



HBR4HF V3.0

4 Band HF Transceiver

Si5351 on board

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HBR4HF V3.0

Description :



HBR4HFS, is another 4-banders series from Hambuilder. It is a medium size desktop transceiver with big enough power. We try to keep it low cost, simple to operate and simple to maintain. This item actually an upgraded power of HBR4HFN with previously providing maximum 25W power out by using 2x IRF520 as the final transistor. We can still adjust the power out to QRP level (below 10W) if required.

specification :

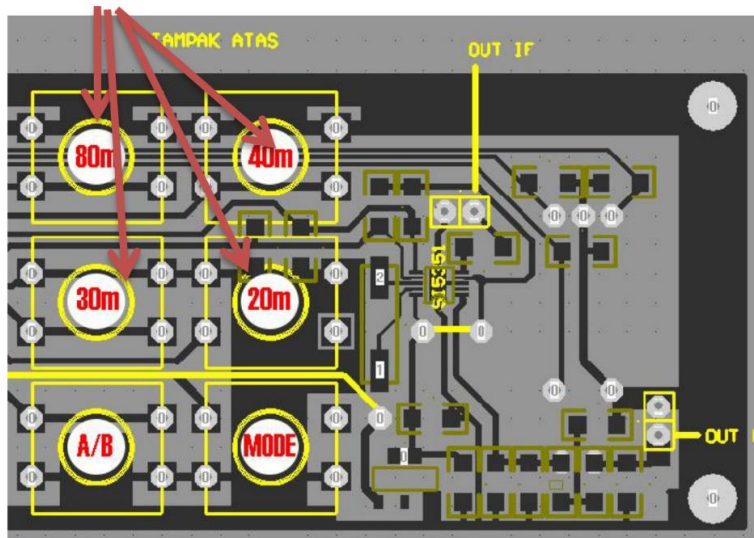
- *. 2.2 Inch TFT Display
- *. ATmega128 microcontroller
- *. ADE-1 main mixer
- *. Power out 25W at 80m, 20W at 40m, 15W at 30m, 10W at 20m
- *. RX gain setting
- *. TX gain setting (power out adjusting 0-25W)
- *. Mic gain setting
- *. 2 x IRF520 final transistor
- *. Morse generator, with ATTiny13 microcontrolle (tone modulated mic)
- *. PSU Voltage 13.8 V (12-13.8 V)
- *. 2 Watt, Speaker out
- *. 6 Button
- *. AF Gain Setting

PSU requirement

- Voltage 13.8V

Operation

1. **BAND** button

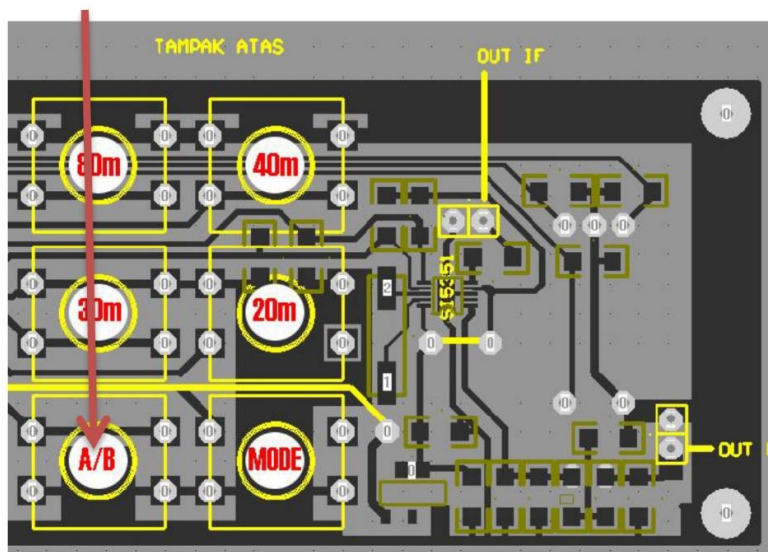


Band selection

- | | | | | |
|-------|---|------------|---|------------|
| • 80m | = | 3.500 MHz | - | 3.999 MHz |
| • 40m | = | 6.900 MHz | - | 7.500 MHz |
| • 30m | = | 10.100 MHz | - | 10.149 MHz |
| • 20m | = | 14.000 MHz | - | 14.349 MHz |

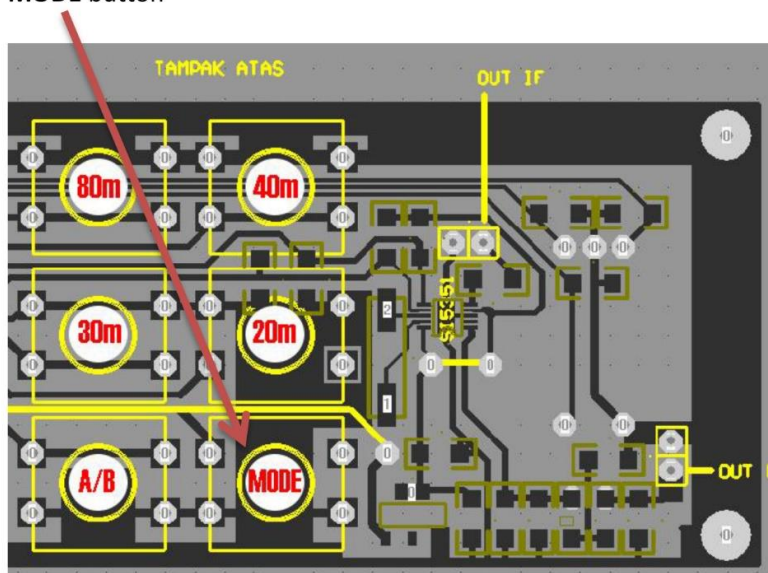
Each band have their own output control pin with active logic high 5V to pre-drive BPF dan LPF. Special for 26m the control band follow 30m band and CB will follow 10m band. Selected active band will store into microcontroller EEPROM after a few second.

2. VFO **A/B** button



VFO A/B button used to choose active VFO A or B, each band have A/B to selected VFO and will be store in microcontroller EEPROM after a few second.

3. **MODE** button



MODE Button used to choode modulation (LSB, USB, and CW). This button will drive output pin for selected modulation out pin and or drive BFO frequency out. This modulation pin out will have 5V high logic pin to drive external BFO for example.

Active mode will be store in microcontroller pin after a few second



Warning

- *. Setting this may change the transceiver performance
- *. Push A/B + Mode button (together) for setting value
- *. PLEASE DO NOT to change settings value unless you understand well
- *. The setting and calibration values are under the enclosure.

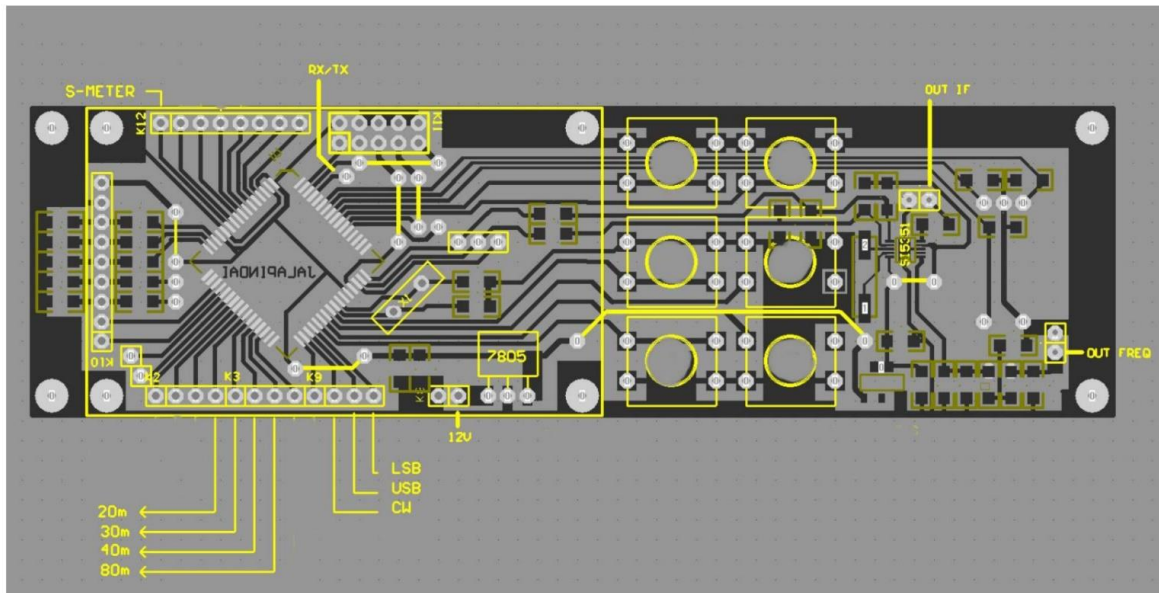
EEPROM Value setting

For the first time we need to set up the system such as correction value (calibration), IF and etc.

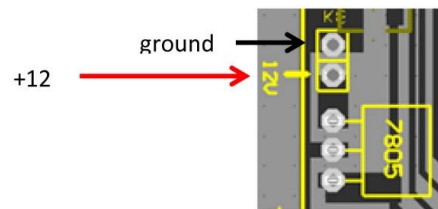
1. Correction menu will show up as default initialization.
Default correction value is zero except already calibrate. If we dont want to set the new calibration value, just push DWN button to skip then go to other setup.

Read the vfo value on VFO out pin. If counter read value did not show exact 10MHz please do rotate dial button left or right until counter read exact. Then push DWN button for next step.
2. IF SSB
IF SSB use to set up IF offset value, we need to rotate dial rotary button left or right. We could push rotary dial button also to change step.
Then push DWN button for next step.
3. IF CW
Same as above but for CW mode
Then push DWN button for next step.
4. BFO USB
BFO offset for USB. Default value is 1500Hz (1.5KHz), we could rotate rotary dial button to change the value.
Then push DWN button for next step.
5. BFO LSB
BFO offset for LSB. Default value is -1500Hz (-1.5KHz), we could rotate rotary dial button to change the value.
Then push DWN button for next step.
6. BFO CW
BFO offset for CW. Default value is 600Hz, we could rotate rotary dial button to change the value.

RTC for HBR4HF Connection and pinout



- 12V supply pin (beware connecting this pin)



- Output pin
 - This pin pin have logic high (5V) when active and logic low (0V) when not active
 - Alarm pin (K2.0)
 - Band control pin (K2.1 – K2.3)(10m, 15m, 20m)
 - Band control pin (K3.0-K3.3)(30, 40m, 80m, 160m)
 - Mode control pin (K9.0-K9.3)(AM, CW, USB, LSB)
- Frequency out pin
 - OUT FREQ (VFO out)
VFO out = IF + Display Frequency +/- SSB BFO offset
 - OUT IF (BFO out)
BFO out = IF +/- SSB BFO Offset

- RX/TX input pin
This digital input pin will accept 5V as RX state and 0V as TX state.

RX state will drive LCD display to show RX state and set up VFO value according to rx state, special for AM mode, will offset RX vfo to AM IF. This will also drive microcontroller to read s-meter value (see ADC input s-meter).

TX state will drive LCD display to show TX state and set up VFO value according to tx state, special for AM mode will not offset TX vfo to AM IF. This will also drive microcontroller to read forward (FWD) and reflected (REF) value (see ADC input pin REF/FWD)

- S-Meter (0-2.56V)
Connect this pin to s-meter buffer then do calibration. (replace analog meter then connect it to microcontroller s-meter input)

