

NASA SBIR 2001-1 Solicitation

FORM 9B - PROPOSAL SUMMARY**PROPOSAL #:** A4.02-9234 (*For NASA Use Only - Chron: 012765*)**PROPOSAL TITLE:** Powerplant Which Transitions Automatically to Ramjet Operation**TECHNICAL ABSTRACT (LIMIT 200 WORDS)**

Cottrill Cyclodyne Corporation's 'Cyclodyne' powerplant design combines an efficient ramjet design with a simple static-running concept, and provides a gradual transition from static-running operational mode to a reasonably efficient subsonic ramjet mode as forward velocity is increased over a practically attainable range. High affordability is a primary claim; a reasonable goal is total cost of ownership reduced to half that of equivalent turbocompressor designs, over the life of the engine. Other claims of interest are:

- (1) complete absence of internal moving parts for powerplant operation;
- (2) complete absence of pumped lubricants;
- (3) extremely low cost to manufacture, due to absence of any high speed balancing and high-precision machining requirements, overall mechanical simplicity, and no structural use of exotic materials;
- (4) extremely low ongoing maintenance, due to overall mechanical simplicity;
- (5) very low engine weight and high thrust-to-weight ratio (at normal flight speeds);
- (6) practically instantaneous power output response to throttle changes;
- (7) efficient operation with a wide variety of cheap liquid fuels and, eventually, the possibility of the use of pure gaseous hydrogen as a non-polluting alternative fuel.

POTENTIAL COMMERCIAL APPLICATIONS

Potential commercial applications of Cottrill Cyclodyne Corporation's 'Cyclodyne' powerplant design include, but are not limited to:

- (1) Full-scale experimental aircraft builders (probably the best first choice for rapid penetration of an existing market);
- (2) Private civil aviation (high potential impact on industry revitalization);
- (3) Small commercial civil aviation - business jet craft, etc.;
- (4) Airline transport civil aviation (with major upward re-scaling of the design);
- (5) Military aviation, including combat aircraft (with major re-scaling);
- (6) Unmanned flight programs - target drones, surveillance, weather research, etc.;
- (7) Scale and speed model aircraft hobbyists (with downward re-scaling - reduction in thermal efficiency is to be expected);
- (8) Non-aviation and non-vehicular uses - turbine drives, pelletized solid fuel combustors, etc. (with ramjet section omitted, static-running section should be at least as efficient as commonly used combustor types).

NAME AND ADDRESS OF PRINCIPAL INVESTIGATOR (Name, Organization Name, Mail Address, City/State/Zip)

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