

## **Graupner GPS Map Widget**



**for mz-16 and mz-32 Radio System**

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## OVERVIEW

The new Graupner GPS Map widget provides an on-screen display of your model during a flight on an mz-16 or mz-32 Graupner HoTT radio system

It provides a visual, real-time position location of your model, including distance, altitude, speed, Latitude/Longitude, and the number of satellites used for computation.

The offline map also shows the home location, which is the starting position from where your model was launched from where you would typically control the airplane. This can be used to reference where the airplane is flying and provide visual cues for flying the proper heading to get the airplane back to its starting position or avoid no-fly zones.

Each map can have multiple alarm notifications set for when the airplane is flying outside the map boundaries, which can assist the pilot with compliance to mandated FAA or flying club rules.

Maps and no-fly zones can be easily created by the user. The radio can facilitate up to 5 different maps, which can have different detail levels for different locations. For example, you can have a map of your flying site that shows one mile of coverage and another that has two miles of coverage. Changing maps during flight can be easily done during flight, therefore effectively extending map range.

When flying from multiple locations, such as different flying fields, the pilot can load a new map for each that location which will automatically adapt the display to the new location. Maps can be easily exchanged between pilots online or uploaded from a mobile phone at the field to the radio. The maps are small and have their own set of Latitudes/Longitudes coordinates.

The new Graupner GPS Map Widget adds a positive dimension to the RC pilot and the RC community, which are being taxed with complex and difficult to comply with regulations.

Combined with Graupner's award-winning mz-16 and mz-32 telemetry radios, this new capability which is a first of its kind will promote improved situational awareness, increased safety and will simplify regulatory compliance and, open new possibilities for becoming better RC pilots.



*Standard map with no-fly zone alarms at map boundaries*



*Enhanced map with custom no-fly zone alarms (flying inside the box)*

## FEATURES

- Real-Time airplane position display on the radio.
- Maps can be referenced in North, South, East, or West orientation.
- Out of map notifications when the airplane is out of designated map coordinates or entering a no-fly zone.
- Out-of-map notifications can be customized for individual directional flights for North, South, East, or Westbound flying or a combination of each.
- Inside map notification when returning from a no-fly zone to a safe flying zone.
- Total of five maps for each model for any location or map resolution.
- Altitude too low or too high notifications assisting pilots with airspace navigation and compliancy.
- Pixel-based fly zone coordinates for customized referencing of map locations such as topographical features, training zones, or virtual pilot boxes.
- Airplane locator in case of emergency (crash).
- User-created visual maps for competition and training purposes such as sailplane GPS triangle, pattern flying, pylon racing, and more.
- Real-time information of flight direction, return to home direction, min/max GPS speed, max/min altitude, climb and descent rate, Vario, Airspeed, G-Forces, and more.
- During the flight, the pilot also has access to essential telemetry information such as RSSI (signal strength), receiver voltage, and temperatures. This can be further expanded with additional modules such as main battery voltage, capacity, current, power, RPM, and more.

## HARDWARE REQUIREMENTS

- Graupner mz-16 or mz-32 telemetry HoTT radio
- Compatible HoTT GPS Telemetry Module (Graupner GPS, sm-Modellbau GPS Logger, PowerBox GPS)

## OPTIONAL SOFTWARE

- Mapping software (Google Maps, Google Earth, Windows Maps, GMapCatcher)
- Screen capture software (Snagit, Windows Screen Snipping, Apple Snipping Tool, GMapCatcher)
- Graphics software for image resizing and scaling such as Paint 3D, Corel Paint, etc.

## CREATING A MAP

The first step is to decide which mapping software you will be using. The radio needs Latitudes/Longitudes locations in decimal format. If you plan to use the common format of degrees, minutes, and seconds (DDD, MM, SS), you will have to convert them between second and decimal minutes.

Luckily, [Google maps](#), [Windows maps](#), and [GMapCatcher](#) provide the needed information in a decimal format, so no conversions or math will be needed to create a map if you will be using those.

Maps can be north, south, east, or west referenced. Most mapping software will have north as the default map display. If you plan on having a south reference map, you must rotate the map accordingly. Do not change the map orientation to any other position but north, south, east, or west, as the maps will be inaccurate and will fail to show the airplane at the proper map location.

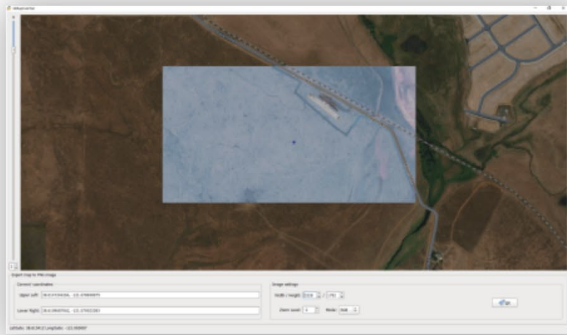
Before capturing a location, you will need to find it on the map first. This can be done by searching for an address or known feature.

For example, if you want to locate the AMA flying fields in Muncie Indiana, you would type their address, 4907 E Memorial Drive, Muncie, Indiana, which will move the map to that location. You can now move the map to your desired position and zoom in or out to get the best possible view of the map you wish to capture.

In this example, we moved our map to show the main flight line and zoomed in to cover the region we would like to capture. The best way to do this is by using available screen snipping tools that allow you to position a cursor at the exact location you would like to capture. The easiest software to use is Snagit, as it can capture a region at the exact pixel size needed for the maps.

The next step is to paste the captured image into your graphics program and, if needed, resize the image to 480 x 214 pixels which is the required size for the map. The image needs to be saved in Windows BMP 24-bit format and copied to the maps folder on the radio.

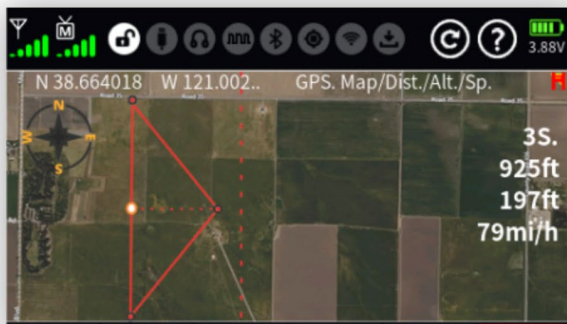
You can enhance the map image with additional visual markings to include, for example, a compass rose, no-fly zone border lines, obstacle markings, extended runway lines, flight tracks for practicing, and anything else to further enhance your situational awareness while flying.



Capturing region using GMapCatcher. The lower left contains Latitude/Longitude



The captured region with graphic map enhancements with North no-fly zone alarm



GPS Triangle course with an alarm set for an eastbound no-fly zone



Pylon racing track with custom no-fly zone alarms (flying inside the box)

## FINDING THE COORDINATES

The next step is to find the coordinates (Latitudes/Longitudes) for the upper left and lower right corners of the image. For this, we must go back to the map and locate the corner locations. Note that it is not necessary to get it 100% right. You can always make minor adjustments later if needed.

Locate the upper corner of the image on the map and right-click with the mouse on that position which will reveal a dialog with the following coordinates 40.168413, -85.325673.

Do the same for the lower right corner, which on the map will give the following coordinates 40.163270, -85.312331, which is about 1.3Km or 0.79 miles diagonally.

Now we must prepare the coordinates so that they can be entered into the radio.

Muncie is located in the Northern and Western hemispheres, which means that the latitude will always point to the north and the longitude to the west.

The radio will need two latitude and two longitude locations to reference the map for the GPS correctly.

Combine the latitude of the upper and lower corners with the upper latitude entered first.

Latitude: 40168413N40163270

Combine the longitude of the upper and lower corners with the upper longitude entered first.

Longitude: 85325673W85312331

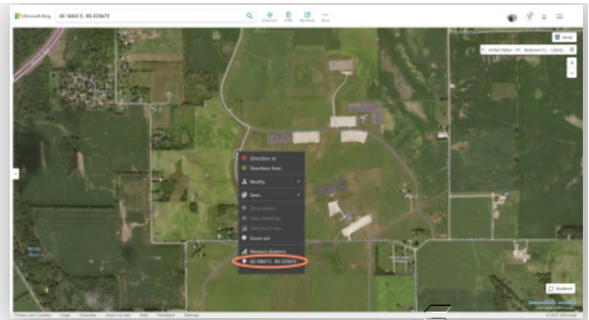
Keep those coordinates in a text file for future reference.



If you are in the Southern or Eastern hemisphere, you change N to S and the W to E.



Lower right map coordinates (Google maps)

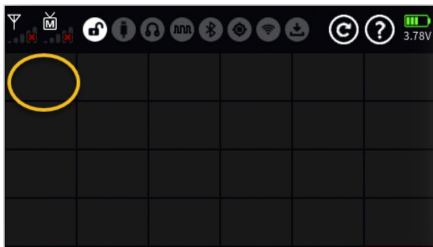


Upper left map coordinates (Bing maps)

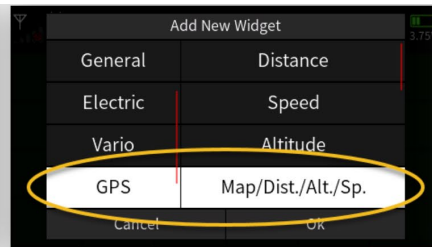
## MAP INSTALLATION

To install the map, you need to connect the radio to your computer and enable mass storage mode from the USB menu. Copy the map file to the maps folder on your radio.

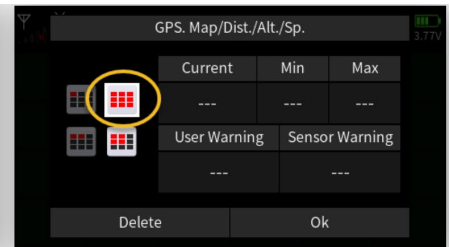
To load the map on your display, you will need an empty widget deck. The GPS map widget cannot be combined with other widgets.



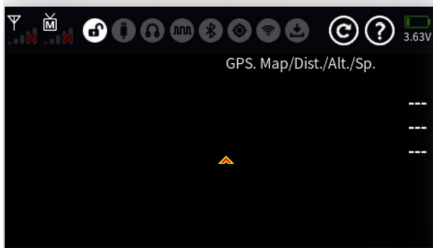
Tap on the upper left corner of the deck which brings up the add new widget dialog and select GPS from the scrollable left list



Select the Map/Dist./Alt./Sp. widget



Tap on the full deck widget icon so that the map will use the full-screen size on the radio



Now you need to associate the widget with a map previously installed on the radio. Tap on the widget to bring up the widget option dialog and tap on edit which brings up the keyboard



Enter the map file name which for our example is Muncie and tap on the enter key



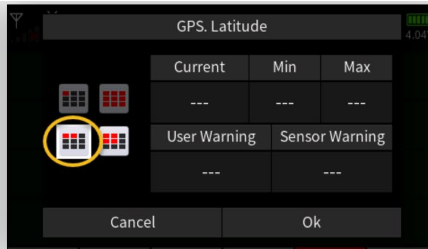
The Muncie map file is now loaded on the screen

## MAP GEO REFERENCING

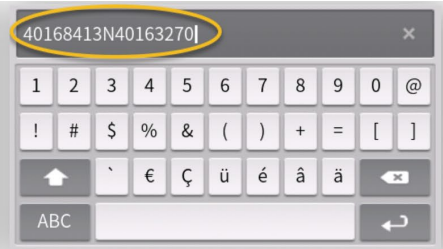
A single model can have up to five maps loaded for different locations. Each map requires a single deck and a separate deck where all the Latitudes and Longitudes are entered for each map. Next, we must reference the map with the Latitude and Longitude coordinates previously located on the map.



Move to the new deck and add a new GPS Latitude widget.



Select a 2 x 1 size for the widget.



Tap on the widget to bring up the edit bar.

Tap on edit to reveal the keyboard and enter the Latitude coordinates 40168413N40163270. Make sure to not make any mistakes by verifying the numbers closely as wrong entries will cause an inaccurate map reading.

Add a longitude widget as in the previous steps and enter 85325673W85312331.

If your maps are east or west referenced, you will need to add E or W for east or west-oriented maps in front of the latitude coordinates. For example, W40168413N40163270 for the Muncie coordinates.

Your map is now ready for action!

## MAP NOTICES

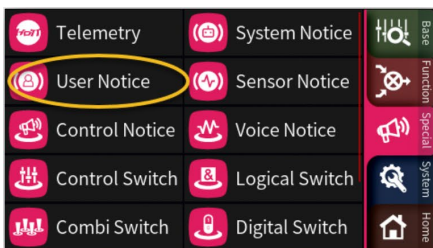
The radio can provide user notifications when the airplane is outside of the map coordinates.

Notifications can be set individually for the North/South/East or West direction or globally when any map boundaries have been crossed.

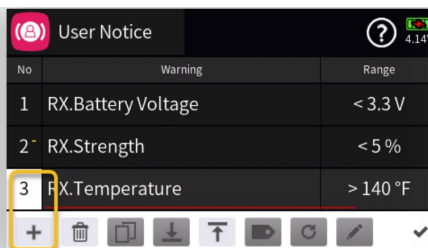
For example, you can create a notification for when a pilot accidentally crosses a designated flight line or for when the field flying boundaries have been crossed. The pilot will receive up to three map limit warning notices.

After the flight path of the airplane has been corrected and is flown back to the designated safe flying zone, it will notify the pilot that the airplane is back inside the map.

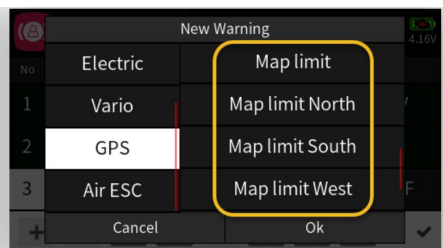
Setting up a notice is done from the special, user notice menu.



Select user notice from the special menu.



Tap on the number column which brings up the toolbar and tap on the plus sign.



From the new warning menu, scroll down to the GPS warning menu and look for the map limit options and select which warning should be active.

Map Limit:	The warning is provided for the full-size map when no-fly zones are entered.
Map Limit N/S/E/W:	<p>The warning is provided for when a no-fly zone has been entered depending on flight direction.</p> <p>For example, you may have warnings only on north and west headings when any of those no-flight-zone are entered.</p>
Inside Map:	Notifies the pilot that the airplane is flying inside the map boundaries after returning from a no-fly zone area.

Map limit notifications can be for some unsettling or too long. You can reduce the notification length by disabling the alarm Pre-Warning or programing a switch to mute the alarm notifications.

## ADVANCED MAP SETTINGS

Occasionally you may want to alter the fly zone without changing the longitude or latitude of the map.

For example, you may want to resize the fly-zone inside an existing map to mark a flight line, create a flight box for training purposes or create a temporary no-fly zone on an existing map.

This is accomplished by moving the North/South/West/East map locations by a certain number of pixels to the inside of the map.

First, you will need to prepare a map where you can draw the new boundaries. In our example, we use the AMA flying field in Muncie.



The image shows a fly-zone rectangle that is more to the north and to the west.



Measure the number of pixels from the bottom of the image (South Boundary) to the rectangle and do the same from the right (East Boundary).

User Notice		
No	Warning	Range
4	GPS.Map limit South	> 80
5	GPS.Map limit East	> 60
6	GPS.Map limit North	> 0
7	GPS.Map limit West	> 0

In the User Notice menu enter the pixel number for each map limit as shown to activate the new map limit fly-zone.





## SUPPORT

You can obtain support in the English language from the following locations:

*Products, service, and support:*

[www.controlhobbies.com](http://www.controlhobbies.com)

*RC Groups Vendor Forum*

<https://www.rcgroups.com/graupner-control-hobbies-874/>

*Facebook*

<https://www.facebook.com/ControlHobbies/>

*Youtube*

[Control Hobbies - YouTube](#)