

TURN ^{AND} BANK

OFFICIAL NEWSLETTER OF RAAC CHAPTER 85

October 1999

Cavanaugh Flight Museum



*Your Editor Ponders
The Moller Aircar*

*The Technical Guy and
Ignition Noise*



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Cavanaugh's Stearman. Photo by Rob Prior

The TURN AND BANK is the monthly publication of RAAC Chapter 85 and is intended to keep members informed as to the club's activities, and to promote safety and technical excellence in the field of sport aviation. No responsibility or liability is assumed, expressed or implied as to the content of articles contained in the Turn and Bank: the intention is to provide a forum for discussion and exchange of ideas.

Newsletter contributions should be mailed to George Gregory, 19470-88th Avenue, Surrey, B.C. V4N 3G5 no later than the 12th of each month. Business Fax is (604)-469-3495. Please remember to indicate "attention George Gregory" on your fax.

Enquiries to the Membership Chairman should be mailed to Rob Prior, #204-130 E.11th St., North Vancouver, B.C. V7L-4R3

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Delta Heritage Airpark
Vancouver, B.C.

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For inspections of Amateur Built Aircraft Projects contact the Recreational Aircraft Association Headquarters at 1-800-387-1028

Regular Meetings are held on the first Tues. of each month at 20:00 in the clubhouse:
Delta Airpark, 4103-104th Street Delta, B.C. Clubhouse phone: 596-3644

Mailing Address: Chapter 85, RAAC
c/o Delta Heritage Airpark, 4103-104th St., RR#3, Delta, B.C. V4K-3N3

Executive meetings are on the third Tues. of each month at 19:30 in the clubhouse.
Chapter aircraft pilots, mail cheques (Payable to RAAC Chapter 85) to:
Brad Short, 8052-122a Street.Surrey. B.C. V3W-7R4

RAAC National Homepage: <http://www.inforamp.net/~raac>
RAA Chapter 85 Homepage: http://home.istar.ca/~airframe/raa_85
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Technical Guy

From the Western Canada RVator

Shielded Wire?

Robert L. Nuckolls III

(nuckolls@aeroelectric.com)

Aeroelectric Connection

"So what about the capacitor? Will it help reduce any noise in the intercom, radio, etc. system if we install one? A friend of mine recommended that I install a capacitor in the system along with shielded wire from the alternator."

A builder called me about ten years ago and spent several minutes outlining all the

shielding, filtering, pre-positioning of hardware in the airplane all in the name of eliminating electrical noise. All in all, several dozens of hours, pounds of hardware and no small sum of cash.

I was a bit astonished and asked what kind of noise problem he was having. "Oh," says he, "I don't have a noise problem; the airplane is not yet ready to fly." My advice is generally this: put shielded wire on magneto p-leads, spark plug wires and on any appliances where the manufacturer recommends it and describes how it is to be hooked up.

Then, if a noise problem presents itself, you need to identify the source, propagation mode, and victim and plan the best way to

AIRFrame



Aircraft Portraits

Rob Prior
robp@vancouver.bc.ca

mail to: Airframe@istar.ca
<http://home.istar.ca/~airframe>

#204-130 E 11th Street, Northvan, B.C V7L 4F3 Ph. 604-280.7723

handle that particular problem by filtering at source, breaking the propagation mode, or filtering at the victim. Given that there are dozens of possible combinations, you can easily spend the time and dollars represented by our hero's precautions and still not assure yourself of a noise-free airplane.

Begin with good basic installation practice and whip each problem as it presents itself. It's generally not hard to do. **T&B**

News on Homebuilt Aircraft Border Crossing Permits

Here's the FULL story!

...The permanent, perpetual, don't-have-to-apply-for-it **Border Crossing Permit For Homebuilts!**

By the long and splendid efforts of EAA, EAA Canadian Council, MOT and FAA, we now have a standing Border Crossing Permit to carry on board. Many Thanks to Rem Walker, EAA Canadian Council for sending it along.

Note! Copy of the permit along with requisite "letter of Permission" will be included in the journey logs for the Turbi and the J-5.

The following conditions must be met:

- 1) The aircraft has been issued a Canadian Special Certificate of Airworthiness with Block 7, "classification" listed as amateur-built.
- 2) The currently effective Canadian special certificate of airworthiness and this authorization shall be carried on board the aircraft.
- 3) A copy of this authorization shall be displayed in the aircraft when operating under the terms of this SFA.
- 4) The identification markings assigned to the aircraft by the country of registry must be displayed on the aircraft according to that

country's applicable requirements.

5. The aircraft shall be operated only by airmen holding appropriate certificates or licenses issued or validated by the United States or by the country of registry.

6. No person may be carried in this aircraft during flight unless that person has been advised of the content of this authorization and of the airworthiness status of the aircraft.

7. Persons or property shall not be carried for compensation or hire on board the aircraft.

8. The aircraft shall be operated under visual flight rules (VFR) day only, unless the operating limitations issued for the aircraft authorize night or instrument flight (IFR) operations, in which case the aircraft shall be equipped in accordance with 14 CFR part 91.205 and the pilot in command shall comply with 14 CFR part 91.711.

9. The aircraft shall be operated according to restrictions imposed by Transport Canada Aviation provided those restrictions do not limit or change the conditions herein imposed.

10. Except when they have been waived by the administrator for the purpose of an air show, the aircraft shall be operated according to the general operating and flight rules of 14 CFR part 91, and in particular section 91.711.

11. The operator of the aircraft shall advise

Air Traffic Control of the nature of the flight when establishing communications.

12. Except when otherwise directed by Air Traffic Control, or in the event of an emergency, all flights shall be conducted to avoid areas having heavy air traffic and to avoid cities, towns, villages, and congested areas, or any other area where the flights might create hazardous exposure to persons or property.

13. For participation in and air show, the FAA may impose any additional conditions or limitations deemed necessary to ensure the protection of persons or property. An operator who wished to participate in an air show must contact the geographically responsible Flight Standards District Office (FSDO) for issuance of a waiver to participate in waived airspace.

14. An aircraft operator, who is not the registered owner of the aircraft, must carry a signed letter of authorization from the registered owner showing the owner's permission for continued operation of the aircraft in U.S. airspace.

15. This Special Flight Authorization is valid for an indefinite period unless superseded or canceled in writing by the Administrator.

L Nicholas Lacey

**Director, Flight Standards Service, FAA
Issued in Washington, D.C.**

on July 31, 1999

BULLETIN BOARD

If you have questions or problems with your aircraft construction, we have members who have developed some expertise in various fields who have volunteered to advise you on methods, procedures and pitfalls in the capacity of **Builders' Counselors** something along the lines of the former designee programme. Please respect the fact that these are volunteers who may not appreci-

ate late calls, and will not return long-distance calls on their answering machines. Also, none are inspectors, and although experienced in their various fields, cannot be held responsible. It is and remains **YOUR** project. Their names and numbers are on page two and will be a regular feature of our contents page.

Please note that the locks for the club-

house and the club hangar have been changed. If you want a key that works in both hangar and clubhouse, give Rob Prior a call at 980-7723.

Please Take Note: October's meeting will be the Chapter's AGM and we will be electing officers for the next term of Office. If you haven't served before, and you're nominated, consider serving! **T&B**

Minutes by Jim Hunter

Minutes of the General Meeting, 7 September, 1999

Call to Order: 8:00 pm by President Pat O'Donnell. There were no visitors this evening.

Prior2/McClymont: that the Minutes of the General meeting of 3 August, 1999 be adopted as printed in the newsletter. Discussion carried.

Correspondence: letter received from Rem Walker, EAA Canadian Council with copy of the new permanent, don't-have-to-apply-for-it, generic Homebuilt Border Crossing Permit. Hopefully, will be printed in the *Turn and Bank*.

Committee Reports:

Treasury: Verbal report by Tim Novak, Treasurer.

Membership: Rob Prior: One new which gives us 143 regular, 27 complimentary.

Buildings, Library, Newsletter: All fine according to their chairmen.

DHAPCOM: Terry Wilshire:

1) A crew will be doing some filming at DHAP on September 14, 15 and 16. Have assured us that they will not interfere with ground or flight operations. In response to Charlie Brown's question Terry informs that the filming people pay GVRD for using the field and thus we receive our share as commission.

2) Terry will be meeting with the liaison committee between DHAP and CZBB folk. This Group exists to smooth out the frictions that could exist between the two fields' flight operations.

RAAC: Bruce Prior: Bruce will be attending the RAAC AGM in St. Johns. Some members asking Bruce to solicit a name change for RAAC.

Old Business:

Bruce Prior: Bruce will be nominations/election chairman for chapter AGM in October.

Keon/Vlake: that we adjourn: Carried.

Jim Hunter, Scribe.

Last Word *continued from page 8*

Those who know me would think I'd be pretty excited about this development, and at first blush I was: what a way to popularize flying! An Aircar in every garage! Think of what it could do for the morning commute!

But after a second look...

If this thing really is viable and thousands of new riders (I hesitate to use the word "pilots") and their vehicles take to their automated skyways, what will that do for those of us who fly for the fun of it, non-automated, stick and rudder types? How will it affect our airspace restrictions?

Expensive new transponders (there's already the threat of mode S being mandatory - what next?) would be a given. If the new machines outnumbered conventional aircraft, there would be a lot of pressure to make more, if not all, aircraft to conform to the new, total control environment; and without VTOL capability, fixed wing might not be able to fit in.

Further: if VTOL becomes the norm, what will happen to our airports? They

wouldn't be needed if you could take off from your driveway.

I'm curious about something as well. I haven't seen anything about this in aircraft publications. The newspapers and TV have picked up on it, but the sport aviation community hasn't said anything that I know of. Are we discounting this as a loony idea, or are our heads just in the sand? Maybe this thing is perceived as a threat to our way of flying and everyone's just trying to ignore it.

It's sort of ironic. If, and I mean if, this thing revolutionizes personal flight the way it is intended by its designers, we would so have reached a goal long sought after: flying for the masses. But surely one of the reasons we enjoy our (already too limited) freedoms is that there is just not enough small aircraft to cause the mass carnage that would ensue if there were as many fliers as there are drivers?

The Aircar's capabilities introduce two new things to the mix: with its automated piloting capabilities, of thousands, maybe millions of air travellers in small craft to the air, and by virtue of its VTOL performance of being truly, totally controlled by ground based controllers, which because of the increase of users, would be deemed necessary.

So: I have mixed feelings. I always wanted to be able to take my airplane home at night. It looks like this could happen, and within the next 5 to 10 years. And if they do become available, I'll really want one... but I really am ambivalent about this thing. The freedom I always wanted: but at what price?

Just a thought. There's some stuff on the internet about this: even with my limited understanding I was able to get a lot by just entering "Moller Aircar" in the search area of my browser.

There's change in the air. I'm not sure if *this* is it, but something's coming... **T&B**

Cavanaugh Flight Museum

Text and Photos By Rob Prior



Cavanaugh's F-105 Thunderchief

I'M STARTING TO LIKE BUSINESS TRIPS. Tack on two extra days in order to take advantage of a Saturday night stayover, and you have two days in which to sample the local scenery (which for me means visiting the local airports). This time, the extra two days cost me less than \$200 in food and lodging, but saved about \$1000 in airfare! A win-win situation, if there ever was one.

The destination for this trip was Dallas, Texas, home of the Cheerleaders, J.R. Ewing, big steaks, and a whole lot of warbirds. Before I left I consulted my little book listing Aircraft Museums throughout the U.S. For the part of Dallas I was going to be visiting (a suburb called Addison, about 1/2 hour north of downtown Dallas), it listed the Cavanaugh Flight Museum, with about two dozen air-

craft ranging from a J-3 Cub to an F-105 Thunderchief.

It sounded like any other museum, and I expected to arrive to find a couple of nice aircraft surrounded by a selection of partial airframes in various states of restoration. Boy was I wrong. Of the over 30 airplanes I counted on site, I believe only two or three weren't airworthy. Not only that, these aircraft are *all* in beautiful condition. Almost every one of them looks like it had just rolled off the assembly line and was ready to go.

The aircraft are divided between the four hangars roughly by time period. The first hangar contains some aircraft we're more likely to see around the average airport. There's a J-3 Cub, a Pitts Special, a Taylorcraft L3B, and a Tiger Moth. But then there's also some more interesting stuff thrown in: A

Boeing N2S-4 Stearman, a Ryan PT22, an SNV-2 Valiant, A Fokker D.VII (replica), and a Sopwith Camel (again, a replica, but powered by a genuine nine-cylinder Gnome Rotary engine). Interspersed with all of these are some examples of early piston and jet engines, a Link Trainer, and a Whizzer Motor-bike!

In between hangars

one and two, you'll find an F-104 Starfighter (just like the two you saw at Abbotsford this year). This F-104 was one of the first to be delivered to the U.S.A.F., where it served many years before being sold to the Jordanian Air Force. Following several decades of service in the Middle East, it was sold back to a private owner in the U.S., who later sold it to the Cavanaugh Museum where it now

**Walking into Hangar Two
you'll find some of the
finest World War Two air-
craft restorations I've
seen to date.**

basks in the sun on permanent static display.

Walking into Hangar Two you'll find some of the finest World War Two aircraft restorations I've seen to date. Here you'll find a P-51D Mustang that served with both the Swedish Air Force and in the Dominican Republic, a Spanish-built Me-109 powered by a Rolls-Royce 500-45 Merlin engine, a

Continued next page



Curtis P-40N Warhawk, a Hawker Hurricane Mk. II, and a Mitchell B-25J bomber. This particular B-25 was rescued from a pedestal in a military cemetery, restored in Chino, CA, and went on to win "Grand Champion Warbird" at Oshkosh in 1995 and at Sun'n'Fun in 1996.

Hangar Three is more of a 'view it from the tarmac' hangar, with only four airplanes in it. But when the four airplanes are a Grumman S2F Tracker, a Heinkel He-111 (with a Christen Eagle II tucked under one wing), and a Supermarine Spitfire Mk. VIII, do you really need to go closer? Well, okay, I guess you do. The He-111 (actually a Spanish-built CASA 2111) is currently a work-in-progress. Its exact history is unknown. The Grumman Stoof (S-two-F) served with the U.S. Navy constantly from its manufacture in 1957 until its retirement in 1979, while it accumulated nearly 11,000 flight hours and more than 650 catapult launches. The Spitfire served with the R.A.F.'s No. 17 Squadron in India from its acceptance in 1944 until it was sold to the Indian Air Force in 1947, where it would stay for thirty years before being sold to a private collector in 1977. It was restored fully and only in 1993 was it sold to the Cavanaugh Museum, once again bearing the colors and markings of No. 17 Squadron.

Moving on to Hangar Four you'll find the 'newest' of the aircraft on the field. The Cavanaugh Museum was until recently home to an F4U-4 Corsair, which you may have seen on the news recently ending its distinguished career by being almost totally destroyed in an unfortunate take-off accident at Oshkosh (the pilot, at last report, is pulling through). Rounding out the propeller-driven Navy birds, there is a Grumman FM-2 Wildcat and a TBM-3E Avenger. This Wildcat was one of the last ones built, and was accepted by the U.S. Navy only days before the official Japanese surrender. It spent most of its career in storage at Bethpage, NY, and was eventually struck from the register in 1947. After restoration in the late 70's, it was awarded "Grand Champion" at Oshkosh in 1979 (Hey! I just realized that's the year I was at Oshkosh!). The Avenger's history is less well known, but it is believed to have served with the U.S. Navy in San Diego.

Last, but not least, the jets! The Cavanaugh Museum is the home to a few; an F-86E Sabre (Mk. IV, Canadian Built, with an Orenda engine), an F9F-2B Panther (the last flying example of its kind, that was awarded "Grand Champion Warbird" at Oshkosh in 1995), an F-4 Phantom II (on long-term loan from the Frontiers of Flight Museum), a Mig-21 Mongol (Polish built for the Polish Air Force as an advanced trainer), a TS-11 Iskra (Poland's primary jet trainer for pilots destined to fly the Mig or Sukhoi aircraft used by the Polish Air Force), a Mig-15 UT1 (actually a Polish built copy called an SBLim-2 Midget), a Mig-17 (again, Polish built, and designated a Lim-5), and an F-105 Thunderchief (outside on the ramp along with the Mig-17). I can just imagine how fast your bank account would decrease running these engines, it must be something like watching the Canadian Debt Clock, but in reverse!

Outside on the ramp the day I visited was one of the museum's two T-6 trainers, both of which were built at North American's Inglewood, California plant between 1942 and 1943. These two aircraft are used primarily for customer flights and photo work now, but have also appeared as pace planes at the Reno Air Races (I thought they looked familiar...). While the T-6 remained static all day, the Museum's Stearman was pulled out to give a ride to some lucky customer. They didn't use the inertial starter, though, just the lazy electrical one. Not quite as impressive, but it gets the job done.

Visiting the museum took half a day, and I arrived at opening

time and had the place to myself for about two hours before any other visitors arrived. If you ever happen to have a spare day in Dallas, it's worth your time to stop in. You won't be disappointed. *T&B*



*Cavanaugh's
B-25
Mitchell.*



*A Fokker D-VII
and a Sopwith
Camel.*

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Classified Ads are free (within reason) to members. Display Ad rates are:

Business Card: \$25 per year

| | | |
|-----------|------------|----------|
| 1/4 page: | \$10/month | \$100/yr |
| 1/2 page: | \$15/month | \$150/yr |
| 1 page: | \$25/month | \$250/yr |

Ads that have been in for more than 6 months are subject to removal if space is required for other stuff. Please contact George the editor if you want it kept in.

FOR SALE: New 4130 Tubing - most sizes available. **Used** - Tripacer Fuselage (comes with logs), metal prop off 150 hp TRIPACER (comes with logs) Cessna spring steel gear legs, misc. wheels, axles, brakes and parts, misc. instruments (no altimeters!) A75 engine case, 7 Continental cylinders, some Lycoming cylinders (big), carbs, mags, pumps, old radios, etc. Call Pat at home, 533-1839.

WANTED: Medium size air compressor, with or without tank.

Doug 275-1405

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George 882-8016

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Bob Cutting 275-1603
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Vic Gabas (604) 853-2778

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Wings: ribs and minor spars done. Spar

diaphragms done. Two spar-grade spruce planks. No other wing parts.

\$15,000 firm, complete and not interested in parting-out

Jim Hunter 576-2678

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1 set (8) 60810 (68763) M10 main bearings \$295 per set

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Gogi (604) 823-6428

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1957 Tripacer Wings uncovered, all reworked. New leading edge. New ash tip. All Zinc Chromate ready to fabric. Included: 2-18 gal. gas tank, 2 - gas tank cover, landing light, aileron and flap, front and rear struts. Asking \$4000 Canadian.

Roger Gauthier (Kelowna) (250)-763-1529
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WANTED: PA 18 or PA 20/22 Wings. Some damage OK. 946-5881

FOR SALE: Tailwind Project. I hate to let it go! All wood for wings, spars and ribs done,

Classified continued on page 8

Classified Ads
(Continued from page 7)

new wing fittings, control system, Cougar fuselage mostly modified for Tailwind use.

George Gregory 882-8016

FOR SALE: Mags, turn and bank indicator. Fuel tank with gauge, cut down Sensenich prop, lots of other stuff.

George Gregory 882-8016

FOR SALE: Fleet F7 Biplane replica. Very close to original copy except for uncowed engine. Engine: Kinner R55 160 hp. Aircraft is modified for solo operation from rear cockpit. Extra bellytank with wobble pump. Original Fleet wheels, brakes, pedals and stick column. Original parachute accommodating bucket seats, oversize tires, Stits covering, voice activated intercom. Ted Hendrickson Propeller, manual and extra key magswitch.

\$35,000 Canadian. (604) 478-6048

Will consider small antique aircraft engine as trade-in.

FOR SALE: Some Cont.0-200 parts: Case (checked, no cracks) Camshaft, Gears, Rods and Pistons; Carb and spider, Starter (pull type) and Generator, mags (one is disassembled). \$2500 for the package, offers considered on individual parts. Also, Prop hub for Cont. tapered shaft, \$350, Wing parts for Taylorcraft BC-12D (disassembled) including ribs, spars, compression struts, brace wires and strut fittings. Offers?

Contact David Smith (604) 513-0353

(604)513-0373 (fax)

FOR SALE: 1 pair David Clark Helicopter headset, 1 Telex MRB-2400 headset, 1 Marvel Schebler MA3-SPA and 1 MA4-SPA carburetors. June McMann 943-5369

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E-mail:sgear@infoserve.net

FOR SALE:

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- 4'X8' .032 - 2024-T3

- 4'X6' .040 - 6061-T3

- 3'X16" .090 - 2024-T3

Call GRANT (604) 536-6945

FOR SALE:

ELT: ACK E-01, meets TSO c91 - A, complete with external antenna kit and remote panel \$225.

David Clark Headsets \$225 (mostly 10-30 type, helicopter and airplane.

Telex PT-300 PTT \$30.

Full map GPS Garmin 195 - Nicad pack,

Pacific NW map chip, PC/MAC computer cable kit, mounting bracket. \$1500 or \$1200 without map data chip.

Bendix RSA 10 ED1 Injector Body, no history, \$400. Woodward Prop Governor #210681, no history, \$400.

National 360 Parachute, blue with matching carry bag \$900

Christen 5 point aerobatic seat belt harness, with 2-point Military 3" belt \$350

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FOR SALE: 4130 Annealed Gauge Plate now in stock, .025 to .375. We will sell you the plate or laser cut the parts Industrial Laser Cutting ltd.

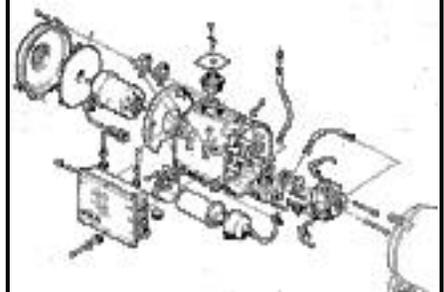
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FOR SALE: 1- Miller 200 amp AC/DC H.F. Tig/stick welding machine - 220V 1 ph. \$1200. 1- Miller 120 amp MIG (wire) welding machine, 110 volt. Portable sheet metal type, c/w gas kit (almost new) - \$800.

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Technical Illustration
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I AM SURE there are amongst our group those who are familiar with the Moller Aircar. For those of you who are not, I'll fill you in.

The Aircar is a vehicle powered by four horizontally mounted ducted fans, roughly analogous to the wheels of a car, and in the same approximate position. By virtue of what appears to be ducted lift, this craft is capable of vertical takeoff and landings. It doesn't have a lot of wing; I would assume in horizontal flight the ducts serve as some sort of annular wing. I haven't read any



decent technical reports, but from what I gather, thrust can be vectored aft or downwards from these ducts by some sort of nozzle or vanes near the back of the ducts.

Along with its takeoff capabilities, it is said to be designed for horizontal flight speeds of 350 mph. It is intended to navigate, in the context of computerized, GPS

based automated flight by unskilled personnel. Testing of the 4 place version is to take place this fall. All systems have redundancies, especially the computers. There is a ballistic parachute employed as well.

Moller thinks if the idea really flies (pun intended) and mass production were to occur, these vehicles could be sold for well under \$100,000 US. (I have heard between \$40,000 and \$80,000.) What's more, NASA, the U.S. Military, and some of the Boeing folk are taking this guy seriously.

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