DCP COMMAND

...bringing two-way communications to your DCPs
DCP COMMAND

GOES COMMAND LINK
(Reply link not shown)

GOES SATELLITE
East or West

WALLOPS
GOA UPLINK

FIELD LOCATED DCP STATIONS

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
SBIR Goals

- Design and Build a DCPCCommand 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.
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.
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
Design of the Front End Receiver board with the first prototype currently being tested.
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
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)
Received Data in Buffer of DSP system showing complete reception and decoding of the message.

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Command Definition Phase

- DCPC commands were provided from Paul Tippett 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