

BASICS OF RADAR

A VERY ACCURATE CLOCK

CONVENTIONAL (INCOHERENT)

- OSCILLATOR ~~TUBE~~ MAGNETRON
- GENERATES HIGH-POWER PULSES (100KW) AT A GIVEN FREQ.
- THE PHASE TO PULSE INFO IS RANDOM

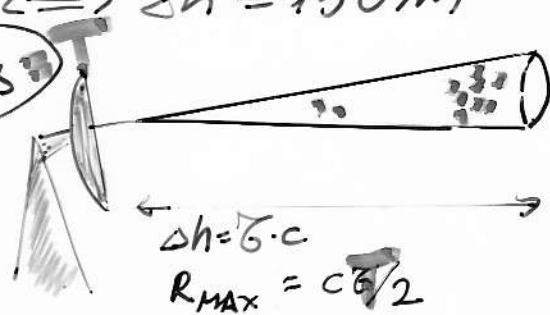
DOPPLER (COHERENT)

- KLYSTRON
- IT MAINTAINS PHASE COHERENCE
- 2 MW PEAK POWER

A PULSE IS $\approx 6 \sim 1 \mu s \Rightarrow \Delta h = 150 m$

T: PRF $\sim 1000 Hz \Rightarrow 1 m/s$

- PULSE TRAVELS OUT & BACK



- DUPLEXER, TRANSMITTER (MAGNETRON &/OR KLYSTRON)
- ANTENNA, RECEIVER, INDICATOR (PPI, RHI, CAPP, etc.)
- 12° 10¹³W

$$R_{max} = \frac{c}{2 \cdot PRF} = \frac{c \cdot T}{2}$$

DOPPLER: SINCE 70's WITH COMPUTERS

f_d = DOPPLER SHIFT FREQ., f_t = TRANSMITTED FREQ.
RECEIVED = $f_d + f_t$ (TOWARD) RADAR $\Rightarrow f_d > 0$