Advanced Generic Presets for use with Sim Randomizer 3

1. Introduction

Representing many of the features of Sim Randomizer 3, these presets are intended to provide random variations for departures and arrivals at any airport.
There are SIDs and STARs, shortcuts, direct clearances, speed restrictions, high speed approaches and visual approaches at pilot's discretion as well as varied speed assignments on the approach.

Different presets for small (few traffic), medium (medium traffic) and large (heavy traffic) airports are provided, furthermore for airports in the vicinity of high terrain.
Another difference is made regarding the type of the STAR (published procedure as transition to final approach or ATC vectors to final approach after STAR).

To illustrate the use of these presets a sample (return-) flight KSFO-KLAS-KSFO is elaborated.

As an outlook, procedure-specific presets for KLAS and KSFO are included also.

The presets were designed for an Airbus A320, but should work with all jet airliners. For turboprops some of the values might have to be adjusted.

Even though I tried to depict what I imagine could be fairly realistic, these presets do not in any way claim to be compliant with real world ATC-regulations.

2. Installation and Setup

2.1 **Installation**

2.1.1 Optional (only needed if you want to do the sample flights): Put the pln files into your sim's documents folder (e.g. ...documents\prepar3d v3 files) where all the other flightplans are saved. Put the jpg files wherever you want.
2.1.2 Put the other files in your SimRandomizer 3 folder.
2.1.3 Open Randomizer PF3.ini in notepad (or similar) and change the first part of the [presets] section as follows:

[Presets]

INIdeparture=AGP_departures.ini
INIarrival=AGP_arrivals.ini
INIairlines=AGP_airlines.ini
;//INI files for departure, arrival and airlines presets. This enables you to use your custom files or try presets shared by other users.

2.2 **Basic Setup of PF3 for use with these presets:**
The following aspects of the PF3-ATC are affected by these presets:

2.2.1 The Holding Probability
This is the "% probability of Hold (if selected)" value on the Options#1 page of PF3.

A different percentage interval is set for small, medium and large airports. There is an interval for the holding percentage so you will have a different holding probability on every flight. You can see the actual value on the Randomizer User Interface - regard that as an estimation of the current traffic situation.

To use this feature you have to assign a "Hold" waypoint on the "Adjust Altitudes, SIDs, STARs and Holds for Selected Flight Plan" page of PF3 for the actual Flight Plan.

2.2.2 The Probability of being cleared for a standard procedure instead of being vectored
This is the probability for the SID / STAR option to be ticked on the "SIDs / STARs" page of PF3.

Again there is an interval for the probability to provide a different estimate of current traffic conditions on every flight – appearing on the Randomizer User Interface.

2.2.3 Variations of the Standard Procedure
This is the name of the Standard Procedure entered on the "SIDs / STARs" page of PF3.

To use this feature the "If no SID / STAR name entered use" checkboxes have to be ticked and no specific names are to be entered for the relevant airport / runway on the "SIDs / STARs" page of PF3 because those would override the randomized name.

2.2.4 The Final Approach Speed
This is the speed ATC slows you down to when approaching the FAF.

Even though not documented in the Randomizer's User Manual, this value can now be randomized with the Randomizer.

To use this feature you have to tick the checkbox "Final App Speed" on the "Advanced Options and INI File Tweaks" page of PF3 (under Options#2).
Furthermore you must not include an Approach Speed in the Flight Profile Preset on the "Select a Flight Plan" page of PF3 because that would override the randomized value of the "Advanced Options and INI File Tweaks" page.

The specified speed is added to the Flaps_Up_Stall_Speed of the respective aircraft.cfg file.
For example: Flaps_Up_Stall_Speed = 142 kts (Airbus A320)
Speed Range = 10 – 60 kts
resulting speed restriction = 150 – 200 kts.

2.3 **Setting up Randomizer**

2.3.1 In Randomizer PF3.ini set RandomizeHold=0, because it would override the preset setting.

2.3.2 If using MCE it is recommended to set AnnounceVectors=0 in Randomizer MCE.ini to have one more element of uncertainty.

2.3.3 When running Randomizer always set the procedures to *Random*.

3. Considerations on flightplanning and setting up PF3 for the Flight Plan
As generally when using PF3 a thorough flightplanning is essential to get the most out of PF3, the Randomizer and these presets.

3.1 The flightplanning should include choosing a SID and a STAR for every possible runway. Those will be needed when getting a clearance for a standard procedure.
It should be worked out what kind of STAR is to be used:
- wether the STAR is runway specific or not,
- wether a published procedure to the final approach has to be flown after the STAR or vectoring is to be expected after the STAR.

3.2 Are the SID and STAR waypoints to be included in the flightplan that is loaded into PF3?

3.2.1 The SID waypoints should never be included in the flightplan loaded into PF3 with these presets. Otherwise a Direct clearance to the end of the SID would be a problem because PF3 would still expect every waypoint to be reached.
The first waypoint of the flightplan loaded into PF3 should be the exit of the SID (the transition to the airway).

3.2.2 With the STAR waypoints it depends:

3.2.2.1 With STARs that are runway specific (leading to a final approach for specific runways) you should not include these waypoints in the flightplan loaded into PF3. Otherwise a runway change due to weather (involving a different STAR) would become a problem as well as a clearance Direct to the FAF, because PF3 would expect every waypoint of the STAR to be reached. The last waypoint of the flightplan loaded into PF3 should be the entry to the STAR (the transition from the airway to the STAR).

3.2.2.2 With STARs that are not runway specific and lead to a waypoint from where either a published transition procedure to the final approach begins or ATC vectoring is to be expected, the STAR waypoints should be included in the flightplan loaded into PF3. The last waypoint of the flightplan loaded into PF3 should be the last waypoint of the STAR after which a transition to a final approach begins or vectoring is to be expected.

3.3 On the “Adjust … Flight Plan” page of PF3

- the altitudes should be compared to the actual charts and be adjusted accordingly.
- a holding should be assigned according to the charts or at the last waypoint,
- an End of SID and a Start of STAR do not need to be assigned with these presets.

4. The Variations of the Standard Procedures

The following abbreviations are used for the varied Standard Procedures.
They are compliant with the Randomizer Unified Naming System, so MCE users will be able to hear the procedure name in plain english. It is highly recommended to use this feature and create some corresponding voicescripts in MCE.
All altitudes will be in the format of a flight level in PF3 – regardless of the transition altitude. MCE users will always hear the altitude in feet.

4.1 Departure

4.1.1 Standard Departure: S

You are cleared to fly the planned **S**ID of your (your airline's, your dispatcher's, your flightplanning software's etc…) choice.

4.1.2 Standard Departure with Shortcut: SC

You are cleared to fly the planned **S**ID and are allowed to take a short**C**ut in the course of the SID when and how it is safe and reasonable to save some distance, for example with a long outbound leg.

4.1.3 Standard Departure with speed restriction: SK<knots>A<Flight Level>

You are cleared to fly the planned **S**ID, but your speed (in **K**nots) is restricted until you reach a specified **A**ltitude.
The speed ranges from 180 kts to 240 kts, the altitude from 5000 ft to 15.000 ft. (FL050 to FL150).
Example: SK210A060 = Cleared via planned SID, maintain 210 kts to FL060.

4.1.4 Standard Departure, Direct to End of SID above specified altitude: SA<Flight Level>XE

You are cleared to fly the planned **S**ID; when you reach a specified **A**ltitude you are cleared to proceed direct (**X**) to the **E**nd of the SID (corresponding to the first waypoint of the flightplan loaded into PF3).
Altitude ranges from 5000 ft. to 12.000 ft. (FL050 to FL120).
Example: SA080XE = Cleared via planned SID, at FL080 cleared direct to end of SID

4.1.5 Runway heading, Direct to End of SID above specified altitude: RA<Flight Level>XE

You are cleared to fly the **R**unway heading until you reach a specified **A**ltitude, then proceed direct (**X**) to the **E**nd of the SID.
Altitude ranges from 1000 ft. to 5.000 ft. (FL010 to FL050).
Example: RA040XE = Runway heading, at FL040 cleared direct to end of SID

4.2 Arrival

4.2.1 Standard Arrival: S / Standard Arrival, Transition: ST

You are cleared to fly the planned **S**TAR or final approach **T**ransition of your (your airline's, your dispatcher's, your flightplanning software's etc…) choice.
The variations "Standard Arrival" or "Standard Arrival, Transition" are intended for airports that have several different arrival procedures, for example one via a VOR and one via an RNAV transition. "Standard Arrival, Transition" means you should take the RNAV transition (or the longer variant). "Standard Arrival" means the VOR (or the shortest possible procedure). If there is only one procedure at the airport both variants are equal.

4.2.2 Standard Arrival (,Transition) with Shortcut: SC / STC

You are cleared to fly the planned **S**TAR or final approach **T**ransition (see above) and are allowed to take a short**C**ut in the course of the procedure when and how it is safe and reasonable to save some distance, for example with a long downwind transition.

4.2.3 Direct to FAF: XE

You are cleared direct (**X**) to the final approach fix (i.e. the **E**nd of the STAR / Transition).

4.2.4 High Speed Approach: S/SC/XE K(<knots>)D<miles from runway>

All of the above three can be combined with a high speed (in **K**nots) approach to a certain **D**istance to the runway.
You will either be assigned a certain distance to the runway you have to maintain the last speed assigned by PF3-ATC (for large airports) or you will be assigned a specific speed you have to maintain until a certain distance to the runway (small and medium airports). Occasionally (at medium airports only) PF3-ATC might overrule this speed by assigning you a lower speed than that. In that rare case you again have to maintain the last speed assigned by PF3-ATC until the given distance to the runway.

The speed range is 160 kts to 190 kts or 20 kts to 50 kts above Flaps_Up_Stall_Speed. The distance ranges from 5 nm to 7 nm from the runway.
These values might have to be adjusted according to the aircraft in use – and to personal preference.
The most extreme High Speed Approach would be 190 kts (or 50 kts above Flaps_Up_Stall_Speed) to 5 miles from the runway. If your aircraft cannot safely slow down to Vapp and be stabilized on the approach in time, you should either reduce these speed values in the presets – or practice some go-arounds...

Example:SK170D5 = Cleared via planned STAR, maintain 170 kts to 5 miles from the runway.

4.2.5 Visual / at pilot's discretion: Y

You are cleared to fly a visual (in VFR conditions) or any instrument (in IFR conditions) approach at **Y**our discretion.

5. The Presets

DEPARTURE:	ARRIVAL:
^ High Terrain – Small Airport	^ High Terrain – Small Airport
^ High Terrain – Medium Airport	^ High Terrain – Medium Airport
^ High Terrain – Large Airport	^ High Terrain – Large Airport
* Small Airport	* Procedure – Small Airport
* Medium Airport	* Procedure – Medium Airport
* Large Airport	* Procedure – Large Airport
	- Vectors – Small Airport
	- Vectors – Medium Airport
	- Vectors – Large Airport

5.1 High terrain

If there is high terrain in the vicinity of the airport that might get in the way when being vectored (PF3 does not know the terrain and thus will vector you right into a mountain in the worst case), choose one of the „High Terrain“ presets.
With these presets vectoring is precluded for departures and minimized for arrivals.
In the rare case you will be vectored on arrival in the vicinity of high terrain, remember it is the pilot's responsibility to always maintain situational awareness. If you are unable to comply with a given vector due to terrain you have to request a clearance to the final approach and then fly the approach at pilot's discretion.

If there is no high terrain in the vicinity of the airport choose one of the other presets. With those presets you will evenly get vectors or a clearance to fly a published procedure.

5.2 ATC Vectors after the STAR or Published Procedure to Final

If the charts show that ATC vectors to the final approach are to be expected after a particular waypoint, choose one of the „Vectors“ presets. You will then most likely be vectored but there is also a chance for a clearance direct to the final approach fix or a visual approach.
If the charts show a published procedure that leads directly the final approach, choose one of the „Procedure“ presets. With these you will most likely be cleared via (a variation of) a procedure, nevertheless you still might get vectors instead.

5.3 Small, medium or large Airport

With the presets for large airports you have to expect more restrictive clearances, more holdings and a higher chance for vectoring. The presets for small airports offer scarce holdings and a higher chance for direct clearances or visual approaches. The presets for medium airports are balanced in-between.

5.4 The Presets and their Percentages

5.4.1 Departures

%	High Terrain					
	Small	Medium	Large	Small	Medium	Large
Procedure	100	100	100	80-99	60-99	50-90
Standard Departure	30	40	50	20	30	40
Standard with Shortcut	50	30	10	20	10	10
Standard with Speed Restriction	20	30	40	10	20	30
Direct above specified Altitude	-	-	-	20	20	10
Runway Heading, then...	-	-	-	30	20	10

5.4.2 Arrivals

%	High Terrain			Procedure			Vectors		
	Small	Med.	Large	Small	Med.	Large	Small	Med.	Large
Final Appr. Speed	50-100	30-90	20-50	50-100	30-90	20-50	50-100	30-90	20-50
Holding	1-30	10-60	30-99	1-30	10-60	30-99	1-30	10-60	30-99
Procedure	90-99	80-99	70-99	60-99	50-90	40-80	40-80	20-60	1-40
Visual	60	40	20	40	20	10	50	30	20
Direct to FAF	-	-	-	20	15	10	40	50	50
Direct to FAF, Hi Spd	-	-	-	5	5	5	10	20	30
Standard w. Shortcut	20	10	10	15	10	5	-	-	-
Shortcut, Hi Speed	5	10	10	5	10	15	-	-	-
Standard Arrival	10	30	40	10	30	30	-	-	-
Standard, Hi Speed	5	10	20	5	10	25	-	-	-

6. Converting the Generic Presets into Basic Airport-Specific Presets

The generic presets can easily be converted into basic airport-specific presets.
I recommend to do that for every airport you use (once you use it). The benefit of doing so is the option to take advantage of the gate assignment function of Randomizer and that you don't need to choose the appropriate preset each time - you only do it once and then just choose the appropriate ICAO-Code.

- Choose the appropriate preset for the airport
- Copy and paste this preset in the arrivals.ini and departures.ini files
- Change the name of the preset copy to the airport ICAO-Code
- Fill in the line “ICAO=” in the preset.

7. Sample flight KSFO-KLAS-KSFO

Let's plan a sample flight from KSFO to KLAS and back to illustrate how to work with these presets.
You can use the provided pln files and the PF3 flightplan settings displayed in the jpg files.

7.1 Preset selection

7.1.1 KSFO

I consider KSFO a large airport. There is no high terrain around which would be a problem when being vectored. Many of the STARs lead to an approach procedure.
So the presets for KSFO are:
Departure: Large Airport
Arrival: Procedure – Large Airport.

There is no “right” or “wrong” here. It is all about probabilities. You could for example also choose “Vectors – Medium Airport”, because there are some STARs leading to a waypoint where ATC vectors are to be expected and there are airports even larger than KSFO.
Both presets will work fine. Remember that even with a “Procedure” preset you might be vectored and with a “Vectors” preset you might get a direct clearance or a clearance at pilot's discretion which means you can fly a procedure. It is just about probabilities.

7.1.2 KLAS

I consider KLAS as large also. But here, there is high terrain in the vicinity that might be a problem when being vectored while descending to the final approach altitude. On the other hand for the departure the terrain won't be an issue because the climbout will easily go above the terrain even if being vectored.
So the presets for KLAS are:
Departure: Large Airport
Arrival: High Terrain – Large Airport.

You will find the according presets [KLAS] and [KSFO] in the AGP_Arrivals.ini and AGP_Departures.ini files.

7.2 The Procedures

7.2.1 Departure

Our first waypoint out of KSFO is SYRAH. So choose any SID that offers this transition and is available for the runway in use.
Let's say it is the NIITE SID. So this will be your “Standard Procedure”. If you get the “Standard Procedure with Shortcut” you could for example turn direct to SYRAH after REBAS, skipping TAMMM.

7.2.2 Arrival

The last waypoint is IPUMY. We are looking for two different procedures from there. Those might be the FUZZY STAR and the SUNST STAR. So if you get the “Standard Procedure” that will be the (shorter) FUZZY STAR. If you get “Standard Procedure, Transition” that will be the (longer) SUNST STAR. With a “Shortcut” you might want to cut POKRR out of the SUNST STAR and proceed from CHIPZ direct to PRINO.

These are only examples. What you make of “Standard Procedure”, Standard Procedure, Transition” and “Shortcut” is totally up to you.

For the return flight you can choose the SHEAD SID and the ALWYS resp. DYAMD STARs.

7.3 The Gates

A gate assignment for Southwest and United is included in the AGP_Airlines.ini file.
Be sure to have the Gates Functionality activated in the Randomizer PF3.ini file.

Now you can fly these two routes several times in a row and every flight will be different.

8. Outlook: More Specific Presets

The generic presets can serve as a basis for presets specific to particular procedures. Primarily for MCE users (with TTS voices) anything is possible here.

I recommend creating presets specific to an airport and a specific airway-transition. So you can use that preset for every flight into resp. out of that airport via that transition.

First steps could be:

- adapt altitudes / flight levels
- find alternative standard procedures via the same airway-transition
- give the standard procedure(s) the real name(s)
- define specific shortcuts with real waypoint names
- choose several alternative transitions to final (e.g. FAF, IF, IAF)
- choose real waypoints with their real names for speed or altitude restrictions.

Make sure the procedures (at least for the arrival) work with any runway in use, because you have to run Randomizer before starting the flight (thus before knowing the weather at your destination).
If you use the free text in {curly brackets} for MCE – and I recommend to do it! - remember that the length is limited to 122 characters (Randomizer will use the generic RUNS code instead if that limit is exceeded).

Examples for KSFO and KLAS are included. You can test them with the provided .pln files and the according PF3 flightplan settings also. You have to know the active runway for departure in KSFO (28/01 or 10/19) to choose the appropriate preset.

Again, the presets do not in any way claim to be realistic or in compliance with real world procedures!

Use them as an inspiration for your own specific presets.

8. Credits

Thanks a lot to Roman Heriban who made all this possible with his SimRandomizer 3.

And thanks to Dave March for allowing all this flexibility in PF3 without which these presets wouldn't have been possible.

Any suggestions to improve these presets are welcome. Feel free to share them – as well as all kinds of questions you have - on the designated forum generously provided by Oncourse-Software.

Have fun and happy landings!

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