# VARIABLE FREQUENCY OSCILLATOR WITH DDS
For Felipe A. Calcavecchia LU5DJV

The oscillator is based on a board with AD9850 from Analog Divice of which are available in the online sales portal www.ebay.com. The oscillator is designed to be used as RF generator from 0 to 40Mhz or as a VFO for a transceiver taking into account the conversion of IF and offset SSB or CW.

OPERATION
The frequency can be varied with the encoder with steps selectable of 10Hz, 100Hz, 1kHz or 10kHz. Depending on the mode selected the output frequency matches the read on the LCD (generator mode) or is conversion to FI if used in SSB or CW mode (mode LSB, USB, CW).
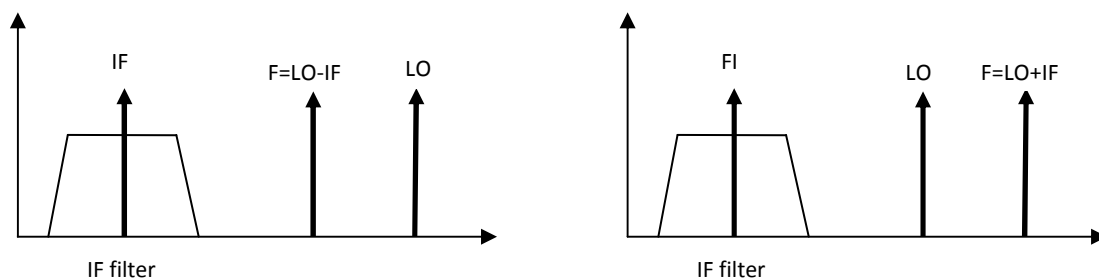
The oscillator frequency can jump from band to band for the displacement facilitate.
Another feature is to have two VFO's, that allows to work in duplex, transmitting on one frequency and receive on another.

METHOD OF USE
The circuit is powered by a DC source appropriately filtered from 9 to 12V. The OFV always starts in the last used frequency band. The RF output is 1Vpp. The circuit has four buttons like "touch". Some of the buttons have a dual function depending on how long are maintained under pressure. A short pressure acts on the basic functions while a long on special.
The key of TX / RX or PTT off the VFO in reception when VFO is in generator mode.

FUNCTION BAND: Pressing button BAND are going cyclically changing bands from 160m to 10m amateur bands including new.

FUNCTION MODE: Pressing the MODE button are going cyclically changing the generator mode, LSB, USB or CW.

FUNCTION VFO AB / SPLIT: Pressing the button in short form AB VFO oscillator is changed to another.
Pressing the button in the form long VFO AB Split mode is entered. In this mode and being in LSB, USB or CW when moving from TX to RX VFO is changed. To exit Split press again the button VFO AB in the form long .

FUNCTION STEP / SETUP: Pressing in short form STEP button will cyclically changing in steps or frequency jumps when rotating the encoder. These steps can be 10Hz, 100Hz, 1kHz or 10kHz and this is marked on the LCD frequency readout emphasizing the number changed.
Pressing the button in long form, is passed to SETUP function. Rotating the encoder searches menu the parameter to be changed. Then click on the STEP button in short form to enter and modify the value.

1) **IF OFFSET:** To make this adjustment the DDS should be in reception (Rx), then the VFO is placed automatically in the generator and encoder finds the center FI channel. To store the value you must press the button in form long STEP.

2) **SSB OFFSET:** Here is placed the value at half the bandwidth of the SSB filter. So if the filter is 3000Hz should be placed 1500Hz .

USB=LO-SSB   FI   LSB=LO+SSB

Filtro BLU
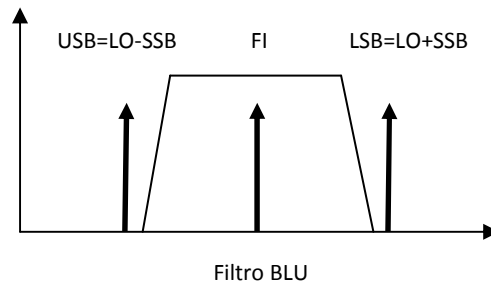
   Is calibrated on the upper sideband.
   For the case of LSB to frequency LO (local oscillator) is added the value of BLU. For USB subtracts the SSB to LO. To accept press in form long STEP button.

3) **CW OFFSET:** Similar to the case of SSB but for the bandwidth CW filter. Note that the conversion CW always done on the upper sideband.

4) **CONVERSION:** Here you select whether the conversion is positive or negative, ie if the output frequency of the VFO is LO + FI or LO-FI . To accept pres in form long STEP button.

5) **CAL. XTAL:** It help to correct the crystal reference of the DDS and then adjust its output frequency. For calibration use a frequency counter or tune whith a receiver a known broadcasting, then place the DDS in GEN function and search the display the same frequency of broadcasting. They must hear a beat signal, then go to Settings Menu and choose the function 5) XTAL CAL. Vary the encoder to hear the beat to zero and confirm by pressing the button STEP in long form.

6) **LICENSE:** Here you can edit the presentation of the display when the oscillator turns placing their own license. Look for the letter, number or character to be changed with the encoder and then pressed to accept STEP in short form . So on until the 6 spaces.

RESTORING VALUES

In the case of malfunction or errors in the internal memory can be reset the microprocessor and reinstall defoult values. To do this, turn on the VFO pressing the STEP / SETUP switch for a moment, the display will show the words "reset values" and then the boot logo.