

UNLIMITED CLASS

AIR RACING

BY PETER LAW



Peter Law – Who is He and Where Did He Work?

- BSME – Stanford University, 1958. Majored in Thermodynamics
- MSAE – University of Southern California (USC), 1965
- Registered Professional Mechanical Engineer in California & Washington
- Member SAE and AIAA
- Thermodynamics Engineer at Lockheed-Burbank & Palmdale since January 1959; Entire Career of 42.5 years at Lockheed
- Transferred to Lockheed *Skunk Works* in July 1961
- *Skunk Works* Thermodynamics Department Manager from 1980
- Retired from Lockheed July 2001 after 40 years at *Skunk Works*
- Worked on *F-104*, *A-12*, *YF-12A*, *SR-71*, *M-21*, *D-21*, *U-2*, *F-117A*, *F-22*, *JSF(X-35)*, and many other Classified Projects
- Did internal and external Heat Transfer and Thermodynamics, Structural Thermal Analysis, Cooling System Design, and Internal Subsystem Thermal Analysis, including hydraulics, fuel, and other systems
- Involved in Piston Engine Aircraft Racing since 1964
- Involved in Unlimited Hydroplane Racing since 1970

Peter Law - *What Does He Do?*

- Involved in Unlimited Racing since 1964
- Started with Darryl Greenamyre, Lockheed A-12 & SR-71 Test Pilot, in 1964 after First Reno Races
- Involved then and since with Bruce Boland
- Boiled ADI Fluid to Cool Oil & Reduce Drag on Darryl's Bearcat Starting at Reno 1965
- Built Water Injection Systems for P-51s & other Aircraft since 1970 through Al DiMauro & Aircraft Carburetor
- Flow Check & Adjust Carburetors for most Unlimited Aircraft Since 1978, when Aircraft Carburetor Terminated
- Design & Build Spray Bars for Oil & Engine Cooling, plus other Engineering since 1970

Peter Law - *What Has He Worked On?*

- **Started with Darryl Greenamyer's Bearcat**
- **Worked with Bruce Boland on several more**
 - Dave Zeuschel P-51 & *Miss America P-51* in 1,000 Mile Races
 - *Candace* (Cliff Cummins), *Jeannie* (Mac McClain)
 - *Red Baron P-51, Merlin & Griffon*
 - *Ciuchetton, Cloud Dancer, Georgia Mae, Ridge Runner*
 - *Dago Red, Original Strega, Stiletto, Super Corsair*
 - *Tsunami, Risky Business, Huntress III & More*
 - Help on *Rare Bear, Dreadnought*
- **Unlimited Division Contributions**
 - Rules Committee - Coordinated New Rules 1980
 - Division Secretary-Treasurer for 2 years
 - Division Newsletter for Several Years (with Joanne)
 - Records Keeper & Pilot's Qualification Secretary
 - Unlimited Hydroplane Involvement

Modern Era Unlimited Class Air Racing Since 1964

History and General Information

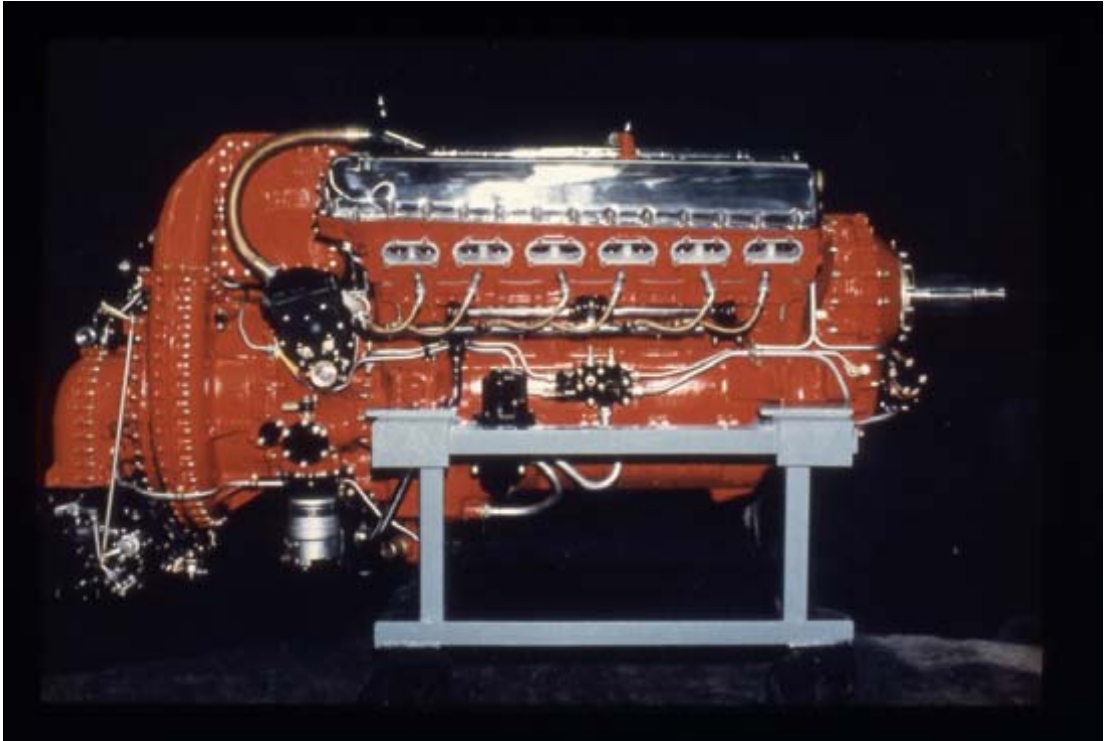
- Background:
 - Unlimited Air Racing was revived after WWII with surplus fighters replacing pre-war Homebuilts
 - Unlimited Pylon Racing for the “*Thompson Trophy*” returned to Cleveland in 1946 through 1949.
 - Unlimited Aircraft Used: P-38, P-39, P-40, P-47, P-51, P-63, F4U, F2G
 - Races ended after 1949 due to a serious fatal accident
- Modern Air Racing: ***Reno National Air Races***, began in 1964
 - Racing restarted in September 1964 in Reno, Nevada by Bill Stead, an Unlimited Hydroplane Boat Driver
 - Races are held starting 10 days after labor day each year
 - 1964 & 1965 Races at Bill Stead’s Skyranch, near Reno
 - 1966 and thereafter, at old Stead AFB, 12 miles north of Reno
 - Several Classes of Racing: Midgets, Bi-Planes, Unlimiteds, and Cross Country Races for first several years. Now Midgets, Bi-Planes, T-6’s, Unlimiteds, and Jets

History and General Information (Continued)

- Other Race Sites have been tried over the years:
 - Lancaster, CA; Boulder City, NV; Mojave, CA; San Diego, CA; Cape May, NJ; Miami FL; Homestead, FL; Moosejaw, Canada; Hamilton AFB, CA; Sherman, TX; Denver, CO; Olathe, KS; Shafter, CA; Phoenix, AZ; Tunica, MS. Most were financially unsuccessful and not continued.
- Reno Unlimited Class Racing Activities (Current Schedule)
 - Qualifying: Monday, Tuesday, Wednesday
 - Racing: Thursday, Friday, Saturday – Placement Heats (3 each day), Sunday, Bronze, Silver, Gold Final Races (Up to 27 planes race Sunday, 9 in each race).
- Other Class Races and Aerobatic Acts Fill the Daily Race Schedule
- Three Unlimited Racers have held FAI World Propeller Speed Record:
 - Darryl Greenamyre – F8F Bearcat “*Conquest I*” 482.463 mph Aug 1969
 - Steve Hinton – RB-51 “*Red Baron*” 499.046 mph Aug 1979
 - Lyle Shelton – F8F Bearcat “*Rare Bear*” 528.314 mph Aug 1989

Inline Engines used in Modern Unlimited Class

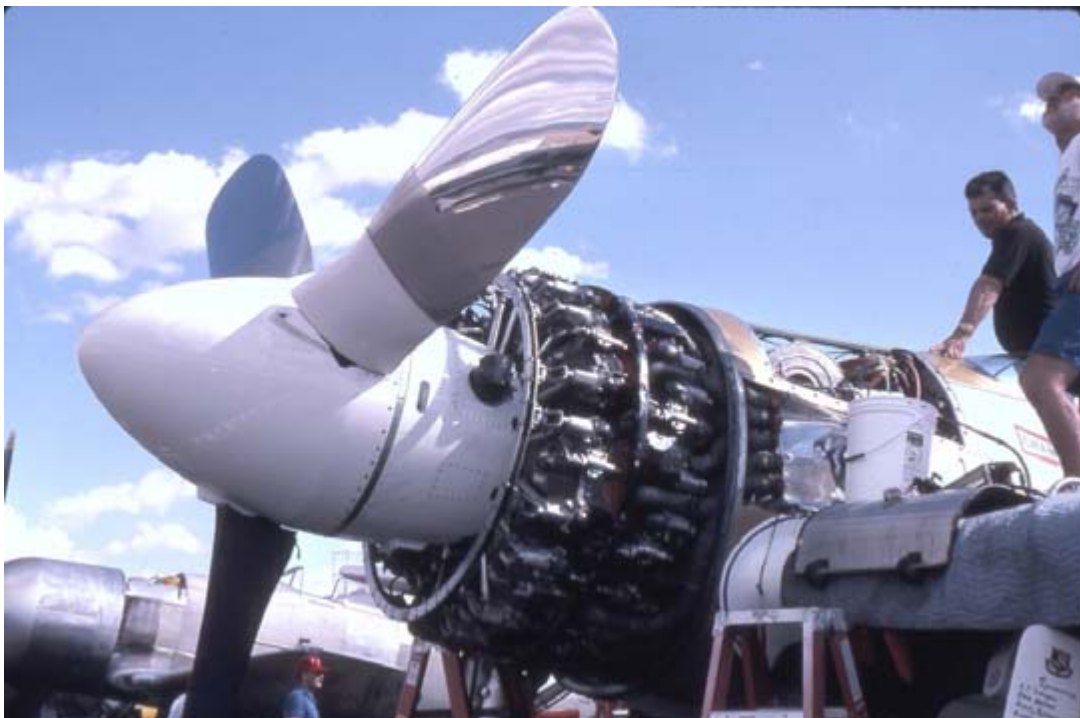
- Rolls-Royce V-1650 **Merlin**, V-12 Engine
 - Modified P-51D Racers: *Dago Red, Strega, Stiletto, Red Baron, Miss RJ, Miss America, Jeannie, Sumpthin Else, Vendetta, Bardahl Special, VooDoo*, Many Others
 - Spitfire Mark IX Racer: *no name, Race #9*
 - Homebuilt Racer: *Tsunami*
- Allison V-1710, V-12 Engine
 - P-38's: *White Lit'nin', Double Trouble, Yippee, Scatterbrain Kid*
 - P-39s: *Mr. Mennen*; P-40s: *Sneak Attack, Spud Lag*
 - P-51As: *Planes of Fame, Polar Bear*; P-63's: *Tipsy Miss, Crazy Horse*
 - Yak-3, Yak-9, Yak-11: *Several over the years*
- Rolls-Royce **Griffon**, V-12 Engine (2239 in³)
 - Modified P-51D Racers: *Red Baron, Precious Metal, Miss Ashley II*
 - Spitfire Mark XIV Racer: *no name, Race #14*
- Electromotive V-6 Racing Engine, 3.2 Liters (195 in³)
 - Homebuilt twin *Pond Racer*



2-Stage V-1650 *Merlin* Engine

Radial Engines used in Modern Unlimited Class

- Pratt & Whitney R-1830: F4F *Wildcat*, Yak-11 *Maniyak*
- Pratt & Whitney R-2000: Yak-3 *Czech Ride*, Yak-11 *Miss Trinidad*
- Pratt & Whitney R-2800: F8F Bearcat *Conquest I*, several stock F8Fs, two F7F Tigercats, *Tigercat*, *Bossman*; Several F4U Corsairs; Several P-47 Thunderbolts; two A-26 Invaders, one Yak-11 *Czech Mate*
- Pratt & Whitney R-4360: F4U *Super Corsair*, Sea Furys *Furias*, *Dreadnought*, and possibly Darryl Greenamyer's *Shockwave*
- Wright R-1820: Several T-28s
- Wright R-2600: B-25 Mitchell's *Pacific Princess*, *Race 69*, *Silver Lady*
- Wright R-3350: F8F Bearcat *Rare Bear*, Yak-11 *Mr. Awesome*, several Sea Furys; *September Fury*, *September Pops*, *Riff-Raff*, *Fury*, *Cotton Mouth*, *Spirit of Texas*, *Argonaut*, *Bad Attitude*, *Southern Cross*, AD-4 Skyraider *Able Dog*, DC-7 *Supper Snoopy*
- Bristol Centaurus 18 (3270 in³): Sea Furys *Baby Gorilla*, *Miss Merced*, *Simply Magnificent*, plus other stock Sea Furys



Rare Bear #77, Cowling Removed from R-3350



R-4360 Powered Super Corsair

R-4360 in Super
Sea Fury
Dreadnought #8



Race Statistics – All 66 Gold Races from 1964 to 2005

Gold Race Wins	F8F	22	Shelton 10, Penney 5, Greenamyer 6, Slovak 1
By Aircraft Type	P-51	36	Several – See other slides
All Races	Sea Furies	6	Cooper 2, Anderson 1, Brickert 1, B. Sanders 1, F. Sanders 1
	Corsair	1	Steve Hinton
	<i>Tsunami</i>	1	Steve Hinton
Most Gold Wins	<i>Rare Bear</i> (F8F)	15	Lyle Shelton 10, John Penney 5
By A/C Name	<i>Strega</i> (P-51)	10	Bill Destefani 9, Ron Helve 1
	<i>Red Baron</i> (P-51)	7	Mac McLain 2, S. Hinton 4, D. Greenamyer 1
	<i>Dago Red</i> (P-51)	6	Ron Helve 1, Bruce Lockwood 2, Skip Holm 3
	<i>Conquest I</i> (F8F)	6	Darryl Greenamyer 6
	<i>Dreadnought</i> (SF)	3	N. Anderson 1, Rick Brickert 1, Brian Sanders 1
	<i>Miss Merced</i> (SF)	2	Sherm Cooper 2
	<i>Miss Bardahl</i> (P-51)	2	Chuck Lyford 2
Most Gold Wins	Lyle Shelton	10	John Penny 5
By Pilot	Bill Destefani	9	Roy McClain 3
	Darryl Greenamyer	7	Sherman Cooper 2
	Steve Hinton	6	Ron Hevle 2
	Skip Holm	6	Bruce Lockwood, Chuck Lyford 2

Race Statistics – 41 Reno Gold Races from 1964 to 2005

Reno Gold Wins	F8F	16	Shelton 6, Greenamyner 6, Penney 3, Slovak 1
By Aircraft Type	P-51	22	Several – See other slides
All Races	Sea Furys	2	Neil Anderson 1, Rick Brickert 1
	Corsair	1	Steve Hinton
Reno Gold Wins	<i>Rare Bear</i> (F8F)	9	Lyle Shelton 6, John Penney 3
By A/C Name	<i>Strega</i> (P-51)	6	Bill Destefani 6
	<i>Dago Red</i> (P-51)	6	Ron Helve 1, Bruce Lockwood 2, Skip Holm 3
	<i>Conquest I</i> (F8F)	6	Darryl Greenamyner 6
	<i>Red Baron</i> (P-51)	2	Darryl Greenamyner 1, Steve Hinton 1
	<i>Jeannie</i> (P-51)	2	Mac McClain 1, Skip Holm 1
	<i>Dreadnought</i> (SF)	2	Neil Anderson 1, Rick Brickert 1
Reno Gold Wins	Darryl Greenamyner	7	<i>Conquest I</i> 6, <i>Red Baron</i> 1
By Pilot	Lyle Shelton	6	<i>Rare Bear</i> 6
	Bill Destefani	6	<i>Strega</i> 6
	Skip Holm	5	<i>Jeannie</i> 1, <i>Stiletto</i> 1, <i>Dago Red</i> 3
	John Penney	3	<i>Rare Bear</i> 3
	Steve Hinton	2	<i>Red Baron</i> 1, <i>Super Corsair</i> 1
	Bruce Lockwood	2	<i>Dago Red</i> 2

Race Statistics – Historic Pilots from 1964 to 2005

Pilots winning Gold races in *four* different aircraft:

Skip Holm	<i>Jeannie</i>	Reno 1981
	<i>Healer</i>	Moosejaw 1984
	<i>Stiletto</i>	Reno 1984
	<i>Dago Red</i>	Reno 2000, 2002, 2003

Pilots winning Gold races in *three* different aircraft:

Steve Hinton	<i>RB-51</i>	Reno 1978, Mojave 1978, 1979, Miami 1979
	<i>Super Corsair</i>	Reno 1985
	<i>Tsunami</i>	Sherman, TX 1990
Roy McClain	<i>RB-51(Merlin)</i>	Mojave 1974
	<i>RB-51(Griffon)</i>	Mojave 1976
	<i>Jeannie</i>	Reno 1980

Pilots winning Gold races in *two* different aircraft:

Darryl Greenamyer	<i>Conquest I</i>	Reno 1965, 1966, 1967, 1968, 1969, 1971
	<i>RB-51</i>	Reno 1977
Ron Hevle	<i>Dago Red</i>	Reno 1982
	<i>Strega</i>	Shafter 1985

66 Gold Race Winning Pilots from 1964 to 2006

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<u>PILOT</u>	<u>WINS</u>	<u>RACE</u>
Lyle Shelton	10	Cape May 1971, Miami 1973, Reno 1973, Mojave 1976, Reno 1975, Hamilton 1988, Reno 1988, 1989, 1990, 1991
Bill Destefani	9	Reno 1987, 1992, 1993, 1995, 1996, 1997, Denver 1990, 1992, Olathe KA 1993
Darryl Greenamyer	7	Reno 1965, 1966, 1967, 1968, 1969, 1971, 1977
Steve Hinton	6	Reno 1978, Mojave 1978, Miami 1979, Mojave 1979, Reno 1985, Sherman 1990
Skip Holm	6	Reno 1981, Moosejaw 1984, Reno 1984, 2000, 2002, 2003
John Penny	5	Reno 1994, 2004, 2005, Phoenix 1994, 1995
Roy McClain	3	Mojave 1974, 1976, Reno 1980
Sherman Cooper	2	Mojave 1970, San Diego 1971
Ron Hevle	2	Reno 1982, Shafter 1985
Bruce Lockwood	2	Reno 1998, 1999
Chuck Lyford	2	Lancaster 1965, Boulder 1965

66 Gold Race Winning Pilots from 1964 to 2006

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<u>PILOT</u>	<u>WINS</u>	<u>RACE</u>
Neil Anderson	1	Reno 1983
Gunther Balz	1	Reno 1972
Rick Brickert	1	Reno 1986
Ken Burnstein	1	Reno 1974
John Crocker	1	Reno 1979
Cliff Cummins	1	Mojave 1975
Lefty Gardner	1	Reno 1976
Clay Lacy	1	Reno 1970
Brian Sanders	1	Tunica 2005
Frank Sanders	1	Mojave 1971
Mira Slovak	1	Reno 1964
E.D. Weiner	1	Lancaster 1966

Unlimited Racing Pilots Since 1964

- **214 PILOTS HAVE PARTICIPATED IN UNLIMITED PYLON RACING**

Noteworthy Pilots, In Order of their First Races, Include:

PILOT

RACE PLANE(S)

Bob Love (1964)	<i>Bardahl Special #8 (P-51D); Oogahonk Special #97 (P-51D)</i>
Darryl Greenamyre (1964)	<i>Conquest I #1 (F8F); Red Baron #5 (P-51D w/Griffon)</i>
Clay Lacy (1964)	<i>Miss Van Nuys #64 (P-51D); Super Snoopy #64 (DC-7)</i>
Chuck Lyford (1965)	<i>Bardahl Special #8 (P-51D)</i>
Lyle Shelton (1965)	<i>Able Cat #70 (F8F); Rare Bear #77 (F8F w/R-3350)</i>
Chuck Hall (1966)	<i>Miss R.J. #5 (P-51D); Section Eight #3 (P-51D)</i>
Cliff Cummins (1969)	<i>Miss Candace #69 (P-51D)</i>
Howie Keefe (1969)	<i>Miss America #11 (P-51D)</i>
Sherm Cooper (1970)	<i>Miss Merced #87 (Sea Fury)</i>
Lefty Gardner (1970)	<i>White Lit'nin' #13 (P-38); Thunderbird #25 (P-51D)</i>
Gary Levitz (1970)	<i>Double Trouble #38 (P-38); Miss Ashley II #38 (P-51D w/Griffon)</i>
Frank Sanders (1971)	<i>N232 #0 (Sea Fury); Dreadnought #8 (SF); "Race 924" (Sea Fury)</i>
Lloyd Hamilton (1971)	<i>Baby Gorilla #16 (Sea Fury); Furias #15 (Sea Fury w/R-4360)</i>

Unlimited Racing Pilots Since 1964 (Con't)

<u>PILOT</u>	<u>RACE PLANE(S)</u>
Mac McClain (1973)	<i>Escape I</i> #17; <i>Red Baron</i> #5; <i>Jeannie</i> #69 (P-51Ds)
John Crocker (1973)	<i>Miss Francis</i> #9 (P-51D); <i>Sumthin' Else</i> #6 (P-51D)
Ken Burnstein (1973)	<i>Miss Suzi Q</i> #33 (P-51D); <i>Miss Foxy Lady</i> #34 (P-51D)
John Putman (1975)	<i>Ciuchetton</i> #86 (P-51D); <i>Jeannie Too</i> #96 (P-51D); <i>Georgia Mae</i> #69 (P-51D)
Jim Leeward (1976)	<i>Cloud Dancer</i> #9; <i>Leeward Air Ranch Special</i> #9 (P-51Ds)
Don Whittington (1976)	<i>Precious Metal</i> #09 (P-51D w/Merlin, Griffon in 1988)
Steve Hinton (1976)	<i>Red Baron</i> #5 (P-51D w/Griffon); <i>Super Corsair</i> #1 (F4U); <i>Tsunami</i> #18
Dan Martin (1978)	<i>Ridge Runner</i> #7 and #20 (P-51D)
Howard Pardue (1979)	<i>Bearcat</i> #14 (F8F); <i>Fury</i> #13 and #66 (Sea Fury)
John Dilley (1979)	<i>LouIV</i> #19 (P-51D); <i>Vendetta</i> #19 (P-51D)
Ron Hevle (1980)	<i>Mangia Pane</i> #72; <i>Dago Red</i> #4; <i>Strega</i> #7 (P-51Ds)
Rick Brickert (1980)	<i>Dago Red</i> #4 (P-51D); <i>Dreadnought</i> #8 (SF); <i>Pond Racer</i> #21
Skip Holm (1981)	<i>Jeannie</i> #69; <i>Healer</i> #39; <i>Stiletto</i> #84; <i>Dago Red</i> #4 (P-51Ds); <i>Mr. Awesom</i> #97 (Yak-11); <i>Critical Mass</i> #15 (SF)
Bill Destefani (1982)	<i>Mangia Pane</i> #72 (P-51D); <i>Strega</i> #7 (P-51D)

Unlimited Racing Pilots Since 1964 (Con't)

<u>PILOT</u>	<u>RACE PLANE(S)</u>
Neil Anderson (1983)	<i>Dreadnought #8 (SF); Mr. Awesome #97 (Yak -11)</i>
John Maloney (1983)	<i>Spam Can #0 (P-51D); Super Corsair #1 (F4U)</i>
Art Vance (1984)	<i>Baby Gorilla #16 (SF); Million Dollar Baby #31 (P-51D); Speedball Alice #31 (P-51D)</i>
Dennis Sanders (1984)	<i>"Race 924" #88; Dreadnought #8; Argonaut #114 (Sea Furys)</i>
John Penny (1985)	<i>Rare Bear #77 (F8F w/R-3350)</i>
Bruce Lockwood (1985)	<i>Dago Red #4 (P-51D)</i>
Brian Sanders (1987)	<i>Dreadnought #8 w/R-4360; Argonaut #114 (Sea Furys)</i>
Bill Rheinschild (1988)	<i>Risky Business #45 (P-51D); Bad Attitude #117 (Sea Fury)</i>
Kevin Eldridge (1990)	<i>Platinum Plus #28 (P-51D); Super Corsair #1 (F4U w/R-4360)</i>
Erin Rheinschild (1990)	<i>No Business #553 (P-51D)</i>
Tom Dwelle (1993)	<i>Critical Mass #10 (Sea Fury)</i>
Brent Hisey (1995)	<i>Miss America #11 (P-51D)</i>
Sherm Smoot (1996)	<i>Czech Mate #86 (Yak-11)</i>
Dan Vance (1996)	<i>Sparky #44 (P-51D); September Pops #911 (Sea Fury)</i>

Unlimited Racing Pilots Since 1964 (Con't)

<u>PILOT</u>	<u>RACE PLANE(S)</u>
Curt Brown (1997)	<i>Voodoo #5 (P-51D); Strega #7 (P-51D)</i>
Stu Dawson (1997)	<i>Spirit of Texas #105 (Sea Fury)</i>
Michael Brown (1998)	<i>September Pops #911 (Sea Fury); September Fury #232 (Sea Fury); Bossman #1 (F7F)</i>
Robert Gibson (1998)	<i>Riff-Raff #99 (Sea Fury)</i>
Ron Baccarilli (2001)	<i>Precious Metal #38 (P-51D w/Griffon)</i>

Reno Qualifying Speed Records

<u>Year</u>	<u>Pilot</u>	<u>Aircraft</u>	<u>Airplane</u>	<u>Speed, mph</u>
1964	Bob Love	P-51D	<i>Bardahl Special #8</i>	395.46
1966	Darryl Greenamyer	F8F	<i>Smirnoff #1</i>	409.97
1969	Darryl Greenamyer	F8F	<i>Conquest I #1</i>	414.63
1971	Gunther Balz	P-51D	<i>Roto-Finish #5</i>	419.501
1973	Lyle Shelton	F8F	<i>7¼ % Special #77</i>	426.602
1974	Lyle Shelton	F8F	<i>Phoenix I #77</i>	432.252
1975	Darryl Greenamyer	F8F	<i>American Jet #1</i>	435.56
1976	Don Whittington	P-51D	<i>Precious Metal #09</i>	438.81
1979	Mac McClain	P-51D	<i>Jeannie #69</i>	446.928
1981	Skip Holm	P-51D	<i>Jeannie #69</i>	450.085
1986	Rick Brickert	Sea Fury	<i>Dreadnought #8</i>	452.737
1987	Bill Destefani	P-51D	<i>Strega #7</i>	466.674
1988	Lyle Shelton	F8F	<i>Rare Bear #77</i>	474.622
1991	Lyle Shelton	F8F	<i>Rare Bear #77</i>	475.899
1992	Lyle Shelton	F8F	<i>Rare Bear #77</i>	482.892
1995	John Penney	F8F	<i>Rare Bear #77</i>	489.802
1996	John Penney	F8F	<i>Rare Bear #77</i>	491.266
2002	Skip Holm	P-51D	<i>Dago Red #4</i>	497.787

Reno Gold Race Speed Records

<u>Year</u>	<u>Pilot</u>	<u>Aircraft</u>	<u>Airplane</u>	<u>Speed, mph</u>
Fastest Previous to Reno:				
1949	Cook Cleland	F2G	#94	397.071
At Reno:				
1964	Mira Slovak	F8F	<i>Smirnoff Vodka #80</i>	Points Only
1965	Darryl Greenamyer	F8F	no name #1	375.10
1966	Darryl Greenamyer	F8F	<i>Smirnoff #1</i>	396.221
1969	Darryl Greenamyer	F8F	<i>Conquest I #1</i>	412.631
1971	Darryl Greenamyer	F8F	<i>Conquest I #1</i>	413.987
1973	Lyle Shelton	F8F	<i>7¼ % Special #77</i>	428.155
1975	Lyle Shelton	F8F	<i>Aircraft Cylinder #77</i>	429.916
1977	Darryl Greenamyer	RB-51	<i>Red Baron #5</i>	430.703
1980	Mac McClain	P-51D	<i>Jeannie #69</i>	433.010
1984	Skip Holm	P-51D	<i>Stiletto #84</i>	437.621
1985	Steve Hinton	F4U+	<i>Super Corsair #1</i>	438.186
1987	Bill Destefani	P-51D	<i>Strega #7</i>	452.559
1988	Lyle Shelton	F8F	<i>Rare Bear #77</i>	456.821
1990	Lyle Shelton	F8F	<i>Rare Bear #77</i>	468.620
1991	Lyle Shelton	F8F	<i>Rare Bear #77</i>	481.618
2003	Skip Holm	P-51D	<i>Dago Red #4</i>	487.938



Graham White and Pete Law at Reno 2002

Photo Credits

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