

LENTUS EASY WITH MULTIPSK (4.21.1)

Introduction

In this document it will be found several snapshots of Multipsk screen with indications to the « how to operate », which shows the basic functions of the LENTUS (slow, indolent, nonchalant, quiet... in latin) mode.

This mode is used for QRP transmissions (down to a minimum S/N ratio of -34 dB, with first decoding at -36.5 dB) either in LF, MF and HF (14 MHz maximum) but not beyond.

For questions about Lentus, ask them on the Multipsk Yahoo group (<http://groups.yahoo.com/group/multipsk/>).

There is a Yahoo group only dedicated to Lentus:

(<http://groups.yahoo.com/group/MULTIPSK-LENTUS/>).

For Lentus skeds, there is a good address: <http://www.obriensweb.com/sked>

Note 1: Lentus use is not very different from JT65 use (on Multipsk).

Note 2: due to some bugs existing in the Multipsk 4.21 version (first release of this mode), this version must not be used for Lentus QSO. Instead, it must be used Multipsk version 4.21.1 or following ones.

Recommended frequencies

The recommended frequencies (on the XCVR) are the following (with an AF frequency of 1000 Hz, in USB): 136.3, 1837.0, 3589.0, 7037.5, 10138.7, 14074.0, **14095.6** KHz. In all cases, the frequencies chosen (HF+AF) must coincide with a 100 Hz division (900, **1000**, 1100 Hz...on the waterfall)..

About the help in Multipsk:

- * for the contextual help, click on the right button of the mouse, with the focus over the mode button ("LENTUS" in this case).
- * use also the button hints (wait a fraction of second over a button).

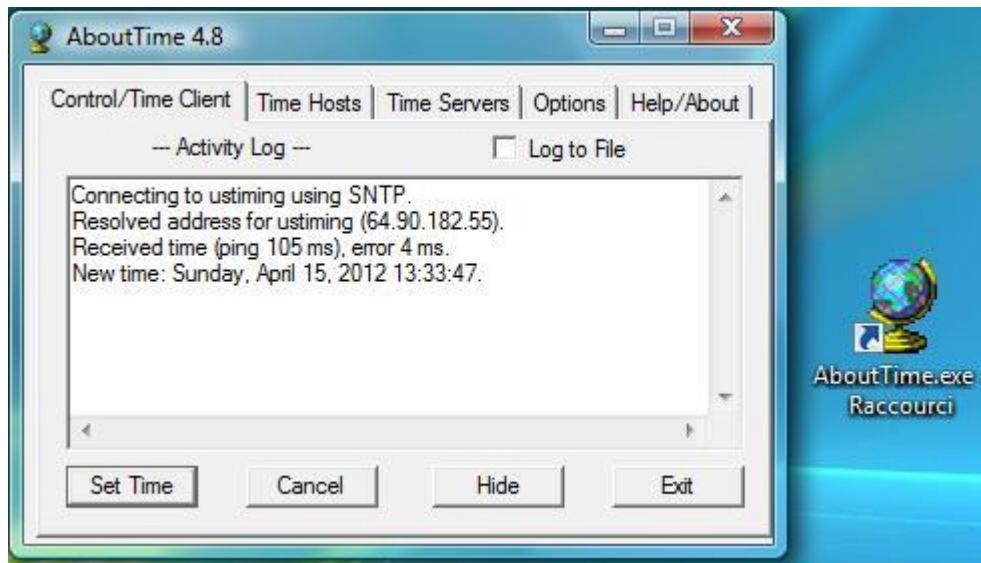
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PC time adjustment

The transmission of a LENTUS frame must begin theoretically at the fourth second of the minutes 0, 5, 10,...,50, 55 with a tolerance of +/-0.1 sec on the PC clock. So it will be necessary before beginning to do LENTUS, to set your PC clock to the right time through Internet.

For this, it must be used the very accurate time from an Internet Time Service as the NSIT, through a SNTP or NTP protocol (but not through the RFC-868 Time Protocol) so to have an accuracy widely better than 50 ms. The use of the “AboutTime” freeware (<http://www.arachnoid.com/abouttime/>) is widely encouraged as the PC time error is determined by the soft, simply by setting time twice, the second time (and the followings) will give the PC time error (4 ms below).



The time service “**nist1-ny.ustiming.org**” works well (to add in the page "Time Hosts", function "Add"). Also see <http://tf.nist.gov/tf-cgi/servers.cgi>.

It is recommended to, automatically, set time each 30 minutes (page "Options", check "Set time at" 30 minutes intervals).

Attention: it must not be used GPS time because the accuracy by these means is not sufficient (+/- 1 sec for +/- 0.1 sec required). Clock (the companion of Multipsk) can, possibly, be used only if the PC is powerful and if the time station is very well received (as Allouis in France for example).

Other adjustments

- **HF frequency accuracy**

Due to the very low S/N ratio, it is possible neither to hear the Lentus signal nor to see it on the waterfall. So the transceiver must be very precisely tuned, to be sure to be on the right frequency. For this:

- first make work the transceiver (in reception) at least one half an hour, for temperature stabilization,
- if not residual (<10 Hz), determine the offset of the transceiver for a given HF frequency using a fixed WWV carrier (see help for details).

- **Sampling frequency and AF level**

It is strongly recommended to calibrate the sound-card: click on the "Adjustments" menu button, then select the "Determination of the RX/TX sound-card sampling frequencies" option.

If the AF level is not sufficient, modify the adjustments on the mixer (sound card input).

Menu "Adjustments" then "Determination of the RX..."
 Click on the button "Determination of the 48 KHz..."
 and, afterwards, on "Determination of the offset..."

AF level indication: aim at about 50 % (not critical)

The screenshot shows a software window titled "Determination of the RX and TX sound card sampling frequencies". The window has a menu bar with "Configuration", "Adjustments", "Options", "Tools", "PSKReporter", "Panoramic", and "Help". The main area contains instructions and controls for testing the sound card. It includes buttons for "16 bits", "Sound card 48 KHz", "Sound card 44.1 KHz", "Return", and "Help". Below these are instructions: "PSE, after each automatic determination, leave the result as it has been found. Your sound card can be a modern one at 48 KHz or an old one at 44,1 KHz." There are two main steps: "First step: determination of the 48 K RX sampling frequency (standard=48000)" with a control for "48000 samples/second" and "Second step: determination of the offset between RX and TX sampling frequencies" with a control for "Determination of the offset between TX/RX 48 KHz frequencies...initially: 0 samples/s".

On the right side of the screenshot, a mode menu is visible. It shows a "Level: 45 %" indicator. Below it is a grid of mode buttons: BPSK31, QPSK31, PSKAM10, PACKET+APRS, RTTY 45, THROBX, PAX/PAX2, FM HELL, Filters, Analysis, Binaural, Amateur modes, PSK10, CHIP, PSK220F, CW, CCW, MFSK16+PIC, MFSK8, JT65, OLIVIA, FELD HELL, HELL 80, ALE400, HF FAX. The "Level: 45 %" indicator is highlighted with a red box and an arrow pointing to it from the text "AF level indication: aim at about 50 % (not critical)".

Personal data useful for Lentus

Click on LENTUS then on the Personal button.

The image shows two parts of the LENTUS software interface. The top part is a 'my personal data' dialog box with the following fields:

- <MY CALL>: F6CTE
- <MY NAME>: (empty)
- <MY QTH>: (empty)
- <MY LOCATOR>: JN18ET
- <MY LATITUDE>: 48-49.86N
- <MY LONGITUDE>: 002-22.00E
- <WEB ADDRESS>: (empty)
- <WEB SITE>: (empty)
- <RIG>: (empty)
- <ANTENNA>: (empty)
- <NOTE 1>: (empty)
- <NOTE 2>: (empty)
- <NOTE 3>: (empty)
- <NOTE 4>: (empty)

Buttons at the bottom of the dialog are 'Cancel', 'Save', and 'Help'. A text box says: 'The fields used in Lentus are these ones. Note: for latitude and longitude the format is fixed (i.e, for longitude, don't write -2.22E but 002-22.00E)'. Another text box says: 'Click on "Save" after filling the fields.'.

The bottom part of the image shows the 'LENTUS TX panel' with the 'Personal' tab selected. A box highlights the following fields:

- Station info: CQ F6CTE / JN18ET
- Meteo info: CQ F6CTE JN18ET T= 20 C Wind: Calm Weather: Sunny Hum: Normal
- Complete call: CQ / F6CTE / JN18ET
- Latit. / Longit.: CQ F6CTE 48-49.86N 002-22.00E
- Answer 1: HISCALL F6CTE JN18
- Answer 2: HISCALL F6CTE / 0 dB
- End of QSO: HISCALL F6CTE / 73 GB SK

Other fields in the TX panel include HF power (20 W), Antenna (Vertical), Dir (Omni), and a list of messages (MESSAGE 1 to 5) with 'Free' status.

Text boxes with arrows provide instructions: 'Click on LENTUS' points to the top right of the dialog; 'Click on "Personal". Then the window "My personal data" will appear.' points to the 'Personal' tab; 'The fields will be automatically filled with the personal data.' points to the highlighted fields in the TX panel.

Lentus reception

The screenshot shows the PSKReporter software interface. The main window displays a QSO window with the following details:

- Station info:** CQ F6XYZ / JN15RG HF power: 20 W Antenna: Vertical Dir.: /
- Meteo info:** CQ F6XYZ JN15RG T= 20 °C Wind: Calm Weather: Sunny Hum: Normal
- Complete call:** CQ / F6XYZ / JN15RG CQ MESSAGE 1 Free 1
- Latit. / Longit.:** CQ F6XYZ 45-16.50N 003-25.67E CQ MESSAGE 2 Free 2
- Answer 1:** F6CTE * F6XYZ JN15 CQ MESSAGE 3 Free 3
- Answer 2:** F6CTE * F6XYZ / 9 dB * CQ MESSAGE 4 Free 4
- End of QSO:** F6CTE * F6XYZ / 73 GB SK CQ MESSAGE 5 Free 5

The RX/TX window shows a received message:

Time	dB	Hz	Hz/mn	Received
13:19	07	1000	-0.0	Beacon: F6CTE JN18ET Power: 20 W Antenna: Broad band Directivity: Omni.
13:24	-02	1000	-0.1	Beacon: F6CTE JN18ET Power: 20 W Antenna: Broad band Directivity: Omni.
13:29	09	1000	-0.0	F6CTE JN18ET Power: 20 W Antenna: Broad band Directivity: Omni.

Annotations below the table explain the columns:

- Time of reception
- S/N (Signal to Noise ratio)
- Central RX frequency
- Drift in Hz/mn
- Message received

The "Frequencies.TXT" window is also visible, showing a list of frequencies and modes:

Frequency (KHz)	Mode	Notes
136.300	Forward	QSO or beacon
1837.000	Forward	QSO or beacon
3589.000	Forward	QSO or beacon
7037.500	Forward	QSO or beacon
10138.700	Forward	QSO or beacon
14074.000	Forward	QSO or beacon
14075.600	Forward	Beacons only
28124.600	Forward	QSO or beacon. Only for very stable XCVR

Note: Lentus receptions can automatically be reported to PSKReporter (menu "PSKReporter" on the top of the RX/TX window).

Lentus Transmission in beacon mode

Click on a beacon button and then select the message to transmit. On selecting the message to send, the text of the message appears. Confirmation of the mode selected (beacon)

The beacon will transmit at minutes 0, 5, 10, ..., 50, 55 The beacon will transmit each 30 minutes

Answer 1	HISCALL	F6CTE	JN18	CQ	MESSAGE 3	Free 3
Answer 2	HISCALL	F6CTE	0 dB	CQ	MESSAGE 4	Free 4
End of QSO	HISCALL	F6CTE	73 GB SK	CQ	MESSAGE 5	Free 5

It is possible to use a LENTUS beacon, transmitting at different periods:

- the "0, 5, 10..." (minutes) button: if this button is pushed, the selected message is repeated each 5 minutes (without any possible LENTUS reception),
- the "0,10..." (minutes) button: if this button is pushed, the selected message is repeated at minutes 0, 10, ..., 50 (with reception of a possible answer at minutes 5, 15, ..., 55).
- the "5,15..." (minutes) button: if this button is pushed, the selected message is repeated at minutes 5, 15, ..., 55 (with reception of a possible answer at minutes 0, 10, ..., 50),
- if the "Period" button is pushed, the selected message is going to be transmitted with the indicated period in minutes (15 to 90 mn).

Lentus Transmission in QSO mode

On selecting the message to send, the text of the message appears.

Click on a QSO button and select the message to transmit.

Confirmation of the mode selected (QSO)

Note: after each transmission (CQ or Answer), the message (here "Latit./Longit.") is deselected.

Reversely, in beacon mode the message remains selected.

Click on this button to transmit your precise geographical position (latitude, longitude), the position accuracy being equal to +/- 9 m

If you want to transmit an any possible minute (0, 5, ..., 55)

Preferably, to send a CQ (at minute 0, 10, 20, ..., 50)

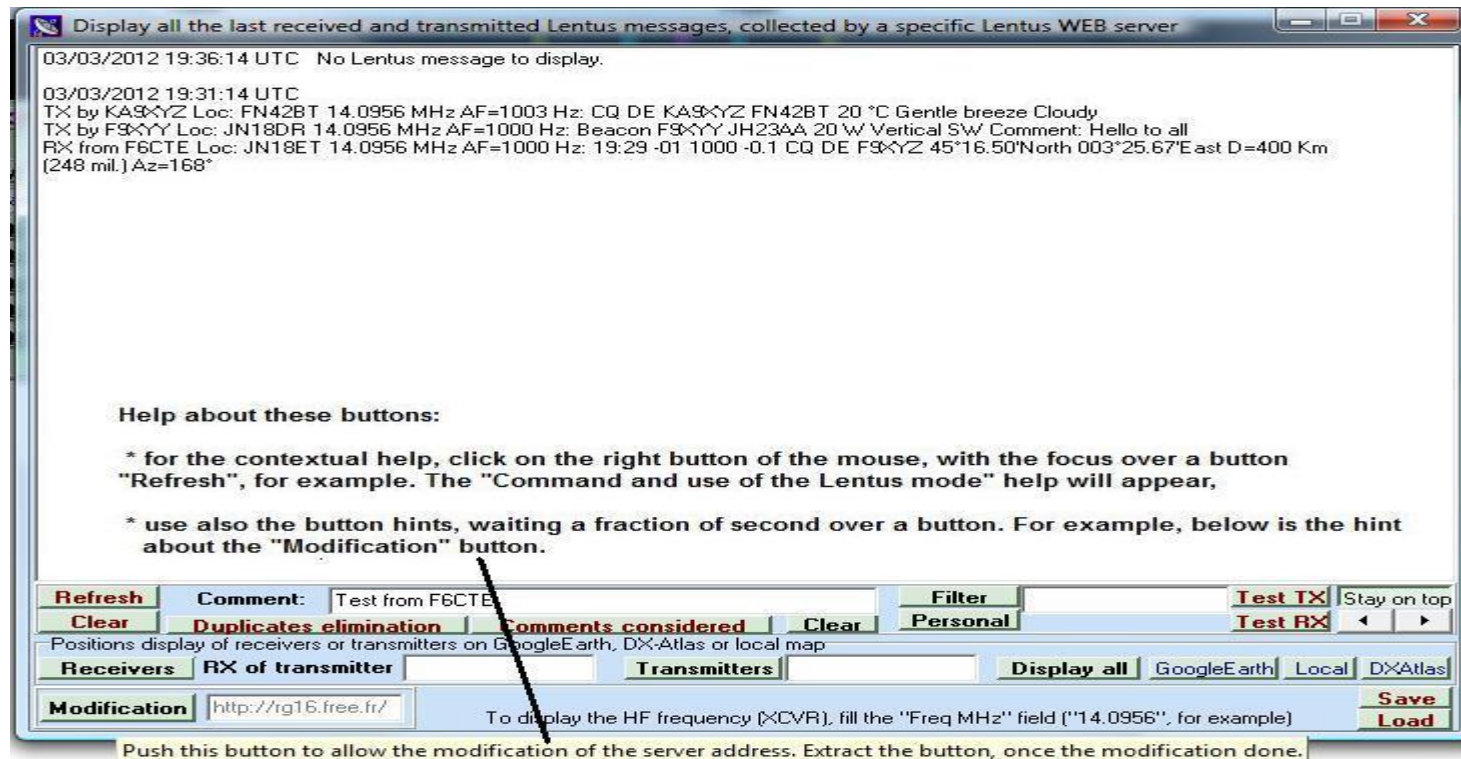
Preferably, to answer (at minute 5, 15, 25, ..., 55)

This is an example of minimum QSO (with formatted messages):

- 1) **CQ F6CTE JN18AB** ("Complete Call" message)
- 2) **F6CTE F9XYZ JM17** ("Answer 1" message)
- 3) **F9XYZ F6CTE -20 dB 1.0 Hz/mn** ("Answer 2" message)
- 4) **F6CTE F9XYZ -34 dB 0.7 Hz/mn** ("Answer 2" message)
- 5) **F9XYZ F6CTE 73 GB SK** ("Answer 3" message)
- 6) **F6CTE F9XYZ 73 GB SK** ("Answer 3" message)

Using the Lentus traffic window

To reach the traffic window, click on the "Traffic" button and specify the frequency that you use (as SWL or Ham). Don't forget to fill your call sign (if you are a Ham) and, in all cases, your Locator, in your Personal data (see previous snapshot). It will be displayed all the last received and transmitted Lentus messages, collected by a specific Lentus WEB server.



Test on a Lentus recording



LENTUS.WAV

It is proposed to test Lentus with the above Lentus recording called LENTUS.WAV:

- Start Multipsk on the Lentus mode,
- Click on the above Lentus.WAV file and stop the playback,
- As soon as the time is at 4 seconds (or a very little moment before 4 seconds) after the minute 0, 5, 10, ..., 50, 55, start the playback,
- After about 4mn 35 sec, the decoded text appears. It must be seen the snapshot below (except the time).

BEACON 0, 5, 10... 0,10... 5,15... Period 35 Stop RX/TX QSO 0, 5, 10... CQ at 0,10... Answer at 5,15..										RX time + callsian + mode				
LENTUS TX panel										Control Personal QSO mode in progress		17:24:37 F9XYY LENTUS (France)		
Station info.	CQ	F6CTE	/	JN18ET	HF power:	W	mW	20 W	Antenna:	Vertical	Dir.:			
Meteo info.	CQ	F6CTE	/	JN18ET	T=	20 °C	Wind:	Calm	Weather:	Sunny	Hum:	Normal		
Complete call	CQ	/	F6CTE	/	JN18ET	CQ	MESSAGE 1	Free 1	Repeaters					
Latit. / Longit.	CQ	F6CTE	/	48-49.86N	002-22.00E	CQ	MESSAGE 2	Free 2	0.>>5.. 5.>>10..					
Answer 1	F9XYY	F6CTE	/	JN18	CQ	MESSAGE 3	Free 3	SNR min/max (dB):						
Answer 2	F9XYY	F6CTE	/	1 dB	CQ	MESSAGE 4	Free 4	-1 / 7						
End of QSO	F9XYY	F6CTE	/	73 GB SK	CQ	MESSAGE 5	Free 5							
Time	dB	Hz	Hz/mn	Received	Lat: 45.2500° North		Long: 3.4167° East							

17:24 01 1000 -0.0 CQ DE F9XYY JN15RG Power: 20 W Antenna: Broad band Directivity: Omni.