



### VHF/UHF Transverter and Transverter Kits

DEMI is in the final development stages of our new DEMI VHF/UHF transverters (2010 release). We have put together a list of features and descriptions with some basic specifications.

The original DEM VHF and UHF transverters were first introduced in 1993. Over the years many upgrades and circuit design changes have occurred to keep our VHF and UHF transverter line current with the type of operation required by today's VHF/UHF enthusiasts. This design will encompass all of the past features with the addition of circuitry once considered options and auxiliary interface equipment all within the same enclosure for ease of operation and interfacing.

#### Specifications

Bands and Model #'s:	All Single band units: 50 MHz, 50-28 (50-52 MHz.) 70 MHz, 70-28 (70-72 MHz.) 144 MHz, 144-28 (144-146 MHz.) 222 MHz, 222-28 (222-224 MHz.) 432 MHz, 432-28 (432-434 MHz)
Noise Figure and Gain:	<0.8 dB NF, > 17 dB Gain
Power Output:	>25W nominal (Standard) available as kit or assembled. >50W nominal (HP version) available assembled only.
TXIF Drive level:	-20dBm to 25 watts max. by selecting a 20dB TXIF drive range.
DC Power requirements:	13.8 VDC nominal 11 to 16.5 VDC operational. Current drain: 5 -6 amps 25 watt version. 10-12 amps 50 watt version
Connectors: (DC and AUX mating connectors supplied)	DC: 4 pin AMP 20 amp rating RF: Type "N" or UHF IF: BNC only PTT: RCA AUX: 8 Pin

#### Product Features:

DEMI VHF/UHF transverters will have all of our standard transverter functions plus the additional features and circuits listed below to allow for ease of interfacing and expandability.

1. Complete kit (standard 25 W version) available with new Style DEMI enclosure.
2. Improved high dynamic range receive section.
3. Narrow receive bandwidth provided by a total of 5 poles of helical filtering. Resulting in better out of band rejection performance.
4. Latest technology in oscillator performance with option for future implementation of external 10MHz sourced synthesizer.
5. TXIF drive levels operating between -20 dBm and 25 watts with RF sense option (AOS).
6. Built in negative voltage generator (TIB).
7. Built in sequencer (TRS).
8. Variable speed cooling fan (FC).
9. Relative output power monitor circuit (RFPM).

## Descriptions of New Features

### Complete kit (standard 25 W version) available with new Style DEMI enclosure:

The new Standard level transverter, kit or assembly, will be available in the same enclosure utilized in our High power transverters. The exception will be that in place of the heat sink will be a smaller and lighter heat sink that doubles as an assembly fixture and test bed. This “test bed” will enable the kit builder additional flexibility to evaluate individual circuits and understand functionality. This will also provide the means and ability to experiment with the interface features or to have the ability to compare the functionality of various interfaces. The interfaces that will be standard in this line of transverters include circuitry from our AOS, TIB, TRS and HIF/LIF options.

The IF and RF configuration of the transverter is still the same, Common IF , Common RF, Split IF , Split RF, along with the hard key switching schemes, PTT-H, PTT-L. What will be different will be a multi-pin AUX connector that will accommodate the various interfacing options

without additional enclosure modifications. These additional I/O's, through the AUX connector, may be utilized to interface the internal sequencer to the outside world and allow a connection from the negative voltage generator to the transceiver's ALC circuit. Additional outputs may be used for signaling or remote monitoring if you desire.

The new DEMI VHF/UHF transverter can now be the control center of your band specific system without the additional need of any

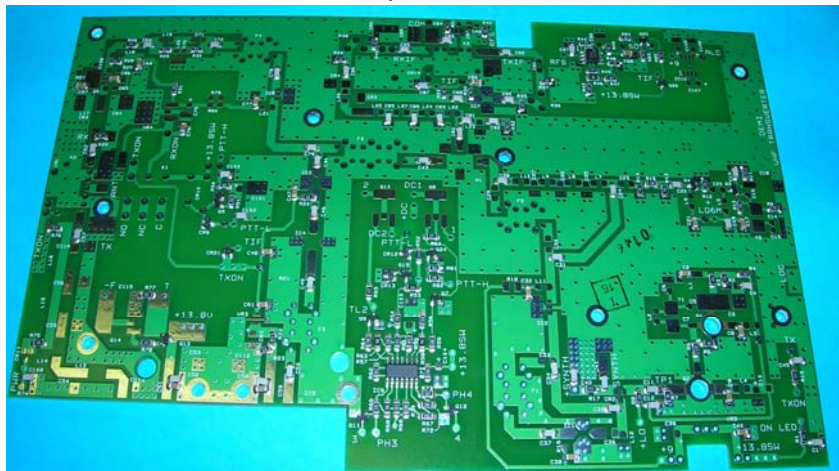
add on accessory equipment. This will also eliminate the need of additional cabling for interfacing.

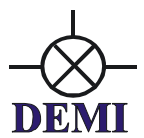
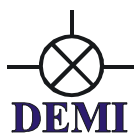
As for kit building, the Circuit boards will be pre-assembled with the common components shared by all of the five bands of operation. What the kit builder will be expected to do is assemble the “Band Specific” components such as Helical Filters, Crystals, Hybrids, and other frequency specific components and adjustment circuits. Then, complete the final wiring and preliminary testing. Along the way the Kit builder may evaluate specific circuits and make informed decisions about particular interfacing such as RF sensing and Sequencing before the final product is ready to be put into service.

### Improved high dynamic range receive section:

With the latest PHEMT technology, we were able to design a more robust and lower noise receive section. Utilizing a diplexer between the LNA and the first band pass filter, high level reflected out of band signals and noise are absorbed and not allowed to “re-mix” in the LNA which would result in higher intermodulation distortion at a lower signal levels. A feedback circuit is also employed in the LNA to control excessive gain at low frequencies while maintaining in band gain and noise figure specifications.

**Narrow receive bandwidth provided by a total of 5 poles of helical filtering. Resulting in**





**better out of band rejection performance:**

All of the previous VHF transverter designs except for the 70 cm version, had only 3 poles of filtering in the receiver. The 6M version had a 3 pole LC circuit. This new design incorporates 5 poles of helical filtering custom tuned to our design specifications to provide the best available performance today. By inserting filtering between the two receive gain stages, more out of band energy and noise is prevented from entering the standard high level mixer resulting in less reciprocal mixing and imaging.

**Latest technology in oscillator performance with option for future implementation of external 10MHz sourced synthesizer:**

We have incorporated the latest technology in the Crystal oscillator design for improved stability and accuracy. But, because of the new digital modes, we understand that this improved performance may still not be up to the requirements. We are in the process of developing a VHF synthesizer locked to a 10 MHz standard that will provide the ultimate in stability and accuracy. This synthesizer design, when released, will be easily implemented into this transverter design. We have provided two Local Oscillator inputs in the transverter that are activated with a simple switching circuit. This dual input may be used by any second Local oscillator if you choose to develop your own or add an external stabilized unit without any circuit modifications. This opens the possibility of having both synthesizer, which is stable and accurate but may suffer from higher phase noise, and crystal oscillator that is virtually phase noise free that can be utilized in crowded band or any strong signal environment by simply flipping a switch.

**TX IF drive levels operating between -20 dBm and 25 watts with RF Sense option:**

The low TXIF drive level is the same but we have increased the upper limit from 10 watts to 25 watts. Depending on the configuration, all levels are available in the standard transverter. What is new is the TXIF RF sense option. If your transceiver of choice lacks a PTT output that would control the transverter's TX and RX functions, the RF sense option may be utilized. But caution! Using this option will add some limitations to your system such as sequencing and controlling other external devices such as Power amplifiers and mast mount preamplifiers. These limitations will be covered in the User Manual and Kit document. This RF sensed circuit is similar to our AOS-28

**Built in negative voltage generator:**

If your transceiver doesn't have a transverter port or the ability to reduce its output power to less than 25 watts, we have included a negative voltage generator. The output of the generator may be connected to your transceiver's ALC input port. In most cases, when the ALC voltage is applied, it will reduce the power output of your transceiver to a minimum level that may drive the transverter directly. This voltage is delivered to your transceiver through the multi-pin accessory connector on the transverter. Other signals may be delivered through this connector such as a positive voltage to disconnect your HF antenna system from your transceiver when the transverter is powered up and connect the transverter with a simple coax relay. Other schemes may be developed depending on your requirements. This circuit is similar to our TIB.

**Built in sequencer option:**

We have provided a simple 4 step sequencer built in to the transverter. It is similar to our TRS in theory but without the relays. It is all solid state switching. This is a perfect complement to a transceiver with a low level transverter port. BUT—if the TXIF levels increase above 250 mW, the functioning of the sequencer becomes complicated and will be handled with detailed instructions found in the assembly or operators manual to avoid set up mistakes. Caution: RF sensing PTT switching schemes will not allow the use of the sequencer or at least complicate its use. With simplicity in set up, and common sense when using, this sequencer is an economic

alternative to any external device. All external switching signals will be accessible through a multi-pin connector.

**Variable speed cooling fan:**

All high power version transverters will have a cooling fan attached to the heatsink. The fan is connected to a variable speed circuit assembled on the transverter's circuit board. This is available as a extra option for the assembled 25 watt version transverters. The kit builder will have the option of utilizing it if desired (Please note the fan is not provided in the kit just the circuit).

**Relative output power monitor circuit:**

The relative output power monitor has been standard in all High power transverters. This monitor circuit and 10 segment LED display will now be included with the assembled and kit version 25 watt transverter models. The output monitor may be calibrated to indicate certain levels if required. This relative power meter is a forward power indication only and will not measure or indicate reflected power. The RF detection circuit may be used separately or in conjunction with the 10 segment LED display in case of a requirement to monitor output power with the transverter in a remote location.



Standard Version

High Power Version

Unit size:  
 Standard version: 10"(L)x7"(W)x2.75"(H)  
 High Power version: 10"(L)x7"(W)x5"(H)

