

Parameter	RADAR	Optics
Aperture (d) required for 1mrad angular resolution	X-band 8-12GHz ($\lambda \sim 2.50-3.75\text{cm}$) $\sim 37\text{m}$ K _u -band 12-18GHz ($\lambda \sim 1.67-2.50\text{cm}$) $\sim 25\text{m}$ K _a -band 24-40GHz ($\lambda \sim 0.75-1.11\text{cm}$) $\sim 11\text{m}$	LWIR ($\lambda \sim 8-14\mu\text{m}$) $\sim 0.030\text{m}$ MWIR ($\lambda \sim 3-5\mu\text{m}$) $\sim 0.010\text{m}$ SWIR ($\lambda \sim 1-2.5\mu\text{m}$) $\sim 0.005\text{m}$
Receiver signal	$P_{\gamma} = \frac{\sigma \cdot R \cdot F^4}{(4\pi)^2} \frac{A_{\gamma} \cdot G_{\gamma}}{R^4}$	$P_{\gamma} = J_{\text{obs}} \frac{A_{\gamma} \cdot G_{\gamma}}{R^2 / \tau_{\text{opt}}(R)}$
Range measurement	Very accurate - pulse Time of Flight measurement	Difficult. Only by means of triangulation from multiple viewpoints, or - passive ranging with signal processing from multiple optical band.
Velocity measurement	Very accurate - Doppler effect measurement	Difficult. Only by means of triangulation from multiple viewpoints.
Weather dependency	Weak	Strong. Inoperable in dense fog and clouds.

FIG. 1

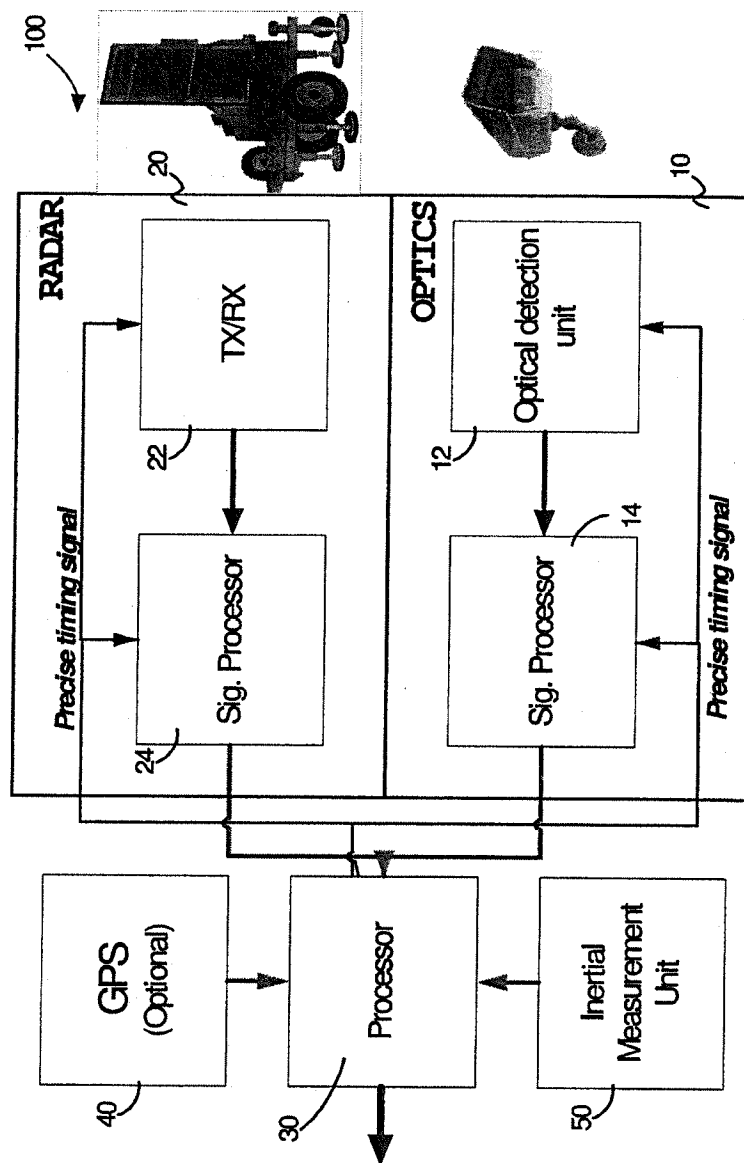


FIG. 2

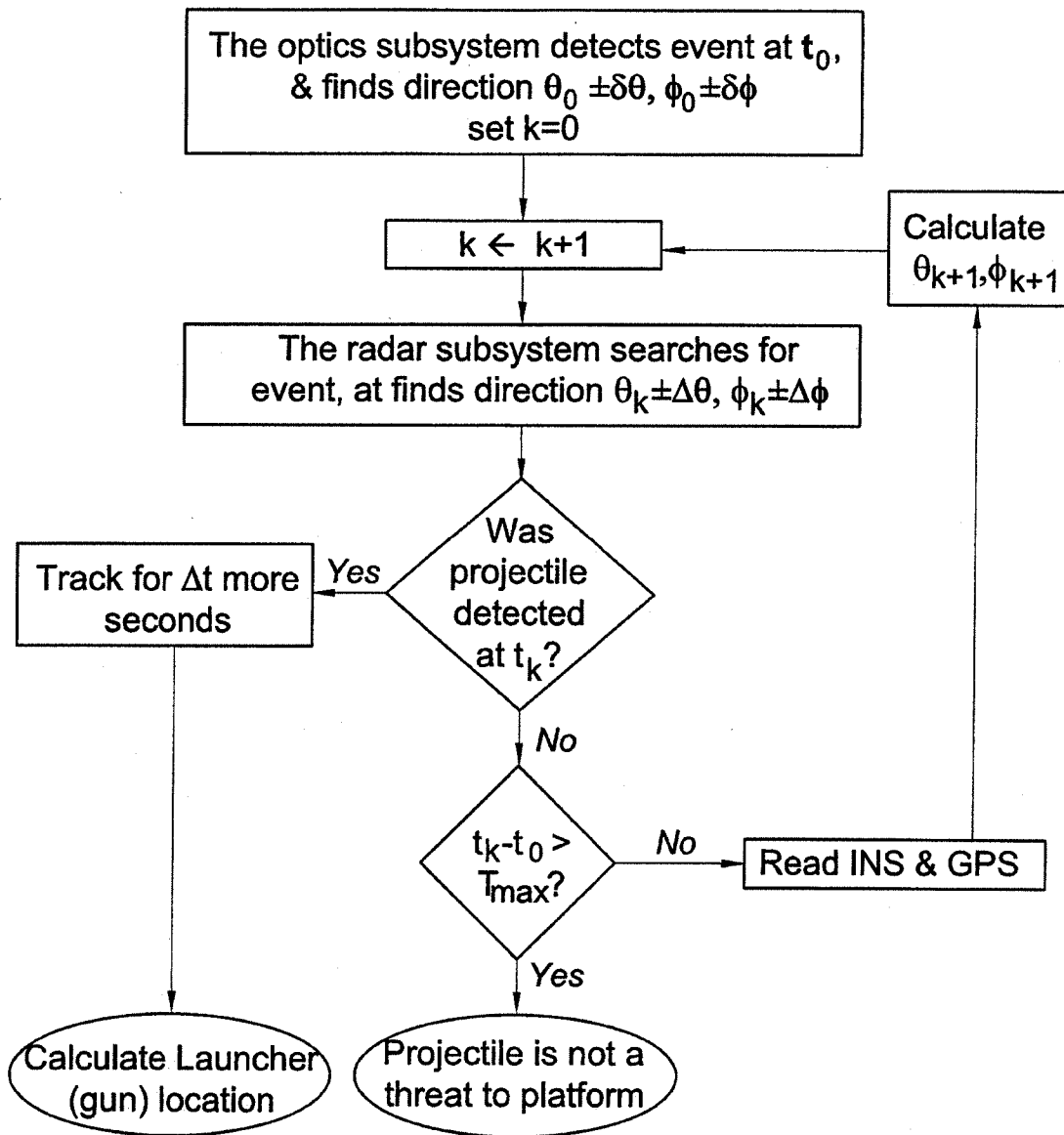


FIG. 3

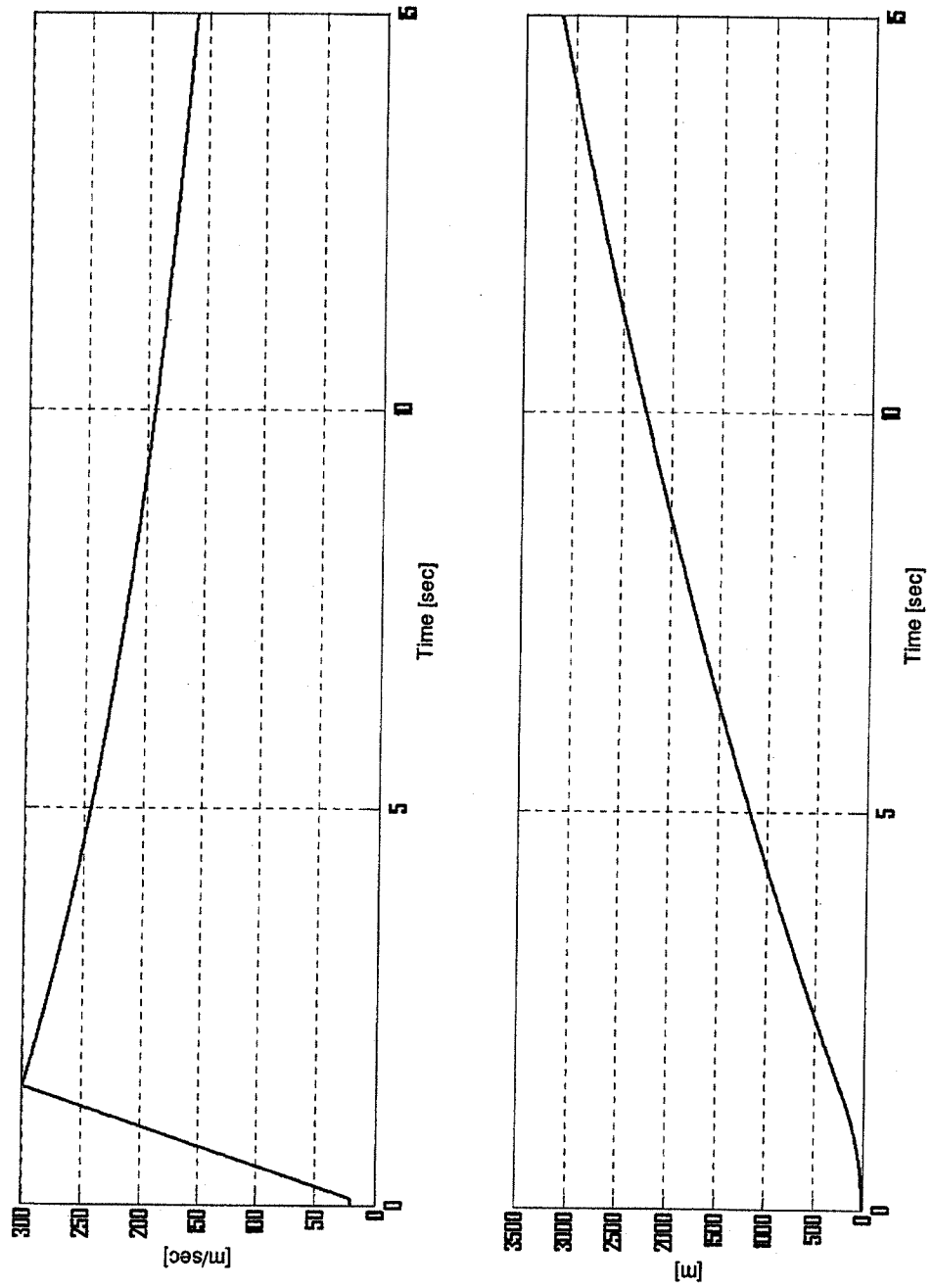


FIG. 4

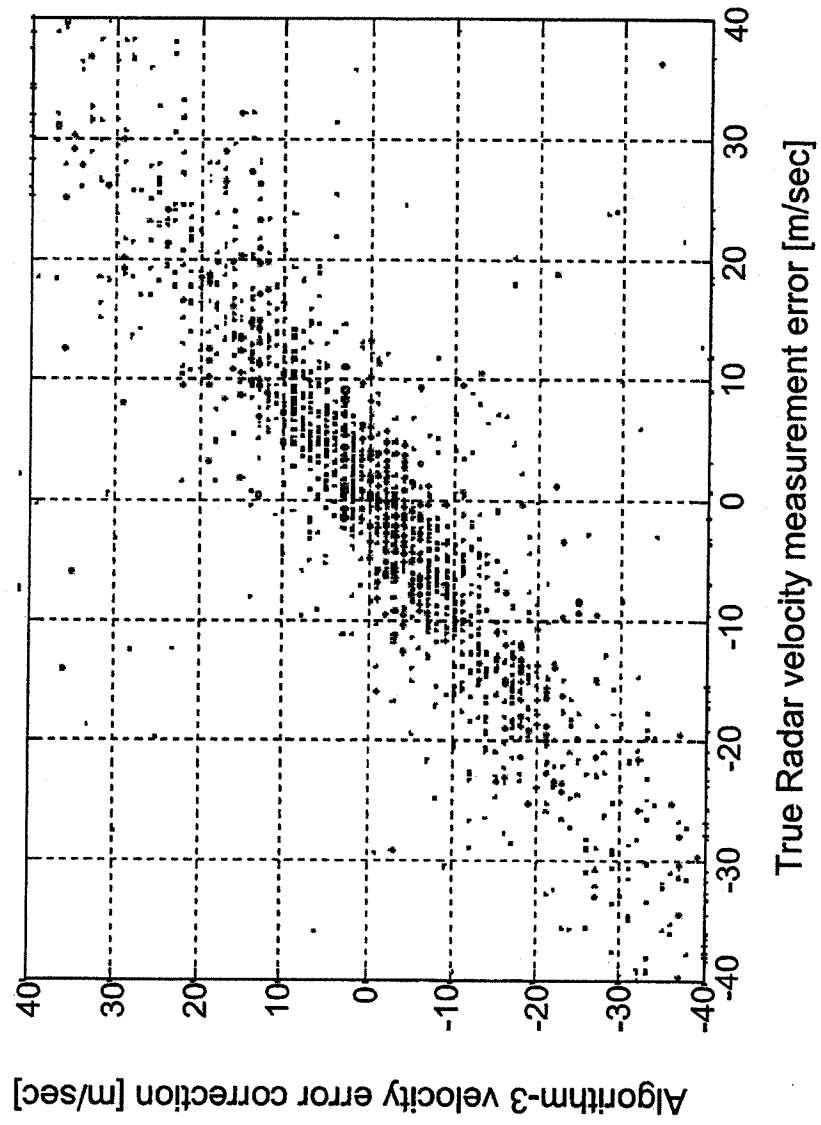


FIG. 5

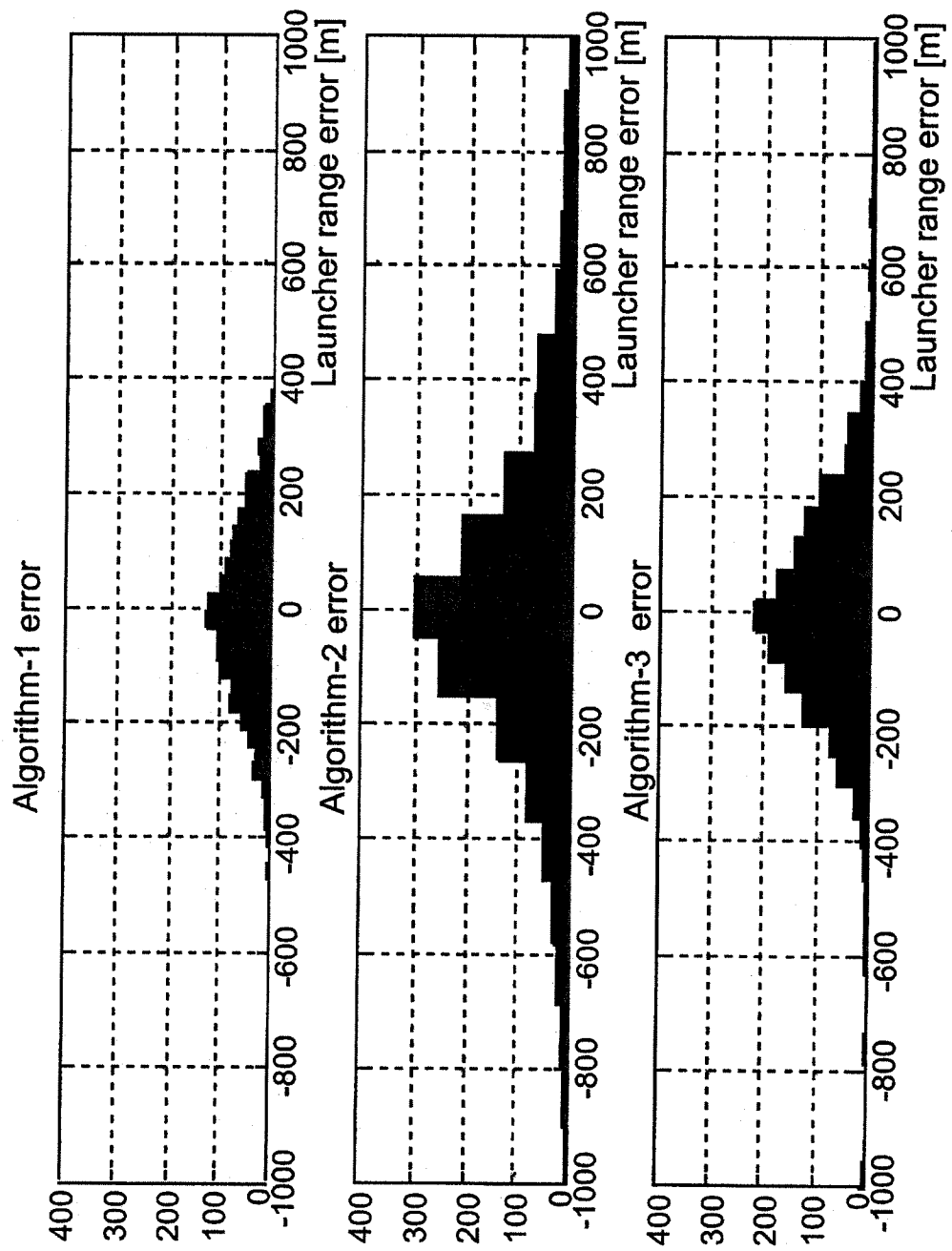


FIG. 6