

SIM

User's Guide

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Introduction

SIM is an experimental computer program, designed to facilitate basic amateur radio communications when using a very weak signal with ***SIM31***, a new robust digimode specially designed for making reliable, confirmed QSOs under extreme conditions on world wide amateur bands.

"SIM31" stands for **"Structured Integrated Message BPSK 31 bauds"**.

This new mode, using audio DSP techniques, provides an important message encoding innovation and thus a new simplified approach to the operating mode when compared to the already known modes, thereby overcoming some of the difficulties of communication between amateurs of the world.

It is designed to establish friendly human to human contacts by exchanging full structured info with possible plain text option; But moreover, it also allows to initiate contacts with a world wide Semi-Automatic stations, **even under noisy and weak conditions**.

It is interesting to note that even when a band appears to be closed, there is well chances for an open SIM31 path. If you have a restricted antennas, power or both, high local noise or weak propagation, SIM31 could be the preferred mode for you. **Signals that are -18dB S/N on 3000 Hz equivalent noise bandwidth**, can be decoded with relative ease. All received stations, with S/N reports, are spotted automatically to the **PSKReporter.info** map service and to the **HamSpots.net/SIM** web pages. So you can see on world map where are you well received and at what signal report.

SIM31 mode require an ultra stable VFO oscillators $\pm 1\text{Hz}/\text{minut}$, with very low phase noise $\pm 0.2\text{ Hz}$ peak to peak, in both transmitter and receiver. The DDS technologie for VFO's was highly recommanded, SIM31 occupies a narrow bandwidth of less than 45Hz, No need of external modem; a 48 Khz Windows compatible sound card model was just enough .

Signal reports are specified as signal-to-noise ratio (S/N) in dB, using a reference noise bandwidth of 3000 Hz. SIM31 Signals become :

- Just visible on the spectrum around **S/N = -25 dB**.
- and audible (to someone with good hearing) around **-15 dB**.

Thresholds limitations for SIM31 decodability are around :

- **-23 dB** for callsigns decoding.
- **-21db** for structured messages decoding.

- **-18db** for free typed text decoding.

Compared to other digimodes, SIM31 is probably the only one to have that new kind of "Semi-Automatic QSO's mode" with translation functionality (**Automatic translation of included structured messages only**) Languages: English, French, Russian, Dutch, Spanish, Italian, German, Portuguese...

NB: The program does not translate plain typed text.

Remark : for the moment, due to our software limitation, only Latin characters are used, Russian characters was planned for advanced future versions.

Then, you can set your software in **Semi-Automatic mode** <SIM-Auto >, and initiate an Automatic CQ CQ calling, SIM-PSK will :

- Reply to the callsign who just answered manually to your callsign.
- Afterwards, it will detect and fill in all received info's concerning the current QSO, (**Name, QTH, LOC, RSQ ...**),
- At the end, all info's about the QSO will be saved automatically into the local SIM-Logbook, and optionally uploaded automatically to the other local logbooks such as **HRD Logbook, DXKeeper, SwissLog, Logger32, Mixw , Log4OM and other TCP server of available logbooks**, or in real time, to one or more of your online web logbooks services : **eQSL.cc, QRZ.com, HRDLog.net, HAMQTH.com, ClubLog.org and HamLog.eu** .

The program does all that automatically, without any operator assistance...

Note: it's recommended never leaving your transceiver working alone without any presence!!

As you can guess, it is **only possible to upload a QSO** in real time when you have enabled this option, and if an internet connection is available.

Remark : **uploading your ADIF File** into an amateur radio service (eQSL.cc, LOTW ...) could be made later, at the end of your contacts if you prefer ; up to you, it's in the :

Menu ➔ Log ➔ Export to <ADIF> File .

SIM program also implements a new mode "**SIM63**" running at twice the baud rate of SIM31.

You can make QSOs in both modes using nothing more than mouse clicks

Distinctive features and SIM Highlights

SIM is an experimental amateur radio digital communications program optimized for making very weak signal contacts using a narrow bandwidth while decreasing the number of bits required to send a word. SIM uses the same sound card DSP technology used by most other digital communications programs.

Distinctive features of SIM are:

- Structured Messaging which compresses frequently used amateur radio phrases to a few bytes and translates phrases into the operator's native language. Currently supported languages are: **English, French, Russian, Dutch, Spanish, Italian, German, and Portuguese**. Note, the translation feature does not apply to typed text.

An expanded concept of varicode, to encompass not only individual characters but words and phrases.

"**Thanks for coming back to my call.**" Message, for example, is sent as only 6 characters rather than 34 characters as usually required.

- SIM decodes all SIM31 stations detected on the received 2500Hz audio input signal simultaneously, and show them on the upper Report panel displaying the signal report, type of call (CQ, CQ Auto, etc.), the callsign, and the country of origin among other info. Double-clicking on a callsign, zeros in on that offset frequency and prepares SIM to respond.

Optionally, SIM can be configured to verbally announce new decoding's. This is great for monitoring while attending to other tasks near your communications equipment.

The Signal Report panel can be configured to automatically report decoded callsigns and your transmissions to PSK-Reporter.

- Rather than a waterfall, SIM displays signals in a 2800Hz bandwidth Spectrum panel. This is sufficient since SIM only decodes 4 modes: SIM31, SIM63, PSK31, PSK63.

- Automated logging is supported via the ADIF format. Optionally, the contact log can be Auto-uploaded to one or more of local logbooks as **HRD-Logbook, DXKeeper, SwissLog, Logger32, MixW2 Log4OM and other TCP server of available logbooks** or to online web logbooks as **eQSL.cc, HRDLog.net, QRZ.com, ClubLog.org, HAMQTH.com, or HAMLog.eu** using your real time internet connection.

- Much of a typical QSO can be handled by clicking a handful of buttons with little or no typing. These buttons are similar in concept to predefined macros as used in other programs. They are simpler to use and make it easy to insert custom text in the middle of a QSO.
- There's an option so that SIM QSOs can be fully automated for the station calling CQ. The replying station has to conduct their end of the contact manually. When a contact is concluded, it is automatically logged and the originating station resumes calling CQ. Logging is automatic only for the station that is in Auto-QSO mode. The station that manually answered the call has to click the "Save QSO" button.

In compliance with ham-radio regulations, it's recommended that you don't leave your transmitter in Semi-Automatic-QSO Mode without your presence or leave your station in Semi-Automatic mode for extended periods of time.

- A meeting place frequency has been selected for each of the ham bands, and these are available via a list-Box menu. Combined with automatic reporting to PSK-Reporter, this maximizes your chance of finding other SIM users. Currently, most of the stations are in Europe and North America. Example 14067.0 Khz for 20m band.

Summary

All these features combine to make SIM an interesting and easy to use communications program. The software is updated frequently from user suggestions—usually about once a week. See the Installation and Setup section on the page that follows for download instructions.

System Requirements

If you are already using another sound-card based digital mode, you are all set. SIM can use either the built-in sound card or an external sound card based interface such as: Signalink, RigBlaster, Navigator or a home-brewed interface

- SSB transceiver and antenna.
- Computer running Windows XP or later, as Win Vista, Win7, Win8, Win8.1 and Win10, but it should also run under Linux +Wine, OS-X +WMare, and probably FreeBSD and other Unix-like operating systems with windows emulator.
- 1.0 GHz or faster CPU and 100 MB of available memory
- Monitor with at least 1024 x 780 resolution (more is better) (1024X600 pixel format version can be downloaded separately)
- Sound devices supported by your operating system. (48000 Hz raw sampling rate was needed for full decoding performance).
- Audio cable or equivalent USB connection between transceiver and computer.
- Computer-to-radio interface such as a serial port, or a virtual/emulated serial port to switch on/off your PTT line, and/or communicate with the "CAT" control, Or VOX for T/R switching.
- it is not necessary to synchronize your computer to UTC clock within +/- 1 second. (+/-1 minut is enough).

Installation

1. SIM can be downloaded from the *SIM31Home* page:

<http://www.on4nb.be/sim31.php>

or http://www.on4nb.be/last_release/sim_psk.rar

NB: To have the best decoding performance and the newest enhanced options, please make sure to get the newest daily version (V6XXX) available from the SIM31 Home page. Check for new releases at least once a week. Sometimes changes are made that break compatibility between versions.

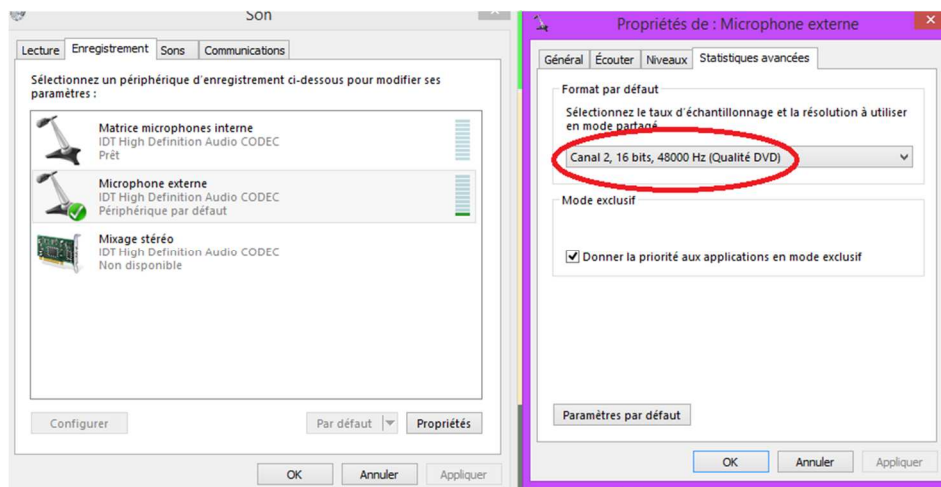
2. For your installation, download the .rar file, it contains all the supporting files.
3. Manually create an installation directory. Preferably C:\SIM31\ . to avoid permission problems, DO NOT place this directory inside Windows directories.
4. Unzip the .rar file into the new directory. Eight files will be installed.
 - sim_psk.exe (executable program)
 - SIM_Log_Viewer.exe (separate program for log viewer)
 - ASCII_Converter.exe (ASCII to Hex converter program)
 - pskreporter.dll (library for PSK-Reporter option)
 - Sqlite3.dll (library for Log4OM SQLite database)
 - sim_users_guide_en.pdf (English user's guide)
 - sim_users_guide_fr.pdf (French user's guide)
 - SIMCQ.wav (sound alert when a SIM31 frame was received)
5. Manually create a shortcut on your desktop or your taskbar pointing to sim_psk.exe file.
6. Run the shortcut to start SIM.
7. When SIM starts, a pop up window appears allowing you to configure your sound card plus other setting parameters. Details follow.
8. For installing a new updated version, it's quick and easy:
 - Download new sim_psk.rar file.
 - Unzip sim_psk.rar at the same old folder.
 - New unzipped files should overwrite old ones.The Other old files, of the folder, should not be deleted manually, Otherwise the program will start with the default reset setting.

Interface Settings (Sound Card +Transceiver)

Before starting the program, please check first for the 2 system recommendations follows:

Raw sampling rate Setting : (Very important)

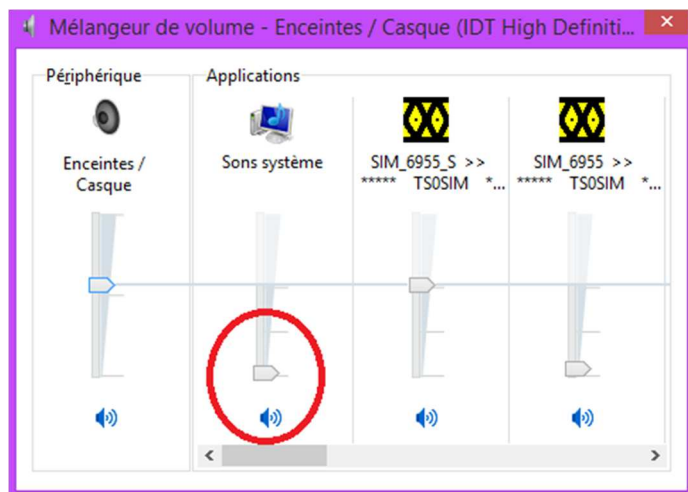
SIM expects your sound card to do its raw sampling at 48000 Hz, Otherwise decoding performance can be altered. If you are new to digital communications, open your Windows OS sound control panel. Click on "Properties", then "Advanced", and select “16 bit, 48000 Hz (DVD Quality)” for both the “Recording” and “Playback” devices.



(Maximum sound hardware acceleration option should be selected on some Windows XP)

Windows system sound inhibit : (Very important)

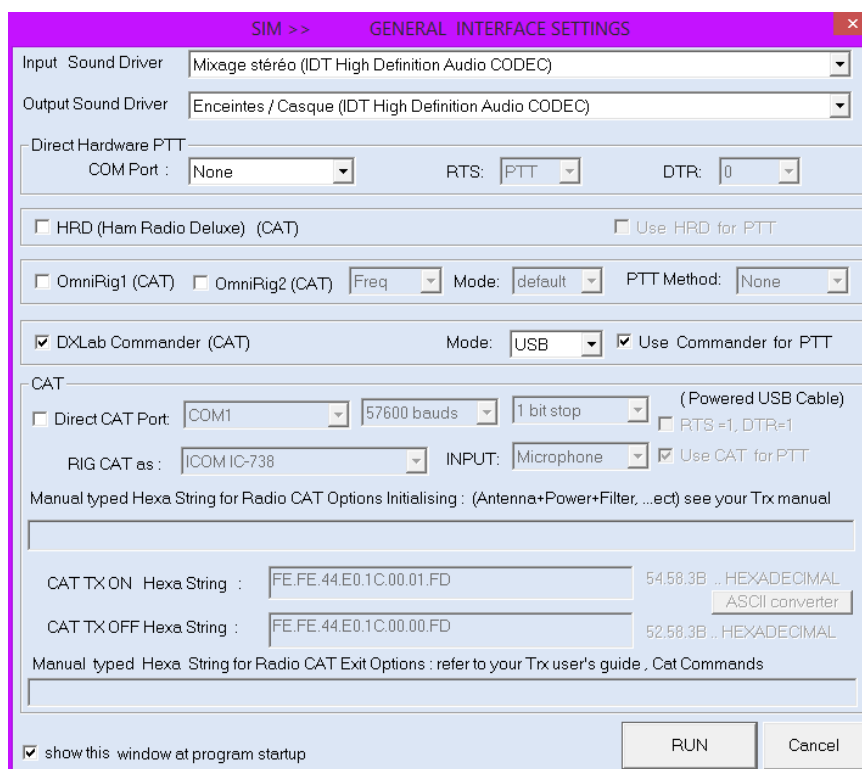
If you are using the Windows default sound card rather than an external interface, be sure to **turn off Windows system sounds** (By Win mixer), so system sounds are not transmitted over the air.



Good Advice :

If you're already using another digital communications program, it may help to open its configuration window before starting your SIM configuration and print or write down the settings being used there (COM, Baud, Stop bit, ...).

The configuration window for SIM automatically opens at program start up .



Set Input and Output Sound Driver popup menus

Select your input and output sound drivers from the lists. If the correct one doesn't appear in its list:

- If it's an external interface, make sure it's connected via USB cable and has power.
- There's a limit of 24 audio drivers listed in this popup, you may need to remove old unused ones to make room for all to show up.

Set Direct Hardware PTT (RTS/DTR)

If you will use RTS or DTR for PTT command (Press To Talk), choose an exclusive serial port being used (com port can be physical or virtual). Otherwise, leave at the default value (NONE).

Set CAT through HRD (Ham Radio Deluxe) :

Check HRD checkbox, then you can setup

Mode : default/USB/DATA-U / DIG/ DIGU /PSK/PKT /RTTY and PTT option method. HRD was intended to be already started and correctly configured.

SET CAT Through OmniRig engine:

Check OmniRig1 or OmniRig2 check-Box, then you can setup some more details as main/sub transceiver, SSB_USB/DIG_USB modes or PTT method: CAT/RTS/DTR/RTS+CAT/None . OmniRig was intended to be already installed and correctly configured.

SET CAT Through CIV-Commander (DXLab suite) :

Check CIV-Commander check-Box, then you can setup mode USB/DATA_U / DIGU /PKT /RTTY and PTT option method: CIV-Commander was intended to be already started and correctly configured.

Set Direct CAT

Check “SET Direct CAT” check-Box.

- a. Select Com port, your transceiver, baud rate, and stop bits. (Check your transceiver settings and manual.)
- b. Select the type of input used for input sound by CAT on your transceiver (microphone, rear panel, digital input)
- c. Enable PTT by CAT if needed.
- d. RTS/DTR auto power. Some external USB interfaces require power through the CAT cable.

Set Manual Hex String

This allows you to select special features offered by your transceiver when starting the SIM program (Power, Antenna, Filter, ...). See your transceiver manual. Most operators will leave it empty.

Set CAT TX ON and CAT TX OFF

These fields were filled in automatically when you selected your transceiver in step 5 above. You can edit them if needed for special cases. See your transceiver manual.

Set manual CAT Hex String for exit options

This allows you to reset your transceiver settings when exiting SIM for special needs (Power, Antenna, Filter, ...). See your transceiver manual. Most operators will leave it empty.

Displaying the configuration menu at every startup.

At bottom left of the interface settings window, you can uncheck the box once you have SIM well configured. This allows you to do not display the settings window at each program start up.

ICOM IC-756 PROIII Direct CAT Setup example:

SIM >> Audio & Radio Settings

Input Sound Driver: Microfoon (USB Audio CODEC)

Output Sound Driver: Luidsprekers (USB Audio CODEC)

Direct Hardware PTT:
COM Port: COM3 RTS: PTT DTR: 1

☐ OmniRig1 ☐ OmniRig2 Freq: PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☐ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☐ Use Commander for PTT Rig Mode: USB

CAT
☒ Direct CAT Port: COM2 19200 baud 8bit 2stop no-parity ☒ Use CAT for PTT
 RIG CAT as: ICOM IC-756 PROIII RIG Input: USB-DATA1 (Cable Power Supply)
☐ RTS =1, DTR=1

CAT Commands of your Trx at program startup: Help

(CAT Hexa String) PTT-ON: FE.FE.6E.E0.1C.00.01.FD 54.58.3B ..
 (CAT Hexa String) PTT-OFF: FE.FE.6E.E0.1C.00.00.FD 52.58.3B .. ASCII converter

CAT Commands of your Trx at program exit (Power/Antenna/Filter...): Help

RUN Cancel

YAESU FT-450 Direct CAT Setup 2 examples:

SIM >> Audio & Radio Settings

Input Sound Driver: Microphone (2- USB Audio CODEC)

Output Sound Driver: Haut-parleurs (2- USB Audio CODEC)

Direct Hardware PTT:
COM Port: None RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq: PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☒ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☒ Use Commander for PTT Rig Mode: Data

CAT
☒ Direct CAT Port: COM11 38400 baud 8bit 2stop no-parity ☒ Use CAT for PTT
 RIG CAT as: YAESU FT-450 RIG Input: DIG / DIG-U (Cable Power Supply)
☒ RTS =1, DTR=1

CAT Commands of your Trx at program startup: (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON: 54.58.31.3B 54.58.3B .. HEXADECIMAL
 (CAT Hexa String) PTT-OFF: 54.58.30.3B 52.58.3B .. HEXADECIMAL ASCII converter

CAT Commands of your Trx at program exit (Power/Antenna/Filter...): Help

RUN Cancel

SIM >> Audio & Radio Settings

Input Sound Driver: Microfono (2- Dispositivo High Definition Audio)

Output Sound Driver: Altoparlanti (2- Dispositivo High Definition Audio)

Direct Hardware PTT:
COM Port: COM8 RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq: PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☐ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☐ Use Commander for PTT Rig Mode: USB

CAT
☒ Direct CAT Port: COM8 9600 baud 8bit 1stop no-parity ☒ Use CAT for PTT
 RIG CAT as: YAESU FT-450 RIG Input: Rear Panel (Cable Power Supply)
☐ RTS =1, DTR=1

CAT Commands of your Trx at program startup : (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON : 54.58.31.3B 54.58.3B ...HEXADECIMAL
 (CAT Hexa String) PTT-OFF : 54.58.30.3B 52.58.3B ...HEXADECIMAL
 ASCII converter

CAT Commands of your Trx at program exit (Power/Antenna/Filter...) Help

RUN Cancel

YAESU FT-817 Direct CAT Setup example:

SIM >> Audio & Radio Settings

Input Sound Driver: Microphone (2- USB Audio CODEC)

Output Sound Driver: Haut-parleurs (2- USB Audio CODEC)

Direct Hardware PTT:
COM Port: None RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq: PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☒ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☒ Use Commander for PTT Rig Mode: Data

CAT
☒ Direct CAT Port: COM5 9600 baud 8bit 2stop no-parity ☒ Use CAT for PTT
 RIG CAT as: YAESU FT-817 RIG Input: DIG / DIG-U (Cable Power Supply)
☒ RTS =1, DTR=1

CAT Commands of your Trx at program startup : (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON : 00.00.00.00.88 54.58.3B ...HEXADECIMAL
 (CAT Hexa String) PTT-OFF : 00.00.00.00.88 52.58.3B ...HEXADECIMAL
 ASCII converter

CAT Commands of your Trx at program exit (Power/Antenna/Filter...) Help

RUN Cancel

YAESU FT-897 Direct CAT setup example:

SIM >> GENERAL INTERFACE SETTINGS

Input Sound Driver: USB Audio CODEC

Output Sound Driver: USB Audio CODEC

Direct Hardware PTT
COM Port: None RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq: PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☒ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☐ Use Commander for PTT Rig Mode: USB

CAT
☒ Direct CAT Port: COM13 9600 bauds 1 bit stop ☒ Use CAT for PTT
 RIG CAT as: YAESU FT-897 Rig Input: DIG-U ☐ RTS=1, DTR=1 (Cable Power Supply)

Manual typed Hexa String for Radio CAT Options Initialising : (Antenna+Power+Filter, ...ect) see your Tx manual

CAT TX ON Hexa String : 00.00.00.00 54.58.3B...HEXADECIMAL
 ASCII converter

CAT TX OFF Hexa String : 00.00.00.00 52.58.3B...HEXADECIMAL

Manual typed Hexa String for Radio CAT Exit Options : refer to your Tx user's guide , Cat Commands

☐ show this window at program startup RUN Cancel

YAESU FT-991 Direct CAT setup example:

SIM >> Audio & Radio Settings

Input Sound Driver: USB Audio CODEC

Output Sound Driver: USB Audio CODEC

Direct Hardware PTT
COM Port: None RTS: PTT DTR: PTT

☐ OmniRig1 ☐ OmniRig2 Freq: PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☒ Use HRD for PTT Rig Mode: DIG

☐ DXLab Commander (CAT) ☐ Use Commander for PTT Rig Mode: USB

CAT
☒ Direct CAT Port: COM20 4800 baud 8bit 2stop no-parity ☒ Use CAT for PTT
 RIG CAT as: YAESU FT-991 Rig Input: DIG / DIG-U ☒ RTS=1, DTR=1 (Cable Power Supply)

CAT Commands of your Tx at program startup : (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON : 54.58.31.3B 54.58.3B...HEXADECIMAL
 ASCII converter

(CAT Hexa String) PTT-OFF : 54.58.30.3B 52.58.3B...HEXADECIMAL

CAT Commands of your Tx at program exit (Power/Antenna/Filter...) Help

RUN Cancel

YAESU FT-DX1200 Direct CAT Setup example:

SIM >> Audio & Radio Settings

Input Sound Driver: Microphone (2- USB Audio CODEC)

Output Sound Driver: Haut-parleurs (2- USB Audio CODEC)

Direct Hardware PTT

COM Port: None RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☒ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☒ Use Commander for PTT Rig Mode: Data

CAT

☒ Direct CAT Port: COM8 38400 baud 8bit 2stop no-parity ☒ Use CAT for PTT

RIG CAT as: YAESU FT-DX1200 RIG Input: PKT-U (Cable Power Supply)

CAT Commands of your Trx at program startup: (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON: 54.58.3B 54.58.3B .. HEXADECIMAL

(CAT Hexa String) PTT-OFF: 54.58.3B 52.58.3B .. HEXADECIMAL

CAT Commands of your Trx at program exit (Power/Antenna/Filter...) Help

RUN Cancel

KENWOOD TS-2000 CAT Setup example:

SIM >> Audio & Radio Settings

Input Sound Driver: Microfono (Realtek High Definition Audio)

Output Sound Driver: Altoparlanti (Realtek High Definition Audio)

Direct Hardware PTT

COM Port: COM6 RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq-A PTT Method: None Rig Mode: SSB_U

☐ HRD_CAT (Ham Radio Deluxe) ☐ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☐ Use Commander for PTT Rig Mode: USB

CAT

☒ Direct CAT Port: COM3 9600 baud 8bit 1stop no-parity ☐ Use CAT for PTT

RIG CAT as: KENWOOD TS-2000 (Main) RIG Input: Microphone (Cable Power Supply)

CAT Commands of your Trx at program startup: (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON: 54.58.3B 54.58.3B 54.58.3B 54.58.3B .. HEXADECIMAL

(CAT Hexa String) PTT-OFF: 52.58.3B 52.58.3B .. HEXADECIMAL

CAT Commands of your Trx at program exit (Power/Antenna/Filter...) Help

RUN Cancel

ELECRAFT K2 CAT Setup example:

SIM >> Audio & Radio Settings

Input Sound Driver: Microphone (USB Audio CODEC)

Output Sound Driver: Speakers (USB Audio CODEC)

Direct Hardware PTT
COM Port: None RTS: PTT DTR: 0

☐ OmniRig1 ☐ OmniRig2 Freq PTT Method: CAT Rig Mode: default

☐ HRD_CAT (Ham Radio Deluxe) ☐ Use HRD for PTT Rig Mode: default

☐ DXLab Commander (CAT) ☐ Use Commander for PTT Rig Mode: USB

CAT

☒ Direct CAT Port: COM3 38400 baud 8bit 2stop no-parity ☒ Use CAT for PTT
☐ RTS =1, DTR=1
RIG CAT as: ELECRAFT K2 RIG Input: Microphone (Cable Power Supply)

CAT Commands of your Trx at program startup: (Antenna/Power/Filter...) Help

(CAT Hexa String) PTT-ON : 54.58.3B 54.58.3B .. HEXADECIMAL
(CAT Hexa String) PTT-OFF : 52.58.3B 52.58.3B .. HEXADECIMAL
ASCII converter

CAT Commands of your Trx at program exit (Power/Antenna/Filter...) Help

RUN Cancel

Overall test :

To test your configuration, push “Run” button of this window, and call CQ. Check that your transmitter is being keyed and that your Power and SWR meters indicate audio is being transmitted at the expected power level. To check CAT, change the band being used via the popup menu near the upper right of the main window. Your transceiver should change to the new frequency.

If things aren't working correctly, check once again the sound card and COM port settings. If still not working, try changing some of the other settings in the PTT and CAT sections one at a time.

SIM Main Window :

Mode Setup Log Font View SIM Alerter Psk-R Link's Clear Help

UTC	Hz	dB	(Double-Click)	DXCC	ITU/CQ-Z
16:27:29	1326	-14	CQ-Auto	IN3IZQ 30W ITALY	28/15 EU
16:28:05	906	-11	CQ	CT1CKP 20W PORTUGAL	37/14 EU
16:28:27	1323	-12	CQ-Auto	ON2AJ 15W BELGIUM	27/14 EU
16:48:17	1327	-21	CQ-Auto	IN3IZQ 30W ITALY	28/15 EU
17:09:06	1328	-15	CQ-Auto	IN3IZQ 30W ITALY	28/15 EU
17:19:25	1328	+00	CQ-Auto	IN3IZQ 30W ITALY	28/15 EU
07:17:46	1219	+21	CQ	DG4YIR 15W GERMANY	28/14 EU
07:18:27	1219	+16	CQ	DG4YIR 15W GERMANY	28/14 EU
07:58:23	1281	+17	CQ-Auto	IN3IZQ 30W ITALY	28/15 EU
08:08:47	2158	+08	CQ-Auto	IN3IZQ 15W ITALY	28/15 EU

calling 20:07:58z
CQ-Auto DE IN3IZQ IN3IZQ IN3IZQ
CQ-Auto DE IN3IZQ IN3IZQ IN3IZQ IN3IZQ (30W +1dB)
pse<answer>
calling 20:18:22z
CQ-Auto DE IN3IZQ IN3IZQ IN3IZQ
CQ-Auto DE IN3IZQ IN3IZQ IN3IZQ IN3IZQ (30W +3dB)
pse<answer>
calling 20:28:46z
CQ-Auto DE OQHIZQ IN3IZQ IN3IZQ
CQ-Auto DE IN3IZQ IN3IZQ IN3IZQ IN3IZQ (30W -20dB)
pse<answer>
calling 09:49:38z

Mode SIM31

to switch quickly between SIM31 and PSK31 modes without going to the menu

to Re-decode the last 2 minutes recorded signal at the same current offset audio frequency, decoding result may be better in some particular weak conditions

CALL : IN3IZQ
NAME : DANILO
QTH : PREGHENA
RSQ* : Save qso Clear
LOC : JN56MJ
20m USB 14067.0
CQ CQ QRZ ?
Answer CQ
Send my Info 2nd Round
Chat Send 73 Bye
RX
1357.2 Hz -36 dB
20 W
Pwr
2015 December 16 08:26:58
SIM-Auto (s) 43
Input Output Tune

Set Input signal level

For all digital modes, it's usually best to reduce the **Transceiver's AGC gain to the minimum** to avoid signal distortion. Other DSP functions can also impact the received signals, so **turn off all transmit or receive special DSP filters**, compressors and equalizers. SIM31 does all the digital processing of RX and TX for you, it is VERY important that your Transceiver does not process or alter the audio TX and RX signals at all.

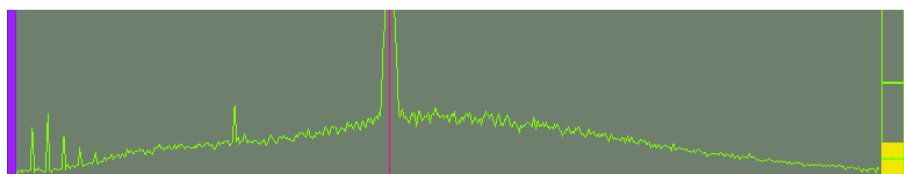
On the other hand, analogic IF Narrow band filter, such as the known 500Hz CW IF filter, can be appreciated, especially by Semi-Automatic SIM-stations, to prevent saturation by strong neighbour stations signals.

If you are already using another digital mode, you shouldn't have to make adjustments for SIM and you can easily switch back and forth between programs.

For most PC internal sound card's, there is an input hardware amplifier option, it should be disabled at the beginning, otherwise it can distort the input signal before digital conversion .

While receiving a SIM or PSK signal, adjust the input signal level while watching the yellow vertical bar graph (at the right of the SIM Spectrum Window). The signal should no peak more than the middle at the 0dB mark.

The background noise level should be around 20% on the bar graph (the lower green line). If it's too low, decoding performance will be hurt.



With the same input/output sound card drivers, the optimal settings, once they are done, should remain good for all other digital modes, regardless of the used software.

Any high Input level should be alerted by the program with “ Please Reduce input signal Level” , in add the background spectrum colour display become red.

Set Transmit Power and Audio Level:

Transceiver DSP functions can also impact the transmitted signals so turn them all off. If you are already using another digital mode, you shouldn't have to make adjustments for SIM and you can easily switch back and forth between programs

If you are using an external USB sound card interface such as: Signalink, RigBlaster, or Navigator follow their instructions for setting transmit power and audio levels. Level Adjustments can be made in three possible places.

1-- External Interface. See the manual for your interface—it may be a manual control on the interface and/or a software control.

2—PC Internal Sound card. The volume level as set in the Windows: Sound control panel. You can open it by clicking the “Output” button in the lower right corner of the SIM window.

Increase the mixing control of the audio output to reach the maximum possible RF output example 100 watt, and then decrease the setting until the RF output will fall back to about 30%. This will be a good audio level to drive your TX transceiver. So, 30 Watts will be a good choice for a 100 Watt CW Transceiver.

If you are using a sound card that is also the Windows default audio device, be sure to turn off all Windows sounds so they are not transmitted over the air.

3-- Power Level slider: located at the right of SIM main window. A good starting point is the default full power .

The transmit power setting on your Transceiver. If it is rated at 100 watts for CW and USB, the usual **maximum** power for use with digital modes is about 30 watts. With the adjustment above, your power output will be reduced accordingly.

To check the output audio quality and transmit level of your setup, click the "Tune" button on the main SIM screen. Your transceiver will be switched to transmit mode for a few seconds, with a steady audio tone equivalent to the level of a real SIM-31 signal.

Listen to the generated audio tone using the RF monitoring of your radio, or any other method. If your transceiver supports this function look at the transmit ALC and adjust it to zero. This will get the strongest output without distortion or splatter. The tone should be perfectly smooth and constant, with no clicks or glitches. Too high of an audio level can generate spurious signals and interference. **If you use more than about one-third the rated power for digital modes, you are likely to overheat your transmitter, tuner, etc. ,** finally make sure to suppress any unwanted RF signal, which would return back to the transceiver.

SIM31 is a good weak signal mode. Many SIM31 radio operators use much less than the maximum one-third of rated power mentioned above. SIM31 can decode signals as weak as -18dB S/N.

Good digital practice is to use the minimum power necessary to communicate, with good antenna systems long distance communications can be achieved with just 2 or 5 watts.

Set Your Personal Info

To configure your personal info, select the menu: Setup > Personal info and fill in your personal info: Call, Name, QTH, Grid, Birth Date, Age, Year Licensed, Clubs, Websites, and QSL methods. There is a limit of 12 characters for your Callsign, NAME and QTH. This info will be inserted into Structured Messages.

SIM31> PERSONAL INFO

CALL: (It's better, to avoid as possible the Prefix/Suffix)

NAME:

QTH: +

GRID: ☐ Miles for distance

☒ BIRTH: AGE: Y YEAR LICENSED: BIRTH IN XXXX LICENCED: XXXX

CLUBS:
(Example : SMC#0012 EPC#12365 30MDG#1458 ...)

INFO's : ☒ QRZ.COM ☐ QRZCQ.COM ☐ HRDLOG.NET ☐ HAMQTH.COM ☐ CLUBLOG.ORG

QSL VIA:

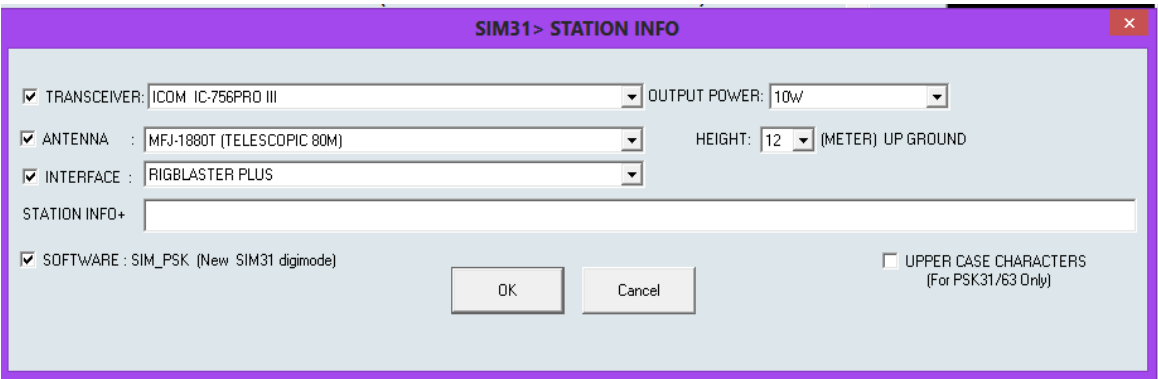
☒ DIRECT ☒ BUREAU ☒ E_QSL.CC ☐ LOTW ☐ SWL Report accepted

Callsign Alerter :

Set your Station info

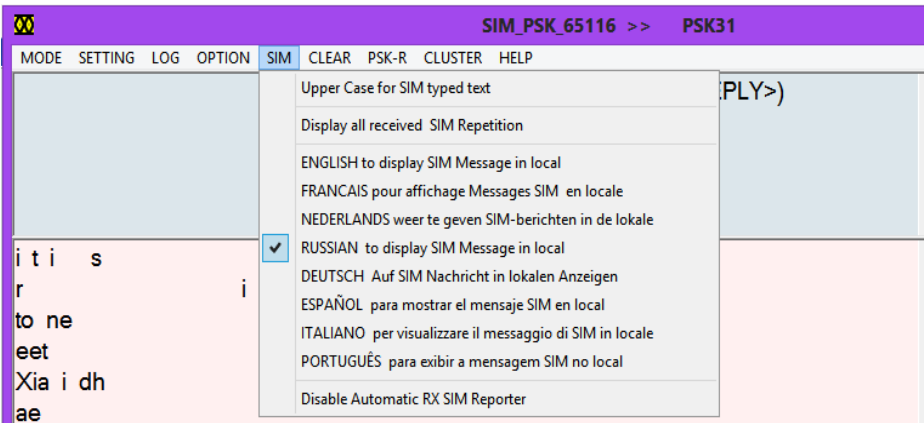
To configure information about your station, select the menu: Setting > Station info and select or fill in: Transceiver, Output Power, Antenna, Antenna Height, and additional station info. When you select an entry from one of the popups, it will be sent as a SIM Structured Message rather than as individual characters.

There is also a checkbox to display PSK characters as all upper case on your system rather than as all lowercase.



Set your Favourite Language for SIM Messages

To select the language used to display Structured Messages on your system, select the menu: SIM and then one of the listed languages. An operator in Russian can see a Structured Message conversation in Russian while his contact in the USA sees the Structured Message conversation in English.



Status Indicators

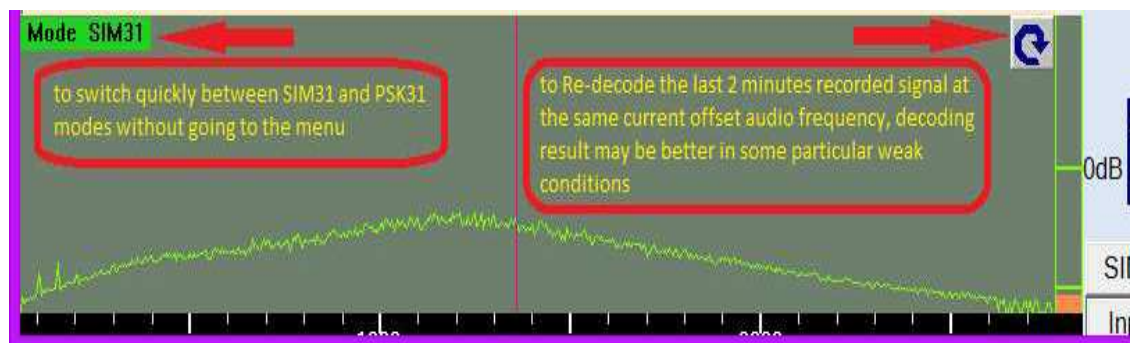
Mode button:

Indicates the current mode and changes the current mode from SIM to PSK and back.

Re-Decode button:

Re-decodes the last two minutes of signal received on the current accurate offset frequency.

You can re-decode at a different offset by left-clicking in the spectrum window for 31 baud, or right click for 63 baud. .



Left Clicking in the Spectrum window:

Changes the offset frequency and sets the speed to SIM31 or PSK31

Right-Clicking in the Spectrum window:

Changes the offset frequency and sets the speed to SIM63 or PSK63

On-Screen Controls

The screenshot displays a software interface for logging and communication. At the top, there are fields for CALL (F1ABL), NAME (MICHEL), QTH (MOLLANS), and LOC (JN24OF). Below these is an RSQ* field with buttons for Log qso and Clear. The frequency is set to 14067.0 on 20m USB. There are buttons for CQ CQ, QRZ ?, Answer CQ, Send my Info, 2nd Round, Custom, and Send 73 Bye. A Tchat button is also present. A large pink RX button is in the center. Below the RX button, there are fields for 1182.1 Hz, Rx S/N, and 3 dB. A digital display shows 14:49:04. At the bottom, there is a section for Auto-CQ Waiting (sec) set to 32, and a SIM Auto-QSO mode section with buttons for Input, Output, and Tune.

Logging Fields panel: Call, Name, QTH, LOC, RSQ* fields

The logging fields, are automatically filled in during a QSO as the other party sends the appropriate Structured Messages. To work correctly the other operator must have:

- configured the “Personal Info” window
- clicked the “Send my Info” or 2nd Round buttons
- selected the “Insert ? Name, QTH, Loc, Age..” checkbox in the “Send my Info” or “2nd Round” windows.

“Save qso” button:

This button is enabled at the end of QSO and logs the QSO to the entities selected in the Personal Info window.

Clear button:

This button clears the above fields.

Frequency Controls :

The first control selects a ham band and a predetermined SIM meeting-place frequency. The second control displays the selected frequency and allows it to be adjusted.

Yellow buttons: CQ CQ, QRZ?, ANSWER CQ button

These buttons don't open windows, they transmit preset Structured Messages using SIM varicode.

CQ CQ transmits: CQ de your callsign and transmit wattage (Both as entered in the Station Info window.) You can modify the CQ call in the Setting menu > “Macro's ...” Choices include CQ DX, CQ Asia, among others.

QRZ? : transmits QRZ? de your callsign

ANSWER CQ : transmits the callsign in the CALL field de your callsign

All three yellow buttons transmit a little more info than described above. Try each of them off the air to see exactly what is being sent.

Green buttons: Send my Info, 2nd Round, Custom, Send 73 bye, and Tchat

These buttons open a window that allow you to select both Structured Messages and to type text. Your choices for Structured Messages can be saved so you only have to configure greetings and good-byes on your first use. During a QSO, if you don't want to change Structured Message or enter text, you can quickly hit the “TX All NOW” button and immediately transmit.

You probably won't use more than two or three of these buttons in a QSO. Between them they offer a lot of overlapping functionality that you can customize to meet your operating style.

Remember that the Structured Messages are sent as a few bytes of varicode rather than letter by letter so the effective speed is much faster than PSK.

The <<name and <<qth buttons will transmit the name and qth of the other contact as received and displayed in the logging panel. This lets the other party know if you received their NAME and QTH correctly.

If you want to enter text, start typing in the text area. Transmission doesn't start until you click the button labelled: "Click this Button to <<Start TX>> while you type". This sends both callsigns and any Structured Messages selected above the text area. It then sends the first character of your typed text and pauses. Your typing, the Structured Messages below the text area, and the closing callsigns aren't sent until you click the "TX ALL NOW" button. You can edit text until it has been sent.

A good way of using this functionality to speed a conversation is to start typing your reply while you are receiving info from the other party. When the other operator finished, click the Start TX button, finish your reply, and end the transmission with the TX ALL NOW button.

Pink indicator/button RX / Halt TX:

When this indicator displays RX in disabled-style text, it indicates that SIM is receiving. When this button displays Halt TX, it indicates that SIM is transmitting. Clicking it will abort the transmission.

Hz indicator and selector

This indicator displays the offset frequency SIM is using for receiving and transmitting. You can use it to fine tune the offset frequency. For example: click in the Spectrum panel to set the offset to 1500 and you'll likely be off a few Hz. Use the up or down arrows to zero in on exactly 1500.

Rx S/N display

This indicates the signal to noise ratio of the signal being received.

UTC Time display : Indicates the current time.

Auto-SIM (sec) indicator and control

This adjusts the time between CQs when using the SIM Auto-QSO mode.

Auto-SIM QSO's Mode button :

to setup your station as a Semi-Automatic SIM station .

Input and Output buttons:

The input button opens the Windows sound configuration control panel for input from the receiver. The output button opens the Windows Volume Mixer control panel for output to the transmitter.

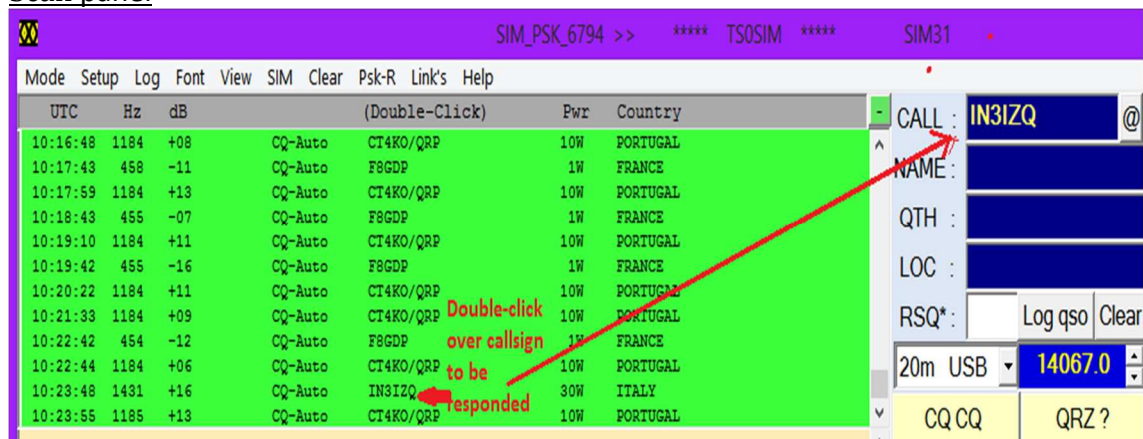
Tune Button :

Sends a signal to the transmitter so you can check your TX power, your SWR, the clarity of your signal, etc. The length of time for the tune can be set in the Setup menu > "Macro's ...".

How to select a SIM station for starting a QSO

The easiest and most convenient method to select a SIM station is probably to use the Scan panel (See the screenshot below).

Scan panel



Double-click on a on the most recent occurrence of desired callsign in the Scan Signal Report panel, the program will prepare itself to start a QSO as follows :

- The callsign is copied into the CALL pad for answering.
- Rx cursor is positioned on the spectrum at the right frequency.
- SIM mode and baud-rate are set.
- If you've contacted this station before, your log is used to display the date and other details of your last contact. The Name, QTH, and LOC fields are also populated.

Nothing else to do, just click the < Answer CQ > button to answer the selected station on the air. Just two mouse clicks, without any keyboard entry, are sufficient to start a SIM31 QSO.

- Wait for response.
- If not ok, Click again "Answer CQ" Button and wait until success.

Very easy isn't it ?

As you see, You can make QSOs using nothing more than mouse clicks.

We should response to an automatic calling station by the same procedure.

TX Macro's

SIM31 mode is mainly a structured message based mode, but it can also handle a classic "plain text" messages.

A structured message must be preferred here anyway, because it's a lot faster and more robust against noise and large spread distortions. Most classic ham radio messages were prepared in a macro list, and coded as structured binary messages, so they could be sent faster and be less sensitive to noise and QRM.

You can choose your messages to send among the macro list content, simply by selecting each message in a "list-box".

You can also prepare messages in plain text mode, with free content of your choice.

Of course, in this case, as each letter has to be separately encoded, it takes more time for transmitting, exactly like a PSK mode.

Or, it remains possible to type a text in real time, during a contact, at keyboard, exactly like any other classic mode as BPSK31.

Making QSO's

By long standing tradition and / or legal obligations, a minimal valid QSO requires to exchange callsigns, a signal report, and several other info's which are also generally sent.

SIM-PSK is particularly designed to facilitate such QSOs, thanks to the short structured messages.

But please be fair play, don't initiate a Semi-Automatic calling before having answered manually to other interesting automatic callsigns on the air.

The process works best if you use the structured formats and follow recommended standard procedures as in the following example.

Example of QSO:

1. **BUTTON CQ CQ :** CQ CQCQ DE ON2VH ON2VHF ON2VHF
2. **BUTTON ANSWER :** ON2VHF ON2VHFON2VHF DE F1ABL
F1ABL F1ABL R-12
3. **BUTTON MY_INFO:** F1ABL F1ABL F1ABL DE ON2VHF
ON2VHFON2VHF RR-9
Hi dear OM
Happy to meet you in SIM31 mode
NAME : LAURENT LAURENT LAURENT
QTH :
LOCATOR :
HW? ***** BTU *****
F1ABL F1ABL DE ON2VHF ON2VHF PSE
KN
4. **BUTTON MY_INFO:** ON2VHF ON2VHF ON2VHF DE F1ABL
F1ABL F1ABL RR-12
Hi dear OM LAURENT
Thank you for call/answer
NAME : MICHEL MICHEL MICHEL
QTH :
LOCATOR :
HW? ***** BTU *****
ON2VHF ON2VHF ON2VHF DE F1ABL F1ABL
F1ABL PSE KN
5. **BUTTON MY_STATION (ON2VHF).**
6. **BUTTON MY_STATION (F1ABL).**
7. **BUTTON BYE 73 (ON2VHF)..**
8. **BUTTON BYE 73 (F1ABL). End of QSO**

Log Book

NB :With a Semi-Automatic QSO mode, the program does collect and save the information's automatically, and then can be uploaded in real time to online web logbooks as eQSL.cc , QRZ.com, ClubLog.org, HRDLog.net , HAMQTH.com and HAMLog.eu, or to a local used logbooks as SIM-Logbook (by default), HRD-Logbook, DXKeeper, SwissLog, Logger32, Mixw , Log4OM and other TCP server of available logbooks, so there is nothing to do manually during a Semi-Automatic QSO. At the end of automatic traffic, we just need to check and correct manually any possible false infos; afterwards, the Log result can be also uploaded to web ham radio login services, manually via ADIF files.

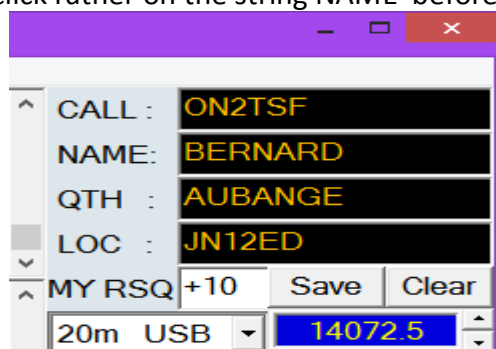
Format of a QSO with structured SIM Mode:

All the fields, Callsign, NAME, QTH, LOCATOR, are initially structured in the program during setup, so, except on errors , the program should get easily and automatically all these info's when receiving a contact, afterwards, it will display them on the screen and will write each info at the right pad, without any operator assistance . You just have to verify their authenticity, and then confirm by manually clicking the button <Save qso> at the end of the QSO....

Save QSO infos manually :

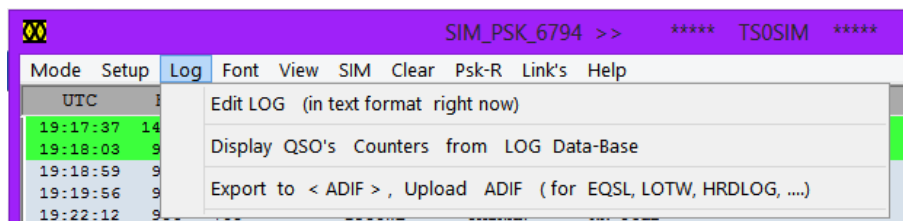
In some rare case, (eg for not structured messages, transmitted in plain text mode or by classic BPSK31 mode) you must double click manually, on the strings in order to copy them one by one into their reserved pad's "NAME, QTH, LOCATOR" . Then you will press the button <Save qso>, for saving info's of this QSO into the SIM-Logbook.

Remark: double-click rather on the string NAME before QTH.

A screenshot of a software window titled "Log Book" with a purple title bar. The window contains a form with several fields: "CALL : ON2TSF", "NAME: BERNARD", "QTH : AUBANGE", and "LOC : JN12ED". Below these fields are two buttons, "Save" and "Clear". At the bottom of the window, there are two more fields: "MY RSQ +10" and "20m USB", followed by a frequency field showing "14072.5".

Reserved pads:

Log menu



LINUX + Wine config-HELP :

Our software SIM can be used now under Linux thanks to the WINE emulator. Some questions were asked by OMs, indicating that, configuration stays somehow difficult, mainly for those who do not know Linux commands. It's the reason why I decided to describe here the procedure to follow, as clearly as possible, in order to make anyone able to do this installation. SIM was tested with some versions of UBUNTU until 14.04 . On an old PCs, it's running with a light Linux version , such as Xubuntu or Lubuntu. There are two distinct points to set up:

- 1 - serial ports for PTT and for « CAT » commands
- 2 – choose the audio port and set up the interface and audio level.

COM ports Configuration under Linux+Wine :

- Some cases :

If you are using an old desktop PC, it certainly has one or two RS232 serial ports that are normally recognized as elements (dev) ttyS0 and ttyS1 ; but that does not mean they could be used directly without some prior settings.

On recent PCs and/or laptops, these serial ports are usually non-existent, it is necessary to use USB ports and converters "USB / RS232" as virtual COM ports . If you do not use the commands "CAT" , only one serial port is needed to switch the PTT. The second COM port is only used for the CAT communication between the PC and the transceiver. For testing, I used two FTDI converters PL2303 Type and it works fine, but at beginning of the installation it was far from being ok ! This is one of the hotspots for virtual com ports which are not directly available under Linux.

The first thing to do is to check what kind of hardware is installed and at what addresses. For this it is necessary to pass some commands from a terminal window. So let see how to use the COM ports:

For the uninitiated, who know very little or none at all about Linux, you must first open a terminal window. It is a bit like in Windows that allows to enter DOS commands, but here of course commands are those recognized by Linux ...

There are two ways to open this window,

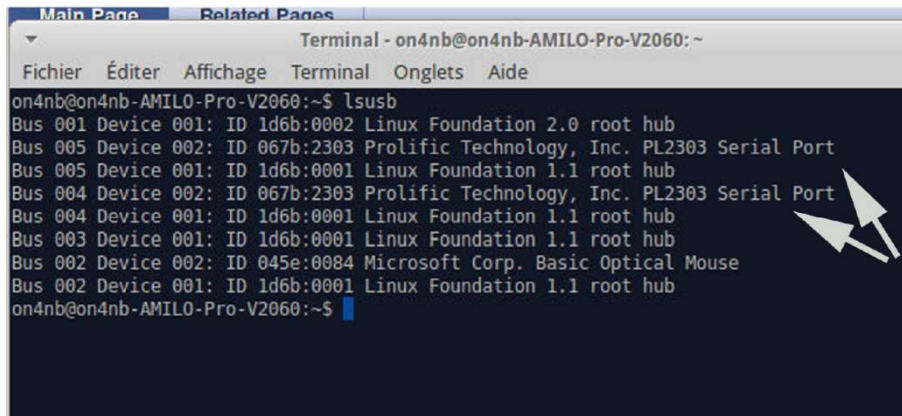
click in the menu to "search for Files on the PC" and enter the key word "terminal" in the search window. Then click on the icon of the terminal (small black window icon) visible on the screen.

OR

Use the 3 keys **CTRL + ALT + T**

In the Terminal window that opens, enter the command **lsusb**

It should list the FTDI ports connected to the PC as shown by white arrows here under:



```
on4nb@on4nb-AMILO-Pro-V2060:~$ lsusb
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 005 Device 002: ID 067b:2303 Prolific Technology, Inc. PL2303 Serial Port
Bus 005 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 004 Device 002: ID 067b:2303 Prolific Technology, Inc. PL2303 Serial Port
Bus 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 002 Device 002: ID 045e:0084 Microsoft Corp. Basic Optical Mouse
Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
on4nb@on4nb-AMILO-Pro-V2060:~$
```

Optionally, you can compare the results by first entering this command without connecting the converters, and then do the same with converters connected. The detected devices on USB will probably be available as follows:

ttyUSB0 for virtual port COM1

ttyUSB1 for virtual port COM2

The needed steps :

- Establish the link between ttyUSB0 and COM1 between ttyUSB1 and COM2
- Add COM ports (dialout) to user group (on my PC group = on4nb)
- Make the two ports accessible under / .wine
- Give the correct permissions to allow access to the tty files from the current user group.

Note: Some commands must be entered twice, once for each COM port.

Beware to respect uppercase / lowercase. They must be used in the commands exactly as they are shown !

Indeed, if I type the command **setserial /dev/ttyS0** that's ok, I see com 1 linked to the address 3f8 and IRQ4

BUT , if I type the command **setserial /dev/ttys0** that will not work because the S in ttyS0 should be in uppercase !!!

Linux as Unix are sensitive to upper / lower case...

The first thing to do is record the details of the equipment listed by **lsusb** for virtual ports and by **lspci** if the ports are installed in the PC (on motherboard or a PCI card) Here, the two converters have a chipset "Prolific" and as shown by the white arrows on the screenshot above, the ID parameters to be used are manufacturer ID 067b and type of product 2303.

Once this informations are known and memorized, type the following commands (adapted to YOUR devices) :

```
sudo modprobe usbserial vendor=0x067b product=0x2303  
setserial /dev/ttyS0  
setserial /dev/ttyS1  
sudo chmod o+rw /dev/ttyS0  
sudo chmod o+rw /dev/ttyS1
```

You should see that

ttyS0 is linked to the com port 1 (address 03F8 IRQ4)
ttyS1 is linked to the com port 2 (address 02F8 IRQ3)

Note:

if you have more than 2 COM ports there may be a conflict because the IRQ for ports COM1 and COM2 are shared with COM 3 (03E8 IRQ4) and COM 4 (02E8 IRQ3)
Remember to adapt the vendor and product parameters according to those indicated by lsusb in the window on your PC when entering it in modprobe or you will receive an error message !
For example,if your FTDI component is not a PL2303 but a FT232,
Instead of ID 0x067b : 0x2303
you will have 0x0403 : 0x6010

Next: check if the COM ports are accessible from the current user group ;Originally they are in the Dialout group and so Dialout must also be accessible to the user.

We can know it by typing **groups**, The response will be more or less as shown below

on4nb adm sudo ...

This response shows that the Dialout group is not yet available in the on4nb group. to add it, type the command

sudo adduser on4nb dialout.

The dialout group can now be used from the group on4nb

Then: make ports accessible from the WINE emulator

To link serial ports com1 and com2 to Wine you must enter the following command twice : once for com1 and then for com2

```
ln -s /dev/ttyUSB0 ~/.wine/dosdevices/com1  
ln -s /dev/ttyUSB1 ~/.wine/dosdevices/com2
```

Then reboot the machine with the command:

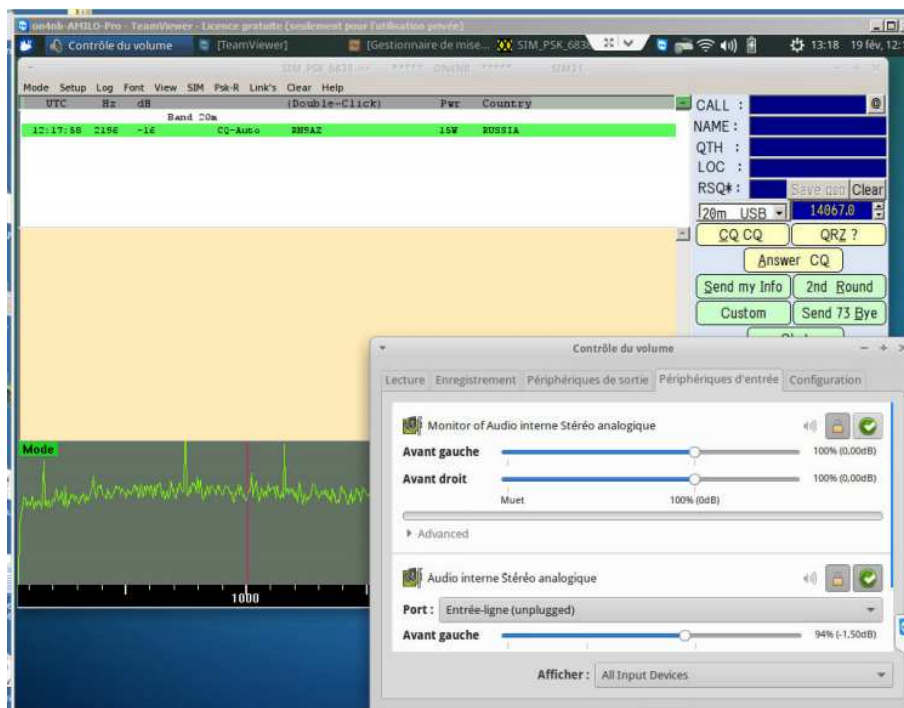
sudo reboot

Normally you can now use your serial communication ports

Configuration of audio interface under Linux+Wine

By default the (old linux) audio interface is Pulse Audio. I tried ALSA, but when both ALSA and PULSE AUDIO drivers are present on the PC, SIM only sees only pulse_audio ... (I have not tried uninstalling pulse-audio)

Each time, when starting the program, I have no sound on the input of SIM; I have first to click on the speaker, In the window that opens I select the audio input tab, then display all audio, and I select the line input as shown on the picture here under. I guess we should add the option "use MIC input" in an audio configuration file to avoid having to repeat each time the choice - It remains to be tested.



I have to make the sound settings by a right clic on the speaker icon ; and from the mixer window, adjust the input levels and audio output, outside of SIM.

Special Mouse Commands

SIM RX REPORTER WINDOW	Double-click a desired callsign on the scanner panel (upper window), the program by itself prepare to answer by settings all required parameters (Callsign , Mode , baud rate and frequency) so you are ready to click <Answer CQ> button to answer, many times if needed, to start a QSO ...
Received text window	Double click any callsign on received text, to copy it into the CALL pad before answering.
	Double-click on QTH string to put it into QTH pad (for message insertion and later login).
	Double-click on Locator string to put it into LOCATOR pad (for later Loggin).
SPECTRUM (REWIND)	Left click onto spectrum position: rewinds the last 2 minutes signal recorded and decodes it at 31 bauds default mode : PSK31 or <i>SIM31</i> .
	Right click onto spectrum position: rewinds the last 2 minutes signal recorded and decodes it in 63 bauds default mode (PSK63 or <i>SIM63</i>).

You are ready to use *SIM-PSK*. Good DX.

Technical Description

SIM is an experimental amateur radio digital communications program optimized for making weak signal contacts using a narrow bandwidth while decreasing the number of bytes required to send a word. It offers two modes: SIM31 with a bandwidth of only 45Hz and SIM63 which is twice as fast but uses twice the bandwidth. SIM uses the same sound card DSP technology as other digital communications programs.

Distinctive features of SIM are:

- Structured Messaging which compresses frequently used amateur radio phrases to a few characters and translates phrases into the operator's native language. Currently supported languages are: English, Russian, Dutch, Spanish, Italian, German, and Portuguese.

Only lowercase latin characters can be used--even for Russian translation. There are 53 supported characters: A-Z (uppercase only) 0-9 <CR> <SPACE> . , : - = + ? ' () ! / @ # * Special characters such as "É" are converted to "E"

- An expanded concept of varicode, to encompass not only individual characters but words and phrases. "Thanks for coming back to my call." is sent as only 6 characters rather than the 34 Characters required by PSK.

SIM31(Structured Integrated Message BPSK31.)

Name of software: *SIM*

Modulation : DBPSK « Differential Binary Phase Shift Keying ».

Speed : 31 bauds , 187 char/min (or 31.25 wpm).

Pulse shape : Similar to classic BPSK31

Bandwidth : About 45 Hz
It's interesting to note that the CW mode identifier, which is a part of the SIM31 Signal Header during CQing, is limited to the same spectrum bandwidth as the SIM31 signal itself. This means that the CW generated by the SIM31 program is actually narrower than average CW. In other words, it is completely free of key clicks!

Code : "varicode" able to encode characters or messages (words or full sentences.).

Demodulation : Coherent demodulation .

Synchronization : Automatic on signal

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SIM31 Frequently Asked Questions (FAQ):

1/ How I can switch to SIM63 baud rate ?

Just by clicking the spectrum panel by right mouse button, instead of left right button reserved for SIM31.

Left click mouse button -----→ instantly decoding SIM31.

Right click mouse button ----→ instantly decoding SIM63.

No menu command was needed to switch between SIM31/SIM63.

2/ I can receive SIM31 signals but I decode them only 50% of time, how can I fixe this ?

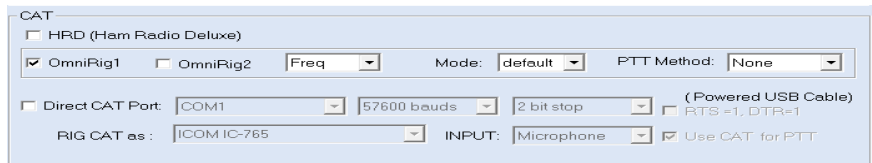
- First exit all SIM program's.
- Restart again your PC.
- Download and install the newest version from the net.
www.sim.on2vhf.be
- The raw sampling rate of your sound card may be not set to 48000Hz, SIM expects your sound card to do its raw sampling at 48000 Hz. Open your Windows OS sound control panel. Click on "Properties", then "Advanced", and select **"16 bit, 48000 Hz (DVD Quality)"** for both the "Recording" and "Playback" devices.
- Exit and restart again SIM program.
- (For Windows XP , you need also to enable the Maximum sound hardware acceleration option if exist)

3/ How I Can activate CAT commands for My Rig?

SIM program gives us 4 ways to do it :

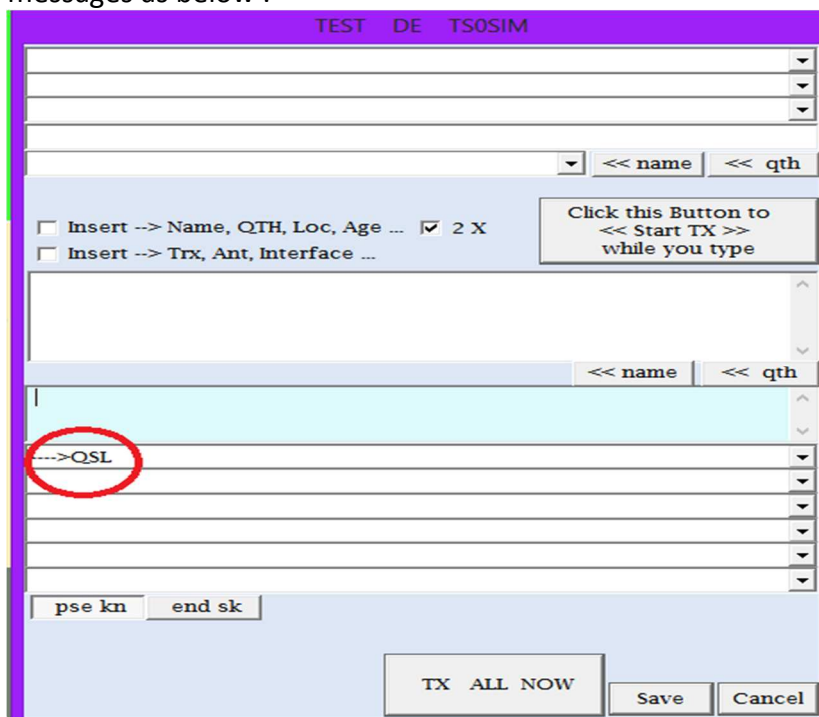
- By HRD (Ham Radio Deluxe) if you already use it : just check HRD box , then you can setup mode Default/USB/DATA-U / DIG/ DIGU /PSK/PKT /RTTY and PTT option method. HRD was intended to be already started and correctly configured.
- By OmniRig 1 or 2 if you already use it : just check OmniRig1 or OmniRig2 checkbox, you can then setup some more details as main frequency or sub-frequency , SSB_USB/DIG_USB modes or PTT method: CAT/RTS/DTR/RTS+CAT/ None . OmniRig engine should be already correctly installed and configured.
- By CIV-Commander if you already use it : just check CIV-Commander checkbox, you can then setup some more details as mode USB/DATA_U/DIGU/PKT/RTTY and PTT method: CIV-Commander was intended to be already started and correctly configured.
- By direct CAT commands, then you can choice one of the pre-setting Rigs within the CAT-Rig list, if your rig wasn't listed , you can select the most similar commands rig, otherwise it remain possible to choose manual setting and then typing

manually the TX-ON /TX_OFF commands Hexadecimal Strings for your non listed Rig , please refer to your transceiver manual. It will be nice to send an email to the developer to inform him about your rig missing. benrejebnizar@gmail.com



4/ Can I transmit QSL info by structured message?

Yes we can do it and then we can get better transmission reliability, at "My Info" Tx Macro select → QSL message from the drop list box messages as below :



this assumes we have already set our QSL info's in the program setup menu → setting → personal info.

5/ How can I change the font or the size of received text ?

By menu bar → Font.

6/ How I can answer a received a Semi-Automatic station calling CQ-Auto?

Only by manual response, similar to normal manual QSO:

- Double-click, by left mouse button, over the callsign displayed on scan report panel (Upper window) , the program will prepare itself to start a QSO as follows :
a/ The callsign is copied into the CALL field for answering.

b/ Rx cursor is positioned at the right frequency.

c/ SIM mode baud-rate are set.

d/ If you've contacted this station before, your log is used to display the date and other details of your last contact. The Name, QTH, and LOC fields are also populated.

- Click "Answer CQ" Button (Right of main program window).
- Wait for response.
- If not ok, Click again "Answer CQ" Button and wait, repeat "Answer CQ" until success.

7/ How can I get the maximum SIM decoder performances ?

- Try to download the newest version of SIM program from one of the available sites, at least weekly; new version, sometimes, can slightly improve the decoder performances. The version number was marked by the title bar of the program main window .
- Select the better audio driver available on the dropdown list.
- If your sound driver was suspected to be old, try to download the newest available one from internet.
- For win7 , win8 or win 10 , It's better to set multimedia on medium consumption batteries mode (there is less computing on filtering and then less computing distortion alteration of the very weak signals), if you prefer stay in normal batteries mode , you can set manually only the multimedia on medium consumption mode. For that see your batteries setting modes of your windows.
- It's intended that the raw sampling rate of the input sound card should be set at 48000 Hz instead of 41000 Hz , refer to the sound card utility of your Windows.
- It's recommended that radio AGC button was put at the minimum, this is for reducing distortions due to AGC system.
- RIT Radio Button (**R**eceiver **I**ncremental **T**uning) should be set to zero, so Rx frequency signal should beat at zero Hz to the Tx one, no frequency sheeft can be accepted.
- It's recommended to inhibit all DSP audio effects of the radio, any audio signal digital processing can alter decoding performances. the Rx signal should be preserved as it's, before decoding.
- Input signal level should be correctly set, the bar-graph level should be below 0db mark and above the lowest green mark.
- Background noise on spectrum graph should be always clearly displayed above zero ground Line.
- For a Semi-automatic station mode, a 500 Hz or 250 Hz analog centred IF bandwidth filter was recommended for long time running, it can help to avoid input saturation by strong neighbours signals during your absence.

8/ How SIM Semi-Automatic mode is running?

You can convert your station to a Semi-Automatic station, so no manual action was allowed during Semi-Automatic mode, your station will do all things for you, during unlimited long time, including :

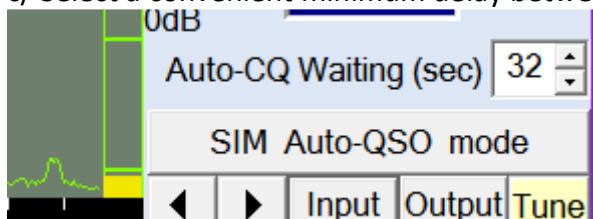
- Calling CQ-Auto every delayed time.
- Listening for other manual station response within +/-15 Hz.
- Checking for correct callsign's received using Checksum.
- Sending a QRZ? Request if detected callsign is not already sure.
- Answering by sending info's as a first round.
- Decoding info's of received station.
- Filling log fields by decoded info's (NAME , QTH, QRA LOC, RSQ ...) automatically without any manual assistance.
- Answering by sending decoded (NAME + QTH) +73 message on second and final round of the Semi-Automatic QSO.
- Saving automatically QSO info's to the Local SIM-Logbook.
- Saving automatically QSO info's to the other local Logbooks as **HRD-Logbook, DXKeeper, SwissLog, Logger32, MixW2, Log4OM** and other TCP server of available logbooks, if selected.
- Saving automatically QSO's ,in real time, to web service's Log's if selected and internet was allowed (**eQSL.cc, QRZ.com, HRDLog.net, HamLog.eu, ClubLog.org, HAMQTH.com....**) .

9/ How Can I put my station on Semi-Automatic mode ?

a/ Listen to the band for at least 10 minutes to mark most active frequency's.

b/ Select a free cursor frequency by clicking left button on free spectrum position.

c/ Select a convenient minimum delay between CQ-Auto calling



d/ Click " SIM Auto-QSO Mode" button at left main window.

e/ a popup window will be displayed , then you can Setup info's to be send in first and second round , Click Ok , and station become Semi-Automatic , don't try to interfere manually , it's or automatic or manual, no possible way to mix the two modes.

10/ How can I save My current QSO?

At the end of a QSO , and after checking for the QSO info's exactitude (NAME, QTH, QRA LOC), you can click over "Save qso" Button located on main window and then it ask you to enter some comments and click "OK" Button , then QSO will be stored to the local SIM LogBook , in add the program will try to send them automatically at the desired checked local logbook as **HRD-Logbook DXKeeper, SwissLog, Logger32, MixW2 , Log4OM** an other TCP server of available Logbooks or to Web Log's as **eQSL.cc , QRZ.com,HRDLog.net, HamLog.eu,ClubLog.org and HAMQTH.com .**

11/ How can I edit or modify my SIM-log Book ?

Menu → Log → SIM-LogBook

12/ How can I view my SIM logBook separately from program?

For a separate program viewer of your SIM_LogBook

Menu → Log → SIM_LogBook viewer

With this separate program, you can display permanently your LogBook in a free corner of your screen (for who have a large screen) , but only for view , modification are not allowed here.

13/ How can I export my QSO's to my favourite Log program?

All your old SIM QSO's should be saved at the local SIM-LogBook, so you can access to all your old saved QSO's easily any time you want. ADIF file should be the standard method for exporting your SIM31 QSO's to other Log program's.

menu bar → Log→ Export QSO's , a popup window will be displayed , fill in the asked parameters and then Click "Export Selected QSO's" button .

14/ How can I save my Local SIM Logbook before formatting a C: Hard Disk ?

The local SIM logbook data base was in a unique file:

C:\SIM_PSK31\DataLog_SIM.dta so just save this file in secure place before formatting your C:\ hard disk , after formatting the disk please replace the saved file to the same folder C:\SIM_PSK31\ , then your old database QSO's will be recovered .

It's also possible to export the all Logbook records to an Adif standard file, afterward this file can be imported by the program log menu.

15/ How can I export my old local SIM Logbook when changing for a new PC ?

Similar to the upper question, is to move the old data base file
C:\SIM_PSK31\ DataLog_SIM.dta to the new PC at the same
C:\SIM_PSK31\ folder name .

NB: DataLog_SIM.dta have "read only" file attribute.

Otherwise, ADIF file import function can be also used when changing to a new PC and before working some new QSO's.

16/ How can I adjust the Tune length ?

For Simple click down, Tune button delay should be adjusted from :
menu bar → Setup → Macros → Tune Length.

NB: Tune Button can be remain clicked down as long time as wanted manually by mouse Button.

17/ How my plot can be reported to PSK-Reporter map ?

Check Menu_bar → Psk-R → Enable Auto PSK-Reporter

This need pc already connected to the internet.

18/ Can I see who has reported me to PSK-Reporter map ?

Yes by menu bar → Psk-R → Go to My PSK-Reporter Map.

19/ How I can be alerted by a Wanted callsign ?

SIM program has his own callsign SIM-Alerter :

Menu → Alerter → SIM Alerter

You can be alerted by a Yellow colour when a desired callsign has meet the desired criteria :

- Wanted Continent.
- No worked CQ-Zone.
- No worked ITU-Zone.
- No worked DXCC country.
- No Worked Callsign since .
- Wanted CQ-Zone.
- Wanted prefix.
- Wanted Callsign ...
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