VCL – VHF & Microwave Contest Logger Software

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Manual applicable to Versions 1.5 and above - October 2023

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1 Overview

This amateur radio software provides the ability to log and display the QSOs (radio contacts) made during one of the ARRL VHF, NA VHF Sprints or various NA Microwave contests. It offers a simple and efficient interface customized for these contests. The interface is distributed over several independent windows, which allows the user to better organize the desktop. The software performs continuous "dupe checks" and score calculation. It also displays the worked grid squares using color boxes on a zoom-able Maidenhead grid world map. Both 4-character and 6-character grid square logging is supported. Digital QSOs made on the WSJT-X software can be automatically logged. To save the contest information, the script uses a simple CSV (comma-separated text) file; no complex database is used. Since this software is a python script, it can be run on Linux, Windows and Mac, once the python-3

interpreter is installed. Another benefit of being a Python script is that it uses a simple text file as source code. It can thus be easily improved and customized by the user. Though it is customized for VHF and Microwave contesting, this software can also be used for general logging of VHF/UHF contacts.
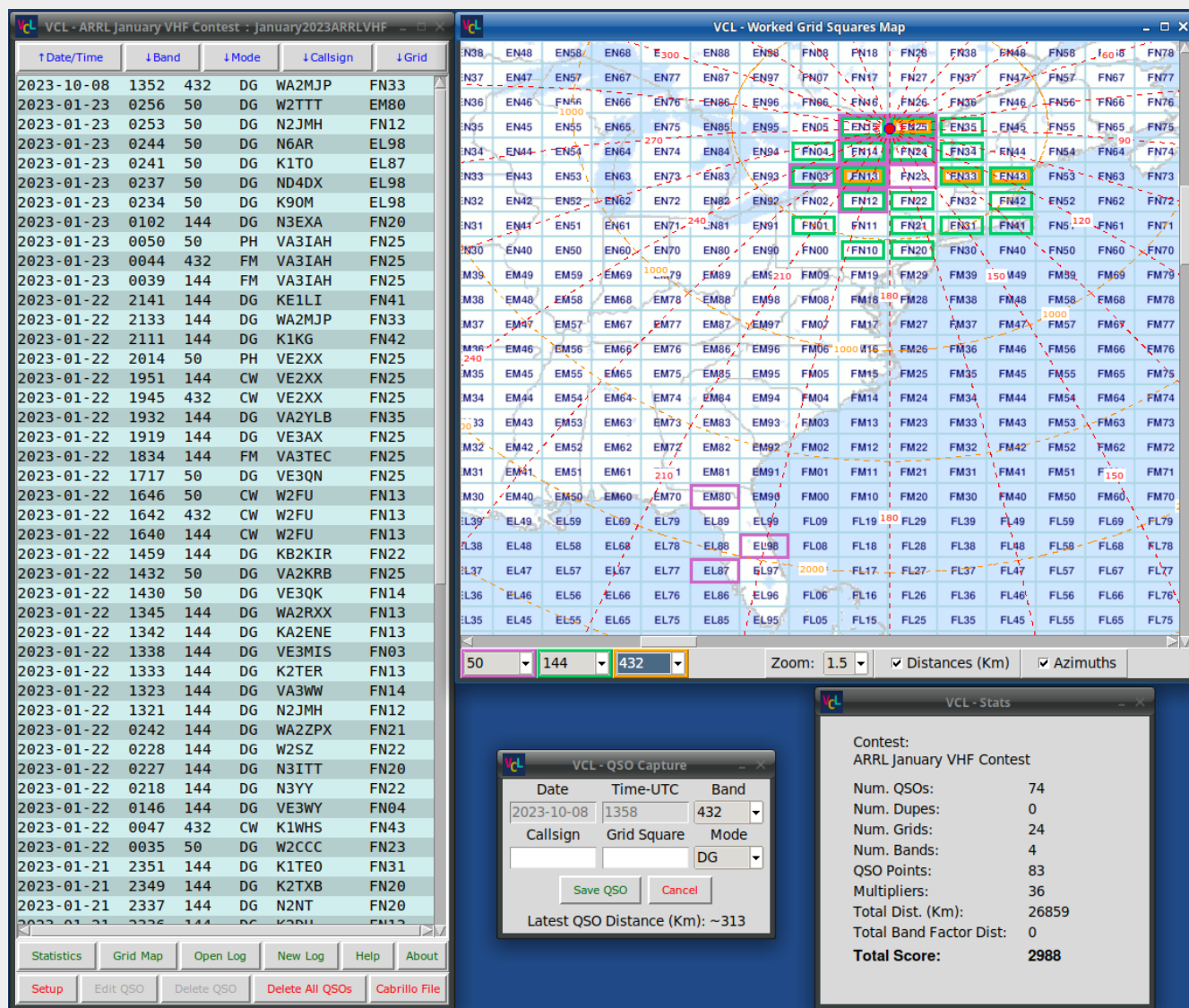
The VHF/Microwave Contest Logger software windows

2 Detailed Description

2.1   QSO Capture Window

The QSO Capture window is the main input channel for adding new QSOs or for editing existing QSOs in the logbook. The QSO Capture window has the following features and behavior.

- A new QSO is added to the logbook by executing the following sequence:
    1. Fill in the amateur radio call sign of the worked station in the Call sign entry box,
    2. Fill in the 2-Letter/2-number (plus 2-Letter for Microwave contests) Maidenhead grid square in the Grid Square entry box,
    3. From the "Band" pull-down list select the amateur radio band used for working the station,
    4. From the "Mode" pull-down list select the modulation mode used.
    5. Click on the "Save QSO" button.

The QSO Capture window

- The program automatically fills in the current date and time when the "Date" and "Time-UTC" entry fields are grayed out, which is the default program behavior. The user can also perform manually date/time entry when needed by clicking on one of these two fields. A white background in the fields indicate a manual date/time entry mode.
- Once the proper band and mode are selected, the interface allows to repeatedly capture QSOs using only the keyboard, without reaching for the mouse, for as long as the QSOs occur on the same band and with the same mode. The <Tab> key provides a quick jump of the cursor from the Call sign field to the Grid Square field. Pressing the <Return> key when the cursor is located in either of these fields will save the QSO to the logbook.
- The "Cancel" button clears any data from the Call sign entry and the Grid Square entry fields. It also puts the Date/Time fields back into automatic update. When in QSO Edit mode, it cancels the Edit QSO mode and returns the window back into new QSO Capture mode. The Cancel button has no effect on the Logbook content.
- The program performs "Dupe" (QSO duplication) checks on-the-fly as the operator is typing in the data (a dupe is a contact with the same call sign/grid/band). In the presence of a dupe, the QSO Capture window background switches to an orange color and the already existing QSO is highlighted in orange color in the QSO list.
- The program performs an on-the-fly check of the call sign and grid square formats. Any character not allowed in the formats is deleted by the program as soon as it is entered by the user. The allowed call sign format is a maximum of 10 letters, digits and the slash ('/') character. The allowed grid square format is two letters followed by two digits (and followed by two letters when a Microwave contest is selected).
- The program converts all characters typed in to UPPERCASE.
- The logbook file gets updated as soon as a new QSO is captured, and after a QSO is edited or erased.

- The bottom of the QSO Capture window displays the distance of the latest logged radio contact, as calculated using the grid square locations. The center of the remote grid square is used as the location point for distance calculation. The best distance accuracy is achieved when logging in 6-character grid squares. For obvious reasons, logging in 4-character grid square QSOs only yields approximate calculated distances. In that case, a tilde "~" sign gets displayed with the distance number.

2.2   QSO List Window

The "QSO List" window is the main program window. It shows a list of all radio contacts that were entered in the logbook. It also offers a series of buttons above and below the QSO list to manage the program features. The "QSO List" window has the following features and behavior.

- The QSO List window banner shows the selected contest description, along with the Logbook file name (file extension removed).
- A newly logged QSO always show up at the top of the list, regardless of the sorting criterion previously invoked. This provides an easy way of locating the new QSO in the list.
- Any QSO can be edited at a later time by executing the following sequence:

  1. Select the QSO to be edited from the QSO list content by clicking on the corresponding line.
  2. Click on the "Edit QSO" button. This sends the QSO data back to the QSO Capture window for editing.
  3. Make the desired changes to the QSO data in the QSO Capture window.
  4. Click on the "Update QSO" button to save the modifications, or click on the "Cancel" button to cancel the changes and return the QSO Capture window to the New QSO Capture mode.

The QSO List window

- The QSO List window will show any duplicate QSOs logged in the list with a red font.

The first QSO of a set of duplicate QSOs is shown in orange font. This provides an easy way to spot duplicates in the QSOs already captured in the logbook.

- The on-the-fly dupe checker will highlight any potential duplicate QSO in the list with an orange color, as the user types in the new QSO data in the QSO Capture window, and even before the new QSO is saved.
- The QSO list can be sorted by date/time (latest first), call sign, grid square, radio mode and radio band using the 5 buttons places just above the QSO list.
- Clicking on a QSO in the QSO list recalls the QSO information back into the QSO Capture window. This allows to quickly save consecutive QSOs with the same station, but on a different grid or band. The Cancel button will clear that QSO data.
- The QSO list font size can be changed in the Setup Window. See a description of that feature in the Setup window section below.

Additionally, various buttons are available at the bottom of the QSO List window.

- The "Statistics" button brings up the logbook statistics window.
- The "Grid Map" button brings up the worked Maidenhead grid square map.
- The "Open Log" button opens an existing contest logbook file (.VHFlog extension).
- The "New Log" button clears the logbook list and allows to create a new logbook file. This does not erase any previously-opened logbook file contents.
- The "Help" button brings up the Help window to display additional information on each function or button.
- The "About" button brings up the splash screen with program and author information. You can click on the splash screen to get rid of it.
- The "Setup" button brings up the Setup window to configure various program settings such as the user's call sign and grid square, the contest and the font size for the QSO List.
- The "Edit QSO" button sends the selected QSO to the QSO Capture window for entry correction.
- The "Delete QSO" erases the selected QSO from the QSO list. A confirmation of this action is requested via a popup window.
- The "Delete All QSOs" erases all the QSOs from the QSO list. A confirmation of this action is requested via a popup window.
- The "Cabrillo File" button produces a Cabrillo-formatted logbook file for submission to the ARRL.

More information on the action produced by these buttons is available below.

2.3 Grid Map Window

The "Grid Map" window displays the worked Maidenhead grid squares (only the first 4-

characters considered) for up to four radio bands using color boxes on a scroll-able world map. The window can also display azimuth lines and distance circles. The Grid Map window has the following features and behavior.

- The world map is available in in x1, x1.5 and x2 zoom levels. The zoom level can be selected via a pull-down list at the bottom of the Grid Map window.
- Depending on the zoom level, up to four colors are available to display the grid squares worked during the contest. For each color, a pull down list is provided to select which amateur radio band to display. A worked grid square will show up as a colored rectangle contained within the grid square.
- Due to grid size constraints, the number of bands that can be displayed is limited to two for the x1 zoom level and to three for the x1.5 zoom level. The x2 zoom level allows for four bands to be displayed.
- Moving the map around is as easy as clicking on the map surface and dragging the map within the window. Alternatively, the map can be moved using the vertical and horizontal scroll bars. Note that the Grid Map window can be resized to the user's preference.
- When the software is launched, the world map is loaded into memory even if the Grid Map window is not shown. Depending on how powerful the user's computer is, and depending on which zoom level is selected, it may take more or less time to load the map. During that time, the program's "splash screen" is shown. That loading delay will re-occur whenever the zoom level is changed.
- The world map projection is "equirectangular", which produces grid squares of identical on-screen size regardless of the latitude. This has the drawback of increasingly distorting the map features as the latitude is increased.

The Grid Map window

- Check mark buttons allow to enable the display of heading lines (15 degree increments) and distance circles (500km increments). This feature is new to version 1.1 .
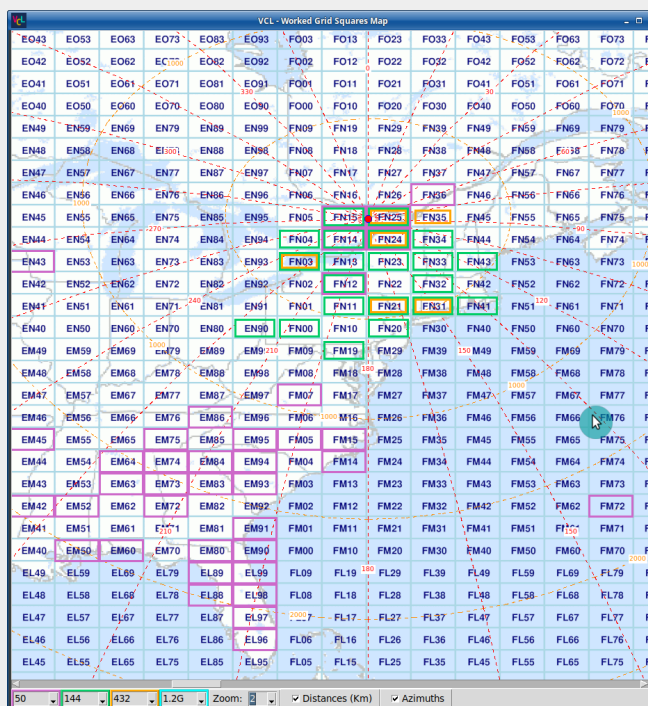
2.4 Statistics Window

The "Statistics" window displays the contest metrics in real time, as new QSOs are added to the list. The software applies the rules of the selected contest for calculating the score. One example is the ARRL January VHF Contest, which awards a higher score to UHF and microwave QSOs). Other examples are the various microwave contests that use different score calculation methods. Note that duplicate QSOs are not included in the final score calculation.

The Statistics window displays the following metrics:

- The number of completed QSOs,
- The number of duplicate QSOs (Dupes),
- The number of worked grid squares,
- The number of worked radio bands,
- The QSO points,
- The multipliers,
- The total distance of the QSOs, applicable to the microwave contests,
- The total distance multiplied by the band factors, applicable to the ARRL 222 MHz and Above Distance contest,
- The total score. This is the metric that counts in the end!

The Statistics Window

Not all of these metrics are used for the score calculation of any one contest. Also remember that in order for the software to calculate an accurate contest score, the right contest must be selected in the Setup window.
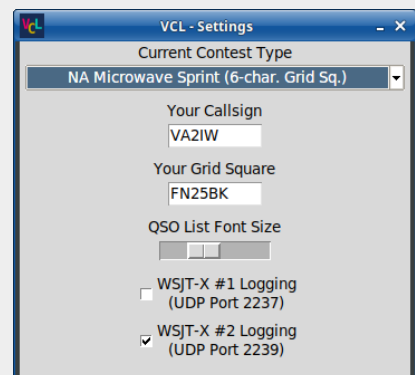
2.5 Setup Window

The "Setup" window allows the user to provide the following information and make settings adjustments:

- A pull-down list is provided to select the current contest, allowing the software software to produce an accurate score calculation and regulate the number of characters in the logged grid squares.
- The user's call sign and grid square (2-letters/2-digits/2-letters format) are filled in in two separate entry boxes. These are used to produce the Cabrillo format file, pin-point the operator location on the Grid Map and make accurate distance calculation for scoring purpose.
- A slider is provided to adjust the QSO list font size to
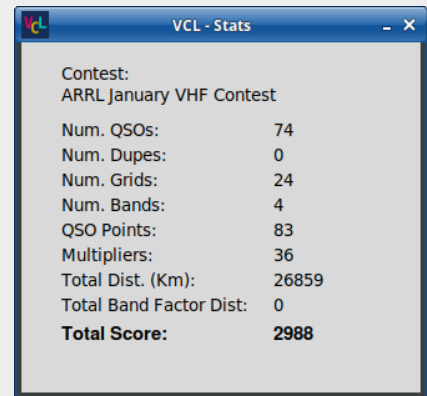
The Setup window

the user's preference.

- Check marks allow to enable/disable reception of the UDP logging packets from up to two separate WSJT-X software sessions through the default UDP ports 2237 and 2239. More details are provided in the Other Features section.

Note that while the Setup window is shown, all other windows are disabled. The user must close the Setup window to return to normal software operation.

2.6 Other Features

- This software offers basic logging integration with the WSJT-X digital mode software. Whenever a QSO is logged within WSJT-X, whether manually or automatically, local UDP packets containing the QSO details are sent. When the WSJT-X logging feature is enabled in this software's Setup window, the packets are decoded by this software, and completed QSOs are added to the QSO List. WSJT-X default local UDP ports 2237 and 2239 can be selectively or simultaneously monitored. This provides logging capture for up to two separate WSJT-X software instances (SO2R situation). Note that only WSJT-X message type 12 (ADIF) packets are used by this software to capture the information. Other message types are disregarded.
- The software saves the logbook as a simple CSV (comma-separated text) ASCII text file .The logbook file can be manually consulted and edited using an ASCII text editor if ever needed. However, the original formatting must be maintained for the software to properly run.
- Before any change is made to the QSO list (and to the logbook file), the software makes a backup copy of the logbook file (the file has a .VHFlog.bak file extension). This becomes the operator's "undo" solution in case of a major error from his part, or a computer system fault. Note that the backup file is overwritten whenever a QSO is added, erased or edited.
- The program generates a Cabrillo format contest results submission file. Within that file, the user merely fills in the header part using any ASCII test editor. Then the file can be electronically submitted to the ARRL. Note that the user's call sign and grid square are required to be filled in in the Setup window prior to generating the Cabrillo file.
- When exiting the software, the most common program settings are saved in a configuration file named "config.sav"). They are retrieved at the next program launch. In other words, quitting and then re-launching the program will bring back the same configuration (loaded contest file, contest selection, QSO list, windows positions and sizes, operator's call sign and grid square, etc.). If for any reason the configuration file gets corrupted, it may cause software errors and misbehavior. When this happens, it is recommended to simply delete the config.sav file, launch the software again and

reconfigure it as if it was the first time that the software is run. This obviously will have no effect on the logbook files' integrity.

3 Prerequisites and Installation

This software is non-invasive:

- Everything happens in the local directory and sub-directories where the python script is located.
- No Windows registry writes are deliberately performed by the software. No Windows environment variables are modified or added.

The ARRL VHF Contest Logger software is contained in a single folder that can be downloaded from GitHub (hyperlink below). Simply decompress the downloaded .zip file to a suitable disk location of your choice.

<div align="center">

[Link to the VCL software .ZIP file](#)

</div>

3.1   Python 3 Installation

Since the software is a Python 3 script, the Python 3 interpreter must be already installed on the computer in order to to run this software. The Python 3 installation procedure differs depending on which operating system the program is executed in.

3.1.1   Windows Systems

If your computer has Windows 10 running, and is up-to-date, the easiest way to install Python 3 (including IDLE) is through the Microsoft store. Select the latest available stable release of Python 3 (3.9 at the time of writing this).

For other Windows versions, or if your Windows 10 system is not up-to-date, the Python 3 interpreter can be installed by downloading the proper Windows installer (select either 32-bit or 64-bit version based on your current Windows installation) from https://www.python.org/downloads/windows/, and by running the downloaded installation executable file.

Everything that is needed to run the VHF Contest Logger software is included with this Python 3 installation. No other 3rd party libraries are required when installing on Windows.

3.1.2   Linux Systems

Python 3
The most recent major Linux distributions include Python 3. To verify its presence, type the following command at the command prompt:

```
$ ls /usr/bin/python*
```
The terminal should display the installed Python version executables:
```
/usr/bin/python      /usr/bin/python3    /usr/bin/python3-config
/usr/bin/python2     /usr/bin/python3.8
/usr/bin/python2.7  /usr/bin/python3.8-config
```
In this example, the systems has both python 2.7 and python 3.8 already installed.

If your Linux distribution does not offer Python 3 pre-installed, you can install it like any major software:

- Using the built-in Linux software installer, Synaptic, or such built-in tool, the Python 3 installation should be easy.
- Alternatively, you can issue the standard installation command that your system supports, examples being:
  `~$ sudo apt-get install python3` for Debian-based distributions (Debian/Ubuntu/Linux Mint, etc.).
  `~$ sudo dnf install python3` for Fedora distributions.
  `~$ sudo yum install python3` for Redhat/RHEL/CentOS distributions.

Tkinter library

The Linux installation of Python 3 will likely not include the TKinter library, which produces the windows and buttons created by the VHF Contest Logger software. If that is the case, you will get the "ImportError: No module named 'tkinter'" error message when trying to run the program. To install Tkinter for Python 3, issue the following command:

`~$ sudo apt-get install python3-tk` for Debian-based distributions (Debian/Ubuntu/Linux Mint, etc.).

`~$ sudo dnf install python3-tk` for Fedora distributions.

`~$ sudo yum install python3-tk` for Redhat/RHEL/CentOS distributions.

3.1.3   MacOS

Although it has not been tested, the software should also run properly on the MacOS once the installation of Python 3 is performed. Like with a Windows installation, the TKinter library is included. Follow the Python 3 installation instructions given here:
https://www.python.org/download/mac/tcltk/

4 Running the VHF Contest Logger software

The best way to launch the software is to invoke it from the command prompt. There are alternatives for launching the software, such as double-clicking on the python script or running it within the Python IDLE environment, but the results are not guaranteed.

4.1　　Windows Systems

Open a Command Prompt window and "cd" (change directory) to the directory where the VHF Contest Logger software is located (where you have unzipped the GitHub file). For example:

```
C:\Users\me> cd \software\QSO_Logger
```

Then launch the program by typing the following command at the prompt:

```
C:\software\QSO_Logger> python3 VHF_Contest_QSO_Logger.py
```

Note that on some Windows installations, the command to launch the program may be different, "py" instead of "python3":

```
C:\software\QSO_Logger> py VHF_Contest_QSO_Logger.py
```

The software was tested in Windows 7 32-bit and Windows 10 64-bit environments.

4.2　　Linux Systems

Open a Command Prompt window and "cd" (change directory) to the directory where the VHF Contest Logger software is located (where you have unzipped the GitHub file). For example:

```
~$ cd software/QSO_Logger
```

Then launch the program by typing the following command at the prompt:

```
~/software/QSO_Logger$ python3 VHF_Contest_QSO_Logger.py
```

Note that on some Windows installations, the command to launch the program may be different, "py" instead of "python3":

```
~/software/QSO_Logger$ py VHF_Contest_QSO_Logger.py
```

The software was tested in Xubuntu 20.04 64-bit and in Lubuntu 18.04 64-bit environments.

5　Legal Notice

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