



In the dark of night, a high-rise apartment building burns. Emergency vehicles pull up to it, and the crews need electricity for lamps, power tools, and computers. But in the time it takes to set up and operate a synchronous generator to run the equipment, lives could be lost. Here is a product that could instantly provide emergency crews the power they need.



Blackbird

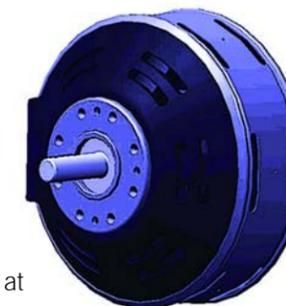
How It Helps: The Blackbird auxiliary AC power generator supplies 5 kW of instant, under-the-hood power. It provides 120-volt, 60-Hz power at any engine speed, so a user is free to vary engine speed to match the need of other field operations. Idling an engine to save fuel will not affect the power output. Up to 90 percent of the input horsepower is converted directly into useable electric power with no need for a bulky inverter control box. Since a Blackbird connects by belt directly to the main engine, there also is no need for a separate engine, separate generator, or complex hydraulic drive system. The Blackbird is a compact unit (weighing less than 75 pounds) with simple bracket mounting.



How It Works: The Blackbird power generator is a resonant controller that shapes the output waveform by modulating the level of field coil excitation. As engine speed is varied, the amplitude of the field modulation is adjusted so that the output stays at 120 volts AC. The field control allows a variable-speed engine to produce a constant 60-Hz output with minimal losses. The field control box is easily cooled by natural convection within the engine compartment. To achieve high efficiency, the control system uses two capacitors to capture and store energy for reuse. Net result: up to 5 kW of normal household-type current available instantly from an engine running at any speed.

How Much It Will Cost: Prices vary depending on custom user-specified accessories and installation, with an estimated range of between \$4,000 and \$6,000.

When It Will Be Ready: A series of preproduction units is being readied for beta tests in early 2003, and a commercial unit, aimed at the emergency services market, is scheduled for release in mid-2003.



Who Is Working On It: This product was developed by Raven Technology, LLC. Raven was founded in 1998 by Christopher Tupper and Duncan Wood (formerly of Dirigo R&D, Inc., which was founded in 1990 and continues to exist today with Mr. Tupper as its president) and registered as a limited liability company in 1999. It employs eight people and occupies 3,000 square feet of office space in Brunswick, Maine. For more information, contact Christopher Tupper of Raven Technology at (207) 721-1044 or raven@raventechpower.com. The company Web site is www.raventechpower.com.



MDA Origins

The Blackbird is built using AC-Direct™ technology, which is the direct result of BMDO-funded research at Raven to develop a lightweight and fuel-efficient mobile electric power generator. Under a 1997 SBIR Phase I contract, researchers proved the feasibility of a 120-volt, 60-Hz, 2-kW unit using a wave-shaping technique that modifies alternating current. Company engineers extended their efforts in 1999 under a Phase II award and developed prototype and field test units with improved efficiency and higher output.

