

autoGribLoader User Manual Version 2.5.2

Release Notes

Version 2.5.2 has the following enhancements

1. Danger mark has been added to DC's inside which any rounding has the risk of failure
2. Now warns if DC checking runs out of grib and will generate waypoints up to that point.
3. Log files are now created in waypoint format and can be loaded directly into the graphical checker.

Bug fixes – 2.5.2

1. Finish line was still incorrectly positioned and naming did not match Brainaid. Now fixed.
2. DC "creep" fixed. The wrong boat speed was being used for the recovery calculation.
3. All bearing calculations have been converted to rhumb line calculations, which appear to match the SOL client.

Version 2.5.0 has the following enhancements

4. Select and delete a subset of the DC's
5. Only DC's that have changed are updated. A single DC can be edited, and only that one will change
6. Coordinate copy now available in DC Checker. Left or right mouse click will copy those coordinates into the paste buffer in waypoint or SOL format.
7. Toolbar added and buttons removed.
8. DC Checker highlights when TWA is outside optimal range.
9. Course and additional course waypoint markers are now scaled to 10 metres across.
10. Log file can now be loaded as a set of waypoints.

Bug fixes – 2.5.0

4. Finish line correctly positioned.
5. Boat coordinate update time now correct.
6. Fixed map issue when crossing 0 meridian.

Version 2.4.9 has the following enhancements

1. Allows additional waypoints to be loaded as course waypoints. Supports gpx format files as well.
2. Check Waypoints now supports gpx format files
3. Documentation updated to reflect new waypoint file structure.

Bug fixes – 2.4.9

1. DC Checker problems when crossing the 180 meridian.
2. Null pointer exception when AIS is trying to access Wx information during a Wx change.

Overview

autoGribLoader is a Java application designed to assist SailOnline sailors execute their race. It provides a set of tools to make some of the repetitive tasks less laborious, and to help avoid BBQs. The key features of autoGribLoader are as follows:

1. Automatic creation of the grib file each time it is updated.
2. DC editor to manage DC series.
3. Graphical DC checker to check DC series against the map tiles, allowing for performance loss.
4. Position data written to a csv file, to one second of accuracy.
5. Logging of boat data to a csv file for later analysis.
6. Automatic creation of the Qt and Expedition detailed polar files for the race.
7. Mayday calls and rescue commands via chat in the event of a BBQ.
8. Generates a GPX file of the course waypoints and route to load into routing packages.
9. An NMEA server that produces data to allow updating of boat position in real time in routing packages. Includes AIS class A messages for SOL boats.
10. Sounds a boat horn when you run aground, and are racing.

Each of these features is described further below.

Installing autoGribLoader

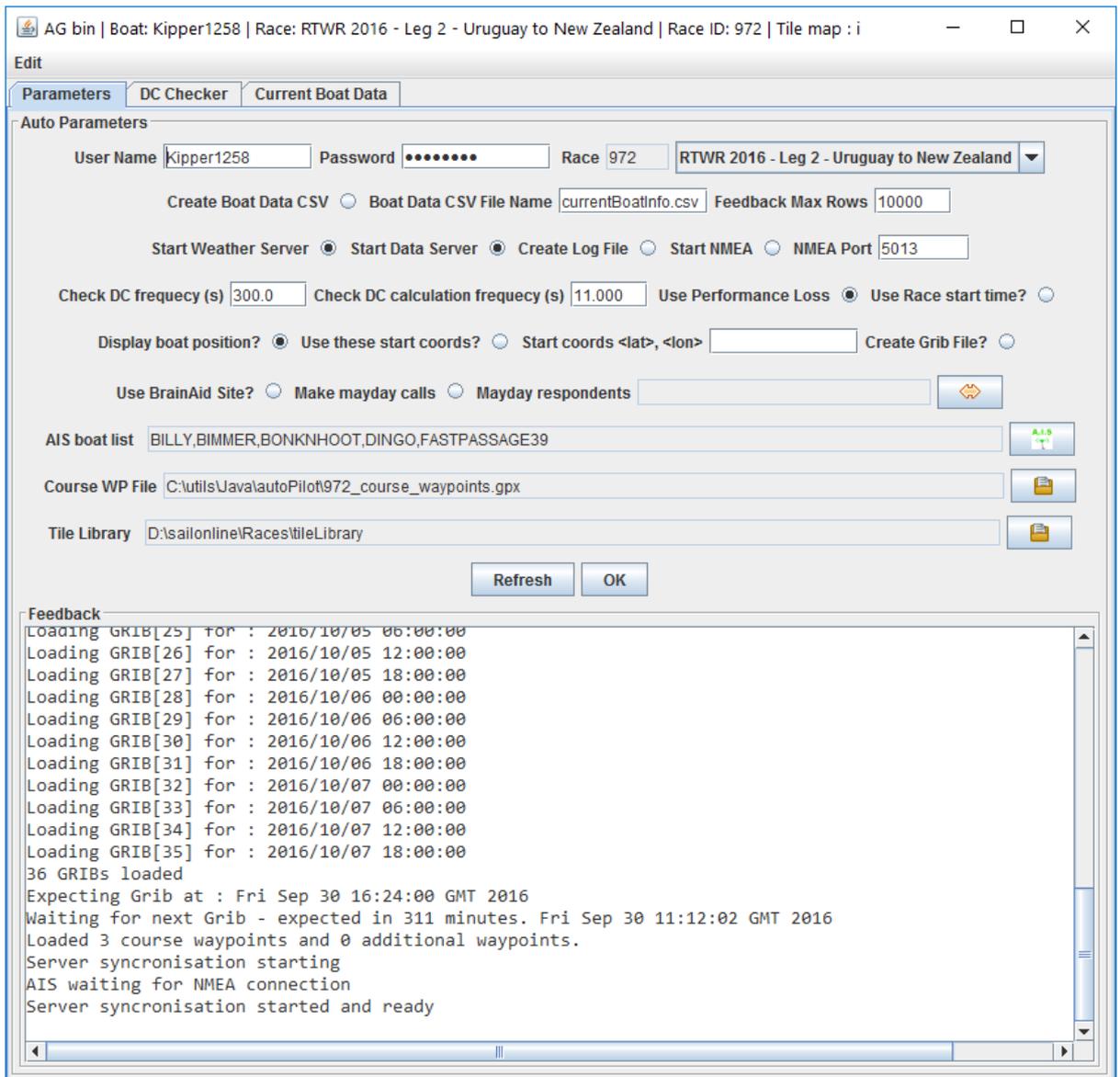
Installation instructions are as follows. Please note that Java (64-bit) must be installed and working. It can reside next to your Java (32-bit) without issues or conflicts.

1. Unzip autoGribLoader_2_5_2.zip to a folder where you want to run it. Two files should now be in the directory, autoGribLoader_2_5_2.bat and autoGribLoader_2_5_2.jar. Note that these file names will change as later versions are released, but they will always match.
2. Run autoGribLoader_2_5_2.bat. The following screen will appear, ready for configuration.

Note: You may install one copy of autoGribLoader_2_5_2.jar in a folder and provide the full path to it in the .bat file. The .bat file **must** reside in the folder for that race, and each race must have its own folder, if races are being run concurrently. This line in the bat file works if *D:\sailonline\Races\java* is the folder on your computer where you store the single copy of the .jar file:

```
java -jar D:\sailonline\Races\java\autoGribLoader_2_5_2.jar autoGribLoader.ini
```

Obviously, change the folder to suit your computer.



Note: You **must** have a good internet connection for this to work.

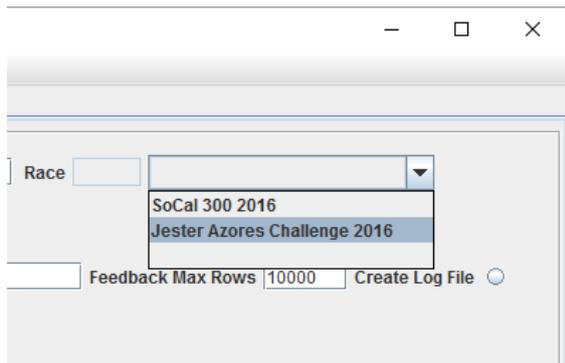
Configuration

You are now ready to configure and fill out the fields as follows:

Username: Your SQL username (boat name)

Password: Your SQL password

Race: Using the Race dropdown combo list, select the current Race. This will automatically populate the race ID.



Note: If there are no races in the list, you most likely have an internet connection error. Check your internet, close the app and restart.

Create Boat Data CSV : If checked, this will create a csv file of all the boat data every time there is a server jump. It will be written to the file specified in **Boat Data CSV File Name**. The CSV data file contains two lines as shown below.

```
TimeStamp, TWS, TWA, SOG, LAT, LON, COG, PL
Thu May 26 00:07:52 GMT 2016, 5.04, 35.0, 3.25, 50.3315, -4.1608, 76.22, 1.0
```

Simply, the data from your SOL client dashboard. However, note that TWS is returned in m/s.

Caution: If the CSV file is opened in Excel and some other editors, it is locked and cannot be updated. You may end up with stale data in the file. Make sure the file is not locked when reading. For example, create a data connection in Excel to read the CSV and refresh that, or use an editor like NotePad++.

Feedback Max Rows : The data in the Feedback window is stored in memory and the application memory can grow very large if this is not limited. The 10000 default is fine for most computers.

Create Log File: If checked, the application will automatically create a log file of all the boat data every server jump. This ranges from 10 to 30 seconds.

The **Log File** name will be similar to `boat_log_935_2016_05_25_0_28.txt` i.e. is made up as “boat_log_<Race_ID>_<YYYY_MM_DD_HH_MM>.txt”.

It is the same format as **Boat Data CSV** but with many more lines and the following extra fields

Dist Lost:	Not used
CMD:	Current DC command, cc or twa
DTG:	Distance to go in nm
POSN:	Current position
DBL:	Distance behind leader in nm
VMG+:	TWA for maximum VMG to windward in decimal degrees
VMG-:	TWA for maximum VMG downwind in decimal degrees
Max TWA:	TWA at which maximum boat speed occurs
Max Speed:	The maximum speed in knots

Note: The log file can be loaded into the graphical checker.

Start Weather Server: If checked, the grib downloading will start and DC Checking will be enabled. DC’s cannot be checked without the Weather Server running.

Start Data Server: If checked, the application will acquire the current boat information and make that available for logging and other uses. The Mayday service, DC Checking and NMEA all require this service to be running.

Start NMEA: If checked, application will start listening for a connection on the NMEA Port, and when a connection occurs, will start transmitting NMEA sentences. Supported sentences are:

- GGA - Global positioning system fix data
- HDT - True heading
- MWD - Wind direction and speed
- RMB - Recommended minimum navigation information
- RMC - Recommended minimum specific GNSS data
- VHW - Water speed and heading
- VWR - Relative wind speed and angle
- VWT - True wind speed and angle
- WPL - Waypoint location

It will also send the course waypoints, including the finish line.

Data from other boats on Sailonline is also sent as AIS class A messages:

- Message 1 - Position report
- Message 5 - Ship static and voyage related data

If the client disconnects, the application will stop transmitting, and then wait for a new connection.

NMEA Port: The TCP port number on which the application will accept a connection. The application only allows for one NMEA connection.

If the client disconnects, the application will stop transmitting, and wait for a new connection.

Note: It can take up to 30 seconds for the data feed to start. The waypoints will be sent immediately, but the data feed waits for the next server jump to start. The Data Server must be running for this to work.

The next two rows of parameters are associated with DC checking and are described in the section.

Create Grib File. If this is checked, AutoGrib will automatically download the grib XML into the *SOLGribXml* folder, if it does not exist. It will then create a binary grib file in the *grib* folder compatible with routing software. Once downloaded, it will wait until notified by SOL that there is a new grib file, and repeat the process. This does not use the BrainAid site, but the grib file has the exact same name as the one that would be generated by BrainAid.

Use BrainAid Site. If this is checked, AutoGrib will use the call to BrainAid to create the grib file and place it in the *grib* folder.

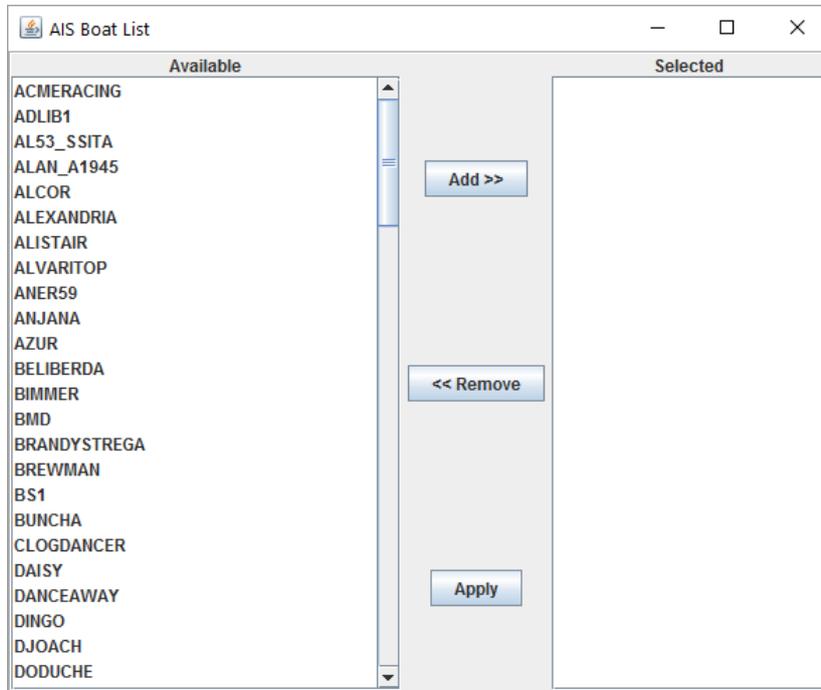
Note: No attempt is made to clean up old files. You need to do that manually. Any data in the *grib*, *SOLGribXml*, *polar* and *tiles* directories can be safely deleted at the end of a race. If any of the required data does not exist, it will be reloaded from the server.

Make mayday calls : If checked, the BBQ rescue feature will be enabled. The feature is discussed in detail later.

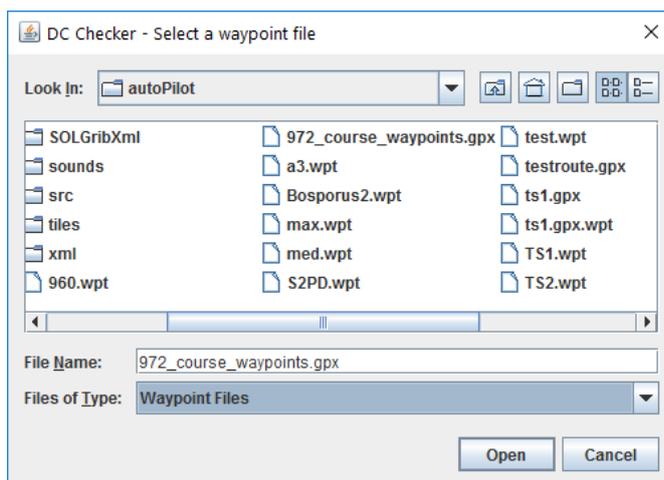
Mayday respondents : Who can respond to you mayday calls. Discussed later.

AIS boat list : The list of boats whose AIS information will be sent in the NMEA feed. If blank, all boats are sent. Selecting the  icon opens the AIS Boat Chooser. Selected the desired boats and click Add. The click Apply to update the AIS boat list. The icon is on both the Parameters and DC Checker tabs.

Note: The boat chooser will not be active until initialisation is complete, as a valid login into the server is required to retrieved the active boats.



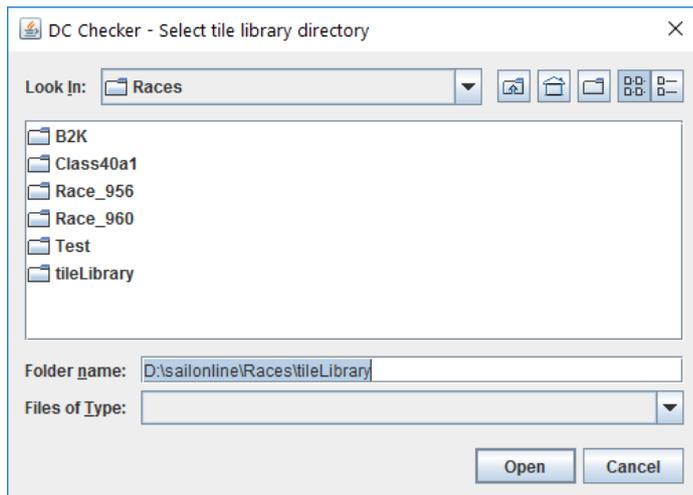
Course WP File : Allows a waypoint or gpx format file to be loaded as additional course waypoints. Select the  which will launch the file chooser.



Select the file to use and **Open**. Selecting **Cancel** will clear the currently selected file. This file will now be automatically used each time DC Checker is used.

Note: Scaling has been applied to the course waypoints. The cross size is 10 metres across.

Tile Library: Allows a directory to be specified in which to store all the map tiles for any race. If a required tile exists in the library, it will be reused. If not, it will be downloaded and stored in the library for future use. Select the  which will launch the directory chooser.



Select the directory to use and **Open**. Selecting **Cancel** will clear the currently selected file. This directory will now be automatically used each time DC Checker is used to load map tiles.

If no library is specified, the application will use the *tiles* folder in the current directory. Note that the application will still create a *tiles* folder and an *h* and an *i* folder underneath the *tiles* directory

To start the application, select **OK** will apply the settings and start the selected components.

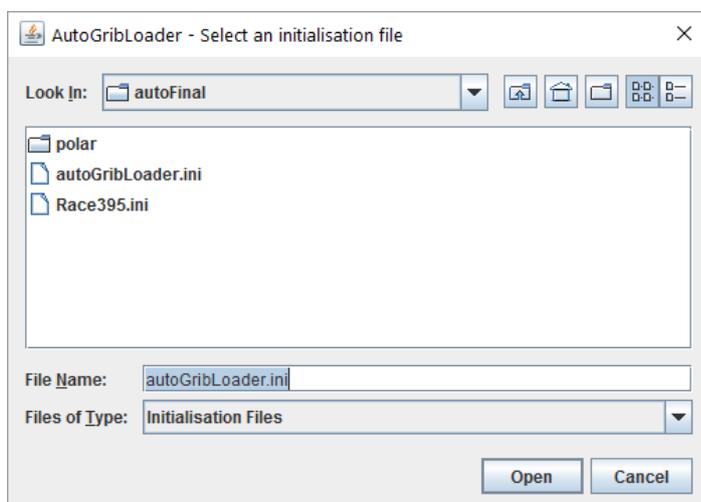
The parameters are written to an .ini file, which by default, is call autoGribLoader.ini. The application supports different .ini files in two ways. By default, the .bat file specifies the .ini file as a command line argument, thus:

```
java -jar autoGribLoader_2_0.jar autoGribLoader.ini
```

You can edit the .bat file using a text editor and specify a different .ini file, or none. If no .ini file is specified, i.e. thus,

```
java -jar autoGribLoader_2_0.jar
```

a file chooser will appear when you execute the .bat file and the ini file can be selected as shown below.



Select the file or Cancel to exit completely.

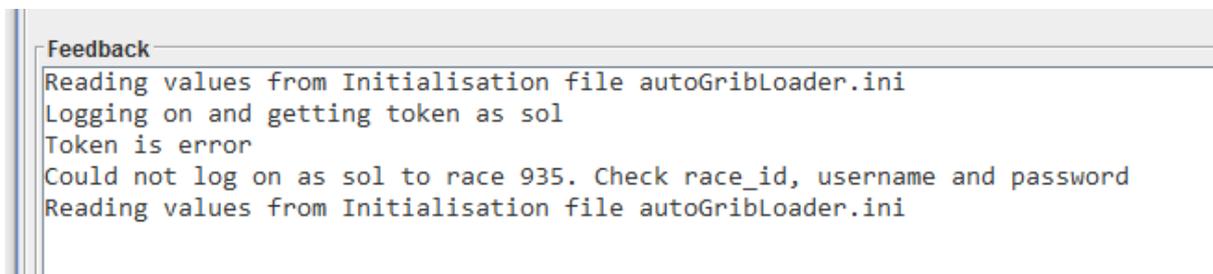
Refresh will reload the parameters from the ini file.

To exit the application, simply click on the X at the top right hand corner of the screen.

Initialisation

On applying the parameters, and provided you have given the correct username, password and race (you must be registered in that race), the application will go through an initialisation process that could take up to 30 seconds to complete. If you do not see the following in the feedback window, check the race, username and password, and try again. Note that the same result can happen if there is no internet connection.

Note: Downloading the race information (which includes the boat polar) and the weather information can hang. After about two minutes, the application should time out these downloads and try again. If that does not happen, close the application and start again.



```
Feedback
Reading values from Initialisation file autoGribLoader.ini
Logging on and getting token as sol
Token is error
Could not log on as sol to race 935. Check race_id, username and password
Reading values from Initialisation file autoGribLoader.ini
```

After a successful login, you will be taken to the DC Checker Tab. Buttons and tabs will remain inactive until they are configured and ready for use. Also, if the servers required for that functionality have not been started, they will not be enabled. At this stage, the weather grib file and boat polar will have been created, and logging started if requested.

Note: The application window title will update to show the boat, race name and race id. This can be used to check which race this instance applies to. Multiple instances of the application can be run on the same computer, but they should each be run in their own folder.

QtVLM and Expedition Boat Polars

Part of the initialisation process is to create a detailed QtVLM and Expedition style boat polars, if it does not already exist. The application creates a directory called **polar** and places the file in that folder. It is named <Boat Type>_polar.csv, for example *Twister_28_polar.csv*. This file can be copied to the polar folder in Qt and used. For Expedition, it is named <Boat Type>_expd_polar.csv, for example *Twister_28_expd_polar.csv*.

Course Waypoints GPX

The application will create a gpx file of the course waypoints, and a route linking those waypoints together in the order they should be sailed. This data can then be loaded into routing packages such as Expedition and Qt. The file is created in the **polar** directory and is called <Race ID>_course_waypoints.gpx. For example, for race id 565, the gpx file will be *565_course_waypoints.gpx*.

The application also adds in the finish line ends, but does not include these in the route.

Current Boat Data Tab

Once initialisation is complete, the application will start to report the current boat data on this tab. The data looks like this. All data is in decimal degrees, nautical miles and knots.

Edit

Parameters	DC Checker	Current Boat Data
Current Boat Data		
Date & Time	Latitude	Longitude
2016/10/21 03:54:20	-48.217322	266.965818
TWD	TWA	TWS
158.255	-123.000	17.560
SOG	COG	Performance Loss
20.193	281.255	100.000
Max VMG up TWA	Max VMG down TWA	Max Speed TWA
42.440	144.000	123.000
Max Speed	Current Command	Distance to Go
20.193	twa	3889.673
Position	Distance behind	Leg
218	3889.935	1
Current server jump (s)	Time to next update (s)	
30.10	7	
Race Start Time UTC	Race Start Time Local	Time to race start
2016/10/02 13:00:00 UTC	2016/10/02 23:00:00	-18 days 14:54:43
Crossing 180E		
<input type="radio"/>		

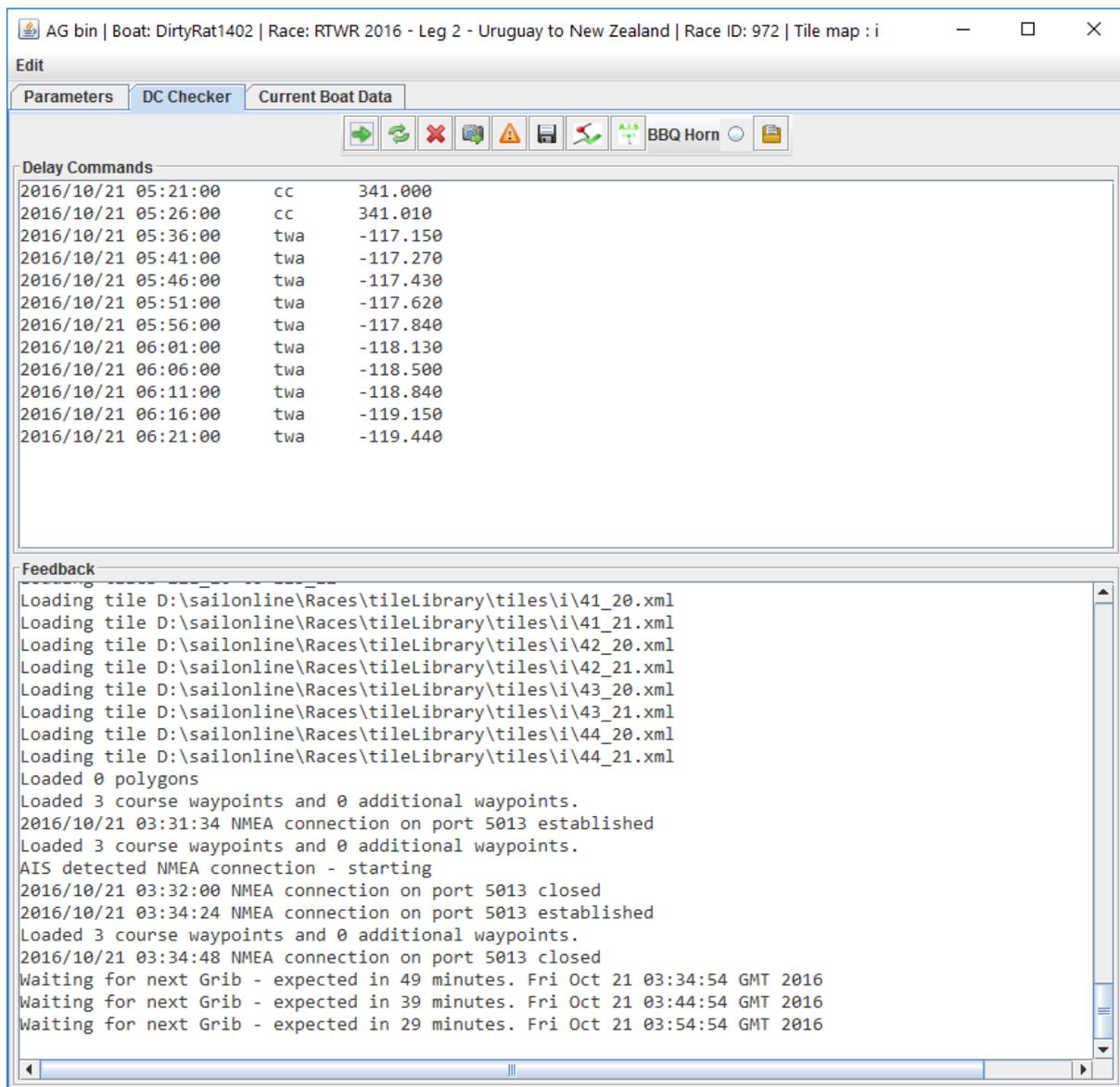
Also calculated is the current server jump duration (ranges from ~10 to 30 seconds) and how long until the next update is due. The date and time of the data is accurate to about one second.

Parameters Tab

Click on this tab to take you back to the parameters. These can be changed at any time, and the application will respond accordingly. For example, changing the race will cause a complete re-initialisation.

DC Checker Tab

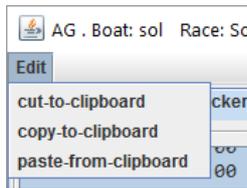
Once initialisation is complete, the DC Checker Tab buttons become enabled. Additionally, any current DC's will be downloaded into the Delay Commands window. The tab should look like this once fully configured.



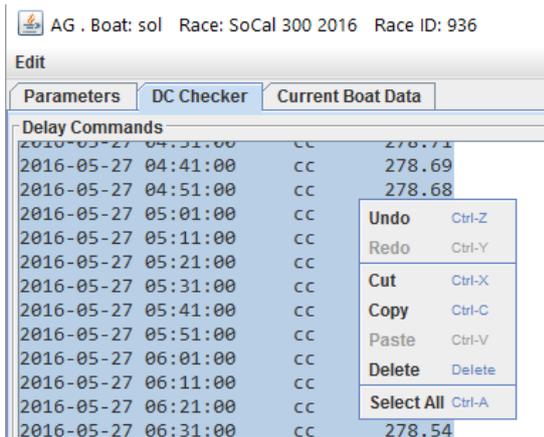
The features of this tab are described below.

Context Sensitive Editing Menus

There are two menus that can be used for copy and paste. The first is **Edit** which shows this menu.



The second can be accessed by right mouse click in the Delay Commands window.



Set Button

This button is used to set any DC's that have been pasted into the window. The set operation will

1. Check that all DC's are valid.
2. Remove any duplicate DC's. That is, if the next DC command and value is the same as the previous, it will be deleted.
3. Delete any DC's that are stale (that is, older than now).
4. Delete any DC's on the server that do not match those in the DC area. Note that only one DC at a time can be deleted, so this may take a while depending on internet speed.
5. Update with the current valid set.

Note: A DC record must be in this format: 2016/05/27 01:51:00 twa 138.45

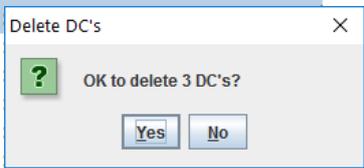
Refresh Button

The refresh button will request the list of current DC's from the server and display them.

Delete Button

To delete all DC's, click the delete button . To delete a subset, highlight those to be deleted.

Delay Commands			
2016/10/21 05:21:00	cc		341.000
2016/10/21 05:26:00	cc		341.010
2016/10/21 05:36:00	twa		-117.150
2016/10/21 05:41:00	twa		-117.270
2016/10/21 05:46:00			
2016/10/21 05:51:00			
2016/10/21 05:56:00			
2016/10/21 06:01:00			
2016/10/21 06:06:00			
2016/10/21 06:11:00			
2016/10/21 06:16:00	twa		-119.150
2016/10/21 06:21:00	twa		-119.440



A confirmation popup will be displayed. Yes will delete and No will cancel.

Snapshot Button

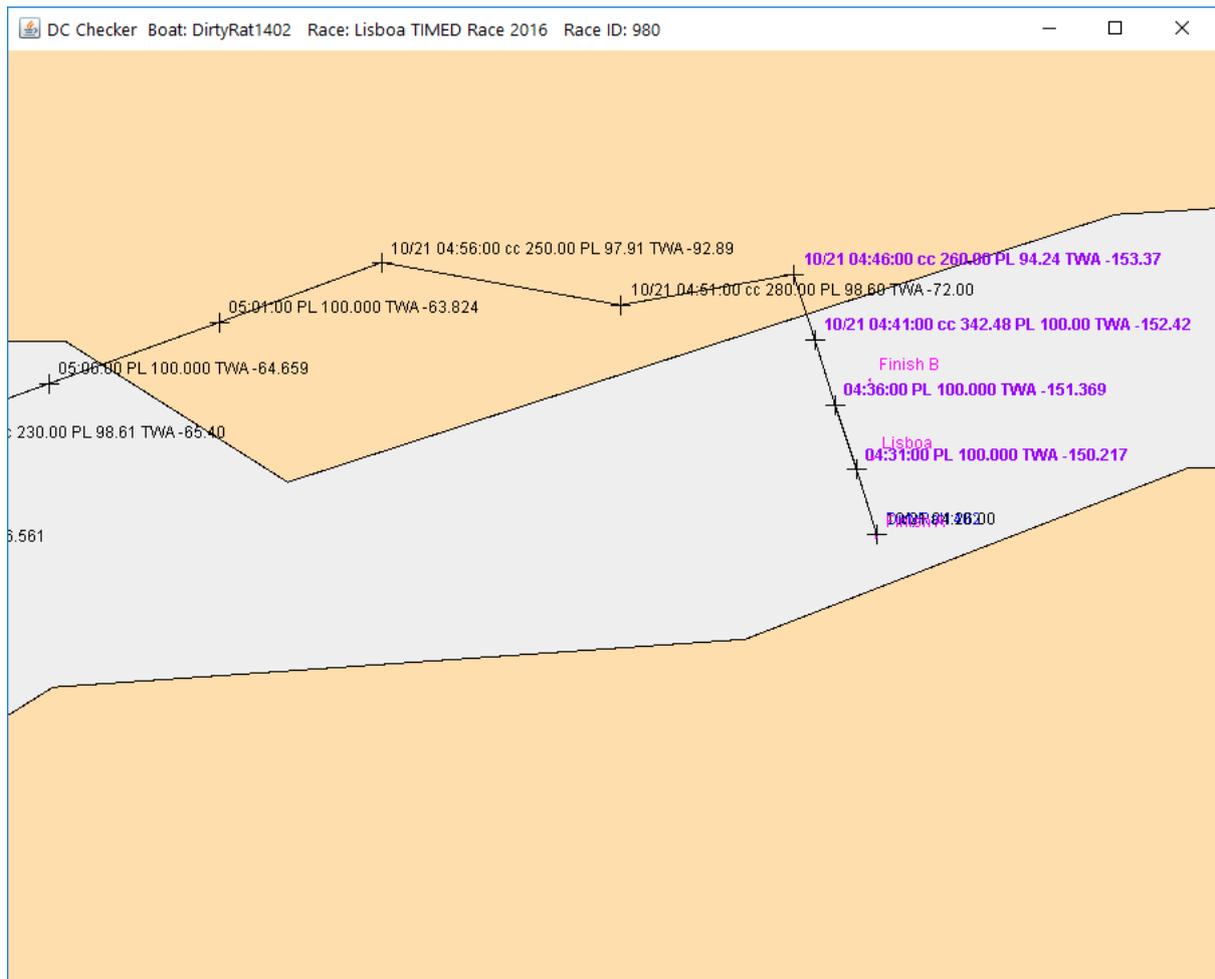
This is used for debugging purposes. It writes a copy of the feedback window to a file and is needed to report any strange behaviour.

The snapshot file name will be similar to *snapshot_935_2016_05_25_0_28.txt* being made up of "snapshot_<Race_ID>_<YYYY_MM_DD_HH_MM>.txt".

Check DC's Button

This button will take whatever DC's are shown in the DC window and convert them into a plot as shown below. We can now talk about what each of the parameters does, and how it works.

If the waypoint is highlighted in purple, the boat will be sailing **to** that waypoint outside the optimal TWA range.



Parameters

You will find all of these on the Parameters tab.

Check DC frequency: This parameter (in seconds) decides how often additional points are plotted on the screen between each of the DC's. Waypoint 04:31:00 PL 100.000 TWA -150.217 shown above is one of these, and is 300 seconds away from the start. The waypoint name is the time that the boat will arrive, and PL is the performance loss that the boat will be experiencing at that point, and TWA is the TWA that the boat will sail under to that waypoint.

When a DC is reached, it is named in full. 10/21 04:46:00 cc 260.00 PL 94.24 TWA -153.37 is the first DC that will be reached in the example shown.

Check DC calculation frequency: This parameter (in seconds) determines how often the boat is advanced. Similar concept to the server jump. The points generated are not plotted, but are used to determine the coordinates of each waypoint, by sampling TWS and TWD after each advance and then using those numbers for the next advance.

Use race start time: This allows the user to check DC's from the start. If checked, the checker will assume that the boat is at the start waypoint, and the time is the start time. Any DC's after that time will be processed in producing the route. If left unchecked, the start time will be now.

Display boat position: This is used when the boat is a long way away from the DC's of interest. It will not be plotted or considered in producing the route. Most applicable when **Use these start coords** is checked.

Use these start coords: The route will be calculated assuming the boat is at the **Start coords**, and the time will be wound forward to the time of the first DC.

Start coords <lat>,<lon>: The start coordinates for the route. It is in the format that can be pasted directly from the SOL client. To pick up coordinates from the SOL client, hold the Alt key down, and then click the left mouse button. This copies the coordinates of the crosshairs into the copy/paste buffer.

Note: If the boat is currently TWA 0, it means it is not moving. The only action that can be taken is to advance the clock to the first DC time, and assume that the boat will start moving on that course at that time. The start point will therefore be the current boat position, and the time of the first DC.

Zoom and Pan

The zoom function is only enabled by the use of a mouse with a wheel (on its back, not underneath). Scrolling the mouse wheel zooms in and out. Pan is achieved by holding the left mouse button down, and dragging to the desired location.

Mouse Click

A **left** mouse click will copy the current mouse coordinates to the paste buffer in the format

,CP,<lat>,<lon>

Eg. ,CP,38.681941,-9.201922

This allows a simple paste into a waypoint file where all that is required is the name to make a valid waypoint.

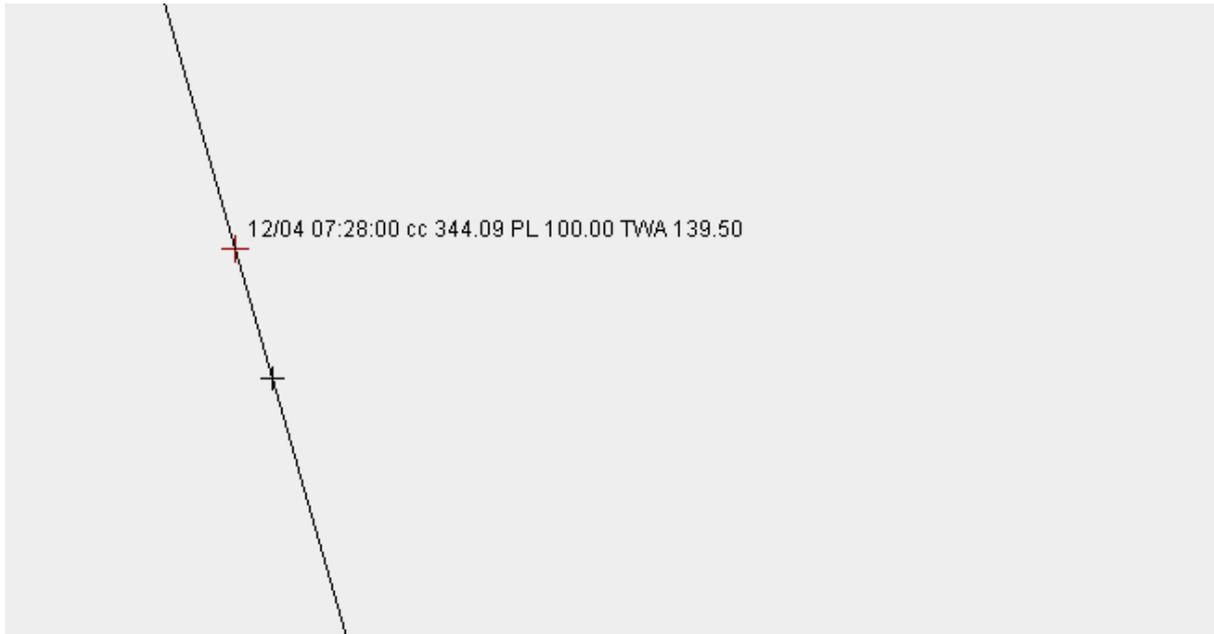
Eg, WP01,CP,38.671979,-9.196492

A **right** mouse click will copy the current mouse coordinates to the paste buffer in the same format as the SOL client, that is

38.605778,-9.485908

Danger Point

The DC Checker has been enhanced to include the danger point, inside which the execution of a round has the risk of failing. The boat may execute the rounding any time from the danger mark to the main DC. The danger mark is a scalable (10m across) mark that is shown just before the main DC. This is shown below as the unabled cross.



The Map Tiles

The application works out which map tiles it needs and downloads them from the server as required. It always loads the highest resolution specified by the race information, as it is this set that need to be checked against. If a tile has been downloaded already, it won't be re-downloaded. The downloaded tiles are stored in separate directories according to resolution.

Check WP's 🏃

The application has the option to write a route out to a set of waypoints, then read them back in. The waypoint file is a simple csv file in the format

```
<name>, CP,<lat>,<lon>
```

The two letters CP must be provided after the name, as the library is used for other purposes.

An example of a waypoint file is shown below, which was produced by the write routine.

```
09/30 11:50:00,CP,-35.246400,305.470000
09/30 11:55:00 cc 237.99 PL 100.00 TWA -121.45,CP,-35.257007,-54.550771
09/30 12:00:00 cc 238.00 PL 100.00 TWA -121.93,CP,-35.267607,-54.571538
09/30 12:05:00 cc 238.02 PL 100.00 TWA -122.41,CP,-35.278203,-54.592308
09/30 12:10:00 cc 238.03 PL 100.00 TWA -122.94,CP,-35.288792,-54.613085
09/30 12:15:00 cc 238.04 PL 100.00 TWA -123.48,CP,-35.299379,-54.633867
09/30 12:20:00 cc 238.06 PL 100.00 TWA -124.06,CP,-35.309965,- 54.633867
```

The application can also read and write gpx files. A valid waypoint gpx file will have the following format

```
<gpx xmlns="http://www.topografix.com/GPX/1/1"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:schemaLocation="http://www.topografix.com/GPX/1/1
http://www.topografix.com/GPX/1/1/gpx.xsd"
      version="1.1"
      creator="AutoGribLoader">
  <wpt lat="-35.2" lon="-54.0">
```

```
<name>Punta DO </name>
<type>RTWR 2016 - Leg 2 - Uruguay to New Zealand</type>
</wpt>
<wpt lat="-52.3" lon="-68.3">
  <name>Cabo 0</name>
  <type>RTWR 2016 - Leg 2 - Uruguay to New Zealand</type>
</wpt>
</gpx>
```

A gpx file is recognised by the file extension .gpx.

Write WP's

Will take the current set of DCs as plotted on the screen, and write them out as a waypoint file in the format shown above. If the file extension is not provided, the default .wpt will be used and the file will be a csv in the format

<name>, CP,<lat>,<lon>

If the extension .gpx is used, a gpx format file will be created which will contain both the waypoints, and a route connecting the waypoints.

AIS Button

Opens the AIS Boat Chooser. Selected the desired boats and click Add. The click Apply to update the AIS boat list. The icon is on both the Parameters and DC Checker tabs.

Boat Horn Radio Button

When checked, the boat horn will sound if

- The race has started
- The boat has not finished the race
- The boat has left the start, and
- The boat is twa 0.

Additional Course Waypoints Button

Launches the Additional Course Waypoints file chooser. Note that course waypoints are now scaled to 10 metres across.

Mayday Feature for Rescue from BBQs

The application has a BBQ rescue feature that will enable you boat to be rescued by a buddy through the chat commands. This feature may only be used within the bounds of the SOL rules regarding boatsitting.

Note: A ruling by the SailOnline Race Committee is that only **one** Mayday respondent may be used in any race, and that respondent cannot be changed. If you do, you are in breach of the rules and can be disqualified. The application allows many or all respondents. Once a rescue has been initiated by a respondent, that person is the only one allowed to respond in the future.

How does it Work

The feature will only work if

- a) It is enabled
- b) The race has started
- c) Your boat has not finished the race
- d) Your SOG is zero.

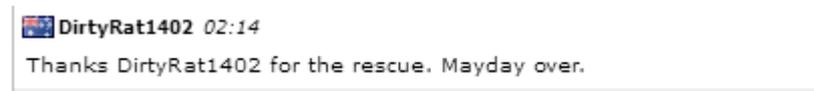
If all those conditions are true, the application will issue a mayday call to the English chat room as shown below.



Anyone in the respondent list can then respond to your call with a series of commands to get your boat going again. These are issued from the SailTalk chatroom. The command is a simple chat message in the form:

Mayday <boat> <command> <value> <more commands>

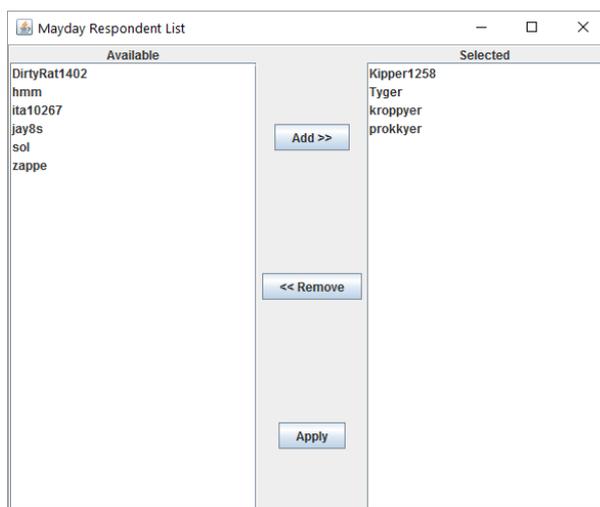
Once complete, the application will notify the English chat room the rescue is over.



Enabling the Feature

The feature is enabled by checking **Use mayday calls** radio button. Before enabling, it is important to set up your respondent list, as only those people can respond to call. The Respondent List Editor is opened by clicking on the 🚢 button. This will display the picker below. To add or remove boats, click on the boats (multiple selection is allowed) and then click Add or Remove. To Apply the changes, click Apply, which will close the picker.

Note: Apply is the only way to close the picker.



Note: If the respondent list is left blank, anyone can respond to your mayday call.

Now click OK. The application will post a message in the SailTalk that you have Mayday enabled and the M flag (🚩) will be hoisted on <http://sol.kroppyer.nl/flagpole/> . The SailTalk message is



If the mayday conditions are all met, a mayday will be issued at the next server jump. This also hoists N over C on Flagpole ( ), the International Code flags for Mayday.

Once activated, a mayday will remain active until

1. A respondent responds
2. No one responds and the boat starts moving again

Responding to a Mayday Call

The mayday call will only listen to boats in the **Respondent List**. If the list is blank, any boat can respond. The following steps need to be followed to acknowledge a call and respond.

1. Select the SailTalk Only chat room.
2. Type in a message in the form *Mayday <distress boat name> <command> <value> <more commands>*. For example, assume DirtyRat1402 has issued the call, valid responses would
Mayday DirtyRat1402 cc 123.6 1
Mayday DirtyRat1402 cc 123.6
Mayday DirtyRat1402 twa 43.0 1

The <more commands> is optional. If left off, this will be the last command and DirtyRat1402 will cease to listen to rescue commands. The value should only be 1 if there are more commands to follow.

Note: A maximum of 4 commands can be issued for any one Mayday.

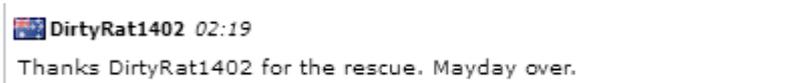
3. Wait for DirtyRat1402 to respond. The response will look like



 DirtyRat1402 02:17
Roger DirtyRat1402. Rescue commands 1 of 4 used.

Note: If more than one command is sent in the same server jump, only the last command will be executed. It is important therefore to wait until you get a response.

4. Once the final command is issued the rescued boat will issue a mayday over command in the English chat room and thanking the boat that rendered assistance.



 DirtyRat1402 02:19
Thanks DirtyRat1402 for the rescue. Mayday over.

Known Issues and Bugs

There are some know issues.

1. There may be some un-trapped connection error exceptions, which could cause the application to hang. Check the CMD window for any errors. If in doubt, restart the application.
2. The download of the race information and the weather information can hang at times. This is a system problem. An attempt has been made to trap this and re-initiate the download. However, a full restart may be necessary of the application. Tends to happen on poor internet connections.

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