

DEM Part Number 5760-144_____

5760 MHz. Transverter, _____ **MHz IF, SN**_____

Power Out:	>2.5 W adjustable	LP version: > 10 mW
Noise Figure and Gain:	<1.5dB @ 17dB G	<3.5dB
DC Power Requirement:	10 - 15.5 VDC @ 2.5 Amp	<0.6 Amp
IF Option:	Common	Split
IF Drive Level Requirement:	1-250 mW 250mW-3W 3-10W Other_____	
Keying Option:	PTT - to ground	TTL - Positive Voltage
Aux. Connection Output Option:	TX RX High Low RVD	
Antenna Option:	Common	Separate TX & RX
EXT.10 MHz Source Level:	+3dBm +/- 6db (Terminate the port when not in use)	
OPTIONS:		

Operational Overview

The DEM 5760-144 is a 5 cm to 144 MHz transmit and receive converter. It has a linear output power of >2.5 watts (> 10mW for LP version) and may be achieved with as little as 10mW or a maximum of 10 W of IF drive with the correct IF configuration. The receive section is a design using a PHEMT LNA (GaAs MMIC in the LP).

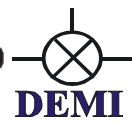
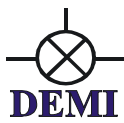
The base local oscillator frequency is provided by Q5 Signal DigiLO synthesizer. It has a internal 10 MHz clock or can be used with a external clock. The DEM 5760-144 has a built in transmit / receive relay driver to provide voltages required by common SMA relays and provisions for external switching so adding a high power amplifier or preamplifier to your 5cm system is easy. TXIF level options have been built into the transverter. The IF levels are adjustable on both transmit and receive and have a dynamic range of approx. 25dB. This is useful for adjusting your maximum output power and setting the "S" meter level on your IF receiver. The IF connections are via BNC connectors.

Options have been provided for a key line input PTT-H (+1 to 15 VDC) or PTT-L (a closure to ground) and auxiliary contacts on either transmit or receive with a common line for many applications. The control, power, and auxiliary connections are via DC feed thru connectors and the 5cm connectors are SMA. The 5760-144 is housed in our standard 4.125" x 1.875" x 9.75" extruded aluminum enclosure that matches the all of our other microwave transverters.

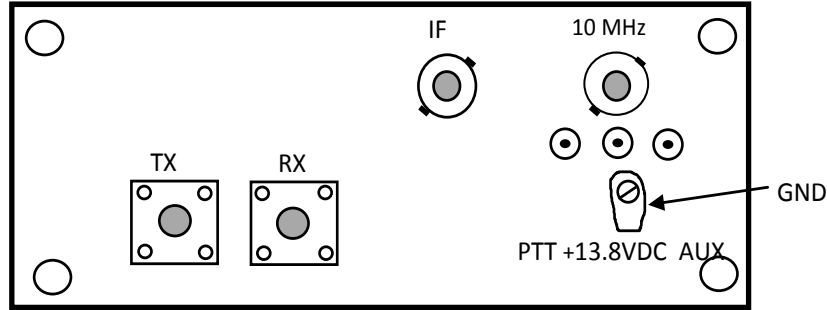
Connect your transceiver to the transverter:

Interfacing the transverter to the transceiver is easy. First review the assembled configuration above. If the transverter was configured for direct connection to your transceiver (10 watts or less), follow the steps listed next.

1. Open the top lid of the transverter by removing 4 screws.



2. Connect all IF cables. The transverter may have a common IF port or two separate ports TXIF and RXIF. Use good quality coax cable to connect the ports between your transceiver and the IF connectors on the transverter.
3. Connect the Push to Talk line out of your transceiver to the transverter. It is labeled PTT on the transverter and uses a solder type DC feed through connector. The correct keying type can be configured for your transceiver at time of order or you may select it in the transverter now by moving the PTT jumper on the TC board.
4. If the WTR option was not ordered, you will have separate TX and RX ports. You may connect your own transfer relay at this time or continue interfacing without it. Connect your 5cm antenna system or a dummy load with a power meter to the appropriate transverter ports. Always terminate the receive port with a 50 ohm load.
5. Connect the external 10 MHz clock if you desire. Not required for testing or use.
6. Connect the DC power to the transverter. It uses a DC feed through type connector. 13.8 volts is optimum but the transverter will operate normally from 11 to 15 volts.
7. Preset the TXIF gain control fully counter-clockwise and the RXIF gain control fully clockwise in the transverter. This is maximum attenuation on Transmit and minimum attenuation on Receive.
8. Power your transceiver "ON". The green "ON" LED will be lit and either a red or green "Lock" LED should be lit. Green is when an external 10 MHz source is connected. The TX LED should not be lit. Set your Transceiver set to 144.100 MHz. This should be 5760.100 unless you ordered a different frequency scheme.
9. Adjust the RXIF gain control until a slight noise increase is heard in the transceiver or just a slight movement in the "S" meter is detected. Power the transverter on and off to verify the change of noise in the transceiver. You may also remove the 50 ohm load to determine receiver performance. Find a signal on the band or use a signal generator to determine correct frequency, or minimum signal level desired. If you are planning on installing an external LNA you may adjust the IF level after installation.
10. It is recommended to test the transverter in the CW mode because most transceivers have carrier level controls in this mode only. Do not use full or semi break-in if possible. Do not use FM, SSB or AM because it may not be possible to obtain maximum output power with your transceiver in these modes. Set the carrier/output power control on your transceiver to minimum or "0" output power. Place the transceiver into transmit. If the PTT circuit is connected correctly, the transmit LED on the transverter will switch on. While observing a power meter on the 5cm system, slowly increase the carrier control (with key down) or increase the power output control to 10 watt maximum on the transceiver. If the transverter is configured correctly for your transceiver, minimal power may be detected on the power meter. Slowly adjust the TXIF control in the transverter in a clockwise direction while observing the power meter. Set it to obtain a saturated power reading and then just back off a little to avoid total saturation. If a power meter is not available this will be difficult. You may use a current meter on the DC power line to determine if the transverter is transmitting with the 3 watt unit only. A maximum of 2.5 amps should be obtainable and it should not vary as the TXIF control is adjusted. When maximum power is achieved the current will suddenly decrease. This is saturation. Back off the TXIF drive to limit the amount of saturation. Switch the transceiver to USB and make a transmission. The power output and current drain should correlate to your speech pattern.
11. You may re-adjust both RXIF and TXIF again if desired. Do not adjust any of the filters unless you have access to a spectrum analyzer at minimum. It is also not recommended to adjust the bias pots of the LNA and power amplifier in the 3 watt unit. They have been optimized.
12. Put the top on the enclosure and install the screws. Your transverter system is ready to use. Connect as you wish to use it in your 5cm system and have fun!



DEM 5760 - 144 User Options:

Auxiliary Switching contacts:

The auxiliary contacts on the TC board (see the TC document) are labeled C (common) NO (normally open) and NC (normally closed). The C connection can be wired to ground or +13.8 VDC. This will then be connected or dis-connected depending on if the transverter is in transmit or receive. The contacts are marked for the receive mode. The NO or NC can be wired to the AUX connector on the enclosure.

PTT options:

Both PTT-H and PTT-L can be changed on the top side of the TC board. The connections are located in the center of the board near the connector panel. Change the jumper as required from the PTT connection to either "L" (Ground to transmit) or "H" (Apply positive voltage to transmit)

IF options:

All possible IF configurations are shown in the TC document and in the supplied schematic. Follow the schematic and component list for changing the desired drive level ranges if you require a different configuration or drive level. Splitting the IF to separate TX and RX is also explained. Other combinations and drive levels may work but do not exceed 10 Watts input. The minimum TX drive level for without damaging the TX mixer diode is 20 mW. Do not exceed this level and try to limit the drive to 10 mW for a safety margin.

Frequency Options:

For other frequency options see the attached DigiLO synthesizer document.

5760 -144LP Transverter Board Component List

All components are Surface Mount

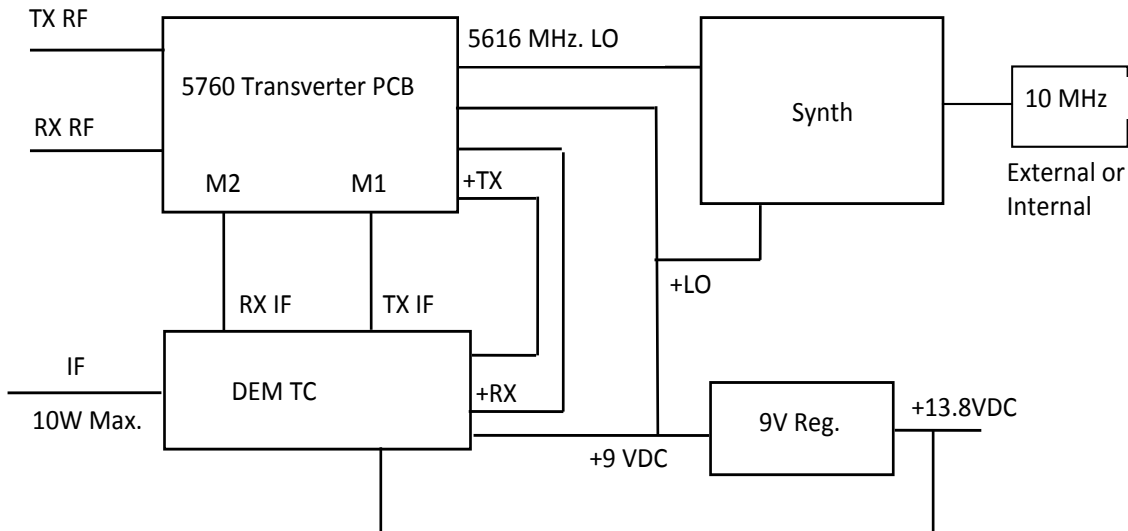
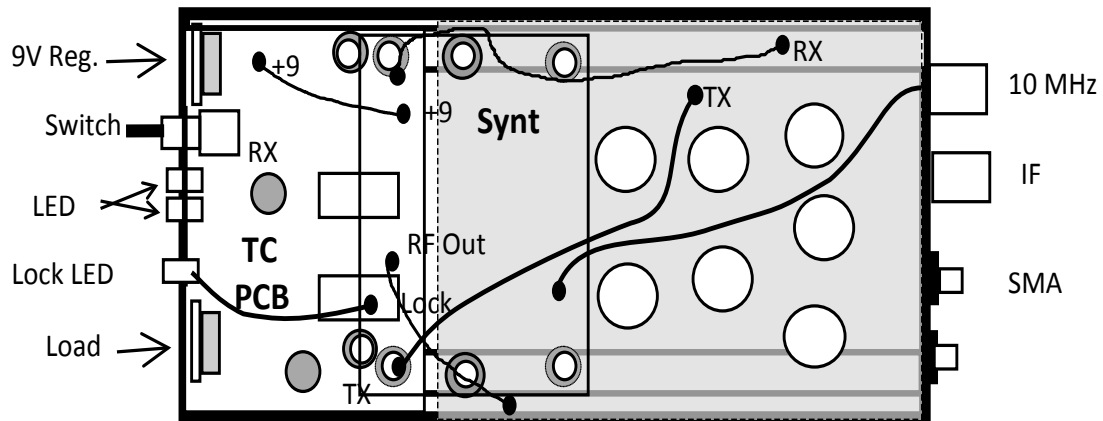
C1 100 pF	C12 5pF (0805)	C21 100 pF	R4 51 Ω	U1 ERA-1
C2 5pF (0805)	C13 0.1 μF	C22 0.1 μF	R8 51 Ω	U2 ERA-1
C3 0.1 μF	C14 100 pF	C23 0.1 μF	R9 36 Ω	U4 N6
C4 0.1 μF	C16 0.1 μF	D1 HSMS2822	R10 51 Ω	U5 N6
C5 0.1 μF	C17 5pF (0805)	D2 HSMS2822	R11 130 Ω (LP opt)	U6 MGA86576
C6 100 pF	C18 5pF (0805)	R1 51 Ω	R12 51 Ω	2" #24 enamel
C7 5pF (0805)	C19 5pF (0805)	R2 82 Ω	R13 100 Ω	
C11 5pF (0805)	C20 0.1 μF	R3 82 Ω	R24 36 Ω	

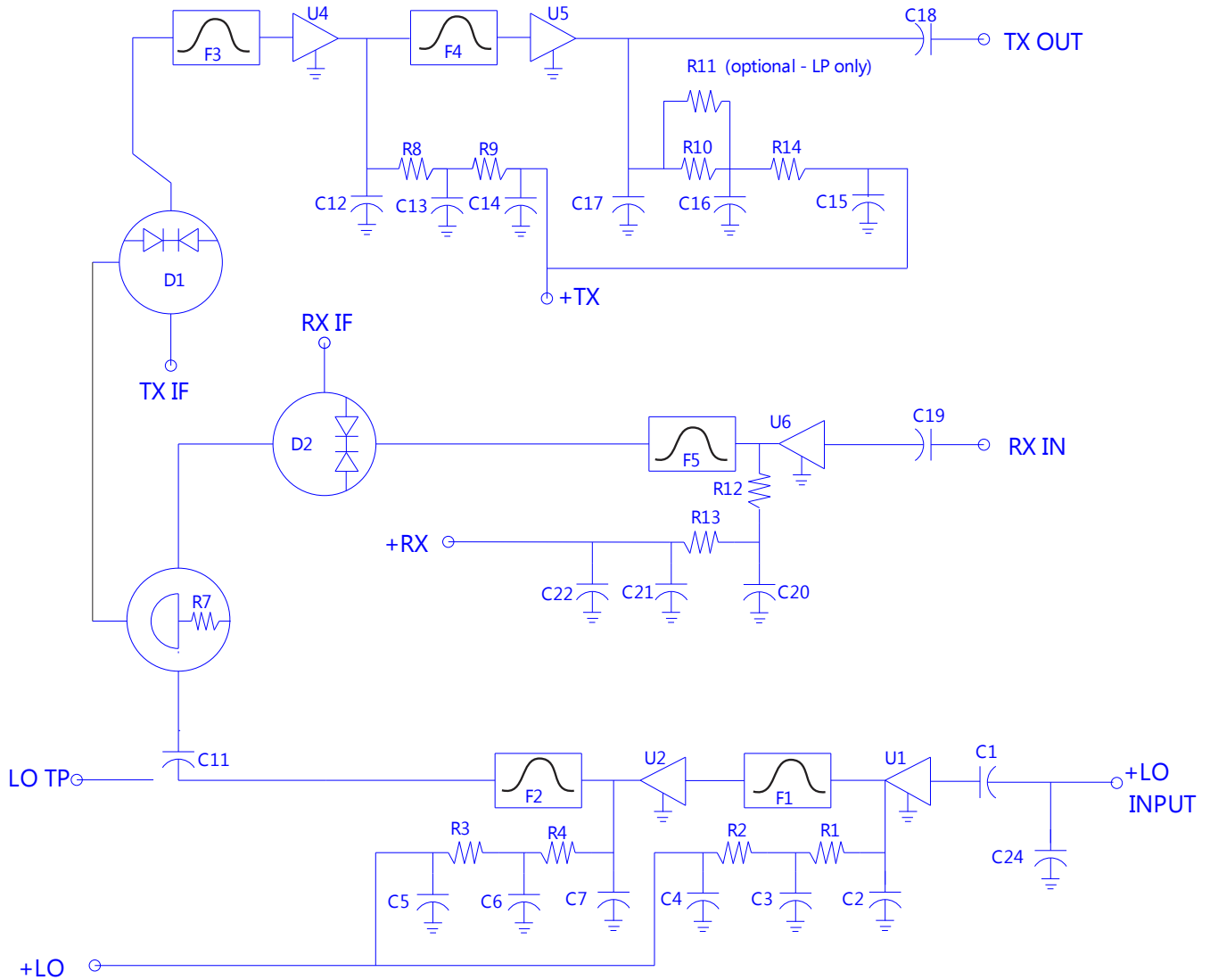
5760-144 LNA and Power Amplifier Section

C26 0.1 μ F	C35 2.7 pF 50mil	C43 10.0 μ F	R15 10 Ω (0805)	R23 36 Ω
C27 100	C36 5pF (0805)	C44 10.0 μ F	R16 51 Ω	VR1 78M05
C28 10.0 μ F	C37 0.1 μ F	D3 MMBD914	R17 51 Ω	3 Ω 10W
C30 100	C38 0.1 μ F	IC1 FMM5056VF	R18 220 Ω	4-40 Feed Thru
C31 10.0 μ F	C39 0.1 μ F	IC2 NMA0505S	R19 5.1K Ω	
C32 2.7 pF 50mil	C40 0.1 μ F	Q1 CE3512K2	R20 5.1K Ω	
C33 2.7 pF 50mil	C41 10.0 μ F	Q2 MMBT3904	R21 5.1K Ω	
C34 2.7 pF 50mil	C42 10.0 μ F	R14 200 Ω pot	R22 1K Ω pot	

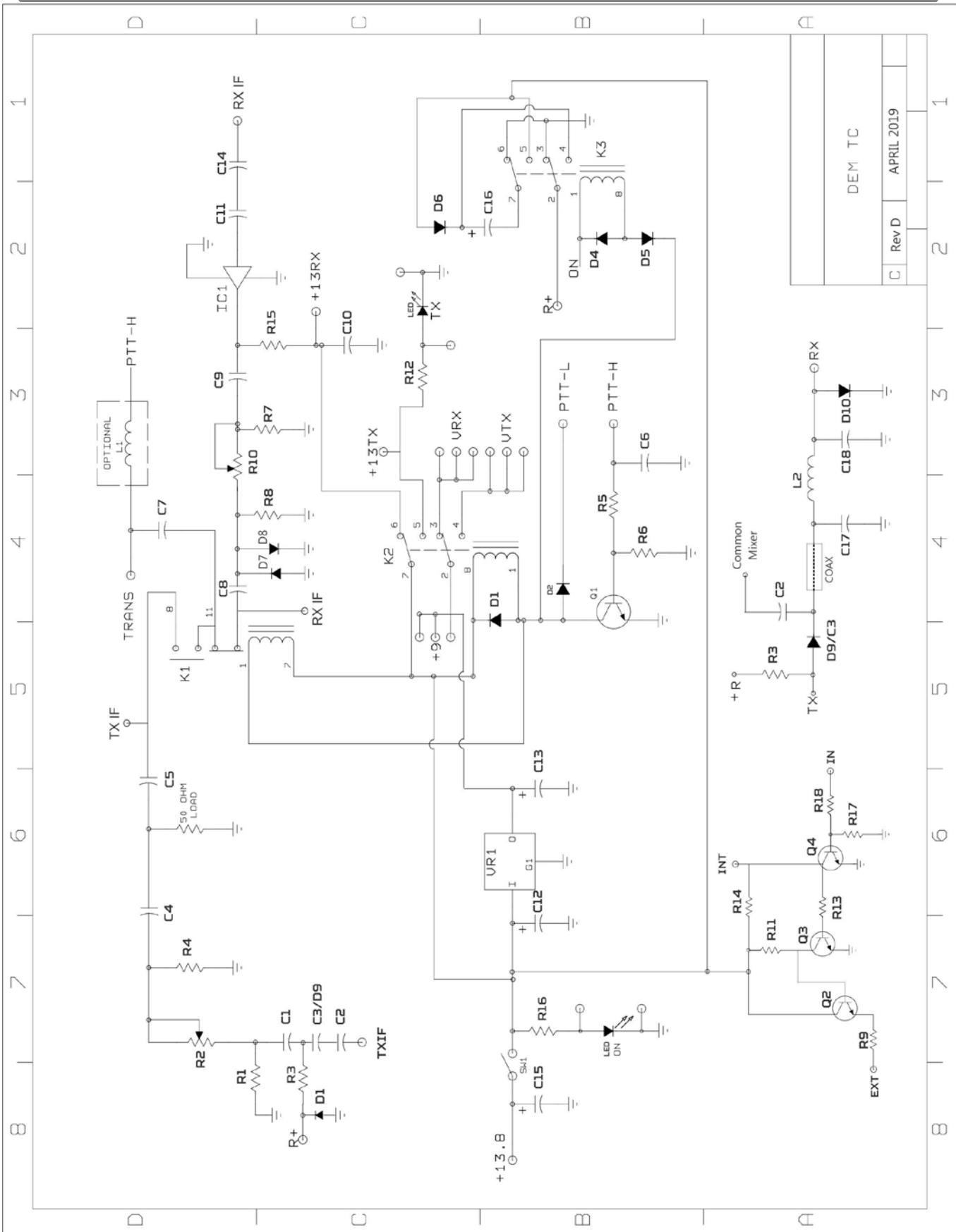
FILTER COMPONENTS

5760-144LP	5-3/4" Pipe caps	5-8-32 plated nuts	12-brass pins	5-8-32x 5/8" Brass screws
5760-144	7-3/4" Pipe caps	7-8-32 plated nuts	16-brass pins	7-8-32x 5/8" Brass screws

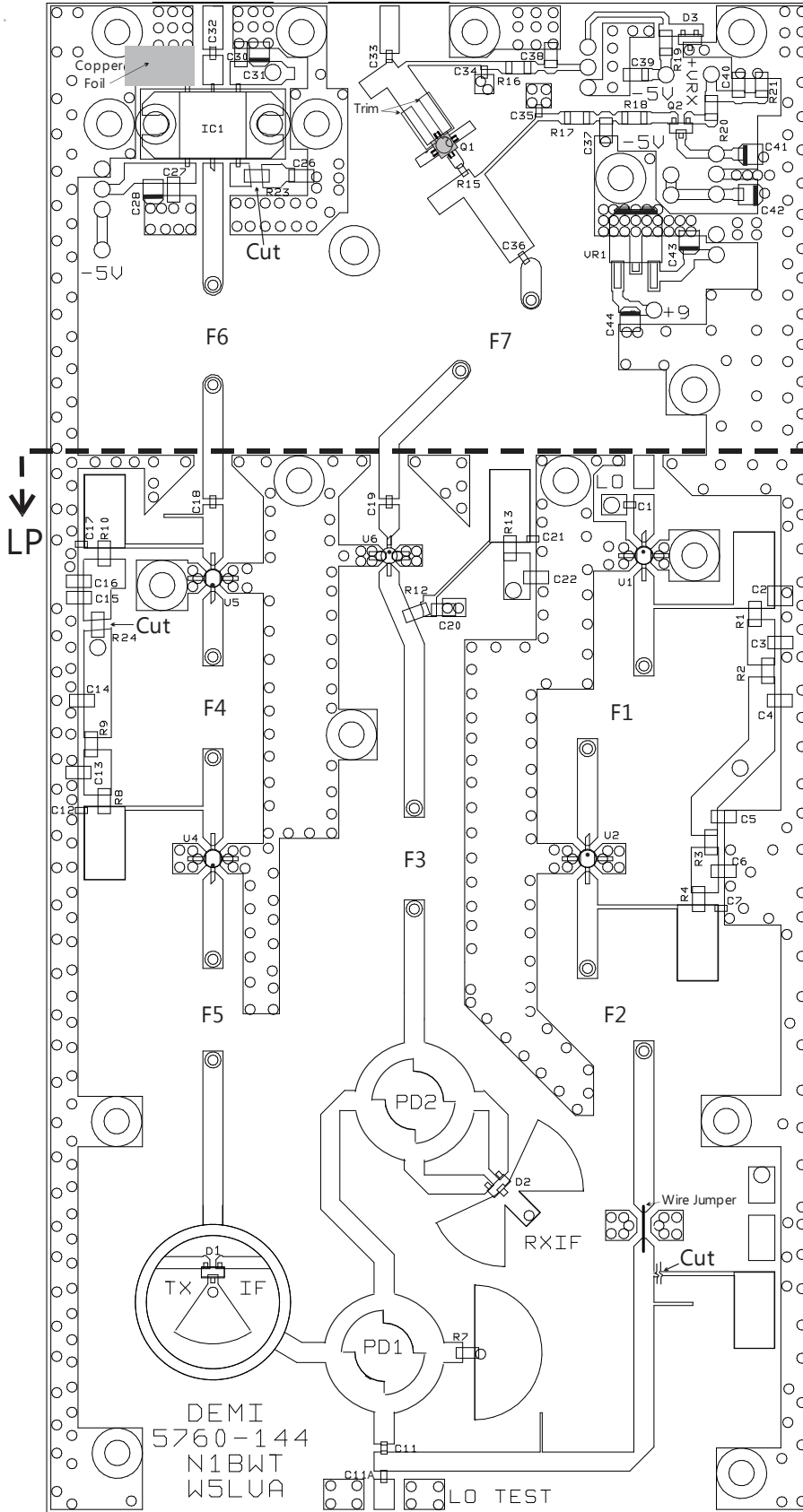




5760-144LP TRANSVERTER SCHEMATIC

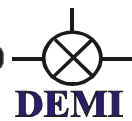
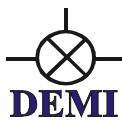


DEM TC	
C	Rev/D
	APRIL 2019



5760MHz Transverter Top Assembly Layout

NOTE - R14, R22, IC2 AND F1-7 ARE LOCATED ON THE BOTTOM SIDE OF THE PCB BOARD.



DEM Part Number TCK DEM TRANSVERTER CONTROL

The DEM Transverter Control (DEM TC) was redesigned in 2019. to perform with both separate IF and common IF microwave transverter boards or Mixers and to accommodate the connections for the DIGILO synthesizer such as frequency switching and "LOC" indication. It is still our basic "TC" board with the extra hooks incorporated. It is used in every DEMI microwave transverter 2304 and up and provides the regulated +9VDC, IF switching and attenuation functions, DC switching functions and external 24 VDC relay driver.

Circuit Description:

The DEM TC circuit board measures 3.75" x 2.15", which is designed to fit all DEMI microwave enclosures. ***It is not designed*** to be a drop in replacement for the original TC board. The TC offers all of the functions our microwave transverters require such as providing a common or split IF operation with up to a 10 watt IF drive level with either a PTT High or Low for keying. It also incorporates adjustable attenuators for both transmit and receive and has an option for additional receive gain if required. It will perform all dc switching functions for the transverter including switching 24 VDC microwave relays. A new optional feature in the TC includes a PIN diode switch network that connects the TC to a single mixer transverter while still allowing the TX and RX gain to have independent adjustments. With this new design, the TC is more versatile and will accommodate other makes of microwave transverters or offer more flexibility for homebrew equipment.

Construction:

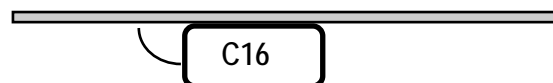
Before construction, read the complete document and review the component placement document and schematic. Depending on your system design, or the type of transceiver to be used, you will need to make a few decisions about the assembly of the TC.

Most components are thru-hole except for IC1, SMD capacitors and Pin diodes used for common mixer transverters. All DEMI transverters will need the standard TC and not the common mixer configuration. The common mixer configuration will be shown at the end of the document.

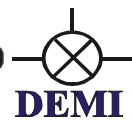
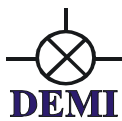
Referring to the provided schematic, parts list, and component placement diagram, install and solder all components in this order: All leaded components, R1- R3, R5 - R12, D1 – D8, C9-C11 and Q1 on the topside.

Install K1 and C16 on the bottom side of the PCB. Refer to the pictorial for the installation of C16 and check it's polarity. This capacitor is mounted so that the case is against the bottom of the PCB. If it is mounted in the traditional manner, the TC will not fit in the Complete Kit enclosure.

TC PCB TOP



If this TC is to be installed in a 5760 or 10368 transverter, install K2 and K3 on the bottom side. If the TC is to be installed in a 2304 or a 3456 transverter, install K2 and K3 on the topside. The reason is that all DC control wires may be added or removed with ease if the relays are not in the way. Also Damage may occur to the relays if they come in contact with a solder iron inadvertently. Final assembly step is to install the required jumpers. Connect the +9, and the +13TX with 2 short Teflon wires on the bottom side of the board.



You may install the optional RXIF gain stage but it is a judgment call. If you do not need the extra receive gain, do not install it. This gain stage will not affect the final system noise figure in our standard transverters but will affect the dynamic range of the IF transceiver. Refer to the transverters operation guide to decide to install or not. To install it, cut and remove the trace where IC1 is located and install IC1 as shown.

If you are using less than 100 mW of IF drive, install the extra .01chip capacitor in the R4 position. If you wish to use up to 1 watt, install R4 by surface mounting the leads. If you plan to use 1 - 10 watts of IF drive, install the 1pF capacitor in the R4 position. You may experiment with higher drive levels and a variable capacitor may be used in the R4 position. It is not supplied in this kit. In most cases, all drive levels between 1 mW and 10 watts will work with these configurations.

If you are using the TC with a different system other than a DEMI transverter, or have a different configuration in mind, you may choose not to assemble certain components. If you wish to use the TC with separate TX and RX ports, you may omit C3 and C5 or do not assembly K1. If you do not have a use for the 9 VDC circuit, do not install VR1. You may also install any other value regulator you wish. If you do not desire the 24 Volt relay driver, do not install K3, C13, and D3-D6. You may also use the K3 relay for other switching circuits. Just wire it as you desire. There are many possibilities so plan ahead but if you assemble everything, you have the options in the future. If the TC is not placed in a DEMI Transverter enclosure, you will need to make a decision on how to provide heat sinking to VR1 and the 50-ohm load if used. Also a determination will need to be made about how to install the switch and the 3 LED's. Also—K1 should always be installed on the bottom side of the board. It is designed to be mounted on the bottom side. If it was mounted on the top side, the transmit and receive functions would be reversed.

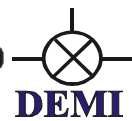
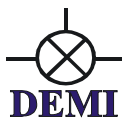
Installation:

When installing the TC in a DEM transverter enclosure, refer to the transverters complete kit document for the location of the TC. To install the TC, mount it in place with two 4-40 x 3/16 screws. Insert the switch, 2 two lead LED's, 1 three lead, (3 total) and VR1. Red LED for TX, Green for ON. The ground side of the two lead LED is the shorter lead. Solder all in place. Position the three lead LED with the shortest lead in the EXT via. Solder in place. Now solder the switch. Install and solder VR1. Remove the excess leads from the bottom of the board. Attach the front panel with 2 flat head screws. Bend the LED's in position to extend through the front panel. Attach VR1 to the front panel with a 4-40 x 1/4 screw and nut.

If your TX drive level is higher than 250 mW, the 50 Ohm load should be installed now by bending the lead up on the package then placing it aligned with the mounting hole. Bolt it to the panel with a 5/16" or longer 4-40 screw and nut. You will need to mark and clear the solder mask on the board with a razor knife before soldering in position. Solder one lead to the ground and the other to the active circuit, surface mounted and cut excess lead as you see fit.

The TC is designed to have all DC interconnects on the topside in a 5760 or 10368 transverter and the bottom side in a 3456 or 2304 transverter. If the wires are to be installed on the top side, you are ready to attach. If it is a 2304/3456, remove the TC from the enclosure by unbolting the Load and VR1 then the two mounting screws.

Now for both wiring schemes do the following. If you are using a 24 volt TR relay, connect the AUX connector wire on the transverter, to the +R on the TC. If you desire to have either +13 or +9 voltage during receive or transmit connected to the AUX connection, do so. Depending on the Push-to talk scheme of you transceiver, either connect the PTT-H (voltage to transmit) or PTT-L (ground to transmit) connection of the TC to the PTT connector of the transverter. Connect the



+DC input connector of the transverter to the +13.8 connection on the TC board. Connect all of the Receive, Transmit, and +9VDC connections from the transverter to the TC board at the VTX, VRX and +9 connections. Now at this time, if you wish to add any extra connections to the outside of the transverter, install the connector and hook it up to the connection on the TC. Be sure that all connections except for the IF cables, are connected between the TC and transverter. If complete, and all wires are installed on the bottom side, install the TC on the 1/4" standoffs using 4-40 x 1/4" screws.

All IF coax connections now need to be made. The 5760 and 10368 transverters have coax jumpers installed in the pallets. Just trim and connect to where they belong. For the 2304 and 3456, cut and trim short coax jumpers and solder between the mixers and the correct RX and TX connections on the TC. Position all coax connections and remove any solder mask that will interfere with the attaching of the coax to the board. Soldering the coax on the RX and TX side of the TC is straight forward. Solder the center conductor to the path and the shield to the ground plane. The transceiver input/output connection to K1 should now be made. Make these connections as desired or as shown in the transverter document. If you require separate transmit and receive connections, two coaxes will be required. Solder both ends of the shield to the lugs of the connectors and ground plane of the circuit board. If your IF rig has a PTT voltage on the coax, The L1 choke can be installed between the TRANS side of C4 and the PTT-H connection on the TC.

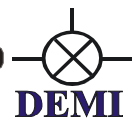
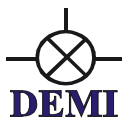
Final connections for the DIGILO synthesizer need to be made. With the synth positioned in the enclosure, make the +DC connection to the +9 via located by VR1. Then, the LOC wire connected from the synth connects to the "IN" via. The transverter is now ready to test unless the complete kit transverter document says otherwise.

Operation:

Before powering up and actuating, refer to the transverter's testing procedure. RF Input power to the TC is dependent on the attenuation installed on the C3 side of the K1 relay. The 50 ohm load resistor is designed to handle 35 watts with proper heat sinking. When mounted to the front panel of the transverter, it will not tolerate more than 10 watts reliably for a long period of time. You may experiment with external heat sinking if you desire additional external attenuation. External attenuation may be used in the transceive path. The added attenuation on the receive signals may be overcome by adding the RXIF gain stage. The level may be adjusted with the RXIF adjustment.

The RX/TX IF isolation is ≈ 60 dB. The adjustable RXIF and TXIF controls have 15 -20 dB of range. Simply grounding the PTT-H line or applying a voltage between 1-15V to the PTT-L input will switch all RX/TX functions in your transverter and provide external DC switching functions. If your transceiver has +voltage on the coax during transmit, the addition of the L1 inductor will perform the TX/RX switching functions of the transverter. The output of the +24 volt relay driver should measure +24 to +28 VDC with no load. It will only measure the DC input voltage of the transverter if it is loaded with a common type SMA relay.

The TC is not designed to be a RF sensed switch. It has 3 relays and it may be connected to external mechanical relays. If any RF sensing scheme is added to the circuit, it will cause excessive relay chatter that will not only wear out the relays prematurely, but could cause other failures to external preamplifiers and or power amplifiers if used in your system. RF sensing circuits are not recommended with any circuit that contains mechanical relays at RF frequencies!!



Parts List

All components on this list are 1206 size and are hand solder repairable if required. Highlighted components are to be installed by the kit builder.

C1 0.1 μ F	C14 0.1 μF	Q3 MMBT3904	R12 330 Ω
C2 0.1 μ F	C15 100 μF elect.	Q4 MMBT3904	R13 10K Ω
C3 0.1 μ F	C16 330 μF elect.	R1 220 Ω	R14 1K Ω
C4 0.1 μ F	D1 -D6 1N4000	R2 1K pot	R15 330 Ω
C5 0.1 μ F	D7 1N914 or 1N4148	R3 1K Ω	R16 1K Ω
C6 0.1 μ F	D8 1N914 or 1N4148	R4 220 Ω	R17 10K Ω
C7 0.1 μ F	IC 1 MAR6 ❶	R5 5.1K Ω	R18 1K Ω
C8 0.1 μ F	K1 G5Y relay	R6 5.1K Ω	2 - LED
C9 0.1 μ F	K2 G5V or equiv. relay	R7 220 Ω	VR1 78S09
C10 0.1 μ F	K3 G5V or equiv. relay	R8 220 Ω	50 Ω load
C11 0.1 μ F	L1 1.0 μh (Brown/Black) ❷	R9 1K Ω	1 pF ❸
C12 4.7 μF Tant	Q1 MMBT3904	R10 1K pot	
C13 4.7 μF Tant	Q2 MMBT3904	R11 5.1K Ω	

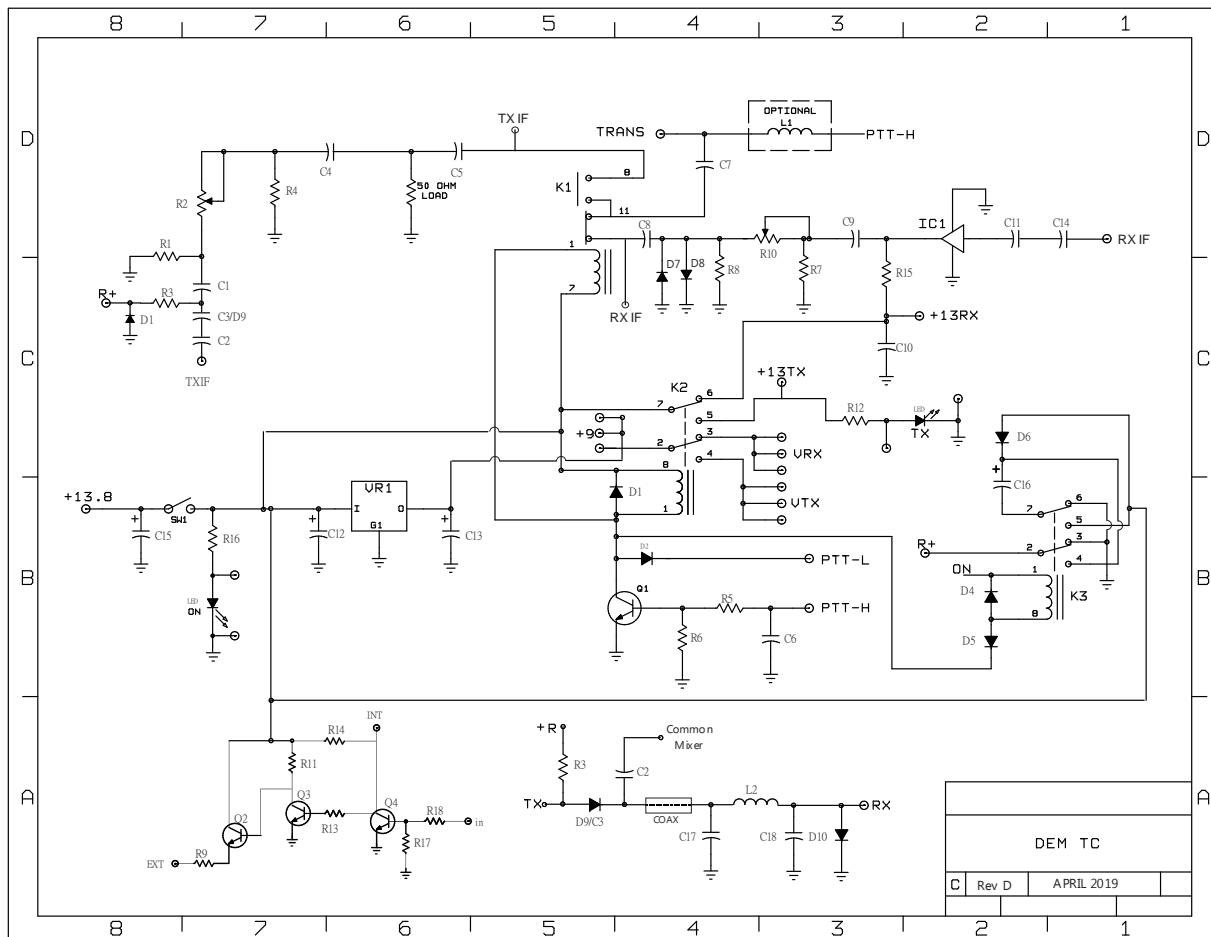
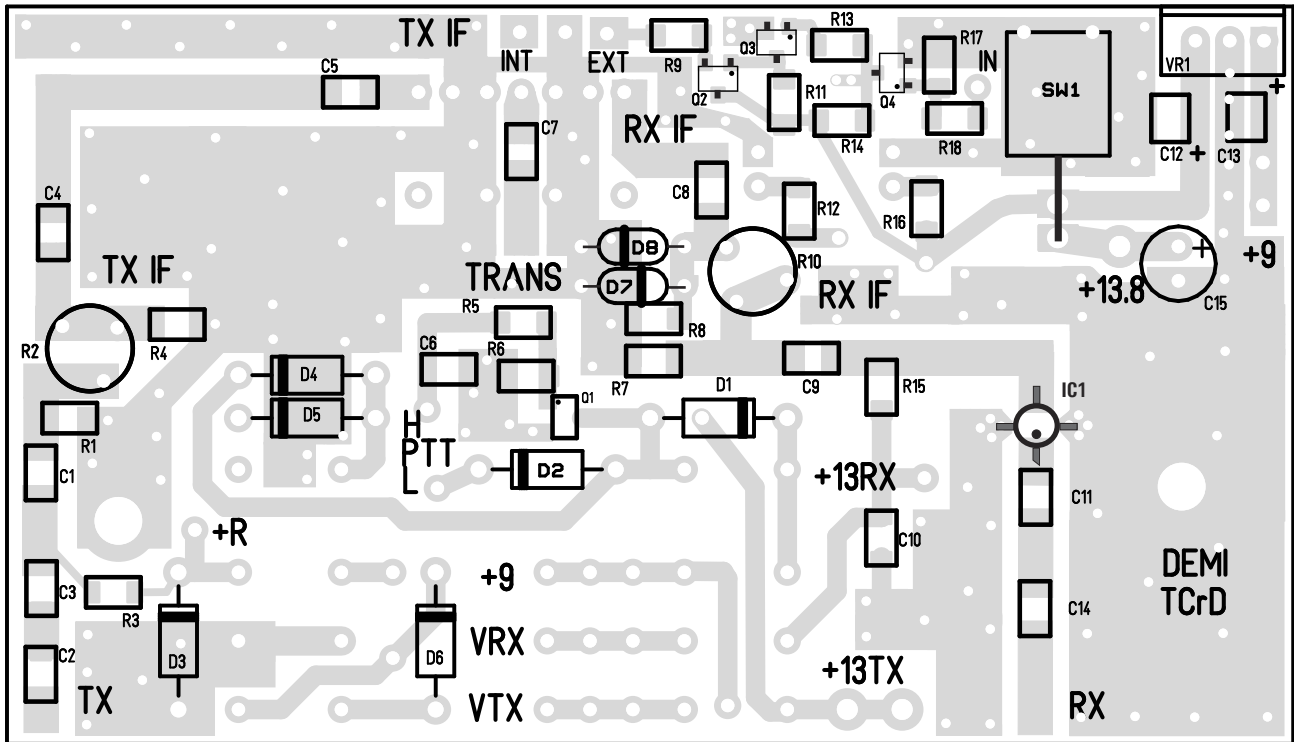
- ❶ Optional Gain stage.
- ❷ L1 is used with transceivers that have + DC voltage on RF line during transmit
- ❸ Depending on the drive level used, C4 may be replaced with a 0.1 μ F chip, a 1pF leaded capacitor, a 220 ohm leaded resistor or a variable capacitor. See text for description.

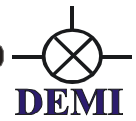
Single Mixer Option Parts List for 144MHz IF

C17 18pF ❹	D9 MPN3404	L2 5T 1/8" dia. ❹
C18 18pF ❹	D10 MPN3404	

- ❹ For 70cm IF operation use 7 pF and 3 turn inductor.

Single mixer option instructions: Replace C3 with D9 and replace C14 with L2. Install all components as shown. Isolation may be optimized by stretching /compressing L2 if required. Keep Coax as short as possible.





digiLO – A Wideband PLL Synthesizer

The digiLO is a Wideband Fractional-N / Integer-N PLL Synthesizer based on Maxim's MAX2870 capable of generating signals from 23.5MHz to 6GHz. It measures only 2" x 3" and comes programmed with over a hundred popular frequencies. A connection to an external 10MHz reference is provided. But the digiLO automatically switches to its on-board TCXO reference when its 10MHz external reference is not detected.

The recommended supply voltage for "+V" is 9V. But reliable operation is possible down to 7V. The digiLO is tolerant of supply voltages up to 15V. But operation beyond 9V results in excessive heating of the voltage regulator. So if 12V operation is desired, it is recommended to use a 27 Ohm 2-Watt resistor in series with the power connection. This should drop the voltage to the digiLO to a safer level. A +5V direct connection which bypasses the voltage regulator is also available.

The MAX2870's internal voltage controlled oscillator (VCO) operates from 3GHz to 6GHz. The MAX2870 generates output frequencies lower than 3GHz by inserting dividers after its VCO up to a maximum of 1/128. Every divider slightly increases the MAX2870's current consumption. Therefore, the supply current increases as output frequency decreases. Below 47MHz, supply current is a maximum of 200mA. And above 3GHz, the supply current drops to 130mA.

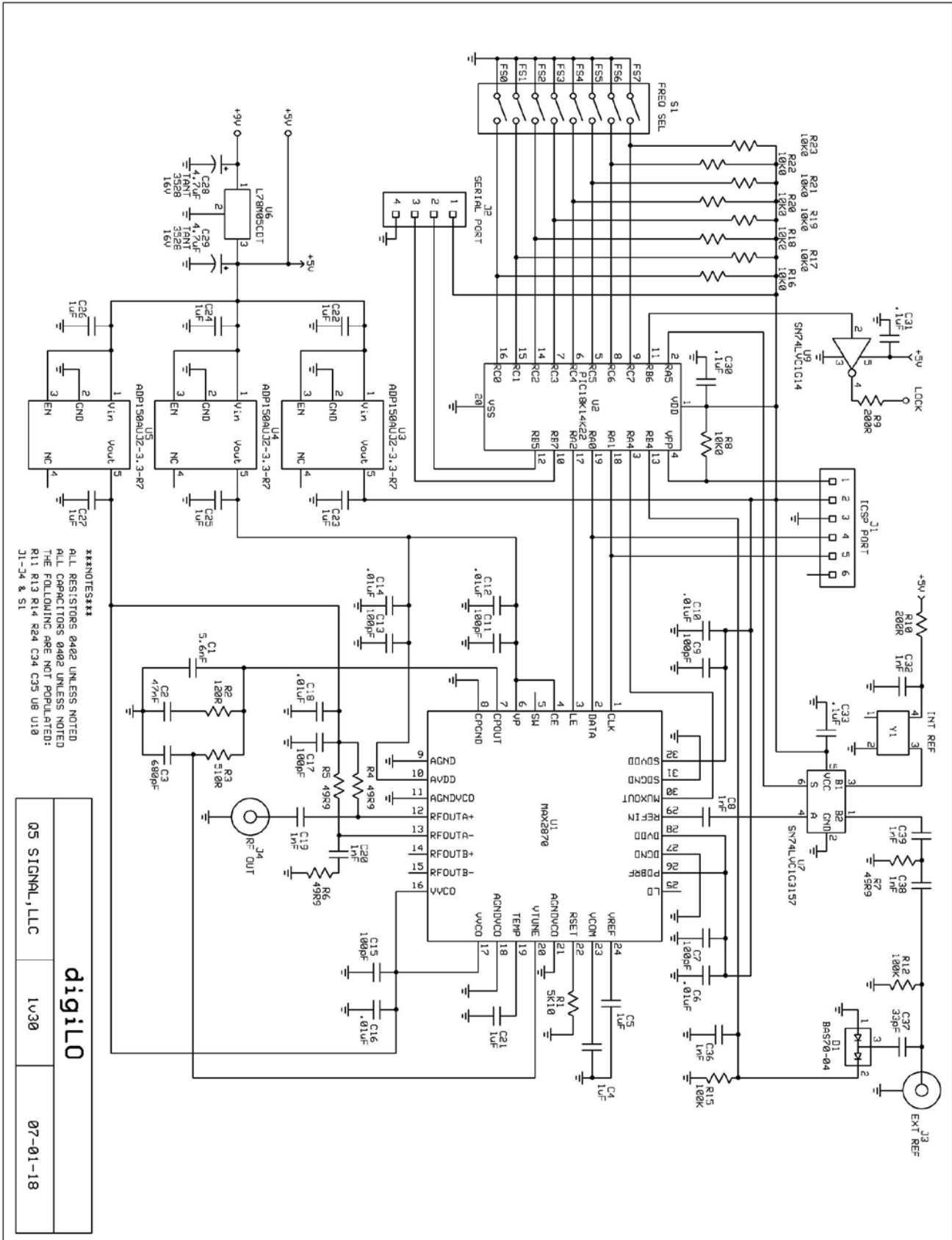
The 10MHz External Reference should be from a clean and stable source. Keep in mind that the digiLO's output is directly affected by the quality of its reference. The recommended input range for "REF IN" is 0dBm to +13dBm. At levels below 0dBm, the digiLO automatically switches over to its internal TCXO reference.

When the digiLO is locked to its external 10MHz reference, the "LOCK" output switches from 0V to 5V through a 200 Ohm resistor. This output can also serve as a simple indication of which reference (external or internal) is sourcing the digiLO. Up to 20mA can be safely sourced from this connection. Therefore, a LED can be connected directly from the "LOCK" output to ground.

The RF output of the digiLO appears on the "RF OUT" connection. The output level is virtually flat from 23.5MHz up to 2GHz. And it maintains a level of +2dBm \pm 2dB up to 3GHz. Beyond 3GHz, the output gradually falls to -10dBm at 6GHz.

Further details of the DIGILO Synthesizer can be found at :

http://q5signal.com/image/catalog/digiLO%20Doc%2018_9_1.pdf





TCXO Specification IQXT-220

ISSUE 2; May 2018

Description

- Temperature compensated crystal oscillator available with or without voltage control function.

Please note: This document is intended to illustrate the general capability and versatility of IQD's design. For specific enquiries please contact one of IQD's sales offices where we can tailor a unique specification to meet your needs.

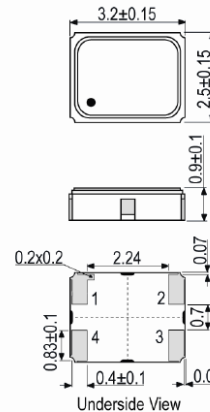


Frequency Parameters

- Frequency: 10.0MHz to 40.0MHz
- Frequency Tolerance: ± 1.00 ppm
- Frequency Stability: ± 0.28 ppm
- Ageing: ± 0.02 ppm max/day, ± 1 ppm max/year
- Frequency Tolerance: Measurement referenced to frequency observed with $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and load= $10\text{k}\Omega//10\text{pF}$, within 30 days after ex-works.
- Frequency Stability: T_A varied across the operating temperature range, measurement referenced to frequency observed with $f_{\text{ref}}=(f_{\text{max}}+f_{\text{min}})/2$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$, load= $10\text{k}\Omega//10\text{pF}$ and temperature variable speed less than $2^\circ\text{C}/\text{min}$.
- Ageing: V_s , V_C , T_A and load constant, measurement referenced to frequency observed with $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$, load= $10\text{k}\Omega//10\text{pF}$ and after 1hr of operation.
- Supply Voltage Variation (measurement referenced to frequency observed $T_A=25^\circ\text{C}$, V_s varied from 3.13V to 3.47V, $V_C=1.5\text{V}$ and load= $10\text{k}\Omega//10\text{pF}$): ± 0.1 ppm max
- Load Variation (measurement referenced to frequency observed with $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and load change= $10\text{k}\Omega//10\text{pF} \pm 5\%$): ± 0.1 ppm max
- Developed Frequencies: 10.0MHz, 12.80MHz, 16.320MHz, 16.3840MHz, 19.20MHz, 20.0MHz, 30.720MHz, 32.7680MHz, 38.880MHz, 40.0MHz.

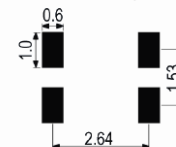


Outline (mm) None =



Pad Connections
 1. N/C or Voltage Control
 2. GND
 3. Output
 4. +Vs

Solder Pad Layout



Electrical Parameters

- Supply Voltage: $3.3\text{V} \pm 5\%$
- Current Consumption (@ $T_A=25^\circ\text{C}$, $V_s=3.3\text{V}$, $V_C=1.5\text{V}$ and load= $10\text{k}\Omega//10\text{pF}$): 5mA max

Frequency Adjustment

- For devices with Voltage Control:
 Pulling: ± 10 ppm min to ± 15 ppm max
 Control Voltage: $1.5\text{V} \pm 1.0\text{V}$
 Input Impedance: $100\text{k}\Omega$ min
 Linearity: 10% max
 Slope: Positive

Operating Temperature Ranges

- 40 to 85°C

Output Details

- Output Compatibility: Clipped Sine
- Drive Capability: $10\text{k}\Omega//10\text{pF}$
- Output Voltage Level: 0.8V pk-pk min