

# Official Program

Second Annual AEHS Convention

Kalamazoo, Michigan

July 21 - 24, 2005

*Inventors*  
Leonard S. Hobbs  
Andrew F. B. Willgoos  
Dr. Charles S. Shelton  
*Attorneys*

## Message from the Vice President

Welcome to our second Annual Convention. Based on the success of our inaugural convention last year, the format for this year remains quite similar. Comments and suggestions have been incorporated wherever possible so keep those ideas rolling in – it's our intent to make the AEHS Convention a world class event. And with the line up of speakers we have we are well on our way to achieving that lofty goal. As with many organizations it's you, the membership, who make this organization as successful as it is.

This Convention presents another wonderful opportunity to discuss our favorite subject without being thought of as “strange” or worse yet, “anti-social”. As the significance and history of aircraft power plants becomes more prominent more emphasis is placed upon organizations such as AEHS to come through with a quality product via *Torque Meter*; the web site, forums...etc. It's with great pride that we recognize the contributions made by the membership to the above mentioned vehicles for disseminating aircraft power plant knowledge. Within our membership the collective expertise is nothing short of amazing, we are indeed fortunate to have such prominent aviation experts as members.

Being our first shot at such an event, last years convention was a learning curve. The President and I were very pleasantly surprised at the camaraderie displayed by attendees. The informal “bull” sessions proved to be extremely popular and that's not surprising considering the pent up demand for such socializing. Let's hope this year's will be as productive in that respect – there will be plenty of opportunity to swap lies and engine lore during breaks, lunches and dinners, so enjoy.

You may have noticed we have changed our focus in *Torque Meter*. Although many of our members love the “big iron”, i.e., large recipcs., we came to the realization that we were giving short shrift to gas turbines, that's why we have run more articles addressing this important type of power plant. It's also a great honor to have the world's leading builders of miniature engines contributing articles and presentation for the Convention. The jewel like precision of these little masterpieces is breathtaking. It's gratifying to see these remarkable efforts rewarded via articles and presentations.

As with last year's Convention, there may be a chance to see an engine demo run. Bill Painter has kindly looked into getting a Guiberson Diesel run-up at the Air Zoo Museum. Although AEHS is not focused on being an “engine collectors” club, it's still a fascinating aspect of one of our mission goals so if you have a running engine please consider bringing it along for future AEHS functions.

Once again, welcome to our Second Annual Convention.

Graham White, V.P., AEHS

## **AIRCRAFT ENGINES ON DISPLAY AT THE "ORIGINAL AIR ZOO" BUILDING**

1.	Allison	V-1750-111	V-12
2.	Buick-built	Liberty	V-12
3.	Buick-built	J65 Armstrong Siddeley Sapphire	Turbojet
4.	Cirrus-Hermes	Cirrus III	Inline-4
5.	Continental	A-50 (O-170)	Opposed-4
6.	Continental	E185-9 (O-470)	Opposed-6
7.	Continental	V-1650-7 Merlin	V-12
8.	Franklin	4AC150 (O-150)	Opposed-4
9.	General Electric	I-16 (J31 - Whittle Type 1)	Turbojet
10.	Hirth	HM-504A-2	Inverted Inline-4
11.	Kiekhaefer	O-15-1	Opposed-2
12.	Lycoming	O-145-B1	Opposed-4
13.	Ranger	I-440-C-5	Inverted Inline-6
14.	Ranger	IV-770-11	Inverted V-12
15.	Packard	V-1650-7	V-12
16.	Rolls-Royce	Viper (Cutaway)	Turbojet
17.	Pratt & Whitney	R-2800-34	18-Cylinder Radial
18.	Pratt & Whitney	R-4360-4 (Cutaway)	28-Cylinder Radial
19.	Pratt & Whitney	R-4360-35 (B-50 QEC on Stand)	28-Cylinder Radial
20.	Wright	R-1820-56	9-Cylinder Radial
21.	Wright	R-3350 Turbo-Compound (988TC18EA2)	18-Cylinder Radial

## **ROCKET ENGINES IN THE AIR ZOO COLLECTION (MICHIGAN SPACE & SCIENCE CENTER COLLECTION)**

(These engines are not on display at this time)

1.	Aerojet General	Stage 1 Thrust Chamber for the LR87-AJ-5
2.	Rocketdyne	A-6 Redstone Engine
3.	Rocketdyne	F-1 Saturn 5
4.	Rocketdyne	J-2 Saturn 5
5.	Rocketdyne	S-3 Atlas
6.	Solid Fuel Thrust Chamber - Titan ICBM Warhead Push Motor	
7.	Thrust Chamber - NERVA Nuclear Mars Mission Rocket Engine	

# Schedule of Events

## Thursday July 21

- 12 noon to 5:00pm Registration at the Clarion Hotel Lobby. This also presents an ideal opportunity to chit-chat and meet other Convention attendees.
- 6:00pm to 8:00pm Happy hour and socialize at Clarion Hotel bar. Light hors d'oeuvres served.

## Friday July 22

- 9:00am to 10:30am Introductions - each attendee gives a one minute bio.
- 10:30am to 11:00am Break and shoot the breeze.
- 11:00am to 12 noon Presentation - Clen Tomlinson; miniature engines.
- 12 noon to 1:30pm Lunch break. Special interest sessions.
- 1:30pm to 2:30pm Presentation - Tom Fey; propellers.
- 2:30pm to 3:00pm Break and shoot the breeze.
- 3:00pm to 4:00pm Presentation - Bud Wheeler, V-1710 overhauler.
- 4:00pm to 4:30pm Break and shoot the breeze.
- 4:30pm to 5:30pm Presentation - Jack Connors; J57 Development.
- 6:30pm to 9:00pm Dinner on your own.

## Saturday July 23

- 8:30am to 10:30am Presentation - Pete Law.
- \*9:30am to 9:40am 10 minute pit stop.
- 10:30am to 11:00am Break and shoot the breeze.
- 11:00am to 12 noon Presentation - Kevin Cameron.
- 12 noon to 1:30pm Lunch break. Special interest sessions. 20 minute overview of the P&W J58 by Pete Law.
- 1:30pm to 5:00pm Museum visit - Kalamazoo Air Zoo. This will include an informal presentation by Pete Law on the remarkable J58 - power plant for the SR-71.
- 6:00pm to 9:00pm AEHS Convention Dinner at Clarion Hotel.

## Sunday July 24

- 9:30am to 10:00am Presentation - Pete Law, informal discussion.
- 10:30am to 11:00am Break and shoot the breeze.
- 10:30am to 12 noon Auction, critique, general discussion, state of the union AEHS and good byes.

## Speaker's Biographies

### **Clen Tomlinson**

Clen is a 72 year old retired Electro/Mechanical Engineer, living in West Sussex England. He started working life as an apprentice in the motor vehicle industry. Qualified as Motor Vehicle Technician. Experience on cars, commercial vehicles, agricultural tractors and equipment, civil engineering plant and equipment, and motorcycles. He designed and built many special purpose machines, road and race cars, and bikes. Managed sports and racing car department. In the middle of this time he spent two years National Service (Draft) in the Royal Air Force where he spent 13 months, 5 days/week, 8 hrs/day in classroom being trained as Aircraft Flight and Navigation Instrument Technician. Clen learned more in that period of his life to that point! Mid sixties saw a change into scientific manufacturing - spent three years making small high speed (500k rpm) turbines and free piston engines for use in cryogenics for liquefying helium. Then took training in Education and joined large manufacturing company to set up and run engineering training school. Progressed to Group Training Manager and finally Group Personnel and Training Manager. The company designed and built large electro-magnets for atomic particle physics research. Also specialized in new manufacture and refurbishment of underwater weapons. Designed and built ion implanters for the electronics manufacturing industry. In the early seventies, joined with three other senior managers to set up new company operating in similar areas. Company developed into one of the leading magnet manufactures in the world. As Engineering Director was responsible for tendering, design and manufacture of tooling for production. Designed and built large resistive and super-conducting magnets and associated equipment for atomic particle and fusion physics research projects throughout the world. He has been involved in many projects in the USA including the Brookhaven National Laboratory, Long Island, New York, NAL, Chicago, The Super-Conducting Super Collider, Texas, Boeing, Seattle; Starwars. Always making or "improving" things including many relatively simple model engines both steam and internal combustion. In retirement he had been slowly developing his workshop and enjoying life when his wife died very suddenly some six years ago. Clen needed something to totally occupy his head for the waking hours and that is where the first complex replica, the Napier Deltic, came from. He had been thinking about it for some time! He is currently developing the prototype for a quarter-scale working replica of the Napier Sabre engine. Clen is also trying to complete the restoration/improvement of a 30 year old BMW 30Csi coupe he has owned it for 20 years! He has another BMW car and two motorcycles to look after. Clen has two grandsons to "train".

### **Tom Fey**

Tom Fey is a 48 year old father of 2, research pharmacologist, R/C designer/flyer, and amateur writer from the suburbs of Chicago. His interest in aircraft engines and aviation technology was sparked by the piston WWII fighters, the Reno air races, and a trip to the Garber facility of the NASM. No turning back, he subsequently joining the EAA, Society of Air Race Historians, AEHS, and subscribes to 107 lbs of magazines per year. Tom is an autograph hound (test pilots, aircraft designers, aces), has written three articles on hollow-shafted, constant speed propellers for *Torque Meter*, and is currently researching contra-rotating propeller technology while cleaning up a tired Wright R-3350 power recovery turbine for display. He is also lucky, having flown in the jumpseats of two different P-51 Mustangs completely by chance.

### **Kevin Cameron**

Harvard educated Kevin Cameron is probably best known as a motorcycle journalist. He has been the technical editor of *Cycle World* for many years where he enjoys an enthusiastic following of fellow gear heads. Kevin is renowned for explaining the most complex issues in layman's terms – a good indicator that he has a thorough grasp of all things technical. Many people do not realize that Kevin's technical knowledge goes far beyond motorcycles; he is equally conversant in aviation matters. AEHS is indeed fortunate to have such a talented individual as a guest writer for *Torque Meter* and as a speaker at our convention.

# Speaker's Biographies

## **Jack Connors**

Jack graduated from MIT in 1948 with a BS and MS in Mechanical Engineering. He reported to Pratt & Whitney in 1948 where he joined the turbine design and research group. Very soon he became a member of the aerodynamic and mechanical design team for the high and low turbines in the J57. His subsequent career included 25 years in Engineering, 3 years in Domestic and International (Europe) Marketing and 7 years in Program Management. Retirement came in 1983. As a volunteer retiree Jack became Engine Curator at the New England Air Museum and also worked with fellow retiree Jesse Hendershot in the Pratt & Whitney Archives. For about six years Jack worked on putting together the history of P&W. Finally P&W contacted the American Institute of Aeronautics and Astronautics and assured the organization that P&W is behind the book. The P&W President will write a Foreword.

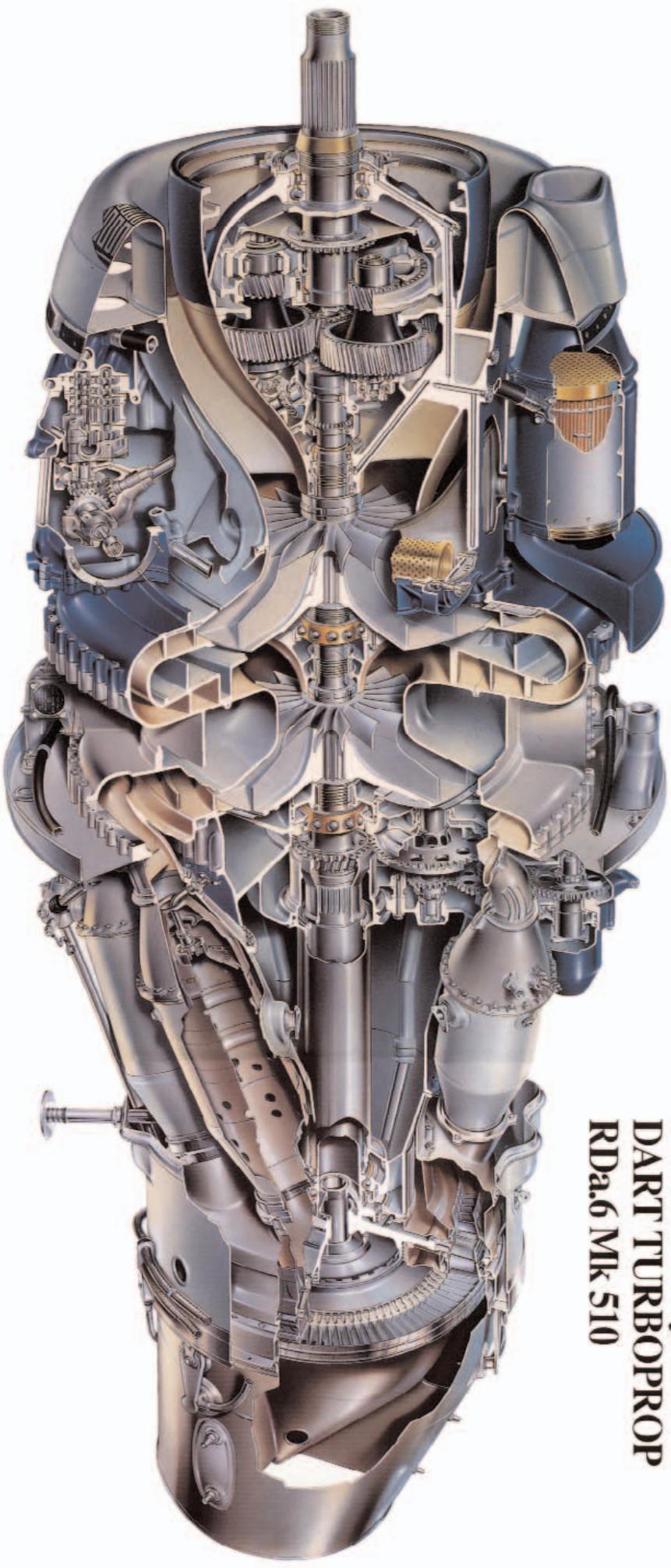
In WWII Jack was a meteorologist (weather officer) in the Army Air Corps. In off hours he used to roam through the engine maintenance shops. The maintenance officers invariably told him that Pratt & Whitney engines were the best. That is what pointed him in the direction of East Hartford in 1948.

## **Pete Law**

Pete has enjoyed a fascinating career – primarily working in Lockheed's famous "Skunk Works". The first post-1949 Thompson Trophy Unlimited Class air race was held in Reno in 1964. Shortly after this inaugural event Pete became involved in Daryl Greenamyer's Bearcat project. Fellow Skunk Works engineer Bruce Boland was also involved. With these two brilliant engineers there is little wonder that Greenamyer's Bearcat quickly established itself as the world's fastest piston engined aircraft. It was on this project that Pete cut his teeth on systems such as cooling, carburetors, water injection systems, ram recovery designs...etc. Within a few short years Pete became indispensable on the Reno ramp as he was barraged with requests from racers on engineering problems. It would be impossible to list all of Pete's accomplishments in this brief bio but suffice to say he was intimately involved with aircraft such as the Red Baron RB-51, Super Corsair and Tsunami. It is indeed a privilege and honor to have Pete as one of our guest speakers.

## **Bud Wheeler**

Bud Wheeler is a master engine builder, licensed A&P, and the President of *Allison Competition Engines (ACE Allisons)* in Latrobe, Pennsylvania. After fifteen (15) years of rebuilding Allison V-1710 engines he was asked to provide the Allisons for the Santa Monica Museum of Flying new-manufacture YAK-3 program. This became the beginning of Mr. Wheeler devoting his full-time to aviation and the support of the Allison V-1710. Now fifteen years later, his many satisfied customers from around the world know his passion and expertise with the Allison engine, as his is the only strictly Allison overhaul shop in the world. There he provides the only cylinder-bank restoration facility for V-1710s, including installation of nu-chrome cylinder liners that he pioneered, liners that result in outstanding engine performance and reliability. ACE's extensive inventory of engine parts is used to overhaul the complete range of Allison V-1710 models, including the V-3420 and long-nose V-1710-C15. Overhauled V-1710 engines are run on the only completely instrumented test-cell, providing comprehensive engineering data on air/fuel ratio, exhaust gas temperature, and horsepower. Mr. Wheeler provides thirty years of experience to the Warbird owner-operator community and will be addressing the conference on his experiences building reliable Warbird engines.



**The Rolls-Royce  
DART TURBOPROP  
RDa.6 Mk 510**

*(Drawing Courtesy of Rolls-Royce Heritage Trust and Richard Haign)*