

## OPERATIONAL DESCRIPTION

DF20 is a wireless depth sounder which sends depth reading to remote readers, either DF2D or DF2R. The micro-controller sounds ultrasonic pulses to the transducer connected to DF20, measures the time elapsed for the echoes and computes the depth. Depth readings are sent via radio link to remote units (DF2D or DF2R) to display the readings.

Depth data is a low speed serial bursts of 22 kHz digital signal which FM modulates the 900 MHz RF carrier. There are two frequency channels to be selected.

The heart of the transmitter is a RF2512 transmitter IC by RF Micro Devices. Build inside the RF2512 is a PLL, the division ratio of which can be external selected. In this application, a division ratio of 64 has been selected. The transmitter frequency is determined by the frequency of the crystal selected. That is transmitter frequency is determined by  $64 \times \text{crystal frequency}$ .

There are two crystals which can be selected by the micro-controller. The "Chan Select" line selects which crystal. X2 is selected when "Chan Select" is high. The trimmer capacitors are used to trim the crystal to a desired 900 MHz frequency.

FM modulation is done by directly modulates the VCO (formed by L1-3, D1 and C6) via pin 16. R1 and R2 determine the frequency deviation.

Transmitter power is adjustable. The control pin is at pin 7, R5 and R6 set the output power.

RF out is at pin 8. C19, C20 and L4 form a pi filter which filters out the higher order of harmonics.

The antenna is an internally mounted printed circuit whip. Inductor L5 is used to compensate for the antenna's high capacitive reactance.