



DEM TRS Transmit / Receive Sequencer

Specifications

Operating Voltage: +8 - 16 VDC	Sequenced Steps: 4
Full Sequenced Time: \cong 500 ms, User adjustable	Outputs: 8
Outputs Sink or Source: 2 Amps max./ @ 30VDC or less .6 A @ 125VAC, .5 A @150VDC	Keying: PTT-L (Ground) Sinks 1 ma. PTT-H (+1.5-16 VDC) Source 2 ma.

Operation:

The DEM TRS, based on a design by WB5LUA, is a time delay generator / sequencer that is intended to be used with any lash-up that requires separate sequenced switching circuits to control pre-amps, TR relays, transmitters, and power amps. The TRS is a stand alone unit that is activated by a either a push to talk to ground (PTT - L) or by applying a + 1.5 - 16 VDC (PTT-H). At the time of activation, a R/C timing circuit in combination with a voltage divider network, begins to turn on each individual op-amp, (1st through 4th) in sequence. The op-amps in turn drive their respected switching transistor and relay circuits. When the PTT circuit is released, the sequencer moves back to the resting state in the reverse order (4th through 1st).

Each of the 4 sequenced stages have 2 separate outputs (8 total) that may be wired to produce a voltage, a connection to ground or an open circuit in either transmit, receive, or both. This provides many switching functions and output combinations that should fit any requirement. The outputs may be changed or altered at any time if your station's requirements change. Refer to the Matrix for the wiring of this unit.

Operation and Use:

A question that is asked most about this sequencer is "How should I fuse it in my system". This is a question that is determined by its use. The complete unit can be fused but the size of fuse should be the total of all the switched circuits with margin plus 250 ma for the sequencer itself. If the fuse blows, nothing works. Most setups, this shouldn't be a problem. But if you have and instance where 2 or 3 of the outputs are over 1 amp, then the safety margin could be exceeded. With a 4 amp fuse on the input, and a dead short on the output of one of the stages, the current rating of the relay (2 Amps at 30VDC or less) can be exceeded before the fuse blows. So if you fuse the outputs, ones stage can blow a fuse and the others will still sequence. This is OK if it is a power amp or a preamp. You just won't have any receive or transmit. But if a fuse blows on an output that is activating a RF relay, serious damage may be cased if you transmit high power into an open RF relay. So think it over, and plan it out. Try to keep to total current drain below 2 amps and fuse it with a fast blow version.

Parts List

Components			
C1	22 uf	Q1-Q3,Q5,Q7,Q9	PN2222
C2	100 uf	R1,2,5,6-8,10,12,13, 15,17,18,20,22,23,25	10K 1/4W
D1, D2	1 N914	R3	22K 1/4W
D3 - D6	1N4000 type	R4	470 1/2W
IC 1	LM 324	R9,14,19,24	1 MEG
K1 - K4	G5V DPDT	R27	1 K 1/4W

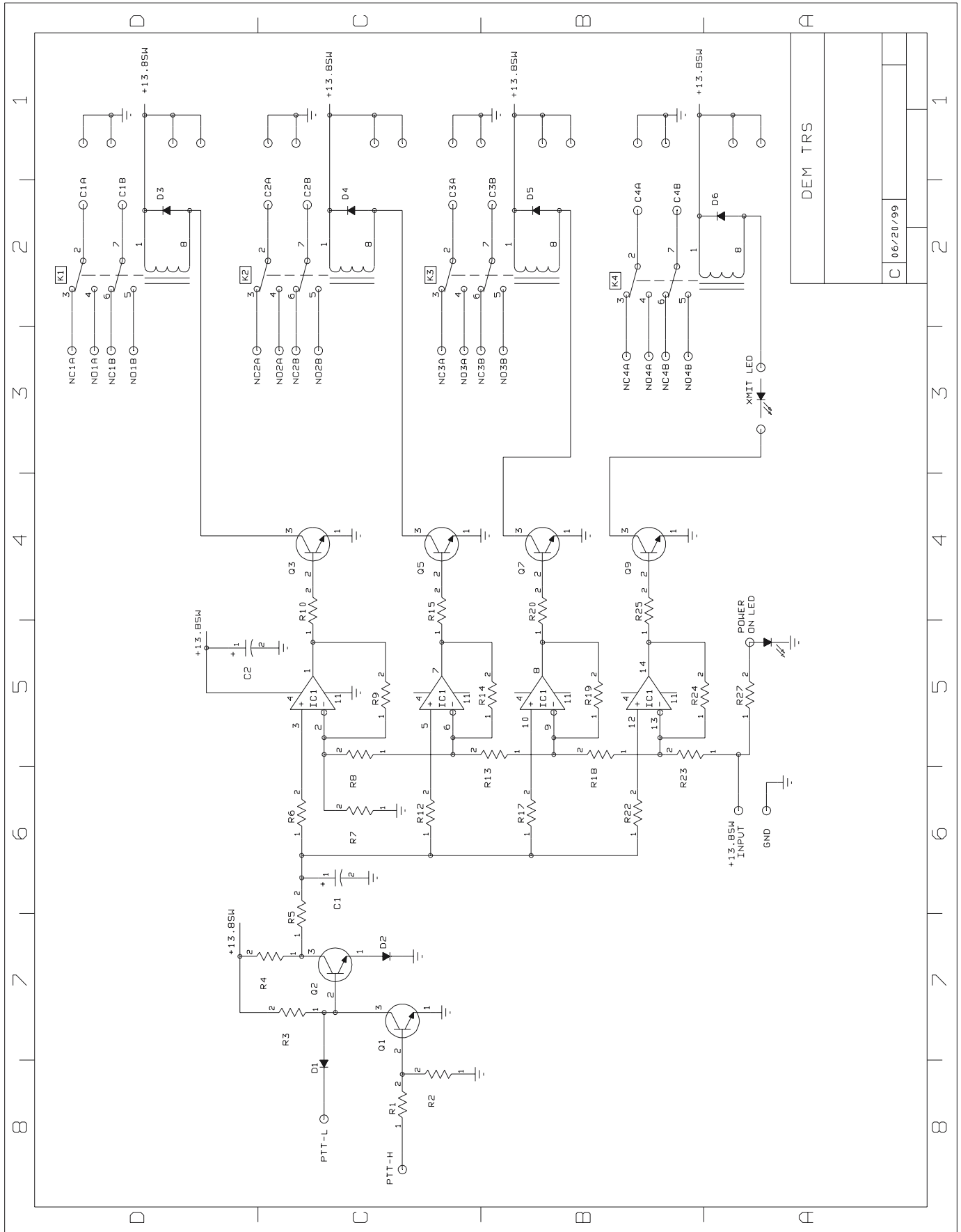


Sequencer Matrix

The matrix below indicates what signal will be on the specified connector during receive (RX) or transmit (TX). The sequencer in its resting state will be in RX. Applying a PTT signal will transfer the sequencer to the TX state in the order shown, 1st through 4th. Removing the PTT signal will allow the sequencer to go back to the RX or resting state in reverse order, 4th through 1st. "L" or low, indicates a connection to ground, "H" or high, indicates a connection to +13.8VDC, and "O" indicates an open or floating connection that is neither High or Low. A second copy of the matrix form is available if you change the configuration at a later date.

1		2		3		4	
A	B	A	B	A	B	A	B
RECEIVE		RECEIVE		RECEIVE		RECEIVE	
L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H
O	O	O	O	O	O	O	O
TRANSMIT		TRANSMIT		TRANSMIT		TRANSMIT	
L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H
O	O	O	O	O	O	O	O

1		2		3		4	
A	B	A	B	A	B	A	B
RECEIVE		RECEIVE		RECEIVE		RECEIVE	
L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H
O	O	O	O	O	O	O	O
TRANSMIT		TRANSMIT		TRANSMIT		TRANSMIT	
L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H
O	O	O	O	O	O	O	O



TR SEQUENCER ASSEMBLY

