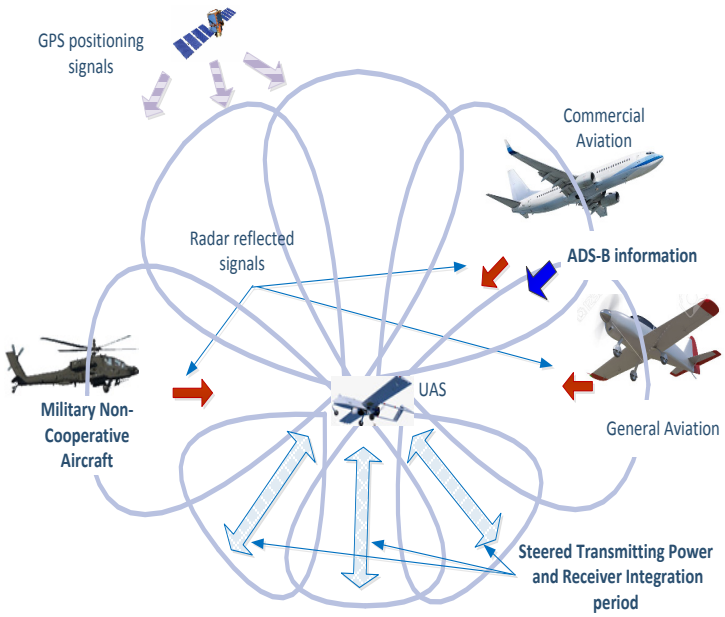
PLANAR MONOLITHICS INDUSTRIES, INC.
PMI East Coast: 7311-F Grove Road, Frederick, MD 21704 USA
Tel: 301-662-5019 Fax: 301-662-1731
PMI West Coast: 4921 Robert J. Mathews Parkway, Suite 1, El Dorado Hills, CA 95762 USA
Tel: 916-542-1401 Fax: 916-265-2597
Web: www.pmi-rf.com Email: sales@pmi-rf.com

SENSE AND AVOID RADAR FOR UAS

Multibeam monopulse radar for Airborne Based Sense and Avoid (ABSAA) system concept:

- Multibeam monopulse radar with array of directional antennas is positioned on Unmanned Aircraft System (UAS). Radar signals simultaneously transmitted and received by multiple angle shifted directional antennas with overlap antenna patterns the entire sky, 360 degrees for both horizontal and vertical coverage.
- Digitizing of signals in separate directional antennas relative to reference signals provides high-accuracy high-resolution range and azimuth measurement and allows to record real time amplitude and phase of reflected from non-cooperative aircraft signals.
- High resolution range and azimuth measurement provides minimal tracking errors in both position and velocity of non-cooperative aircraft and will be determined by sampling frequency of digitizer.



- High speed sampling with high-accuracy processor clock provides high resolution phase/time domain measurement even for wide Field of View (FOV) directional antennas.
- Fourier transform (frequency domain processing) of received radar signals provides signatures and dramatically increases probability of detection for non-cooperative aircraft.
- Steering of transmitting power and integration, correlation period of received reflected signals for separate antennas (directions) allows dramatically decreased ground clutter for low altitude flights.
- Open architecture, modular construction allows combination of radar sensor with Automatic Dependent Surveillance – Broadcast (ADS-B), electro-optic, acoustic sensors.

REFERENCES

[1] A. Gorwara, P. Molchanov, O. Asmolova, Doppler micro sense and avoid radar, 9647-6, Security+Defense 2015, Toulouse, France, September 2015, (http://pmi-rf.com/documents/DopplerMicroSenseandAvoidRadarPaper.pdf).

[2] P. Molchanov "All digital radar architecture." Paper 9248-11, Security+Defense Conference, Amsterdam, September 25, 2014, (http://spie.org/Publications/Proceedings/Paper/10.1117/12.2060249).

[3] P. Molchanov, O. Asmolova. "Sense and avoid radar for micro-nano robots (Invited Paper)," Security+Defense Conference, Amsterdam, September 24, 2014, (http://spie.org/Publications/Proceedings/Paper/10.1117/12.2071366).