Notes on the ICAO 2012 Flight Plan changes for PPL/IR Europe members

Important note: **This paper supplements the formal guidance available on the new flight plan system. It is does not cover "all you need to know", so you must refer to a complete, formal source: for example, UK AIC Yellow 099 2012. In addition, the specifics of RNAV/RNP/PBN capability are detailed in the Eurocontrol Guidance document here:**
http://www.eurocontrol.int/sites/default/files/content/documents/nm/flight-planning/icao-2012/icao-2012-guidance-latest.pdf

New codes for FPL Item 10a

The long list of Equipment and Capability codes might appear confusing. Many are unlikely to be relevant to light aircraft; these are greyed out in the table below. Obviously, if you have an advanced turbine aircraft or specialised equipment, you need to check the grey boxes in detail.

S if standard COM/NAV/approach aid equipment for the route to be flown is carried and serviceable

Code	Description	Code	Description
A	GBAS landing system	J7	CPDLC FANS 1/A SATCOM (Iridium)
B	LPV (APV with SBAS)	K	MLS
C	LORAN C	L	ILS
D	DME	M1	ATC RTF SATCOM (INMARSAT)
E1	FMC WPR ACARS	M2	ATC RTF (MTSAT)
E2	D-FIS ACARS	M3	ATC RTF (Iridium)
E3	PDC ACARS	O1	VOR
F	ADF	P1-P9	Reserved for RCP
G	GNSS (See Note 2)	R	PBN approved (see Note 4)
H	HF RTF	T	TACAN
I	Inertial Navigation	U	UHF RTF
J1	CPDLC ATN VDL Mode 2 (See Note 3)	V	VHF RTF
J2	CPDLC FANS 1/A HFDL	W	RVSM approved
J3	CPDLC FANS 1/A VDL Mode 4	X	MNPS approved
J4	CPDLC FANS 1/A VDL Mode 2	Y	VHF with 8.33 kHz channel spacing capability
J5	CPDLC FANS 1/A SATCOM (INMARSAT)	Z	Other equipment carried or other capabilities (see Note 5)
J6	CPDLC FANS 1/A SATCOM (MTSAT)		

The remaining codes are relatively straightforward, with a few rules to remember

(i) If you have VHF radio and VOR and ILS equipment, use the entry "S" as your <u>first</u> entry. If you use "S", do not enter any duplicates, ie. "V" or "L" or "O1"

(ii) Enter any additional codes that apply to you from the table, in alphabetical order

(iii) Since the codes indicate Capability as well as Equipment, only use a code if you are formally "capable". For example, code "B" refers to LPV approaches. Only use "B" if you are capable of complying with the requirements for LPV minima (typically, a Flight Manual supplement approving your GPS installation for LPV is needed). If you have the equipment fitted but not the formal AFM entry, omit the code

(iv) If you have an approved GPS installation, enter code "G". If at least one is an EGNOS/WAAS unit, note that you should indicate the type of augmentation in Item 18 with the entry "NAV/SBAS"

(v) If you have any approved capability for area navigation, enter code "R". That could be B-RNAV, P-RNAV or GPS approach approval. This will mostly be through GPS equipment, but an aircraft with B-RNAV approval based on Rho-Theta equipment (eg. a KNS80) should also use code "R".

(vi) If you are 8.33kHz capable, use code "Y"

(vii) You should only use the "D" (DME) and "F" (ADF) codes if you have the actual equipment, GPS-derived 'equivalent' capability does not count for this purpose.

Note that without the "R" entry, your FPL will be rejected for any IFR route or airspace requiring BRNAV. But, with an "R" entry, your FPL must detail your area navigation capabilities in item 18 with a "PBN/" entry, explained below. An FPL with "R" in Item 10 but not the corresponding "PBN/" in Item 18 will also be rejected.

New codes for FPL Item 10b

For most IFR-capable light aircraft, the 10b entry for Surveillance (Transponder) equipment will be "S", for Mode S with Pressure Altitude and Aircraft Identification. If you have an advanced installation (eg. ADS-B, or Enhanced Mode S in a faster turbine aircraft) see formal references for the appropriate code.

New codes for FPL Item 18

The key new requirement is to specify Performance-Based Navigation (PBN) capabilities in Item 18 with a "PBN/" entry followed by the appropriate codes. The terminology may be confusing, so it is worth a quick overview:

Area Navigation ("RNAV") was originally implemented at a regional level, with some variation in standards and completely non-standardised names. For example, Europe developed the "B-RNAV" standard, with a Required Navigation Performance (RNP) of +/- 5nm for 95% of flight time. "MNPS" is used in the North Atlantic. Approaches using area navigation are charted with a host of different names (GPS Rwy X, RNAV Rwy X, RNAV (GPS) Rwy X, RNAV(GNSS) Rwy X etc etc).

ICAO's PBN Manual has introduced new standards and terminology. Firstly, PBN is the "umbrella" term for all things that we used to call Area Navigation. Secondly, there are two main classes now of PBN standards
- RNAV, without a requirement for performance monitoring
- RNP, with a requirement for performance monitoring

The track-keeping requirement is still measured in NM for a particular standard, but the term "RNP" is no longer used in the narrow sense of "within Xnm 95% of the time", but more generally for a PBN standard with the performance monitoring requirement.

The "old" European B-RNAV standard complies with the "new" definition of RNAV 5, but not that of "RNP 5", because B-RNAV does not have a requirement for performance monitoring. *(Performance monitoring is the ability for navigation equipment to detect and alert the pilot if certain performance criteria are not met. Generally, GPS units are RNP capable (eg. through internal calculation of satellite geometry/dilution of precision and through RAIM or SBAS integrity checks) but, for example, radio aids are not, eg. a KNS80 RNAV unit based on VOR-DME cannot autonomously alert a user to an erroneous VOR signal)*

Amongst the codes available for Item 18 "PBN/", only three are likely to be relevant for lighter aircraft

B2 if you are B-RNAV (ie. RNAV 5 in the new terminology) capable using GPS (**B4** if you are B-RNAV capable using VOR-DME)

D2 if you are P-RNAV (ie. RNAV 1 in the new terminology) capable using GPS. *P-RNAV is not strictly compliant with RNAV 1, but Eurocontrol has deemed that it be treated as such for the purpose of Item 18 coding. This means that if you fly outside the European (ECAC) region, you should check if you are ICAO RNAV 1 compliant before filing "D2". Note also that the FAA stipulates additional Item 18 codes for flights in the USA, see the FAA's AIM.*

S1 if you are approved for GPS approaches (ie. RNP APCH in the new terminology), whether LNAV-only or LPV. *However, in the case of LPV approval, you would also include "B" in Item 10.*

The entry in Item 18 "PBN/" includes
- <u>All</u> the codes for PBN capability for that particular flight (up to a max of 8, ie. 16 characters)
- In alphabetical order
- Without spaces

For the sake of clarity, you do not enter only the code for your "highest" capability. For example, if P-RNAV and B-RNAV approved, you include "B2D2", not just "D2".

For example, a light aircraft with a Garmin 430 (non-WAAS) installed that is approved for B-RNAV and GPS approaches but not P-RNAV would have the following entry: "PBN/B2S1"

In addition, if you entered "G" in Item 10, to designate GPS equipment and you have an SBAS (ie. WAAS/EGNOS) installation, you should enter "**NAV/SBAS**" also in item 18. *The other form of augmentation is GBAS (Ground-based) – this is not yet available for light aircraft.*