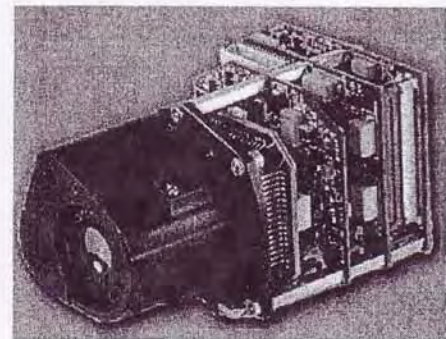
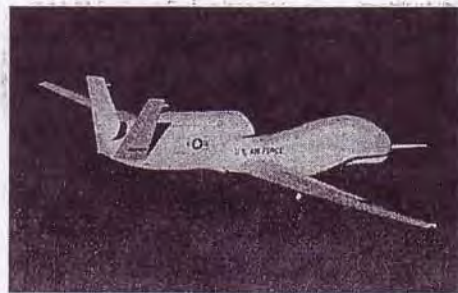


Unmanned Aerial Vehicle Payload and Sensor Development

The development of remote sensing payloads for flight by Unmanned Aerial Vehicles is currently underway by students within the School of Engineering & Mines. Currently, electrical engineering students are in the process of developing an uncooled thermal infrared imager for scientific and civil applications, such as measuring the temperature of regional sugar beet piles, monitoring power lines and substations for regional power companies, and estimating the surface temperature of roadways for the Department of Transportation to provide information to travelers regarding icy conditions. Additional sensors will be added to this payload to detect oil spills for the maritime industry, designed specifically for flight on an experimental UAV platform provided by Lockheed Martin Corporation to the John D. Odegard School of Aerospace Sciences.

A related project involves the development of a custom detect, sense, and avoid instrument for UAVs that can provide digital communications with air traffic controllers on the ground and other aircraft in flight. The commercial need for low-cost electronic detect, sense, and avoid instrumentation has a high priority in both the burgeoning UAV and general aviation (i.e., small aircraft) markets. This project is an R&D effort to create a working electronic prototype and a test plan for seeking Federal Aviation Administration approval of the custom sensor for use in both manned and unmanned aircraft, in collaboration with the John D. Odegard School of Aerospace Sciences.



Top: Unmanned Aerial Vehicle flown by the U.S. Air Force. *Bottom Left:* Thermal infrared picture of a field, showing how IR cameras measure radiated heat rather than visible light. *Bottom Right:* Uncooled thermal imaging camera, with the lens and electronics exposed.