

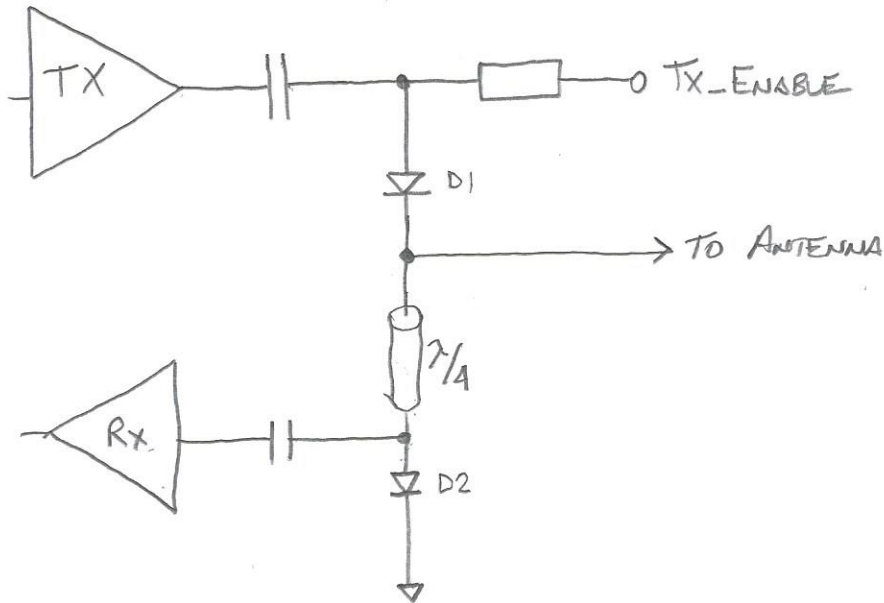
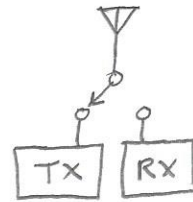
RF FUN

# TRANSMIT / RECEIVE SWITCH (T/R SWITCH)

W2AEN

USING: - PIN DIODES

- QUARTER WAVELENGTH TRANSMISSION LINE



## PIN DIODES

- LOW CAPACITANCE
- LONG REVERSE RECOVERY
- LOW FORWARD BIAS IMPEDANCE
- HIGH REVERSE BIAS IMPEDANCE

## λ/4 TRANSMISSION LINE

- IMPEDANCE TRANSFORMER

$$-\frac{Z_{IN}}{Z_0} = \frac{Z_0}{Z_L} \quad Z_{IN} = \frac{Z_0^2}{Z_L}$$

- LOOKS LIKE A SHORT WHEN OUTPUT IS OPEN

- LOOKS LIKE AN OPEN WHEN OUTPUT IS A SHORT

## T/R SWITCH FOR 10.1 MHz (30m)

PROBLEM:  $\lambda/4$  COAXIAL TRANSMISSION LINE $\approx 16$  FEET OR 4.9m LONG! (0.66  $\lambda$ )

SOLUTION: USE A "LUMPED ELEMENT" EQUIVALENT



$$X_L = X_C = Z_0$$

$$\text{use } Z_0 = 50 \dots$$

$$L = \frac{50}{2 \cdot \pi \cdot f} \approx 790 \text{ nH}$$

$$C = \frac{1}{2 \cdot \pi \cdot f \cdot 50} \approx 315 \text{ pF}$$

