

PBS Basics

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Purpose and overview

The problem is that often times we find that pilots are missing the forest through the trees. The purpose of this document is to provide an overview of how PBS works – the forest view. The PBS Gouge and NAVBLUE documentation provide much more detail about each subject.

This document is meant for almost everyone. We have new pilots from a military background where bidding for schedules is a new concept. Other pilots familiar with PBS have misconceptions about the Delta system based on assumptions based on experience with previous systems. We also find that pilots who have used our system for years are not up to date with some of the evolutionary changes over the years.

Where to get more information

Always check the info tab in the PBS interface for late breaking news and monthly parameters. The Crew Resources and Scheduling page of Delta Net also has good information.

We publish several documents at pbshelp.info/Delta. PBS Notepads are essentially newsletters discussing important topics, especially new features. The PBS Gouge was written by the PBS Committee and brings a pilot's perspective and specific contractual items that are out of context of the NAVBLUE Bidder manual. Information from the Notepads is integrated into the PBS Gouge.

Where to get help

The PBS Bid Inquiry form sends an e-mail to both the PBS Administrator and the PBS Committee. DeltaNet -> My Division -> Crew Resources/Scheduling -> PBS Bid Inquiry Form under the PBS Inquiry heading on the page. You can also try this direct link: [PBS Inquiry Form on Deltanet](#)

Delta staffs a call center with a couple of pilots. This is available during a limited time within the bid window. Hours are published on the info tab of PBS.

If you have an emergency PBS issue, such as not being able to input bids shortly before bid closing, call scheduling and have them page the PBS Administrator.

Logic with regard to looking at bidders

It is important to keep in mind that for the most part, PBS is a very step-by-step system. When PBS builds your schedule, it is only working on your schedule and is not looking at pilots junior to you. PBS will not withhold pairings so that it can build a line for a junior pilot. If a junior pilot is awarded a pairing that you thought that you bid for, the question to ask is not why PBS awarded the pairing to the junior pilot. This is simple – because it was available. The relevant question is why PBS did not award the pairing to you making it available to the junior pilot.

Bid Groups

Think of reserve and regular bid awards as two separate modules that operate in parallel. As with most things in NAVBLUE PBS, the logic is very sequential step by step.

As PBS goes from bid group to bid group in processing your bid, it can either use the reserve or pairings process. What causes PBS to jump from one bid group to another will be dealt with within the explanation of the respective bid group logic. The process can be summarized at this point by saying that PBS will jump to the next bid group if you tell it to do so with a “Clear Schedule and Start Next Bid Group” or “Else Start Next Bid Group” command or if PBS is unable to build any line of the bid group type (pairing or reserve).

Bid Groups do not simply fail because they are too restrictive. PBS will consider all restrictions from top to bottom and in the case of Prefer Off, from left to right. It will only jump to the next bid group without being commanded if it is unable to build any line of the appropriate type – reserve or pairings.



Figure 1

Pairings Bid Group Processing

When PBS is processing a pairing bid group it basically goes through your bid in a step by step manner. It is easiest to think of PBS as operating on a pool of pairings left over from creating lines for more senior pilots. As PBS processes each line in the Pairings bid group the following occurs:

1. Set Condition Preferences put restrictions on what can be considered a complete line at the end of the bid group or on how it will place pairings on your line.

2. Avoid and Prefer Off preferences remove pairings that match the conditions that you have specified from the pool of available pairings. This pool of pairings is called the Filtered Pool in the PBS pairing analysis.
3. Award preferences go into the Filtered Pool and attempts to put them onto your line.

It is important to realize that PBS has only two cases of left to right logic. One case is Prefer Off unless you specify "Clear Schedule and Start Next Bid Group" or "All or Nothing". The other case is the Pairing Number Departing On preference in an Award preference, but only when the Ordered option is selected.

Take the following two bids:

Scenario A:

Avoid Pairing If Layover In <undesirable location>
Award Pairings If Pairing Length = 4 days

Scenario B:

Award Pairings If Pairing Length = 4 days
Avoid Pairing If Layover In <undesirable location>

In scenario A, PBS will have removed the pairings with undesirable layovers from the pool before it looks for 4 day pairings. In scenario B, PBS may award any 4-day pairing (even with an undesirable layover) because the undesirable pairings will not be removed from the pool until the next step. Think step-by-step logic.

Each Award or Avoid preference describes a set of pairings. You can use multiple conditions within an Award or Avoid. All of the condition must be true in order for the preference to be true.

In general, Award preferences with multiple conditions are very useful to be more specific.

Use multiple conditions within an Avoid statement with caution because a set of pairings will only be avoided if all of the conditions are true. If you know what you are doing, this can be a very useful, but somewhat advanced technique.

How PBS handles overly restrictive bids (Denial Mode)

Your restrictions may cause PBS to reach the end of the bid group without being able to produce a line. PBS will use something called Denial mode then go through multiple completion attempts to iteratively determine which restrictions it can honor and which must be ignored. PBS will first start over and make a completion attempt with none of your restrictions to see if it is even possible to build a line. If so, it will then add your first restriction. If PBS can complete a line and honor your first restriction, it will keep the restriction in subsequent attempts. If PBS cannot complete the line with the restriction, it will ignore the restriction in all subsequent attempts.

PBS will continue adding in and testing your restrictions with a new completion attempt until it has considered all of your restrictions. PBS adds the restrictions working from top to bottom. Additionally, PBS will individually add dates in a Prefer Off preference from left to right. Each completion attempt is a fresh start that processes your preferences in a step by step process.

Denial Mode has always existed in NAVBLUE PBS. However, the logic has been significantly improved and you may see the logic also referred to as Top Down Inclusion to better label the improved logic. With top down inclusion, Denial mode tries to include all of your restrictions starting at the top as just described.

How PBS handles bottleneck awards (Shuffle)

In addition to bids being too restrictive, sometimes the awarding of a pairing from a higher preference will cause a bottleneck that will preclude PBS from completing the line. If necessary, PBS will attempt to shuffle at each completion attempt.

Take a simple case of an international category where the only pairings left are long pairings worth 69:00 and other pairings worth 20:00. To keep the scenario simple, none of the pairings carry out. The line construction window for the scenario is from 70:00 to 85:00.

1. Start Pairings
2. Award Pairings If Pairing In-Period Credit >60:00
Award Pairings

PBS is very step by step and would award the 69:00 pairing. It would then attempt to finish the line at the system generated Award Pairings preference. However, with only 20:00 pairings left, PBS would be unable to complete the line. The problem is that the 69:00 pairing creates a bottleneck. Shuffling would remove the 69:00 hour pairing and award four 20:00 pairings to create a line within the line construction window. This reason given would be "Pulled for Shuffle."

Shuffling should be thought of in the context of the denial process and multiple completion attempts. PBS will shuffle at each completion attempt including the initial attempt with all of your restrictions. PBS will only shuffle if it is otherwise unable to create a line with the set of restrictions being considered. Since the purpose of shuffling is to honor even higher restrictions, it will only pull pairings for shuffle that are below any restrictions that PBS has determined can be honored. By shuffling, PBS may be able to otherwise honor a higher restriction that it otherwise it would have been unable to honor.

How PBS handles peaks such as holidays (Coverage)

There is a mechanism to cover peaks in open time that would naturally form as a result of pilots bidding days off. Figure 2 shows a test run where most of the open time, over 100 pairings, are left uncovered over the holidays. Since open time is concentrated on several days, it is impossible to make more lines with the open time.

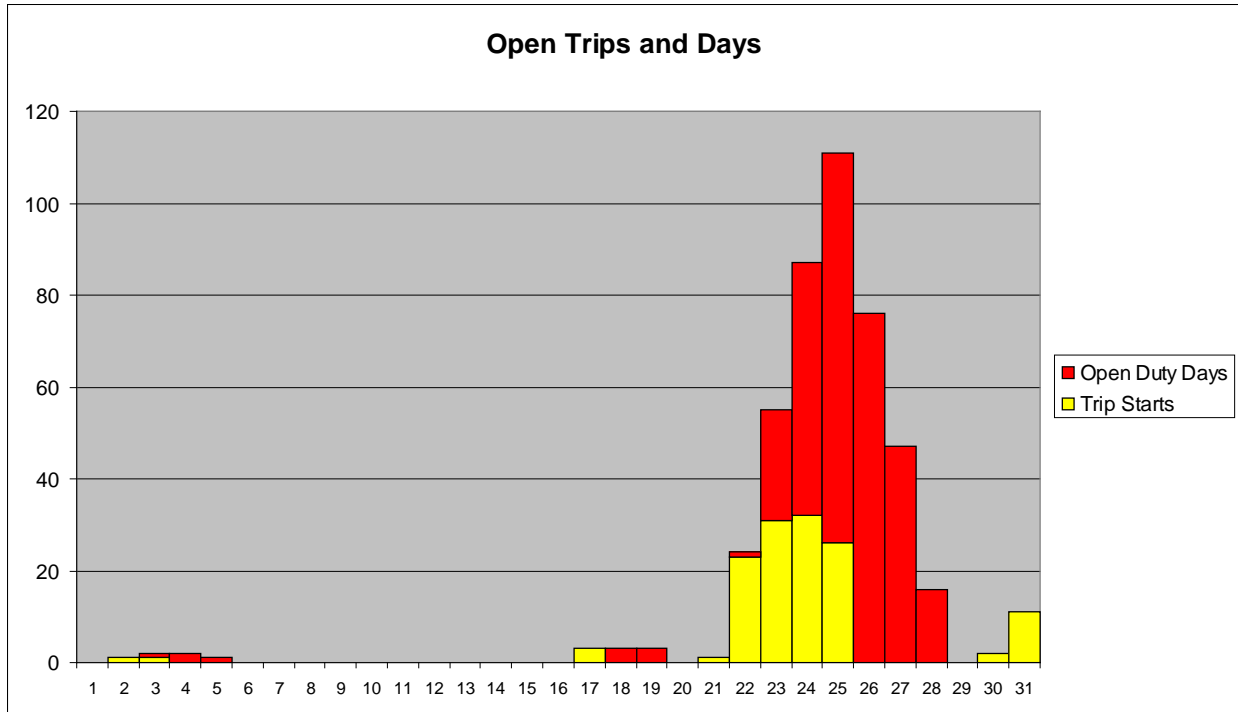


Figure 2

Major holidays are the obvious cases, but stacks of open time can occur at any time. PBS deals with this by awarding pairing for coverage to everyone below a given seniority level. PBS estimates the seniority level where it needs to start this process, erases the results below that level, and starts the line award process including coverage below that point. This is an iterative process and PBS will often require more coverage awards lower in the seniority list.

From a bidder standpoint, PBS first looks at the Avoid, Prefer Off, and Award bids within the bid group and compares them to the coverage pool to assign the coverage solution that best matches or least violates your preferences. This is a very step-by-step process. If a Prefer Off date or Avoid preference leaves some coverage solutions that it can still award to you, PBS will use the restriction to narrow the pool. If the Prefer Off date or Avoid preference eliminates all of the coverage solutions, then it is ignored and PBS moves on. If an Award preference describes one of the coverage solutions, then it is awarded.

Once PBS has found and awarded a coverage solution, PBS treats the awarded coverage pairing(s) like a vacation, training, or other award and proceeds to build the rest of the line around it. If PBS jumps to another bid group, the coverage process begins again using the bids from that bid group.

How PBS jumps to a next bid group from a Pairings Bid Group

One way that PBS will jump to the next bid group from a pairings bid group is that it simply cannot build a regular line. It will only do this after it has found that it is impossible to build a line using no restrictions and shuffling any pairings that it may have awarded. Additionally, PBS will make one last effort called SLG (Secondary Line Generation) where it attempts to find any combination of pairings to create a line.

You can tell PBS to jump out of the automatic completion process offered by Top Down Inclusion using a Clear Schedule and Start Next Bid Group preference or adding an Else Start Next Bid Group clause to an individual Prefer Off, Avoid, or Set Condition preference.

Putting an Else Start Next Bid Group on a Prefer Off, Set Condition, or Avoid preference tells PBS to jump to the next bid group if the preference cannot be honored as part of top down inclusion. This allows you to allow top down conclusion to consider, but deny if necessary, some restrictions, but jump to the next bid group if it cannot honor your most important restrictions. From a logic standpoint, you should have your restrictions with an Else Start Next Bid Group preference above your restrictions without an Else Start Next Bid Group.

You can put a Clear Schedule and Start Next Bid Group at the end of a pairings bid group. This is always before the system generated Award Pairings preference. Thus, it is necessary to have an award preference before the Clear Schedule and Start Next Bid Group Preference. If PBS reaches the Clear Schedule and Start Next Bid Group preference without a line, it will attempt to shuffle, but will not deny any Prefer Off, Set Condition, or Avoid preferences. If it still does not have a line, PBS will jump to the next bid group.

The PBS administrator can limit the number of pilots by seniority who can have their Set Condition Maximum (or Minimum) Credit bids honored. This restriction could be as high as the most senior pilot in the category. If you are below this point and the bid group has a maximum or minimum bid preference and a Clear Schedule and Start Next Bid Group preference, PBS will jump to the next bid group. This logic is consistent with the philosophy that PBS will jump to the next bid group if it cannot honor every restriction within the bid group.

We often find pilots using multiple less restrictive bid groups. While permissible, this is often unnecessary. The Top Down Inclusion logic would often provide more granularity and less bidding effort to accomplish this same goal. Multiple bid groups are useful for taking a different strategy if a restriction cannot be honored. For example, if you cannot get a set of days off on a regular line, you might want to try a reserve line with those days off, and jump back to a regular line if you cannot get those days off on either.

Pairings Bid Group Logic Summary:

1. PBS will first assign coverage pairings if this is necessary using the bids from the bid group in a step-by-step logic.
2. PBS will process the preferences in an attempt to build a line with all of the pairings not awarded to senior bidders in a step-by-step manner.
3. If PBS reaches the end of the bid group or a Clear Schedule and Start Next Bid Group, PBS will attempt to shuffle awards as long as they are below any restriction.
4. If PBS is unable to build a line, it will engage in Shuffle and Denial mode to honor as many restrictions as possible unless a Clear Schedule and Start Next Bid Group or Else Start Next Bid Group causes it to abandon the process and jump to the next bid group.

- a. PBS will start by lifting all restrictions and make multiple completion attempts each time adding a restriction until every restriction has been considered.
- b. If PBS is unable to create a line in any completion attempt, PBS will shuffle awards below the added restriction in an attempt to complete the line and therefore honor the restriction.
- c. If PBS can build a line with the restriction, it will continue to use it in subsequent attempts. If PBS cannot build a line with the restriction, PBS will ignore the restriction in subsequent attempt.

An Else Start Next Bid Group cuts this process short and tells PBS to jump to the next bid group if it is unable to honor the restriction containing it. A Clear Schedule and Start Next Bid Group will allow PBS to shuffle awards that are below every restriction, but will cause PBS to jump to the next bid group rather than continue with the Top Down Inclusion process.

Reserve Bid Group Logic

Think of the reserve logic as successive filtering. The first filter PBS applies is to narrow the lines to those that satisfy the coverage needs. Next PBS works through your preferences in a step by step method filtering the possible reserve lines. Unless a Prefer Off preference had an Else Start Next Bid Group or All or Nothing, PBS will step through each date from left to right. If PBS can honor the preference or date it will narrow the possible lines from the previous step. If honoring the preference or date will eliminate all of the possible reserve lines, then PBS will ignore the date and move on.

When building lines, there are rules for:

- The minimum number of days in a row within a block of work days
- The maximum number of days in a row within a block of work days
- The maximum number of X day blocks

The parameters for these are published every month for each category in the info tab of PBS.

How PBS jumps to a next bid group from a Reserve Bid Group

PBS only offers an Else Start Next Bid Group within a reserve bid group. We often find pilots putting Else Start Next Bid Group on multiple Prefer Off preferences. It is important to realize that every date within a Prefer Off with an Else Start Next Bid Group must be honored no matter where it is within the pairings bid group.

We also find pilots putting a Prefer Off with an Else Start Next Bid Group after a Prefer Off without an Else Start Next Bid Group. PBS will try to honor the higher Prefer Off without the Else Start Next Bid Group first, which will often cause it to be unable to honor the subsequent Prefer Off with the Else Start Next Bid group.

Passwords

Your PBS password is independent from your DeltaNet password. Use your 9-digit employee number for both the username and password for the first time you log into the system.

Interface

The Web App interface allows you to cache data for use offline and to analyze your bids. You do not need to log into Delta Net do access the web interface, you can go directly to:

<https://deltapilotbids.delta.com/webapp>.

If you enter the address manually remember the “https” as opposed to “http.” You can also bookmark the page.

This should work on Safari, Internet Explorer, and Google Chrome. Google Chrome offers the best performance. If you have issues, the solution that solves most issues is to delete the browser cache.

Internet Explorer will not render the web UI properly if it is in compatibility mode. Compatibility mode makes Internet Explorer behave as if it was IE 6 even though the latest version is IE 11. A web search will quickly give you instructions on how to turn off compatibility mode.