



**DoD SBIR / STTR**

## **DETAILS - Awards Search Results**

**Program:** SBIR

**Agency:** NAVY

**TOPIC Number:** N1993-117

**Contract Number:** N00421-97-C-1209

**Awarded In:** 1997

**Award Start Date:** 5/23/1997

**Field Office:** NAWCPAX

**Control Number:** 93N10-114

**Phase:** 2

**Award Amount:** \$745,746

**Award Completion Date:** 5/23/1999

**Proposal Title:** Helicopter/Tiltrotor Gearbox Debris Monitoring

**Principal Investigator Name:** Jack A. Edmonds

**Principal Investigator Phone:** (607) 257-0533

**Principal Investigator Email:**

### **Firm**

INNOVATIVE DYNAMICS, INC.

244 Langmuir Lab

Ithaca, NY 14850

**URL:**

**Woman Owned:** N

**Minority Owned:** N

**Number of Employees:** 16

**Keywords:** ULTRASONIC NEURAL NETWORK SAFETY MULTI-STATIC WEAR DEBRIS

**Abstract:** In Phase I, IDI investigated intelligent sensor technologies capable of providing an on-line real time indication of helicopter gear box health based on the detection and evaluation of wear debris present in the lubrication system. An on-line debris monitoring system could provide prognostic and diagnostic wear data on which condition based maintenance activities can be planned and carried out at a substantial cost savings to the government. Current gearbox chip detectors do not have this capability. For Phase II, IDI proposes to develop a multi-static acoustic oil debris sensor and integrate it with an existing commercially available inductive sensor. Phase I results show that the inductive and multi-static acoustic sensors form a complementary pair that, if combined in a gearbox debris monitoring system, could provide full spectrum debris monitoring and tracking of particles that are precursors of wear and incipient damage. The multi-static approach, coupled with intelligent sensor signal processing provides excellent particle recognition while rejecting interfering

responses from entrained air bubbles. The integrated system will provide prognostic wear status and trend information that would enable the implementation of a condition based maintenance program.



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