Ranging Experiment using the MIT IAP 2011 Laptop Based Radar*

Presented at the 2011 MIT Independent Activities Period (IAP)

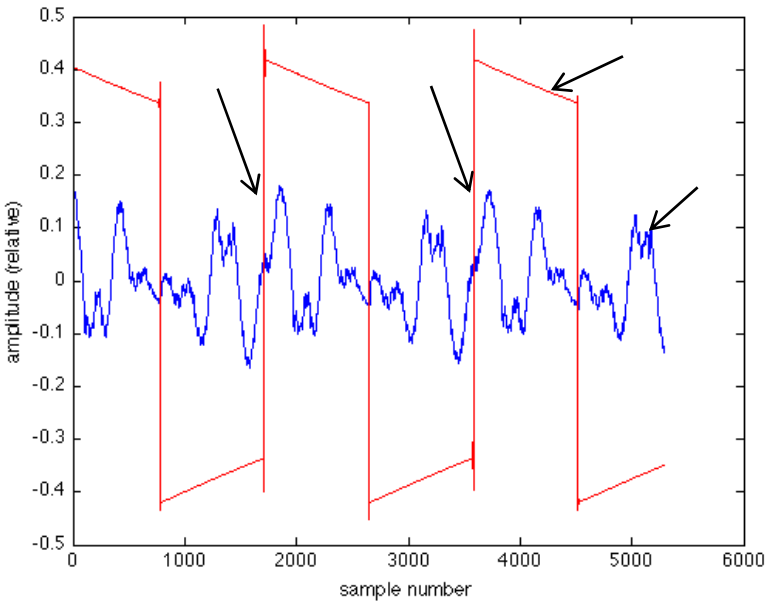
Gregory L. Charvat, PhD
MIT Lincoln Laboratory

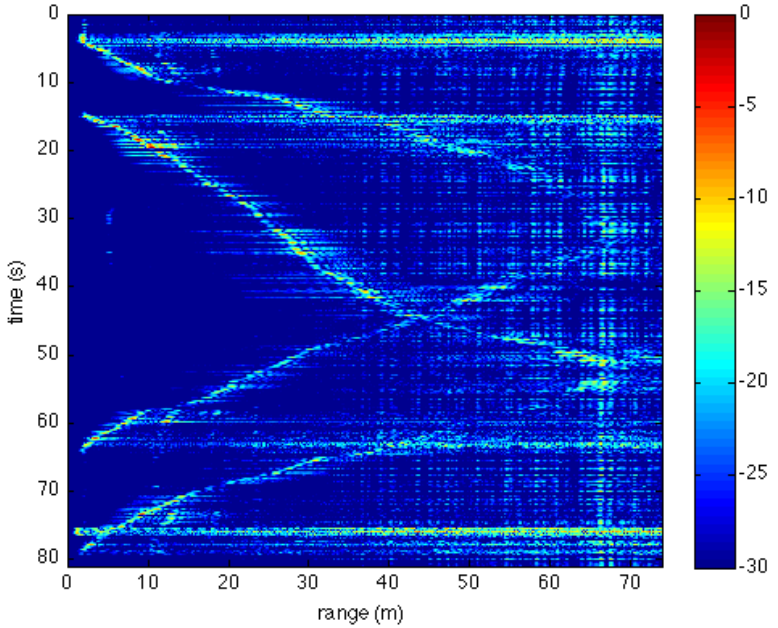
17 January 2011

***This work is sponsored by the Department of the Air Force under Air Force Contract #FA8721-05-C-0002. Opinions, interpretations, conclusions and recommendations are those of the authors and are not necessarily endorsed by the United States Government.**

Radar Kit: Ranging vs. Time

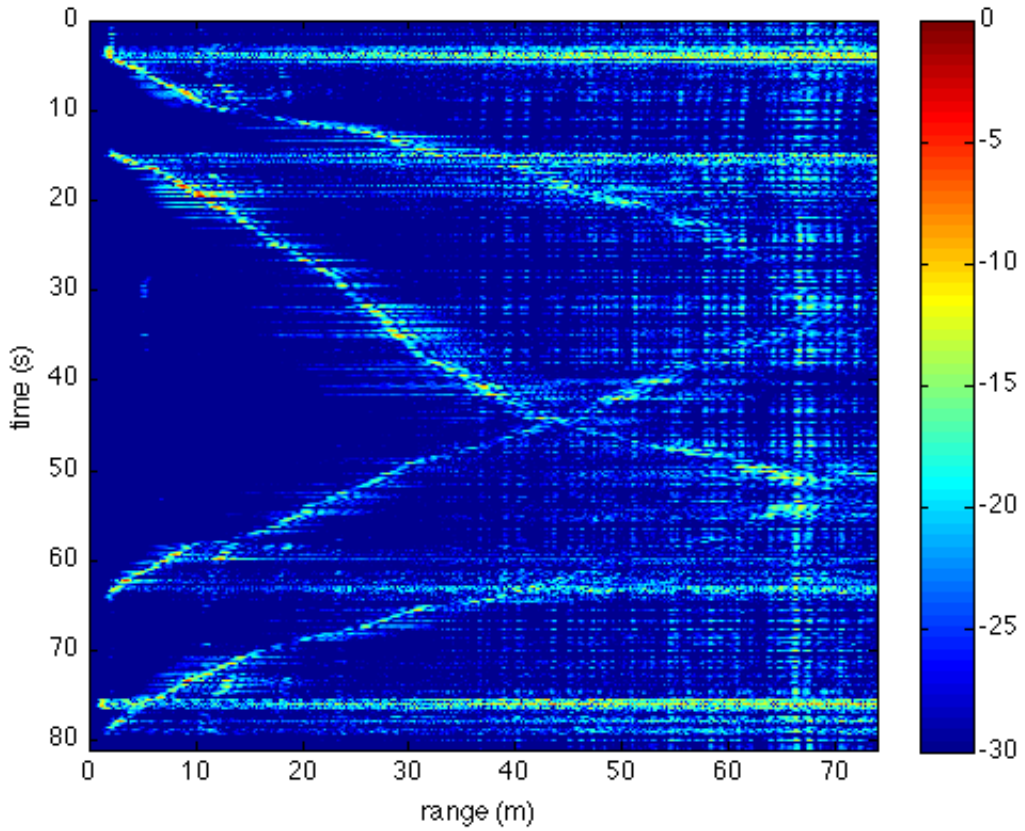
1. Re-connect Vtune to modulator output.
2. Set up-ramp duration to 20 ms, adjust magnitude to span desired transmit bandwidth.
3. Deploy radar where there are moving targets
4. Record a .wav file.
5. Process .wav using read_data_RTI.m
   - Looks for rising edges of sync pulse on Left channel
   - Saves 20 ms of Right channel data from rising edge, puts into array of de-chirped range profiles
   - Coherently subtracts the last range profile from the current one (2-pulse canceller)
   - Displays the log magnitude of the IDFT of the result as a range-time-indicator (RTI) plot





2 targets walking in the woods

Example: Two People Walking in the Woods



MIT OpenCourseWare
http://ocw.mit.edu

Resource: Build a Small Radar System Capable of Sensing Range, Doppler, and Synthetic Aperture Radar Imaging

Dr. Gregory L. Charvat, Mr. Jonathan H. Williams, Dr. Alan J. Fenn, Dr. Steve Kogon, Dr. Jeffrey S. Herd

The following may not correspond to a particular course on MIT OpenCourseWare, but has been provided by the author as an individual learning resource.

For information about citing these materials or our Terms of Use, visit: http://ocw.mit.edu/terms.