

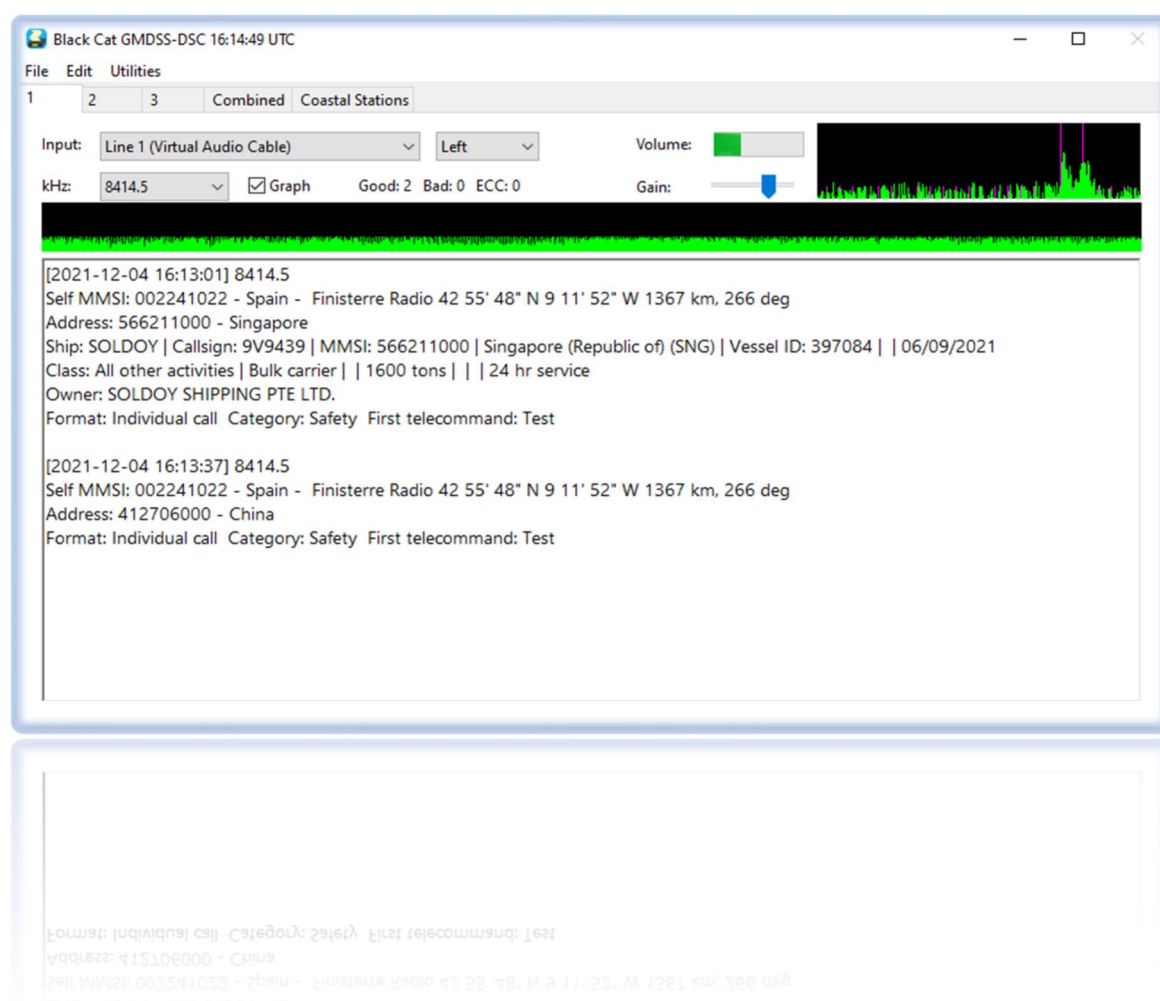


Black Cat GMDSS

Multi-channel GMDSS HF decoder

by Chris Smolinski W3HFU

Guide v0.23 - aligned to release 0.7.4b1 (11 dec'21)



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Introduction

Black Cat GMDSS is a first multi-channel Global Maritime Distress and Safety System (GMDSS) / Digital selective calling (DSC) HF decoder with new concept compared to previous radioamateur decoders that will surely make people talk!

Up to 8 decoders can run at the same time for all GMDSS channels provided by the worldwide system! Dedicated multiple radio Input Source and realtime decoding from WAV audio file with integrated Coastal Stations Windows/Map and MMSI database searching!

Each decoder can be connected to its own audio input source (a virtual audio device, from now on always referred to as VAD, or physical sound input device). Select Settings from the Edit menu to change the number of decoders.

Its working range is HF, and with any receiver, though preferably SDR, it is possible to see it at work with some real signals and with operational suggestions *collected and typographically highlighted in blue italics*.

Requirements: Windows 8/10 or Mac OS X 10.10 to Big Sur

GMDSS frequencies: 2187.5, 4207.5, 6312, 8414.5, 12577, 16804.5 kHz.

Ship to ship calling frequencies: 2177.0, 4208.0, 6312.5, 8415.0, 12577.5, 16805.0, 18898.5, 22374.5, 25208.5 kHz

Ship to shore duplex DSC channels (ship TX - ship RX): 2189.5-2177.0, 4208-4219.5, 6312.5-6331.0, 8415.0-8436.5, 12577.5-12657.0, 16805.0-16903.0, 18898.5-19703.5, 22374.5-22444.0 kHz

These are the transmit center frequencies, if you set the center frequency in Black Cat GMDSS to 2000 Hz, then tune 2 kHz lower... (see examples below)

Windows installation

So let's see how to start using the software starting from the installation.

In fact, since there is NO real installation procedure on Windows, you only need to extract the zipped content into any directory (excluding ONLY the "Program Files")

📁 [..]		<DIR>
📁 [Black Cat GMDSS Libs]		<DIR>
📁 [Black Cat GMDSS Resources]		<DIR>
📄 Black Cat GMDSS	exe	5.321.536
📄 Black Cat GMDSS Docs	rtf	11.414

All you need are these few files and Libs directory (keep them together)...

Same for the uninstallation... to delete the software it is sufficient to delete the directory.



...this is the program icon. That's all!!

Purchase and licensing

You can, and should, fully test this program prior to purchase. Other than some usage time restrictions, it is fully functional. If something “doesn’t seem to work”, or work the way you want it to, in trial mode, it’s probably not going to work differently once you have paid. So be sure to address any issues prior to purchase, as refunds are not available.

Black Cat GMDSS license code is available. A license code will work with the current release version at the time of purchase as well as any updates released over the next year. Use of updates past then will require a renewal of your license code. Of course your license code will continue to work with the previous versions, should you not wish to renew.

Also note that in trial mode without any license code, your usage may also be limited (but again you can restart the program to continue using it).

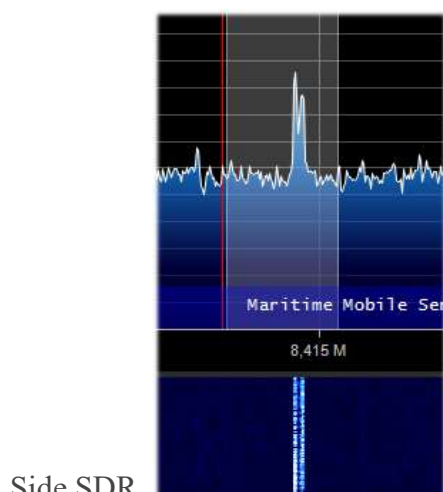
Visit the Black Cat GMDSS program page to purchase your license code, when you are ready:

https://blackcatsystems.com/software/black_cat_gmdss_decoder.html

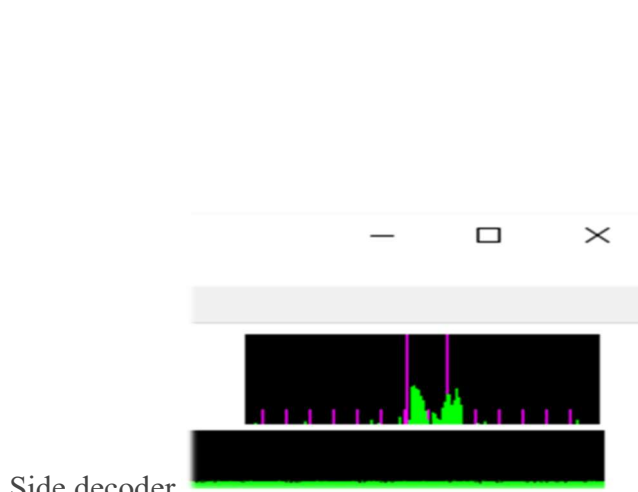
First start-up

The first time Black Cat GMDSS decoder is started, check the following points for this basic operation:

- The program defaults run with one decoder. It's recommended to get some experience in single decoder mode first, before enabling additional decoders.
- Previous pre-installation and configuration of a VAD (Virtual Audio Device). *See dedicated section.*
- Select your sound input device from the popup menu.
For example, if you are using an external analogue receiver it is advisable to use the "Microphone (Realtek High Definition)", whereas if you are using a newer SDR receiver then it is preferable setting a VAD on "Line1 Virtual Audio Cable". In most cases, you can ignore the "Left/Right channel" selection unless your sound input device supports different audio feeds on each channel.
- Tune in a live GMDSS signal (transmissions are in USB) with the correct frequency and tuning. Or perhaps at the beginning, in order not to wait too long on air for a real signal, it might be a good idea to use your own recorded audio sample or WAV file that you can find on the net, for example one of these:
https://www.sigidwiki.com/images/c/cb/Dsc_examples.mp3
- Try adjusting the Gain control.
The gain slider can be used in some cases to adjust the input level, but note that not all sound devices support this capability.
- In the presence of an GMDSS signal, you should start to see activity in the spectrum and volume displays, once you start feeding audio from a radio into that audio channel will show sounds data.
If you don't see activity, troubleshoot your audio connection/settings.



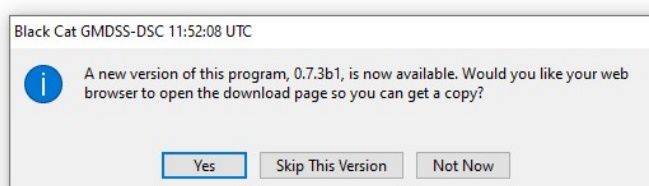
Side SDR



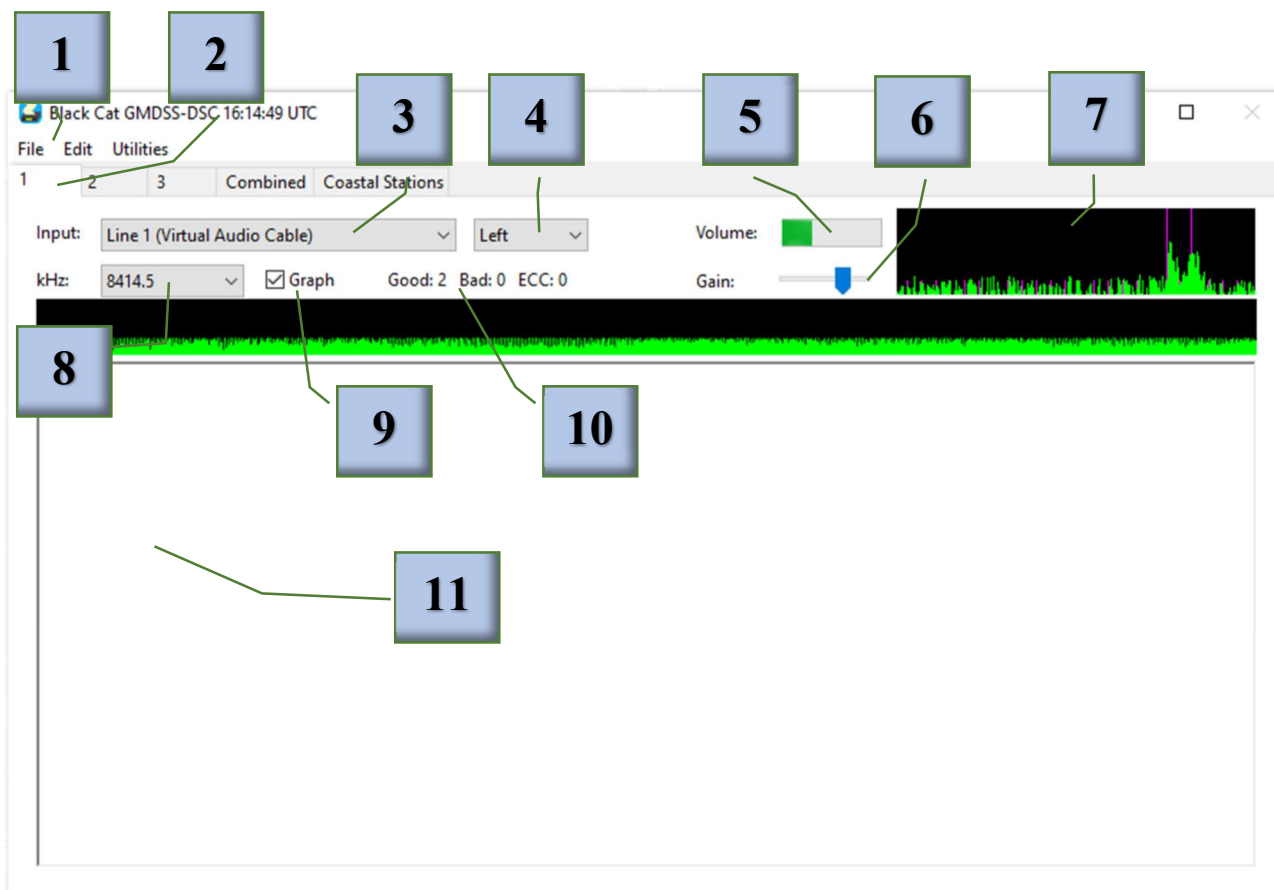
Side decoder

- Set the frequency in the appropriate field to get the correct logs
- At this point the software starts working and displays all decoded traffic.

In addition, at each startup, the presence of a new version of the program is checked, with the possibility of using your web browser to access the download site, skip this version or postpone the activity later.

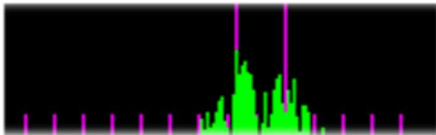



GMDSS user interface overview

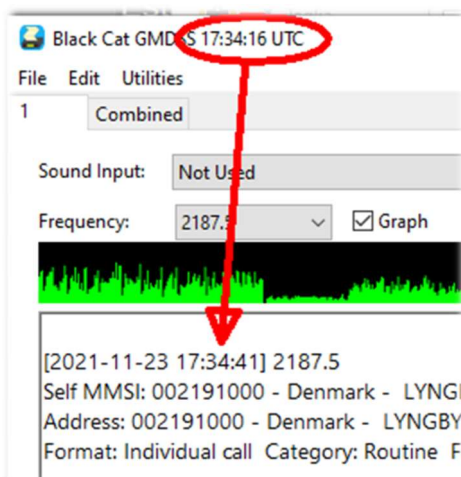


These are the main points in details:

1. **Main Menu: File / Edit / Utilities**
2. **Tab decoder (1/8, Combined, Coastal Stations)**
3. **Sound Input**
4. **Channel sound input**
5. **Volume (input audio level)**
6. **Gain (input audio gain)**
7. **Audio Spectrum displays**
8. **Frequency presets (in kHz)**
9. **Graph signal display**
10. **Statistics counter**
11. **Windows received text**

Key	Action
1. Main Menu	File / Edit / Utilities (<i>see dedicated section</i>)
2. Tab decoder	<p>Up to 8 decoders can run at the same time.</p> <p>Each decoder can be connected to its own audio input source (a Virtual Audio Device or physical sound input device). The program defaults to one decoder. Select Settings from the Edit menu to change the number of decoders. Each decoder appears in its own tab in the main window.</p> <p>There is also a tab labeled “Combined” on the far right, this displays the text from all decoders in one more easy to read display.</p> <p>The tab “Coastal Stations” brings up a window with a list of all coastal stations that messages have been received from, and a count of the number of messages for each frequency. Double clicking on a count will bring up another window with timestamps for each message. To reduce clutter, message counts for the seldom used frequencies of 2177 and 2189.5 kHz are not displayed.</p> <p><i>Restart of the program is necessary after a change.</i></p>
3. Sound Input	The device (physical or VAD) to use, along with which sound channel (left or right) to use. The latter can sometimes be used to double the effective number of VADs on your system, if your SDR or other software can feed audio to just a single channel, vs stereo.
5. Volume	The volume bar from audio input.
6. Gain	The gain setting for the audio input. <i>Not all devices support changing the gain, so it may do nothing on your setup.</i>
7. Audio Spectrum Displays	<p>Audio spectrum displays for diagnostic and tuning purposes.</p> <p><i>Very helpful for tuning!</i></p> 
8. Frequency presets	Eight presets frequencies: 2177, 2187.5, 2189.5, 4207.5, 6312, 8414.5, 12577 and 16804.5 kHz
9. Graph	<p>Enables/disables the graphical audio signal display.</p>  <p><i>You can turn this off to use a little less CPU time, as well as gain a little more decode text space.</i></p>
10. Statistics counter	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>Good: 6 Bad: 1 ECC: 0</p> </div> <p>Received messages statistic: for each decoder is displayed, as well as the total for all decoders on the Combined tab:</p> <p>Good - The number of valid decoded transmissions.</p> <p>Bad - Transmissions with unrecoverable errors. They will not be displayed.</p> <p>ECC - Transmissions with an ECC error. If Print Decodes With Bad ECC is selected in Setup, these will be displayed.</p>

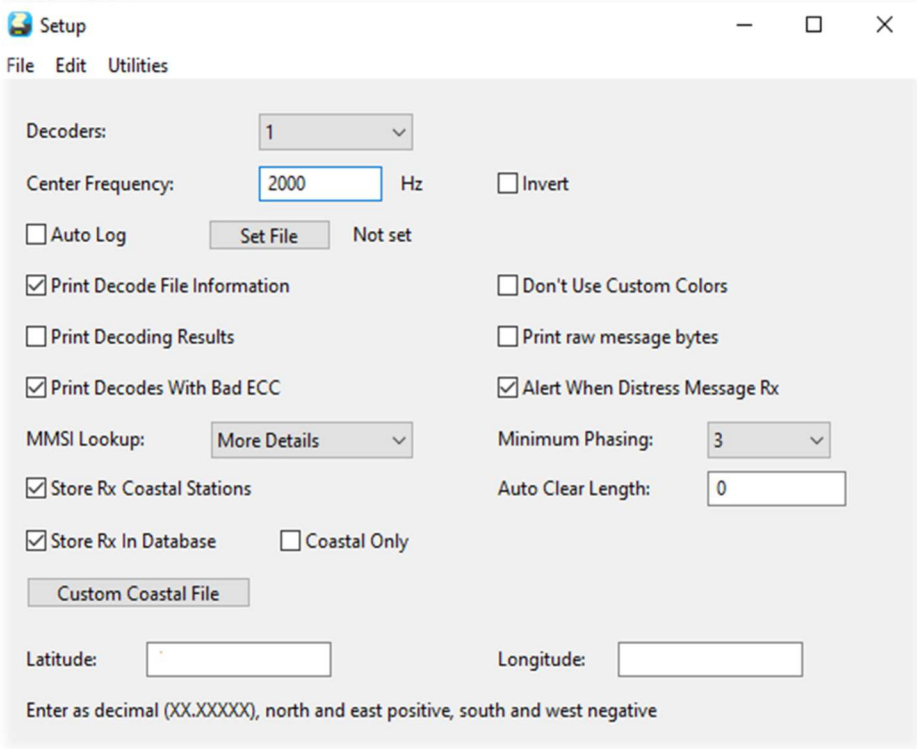
	<p><i>(Error-Check Character - is the final character transmitted and it serves to check the entire sequence for the presence of errors which are undetected by the ten-unit error-detecting code and the time diversity employed).</i></p> <p>If you click on the statistics, it will be copied to the clipboard so you can paste it into another program.</p>
<p>11. Windows received text</p>	<ul style="list-style-type: none"> Each line of a fully parsed message contains the following informations: [Date & Time] (in UTC). <i>A very useful clock in the top left corner allows you to automatically create listening logs with the exact UTC real time...</i> Frequency GMDSS messages and routines with various selectable levels of details in “MMSI Lookup” options If you select an MMSI number in the decode text (<i>with by double clicking</i>) then right click on it, you can do a Google web search for that MMSI number, which often turns up pictures of the ship, tracking information, etc. <p><i>With right click in the decoded text area to Select all the text, Copy text, or Clear the text.</i></p>



Menu File

Key	Action
Decode Audio File...	<p>Interesting possibility to use one's own previous recordings or audio samples found on the net. It is also possible to load several files simultaneously for subsequent sequential decoding.</p> <p><i>Depending on the power of your PC, audio files are decoded in a fraction of the original time. See also the specific section “Decoding from audio file”.</i></p> <p><i>(See the dedicated chapter below)</i></p>
Abort Decoding File / All File	Stops the decoding of one or all audio files.
Start Logging...	Enables logging to file by asking for name and directory.
Stop Logging	Stop recording the Log.
Exit	Closes and exit the programme. <i>At the moment the X button (top right) is still not working...</i>

Menu Edit

Key	Action
Settings...	 <p>Decoders From 1 to 8: each decoder appears in its own tab in the main window. There is also a tab "Combined" on the far right, this displays the text from all decoders in one easy to read display. Restart of the program is necessary after a change.</p> <p>Center Frequency (Hz) From the previous transmit center frequencies, if you set the center frequency in Black Cat GMDSS to 2000 Hz, then tune 2 kHz lower. You can use other offsets as well, from 500 to 4000 Hz. <i>For example, if you want to decode 8414.5 kHz GMDSS and set this to 2000 Hz (2 kHz) then tune in USB mode 2 kHz lower at 8412.5 in USB.</i></p> <p>Invert Check this box if receiving in LSB mode.</p> <p>Auto Log (Set File) Check this box and set the log file, and it will automatically be opened for logging each time you launch the program.</p> <p>Print Decode File Information When decoding from an audio file, the file name is added to the decode window.</p>

NOTE: You must close this window after making changes, for those changes to take effect!

Don't Use Custom Colors

Uses default colors, even if you have selected custom colors.

Print Decoding Results

Prints diagnostics information if messages with bad symbols or a bad ECC are decoded.

Print raw message bytes

The raw symbol values are also displayed.

Print Decodes With Bad ECC

These messages are displayed.

Alert When Distress Message Rx

Plays a "red alert" style sound effect when distress related messages are received.

MMSI Lookup

Polls the ITU website for information about the ship based on the MMSI. Four levels of information can be displayed.

Note it is always possible the ITU website could go down, or they could change/restrict how this information is displayed, SO THIS FEATURE IS NOT GUARANTEED TO WORK.

Also note that it can take several seconds for the information to be downloaded, which will delay display of messages.

Also note that if your internet connection (or the ITU website) is down, then no messages will be displayed.

So if reliability is your main concern, then don't use this feature.

Minimum Phasing

Number of phasing characters required to start decoding. This is currently for experimental purposes.

Auto Clear Length

If set to a non zero value, decode windows will be cleared when this length is exceeded. This can help prevent sluggish performance if they contain too many characters.

Store Rx Coastal Stations

Store timestamps from received transmissions by coastal stations, which can then be viewed in the GMDSS Coastal Stations Received window.

Store Rx In Database

Store all received messages in a database, which can be searched. Also an option to only store messages from "Coastal Only" stations.

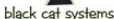
Custom Coastal File

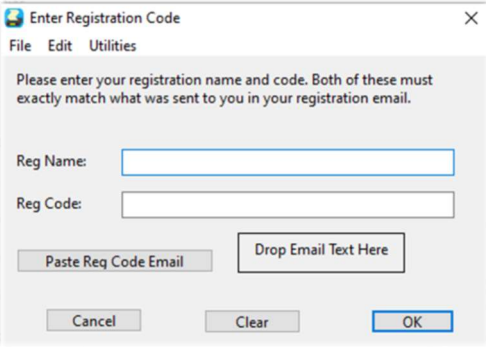
Select a text file using this button, which contains information about coastal stations that will over-ride the build in data.

Each line of the PLAIN ASCII TEXT FILE contains:

MMSI, latitude, longitude, and station name/other info

Each line MUST BE IN EXACTLY IN THE FOLLOWING FORMAT OR IT WILL NOT WORK.



	<p>Note there is one space between fields, and the use of the single quote between the lat/lon minutes value and sign, which is a single character E/W or N/S.</p> <pre> 1 MMSI Lat Lon Station name and other information follows 2 nnnnnnnn nn nn'c nn nn'c ccccccccccccccccccccccccccccccccccccccc 3 4 Example: 5 002240992 43 21'N 008 27'W Coruna MRSC Coruna 6 7 </pre> <p>Latitude/Longitude</p> <p>Set your location, and the location of many Coastal Stations will be displayed, along with the distance and bearing. Please set as a DECIMAL value, not degrees/minutes/seconds!</p> <p>These fields use localized text, so if you are in Europe you likely will need to use a comma as the decimal separator, vs in the USA where you will want to use a period.</p>
Enter Registration Code...	<p>After the trial period it is necessary to register the software.</p>  <p><i>Prior to registration, a reminder of the trial version will appear when the programme is started.</i></p> <p>Obtained the license, enter the data in this panel. In case of doubt clear out the “Reg Name” and “Reg Code” text fields completely (use the “Clear” button) and re-enter the information. If it still is not accepting the code, then there is still bad information in one field or the other.</p>
About Black Cat GMDSS	Displays the software release and allows to visit the website to check for updates.
Cut / Copy / Paste / Delete	Allows you to perform the indicated operations on the decoded text windows.
Select All	Selects all decoded text for processing with Cut / Copy / Paste / Delete.
Clear Decodes	Cleans the current decoded screen (but not the Combined).
Clear All Decodes	Cleans all decoders.
Clear DSP Internals	<p>This is used to "reset" the decoding machine in the software.</p> <p><i>Think of it somewhat like quitting and restarting the program...</i></p>

Reset Statistics	Reset the Statistics counter
Delete This Log	
Lock Controls	Blocks unintended changes to “Input”, “Volume”, “kHz”, “Graph” and “Gain” fields
Set Text Font, Size, Color...	Change text size, font type and colour.
Set Text Background Color...	Change the background colour of decoder windows.
Auto Scroll Messages Windows	The text in the decoding window will automatically scroll upwards...
Highlight Coastal Stations	<p>You can also select a highlight color, and the words that will trigger displaying a message in this color.</p> <p>This can be helpful to quickly find interesting messages, such as those distress related.</p> <p>You can also highlight messages from Coastal Stations.</p> <p>Again, you can select the color used.</p>
Set Coastal Station Color...	
Highlight Text	
Set Text Highlight Color...	
Highlighting Words...	<p>Right click to add a row, and change the text in this row to the word you wish to trigger highlighting.</p> <p>Repeat for additional words. Then close this window for the word list to be put into effect.</p>
Set Graph Color...	Change the colour of the Graph waveform.
Set Graph Background Color...	Change the background colour of Graph.
Map Zoom in / out	Increase or decrease the display of the Map.
Clear Coastal Stations Map	
Auto Position Map	
Set Coastal Map Text Font / Size	

Menu Utilities

Key	Action
Export Database Search Results as CSV...	Lets you export your logging database search results as a CSV file.
Export Database Search Results DscList...	Lets you export your logging database search results as a DscList file suitable for posting to dsc-list on IO Groups.
Export Database as CSV...	Lets you export your entire logging database as a CSV file.
Delete Database...	
Coastal Stations Window See screenshot (1)	Brings up a window with a list of all coastal stations that messages have been received from, and a count of the number of messages for each frequency. Double clicking on a count will bring up another window with timestamps for each message. To reduce clutter, message counts for the seldom used frequencies of 2177 and 2189.5 kHz are not displayed.
Coastal Stations Map See screenshot (2)	Coastal stations that messages have been received from will be plotted on the map, along with the number of decodes. The most recent station will be displayed in red so as to be more obvious. All stations/decodes in the Coastal Stations Window will be displayed. You can pan around the map by clicking the mouse button and moving it. Double click on a station to bring up a list of timestamps of all the decodes. Right click to decrease/increase the contrast of the map lines, which can help with text readability. This window is under development, and additional ability to select what is displayed may be added over time.
Search Loggings Database...	Brings up a window that currently shows all received messages. Columns can be sorted by clicking on them, and column widths can be changed. Double clicking on an entry will bring up another window with a complete message. Eventually this database will be searchable (see below dedicated chapter).
Frequency and Time Statistics Window	Displays the number of decodes per hour, per frequency, using logs in the database. Right click to toggle between displaying statistics for all decodes, and only those from coastal stations. This window continuously counts loggings in the database, and can use significant CPU time, so only leave open when necessary.
Extract Raw Symbols...	Takes a logging file and writes out a new file with just the raw symbols.
Sort Raw Symbols...	Sorts a raw symbols file by message format, category, etc.
Diagnostics Windows	For internal testing purposes. If something odd happens, this window may provide some clues. It also has a checkbox that will cause a "debugging" file to be created and continuously updated, to maybe help determine the cause if the program were to crash.



This file will be written to the Documents directory for your user account. The filename is of the form BC-GMDSS-StatusLog-YYYY-M-DD-HH.txt (local time) for example: BC-GMDSS-StatusLog-2021-11-28-13.txt.

The file can grow large, hence a new one written each hour. You can manually delete old ones every so often. If a crash does happen, you can send me the last few dozen lines of the file, I don't think I will need the whole file.

Each one hour file here is about 15 MB long.

(1) Coastal Stations Windows

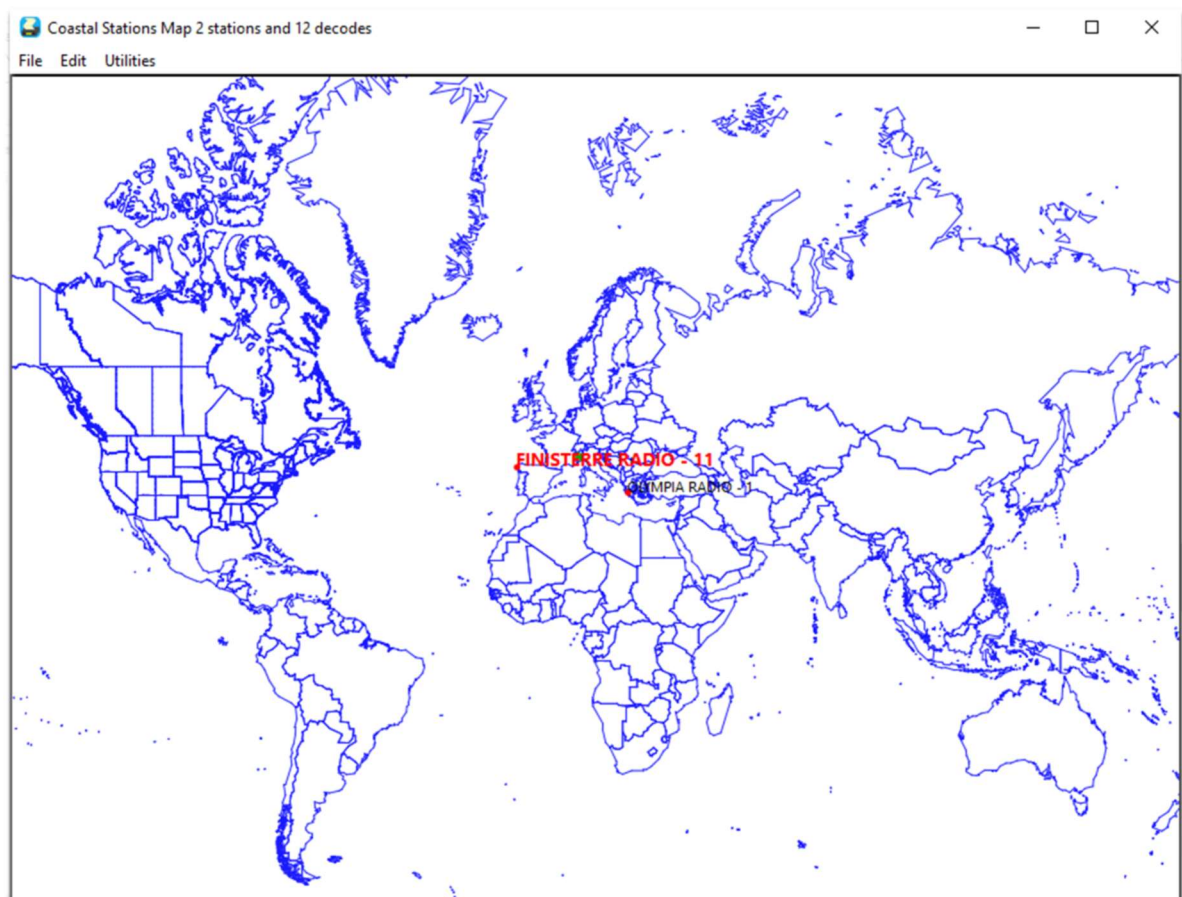
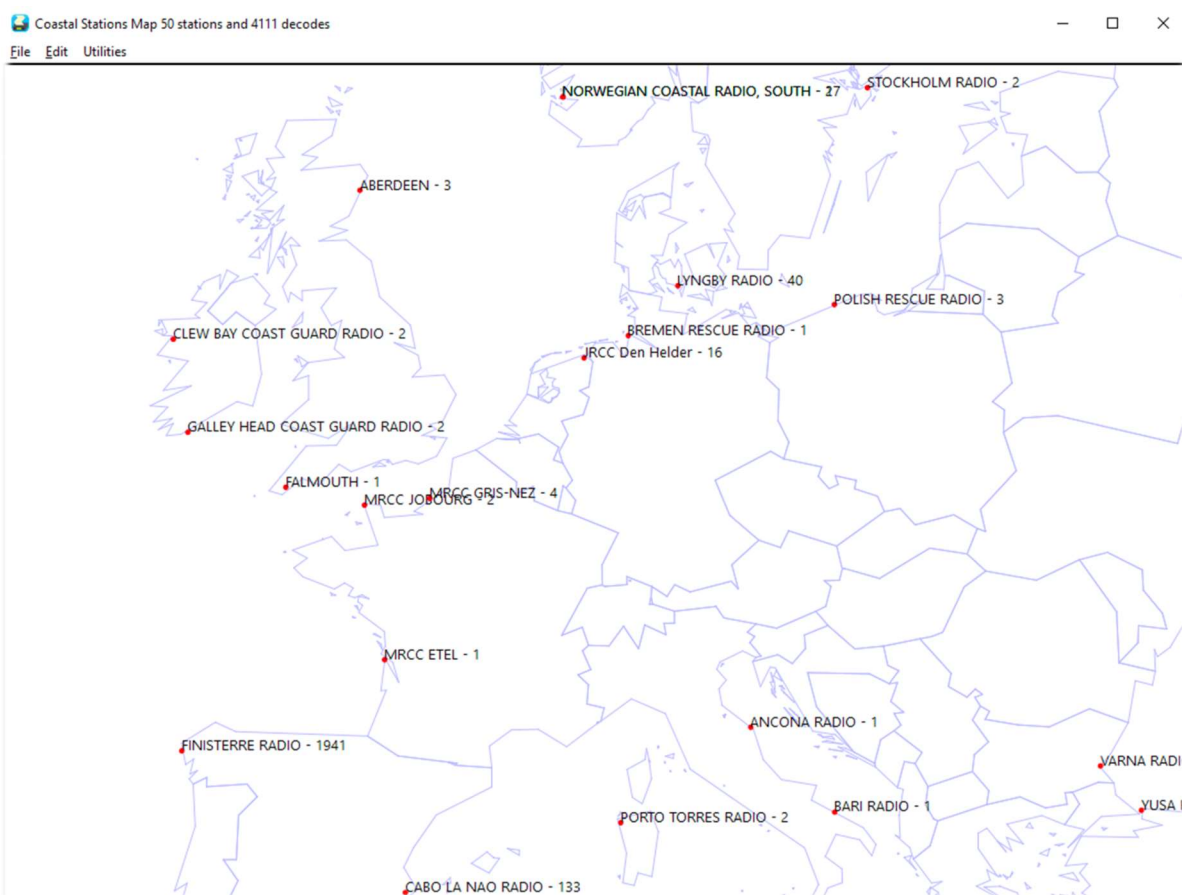
GMDSS Coastal Stations Received											
Station	Country	MMSI	2177	2187.5	2189.5	4207.5	6312	8414.5	12577	16804.5	Total
FINISTERRE RADIO	Spain	002241022	0	0	0	0	0	9	0	0	9
OLYMPIA RADIO	Greece	002371000	0	0	0	0	0	1	0	0	1
			First	Last		Location					
			2021-11-28 10:42:46	2021-11-28 11:09:27		42 55' 48" N 9 11' 52" E					
			2021-11-28 11:06:02	2021-11-28 11:06:02		37 36' 0" N 21 29' 10" E					

Black Cat GMDSS 11:09:39 UTC											
Station	Country	MMSI	2177	2187.5	2189.5	4207.5	6312	8414.5	12577	16804.5	Total
FINISTERRE RADIO	Spain	002241022	0	0	0	0	0	9	0	0	9
OLYMPIA RADIO	Greece	002371000	0	0	0	0	0	1	0	0	1
			First	Last		Location					
			2021-11-28 10:42:46	2021-11-28 11:09:27		42 55' 48" N 9 11' 52" E					
			2021-11-28 11:06:02	2021-11-28 11:06:02		37 36' 0" N 21 29' 10" E					

[2021-11-28 10:42:46] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 10:43:07] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 10:43:30] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 10:44:57] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 11:02:40] 8414.5	000846000			
[2021-11-28 11:06:02] 8414.5	002371000	Greece	OLYMPIA RADIO	37 36' 0" N 21 29' 10" E 1417 km, 121 deg
[2021-11-28 11:06:29] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 11:07:00] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 11:08:40] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 11:09:07] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg
[2021-11-28 11:09:27] 8414.5	002241022	Spain	FINISTERRE RADIO	42 55' 48" N 9 11' 52" W 1367 km, 266 deg

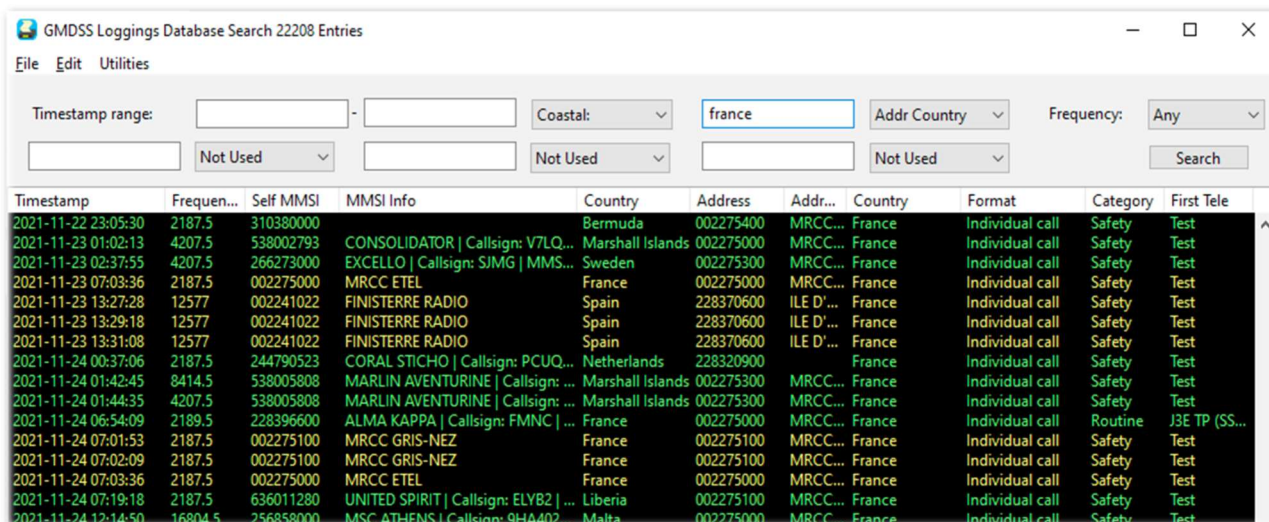
GMDSS Coastal Stations Received											
Station	Country	MMSI	2177	2187.5	2189.5	4207.5	6312	8414.5	12577	16804.5	Total
FINISTERRE RADIO	Spain	002241022	0	45	0	167	0	987	742	0	1941
YUSA RADIO	Turkey	002711000	0	6	0	25	20	35	39	43	168
OLYMPIA RADIO	Greece	002371000	0	0	0	37	72	118	0	111	338
RCC BOSTON	United States	003669991	0	0	0	173	2	4	0	4	183
ISALUT COAST GUARD RADIO	Canada	003160023	0	0	0	25	38	50	91	71	275
JRCC AUSTRALIA	Australia	005030001	0	0	0	0	3	177	47	0	227
USCG Portsmouth/CAMSANT (NMN)	United States	003669995	0	0	0	139	1	2	1	1	144
CAPE TOWN RADIO	South Africa	006010001	0	0	0	0	0	51	44	23	118
CABO LA NAO RADIO	Spain	002241024	0	35	0	27	0	51	20	0	133
NORWEGIAN COASTAL RADIO, SOUTH	Norway	002570000	1	9	0	0	3	4	0	0	17
JRCC Den Helder Netherland CG Radio	Netherlands	002442000	0	16	0	0	0	0	0	0	16
CYPRUS RADIO	Cyprus	002091000	0	0	0	0	0	10	0	0	10
BANGKOK RADIO	Thailand	005671000	0	0	0	0	1	3	0	0	4
TARIFA RADIO	Spain	002241026	0	55	0	40	0	113	35	0	243
VALPARAISO PLAYA ANCHA RADIO	Chile	007251860	0	0	0	3	10	28	7	0	48
MRCR JOBOURG	France	002275200	0	2	0	0	0	0	0	0	2
GALLEY HEAD COAST GUARD RADIO	Ireland	002500200	10	2	0	0	0	0	0	0	12
MRCR GRIS-NEZ	France	002275100	0	4	0	0	0	0	0	0	4
LYNGBY RADIO	Denmark	002191000	0	40	0	0	0	0	0	0	40
SAN FRANCISCO	United States	003669990	0	0	0	44	4	0	0	2	50
CLEW BAY COAST GUARD RADIO	Ireland	002500100	0	2	0	0	0	0	0	0	2
AASIAAT RADIO	Greenland	003313000	0	12	0	0	0	0	0	0	12
RCC MIAMI	United States	003669997	0	0	0	9	10	7	1	8	35
MAR DEL PLATA PREFECTURA NAVAL	Argentina	007010003	0	0	0	0	0	6	4	1	11
MRCR Bodoe	Norway	002570700	0	0	0	0	4	2	0	0	6
USCG New Orleans (NMG)	United States	003669998	0	0	0	4	6	1	0	2	13
KODIAK RADIO	United States	003669899	0	0	0	6	3	0	3	4	16
GUANGZHOU RADIO	China	004123100	0	0	0	0	0	2	0	0	2
MAURITIUS RADIO	Mauritius	006452700	0	0	0	0	3	0	0	0	3
RCC Bermuda Harbour	Bermuda	003100001	0	2	0	0	0	0	0	0	2
RCC London Maritime	New Zealand	005120010	0	0	0	0	0	3	1	0	4

(2) Coastal Stations Maps



Database Searching

All your database of received loggings can be searched. Open the window by selecting UTILITIES / SEARCH LOGGINS DATABASE... You can search by several parameters:



The screenshot shows the 'GMDSS Loggings Database Search 22208 Entries' window. It has a menu bar with 'File', 'Edit', and 'Utilities'. Below the menu bar are search filters: 'Timestamp range:' with two input fields, 'Coastal:' with a dropdown menu, 'Addr Country' with a dropdown menu, and 'Frequency:' with a dropdown menu. There are also 'Not Used' buttons and a 'Search' button. Below the filters is a table with columns: Timestamp, Frequen..., Self MMSI, MMSI Info, Country, Address, Addr..., Country, Format, Category, and First Tele. The table contains 20 rows of data, including loggings from Bermuda, Marshall Islands, Sweden, France, Spain, Netherlands, and Liberia.

Enter just one timestamp in the first field, and loggings starting with that timestamp will be displayed.

Enter just one timestamp in the second field, and loggings up to that timestamp will be displayed.

Enter a timestamp in both fields, and loggings between those two values, inclusive, will be displayed.

Next, a description of the timestamp format. The format must be understood and used correctly to be able to properly search via timestamp.

Timestamps are of the form: which allows easy comparisons as the first field, year, is the most significant, and the last field, seconds is the least. You can enter as much of a timestamp as you wish, but unentered fields will be treated as zeros. This can affect your search results in seemingly odd ways, if used incorrectly.

For example, a search parameter timestamp of 2021-09-13 has an implied time value (HH:MM:SS) of 00:00:00. This means that if you search for the range of say 2021-09-13 to 2021-09-13 (this same value in both fields) you would actually be searching for timestamps in the range 2021-09-13 00:00:00 to 2021-09-13 00:00:00, and probably get zero results. Instead, if you want to search for just loggings on one date, the second field should either have an hour value of 24, ie: "2021-09-13 24" or a date value of "2021-09-14", which gets interpreted as "2021-09-14 00:00:00". This also needs to be kept in mind when using a timestamp in just one search field.

The popup menu to the right of the second timestamp field, which defaults to "Coastal:" can be used to search for just loggings FROM or TO coastal stations. In its default setting, it has no effect.

Set to "To Coastal" it will select only those decodes sent to a coastal station.

Set to "From Coastal" it will select only those decodes transmitted by a coastal station.



Set to "Coastal Freq" it will select only those decodes transmitted by a coastal station, and limited to one decode for a given frequency. For example if there are 30 decodes for a given coastal station over 4 frequencies, only 4 decodes will be displayed, one for each frequency. No additional control over which are selected for display is available.

Set to "Coastal Unique" it will display just one decode transmitted by a given coastal station, randomly selected from all the decodes and frequencies. This can be useful for seeing which stations have produced at least one decode.

To the right of this popup menu is a text field and a popup menu. This pair can be used to search for text in any of several message fields. On the next line down are three more sets of these, which can also be used, to further narrow down results. Text values are case insensitive.

Next there is the frequency menu, which can be used to restrict results to just one frequency. Left in its initial setting, it will not be applied.

One tip: If you think you're not getting the search results you should, double check that you do not have one or more overly restrictive search parameter settings in use. Also, while some parameters can be used together, some don't play well together and can cause unpredictable results. Experiment with the least restrictive search parameters at first, then apply others as needed to further narrow down the results.

Keep in mind that as your database of loggings grows, searches may take longer, especially if many results are returned, so exercise some caution with search parameters so as to not return too many results.

There are three options under the Utilities menu for saving database results. Results can be exported to a CSV (Comma Separated Values) file, as can the entire database.

There is also an option to save in a format suitable for posting to the dsc-list mailing list. In general, the best way to use this feature for posting your logs is to select a timestamp range reflecting your listening period of interest, then from the "Coastal:" popup menu select "Coastal Freq", perform your search, then save the results.

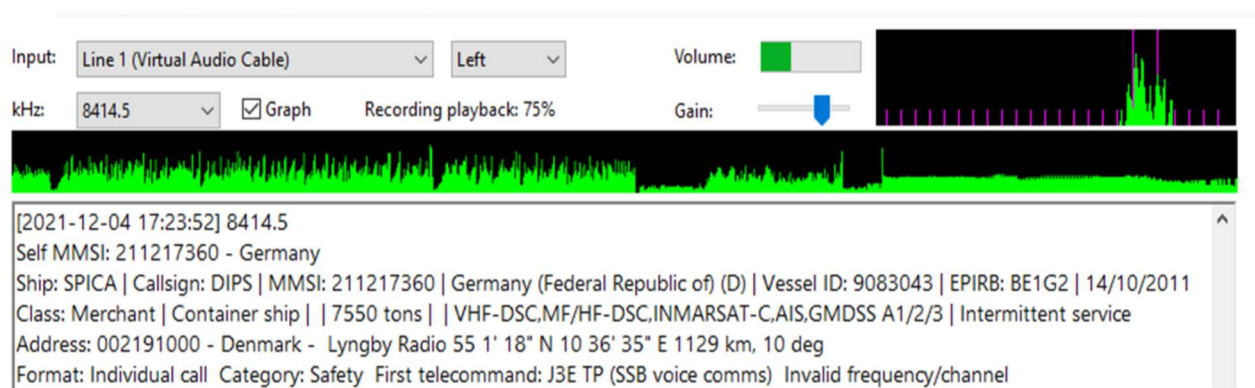
Decoding from audio file

One of the special features of the decoder is that it can decode directly from a WAV audio file (*Remember: not MP3 or other format, although these can be read by external software and decoded via VAD*).

Simply go to one of the decoders and select from the menu FILE / DECODE AUDIO FILE.

Multiple files can be selected, they will decode one after another. Don't change the decoder tab while files are decoding.

Decoding of WAV files is much faster than real time decoding, limited by the speed of your computer, often 10x real time processing.



During playback WAV audio file, you will see active the Audio Spectrum Displays (top right), the Graph bar (if activated) and the Recording playback percentage...

If your WAV file has been recorded with a different offset just remember to slightly correct +/- the Hz frequency in EDIT / SETTINGS / CENTER FREQUENCY

Internally, sound is processed at a 44.1 kHz rate, monophonic, 16 bits.

If the sound file is different from this, it will be converted internally to this format. As this takes some time, the fastest processing will occur if the sound file is already in this format.

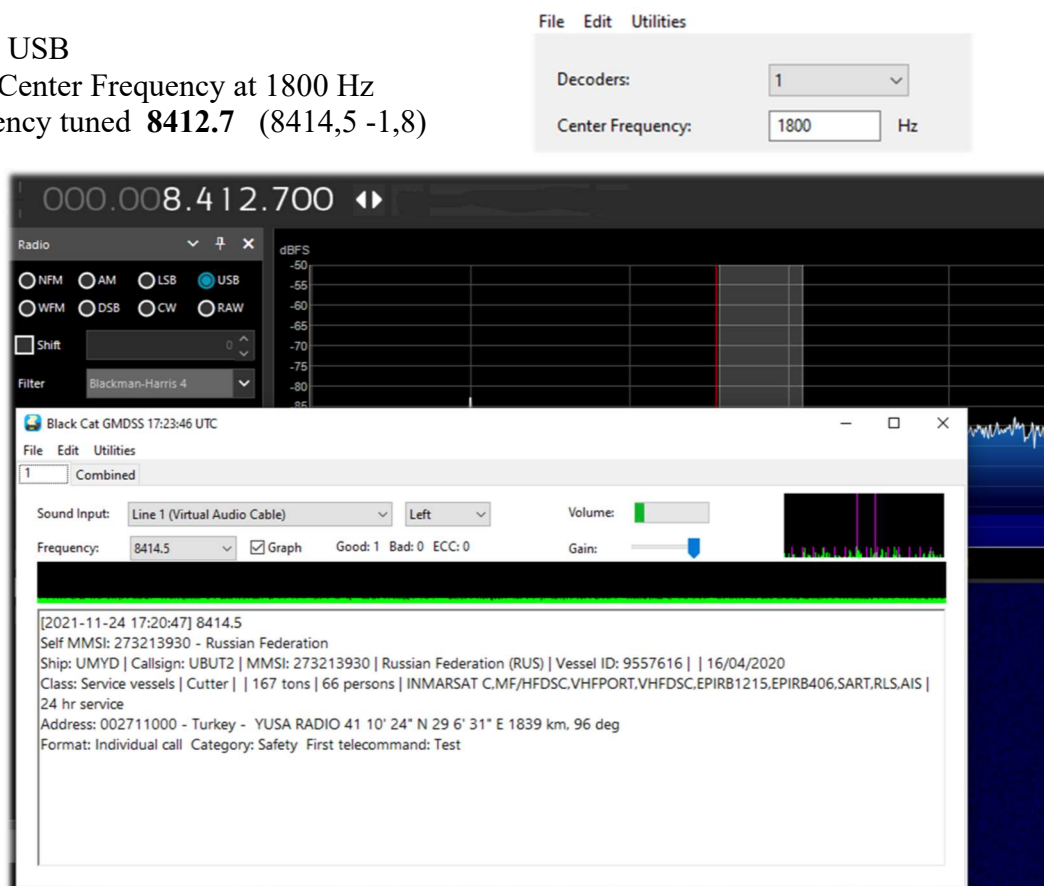
Let's see some examples...

Single channel AIRSPY HF+ Discovery

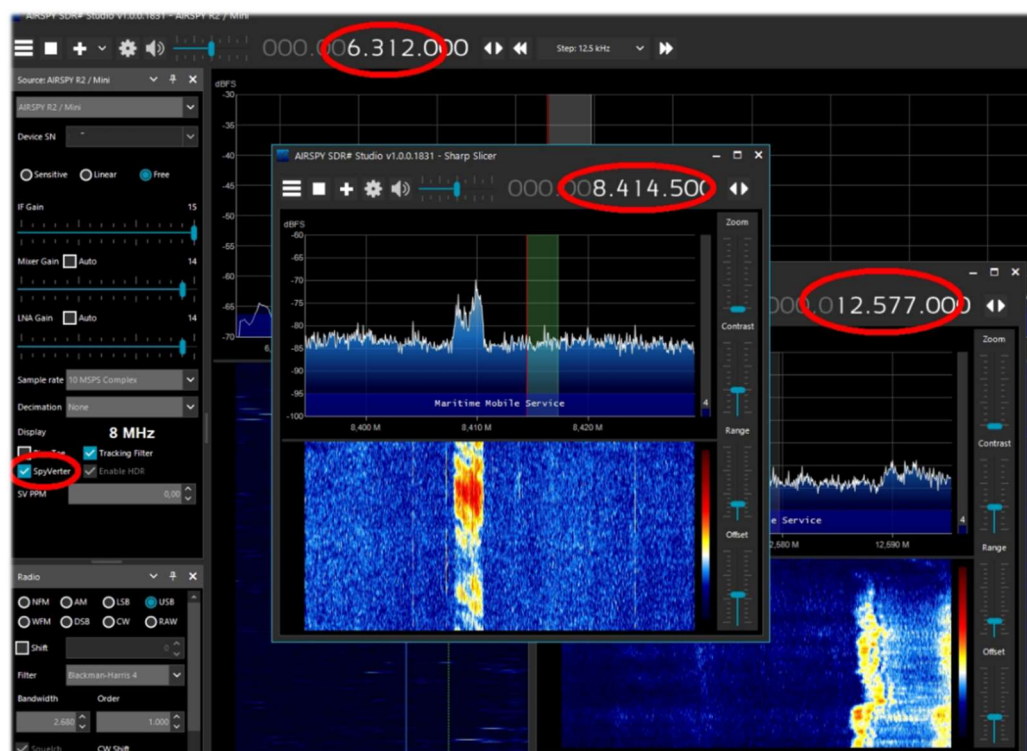
Mode USB

If use Center Frequency at 1800 Hz

Frequency tuned **8412.7** (8414,5 -1,8)



Multi channel VFO with AIRSPY R2 and SpyVerter option



Software integration

The SDRs or receivers can be different, each with its own specific characteristics but some are more performing than others for the number of receivers that can be added. But for all of them is essential the use of VAD or Virtual Audio Devices with which to bring the audio of the various receivers to the different channel decoders of the software.

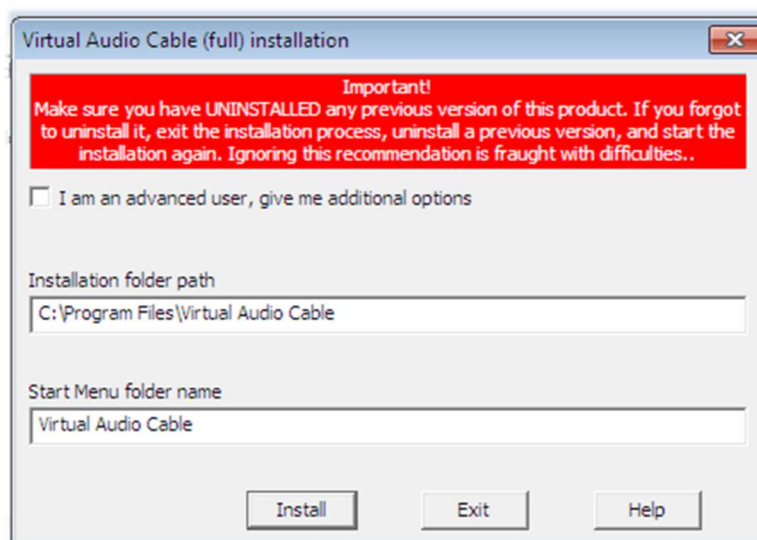
VADs are programs that create virtual cables between the audio output of the computer and the audio input of the same: in this way you can perform any operation (record / playback / mixing) with the highest possible quality and especially without external cables and physical sound card on your computer!

Their use is easy and the proposed automatic configurations should go well right away, however the first few times of use it is good to take some care to remember to select/deselect it when we are done as the default audio device.

For this purpose there are different software with different names and features:

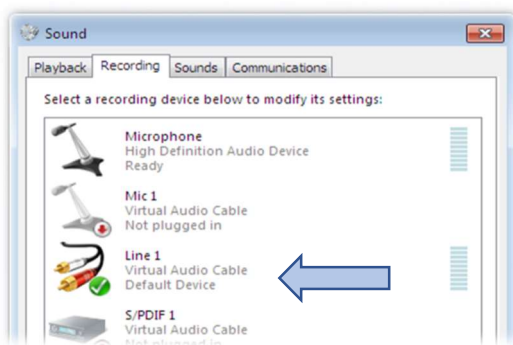
WINDOWS	macOS
VAC – Virtual Audio Cable	BlackHole
VAS – Virtual Audio Streaming	Ground Control
VB-Cable	Soundflower
VSC – Virtual Sound Card	VB-Audio CABLE - They also offer other versions, for additional audio connections: VB-Audio CABLE A & B VB-Audio CABLE C & D

One of the best known and popular is the VAC by Eugene Muzychenko and on this I will dwell with some indications, but before using the ALE decoder it is necessary to install with the default options...

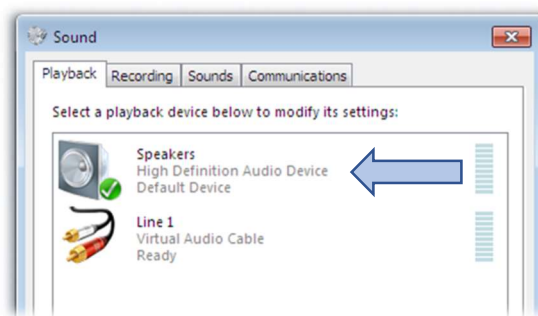


As indicated, a new pair of audio devices is created in Windows with the name "Mic 1 Virtual Audio Cable" and "Line 1 Virtual Audio Cable", which should be set in Device Default as in the example...

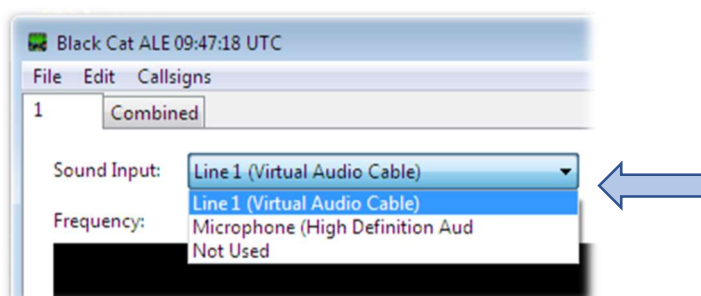
RECORDING panel



PLAYBACK panel

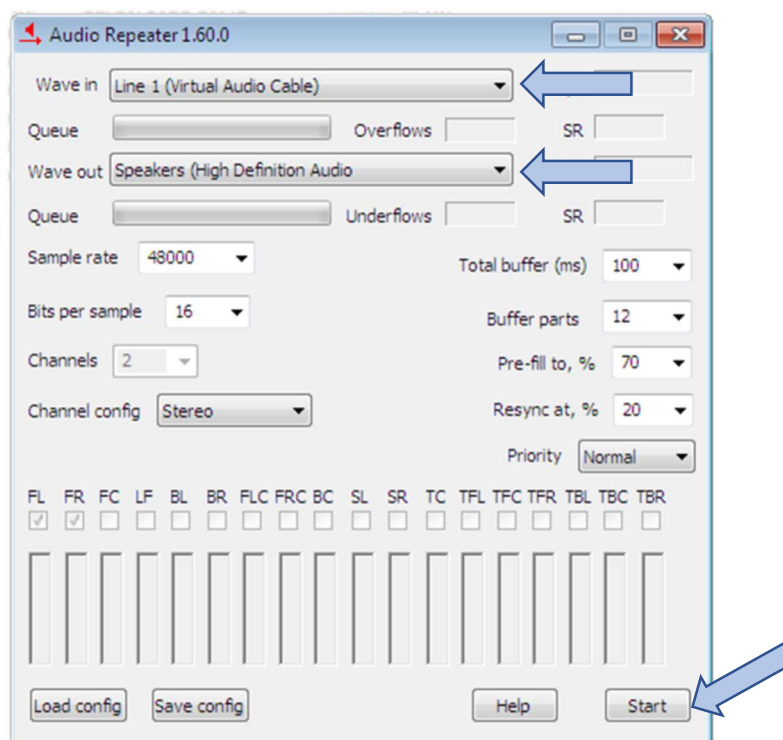


Now starting the Black Cat ALE we will have the new device available in "Sound Input".



Everything is ready!

*However, we must remember that now the audio transits internally and if you want to listen to the HF audio in speaker you must use the internal additional tool (in the directory of VAC) named **audiorepeater.exe** and configure it as indicated...*



Things to know...

- Depending on the number of decoders enabled and the decoding settings, the program can be extremely CPU intensive! To the point of effectively making your computer non functional. Start with one decoder with a selected sound input device when changing the other settings, especially the integration step, then enable additional decoders one by one, by selecting a sound input device, while watching the CPU usage in the Task Manager (Windows) or Activity Monitor (macOS).
- Sound issues. If you don't see any sound devices, quit and run again.
- Quit all open instances of the program and make sure you are only running one copy. *Always quit by using Exit from the File menu.*
- The program does not use the registry. There is no need to edit it or uninstall/reinstall. Just run the latest version when available.
- Clear out the name and code text fields completely (use the Clear button) and re-enter the information. If it still is not accepting the code, then there is still bad information in one field or the other.
- Nils Schiffhauer DK8OK wrote specific documents which provides some very useful usage tips, and is well worth reading:
<https://dk8ok.org/2021/11/22/ahoy-decoding-eight-gmdss-channels-in-a-convoy/>
- Email your comments and questions to info@blackcatsystems.com

WARNING! RECEIVING AND SPREAD RADIO COMMUNICATION SYSTEMS IT COULD BE ILLEGAL IN YOUR COUNTRIES! Check carefully and thoroughly the regulations in force in your country. Some of this radio system was specifically designed for use by government, emergency services, for public safety networks, etc etc. who all share spectrum allocated.

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