

TRANSVERTER INTERFACE & ATTENUATOR BOARD

WITH RF SENSE PTT SWITCH

This Transverter Interface & Attenuator board allows you to interface your base HF radio to the VHF/UHF Transverter. This board contains 30 dB Attenuator with the fine output power adjustment POT, RF SENSE PTT SWITCH and BYPASS / PTT relays.

When the Power Switch is set in OFF position the Attenuator Board is in HF BYPASS mode. HF antenna is connected to your base HF radio through the bypass relay contacts K2. You can operate on HF bands with full 100 watts output power of your base HF radio.

BEFORE SWITCHING IT TO THE VHF TRANSVERTER OPERATING MODE TO SET OUTPUT POWER OF YOUR BASE HF RADIO TO ABOUT 5 - 10 W !!!

To get it worked in the VHF TRANSVERTER mode to switch +12V Power Switch ON. Doing this your HF antenna is cut off from your HF radio by contacts of K2 relay and your VHF Transverter is set in RX mode connecting through the contacts of K3, K2, K1 relays to your base HF radio.

Connecting PTT line to the GROUND brings your VHF Transverter into TX mode connecting its IF input through the ATTENUATOR to the output of your base HF Radio.

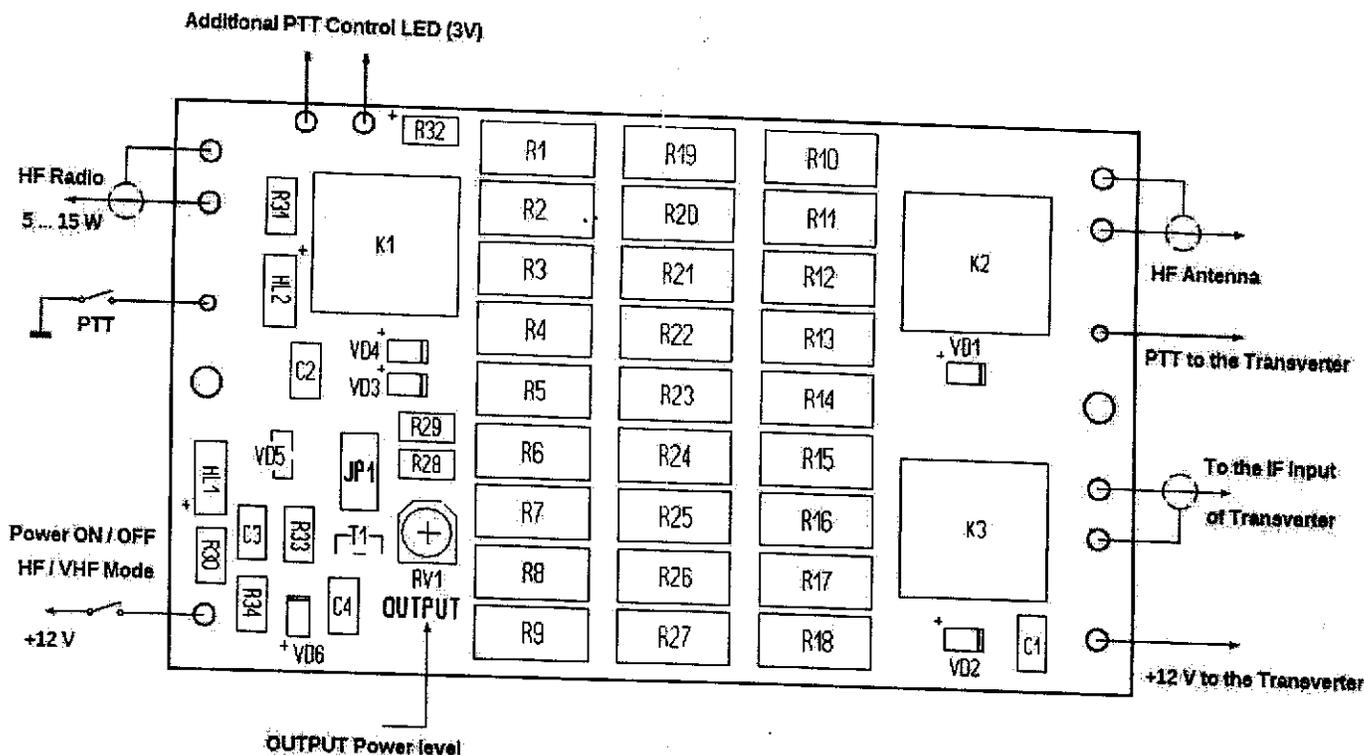
This Attenuator Board contains RF SENSE PTT SWITCH so you can even use it without PTT line connected to your HF Radio. Just push your HF Radio to the TX mode and RF SENSE PTT SWITCH instantly switches the Attenuator Board and VHF transverter to the TX mode. Do not forget to drop output power of your HF Radio to about 5 - 10 W !!

To note please: Even though RF SENSE PTT SWITCH works fine using it in SSB or slow speed CW modes might cause its relay clicking so in such modes I recommend to use the PTT line connected to your HF Base Radio.

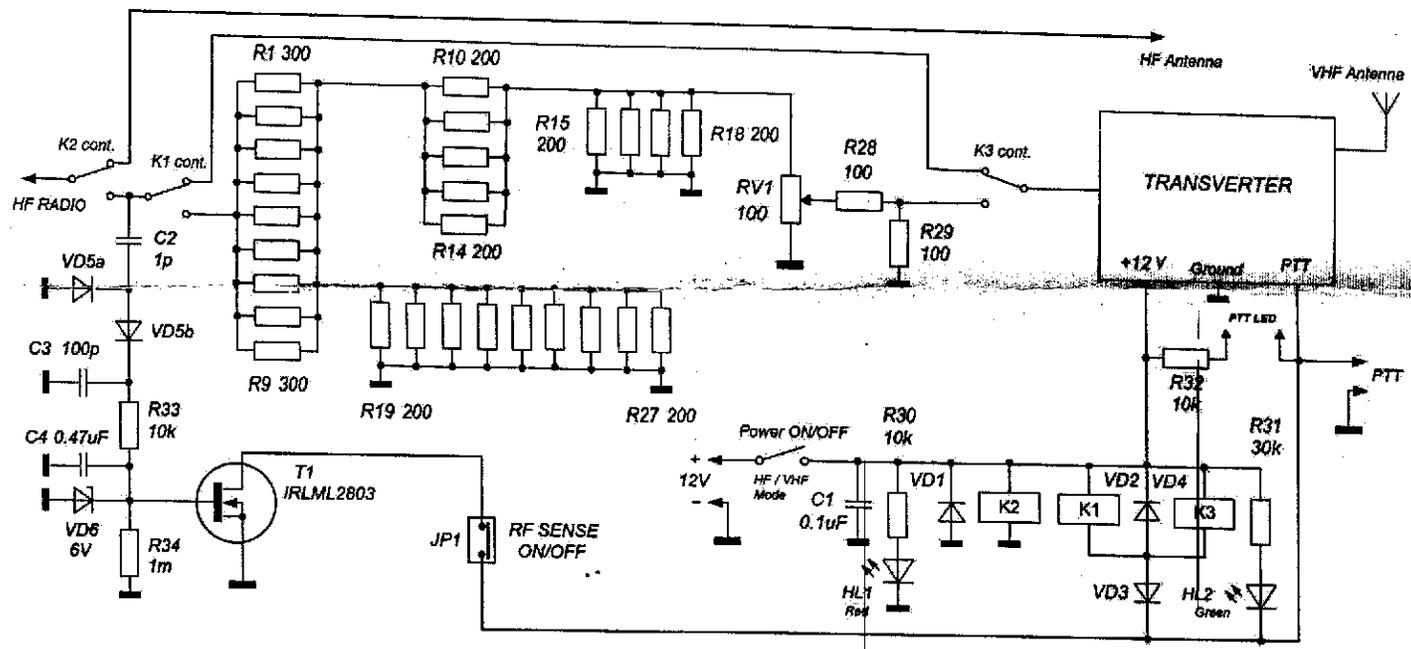
YOU CAN EASILY SWITCH OFF RF SENSE PTT SWITCH BY REMOVING JP1 JUMPER.

Technical specifications

- Attenuation Level - 30 dB (10 W IN - 0.015 W OUT adjustable almost to ZERO)
- RF Input Power - 5 ... 10 W (15 W Maximum)
- HF Bypass Power - 100 W
- PTT control - Contact closure to the ground or RF SENSE PTT SWITCH
- RF Sense Minimal Input Level - 0.5 W
- Supply voltage - +13.8 VDC (+12 ... 14 VDC)
- Dimensions (mm) - 39 x 67



OUTPUT Power level



All RF CONNECTION MUST BE DONE WITH THE 50 OHM COAX CABLE !

BE CAREFUL !

DO NOT APPLY MORE THAN 15 WATTS TO THIS ATTENUATOR BOARD. IT MIGHT BE DAMAGED !!!

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Setting up the Assembled Transverter WITH RF SENSE PTT Attenuator Board

This transverter contains our known Transverter and Attenuator boards. Description and circuit diagrams of both boards you find in this package. Basically the Transverter is ready to use. You need to connect it to your base HF radio and it works. Below some tips how to do this right.

1. To read the descriptions of the transverter and attenuator boards. There you find a pinouts of the boards and their circuit diagrams. Closely take your attention on the description of the attenuator board. To read how the Attenuator board works.
2. **Set your HF radio on 28 MHz (10m) band. Before connecting the transverter to your base HF radio REDUCE output power of your base radio to 5 - 10 Watts. No more! And be careful. Hi output power would kill the Attenuator and Transverter boards.**
3. **This Transverter contains the Attenuator Board with RF SENSE PTT Switch so it will work fine without PTT line connected to your radio. RF SENSE is detecting RF signal on the Attenuator Board input and instantly switches the transverter to the TX mode.**

Even though RF SENSE PTT SWITCH works fine using it in SSB or slow speed CW modes might cause its relay clicking so in such modes I recommend to use the PTT line connected to your HF Base Radio.

IF YOU ARE NOT GOING TO USE the PTT LINE then go to the p.5

4. To find PTT output pin or PTT connector on your base radio. It might be the ACC , PTT, Output, Remote or some other connectors. To check it in the manual of your radio. Some radios have the PTT setting in its menu. Then as you had found it to check the PTT chain of your radio. Switching your base radio to the transmit mode (TX) should ground the PTT line. Connect PTT output of your radio to the "PTT" connector on the back panel of the transverter. To use double wire cable. One wire to the PTT line and the other one to the ground.
 5. Check that the "POWER" switch on the front panel of the transverter is in OFF position. Connect the transverter to your power supply using a power cord included with the transverter. The power connector is on the back panel of the transverter. The red wire is +12V and the black wire is the ground -12V.
 6. Using good quality coax cable connect the ANTENNA connector of your base HF radio and the "RADIO" connector on the back panel of the transverter.
 7. Connect your VHF antenna to the "VHF ANT" connector on the back panel of the transverter.
 8. You can connect your HF antenna to the "HF ANT" connector on the back panel of the transverter and use it on HF bands. This transverter has the bypass relays connecting your HF antenna to your base HF radio. To read the description of the Attenuator board and you find there how it works.
- Although the bypass chain of the Attenuator board works very well and you could use full 100 Watts output power of your HF radio on the HF bands, I recommend DO NOT DO this through the Transverter bypass chain! Some day you might forget to reduce output power of your HF radio and full 100 watts would instantly kill your transverter.**

9. Push ON the power switch of the transverter. The +12V LED is lighting now. You should hear an increasing of the noise of your HF radio at least on about 6-10 dB. It means the RX stages are working. Try to find someone on the band.
10. Pushing your HF radio to the TX transmitting mode brings the transverter to the TX mode. The PTT LED on its front panel is lighting now. It means the transverter is in the TX mode. You can use any modes such SSB, CW, AM, FM or digital that your base HF radio had.
11. Transmit some more time and you could see that the transverter getting heated. It is normal operating process. Its box serves it as the heat sink.
12. You can adjust output power of the transverter slightly adjusting output power of your base radio or the best way do this is to open the transverter box and adjust the pots on the transverter and ATT boards.
13. **Do not overdrive the transverter by your base radio and it would work good and have a clear output signal.**
14. Pushing the "POWER" switch OFF brings the Transverter into the HF Radio operation mode so as I described it in the note 8 you can work on any HF bands now using your base radio already hooked up to the transverter.

If you have any questions you can e-mail me and ask them.

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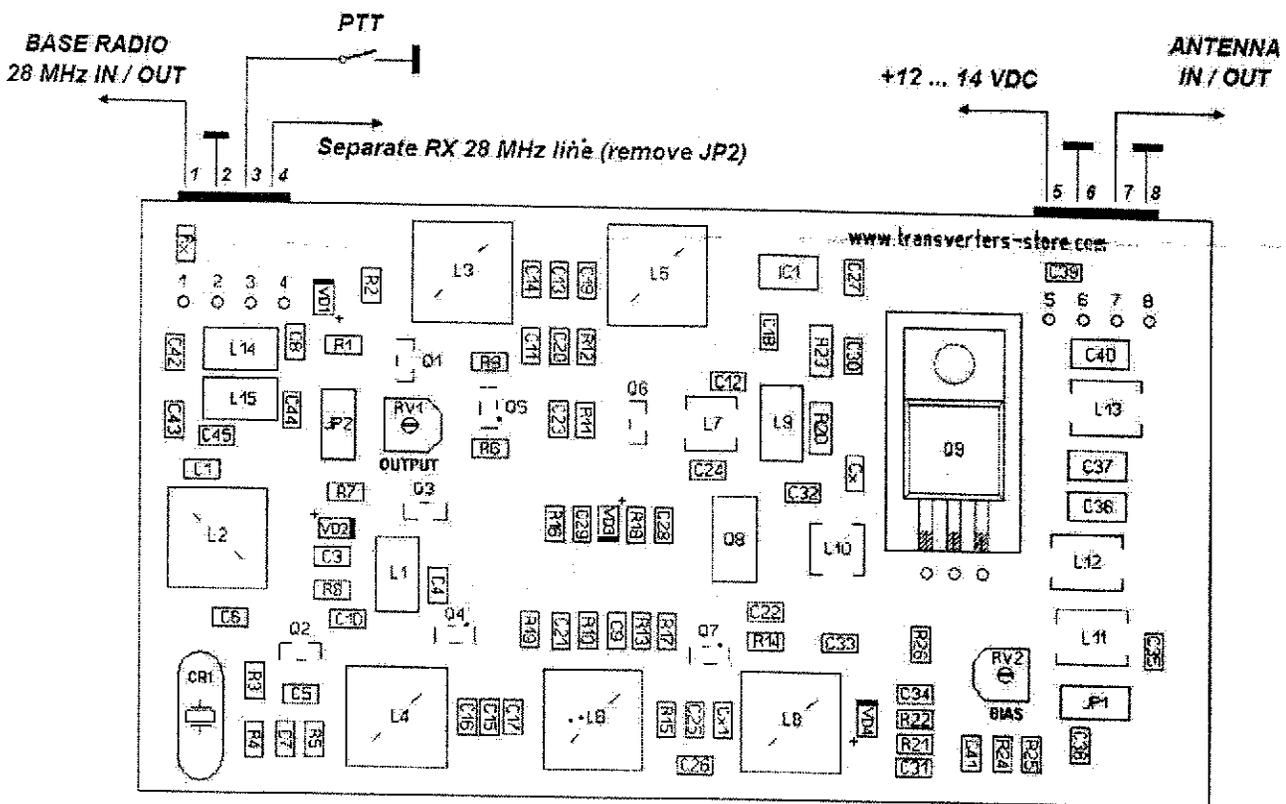
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144/28 MHz TRANSVERTER BOARD

With this Transverter board you can work on **2 meter** band using any type of the HF radio that has **10 meter** band. It would work the whole 2 meter band at **144 to 148 MHz** if your base radio has the **28 to 32 MHz** band. Most HF radios have 28 to 30 MHz band so in this case it means you would have the 144 to 146 MHz band. **It works any modes such SSB, CW or FM if its available in your radio.**

Technical specifications

- RF range - 144 ... 148 MHz
- IF range - 28 ... 32 MHz
- IF input power - 1 ... 50 mW (0.05 W max.) or 0 ... 17 dBm
- LO frequency - 116 MHz
- Output power - 10 W
- RX gain - **typ. 20 dB**
- Noise figure - **typ. 1.0 dB**
- Image rejection - **typ. 70 dB**
- PTT control - **Contact closure to the ground**
- Supply voltage - **+13.8 VDC (+12 ... 14 VDC)**
- Current consumption - **typ. 1.3 A (TX)**



Pinout of the connectors:

1. IF 28 MHz transverter input/output line
2. Ground
3. PTT line (**ground it to switch the Transverter to the TX mode**)
4. **Separate RX 28 MHz line (remove JP2)**
5. +12 V
6. Ground
7. Antenna 144 MHz
8. Ground

To read the tips below and mount your transverter EXACTLY as it described.

1. RF input power to the transverter from your HF radio should NOT be MORE than 50 mW (0.05 W max). You can adjust it using RV1 pot on the board.
2. Initially Transverter set on the common IF 28 MHz RX/TX line on the pin 1.
3. Removing JP2 jumper allows you to use RX/TX lines separately (TX pin 1, RX pin 4).
4. DC supply is +12 ... 14 VDC
5. To get the transverter switched to the TX mode close the PTT line to the ground.
6. RV1 pot adjusts OUTPUT POWER of the Transverter.
7. RV2 pot adjusts BIAS of the output transistor.

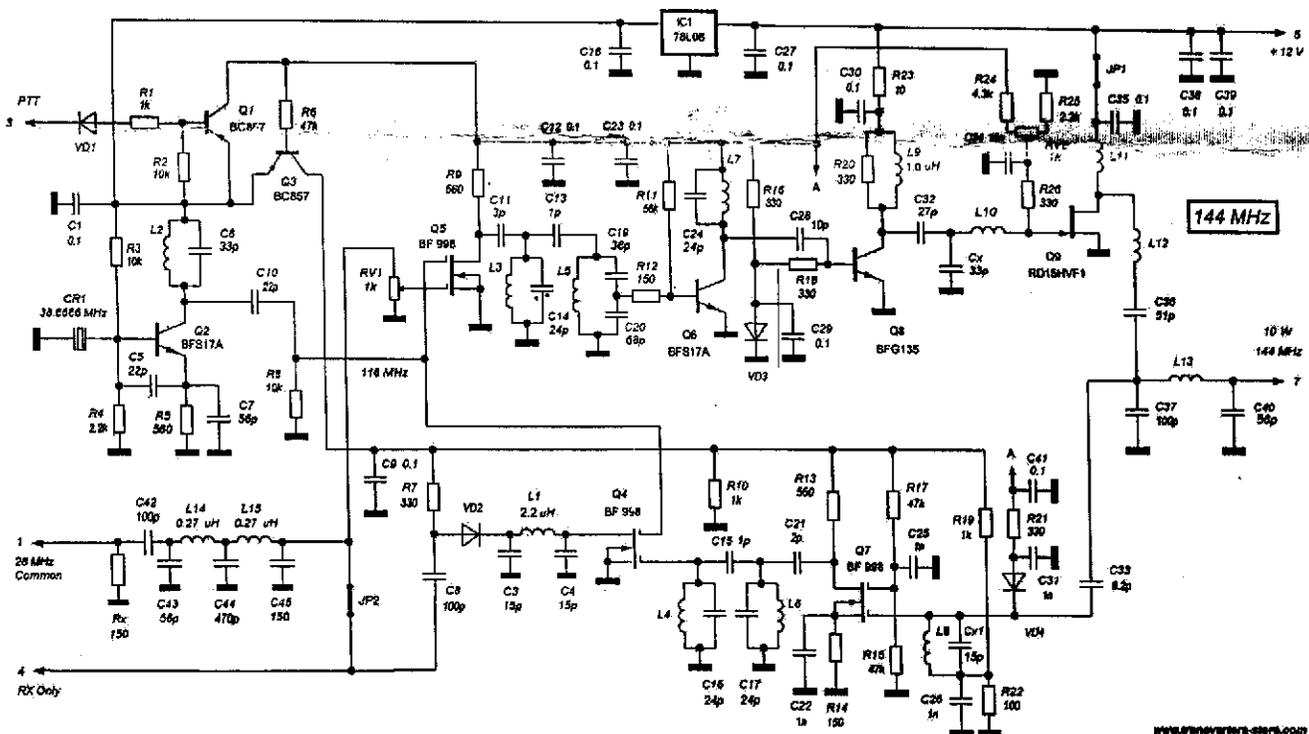
The transverter board suppose to be mounted onto heat sink.

Using the metal bolts screw down the transistor onto the heat sink and then put a few nuts or washers under both mounting holes between the board and the heat sink so to get the board flat mounted above the heat sink about a few millimetres. Or you can use the pieces of plastic between the board and heatsink under mounting holes drilling the holes in and get the bolts through. Both mounting bolts should have a good contact to the transverter board ground. The stable work of the transverter depends of this!

The output transistor is mounted onto the heat sink without insulation.

To check mutual GROUND of the output transistor, heat sink and board.

All RF RX and TX lines must be done using good quality coax cable !



BE CAREFUL! Driving power more than 0.1 W instantly kills the Transverter !

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