Tiny Flight Tracker & Viewer Manual

Version 4.xx

Note: Program version number that appears in the pictures of this document may not reflect the latest available release.

TINY FLIGHT TRACKER & VIEWER

Tiny Flight Tracker is a program that permits, via the FSUIPC/XPUIPC modules, an automated and precise recording of some relevant flight parameters without requiring any complex user action. The recorded parameters may then be reviewed and displayed in Google Earth by the **Tiny Flight Viewer** application that is a customizable application. This software is of interest for displaying and analyzing retrospectively any flight completed with Microsoft Flight Simulator, P3D and X-Plane.

1 – INSTALLATION AND REQUIREMENTS

The *Tiny Flight Tracker* (recording program) and *Tiny Flight Viewer* (flight data and Google Earth viewer) are both provided as *portable applications that do not require an installation and will not change registry and files outside the installation folder*. These portable versions can be executed from any unprotected folder in which you will have unzipped the provided package.

1.1 Installation

In order to use Tracker end Viewer software, extract all files included in the **TinyFlightSoftware.zip** package to any non-protected folder of your choice. Launch the portable executables (Tracker or viewer) from it. That's all. [Note that software cannot be executed from within a protected folder so as to ensure configuration files are properly written between sessions, installation directory can be used as the destination folder for flight records (default setting) and executables can be easily updated when a new version is available].

Google Earth will have to be installed on your computer for displaying Google Earth paths from a tracker file since there is no official portable version of this application. In case you didn't install Google Earth only tabulated flight data will be available.

1.2 OS requirements

Both applications are compatible with Windows XP, Vista, Windows 7, Windows 8/8.1 and 10 (x32 and x64 versions). Earlier Windows OS and Mac OS are not supported.

1.3 Simulator requirements

Tracker is working with FS9, FSX (any version), P3D v1-5, MSFS 2020 and X-plane v9 to 11.

FSUIPC module (FS/P3D/MSFS 2020) or XPUIPC plugin (X-Plane) must be installed on the simulator where the tracker is running. The flight tracker requires at least FSUIPC version *3.99* for FS9, version *4.963* for FSX; more recent versions are required for P3D v3-5 and MSFS 2020 (see Pete Dowson site link below); XPUIPC version 2.0 or above is required for X-Plane.

Latest FSUIPC3 (FS9), FSUIPC4 (FSX, P3Dv1-3), FSUIPC6 (P3Dv4-5) and FSUIPC7 (MSFS 2020) versions are freely available on [Pete Dowson's site](#); XPUIPC

plugin is not anymore available from its original source. A repackaged 2.0 version (with an installer) is available [here](#).

Tracker will check for updates on a regular basis (unless auto update is disabled, see chapter 7). Viewer updates can be performed manually. If new versions are available, they will be installed automatically. To ensure proper compatibility, always make sure you use the latest versions of the software.

2 – SERVER COMMUNICATION

If an Internet connection is active, the tracker will check at start-up your system time against that of a NTP time server so as to ensure recorded times are current. If a significant difference is detected (more than 30 s), it will synchronize your system time. You are free to use a different FS time (for example if you want to fly at daytime) but only UTC time will be recorded. If needed, disabling synchronization can be achieved via the options screen (see chapter 7).

3 – RECORDED PARAMETERS

In addition to system time, the flight tracker accurately records some relevant flight data that are. *coordinates* (latitude and longitude), *current altitude* (AMSL and AGL), *indicated air speed* (IAS), *true air speed* (TAS), *ground speed* (GS), *vertical speed* (Vz), *aircraft gross weight*, *fuel on board*, *wind speed and direction* at aircraft position, *altimeter setting*, *mach number*, *NAV1, NAV2 and ADF1 settings*, NAV1 CDI (and GS deviation if NAV1 is tuned on an active ILS), *gear and flaps commands positions*, active *autopilot modes* (see Chapter 5 for more details), *GPS navigation data* (FS9, FSX, P3D and MSFS 2020 only).

Main sampling frequency is selectable and can be changed at any time (selections are: Auto, 15 sec, 30 sec, 1 min, 2 min and 5 min). Except for the automatic setting (see chapter 4 below), the tracker will store a complete data set for review at these intervals; *in case significant heading or altitude changes occur, additional data will be recorded* every 5/15 seconds respectively so as to depict an accurate flight path. This process is automatic and doesn't request any user action.

The time needed to process each sample does not exceed 5-10 ms and the program does not use more than 1% of the processor time, hence without significant impact on Flight Simulator frame rate.

4 – USING THE TINY FLIGHT TRACKER

Once Flight simulator has started and initialized and you are ready to start your flight, launch the Tiny Flight Tracker (exe file).

At this stage, you may wish to:

- change the Tracker files folder (the one in which the report files will be

generated),

- set the main initial tracker sampling interval (Auto, 15 sec, 30 sec, 1 min, 2 min or 5 min); "Auto" is the default.
  Note that the tracker sampling interval can be changed at any time, even after recording has started.

  The *"Auto" mode* (default) will result in a variable sampling interval from 5 seconds to 1 minute depending on aircraft height above ground level; this mode is really appropriate for recording and analyzing some "test" flights without any need for user intervention. However, you may choose a fixed recording interval instead.
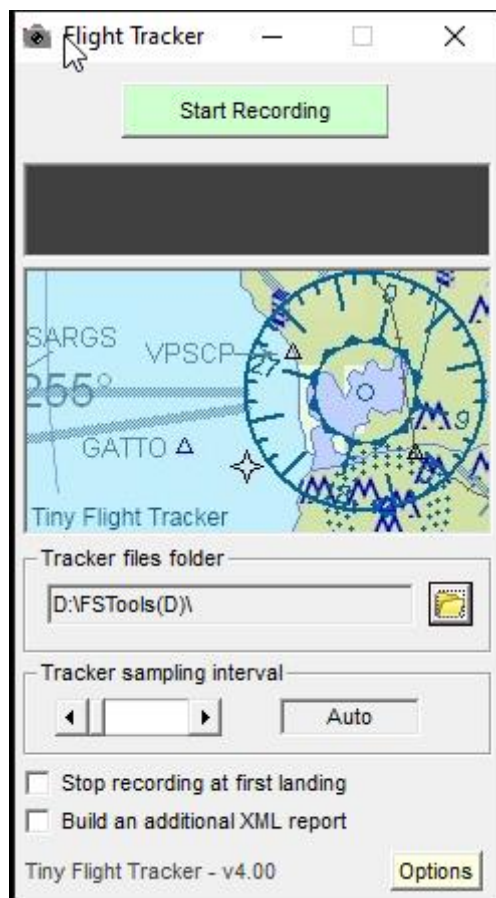
Options are saved and will be restored at next program start-up at the exception of sampling interval setting that will be set to "Auto" at startup.

Before recording, please ensure you have selected the aircraft you intend to use and you have loaded the required fuel.

After you clicked on the **Start recording** button, the program will first check flight simulator activity, FSUIPC/XPUIPC availability and version and valid data acquisition through FSUIPC/XPUIPC; should one of them fails, it will stop and prompt you with a message. *If you are on ground, recording will be paused until takeoff*.

After recording has started, the tracker will work in the background and will not influence your flying. Minimizing the application in the taskbar will have no effect on the recording process.

Normally, recording will stop when the **Stop recording** button is pressed (a confirmation will be asked for if not on ground). However, some other actions or events may interrupt recording with or without creating a report file:

- *Closing the program before recording has been stopped* ; a confirmation will be required (no report generated),

- *Closing Flight Simulator before the end of the recording or communication with FSUIPC/XPUIPC is lost* (partial report),

- *FS/X-Plane crash* (partial report).

Use of the pause mode (sometimes triggered by 3rd party tools) or accessing some simulator menu items will temporarily pause the recording.

If "*Stop recording at first landing*" option is checked recording will stop as soon as the aircraft is on ground after a sequence has started (at least 2 recorded points). *Use this option it if you do not intend to perform touch and goes*.

The program will notify the end of the recording process and *display the name of the created file* that has been stored in the directory you specified. Should an existing file with the same name be found in the destination directory, it will be overwritten.

File name is based on the day and time at which the recording has started (ex: TFT_**ddmmyy_hhmmss**.tftdat)

Report files are small binary files that make use of a proprietary format and are not readable by any other program than the associated viewer.

In case the "*Build an additional XML report*" option is checked, a XML report file will also be generated (i.e. TFT_ddmmyy_hhmmss.xml).

5 – USING THE TINY FLIGHT VIEWER

The Tiny Flight Viewer enables to load any recorded flight for reviewing flight data and displaying it within Google Earth (if available).

Google Earth can be downloaded and installed from here; it is recommended you use the latest 7.x version (kml version 2.2).

Note that the viewer *will fail loading files that have been recorded with some outdated versions of the tracker software (that is a lower major version number)*; backward compatibility is maintained between tracker and viewer versions having the same major version number although some improvements may be lacking.

Consequently, we recommend you ensure both recording and viewing are performed with the latest available versions. Updating Tiny Flight Viewer to latest version can be done using the update link (Viewer doesn't have an auto update function)
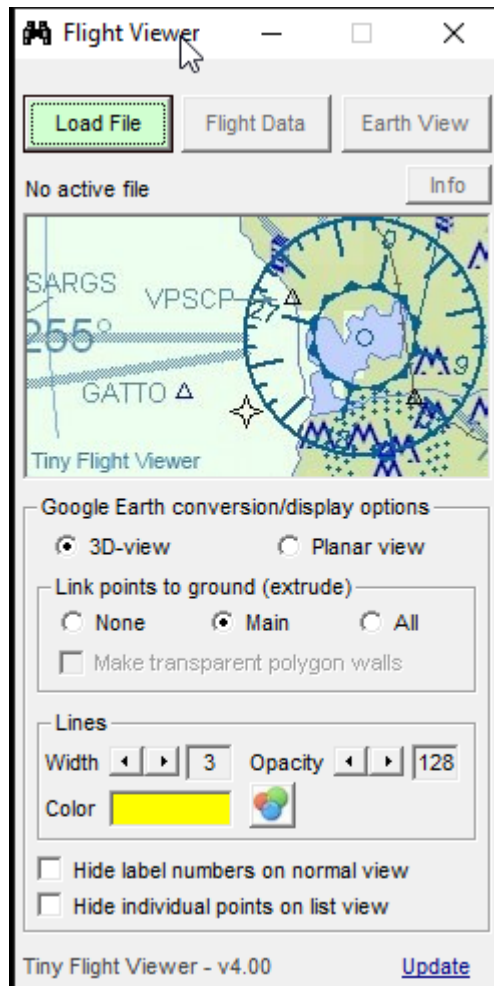
Flight Viewer display options will be saved between sessions and include:

- *Flight path view type.*(3D-view or planar) [default is 3D-view],


3-D view   *Planar view*

- *Linking recorded points to ground or not* (3D-view only) [default is ON],

- *Displaying transparent polygon walls* (3D-view only) [default is OFF],

- *Making transparent polygon walls* (3D-view with ALL linked points only),

- *Line width* (1 to 5 pixels, *default is 3*), *line and polygon opacity* (about ¼ to full, default is ½) and *line/polygon color (*default is yellow*),*

- *Hide label numbers on normal view*: if checked, will not display numbers but only icons, unless highlighted [default is OFF],

- *Hide individual points on list view* [default is ON].

Flight information is provided within "balloons" for the main recorded points (numbered from 0) when clicking on the corresponding icon. Flight information is not provided for additional points that are only used to accurately build the flight path.

Recording time and basic flight data are available for each point. Extended flight data are only available from the tabular view (see below).

When launching "Earth View", the program will automatically generate the kml file (with selected options) and display it in Google Earth; the initial eye point of view will be set at the start of the flight.
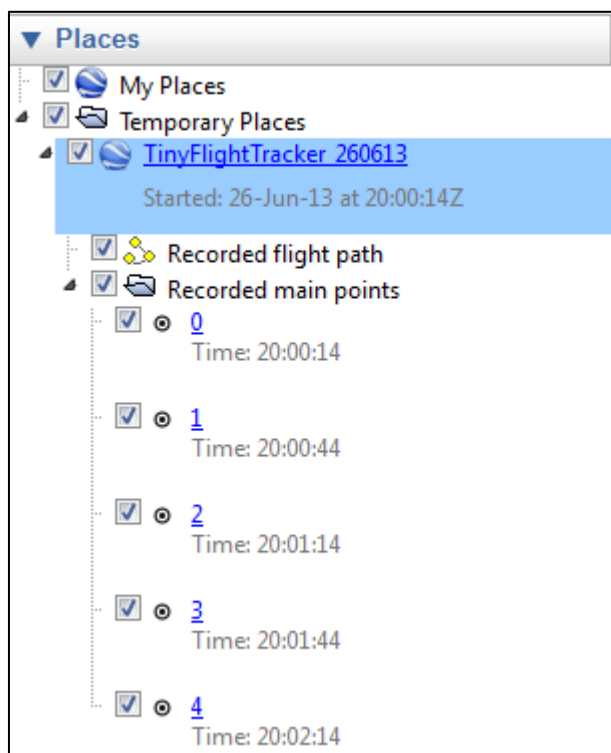
All Google Earth functionalities (zooming, tilting, eye point, distance, altitude profile, etc) can be used as usual so as to analyze in detail the flight path.

Profile views can be displayed as well.

Numerical flight data can be reviewed via the [Flight Data] button. Only the main records (those corresponding to the numerical icons in Google Earth) are tabulated.

Tabulated data include:

- *Altitude above medium sea level* (AMSL, ft),
- *Altitude above ground level* (AGL, ft),
- *Indicated air speed* (IAS, kts),
- *True air speed* (TAS, kts),
- *Ground speed* (GS, kts),
- *Vertical speed* (Vz, fpm),

- *Aircraft gross weight* (GW, lb),

- *Total fuel on board* (FOB, lb),

- *Current wind at aircraft position* (magnetic direction degrees and speed in kts) [Note that in X-plane, a few discrepancies may occur when reaching the surface wind base layer transition],

- *Altimeter setting* (Alt, hPa) [Note that this information can be wrong on some modern aircrafts],

- *Mach number* (Mach),

- *Active NAV1 frequency* [NAV1, (A/I) indicates VOR1 reception is active/inactive respectively],

- *Active NAV2 frequency* [NAV2, (A/I) indicates VOR2 reception is active/inactive respectively],

- *Active ADF1 frequency* [ADF1, (A/I) indicates ADF1 reception is active/inactive respectively],

- *NAV1Dev* (course deviation indicator, degrees)*:* For an active VOR1, the first value indicates the angular deviation (degrees) from the selected course, from +10° (right) to -10° (left); for an active ILS, it indicates the CDI angular displacement from the localizer centerline from +2.5 to -2.5°; in case glideslope indicator is available and active, the 2nd value is the deviation of the horizontal needle (full scale deviation being here from +0.7° (down) to -0.7° (up),

- *Flaps* (proportional setting %): this value will depend on the number of available flaps positions on the used aircraft (for example, 5° for a 737 with 1, 2, 5, 10, 15, 25, 30 and 40° command positions will read 3/8 that is 38%)*,*

- *Gear* (Up or down),

- *AP modes*: the following letters apply: **M**: autopilot master switch ON, **N**: NAV1 locked, **G**: NAV GPS locked (GPS switch on) **A**: altitude locked, **S**: airspeed or mach hold, **H**: heading lock, **P**: approach mode engaged. Note that only aircrafts using FS/X-plane default autopilot functions will report these settings correctly – 3rd party aircrafts using specific autopilot routines (PMDG and some others) will not set these flags accurately.

- *Active GPS WP:* Indicates if an active GPS waypoint is set and displays its identifier [with (D) if Direct to is selected). Not available for X-Plane records

Flight Data [TFT_111217_163054]

Time (Z)	AMSL (ft)	AGL (ft)	IAS (kts)	TAS (kts)	GS (kts)	Vz (fpm)	GW (lb)	FOB (lb)	Wind	Alt (hPa)	Mach
16:31:22	262	2	71	71	57	102	1957	297	340@17	988	0.110
16:31:32	334	74	74	74	69	1137	1957	297	347@17	988	0.116
16:31:37	430	171	71	71	78	924	1957	296	357@16	988	0.111
16:32:31	493	237	75	76	90	550	1957	296	003@16	988	0.117
16:32:36	562	299	77	78	93	1258	1956	296	010@16	988	0.120
16:32:41	712	449	70	71	86	1622	1956	296	025@16	988	0.110
16:32:46	788	539	73	75	90	838	1956	296	033@15	988	0.115
16:33:01	1005	770	79	80	91	1166	1956	295	049@15	988	0.124
16:33:16	1053	787	60	61	68	-454	1955	295	051@15	988	0.095
16:33:31	965	677	67	68	71	-178	1955	295	044@15	988	0.105
16:33:46	1020	740	59	60	65	215	1955	295	051@15	988	0.093
16:34:01	1068	793	72	74	65	1120	1955	294	056@15	988	0.113
16:34:16	1260	993	78	80	70	1092	1954	294	075@14	988	0.122
16:34:31	1478	1235	77	79	72	1087	1954	293	099@14	988	0.121
16:34:46	1644	1428	81	85	81	246	1953	293	115@13	988	0.129
16:35:01	1746	1548	85	89	85	434	1953	293	117@13	988	0.135
16:35:16	1842	1670	87	91	81	369	1953	292	118@13	987	0.138
16:35:31	1939	1762	89	93	82	244	1953	292	118@13	987	0.142
16:35:46	1978	1764	96	101	90	110	1952	292	118@13	987	0.153
16:36:01	2000	1776	103	108	97	75	1952	292	118@13	988	0.163
16:36:16	2015	1793	108	113	102	49	1952	291	118@13	988	0.171

See documentation or description below for data meaning

Altitude above medium sea level (ft)

Some additional technical information on the recorded flight is available via the [Info] button.

Flight record information

Flight simulator	MSFS2020
FSUIPC	7.009
Engine Type	Piston
Engine number	2
End record	On ground (normal)
Paused (s)	4
Accelerated (s)	0
Recorder ver	4.00

- *Version of the flight simulator used for the record:* FS9, FSX, P3D (with subversion), MSFS 2020 or X-Plane,

- *FSUIPC or XPUIPC* version number,

- *Engine type:* piston, jet, helicopter or turboprop,

- *End recording mode: On ground normal* (recording was ended via the stop recording button while on ground), *On ground auto* (recording was ended at

touch down, auto mode), *lost COM* (recording was interrupted due to loss of communication with the simulator), *aircraft crash, stopped in flight* (recording was ended via the stop recording button after confirmation while airborne),

- *Paused (s)*: total number of seconds during which the flight was paused while recording was active,

- *Accelerated (s)*: total number of seconds during which the flight was accelerated (x2 or higher) while recording was active,

- *Recorder ver:* version of the Tiny Flight Recorder software.

6 – XML RECORD

In addition to the binary tftdat records, the Tiny Flight Tracker can also generate xml flight records if the "*Build an additional XML report*" option is checked at any time before the recording is stopped. An XML record can also be created after the event from any binary tftdat file using the included **Tiny Flight Tracker XML converter** (TFT_XML_Converter.exe).

An example is represented below (Thanks to Emmanuel Pierrez for his contribution generating a properly formatted XML).

```xml
<?xml version="1.0" encoding="UTF-8"?>
<flight>
   <info>
      <sim>FSX</sim>
      <enginetype>Turboprop</enginetype>
      <enginenumber>2</enginenumber>
      <uipc>4.853</uipc>
      <tft>3.00</tft>
      <pauseseconds>0</pauseseconds>
      <accelseconds>0</accelseconds>
      <endrecord>Normal</endrecord>
   </info>
   <log>
      <entry>
         <time>1459517635</time>
         <pos lat="44.82436" long="0.52167"/>
         <alt amsl="177" agl="1" altsetting="1019"/>
         <speed ias="114" tas="113" gs="109" vz="19" mach="0.173"/>
         <weight>9944</weight>
         <fuel>1084</fuel>
         <gear>down</gear>
         <wind dir="039" force="9"/>
         <vor1 active="A">116.80</vor1>
         <vor2 active="A">108.15</vor2>
         <adf1 active="A">374.0</adf1>
         <nav1dev>-9.1/na</nav1dev>
         <flapspercent>50</flapspercent>
         <ap master="On" nav="Off" hdg="Off" alt="Off" iasmach="Off" apch="Off"/>
      </entry>
```

[Note: time element is provided as an UNIX time stamp]

7 – TRACKER OPTIONS

Clicking the "Options" button on Tracker window will give the possibility to:

- *Enable or disable time synchronization* (Enabled is the default),

- *Disable auto update* (Enabled is the default); manual update is always possible via the Check/apply update button.