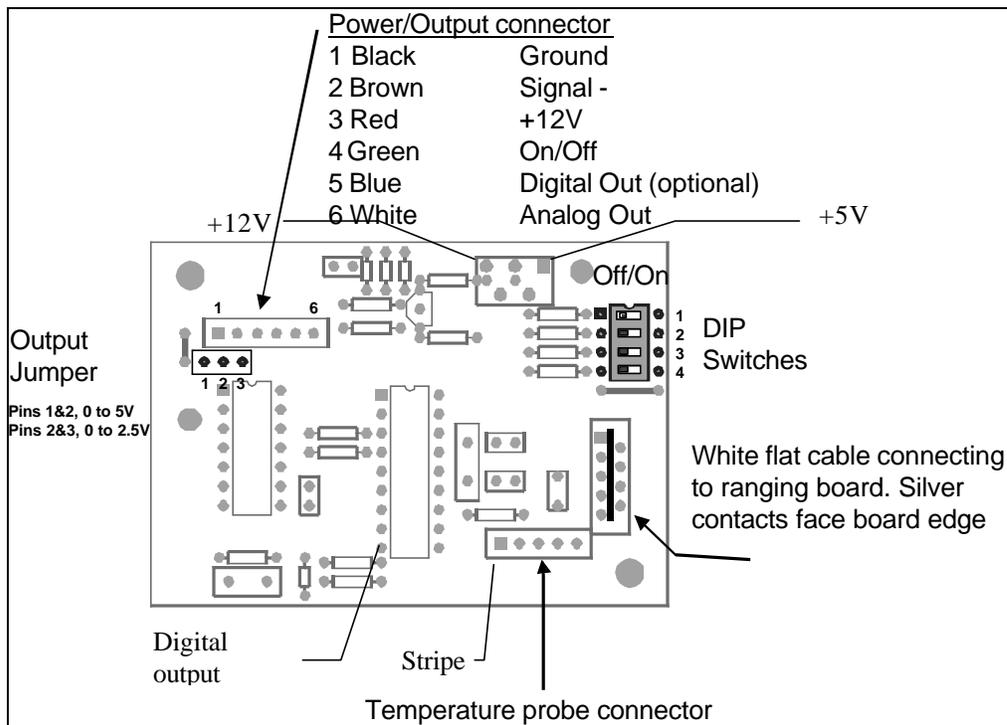
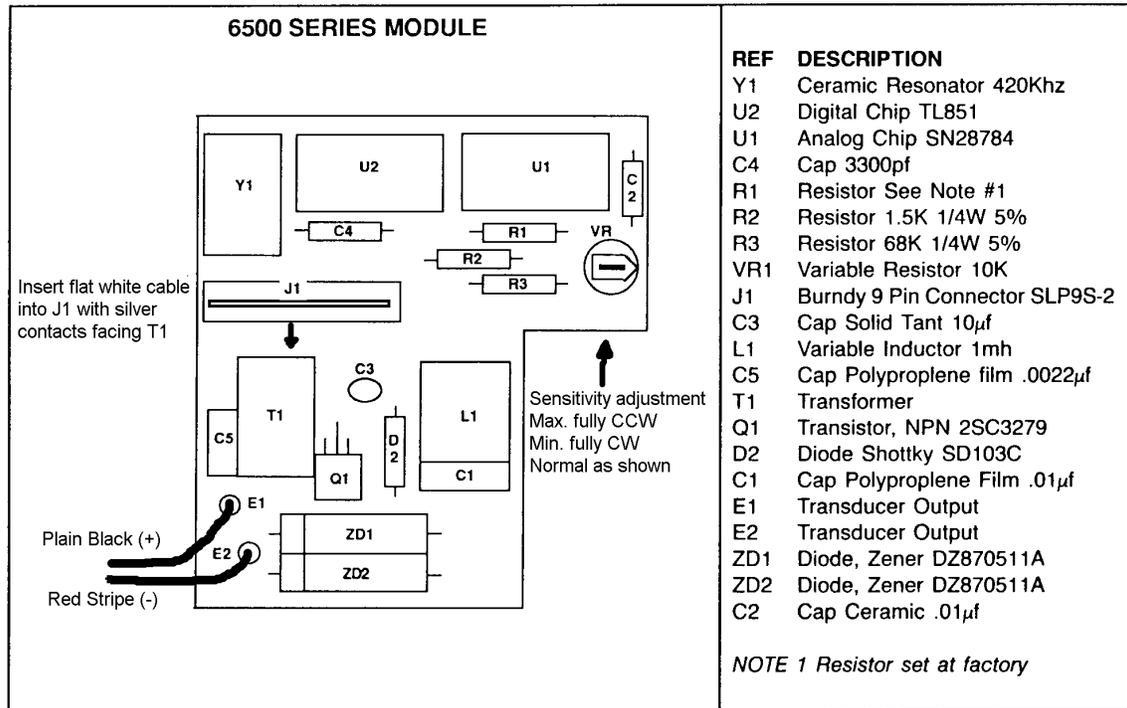


# Judd Communications Depth Sensor Technical Manual

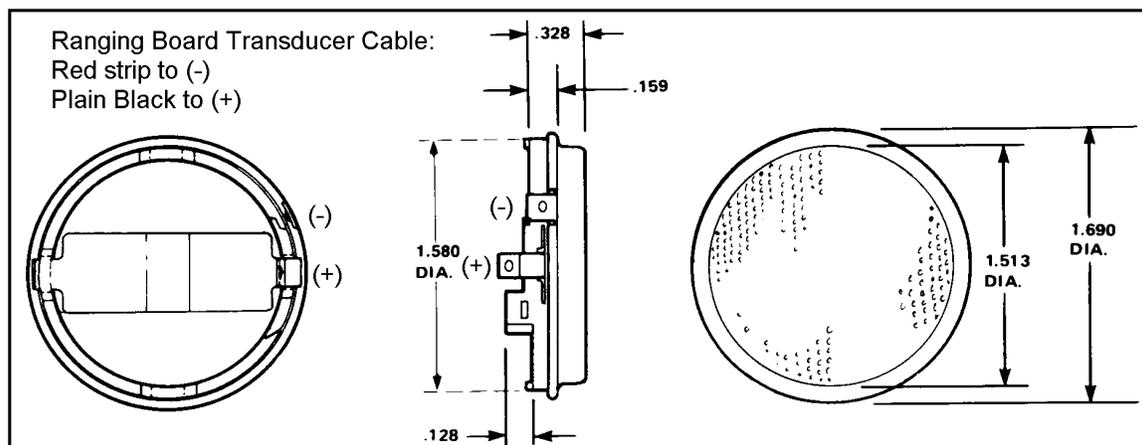
## Controller Board



## Ranging Board



## Transducer



## Ranging Board Schematic, Waveforms, & Timing

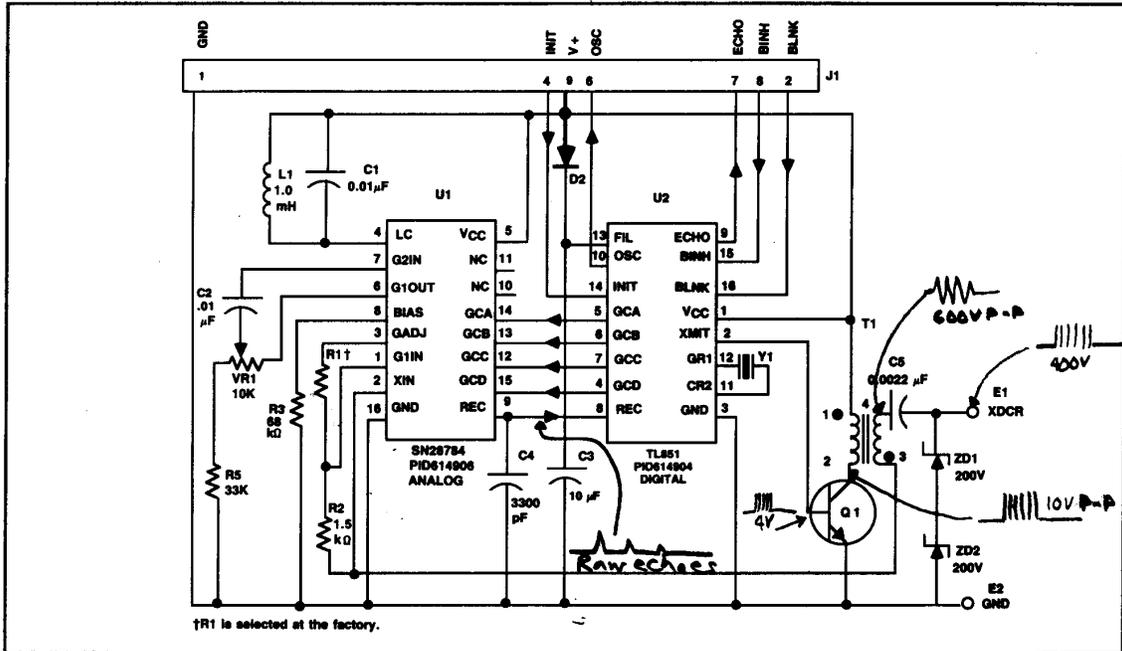


FIGURE 2.2 RANGING CIRCUIT BOARD SCHEMATIC (6500 SERIES)

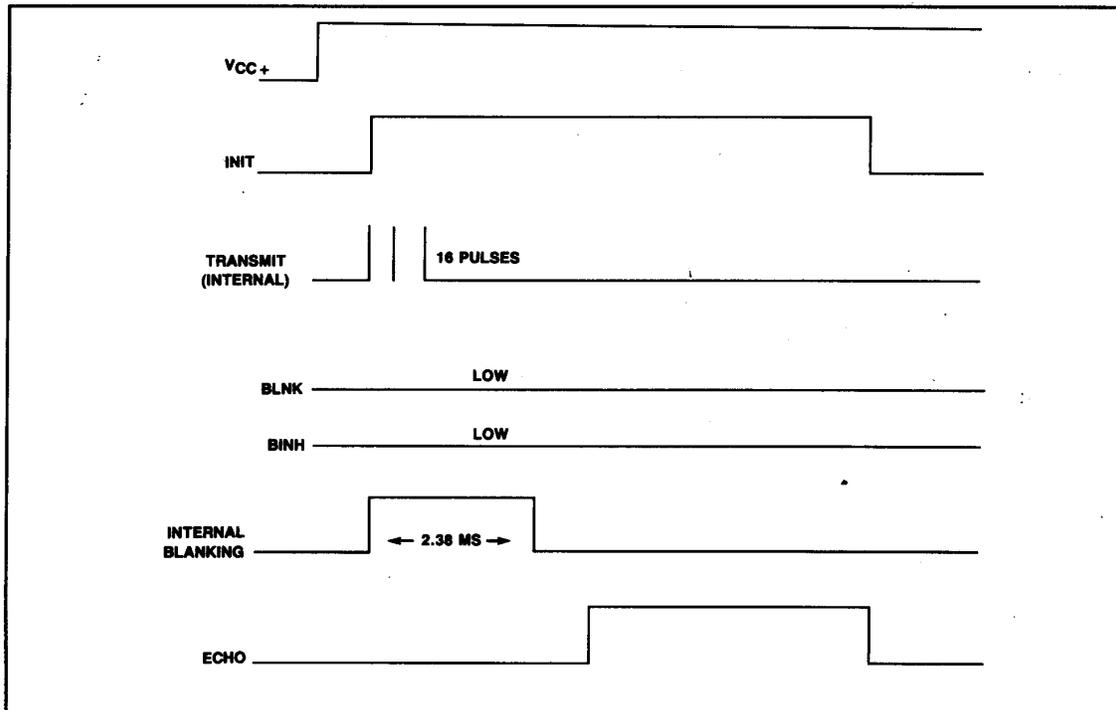


FIGURE 2.3 WAVEFORMS EXAMPLES OF A SINGLE MODE CYCLE WITHOUT BLANKING INPUT

## ***Depth Sensor Troubleshooting***

The following tests assume that the depth sensor is connected to a +12V power source. **Red and Green** wires +12V, **Black** wire Ground. DIP switch 1 should be turned ON. This will configure the sensor for Free Run Mode. In Free Run Mode, the sensor will make repeated measurements as long as power is applied to the sensor. When finished testing be sure to turn DIP switch 1 OFF.

When the sensor is making a measurement you should be able to hear the transducer fire. It should sound like a rapid succession of clicks, at least two.

### **Before Surgery...**

Was the sensor installed properly? Broken wires? Delay set to at least 3 seconds? Is the multiplier and offset correct? Jumper on the Controller board set for 0-5V output?

### **Symptom: Dead Sensor, no clicking**

On the Controller board, check for 12 Volts at the input to the voltage regulator and 5 Volts at the output. No input voltage indicates a bad blocking diode. The blocking diode should be replaced with a 1N4001-7.

With a scope or palmtop (8N1, 1200 baud, temp Kx2, time, distance mm, retries), check for a digital pulse train on pin 9 of the PIC16C61 IC on the Controller board. No pulse train indicates a bad Controller board.

Check pin 2 of IC U2 on the Ranging board with a scope. If no output try replacing U2 (socketed).

Next try swapping out the Ranging board.

### **Symptom: Clicking, multiple retries, and erratic output**

This indicates that the Controller board is functioning properly. The problem is either a bad ranging board or a transducer. First, check the connectors that attach to the transducer and make sure they are solid. Point the sensor at a soft target (fresh snow, a sheet of open cell foam, a blanket, cotton towel, etc) at least 10 feet away. With the sensor properly pointed at the target, you should only hear two clicks. If it is clicking more than twice, that is an indication that it is having trouble consistently hearing the echo from the target.

If the problem is minor, increasing the sensitivity adjustment pot on the ranging board can sometimes compensate. Next swap out the Ranging board. If the problem persists, try a different transducer.

### **Symptom: Clicking, no retries, but no analog output**

Bad MAX531 digital to analog IC. If low voltage, make sure that pins 2 and 3 are jumpered on the controller board.

### **Symptom: Sensor functioning properly, excessive diurnal variation in output.**

Check solar radiation shield for bug infestations. Bad Temperature Probe.