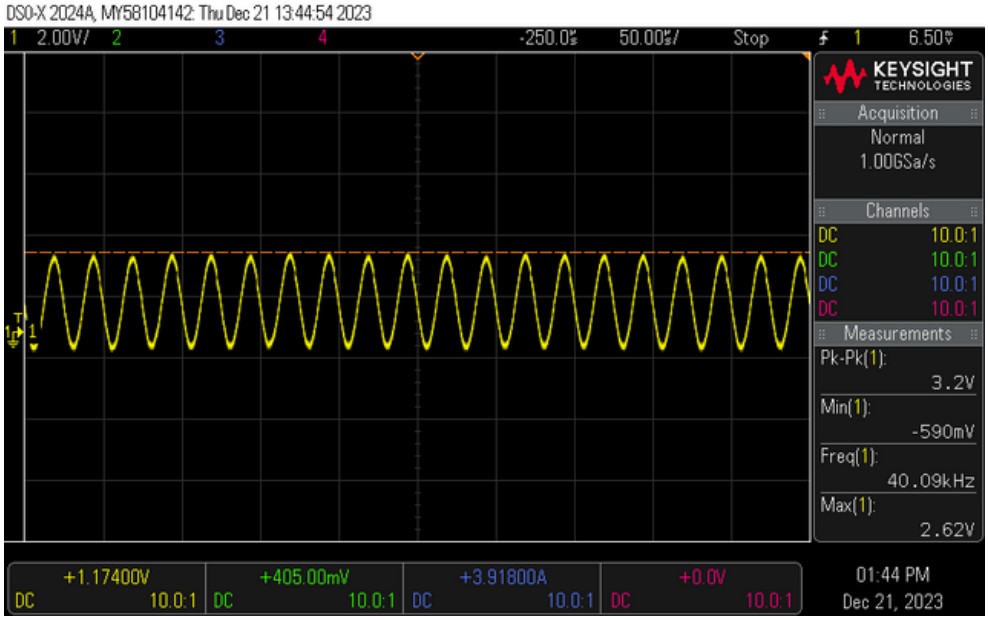
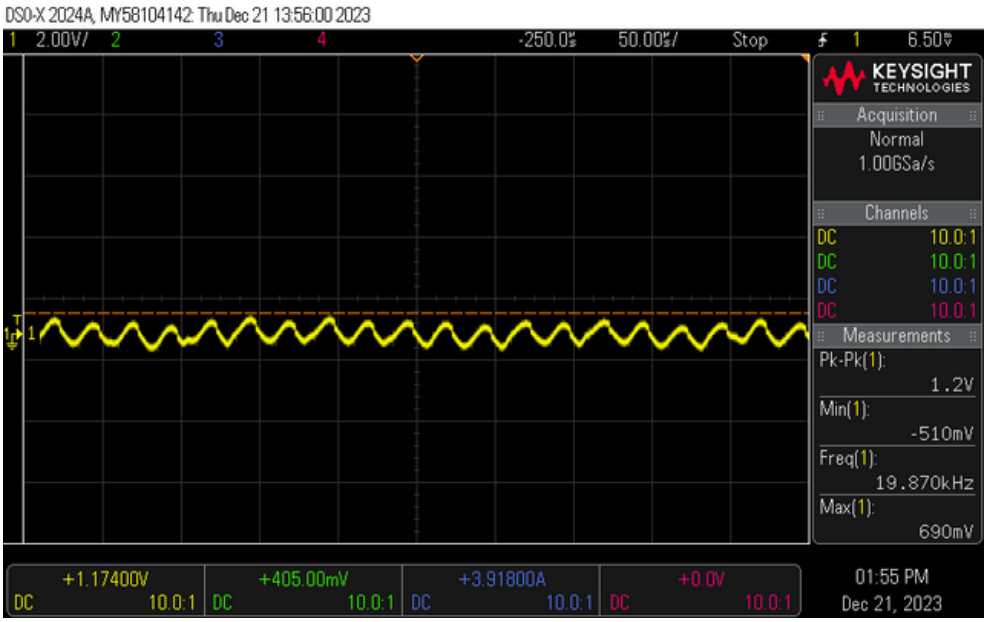
Multiplexer

The switching functionality of the mux-based circuit was tested, and it was found to be working.

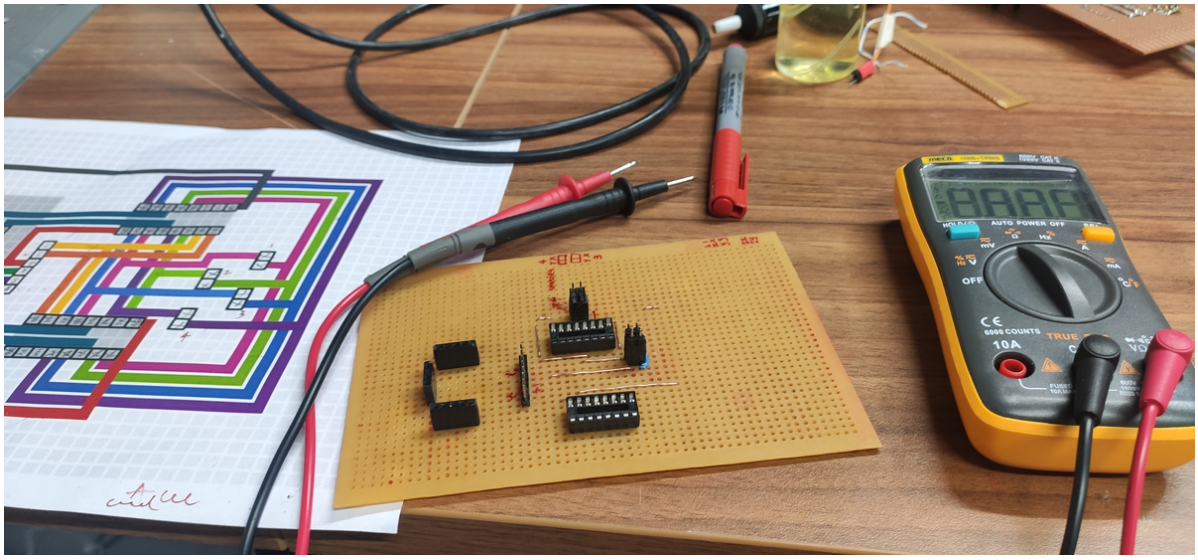
Functionality testing of the roll-switching circuit was conducted using ultrasonic transducers salvaged from HCSR04 and US100 modules. The received signal was monitored using a DSO (Digital Storage Oscilloscope). Selector pins were assigned different values corresponding to the X and Y axes. It was observed that the transducers are not designed for roll switching, as the signals were found to be weaker. Utilizing the DSO, it was determined that the peak-to-peak voltage of the received signal drops to one-third. The peak-to-peak voltage obtained from the transmitter to the receiver was 3.3V. However, the rolls were reversed, i.e., the receiver was transmitting, and the transmitter was receiving; the voltage of the signal dropped to 1V as Vpp. The quality of the signal was also affected. The results are attached.

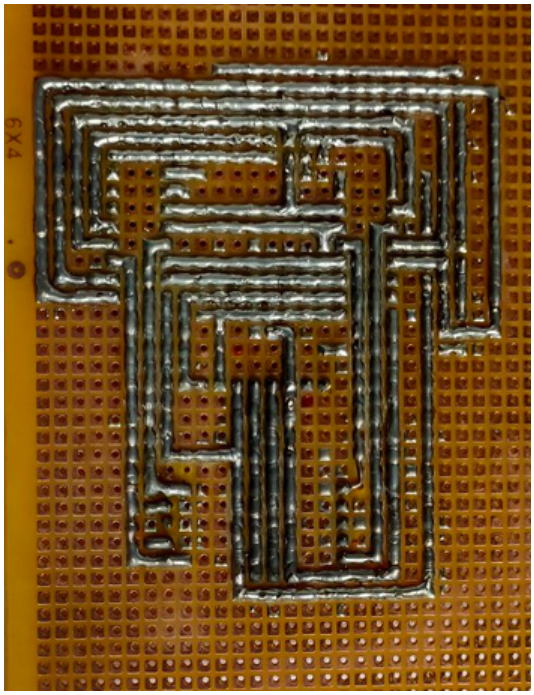
The switching functionality of the mux-based circuit was tested, and it was found to be working. To obtain accurate results, we need transducers that can function as both transmitters and receivers.

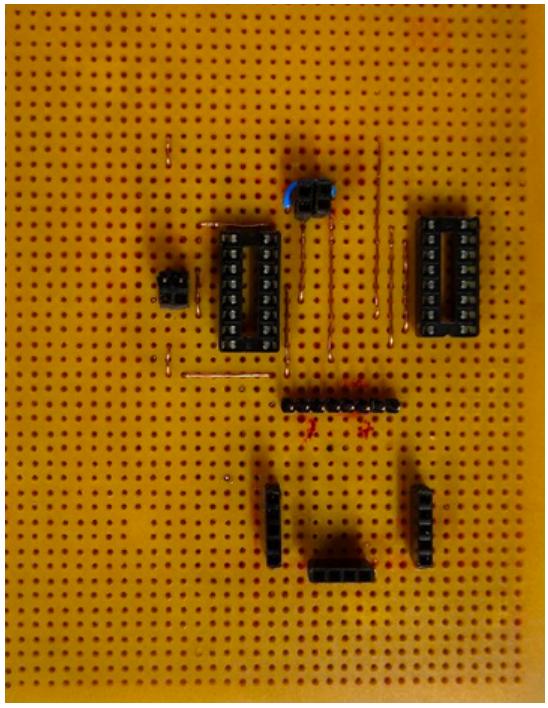


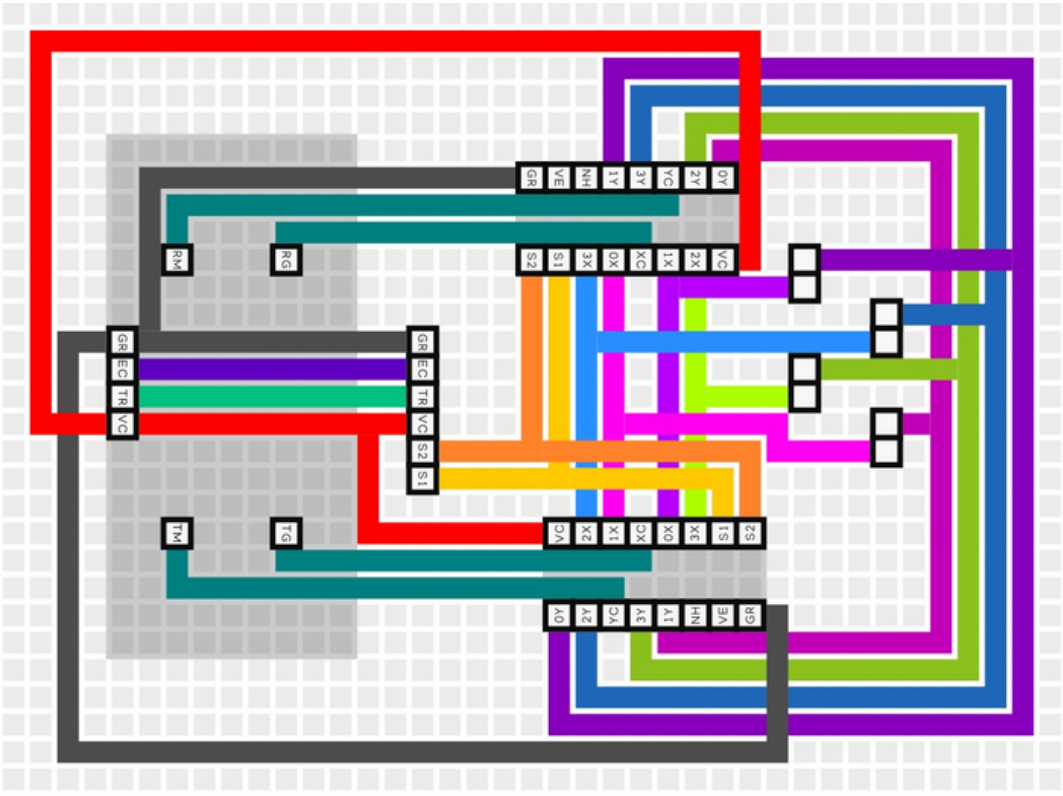


Schematic diagram of Multiplexer for switching circuit attached here.The track design for switching 4 ultrasonic transducers using a single signal generation & processing circuit and 2 units of dual 4 channel mux is attached herewith.








GR VE NH 1Y 3Y YC 2Y 0Y
RM RG S2 S1 3X 0X XC 1X 2X VC
GR EC TR VC
GR EC TR VC S2 S1
TM TG VC 2X 1X XC 0X 3X S1 S2
A0 A2 YC 3Y 1Y HN VE GR