

Updating The Prodigy G1000 Aeronautical Databases

Applicability:

Phenom 100 aircraft with Garmin/Prodigy G1000 System version 0734.54 (Load 54) or Later

Phenom 300 aircraft Garmin/Prodigy G1000 System version 0734.54 (Load 54) or Later

Description:

The following document outlines the procedures to follow to properly update the Primary Jeppesen Navigation Database and all optional databases on the Prodigy G1000 MFD and PFDs.

I will address the most cost effective way to manage your subscriptions as well as how to use The Automatic Database Synchronization Feature to save time and reduce equipment wear during the update process.

I will also describe the procedure used to update all the databases from the MFD without the need to neither extract the SD cards from the PFDs nor update the NAV database on each display independently. This technique will also allow you to update the standby NAV database at any time from the issue date to the effective date, causing the standby database to be copied into the internal memory of the Garmin Display Unit (MFD & PFDs) and become active at the first power up of the flight deck after the databases effective date, thereby further reducing the possibility of flying with an outdated database.

Databases & Subscriptions:

Before we begin, lets review a list of the databases we have available for use in the Prodigy G1000.



Jeppesen Navigation Database (Active & Standby) (Updated Every 28 Days)

This database contains all the primary navigation data for en route, terminal and approach procedures, including airports, airways, VORs,

NDBs, SUAs, etc.; this data is used by the FMS to generate all flight planning functions, drive the AFCS, and populate all the Map Pages.

Expanded Basemap (Updated as Needed)

As the name implies, this is a basemap over which all other data is overlaid on the various map pages within the G1000. This map includes the locations of oceans, rivers, lakes, cities and towns, major interstates and highways, and political boundaries.

SafeTaxi (Updated Every 56 Days)

SafeTaxi identifies runways, taxiways, FBOs, and hangars, as well as your aircraft's geo-referenced position on the field. SafeTaxi is seamlessly integrated with existing basemap data, so the airport information automatically appears at the appropriate map range setting with details increasing as the range setting decreases. Since SafeTaxi is geo-referenced, pilots will benefit by seeing their aircraft icon move precisely along the taxiway diagram on their navigation screen. SafeTaxi includes position information for hundreds of airports. A current list of airports covered may be found at the following link: (Cycle 13S1) [US SafeTaxi Coverage](#)

Airport Directory (AOPA or AC-U-KWIK) (Updated Every 56 Days)

Airport Directory databases offer detailed information for thousands of airports. These databases include the names and phone numbers of thousands of FBOs, plus ground transportation, lodging, restaurants, and more.

Terrain (30 Arc Second & 9 Arc Second) (Updated as Needed)

There are two Terrain Aviation Databases currently available for the Prodigy G1000, the 30 arc second resolution and 9 arc second resolution; both provide worldwide coverage and enhanced situational awareness by allowing the G1000 to display your current position in relation to surrounding terrain. These digital databases contain the elevation data that represents the earth's topography. Since Terrain data does not include man-made objects (towers, airports, etc.), updates to Terrain data do not occur on a regular basis.

The 30 Arc Second Terrain Aviation Database has 30 arc-second (latitude and longitude) spacing between data points and is based on the Global 30 Arc-Second Elevation Data Set (GTOPO30), it is a global raster Digital Elevation Model (DEM) with a horizontal grid spacing of 30 arc second (approximately one kilometer). The data is expressed in geographic coordinates (latitude/longitude) and is referenced to the World Geodetic Survey (WGS) system of 1984 (WGS84). In short the data points that comprise this database are spaced approximately one kilometer apart, or stated another way, this database has a resolution of approximately one-kilometer.

The 9 Arc Second Terrain Aviation Database has 9 arc-second (latitude and longitude) spacing between data points, which is required for

Synthetic Vision Technology (SVT), it is based on the Global Multi-resolution Terrain Elevation Data Set 2010 (GMTED2010) that replaced GTOPO30 as the elevation dataset of choice for global and continental scale applications. The GMTED2010 contains seven new raster elevation products for each of the 30-, 15-, and 7.5-arc-second spatial resolutions and incorporates the current best available global elevation data. The data points that comprise this database are spaced approximately 270-300 meters apart, or stated another way, this database has a resolution of approximately 300-meters.

Incidentally, all this new elevation data that facilitated the development of the GMTED2010 Data Set, The 9 Arc Second Terrain Aviation Database and consequently the new synthetic vision products, was the result of The Shuttle Radar Topography Mission (SRTM) that was flown aboard the space shuttle Endeavour on February 11th to the 22nd, 2000. The National Aeronautics and Space Administration (NASA) and the National Geospatial-Intelligence Agency (NGA) participated in an international project to acquire radar data, which was used to create these very detailed topographic maps. Endeavour orbited the Earth 16 times each day during the 11-day mission completing 176 orbits. SRTM successfully collected radar data over 80% of the Earth's land surface between 60° north and 56° south latitude with data points posted every 1 arc-second, approximately every 30 meters.

Airport Terrain (Updated as Needed) (Distributed With The Terrain Database)

The G1000 also uses an Airport Terrain Database, distributed as part of the Worldwide Terrain Aviation Database; The Airport Terrain Database resolution is also 9 arc second, this is the same for both the 30 arc second and 9 arc second versions of the World Wide Terrain database. Up until GDU software version 12.0 the TAWS algorithms expect the airport terrain file to be present to assist alerting. SVT also requires airport terrain data up until GDU software version 12.0. For software versions 12.0 and later, the airport terrain file is still bundled with the terrain database download, but is technically not required by the unit nor does it provide any improved terrain representation.

Obstacle (Updated Every 56 Days)

The Obstacle database is also used as part of the TAWS and Synthetic Vision systems, it includes man-made structures such as tall buildings, towers other vertical obstructions that could be a potential source of hazard to pilots. Note: I learned recently that the Obstacle Database also includes tethered aerostats, such as those present along the southern borders of the United States, R-5115 & R-2916 for example, the STV will display a tower symbol on the PFD identifying the obstacle.

Jeppesen “ChartView” (Updated Every 14 Days)

ChartView utilizes electronic versions of Jeppesen’s proprietary “briefing strip” approach charts and will give you geo referenced Approach Charts & Taxi Diagrams, plus Standard Instrument Departure and Arrival

Procedures displayed on the MFD. Jeppesen offers several different coverage areas ranging from regional USA to worldwide.

Garmin “FliteCharts” (Updated Every 28 Days)

FliteCharts is Garmin’s offering for displaying approach plates; FliteCharts are electronic versions of AeroNav terminal procedures charts. With FliteCharts you can view all AeroNav Departure Procedures, Standard Terminal Arrival Routes, approach plates and airport diagrams on your MFD. FliteCharts are not geo-referenced to show aircraft position on the display, the coverage areas available from Garmin are also limited to the United States.

Information and pricing for both providers can be researched at the following websites, pricing will vary depending on which provider, service level and coverage area you choose.

Jeppesen: [PilotPak™ for Garmin G1000 & Prodigy](#)

Garmin: [flyGarmin - PilotPak™](#)

The Jeppesen Navigation Database is available for download 7 days prior to the effective date; Garmin “FliteCharts” and Jeppesen “ChartView” are made available for download 2 days prior to their effective date.

For more information on database update cycles, including the issue dates and effective dates of the various databases, consult the following documents:

[NavData Update and Effectivity Schedule](#)

[Aviation Database Cycles](#)

[Airway Manual \(ChartView\) Calendar 2013](#)

[Jeppesen production cycle dates FAQ](#)

The only database that can be pre-loaded as a standby database is the Navigation Database, all others must be loaded on, or after, their effective date to be valid, you can load them ahead of time if you do not intend to fly between then and the effective date, but they will not become valid until their effective date and as a result will be listed in yellow on the MFD.

All but the Jeppesen Active Navigation Database reside on the lower Garmin Supplemental Data Cards (SD Cards) in each display, these cards are all identical and must all have the same number and version of databases installed, with one exception: If you subscribe to Garmin FliteCharts or Jeppesen ChartView that database will only reside on the lower SD card in the MFD. Since these databases are not stored internally in the displays, an SD card containing identical database versions must be kept in each display unit, these cards must not be removed except to update the databases. The Jeppesen Active Navigation Database resides in the internal memory of each display and may be loaded directly onto each display via the top SD card slot or automatically using The Automatic Database Synchronization Feature, which we will discuss in detail.

While I recommend keeping all your databases up to date to take full advantage of the G1000's many features, only the Active Jeppesen Navigation Database must be current to operate under Instrument Flight Rules using the G1000's dual GPS sensors, there is a caveat to this as it relates to the regulations, however I will not go into the details of when you can operate with an expired database an/or charts and still be legal as it is outside the scope of this document.

All of the databases are available from either Garmin or Jeppesen except for FliteCharts and ChartView, which are only available, from their respective providers.

Both Garmin and Jeppesen are excellent sources for data and both companies will ultimately deliver the very same data to your devices and both offer Pilot Packs (database update bundles) that save time and money.

If you currently have ChartView enabled on your aircraft then Jeppesen will offer you the greatest value by bundling all the databases into a Pilot Pack for about the same cost as your Navigation and Chart Data alone, in my case I added all the supplemental databases for an additional sixty dollars a year. Jeppesen affords you the additional benefit of having the navigation and chart data available to you via either of their iPad applications, Jepp TC or Jepp FD, at no additional charge. Jeppesen's JeppView licensing agreement allows you to install the data on up to four devices; this can be any combination of iPads, laptops, or desktop computers.

If on the other hand you have Garmin FliteCharts enabled on your aircraft then a Pilot Pack from Garmin will likely be your best bet and provides the same advantages as the Jeppesen product married to the AeroNav based FliteCharts database for approach charts. If you choose to purchase your Pilot Pack from Garmin, you will still receive the Jeppesen Navigation Database, you will simply pay Garmin for the service and download it from Garmin, the databases themselves are the same.

If you currently have individual subscriptions spread over both service providers, it is easy to consolidate everything into a Pilot Pack from your preferred provider, both Garmin and Jeppesen will refund the unused portion of your subscription and either provide a direct refund or a credit towards your Pilot Pack.

Regardless of whom you choose as your data provider, consolidating your subscriptions into a Pilot Pack will save you hundreds of dollars a year and provide the convenience of using only one program for performing all your required updates.

Getting Started:

The manner in which you will download your databases and program your SD cards will vary slightly depending on which provider you choose, if you use Jeppesen for your data, all your updates will be performed using Jeppesen's proprietary Jeppesen Service Update Manager (JSUM) software for Windows PC

or Jeppesen Distribution Manager for Mac OS X, if on the other hand you elect to subscribe to the Garmin service, you will download an update your data from their website using a standard web browser and the Garmin plugin.

Regardless of whose software you use, you will need a Windows PC or Apple Computer with Mac OS X an SD card reader and a valid login, once the SD cards are programed, the remainder of the procedure is identical regardless of the update service provider.

Garmin's web based update software, and can be accessed through the FlyGarmin website by following the link below:

[FlyGarmin](#)

Jeppesen's applications for the PC and MAC are available for download by following the links below.

[Jeppesen JSUM for Windows PC](#)

[Jeppesen Distribution Manager for Mac OS X](#)

I wrote to both Jeppesen and Garmin to inquire as to the future availability of iPad applications for use in the updating of aeronautical databases, both answered that such an application was not being developed and/or considered. Given the prolific nature of the iPad in aviation applications, I believe an iPad App that could download the aeronautical databases and program them to the SD cards would be of great interest to many pilots, SD card readers are readily available for the iPad and both Jeppesen and Garmin have advanced iPad applications, I would think adding this functionality to their existing iPad software offering would be relatively simple. Add to this the recent [Amendment to 14 CFR Part 43 - Pilot Loading of Aeronautical Database Updates](#), which further relaxes the regulations regarding who may perform these updates, and perhaps if enough pilots request such an App, Jeppesen and Garmin would consider it further. Here are their respective customer service email addresses should you feel compelled to comment on the development of an iPad application for database updating and/or any other comment or concern.

[Jeppesen Customer Service](#)
[Garmin Aviation Support](#)

Using The Automatic Database Synchronization Feature

One Time Set Up:

Enabling the Automatic Database Synchronization Feature:

Garmin made a change in the most recent software load (System version 0734.54 (Load 54), the Automatic Database Synchronization feature is now activate by default and cannot be disabled. The system now automatically compares all

copies of each applicable database on the lower cards of the MFD and Both PFDs, if the databases do not match; the most recent valid database is automatically copied to each card in the system that does not already contain that database.

Note: If you are running on a prior software version, and want to use this feature, you will have to enable Automatic Database Synchronization by navigating to the Aux, System Status Page on the MFD and selecting the **SYNC DBS** Softkey (label background changes to grey indicating the Softkey is selected). This need only be done once; the feature will remain enabled through multiple power cycles and all user profiles.

Step One:

Extract the SD card from the lower slot of the MFD, as always, never remove or install an SD card with the display powered up.

If you keep an SD card in the top slot of your displays, perhaps to allow for the use of the ["Print Screen"](#) function, this is also the time when you want to remove that SD card from the top slot on the MFD and set it aside.

Step Two:

Once you have your preferred providers software or website running and all your available services listed, perform all the required updates to the MFD's Garmin Supplemental Data Card (Lower SD Card), this will include all expired databases including ChartView or FliteCharts but not the Jeppesen Navigation Database which we will update separately.

Remove the Garmin Supplemental Data Card (Lower SD Card from the MFD) from the PC card reader and set it aside.

Place a compatible, formatted and blank, SD card* in the PC's SD card reader, this is the card you will be using to update the Standby Jeppesen Navigation Database, proceed to download and program the Jeppesen Navigation Database to this SD card. The database may either be the current Jeppesen Navigation Database or the pre-release Jeppesen Navigation Database; in either case the procedure is the same.

*Embraer recommends the use of SD cards from the following manufacturers:

- Toshiba
- Scandisk
- Stek

Embraer also recommends that these cards NOT be used for general storage; they must be dedicated to the update of the Navigation Database.

The G1000 will currently accept SD cards with a maximum storage capacity of 8GB; Garmin has said they are working on making the Prodigy GDUs compatible with SD cards of greater storage capacity and from a broader list of manufacturers.

If you are only updating the Jeppesen Navigation Database, then perform only that step of the procedure; same goes for the chart data update.

A note about the Worldwide Terrain Database, especially the 9 Arc Second version, the files are very large and although the Automatic Database Synchronization Feature will work for these databases also, but it can take 100 minutes or more to complete, and I suggest you download these databases directly to the lower card on each display just as was required before the implementation of Automatic Database Synchronization.

The automatic database synchronization feature automatically transfers the databases from a single SD database card located in the lower card slot of either display (GDU) (the MFD in this example) to the SD cards on each of the other two displays thereby ensuring that all the databases are synchronized throughout the system and eliminating the need to update each display individually.

If you are unsure how to perform these updates please consult the users manual for your service providers update software:

Jeppesen Service Update Manager Online Help:

[Jeppesen Services Update Manager - Users Manual](#)

Jeppesen JSUM Instructional Videos:

[Garmin G1000 - Downloading Databases](#)

[Garmin G1000 - Uploading Databases](#)

Garmin Aviation Product Support:

[flyGarmin - Aviation Product Support](#)

Step Three:

Return the Garmin Supplemental Data Card to the lower SD card slot in the MFD and place the other SD card, containing the Navigation Database, in the upper SD card slot on the MFD.

Step Four:

Power-up the aircraft.

When prompted: Update the STANDBY NAV Database by answering YES!

When prompted: **DO NOT** update the ACTIVE NAV Database by answering **NO!**

Let me clarify; only the databases on the **LOWER SD CARD** will be synchronized, and only the databases on the lower SD card reside permanently on those cards, the ACTIVE Navigation database is stored internally and can only be synched if it is first programmed to the lower SD card as the STANDBY database, it does not matter what the effective date of the database is, if it is a future database and you upload it as a standby database, the system will not transfer it to the internal memory until the effective date, if it is already within the effective period, you

must still program it to the **STANDBY** database location for Automatic Database Synchronization to work, the system will program it to the internal memory when power is cycled. Let me further clarify this last point, if you choose to update the Navigation Database within the effective date range of the cycle, follow the same procedure as with pre-loading the database, the only difference will be that the now valid database will be copied to the internal memory on each display when the power is cycled as directed at the end of the procedure.

Allow the MFD to boot and once the welcome screen is displayed, confirm that all your optional databases are current and acknowledge. Once the MFD is fully booted, the synchronization progress may be monitored on the AUX-System Status Page in the Sync Status section of the Database Window, once the update process concludes, power down the aircraft, remove the upper SD card from the MFD, return your ["Print Screen"](#) SD card to the top slot if applicable, and power up the aircraft. So long as you are not synchronizing the terrain database, which is the norm, the database synchronization process takes approximately one minute.

NOTE: An indication of 'Complete' still requires a power cycle before the synchronized databases will be used by the system. When loading database updates, the 'DB Mismatch' message will be displayed until database synchronization is complete, followed by turning system power off, then on.

You will see a startup message (which you can acknowledge for a quicker boot) on both PFD's indicating the system is verifying the integrity of the standby database.

Done!

Once you cycle power to the aircraft you are done, each display will verify its data just as before and all the prompts displayed during the boot process will be the same.

If you updated the Standby Navigation Database with the pre-effective release, the active database will not be updated until the database becomes valid, the system will automatically update the Active Nav Database the first time you power up the aircraft within the effective period.

All three displays will update simultaneously and the following message will be displayed during the boot process:

Please Wait. Navigation Database Update in Progress. Do Not Remove Power from Displays'

Followed by:

NAV DB UPDATED

The updated databases are now ready for use; no power cycle is required.

Replacing a Failed SD Card Using Automatic Database Synchronization

In the event one of your Garmin Supplemental Data Cards was to fail, having Automatic Database Synchronization enabled can make replacing the inoperative card very simple.

The Garmin Supplemental Data Cards which reside in the lower slot on each of our three displays are original installed equipment, and as such, must be replaced with an OEM part (010-00330-42, or -43), the card you will receive from Garmin however is no different then a COTS (consumer of the shelf) SD card and will not have your databases preloaded on it (although the terrain database may be pre-loaded, the other DBs will not), If you have Automatic Database Synchronization enabled, simply place the “blank” SD card in the lower SD card slot on the affected display and the system will transfer all the databases and required files to the card automatically, be aware that if you have the 9 arc second terrain database installed, this process will take approximately an hour and a half, so having a GPU connected is essential.

Here are the links to the latest Prodigy Pilot Manuals, please refer to the section on Database Management for additional information:

Pilot's Guides Prodigy Flight Deck:

[Pilot's Guide Prodigy Flight Deck 100 w/Sys SW Version 0734.54](#)

[Pilot's Guide Prodigy Flight Deck 300 w/Sys SW Version 0734.54](#)

If you require technical support, you can reach Garmin and Jeppesen at the numbers below:

Jeppesen 24/7 Aviation Technical support:

Toll-Free: 1-800-732-2800

Direct: 1-303-328-4587

Garmin Aviation Support:

Toll-Free 1-866-739-5687 - M-F: 7am-7pm (CST) Closed for U.S. holidays

Aircraft On Ground Phone: 1-913-397-0836

I hope you found this document helpful and informative, if I can be of any further assistance and/or answer any questions you may have, please post them on the Phenom Jet Association forum and/or call, or email, me at the number and address listed under my [PJA member profile](#).

-Hans Barbachano