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Paper Session I-C - A Florida Firm Enters the Commercial Space Business

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International Space Corporation (ISC) is a start-up company specializing in the near term production of next-generation semiconductor materials on the ground, and later in the zero-gravity of space. The primary materials to be produced are Cadmium Telluride, Gallium Arsenide and Indium Phosphide, all used in the manufacture of the next generation of computer chips, infrared sensors and fiber optic systems. ISC also designs, develops and manufactures the state-of-the-art furnaces required to produce these semiconductor crystal materials on the ground, and ultimately in space.

The recent economic upturn of the United States semiconductor and electronic industry has been spurred in major part by advances in the development and utilization of new "supercomputer" chips and sensor elements. One of the primary factors contributing to this upsurge is the availability of higher quality electronic substrate materials. The current commercial and military demand for this next generation of electronic materials already represents a $160 million annual market which is expected to grow to $500 million by 1990. The annual market for space manufactured semiconductor crystal could also reach an additional $500 million by 1995.

With near-term profit potential and current market demand in mind, ISC is completing the construction of a pair of ground-based, advanced design Cadmium Telluride furnaces in Huntsville, Alabama. The production of the first ingots is planned for the first quarter of 1989. Using "spin-off" techniques from the United States Space Program, the company's objectives are to grow crystals of larger diameter and superior quality compared to that available on the market today and, in the process, to achieve a greater wafer manufacturing yield, and therefore profit. Commercial production is scheduled to start in the third quarter of 1989.

In space and "zero-g", ISC plans to further improve crystal quality and purity by capitalizing on the absence of gravity induced effects. Initially using space-grown crystal as "seed material" for ground crystal production in 1992/93, and by 1994/95 developing a full commercial, space-based production capability, ISC plans to become a leader in space materials production. A major milestone toward achieving this goal, at minimal cost, has been reached through the signing of a Joint Endeavor Agreement (JEA) between NASA and ISC. This agreement provides ISC with six to eight free shuttle flight opportunities to test ISC's crystal growing furnaces in the space environment. The value of these developmental flights is estimated at $10 to $24 million. In a more recent action, the State of Florida has purchased an equity position in ISC through the State's high-tech R&D Program established to provide funding for innovative start-up companies.

Additional opportunities for ISC in ground and space materials processing have been identified in the area of production of pharmaceuticals and protein crystals. The Company is currently investigating cooperative space ventures with firms having interest in the growing market for highly specific and ultra-pure pharmaceuticals. The demand for some highly pure drugs or protein crystals far exceeds the present ground-based production capacity, and Space offers a high vacuum, extremely low gravity laboratory in which experimentation, and ultimately mass production, can be uniquely pursued. With the first space-produced drug, erythropoietin, now undergoing tests on human patients, the market worth for this and similar drugs is projected in several hundred million dollars. When proper funding becomes available, ISC intends to enter this unique industry, and possibly utilize currently reserved free Shuttle space for such experiments.