPERATIONS

Descent Planning

Three different types of descents are suggested.

TYPE 1

- KIAS 238 UP TO FL 90
- KIAS 250 AT FL100
- KIAS 277 AT FL 110 –FL180
- KIAS 260 AT FL 200
- KIAS 250 AT FL 210
- KIAS 240 AT FL 240
- KIAS 233 AT FL 270

TYPE 2

- KIAS 200 - FOR ALL ALTITUDES

TYPE 3

- KIAS 160 FOR ALL ALTITUDES

TYPE 1 DESCENT

FL	TIME (MIN)	DIST (nm)
20	05	04
40	06	07
60	07	12
80	08	18
100	09	23
120	10	28
140	11	34
160	12	40
180	16	62
200	20	85
220	23	105
240	27	125
250	28	132
270	33	155

TYPE 2 DESCENT

FL	TIME (MIN)	DIST (nm)
20	05	05
40	07	10
60	08	15
80	09	20
100	11	25
120	12	30
140	13	35
160	15	40
180	16	45
200	20	65
220	23	80
240	27	96
250	28	104
270	32	122

TYPE 3 DESCENT

FL	TIME (MIN)	DIST (nm)
20	04	05
40	08	10
60	10	16
80	12	23
100	14	29
120	16	35
140	18	42
160	20	48
180	22	55
200	24	62
220	26	69
240	28	77
250	29	82
270	31	90

NOT TO BE USED FOR REAL WORLD OPERATIONS

DASH 8 Q400 NORMAL CHECKLIST

FIRST FLIGHT CHECKS

Battery Master/Main/Aux/Stby BatteryON
 Main Bus Tie.....TIE
 Engine Intake Bypass Doors OPEN HTR
 APUON
 • Pressurization/Packs SET/CHECK AUTO
 Recirc FanON
 Caution/Advisory Lights TEST
 Bleed Air 1 & 2 MIN/OFF
 PFD/MFD/ED/FMS ON/CHECKED
 • Circuit Breakers..... CHECK
 Position LightsON

BEFORE START

• Emergency LightsARM
 • Fuel QuantitySUFFICIENT
 • Brake/Pressure ON/CHECK
 • Power LeversDISC
 • Condition LeversFUEL OFF
 • Departure Briefing COMPLETE

ENGINE STARTING

• Take-off Speeds/Trims REVIEWED/SET
 • Seat Belts Sign ON
 • Anti-Collision LightRED
 • APU Bleed OFF

AFTER START

APUOFF
 • Bleeds MIN/ON

AFTER PUSHBACK + PUSH CREW CLEAR

• Condition Levers MAX

WHEN A/C GEN CAPTIONS OUT

• Flaps SET/INDICATING
 • Autofeather SELECT
 • Fuel PumpsON
 • Stby Hyd Pump/PTU Control.....ON
 • Rudder FULL TRAVEL
 • Flight/Taxi..... TAXI
 • PFD/MFD/ED..... CHECKED

• Ice Protection AS REQ'D
 Transponder/TCAS ALT/ON

TAXI

• Brakes CHECK
 • Altimeters.....QNH SET
 • T/O Power Rating NTOP
 Flying ControlsFULL/FREE

LINE UP

Anti-Collision WHITE
 Landing/Flare Lights ON
 • Pitot Static Switches..... ON
 • Flight/Taxi FLIGHT

CLEARED FOR TAKE-OFF

Caution/Warning Light Panel CHECK
 Taxi Light OFF

AFTER TAKE-OFF (1000' AGL)

• Landing GearUP
 • FlapsZERO
 • Bleeds ON/NORM
 • Climb Power900 RPM SET

WHEN CLEARED TO FLIGHT LEVEL

• Altimeters..... STANDARD SET
 • Ice Protection AS REQ'D
 Stby Hyd Pump/PTU Control..... OFF
 Fuel Pumps OFF
 Autofeather OFF

DESCENT

• Ice protection AS REQ'D
 • Arrival Brief/MSA/Speeds..... REVIEWED/SET

NOT TO BE USED FOR REAL WORLD OPERATIONS

DASH 8 Q400 NORMAL CHECKLIST

WHEN CLEARED TO AN ALTITUDE

- Altimeters QNH SET
- Ice protection AS REQ'D
- Fuel Pumps ON
- Stby Hyd Pump/PTU Control ON
- Hydraulics Qty/Pressure CHECK
- Seat Belts Signs ON
- Caution/Warning Lights Panel CHECK

LEAVING AIRCRAFT

- Emergency Lights OFF
- Recirc Fan OFF
- Ignition OFF
- APU OFF
- Ice Protection OFF
- Engine Intake Bypass Doors CLOSED
- Stby/Aux/Main Batteries OFF
- Battery Master OFF

LANDING

- Ice protection AS REQ'D
- Landing Gear DOWN/3 GREENS
- Flaps SET/INDICATING
- Bleeds MIN/ON

KEY

- Read and Do checks
- Challenge and Response Checks

AFTER LANDING (RUNWAY VACATED)

- Landing/Flare Lights OFF
- Anti-Collision Light RED
- Ice Protection OFF
- Pitot Static Switches OFF
- Flight/Taxi TAXI
- FUEL Pumps OFF
- Flaps ZERO
- Bleeds MIN/OFF

PARKING

- Taxi Light OFF
- Brakes ON
- Stby Hyd Pump & PTU Control OFF
- Power Levers DISC
- Condition Levers START/FEATHER
- Transponder STBY
- APU ON
- Condition Levers (After 30 sec) FUEL OFF
- Seat Belts Signs OFF



DASH 8 Q400



NORMAL OPERATING PROCEDURES

The following guide walks you through everything you need to know about how to fly the Q400 from start up to shut down. We will be following the Q400 NORMAL CHECKLISTS listed above and will be going into depth on where to find the items in the list and what they do.

NOT TO BE USED FOR REAL WORLD OPERATIONS

FIRST FLIGHT CHECKS

With the aircraft loaded into a cold and dark setup:

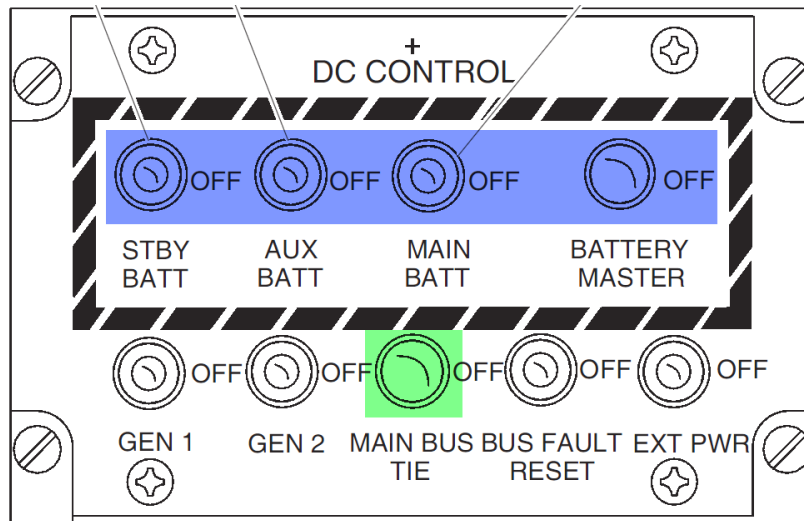
Our first item on the checklist is:

BATTERY MASTER/MAIN/AUX/STBY BATTERY.....ON

We find the battery switched on the overhead and that is where we start out first flight checks.

You will find the DC CONTROL panel on the top left hand side of the *overhead panel*.

The four switches in the top half of the DC panel make up our battery switches. They are indicated in the blue area in the image below. Click them down into the on position. All switches on the overhead panel follow the same principal of down equals on.



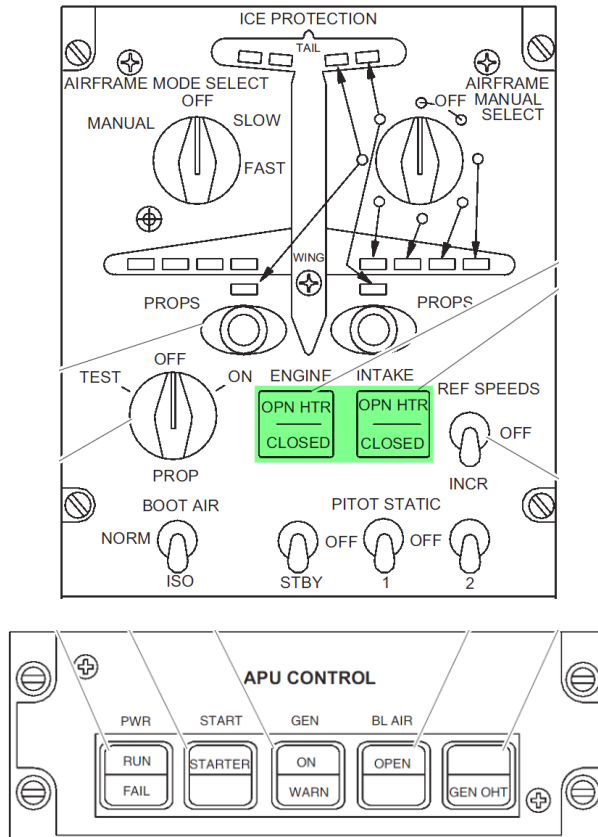
MAIN BUS TIETIE

This next step asks us to turn on the main bus tie, which is located right under the battery switches on the DC CONTROL panel. The switch is indicated by the green in the image above.

NOT TO BE USED FOR REAL WORLD OPERATIONS

ENGINE INTAKE BYPASS DOORS.....OPEN HTR

Moving down from the DC CONTROL panel onto the ICE PROTECTION panel, we need to turn on the Engine Intake switches. These switches are indicated by the green area in the image below. The switches currently read CLOSED and once pressed will read OPN. The switch opens the bypass door located underneath each engine as well as turns on the associated engine intake heater if the temperature is below 15°C at which point an amber HTR will display as well.



APU.....ON

Next, we need to turn on the APU. The APU CONTROL panel is located on the overhead, third column from the right, just above the starter panel.

There are 4 steps to turning on the APU.

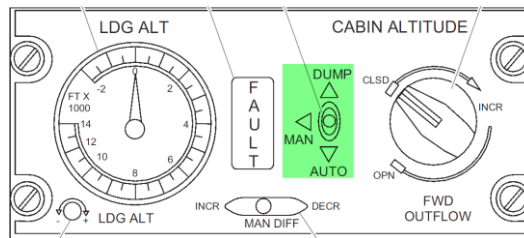
1. Press the left most switch, this is the power switch and it opens the fuel valves for the APU.
2. Press the second to the left switch, this is the Start switch and this will start then APU if the power switch is on.

NOT TO BE USED FOR REAL WORLD OPERATIONS

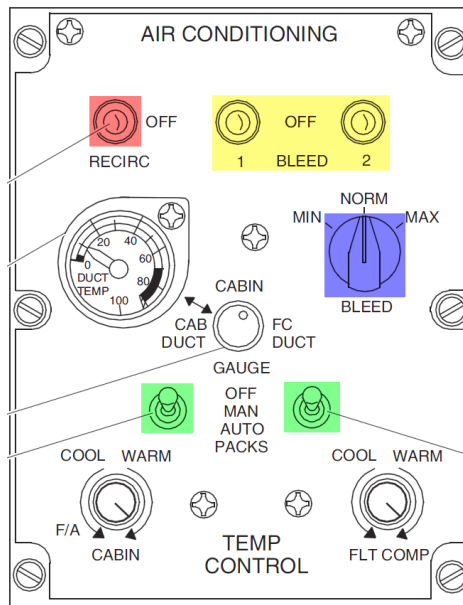
3. Turn on the generator, which is the third switch from the left. This will supply power to the electrical system.
4. You should also turn the APU bleed air on, this would be the 4th switch in. But since we will be turning it off anyway before engine start, you may keep it off.

PRESSURIZATION/PACKS..... SET/CHECK AUTO

We then check if the Pressurization is set correctly. We look at the Cabin Altitude panel located below the APU CONTROL panel. Check if the switch in the middle indicated by the green area in the image below is set to the down or auto position. It should be as this is the default position.



We then check if both PACKS are set to auto on the AIR CONDITIONING panel located to the right side of the overhead. They should be as again this is default. The packs are indicated as green in the image below.



RECIRC FAN.....ON

The recirc fan switch is located at the red area in the image above.

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CAUTION/ADVISORY LIGHTS.....TEST

The switch for this is located on the overhead near the bottom right. The switch will light up the Caution and Advisory light board that is located right under the overhead.

BLEED AIR 1 & 2..... MIN/OFF

This is a check to make sure the Bleeds are off and at minimum. The bleed switches are on the AIR CONDITIONING panel and indicated by the yellow area on the image above. They should be off as indicated by the switch being in the neutral or up position. The bleed rate control knob is located right above them and should be set to MIN. The bleed rate knob indicated by the blue area on the image above.

PFD/MFD/ED/FMS.....ON/CHECKED

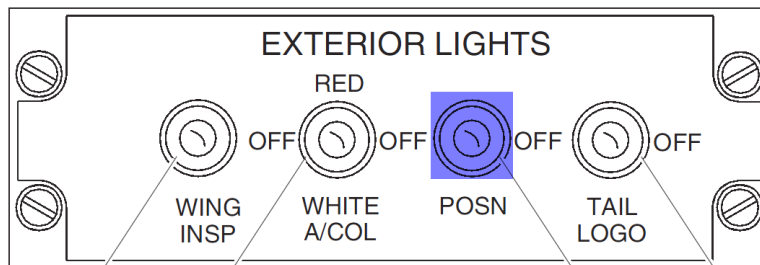
In this step we check if the EFIS displays are on. Are they, have a look. If they are not or are turned down, you may turn them up with their associated lighting knob on the forward and aft center console.

CIRCUIT BREAKERS CHECK

You can look at them, if you like, but they won't change on you. Not yet anyway.

POSITION LIGHTSON

The Position light switch is located on the EXTERIOR LIGHTS panel which is on the overhead, third column on the bottom. The switch is indicated by the blue area in the image below. This switch, otherwise known as the NAV light switch turns on the wing tip and tail lights.

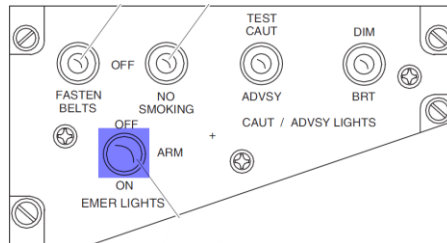


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BEFORE START

EMERGENCY LIGHTS.....ARM

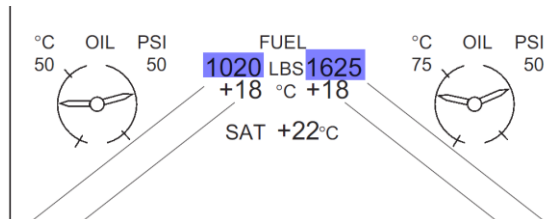
We now check if the emergency lights are armed and if not we arm them. This switch is located on the overhead on the right bottommost panel. It is indicated as the blue area on the image below. The switch has three positions, OFF, ARM and ON. Click the switch until it is in the ARM position



FUEL QUANTITYSUFFICIENT

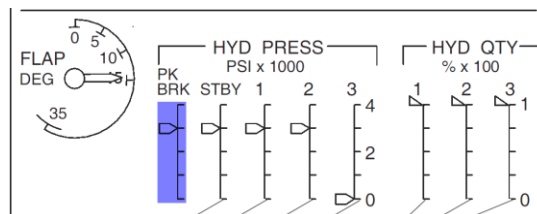
We now make sure the fuel quantity is sufficient to start the engines. It is also a good time to check if you have enough for the flight you wish to take. For most flights, the default fuel levels should be enough.

The fuel gauge is located on the central EFIS display, also known as the ENGINE DISPLAY or the ED.



BRAKE/PRESSURE.....ON/CHECK

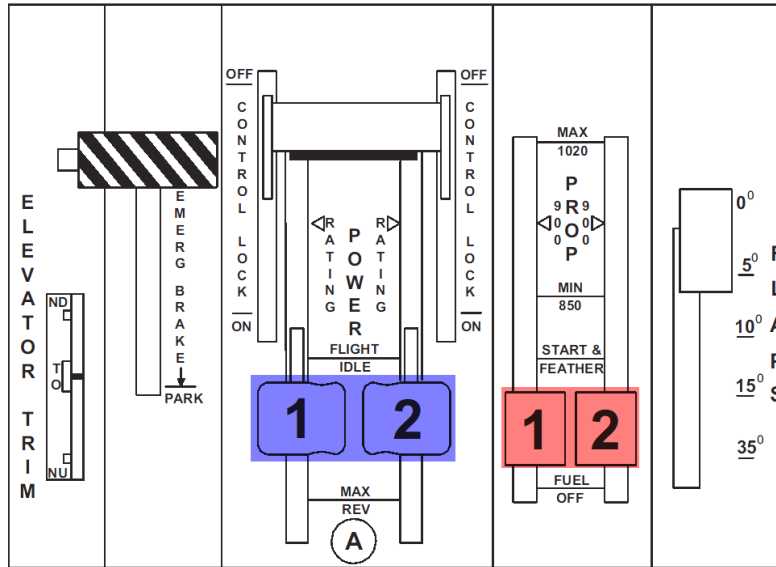
We now check if the brakes are set, and if the break pressure indicator is agreeing with that. Press 'b' to cycle the brakes and note the PK BRK on the HYD PRESS indicators. The HYD PRESS indicator is located on Multifunction Display 2 or MFD2 which is the 4th EFIS display from the left.



NOT TO BE USED FOR REAL WORLD OPERATIONS

POWER LEVERS.....DISC

Located on the Center Console are the POWER Levers. They are your basic throttle, they should indicate in the DISC position, but to be sure turn your throttle all the way down or back to zero percent. This will make sure they are ready for engine start.



CONDITION LEVERS.....FUEL OFF

The CONDITION or PROP levers are also located on the Center Console and need to also be set to zero percent before engine start. You will see them indicate FUEL/OFF

DEPARTURE BRIEFING COMPLETE

Finish getting your briefing from the Dispatcher, and make sure you are fully ready to depart.

NOT TO BE USED FOR REAL WORLD OPERATIONS

ENGINE STARTING

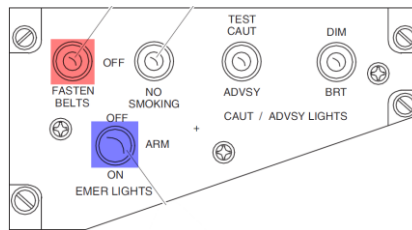
We will go through the checklist, and then I will give you a walkthrough of how you start the engines.

TAKE-OFF SPEEDS/TRIMSREVIEWED/SET

Not fully simulated yet. Check the takeoff speed section of this manual for a full list of V speeds to use for takeoff based on weight.

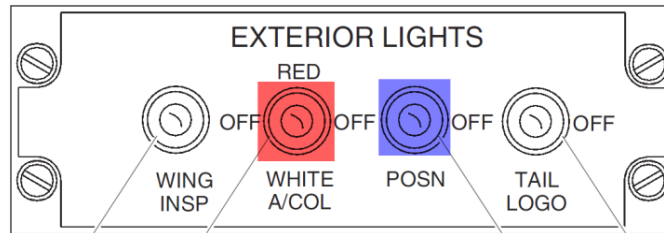
SEAT BELTS SIGN.....ON

This would be the time to turn on the Fasten Belts sign for the passengers. This switch is located on the overhead on the bottom right panel.



ANTI-COLLISION LIGHTRED

The switch for the Anti-Collision lights is located on the EXTERIOR LIGHTS panel on the overhead. The switch is indicated in the image below as red. This switch is a three position switch, clicking the switch once will flip it up into the RED position, which is also known as your BEACON. Clicking once more will flip it down into the WHITE position and this is your STROBE lights. Neither can be on at the same time. Clicking it once more will shut them off.



APU BLEED.....OFF

If you had turned it one earlier, now is the time to turn off the APU bleed. If not, that is one less step you have to worry about.

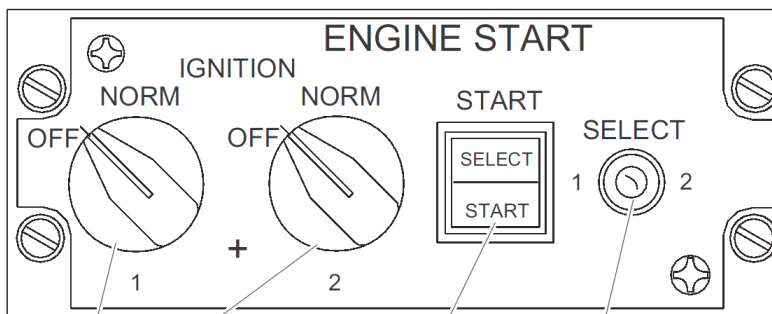
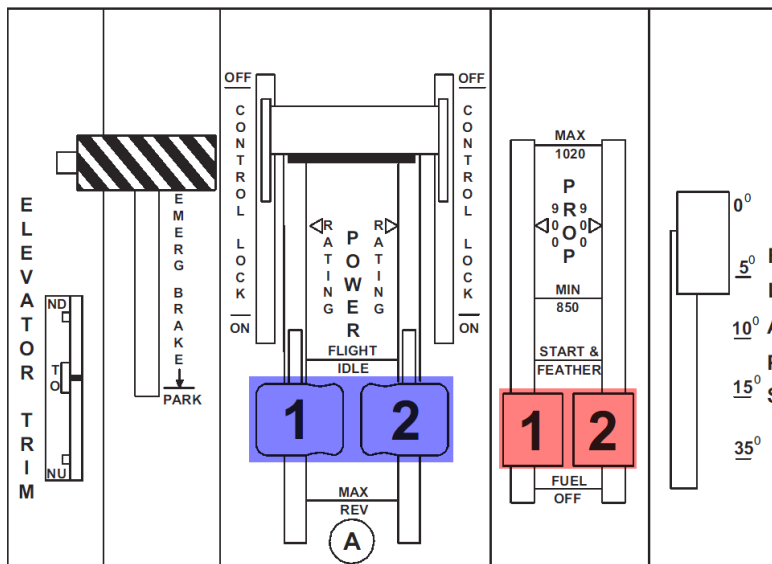
NOT TO BE USED FOR REAL WORLD OPERATIONS

ACTUALLY STARTING THE ENGINES

Now I will go in depth on how to start the engines.

First thing I would suggest you do, though this differs from the real aircraft slightly is to bring the PROP/Condition levers, marked as red below, into the START & FEATHER position by clicking and dragging each one up all the way. You will notice they cannot be dragged farther than START & FEATHER.

This action will enable fuel to flow into the engines. In the real Q400 this action would be done immediately following the engine start button being pressed. Due to the awkward way we use the 3d cockpit in X-plane I suggest doing this step first.



Now, on the overhead find the ENGINE START panel.

You need to select both IGNITION knobs to the NORM position by clicking them once.

NOT TO BE USED FOR REAL WORLD OPERATIONS



DASH 8 Q400



Now we are ready to start the engines. To start the first engine we click the SELECT switch once. It should move over to the right to show number 2. We always start number 2 first on the Dash. The SELECT light will light up on the START button showing you it is ready for start.

Press the START button now. You will see START light up on the button and the engine number 2 is now starting.

Only press the START button once and do not hold it down.

The start sequence will take several seconds to complete. During the start, you will notice a few things happening. On the ED panel, the NH will start to rise followed by the PROP RPM. On the CAUTION and WARNINGS panel several lights will turn off as the engine comes online.

The SELECT switch will return to its neutral position once the engine is started. At this time, you can now start the number 1 engine by click the SELECT switch twice until it is in the number 1 position. Pressing the START button will now begin the number 1 engine start sequence.

Once the SELECT switch clicks back to neutral you may continue with the checklists.

NOT TO BE USED FOR REAL WORLD OPERATIONS

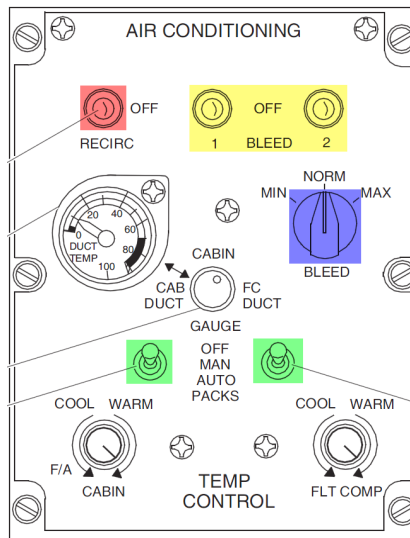
AFTER START

APU.....OFF

We now are able to turn the APU off but you can keep it on if you feel you need to. Different airlines have a different procedure for this, but generally in X-plane you don't need it on after you have started the engines.

BLEEDS MIN/ON

Now we turn on the Bleeds located on the AIR CONDITIONING panel on the overhead, indicated by yellow below. Clicking any of the two switches will turn on both bleeds. Also make sure that the Bleed selector, indicated in blue, is also set to MIN



NOT TO BE USED FOR REAL WORLD OPERATIONS

AFTER PUSHBACK

Ok so now the plane is started and, if you have the simple pushback plugin, you were able to push back out of the gate. If not, the Dash is fully capable of turning around in a short distance so you can do that as well. If you are turning around then you do this next step before, and if you are pushing back you do it after.

CONDITION LEVERS..... MAX

Also known as the PROP lever, these levers will need to be brought up to 100% or MAX for taxi and takeoff. Bring them up now using the keyboard or throttle on your joystick. You will see the PROP handles go to max.

Another step to take into account here is to bring your THROTTLE up just a bit. If you are using a joystick with a throttle, bring the handle up to sit between 5% and 35%. This will ensure the power lever is in the DISC mode. Anything lower than 5% may bring the props into reverse mode, but will only occur if PROP RPM is already high.

What you should look and wait for is the PROP indicator on the ENGINE DISPLAY to settle at 660 RPM.

Now you should be ready for the next set of checks

WHEN A/C GEN CAPTIONS OUT

What does that mean you may ask, well, when you put the condition levers to max on the previous list you allowed the PROP RPM to increase and at a specified point the A/C GEN lights on the CAUTION and WARNINGS panel go out. At that point you may continue with this check list.

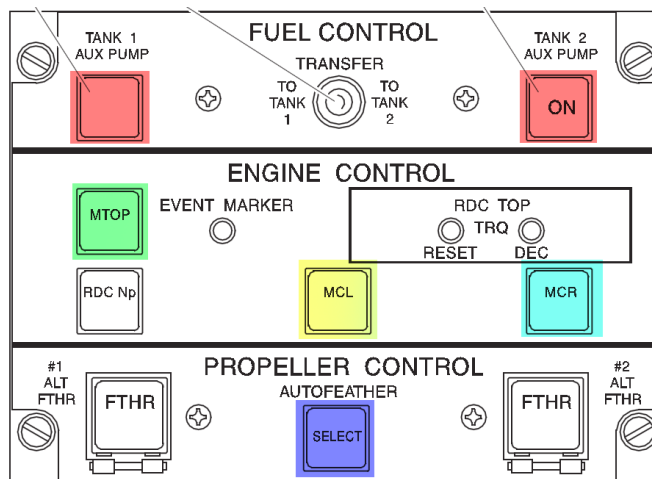
Basically, this is everything we do before taxi.

FLAPS.....SET/INDICATING

The FLAPS handle is located next to the PROP handles on the CENTRAL CONSOLE. Clicking and dragging down or up will increase or decrease the detent. Normal Q400 takeoff FLAPS are 5° so clicking, holding and dragging down once on them will do the trick. You will notice the FLAPS indicator on the 4th EFIS display from the left, also known as MDF2

AUTOFEATHERSELECT

The Autofeather select switch is located on the FORWARD CENTER CONSOLE right under the fuel pumps and xfer switches. Clicking on the switch will light up SELECT on the switch itself and AF SELECT on the ED. When the conditions are right the AF ARM will replace AF SELECT on the ED. When armed the Autofeather system is operating and a failure of and engine will prompt the autofeather system to feather the prop on the failed engine allowing for limited yaw to be created by drag from an unfeathered prop.



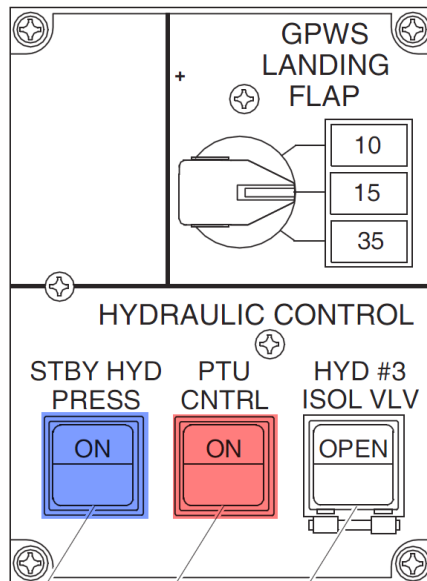
FUEL PUMPS.....ON

NOT TO BE USED FOR REAL WORLD OPERATIONS

The fuel pump switches are located on the FORWARD CENTER CONSOLE on the FUEL CONTROL panel. There are two switches and are indicated in red above. These switches turn on the Auxiliary fuel pumps which are used for specified phases of flight. Turn both of them on now.

STBY HYD PUMP/PTU CONTROLON

The STANDBY HYDRAULIC PUMP switch is located on the main panel, just under the GEAR HANDLE on the HYDRAULIC CONTROL panel. There are two switches that need to be turned on for this step. The STBY HYD switch indicated in blue below, and the PTU CNTRL switch indicated as red below. Clicking the STBY switch, will turn on the electric driven standby hydraulic pump. Clicking the PTU switch will turn on the power transfer unit which will transfer pressure across the hydraulic system ensuring adequate pressure on both sides.



RUDDER..... FULL TRAVEL

We now check if the rudder is able to travel fully. There is an indicator on the MFD1, which is the second EFIS display from the left.

FLIGHT/TAXITAXI

The FLIGHT/TAXI switch is located in front of the Captain's seat, on the left side of the glareshield. When the switch is in FLIGHT or UP, the spoilers are up as long as the power levers are below 40% and there is weight on wheels. When the switch is in TAXI the spoilers are down. General use of this switch is when you taxi you click the switch down into TAXI, and before takeoff you click it into FLIGHT.

Indicators on the MDF1 and next to the switches will indicate if the spoilers are up or down.

NOT TO BE USED FOR REAL WORLD OPERATIONS



DASH 8 Q400



The spoilers are not able to come up when the aircraft is airborne.

PFD/MFD/ED CHECKED

This is the time we would also check if our Autopilot is setup as well as all navigation like FMC and altimeter settings.

A good rule of thumb for the Autopilot is setting up your heading to the runway heading you are taking off from. Hit HDG on the Autopilot Control Panel (glaresheid) and then select IAS for indicated airspeed and use the wheel in the center to set the IAS to 160 kts. The autopilot will show indicators of what system is armed or engaged on the primary flight display (PFD).

Once that is setup, the second you takeoff, you can engage the autopilot and you have easy flying after that. Normally you wait till 500 ft RadAlt or more to engage though.

ICE PROTECTIONAS REQ'D

We now setup ice protection. If the temperature (OAT) is below +10° or less, (We can find that information on the ENGINE DISPLAY) and if there is visible moisture then we should consider ice protection.

TRANSPONDER/TCAS.....ALT/ON

Set the transponder on the radio panel located on the AFT CENTER CONSOLE if you haven't already.

To do this, select the SIDE KEY next to the transponder code. This will allow you now to tune the code in using the radio tuning knob. Clicking, holding and dragging up or down on the big knob will change the values on the left, and doing the same on the smaller knob will change the values on the right.

NOT TO BE USED FOR REAL WORLD OPERATIONS

TAXI

This is the checklist we will run through while taxiing from the gate to the runway.

To begin taxiing, release the brakes ('B') and increase the throttle a bit. (If you are using the mouse, to bring the power levers out of disc, hit NTOPS switch located on the FORWARD CENTER CONSOLE.)

BRAKES CHECK

We need to make a check of the brakes to ensure they work while we taxi. Once the aircraft is in motion, tap the brakes to make sure they are working.

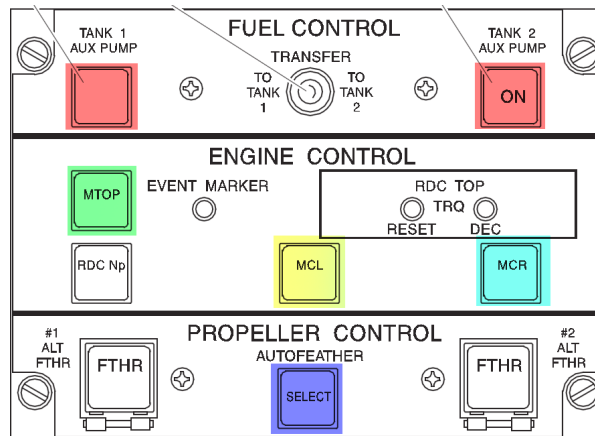
ALTIMETERS.....QNH SET

If not already set, set your altimeter to the proper setting.

T/O POWER RATINGNTOP

Although not fully simulated in our first release of the Dash, what you want to check for is if the PROP controls are fully forward and you have hit the NTOPS switch located on the FORWARD CENTER CONSOLE. The switch is indicated by the GREEN below.

Power Rating is always set to 90% by default.



FLYING CONTROLS FULL/FREE

Check if the flight controls are free and clear, by moving them through full motion.

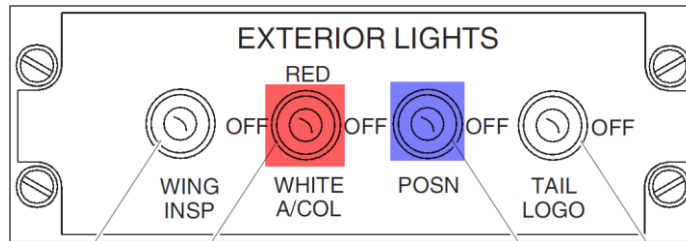
NOT TO BE USED FOR REAL WORLD OPERATIONS

LINE UP

So now we are holding short of the runway, the last few things we need to do before takeoff are in this list.

ANTI-COLLISION WHITE

The Anti-Collision switch should be on RED, clicking the switch once will turn it to WHITE.

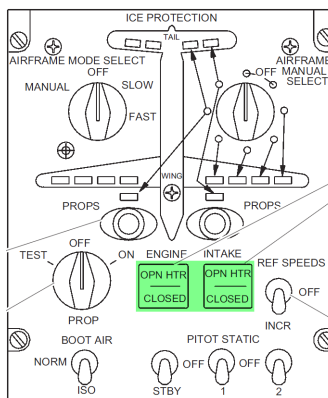


LANDING/FLARE LIGHTSON

Normally turned on before takeoff and landing, but not always needed during the day, these switches are located just left of the EXTERIOR LIGHTS panel.

PITOT STATIC SWITCHES.....ON

Turn on the Pitot Heat Switches, which are located on the ICE PROTECTION panel, near the bottom. All three switches should be on during flight.



FLIGHT/TAXI FLIGHT

Described earlier, now is the time to click the FLIGHT/TAXI switch back to FLIGHT. You will notice the spoilers go up. They will retract when you advance the throttle in order to take off.

NOT TO BE USED FOR REAL WORLD OPERATIONS

CLEARED FOR TAKE/OFF

Now ATC has cleared us to takeoff, we start our roll onto the runway and before firewall the throttle we do the following list.

CAUTION/WARNING LIGHT PANEL CHECK

We do a last check of the CAUTION and WARNING panel, ensuring all lights are out, and if not, we fix those that are.

TAXI LIGHT.....OFF

If we had turned the TAXI lights on prior to taxi, this would be the time to turn them off.

ACTUAL TAKEOFF

Now I will give you a brief about what to expect on takeoff.

To take off simply increase the throttle like any other aircraft until it is at 100%. You will notice the TRQ indicator reach 90% and PROP RPM reach 1020.

The Dash doesn't require much runway to takeoff, so be ready. When the IAS passes 80 kts begin to pull back gently on the yoke and let the nose lift off the ground gently but without exceeding 8° nose up attitude. The plane should lift off the ground around 110 to 120 kts and should also give you only little trouble with torque effects which will try to roll the aircraft.

If you will be manually controlling the aircraft, then I would suggest adding some aileron trim in to compensate for the roll and trim for 160 kts.

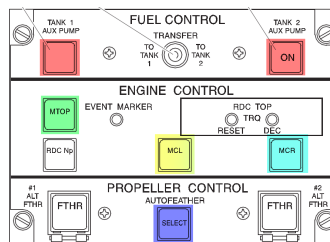
If you have setup your autopilot as suggested above, then engage it after you have reached 500 ft or so.

When climbing on IAS mode, the Q400 will attempt to keep the speed set on the autopilot and will pitch up or down to compensate.

After you engage autopilot, you will want to decrease the PROP RPM to a standard climb rate, there are two normal settings, 900 or 850. You can adjust the RPM manually or you can hit the MCL/MCR switches on the ENGINE CONTROL panel located on the FORWARD CENTER CONSOLE. The switches are indicated by yellow and cyan below.

MCR will give you 850 and MCL will give you 900.

These switches work best if the PROP handle on your joystick is all the way up at 100%



Depending on the airline, we normally climb at 160 kts IAS until reaching FL100(10,000ft) at which point we increase the autopilot IAS setting using the wheel to 210 kts IAS. The aircraft will pitch down for a bit while it picks up speed then will resume the climb.

Keeping that IAS setting all the way up to FL250 is ok, but you can also switch to pitch mode after FL150 and set it to 5° nose up.

Now you are ready to continue with the checklists.

NOT TO BE USED FOR REAL WORLD OPERATIONS

AFTER TAKE-OFF

We do the following after takeoff.

LANDING GEAR UP

Using the GEAR HANDLE on the main panel we retract the gear, normally once we are in the air and a vertical climb rate has been established. Clicking it once will toggle it.

FLAPS..... ZERO

Return the flaps handle to its up or zero position once airborne and passing 1000 ft RadAlt, if your airspeed is above the flaps retraction speed.

BLEEDSON/NORM

Ensure the BLEED switches are on as they should be and then toggle the BLEED RATE select knob to the NORM position.

CLIMB POWER 900 RPM SET

Like described above, you can set it manually or using the stiches on the ENGINE CONTROL panel. 850 or 900.

WHEN CLEARED TO FLIGHT LEVEL

Now you are airborne and waiting to ATC to clear you to the flight level you planned to fly at, which for the Dash is somewhere between 180 and 250. Once ATC clears you up, you do the following checklist:

ALTIMETERS..... STANDARD SET

Set your altimeter to standard, which is 29.92. Do this only if you won't be stopping your ascent under FL180, or plan to change this to standard once you are passing FL180.

To those unfamiliar, altimeter is always set to standard, 29.92 while flying at flight levels above FL180.

ICE PROTECTION AS REQ'D

Check again for icing conditions, and be prepared to turn on deice systems if you run into any bad weather. Alternatively, if you have your deice on already, ask yourself if you still need it on.

STBY HYD PUMP/PTU CONTROL OFF

Turn off the STBY HYD PRESS and PTU CNTL.

FUEL PUMPS OFF

You can also turn off the Fuel Pumps as they are not needed anymore. They are located on the FORWARD CENTER CONSOLE.

AUTOFEATHER OFF

Turn off the autofeather at this time. The A/F SELECT will delight on the ED.

CRUISE

Now I will explain what to expect while in cruise flight and initial decent.

Once at your cruise altitude, the Q400 will accelerate and begin to cruise at MAX CRUISE POWER as long as you keep the throttle all the way up. TRUE AIRSPEED (TAS) will settle around 360.

Depending on the outside air temperature, pressure and wind speeds the Q400 will tend to go into overspeed in this type of cruise. Brining the throttle back to about 99% NH will give you a better cruise speed, which we will call NORMAL CRUISE RATE.

Generally you can ride the Q400 right up at the Vmo cue located on the speed indicator. Riding a little lower will keep the Q400 from going overspeed if you happen to hit some bumpy air.

When you are ready to descend, pick a vertical navigation mode of your liking from the autopilot and then reduce throttle till the TRQ indicator reads close to 0%. I normally go with an IAS mode and set it to 240 or 250.

Once a good descent rate is achieved adjust your throttle to keep at least a -1800 vertical rate. Of course this number is given as reference, and can be changed to fit your situation.



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DESCENT

Once you are established in your descent you may go through these checks:

ICE PROTECTION AS REQ'D

Check to see if you will run into icing conditions at your destination. If so turn on the appropriate deicing equipment.

ARRIVAL BRIEF/MSA/SPEEDS REVIEWED/SET

Make sure you have your charts handy and review them so you know what to expect on the approach and landing phases. Also know your MSA (minimum safe altitude) for the area you are descending into. You don't want to hit a mountain that just happens to be lurking below you.

Also review your approach and landing speeds and set them if you like.

NOT TO BE USED FOR REAL WORLD OPERATIONS

WHEN CLEARED TO AND ALTITUDE

When ATC clears you to an altitude you can do the following checks. Sometimes ATC assigns you a descent altitude before you begin your descent, if so, do these checks when passing through FL180.

ALTIMETERS QNH SET

Set altimeter to your destination airfields current altimeter reading.

ICE PROTECTION AS REQ'D

Again check if the proper ice protection is needed or not.

FUEL PUMPS ON

Turn both fuel pumps back on at this time. This ensures proper fuel flow to the engines during landing.

STBY HYD PUMP/PTU CONTROL ON

Same as the fuel pumps, the STBY HYD PRESS and PTU CNTL switches should now be turned back on.

HYDRAULICS QTY/PRESSURE CHECK

Check on the MFD2 EFIS if the HYDRAULIC fluids and pressure are ok. They almost always are, unless your engines are turned off and the STBYHYD PRESS switch is off.

SEAT BELTS SIGNS ON

We also need to check if the seat belt signs are on still. They should be unless you turned them off when you hit cruise, though if you didn't, then you may have a lot of passengers needing to use the bathroom when you land.

CAUTION/WARNING LIGHTS PANEL CHECK

Check the CAUTION and WARNINGS panel to make sure all the lights are checked out and if not, make sure the abnormal situations are dealt with.

NOT TO BE USED FOR REAL WORLD OPERATIONS

APPROACH AND LANDING

Now I will go through what to setup for and except during approach and landing.

Setting up for the approach should be like this

16 miles out you should be at 235 kts or less and now we would start reducing to 200 which is the gear and flaps limiting speed.

At 12 miles out reduce to 180 kts and extend the flaps one notch to 5°. At this point you should be closing in on the final approach course and be at the altitude appropriate for that approach. I would normally say 3000 feet above ground level would be a good altitude to aim for.

A 6 miles out from the runway now gear should be down and start reducing to 160 kts. Set another notch of flaps, 10° now

4 miles to go take flaps 15° now. At this point you can either set PROP RPM to 1020 or keep it at 850, it will change very slightly how the plane lands.

Reduce speed to 140 kts reaching 1000 feet above ground level at which point you can apply another notch of flaps, 35°. At this point the plane will balloon a little as the flaps will increase lift, if you are on autopilot the nose will pitch down to close to 10° nose down. Speed will also now start to fall off faster so pay attention to your power setting. Increase TRQ to around 25 to 35 percent and keep aim for a speed of 110 kts or whatever Vref speed you pick out of the Vspeeds document for your weight.

By 500 feet radio alt callout the plane should be stable at your Vref speed and everything should be ok for landing.

At 20 feet radio altitude callout, flare gently as flaring to fast will cause the dash to balloon up. You will want to establish a nose up of 2 to 3 degrees as you touch down. If you decide to land with flaps 15, you can expect a nose up of 5 to 6 degrees for touch down.

Once the wheels are on the ground, put the nose down to allow the spoilers to come up. Bring the power back to between 5 and 35% on your throttle if you are using a joystick with a throttle or some other physical throttle, if not bring the power all the way back on the mouse wheel or F1 key. Apply brakes gently to slow the dash and look for a taxiway to exit the runway on.

NOT TO BE USED FOR REAL WORLD OPERATIONS



DASH 8 Q400



LANDING

Now that you have an idea of what to expect, we can continue with the checklists. This list is what we make sure is done before landing.

ICE PROTECTION AS REQ'D

Check again for icing conditions. There is nothing like icing up on approach and missing the runway to end a flight.

LANDING GEAR DOWN/3 GREENS

When you put the gear down, check that the three green lights are lit above the gear handle indicating the gears are really down. Sometimes, X-plane will actually fail one of the gear deployments so this is important to check. If x-plane does happen to spring this failure on you, call out the fire truck and set down carefully.

FLAPS SET/INDICATING

After selecting your flaps, double check that they are at the right position by checking the FLAP POSITION indicator on the MFD2 EFIS display.

BLEEDS MIN/ON

Ensure that your bleeds are on and that their rate is set to minimum (MIN)

NOT TO BE USED FOR REAL WORLD OPERATIONS

AFTER LANDING

Once you are clear of the runway, you can proceed with this set of checks.

LANDING/FLARE LIGHTS OFF

If you had them on, turn them off now.

ANTI-COLLISION LIGHT RED

We turn the ANTI COLLISION lights from white to red, do this by clicking on the switch twice.

ICE PROTECTION OFF

Now you are finally free of this check, you can now turn off any ice protection you have running.

PITOT STATIC SWITCHES OFF

As well you can turn off the three pitot static switches located on the ICE PROTECTON panel.

FLIGHT/TAXI TAXI

Select the FLIGHT/TAXI switch to taxi for the taxi in. This will drop the spoilers which are not needed anymore.

FUEL PUMPS OFF

Turn off both fuel pump switches.

FLAPS..... ZERO

Retract the flaps to 0°

BLEEDS MIN/OFF

Turn off the bleeds at this time.

NOT TO BE USED FOR REAL WORLD OPERATIONS

PARKING

After taxiing in and picking a parking spot, do the following checks.

TAXI LIGHT OFF

If you had turned it on, now would be the time to turn it off.

BRAKES ON

Check that the parking brake is on so she won't roll away on you. Press the 'V' key to enable the parking break.

STBY HYD PUMP & PTU CONTROL OFF

STBY HYD PRESS and PTU CNTL can now be depressed.

POWER LEVERS DISC

Bring the power/throttle levers back to 0%. Do this along with the next check. If the PROPs are also not brought back to 0% then the props may go into reverse, which may make the ramp crew laugh at you.

CONDITION LEVERS START/FEATHER

Bring the Condition/prop levers back to 0% or start and feather. When you do this, ensure the brakes are on as feathering the prop will create a short but significant burst of thrust that will try and lurch the Dash forward a bit.

TRANSPONDER STBY

Ensure the transponder is off. Do this by pressing the side key next to the ATC box on the radio control unit.

APU ON

If you are planning to do a short turnaround then turn the APU on.

NOT TO BE USED FOR REAL WORLD OPERATIONS



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CONDITION LEVERS (AFTER 30 SEC)FUEL OFF

After waiting 30 seconds, to allow the engines to cool, you may turn off the engines by grabbing the PROP handles and dragging them down to the FUEL/OFF position. You can also hold F5 to do this. The engines will then spool down

SEAT BELTS SIGNS OFF

Now you can turn off the seat belt signs so people may start to exit the plane.

NOT TO BE USED FOR REAL WORLD OPERATIONS

LEAVING AIRCRAFT

If you won't be flying anymore today, you can continue with this checklist. If you are going to continue to fly, start back up at the BEFORE START checklist.

EMERGENCY LIGHTS OFF

Turn off the emergency lights.

RECIRC FAN OFF

The recirc fan is now ok to be turned off.

IGNITION OFF

Turn off both ignition switches located on the ENGINE START panel

APU OFF

If the APU is running, turn it off by selecting the PWR button and then the GEN button.

ICE PROTECTION OFF

Check to ensure all the ice protection is turned off.

ENGINE INTAKE BYPASS DOORS CLOSED

From the ICE PROTECTION panel, turn off the ENGINE INTAKE buttons. They should read CLOSED.

STBY/AUX/MAIN BATTERIES OFF

Turn the 3 battery switches to the off position.

BATTERY MASTER OFF

The last check is to turn off the battery master switch.

NOT TO BE USED FOR REAL WORLD OPERATIONS

SYSTEMS

The following pages will go through the various panels and explain what each switch or indicator is for. Some info, though little may differ from the real aircraft and we try to explain that on the items which do.



1. OVERHEAD PANELS
2. GLARESHIELD PANEL
3. CAUTIONS AND WARNINGS PANEL
4. MAIN PANEL
5. FORWARD CENTER CONSOLE
6. CENTRAL CONTROL CONSOLE
7. AFT CENTER CONSOLE

NOT TO BE USED FOR REAL WORLD OPERATIONS

OVERHEAD

The overhead contains many systems which are broken up into individual panel areas.



NOT TO BE USED FOR REAL WORLD OPERATIONS

1 DC CONTROL



1. STBY BATT Switch. (two positions) Click to toggle. Connects the Standby Battery to the main left feeder bus. On during normal operations.
2. AUX BATT Switch. (two positions) Click to toggle. Connects the Auxiliary Battery to the main left feeder bus. On during normal operations.
3. MAIN BATT Switch. (two positions) Click to toggle. Connects the Main Battery to the main right feeder bus. On during normal operations.
4. BATTERY MASTER Switch. (two positions) Click to toggle. Connects the batteries to their associated essential buses. Always flip this switch to on before the battery switches. On during normal operations.
5. GEN 1 Switch. (two positions) Click to toggle. Connects the Left engine driven DC power generators to its associated buses. Can be left on and always on when the engines are powered.
6. GEN 2 Switch. (two positions) Click to toggle. Connects the Right engine driven DC power generators to its associated buses. Can be left on and always on when the engines are powered.
7. MAIN BUS TIE switch. (two positions) Click to toggle. Connects both left and right DC power buses to each other. Should be left on at all times.
8. BUS FAULT RESET Switch.(momentary selection) Click to toggle. Not simulated
9. EXT PWR Switch.(two positions) Click to toggle. Not simulated

NOT TO BE USED FOR REAL WORLD OPERATIONS

2 AC CONTROL



1. EXT PWR switch. (two positions) Not simulated
2. GEN 1 switch. (two positions) Click to toggle. Arms the generator control unit to connect the left AC generator to its associated variable frequency bus when conditions are right. Can be left on. On during normal operations.
3. GEN 2 switch. (two positions) Click to toggle. Arms the generator control unit to connect the right AC generator to its associated variable frequency bus when conditions are right. Can be left on. On during normal operations.

NOT TO BE USED FOR REAL WORLD OPERATIONS

3 ICE PROTECTION



1. AIRFRAME MODE SELECT Knob. (two positions) Click to toggle. While FAST, enables the automatic sequencing of deice boots with a 1 minute cycle time. This is turned on if there is a need to break ice off the leading edge of the wing surfaces.
2. AIRFRAME BOOT SECTOR BOARD.(green) Indicates, while the airframe mode select is on FAST, the boot that is being inflated during the sequence.
3. PROP SELECTOR Knob. (two positions) Click to toggle. While in the ON position, the automatic prop leading edge heater comes on for 7 seconds on each prop sequentially. Turn on if there is suspect for ice buildup on the propeller blades.

NOT TO BE USED FOR REAL WORLD OPERATIONS

4. PROP ADVISORY LIGHT. (green) Will appear when the PROP SELECTOR is toggled on and indicates which prop is being heated.
5. ENGINE INTAKE SWITCHLIGHT. (alternate action) Click to toggle. Pushed in, the OPN segment will appear in amber and will indicate that the engine bypass doors, located under each engine are open. When depressed the CLOSED segment will appear in green and will indicate the engine bypass doors are closed. While pressed and outside air temperature is less than 15° C the HTR segment will illuminate indicated the engine intake heater is on. Normally open during normal operations to eliminate any trace of icing from the engine intakes.
6. REF SPEED Switch. (two positions) click to toggle. Not fully simulated.
7. BOOT AIR Switch. (two positions) Click to toggle. Not fully simulated but should otherwise be in the NORM position.
8. STBY PITOT/STATIC PORT Switch. (two positions) Click to toggle. Turns on the standby pitot/static probe heater. Should be turned on for normal flight operations
9. 1 PITOT/STATIC PORT Switch. (two positions) Click to toggle. Turns on the number 1 pitot/static probe heater. Should be turned on for normal flight operations
10. 2 PITOT/STATIC PORT Switch. (two positions) Click to toggle. Turns on the number 2 pitot/static probe heater. Should be turned on for normal flight operations
11. WINDSHIELD HEAT Switch. (two positions) Click to toggle. When on NORM the windshield is heated with power from the left AC bus and will ensure no buildup of ice on the cockpit windows.
12. WIPER Switch. (two positions) Click to toggle. Not simulated

4 AIR CONDITIONING



1. RECIRC Switch. (two positions). Click to toggle. Turns the recirculation fan on. On during normal operations.
2. BLEED Switches. (two positions) Click one to toggle both. Starts bleed air flow from the #1 and #2 engines to the air conditioning packs. Turn these on after you have started the engines. Without these turned on the cabin cannot be pressurized correctly and you will get the red CABIN PRESS annunciator on the caution and warning panel as you climb.
3. BLEED CONTROL SELECTOR. (three positions) Click to cycle through. Provided airflow for one of the three selected settings. See the normal operating checklists to see what settings are needed for your phase of flight.
4. PACKS CONTROL SWITCHES. (three positions) Click each to cycle through OFF, MAN or AUTO. These switches control the Pneumatic Air Cycle Kits, which provide cabin air pressurization and temperature conditioning. Settings these to AUTO is the simplest solution for all phases of flight.

NOT TO BE USED FOR REAL WORLD OPERATIONS

5. CABIN TEMPERATURE SELECTOR. (rotary action) Click, hold, and drag up or down to change setting. Adjusts cabin temperature when PACKS are set to AUTO or MAN.
6. FLT COMP TEMPERATURE SELECTOR. (rotary action) Click, hold, and drag up or down to change setting. Adjusts flight deck temperature when PACKS are set to AUTO or MAN.

5 PANEL LIGHTING



1. OVERHEAD CONSOLE KNOB. (rotary action) Click, hold and drag up or down to change setting. Changes overhead console indirect lighting intensity.
2. GLARESHIELD KNOB. (rotary action) Click, hold and drag up or down to change setting. Changes the glare shield indirect lighting intensity.
3. FWD CTR CONSOLE KNOB. (rotary action) Click, hold and drag up or down to change setting. Changes the forward center console indirect lighting intensity.
4. AFT CTR CONSOLE KNOB. (rotary action) Click, hold and drag up or down to change the setting. Changes the aft center console indirect lighting intensity.
5. STORM/DOME LIGHT Switch. (two positions) Click to toggle. Turned on the storm lights, which illuminate the cockpit up at night, but can be used during storms to lessen the flash effect lightning or strobe lights have on your eyes.

NOT TO BE USED FOR REAL WORLD OPERATIONS

6 APU CONTROL



1. PWR SWITCHLIGHT. (alternate action) Click to toggle. Pushing once arms the APU start circuits and allows the START switch to be pressed. The APU FUEL VALVE OPEN light on the fire protection panel illuminates. RUN segment lit when APU is running. When RUN is lit, pushing this button will turn off the APU.
2. START SWITCHLIGHT. (alternate action) Click to engage. When pressed, STARTER segment illuminates and the APU is starting up. This button can only be pressed after the PWR switch has been pressed.
3. GEN SWITCHLIGHT. (alternate action) Click to toggle. Connects the APU generator to the DC power busses. GEN segment lit when generator online.
4. BL AIR SWITCHLIGHT. (alternate action) Click to toggle. OPEN segment illuminates when the APU bleed air valves are open. This switch will turn off the engine bleed air if they are on.

NOT TO BE USED FOR REAL WORLD OPERATIONS

7 ENGINE START



1. IGNITION CONTROL Switches. (two pots) Click to toggle. Selecting NORM allows the FADEC to enable ignition during engine start for the respective engine.
2. ENGINE START SWITCHLIGHT. (momentary action) Click once to engage. After an engine is selected and that engine is not already started, the SELECT segment will lite indicating you can now press the engine start switch. Pressing the switch while the SELECT segment is illuminated will start the engine startup sequence for the engine selected. **Do not hold down the start button.** When the engine is started the START segment will appear. Once the engine has finished starting, both SELECT and START will go out.
3. ENGINE START SELECT Switch. (three position toggle) Click to cycle through 2, 1, off. Toggling to #1 or #2 will arm the start control circuits for that engine. You would normally start number 2 first. The switch will center back to neutral once the engine has started.

NOT TO BE USED FOR REAL WORLD OPERATIONS

8 CABIN ALTITUDE



1. REAR OUTFLOW VALVE CONTROL Switch. (three positions) Click to cycle. This switch controls the rear out flow valves which keeps cabin pressure. AUTO, which is the default system, automatically maintains proper pressure in the cabin. DUMP will dump the pressure to altitude, and MAN will allow the pilot to select their altitude manually. This switch is not fully simulated. X-planes default auto pressurization is in use.
2. FWD OUTFLOW VALVE ROTARY KNOB. (rotary action) Click, hold and drag to change setting. Not simulated.

9 EXTERIOR LIGHTS (LEFT)



1. APPROCH LIGHTS Switch. (two positions) Click to toggle. Turns the left and right approach lights on.
2. FLARE LIGHTS Switch. (two positions) Click to toggle. Turns the left and right flare lights on.
3. TAXI LIGHT Switch. (two positions) Click to toggle. Turns the taxi lights on.

10 EXTERIOR LIGHTS (RIGHT)



1. WING INSP LIGHT Switch. (two positions) Click to toggle. Turns on the wing inspection lights which illuminate the front and underside of the wings.
2. ANTI COLLISION LIGHT Switch. (three positions) Click to cycle through. OFF, RED, WHITE. One click will flip it up to the RED position and the RED beacon light will illuminate. One more click and it is in the WHITE position and the white flashing anti-collision lights are on. The RED is normally selected after engine start and is on for taxi. The WHITE is selected for takeoff, flight and landing.
3. POSN LIGHTS Switch. (two positions) Click to toggle. This turns on the aft and wing tip position lights. This is also known as the NAV lights.
4. TAIL LOGO LIGHTS Switch. (two positions) Click to toggle. This switch turns on the tail logo light which illuminates the whole of the tail.

NOT TO BE USED FOR REAL WORLD OPERATIONS

11 INTERIOR LIGHTING CONTROL PANEL



1. FASTEN BELTS Switch. (two positions) Click to toggle. Turns on the fasten seat belts signs for the passengers.
2. NO SMOKING Switch. (two positions) Click to toggle. Turns on the no smoking passenger signs, and should be turned on at all times.
3. TEST CAUT/ADVISY Switch. (momentary action) Click to hold on. Illuminates the Caution and Warnings panel lights.
4. CAUT/ADVSY DIM/BRT Switch. Not Simulated.
5. EMER LIGHTS Switch. (three positions) Click to cycle through. Not fully simulated. Normally in the arm position.

NOT TO BE USED FOR REAL WORLD OPERATIONS

GLARESHIELD



NOT TO BE USED FOR REAL WORLD OPERATIONS

1 LEFT GLARESHIELD



Right side similar.

1. PROPELLER GROUND RANGE indicator. This annunciator indicates when the number 1 and/or number 2 propeller is in the ground pitch range. This should not be illuminated during flight.
2. OUTBOUND/INBOUND SPOILER ADVISORY LIGHTS. These lights will illuminate to indicate the inbound and or outbound spoilers deployed.
3. FLIGHT/TAXI Switch. (two positions, lever locked switch) Click to toggle. FLIGHT must be selected for takeoff and if it is not selected the switch will automatically engage into FLIGHT once the throttles are brought up to FLIGHT IDLE + 12°. This allows spoilers to be deployed upon touchdown. TAXI should be selected for taxi.
4. GPWS annunciator. This will light up if the ground proximity warning is going off. This differs from the real Q400 only in that this switch would be pressed to test the GPWS as well.
5. BELOW G/S annunciator. This will light up if the below glide slope aural warning is going off. This differs from the real aircraft in that pressing this button would shut off the warning. After multiple flight tests, I believe this is needed in the simulation and will be added in future updates.
6. A/P DISCONNECT annunciator. Comes on if the autopilot has been disconnected.
7. MASTER WARNING SWITCH (momentary action) Indicates there is a warning needing attention. Pressing this will reset the warning light. There is a similar switch on the right glareshield for MASTER CAUTION and works the same way.
8. ELAPSED TIME Switch. (momentary action) Click to engage. Starts the elapsed time indicated on the clock. The time will be shown in seconds then minutes and the second arm will move around the clock face. pressing this button again pauses the time and a third click continues it.
9. CHRONOMETER FUNCTION Switch. (momentary action) Click to engage. Resets the elapsed time to zero.

NOT TO BE USED FOR REAL WORLD OPERATIONS



DASH 8 Q400



10. FUNCTION SELECTOR Switch. (three positions) Click to cycle modes. Switches between LOCAL time, Greenwich Mean Time, and the current DATE.
11. This toggles the Load & Balance Manager screen

NOT TO BE USED FOR REAL WORLD OPERATIONS

2 FLIGHT GUIDANCE CONTROL PANEL/AUTOPILOT



1 through 5 are vertical navigation modes and 6 through 10 are lateral navigation modes.

1. IAS MODE (momentary action) Click to engage. Activates vertical commands to hold indicated airspeed. Will engage first to your current speed IAS then use NOSE DN/NOSE UP trim wheel to change airspeed. Airspeed being held is indicated on the PFD.
2. VS MODE (momentary action) Click to engage. Activates vertical commands to hold vertical speed. Will engage to your current vertical speed then use the NOSE DN/NOSE UP trim wheel to change vertical speed. Vertical speed being held is indicated on the PFD.
3. VNAV MODE (momentary action) Click to engage. Activates vertical commands to acquire and hold a vertical flight path computed by the FMS. Not fully simulated, and not normally used in the real Q400 unless for RNAV approaches.
4. ALT MODE (momentary action) Click to engage. Activates vertical commands to hold aircraft altitude at the time of mode engagement.
5. ALT SEL MODE (momentary action) Click to engage. Arms vertical guidance to capture the pre-selected altitude displayed on the PFD. IAS, VS, VNAV, or PITCH HOLD modes can be used to capture the selected altitude.
6. HDG MODE (momentary action) Click to engage. Activates the lateral guidance commands based on selected heading as displayed on the PFD.
7. NAV MODE (momentary action) Click to engage. Arms the lateral guidance commands for capture of the selected navigation source that is displayed on the active PFD.
8. APPR MODE (momentary action) Click to engage. Arms the lateral commands to capture and track the approach navigation aid displayed on the PFD. Will also arm vertical modes if a glideslope is present.
9. BC MODE (momentary action) Click to engage. Activates lateral commands to track backcourse localizer displayed on active PFD.

NOT TO BE USED FOR REAL WORLD OPERATIONS

10. STBY MODE not simulated. Will currently turn off the autopilot.
11. AP PUSHBUTTON (momentary action) Click to engage. Engages autopilot.
12. YD PUSHBUTTON (momentary action) Click to engage. Engages the yaw damper. Not fully simulated currently. We tried but there are some serious problems with the X-plane artificial stability system that we noted.
13. PITCH THUMB WHEEL (rotary action) Click, hold and drag up or down to change settings. With a vertical guidance mode selected (VS, PITCH HOLD, IAS) vertical reference is changed and displayed on the PFD.
14. NAV SOURCE SELECTION KNOB (rotary action) Click, hold and drag up or down to change settings. Selects the source to be used for navigation, NAV1, NAV2 or FMS
15. HDG SELECTION KNOB (rotary action) Click, hold, and drag up or down to change settings. To the left and right are invisible buttons which will allow you to click up or down by one unit. Selects the heading to be used for lateral navigation mode. Indicated on PFD.
16. ALTITUDE SELECTION KNOB (rotary action) Click, hold and drag up or down to change setting. To the left and right are invisible buttons which will allow you to click up or down by one unit. Selects the pre-selected altitude to be used for vertical navigation. Indicated on the PFD. Goes up or down by increments of 100 feet. If the selected altitude is stuck between the next 100 feet, select either 0 or 30,000 feet, let go and then reselect your altitude. This resets the altitude bug to be at 100 foot increments.
17. COURSE SELECTION KNOB (rotary action) Click, hold and drag up or down to change settings. To the left and right are invisible buttons which will allow you to click up or down by one unit. Selects the course to be used for lateral navigation when using NAV 1 or NAV 2. Indicated on the PFD.

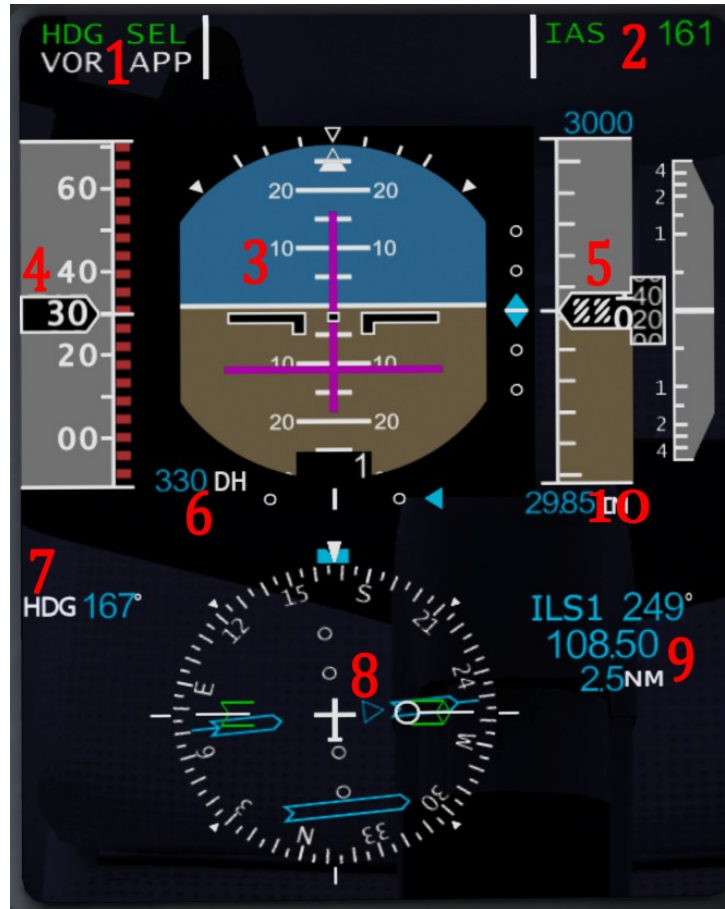
MAIN PANEL



The main panel consists of all 5 of the main EFIS displays. In addition there is the Integrated Standby Instruments(1), Landing gear controls(2), and hydraulic controls(3).

The Integrated Standby Instruments are not simulated in this version of the Q400. This saves a lot on FPS as the instrument contains almost everything that is on the PFD. It will read INOP when the power is on. Good thing it is on the MEL. Future versions of the Q400 WILL have the Integrated Standby Instruments.

PFD1



1. LATERAL MODE ANNUNCIATION (white for armed, green for engaged) Indicates the lateral autopilot mode armed or engaged.
2. VERTICAL MODE ANNUNCIATION(white for armed, green for engaged) Indicates the vertical autopilot mode armed or engaged. Will also indicate the selected input for IAS, and VS modes.
3. PRIMARY ATTITUDE INDICATOR. Shows aircraft current pitch, roll, and yaw. Has a set of flight director bars which show up if autopilot modes are selected or armed. Underneath is a radio altitude indicator, which will indicate radio alt up to 2500 ft. On the bottom is a localizer pointer and scale. On the right side is a glideslope scale and pointer.
4. AIRSPEED INDICATOR AND TAPE. Indicates current airspeed starting at 30 kts up to 400 kts. Vmo cue and minimum control cue shown in red on the side of the tape. Airspeed bugs also shown on the side of the tape.

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5. ALTITUDE TAPE AND VERTICAL SPEED TAPE. Altitude tape indicates current altitude. Brown area indicates ground level. On top there is the current preselected altitude indicator which can be changed by the ALT knob on the autopilot panel. On the bottom of the tape is the altimeter setting, indicated in inches of mercury. The vertical speed tape is to the right of the altitude tape and indicates aircrafts current vertical speed.
6. DECISION HEIGHT SELECTED. Shows the pre-selected decision height. Will not display if no DH selected.
7. HEADING INDICATOR. Shows current selected heading to follow. To change this setting, use the HDG knob on the autopilot panel.
8. HORIZONTAL SITUATION INDICATOR. Shows current heading and navigational track. There is also a heading bug.
9. NAVIATION INFORMATION AREA. Shows currently selected nav source information. Indicates NAV source, NAV course, NAV frequency or fix, and DME.
10. Clicking here will change the BARO setting from IN to HPA and back again.

NOTE: CLICKING ANYWHERE ON THIS PANEL WILL TOGGLE THE VISIBILITY OF THE PILOT'S FLIGHT CONTROLS (YOKE)

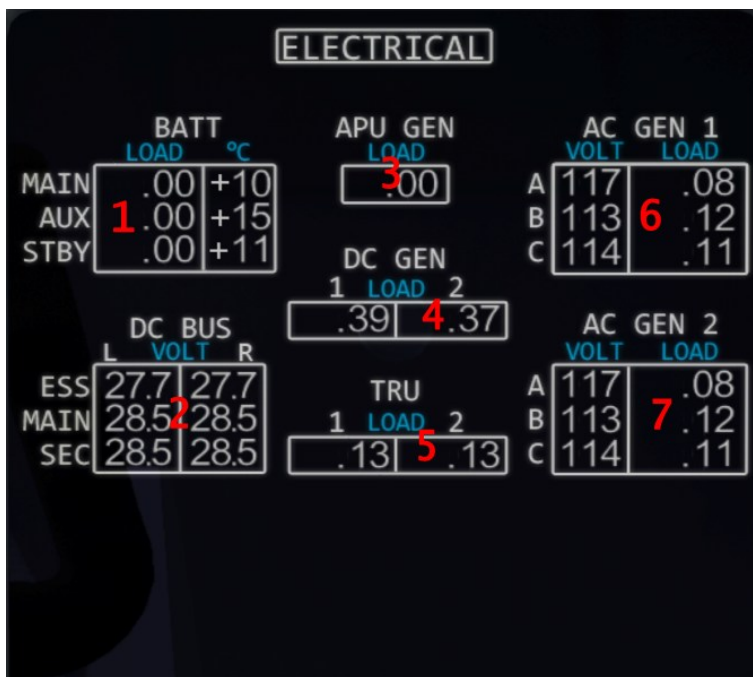
MFD1



1. PRIMARY NAVIGATION AREA. Shows FMS course, nav fixes, airports, VORs, NDBs, weather, and TCAS. Heading bug shows current selected heading in relation to present course. Hitting the FORMAT button changes this to approach mode.
2. WX INDICATOR. When the weather radio is on, WX ON is indicated here, when it is off, nothing is shown.
3. WIND, TAS, GS INDICATORS. These indicators show the current airspeed and direction in relation to the aircraft. TAS shows the current true airspeed of the aircraft, and GS shows the current groundspeed of the aircraft.
4. POWERED FLIGHT CONTROL SURFACE INDICATOR. Indicates the position of the Left Inbound, Left Outbound, Right Inbound, Right Outbound, spoilers as well as the Left and Right Elevators and Rudder.

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The MFDs also have alternate screens. These are shown below.

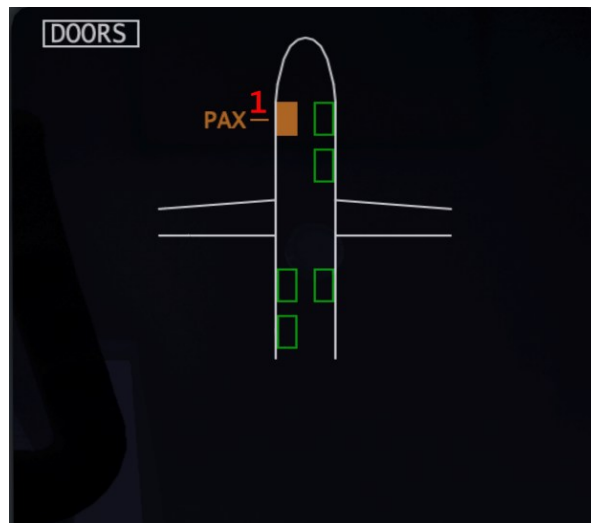


- Shows a Digital Display of Battery Load. All three batteries are show. A value of 1.30 indicates a charge of 30% over the maximum rate of charge. A value of -0.30 indicates the battery discharging 30% over the maximum rate of discharge.
- Digital readout of all 6 DC Busses. Indicated in volts.
- Digital readout of the APU Generator Load. Same for the Battery loads. A positive number indicates total percentage of load based on maximum.
- Digital readout of the DC Generator Load. There are two, one for each engine. Reads similar to the APU gen load.
- Digital readout of the TRU loads. There are two of them, one for each engine.
- Digital readouts of AC generator 1 voltage and load. Displays the bus voltage and load for each phase.
- Digital readouts of AC generator 2 voltage and load. Displays the bus voltage and load for each phase.

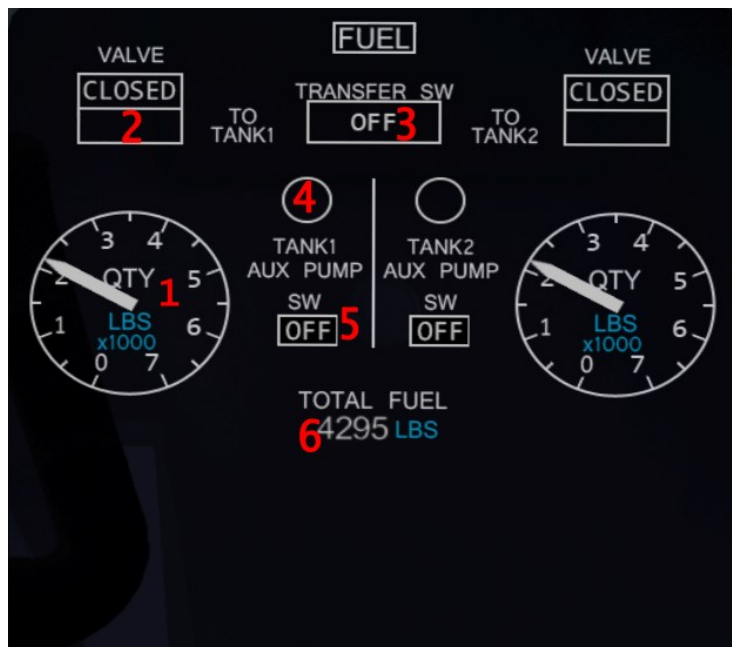
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The ENGINE screen is almost identical to the normal Engine Screen(ED). This is normally used only as a backup if the ED fails.



The doors screen shows you if there are any open doors. I have also added a toggle here to open the main cabin door. Just click the top left door, indicated in the image above by a 1, and the door will open if you are on the ground and the engines are off.



1. Analog Display of Fuel Quantity: gives an analog readout of fuel quantity in the left and right tanks.
2. Fuel Shutoff Valve Annunciator: indicates the shutoff valve state in response to a crew transfer request.
3. Fuel Transfer Switch Indication: indicates the position of the FUEL TRANSFER switch on the FUEL CONTROL panel
4. Tank Auxiliary Pump Pressure Status Indicator: indicates between low or no pressure to normal pressure.
5. Auxiliary Fuel Pumps Switch Annunciator: Indicates the position of the Fuel pump switches
6. Digital Display of Total Fuel Quantity: shown in pounds, will show the total value of fuel.

ED

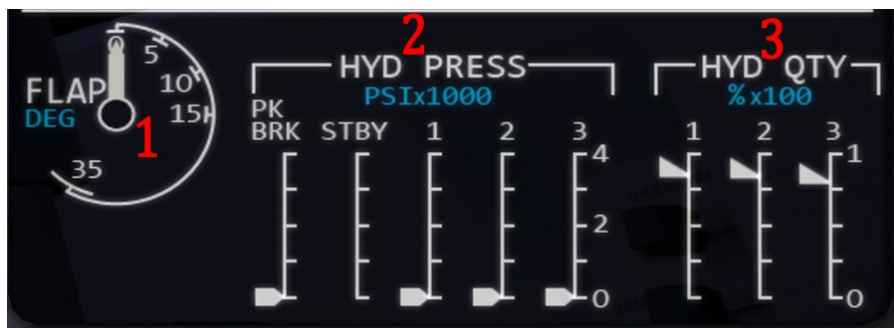


1. TORQUE INDICATOR. Torque needle and digital readout indicates current percentage of torque generated by the engine. The cyan torque bug indicates the suggested power rating for a specific phase of flight. Actual values will differ depending on atmospheric conditions.
2. PROP INDICATOR. Prop needle and digital readout indicates current prop RPM.
3. ITT INDICATOR. Indicates the current Inlet Turbine Temperature. Generally, if this changes to red, reduce power until it is white again.
4. NH INDICATOR. NH needle and digital readout indicates current high pressure centrifugal compressor speed as a percentage of max allowable power
5. FUEL FLOW. Indicates current fuel flow for the left and right engines in pounds per hour.
6. NL INDICATOR. NL digital readout indicates current low-pressure axial compressor speed as a percentage of max allowable power.
7. OIL TEMP AND PRESSURE. Indicates current oil temperatures and pressures for the left and right engine.
8. FUEL INFO. Indicates current fuel in the left and right tanks in pounds. Fuel temperature is currently not simulated. SAT indicates current Static Air Temperature in degrees Celsius.

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9. A/F ANNUNCIATOR. Displays A/F SELECT if the autofeather is selected and is ready to be armed when conditions are right. A/F ARM displays if the conditions have been met and the autofeather is now armed and ready to feather the props if an engine fails.
10. ENGINE RATING MODE. Not fully simulated. Will indicate power rating based on prop speeds and suggest torque setting based on current phase of flight. Values indicated can vary depending on atmospheric conditions. BLEED is also displays if the bleeds are on and NTOPs power rating selected.

MFD2



1. FLAP POSITION INDICATOR. Indicates flap positions from zero degrees up to 35 degrees.
2. HYD PRESS. Indicates hydraulic pressures for five hydraulic systems. Parking break, standby, 1, 2, and 3.
3. HYD QTY. indicates hydraulic fluid quantity for 1,2, and 3 systems. Not fully simulated. These values will never change.

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LANDING GEAR



1. GEAR ADVISORY LIGHTS. Top row indicates in amber if the landing gear doors are open. Middle row indicates in green if the landing gear is down and safe. Bottom row indicates in red if the gear is not safe and locked up or down.
2. GEAR HANDLE. (two positions) Click to toggle. Toggles the landing gear up or down.

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HYDRAULIC CONTROL



1. STBY HYD PRESS SWITCHLIGHT. (alternate action) Click to toggle. When ON segment is lit the electrical standby hydraulic pump is on and supplying hydraulic pressure to the 1 and 2 systems.
2. PTU CNTRL SWITCHLIGHT. (alternate action) Click to toggle. Not fully simulated.
3. GPWS LANDING FLAPS. Not simulated. Will always read 35.

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FWD CENTER CONSOLE



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1 FMC



The FMC is a modified version of the default X-Plane FMC. The screen (1) is the same as you would find on the default, whereas the keys (3 and 4) are in the place you would find them on the Q400s UNIVERSAL FMC. The inputs for navigation (2) are setup similar to where they would be placed on the real FMC, but are shown as the inputs for the default X-Plane FMC. The ENTER (5) key is the equivalent to the “direct to” button.

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2 EFIS CONTROL



1. TCAS SOFTKEY. (momentary action) Click to toggle. Turns Traffic Collision Avoidance System on and displays it on the MFD.
2. FORMAT SOFTKEY. (momentary action) Click to toggle. Toggles between normal and approach modes for the MFD navigation screen.
3. WX/TERR SOFTKEY. (momentary action) Click to toggle. Not fully simulated. Turns on or off the default X-Planes weather overlay images on the MFD navigation area.
4. RANGE KNOB. (rotary action) Click, hold, and drag up or down to change setting. Changes the display range for the navigation area on the MFD.
5. PFD BRIGHTNESS CONTROL KNOB. (rotary action). Click, hold, and drag to change settings. Adjusts the brightness of the PFD1 and PFD2.
6. MFD BRIGHTNESS CONTROL KNOB. (rotary action). Click, hold, and drag to change settings. Adjusts the brightness of the MFD1 screen. Similar knob on the right side controls MFD2
7. BEARING SELECTOR KNOBS(4 positions each, Rotary Action) Click to toggle. Defaulted on Off. Will change the display of the two RMI needles on the PFD. Left selector controls VOR1,ADF1, or FMS. Right selector controls VOR2,ADF2, or FMS. If any radio is selected but not valid, the RMI needle will park at 90°.

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3 FUEL CONTROL



1. TANK 1 AUX PUMP SWITCHLIGHT. (alternate action) Click to toggle. When ON segment is lit, the left auxiliary fuel pump activated.
2. TANK 2 AUX PUMP SWITCHLIGHT. (alternate action) Click to toggle. When On segment is lit, the right auxiliary fuel pump activated.
3. FUEL TRANSFER SWITCH. (three positions) Click to cycle through. Allows transfer of fuel from one tank to the other if there is an imbalance.

4 ENGINE CONTROL



1. N TOP SWITCH. (momentary action) Click to engage. Clicking this will set the PROPs to 1020 rpm. A physical prop handle may override this if not set at 100% or 0%
2. MCL SWITCH. (momentary action) Click to engage. Clicking this will set the PROPs to 900 rpm. A physical prop handle may override this if not set at 100% or 0%
3. MCR SWITCH. (momentary action) Click to engage. Clicking this will set the PROPs to 850 rpm. A physical prop handle may override this if not set at 100% or 0%
4. M TOP SWITCH.(momentary action) Click to engage. Clicking this will set props to 1020 rpm and give the engine full power for takeoff. The ED will indicate 106% maximum Torque on full throttle.
5. RDC TOP TRQ DEC PUSHBUTTON. (momentary action) Push to reduce N TOP power by steps of 2% to a limit of 10%. Cannot be activated in any other mode other than N TOP.
6. RDC TOP TRQ RESET PUSHBUTTON. (momentary action) Push to reset to normal take-off power.

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5 PROPELLER CONTROL



1. AUTOFEATHER SWITCHLIGHT. (momentary action) Click to toggle. When SELECT segment lit, the autofeather system is selected and will arm when conditions are right. A/F SELECT will indicate on the ED.

6 BACKUP COM 1 CONTROL AND DISPLAY UNIT



1. ACTIVE COM1 FREQ. Shows the current active com1 frequency.
2. STANBY COM1 FREQ. Shows the current standby com1 frequency.
3. FREQUENCY TRANSFER PUSHBUTTON. (momentary action) Click to switch. This button flips the active COM1 frequency with the standby COM1 frequency.
4. FREQUENCY SELECTOR KNOB. (rotary action, two parts) Click, hold, and drag to change freq. There are two knobs here, one smaller, one bigger. They each change the Standby Com1 frequency at different rates.

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CENTRAL CONTROL PANEL



1. ELEVATOR TRIM INDICATOR. Indicates set elevator trim. ND = nose down. NU = nose up. Inside the white TO area indicates the allowed trim range for takeoff.
2. PARKING BRAKE HANDLE. Will move when you set the brake.
3. POWER LEVER. Will move with a physical throttle. If you are not using a physical throttle and need to bring the handles out of DISC, select the NTOP switch from the engine control panel. As a general rule, when using a physical throttle, at 0% to 5% the engines may go into reverse depending on the prop settings. From 5% to 35%, the handle will be in DISC mode and the propeller will pitch to 0°. DISC mode is the proper mode to be in for taxiing. Anything above 45% will give you FLIGHT IDLE to MAX RATTING. During flight do not bring the throttle below 35%. For starting, start in a setting below 5%. After start and ready to taxi bring them into DISC mode.
4. PROPELLER HANDLE. Controls PROP RPM and fuel mixture. When the mixture is 0% and the prop handles are all the way back, the handles will show FUEL/OFF. Drag the handles up to START & FEATHER to bring the mixture to 100%. Once started, moving the physical prop handle or hitting the prop increase button on your keyboard will bring the prop handles out of START & FEATHER up to MAX/1020.
5. FLAPS HANDLE. Click, hold and drag up or down to change position. Allows for setting of the flaps between 0, 5, 10, 15 and 35 degrees.

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AUDIO AND RADIO CONTROL DISPLAY UNIT (ARCDU)



The ARCDU contains many functions that we have not yet simulated, but instead we have put in the most basic systems that you would normally use. Later versions may build upon what we already have.

1. **SIDE KEYS** (8, momentary action) Click to activate. Two operations available. Pushing the key next to the radio you wish to change will activate that radio and you will be allowed to tune the frequency on the TUNE knob. Pushing it a second time will swap the standby frequency with the active. For the transponder side key, it will change between OFF, STBY, and ON ALT modes.
2. **IDENT KEY** (momentary action) Click to activate. Clicking this will send the IDENT signal through the transponder. ID will display on the ATC1 screen
3. **TUNE KNOB** (rotary action) Contains 4 separate click spots, Two on each knob section. Two knobs, one large, one small for turning speeds. Will allow turning of highlighted frequency. For transponder code changes, the large knob will change the left numbers and the smaller knob will change the right numbers.

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ENGINE AND SYSTEM CONTROL PANEL



1. MFD1 Selector (rotary Action, 3 positions) Click to cycle between NAV, SYS, and ENG. PFD not simulated. NAV is default and will display the NAVigation screen on MFD1. SYS is the second, and will initially show you the ELECTrical display, which then you can select different systems from the system select soft keys. ENG displays a digital ENGINE display on the MFD1.
2. MFD2 Selector (rotary Action, 3 positions) Click to cycle between NAV, SYS, and ENG. PFD not simulated. NAV is default and will display the NAVigation screen on MFD2. SYS is the second, and will initially show you the ELECTrical display, which then you can select different systems from the system select soft keys. ENG displays a digital ENGINE display on the MFD2.
3. ED brightness knob. Click hold and drag to adjust the brightness of the Engine Display. This also controls the FMS and ARCDU panels.
4. ELEC SYS PUSHBUTTON (momentary action) Clicking this provides a display of the electrical system page on the MFD with MFD selector set at SYS.
5. ENG SYS PUSHBUTTON (momentary action) Clicking this provides a display of the composite engine system page on the MFD with MFD selector set at SYS.
6. FUEL SYS PUSHBUTTON (momentary action) Clicking this provides a display of the fuel system page on the MFD with MFD selector set at SYS.
7. DOORS SYS PUSHBUTTON (momentary action) Clicking this provides a display of the door system page on the MFD with MFD selector set at SYS.
8. ALL PUSHBUTTON (momentary action) If MFD selector is set to SYS, repeated selection of the ALL pushbutton causes the MFD display to cycle though the following page displays. ENG, FUEL, DOORS, ELEC, ENG, etc.

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DASH 8 Q400



CREDITS

Jack Skieczius :

- *Primary simulation development, including, 3d models, flight model, texture, animations, systems, and manual.*

Joe Vermeulen :

- *Primary flight testing, sound development and quality control.*

Unnamed Q400 Pilot :

- *Provide a source of information for all Q400 systems. High resolution reference images, and measurements.*

Jesse J Patchett :

- *Secondary flight tester. Provided reference videos.*

SPECIAL THANKS TO:

Austin Meyer, Ben Supnik and the rest of the Laminar team for creating X-Plane.

Ben Russell for creating Gizmo.

Bombardier, for the original real world aircraft.

Peter Wilson, for providing aircraft images.

Brett Wingerter, for providing images of the Horizon livery.

X-Plane.org and X-Pilot communities, for providing support and great feedback.

Porter Airlines, for having incredibly supportive staff in their Flight Ops, Ground Services and Maintenance departments.

Our parents, for putting up with us.

Jason Clark, for initial landing gear model.

Dan Klaue, for creating great tutorial videos on how to make planes for X-Plane.

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