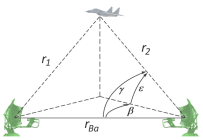
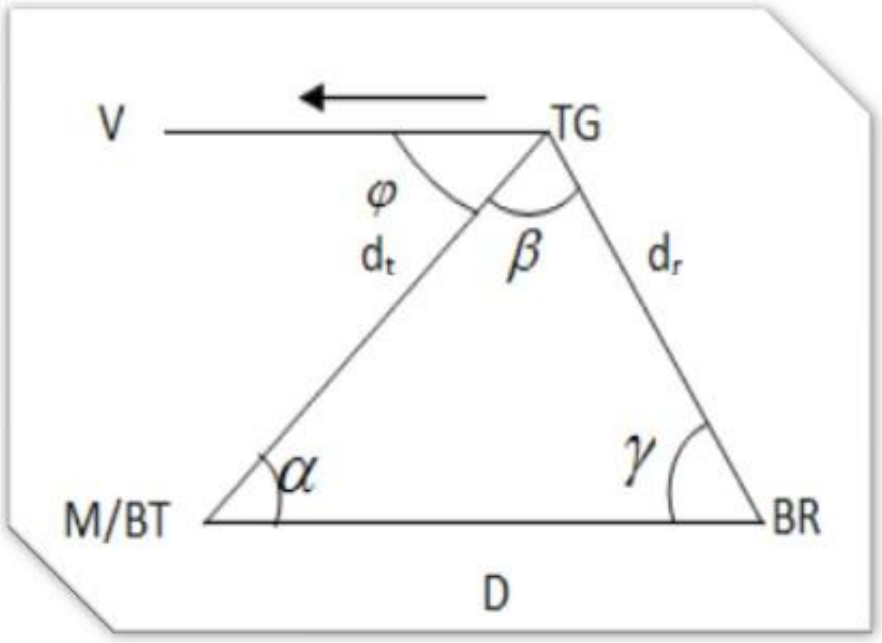
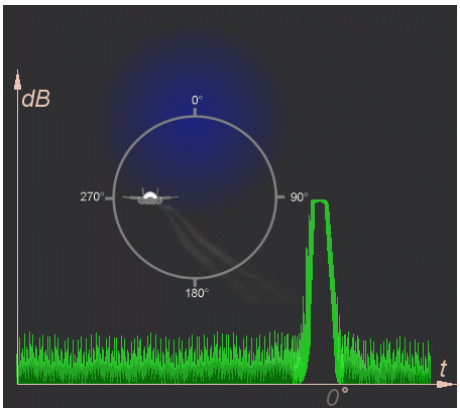
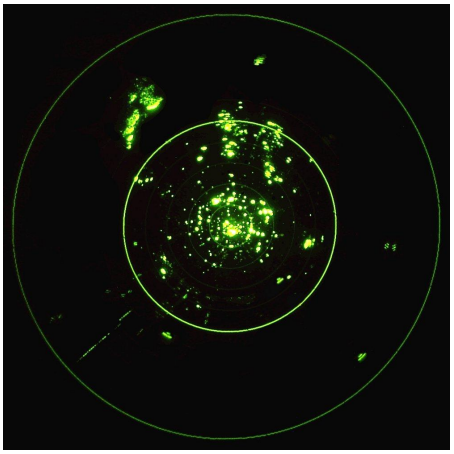
RADAR DECEPTION JAMMING PREVENTION USING BI-STATIC AND MONO-STATIC RADARS



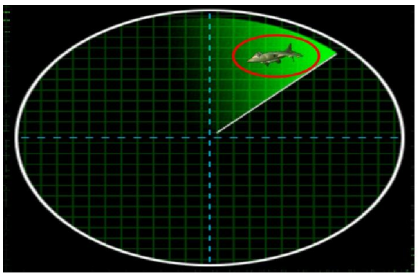


We propose a novel configuration of mono-static and bi-static radars which are physically positioned in such a way that the transmitter, receiver and the target make a scalene triangle. The algorithm assumes that there is a mutual exchange of information between the two radar systems. The advantage of using such a scheme is that it requires a very low level of frequency agility and localizes the target in the presence of Velocity Gate Pull Off and Range Gate Pull Off (VGPO/RGPO).

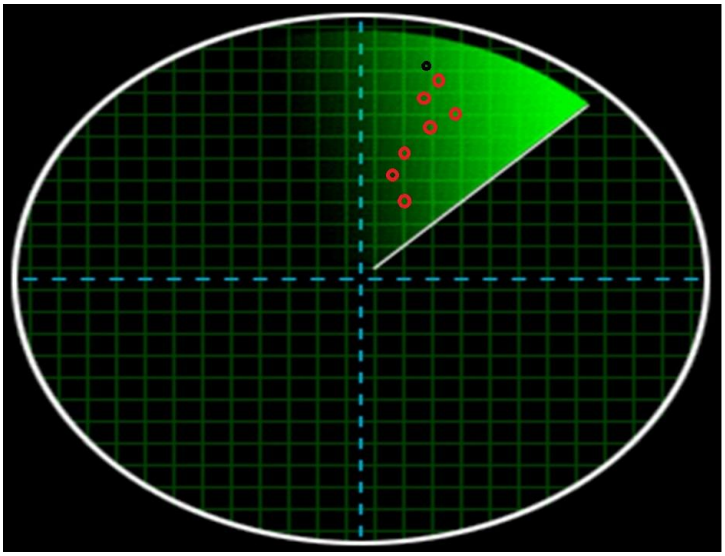


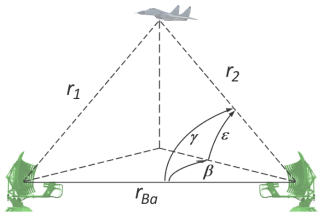


A method of preventing the jamming of radars is introduced which utilizes two radars located at a distance to prevent both velocity and range gate pull offs. In our proposed solution, bi-static radars are used in combination with the mono-static radars to mitigate the Electronic Countermeasures (ECM) effects of deception jamming. The algorithm aims at determining the Doppler frequency by the mono-static receiver and bi-static receiver and ascertaining jamming if the Doppler frequency recorded is found the same by both the mono-static and the bi-static receivers or if the location determined by both the radars is different. Airborne Radar Lock-on can be deceived by breaking the lock and escaping from the window. Our configuration is very simple approach to nullify deception jamming and detect the target.



$$f_{dj} = \begin{cases} f_d & 0 \le t \le t_1 \\ f_d + k\,(t - t_1) & t_1 \le t \le t_2 \\ 0 & t_2 \le t \end{cases}$$





FEATURES

- A scalene triangle configuration with bi-static transmitter (and mono-static transceiver), the target and bi-static receiver to counter ECM effects
- Variable frequency operation continually monitors the velocity and position of the target

BENEFITS

- **Detection and prevention of Deception Jamming of Radars**
- **High probability of target detection**
- **Frequency agility in a desirable manner**
- **Capability to nullify Velocity Gate Pull Off and Range Gate Pull Off (VGPO/RGPO)**
- **Graceful degradation during peace time**
- **Detection of targets operating in different bands**
- **Portable location of the bi-static receiver providing flexibility to the overall network**
- **Hence a very simple but highly effective ECCM System**

APPLICATIONS

- A highly effective Electronic Counter-Counter Measure (ECCM) System to all forms of noise jamming and deception jamming, in particular RGPO and VGPO
- Variable band ECCM system for ground based radars
- A solution to DRFM and Side lobe jamming

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