

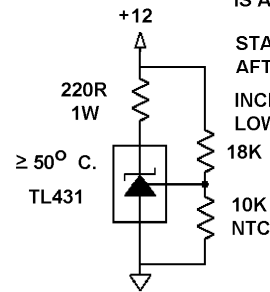
PARTS FROM MOUSER

TCX CORPERATION 9C-12.000MEEJ-T CRYSTAL 10 PPM SMD  
 9B-12.000MEEJ-B CRYSTAL 30 PPM THRU HOLE  
 MV209 DIODE IS NO LONGER STOCKED IN THRU HOLE AT MAJOR DISTRIBUTERS.  
 IT CAN BE FOUND AT DAN'S SMALL PARTS BUT THERE IS A MINIMUM. SOME OF HIS  
 OTHER VARACTOR DIODES HAVE VERY SIMILAR SPECIFICATIONS.  
 GKG 10015 3 - 10pF VARIABLE CAP (PLASTIC). ONE MIGHT WANT TO  
 USE A CERAMIC OR IF POSSIBLE TO SCRONGE, A GLASS PISTON TYPE  
 MV 209 SPECS  
 40pF @ 1 VOLT  
 5pF @ 28 VOLTS

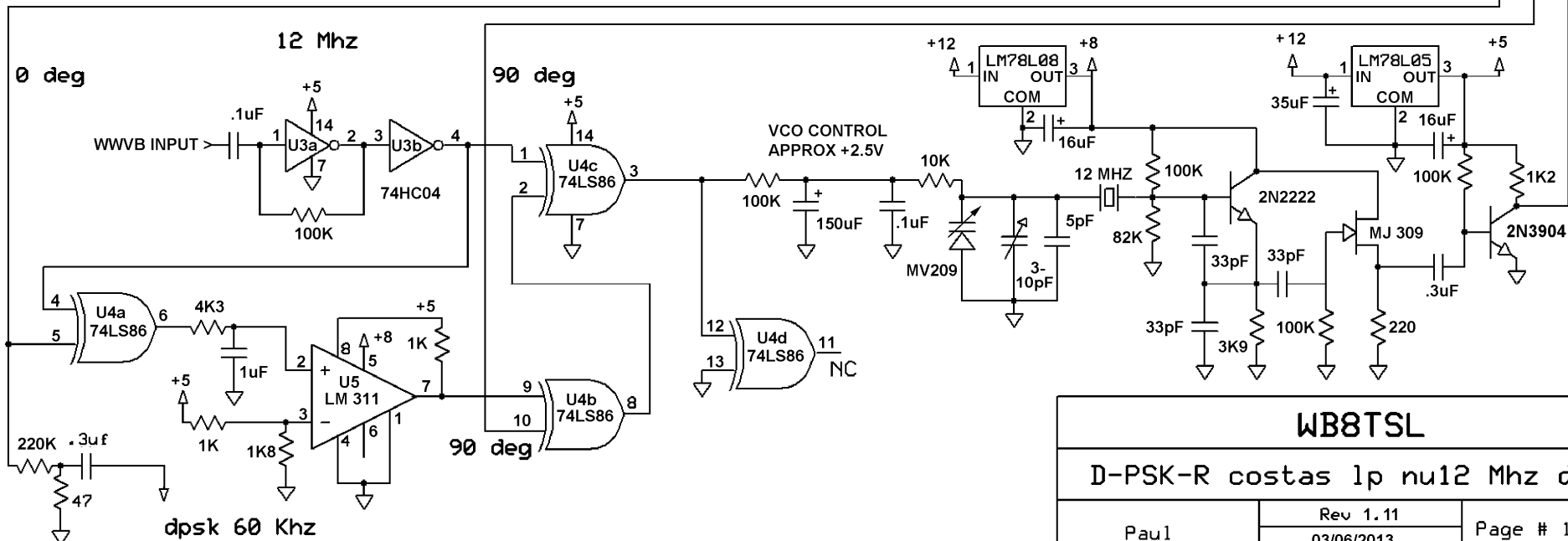
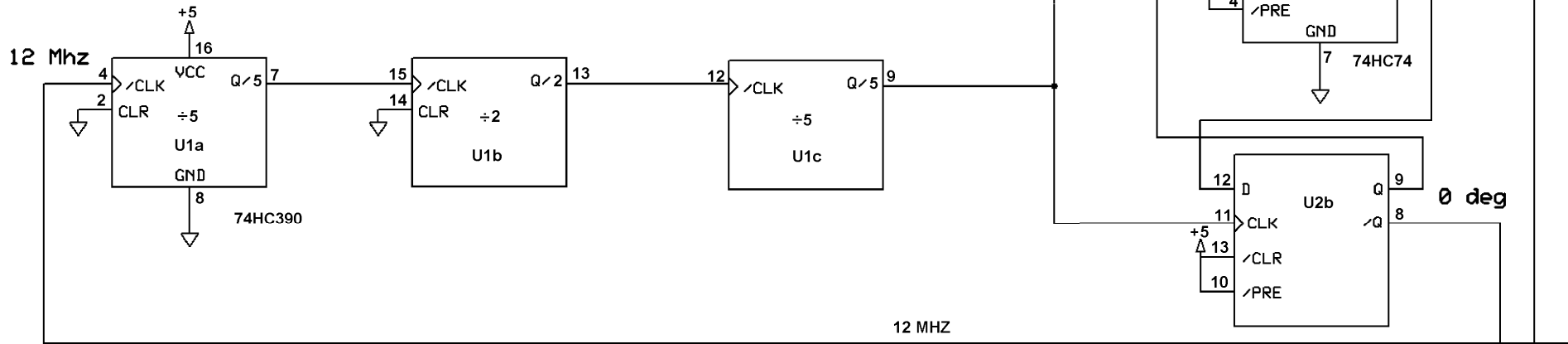
THERMALLY ATTACH THE 220 OHM RESISTOR,  
 THE TL 431, AND THERMISTOR TO A PIECE  
 OF 1/2 INCH BY 1 1/2 INCH LONG FLATTENED  
 COPPER PIPE. SHAPE AS NEEDED. PLACE NEAR CRYSTAL.  
 INSULATE WITH 1" TO 2" OF STYROFOAM. THERMAL GAIN  
 IS ABOUT 20. CKT FROM THE NET.

REVISED COMBINED CKT

SIMPLE HEATER  
 CIRCUIT



START UP CURRENT ABOUT 50 mA  
 AFTER WARM UP ABOUT 25 mA  
 INCREASE 18K VALUE TO  
 LOWER TEMPERATURE



<b>WB8TSL</b>		
D-PSK-R costas lp nu12 Mhz div		
Paul	Rev 1.11 03/06/2013	Page # 1 of 1

19 point