



RXP GNS 530W/430W V2

User's Manual For X-Plane

Fly WAAS approaches!

The WAAS-certified GNS 530W and its slightly smaller sibling, GNS 430W, lead the industry with multitasking, integrated avionics and cutting-edge WAAS navigation. The GNS 530W comes with optional Class B TAWS alerting to warn you of potential terrain and obstacle conflicts along your flight path. Both come with optional Ryan 9900B TCAD, Shadin Fuel and Shadin Air input, and cross fill capability.

The Reality XP GNS 530W/430W V2 is an entirely new GNS WAAS simulation product built on our unique expertise in designing the most authentic Garmin devices simulation since 2002.

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.

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Introduction

The Reality XP GNS 530W and GNS 430W V2 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.

Garmin avionics have become the clear #1 choice in the owner-flown aircraft market. Nearly three-fourths of all U.S. single- and twin-engine piston and turbine aircraft retrofitted since 2000 are now flying with Garmin GPS-enabled equipment. The provision of the integrated communication and navigation radios in the unit gives the extra capabilities of auto tuning and pre-fetching your navigation and approaches frequencies. Flying has never been easier!

The Reality XP GNS 530W and GNS 430W V2 are navigator's heaven with an extraordinary number of user customizable navigation information fields. In short, there is simply no better simulation of the GNS 530W and GNS 430W for any flight simulator, period.



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 GNS 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.

System Requirements

The Reality XP GNS 530W/430W V2 is a plugin for Laminar Research **X-Plane 11, 10 or 9** for Windows¹.

¹ X-Plane minimum versions required: 11.x (64bits), 10.5(64/32bits), 9.42(32bits) ; Windows versions required: WinXP to Win10

Getting Started

Installation

A plug-in with both² the GNS 530W and the GNS 430W simulation installs to³:

XPlane\Resources\Plugin\rxpGNS\

During installation you will be prompted to download and install the Garmin GNS Trainer Lite⁴. 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 in the following folder:

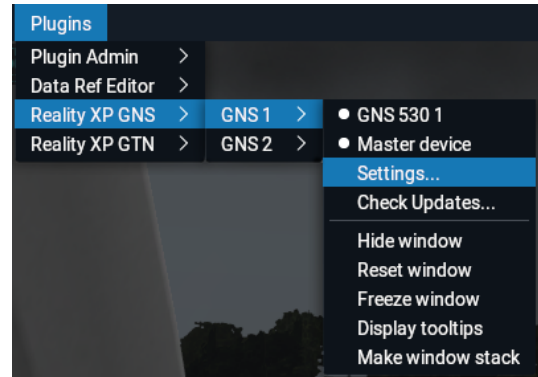
C:\ProgramData\Reality XP\Common\GnsTrainer\

This Garmin trainer is a more recent version never offered before in flight simulation, exclusively showcased in our solution. It has main software version 3.3 released in 2010 and includes bug fixes, faster updates, takes less resources and adds some new capabilities to the integrated navigator.

Plugins Menu

The GNS 530W/430W V2 plug-in loads with X-Plane and is operated using the X-Plane Plugins menu.

Select the menu **Plugins | Reality XP GNS** to add or remove a GNS unit to your aircraft. Once a device is active, additional options appear in the menu:



Master Device	The Master Device has autopilot and navigation authority in dual-GNS panel installations.
Settings...	Open the configuration panel.
Check Updates...	Check whether there is a new version released.
Show Window	Show or hide the gauge window.
Reset Window	Reset default gauge size.
Freeze Window	Locks window dimensions.
Popout Window	Toggles the window between popup (in-sim) and popout (detached) modes.
Display tooltips	Show or hide mouse tooltips.
Make window stack	Make a stack of aligned windows with this device on top and the other below.

² The same plugin file installs both but it requires purchasing and installing both products to unlock both GNS models.

³ X-Plane 9: "Resources\Plugin\rxpGNS2.xpl"

⁴ Compatible trainer versions: 3.3

Configuration Panel

The Reality XP GNS offers a wide variety of configuration options in order to control the way each device operates and integrates in the aircraft. Most device configuration options are available in the configuration panel.

Press and hold the SHIFT key then RIGHT-Click the top edge of a GNS device to open the configuration panel⁵.

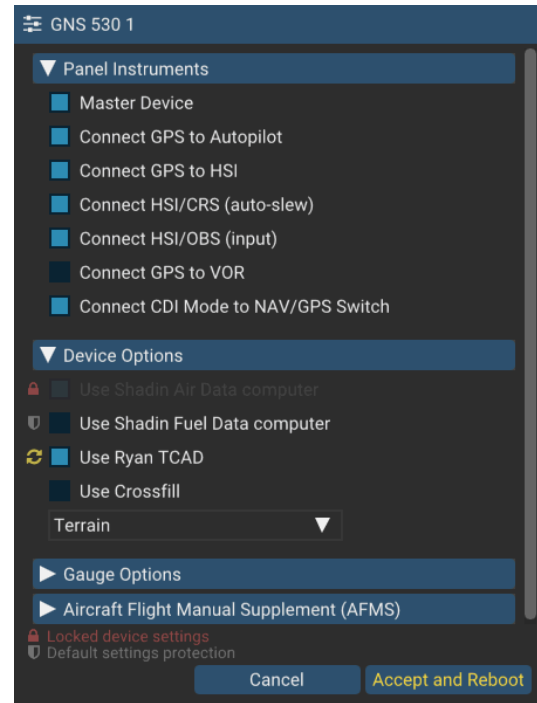
Lock and Shield icons indicate settings restrictions. Read more about these in the *Third Party Vendor Settings* chapter.

Reboot icon shows when settings changes will reboot the device.

The panel saves the settings to the **RealityXP.GNS.ini** configuration file in the aircraft folder. The plugin read this file and restores the device settings when reloading the aircraft, including window size and position.

Warning Drag and Drop a RealityXP.GNS.ini file onto the panel window to import another aircraft settings.

Warning Optimize settings file is an opt-out option which resets back to 'enable' when the panel opens. When 'Accepting' changes the panel saves the values not set to their default and removes inline comments from the file. This reduces the .ini file size on disk to the strict necessary. When disabled (opt-out), the 'Accept' button changes to 'Save' and the panel saves the entire set of values with their inline comments.



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.

Resizing Gauge Windows

The simulation window resizes and maintains its aspect ratio. **Press and hold the SHIFT key then LEFT-Click the top edge** of the GNS device to scale the window to either 1:1 or 2:1 screen sizes⁶.

While the mouse cursor is grabbing any of its edges or corners, **press and hold the SHIFT key** to relax the aspect ratio constraint while resizing.

⁵ **SHIFT+LEFT Click** for **XP10** and **XP9**. The settings panel also opens with menu: **Plugins | Reality XP GNS | GNS # | Settings...**

⁶ Requires X-Plane 11 minimum.

Plugin Details

The plugin includes a complete collection of Garmin GNS devices: the **GNS 530** product includes the **GPS 500**, similar in form and function to the 530, it is a radio-less sibling and fits panels already equipped with radios. Similarly, the **GNS 430** product includes both the **GPS 400** and the **GNC 420**.



Autopilot

The GNS 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 GNS 530W and GNS 430W V2 can control the simulator COM and NAV audio panel volumes using the **Power** and the **Volume** knobs respectively (XP10+ only).

With X-Plane 11.30+ ATC system, the GNS COM box automatically annunciates the **RX flag** when receiving audio and the **TX flag** when transmitting audio

Traffic Collision Alerting Device (TCAD)

The GNS embeds a Ryan 9900B TCAD (Traffic Collision Alerting Device) simulation. It is an authentic TCAS II Mark 7 simulation passing the 250 TSIM tests. Take full control of the TCAD detection shields, view nearby traffic and take actions upon visual and aural TA advisories directly on the GNS device. The X-Plane multiplayer datarefs feed the TCAD simulation.

TAWS-B

The GNS V2 offers both TAWS-B and TERR Proximity modes with advanced settings available to fine tune the capabilities depending on the aircraft configuration. The GNS also connects to the flaps and the gear in order to adjust detection sensitivity and operating limits depending on the phase of flight.

Integral Lighting

Using the configuration panel, select whether you prefer constant or adjustable brightness. The later offers a choice among the first 4 available X-Plane standard rheostats. The plug-in integrates with the X-Plane panel system and provides adjustable integral lighting through the default X-Plane integral lighting rheostats.

Cross-Fill

When enabled in both GNS, this option allows you to transfer a direct- to destination, the active flight plan including VNAV parameters, any stored flight plan or user waypoints to a second 400W or 500W device.

If both units are set to automatic (in the Garmin GNS device settings), a change in the active flight plan, or VNAV parameters, on one unit can also be seen in the other. Initiating a direct-to course to a waypoint on one unit also initiates a direct-to course to the same waypoint on the other unit

Satellite-Based Augmentation Systems (SBAS)

The GNS supports **WAAS** (US), **EGNOS** (EU), **MSAS** (JP) and **GAGAN** (IN)⁷. Display the last GNS AUX page, select **SBAS Selection** then enable each system and improve the performance of the GNSS for enroute, terminal area, non-precision approach operations (including "GPS" or "RNAV" approaches), and approach procedures with vertical guidance (including "**LNAV/VNAV**" and "**LPV**").



Discrete Inputs

Each device supports discrete inputs, via keyboard shortcuts, custom commands or the default GPS commands. These control some of the GNS operation: Toggle CDI source, Toggle OBS mode and TAWS Inhibit.

X-Plane GPS Commands

In addition to publishing its own set of X-Plane commands, the GNS may be configured to also intercept all of the default X-Plane GPS commands. Open the settings panel then select "Use Default GPS Commands" advanced gauge option.

Keyboard Shortcuts

Keyboard shortcuts are found by opening the X-Plane settings screen and going to the Keyboard tab. You can bind a combination of keys with a published GNS command. These commands support press, hold and release actions. The GNS may also be configured to intercept keyboard shortcuts using the X-Plane Plugin Admin Menu. These are managed by the GNS plugin and saved in a "RealityXP.GNS.ini" file located in the X-Plane preference folders, but they only support press-and-release actions.

Pilotedge Integration

Real flying takes place in a dynamic environment populated by other human beings. In a real airplane there's no Pause key, and the pilots and air traffic controllers you interact with on the radio are real people. Enter PilotEdge. Connecting your flight simulation software to PilotEdge⁸ instantly creates the same mental environment you find yourself in when you fly a real airplane.

When using the Pilotedge plugin online, the GNS COM box automatically annunciates the **RX flag** when receiving audio and the **TX flag** when transmitting audio.

⁷ Systems and approaches availability depends on the navigation database.

⁸ <https://www.pilotedge.net>

Failures Annunciation

When enabled in the configuration panel, the GNS plugin uses the following datarefs⁹ as failures sources:

sim/operation/failures/rel_gps sim/operation/failures/rel_gps2 sim/operation/failures/rel_g430_gps1 sim/operation/failures/rel_g430_gps2	Satellite reception failure, displays: "No GPS Position"
sim/operation/failures/rel_gp RXP/operation/failures/rel_waas_gps1 RXP/operation/failures/rel_waas_gps2	Differential GPS failure, reduces location accuracy: satellite reception mode switches to 3D only.
RXP/operation/failures/rel_raim_gps1 RXP/operation/failures/rel_raim_gps2	RAIM check failure.



NB: professional licenses provide additional datarefs to override GPS receiver mode, WAAS solution, dilution of precision, position uncertainty and figure of merit.

Hardware Controllers

The GNS supports a selection of external hardware controllers¹⁰. When the plug-in loads, it automatically detects the connected hardware and saves the bindings to the "RealityXP.GNS.ini" file in the aircraft folder. The following hardware devices are supported: PFC 430 Control Head (Standalone and included in PFC Avionics Stack).

Aircraft Flight Manual Supplement (AFMS)

The GNS supports specific enablement features configured during installation in a real aircraft. These are regrouped in the configuration panel under Aircraft Flight Manual Supplement (AFMS) and allow selecting V-Flag Declutter, disabling CDI key etc...

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. Checklists are created using any text editor and must be saved to a file named **checklist.gns**¹¹ into the aircraft folder. To get started, a sample pack installs to:

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

Unzip the "checklists.zip" archive file to extract the sample ".txt" checklists file. Open the unzipped checklist.txt with notepad.exe to review the file format (it is self-documented). Then copy the file to the aircraft folder and rename it to checklist.gns.

On the GNS device, whether on the last boot page or while viewing the AUX pages group, select the **Checklists** menu to start the checklists function.

⁹ datarefs starting with 'RXP' use the same 'failure' values as X-Plane datarefs (0: normal, 6: inop). See 'Control Variables' p12 for complete list.

¹⁰ Requires separate activation or a hardware enabled version. See reality-xp.com for available options. Existing customers of the GNS Driver don't have to purchase the driver a second time.

¹¹ Supports both "checklist.txt" and "checklist.gns"

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 GNS. The imported flight plans can then be stored to the GNS flight plan catalog. This chapter describes how to enable and use this feature.

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 **FPL** and be located in the GNS Trainer Data folder, typically¹²:

```
"C:\ProgramData\Garmin\GNS Trainer Data\GNS\FPL"
```

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

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

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

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

Importing flight plans

The last step is to import the flight plans into the GNS device. To proceed with the starter pack, unzip the "flightplans.zip" archive file to extract the "LFATLFRG.fpl" flight plan sample file, then copy the file to the "FPL" folder.

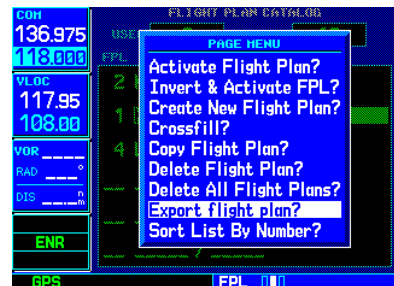
On the GNS device, while viewing the Flight Plan pages, turn the outer GPS knob clockwise to reach the 3rd FPL page and select flight plan file, and the FPL number this flight plan will be assigned to. When done, select **Import?**



Exporting flight plans

The GNS offers a feature to export the flight plans from the device. On the GNS device, while viewing the Flight Plan Catalog page, press the GPS knob to activate the cursor and select a flight plan in the list.

Then press the **Menu** key and select the **Export Flight Plan?** option. The exported flight plan is saved to the same "FPL" folder with a unique file name.



¹² The "FPL" folder must reside in the folder "GNSAPPDATA". See Configuring Alternate Paths chapter for more information.

Configuration

Aircraft Configuration

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

The INI file consists of sections and keys. The name of a section 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]
; comma separated list of gauges
gauges = GNS_530_1, GNS_430_2

[GNS_530_1]
; comma separated list of render targets.
drawto = WINDOW, PANEL2D
; is the master device if true.
MasterDevice = true

[GNS_530_1.WINDOW]
; display window if true.
visible = true

[GNS_530_1.PANEL2D]
; display window if true.
visible = false
```

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

- The **GNS** section contains the gauges key with the content "GNS_530_1, GNS_430_2. These are the names of the sections for each gauge.
- The **GNS_530_1** gauge section contains the drawto key with the default content "WINDOW, PANEL2D". These are the names of the sections for each render target.
- The **GNS_530_1.WINDOW** and **GNS_530_1.PANEL2D** render target sections contain the rendering settings.¹³

Advanced Settings

Advanced settings are only manually editable in the **RealityXP.GNS.ini** settings file in a **[GNS_###_#]** section:

CpuAffinity = -1	selects the CPU running the trainer process: 1 to 32; 0: last core, -1: automatic.
HardwareDevice =	; connects to: 'PFC_STACK','PFC_430','PFC_530' or any '#PID' (#D002 for PFC_430) no value connects to first found, 'OFF' disables connection (requires the Reality XP GNS Driver add-on)
HardwareIdx = -1	; hardware selector number or -1 to disable (requires the Reality XP GNS Driver add-on)

¹³ Please note you can only configure one window per gauge, but you can configure multiple panels per gauge.

Third Party Vendor Settings

Third party aircraft vendor may want to **lock settings** and prevent user changes in the GUI settings panel, or to ensure the device starts up with **default values** like pre-configured 3D cockpit rendering position and size. When configured, locked settings appear disabled with a red lock icon in the GUI settings panel. Default settings appear with a grey shield icon and reset to their default value every time the device reloads.

🔒 How to configure default settings: create a **RealityXP.GNS.defaults.ini** file in the aircraft folder with only the sections, keys and values you want to override as defaults.

🔒 How to configure locked settings: manually add 'locked' in a **[GNS_###_#]** section in the **RealityXP.GNS.ini** settings file. For example, an aircraft requires the device to be set to 'Copilot' side and connected to the HSI:

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

Custom Commands

This chapter describes the list of custom X-Plane commands available to control the GNS with hardware controllers. Each command exists with a "_1" suffix for unit #1, and "_2" suffix for unit #2

RXP/GNS/CFLP	press button: COM fLIP	RXP/GNS/PWR_PUSH	press knob: POWER
RXP/GNS/VFLP	press button: NAV flip	RXP/GNS/PWR_CCW	rotate knob: POWER (ccw)
RXP/GNS/CDI	press button: CDI	RXP/GNS/PWR_CW	rotate knob: POWER (clock-wise)
RXP/GNS/OBS	press button: OBS	RXP/GNS/VOL_PUSH	press knob: VOLUME
RXP/GNS/MSG	press button: MSG	RXP/GNS/VOL_CCW	rotate knob: VOLUME (ccw)
RXP/GNS/FPL	press button: FPL	RXP/GNS/VOL_CW	rotate knob: VOLUME (clock-wise)
RXP/GNS/VNAV	press button: VNAV	RXP/GNS/COM_PUSH	press knob: COM
RXP/GNS/PROC	press button: PROC	RXP/GNS/COM_OUTR_CCW	rotate outer: COM (ccw)
RXP/GNS/ENT	press button: ENT	RXP/GNS/COM_OUTR_CW	rotate outer: COM (clock-wise)
RXP/GNS/CLR	press button: CLR	RXP/GNS/COM_INNR_CCW	rotate inner: COM (ccw)
RXP/GNS/MNU	press button: MNU	RXP/GNS/COM_INNR_CW	rotate inner: COM (clock-wise)
RXP/GNS/DTO	press button: DTO	RXP/GNS/GPS_PUSH	press knob: GPS
RXP/GNS/RDN	press button: RNG UP	RXP/GNS/GPS_OUTR_CCW	rotate outer: GPS (ccw)
RXP/GNS/RUP	press button: RNG DWN	RXP/GNS/GPS_OUTR_CW	rotate outer: GPS (clock-wise)
RXP/GNS/CDI_SOURCE	toggle CDI source (discrete input)	RXP/GNS/GPS_INNR_CCW	rotate inner: GPS (ccw)
RXP/GNS/OBS_MODE	toggle OBS mode (discrete input)	RXP/GNS/GPS_INNR_CW	rotate inner: GPS (clock-wise)
RXP/GNS/TAWS_INHIBIT	inhibit TAWS (discrete input)	RXP/GNS/TOGGLE_WINDOW	toggle window visibility

In addition the plugin exports the following 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 Datarefs

This chapter describes the list of additional sim variables the GTN publishes to third party add-ons. There are three sets of variables representing different Reality XP sources: any GPS #1 (GTN or GNS V2), any GPS #2 and any Reality XP Master Device. Variable names start with "**RXP/radios/indicators/**" followed by a base name and a suffix indicating the source:

Variable Name (any RXP GPS)	Type	Units	Suffix	Remarks
hsi_bearing_deg_mag	float	degrees	_1 _2 _pilot	suffix: GPS#1, GPS#2, Master Device
hsi_flag_from_to	int	enum	_1 _2 _pilot	
hsi_hdef_dots	float	dots	_1 _2 _pilot	
hsi_vdef_dots	float	dots	_1 _2 _pilot	
hsi_has_dme	int	boolean	_1 _2 _pilot	
hsi_dme_distance_nm	float	miles	_1 _2 _pilot	
hsi_dme_speed_kts	float	knots	_1 _2 _pilot	
hsi_dme_time_min	float	minutes	_1 _2 _pilot	
hsi_flag_glideslope	int	boolean	_1 _2 _pilot	
hsi_display_horizontal	int	boolean	_1 _2 _pilot	
hsi_display_vertical	int	boolean	_1 _2 _pilot	
gps_course_deg_tm	float	degrees	_1 _2	no suffix for Master Device 'gps_' vars
gps_cross_track_nm	float	miles	_1 _2	
gps_time_min_eta	float	minutes	_1 _2	
gps_discrete_out	int	bitfield	_1 _2	
gps_nav_id	string		_1 _2	
gps_unit	enum		_1 _2	4 chars encoded device id or 0 ¹⁴
Variable Name (RXP GNS V2 only)				
gns_unit1	enum			4 chars encoded device id or 0
gns_unit2	enum			4 chars encoded device id or 0

Control Variables

Third party plugins write to the following sim datarefs to further enhance the GNS operation:

RXP/operation/failures/rel_waas_gps1(2)	failure enum	(inop: 6) alternative to "rel_gp"
RXP/operation/failures/rel_raim_gps1(2)	failure enum	(inop: 6)
RXP/gps/dscrt_in/obs_mode_sel_1(_2)	boolean	discrete in signal (write 1 to trigger)
RXP/gps/dscrt_in/taws_inhib_1(_2)	boolean	discrete in signal (write 1 to trigger)
RXP/gps/dscrt_in/cdi_src_1(_2)	boolean	discrete in signal (write 1 to trigger)
RXP/gps/dscrt_in/mute_actv_caut_1(_2)	boolean	discrete in signal (INOP)

¹⁴ **GTN:** 'G621' (0x31323647), 'G622' (0x32323647), 'G631' (0x31333647), 'G632' (0x32333647), 'G651' (0x31353647), 'G652' (0x32353647), 'G721' (0x31323747), 'G722' (0x32323747), 'G751' (0x31353747), 'G752' (0x32353747)

GNS: 'G401' (0x31303447), 'G402' (0x32303447), 'G421' (0x31323447), 'G422' (0x32323447), 'G431' (0x31333447), 'G432' (0x32333447), 'G501' (0x31303547), 'G502' (0x32303547), 'G531' (0x31333547), 'G532' (0x32333547)

Device Embedded Memory

The GNS 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\GNS Trainer Data\GNS
```

The Reality XP GNS 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: GNS 5XX #1 and GNS 5XX #2  
sys_nandc, sys_nandd: GNS 4XX #1 and GNS 4XX #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.

The simulation automatically creates and manages per-device/per-unit nonvol file. In addition, should the original `sys_nand0` file is missing, the GNS Trainer recreates it from scratch. When upgrading from one trainer version to the next, the setting files are upgraded automatically as well.

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:

```
GNSSIMPATH="C:\Program Files (x86)\Garmin\GNS Trainer\GNS"
```

Set the application data path, that is where it stores the non volatile memory files (where routes, user waypoints and device settings are saved)¹⁶:

```
GNSAPPPDATA="C:\ProgramData\Garmin\GNS Trainer Data\GNS"
```

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

```
GNSNAVDATA="C:\Program Files (x86)\Garmin\GNS Trainer\GNS\DB"
```

¹⁵ how to add environment variables:

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

¹⁶ The GNSAPPPDATA default to the path shown If not manually configured otherwise.

Configuring Aviation Database Files

Copy the aviation database file and/or the obstacle database file to the location of your choice on your hard drive, for example in "My Documents" folder, then add the following Windows environment variable for the aviation and obstacles files respectively (in this example the aviation db file is renamed to gns_db.bin):

```
GNSADBFIL="C:\Users\MyName\Documents\gns_db.bin" (alias: GNSDBFILE)
GNSODBFIL="C:\Users\MyName\Documents\terrain.odb" (alias: GNSOBSTCL)
```

Installing Multiple Garmin Trainers

This chapter describes a procedure when you want or need to install two different versions of the Garmin GNS Trainer on your computer. The Garmin GNS Trainer installer prevents installing two different versions, such as the latest compatible with the Reality XP GNS and an older one. However, the GNS 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 GNS
2. Copy the "GNS" folder located in "C:\Program Files (x86)\Garmin\GNS Trainer\" to the location of your choice, or rename it for example to: "C:\Program Files (x86)\Garmin\GNS Trainer\GNS (3300)\"
3. Add the following Windows environment variables:
name = "GNSSIMPATH" value = *the path to the 'GNS' folder you have chosen above*
for example:

```
GNSSIMPATH="C:\Program Files (x86)\Garmin\GNS Trainer\GNS (3300)\"
```

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

Troubleshooting

This chapter describes solutions to help troubleshooting problems with the plugin and the Garmin Trainer.

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 Plugin log file: "**My Documents\rxpGNS2.xpl.log**".

The GNS Simulation log file: "**My Document\rxpGnsSim.dll.log**"

Debug Settings

The GNS 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 "rxpGnsSim.dll.log"

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

LogTrainer = 0	1 to enable Garmin Trainer logs.
----------------	----------------------------------

Anti Virus / Windows Security / Windows Defender Security Center

Windows security and Antivirus or Malware scanners are known to flag the Reality XP files as dangerous from time to time. Should the product doesn't work as expected, or refuses to run, please make sure to review your anti-virus protection for any 'RXP' quarantined files. The solution it to recover the file(s) from the quarantine of the antivirus and to set an exclusion for it so it will not be deleted anymore.

How to allow blocked apps by the Windows 10's ransomware protection

Windows Security lets you manage all your security needs, including Windows Defender Antivirus and Windows Defender Firewall. Controlled folder access can help prevent ransomware and other destructive malware from changing your personal files. Sometimes apps that you normally use might be blocked from making changes to common folders like Documents.

Starting with the Windows 10 October 2018 Update (version 1809), the feature has updated with a new option to quickly allow recently blocked applications without the need to disable the security feature just because of a false positive.

To access Controlled folder access controls, select Start > Settings > Update & Security > Windows Security > Virus & threat protection. You should then select Manage settings, and under Controlled folder access, then select Manage Controlled folder access. From there set Controlled folder access to on or off.

Within Windows 10 Windows Security you can now allow a recently blocked app by opening "Virus & Threat protection" within the Windows Security app, clicking "Ransomware protection" and then going through to "Allow an app through Controlled folder access". The new option to add "Recently blocked apps" will appear in a popup.

Tutorial: Upgrade X-Plane 11 Baron 58 GPS

Replacing any aircraft default X-Plane GPS requires a few easy steps. This chapter is a step-by-step guide to replace the aircraft default GPS with the Reality XP GNS 530W/430W V2 on the stock X-Plane 11 Baron 58.

Find gauge panel coordinates

The first step consists in finding where to draw the gauge to the 3D panel.

1. Start X-Plane 11 with the Baron 58 and wait until the aircraft is ready on the tarmac.
2. Press the **CTRL+ALT+SHIFT+SPACE** keys to save the panel preview snapshot.
3. Select **Plugin | Reality XP GNS | GNS 1 | GNS 530W 1** if not already opened.
4. Exit X-Plane 11.
5. Open the saved panel preview snapshot with any paint program, like "Paint" included in Windows:

```
XPlane\Aircraft\Laminar Research\Baron B58\cockpit_3d\-PANELS-\Panel_Preview.png
```

6. In the paint program, zoom to the centre section where you find the default GPS screen.
7. Write down corners coordinates (pixels highlighted in red below)
8. compute display dimensions like this¹⁷:

left = 275 = X1

top = 668 = (Panel_Preview.png image height) - Y1 = (1024 - 356)

width = 260 = (X2 - X1 + 1) = (534 - 275 + 1)

height = 195 = (Y2 - Y1 + 1) = (550 - 356 + 1)



¹⁷ When opening the Baron 58 in plane maker, you'll notice the GPS 500 properties show 0.5 scale. The size computed above equals half the genuine XPlane GPS size, which is 520x390 for the GPS500 and 430x240 for the GPS400.

Add the RXP GNS 530W Gauge to the 3D panel

The second step consists in configuring the GNS 530W to display in the 3D panel.

9. With notepad or any other text editor, open the following file:

```
XPlane\Aircraft\Laminar Research\Baron B58\RealityXP.GNS.ini
```

10. Locate the section header:

```
[GNS_530_1]
```

11. Right below the section header, locate the line starting with `drawto`, then type the names of the render targets to the end of the list¹⁸:

```
drawto = WINDOW, Garmin_530_screen
```

12. Add the following text to create a new section at the end of the file, save and exit notepad¹⁹:

```
[GNS_530_1.Garmin_530_screen]
visible = true
nobezel = true
frame.type = PANEL3D
; display position and dimension (left,top,width,height)
frame.rect = 275,668,260,195
```

13. Open X-Plane 11, select the Baron 58 and open the GNS 530W 1 configuration panel.

14. Enable **Use X-Plane GPS Commands** option then **Accept** to close the panel.

15. Your GNS 530W displays in the 3D panel, and the bezel knobs and keys are working!



¹⁸ It is a comma separated list.

¹⁹ frame.rect values previously computed with the Panel_Preview.png file.

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