

## Hands Electronics

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*Thank you for purchasing one of our kits. We hope it will give you many hours of service once built. Our aim is to provide satisfaction and service. If you have any problems with the construction or use of the equipment, please ring, or write to us. We will do all we can to help.*

*If you are new to construction we suggest you read carefully the about part identity and soldering contained in the tools and construction section.*

*Sheldon Hands*

## Tools and Construction Practice

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We recommend the following tools to make your HANDS kit

- 15/25w soldering iron
- small electrical screwdriver
- 4inch phillips screwdriver
- small side cutters
- electricians pliers
- snipe nosed pliers
- small half round file
- junior hacksaw

Below are some notes on construction practice with a heavy emphasis on soldering. You must use solder with a non-corrosive flux. Acid cored solder MUST NOT be used. A 60/40 type will be ideal. The secret of good soldering is to have the correct temperature at the joint. Make sure the tip of the iron is clean, if necessary clean it on a damp sponge. Do not carry solder on the iron to the joint, by the time you get it there the flux will have burnt or vaporised.

Although it seems to contradict the above, do lightly tin the iron before making a joint. This will aid the heat transfer and lessen the chance of damage to the track or component through prolonged application of the iron.

When you are ready to make the joint, apply the iron and the solder at the same time. Do not apply too much solder, a thin gauge helps in this respect. Humps of solder on a joint either means you did not leave the iron on the joint long enough or you used too much solder.

Try to get a medium coating over the track and the component lead. If you use too much heat you may damage the track or the component. We suggest you try some test joint on scrap wire, you will find it inspires confidence! When the board is complete check for solder bridges and dry joints, an Ohmmeter can be used for checks.

## Circuit Description

Primarily designed for the multiband RTX series ssb/cw and TCX cw transceivers the DC10 will also be found ideal for other homebrewed transmitters and transceivers. The filter and switch system is most suited to follow a class B or AB1 amplifier.

The receiver front end is connected to the board at RX [circuit diagram RMX /6 /10]. This output is dc isolated by C23. D8/9 are 1N4007 used as blocking diodes. The diodes are switched on by forward bias from the 12v per line via R1/2 and the RF chokes RFC2/3. This occurs only when the ground path is active through TR1 and is controlled by the 12VR line to the base connection. C19 connects circuit to the common filter line

The TX final amp is connected filter common line by C24. During a transmit period D8/9 have no bias and attenuate [block] the rx signal connection. To improve the blocking the common cathode connection of D8/9 is placed at RF ground during tx by D10 from C22. D10 is biased on from the 12VT line by R4/RFC5.

The filter comprises of 6 cascaded low pass filter sets, the sets in circuit are determined by the bandswitch relay, these may only be those of the operating frequency and higher. RL1-6 routes the common input line from the final amplifier to the correct filter cascade, with the relay operating voltage derived from the bandswitch select + 12v header. As the 14,21 and 30 mhz filters are also suitable for the 10/18/ and 24mhz bands isolation diodes are provided in the switch lines. These DC block the bandswitch selectline to the common band.

Each set in the cascade are 5 element designs, the first set as selected by the band select line has a cut of frequency just below the operating frequency. Where the filter set operates on 2 bands the cut off will be above the highest frequency.

Output from the final filter is via RL6 to the directional coupler T1/2, D11/12. This is a 4 port hybrid and will provide voltages in proportion to the fwd and any reverse power on the line to the ANT connection.

## Construction

- ✓ ○ Fit the pcb pins listed below. Insert the pins from the track side and push home with a hot iron. Solder the pin to the track. Always support the circumference of the pin with an old cotton or solder reel during this operation.  
✓ ✓ ✓ ✓ ✓ ✓
- Pcb pins:- RX (2), ANT(2), 12VT, 12VP, TX AMP (2), ALC F, ALC R, BAND SELECT 1.8-30[10 OFF]. ✓
- ✓ ○ Fit and solder R1-6. At R3 add a 4K7[R3a] from R3/TR1 base to ground. The pad is overdrilled to allow for both leads. [this mod prevents spurious switching by rf]
- ✓ ○ Fit the ground link for the relay DC return. Use a resistor offcut and solder the link between the track pad and the groundplane at the ground legend adjacent to D10.
- ✓ ○ Fit and solder C1-18 including any A suffix capacitors required. The coloured band at one end of the capacitor indicates the outer foil, this end should be connected to the groundplane. When making connections to the ground plane