



RXP GTN 750/650 TOUCH

User's Manual For Prepar3d / Flight Sim

Tap Into The Future Of Avionics!

With GTN 650/750's revolutionary touchscreen interface, you're rarely more than 2 taps away from all of the system's primary functions! The intuitive touchscreen controls and large display give you unprecedented access to high-resolution terrain mapping, graphical flight planning, geo-referenced charting, advanced navigation and more.

About This Manual

This manual guides you through the product features and is intended for flight simulation purposes only. It shall not be used for any real world aviation application or reference. By reading this manual, you should become well acquainted with the product, and should be able to obtain the information necessary to use the product in your simulator.

We thank you for having chosen a Reality XP Product and wish you a pleasant and a safe virtual flight with us.

Product disclaimer: this software is designed for entertainment only. Although we have designed the product to resemble and function like the original, it is not designed as a training device. Not all systems have been simulated, and some of those that have been simulated may not be entirely functional.

NOT FOR USE IN REAL FLIGHT OR AIRCRAFT OPERATION.

INTRODUCTION	3
System Requirements	3
GETTING STARTED	4
Garmin Reference Guides	4
Add-Ons Menu	4
Configuration Panel	5
Using The Mouse	5
Resizing The Gauge Window	5
ADD-ON DETAILS	6
Autopilot	6
Radios	6
Traffic Collision Alerting Device	6
Taws-A	6
Integral Lighting	6
Discrete Inputs	7
Flight Simulator Gps Commands	7
Keyboard Shortcuts	7
Additional Features	7
Failures Annunciation	8
Checklists	8
Flight Plans And User Waypoints	9
CONFIGURATION	10
Aircraft Configuration	10
Gauge Rendering Settings	11
Third Party Vendor Settings	12
Advanced Settings	12
Keyboard Shortcuts	13
Custom Sim Variables	14
Custom Gps Commands	15
Configuring Alternate Paths	16
Configuring Aviation Database File	16
Installing Multiple Garmin Trainers	16
Device Embedded Memory	17
TROUBLESHOOTING	18

Introduction

The Reality XP GTN 750 and GTN 650 Touch gauges is a faithful reproduction that pilots and flight simulator users can use it as a training tool to familiarize themselves with the workings of the actual equipment. Each button and knob is fully functional and performs identically to its real-world counterpart.

Graphical flight planning capabilities allow you to preview your entire route on the map screen and easily enter new waypoints or modify existing ones. A handy "rubber band" feature lets you grab any leg of your flight plan route and move it to accommodate a deviation to your flight plan.

With the GTN, you can set your standby Com frequency simply by touching the onscreen number pad. Another touch of the screen flip-flops your active and standby frequencies. Recent and favourite user frequencies also are a breeze to access. The GTN also automatically decodes a station's Morse code to provide a positive identification – no aural decoding required.

The GTN can control the simulator audio panel (GTN 750 only) as well as the transponder, with optional IDENT and REPLY annunciations. This setup could save you up to 3-inch of panel space versus a typical GNS 430/530 install. In addition, precise course deviation and roll steering outputs can be coupled to the simulator autopilot so that IFR flight procedures may be flown automatically. This includes all ARINC 424 leg types, including NextGen radius-to-fix (RF) legs.

System Requirements

The Reality XP GTN 750/650 Touch requires either **Prepar3d v4/3/2/1**, **Flight Simulator X - Steam Edition**, **Flight Simulator X** or **Flight Simulator 2004** for Windows¹.

During installation you will be prompted to download and install the Garmin GTN/GDU Trainer². The first time you install this package, or should you need to repair the Garmin Trainer installation, the installer will save a copy of the trainer installer to: "C:\ProgramData\Reality XP\Common\GtnTrainer"



¹ Versions required: Prepar3d 4 (64bits), P3D3, P3D2, P3D1, FSX-SE, FSX-ACC/SP2, FS9-SP1; Windows versions required: WinXP to Win10

² Compatible trainer versions: v6.41.1, v6.41, v6.21

Getting Started

Garmin Reference Guides

In addition to this user's manual which guide you through the functions within the simulator, we recommend referring to the original Garmin GTN series pilots and cockpit reference guide that is installed in its own Garmin program group. Please take the time to read all manuals completely so that you can become properly acquainted with the product and its operation.

Add-Ons Menu

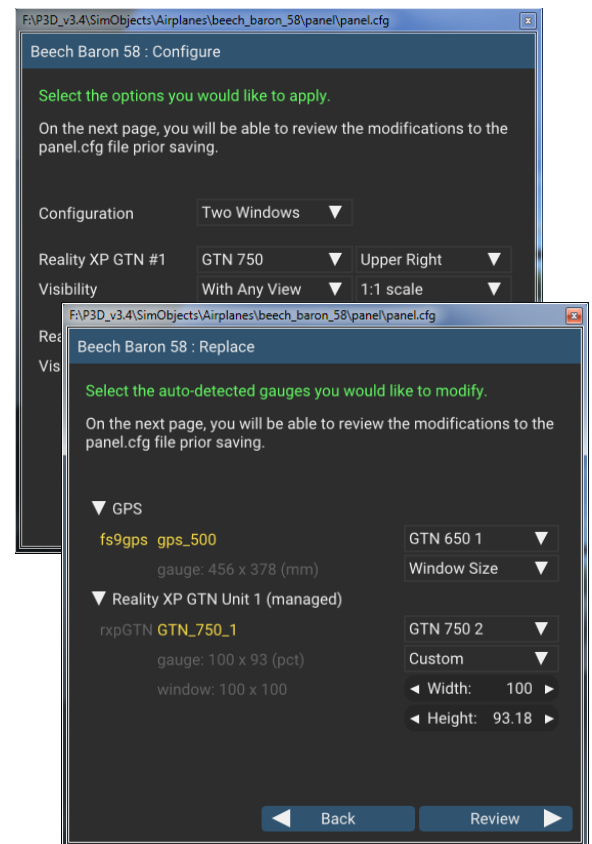
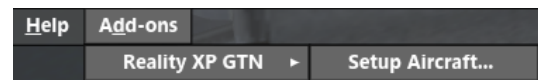
The GTN 750/650 Touch Menu loads automatically and is operated using the Prepar3d/FSim add-ons menu³.

Select the **menu Add-ons | Reality XP GTN** to add or remove GTN units to your aircraft panel. Once selected, the panel wizard opens and guides you through. This task-oriented context aware assistant can help you with the following tasks:

- Configure your aircraft panel with GTN popup windows.
- Replace any similar GPS gauge with a GTN gauge using an auto-detect feature.
- Remove all GTN gauges from the panel.
- Restore the panel to its prior state using the automatic backup.

The first time the assistant modifies the panel, it saves a backup copy of the panel.cfg file next to the original in the same folder. The last option restores the panel from this backup.

Should you manually modify the panel.cfg file afterward, make sure to make your own copy prior using the 'Restore' function otherwise the manual modifications will be lost.



³ FS9 only: the menu displays in a popup when right-clicking anywhere on the FS9 window. See Troubleshooting chapter for other simulators.

Configuration Panel

The GTN can be tailored to suit your needs by configuring the way each device looks and behaves. Most device configuration options are available from the configuration panel.

Press and hold the SHIFT key then RIGHT-Click the top edge of the GTN device to open the configuration panel.

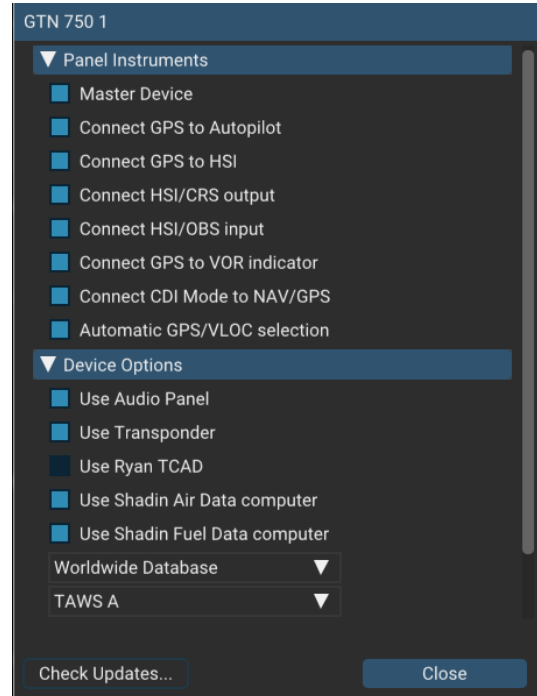
Options are set up for an individual aircraft and then saved to the "RealityXP.GTN.ini" file in the aircraft folder. The add-on restores the last known settings when loading the aircraft.

Whenever the configuration changes, the last row changes to display 'Cancel' and 'Accept' buttons.

When changed settings require rebooting the device, a warning 'Reboot Device' tag displays next to each one and the confirmation button changes to 'Accept and Reboot'.

Select **Check Updates...** to check if you are running the latest version.

You can also **Drag and Drop** any RealityXP.GTN.ini file onto the panel window to import another aircraft settings.



Using The Mouse

This gauge implements a relatively unique implementation of click spots. They work as follows:

- The mouse cursor contextually changes depending on the possible actions.
- As the mouse cursor passes over a click spot it changes from an arrow cursor to a “hand” cursor.
- Whenever a single click spot is used, a left click will accomplish the task.
- Left clicks turn knobs to the counter-clockwise direction when the mouse is in an area to the left of the knob and to the clockwise direction when the mouse is in an area to the right of the knob.
- Mouse wheel turns knobs in either direction regardless if the mouse is to the left or to the right.
- Touchscreen actions are carried naturally with single clicks or click-and-drag. Mouse wheel simulates pinch-in and pinch-out actions.

Resizing The Gauge Window

The simulation window resizes and maintains its aspect ratio. **Press and hold the SHIFT key then LEFT-Click the top edge** of the GTN device to scale the window to either 1:1 or 2:1 screen sizes.

Add-on Details

The simulation comes in the form of a plug-in installed in "My Documents\Prepar3d v4 Add-ons\Reality XP GTN" folder⁴. There is only one plug-in for both the GTN 750 and the GTN 650 simulation⁵.

In addition to GPS integration to the panel system, the GTN offers some additional features described below.

Autopilot

The GTN is capable of precise course deviation and roll steering outputs that can be coupled to the simulator autopilot so that IFR flight procedures may be flown automatically. It controls the simulator A/P system both horizontally and vertically.

Radios

The GTN 750 and the GTN 650 can control the simulator COM and NAV radios. To accommodate a wider variety of aircraft panels, the GTN 750 license unlocks the radio-less GTN 725, and the GTN 650 license unlocks both GTN 635 and GTN 625.

Traffic Collision Alerting Device

The GTN includes a faithful simulation of the Ryan 9900BX TCAD (Traffic Collision Alerting Device). Internally powered by a complete TCAS II Mark 7 simulation passing the 250 TSIM tests, it comes integrated to the RXP GTN 750 Touch and the RXP GTN 650 Touch. Take full control of the TCAD detection shields, view nearby traffic and take actions upon visual and aural TA advisories directly on the GTN touchscreen. The TCAD simulation data source is the Flight Simulator AI Traffic.

TAWS-A

The GTN offers TAWS-A, TAWS-B, HTAWS and TERR Proximity modes. Proper integration and use in TAWS-A mode require advanced settings. When configured to operate in TAWS-A mode, the GTN gauge automatically detects best V_{ref} , V_{fe} and V_{le} for the aircraft. The GTN also connects to the flaps and the gear in order to adjust its detection sensitivity and operating limits depending on the phase of flight.

Integral Lighting

Using the configuration panel, adjust both the screen and the bezel brightness independently.

⁴ P3D3: "Prepar3d v3 Add-ons"; P3D2, P3D1, FSX-SE, FSX, FS9: in their respective "Gauges" folder.

⁵ The same gauge file installs both but it requires purchasing and installing both products to unlock both GTN models.

Discrete Inputs

Each device supports additional external controls, either through the keyboard shortcuts or the default GPS commands. These controls change a GTN operating mode (discrete input in a real GTN):

- Toggle CDI source
- Toggle OBS mode
- Inhibit TAWS

Flight Simulator GPS commands

The GTN can be configured to intercept all of the default FS GPS commands. When the option is enabled in the configuration panel, the FS GPS bezel buttons and knobs control the GTN.

These commands are described in more details in the 'Configuration' chapter.

Keyboard Shortcuts

Each device supports mapping their buttons and knobs to keyboard shortcuts. To change hotkeys, open the "My Documents\Reality XP\GTN Simulation\FItSim\RealityXP.GTN.ini" file with notepad.

It is a self-documented configuration file that lets you configure any combination of ALT, CTRL, SHIFT, WIN and key per device button and knob.

These commands are described in more details in the 'Configuration' chapter.

Additional Features

The GTN offers some nice additional features such as setting the touchscreen 'click' sound volume or adjusting the screen backlight level directly on the unit. Please refer to the 'Garmin GTN Cockpit Reference Guide'.



Failures Annunciation

When enabled in the configuration panel, the GTN plugin uses the following sim variables⁶ as failures sources:

rxp.failures.gps_1 rxp.failures.gps_2	Satellite reception failure, displays "No GPS Position"
rxp.failures.waas_1 rxp.failures.waas_2	Differential GPS failure, reduces location accuracy. Satellite reception mode switches to 3D instead of 3D-Diff.
PARTIAL PANEL AVIONICS	Shuts down unit's power.
PARTIAL PANEL COMM:#	COM radios failure only.
PARTIAL PANEL NAV:#	NAV radios failure only.
PARTIAL PANEL TRANSPONDER	Transponder failure.
CIRCUIT MARKER BEACON ON	Audio Panel failure.



If data fields become invalid, the GTN typically annunciates the failures with a large red X, as shown.

Checklists

The Checklists function provides a built-in method of reviewing your aircraft checklist. As each Checklist is completed, you can advance to the next one in order. In the Checklist Menu, you can access any Checklist, or group of Checklists, and clear the current or all Checklists.

Checklists are created using the Garmin Checklist Editor software⁷ and stored in the aircraft folder as "checklist.gtn". A sample pack installs to the following folder:

```
"C:\ProgramData\Reality XP\Common\GtnTrainer\checklists.zip"
```

To proceed with the sample pack, unzip the "checklists.zip" archive file to extract the sample ".ace" checklists files, then copy one of these to the aircraft folder and rename the file as "checklist.gtn".

On the GTN device, while viewing the Utilities page group, touch the **Checklists** key to start the Checklists function. Touch the **Menu** key to select an option from the Menu.



⁶ Variables starting with 'rxp' can be set from either XML or C++ gauges like any other 'L' var.

⁷ available online: https://www8.garmin.com/support/download_details.jsp?id=5075

Flight Plans And User Waypoints

Flight plans can be created on a computer using compatible flight planning software and saved to a virtual datacard folder to be imported into the GTN. The imported flight plans can then be previewed, used directly or stored to the GTN flight plan catalog. This chapter describes how to enable and use this feature⁸.

Preparing the virtual datacard

The first step is to create a virtual datacard folder where to store the flight plans and the user waypoints. This folder must be named **FPLN** and be located in the GTN Trainer Data folder, typically⁹:

```
"C:\ProgramData\Garmin\Trainers\GTN\FPLN"
```

The second step is to create one or more flight plan files with the ".gfp" file extension and one "user.wpt" file. The product comes with a starter pack installed into the following folder:

```
"C:\ProgramData\Reality XP\Common\GtnTrainer\flightplans.zip"
```

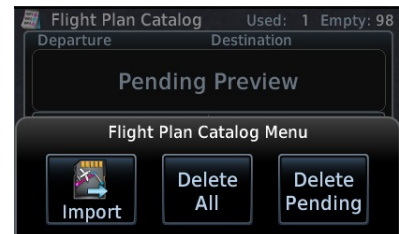
Alternatively, this could be a "FPLN" shortcut instead of a folder, linked to any other folder on the hard drive, for example:

1. Create a folder "Documents\GTN Flight Plans" where to copy the flight plan files and user waypoints file.
2. Open "C:\ProgramData\Garmin\Trainers\GTN\", right-click the empty area to the right, select **new | shortcut**
3. Name the shortcut "FPLN" and select the browse button
4. Browse to select the "Documents\GTN Flight Plans" folder and press OK.

Importing flight plans

The last step is to import the flight plans and the user waypoints into the GTN device. To proceed with the starter pack, unzip the "flightplans.zip" archive file to extract the "KSLE_KSLE.gfp" flight plan and the "user.wpt" sample files, then copy the two files to the "FPLN" folder.

On the GTN device, while viewing the Flight Plan page, touch the **Menu** key and then the **Catalog** key to display the Flight Plan Catalog.



An Import key will be present in the Catalog menu bar when flight plans are present on the virtual datacard folder. Touch the **Catalog Menu** key, then the **Import** key to open a pop-up with a list of the file names of the flight plans on the datacard, then select the desired flight plan to import.

Importing user waypoints

The GTN can import user generated waypoints from a file on the datacard. The created waypoints will be at the latitude and longitude specified in the file with the specified name and comment.

When a "user.wpt" user waypoint file is present in the virtual datacard FPLN folder, a key will be available on the Waypoint Info page for importing user waypoints. From the Waypoint Info page, touch the **Import Waypoints** key. Touch **OK** to acknowledge the pop-up to import all of the user waypoints in the file.

⁸ See "GTN Flight Plan and User Waypoint transfer.pdf" guidelines for how to create text based flight plan files (included in the starter pack).

⁹ The "FPLN" folder must reside in the folder equivalent to "GTNSIMDATA" (see Configuring Alternate Paths chapter for more information).
NB: GTN Trainer before v6.41: "C:\ProgramData\Garmin\GTN Trainer Data\GTN\FPLN"

Configuration

Aircraft Configuration

This chapter details the general organization of the settings file. The GTN settings are automatically saved in the file **RealityXP.GTN.ini** located in the aircraft folder. Every time a GTN opens from the Reality XP GTN menu, it creates this self-documented settings file on save.

The INI file consists of sections and keys. The name of a section in the *.ini file is always entered inside the square brackets. Each section contains several keys (the key must be always assigned to the section that begins in the file before this key). The content of one section ends by a definition of the next section. The name of a key is always on a separate line and the content is assigned by the = char. A line comment starts with the ; char.

```
[GTN_730_1]
; is the master device if true.
MasterDevice = true
; selects COM/NAV Radios '1' or '2'.
RadiosPair = 1
; connects GPS to HSI if true.
LinkHsi = true
; connects GPS to HSI course if true.
LinkCrs = true

[GTN_750_1.DEFAULT]
; show screen only gauge if true.
nobezel = false
; enable mouse clickspots if true, disable if false.
usemouse = true
; left mouse button popup ident (ex: GPS_PANEL or 225) (disables touchscreen when set).
popleft =
```

There are multiple sections in the Reality.GTN.ini file:

- The GTN_750_1 gauge section contains the settings for this device.
- The GTN_750_1.DEFAULT section contains the default settings or each device instance.

Gauge Rendering Settings

A Flight Simulator gauge is a template which defines what to display, and the panel.cfg tells where gauges display. Each entry of the same gauge is an instance (a sibling) from the same template (parent). For example, a GTN 750 both in a popup window and the VC Panel is a single gauge with two instances. When adding multiple instances of the same gauge to the panel.cfg file, the **RealityXP.GTN.ini** supports per-instance configuration.

The default RealityXP.GTN.ini file automatically generated in the aircraft folder has a **[GTN_###_#.DEFAULT]** section for each device you've configured on the panel. If not specified otherwise, each sibling of the same gauge will use the settings from the 'DEFAULT' section, for example [GTN_750_1.DEFAULT].

Should you want a particular instance of the gauge (one sibling) to use anything else than the 'DEFAULT' settings, the gauge 5th parameter¹⁰ must be set. In addition, a new settings section matching the 'param' name must be created.

For example, to set the VC instance to render without a bezel (screen only):

To get started, just copy and paste the entire gauge 'DEFAULT' section to the end of the RealityXP.GTN.ini file, change the suffix from 'DEFAULT' to 'NO_BEZEL' then edit the new section settings.

The **RealityXP.GTN.ini** file may be configured like this:

```
[GTN_750_1.NO_BEZEL]
; show screen only gauge if true.
nobezel = true
...
```

The **panel.cfg** file may be configured like this:

```
[VCockpit01]
gauge00=rxpGTN!GTN_750_1, 0, 0, 100, 90, NO_BEZEL
...
```

In the example above, the 5th param was arbitrarily named 'NO_BEZEL'¹¹. However, you can create as many uniquely named sections as needed, and choose a relevant suffix to match the 5th param:

```
[GTN_###_#.MY_NICE_VC]
[GTN_###_#.MY_COOL_POPUP]
```

¹⁰ gauge_file ! gauge_name, x, y, w, h, **param**

¹¹ Make sure to use non space separated words.

Third Party Vendor Settings

Third party aircraft vendor might want to prevent users from altering settings which would break the integration. For example, a specific aircraft integration might require the device to be set to 'COM1/NAV1' radios, and connected to the HSI. The plugin support additional setting to make any entry read-only. When locked, settings appear disable in the configuration panel.

The following key must be manually added in the **RealityXP.GTN.ini** settings file in a **[GTN_###_#]** section:

locked = RadiosPair, LinkHsi	comma separated list of read only settings. (NB: case sensitive names)
------------------------------	--

Advanced Settings

Advanced settings aren't visible in the configuration panel and are only manually editable in the **RealityXP.GTN.ini** settings file in a **[GTN_###_#]** section. Any text editor suffice to open and edit the content.

VFRcode = #1200	sets transponder VFR code (octal default: #1200).
CpuAffinity = -1	selects the CPU running the trainer process: 1 to 32; 0: last core, -1: automatic.

THIS SPACE INTENTIONALLY LEFT BLANK

Keyboard Shortcuts

This chapter describes the list of custom commands available to control the GTN from keyboard shortcuts. Each command ends with the suffix "_1" for unit #1 or "_2" for unit #2. For example, the command name for the device #2 "HOME" button is: "HOME_2"

TOGGLE_WINDOW	toggle window visibility
DTO	press button: DTO
HOME	press button: DTO
VOL_PUSH	press knob: VOL
VOL_CCW	rotate knob: VOL (counter clock-wise)
VOL_CW	rotate knob: VOL (clock-wise)
FMS_PUSH	press knob: FMS
FMS_OUTER_CCW	rotate knob: FMS (counter clock-wise)
FMS_OUTER_CW	rotate knob: FMS (counter clock-wise)
FMS_INNER_CCW	rotate knob: FMS (counter clock-wise)
FMS_INNER_CW	rotate knob: FMS (counter clock-wise)
CDI_SOURCE	toggle CDI source (discrete input)
OBS_MODE	toggle OBS mode (discrete input)
TAWS_INHIBIT	inhibit TAWS (discrete input)

In addition to custom device commands, the add-on exports the following additional commands designed to work across multiple Reality XP plugins:

RXP_GPS_MASTER_DEVICE_0	select master device: default GPS
RXP_GPS_MASTER_DEVICE_1	select master device: Reality XP GPS 1
RXP_GPS_MASTER_DEVICE_2	select master device: Reality XP GPS 2
RXP_GPS_MASTER_DEVICE_NEXT	select next available master device

Custom Sim Variables

This chapter describes the list of additional sim variables the GTN publishes to third party plugins¹².

<code>rxp.hsi.bearing_deg_mag_pilot</code>	degrees
<code>rxp.hsi.flag_from_to_pilot</code>	number
<code>rxp.hsi.hdef_dots_pilot</code>	number
<code>rxp.hsi.vdef_dots_pilot</code>	number
<code>rxp.hsi.has_dme_pilot</code>	number
<code>rxp.hsi.dme_distance_nm_pilot</code>	miles
<code>rxp.hsi.dme_speed_kts_pilot</code>	knots
<code>rxp.hsi.dme_time_sec_pilot</code>	seconds
<code>rxp.hsi.flag_glideslope_pilot</code>	number
<code>rxp.hsi.display_horizontal_pilot</code>	number
<code>rxp.hsi.display_vertical_pilot</code>	number
<code>rxp.gps.course_degtm</code>	degrees
<code>rxp.gps.cross_track_nm</code>	miles
<code>rxp.gps.time_sec_eta</code>	seconds
<code>rxp.gps.discrete_out</code>	number
<code>rxp.gps.nav_id</code>	number ¹³
<code>rxp.radios.indicators.gtn_unit1</code>	enum (4 chars encoded device id or 0) ¹⁴
<code>rxp.radios.indicators.gtn_unit2</code>	enum (4 chars encoded device id or 0)

Control Variables

Third party gauges write to the following sim variables to further enhance the GTN operation:

<code>rxp.transponder.id</code>	boolean	(squawking if true)
<code>rxp.transponder.light</code>	boolean	(replying if true)
<code>rxp.transponder.mode</code>	enum	(STBY = 0, ON = 1, GRND = 2, ALT = 3)
<code>rxp.failures.gps_1</code>	enum	(FAIL_NONE = 0, FAIL_INOP = 1, FAIL_BLANK = 2)
<code>rxp.failures.gps_2</code>	enum	
<code>rxp.failures.waas_1</code>	enum	
<code>rxp.failures.waas_2</code>	enum	
<code>rxp.panel.rheostat_screen</code>	number	(0 to 100) (reserved for future use)
<code>rxp.panel.rheostat_integral</code>	number	(0 to 100) (reserved for future use)

¹² The "master" device is the only one updating the "rxp.hsi." and the "rxp.gps" variables.

¹³ Because the SDK doesn't allow setting 'string' variables, the ICAO is encoded as a sequence of 6 chars into a 'double' (as binary data).

C code example: `double id = get_named_variable_value(...); const char* szId = (const char*) &id;`

¹⁴ 'G621','G622','G631','G632','G651','G652'; In hex: 0x31323647, 0x32323647, 0x31333647, 0x32333647, 0x31353647, 0x32353647
'G721','G722','G751','G752'; In hex: 0x31323747, 0x32323747, 0x31353747, 0x32353747

Custom Gps Commands

The GTN intercepts these commands with: **Settings Panel | Use Simulator GPS Commands**. These commands are a set of named events which any other gauge, module or 3D model can trigger.

KEY_GPS_NEAREST_BUTTON	GTN CDI MODE (discrete in).
KEY_GPS_OBS_BUTTON	GTN OBS MODE (discrete in).
KEY_GPS_TERRAIN_BUTTON	GTN TAWS Inhibit (discrete in).
KEY_GPS_DIRECTTO_BUTTON	GTN Direct To.
KEY_GPS_MENU_BUTTON	GTN Home.
KEY_GPS_CURSOR_BUTTON	GTN FMS push.
KEY_GPS_GROUP_KNOB_INC	GTN FMS chapter up (right outer knob cw).
KEY_GPS_GROUP_KNOB_DEC	GTN FMS chapter dn (right outer knob ccw).
KEY_GPS_PAGE_KNOB_INC	GTN FMS page up (right inner knob cw).
KEY_GPS_PAGE_KNOB_DEC	GTN FMS page dn (right inner knob ccw).
KEY_GPS_BUTTON1	GTN VOL push.
KEY_GPS_BUTTON2	GTN VOL up (left knob cw).
KEY_GPS_BUTTON3	GTN VOL dn (left knob ccw).

Command Modifiers

Each Flight Simulator command has a parameter which is generally only used for actions requiring a value, like the position of a flap lever. Other actions which toggle or trigger a state change usually pass the value 0.

The GTN uses this existing parameter in order to make it a modifier for the "KEY_GPS_" commands. This system not only facilitates but greatly enhances integration between the GTN and third party controllers, such as 3D cockpit models, add-ons modules, any other XML or C gauges.

The command parameter is interpreted as a bit-field where each binary digit represents a specific modifier:

- Bit #2: press and hold the button if set.
- Bit #3: release the button if set.
- Bit #4: command to GPS unit #2 if set, to GPS unit #1 if clear.

Sending the **HOME** key **press-release** event to **GPS#1: KEY_GPS_MENU_BUTTON, 0**

Sending the **HOME** key **press-release** event to **GPS#2: KEY_GPS_MENU_BUTTON, 8 = bit4 (8)**

Sending the **HOME** key **press and hold** event to **GPS#2: KEY_GPS_MENU_BUTTON, 10 = bit2 (2) + bit4 (8)**

Sending the **HOME** key **release** event to **GPS#2: KEY_GPS_MENU_BUTTON, 12 = bit3 (4) + bit4 (8)**

Configuring Alternate Paths

The Garmin trainer installs various components, each one in a specific path. This chapter describes supported Windows environment variables¹⁵ to configure alternate trainer paths in a typical scenario.

Set the general trainer application path, that is where the trainer is installed:

```
GTNSIMPATH="C:\Program Files (x86)\Garmin\Trainers\GTN\bin"           (Trainer v6.41+)
GTNSIMPATH="C:\Program Files (x86)\Garmin\GTN Trainer\GTN\sys\sim"  (older Trainers)
```

Set the application database path, that is where to look for all the db files (terrain, obstacle, navigation etc.):

```
GTNSIMDATA="C:\ProgramData\Garmin\Trainers"                       (Trainer v6.41+)
GTNSIMDATA="C:\ProgramData\Garmin\GTN Trainer Data"               (older Trainers)
```

Configuring Aviation Database File

Copy the aviation database file to the location of your choice on your hard drive, for example in your "My Documents" folder, with a file name "gtn_db.bin", then add the following Windows environment variable:

```
GTNDBFILE="C:\Users\MyName\Documents\gtn_db.bin"
```

Installing Multiple Garmin Trainers

This chapter describes a procedure when you want or need to install two different versions of the Garmin GTN Trainer on your computer. The Garmin GTN Trainer installer prevents installing two different versions, such as the latest compatible with the Reality XP GTN Touch and an older one. However, the GTN Touch plugin can be configured to use alternate trainer path and data path. Please note the following for dual Trainer installation:

1. Install the trainer for the Reality XP GTN Touch
2. Copy the "sim" folder located in "C:\Program Files (x86)\Garmin\GTN Trainer\GTN\sys\" to the location of your choice¹⁶, or rename it for example to: "C:\Program Files (x86)\Garmin\GTN Trainer\GTN\sys\sim (6210)\"
3. Copy the "GTN Trainer Data" folder located in "C:\ProgramData\Garmin\" to another location, or just rename it to something like: "C:\ProgramData\Garmin\GTN Trainer Data (6210)\"
4. Add the following 2 environment variables in Windows:
name = "GTNSIMPATH" value = *the path to the 'sim' folder you have chosen above*
name = "GTNSIMDATA" value = *the path to the 'data' folder you have chosen above*
for example:

```
GTNSIMPATH="C:\Program Files (x86)\Garmin\GTN Trainer\GTN\sys\sim (6210)\"
GTNSIMDATA="C:\ProgramData\Garmin\GTN Trainer Data (6210)\"
```

5. You can now uninstall the trainer and reinstall the old one: the GTN plugin will use the trainer and its data from the location indicated in your environment variables.

¹⁵ how to add environment variables: <http://www.kunal-chowdhury.com/2016/09/windows-10-anniversary-update-how-to-edit-environment-variables.html>

¹⁶ Please note you only need to copy or rename this folder for the GTN plugin, but you'll need the rest for our G500/600

Device Embedded Memory

The GTN Trainer stores all user settings in a file similarly to a real device using embedded non-volatile memory. Settings include user preferences such as displayed navigation units, map settings, routes catalog and the user waypoints. They are saved in the following folder:

```
C:\ProgramData\Garmin\Trainers\GTN\nonvol           (GTN Trainer 6.41+)
C:\ProgramData\Garmin\GTN Trainer Data\GTN\GTN1nonvol (GTN Trainer 6.21 and below)
```

The Reality XP GTN simulation manages individual non-volatile memory file copies, one per-device and per-unit. These are saved in the same folder next to the original file, using the following file name convention:

```
sys_nand0           : default original file.
sys_nanda, sys_nandb: GTN 625 #1 and GTN 625 #2
sys_nandc, sys_nandd: GTN 635 #1 and GTN 635 #2
sys_nande, sys_nandf: GTN 650 #1 and GTN 650 #2
sys_nandg, sys_nandh: GTN 725 #1 and GTN 725 #2
sys_nandi, sys_nandj: GTN 750 #1 and GTN 750 #2
```

Should you want to backup and restore the settings, you just need to make a copy of the corresponding file(s) listed above to a safe location, then copy them back to the aforementioned folder to restore.

Please note: the simulation automatically creates and manages the per-device/per-unit copy in case the file is missing. In addition, should the original **sys_nand0** file is missing too, the GTN Trainer recreates it from scratch. When upgrading from one trainer version to the next, the setting files are upgraded automatically as well.

Troubleshooting

This chapter describes solutions available to help troubleshooting problems with the add-on and the Garmin Trainer.

Missing Add-On Menu

The Gauge Add-Ons menu requires **SimConnect** which is normally installed automatically with the simulator.

For 32 bits simulators, it requires a minimum of SimConnect FSX-SP2, which is found on the installation disks (FSX-ACC/SP2) or in the following folder (FSX-SE):

```
"SteamLibrary\steamapps\common\FSX\SDK\Core Utilities Kit\SimConnect SDK\LegacyInterfaces
\FSX-XPACK\SimConnect.msi"
```

Should the menu fails to display, you can create or manually edit the add-on/SimConnect files.

P3D4: Start Windows notepad, create a new text document, copy and paste the following content, then save to¹⁷:

"My Documents**Prepar3D v4 Add-ons**\Reality XP GTN\add-on.xml"

```
<?xml version="1.0" encoding="UTF-8"?>
<SimBase.Document Type="AddOnXml" version="3,3" id="add-on">
  <AddOn.Name>Reality XP GTN</AddOn.Name>
  <AddOn.Description>Legendary Gauges Redefined</AddOn.Description>
  <AddOn.Component>
    <Category>DLL</Category>
    <Name>Reality XP GTN Menu</Name>
    <Path>C:\Program Files (x86)\Reality XP\GTN Simulation\FltSim\64\rxpGTN_menu.dll</Path>
  </AddOn.Component>
  <AddOn.Component>
    <Category>Gauges</Category>
    <Name>Reality XP GTN Gauge</Name>
    <Path>C:\Program Files (x86)\Reality XP\GTN Simulation\FltSim\64</Path>
  </AddOn.Component>
</SimBase.Document>
```

P3D3: Do as above but change both <Path> lines '64' to '32' as shown below, and save the file to:

"My Documents**Prepar3D v3 Add-ons**\Reality XP GTN\add-on.xml"

```
<Path>C:\Program Files (x86)\Reality XP\GTN Simulation\FltSim\32\rxpGTN_menu.dll</Path>
<Path>C:\Program Files (x86)\Reality XP\GTN Simulation\FltSim\32</Path>
```

¹⁷ make sure the file extension is .xml and not .txt

P3D2, P3D1, FSX-SE, FSX: The menu uses the global DLL.xml file found here:

"C:\Users\[name]\AppData\Roaming\Microsoft\FSX\dll.xml"

Open the file with notepad, then copy and paste the following **<Launch.Addon>** section¹⁸:

```
<?xml version="1.0" encoding="UTF-8"?>
<SimBase.Document Type="Launch" version="1,0">
  <Descr>Launch</Descr>
  <Filename>dll.xml</Filename>
  <Disabled>False</Disabled>
  <Launch.ManualLoad>False</Launch.ManualLoad>
  <Launch.Addon>
    ...
  </Launch.Addon>
  <Launch.Addon>
    <Name>Reality XP GTN Menu</Name>
    <Disabled>False</Disabled>
    <ManualLoad>False</ManualLoad>
    <Path>C:\Program Files (x86)\Reality XP\GTN Simulation\FltSim\32\rxpGTN_menu.dll</Path>
  </Launch.Addon>
</SimBase.Document>
```

Log Files

The solution monitors certain key operations and logs runtime data to specific files. When troubleshooting a problem, the first step is to analyze runtime data saved to the log files.

The gauge log file: "**My Documents\rxpGTN.gau.log**".

The GTN Simulation log file: "**My Document\rxpGtnSim.dll.log**"

The add-on menu log file: "**My Documents\rxpGTN_menu.dll.log**"

Debug Settings

The GTN simulation support additional settings to help troubleshooting video card drivers, and to report internal Garmin trainer errors. When enabled, the trainer will log additional information to "rxpGtnSim.dll.log"

The following keys must be manually added in the **RealityXP.GTN.ini** settings file in a **[GTN_###_#]** section:

DebugValue = 0	1 to enable video card driver debug logs.
LogTrainer = 0	1 to enable Garmin Trainer logs.

¹⁸ Everything included within <Launch.Addon> and </Launch.Addon> is GTN specific, the rest is the standard DLL.xml file content.

APPENDIX A: Configuration Panel Settings File - RealityXP.GTN.ini file default values¹⁹:

```
[GTN_750_1]
; is the master device if true.
MasterDevice = true
; selects COM/NAV Radios '1' or '2'.
RadiosPair = 1
; uses computer time if true, simulator time otherwise.
ComputerTime = false
; reduce screen update rate by half.
ReduceRate = false
; integral lighting percent (0 to 100)
Rheostat.Display = 100
; integral lighting percent (0 to 100)
Rheostat.Buttons = 75
; connects GPS to HSI if true.
LinkHsi = true
; connects GPS to HSI course if true.
LinkCrs = false
; connects HSI OBS to GPS if true.
LinkObs = false
; connects GPS to VOR if true.
LinkVor = false
; connects GPS to Autopilot if true.
LinkOto = true
; connects CDI key to NAV/GPS switch if true.
AutoNavGps = true
; enables automatic GPS/VLOC selection.
AutoSelect = true
; selects VLOC NAV '1' or '2'. '0' selects same source as 'RadiosPair'.
AutoNavSource = 0
; sets device power source: ALWAYS_ON,AVIONICS_BUS,MAIN_BATTERY
PowerSource = AVIONICS_BUS
; connects GPS to Shadin Air Data computer if true.
UseAirData = true
; connects GPS to Shadin Fuel Data computer if true.
UseFuelData = true
; connects GPS to Audio Panel if true.
UseAudioPanel = true
; connects GPS to Transponder if true.
UseTransponder = true
; connects GPS to RYAN 9900BX if true.
UseRyanTcad = false
; sets TCAD sound alerts volume in percent: 0 to 100.
RyanTcadVolume = 50
; enable device failures if true.
UseFailures = false
; uses Simulator GPS commands if true.
UseSimGpsCmds = false
; sets transponder VFR code (octal default: #1200).
VFRcode = #1200
```

¹⁹ The GTN configuration panel stores the settings in the aircraft folder.

REALITY XP GTN 750/650 TOUCH P3D/FSIM

```
; sets fuel type: AVGAS,JETA,JETB,DIESEL
FuelType = AVGAS
; sets ownship icon type:
; AUTO,LOW_WING,HIGH_WING,KIT_PLANE,TURBOPROP,TWIN_ENGINE,SINGLE_JET,BUSINESS_JET,2BLADES,
3BLADES,4BLADES,ARROW
OwnshipIcon = AUTO
; sets TAWS type: TERR,TAWS_B,TAWS_A
TawsMode = TERR
; sets TAWS surface: HARD,HARD_SOFT,WATER,ANY
TawsSurface = HARD_SOFT
; TAWS minimum runway length (feet)
TawsMinLength = 40
; TAWS approach air speed (knots), -1 (auto detect Vref: 109)
TawsApprSpeed = -1
; TAWS maximum flap extension speed (knots) or -1 (auto detect Vfe: 156)
TawsFlapSpeed = -1
; TAWS maximum gear extension speed (knots) or -1 (auto detect Vle: 176)
TawsGearSpeed = -1
; HSI lateral deviation scale factor.
CdiScale = 1
; HSI vertical deviation scale factor.
GsiScale = 1
; sets voice type: MALE,FEMALE
VoicePref = MALE
; sets master sound volume in percent: 0 to 100.
MasterVolume = 100
; selects the default database: 0: 'Garmin (North America)', 1: 'Jeppesen (Worldwide)'
NavDbType = 1
; selects the CPU running the trainer process: 1 to 32
; 0: last core, -1: automatic.
CpuAffinity = -1

[GTN_750_1.DEFAULT]
; show screen only gauge if true.
nobezel = false
; screen only border size (pixels).
border.size = 0
; screen only border color (#RGB or #RGBA).
border.rgba = #000000
; display mouse tooltips if true.
tooltips = false
; enable mouse clickspots if true, disable if false.
usemouse = true
; enable alternate click-spots (left CCW, right CW, middle Push) if true.
usealtmouse = false
; enable touch beyond screen bounds if true, clip if false (GTN native).
extendtouch = true
; auto-resize dimension (width,height)
refsize =
; left mouse button popup ident (ex: GPS_PANEL or 225) (disables touchscreen when set).
popleft =
; right mouse button popup ident (ex: GPS_PANEL or 225).
popright =
```

REALITY XP GTN 750/650 TOUCH P3D/FSIM

```
; adjust brightness (0 to 100)
brightness.bezel = 100
; offset brightness (-100 to +100)
brightness.screen = 0
```

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