

ESMD-10

Title: Implement Codecs on FPGA

Sponsor: NASA Johnson Space Center, Engineering Directorate, Avionics Systems Division

Team Personnel: 4 CompE/EE majors

Expected Person-Hours: 1000

Duration: Fall 2008 - Spring 2009

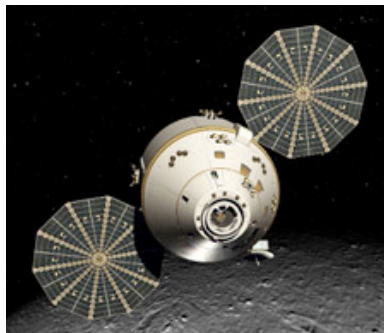
Statement of Work:

America will send a new generation of explorers to the moon aboard NASA's Orion crew exploration vehicle. Making its first flights early in the next decade, Orion is part of the Constellation Program to send human explorers back to the moon, and then onward to Mars and other destinations in the solar system.

Orion will be capable of carrying crew and cargo to the space station. It will be able to rendezvous with a lunar landing module and an Earth departure stage in low-Earth orbit to carry crews to the moon and, one day, to Mars-bound vehicles assembled in low-Earth orbit. Orion will be the Earth entry vehicle for lunar and Mars returns. Orion's design will borrow its shape from the capsules of the past, but takes advantage of 21st century technology in computers, electronics, life support, propulsion and heat protection systems.

This project will be to implement ITU standard G.729 (CS-ACELP) and G.722.2 (AMR-WB) speech compression codecs on FPGA target.

These codecs are typically implemented on Digital Signal Processors (DSP). Constellation wants to implement the codecs on an FPGA so that redundant data-bus audio packet management, speech signal extraction and compression can happen on a single chip, minimizing mass, power and size requirements.



Orion orbits the moon with disc-shaped solar arrays tracking the sun to generate electricity.

Image Credit: Lockheed Martin Corp