

DR-107 "One Design" 25th Anniversary

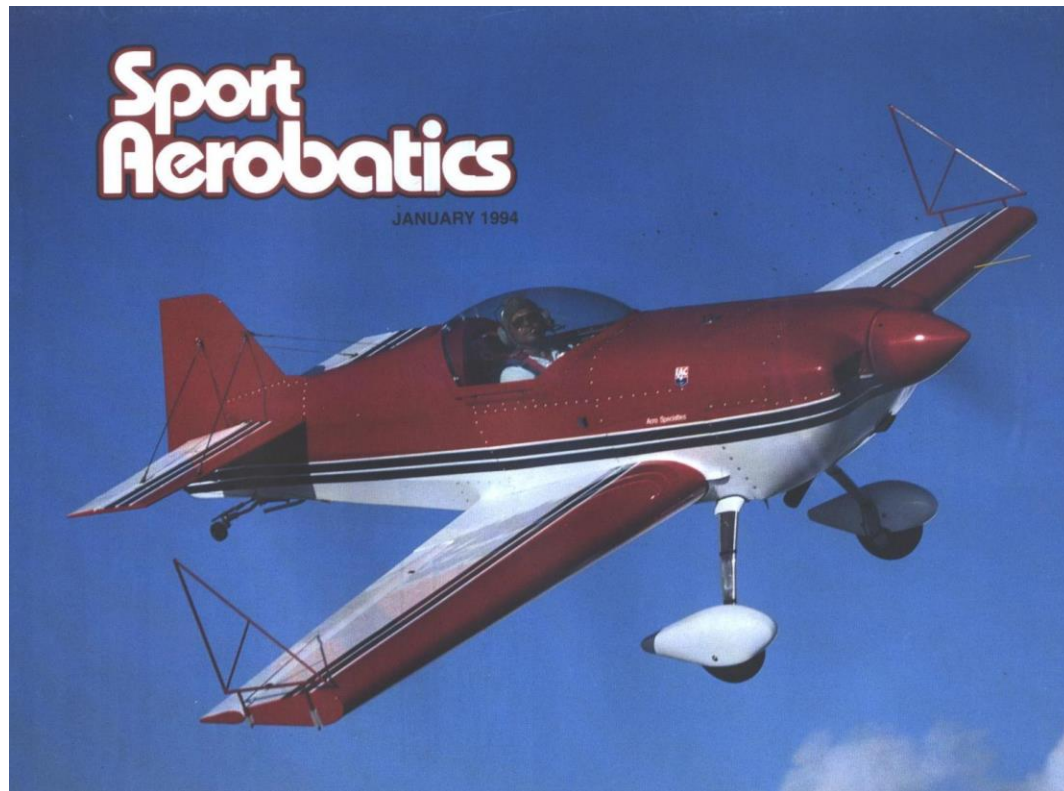
Origins and history of an Aerobatic aircraft design



Dan Rihn
IAC #3836
EAA #16462



DR-107 "One Design" 1993-2018



Origins of the “One Design”



One Design Sailboats



One Design Windsurfer



The true measure of pilot ability and experience is usually shown in the final standing in a contest. What could be more indicative of this when pilots are flying identical sailplanes with identical performance. One design competition is the sure test of soaring skill.

- Paul A. Schweizer

Origins of the “One Design” in Aerobatics



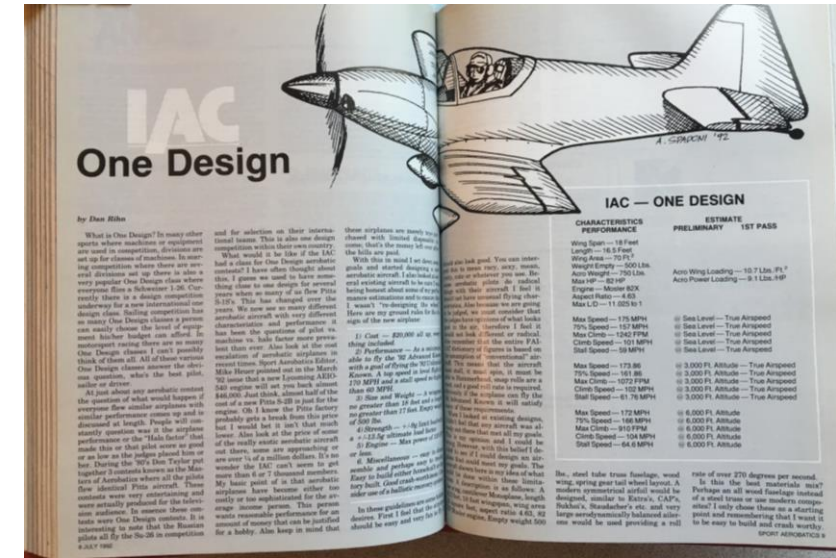
Hilton Masters of Aerobatics- 1982/1983
World Class Pilots

- Henry Haigh, Frank Fry, Gene Soucy, Michel Brandt
- Gordon Price, Kermit Weeks, Chris Schweizer, Jerzy Makula, Eric Muller

“One Design” in Aerobatic Competition
Similar Aircraft Performance
Anonymous Pilot
True Test of Pilot Skill



Corby Starlet- Sport Aviation

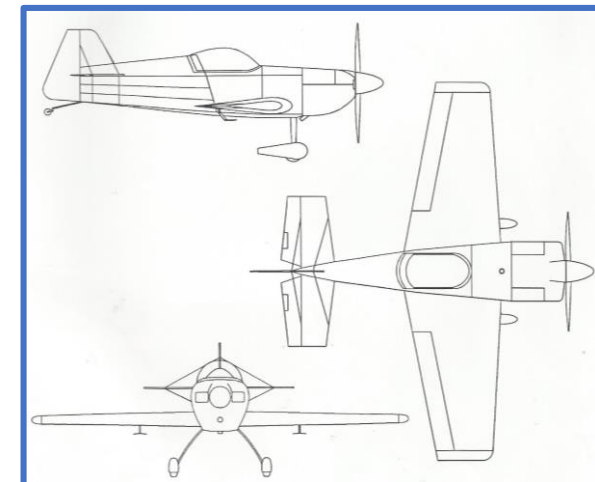


Sport Aerobatics Article July 1992

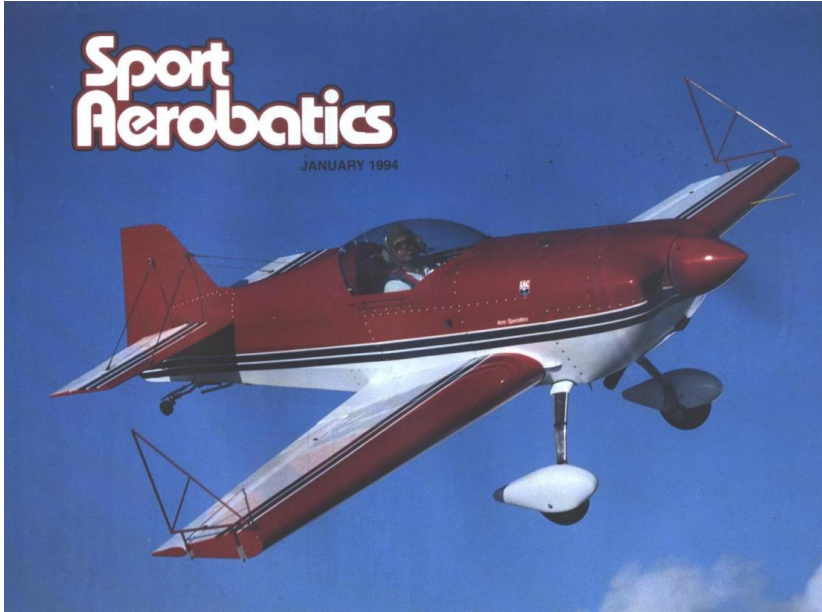
Design Goals

- **Stimulate Interest in Aerobatic Competition**
- **Develop an Affordable Aerobatic Aircraft**
 - **Provide Plans for the Homebuilder**
 - **Start a New Aerobatic Class**

Sport Aerobatics Article generated a lot of Interest and Feedback



Who made the Prototype possible



- Lewis Shaw
- Doug Dodge
- Jon Saudacher
- Barnaby Wainfan
- Ben Morphey



Without the prototype the DR-107 would never have gone anywhere!

Thank you

AirVenture 1993 and 1994



AirVenture 1993-Debut at IAC Pavilion



AirVenture 1994
Ben Morphew, Dan Rihn, Doug Dodge



Dan Rihn and Curtis Pitts- AirVenture 1994



Debut at IAC Pavilion-AirVenture 1993
"Dead Grass Award"



Ben Morphew- Airshow Performer at AirVenture
1994,1995,1996



Ben Morphew with Leo Loudenslager

Aerobatic Aircraft Design Background



DR-101 Sunbird



DR-102 Sunbird II



DR-103 Awesome Lady



DR-104 Phoenix and DR-105 Goshawk



Monoplane Design Work

Stephens Acro

Lazer

Laser

DR-106 Sabre



Monoplane Design Work and Influence



Charlie Larkey

- Wing Loft on CAD
- Rib Templates



Lee Manelski

- Re-Design Tail Surfaces
- Carbon Fiber/Wood Wing
- Airfoil, Ailerons, Actuation



Bill Curry

- Re-designed Fuselage Truss
- Re-designed Tail Surfaces



Super Fli - Designed by Phil Kraft

- *Low Wing Monoplane Influence*

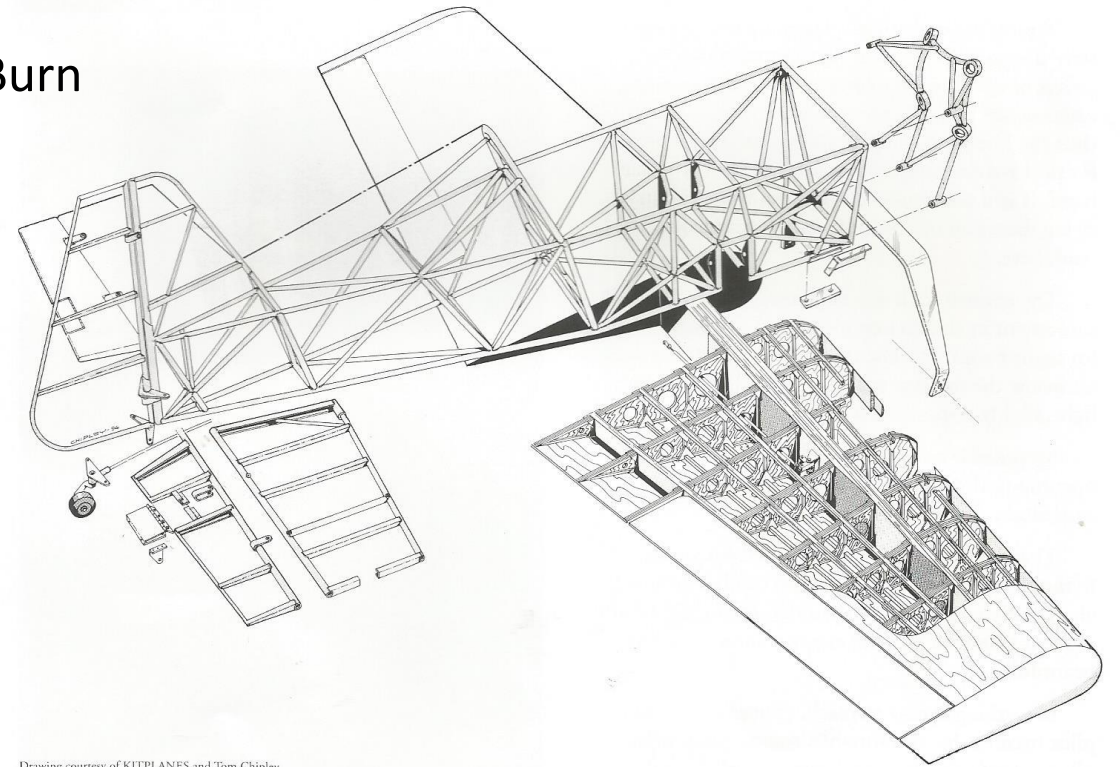


EXTRA 230 - Designed by Walter Extra

- *Airfoil Design*
- *Squared off Aileron Trailing Edge*

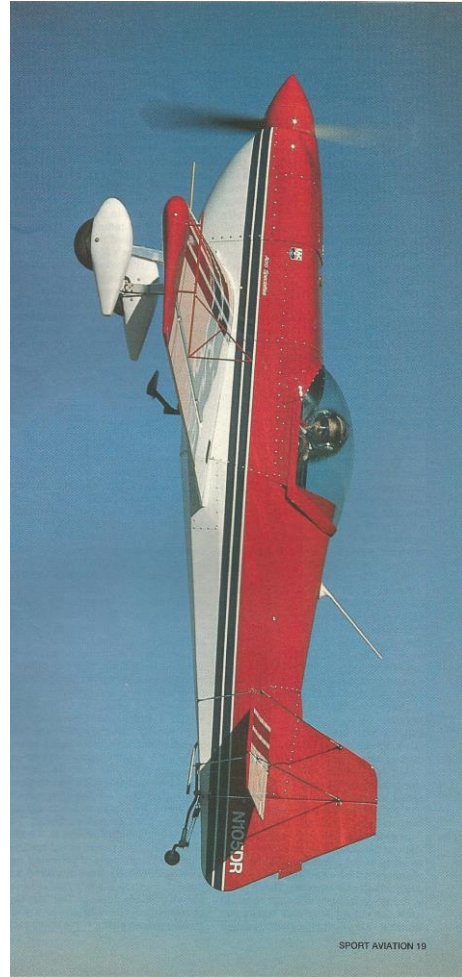
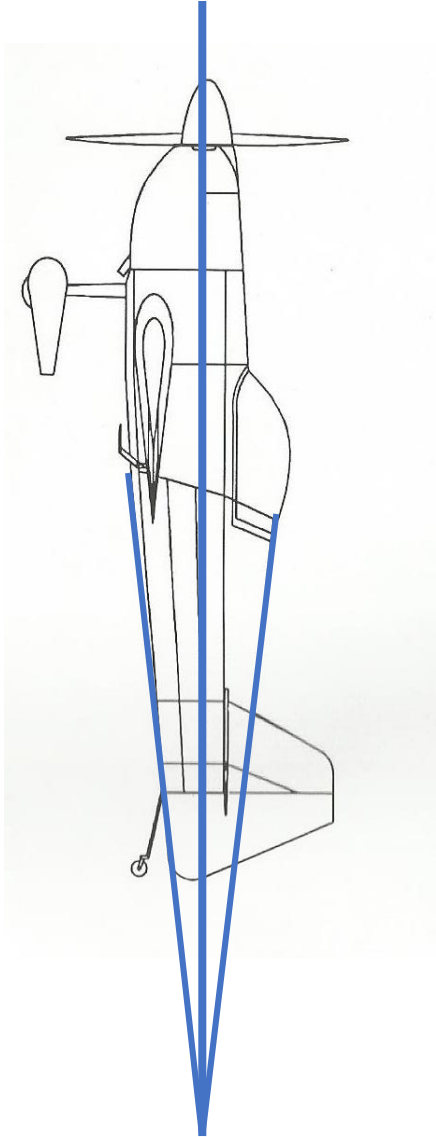
Design Philosophy

- Compact- Minimize Material Costs, Reduced Weight
- Easy to Build From Plans –No Reliance on Kits or Factory
- Engine- Reliable Aerobatic Engine
- Ownership Costs, Hangar storage, Smaller Engine, Fuel Burn
- Competitive- Size weight power
- Steel Tube Truss- Proven Safety
- Wood wing....*not Composite and why*
- Airfoil- Easy to Build, Good Aerobatic Characteristics
- Aileron design- High Roll Rate, Good Break Out Forces
- Aileron Balance- (Aerodynamic and Mass) and Spades
- G Load- +/-10g Design With Safety Margins



Drawing courtesy of KITPLANES and Tom Chipley

Design Philosophy



Judging Presentation

by Lance Hooley
Sport Aerobatics April 1998

Sport Aerobics April 1998

by Lance Hooley, IAC 20989

1995, and I want a aerobatic hot rod. It's Ray Williams' fault. Ray is in Nashville, TN and the nerve to actually teach me aerobatics. You see, it takes a lot of nerve to fly with me, Ray did . . . now I'm hooked on negative G's. The more the better. It's still Ray's fault—thanks Ray, really, thanks.

the novice looking for a good investment, fantastic performance and something I can le, but would not outgrow soon. At the time, monoplanes seemed to be growing in pop- so my interest went with them since they seemed to have better performance than the es. No way was I going to purchase a foreign job—ever. Even if I could afford it. Pitts, or something near it, was my choice.

[illegible][illegible][illegible]

The wing tip is laid out ready for construction.

The wing with ailerons attached prior to skinning.

One glass ply over the wing. The fuselage is in the background.

Fuselage prior to covering.

30 APRIL 1956

[illegible][illegible]

The wing has been attached!

The fuselage 90% complete.

A view of the cockpit.

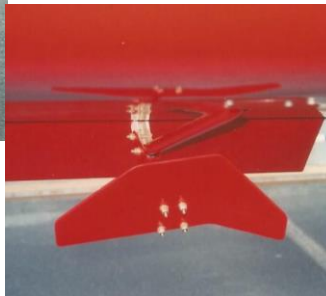
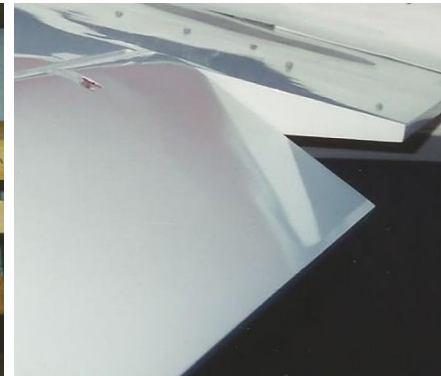
The fuselage 100% complete.

SpotterVision 11

100

[illegible][illegible]

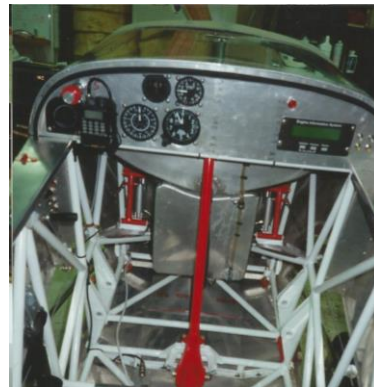
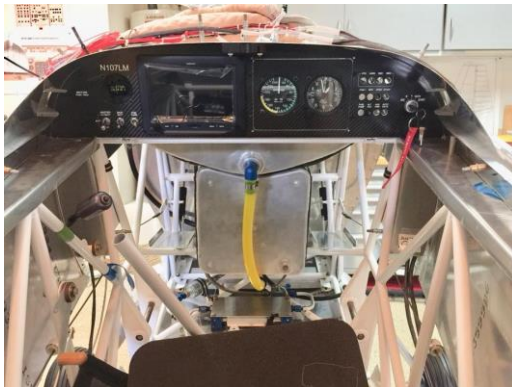
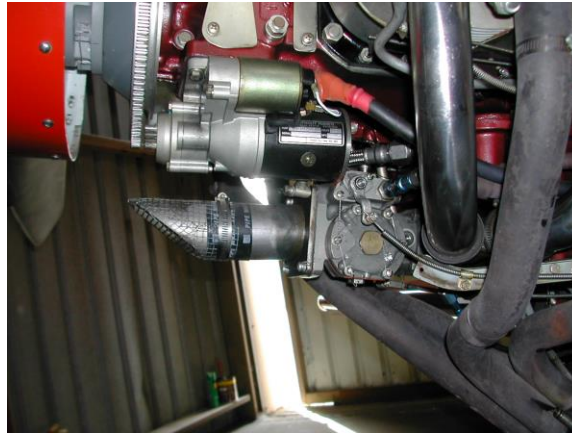
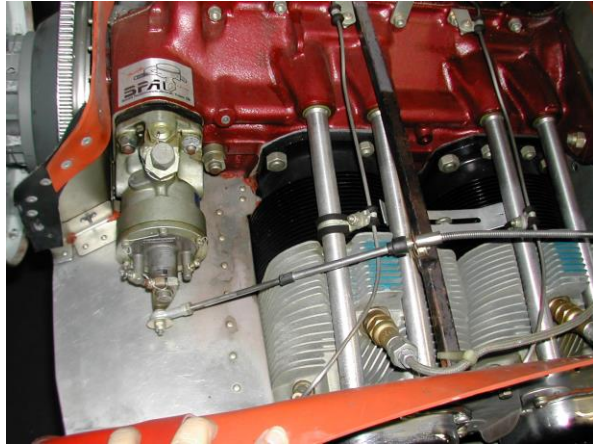
Building the DR-107- Wing



Building the DR-107 One Design- Fuselage



Building the DR-107 One Design- Final Assembly



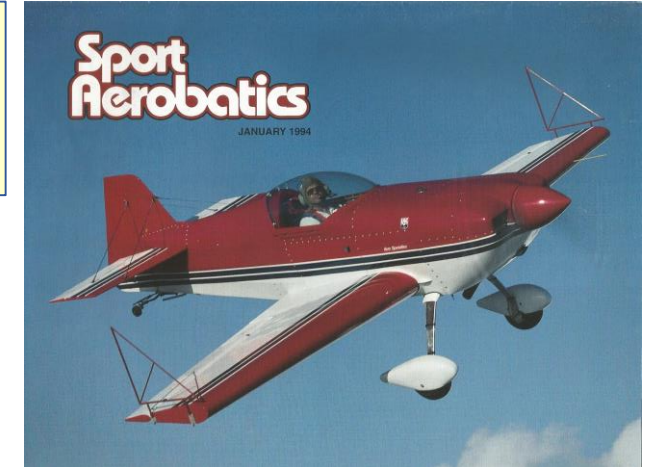
Flying the DR-107 One Design



Mike Anderson-Sport Aerobatics
January 1994; Part 1
February 1994; Part 2 July 2016

Budd Davisson-
Sport Aviation February 1994

www.airbum.com



Phil Burgess- Sport Aerobatics July 2016

www.philburgessaerobatics.com

Rainer Huefner-
Sport Aerobatics Sept. 2014



A few who made many more DR-107's possible

Doug Dodge	Supplying Components- Metal, Fiberglass, etc.
Aircraft Spruce- Jim Irwin	Drawing Sales, Materials, Kits, Components
Rick Dean	Developing the Drawings
Bill Scheunemann	Wing Kits
Jack Rosen	Fiberglass Components
Roger Rourke	Supplying Components- Metal, Fiberglass, etc.
Ben Morpew	Airshow Pilot- <i>par Excellence</i>
Dave Gustafson	Photography, Articles, Publicity, Advertising
Budd Davisson	Pilot Report, Photography
Phil Burgess	Pilot Report, Champion Aerobatic Pilot (UK)
Brian Turner	Fabrication of DR-107's in Australia
Pete Groves	Fabrication of DR-107's in Canada and Newsletters
Nico Murphy	DR-107 videos on YouTube-www.8KCAB.com
Jim Reno	DR-107 Website- www.DR107.net

Thank you

Why no One Design Contests?

It was interesting that there was such a huge response to have a One Design Contest but it never took off

Three Reasons the “One Design” Contest Concept Didn't Happen-

1. Lack of airplanes- It takes time to build a fleet of home built aircraft
2. Paint Scheme- the rules called for a simple Red/White/Blue paint scheme
the rules could have easily been changed, no one ever formally challenged it
3. Logistics-
 - Difficult to have a contest dedicated to one aircraft
 - Difficult to have a contest within an established 4 category contest
 - What level of flying would it be?
 - Not everyone is capable of flying at the higher levels
 - Wouldn't be challenging enough for the ones who can

*The One Design Contest Concept never took off
However the DR-107 has proven itself to be a great little aerobatic airplane
providing tremendous performance for the cost of operating and ownership*

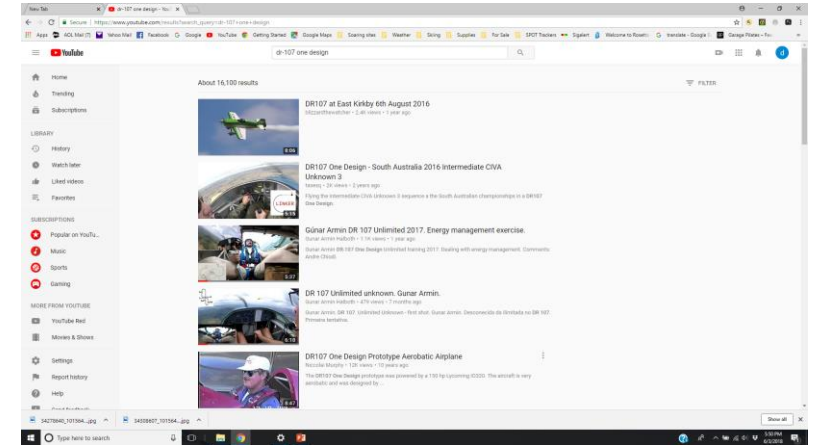
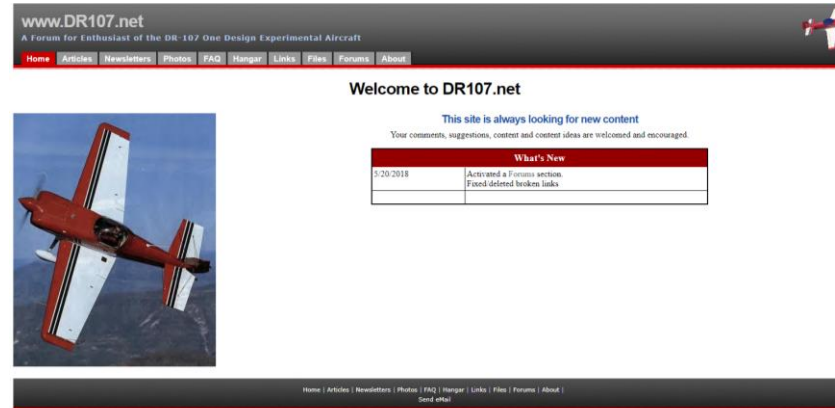
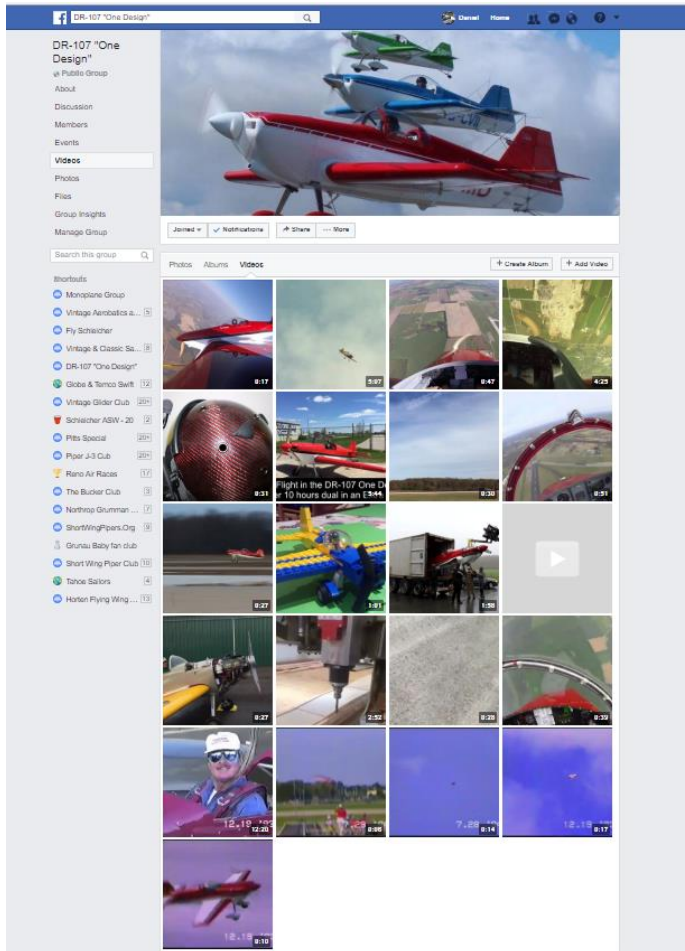
Social Media- Internet- YouTube- Google

Face Book Page

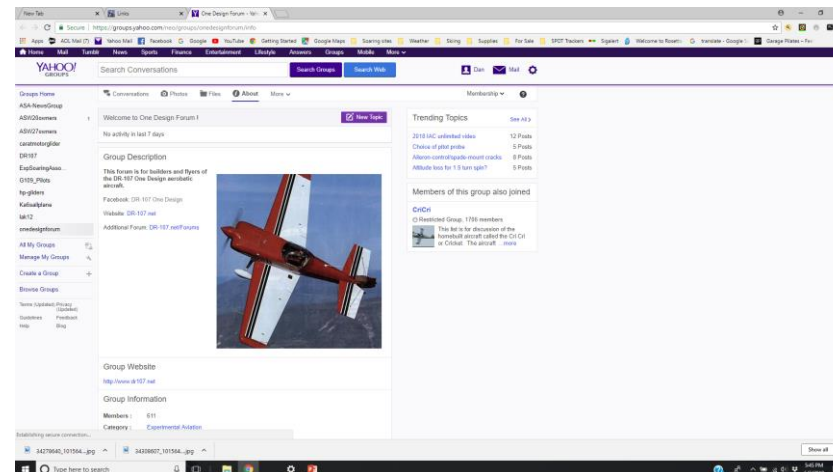
DR-107 One Design

www.DR107.net

YouTube-Videos



YAHOO Newsgroup



Search; DR-107 One Design

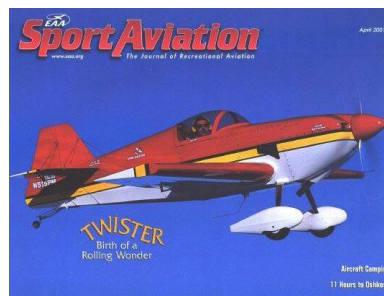
www.8KCAB.com

Google

Rihn DR-107 One Design

<https://groups.yahoo.com/neo/groups/onedesignforum/info>

DR-107 One Design Gallery



DR-107's Around the World



DR-107's in 15 countries

USA, Canada, Iceland, England, Spain, France, Germany, Austria, Switzerland, South Africa, Australia, New Zealand, Brazil, Argentina, and Tahiti

DR-107's in Australia - 11 total

Daniel Comarmond



Richard Wiltshire



Alan Kilpatrick



- Brian Turner
- Trent Stewart
- Kingsley Just
- Krishna Parikh



David Foord- Jesse Jury- Ben Lappin



Rainer Huefner-



Contest in Temora



DR-107's United Kingdom- 9 total



Phil Burgess



Neil Bigrigg



Michael Clark



Anthony Brown



David Kean



Colwyn Darlow



Paul Baisden



Germany



Josef Bertram



Heinz-Berd Hogardt - Josef Bertram



Josef Bertram



ELZ, Germany

France



Thierry Catteau

Canada



Kelly Fawcett



Jeff Seaborn



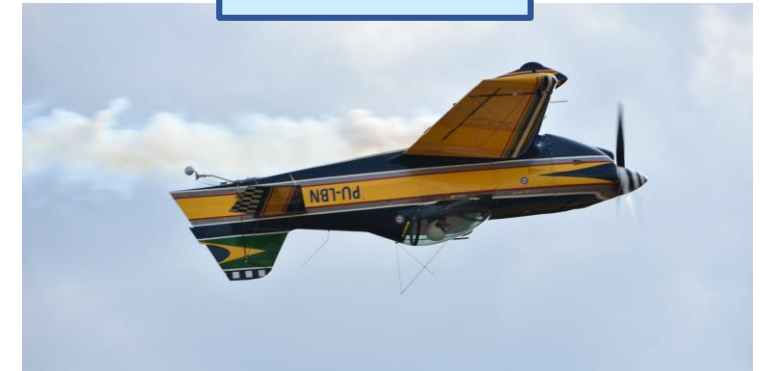
DR-107's Argentina and Brazil



Juan Pablo Pichel



Lidio Bertolini



Guilherme Censoni

Spain



Martin Camacho and Jose Esteban Carmona



Static Load test- 6g's at 1,212 lbs. (7,272 lbs)



G-IIPB ; now in Span

South Africa



Paul Quick

Iceland



Hafsteinn Jonasson



New Zealand

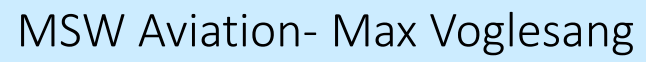


Roger Harris



David Wilkinson





Peter Fluekiger



LEGO – DR 107 “One Design”



LEGO RIHN DR-107 Designed by Trent Stewart

Questions?

