

Operation Manual for Universal VFO/BFO

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Important Note: This is a work in progress and based on usage and the suggestions from users updation may be done in software and manual. Please refer to latest copies of both as and when available.

This work is combined fruit of efforts by many hams who have contributed to the development of ham community with their projects and experiences.

Design:

Arduino (At Mega 328P) chip controls the Si5351 Oscillators. The display is simple 2X16 character LCD. There are 7 pushbuttons connected to a divider network which can be read through Analog input of Arduino. A normal Rotary Encoder is used to adjust the frequency.

The action of switches are defined as follows :

Switches 0 & 1. Left (<) and Right (>) for shifting the underscore on the frequency display. Rotary encoder will change that digit under which the cursor is located. It is effectively the step size for rotary encoder.



Switch 2. VFO Selection : There are three choices of VFOs called as A, B and Memory. A and B are standard VFOs which can be tuned with rotary encoder. There are 20 memory channels where we can store frequencies of our choice for retrieving directly. Any of the three can be saved on EEPROM for getting back later.



Initially the A VFO is selected and on LCD “VFOA” is displayed. On pressing the VFO button once the B VFO is selected and “VFOB” appears on the display. The next press will select the Memory

VFO and go to Memory channel 1 . The memory channel is selected by < and > keys and the frequency is varied as usual by Rotary encoder.



Switch 3. Band Select: By pressing this button one can move from one band to the next . The Bands are defined in the program and can be selected as per our requirement there by providing the two extreme frequencies of the band. Initially 40,20,15 m and a BC band are programmed. Very easy to change in program.



Switch 4.Side band select: One can select USB, LSB, BC and CW by repetitively pressing this button for any frequency. Automatically the LSB is selected below 10MHz and USB above it. Both can be forced to any of the four.



Switch 5. BFO Tune: Tuning the BFO is very interesting as one can select the best RX and will get the best TX. On pressing this bottom BFO is displayed and its frequency is shown. Using Rotary encoder and < , > keys one can change its frequency and immediately feel the effect in audio of received signals.



Switch 6. Save : This button saves all the relevant current parameters on the EEPROM. A + sign is displayed when storing. VFOA, B and Mem are saved at their own seprate locations in EEPROM.

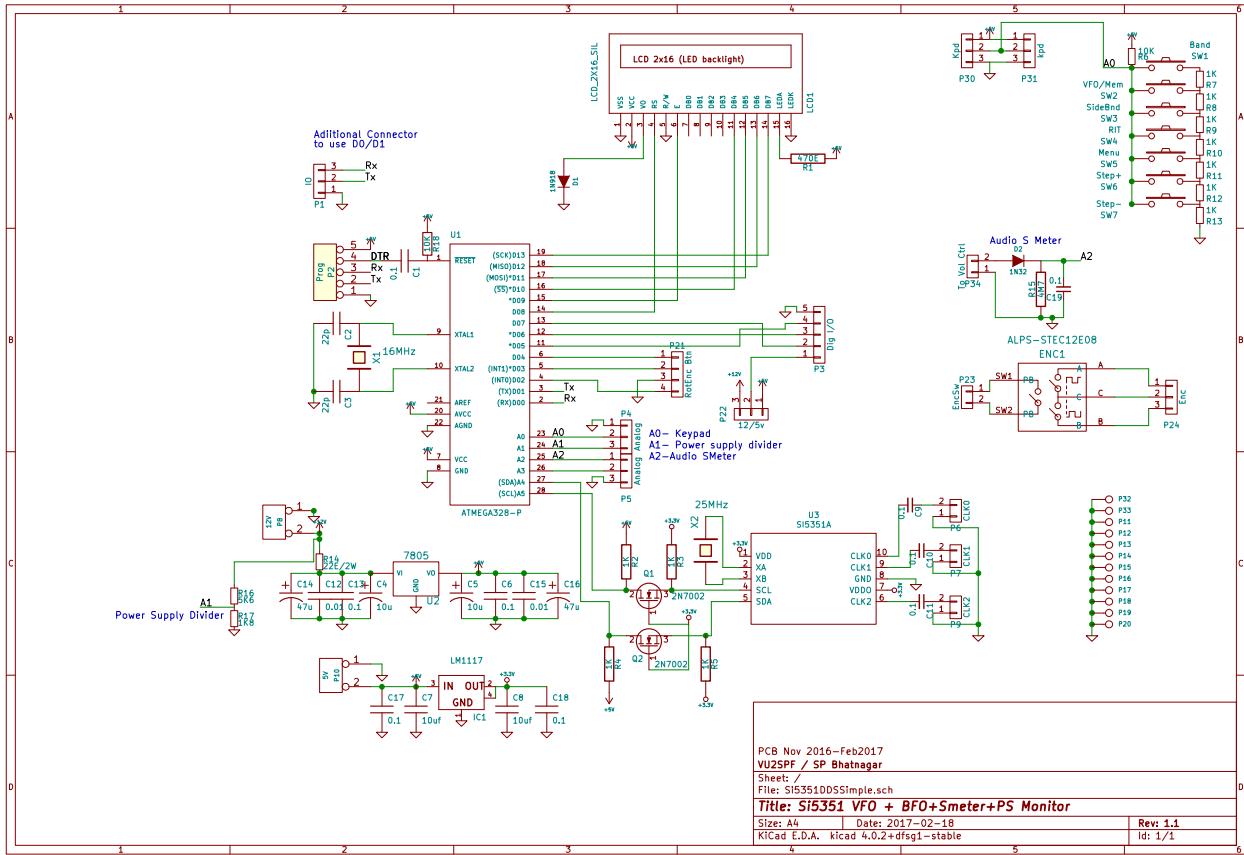


S Meter input, may be given for display as bars

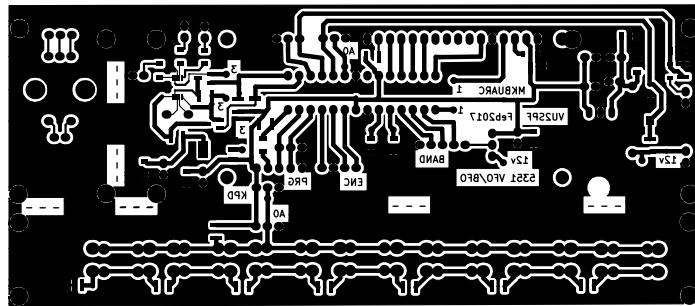
One of the VFO/BFO front Panel. Volume control on Top right, Mic/PTT input Bottom Right.



Circuit Diagram: Done in KiCad.



The PCB: Also created in KiCad.



Gerbers/PDF's for the PCB and the Arduino Sketch are available from vu2spf@gmail.com