About the collection of Multipsk sound files

1) Use of this collection of 97 sound files (*.WAV)

The goal of this collection of sound files is to train the user on digital modes decoded by Multipsk. For this, a sound file is found for each given mode permitting the user:
- To listen to the type of sound generated by the mode in transmission (except for the modes decoded in SDR).
- To see how its spectrum appears on the "waterfall",
- To see how proper decoding looks, and
- To test the different controls.

Most of the modes have an associated sound file. They can be decoded:

- Either from an audio (mono) signal.

- Or, in SDR ("Software-Defined Radio") from a non-demodulated IQ signal. It must be noted that the three modes RDS, LRPT and ADSB can only be decoded in SDR, due to their very wide bandwidth. The other modes can be decoded both ways. However, modes having a wide bandwidth (VDL2 for example) can, favorably, be decoded in SDR mode, with the SDR receiver directly interfaced with Multipsk.

Moreover, sound files associated to RS ID and CALL ID pseudo-modes are provided (see explanations further).

There is no ADSB sound file because the decoding can only be done with a SDR receiver interfaced with Multipsk, due to the very wide bandwidth required. Moreover the WAV file would be enormous. However, it is easy to monitor the ADSB frequency (1090 MHz) with a SDRPlay or a RTL/SDR dongle directly interfaced with Multipsk.

There is no LRPT sound file. The LRPT mode, associated with the Russian satellite METEOR-M2, provides quality satellites pictures. This mode is a bit complicated because it needs the "M2_LRPT_Decoder.exe" program to decode and display the received picture. For those interested by this mode, refer to the Multipsk manual.

Pseudo-modes RS ID (Reed-Solomon IDentifier) and Call ID
These two digital modes work over most of Ham modes (i.e. simultaneously):

- The RS ID permits to automatically identify a mode and the AF transmission central frequency. The sound file proposed is called "RS_ID_QPSK31.WAV". It will make switch Multipsk from a Ham mode ("BPSK31" for example) if the "**RX RS ID**" button (above the waterfall) is pushed, towards the QPSK31 mode and on the transmission AF frequency.

- The Call ID permits, for example, to transmit your call sign, Locator and several pieces of data about your station. The sound file proposed is called "CALL_ID_F6CTE_JN18.WAV". It will be decoded from a Ham mode ("BPSK31" for example) if the "**RX Call ID**" (above the waterfall) is pushed. Click on the "**ID**" button (top of the screen) to see the Call ID information received.

Here are WEB addresses for information about part of the Multipsk modes:

- http://f1ult.free.fr/DIGIMODES/MULTIPSK/digimodesF6CTE_en.htm by Pascal (F1ULT)

- https://wiki.radioreference.com/index.php/HF_and_LF_Modes_used_by_MultiPSK by Mike (KA3JJZ)

There is also a lot of information (documents, videos...) on the Multipsk site: http://f6cte.free.fr/index_anglais.htm

It will be found below an old presentation of Multipsk (2006):
http://f6cte.free.fr/Multipsk_presentation.pdf in English
http://f6cte.free.fr/Multipsk_presentationneu.pdf in German
http://f6cte.free.fr/Presentacion_de_Multipsk_definitivo.pdf in Spanish
http://f6cte.free.fr/Multipsk4_pl.pdf in Polish

Moreover, technical questions can be asked, in English, to the IO Multipsk discussion group https://groups.io/g/multipsk, but not directly to the author.

2) Several Multipsk notions and hints for beginners

About the two main screens ("Configuration" and "RX/TX")

- The "**Configuration**" screen is the first screen met when Multipsk is started. It's there that are configured the main Multipsk settings. For about the manual about the controls of this screen, click on the "**Help**" button. All the part above "**RX/TX screen management:**" concerns the Configuration screen.

- The "**RX/TX**" screen is the screen met when the "**RX/TX screen**" is clicked from the Configuration screen. It is the screen where all the coding and decoding operations are made. For about the manual about the controls of this screen, click on the "**Help**" menu item at the top of the screen. All the part below "**RX/TX screen management:**" concerns this screen.

Calibration of the sound card (useless for SdR receivers interfaced with Multipsk and for the sound files decoding)

It is recommended to calibrate the sound-card: click on the "**Adjustments**" menu item, then select the "**Determination of the RX/TX**

sound-card sampling frequencies" option and push on the "**Determination of the 48 KHz RX sampling frequency (test on 3 minutes)**" button. At the end of the test, click on "**Return**", except if you do transmission, in which case you will have to start "**Determination of the offset between TX/RX**...".
If the RX sampling frequency is very close to 48000 Hz (let's say between 47950 and 48050 Hz), it is better to manually set the RX frequency to 48000 Hz.

Sound level

About the sound level ("**Level**" indication in % at the top of the screen): an AF level superior or equal to 10 % is correct. About 50 % is ideal (but not critical). In case of a very low AF level, select "16 bits" in the "**Determination of the RX/TX sound-card sampling frequencies**" option of the "**Adjustments**" menu item.

About the help in Multipsk

- To bring up the text manual (contextual sensitive one), click on the right button of the mouse, with the cursor over the mode button "**BPSK31**", for example, or any other button. In the example, only the BPSK31 help will be displayed.

- Also use the button hints. For this, wait a fraction of second over a button.

About frequencies

Click on the "**QRG**" button to get all the HF used frequencies, for the chosen mode.
Click also on "**Mode**" then "**Frequencies used**", or directly click on the "**Frequencies**" menu item, for more information about frequencies.

For about CW, RTTY configuration
Click on the "**Mode**" button for the different options (bandwidth, speed…).

3) How to use the sound file in decoding

Preliminary
Recording of the sound files is not of good quality (above all for the 20 first seconds), but it is sufficient for the decoding as it finally leads to a weak number of decoding errors.
For a mode having several sub-modes (as, for example, the Olivia mode), it is only recorded and so proposed the main sub-mode.

Name of not SDR files
The file name begins by the mode name (for example "M10.wav" for the M10 mode).
It can be possibly followed by the sub-mode mode and by an AF frequency that the user will have to adjust on the "waterfall". For example: CONTESTIA_32_1K-1000_Hz.WAV, where the mode is "CONTESTIA", the sub-mode is "32-1K" and the AF frequency is 1000 Hz.

Other examples in AUTEX mode: « AUTEX_2 » is the sub-mode for a meeting between 2 Hams maximum whereas « AUTEX_4 » is the sub-mode for a meeting between 4 Hams maximum.

Name of SDR files

The mode name is followed by "_SDR" (for example "RDS_SDR.WAV"). In that case, the "**Direct via the sound card**" button on the Configuration screen must be clicked before clicking on the "**RX/TX screen**" button. For the RDS mode, the "**+Speaker**" button can possibly be pushed to listen to the demodulated sound issued from the FM station.

If a frequency is added (as in "VDL2_SDR_0_Hz"), it is the SDR frequency adjustable on the SdR window called "**I/Q direct interface via the sound card, for SdR transceivers**".
Note: in the "VDL2_SDR_0_Hz" example, the frequency is at 0 Hz.
However, one must always avoid the nil SDR frequency and prefer a not-nil frequency as +/-12000 Hz for example in VDL2. So "VDL2_SDR_0_Hz" is a bad example.

Decoding of sound files

The user must start from the initial configuration (by default). Where appropriate, click on the "**By default**" button of the Configuration screen ("**Parameters**" panel)

In a general way, for a user having a Multipsk user key, to decode a sound file (*.WAV), in a given mode:

- On the Configuration screen, if the file name contains "_SDR", click on the "**Direct via the sound card**" button.

- On the Configuration screen, click on the "**RX/TX screen**".

- On the "**RX/TX screen**", select the chosen mode, either on the "Amateur modes" panel or on the "Professional modes" ("Utilities") panel.

- Come back to the Configuration screen by clicking on the "**Configuration screen**" option at the level of the menu item "**Configuration**".

- In the "**Decoding: from the sound input or a file**" panel, select the sound file then check (notch) "Sound file". It is also possible to listen to it by clicking on the "**Play**" button. Click on the "**RX/TX screen**". The decoding starts immediately, but not necessarily in the good AF frequency.

- On the waterfall; click on the AF frequency as specified in the file name (if any). According to the mode (not in JT65...), it can be possible to re-play the file by clicking on the "|**<<.Position=**..." button.

For a user not having a Multipsk user key, the sound file must be played by a utility program, connecting the output and the sound card input by a cable. It is reminded that for the professional modes, after 5 minutes Multipsk switches to BPSK31. In this case, Multipsk must be stopped and re-started for 5 new minutes of decoding.

Some remarks about the sound files

- Several modes manage positions which can be, in general, displayed with "Display all on" and "Local map".

- The decoding of certain modes, as RTTY, ASCII and JT65, is not synchronized with the waterfall. So the decoding is much quicker than the waterfall descent. In JT65, the waterfall in not managed (when playing a sound file only).

- AMTOR ARQ: this mode is similar to SITOR A, except that the characters set is wider. SITOR (A or B) is used by ships. AMTOR is used by Hams.

- The RTTY100/110/150/200 modes are similar to the RTTY75 mode, apart the modulation speed. So there are no specific files for these modes.

- It is reminded that for CW and RTTY modes, the "**Mode**" button must be clicked to get the different options (bandwidth, speed…).

- Certain modes manage several functions (EPIRB, for example). The WAV file refers to only one function.

- Note that the POCSAG_bits_inverted.wav file has been recorded with a much too weak level (between 0 and 1%). The level must be at a minimum of 10 %. So this is an example that should be avoided. Moreover, for this file, the « **Inversion** » button must be clicked.

4) List of the sound files

These sound files are stored in ZIP files:
- first the ones beginning by a figure are stored in the "1-2-3-4.zip" file, so for "110A" to "4285" modes,
- afterwards, the ones beginning by a letter are stored in a ZIP file which name contains their first letter. For example, the BIIS mode is stored in the "B-C-D.zip" file.

The ZIP files are downloadable here:
http://f6cte.free.fr/1-2-3-4.zip
http://f6cte.free.fr/B-C-D.zip
http://f6cte.free.fr/E-F-G-H-I-J.zip
http://f6cte.free.fr/L-M-N-O.zip
http://f6cte.free.fr/P-Q.zip

<u>Note</u> : technical questions about Multipsk and about this collection of sound files can be asked, in English, to the IO Multipsk discussion group.

Amateur modes (63)
141A_DBM_NORMANDIE-1625_Hz.WAV
141A_FAE-1625_Hz.WAV
ALE400_CALL_DBM-1625_Hz.WAV
ALE400_FAE-1625_Hz.WAV
AMTOR_FEC-1000_Hz.WAV
ASCII-1000_Hz.WAV
AUTEX_2-1000_Hz.WAV
AUTEX_4-1000_Hz.WAV
BPSK31-1000_Hz.WAV
BPSK63-1000_Hz.WAV
BPSK125-1000_Hz.WAV
BPSK250-1000_Hz.WAV
CCW_FSK_24-1000_Hz.WAV
CCW_OOK_24-1000_Hz.WAV
CHIP64-1000_Hz.WAV
CONTESTIA_32_1K-1000_Hz.WAV
CW-1000_Hz.WAV
DominoEX-1000_Hz.WAV
DominoF-1000_Hz.WAV
DTMF-1000_Hz.WAV
EM.WAV
EM_LOCATOR_BEACON.WAV
EM_GPS_BEACON.WAV
FAX_Hambourg-2250_Hz.WAV
FELD_HELL-1000_Hz.WAV
FM_HELL_245-1000_Hz.WAV
FT4.WAV
FT8.WAV
HELL_80-1000_Hz.WAV
JT65-1000_Hz.WAV
LENTUS-1000_Hz.WAV
MFSK8-1000_Hz.WAV
MFSK16-1000_Hz.WAV
MT63-1000_Hz.WAV
NDB-PHG-1506_Hz.WAV
OLIVIA_32_1K-1000_Hz.WAV
PACKET_APRS.WAV
PACTOR-1000_Hz.WAV
PAX -1000_Hz.WAV
PAX2 -1000_Hz.WAV

PSK_HELL-1000_Hz.WAV
PSK10-1000_Hz.WAV
PSK63F-1000_Hz.WAV
PSK125R-1000_Hz.WAV
PSK220F-1000_Hz.WAV
PSKAM31-1000_Hz.WAV
PSKFEC31-1000_Hz.WAV
QPSK31-1000_Hz.WAV
QPSK63-1000_Hz.WAV
QPSK125-1000_Hz.WAV
QPSK250-1000_Hz.WAV
QRSS_1sec-998_Hz.WAV
RTTY45-1000_Hz.WAV
RTTY50-1000_Hz.WAV
RTTY75-1000_Hz.WAV
RTTYM_32_1K-1000_Hz.WAV
SSTV_BW24_QR_CODE.WAV
SSTV_Martin1.WAV
THOR11-1000_Hz.WAV
THROB_2-1000_Hz.WAV
THROBX_2-1000_Hz.WAV
VOICE-1000_Hz.WAV
WSPR.WAV

Pseudo-modes (2)
CALL_ID_F6CTE_JN18.wav
RS_ID_QPSK31.WAV

Professional modes (32)
110A.wav
1382_GPS_positions.WAV
4285.WAV
ACARS.wav
AERO_SDR-6280_Hz.wav
AIS.wav
ARGOS_ORBIT.WAV
ARQ_E_96B_200HZ-1100_Hz.WAV
BIIS.WAV
C4FM.wav
COQUELET-1003_Hz.WAV
DFM.wav
DGPS_100-1000_Hz.WAV
DMR.wav
DSTAR.WAV
EGC-1986_Hz.wav
EPIRB.WAV
GMDSS-790_Hz.wav

HFDL.WAV
IEC_870_5-1170_Hz.WAV
LMS6.WAV
M10.wav
NWR_SAME_WASHINGTON.wav
ORBCOMM.wav
P25.WAV
POCSAG_bits_inverted.wav
RDS_SDR.wav
RS41.WAV
SELCAL.WAV
SITOR_A-1590_Hz.wav
SYNOP-1580_Hz.WAV
VDL2_SDR-0_Hz.wav