DEM Part Number L24TX SN _____

Power Out Maximum:	25 W linear
Max IF Drive Level	< 0dBm +10dBm 100 mW 1W 10W
Control Frequency Band	10M 6M 70cm
10 MHz Source Level	+3dBm +/- 6dB
DC Power Requirement: **Pin A2** **Pin A1**	11.5 - 15.5 VDC @ 10 Amp +DC – Large Red -DC and Ground Large and Small Black
Pin 3 Transmit Enable:	Green Ground Positive Voltage
Pin 4 Power On:	Red Ground Positive Voltage
Pin 5 Monitor:	White Relative Positive Voltage
Pin 1 Frequency Select	Brown
Pin2 Frequency Select	Blue

Overview: The DEMI L24TX is a transmit converter designed to operate in the 10 Mhz. section of international 24 cm Satellite band. This converter may utilize a 10M, 6M, or a 70 cm transceiver as it's base band controller. Once the control band is selected along with the corresponding internal synthesizer frequency of the L24TX, the TX frequency conversion will track the controlling transceiver as a linear translator at a 1 to 1 ratio. More simply explained, a 430-440 MHz input signal will convert to a 1260 – 1270 MHz output signal if the 70 cm band is selected. Because of frequency restrictions of some transceivers, the complete 24 cm band coverage on the 10 M and 6M band may only be obtained with the frequency select option and will be covered in the operation section of this manual.

The L24TX requires an external 10 MHz source to phase lock the internal synthesizer. Depending on the options ordered, it may be supplied or connected to the 10 MHz port or feed through the controller's RF frequency cable if installed remotely.

All operational functions of the TX converter are controlled by the various pins of the DC Power and AUX connector.

Installation and Operation for Bench Top: Verify that the front configuration sheet matches your requirements with frequency conversion and transmit drive level. If you require a modification to the converter to suit your needs, see the Configuration section of this manual or consult DEMI if you have any questions.

Use quality RF cables rated for the frequency of operation and verify the calibration of any power measurement equipment you may use for Set up and use. The DC power cable supplied is capable of maintaining a constant voltage to the L24TX if not extended in length. The additional wire connections of the AUX cabling may or may not be utilized as specified on the front configuration sheet.

Begin the installation by connecting the DC/AUX cable to the L24TX and connecting the RED/BLACK zip cord to a 13.8 VDC power supply. Be sure to fuse the lines for maximum current and reverse voltage protection. Preliminary testing may be conducted when the DC power is applied. To power cycle the L24TX, connect the small red wire to the 13.8 VDC supply. This will enable the converter and light the Green "ON" Led and the FAN may start to turn if the heat sink temperature is above 75 degrees F. Then connect a 10 MHz source to the L24TX's 10 MHZ connector to verify the blue "LOC" light. The next test is to connect a dummy load, antenna, or power meter to the "RF OUT" connector and toggle (depending on your PTT requirement) the Green wire to enable the Transmit. This should light the red "TX" LED. The L24TX is not "RF Sensed" and will always require a PTT signal.

The next step is to check the output power. This requires the removal of the bottom cover. In one of the corners of the L24TX is the TX Gain adjustment. (See the component placement document) Set this adjustment to the full clockwise position which is maximum attenuation. If you are utilizing a power meter for measurement, connect it in line with the RF OUT connection and connect the "IF IN" connection to your designated transceiver port. If you do not have power measurement equipment for 1.2 GHz. you can connect a Volt meter to the White wire and Ground. This is a relative output power measurement.

Now, understanding your system's frequency translation set the transceiver's frequency within the Satellite band and then switch the Transceiver to the "FM" mode. You may connect the TX enable (The PTT line) to your transceivers PTT or manually toggle it for this test. Then set the transceivers output power to minimum output power. Then toggle the L24TX PTT (if manual) or place your transceiver into transmit. Observe your RF power measurement equipment. You may or may not see any power deflection and the Fan speed may increase.

If no power is indicated, shut down and verify all connections. If all is as it should be proceed with the test and gradually increase the output of your transceivers output up to maximum. There should some sort of power indication by now. Then adjust the TX GAIN control turning it counter clockwise to set the output power to the desired level up to 25 watts of output. If you are using the relative meter, you will see a point in the TX GAIN adjustment where the voltage increases very little or not at all. If so, reverse the adjustment just a bit and call it set.

Replace the cover and retest by varying the output power of the transceiver to vary the output power. If it looks and reacts the same, its ready to put into operation. Sometimes, the bottom cover will affect the operation. If you see a change in power, you may change the TX Gain control setting to compensate.

Special Notes:

If you are utilizing a transceiver that will not tune the full 10 MHz Satellite band, the Frequency Select option will be enabled. Frequency selection is done by toggling the connection to ground to cause the synthesizer to select a different frequency allowing a different frequency conversion. The frequency selection will be set to enable the use of the active portions of the band. The user may change the frequency selection after reviewing the chart below which establishes the possible frequency combinations to activate other portions of the band.

After reviewing the frequency select chart please understand that by changing the frequency of the Synthesizer will not enable you to utilize all transceiver bands. This is only possible with the 10M and 6M bands. They both utilize a common frequency multiplier circuit that enables this. If the frequency that is utilized for a 70 cm transceiver operation is selected with a previously configured L24TX for 10M or 6M, it will produce spurious harmonics that will not be filtered along with producing unwanted distortions.

Frequency Select Chart

IF MHz = RF MHz	Pin Number Shorted
430 = 1260	Blank
28 = 1260	0
28 = 1262	0,1
28 = 1264	0,1,2
28 = 1266	0,1,2,3
28 = 1268	0,1,2,3,4
50 = 1260	0,1,2,3,4,5
50 = 1264	0, 1, 2, 3, 4, 5, 6
50 = 1266	0, 1, 2, 3, 4, 5, 6, 7

Remote Operation Notes:

If you plan to tower mount this unit, understand it is not weather proof. It will need to be in a protective enclosure if expected to be in the outdoors for a prolong period of time. When setting up the output power, the complete set of cables should be used for testing to verify all functions. Expect voltage drop with a DC cable longer than 10 foot. Control lines may be affected by out of band RF signals.

The Heat Sink and Fan may be removed from the enclosure if it is to be mounted on a solid metal plate capable of sinking up to 60 watts of heat.

Option Setup:

DEM L23HP Component List

Resistors (R) values are in Ohms and are (1206) chips unless otherwise specified.

R1 1K	R9 10K	R17 300	R25 18
R2 1K	R10 10K	R18 18	R26 220
R3 1K	R11 1K	R19 300	R27 1K
R4 1K	R12 10K	R20 36	R28 130
R5 1K	R13 470	R21 220	R29 130
R6 1K	R14 51	R22 220	R34 75
R7 100	R15 10K	R23 300	
R8 51	R16 1K POT	R24 300	

Capacitors (C) values are in ρF and are (1206) chips unless otherwise specified.
"T" = chip Tantalum, Band is positive. T

C1 0.1μF	C13 27	C25 1 or 1000	C37 5
C2 0.1μF	C14 0.1μF	C26 1000	C38 5
C3 390	C15 47μF (2312)	C27 150	C39 5
C4 680	C16 100	C28 27	C40 Wire Short
C5 390	C17 330	C29 27	C41 5
C6 0.1μF	C18 47μF (2312)	C30 1000	C42 0.1μF
C7 1.0 or 4.7μF (T)	C19 100	C31 300	C43 0.1μF
C8 100	C20 0.1μF	C32 0.1μF	C44 1.0 or 4.7μF (T)
C9 0.1μF	C21 1000	C33 0.1μF	C45 0.1μF
C10 27	C22 27	C34 0.1μF	
C11 27-43pF ATC	C23 1000	C35 100	
C12 1.0 or 4.7μF (T)	C24 1000	C36 100	

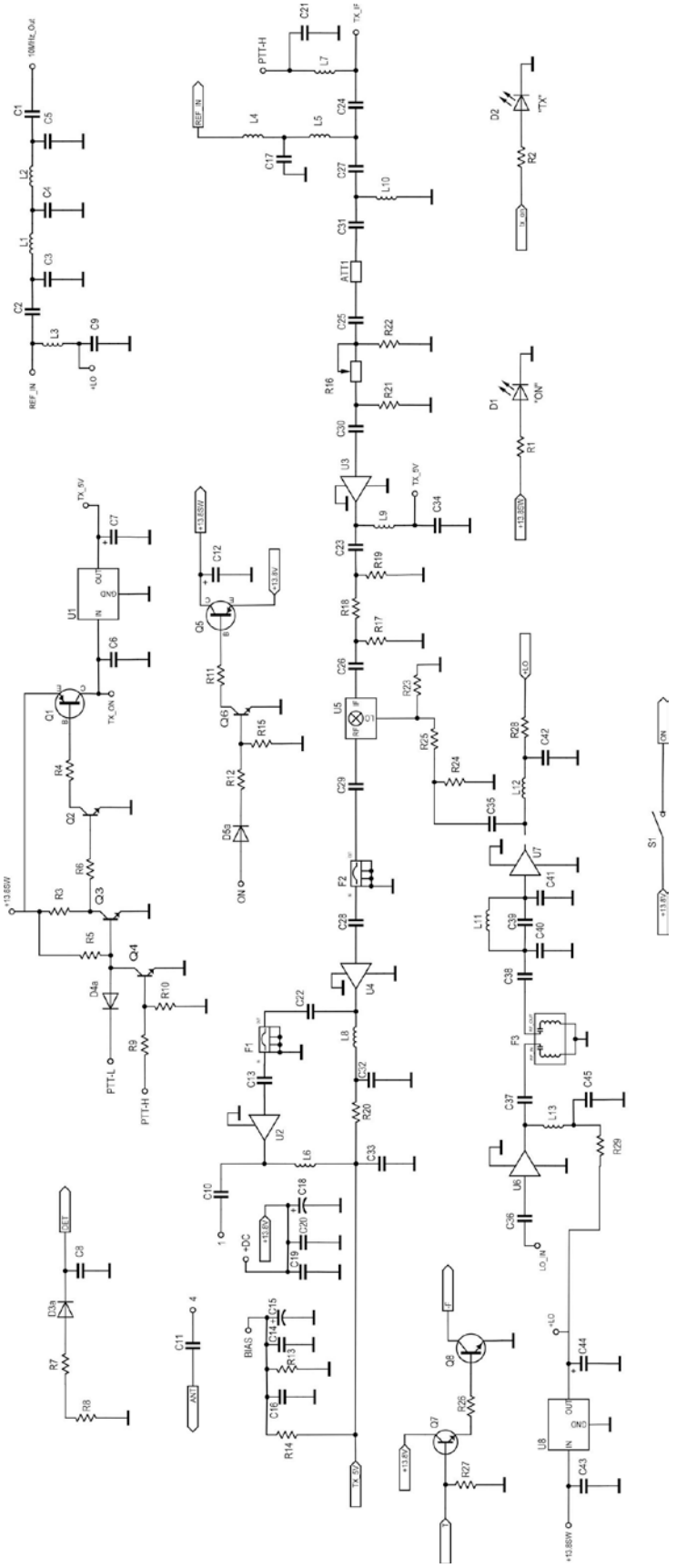
All inductors are specified.

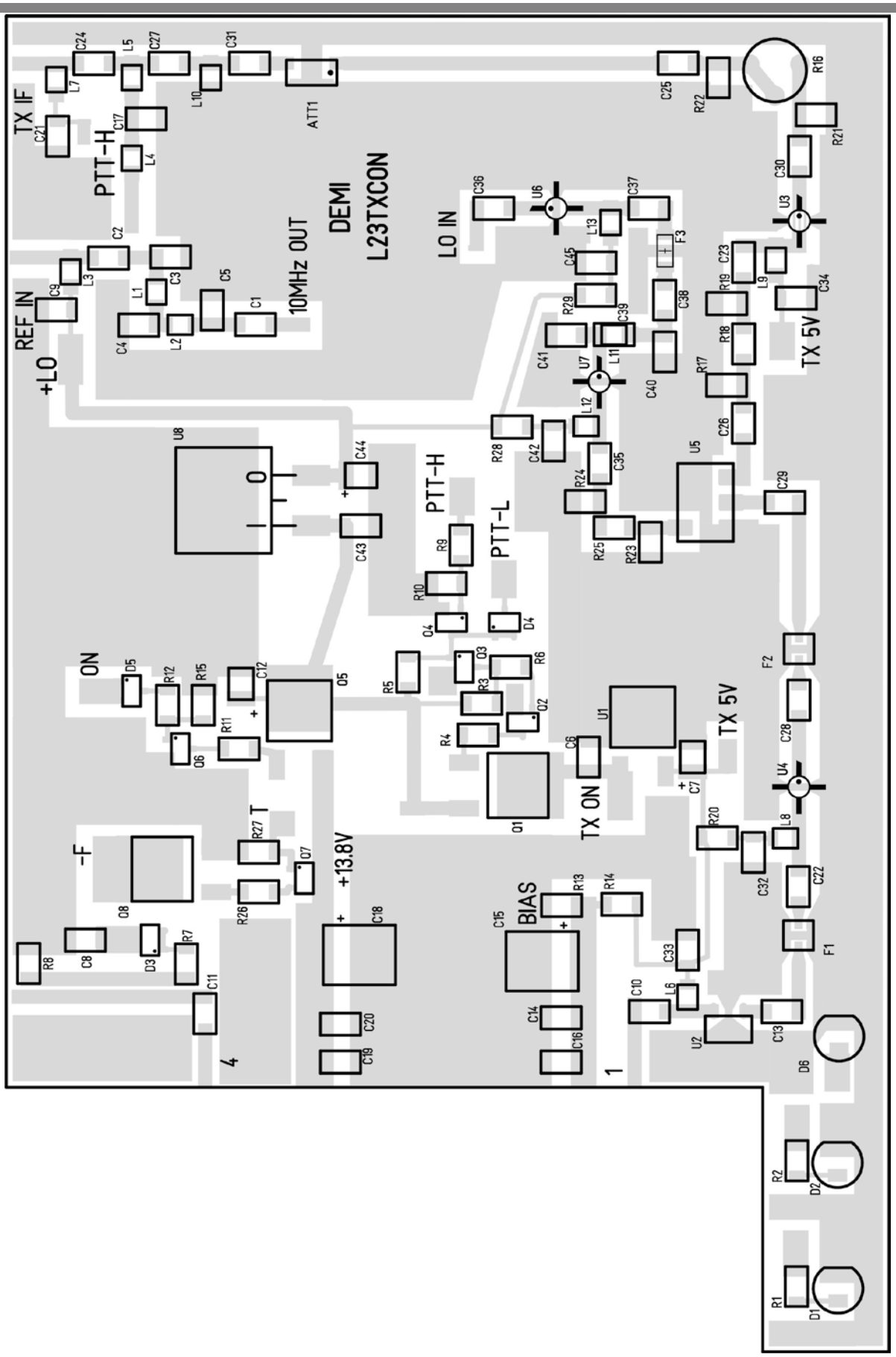
L1 1000nH (1008) (OPTION)	L8 100nH (1008)
L2 1000nH (1008)	L9 1000nH (1008)
L3 1000nH (1008)	L10 300nH (1008)
L4 390nH (1008)	L11 Not Used
L5 820nH (1008)	L12 330nH (1008)
L6 100nH (1008)	L13 330nH (1008)
L7 1000nH (1008)	

Solid State, Relays and Filter Components

ATT1 10dB atten (OPTION)	D1 LED	U1 78M05
Q1 MJD32	D2 LED	U2 RFGA2054
Q2 PMBT3904	D3 HSMS-2800/BAS70	U3 MAR3 or MAR6 (OPTION)
Q3 PMBT3904	D4 MMBD914	U4 ERA-2
Q4 PMBT3904	D5 MMBD914	U5 ADE-11X
Q5 MJD32	D6 LED	U6 ERA-2
Q6 PMBT3904	F1 1268MHz()	U7 ERA-2
Q7 PMBT3904	F2 1268MHz()	U8 7809
Q8 MJD31	F3 HFCN-1200	

RA18H1213G
TH Thermistor




TX IF
PTT-H
DEMI
L23TXCON
10MHz OUT
LO IN
REF IN
+LO
TX 5V
PTT-H
PTT-L
ON
-F
+13.8V
TX ON
BIAS
TX 5V