

# MAKERWYS README version 5.13

by Pete Dowson © 2022

---

## INSTRUCTIONS

*First, please note that this version of MakeRunways is not suitable for use on Win7 based systems or earlier. It is also not intended for use with FS2004 (FS9) or earlier (but see below about that).*

It is aimed primarily at P3D and MSFS, though will work with FSX and FSX-SE, with Win10.

For older system setups please use **MakeRunways version 4.70**, available in **Download Links – Useful Additional Programs**, on the FSUIPC support Forum.

### For: Microsoft Flight Simulator (“MSFS”)

Create a folder for MakeRunways, wherever you like on your PC. Place MakeRunways.exe into that folder, then right-click on it, select Properties – Compatibility – Run as administrator. (That way you won’t need to specify “run as administrator” each time you run it).

You do not need the Lorby-Si program **LorbySceneryExport** for MSFS operation.

Then all you need to do is run the EXE (i.e. double click on it, or make a shortcut for your desktop). For MS-Store and Steam installs of MSFS, it will find your scenery files and extract the data for its files. Hopefully, it will also do this for DVD installations, though this has not been tested at time of writing.

Note that it will take over 10 minutes to complete – there is a lot of data to scan! All the files will be generated in the MakeRunways folder you run the program from. One of the files it generates (for MSFS only) is **SceneryList.txt**, which simply lists the scenery folders being scanned in the order they will be scanned in (with a layer number), along with a note as to whether each is **Active** or **disabled**.

The pathnames for the sceneries there are partial – the owning folder is shown only once, in the first lines. Concatenating that with the individual path will give the complete path, but this may be too long for Windows to accept. In the generated Runways.xml file the path given is the full one, preceded by \\?\ which is supposed to make Windows accept it as a long path – but note that this doesn’t seem to work for all Windows functions.

**NOTE** that many third-party airports installed via the MS Store are encrypted, and may be hidden so that MakeRwys cannot even see the BGL files which contain the data it normally

extracts. Therefore the data provided by MakeRwys will, in these cases tend to be that of the default ("fs-base") scenery. This problem does not seem to apply to Community add-ons.

Thanks go to Matt Johnson on fsDeveloper.com for his invaluable help in sussing out the many changes in the BGL format and encoding since FSX days. This version of my program would still be months away from being released without that help.

### **For: FSX, FSX-SE, Prepar3D v1 to Prepar3D v5 inclusive**

Place the EXE into the relevant main FS folder. For FSX Steam Edition this will be in the Steam folder, under "steamapps\common".

For Prepar3D versions 3 -- 5 see the additional notes just below, before:

Double click on the MakeRwys.exe file to execute it. The data files will be extracted and placed in that folder. A full log of its actions will be created, called "runways.txt".

MakeRunways will find the correct Scenery.CFG file automatically, based on the EXE name it finds there and its version number.

### **NOTE for Prepar3D versions 3, 4 and 5**

Those Prepar3D version 3, 4 and 5 scenery installs abiding by the new L-M system for addons will NOT be seen by MakeRunways unless you copy the **LorbySceneryExport** program from the ZIP into the Prepar3D folder, to sit beside MakeRwys.exe.

MakeRunways will then automatically use the Lorby program to create a file called **MakeRwys\_Scenery.cfg** in your P3D3 or P3D4 folder. This then lists it ALL of the scenery layers with correct layering. MakeRunways will use that file instead of the original.

**NOTE that you should run MakeRunways "as administrator". This is especially true on Win10. The best way is to mark it needing admin privileges in its (or its shortcut) "Properties – Compatibility" settings (right click on the EXE or the shortcut).**

The special CFG file will be left in the main P3D folder for your own reference to the priority ordering of your scenery, something difficult to do from all the XML files.

For P3Dv4, if you want to use the other excellent facilities provided, get the full AddonOrganizer for P3Dv4 from <http://lorby-SI.weebly.com/downloads.html>. But only the included program is used by MakeRwys.

Thanks go to **Lorby-SI** for the use of these programs, and for making them Freeware!

### **For: FS2000, FS2002, FS2004**

Please see the note at the start of this document: you may need to use MakeRunways version 4.70 for these versions of Flight Sim. The current version may be okay but you would need to be running on Windows 10.

Place the EXE into your main FS folder where the SCENERY.CFG file is located.

Double click on it to execute it. The data files will be extracted and placed in that folder. A full log of its actions will be created, called "runways.txt".

## **LIST OF FILES PRODUCED**

The files produced by MakeRwys.exe are:

### **Runways.txt**

This is a text file showing the data analysed by the program in readable format. Use this to check on things when something odd seems to happen. you can find conflicting or overriding sceneries and so on this way. However, be warned. The file will typically grow to over 10 megabytes. You need to view it with a text editor capable of dealing easily with large files.

### **Runways.xml**

An XML file providing a database of airports and their runways. (For MSFS lease see the note above regarding the filepaths provided in this file).

### **FStarRC.rws**

This is a binary runways database used by my FStarRC program.

### **Airports.fsm**

This is a binary airports database used by FS\_Meteo, at present after re-naming to "Runways.rws".

### **Runways.csv**

This is a comma-separated text database of all the runways, sorted, and it is in the particular format used by Radar Contact (all versions up until the change to the following: **R4.csv**)

This is the same as the previous CSV file, but includes additional runway data added at the end of each line. This is used in Radar Contact 4 (before RC4.3) for more precise ATC operations.

### **R5.csv**

This is the same as R4.csv but with runway closure indicators in an extra two fields - CL closed for landing and/or CT closed for take-off. This file is used by RCV4.3 and RC5. **R5.bin**

This is a binary version of the R5.csv file, with some extra fields. Details of the format are given below.

### **G5.csv**

This contains information about Gates, Ramps, Parking places, along with airline lists where specified. It is used by later versions of Radar contact. **T5.csv**

This contains details of all taxi paths. It is used by later versions of Radar contact. **T5.bin**

This is a binary version of the T5.csv file. Details of the format are given below.

### **F5.csv and F5x.csv**

These both list all COM frequencies and associated names, including the airport name. The F5 file contains 25kHz frequencies, converted from 8.33 ones where necessary. F5x contains the full xxx.xxx frequency including any 8.33 specific frequencies.

### **F4.csv and F4x.csv**

These both list all COM frequencies and associated names, including the airport name. Note that if you want to use this with RC4 you must copy it to the Radar Contact 'data' subfolder. Make a safe copy of your original F4.CSV file first (I usually just rename it "f4orig.csv").

The F4 file contains 25kHz frequencies, converted from 8.33 ones where necessary. F4x contains the full xxx.xxx frequency including any 8.33 specific frequencies.

Note that MakeRwys matches frequencies as best it can, with the following extra "fiddles" to ensure a good range of frequencies:

1. Clearance Delivery is preferably met by FS type 14 "CD", but else is met by type 7 "CLEARANCE".
2. Multicom is met by FS type 2 "MULTICOM", but failing that by type 4 "CTAF".
3. Approach is from FS type 8 "APPROACH", but failing that from a second Type 9 "DEPARTURE" if there are more than one of the latter.
4. Departure is from FS type 9 "DEPARTURE", but failing that from a second Type 8 "ARRIVAL" if there are more than one of the latter.

Centre, FSS, AWOS and ASOS frequencies aren't used for this file.

### **Helipads.csv**

This is a list of all the Helipads found, sorted into ascending ICAO order. Details of the fields are given below.

---

## IMPORTANT NOTES ABOUT RUNWAY INCLUSION

### **RUNWAYS MUST HAVE “Start Positions”**

Runways are only included in any of the files (except for being logged in the Runways.txt file) if they are equipped with defined thresholds, or "start positions". Without those they may as well be omitted because the files then won't serve their purpose of assisting programs locate and land aircraft.

The whole data structure within MakeRunways, from which it produces these files, is predicated on this assumption.

### **MINIMUM RUNWAY LENGTH**

By default MakeRunways imposes a minimum runway length of 1500 feet, otherwise runways are omitted from the data files. This is to eliminate so-called "ghost" runways being included -- very small runways provided only to allow AI Traffic to be directed better for landings and takeoffs.

If necessary you can override this value. Just use a command line parameter in the form:

`/>n` where n gives the number of feet to be considered the maximum for exclusion. Take care not to make this too small for fear of including those "ghosts", but if you really do want to see all, you can set `/>0`.

### **WATER RUNWAYS**

The runway lists will normally not contain any water runways. If you need these included just add this command line parameter:

`/Water`

If you want files containing ONLY water runways use

`/WaterOnly`

### **FLAGGING JETWAYS**

Since version 4.85 there is an option to flag those gates with Jetways defined in Airport Facilities Data bgl files. The flag is simply “Jetway” in an extra field in the G5.csv file. See the format details below. Enable this option by:

`/Jetway`

on the command line.

---

## UPDATING RADAR CONTACT'S TRANSITION ALTITUDES FILE

If you are a user of Aivlasoft's EFB program for FSX/P3D, then part of the updated data you will have is a file with the correct Transition Altitudes for most airports in the world. MakeRunways can now automatically use that file to update Radar Contact's list too.

In order to do this, you must copy RC's "M4.CSV" file into the root FS folder, next to MakeRunways. Don't worry about EFB -- if that is correctly installed then MakeRunways will find it.

To tell MakeRunways to update M4.CSV add a command line parameter: `/+T`

(It is "T" for "Transition Altitude").

When MakeRunways has finished simply copy the M4.CSV file back into RC's Data folder.

---

## GATES FOR AIRLINE FILE

There is also an optional file, listing all the Gates for a specifically selected airline. To obtain this for your preferred airline, run MakeRwys.exe with a command line parameter such as (e.g.) `/BAW`

for the airline code BAW (British Airways).

If you are also using the `/>n` and/or `/+T` parameters, those must come first.

The gates are listed in sorted order of Airport, but not of Gate name or number -- the Gates are in their scenery file order. The file produced will be an ordinary text file named `<airline code> Gates.txt`. e.g.

`BAW Gates.txt`

in the above case.

---

## ASSUME "MakeRwys\_Scenery.cfg" FILE ALREADY GENERATED

Programs other than AddonOrganizer may pre-generate this CFG file (SimStarterNG for example). To prevent AddonOrganizer being called upon to do it again, or to simply assume it isn't needed, use this command line option:

`/SSNG`

---

## **VALUES PROVIDED IN EACH CSV FILE**

**Note:** Values marked with \* have extra formatting detail described in the Notes below.

**RUNWAYS.CSV** (ORIGINAL RUNWAYS FILE -- for very old versions of RC): ICAO,

Rwy\*, Latitude\*, Longitude\*, Altitude\*, HeadingMag, Length\*, ILSfreq\* **R4.CSV**

(RUNWAYS FILE for RCV4, until 4.3):

ICAO, Rwy\*, Latitude\*, Longitude\*, Altitude\*, HeadingMag, Length\*, ILSfreq\*, Width\*,

MagVar, CentreLatitude, CentreLongitude, ThresholdOffset\* **R5.CSV** (RUNWAYS FILE for RCV5):

ICAO, Rwy\*, Latitude\*, Longitude\*, Altitude\*, HeadingMag, Length\*, ILSfreqFlags\*, Width\*,  
MagVar, CentreLatitude, CentreLongitude, ThresholdOffset\*,Status\*

**R5.BIN** see below

**RUNWAYS.XML** (Airports and runways for "It's Your Plane")

For each Airport:

ICAO id, ICAOName, City, Longitude, Latitude, Altitude (feet), MagVar, Source BGL  
filepath, Scenery layer title.

And, within each Airport section, for each runway, all this, as available:

Runway id, Len (feet), Hdg (Magnetic: add MagVar for True), Def (surface), ILSFreq  
(nnn.nn), ILSHdg (Mag), ILSid, ILSslope, Lat and Lon of threshold/start, Lat and Lon of  
FS's "Start" point (which may be to the side of the runway), ClosedLanding (TRUE or  
FALSE) and ClosedTakeoff (TRUE or FALSE), EndLights (NONE, LOW, MEDIUM or  
HIGH), CenterLights (NONE, LOW, MEDIUM or HIGH), CenterRed (TRUE or FALSE),  
Threshold offset, ILS name (first 31 chars only), VASI lights, VASI values  
(X/Z/Spacing/Pitch), Approach lights, Pattern direction and altitude.

**G5.CSV** (GATES for RCV5):

Without the /Jetway command line option:

ICAO, GateName\*, GateNumber, Latitude, Longitude, Radius\*, HeadingTrue,  
GateType\*, AirlineCodeList ...

With the /Jetway command line option there is an extra field between the GateType and the  
AirlineCodeList (if one is present). The field is either empty, or contains the word "Jetway".

**F5.CSV and F5x.CSV** (COMMS FREQUENCIES)

ICAO, CommsType\*, Frequency, "name of facility"

(if possible, also with an entry for Airport Name with CommsType=0 and Frequency=0)

#### F4. CSV and F4x.CSV (COMMS FREQUENCIES)

ICAO, Airport Name, ATISfreq, CDFreq, GroundFreq, TowerFreq, UnicomFreq, MulticomFreq, ApproachFreq, DepartureFreq

#### T5.CSV (TAXIWAYS for RCV5):

ICAO,TaxiwayName,MinimumWidthMetres,PointList ...

where PointList is a sequence of: Latitude,Longitude,TaxiType\*,WidthMetres

**T5.BIN** see below

#### HELIPADS.CSV

ICAO, Latitude, Longitude, Altitude(ft), HeadingTrue, Length(ft), Width(ft), SurfaceType\*, Flags\*

---

### DEFINITION OF VALUE FORMATS

**Surface type** is a number 0-23, see list below.

Concrete	0	Dirt	12
Grass	1	Coral	13
Water	2	Gravel	14
(Unknown)	3	Oil-treated	15
Asphalt	4	Mats	16
(Unknown)	5	Bituminous	17
(Unknown)	6	Brick	18
Clay	7	Macadam	19
Snow	8	Planks	20
Ice	9	Sand	21
(Unknown)	10	Shale	22
(Unknown)	11	Tarmac	23

**Flags** is a numerical value made up of one of these "types":

NONE	0
H	1
SQUARE	2
CIRCLE	3
MEDICAL	4

plus optionally 16 for "Transparent" and/or 32 for "Closed".



**Rwy** is nnn for runway number, then 0, 1=L, 2=R, 3=C, 4=W (water)

Runways designated N, NE, etc are denoted by runway numbers over 36, as follows:

37 = N-S  
38 = E-W  
39 = NW-SE  
40 = SW-NE  
41 = S-N  
42 = W-E  
43 = SE-NW  
44 = NE-SW  
45 = N  
46 = W  
47 = NW  
48 = SW  
49 = S  
50 = E  
51 = SE  
52 = NE

**Latitude** is of the threshold, or AFCAD's "runway start"

**Longitude** is of the threshold, or AFCAD's "runway start"

**Altitude** is in feet

**Length** is in feet

**ILSFreq** is given as nnnnn for nnn.nn, or just 0 when no ILS

**ILSFreqFlags** are ILSFreq then optional B (backcourse), D (DME) G (Glideslope) equipped

**Width** is in feet

**ThresholdOffset** is in feet

**Status** is CT for Closed for Takeoff and/or ,CL for Closed for Landing

**Radius** is in metres

**TaxiType** is

0 = unknown

1 = Normal

2 = Hold short

3 = unknown

4 = ILS hold short

5 = Gate/Park (set by MakeRwys to denote arrival at a parking place)

6 = ILS hold short no draw      7 = Hold short no draw **GateName** is either omitted or one of

Dock	PkSE
Park	PkS
PkN	PkSW
PkNE	PkW
PkE	PkNW

**GateType** is:

- |                    |                          |
|--------------------|--------------------------|
| 0 = none           | 6 = Ramp Military Cargo  |
| 1 = Ramp GA        | 7 = Ramp Military Combat |
| 2 = Ramp GA Small  | 8 = Gate Small           |
| 3 = Ramp GA Medium | 9 = Gate Medium          |
| 4 = Ramp GA Large  | 10 = Gate Large          |
| 5 = Ramp Cargo     | 11 = Dock GA             |

**CommsType** is:

- |   |                                |
|---|--------------------------------|
| 0 = Special entry with airport name, zero frequency | 8 = APPROACH                   |
| 1 = ATIS  | 9 = DEPARTURE                  |
| 2 = MULTICOM  | 10 = CENTRE                    |
| 3 = UNICOM  | 11 = FSS                       |
| 4 = CTAF  | 12 = AWOS                      |
| 5 = GROUND  | 13 = ASOS                      |
| 6 = TOWER   | 14 = CLEARANCE PRE-TAXI        |
| 7 = CLEARANCE                                       | 15 = REMOTE CLEARANCE DELIVERY |
-

## BINARY FILE FORMATS

**R5.BIN:** binary format Runways file

Record format:

```
struct {
    char chICAO[4];
    unsigned short wRwyNum;
    char chDesig; // L, C, R or space
    char chStatus[3]; // CT, CL, CTL or all zero
    unsigned short wSurface; // 0-23 as in New BGL format
    float fLatThresh;
    float fLongThresh;
    float fLatCentre;
    float fLongCentre;
    float fAltitude; // feet
    float fThrOffset; // feet
    float fHdgMag;
    float fMagVar;
    float fLength; // feet
    float fWidth; // feet
    float fILSfreq; // zero if none char
    chILSflags[4];
    float fILShdg;
    char chILSid[8];
    float fILSslope;
} rbin;
```

**T5.BIN:** binary format Taxiways file

Record format:

```
struct {
    DWORD dwNumPts;
    char chICAO[4];
    char chName[8]; // zero if not named
    float fMinWidth;
} tbin;

followed by dwNumPts x struct

{
    float fLat;
    float fLon;
    float fType;
    float fWidth; // to next point, =0 for last point
} tpt;
```

### RUNNING MAKERUNWAYS SILENTLY

If an application wishes MakeRunways to run without any progress dialogue then it can start it with the command line parameter `/+Q`

Commented [PD1]:

---

*Peter L Dowson, 21<sup>st</sup> February 2022*