SUCCESS WITH COMMERCIAL TEST AGREEMENTS

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COMPANY NAME:
Massachusetts Institute of Technology – Lincoln Laboratory

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Air Force Research Laboratory
Information Directorate
Rome Laboratory
Rome, NY 13441

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AIR FORCE AND MIT-LL FURTHER
Waveform Development through Partnership

Rome Laboratory, New York – The Air Force Research Laboratory Information Directorate and Massachusetts Institute of Technology Lincoln Laboratory (MIT-LL) are working together to test advanced waveforms that can work at high frequencies.

The two laboratories signed a commercial test agreement (CTA) that made it possible for MIT Lincoln Laboratory to test a newly developed multi-carrier waveform that can achieve high frequencies. The waveform was developed through work between MIT Lincoln Laboratory, the Navy Research Laboratory and the Office of the Secretary of Defense AT&L. The initial testing was conducted at the Information Directorate's Stockbridge, New York test site in May of 2016.

A breakthrough in this area would allow for much faster data transfer during military missions.

"Our Stockbridge site is a remote test site that is highly instrumented and can be utilized to test a variety of technologies," said Paul Gilgallon, deputy lead for the Assured Communications for Nuclear Command, Control and Communications Program at Rome Laboratory.

The testing site is one of only a few research laboratories that conduct research within the high-frequency band.

Research into waveforms that can achieve high frequencies is an important area of study for the Air Force, making the testing results of interest to AFRL as well. According to Gilgallon, current practices pass the information utilizing a 3 kilohertz bandwidth channel at high frequency. Depending upon the method of modulation, this bandwidth can theoretically support data rates from 75 to 16K bits per second. This method is sufficient for analog voice transmissions, but current Air Force fleets require vast amounts of data to plan and execute missions.

"Many mission profiles require 10s of megabytes of information and if high frequency is your only means of transmitting that data, the times required are prohibitive for an agile and timely response in many instances," said Gilgallon. "If we can develop alternative techniques that allow for wider bandwidths, this would allow for greater amounts of data to be transmitted, thereby reducing the amount of time it would take to send large files."

For the testing, MIT Lincoln Laboratory, with AFRL support, installed antennas and equipment at the Stockbridge location and collected data from their transmit site in Massachusetts. MIT-LL remotely operated the terminal and evaluated the new hardware and signal processing concepts at their location. The data collected was analyzed to assess effectiveness of the system and shared with AFRL.

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“The infrastructure at the AFRL site is nearly ideal, making testing fast and easy,” said Mike Lockard, PhD., the assistant group leader for the MIT Lincoln Laboratory Advanced RF Techniques and Systems Group.

Because the agreement is valid until 2019, MIT-LL will be able to return to the site and conduct additional testing.

For more information on commercial testing agreements or other ways to partner with the Air Force, please contact the Air Force Technology Transfer Program office at 937-904-9830 or af.techtransfer@us.af.mil.