

HIGH-DEF MESSENGER LINK TAKES FLIGHT

By Dennis Burman

In April, Global Microwave Systems (GMS), a subsidiary The Allied Defense Group, successfully completed the industry's first unmanned aerial vehicle (UAV) flight demonstration of a High Definition (HD) video wireless link.

The demonstration was held at GMS' facilities in Carlsbad, CA, in partnership with Flying-Cam of Belgium, using a GMS High Definition Messenger Transmitter (HDMT) mounted on a Flying-Cam UAV helicopter platform.

The flight demonstration of an HD wireless link on a small UAV platform paves the way for real-time HD long-range aerial filming for the movie and television industries. Additionally, it opens up the possibilities for operational deployment of HD UAV platforms in critical surveillance and covert applications that require the capture of high resolution imaging.

The HDMT and the Configurable Messenger Transmitter (CMT) are also being evaluated for Electronic News Gathering (ENG) services from helicopter and mobile ground platforms.

Sam Nasiri, the founder and president of GMS said: "This is a significant achievement at a point where the whole world of video is in transition from 'Standard Definition' to 'High Definition.' Now we can not only read a license plate on a car traveling at 65mph, we can see it from 2,000 ft. in the air with greater brightness, clarity, and color definition — all unmanned."

In the UAV demonstration, the HDMT was mounted on the side fuselage of the Flying-Cam UAV helicopter and a small 2dBi omnidirectional antenna was mounted on the landing skid struts. The HD video stream was provided to the HDMT through an HD-SDI interface from a Cannon XH-L1 HD camera mounted in the Flying-Cam gyro-stabilized gimballed platform. The video resolution was set at 1080i at 30 frames per second utilizing the SP@HL profile.

Video stream downlink reception from the HDMT was provided by the GMS "High Definition Messenger Link" (HDML) solution that includes the 6-antenna diversity "Messenger Smart Receiver" (MSR) and an optional "Messenger Antenna Array" (MAA) for exceptional long-distance omni-directional coverage. The MSR/MAA combination is uniquely capable of replacing expensive electro-mechanical auto-tracking pedestals for applications requiring a robust link with a range of up to 80 miles, and provides superior Doppler performance necessary for reliable airborne vehicle applications.

The recorded video stream from the HDMT was exceptionally steadfast during the entire thirty-minute flight. The WM9 compressed version of the flight video can be viewed at GMS' website (http://movieserver.gmsinc.com/GMS_HD_UAV_WM9.htm).



Flying-Cam UAV with GMSHD Equipment on Board

All versions of GMS' digital links use a robust digital modulation scheme known as Coded-Orthogonal Frequency Division Multiplexing (C-OFDM) that provides excellent multi-path rejection, frequency diversity and powerful Forward Error Correction (FEC) algorithms. By transmitting data in parallel over 1705 independent carriers, the high-speed data is converted to low-speed/long-symbol period transmissions that are less impacted by detrimental propagation effects. Utilizing C-OFDM provides superior reception for both Line-Of-Sight (LOS) and Non-LOS (N-LOS) situations making it an excellent modulation to use for low-flying UAVs, especially those with missions that must operate in urban environments. GMS offers small C-OFDM transmitters and repeaters that can be used to transport either Standard-Definition/HD video or raw data streams provided by a variety of imaging platforms.



HDMT

An HDMT, as provided in its standard configuration, operates up to 7 GHz (in selected bands), utilizes 2K C-OFDM carriers and an internal High Definition MPEG-2 encoder supporting both 4:2:2 and 4:2:0 chroma sampling with resolutions from 1080p/1080i to 480p/480i. Optional AES encryption is available to provide secure communications for sensitive applications. The HDMT weighs in at only 13.4 ounces, consumes less than 25 watts and occupies less than 32 cubic inches of precious payload space.

The HDMT is also now available with a 4K carrier "High-Throughput Option" effectively doubling system performance of up to 64Mbps. Such capability allows the user to make tradeoffs between bandwidth utilization, transmission distance and video transport quality. This also enables the user to select a single wireless hardware platform that can be effectively utilized across a variety of different UAV program requirements.

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