



Cross-eye jammers operating from small UAVs can disrupt the tracking functions of **radar and satellite communication systems** by inducing large antenna pointing errors.

## Motivation

- Insurgents use commercial radar systems provide accurate location of friendly forces for targeting and surveillance.
- Very small aperture antenna terminals (VSATs) are used by insurgents to establish high speed internet connections over satellite links for planning and execution of attacks.
- These systems rely on precise tracking using monopulse techniques.
- Cross-eye jammers can induce a loss of tracking capability. The threat system's efficiency degrades significantly.
- Cross-eye jamming from UAVs has advantages: UAVs have low radar cross section platform and the ability to operate at short ranges and low altitudes.

## Proposed Work and Deliverables

- Technical evaluation using analysis and in-house commercial simulation tools. Proposed tasks:
  1. Selection and specification and modelling of victim systems (selected radar systems and VSATs).
  2. Cross-eye jammer system specifications and modelling.
  3. Modeling of the victim/jammer interactions to simulate various operational scenarios.
  4. Deployment strategies using UAVs.
- Deliverables: student thesis or suitable NPS technical report, TechCon or TechExpo presentation.

## Objective and Method

- Acquiring the desired signals and establishing a track is resource intensive.
- The cross-eye technique: The threat receiving antenna uses the jammer's erroneous phase slope to point in the wrong direction, causing a loss in the desired signal.
- Even if loss of track occurs for a short time, the threat system's efficiency degrades significantly.
- The jammer can repeatedly engage and disengage to confound the victim. Often the victim system is not aware that it is being jammed.
- Contributes to the *Electromagnetic Maneuver Warfare* (EMW) goal of spectrum dominance.