Reality XP
Flight Line T

User's Manual

About this manual

This manual is intended for flight simulation purposes only, and shall not be used for any real world aviation application or reference.

This manual is intentionally written using “gray scale” colored text in many areas, and much of the print is intentionally this medium gray color. This has been done to conserve ink while printing. In some cases “black” type has been used for emphasis. Photographs used in this manual have also been reduced to black and white, and also in contrast in order to conserve ink. Please be sure to double-check your printer’s settings prior to printing in order to achieve the best results. We have tested, and experienced no issues printing this manual on laser printers. If you are experiencing a problem using a laser printer, you should check the printer’s quality settings.

By reading this manual you should become well acquainted with the product, and should be able to obtain the information necessary to “fly” the product within Flight Simulator.

Please take the time to read this manual completely; so that you can become properly acquainted with the product and its operation.

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

Important information

www.reality-xp.com

Standard 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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Flight Line T overview

You think smooth 3D gauges in virtual cockpit set the bar? Think again!

For the discriminating pilots, the Flight Line T is a comprehensive solution brought to you by Reality XP. It is a complete set of mechanical gauges based on a state of the art technology.

TrueGauge XP is the leading technology from Reality XP exclusively engineered for simulation of mechanical gauges. With our proven track record of offering the highest standards in simulation Reality XP sets the bar again with mechanical gauges simulation.

TrueGauge XP is a technology offering a higher level of accuracy, smoothness and precision of the 3D modeled gauge approach, while allowing the gauge to be rendered in the Virtual Cockpit, the 2D panel, a popup window or a second monitor!

Because gauge simulation is not just displaying bitmaps that look like a gauge, but because it is also about operational procedures and mechanical constraints, TrueGauge XP achieves the highest simulation fidelity available on the Desktop PC, unsurpassed by any other desktop simulators.

Reality XP's unique expertise brings a new dimension to traditional gauges in offering the smoothest gauges on the market today, as well as the most realistic simulation of the internal mechanical bearings and parts making a mechanical gauge.

TrueGauge XP also sets new standards visually with carefully crafted highlights, shadows and details. With this new technology, the gauge elements are smoothly blended for the best graphics. It is virtually like having an animated multi layered Photoshop photo in real time!

Engineered with the leading edge development best practices in graphics animation, TrueGauge XP renders faster, better and more precisely than any other SDK based gauge for the best simulation experience.

For the first time, you will be able to fly an approach with your instruments to the same level of accuracy and precision you would find with real gauges!

The Reality XP Avionics products are unequaled in providing the features, levels of performance and reliability that flight simulation users require. The Reality XP Avionics sets a new higher standard to which all other Avionics Simulations will be compared.

Product Features

The Flight Line T includes a set of 29 analogue gauges covering the traditional “T-Stack” gauges as found in any “non-glass” aircraft with the following features:

- Bendix King KI256 ADI.
- Bendix King KI525 HSI.
- Bendix King KA51 Gyro Slaving Unit.
- Airspeed Indicators (5 types).
- Altimeters (4 types).
- Attitude Indicators (3 types with 2 pitch card variations).
- Directional Gyro (4 types).
- Turn Coordinator (3 types).
- Vertical Speed Indicator (6 types).
- Dimmer knob.
- Support for any third-party aircraft lighting system both in the 2D panel and the virtual cockpit, as well as adjustable lighting and integral lighting.
- Highly accurate needle position and precision on the gauge scales.
- High resolution Photo-realistic gauges bitmaps.

The gauges features are simulated in form, fit and function. The Flight Line T gauges have been designed as accurately as is possible based on their real-world counterpart.

Documentation

After installation, a new program group is accessible from your Windows Start Menu \ Reality XP. This program group contains the necessary utilities and documentation. Make sure you review all available documentation.

Please take the time to read all manuals completely so that you can become properly acquainted with the product and its operation.

Flight Line T gauges presentation

Bendix King

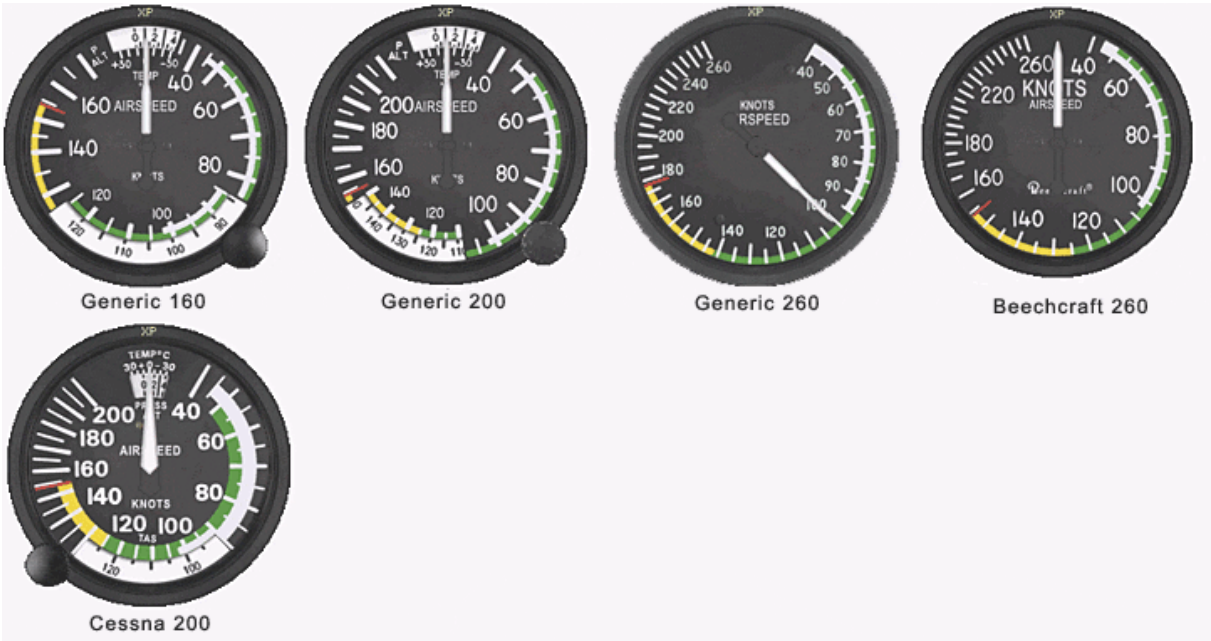
The Bendix King set includes the KI256 ADI with optional Flight Director, the KI525 mechanical HSI with localizer and glideslope indicators and the KA51 Gyro Slaving unit in both horizontal and vertical layout. The KI525 drift rate is user selectable.

- **KI256**: the DH light features a click spot to adjust the decision height.
- **KI525**: the course and heading knobs permits quick-sync-up operation with the middle mouse button (this aligns the course and heading bug to the current heading).
- **KA51**: is automatically working in SLAVE mode in the background when not configured in the panel.

Attitude

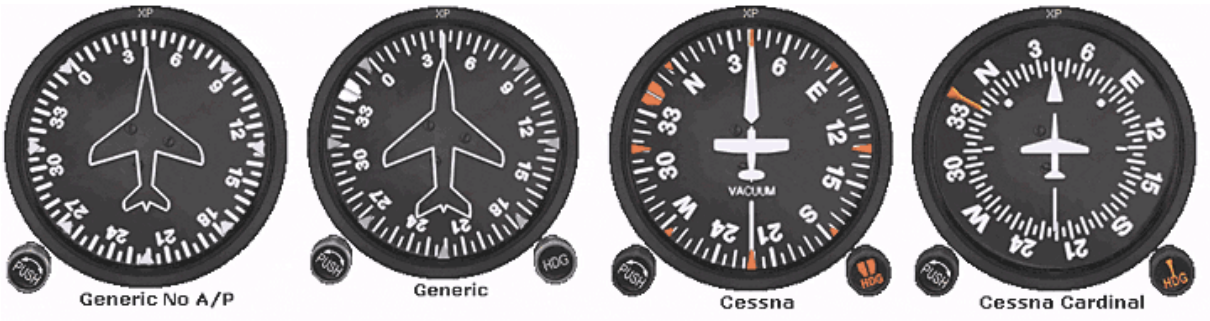
The Attitude set includes three different types with user selectable moving card type. The knob adjusts the aircraft wings height in order to set the zero-pitch reference.

Airspeed



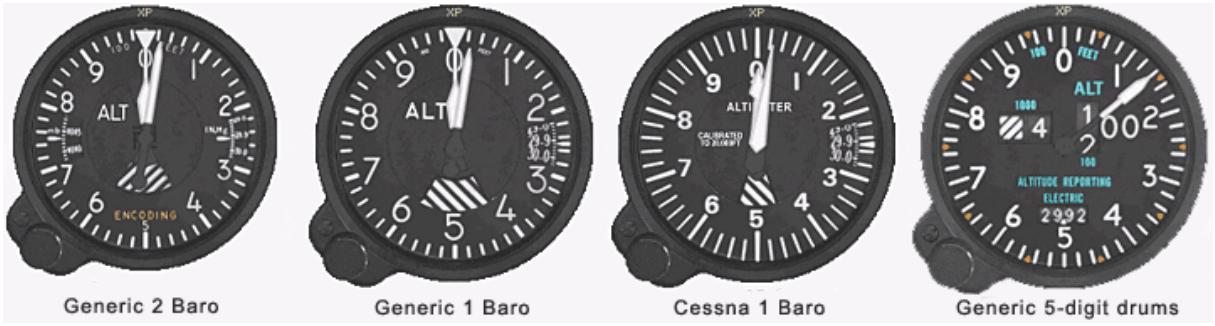
The Airspeed set includes five different types with user configurable color arc ranges and colors (VS0, VS1, VFE, VNO, VNE, VLE) and up to three user selectable speed marks overlays. In addition, some of the gauge permits adjusting a TAS card. Pressing the middle mouse button over the knob automatically adjusts the TAS card with the current Pressure Altitude and Air Temperature.

Directional Gyro



The Directional Gyro set includes four different types. The push and heading knobs permits quick-sync-up operation with the middle mouse button (this resets the gyro drift and aligns the heading bug to the current heading). The drift rate is user selectable.

Altitude

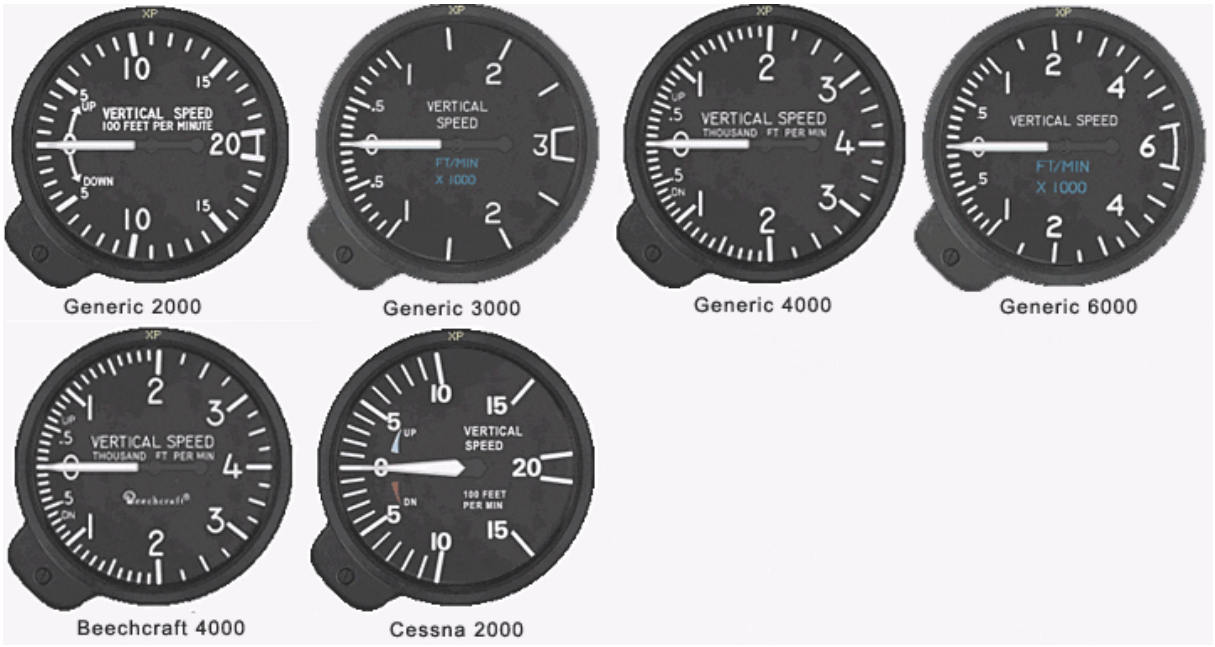


The Altitude set includes four different types with user configurable barometric unit (for the single barometric window type of altimeter gauge). In addition, markings every 50 feet can be configured on the gauge dial. Pressing the middle mouse button over the knob automatically adjusts the barometric setting to standard.

Turn Coordinator

The Turn Coordinator set includes three different types.

Vertical Speed



The Vertical Speed set includes six different types. In addition, the indicator can be configured like a standard VSI or like an IVSI (Instantaneous Vertical Speed Indicator).

Gauge Mounting options

In addition to configuring the type of each gauge in the panel, three mounting options are available for all the gauges but the Bendix King set (KI256, KI525 and KA51).

Operation with Flight Simulator

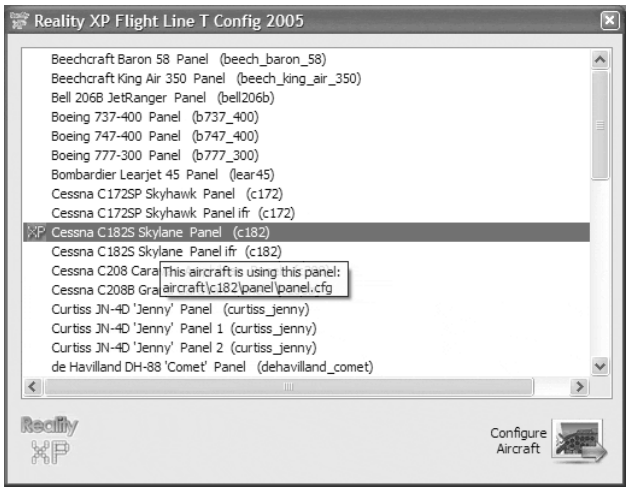
This section covers detailed information about how to access the enhanced features the gauge offers when running with Flight Simulator.

Getting Started

During installation, the Flight Simulator default Mooney will be configured ready-to-fly with Flight Line T (an additional panel configuration file, PANEL.FLT.FLN.CFG is also copied in the Mooney panel folder if you have both FLT and FLN products). A tutorial is included in this manual to help you understand the basics of panel configuration and to permit adding Flight Line T gauges in any of your aircraft.

The Flight Line T is a Flight Simulator compatible gauge pack and can be configured in any Flight Simulator aircraft panel. In addition to configuring the gauges in the panel, many settings are available to tailor the integration to your specific needs. The software package includes an easy to use configuration program to assist with configuration: FLT Config.

When first started, FLT Config detects and prompts you with all available aircraft and panels with the “select an aircraft” panel. Flight Simulator has an open architecture that permits several aircraft to share the same panel, and the selected aircraft can use different panel configurations. Not all available aircraft and panels configurations are listed in the “select an aircraft”: FLT Config lists only the unique combinations of both aircraft and panels.



Refer to the additional FLT Service Manual (located in your Windows Start Menu \ Reality XP program group), for additional panel configuration options and information.

Configuration File

FLT Config provides a graphical user interface to most of the settings provided for the FLT. For each customized aircraft and/or panel, a copy of the configuration files (.INI) will be added to your aircraft\Panel folder.

The FLT gauges look for an ini file, first in the panel folder, then in the aircraft folder and lastly use the settings from the Reality XP Common Settings folder.

Refer to the additional FLT Service Manual (located in your Windows Start Menu \ Reality XP program group), Section RXPFLT.ini for additional details and options.

General Features

All of the Reality XP gauges and controls utilize a relatively unique implementation of click spots. They work as follows:

1. As your mouse cursor passes over a click spot on the panel it will cause it to turn from an arrow cursor into a “hand” cursor. There are no **+** or **-** click spots: the hand cursor will be empty.
2. Whenever a single click spot is used, and depending upon its function a left click will accomplish the same task as a right click. In other cases, a left click will accomplish one task, while a right click will accomplish another.
3. In some cases the click spot will not function as stated above, but instead will feature separate functions for the left and right clicks. Example: For a toggle switch with 3 positions, a left click will move the switch in one direction, while a right click will move it in the opposite direction.
4. Certain click spots will work with left and right clicks, and the mouse wheel, if your mouse is so equipped. This type of click spot is used on gauges that require adjustment, such as the knobs, etc. In this case the left click turns the item “left” and a right click turns it “right”. Forward / back scrolling on your mouse wheel will also do the same.

Tool Tips

By turning on FS “Tool Tips” you will see descriptions of these clicks spots when your mouse cursor is placed over them.

Special Click spots

Illustration of the Bendix King KI525 HSI

1 – Popup / Readout / Cover: Located in the center of all the gauges, the click spot supports multiple functions. The left mouse button operates a popup ident configured in the RXPFLT.INI file and toggles a popup window. On some gauges (Airspeed, Directional Gyro and Altimeter), the middle mouse button toggles a digital readout of the gauge values. The right mouse button toggles a cover to hide the gauge. This permits hiding failed gauges and/or practice gauge failures.

2- Gyro Drift reset: The click spot only available with the KI525 resets the gyro drift. This permits aligning the HSI compass card when the KA51 is not installed in the panel.

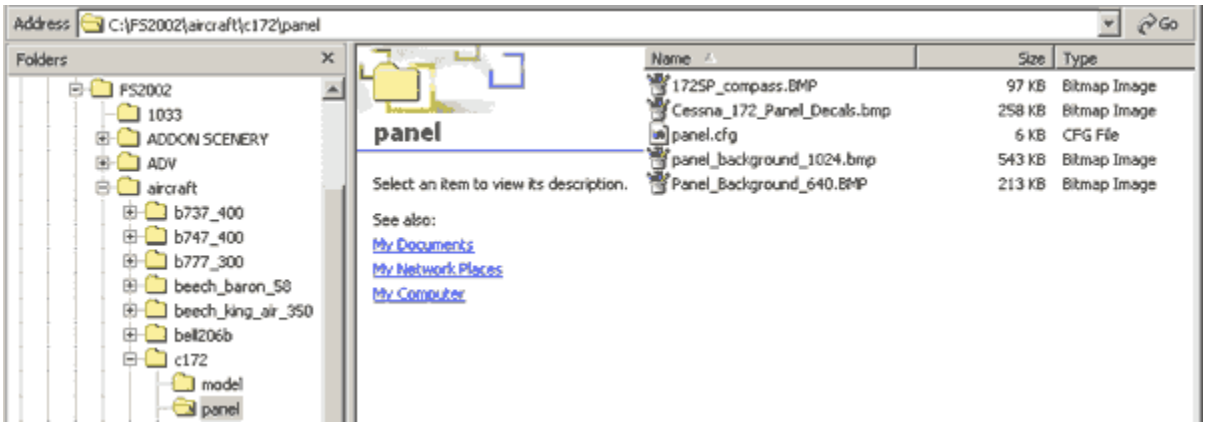
NB: the Directional Gyro gauges features a reset-drift function in pressing the middle mouse button on the PUSH knob.

Flight Line T Panel Configuration

Introduction

The Flight Simulator panel system is designed to allow many different configurations for placing the gauges when designing a panel. The panel of your aircraft could be as simple as a single bitmap layout with the standard T layout for the altimeter, the attitude display or as complex as a multi-window panel with pop-ups radio stacks and GPS. The panel.cfg file holds all the information needed to define what an aircraft panel looks like. The panel.cfg file is a simple text file that can be loaded and edited with the windows notepad.exe.

Each aircraft in Flight Simulator has its own panel.cfg file located in the aircraft folder:



Bendix King set includes the KI256 ADI with optional Flight Director, the KI525 mechanical HSI with localizer and glideslope indicators and the KA51 Gyro Slaving unit in both horizontal and vertical layout. The KI525 drift rate is user selectable.

The following sections will guide you through a step-by-step tutorial to configure the default C172 panel with Flight Line T. More information about panel configuration is available in your Flight Line T Service Manual accessible from your Windows Start Menu \ Reality XP program group.

NB: the Flight Line T installation configures automatically your Mooney normal panel with Flight Line T. Customer with both FLT and FLN will find a PANEL.FLT.FLN.CFG in the Mooney panel folder. Rename to and replace the PANEL.CFG file in order to use it.

Panel Configuration for the C172

Before proceeding with the tutorial, we suggest you make a backup copy of your panel configuration file. The file name and location is:

`FSX\SimObjects\Airplanes\C172\panel\panel.cfg`

Now that you have made a backup copy, you can open the panel.cfg file with notepad.exe.

First look at the panel.cfg file

We willl start with the main panel and replace the entire T stack with Flight Line T gauges. The main panel for the C172 is identified and configured in the following Window section:

```
[Window00]
file_1024=cessna_172_background.bmp
file_1024_night=cessna_172_background_night.bmp
size_mm=640
position=7
visible=1
no_luminous=1
ident=MAIN_PANEL
```

Following the Window information header, the gauges are listed sequentially:

```
gauge00=Cessna!Altimeter, 346, 167, 79, 79
gauge01=Cessna!Annunciator, 517, 159, 62, 15
gauge02=Cessna!Avionics Switch, 288, 426, 37, 47
...
```

A flight simulator gauge file includes one or more gauges. Each gauge in the panel.cfg file is attached to a window with a line beginning with gauge##=, using sequential numbering. To define a gauge in a particular window, the line generally includes the following information:

```
gauge##=gauge_file_name!gauge_name,position_horizontal,position_vertical,gauge_size_horizontal,gauge_size_vertical
```

In some panels, there are some gauges without the gauge_size_horizontal and gauge_size_height parameters. This means that the original gauge size is exactly designed for this panel. In this case, when using gauges in high resolution like the Flight Line T, we can adjust the gauge width and height on the panel to match the main panel background bitmap. This will be done with trial and error in configuring the gauge and then loading the aircraft in Flight Simulator. This cycle is repeated until finding the right sizes.

Replacing gauges in the main panel

We will now replace the default gauges with Flight Line T gauge. The first one in the panel.cfg file is the altimeter. Let's change the following:

```
gauge00=Cessna!Altimeter, 346, 167, 79, 79
```

with this:

```
gauge00=rxpFLT!Altimeter, 346, 167, 79, 79
```

Save the file and start Flight Simulator, select the Cessna 172 to see the change. NB: you can keep the notepad.exe opened for now.

You will notice the default altimeter replaced with the Reality XP Flight Line T altimeter. However, this is not a Cessna indicator. We will configure this later. Keep Flight Simulator running and select another aircraft. We will continue configuring the panel with the rest of the gauges. In the panel.cfg file, locate the following entries:

```
Gauge05=Cessna!Heading_Indicator, 264, 247, 81, 81
…
Gauge12=Cessna!Turn_Indicator, 185, 247, 78, 78
Gauge13=Cessna!Vertical_Speed, 346, 247, 79, 79
…
gauge15=Cessna!Airspeed, 185, 167, 78, 78
…
gauge27=Cessna!Attitude_Alpha, 266, 167, 78, 78
```

and change them with this:

```
Gauge05=rxpFLT!Gyro, 264, 247, 81, 81
…
Gauge12=rxpFLT!TurnCoordinator, 185, 247, 78, 78
Gauge13=rxpFLT!VerticalSpeed, 346, 247, 79, 79
…
gauge15=rxpFLT!Airspeed, 185, 167, 78, 78
…
gauge27=rxpFLT!Attitude, 266, 167, 78, 78
```

NB: the gauges are configured with the same size as the original panel. However, you can change the width and height in order to keep each relative gauge size proportional to their design dimensions. More information about the original gauge resolution is available in the FLT Service Manual.

Replacing gauges in the Virtual Cockpit

The virtual cockpit gauges are configured in a similar way as the 2D panel. First, locate this window section near the end of the file:

```
[VCockpit02]
size_mm=512,512
pixel_size=512,512
texture=$C172s_2
background_color=0,0,0
```

Following the method for the 2D panel, we can now change the relevant entries with Flight Line T gauges. You may also consider raising the virtual cockpit resolution in changing the following line:

```
pixel_size=1024,1024
```

Then we replace the default gauges with Flight Line T gauges:

```
Gauge00=rxpFLT!Gyro, 0, 0, 163, 162
Gauge01=rxpFLT!TurnCoordinator, 164, 0, 158, 158
Gauge02=rxpFLT!Attitude, 323, 0, 158, 158
Gauge03=rxpFLT!Altimeter, 0, 163, 158, 156
Gauge04=rxpFLT!Airspeed, 164, 159, 155, 155
Gauge05=rxpFLT!VerticalSpeed, 323, 159, 156, 157
```

Gauge smoothness in the virtual cockpit is directly affected by the number of [VCockpit##] sections in the panel.cfg file.

A panel with a single section offers the best refresh rate and smoothness, similar to the 2D panel. Each additional virtual cockpit section cuts the refresh rate from a "maximum" rough rate equivalent to ½ of the FS FPS counter (max_rate). The general rule of thumb is:

1 section = max_rate frames per seconds per section.
2 sections = max_rate/2 frames per seconds per section.
3 sections = max_rate/3 frames per seconds per section.
etc…

NB: FLT runs with maximum fluidity and refresh rate, and each gauge draw rate can be independently limited in the INI file. However, the virtual cockpit refresh rate is a flight simulator limitation imposed to the gauges and we suggest you choose aircraft carefully designed by their third party vendors for the maximum performance and fluidity!

You can now save the panel.cfg file and exit notepad.exe. Before loading the aircraft again in Flight Simulator, we need to adjust the Flight Line T gauge types and settings!

FLT Config

FLT Config is an application designed to help you configure your gauge settings with a convenient user interface. Start FLT Config from your Windows Start menu \ Reality XP program group, and then double-click the “Cessna C172 Skyhawk Panel (c172)” line to open the settings pane.

Change the following options. When done, press the OK button, close the FLT Config application and load the C172 panel in Flight Simulator to see the changes!

Airspeed Gauge

Type: Cessna 200KT
VS0: 40
VS1: 50
VFE: 95
VNO: 142
VNE: 178
VLE: 0

(leave the other options to their default and the popup value empty)

Altimeter Gauge

Type: Cessna

(change the other options to suit your need and leave the popup value empty)

Attitude Gauge

Type: Cessna Blue/Brown
Moving Card: Perspective Lines with pitch degrees lines only

(change the other options to suit your need and leave the popup value empty)

Directional Gyro / Turn Coordinator / Vertical Speed

Type: Cessna

(leave the other options to their default and the popup value empty)

Congratulations! Your C172 panel is now configured with Flight Line T!

Going further

Most aircraft panels can be configured using the method outlined above. In addition, the Flight Line T gauge supports individual popup window controls, and night lighting options. For the most demanding configurations, we suggest you use graphical user interface driven panel configuration tools to assist in gauge size and position.

Product Support

You should read this manual, and the others included with this product from cover to cover before asking for support or help with this product. We have found that over 95% of all product support questions can be answered by reading the manual.

You can visit the Reality XP General Forum for general customer service issues.at:

http://www.reality-xp.com/community/users.htm

While anyone may read this support forum, you will need to register in order to post a question or reply with an answer. Support at this forum may be provided by any one of the following individuals:

1. Members of the Development / Publishing Team.
2. Members of the product's beta testing team.
3. Knowledgeable users of the product who know the correct answer.

If you still require help: Product support is available through our online help system. Please visit http://www.reality-xp.com for additional support information.

Thank you.