6m to 10m Transverter (Part 3)

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The third and last part explains the wireing and connection of the units with each other, how to connect a transciver to the transverter, attenuation of the drive power from the exiter, an additional linear amplifier to punchup the power to max. 50W and last but not least a few practical notes.

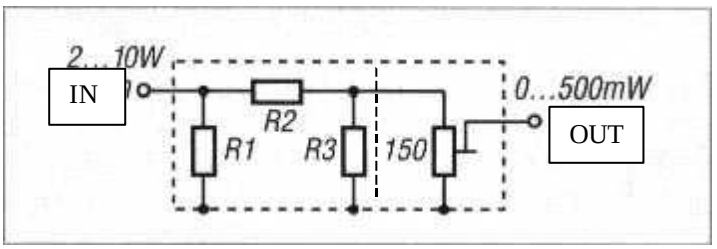
Attaching the exiter (transciver) to the transverter:

Fitting the transciver to the transverter is not difficult, but dipending on the transciver type, you have to use different methods.
The easyst way is to coneckt the transciver via it`s transverter conection, if it has one. The transverter jack should provide an IF-signal on 28 MHz of about 200 mV peak. I used a YAESU FT-757 GX which`s amplifier unit was switched off by seperating a bridge in the four pole powerline. The latest transcivers indipendant which manufacturer (ICOM, YAESU, KENWOOD etc.) don`t have an x-verter jack, maybe they forgot to supply one on thease rigs. This is also the reason why you find a lot of demands on packet-radio to this topic.
Lowering the output power of transcivers by putting an external voltage to the ALC is not recommendable because it is very difficult to maintain the few mW constant enough, so forget this.
A solution to this topic without interfearing in the rig`s scematic is to provide the transverter with an attenuator which can handle power-attenuation till to maximum 10 Watts. You can build the attenuator with induction free resistors (2 Watt, carbon or metaloxyd typs), they must be build in a metal case , shielding is very important.Behind the attenuator you can pickup the requested amount of power over a variabel resistor 150 Ohm (power out is variable from 0 to 500mW) to feed the transmitting unit.

Here a selection of values to build the attenuator.

RX/TX-power out	Attenuation	R1	R2	R3
Output 1--2W max.	20dB	3 X 180 Ohm par.	270 Ohm	2 X 120 Ohm
Output 5--10W max.	24dB	6 X 330 Ohm par.	330 Ohm	1 X 56 Ohm

All fixed resistors must be induktance free 2W carbon or metaloxyd typs.
The variable resistor is a 150 Ohm 0,5 W Type
Don´t forget the shielding between attenuator and powersplitter.



Picture 17: Scematic of attenuator and power-splitter

Before you start operation, allways check the power-setting of the transciver!!

A few notes to the wireing of the units.

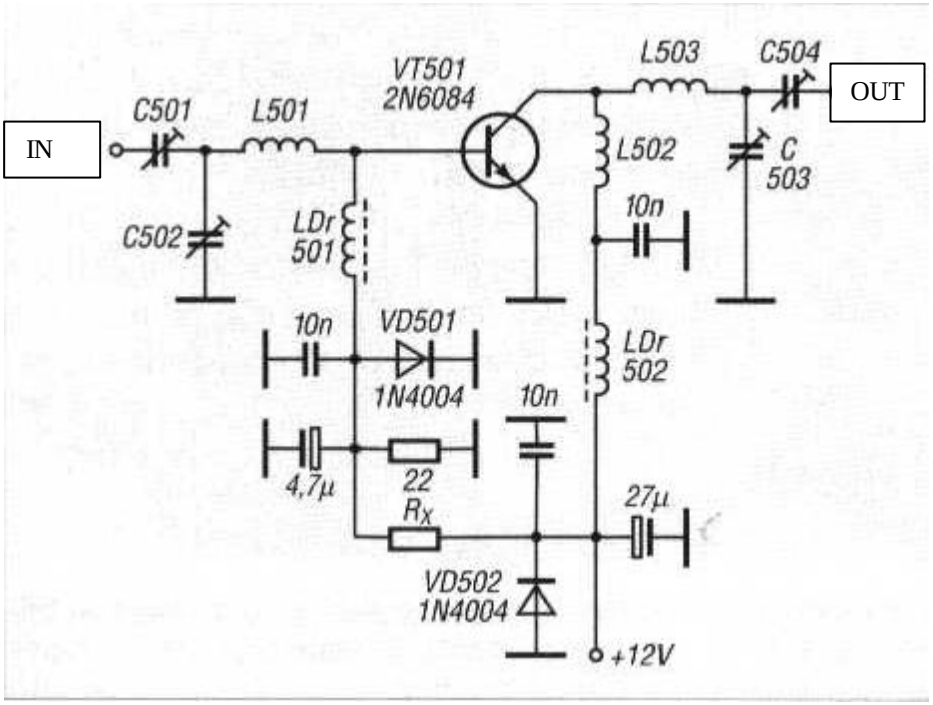
You need all togeather three relay switchover contacts.
The first one switches the RX/TX from the transverter out (from rescieving mode) to the attenuator (in transmitting mode)
The second pair of relay contacts switch the voltage-supply 13.8V from the resceiving converter to the transmitting converter and amplifier unit in transmitting mode.

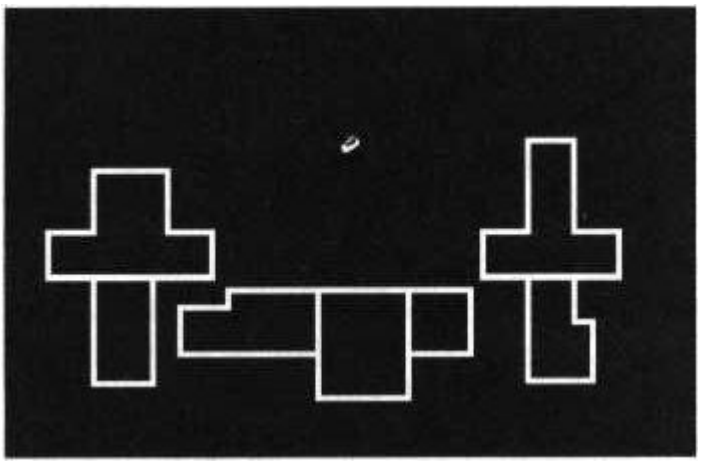
The third pair of contacts switches the antenna from the transverters rescieving unit to the output of the transverters amplifier.
For signal-switching you should use HF-relays with low loss and inductance.
Voltage supply switching can be done by a normal relay
All the relays are controled by the PTT-switch of the transciever.
Signal interconnections are made with RG 174 coax.-cable.
The power lead should have an intigrated fuse of 2A.

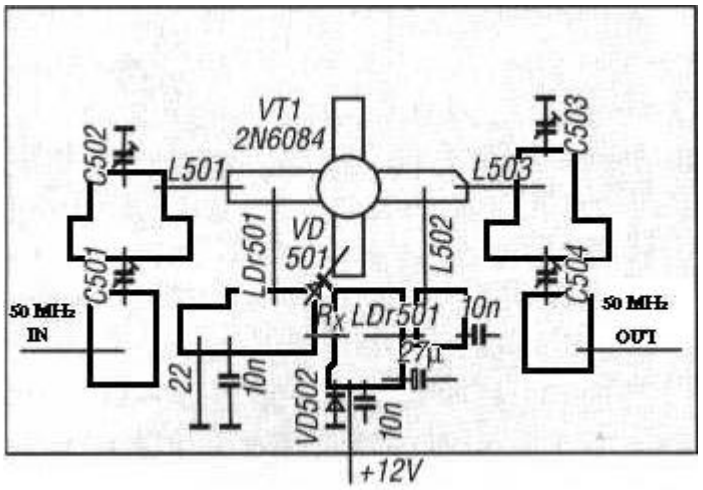
The zip-download includes a wireing scematic, file name is wire.pdf, have a look at it!!!

External linear amplifier.

The external amp. Can boost up the signal from 3W to app. 15W or from 10W to max. 50W. The scematic is similare to the 3W amp. The transistor used is a VHF-type 2N6084 that has a gain of about 7 to 8 dB on 6 meters without parasitik oscillation problems.







On the output side of the amp you should use silver mika variable capacitors, all the parts are solderd on the PCB´s layout side like the 3W version, the other side is only for shielding. The biasing diode should have a good thermal contact to the emitter of the transistor. This unit must be placed in a box of it`s own (external), with a big heatsink.
You might have realised that there are no soldring eilands at the base and collector strips of the transistor on the PCB, that is right. The base and the collektor have about 1mm air gap to the PCB and are the eilands for L501 and LDR 501 at the base and L502 and L503 at the collector, so pay attention that they don´t get conneckted to ground.
The tuning of the unit is preformd in the same way discribed at the 3W stage. In this case is RX a 150 Ohm fixed value + 250 Ohm variable resistance in series, and the idelling current is suppose to be set to 100mA, after mesuring the whole value for RX you should substitute it trough a fitting fixed value 2W type. You also should switch a lowpass filter to the output of the stage.

Partlist for the amplifier described above:

C501 and C502	110pF variable capacitors color of case (violett)
C503 and C504	110pF mica variable capasitors
L501	4 turns of 1mm copper enameld wire, wound on a 8mm shaft
L502	10 turn of 1,5mm copper enameld wire wound on a 10mm shaft
L503	4 turns of 2mm silver coated copper wire wound on a 10mm shaft
LDr 501	5 turns of 0,5mm copper enameld wire trough a ferrit bead
LDr 502	1 turn trough a binocular VHF-balun core
RX	read explenation in the text value between 180 and 390 Ohm 2W resistor
VD 501 and 502	1N4004
VT501	2N6084 (Motorola)

Attention: in part 2, picture 11, the noted 47 Ohm resistor at the base of the transistor is missing in the component layout plan, picture 13. This resistor is important and must be conneckted. Otherwise the amp´s idelling current would exceed to maximum destroying the transistor!!

Sorry for my poor English, I´m out of practice, but I hope this translation is good enough to understand the most important things.
In case you have problems with the poor quality of the scematics, I recomend you to download the german version, the pictures are much better and clear. I had to scan them to the English version.

In case you like this translation, and you think it is worth the work invested, then I would appriciate a rating to my sight, thankyou and hope to hear you on six.....

73 and lots of fun with the transverter, dl5dbm, Anwar von Sroka