Section D

• Radars

Factors affecting range of radar

$$A_{e} = \frac{G\lambda^{2}}{4\pi}$$

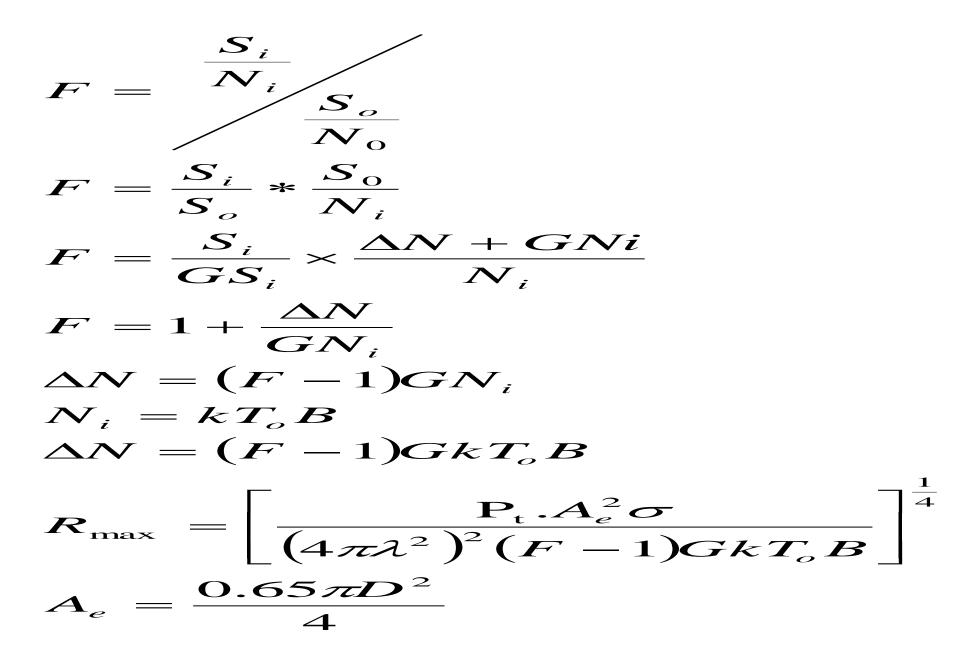
$$R_{max} = \left[\frac{P_{t}A_{e}^{2}\sigma}{4\pi\lambda^{2}S_{min}}\right]^{\frac{1}{4}}$$

$$R_{max} = \left[\frac{P_{t}G^{2}\lambda^{2}\sigma}{(4\pi)^{3}S_{min}}\right]^{\frac{1}{4}}$$

- Transmitted power
- Frequency
- Target cross section area:-ratio of power reflected back by the target towards the source per unit solid angle to the incident power density on the target

Minimum received signal power

• Minimum detectable signal at the receiver



Maximum Unambiguous range

- T=Tr=Ton +Toff= 1/prf
- Rmax=cT

2

- = second time Around echoes
- The range beyond which target appears as second —time around 'Maximum unambiguous Range

Runamb

Pulsed Radar system

- Triggered source
- Pulse modulator
- Output tube
- Duplexer

Receiver

- 1. Low noise amplifier
- 2. Mixer
- 3. Local oscillator
- 4. IF amp
- 5. Detector
- 6. Radar display
- Deflection modulation CRT screen A-scope
- Intensity modulation of CRT (Plan position indictor)
- Feeding the data to a computer