ForeFlight
Intelligent Apps for Pilots™

ICAO Filing with ForeFlight:
Quick Reference Guide

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Common Aircraft ICAO Codes

The following tables provide a list of the most common ICAO codes and a brief explanation of each. These tables are a general aid for entering filing codes in ForeFlight, and are not an authoritative or comprehensive equipment specification. Consult the AFM or AFM supplements for your aircraft to determine which codes are actually appropriate before attempting to file using ForeFlight.

	Code	Capability	Explanation
ICAO Equipment	S	VOR, VHF RTF, ILS	All aircraft should have this.
	D	DME	Most aircraft should have this.
	G	GNSS	Any form of installed GPS capability (WAAS or non-WAAS) that is approved for IFR. Required for all RNAV routes and sufficient for some.
	B	LPV (ABV with SBAS)	Select this if your GPS is capable of flying LPV approaches using WAAS.
	R	PBN Approved	Select this if you specify any ICAO PBN codes.
ICAO Surveillance	C	Modes A and C	All aircraft should have this. You may specify a different code that more closely matches the capabilities of your aircraft, but doing so will not affect clearances or handling by ATC.

	Code	Capability	Explanation
ICAO PBN	B2	RNAV 5 GNSS / B-RNAV	Allows point to point navigation using GPS. All fully IFR-certified GPS avionics systems are approved for this.
	C2	RNAV 2 GNSS	Needed to file Q and T routes or any RNAV route. Most GPS avionics systems are approved for this.
	D2	RNAV 1 GNSS / P-RNAV	Required for RNAV SIDs and RNAV STARs using a GPS sensor. Any WAAS GPS avionics system will have this capability - if you selected Equipment code B then you can select this. Non-WAAS systems must be researched in AC 90-100A to determine eligibility, the supporting document for AC 90-100A and your aircraft AFMS. Part 91 pilots should understand AC 90-100A, section 11, Knowledge Requirements.

Domestic to ICAO Conversion Table

If you're currently filing with the FAA/Domestic flight plan form, you can easily configure your aircraft with equivalent ICAO codes using the table below.

/A	ICAO Equipment: S, D ICAO Surveillance: C		**/P**	ICAO Equipment: T ICAO Surveillance: C
/B	ICAO Equipment: S, D ICAO Surveillance: A		**/S**	ICAO Equipment: S, G ICAO Surveillance: A
/C	ICAO Equipment: S ICAO Surveillance: A		**/T**	ICAO Equipment: S ICAO Surveillance: A
/D	ICAO Equipment: S, D ICAO Surveillance: N		**/U**	ICAO Equipment: S ICAO Surveillance: C
/G	ICAO Equipment: S, G ICAO Surveillance: C		**/V**	ICAO Equipment: S, G ICAO Surveillance: N
/H	ICAO Equipment: S, W ICAO Surveillance: A		**/W**	ICAO Equipment: S, W ICAO Surveillance: C
/I	ICAO Equipment: S ICAO Surveillance: C		**/X**	ICAO Equipment: S ICAO Surveillance: N
/L	ICAO Equipment: S, G, W ICAO Surveillance: C		**/Y**	ICAO Equipment: S ICAO Surveillance: N
/M	ICAO Equipment: T ICAO Surveillance: N		**/Z**	ICAO Equipment: S, W ICAO Surveillance: C
/N	ICAO Equipment: T ICAO Surveillance: A			

ICAO Equipment Codes

Radio Communication, Navigation, and Approach Aids

Choose **N** (NIL) if no Comm/Nav/approach aid equipment for the route to be flown is carried, or if the equipment is unserviceable;
OR choose **S** (Standard) if the aircraft has VHF RTF, VOR, and ILS within U.S. domestic airspace, and/or choose any other applicable from the list below:

A	Ground Based Augmentation System (GBAS) landing system (Not available GA)	**B**	Localizer Performance with Vertical guidance: LPV (APV with SBAS)	**C**	LORAN C Not in USA
D	DME	**F**	ADF	**G**	GNSS
H	HF COM	**I**	Inertial Navigation	**K**	MLS - Not in US
L	ILS (don't specify if S is selected)	**O**	VOR (don't specify if S is selected)	**R**	Performance Based Navigation (PBN) Approved.
T	TACAN	**U**	UHF COM	**V**	VHF COM (don't specify if S is selected)
W	RVSM	**X**	Minimum Navigation Performance Specifications (MNPS) Approved	**Y**	VHF 88.3 kHz spacing Only needed in Europe
Z	Other Information (specify on Flight Plan form when COM/, DAT/ or NAV/ is specified)				

Controller Pilot Data Link Communication (CPDLC) Equipment

Choose applicable option(s) for your aircraft. If you don't know what one of these is, you should not select it.

P1	CPDLC RCP 400	**P2**	CPDLC RCP 240	**P3**	SATVOICE RCP 400
J1	CPDLC ATN VDL Mode 2	**J2**	CPDLC FANS 1/A HFDL	**J3**	CPDLC FANS 1/A VDL Mode 4
J4	CPDLC FANS 1/A VDL Mode 2	**J5**	CPDLC FANS 1/A SATCOM (INMARSAT)	**J6**	CPDLC FANS 1/A SATCOM (MTSAT)
J7	CPDLC FANS 1/A SATCOM (Iridium)				

Aircraft Communication addressing and Reporting System (ACARS) & SATCOM Communication Equipment

Choose applicable options(s) for your aircraft. If you don't know what one of these is, you should not select it.			
E1	Flight Management Computer (FMC) Waypoint Reporting ACARS	**M1**	ATC RTF SATCOM (INMARSAT)
E2	Datalink Flight Information System (DFIS) ACARS	**M2**	ATC RTF (MTSAT)
E3	Pre-Departure Clearance (PDC) ACARS	**M3**	ATC RTF (Iridium)

ICAO Surveillance Codes

Transponder

Choose **N** (NIL) if no operable transponder; OR choose one of the following:					
A	Mode A (i.e.: no Mode C), 4 digits - 4096 codes	**C**	Mode A, 4 digits - 4096 codes **and Mode C**	**E**	Mode S, including aircraft identification, pressure altitude, **and** Extended Squitter (ADS-B)
H	Mode S, including aircraft identification, pressure altitude, **and** enhanced surveillance capability*	**I**	Mode S, including aircraft identification **and** enhanced surveillance capability*, but **no** pressure-altitude capability	**L**	Mode S, including aircraft identification, pressure-altitude, Extended Squitter (ADS-B), **and** enhanced surveillance capability*
P	Mode S, including pressure-altitude **but no** aircraft identification capability	**S**	Mode S, including pressure-altitude **and** aircraft identification capability	**X**	Mode S, without pressure-altitude **or** aircraft identification capability

*: Enhanced surveillance capability is the ability of the aircraft to downlink aircraft FMS derived data such as Selected Altitude, Roll Angle, True Track Angle and Track Angle Rate and other parameters via a suitable Mode S transponder. You should only specify this capability if your transponder is capable and, just as important, the data is provided to the transponder in a digital format. Check with your avionics installer or refer to the aircraft AFMS if you are unsure.

ADS Equipment

If aircraft is equipped with ADS-B or -C, choose one column per applicable row(s):				
B1	ADS-B with dedicated 1090MHz Out **only**	or	**B2**	ADS-B with dedicated 1090MHz Out **and** In
U1	ADS-B with dedicated 978MHz UAT Out **only**	or	**U2**	ADS-B with dedicated 978MHz UAT Out **and** In
V1	ADS-B Out **only** using VDL Mode 4	or	**V2**	ADS-B Out **and** In using VDL Mode 4
And if your aircraft is equipped with Automatic Dependent Surveillance Contract (ADS-C), also choose one of the following:				
D1	ADS-C with FANS 1/A capability	or	**G1**	ADS-C with ATN capabilities

For example, if your aircraft is equipped with ADS-B Out on 1090ES only, choose B1. If your aircraft has ADS-B Out & In on 1090ES and 978, choose B2 and U2.
IMPORTANT: an iPad + ADS-B portable receiver does not "count" for ADS-B In.

CODE/ and SUR/ Values (Other Information)

CODE/	Mode S code (6 characters, hexadecimal) requested by ATC to differentiate aircraft using the same transponder squawk code. You can find this code by searching for you aircraft's tail number in the FAA's registry (http://registry.faa.gov/aircraftinquiry/ nnum_inquiry.aspx). It is listed under "Aircraft Description" as "Mode S Code (base 16 / hex)". **Do not use the "(base 8 / oct)" code.**
SUR/	Surveillance capability not specified in ICAO Surveillance section. If ADS-B capability is compliant with RTCA DO-260B (meaning you have specified **B1** or **B2** *and* the system is 2020 compliant), enter 260B. If you don't know whether your ADS-B system is 2020 compliant **do not specify 260B**. Check with the avionics installer or use the FAA's "Public ADS-B Performance Report Request" web page (https:// adsbperformance.faa.gov/PAPRRequest.aspx) to determine the status of your ADS-B Out system. If you can specify this value, it is advised that you do so as you will be able to obtain preferential routes when there are radar outages or when the route does not have radar coverage.

ICAO Performance Based Navigation (PBN) Codes

Area Navigation (RNAV) Capabilities

Choose applicable option(s) for your aircraft. If you don't know what one of these is, you should not select it. **IMPORTANT: Do not select more than 8 PBN options.**			
A1	RNAV 10 (RNP 10) Need to specify G or I or both as required. Needs an LOA	**C1**	RNAV 2 all permitted sensors Need to specify G, D, and I equipment codes
B1	RNAV 5 all permitted sensors Need to specify G, D, O or S, I Equipment codes	**C2**	RNAV 2 GNSS Need to specify G Equipment code
B2	RNAV 5 GNSS Need to specify G Equipment code	**C3**	RNAV 2 DME/DME Need to specify D Equipment code
B3	RNAV 5 DME/DME Need to specify D Equipment code	**C4**	RNAV 2 DME/DME/IRU Need to specify D and I equipment code
B4	RNAV 5 VOR/DME Need to specify D and (O or S)	**D1**	RNAV 1 all permitted sensors Need to specify G, D, and I equipment codes
B5	RNAV 5 INS or IRS Need to specify I equipment code	**D2**	RNAV 1 GNSS (means your aircraft can fly RNAV SIDs and STARs) Need to specify G Equipment code
B6	RNAV 5 LORAN C (No longer used)	**D3**	RNAV 1 DME/DME Need to specify D Equipment code
		D4	RNAV 1 DME/DME/IRU Need to specify D and I equipment code

Required Navigation Performance (RNP) Capabilities

	Choose applicable option(s) for your aircraft. If you don't know what one of these is, you should not select it. **IMPORTANT: Do not select more than 8 RNAV + RNP options.**		
L1	RNP 4; Need to specify G Equipment code; Requires an LOA	**S1**	RNP APCH (aka GPS approach - LNAV min); Need to specify G equipment Code
O1	RNP 1 all permitted sensors; Need to specify G, D, and I equipment codes	**S2**	RNP APCH with BARO-VNAV (aka RNAV (GPS) approach with LNAV/VNAV min; Need to specify G equipment code
O2	RNP 1 GNSS; Need to specify G Equipment code	**T1**	RNP AR APCH with RF (special authorization required); Need to specify G Equipment code LOA Required
O3	RNP 1 DME/DME; Need to specify D Equipment code	**T2**	RNP AR APCH without RF (special authorization required); Need to specify G Equipment code; LOA Required
O4	RNP 1 DME/DME/IRU; Need to specify D and I equipment codes		

Additional Resources

- **Filing with ForeFlight Mobile Guide** - Dedicated guide on setting up aircraft with ICAO codes and filing

- **AC 90-100A** - FAA guidance on terminal and enroute RNAV operations

- **AC 90-100 Compliance Matrix** - Extensive list of avionics systems and approved RNAV/RNP capabilities of each

- **AC 90-101A** Approval Guidance for RNP Procedures with AR

- **AC 90-105A** Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System and in Oceanic and Remote Continental Airspace

- **Cessna "Performance Based Navigation (PBN)" Technology Briefing, Revision 2** - Explanation of RNAV and RNP technologies and tables listing Citation, Beechcraft, and Hawker aircraft models and approved RNAV/RNP capabilities

Quick Tips: How to Avoid Common Equipment Code Errors

1. Don't over-specifying PBN codes. Remember there is a maximum of 8 PBN codes permitted.

2. Don't specify A1 or L1 without a Letter of Authorization from the FAA. Be sure you have proper FAA authorization (where applicable) for the procedures you are filing for.

3. When specifying a PBN code, be sure to also specify R (Code for Performance Based Navigation (PBN) Approved) and the associated sensors that the PBN code requires. For example, PBN Code D2 is RNAV 1 using GPS, therefore Equipment Code G (GNSS) must also be specified.

4. Don't specify a PBN code when you really don't have the equipment. For example, selecting B1, C1, and D1 indicates you have all the sensors and you are required to specify an INS, DME-DME, and GPS in the ICAO equipment. Aircraft that are not equipped with INS and DME-DME systems should not specify B1, C1, or D1.

5. When specifying an ADS-B code of B1, B2, U1, or U2, or an ADS-C code, be sure to also specify a transponder code. A transponder code must always be selected, regardless of whether an ADS-B or ADS-C code is specified. For example, B1 by itself is invalid. But "B1, E" is valid, so is just E.

6. Don't forget that flight plans using RNAV SID/STAR need to file with D2 or D4 or the flight plan will likely be rejected. D4 requires DME-DME and INS. D2 requires GPS. You'll need to check the procedure chart for requirements as some procedures only allow filing if PBN code D2 is specified.

Quick Tips: Preventing Common Filing Errors

1. When filing with ForeFlight for the first time, make sure you specify your N number including the N. In the US, if the tail number begins with a number, then you must file using an optional call sign which always begins with an alpha character. When you file using a call sign, ForeFlight will copy your tail number to the REG/ field in field 18 (Other information). For example, if your N number is N12345 and your call sign is FFL025, FFL025 will be in the Aircraft ID field of the flight plan and REG/N12345 will be in Other Information. You are then known to ATC as FFL025, or ForeFlight Zero Two Fife.

2. Use the Route Advisor tool (on Maps or Flights view) to select your route and use Procedure Advisor (on Maps) to enter departure and arrival procedures. This ensures that when you send a route to Flights or Proceed to File, the syntax is correct and any waypoints that need to be converted to a lat/lon will be converted using the proper format for filing. Route Advisor and Procedure Advisor help prevent errors that could be introduced from manually typing route and procedure strings.

3. Don't worry, ForeFlight handles: non-ICAO airport identifiers and using the quad Z (ZZZZ), as well as adding DCT (following the ICAO rules).

4. Filing an RNAV SID/STAR in a NAS/Domestic flight plan will get rejected. To remedy, delete the SID or STAR or, better yet, file with the ICAO flight plan format and the appropriate PBN code (usually D2).

5. Filing a SID without a transition fix that is specified in the SID or on the common route. SIDs must always be the very first entry in a route, the departure airport must be valid and not a point, and the SID must have the transition fix specified either with a dot or without one. For example, "KCLT" must be the departure airport and BARMY3.BARMY or NUTZE, RDU, or TYI may be used as the first item in the route. If you just file BARMY3, whatever you enter next in the route will be interpreted as the transition fix and, if not a valid one, will result in a rejection.

6. Filing a STAR without a transition fix that is specified on the STAR or on the common route. STARs must be the last element in the route and preceded by the transition fix. The destination must be a valid airport identifier. For example, filing the PARQ3 STAR at KCLT the route must end with PARQ3 and the STAR must be preceded by one of the transition fixes that are on the common route. If you don't file an appropriate transition fix, ATC will interpret the fix just prior to the STAR as the transition fix and, if it is not valid, the flight plan will be rejected.

7. Don't file to Computer Navigation Fixes. These are indicated on procedures and charts inside parenthesis, start with CF, and are not pronounceable.

8. Don't file using a ILS DME Localizer fixes such as IUZA.

9. In Alaska, don't include an airport in the route field for any flight plan that enters Alaskan airspace.

10. Also in Alaska, routes that cross into or out of Canadian airspace must include a fix inside Canadian airspace within 10 minutes flying time of the Alaska airspace boundary. This can be a lat/lon fix added to a direct route.

11. In Cuba, overflight of Cuban airspace without specifying an alternate airport regardless of weather will get rejected by Cuba.

12. In Honolulu, once you have filed, you can't cancel, amend, or delay your flight plan without calling Honolulu center directly.

13. Do not add a K to non-ICAO airport identifiers, so 35A is not K35A. The latter will be rejected by ATC.

14. Duplicating the departure or destination airport identifier in the route string will result in ATC rejecting the route.

15. All ATC routes (eg: V, T, Q, J, etc) should be coded with an entry fix on the airway, followed by the route designation, followed by the last fix on the route where you are going to exit the route.

16. Avoid using any fixes on an approach that are not an IAF as they are high risk to not being known by the ATC computer. Stick to using waypoints that are in the enroute system and found on an enroute chart.

17. Avoid using two character identifiers for LOM. Many of these are not adapted by ATC computers and will get rejected. Instead, use the 5 character waypoint name.

18. With VORs being decommissioned, in some cases airways are being broken into segments. Each segment needs to be filed using its own entry and exit fixes and you must have a leg you can navigate between the breaks in the segments. If you file across the break, then ATC will reject your route. This can also apply for NOTAMs that indicate that certain fixes are not available due to a decommissioned VOR.

19. Avoid filing from a fix such as a VOR, especially near Center boundaries or your flightplan may get rejected as Centers have private agreements with each other for airspace coverage and will reject flightplans that they don't cover. It is always better to file from an airport and pick up your flightplan in route, with the same Center or TRACON that owns the airport. All airports are assigned a Center (in a published table), so filing from an airport will get routed to the correct center. A table does not exist to indicate Center assignments for VORs and waypoints, so ownership is determined by the Center boundaries.

20. Avoid Filing any SID or STAR that is ATC only by NOTAM or there is a chart note to the effect "Assigned by ATC only."

21. As a jet flier, do not file procedures that are for Prop or Turboprop Only and vice versa.

22. Don't file the destination airport as an alternate.