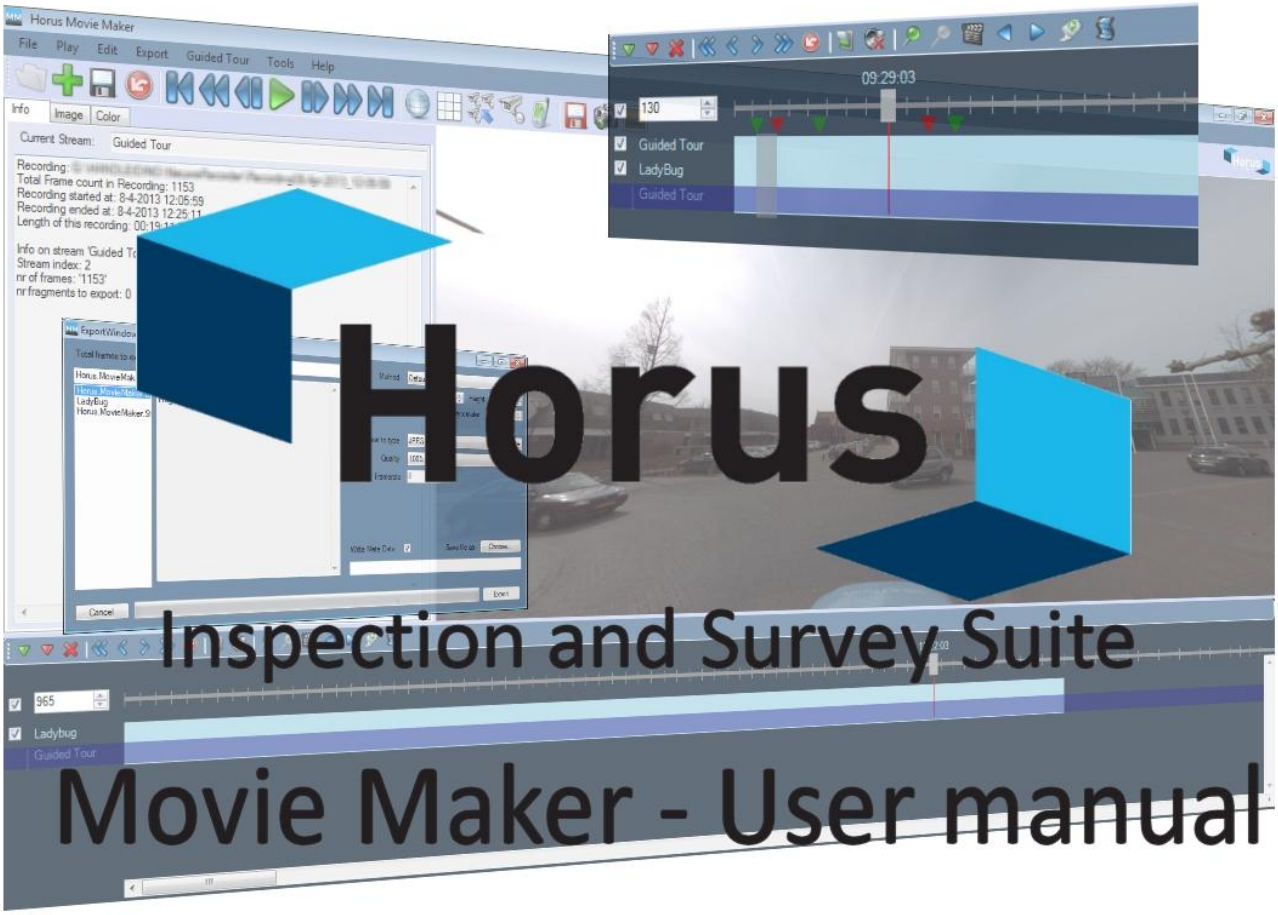
Horus Movie Maker
File Play Edit Export Guided Tour Tools Help
09:29:03
Guided Tour
LadyBug
Guided Tour
Horus
Inspection and Survey Suite
Movie Maker - User manual

REVISION HISTORY

DATE	VERSION	AUTHOR
October 2013	1.0	Bijwoordbeeld tekst en techniek

1 Working with the Inspection and Survey Suite

1.1 Introduction Inspection and Survey Suite

The Horus Inventory and Survey Suite consist of three programs: the Movie Recorder, the Movie Maker and the Movie Player. The Movie Recorder's main function is to record all the data from the camera's and additional sensors. The Movie Recorder has a simple playback function, it is merely used to check the images that have just been recorded.

The Horus Movie Maker is used to edit the recordings, it is used to select the useful recordings and allow you to cut out sections that aren't needed. The Horus Movie Player is used for the actual inspection and survey duties. This manual describes the Horus Movie Maker software. This program is used to edit the recorded camera streams so the recordings are tailored for the Inventory and Survey with the Movie Player software.

This manual is written in the assumption that the reader has basic knowledge of video inspections and basic computer knowledge.

1.2 System requirements

We recommend that you run the Horus Movie Maker on a machine running on Windows 7 x86 / x64, Open GL 2.1 or higher and an Intel Core i3 processer or faster.

2 Installing the software

You can start the installation of the Horus Movie Maker by double-clicking on the installation package icon:

Fig. 1- Installation package icon

This will start the setup wizard, select *Next* to start the installation procedure:

Fig. 2- Start screen of the installation wizard

Before installation can commence, you must have read and accepted the software license agreement. After accepting the terms in the agreement, check the box and press *Next* to proceed:

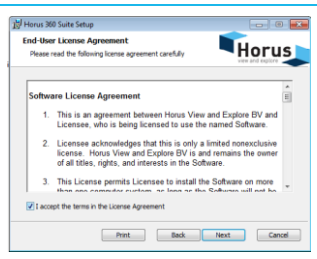

Fig. 3- License agreement

After that, you must select the location where the Horus Movie Player should be installed. Click *Next* after you have selected the desired installation location:

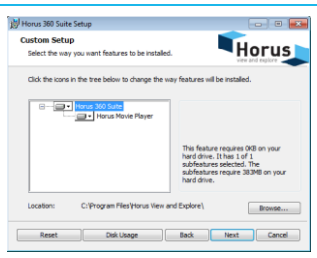

Fig. 4- Selection of the installation location

The installation wizard needs a final approval before it can install the Horus Movie Player. Click *Install* to start the installation. The progress of the installation is shown by a progress bar. After the installation is finished, select *Finish*.

3 Description of the Movie Maker

3.1 Opening a recorder file

To open a recording file, use the *Open recording* button in the toolbar:

Fig. 5- Open recording button

You can select the directory with the recordings you want to open in the *Select a recording directory* window. Click *Select folder* to open the directory in Movie Maker:

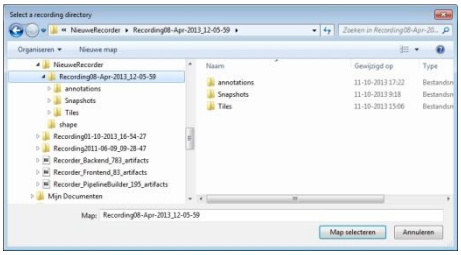

Fig. 6- Select a the folder with the recording you want to edit

The recording in the specified folder will then be opened in Movie Maker.

3.2 Screen elements

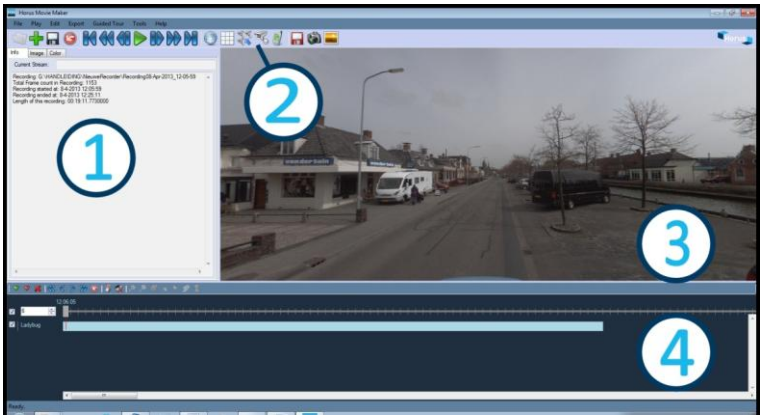

Fig. 7- Overview of screen elements

The Movie Maker screen consists of four main elements:

1 Recording properties

2 Toolbar

3 Main screen

4 Edit screen

3.3 Toolbar buttons

The buttons in the toolbar are used for the most commonly used functions. It can be divided into four sections: the File, Player, View and Export functions.

3.3.1 File buttons

Fig. 8- File buttons

From left to right:

Open recording

Add recording(s)

Save recording

Close recording

3.3.2 Player control buttons

Fig. 9- Player control buttons

From left to right:

Go to first frame

Ten frames back

Previous frame

Play / Pause

Next frame

Ten frames forward

Go to last frame

3.3.3 View buttons

Fig. 10- View buttons

From left to right:

Spherical view

Multiview grid

Select a main camera from the multiview grid

View a single camera

GPS map

3.3.4 Export buttons

Fig. 11- Export buttons

***From left to right**:*

Export selection

Snapshot

Export Equirectangular image

3.4 Recording properties screen

Left of the main screen the recording properties are shown:

Fig. 12- Recording properties

The *Info* tab shows the most relevant data about the recording, like start and end time, total amount of frames and the directory. The *Image* tab provides information about the images from the camera streams. The *Color* tab provides information on the color system of the recording.

3.5 Main screen

The main screen shows the images from the camera streams and helps you to pinpoint the exact in- and outpoints for editing. The rendering of the images can be chosen with the *View* buttons in the toolbar (see 3.3.3).

3.5.1 Rotate / move field of view (spherical view)

To 'look around' in the spherical view in the main screen, place the mouse pointer in the main screen and left click to grab the image and rotate it.

3.5.2 Spherical view

The spherical view is the default mode for the Movie Player. In this mode all images are stitched together to form a seamless spherical view. The spherical view is selected with the *Spherical view* button in the toolbar:

Fig. 13- Spherical view button

Fig. 14- Spherical view

3.5.3 Multiview grid

In the multiview mode, the main screen shows the camera stream from all cameras. This mode is selected with the *Multiview* button:

Fig. 15- Multiview button

Fig. 16- Multiview

3.5.4 Single camera stream

With the *Main camera stream* button you can select the stream from a single camera for the main screen. Click the button to get an overview of all camera streams (like the multiview mode, see 3.5.2). After that, select one of the camera streams you want to enlarge:

Fig. 17- The stream from a single camera is enlarged

3.5.5 View the selected main camera stream

The selected main camera stream can be enlarged to fit the main screen with the *View main camera stream* button:

Fig. 18- View main camera stream button

3.5.6 Switching to GPS map

The *GPS map* button will activate the map in the main screen:

Fig. 19- GPS map button

Fig. 20- Map showing the recording positions

The recording positions for each frame are shown as red dots on the map, together they form the travel path of the recording session. The larger dots represent every hundredth frame. When the mouse pointer is placed on a dot, the number of the frame on that recording position will appear:

Fig. 21- Number of a frame on that recording position

3.5.7 Selecting a frame from the map

By clicking on a recording position on the map you can view the frame that was filmed on that position. Select the regular viewing mode (see 3.5) to actually view the frame.

3.6 Playback functions

Since the Movie Maker is mainly used to edit recordings, it is important to be able to quickly browse through the recording. To speed up the viewing process, the playback speed can be raised. In the fast playback mode, the player skips a set amount of frames. The frame interval during playback can be set with the *Play with interval* mode in the *Play* menu:

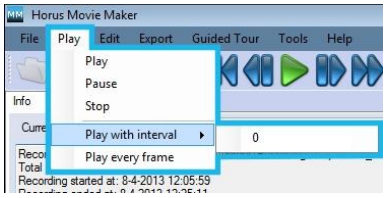

Fig. 22- Setting the playback speed

You can set the frame interval in the field right of the *Play with interval* selection.

3.6.1 Reset default playback speed

To reset the playback speed to the default setting, select *Play every frame* in the *Play* menu (see image above).

3.7 Exporting images

With the export buttons you can export the edited movie, take a snapshot from one recording position or save the frameset as an Equirectangular image. The export function of an edited recording is described in section 4.3.2 of this manual.

3.7.1 Taking a snapshot

With the snapshot button you can take a snapshot from the viewpoint in the main screen. When pressing the camera button, the Movie Maker takes a snapshot from all cameras. After the snapshot is made, the Movie Maker will ask for a file name and a directory to store the snapshot. The default name for a snapshot is a combination of the GPS coordinates and the recording time and date:

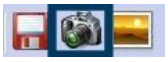

Fig. 23- Snapshot button

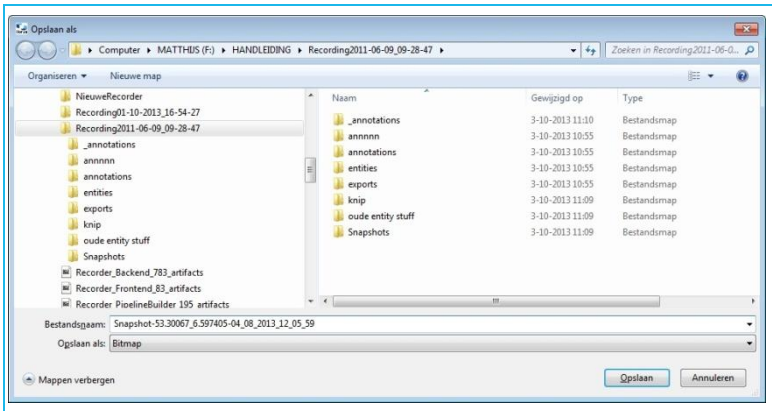

Fig. 24- Specify the directory to save the snapshot

3.7.2 Saving a Equirectangular image (panorama)

The Movie Maker can export the frameset from a recording position as a panorama (also called Equirectangular image). Click the *Equirectangular image* button:

Fig. 25- Equirectangular image button

Movie Maker will instantly generate a panorama from the current recording position in the main screen:

Fig. 26- Equirectangular image in the main screen

With the *Save Equirectangular* screen you can set the image properties:

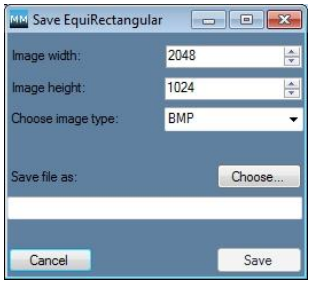

Fig. 27- Set the properties for the panorama

The filename and directory are set via the *Choose* button. Click *Save* to save the panorama.

4 Editing a recording

When a recording is opened in Movie Maker, the buttons in the edit screen are activated and the timeline of the recording becomes visible. The Edit screen consists of the following elements:

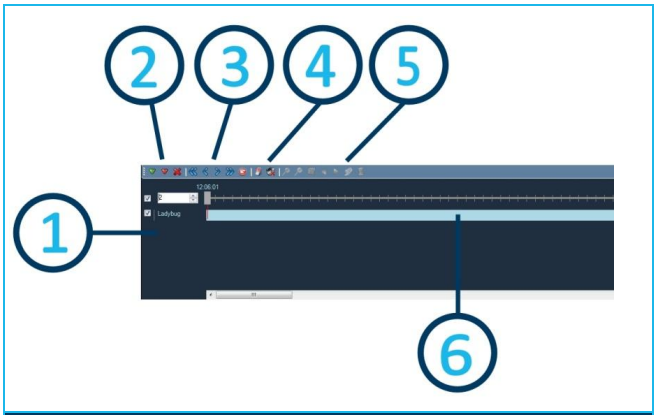

Fig. 28- Screen elements of the Edit screen

1 *Frame counter and camera streams*

2 *Marking buttons*

3 *Stream alignment*

4 *Playback buttons*

5 *Guided tour buttons*

6 *Timeline with slider*

4.1 Frame offset correction

The frame alignment buttons are used to 'align' multiple recording streams that have different time coordinates and which are not in sync. By selecting a stream you can move the entire stream back and forwards to synchronize it with the time of the main camera stream:

Fig. 29- Frame offset correction

With the *Reset offset button* (on the right) you can reset the stream to its original setting.

4.2 Screen elements

4.2.1 Frame counter and camera streams

On the left side of the edit screen the main information on the camera streams and frames is shown:

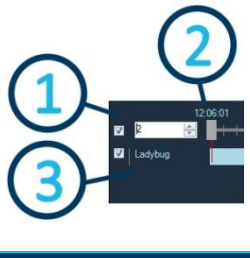

Fig. 30- Frame counter and camera streams

The frame counter (1) shows the number of the frame on a specific point on the timeline (2). Above the timeline slider the recording time is shown. All the recorder camera streams (3) that were recorder are shown under the frame counter.

4.2.2 Go to a frame

To go to a specific frame number, you can type in the number in the frame counter (1) or move the sliders (2) in the timeline. Movie Maker will immediately jump to that frame.

4.3 Edit marking buttons

The marking buttons are used to edit the recording. The *In* button marks the beginning of a scene, the *Out* button marks the endpoint of a scene. With the *Delete* button you can delete any faulty marks:

Fig. 31- Marking buttons

4.3.1 Editing a scene

Editing a scene means that you determine the start and the end of a frame set that form the scene. This is done with the *In* and *Out* marking buttons. You start by selecting the camera stream you want to edit. Normally the combined streams of the immersive view cameras are used, but it is also possible to edit the images from extra (HD) cameras.

Next, you select the first frame of the scene. For this you can use the frame selection buttons in the main toolbar (see 3.3.2) or in the toolbar of the edit screen (see 0). When the first frame of a scene is selected, place the In mark by clicking the *In* button. The In mark appears on the timeline:

Fig. 32- In mark on the timeline

Next, select the last frame of the scene and select the *Out* button to mark the end of the scene. The scene is marked on the timeline:

Fig. 33- A selected scene

After you have selected the first scene you can add the following scenes, there is no restriction to the number of scenes:

Fig. 34- Several selected scenes on the timeline

The markers can also be moved by left-clicking and sliding them to the desired position (frame).

4.3.2 Export an edited recording

After you have selected the scenes you want to use in the Movie Player, click the *Save recording* button in the main toolbar:

Fig. 35- Save recording button

Movie will then ask for a directory to store the edited recording, select the directory and select *OK*:

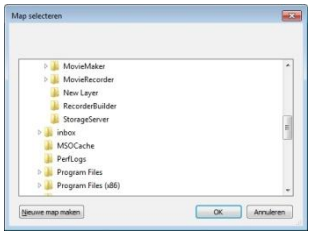

Fig. 36- Select the directory. Movie Maker generates the filename

4.4 Playback settings

With the *Playback mode selection* button you can toggle between the playback or edit mode. The audio mute button is used to switch the audio on or off during playback:

Fig. 37- Playback mode buttons

5 Creating a guided tour

You can create a so called 'Guided Tour' with the Movie Maker. In a guided tour you can set the camera angle and zoom within a specified frame. When the guided tour is played back, the camera will pan and zoom to the specified settings. A guided tour uses 'keyframes' in which the camera angle and zoom ratio is set. This chapter describes how to make a guided tour with the Movie Maker.

To start creating a guided tour, select the *Add tour* function in the *Guided tour* menu:

Fig. 38- Add tour function

Movie Maker will create a guided tour track in the timeline:

Fig. 39- Guided tour track

When the *Guided tour* track is selected, when selected, the track is shaded dark blue (as in the image above). The guided tour buttons are then activated:

Fig. 40- Active buttons

From left to right

Add keyframe

Delete keyframe

Create tour

Previous keyframe

Next keyframe

Remove all keyframe

Only change camera on keyframes

5.1.1 Setting keyframes

To set a keyframe, activate the spherical view (see 3.5.2) and select the frame with the desired recording location. Set the viewing angle and zoom in the main screen. Click *Set keyframe* to mark the keyframe.

Fig. 41- Set keyframe button

The keyframe markers are displayed as vertical lines in the *Guided tour* track:

Fig. 42- Keyframe markers

5.1.2 Deleting a keyframe

To delete a single keyframe, click the *Remove keyframe* button (red pin). To delete all keyframes, click the *Delete all keyframe* (recycle bin) button:

Fig. 43- Delete keyframe buttons

5.1.3 Browsing keyframes

With the *Previous* and *Next keyframe* buttons you can browse through the keyframes. By clicking either one of these buttons, Movie Maker will jump to the previous or next keyframe. The frame number and recording time are shown in the edit screen, the main screen shows the keyframe.

5.1.4 Camera settings on keyframe

With the *Only change camera on keyframe* button the virtual camera can be set to only change on the keyframes. On other frames, the camera will resume the normal viewing mode (in spherical view, see 3.5.2):

Fig. 44- Change camera on keyframe button

When this function is activated, a thin blue square appears on the edges of the button.

6 Exporting a video file

A guided tour, or any other edited recording, can be exported as a video with the *Export selection* button:

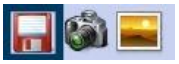

Fig. 45- Export selection button

Click the *Export selection* button to start the file export. Movie Maker will open a screen in which you can set the properties, filename and export directory:

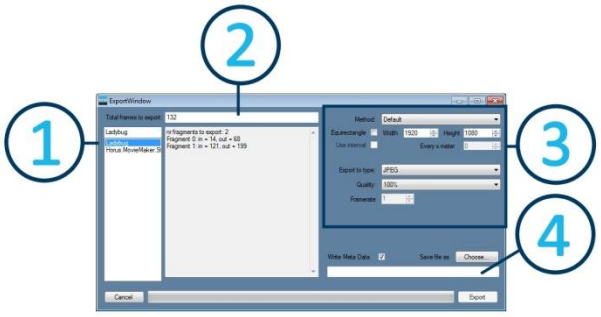

Fig. 46-Settings for the file export

1 *Camera stream source*

2 *Frame information with in- and out points*

3 *File settings*

4 *Directory and filename*

Before you export the edited recording as a video file, check if the correct camera stream (1) is selected for export. In the frame column (2) detailed information on the number of frames and the in- and out point is displayed. If the information in (1) and (2) are correct, you can proceed by setting the file properties in field (3).

6.1.1 Setting video file properties

First select the export method. The Movie Maker can export the movie file to a standard tailored to client standards. To do so, click the pull down arrow in the *Method* field and select the export method. Otherwise, the *Default* setting is advised.

To generate an equirectangular image, check the *Equirectangle* box. The image size can be specified with the *Width* and *Height* fields:

Fig. 47- Set the image size

Note: These fields are left blank in the *Default* export method!

6.1.2 Set the file type and framerate

Next, select the type of file and the file quality. The *Export to type* field has five options which have their own quality settings:

BMP	*No quality setting*
JPEG	*Percentage*
PNG	*No quality setting*
AVI	*Kbit per second and Framerate*
HRS	*No quality setting*

Fig. 48- File type and quality settings

6.1.3 Set the directory and filename

With the *Choose* button you can specify the directory the file has to be saved, and set the filename. Click *Export* to export the file.

7 Creating a setup file

Before a recording can be viewed or edited in the Movie Maker, there has to be a setup file for the camera streams. This setup file determines how the view in Movie Maker is built. The recording consists of multiple camera streams which need to be stitched together to create an immersive view.

For recordings that are used for measuring and annotation jobs it is especially important that the setup is precisely calibrated.

The setup.hsf (Horus setup File) is normally stored in the recording directory:

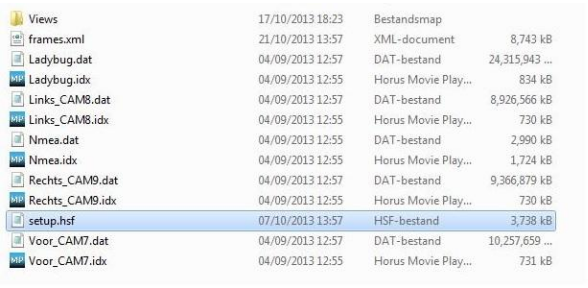

Fig. 49- Setup.hsf file in the recording directory

For a fixed camera setup the setup.hrs file has to be created only once. When the camera setup is altered, the setup.hrs file has to be recreated to ensure an optimal view and accuracy.

7.1 Software requirements

The following software is required for making a camera stitch:

- Horus Movie Maker
- Hugin version 2012.0.0.a6e4184ad538 (or higher)

7.2 Open a recording to stitch

The default setup.hsf file from Horus is a non calibrated and offset version. However, this file is needed to create a new stitch. Copy this file and paste it to the recording folder in which the recording you want to use is stored.

To start, open the recording you want to stitch. Select *Open* in the *File* menu:

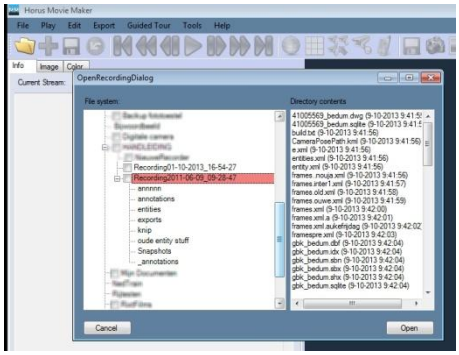

Fig. 50- Open recording

7.3 Create Hugin Stitch PTO

Select *Create Hugin stitch* in the *Edit* menu:

Fig. 51- Hugin Stitch option

Note: To create a good stitch it is important that all camera views have sufficient stitch objects (reference points). Select a recording position that shows as much horizon as possible (unobstructed view), preferably 180 degrees of horizon per camera.

7.3.1 Specify the initial Hugin settings

To make a new Hugin stitch, start by setting the horizontal field of view a single camera in the upper field. The field of view is specified in degrees. Next, specify the type of camera lens using the pull down menu. To proceed, click *Start*:

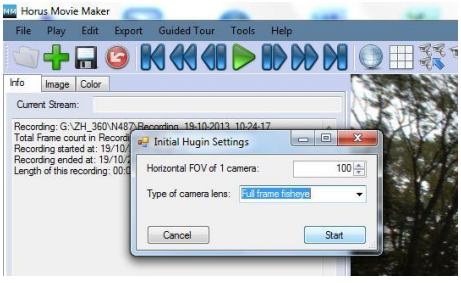

Fig. 52- Hugin stitch settings

The progress of the stitching process is visualized with a progress bar:

Fig. 53- Stitching in progress

When the stitching is complete, the new stitch will immediately be loaded in the spherical view:

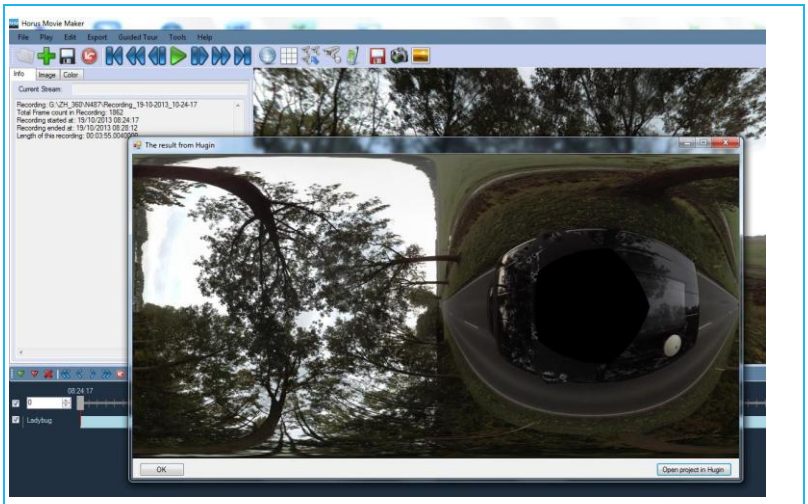

Fig. 54- The result of the Hugin stitch

Check if all images are stitched correctly, if not, select another camera position (preferably with more reference points) and repeat the stitching process. If the stitch is successful, the stitch can be opened in Hugin for further editing.

7.4 Editing the stitch in Hugin

Start Hugin and open the created stitch with the *Open project* function:

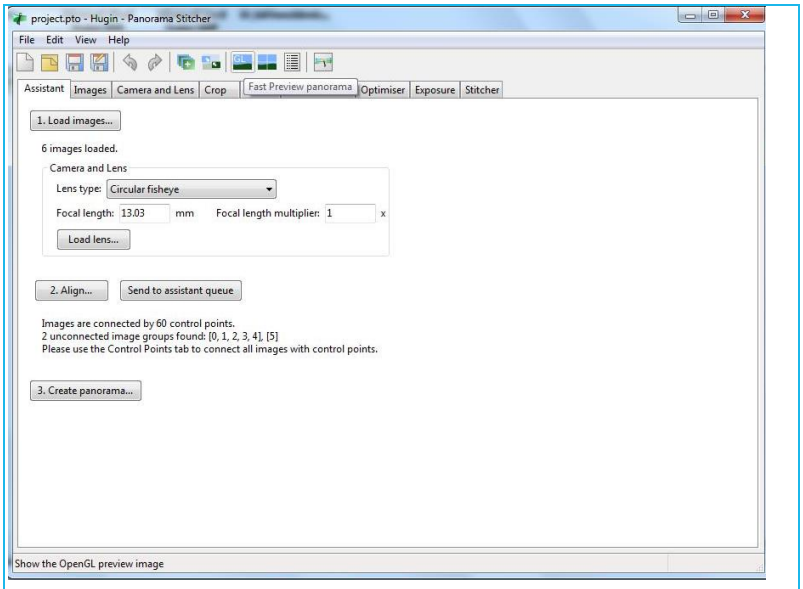

Fig. 55- Open project Hugin

The editing process in Hugin is described in this paragraph.

7.4.1 Position the horizon

Click the *Fast preview panorama* button to view and position the created stitch:

Fig. 56- Fast preview button

Select the *Move / Drag* tab to horizontally and vertically position the stitch:

Fig. 57- Move / Drag tab for positioning the stitch

By clicking and moving the stitch can be positioned. The crosshair is the reference for the horizontal and vertical alignment. The horizon of the image should touch the horizontal line on the 12 and 6 o'clock position seen from the recording position:

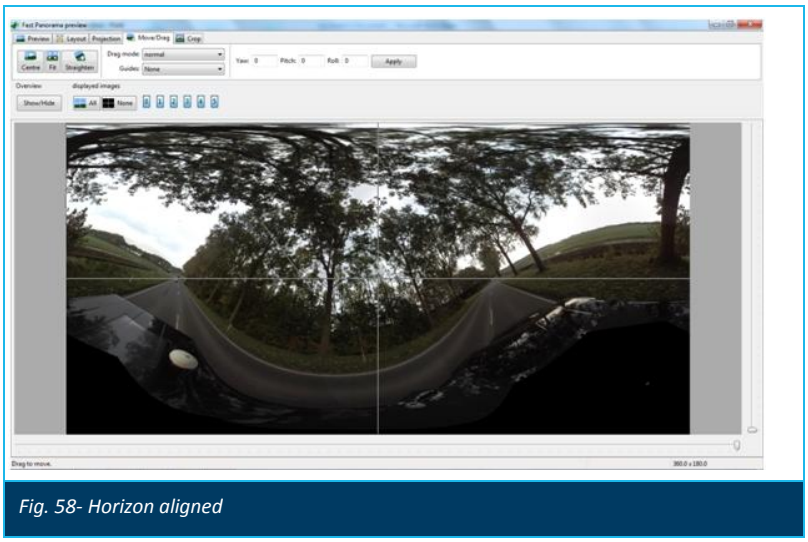

Fig. 58- Horizon aligned

Next, align the vertical line with the 12 o'clock (straight forward) viewpoint:

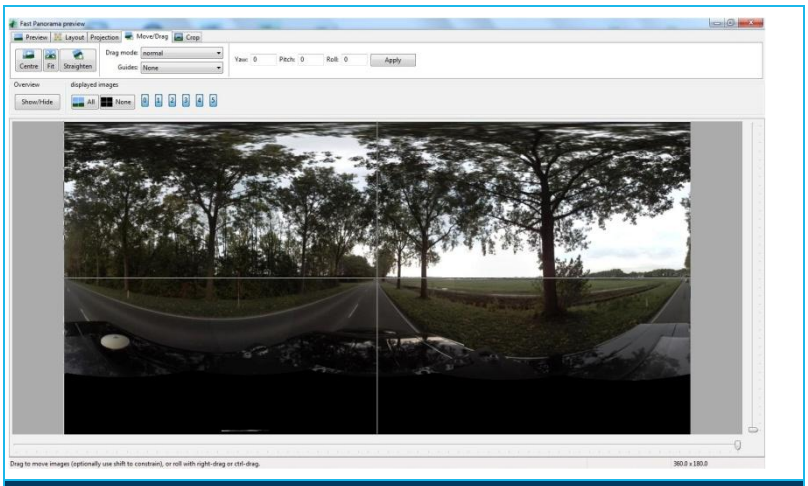

Fig. 59- Straight forward viewpoint aligned

Close the Fast panorama preview screen when the images are horizontally and vertically aligned and save the PTO file. Select *Save* in the *File* menu:

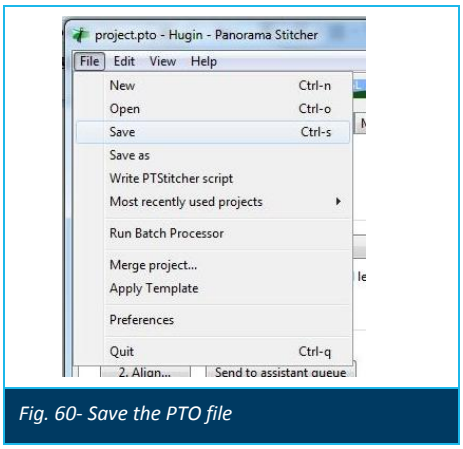

Fig. 60- Save the PTO file

The file is saved to the recording directory:

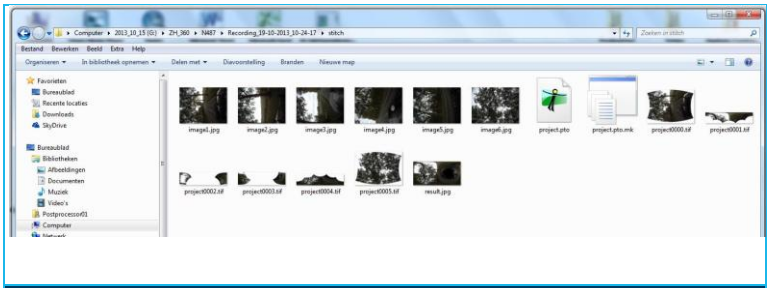

Fig. 61- Saved PTO file

The created stitch file is named *project.pto*. This .pto file is needed to create the setup.hrs file.

7.5 Create a setup from the .pto file

Select the *Create View* option in the *File* menu of the Movie Maker:

Fig. 62- Create view option

Movie Maker will open a dialogue box. Select the create project.pto file with the *File* button:

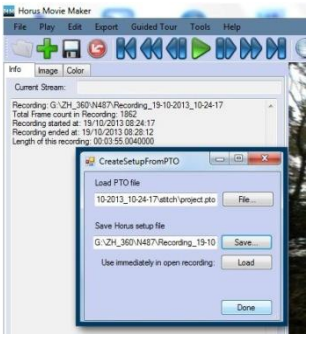

Fig. 63- Select the project.pto file

Next, click the *Save* button. Movie Maker will now save a .hrs file named *new.hrs*. Change the filename to *setup.hrs* and save the file:

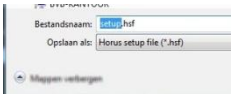

Fig. 64- Change the filename to setup.hrs

Click the *Done* button to close the dialogue box:

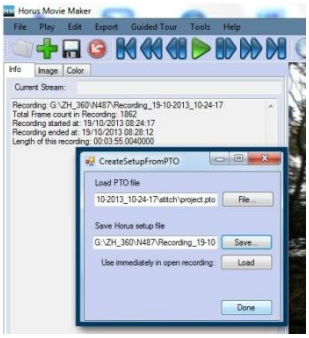

Fig. 65- Click Done to close

The setup.hrs file that you have just created has to be copied and pasted to the recording folder.

7.6 Position the stitch

The setup file that is created in the previous steps will display a correct stitch but it isn't correctly positioned. The positioning process is described in this paragraph.

After you have copied the setup.hrs file to the recording folder, you can open the recording in Movie Maker. Select *Open* in the *File* menu:

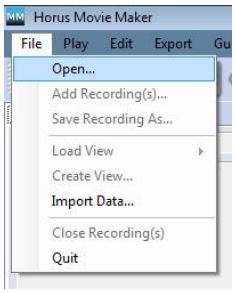

Fig. 66- Open a recording

Select the recording and click *Open*:

Fig. 67- Open the recording

The recording is now opened using the recently created stitch:

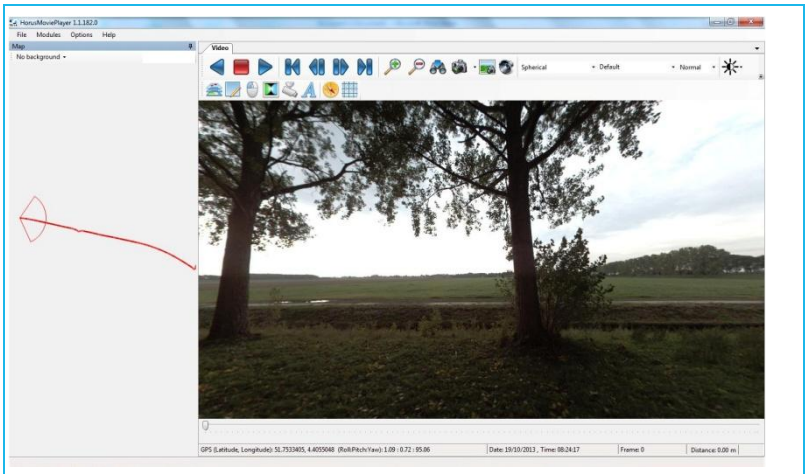

Fig. 68- Recording with new stitch opened in Movie Maker

The stitch may be correct, but the view doesn't correspond with the field of view indicated by the map. Therefore, the images have to be positioned.

Click the *Alignment axis* button to activate the alignment axis:

Fig. 69- Alignment axis button

The alignment axis is displayed in the main screen of Movie Maker. This grid is used for alignment of the images. The horizon of the images must be aligned with the red line:

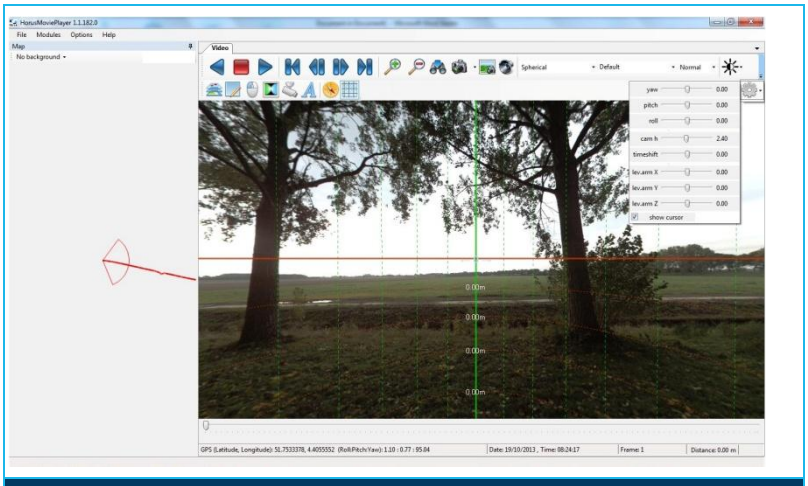

Fig. 70- Alignment axis is activated

To start correction the field of view, click the *Settings* button in the right upper corner of the main screen:

Fig. 71- Settings button

A set of sliders will appear in the right corner of the main screen:

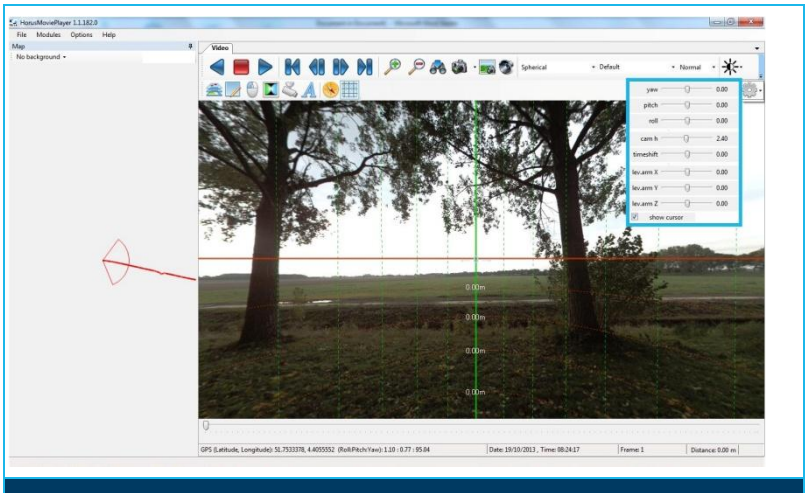

Fig. 72- Settings sliders activated

7.6.1 Adjust the Yaw

With the *Yaw* slider the viewpoint (left – right position) can be moved 180 degrees to the left or right. In this example the yaw is set to -85.95 to adjust the view in the main screen to the field of view on the map:

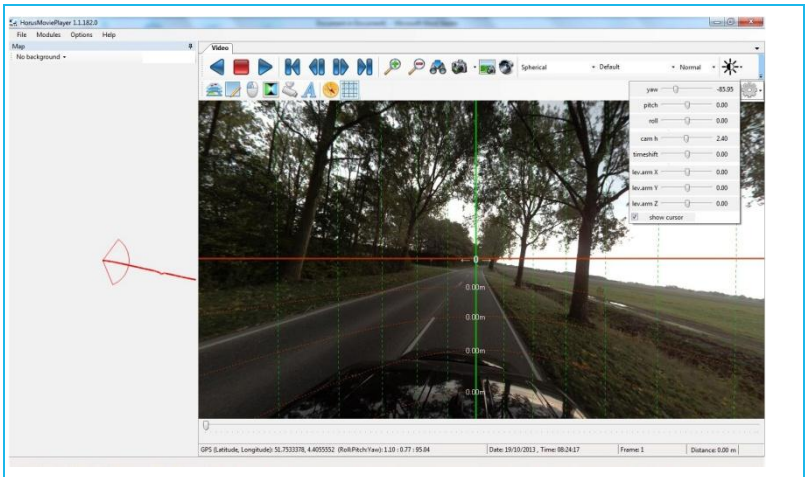

Fig. 73- Yaw adjusted to align view with the field of view on the map

7.6.2 Adjust the Roll

With the *Roll* slider you can adjust the roll (leveling of the horizon of the image). In this example the roll is set to -8.29 to level the image with the horizon (red line) of the alignment axis:

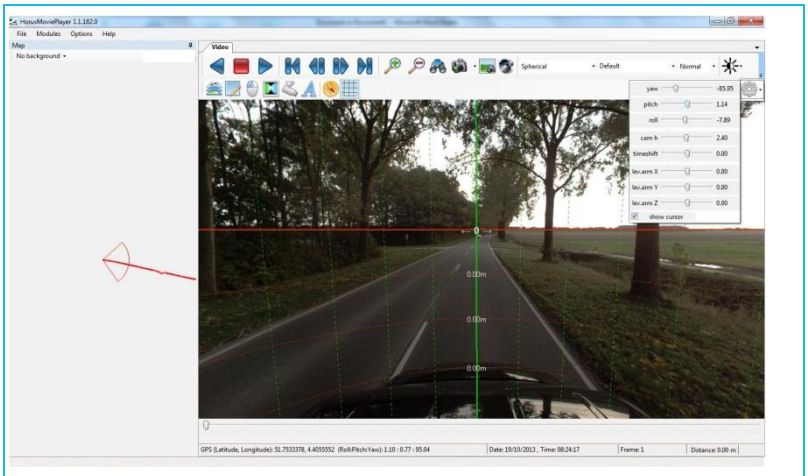

Fig. 74- Roll adjusted to align the horizon

7.6.3 Adjust the Pitch

The *Pitch* slider is used to correct the vertical positioning of the image so that the image is leveled in all directions. When the view horizontally rotated, the horizon of the image will stay leveled with the virtual horizon of the alignment axis:

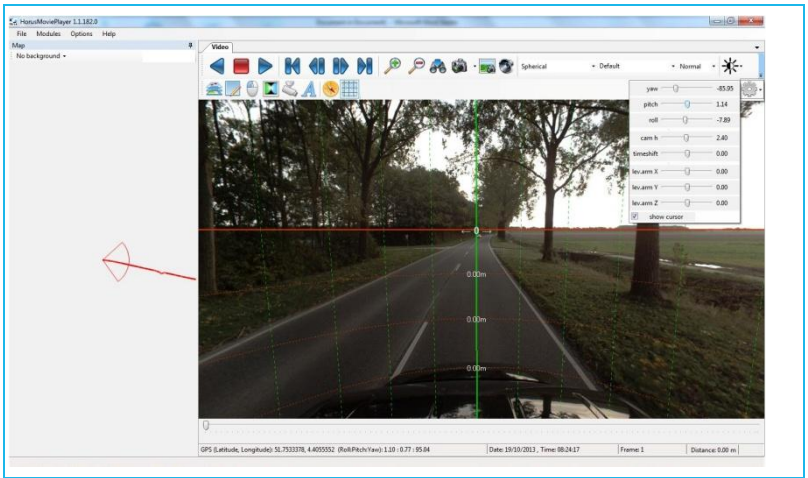

Fig. 75- Pitch adjusted

7.7 Check the positioning

The next step is to check the positioning and alignment. Select the *Spherical* view in the main screen of the Movie Player and rotate the image. The horizon should be on the red line in every view:

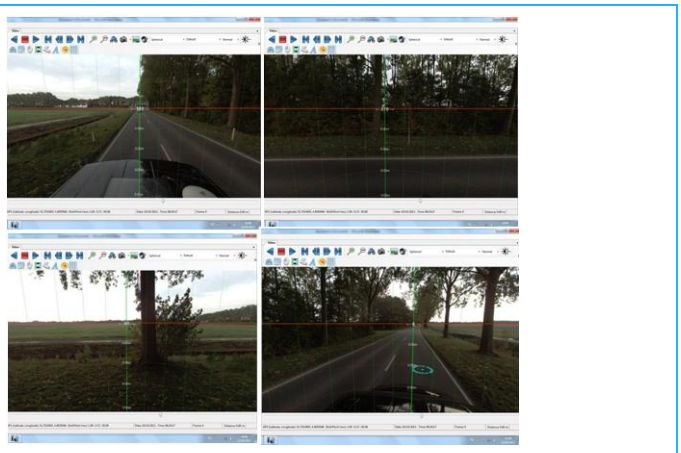

Fig. 76- Checking the positioning

If the virtual horizon and the horizon on the images aren't aligned in every viewing direction, then the previous steps should be repeated.

7.8 Set the camera height

When the recording is used for measuring it is important that the camera height is set. The camera height is measured by a physical measurement. Measure from ground level to the heart of the camera. The default camera height is 2,40 meter.

Set the measured camera height with the *cam h* slider in the settings panel:

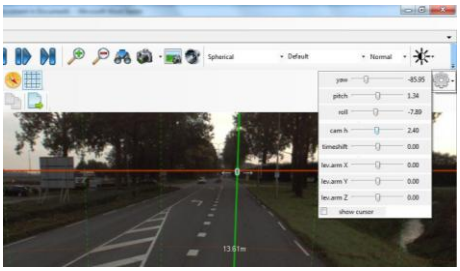

Fig. 77- The camera height is adjusted with the 'cam h' slider

7.9 Save the camera setup

When all the image and camera settings are correct, the setup file can be saved. This is done via the Immersive View Builder module. Click the *Immersive view builder* button in the Movie Player toolbar:

Fig. 78- Immersive view builder button

The Immersive View Builder screen will appear in the left bottom corner:

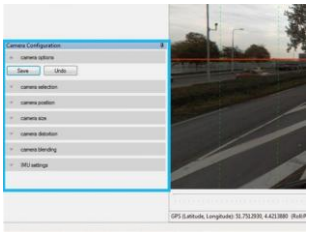

Fig. 79- Immersive view builder screen

To save the camera setup, open the *Camera options* tab and click *Save*. The new *setup.hsf* file is saved in the recording directory (the original setup file is renamed *setup.hsf.original*):

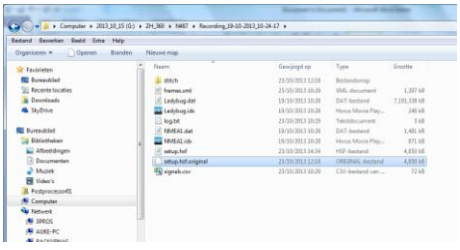

Fig. 80- Setup.hsf file in the recording folder

Always make a backup of the new setup.hsf file. This file can be copied to all recordings made with the same camera setup.

Tip: The Horus Recorder Builder can be used to set a file writer to write this setup to all recordings made with the same camera setup.

7.10 Position the setup on 3D GIS data

To further increase the accuracy, the positioning of the camera must be calibrated to the GIS data. To do so, open a recording that is already correctly stitched. Open the Immersive View Builder and the Layer Manager module:

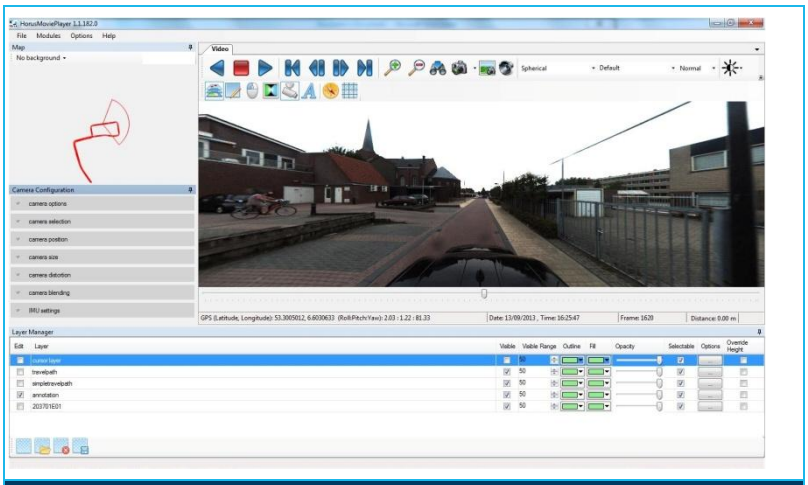

Fig. 81- Immersive View Builder and Layer Manager activated

Open the 3D (GIS) data in the Layer Manager.

To open an existing layer, click the *Import layer* button. The Movie Player will open the *Import Layer* screen:

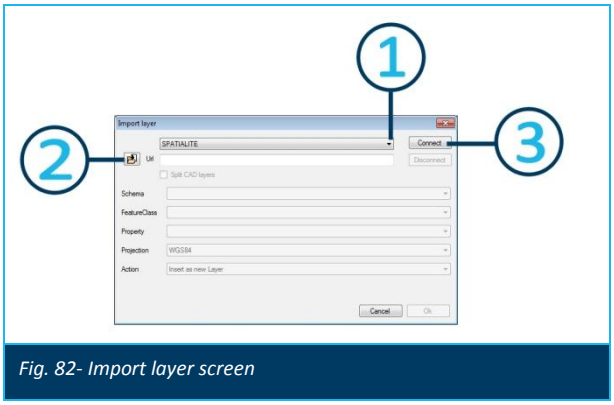

Fig. 82- Import layer screen

To import an existing layer, specify the type of data you want to import in the pull down menu (1):

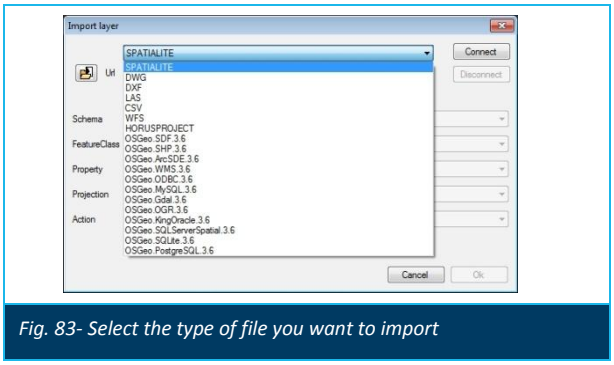

Fig. 83- Select the type of file you want to import

Click the *URL* button (2) and specify the directory of the data you want to import. After that, click the *Connect* button (3). The layer will now be loaded in the *Import layer* screen:

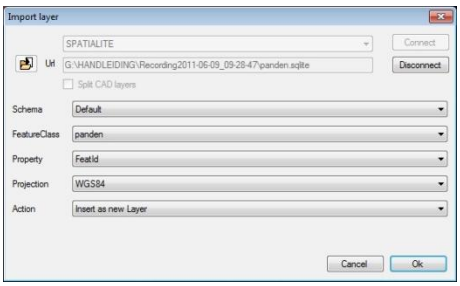

Fig. 84- Select the type of file you want to import

After the layer is opened, minimize the Layer Edit screen to obtain a larger main screen. The spatial data from the layer is visualized in the main screen, the lines must correspond with the images in the main screen:

Fig. 85- Spatial data from the layer is visualized in the main screen

To adjust the image to the spatial data, click the *Settings* button:

Fig. 86- Settings button

7.10.1 Correct the lever arms

If there is no reference for the GPS position of the camera, then the GIS data can be placed on the correct position with the *Lever arms* slider:

Fig. 87- Lever arm sliders

Lev. Arm X *Adjusts the X-axis (forward – backward)*

Lev. Arm Y *Adjusts the Y-axis (Left – Right)*

Lev. Arm Z *Adjusts the Z-axis (Up – Down)*

When the spatial data is aligned with the images, the settings must be saved using the *Save* option in the Immersive View Builder:

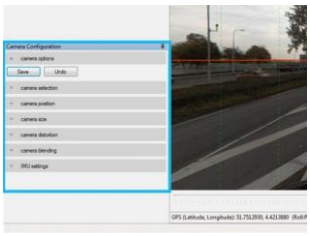

Fig. 88- Immersive view builder screen

8 Movie Maker options

8.1 Repair damaged camera streams

Movie Maker can repair damaged camera streams provided that the data is not excessively damaged. An irregularity in the camera streams appears as a vertical line in the camera tracks:

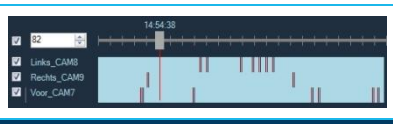

Fig. 89- Irregularities in the camera streams

To start the repair function, select *Repair streams* in the *Tools* menu:

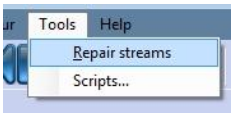

Fig. 90- Repair streams option

Movie Maker will open a screen in which you can select the streams that need to be repaired:

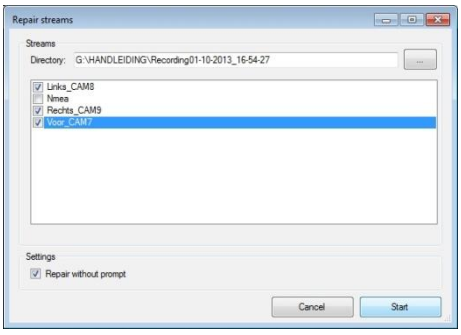

Fig. 91- Select damaged streams

Use the checkboxes to select the streams and select *Start* to repair the streams. A Progress screen will appear.

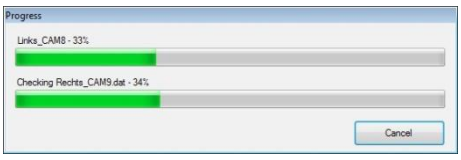

Fig. 92- Repair in progress

8.2 Insert a script

Custom made Horus scripts can be inserted using the *Scripts* function in the *Tools* menu:

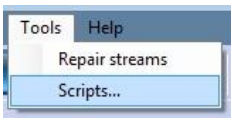

Fig. 93- Scripts function

Selecting this function will open a form in which the script can be selected. Use the pull down arrow to select the script and select *GO* to import the script:

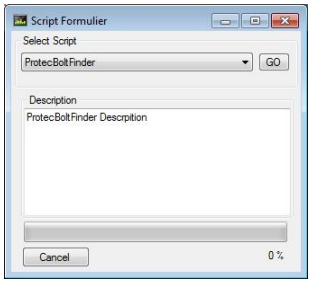

Fig. 94- Script import form

9 Index