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Antenna: Don't Drone Without It

Unmanned aerial vehicles (UAVs) are quickly joining the ranks of ubiquitous must-have technology pieces. There are several estimations for how fast the commercial civilian market for UAVs (or drones) is growing: *MarketWatch* reports, that between 2015 and 2016, UAV sales doubled in the United States. *Tractica* estimates that sales will increase by a factor of ten between 2016 and 2021, to more than 67 million units annually. The worldwide military use of UAVs, of course, precedes the commercial use by decades but probably not by the number of units. There is quite a bit of spread in the size and operating altitude classes between military and civilian UAVs—the former running the gamut from few-grams weight and few-meters altitude to hundreds-of-kilograms weight and tens-of-kilometers altitude, while the latter market is more focused on the kilogram range of weight and subkilometer range of altitudes.

Regardless of the mission or the weight and altitude class of these vehicles, there is one certainty: they need antennas, at least to communicate, but, in many cases, also to perform observation and sensing functions. Reliable antennas with flawless performance are needed to ensure uninterrupted information flow to and from the UAV. Given the wide range of platform sizes and flight geometries, not to mention the often-harsh environments for which many of the original (e.g., military) applications of UAVs were envisioned, antenna and radome design for these vehicles is of growing interest. This issue of *IEEE Antennas and Propagation Magazine* features two articles focused on UAV antenna design: Fernández-González et al. describe a small embedded circularly polarized ultrahigh frequency antenna for telemetry and control systems of small UAVs, while Markina-Khusid et al. discuss the design of satellite communication antennas on a large high-flying Global Hawk.

We also feature several other interesting articles covering a wide range of fundamental theory and applied concepts. On the applied side, Amjadi et al. develop a signal segregation algorithm for responding to interference in a multipath propagation environment (did a UAV cause that?). Ferreira et al. study the effects of bending on a wearable flexible antenna that might be used in textiles (and why not on a UAV also?). The articles by Nepa and Buffi as well as the one by Sarkar et al. provide reviews with fundamental theoretical insights into two important topics, respectively, near-field focused antennas and the distinction among surface plasmon polaritons, Zenneck waves, and surface waves. The article by Haupt generalizes the concept of phased arrays to the wide-band and time-varying antennas, where the array design is carried out in the time domain.

JOIN US AT THE 2017 IEEE APS/URSI MEETING

I hope you will be joining us at the 2017 IEEE Antennas and Propagation Society/U.S. National Committee for International Scientific Radio Union Meeting (APS/URSI), which will be held 9–14 July in San Diego, California. You can access the conference website at http://2017apsursi.org to register online, peruse the technical program, and choose from a variety of outstanding social events. The APS/URSI meeting enjoys a strong participation from graduate students, providing an excellent recruiting venue and a chance for these early career scholars to interact with their more-experienced colleagues. There may also be a few exhibit and sponsorship opportunities still available—please feel free to contact us if you are interested in taking advantage of these opportunities. I am looking forward to seeing many of you at the meeting in San Diego.

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