DCP COMMAND

…bringing two-way communications
to your DCPs

DCP COMMAND

GOES COMMAND LINK

(Reply link not shown)

GOES SATELLITE
East or West

WALLOPS CDA UPLINK

USER WITH REQUEST FOR COMMAND

Command Receiver
Command Ready DCP

Command Receiver
Command Ready DCP

Command Receiver
Command Ready DCP

Command Receiver
Command Ready DCP

FIELD LOCATED DCP STATIONS
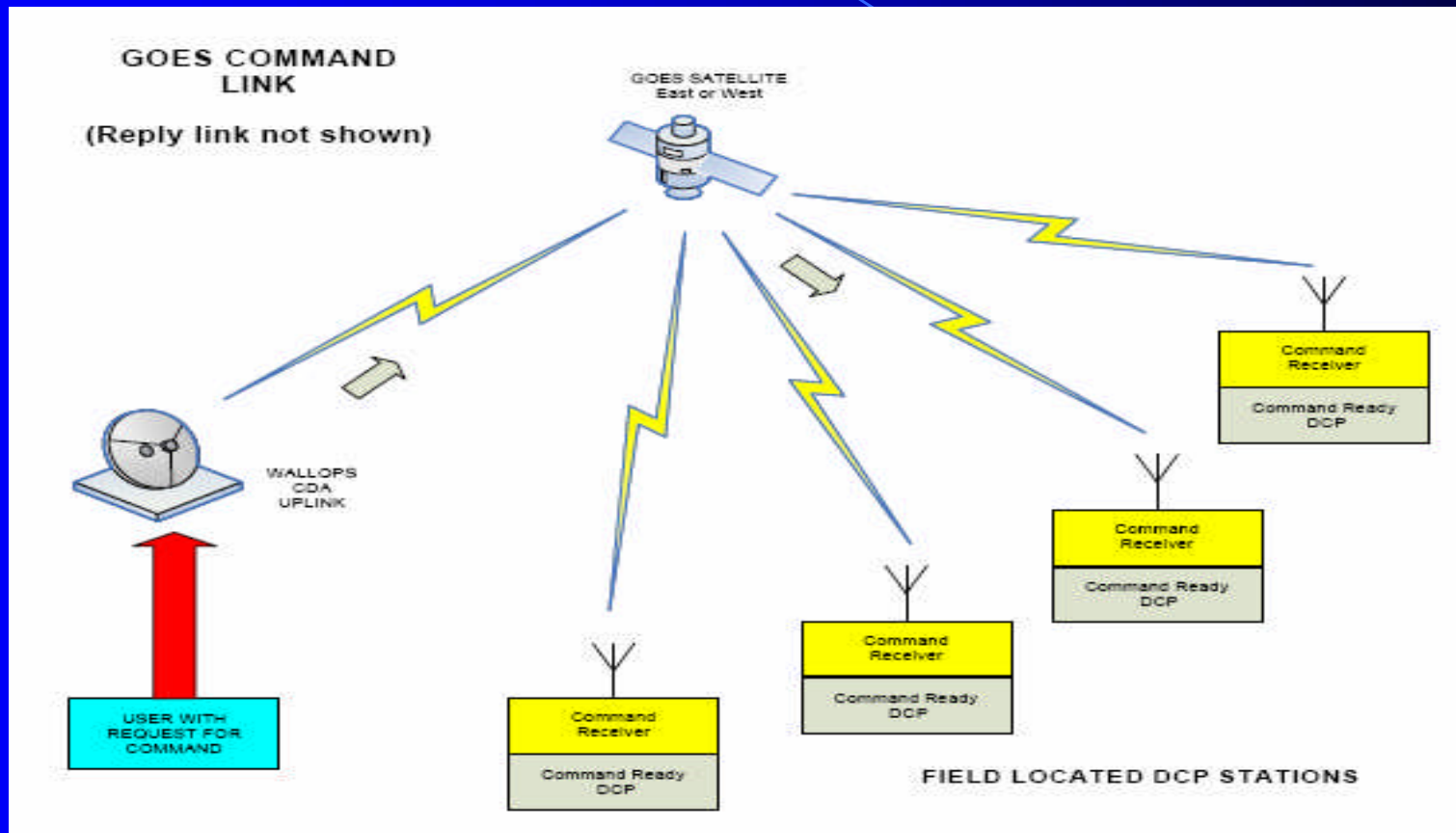
SBIR Goals

- Design and Build a DCPCommand receiver system to replace the discontinued DCPI system.

- Propose General Command set for operation with any manufacturers DCPC enabled DCP.

- Run live Satellite Tests with prototype receivers.

Purpose of Presentation

- Provide users a snapshot of where the development currently stands for the hardware and software.

- Provide some intermediate testing results

- Indicate next steps for the project.

Project Status

- First, a simulation RF test waveform was created using arbitrary waveform generator.

- Adjustable Noise channel arrangement was added for testing the receiver at various S/N ratios.
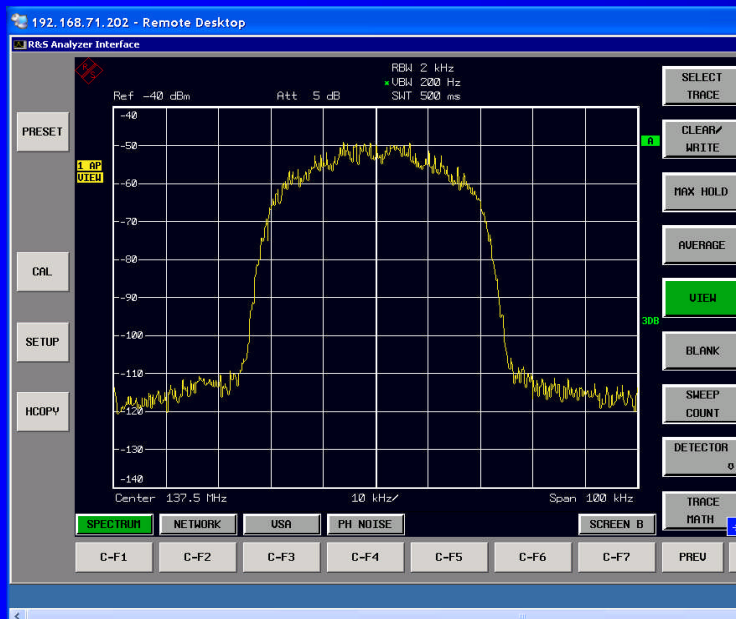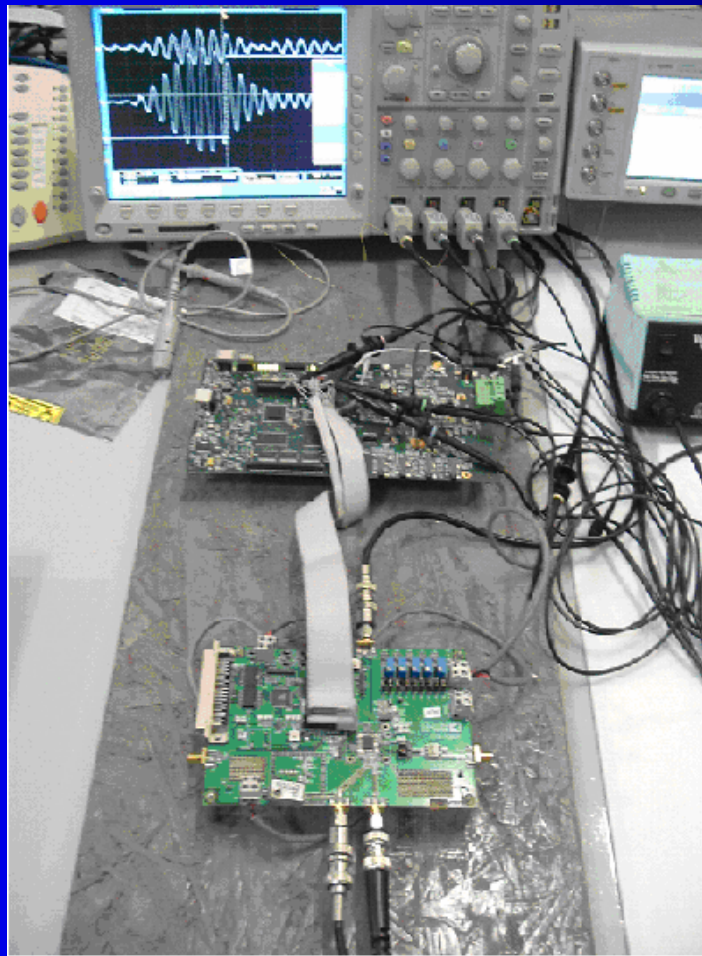
Project Status Cont'd

- Demodulator Software has been written and tested on a PC platform for ease of testing and debugging.

- Porting of the software to an off-the-shelf DSP board has been completed.

- Design, test and debugging the interface between the DSP and the Analog A/D converter chip. This includes data buffer organization and specialized DMA buffer handling processes.
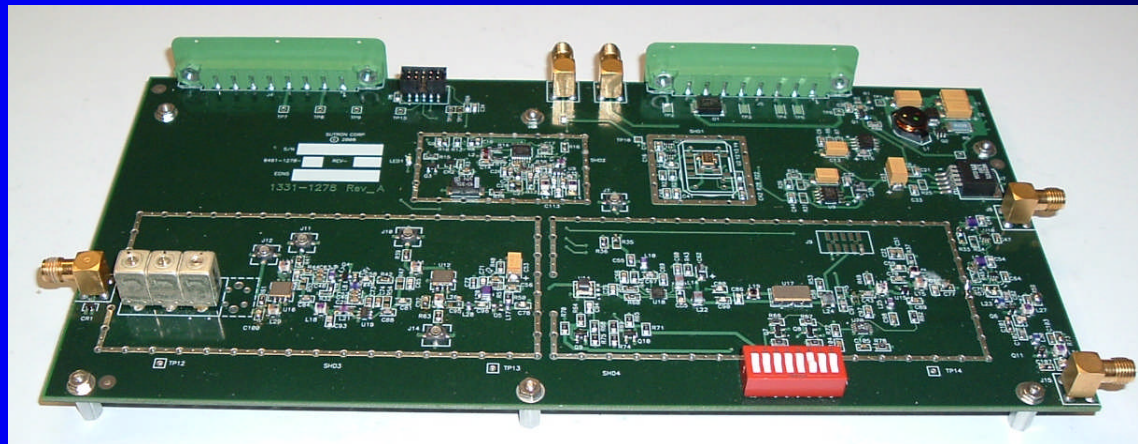
Project Status Cont'd

- Development boards

Project Status Cont'd

- Design of the Front End Receiver board with the first prototype currently being tested.

Project Status Cont'd

The following items have been accomplished in the implementation of the DSP-based DCP Command receiver.

- Interface between the DSP, IF downconverter and A/D converter has been established and debugged thereby transferring IQ data into the DSP.

- A DMA buffering scheme was implemented to separate the data collection and data processing threads on the DSP.

- A coarse PN and frequency acquisition was implemented

Project Status Cont'd

- A fine frequency acquisition, demodulator and Reed-Solomon decoder were implemented.

- The receiver was able to process the IQ data buffer within the real-time constraints.

- Assembly language conversion and code optimization was performed for execution speed optimization (still in process)

Project Status Cont'd

- Received Data in Buffer of DSP system showing complete reception and decoding of the message.


```
          0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00000000h: 1A CF FC 1D 54 68 69 73 20 69 73 20 61 20 73 69 ; .Ïü.This is a si
00000010h: 6D 70 6C 65 20 53 75 74 72 6F 6E 20 74 65 73 74 ; mple Sutron test
00000020h: 20 6D 65 73 73 61 67 65 2E 0D 0A 41 42 43 44 45 ;  message...ABCDE
00000030h: 46 47 48 49 4A 4B 4C 4D 4E 4F 50 51 00 00 00 00 ; FGHIJKLMNOPQ....
00000040h: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ; ................
00000050h: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ; ................
```

Command Definition Phase

- DCPC commands were provided from Paul Tippet following his initial research combined with some original DCPI commands have defined the current list.   Some of this was presented at the last NESDIS meeting.

- Customers are now asked to consider commands (or requirements) that they need and provide them to Sutron over the next several months for inclusion into the list of commands.

- Sutron will compile the requested commands and present at the next meeting a tentative set of commands.

Command Definition Phase

- An Interface Control Document (ICD) will document the interface and allow operation with any manufacturer DCP.

- Send and additional command requests to Cbuchner@sutron.com or Dan@sutron.com

Schedule

- Sutron is currently 11 months into a 22 month contract to develop and test prototype equipment.

- Completion expected in June 2009