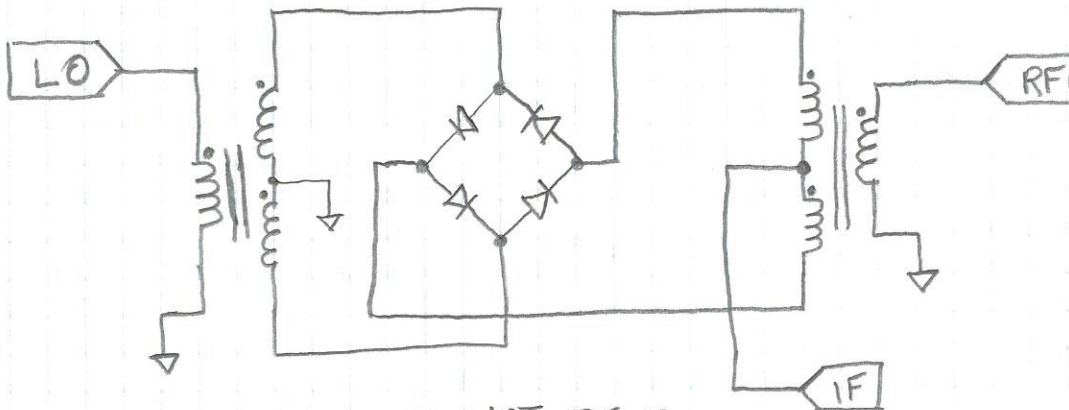


BASICS OF THE DIODE RING MIXER

W2AEW

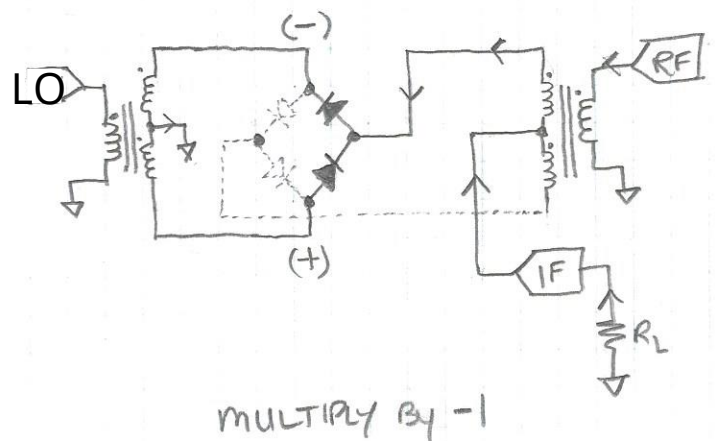
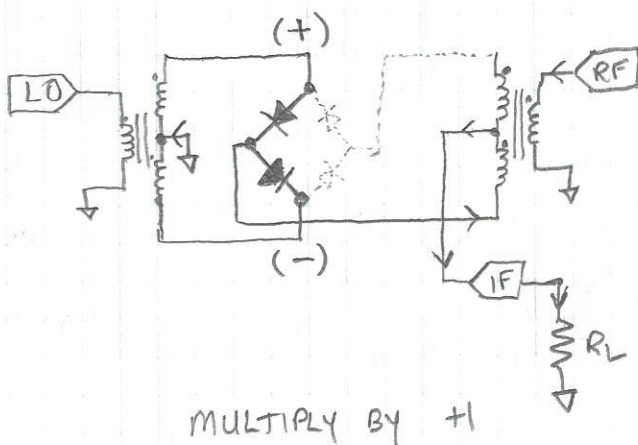


TRANSFORMERS : 10T, TRIFILAR
T37-6 TOROID

DIODES : 1N5711

OPERATION:

- DIODES ARE SWITCHES DRIVEN BY THE LO SIGNAL
- DIODE SWITCHES ALTERNATE BETWEEN TWO STATES
- RF IS REPLICATED / INVERTED AT IF PORT
- SAME AS MULTIPLYING RF BY $+1$ THEN -1 AT LO FREQUENCY



WZAEW

BASIC MIXER OPERATION

- COMBINE TWO SIGNALS USING SOME NON-LINEAR PROCESSES
 - SOME FORM OF MULTIPLICATION TYPICALLY
- WHY?
 - TO TRANSLATE FREQUENCY OF A SIGNAL
 - USING TRIGONOMETRY

$$\cos(\omega_1 t) \cos(\omega_2 t) = \frac{1}{2} \cos(\omega_1 t - \omega_2 t) + \frac{1}{2} \cos(\omega_1 t + \omega_2 t)$$

- MULTIPLY SIGNALS OF DIFFERENT FREQUENCIES AND YOU GET AN OUTPUT THAT CONSIST OF THE SUM & DIFFERENCE FREQUENCIES

- IN REAL WORLD, YOU GET

$$\boxed{m f_1 \pm n f_2}$$

- USUALLY ONLY INTERESTED IN SUM OR DIFFERENCE OF FUNDAMENTALS, REST ARE FILTERED AWAY