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ABSTRACT TITLE: Laser Docking Sensor Engineering Model N93-22247

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NASA JSC has been involved in the development of Laser sensors for the past ten years in order to support future rendezvous and docking missions, both manned and unmanned. Although many candidate technologies have been breadboarded and evaluated, no sensor hardware designed specifically for rendezvous and docking applications has been demonstrated on-orbit. It has become apparent that representative sensors need to be flown and demonstrated as soon as possible, with minimal cost, to prove the capability of the technology in meeting NASA's future AR&C applications. Technology and commercial component reliability have progressed to where it is now feasible to fly hardware as a detailed test objective minimizing the overall cost and development time.

This presentation will discuss the ongoing effort to convert an existing in-house developed breadboard to an engineering model configuration suitable for flight. The modifications include improving the ranger resolution and stability with an in-house design, replacing the rack mounted galvanometric scanner drivers with STD-bus cards, replacing the system controlling personal computer with a microcontroller, and repackaging the subsystems as appropriate. The sensor will use the performance parameters defined in previous JSC requirements working groups as design goals and be built to withstand the space environment where fiscally feasible. Testing of the in-house ranger design is expected to be completed in October. The results will be included in the presentation. Preliminary testing of the ranging circuitry indicates a range resolution of 4mm. is possible. The sensor will be mounted in the payload bay on a shelf bracket and have command, control, and display capabilities using the payload general support computer via an RS422 data line.