

# Freedom Motors & Moller International Industry Commentary



# Henry Lahore—Project leader of an extensive Skycar study undertaken by Boeing Aircraft Company

"With the developing airspace infrastructure in place, the Skycar will become a widely used unpiloted air-taxi. This is the only known commuter vehicle that can move large numbers of people very quickly and safely and still let them conveniently choose their departure point, departure time and destination." He went on to say, "At no time in years of study were we able to find a single flaw of any kind in the Skycar design or any hitch in its application to commercial transportation."

# COL Larry Harman—Vice Director of Combat Services Support Battle Laboratory of the Army Combined Arms Support Command, Ft. Lee VA in his article entitled "A Revolutionary Vehicle for the Future":

COL Harman begins his article with, "While many technological advances occur in an evolutionary manner, occasionally a revolutionary technology appears on the horizon that creates startling new conditions and profound changes. Such is the case with the privately developed Moller Skycar." He goes on to say, "The potential military uses will be numerous. They include aerial medical evacuation, aerial reconnaissance, command and control, search and rescue, insertion of special operations forces, air assault operations, airborne operations forcible-entry operations, military police mobility and maneuver support."

# Dr. Dennis Bushnell—Chief Scientist, NASA Langley Research Center

"The volantor (Skycar) will do for car-based society what the car did for horse-based society. It is the right solution at the right time." He goes on to add, "His machine is certainly at a point where a DARPA DEM/VAL effort could move it in the "Flying HUMVEE" status desired by the Army, SOCOM and the Marines. I am not aware of another such concept with anywhere near similar capabilities." In a separate article Dr. Bushnell said, "It is not a question of IF, but WHEN the market for personal air vehicles will be about \$1 trillion a year."

## Dr. Bruce Holmes—Manager, General Aviation Office, NASA Langley Research Center:

"Once we have the infrastructure then Moller's Skycar has a place to grow into. Such a system is on the way. Various organizations including NASA, the FAA, the Department of Transportation, individual states, and aviation industry groups are developing a small aircraft transportation system."

#### Dr. John Zuk—Chief, Advanced Plans and Programs, NASA Ames

"This is extremely significant," says Dr. Zuk. "It's really a breakthrough for the type and concept and it has merits from a cost standpoint that show promise to be a future personal transportation system. It's a true first." Dr. Zuk goes on to say, "Moller is different. He's got academic credentials. He's thorough."

# LTC James P. Thomas, 304th SB, 3rd Exped. Sustainment Command LNO, Joint Base Balad, Iraq in his white paper entitled "Winning an Asymmetric War with Skycar":

"The Skycar will become the MRAP (Mine Resistant Ambush Protected) vehicle of Afghanistan. The ability to employ soldiers safely and rapidly on the battlefield enables us to exercise economy of force on the battlefield doing more with fewer soldiers." He goes on to say, "Examining the MEDEVAC mission more closely will illustrate why we will save money by spending money to acquire the Skycar."

#### **MSNBC Live Vote Survey- Internet**

"Will you be in the market for a volantor (Skycar)?" Out of 6226 responses: Yes as soon as possible 23%; Yes, after the price comes down 47%; Yes, after it's proven safe 23%; No never 7%.

### Investor's Business Daily—Special Report, "Innovations"

"Moller's car might one day fulfill the prophecy of the world depicted in cartoons like the Jetsons in which the breadwinner commutes to work in a flying car."

# Inc. Magazine— "This is Rocket Science!"

"The engine was the key Moller knew, in combining straight up flight with the speed and simplicity of a light plane."

#### Forbes FYI Magazine— "Are We There Yet?"

"Skycar 'pilots' will simply log on to the tracking system via on-board computers, then stick around for any arising emergency tasks such as deploying the craft's parachutes in the event of a catastrophic power failure."

## John Vostrez—Chief, Technical and Research Division, California Dept. of Transportation

He says Moller's work "goes far beyond the technology we're working on. It makes the technology we're working on look fairly mundane." Vostrez says Moller's idea "is to use the third dimension in a three-dimensional space as opposed to just two-dimensional space that we're tied to on the ground. It's exciting."

#### Fortune Small Business (FSB) Magazine

Described Paul Moller as: "...that rare entrepreneur who can pinpoint the genesis of his idea."

# Sam Farr—Past Chairman, California Assembly Committee on Economic Development and New Technologies (Now US Congressman and head of the California Congressional Delegation)

Described Moller as: "Currently developing the most exciting transportation vehicle since the car and the airplane."

# **World News Tonight- Peter Jennings**

"A remarkable invention that could someday radically change the way we get to work. Definitely a technology on the cutting edge. A personal flying machine."

# Dr. Michael Guillen—Science Editor, ABC's "Good Morning America"

"Helicopters are VTOL's and so are the British Harrier jets. What Moller has done is invent VTOL's that are cheap and easy to operate."

#### Jack Kemmerly—Past Chief, Aeronautics Division, California Department of Transportation

Says he is "excited" to see Moller combining an advance in VTOL technology with fly-by-wire control. "If and when that accomplishment takes place--and in my mind I know it will—Paul Moller will have struck gold with a technology that has real applications."

# USA Today—Cover story, "Is Flying Car Model T of the Future?"

"One immediate advantage would be safety. The (Skycar) engines have so few moving parts that they should require a fraction of the maintenance of a helicopter. One engine could fail and the Skycar could still hover to a landing. Piloting the Skycar should require less skill than driving a car."

# Wall Street Journal—"Upward Mobility: Fliers Build Own Planes as Industry Falters."

"His Skycar is a computer controlled, eight engine vehicle designed to travel on roads, take-off and land vertically, carry four people through the air at 350 miles per hour and sell, once mass production begins, for not much more money than an automobile."

#### Smithsonian Institution INVENTION Series:" The Flying Car"-Produced by the Discovery Channel

"Paul Moller is unique in this world of complex high technology. He is an independent entrepreneur who still makes his own test flights. It is the people with imagination and the ability to see past the end of their nose that are going to be the ones flying instead of sitting down here in gridlock on the freeway."

### The Learning Channel (TLC)—"The Ultimate Ten Machines Ever Built"

A program devoted to describing and rating the ten most significant machines ever built. The Skycar was rated number 6.

#### People magazine—"INVENTORS-Flier Paul Moller is a Former Alien With a Real Flying Saucer"

"Wary as any test pilot taking up an experimental craft, the man in the fireproof blue suit kissed his wife before climbing into the cockpit. One by one he started the eight rotary engines, then pushed a small red throttle with his left-hand and a joystick with his right. With that, engines whining, the flying saucer rose 40 feet into the air. He took his volantor (Skycar) on a 150 second spin in Davis."

#### The Genius Issue of Esquire Magazine. December 2003.

Dr. Paul Moller was listed as one of America's 38 Best and Brightest Radicals and Rebels Who are Creating a New World.

On the New York City Village Voice website (<a href="www.villagevoice.com">www.villagevoice.com</a>), Dr. Dennis Bushnell, Chief Scientist at NASA's Langley Research Center, Virginia, stated that "Paul Moller is one of the finest engineers in the country."

**Dr. Andrew Burke, Institute of Transportation Studies, University of California, Davis** – Dr. Burke is considered the resident expert on hybrid cars at ITS-UCD.

- "Paul Moller and Moller International have been leaders in the development of the modern rotary engine since 1985"
- "The Moller Rotapower® engines are superior to the Mazda engines in several respects: rotor cooling, lubrication, reduced engine friction, and rotor surface coating"
- "Emission tests of Moller Rotapower® engines have shown the capability to meet California ULEV standards in vehicles without exhaust after-treatment"
- "Some advanced features of the rotary engine patented by Moller International have the potential to increase efficiency of the engine to over 40%" (conventional piston ≈ 30%)

## **GE** comments regarding the Rotapower engine technology:

General Electric Aerospace, in a brochure published and distributed to potential users of the Rotapower engines in Unmanned Aerial Vehicle (UAV) applications, made the following statement in late 1992:

"GE Aerospace has recently teamed with Moller International of Davis, California, a leader in Wankel engine technology. Moller's engine technology, in combination with GE's aerospace integration and manufacturing experience, provides the UAV platform with a state-of-the-art heavy fuel engine from a high quality domestic supplier."

# NASA Langley comments regarding the Wankel rotary engine in future aviation applications:

NASA Langley, in Technical Memorandum 109174, issued in December 1994, drew the following conclusion:

"NASA-sponsored research at Beech and Cessna has identified the Wankel as the engine of choice for future light aircraft. The Wankel-cycle engine's ability to operate with a stratified charge combustion system, which allows very lean mixtures and multi-fuel use, makes it a very attractive alternative to the reciprocating engine as a power plant for personal aircraft." The Moller Wankel engine is referred to many times within this NASA memorandum, including schematics of our **industrial** engine on page 18 and a photograph and specifications on page 23.

# NASA Lewis conclusions regarding Moller's patented composite coating (Duplex PS212/PSZ) for engine applications:

- "Duplex PS212/PSZ coatings are expected to be an enabling technology."
- "Concept is applicable to other Wankel engine applications and possibly to other engine types as well."
- "Advantages derived are higher specific power, longer life, and lighter structure."

"The combination of the thermal barrier and wear coatings was established as a sound principle and has wide application."

# California Air Resources Board (CARB) and Bluewater Network.

During tests observed by officials of both organizations, emission levels of the Rotapower engine under test and operated at power and RPM levels prescribed by the US Environmental Protection Agency (EPA), were very significantly below the Federal and California State's required levels.

