PLANAR MONOLITHICS INDUSTRIES, INC.

SMALL PROJECTILE DETECTION WITH DOPPLER RADAR

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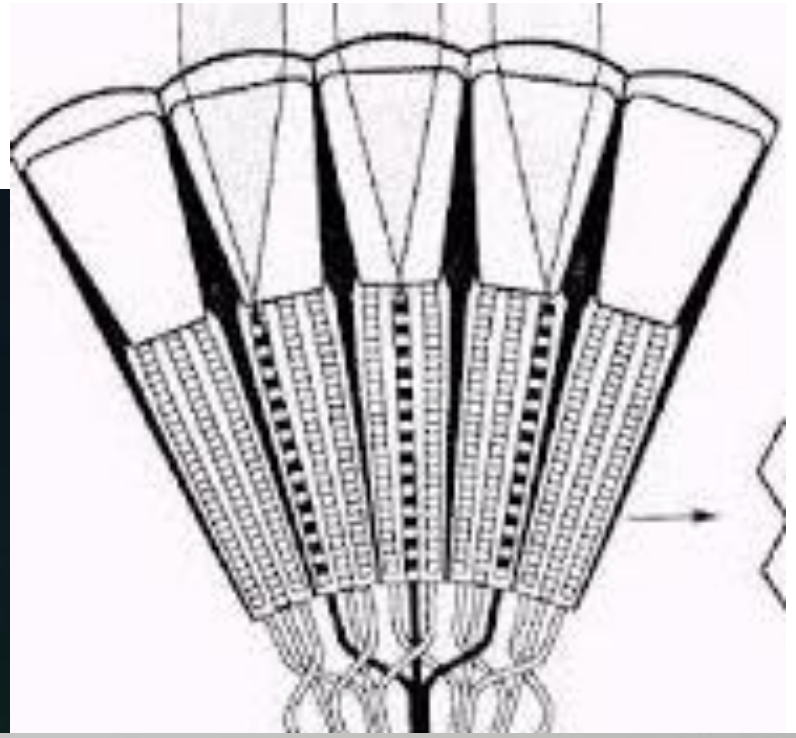
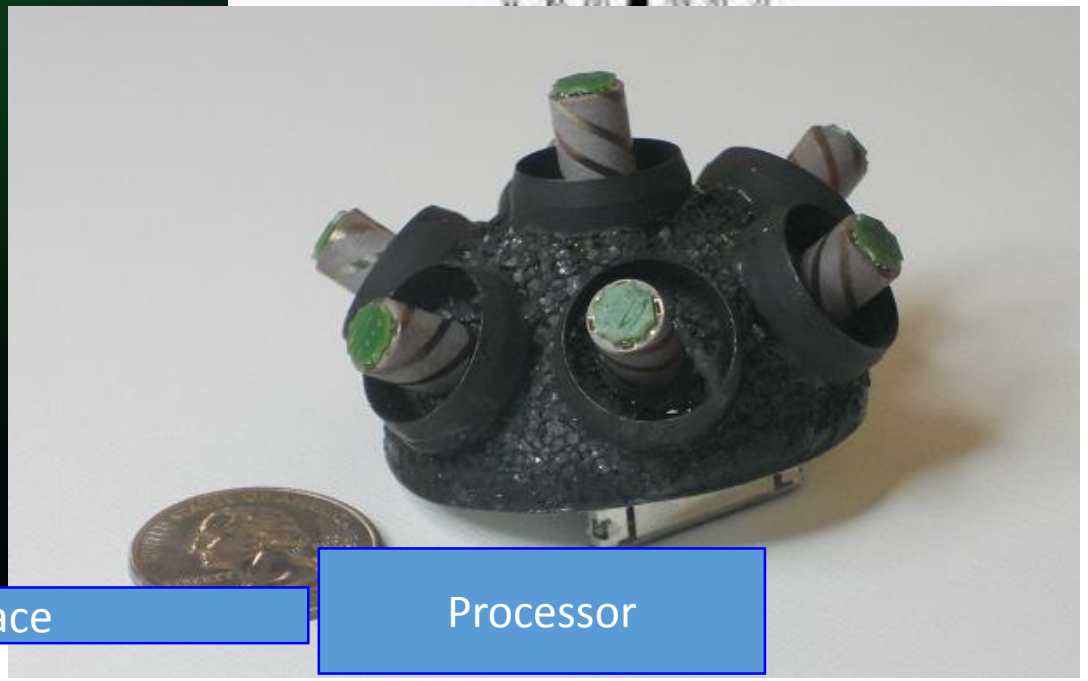
21704

Fly Eye Antenna Array





Sensor

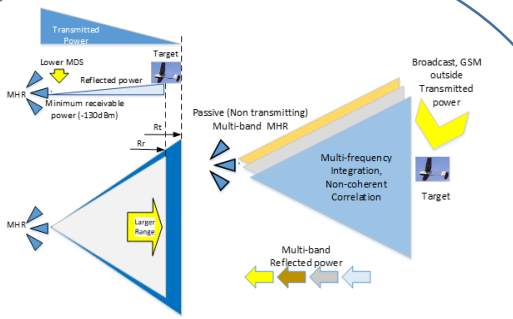
Front End Circuit

ADC

Digital Interface

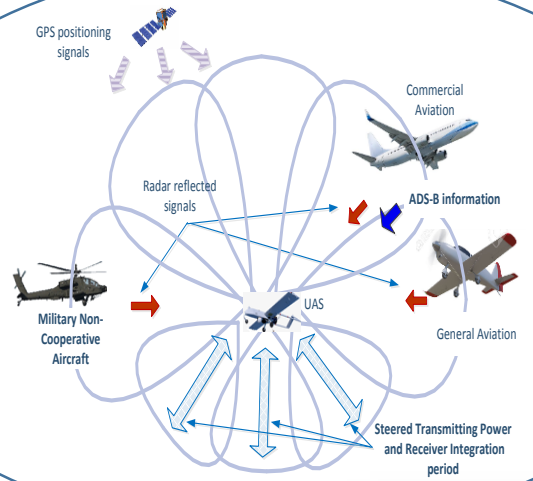
Processor

PASSIVE RADAR

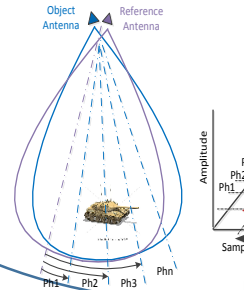


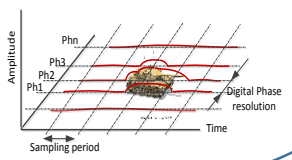
FLY EYE RADAR

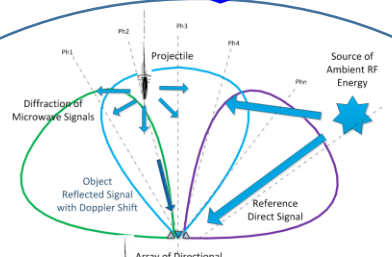
SENSE & AVOID RADAR



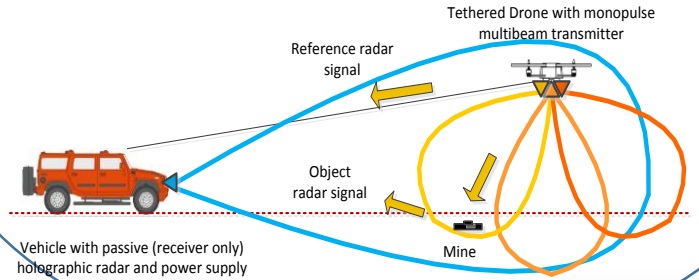
TRACKING, IMAGING RADAR



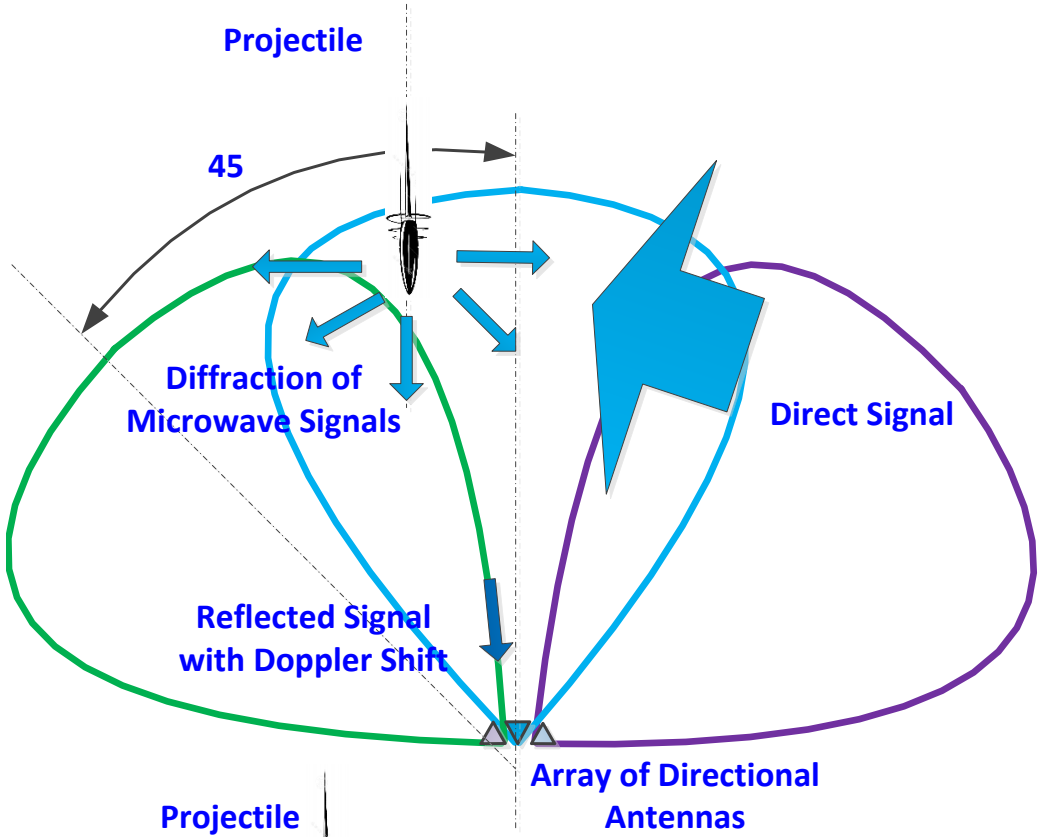


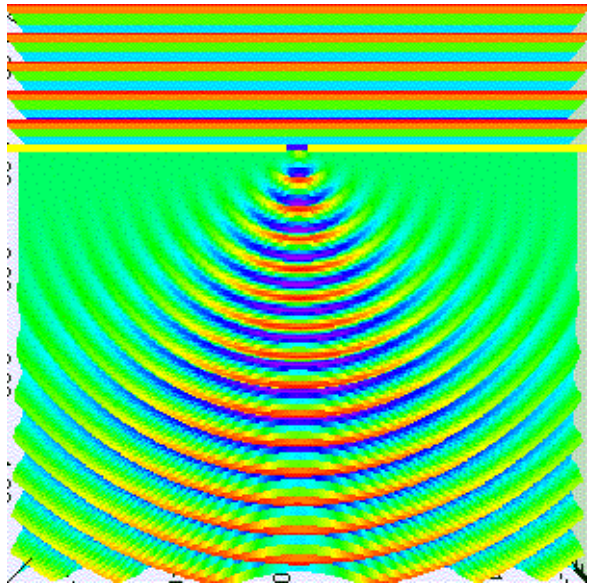


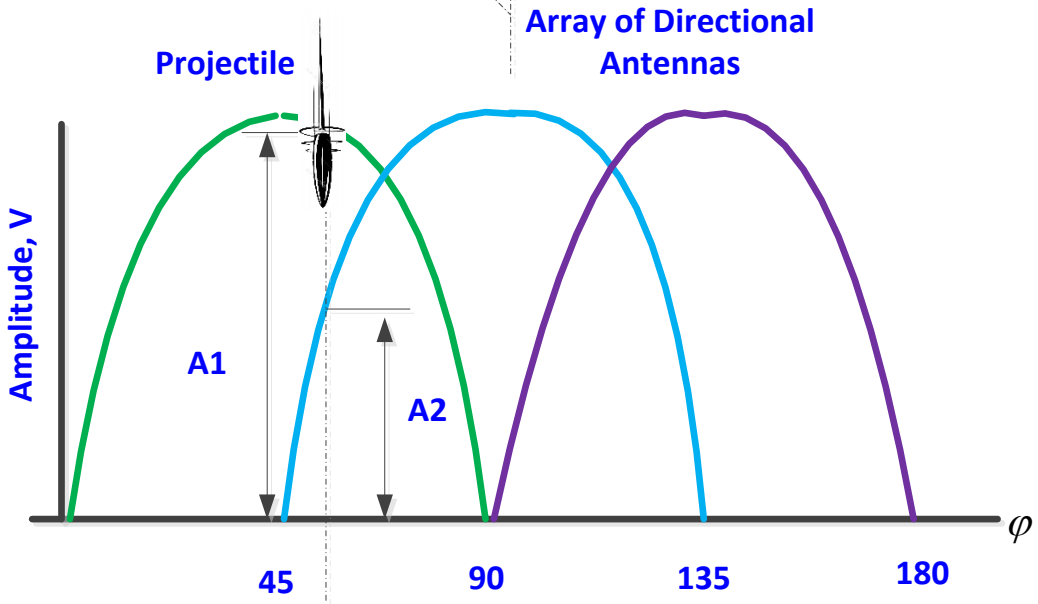
GROUND PENETRATING RADAR



SMALL PROJECTILE DETECTION DOPPLER RADAR







Projectile
Image

The Doppler frequency is calculated as:

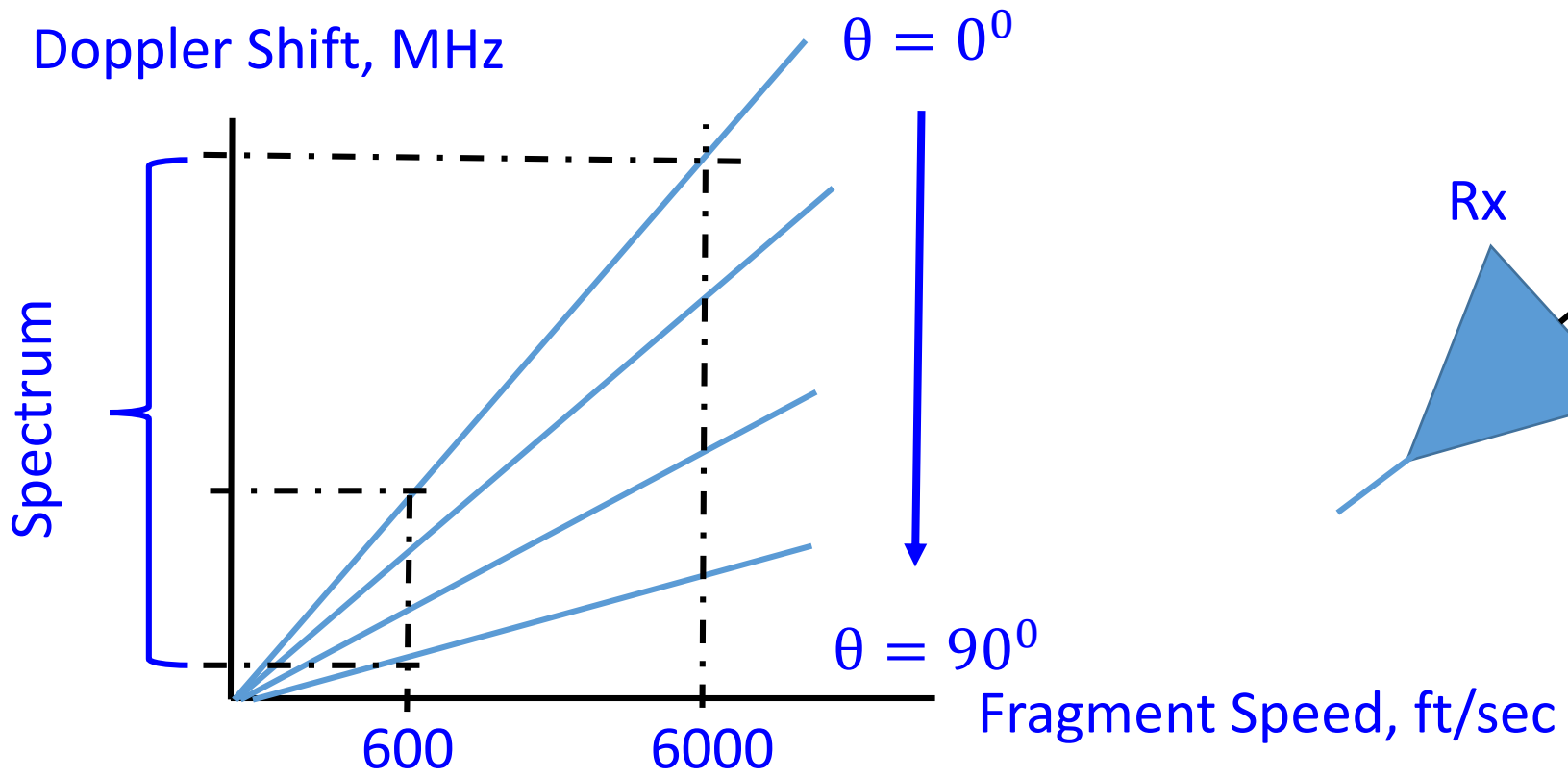
$F_D = 2\ V\ (F_t/c)\ \text{Cos}\ \theta$

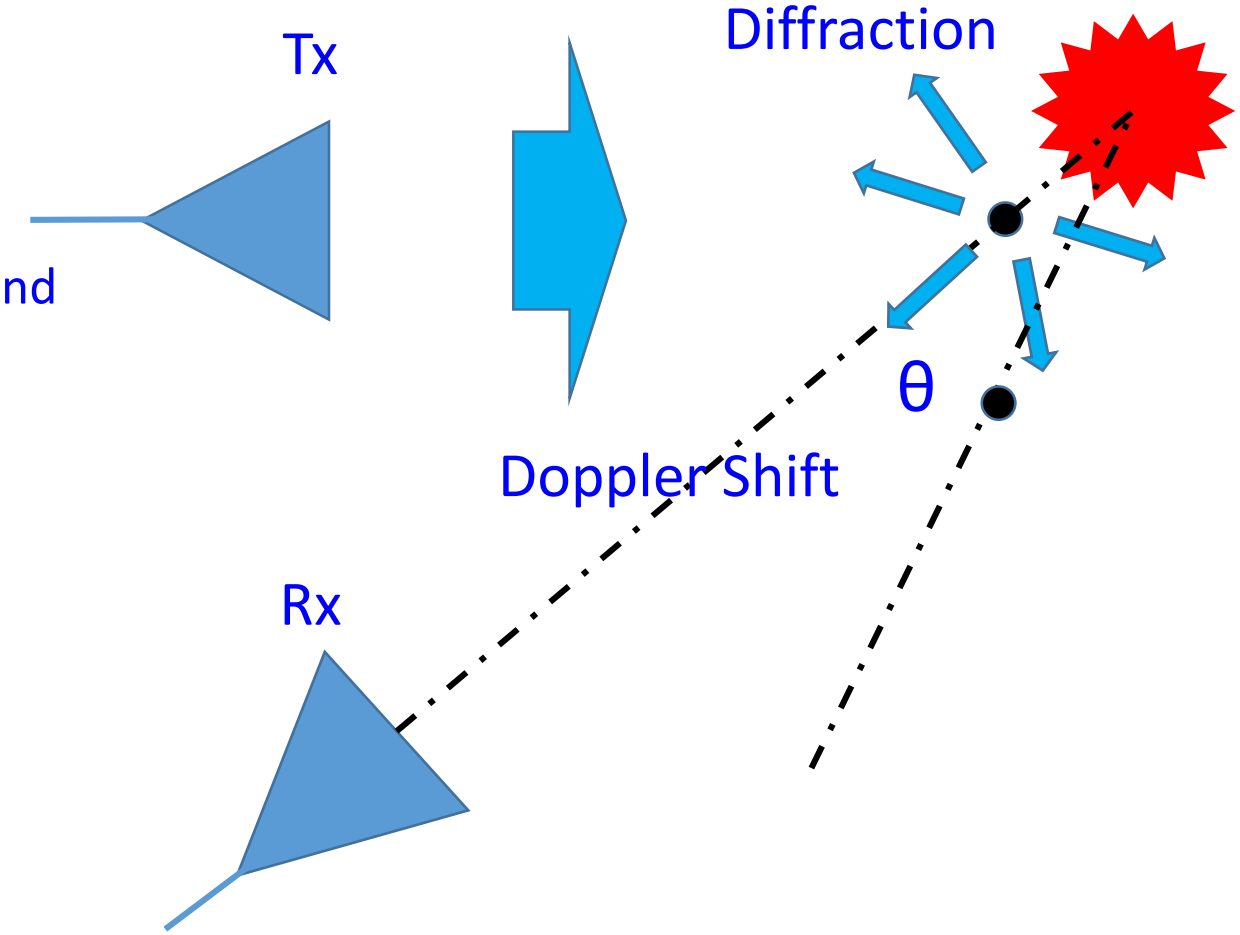
Where: F_D - Doppler frequency; V - Velocity of the target;

Ft - Transmit by ambient signal source frequency;

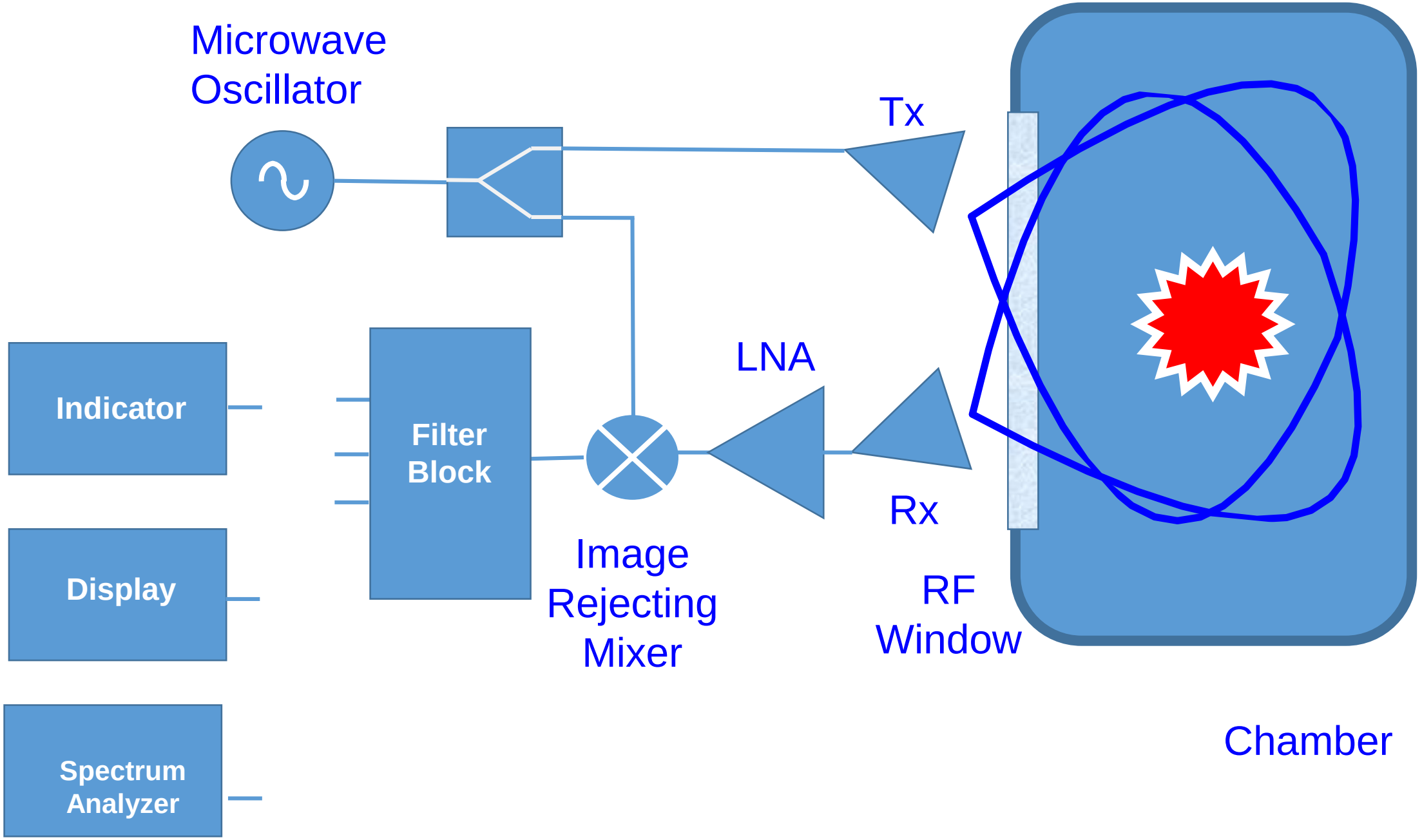
c - Speed of light (3×10^8 m/sec);

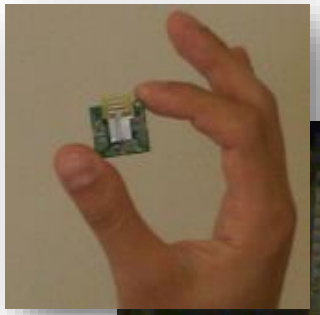
θ - The angle between the object moving direction and the axis of the signal source.

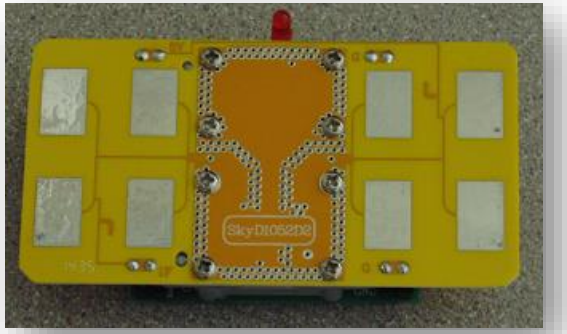


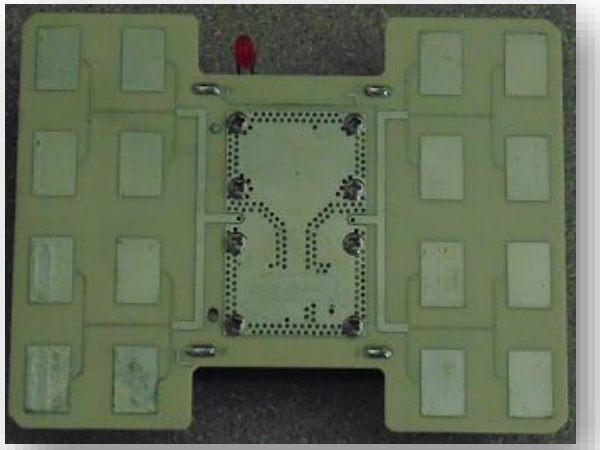


For Ft = 10 GHz, Second harmonic Doppler Shift Approx. 50-500 KHz


Microwave
Oscillator
Tx
Indicator
Filter
Block
LNA
Display
Image
Rejecting
Mixer
Rx
RF
Window
Spectrum
Analyzer
Chamber







Array of Four Directional Antennas