MAKERWYS README version 5.131

by Pete Dowson © 2023

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 – Compatibiliy – 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 over10 minutes to complete – there is a lot of data to scan! All the files with 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 with 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 v6 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 -- 6 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, 5 and 6

Those Prepar3D version 3, 4, 5 and 6 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 P3D3/4/5/6 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 amd above, if you want to use the other excellent facilities provided, get the full AddonOrganizer for P3D 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 versionsup 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 locateand 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.

Surface	Value		Surface	Value
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

  1 = unknown
  2 = Normal
  3 = Hold short
  4 = unknown
  5 = ILS hold short
  6 = Gate/Park (set by MakeRwys to denote arrival at a parking place)
  7 = ILS hold short no draw   7 = Hold short no draw **GateName** is either omitted or one of

Dock	PkS
Park	E
PkN	PkS
PkNE	PkS
PkE	W

Pk
W
PkN
W

GateType is:

1 = none

2 = Ramp GA

3 = Ramp GA Small

4 = Ramp GA Medium

5 = Ramp GA Large

6 = Ramp Cargo

7 = Ramp Military Cargo

8 = Ramp Military Combat

9 = Gate Small

10   = Gate Medium

11   10 = Gate Large

12   11 = Dock GA

13   **CommsType** is:

1 = Special entry with airport name, zero frequency

2 = ATIS

3 = MULTICOM

4 = UNICOM

5 = CTAF

6 = GROUND

7 = TOWER

8 = CLEARANCE

9 = APPROACH

10 = DEPARTURE

11 = CENTRE

12 = FSS

13 = AWOS

14 = ASOS

15 = CLEARANCE PRE-TAXI

16 = REMOTE CLEARANCE DELIVERY

17

18

19

20 BINARY FILE FORMATS

21   R5.BIN: binary format Runways file
Record format:

```
22      struct {
23              char chICAO[4];
24                  unsigned short wRwyNum;
25              char chDesig; // L, C, R or space
26          char chStatus[3]; // CT, CL, CTL or all zero
27          unsigned short wSurface; // 0-23 as in New
BGL format
28          float fLatThresh;
29
float fLongThresh;
float fLatCentre;
30          float fLongCentre;
31          float fAltitude; //
feet    float fThrOffset; // feet
        float fHdgMag;
32          float fMagVar;
33          float fLength; // feet
34          float fWidth; // feet
35          float fILSfreq; // zero if none
        char chILSflags[4];
36          float fILShdg;
37          char chILSid[8];
38              float fILSslope;
39      } rbin;
```

40   T5.BIN: binary format Taxiways file
Record format:

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

44      } tbin;

45      followed by

dwNumPts x struct {         float

fLat;

46          float fLon;

47              float fType;
48                          float fWidth; // to next point, =0 for last point

49      } tpt;
```

50

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

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a **_Peter L Dowson, 1st July 2023_**