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1. Overview

The Lorby-SI Radar Screen is a stand-alone AI Radar and simple moving map addon.

On top of working with the included “LRS DataProvider” app, it has the capability to use the multiplayer protocols of the Lorby-SI applications “AiTracker X”, “FireFighter X”, “CropDuster X” to display the positions of aircraft and other objects on any Windows based device that is capable of running Microsoft .Net 4.0. It can be hosted on the same computer as the master application, or remotely on any Windows device connected over the network.
2. Installation

2.1 Compatibility

LorbyRadar will work starting with the following addons:

- FireFighter X
- AiTracker X
- CropDuster X
- the LrsDataProvider app supplied with the distribution

2.2 Distribution

LorbyRadar and the LrsDataProvider are distributed as a self-extracting installer packages.

2.2 Installation of the LorbyRadar

Running the installer “LorbyRadar_Install.exe”:

On the first page you may select optional installation targets:

- “Start Menu Shortcuts”: LorbyRadar will be added to your Start Menu (advised)
On the next page you choose the installation path for LorbyRadar. **THIS IS NOT THE PATH TO YOUR SIMULATOR DIRECTORY, IT HAS NOTHING TO DO WITH THE SIMULATOR OR THE TARGET ADDON AT ALL!**

- Selecting “Install” will begin the installation

### 2.3 Installation of the Lrs Data Provider
- The Lrs Data Provider has to be installed on the same computer where your simulator is.
- Please use the installer intended for your sim:
  - FSX Acceleration boxed or dual install with SE: `LrsDataProvider_Install.exe`
  - FSX SE stand alone: `LrsDataProvider_SE_Install.exe`
  - Prepar3D V2.5: `LrsDataProvider_P3D_Install.exe`
  - Prepar3D V3.x: `LrsDataProvider_P3D_V3_Install.exe`
  - Prepar3D V4.x: `LrsDataProvider_P3D_V4_Install.exe`

Running the installer:
On the first page you may select optional installation targets:

- "Start Menu Shortcuts": Lrs Data Provider will be added to your Start Menu (advised)

- On the next page you choose the installation path for LrsDataProvider. **THIS IS NOT THE PATH TO YOUR SIMULATOR DIRECTORY!**

- Selecting “Install” will begin the installation
2.4 Microsoft .Net 4.0

The LorbyRadar requires that the .Net (“dot Net”) library version 4.0 is installed and current on your PC. This will most likely be the case if you are running a modern PC with Windows 7.

**On older PCs it may be required to download and install Microsoft .Net 4.0. The download can be obtained here:**

2.5 Network

The LorbyRadar connects to the LrsDataProvider and hooks into the multiplayer protocol of FireFighter X, CropDuster X or AiTracker X using IP network functionality. If you are running the LorbyRadar on a different computer than where the data source addon is installed, the following steps have to be taken:

**Port (6076):**
All Lorby apps communicate over a single UDP port (initially 6076), so you need to allow passage through this port in your firewall and/or router.

**IP-Address:**
For the LorbyRadar to connect to the FFX, CDX, AITX or the DataProvider acting as the Server, the connections to the relevant IP addresses have to be allowed too in firewall and router.

If your computer is located behind a router, you will have to add a port forwarding rule to your router for this to work. This mostly is not needed if all the computers running the simulators are connected to the same local network (LAN). But port forwarding is always needed, if you are connected to the internet by a local router and want to use multiplayer features over the internet.
Please refer to the documentation or online resources about

- How to allow a specific UDP port in your Windows firewall
- How to allow access for specific IP-addresses in your Windows firewall
- How to add a port forwarding rule to your router
3. Quickstart

1. Start up the simulator
2. Start up the data source addon – either the included LRS DataProvider or FireFighter X, CropDuster X or AiTracker X
3. Activate the “Run as Server” function of the addon – please refer to the appropriate chapters about multiplayer operations in the addon documentations.
4. Once everything is up and running start the LorbyRadar
5. Select the addon to connect to
6. Enter the IP address of the server – if you are running the LorbyRadar on the same computer, it is 127.0.0.1
7. Enter the port number
8. Press “Connect”
9. The screen will now fill with blips according to the target app:
   - FireFighter X: the screen shows players, fire and refill station positions
   - AiTracker X: the screen shows the aircraft blips that have been shared over the network
   - CropDuster X: the screen shows players, field and refill station positions
4. Main Window

Elements explained:

- Menu “Connection”: Choose the target addon and connection parameters here
- Menu “Map”: select the depiction parameters for the scope or map
- Menu “Labels”: Choose colors and information items to be displayed for the “blips”
- Menu “Window”: use this to set the window size
- “Green dot”: shows the state of the connection to the target addon. Clicking on this icon will connect or disconnect the radar to/from the target addon.
5. Operations

5.1 Main menu

The menu will disappear when it is left alone for 5 seconds and return when you move the mouse pointer to the top left of the radar screen.

5.2 Menu “Connection”

5.2.1. Choosing the addon

The multiplayer protocols of the Lorby addons are slightly different from each other. To work correctly, the LorbyRadar needs to know which addon you are connecting to – the LRS DataProvider, FireFighter X, CropDuster X or AiTracker X.

5.2.1. Network and local setup

The LorbyRadar uses the multiplayer protocol of the chosen addon. This works locally or remotely on a networked computer.

The IP and Port can be changed by clicking on the menu items. This will
open the input dialog:

![Input Server IP Config](image)

Input the connection parameters here. Note: if you enter an invalid IP address or port, the window will not close when clicking on “Done”.

In both scenarios the target addon has to be run in “Server” mode, which sends out the necessary data on the IP stack.

Local setup:
IP-address 127.0.0.1
Port: same as the target addon

Networked setup:
IP-address of the target computer
Port: same as the target addon
5.3 Menu “Map”

5.3.1. Switch background / Select pictureset

These items handle the background picture/map depiction. See Chapter 6 for details.

5.3.2. Screen orientation

The radar screen can be used in different orientation modes:

- “North up” selected: the radar screen is always aligned north-south. This is the same operation that you would see on a ground based radar.
- “North up” not selected: “up” on the radar screen is pointing into the direction that the player's aircraft on the Server is heading. All blips will be shown in their relative positions to where you are heading yourself. This is the same mode of operations that a radar screen in an aircraft would have.
- “Moving”: if selected, the app will always center the radar screen on
the player's own position on the Server (=the screen center moves with the player's aircraft). Otherwise the center will stay fixed at the position where the player currently is when the option is switched off.

5.3.3. Autozoom

When using the custom background images, the “Autozoom” feature will try to keep as much of the custom image visible as possible at all times.

Example:
- Assuming you want to do a flight from LIEO to LIRF with a moving map
- First go to LIEO and create a pictureset for this position (see chapter 6!)
- Then go to LIRF and create a pictureset for that position too (see chapter 6!)
- Now return to LIEO and begin your flight, switching to the custom map set.
- If you select “Autozoom” the app will now zoom in on your location as far as possible
- Once you start flying, you will quickly leave the map background picture at that zoom level, so the map will zoom out automatically to keep the screen covered.
- When you are nearing LIRF, the app will automatically switch to the pictureset that has been created for that position, and the autozoom will zoom into the map as you are nearing the destination.
5.3.4. Overlay

You can change the amount of information that is superimposed on the radar screen:

- User: turns the blip representing the user's own aircraft on or off
- Rings: displays additional range rings
- Heading: displays a small textbox above the radar screen showing the current heading of the user's aircraft
- Range: turns the radar range text on the top right of the screen on or off.

5.3.5. Set observer (Prepar3D V2/V3 only!)

If the target addon is connected to Prepar3D Version 2.5 or 3.x, then you can use this feature to add an observer camera to your simulator by first selecting this menu item and then clicking anywhere on the Lorby Radar screen. The camera will be created at the same location in the simulator, automatically tracking your own aircraft.

Clicking here.................sets the observer to the same location
5.4 Menu “Labels”

5.4.1. Colors

Blips can be displayed in bright or dark colors, to enhance visibility on different types of maps.

The colors of the depiction elements can be adjusted by clicking in the “Edit” button in the “Colors” section. This opens the ColorPicker dialog:

- Markers: the overlay rings and text labels on the radar
- Aircraft: all aircraft blips
- Fire: the fire blips (FireFighter X only)
- Field: the elements of the fields (CropDuster X only)
- Refill: the refill station blips (FireFighter X and CropDuster X only)
To change a color, click on the colored square. This opens a selection dialog:

- Click on a color to select it.
- The selection is applied to the large rectangle.
- “Apply” sets the selected color for the chose element.
- “Cancel” leaves the dialog without changing the color.

### 5.4.2. Label text

You can influence the amount of information that is displayed as the aircraft blip labels. ATC-ID, altitude and speed can be switched on or off in any combination by using the checkboxes.

### 5.4.3. Font size

The Font Size slider sets the size of the aircraft label font.
5.5 Menu “Window”

The “Smaller/Larger” items will change the size of the whole application window. The app remembers the zoom setting when you shut it down, and it will recreate the same setting when started the next time.

5.6 Radar range

The zoom factor of the radar screen can be changed by clicking on it:
- a click on the left half of the screen picture will zoom in
- a click on the right half of the screen picture will zoom out
- the zoom setting is displayed in the top right corner – the number represents the screen radius in nautical miles
6. Custom background pictures

The Lorby Radar has the option to use custom background pictures like maps or charts.

You can import every standard image type into the application, for example simple screenshots off Google Maps like shown above. If you are using the “Center” option with this, the radar will work as a “moving map”.

To activate the custom picture, select “Switch Background” from the “Map” menu:
- If an image has already been assigned to this radar range, the picture will be loaded directly
- If there is no picture assigned, the Picture Set manager window will open instead
- When connected, selecting the option “Select Picture set” opens the Picture Set manager dialog
6.1. Picture Set manager

Note: Picture sets can only be created or edited when your aircraft in the sim is not moving! Make sure that your aircraft is positioned roughly where you want the center of the picture to be geographically, as this position will be used by the app for geo referencing.

Pictures can be assigned to each radar range level of the app (column “RR”) by left-clicking in the “Filename” column. Right-clicking deletes the assigned picture.

Clicking on the “RR” number will call up the zoom level and picture in the main window.

If a radar range level is left empty, then the app will scale the image that has been displayed last to fit the radar range zoom level.

In the example above, the image “LIRF_G_A4_Hybrid_zoom_5.png” was assigned to the 10nm radar range. If the radar is zoomed in to 5, the application will automatically scale the background image by 2. Note that the image is simply “blown up”, so the resolution will get worse with each zoom level.

Another image “LIRF_G_A4_Hybrid_zoom_2.png” has been assigned to the 80nm mark. In this setup, zooming out from 10 to 20 will result in the larger image from the 80nm setting being zoomed in rather than the 10nm image being zoomed out – otherwise the resulting 20nm image would be smaller than the radar screen.
IMPORTANT:
The center of each image is geo-referenced to your current position. Make sure that your aircraft is in the spot that you want to use as center, and that you are connected to a data provider (LRS, AITX, FFX, CDX).

Static:
If an image is marked “Static”, it will not be zoomed when you change the radar range. Use this setting if you just want to replace the default radar background:
**Picture Sets**
The background pictures are grouped into individual “Sets”, so you can assign a full complement of pictures to your favourite spots and call them up any time.

**Dialog elements:**

- The dropdown box “Choose background picture set” is your main entry point.
- The “Delete” button right under it deletes the currently chosen set
- Use the “Name” field to input the name of a set
- The button “Create set” creates a new camera set with that name
- The button “Rename” changes the name of the currently chosen set to the text that you entered in “Name”.
- Radar range table:
  - Each line of the table represents a radar range setting
  - Assign a picture to a range by left-clicking into the second column in the appropriate line
  - A Windows file explorer window will open, where you navigate to and select the image that you want to assign.
  - When you hold down the right mouse button, left-clicking will delete the entry in the table (the file is not deleted!)

**Notes:**

- You can assign the same image to multiple radar ranges. The application allows you to zoom the image on the screen until it fits the radar range
- It is advisable to gather all your images in one place, so none gets deleted by accident. Lorby Radar creates a sub folder in “My Documents”, this is a good spot to keep your images too.
6.2. Picture adjustment controls

To enable the radar logic to display blips in their correct location, you have to do two things:

- Center the image on your own position (there is a small red dot in the center to help with this).
- Zoom the image until the distances on it correspond to the red radar rings.

You can zoom and move it to fit the radar depiction with the following controls:

- Zoom image in or out:
  → Press and hold the right mouse button
  → Zoom with the mouse wheel

- Move image on the screen:
  → Press and hold the right mouse button
  → Press and hold the left mouse button
  → Drag the image with the mouse

6.3. Download Google Static Maps

Lorby Radar has the ability to download a full set of maps for all zoom levels from Google Static Maps.

Note: The number of downloads from the free Google Static Maps API, the “quota”, is limited. For this reason, the Lorby Radar will only let you download one set of maps per session, unless you provide your own API key. Google Static Maps API keys are free of charge, but it is required that you register a “project” with the Google Maps API to get one. If you have your own API key, you can enter it into the app and use your own quota for downloads – the app will then no longer restrict you to one single download per session.
Our advice is to only get these sets for your preferred airports. Move to a gate or parking space close to the center of the airport, then download the set. The highest resolutions only make sense for finding the refill stations in FireFighter X, for all other uses you should operate with radar zoom levels above 1.25nm.

**Moving map:**
The Lorby Radar will not automatically download and “patch” the next picture when your reach the edge of the current one. But bear in mind that the largest zoom settings cover a very large piece of scenery (up to 640 x 640 nm). When using the Lorby Radar as a moving map, it is advisable to only use these 80/160/320 zoom settings, so the edge if the map is not reached too soon.

That way you won't need to download too many sets, and you should be able to get by with limiting the downloads to your preferred destinations.

To access the Google Maps download, first move your aircraft to the location where you want the center of the map (=the radar screen) to be. Then start LorbyRadar and connect it to the simulator. Open the Picture Set manager, and either create a new set or select and existing one to be overwritten.

Then click on the “Google Maps” key.
This will open the download window:

Select the map type:

- Road map is the standard Google Maps road depiction
- Satellite provides Google Maps Satellite images
- Hybrid is a combination of the first two
- Terrain is a topographical representation

The slider “Scale adjustment” will be set to a calculated value to account for the Google Static Maps projection method. If you find that the distances on the maps don't add up, scale the map in LorbyRadar first, and read off the correct scaling value on the top left of the screen. Then re-download the pictures with that scale setting, overriding the calculated value.

If you have a Google Maps API key, please enter it in the textbox. Lorby Radar will remember that key and use it for your downloads.

Then press “Download images”. The download will take a while, and when it is finished the Picture Set manager will come up again, with all zoom levels filled with map images.

**If the download quota has been depleted, the “Download images” button is disabled. Apart from the daily quota being used up, this happens every time that you obtain a download without providing your own API key.**
Note: the Google maps do not cover the same area on the different zoom levels! Instead, each zoom level is four times larger/smaller than the previous one, the maps are “stacked”:

If you leave the area covered by the map on a certain zoom level, the app will not automatically download the next piece. This would lead to a massive amount of data, that is impossible to handle in this manner. For example, to download an area of 640x640 nm (=the largest view) with the same coverage on each subsequent zoom level down to 1,25nm, that alone would require 90GByte of map data.

The intended use of this feature is to download these map data sets only for your favorite airports and maybe a few points of interest. Note that the map sets are persistent, you only have to download them once, and you can use them until you decide to delete the set. Using the “Autozoom“ feature will adjust the zoom level according to the distance you are flying, and it will automatically switch to the required map sets.
Example: To have a reasonable coverage for a flight from LFMV to LFST, three map sets are enough: one at each airport, and one halfway at LSGG. Choosing a route that passes near LSGG, the app will rarely have to switch to a zoom larger than 80nm.
7. Using the Lrs Data Provider

The LrsDataProvider is a very simple app:

Once your simulator is started and your flight has finished loading, click on “Connect to Simulator”.

**When using this app as data source, none of the other addons (AITX, FFX, CDX) is required.**

If you want to change the port that is being used or your own name that is displayed on the radar screen, use the button “Parameters”:
8. Disclaimer

LorbyRadar and the LRS DataProvider are provided free of charge and for private use only - any property rights remain with the author.

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- any errors in the software will be corrected.
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