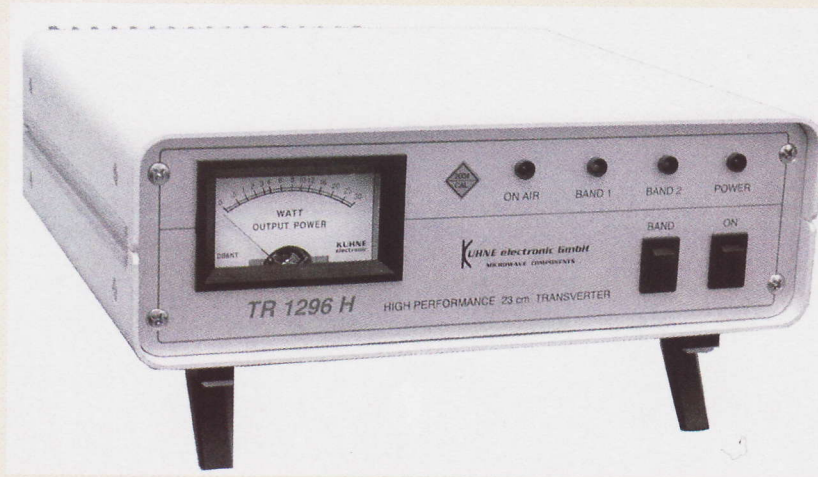


Handbook

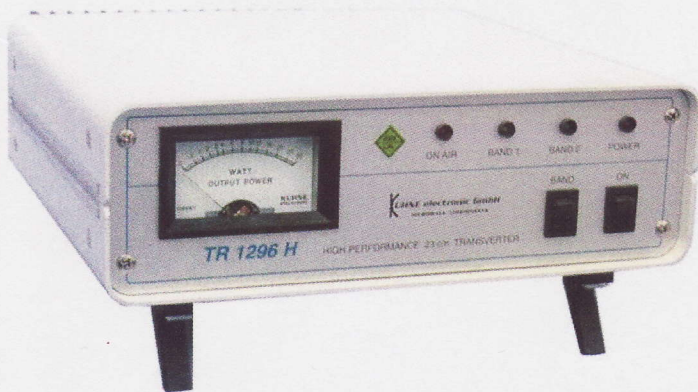
DB 6 NT 1296 MHz Transverter **TR 1296 H - 28MHz**



K **UHNE electronic GmbH**
MICROWAVE COMPONENTS

NEW! High Performance 23 cm Transverter

Several decades of engineering and production of Transverters result in this new 23cm high performance Transverter. His outstanding technical data make it usable for many applications. The high linear MOS-FET-Amplifier with an output power of up to 20W allows a stand-alone operation as well as driving a power amplifier. The consequent usage of SMD components results in a noise figure of typ. 1.2dB. Several operation configurations allow an easy connection of a preamplifier and/or power amplifiers. The case allows the installation of further filter elements, attenuators, oscillators or other components.



Possible Options:

- 01: Band 2: 1268...1270 MHz
- 02: TX 10...200 μ W
IF Input power
- 04: drive gain control on the front panel
- 06: common IF-connector for RX/TX

Opt. 06 (common IF-connector) and Opt. 04 (drive gain control on the front panel) are not compatible.

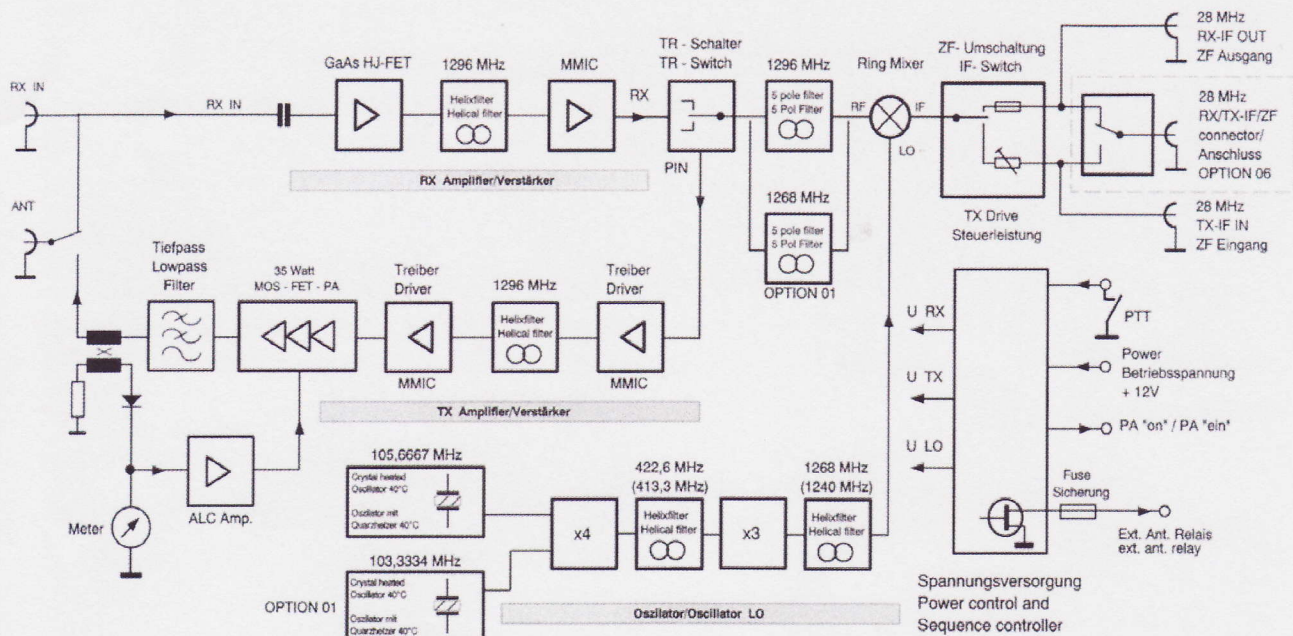
Specifications

TR 1296 H – 28 MHz

Type	TR 1296 H
UHF-frequency range	1296...1298 MHz (Standard) Option 01: 1268...1270 MHz
IF-frequency range	28...30 MHz
IF-input power	1...50 mW, adjustable
PTT-control	ground to transmit
Power output	20 Watt@50 Ohm
Operation voltage	13,8 V DC (12-14 V)
Current consumption	typ. 8 A (TX)
RX gain	> 20 dB
Noise figure	typ. 1,2 dB
Dimensions mm	270 x 260 x 80
Case	Aluminium
Coaxial connectors IF	BNC-female
Coaxial connectors UHF	N-female
Operation voltage and control connector	SUB-D 9-pole

- Aluminium case with a big heat sink
- Inside wiring with silver plated Teflon coaxial cable
- Antenna relay with 60dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic wave suppression
- Spurious and harmonic wave suppression better 60dBc
- Sideband noise of the oscillator better -138dBc/Hz@10kHz
- Built-in sequence control
- Including dc-power and control cable
- Handbook

TR 1296 H - 28 Transverter Blockdiagram/blockdiagram



Oscillator

The oscillator signal of 105.667 MHz is generated by a low-noise and temperature-compensated Butler oscillator. This circuit uses a thermostat crystal with 40° precision crystal heater and is adjusted with a HQ air dielectric trimmer. The single side band noise of the output signal lies at far under -138 dBc/Hz@10kHz which is better as the mostly used shortwave transceivers. After the oscillator a multiplier follows with the BFP92P. After a helical-filter the frequency 422 MHz is selected and coupled to the tripler with BFG93A. After a further helical-filter which is adjusted to 1268 MHz the signal reaches the balance mixer.

Receiver

The receiver works with a low-noise preamplifier stage with an own noise figure of 0.8 dB. After this one follows a helical-filter and a MMIC amplifier stage. At next the signal reaches selection through a 5pole-HI-Q-filter and goes to the balance mixer. For the operation of an external preamplifier via a separate coaxial cable a second N-connector is already built-in

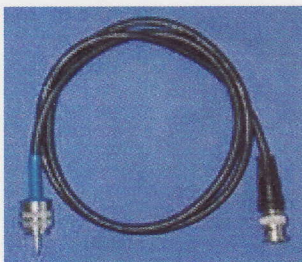
Transmitter

The IF input power is internally presettable in the area of 1...50 mW. The signal passes a helical-filter after the mixer and reaches the first MMIC driver stage. After the selection by 5pole-HI-Q-filter the second MMIC driver stage follows. The driving signal goes to the 35W MOS-FET-module-power-amplifier. To guarantee a clean output signal, the final stage is operated only with 20 W. An overdriving is prevented by an integrated ALC circuit with indicator. A 5-pole harmonic filter realizes a spurious and harmonic suppression of over 60 dB. A directional coupler with a Schottky-diode makes the calibrated indication of the output power possible at the built-in meter.

Sequence Controller

The built-in sequence controller makes a time controlled operation of a high-quality power amplifier and a coaxial relay possible with preamplifier directly at the antenna. Connections for this are at the equipment back side.

Accessories to order:



RX cable

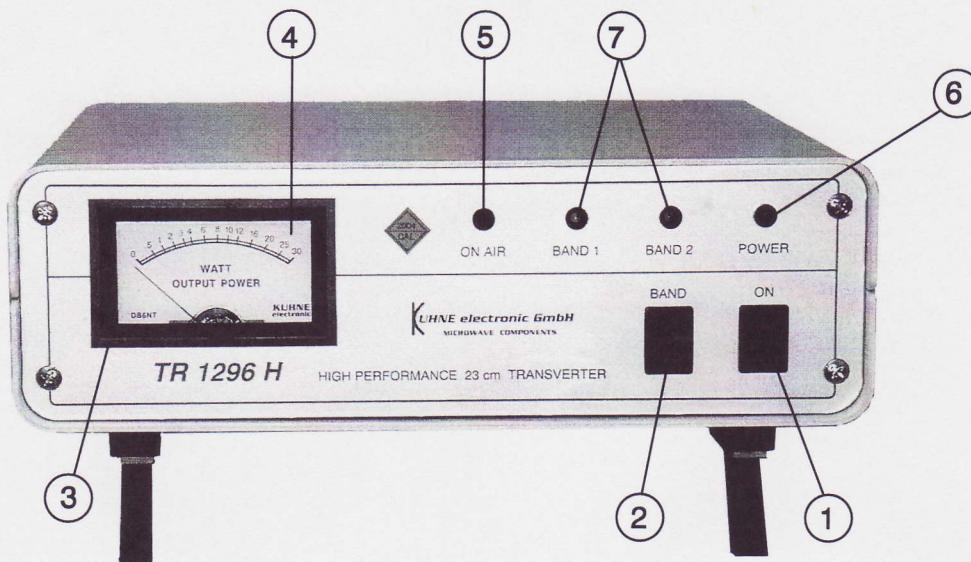


TX cable

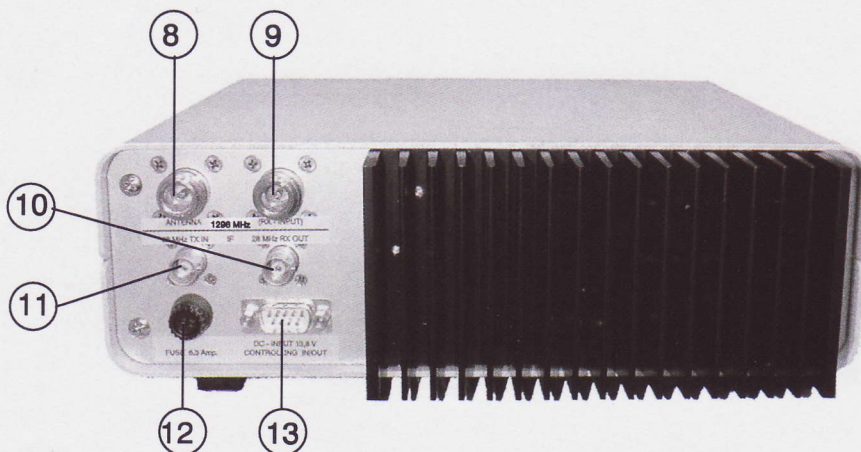
backside with connectors:



TR 1296 H - 28 Connections and Indicators

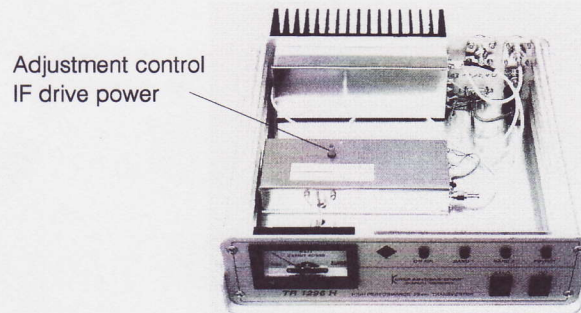


- 1.) ON / OFF switch
- 2.) Bandswitch by Opt.01 only
- 3.) Outputmeter - Displays effective output power in Watts at 50 Ohms
- 4.) ALC indicator
This indicator illuminates when the power limiter is active (too much IF drive)
In order to assure a good transmit signal, IF drive power should be reduced to a point where the indicator does not light anymore. See section "Operation"
- 5.) ON AIR
This indicator illuminates during transmit operation
- 6.) Power ON indicator
- 7.) Band Indicator
- 8.) Antenna connector
- 9.) Separate receiver input (must be changed inside the case)
- 10.) Converter output to SW - receiver
(not in use with Option 06: one common IF-RX/TX connector)
- 11.) Transverter input (1...50 mW TX) from SW - transmitter
(also converter output to shortwave transceiver Option 06: one common IF-RX/TX connector)
- 12.) Miniature fuse 8 Amp. medium time lag (M)
- 13.) Power supply 13.8 VDC / controlling functions

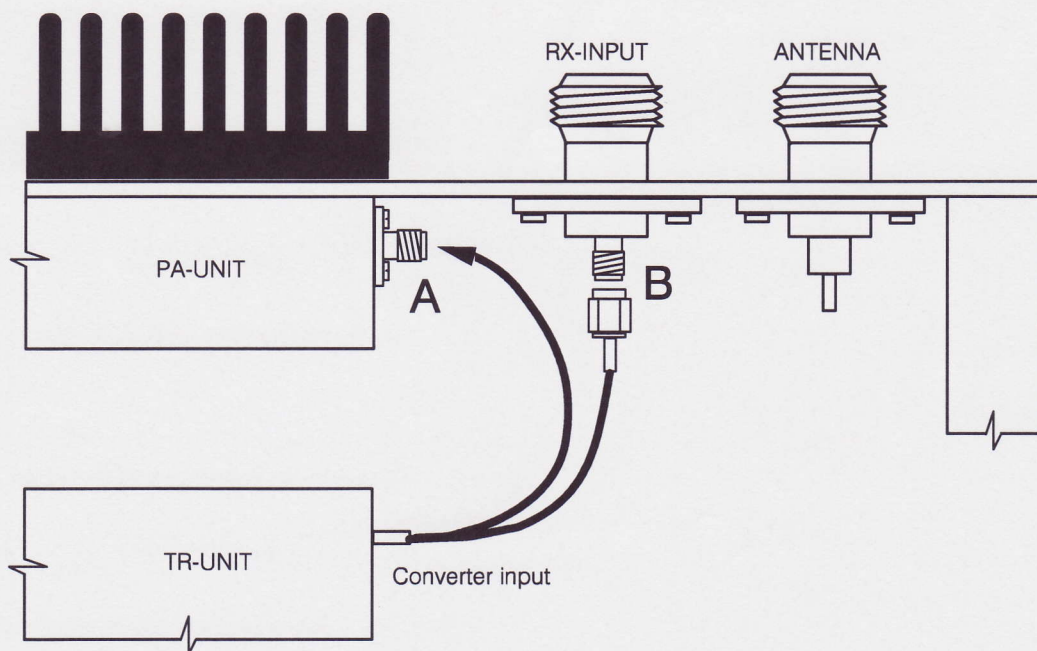


TR 1296 H - 28 Operation

- 1.) Connect a suitable antenna or a dummyload (power meter) to the antenna connector
- 2.) Connect the shortwave transceiver (1...50 mW IF drive power and PTT contact. Option 02 10...200 μ W)
- 3.) Connect a 13.8 VDC / approx. 8 Amp power supply to the transverter
- 4.) Open the transverter by removing the top cover (4 screws)
- 5.) Adjust the output control of the SW-transceiver to maximum (after having switched the transceiver to transverter operation)
Important note: At full output power of the TS 850 S and the FT1000, the provided signal contains unwanted spurious products. To keep a "clean" signal, please adjust the power knob on the HF transceiver's front panel to minimum output power. To achieve maximum large signal performance of your transverter system, switch off the built-in preamplifier of your HF transceiver.
- 6.) Switch the transceiver and the transverter to transmit; adjust the transverter to 20 W transmit power by operating the "drive power" control. The output meter of the transverter may be used for this step. When in SSB - mode a tone should be used to drive the transmitter to full output; a CW carrier would be preferable. Replace the top cover after completion of the adjustments.
- 7.) Almost all SW-transceivers feature the option of continuously adjustable output power. Option 04 power control on the front panel



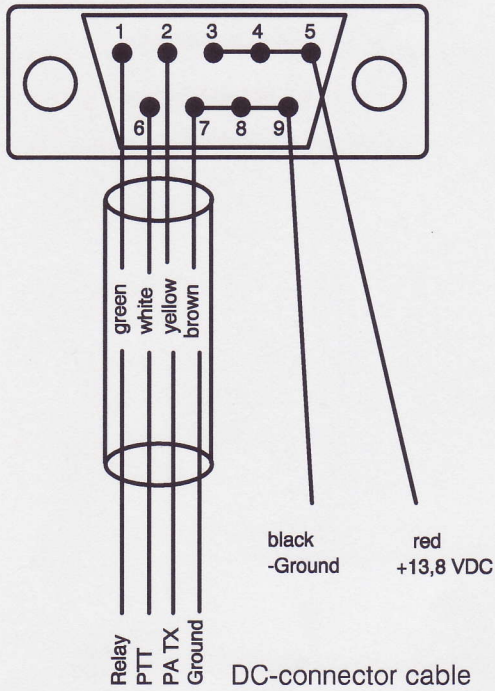
Changing the receiver input to a separate input connector



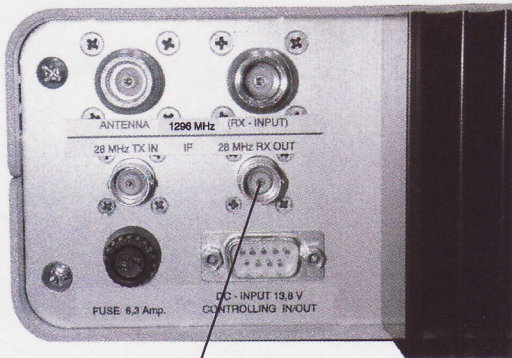
A = Normal receiver operation via antenna connector
B = Receiver operation via separate input connector

TR 1296 H - 28 Connector Wiring

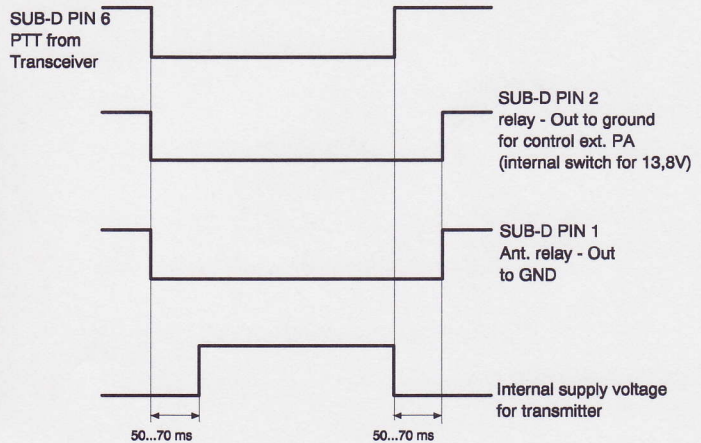
Wiring of SUB-D plug-in connector



- 1.) Contacts 3...5 have wired in parallel for the +13.8 VDC connection
- 2.) Contacts 7...9 have been wired in parallel for the minus connection = ground
- 3.) Contact 6 is PTT-input. For the transmit mode this connection must be switched to ground (by an internal switch the function may be inverted to +13.8 VDC for transmitting)
- 4.) Contact 2 controls an external power amplifier. This connector close to ground (default setting) at transmit. (internal switch for 13,8V) This output is protected with a resetting 400mA semiconductor safety device.
- 5.) During transmit mode contact 1 will be switched to ground via a power - FET(max. 1A). This output signal is also time-delayed and may be used to switch the antenna relay at the antenna (The voltage of the used relay mustn't exceed 13,8V)



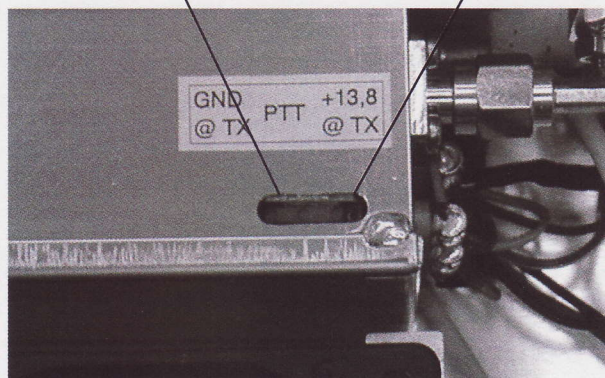
don't exist in model with one common IF-RX/TX connector (Option 06)



Switch to contact 2 (PTT-Control of an external PA).

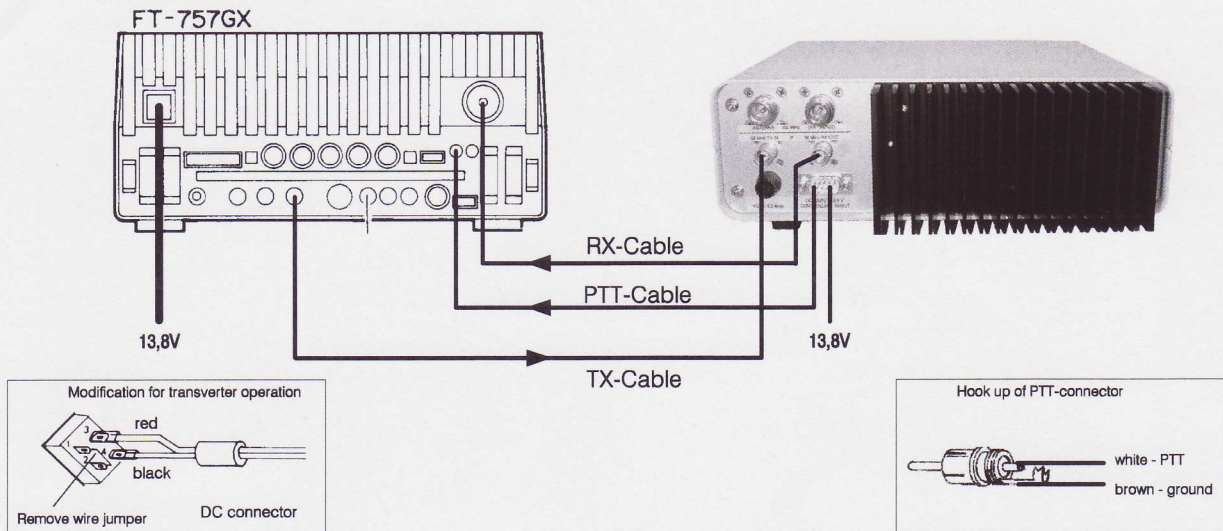
PTT GND @ TX (default setting)

PTT +13,8V @ TX



TR 1296 H - 28 with SW - Transceiver FT-757GX

When connecting the FT-757 GX with the transverter all modification instructions in the SW - transceiver manual must be observed. Especially important is the removal of the wire jumper which disables the power amplifier.



TR 1296 H - 28 with HF transceiver TS 850 S

Please follow all modification instructions in the TS 850 S manual when building your transverter system! Especially the 12 V supply of the connector "IF OUT" should be done carefully. That voltage disables the power amplifier of the TS 850 S. In addition, we recommend the TS 850 S modification from DJ9BV. See DUBUS magazine 2/1992, page 30.

Important note: At full output power of the TS 850 S (at the "IF OUT" port), the provided signal contains unwanted spurious products. To keep a "clean" signal, please adjust the power knob on the TS 850 S front panel to minimum output.

The IF OUT power of the HF transceiver TS850 is significantly higher at the beginning of operation. After some time, the internal temperature rises and the IF OUT power drops. Keep this effect in mind when adjusting the power levels for transverter operation!

To achieve maximum large signal performance of your transverter system, switch off the built-in preamplifier of the TS 850 S.

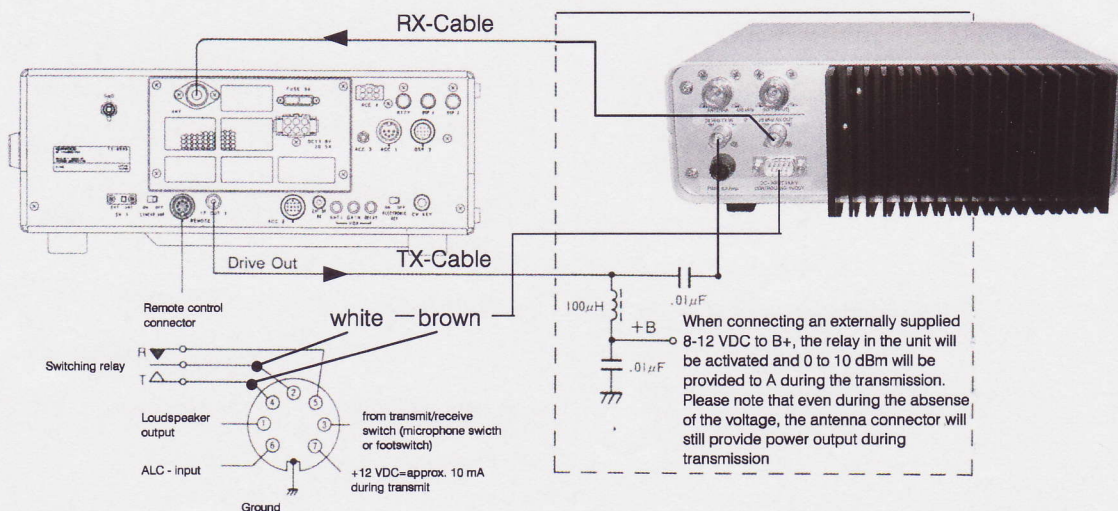
DUBUS article 02.1992:

<http://www.dl6nci.de/ts850-modification.htm>

Other links with Kenwood TS850 Modifications:

<http://www.mods.dk/>

<http://www.qsl.net/s55aw/>



TR 1296 H - 28 mit/with KW-Transceiver IC756 PRO II/III

Bei dem Verbinden der IC756PRO II/III mit dem Transverter sind die Betriebshinweise im Handbuch des KW-Transceivers zu beachten.

Die Option 02 muss im Transverter eingebaut sein!

Inbesondere das Beschalten des ACC-2-Steckers muss gewissenhaft ausgeführt werden!
Das am ACC-2-Stecker anliegende Signal schaltet den Transceiver in den Transvertermode und setzt die Transceiverendstufe außer Betrieb.

Eine Leistungseinstellung des Transverters ist am IC756PRO II mit dem "RF-Power"-Regler möglich.

Des weiteren sollte der Vorverstärker des IC756PRO II ausgeschaltet bleiben ("P.AMP" auf "0"), um die Großsignalfestigkeit des Systems voll ausnutzen zu können.

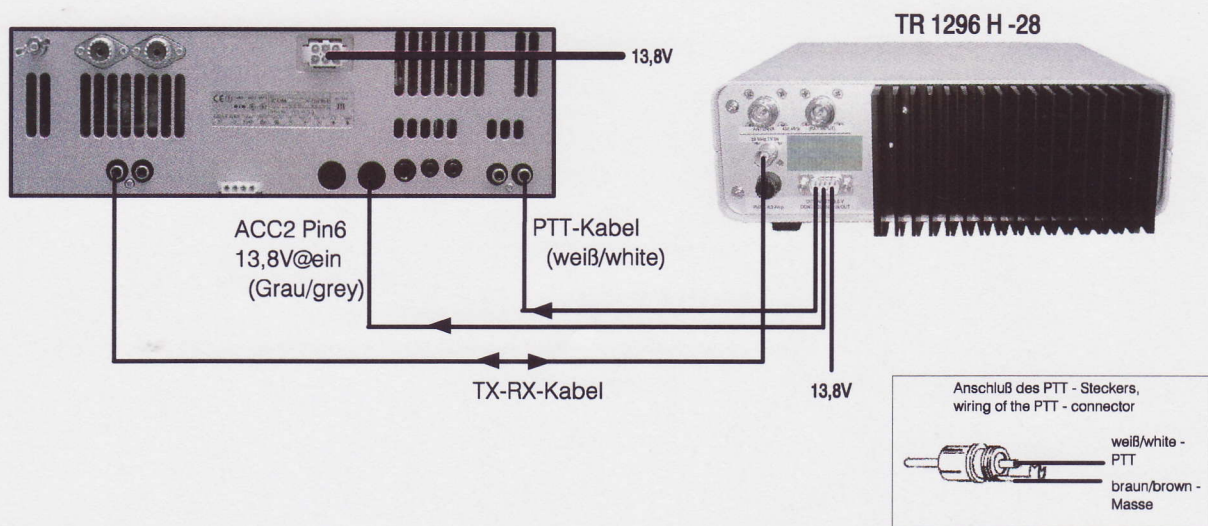
See the instructions in the IC756PRO II/III handbook on wiring with the transverter.

The transverter option 02 is required.

Especially the wiring of the ACC-2-connector must be done carefully.
The signal on the ACC-2-connector switches the transceiver in transverter mode and disables the transceiver-PA.

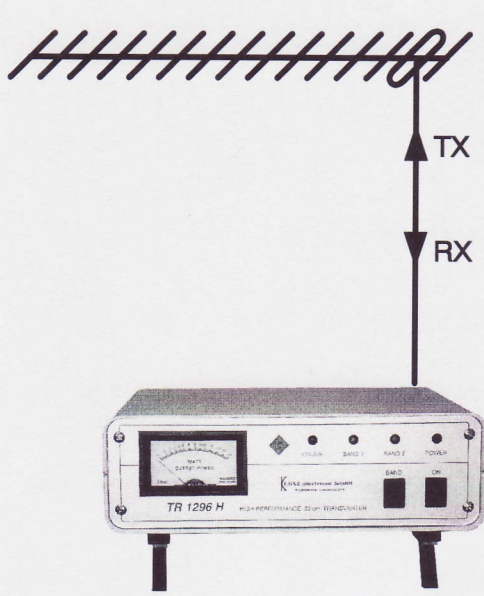
Adjust the transverter output power with the "RF-Power" control knob.

Switch the IC756PRO II ("P.AMP" to "0") preamp off to keep good large-signal performance.

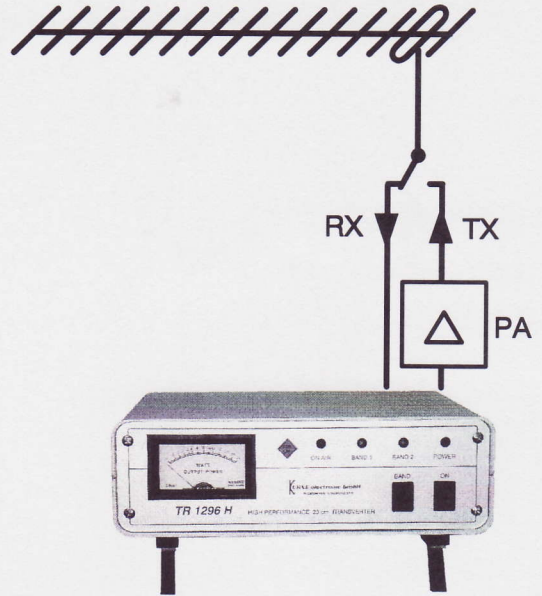


TR 1296 H - 28 Transverter configurations

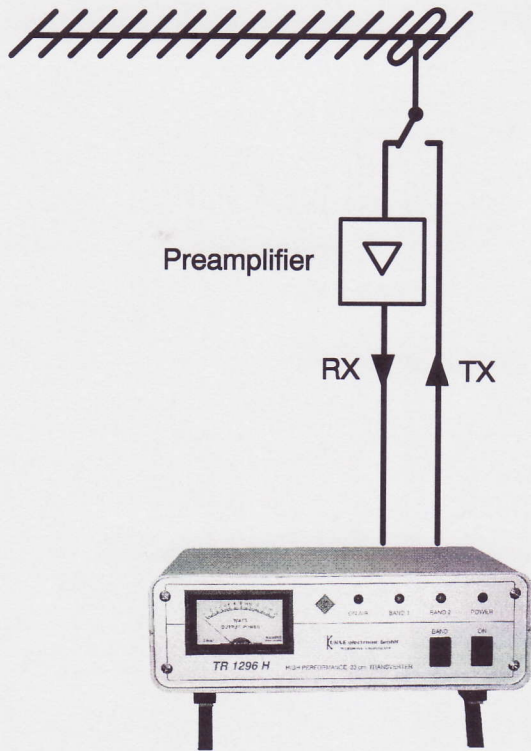
Some examples of transverter - configurations



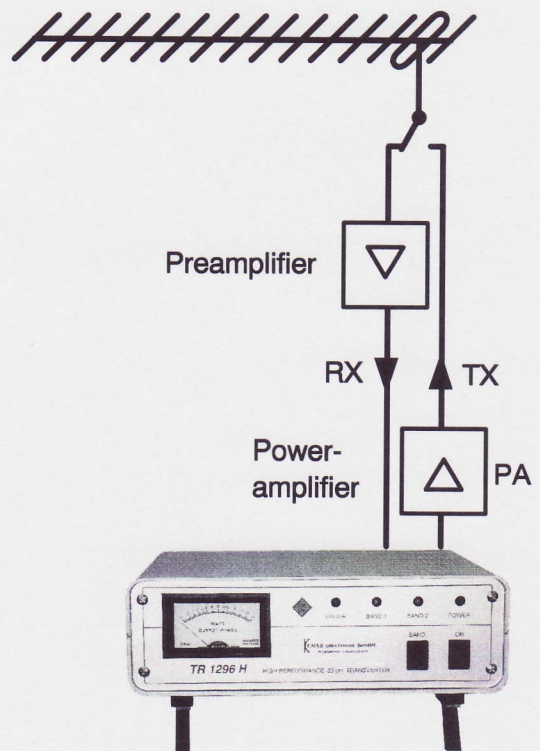
Version A: TR 1296 H without additional amplifier



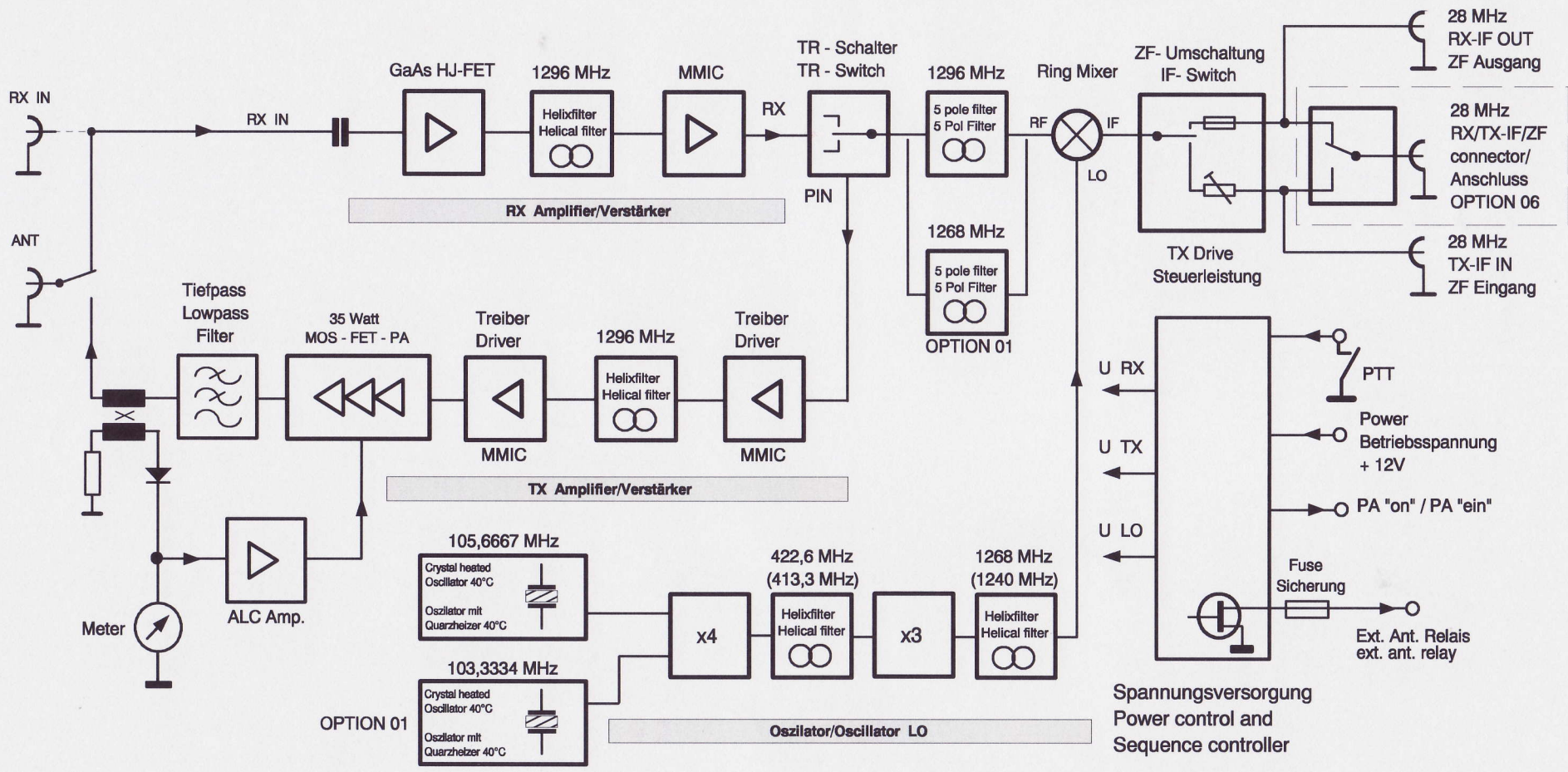
Version B: TR 1296 H with antenna relay, and power amplifier



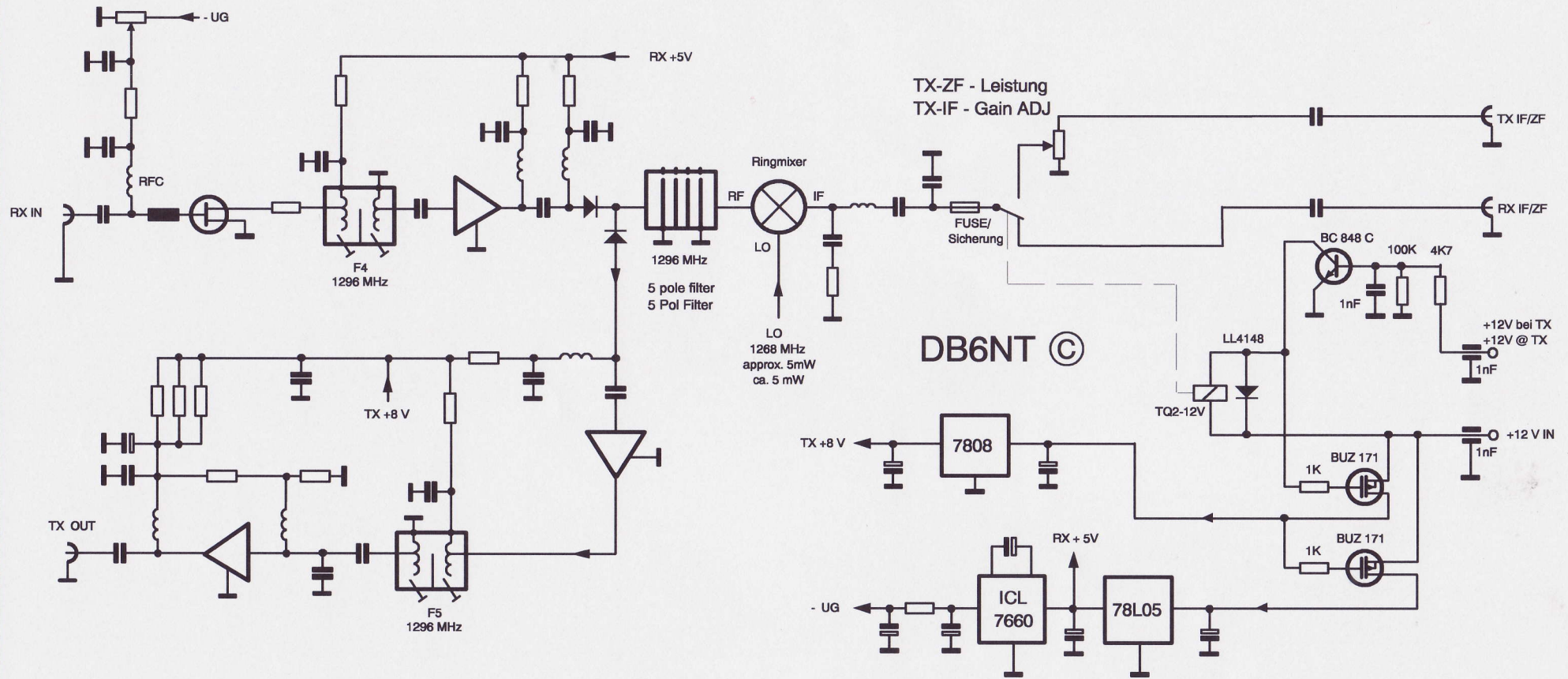
Version C: TR 1296 H with antenna relay and receiver preamplifier at the antenna



Version D: TR 1296 H with antenna relay, receiver preamplifier at the antenna and power amplifier

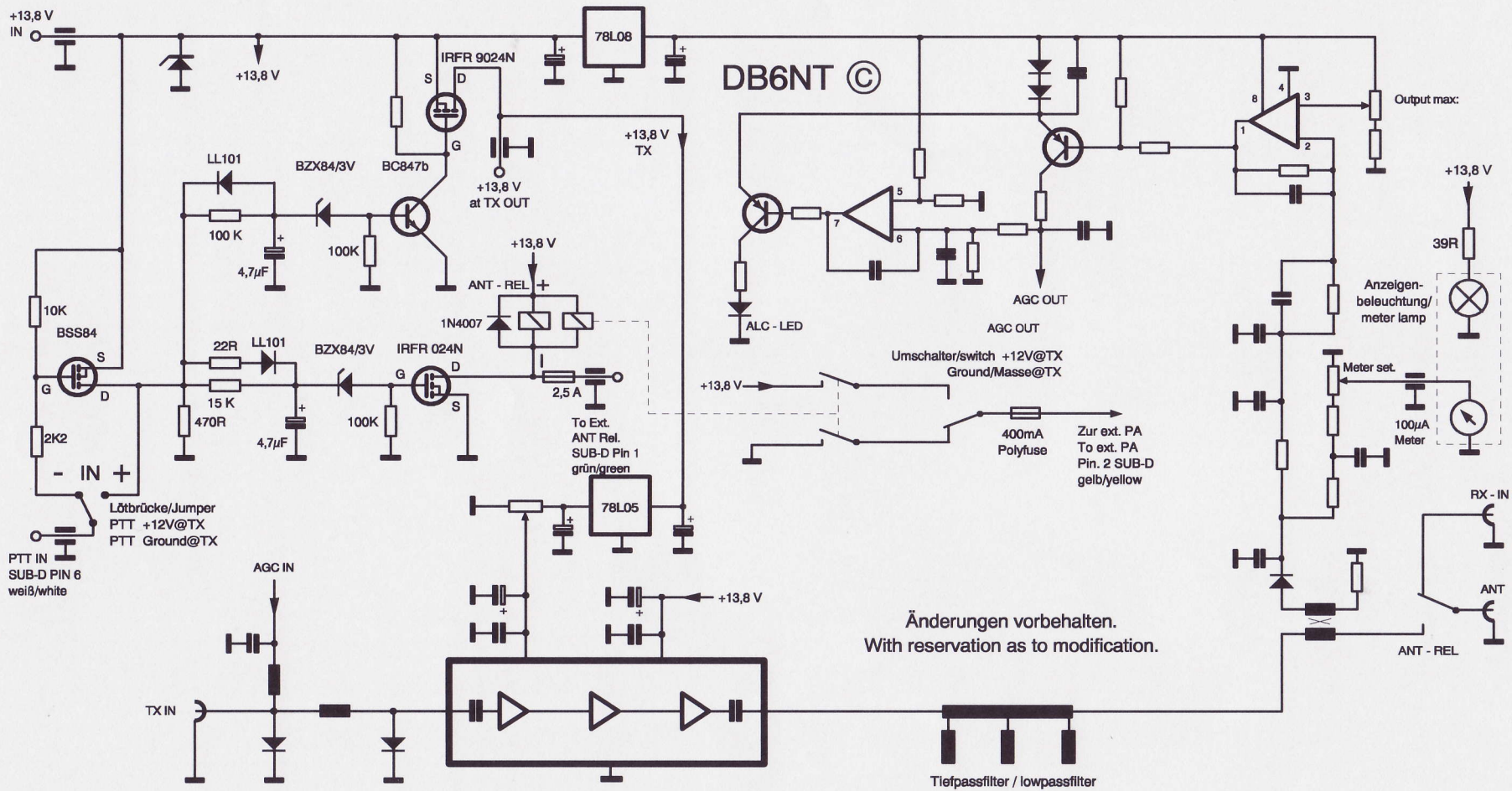


TR 1296 H - 28 Transverter Blockdiagramm/blockdiagram



TR 1296 H - 28 Transverter Schematic/Schaltung

Änderungen vorbehalten.
 With reservation as to modification.

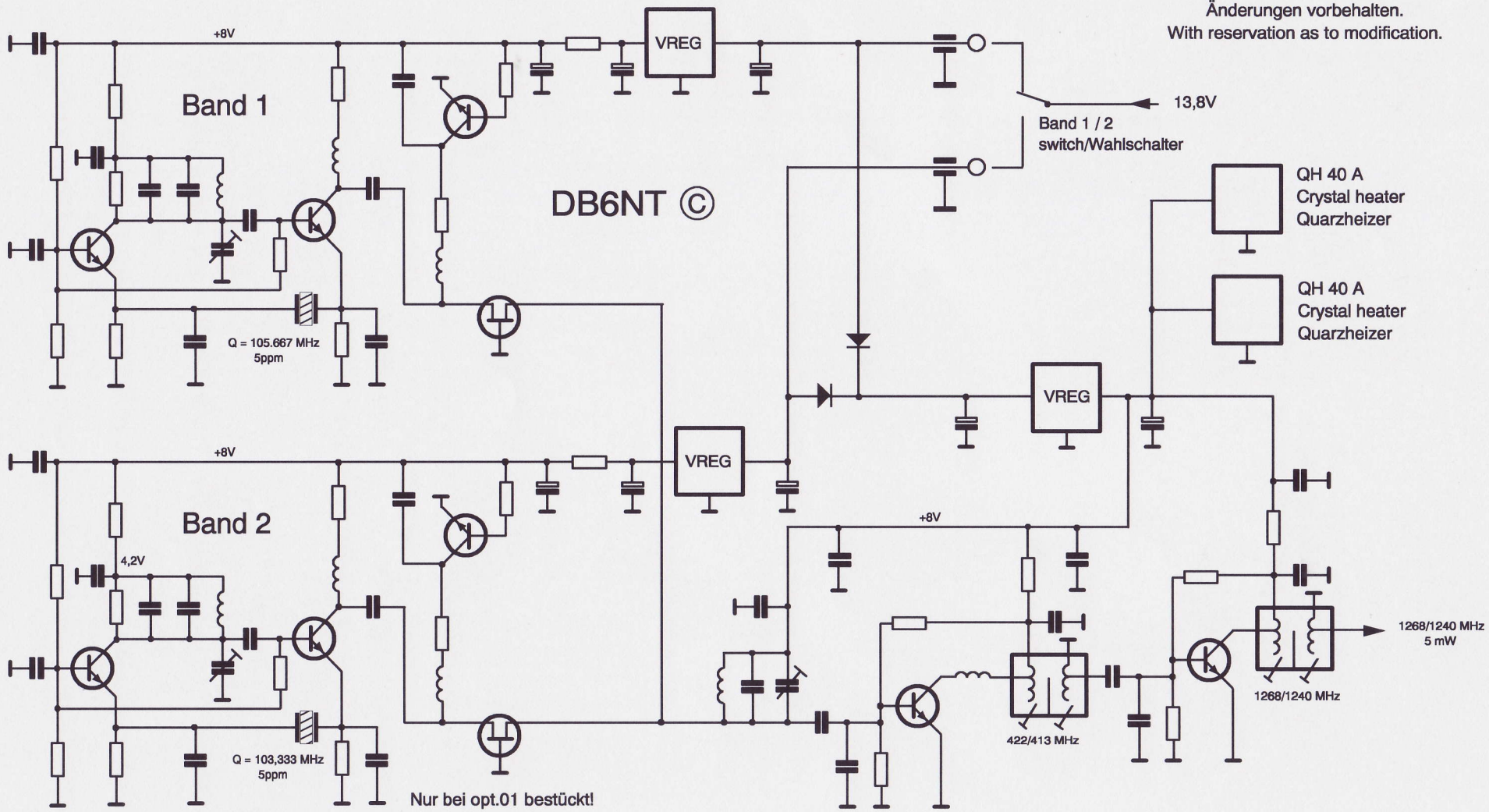


Änderungen vorbehalten.
With reservation as to modification.

TR 1296 H - 28 PA and Control functions/und Steuerung

TR 1296 H - 28 Oscillator Schematic/Oszillatorschaltung

Änderungen vorbehalten.
With reservation as to modification.



Band 2 ist nur bei Option 01 bestückt!
Components for band 2 only mounted with Option 01

Nur bei opt.01 bestückt!

Option 02

For shortwave-transceivers with a transverter power output in the range of 10-200 μ W

Für KW Transceiver mit einer Transverterausgangsleistung im Bereich 10-200 μ W

