



# Passive Radar

## Passive Radar

To see without being seen

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### THE PERFECT PARTNER FOR ACTIVE SYSTEMS.

Passive radar is set to become a supplement to conventional active radar within the next few years. It offers a decisive operational advantage: it cannot be located. Unlike active systems, passive radar does not emit any waves of its own, meaning that it cannot be jammed. The system uses VHF (very high frequency), digital radio and television frequencies as carrier waves rather than its own transmitter.

The passive radar system requires a whole lot of computing power and extremely complex signal processing software. The high-performance on-board computer enables the simultaneous use of 20 transmitters, in a mixture of VHF and digital frequencies.

Be it pop or sports broadcasts, it's all helpful, even if upbeat music is preferred in the analogue FM band (VHF) as it achieves better location accuracy.

Central Europe and other densely populated areas all over the world have enough VHF and digital transmitters that passive radar can use. But the system works in inaccessible areas, too. One can just set up his own transmitter and start our own radio station broadcasting classical music, pop or just white noise.

This makes it possible to position passive radar in remote valleys to track flying objects at low altitudes, including small aircraft, which have flown 'under the radar' until now. The system's mission planning tool can simulate the best location for passive radar, be it for today's mobile unit or tomorrow's stationary systems.



FOR FURTHER INFORMATION PLEASE CONTACT

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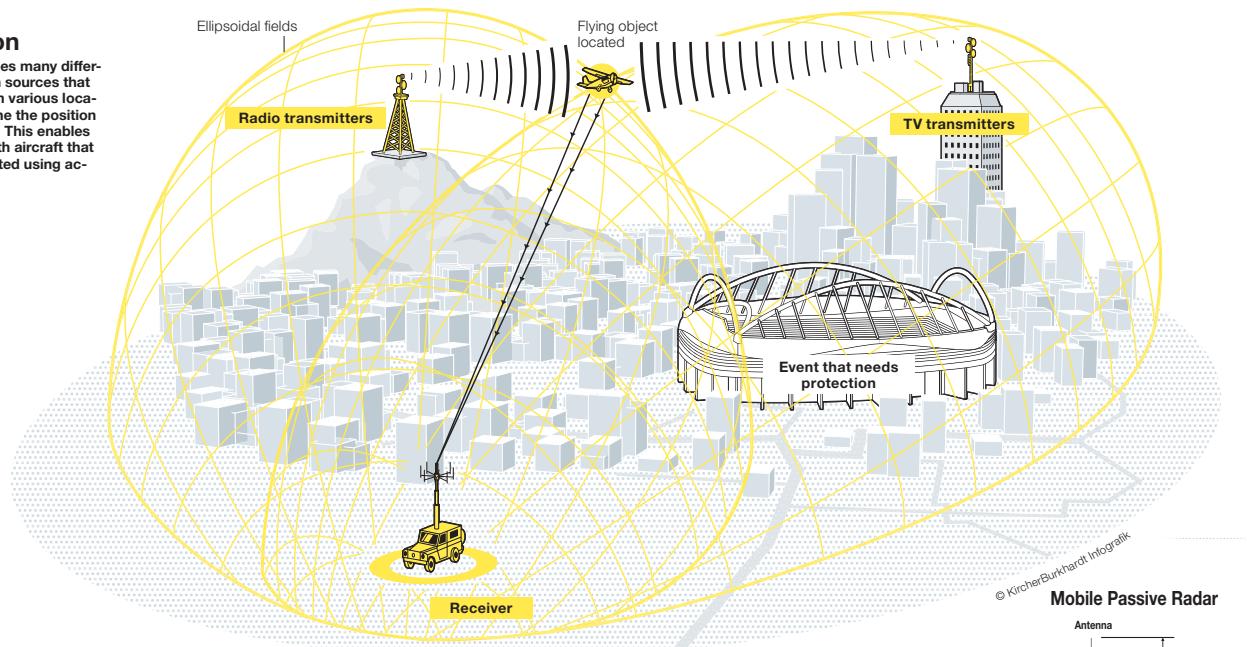
# Passive Radar

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## Passive Radar system: no own transmitter, only receiver

### Application

Passive radar uses many different transmission sources that are sent out from various locations to determine the position of flying objects. This enables it to locate stealth aircraft that cannot be detected using active systems.



### What frequencies does passive radar use?

FM – To detect large aircraft at a distance of up to 200 kilometres.

DAB/DVB-T – Up to a distance of approximately 40 kilometres, small aircraft can be detected with an error margin of just 20 metres.

### Different types of radar detection

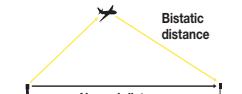


**Active**  
The radar transmits signals and receives reflections. This is how it can be located.



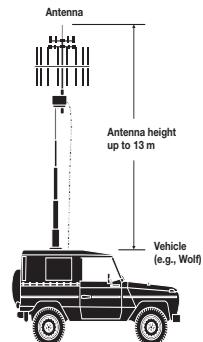
**Passive**  
Low radio frequencies from different transmitters are reflected by the radar and analysed without being detected.

### Detection using interaural time difference



**Bistatic distance**  
Normal distance  
Transmitter      Receiver  
The first information on the possible position of the object to be located is obtained with a transmitter-receiver.

**Mobile Passive Radar**



### Applications of Passive Radar

#### General Application Approach

- „See without being seen“ scenarios
- Detect non-emitting targets
- Gap filler / sensitive spot coverage
- Radar performance where active radars are no option
- Passive Radar sensor fusion with active radars & PET
- „Sensor chain“: strip surveillance, „Sensor cluster“: improved spot surveillance

#### Air surveillance

- Detection of non-emitting & LPI-targets
- Long range border / coastal surveillance
- Near-range high precision slow & low target tracking
- Camp & event protection: G8 summit, sport events, ...
- Air Traffic Mgmt / Low Cost airfield radar performance
- High building & infrastructure signal lighting control

#### Sea and ground surveillance

- Harbour awareness & protection
- Ship self-protection
- Border protection

#### Functional Capabilities

##### Cassidian multiband demonstrator: (FM / DAB / DVB-T)

- 360° coverage/3D location/Real-time processing
- Real time fusion of 8 FM transmitters, 1 Single Frequency Network (SFN) DAB and 1 SFN DVB-T
- Real-time sensor cluster
- Antenna-to-track delay: 1 – 2 seconds, track update rate 0,5 seconds
- Remote ASTERIX data link to CRCs

### Operational Advantages

- No emissions (no active transmitters, invisible to radar search, jammer resistant)
- No electro-magnetic pollution
- Detection of low altitude targets (diffraction)
- „Anti-stealth“ (multi-static, low frequencies)
- Multi-angle target detection when using multiple illuminators

### Other advantages

- Low cost procurement & maintenance (no transmitter needed)
- Operation in difficult terrain
- Due to low cost sensors a network performance (cluster) with multiple sensors is easily installed
- Remote, stand-alone operation
- High detection update rates