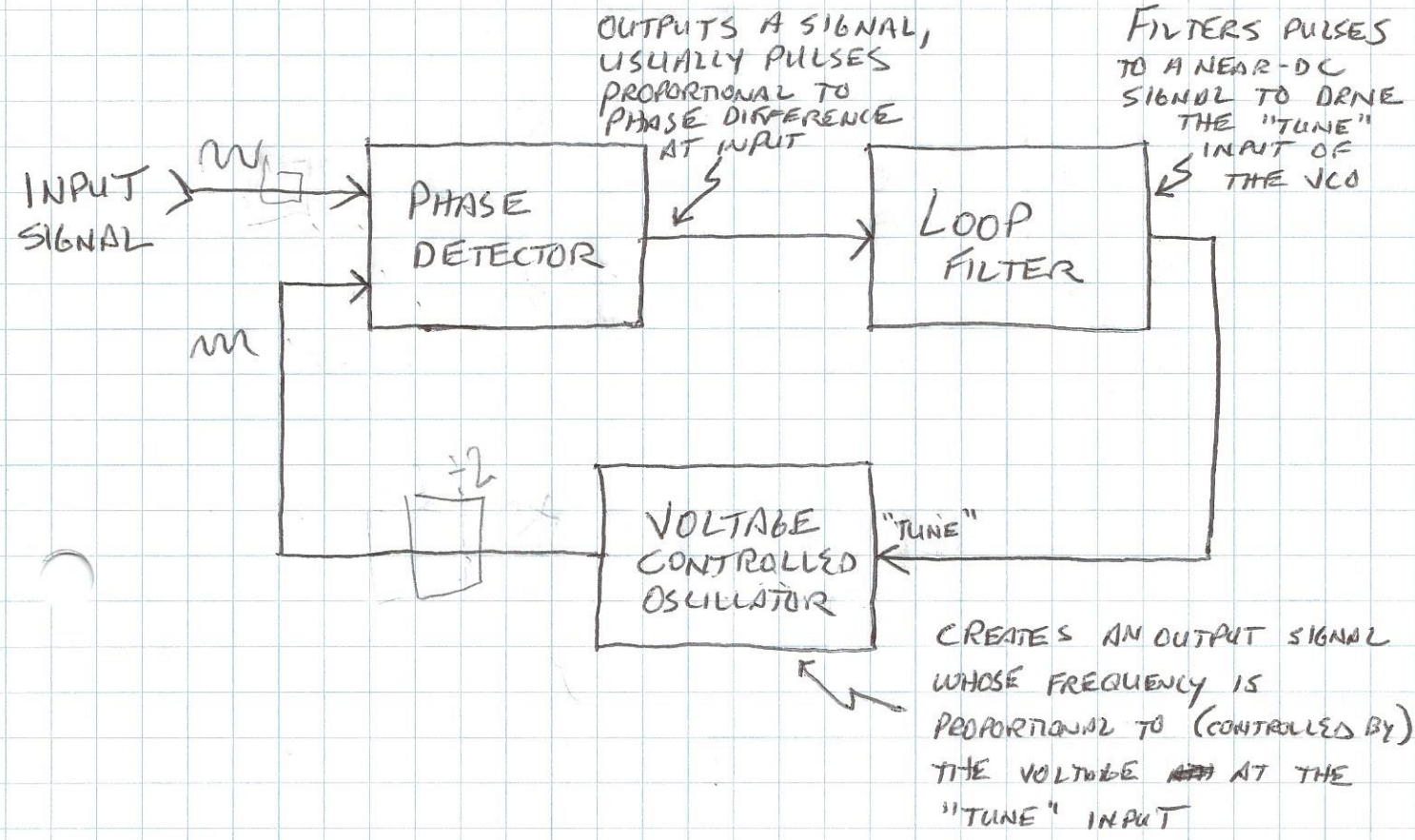
W2AEW

PHASE LOCKED LOOPS

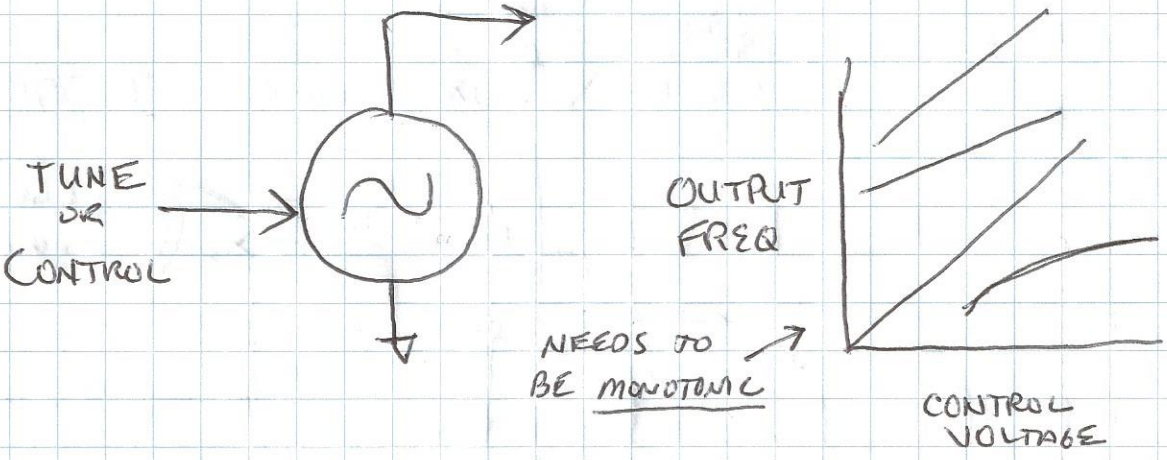


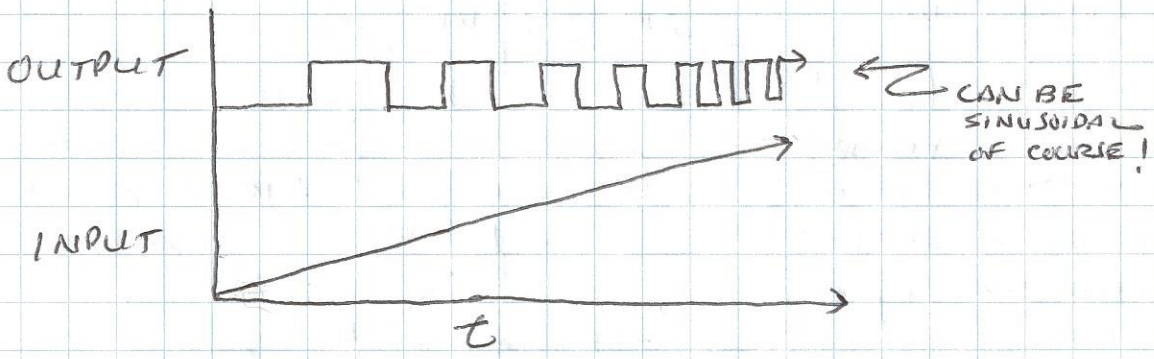
APPLICATIONS INCLUDE:

- DEMODULATION + MODULATION
- FM DISCRIMINATION
- FREQUENCY SYNTHESIS
- TUNING CONTROL
- TONE DECODING
- CLOCK RECOVERY

WRAEW

VOLTAGE CONTROLLED OSCILLATOR : VCO



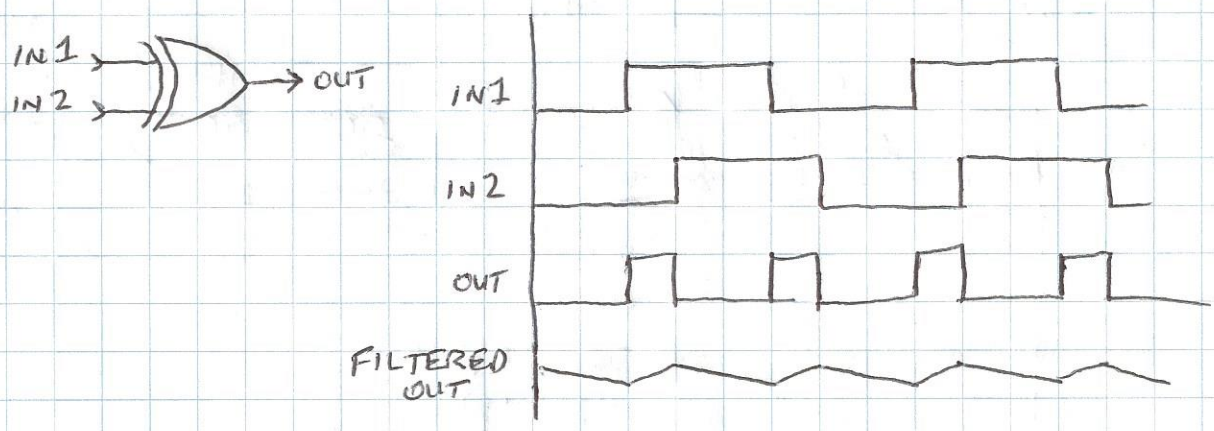


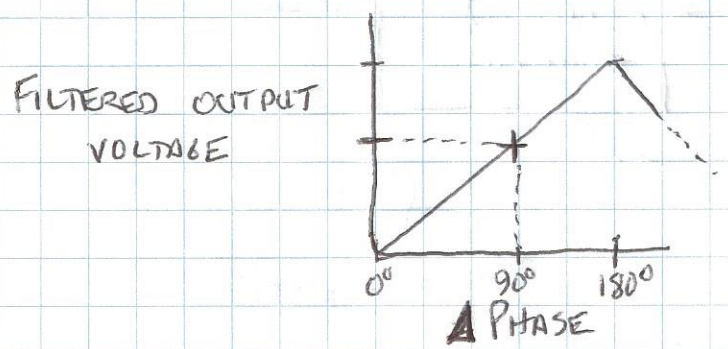
W2AEW

PHASE DETECTOR

DIGITAL APPS ↙ RF APPS ↙

TYPE I: SIMPLE XOR / MIXER





USUALLY DESIGNED SO MID-POINT (90°) VOLTAGE IS DESIRED TUNE VOLTAGE WHEN LOCKED

GOOD

- GOOD WITH NOISY INPUTS
- SIMPLE

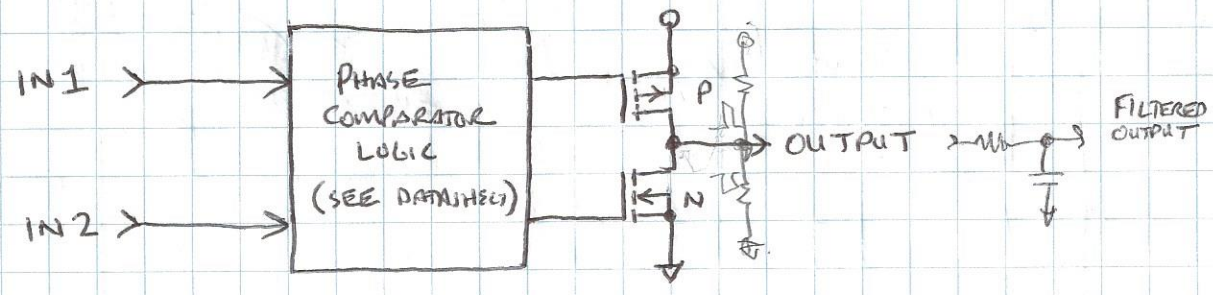
BAD

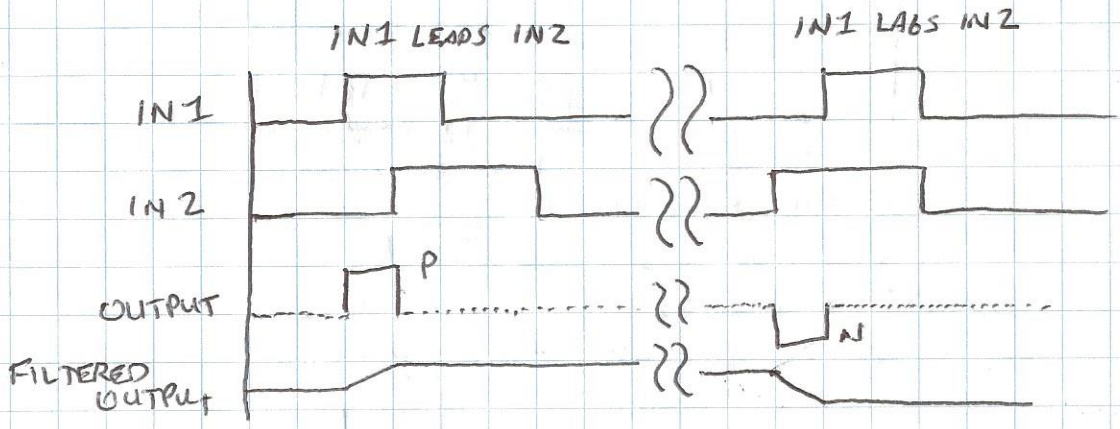
- CAN LOCK ON A HARMONIC
- PHASE AT LOCK CAN BE 0-180°
- INPUTS SHOULD BE 50% DUTY CYCLE
- NO REAL FREQUENCY DETECTION

W2AEW

PHASE DETECTOR

TYPE II : ALSO CALLED PHASE FREQUENCY DETECTOR





GOOD

- GOOD FREQUENCY DETECTION
- WON'T LOCK ON HARMONIC
- SIGNALS DON'T HAVE TO BE 50% D/C
- LOCKS A (NEAR) 0° PHASE

BAD

- MORE COMPLEX
- NOT AS GOOD WITH NOISY INPUTS