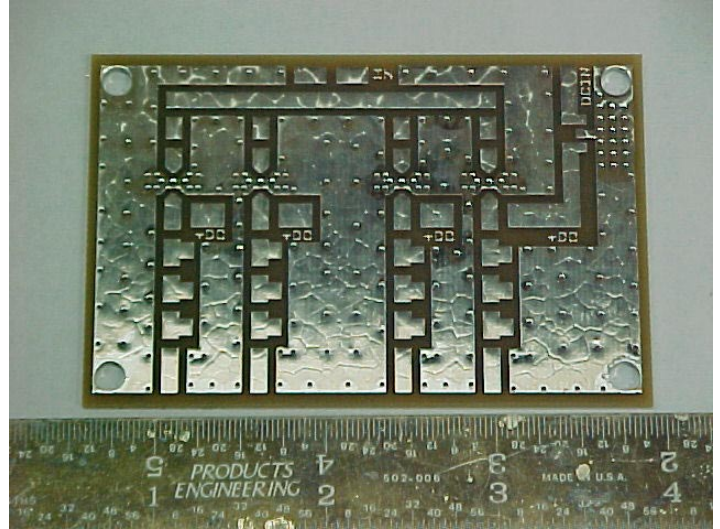


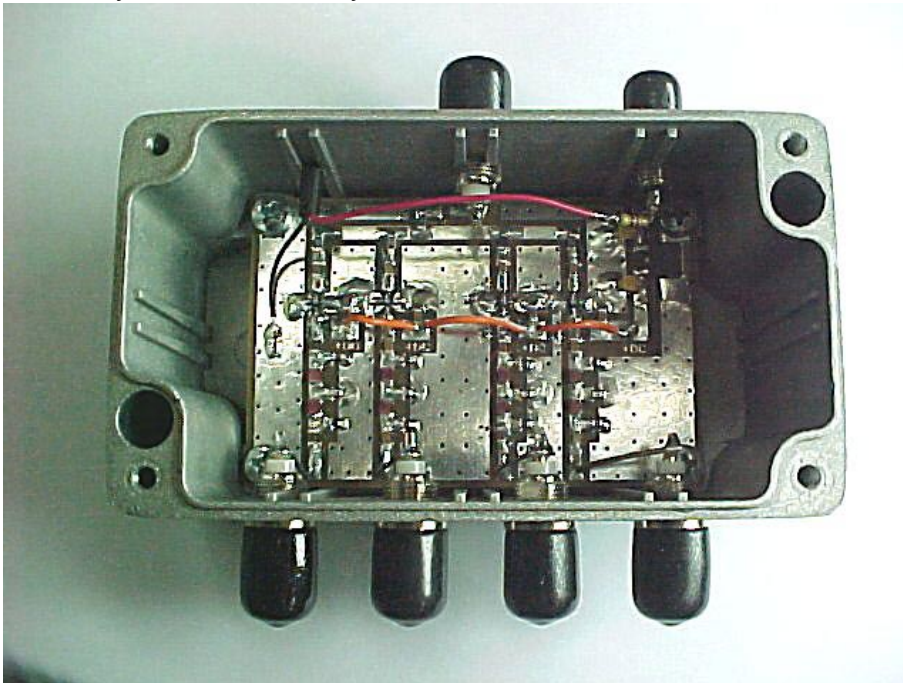
DEM 10-4

10 Mhz. Amplified and Filtered 4 way divider

CONCEPT: The DEM10-4 accepts any 50 Ohm 10 MHz signal up to +10dBm. This signal is divided 4 ways then amplified and filtered to reduce all harmonics higher in frequency producing a clean, unity gain signal that may be better than your sources original signal. With this type of design, the port to port isolation is maximized. The DEM10-4 is available as an assembled unit, as a board kit, the DEM10-4K, as a complete kit, the DEM10-4CK. and the PC board only as the DEM10-4PCB seen to the right. The assembled and CK version have BNC 10 MHz connectors and a RCA DC connector. The K version is a PC board kit that contains all components required for full operation in your own enclosure.



OPERATION: The DEM 10-4 is easy to use. There are no adjustments to make or levels to set. Just simply connect a DC supply between 11 and 18 VDC that can source 200 mA. Then connect the 10 MHz input signal not exceeding +10dBm. The outputs will then produce the same level of 10 MHz signal (+/- 2dBm) with the harmonic level being less than -35dBc. Be sure to terminate the unused ports. Output port to input port isolation is > 35 dB. Output port to output port isolation is > 25 dB. Isolation is measure with DC voltage applied. If you need more than 4 ports, simply add an additional DEM10-4 to one of the output ports to increase it to 7 ports. You may add as many DEM10-4's as you desire because the levels will remain the same as the input within +/- 2 dB. This level should be well within specification of most test equipment and frequency sources that require a 10 MHz reference signal.



KITS: The picture to the left shows the completed assembly in our supplied enclosure. It is all surface mount assembly and point to point wiring to finish. It requires a few basic DC voltage tests and it is ready to go. This picture also shows the mounting holes that would be used to mount the unit in a fixed position or place in the portable setup.

ADVANTAGE OF USING A 10-4: There are some advantages in using this 10 MHz 4 way divider. One is it will clean up any dirty 10 MHz source's. 2nd and third harmonics that make some reference lock or synthesized circuits crazy. Another advantage is you may have an expensive 10 MHz source. Will you purchase one for every band? Why? Or will you just kluge up some coaxial "Tee'd" configuration without filtering or gain control and forget about maintaining the correct levels? Wouldn't it be simple and easy to add a DEM10-4 4 way divider? Then lastly, one of the most fundamental reasons, Consistency! Read further for the explanation.



Say you have four transverters all with separate "low cost" 10 MHz sources. All four sources will not be on the same frequency no matter how often you test and correct them. They will also be moving in different directions at different rates depending on your operation temperature. As you go up in frequency, every band becomes a guess of how much error and in which direction you should tune.

Now suppose this scenario. If you have one source, no matter what the quality and install a 10-4 way divider. This is connected to your 4 transverters with synthesizers or referenced locked LO's, 2304 through 10 GHz. Makes no difference to the 10-4! Now, hopefully you can make the first contact on 2304. If you do then you are calibrated. All you need to do is verify your frequency with the other station. If you are for an example, 3 kHz high on 2304, you will now have a reference of where you are on the other three higher bands. If using the DEMI transverter scheme where the LO is being multiplied x2 on 2304, x3 on 3456, x5 on 5760 and x9 on 10368, you can assume that you will be 13.5 kHz high on 10368 MHz. The math is like this 3 kHz (the difference on 2304) divided by 2 = 1.5 kHz error of the base oscillator. So the 10 MHz standard is off frequency enough to cause the 1080 base oscillator frequency error. So, the other three base oscillators will be off 1.5 kHz. Now depending on the transverter, multiply the base error (1.5 kHz.) by the multiplication factor of that particular transverter. Let's use 10 GHz. 1.5 kHz x 9 = 13.5 kHz. If 2304 was high, then 10 GHz will be high by 13.5 kHz. This means you just need a stable 10 MHz source, temperature wise, and not a dead accurate one. One source of this type can be quite inexpensive and made to be very stable over a slight temperature change. And if properly calibrated, can be quite accurate.

CONCLUSION: We hope you find this basic and simple 4 way divider meeting your requirements. The fundamental reason the DEM10-4 was designed is to provide four quality 10 MHz signals derived from a single 10 MHz reference. This design will complement our new DEM A32 synthesizer option for our 2304 through 10368 transverters that will soon be available.

