



THE VINTAGE AIRPLANE

DECEMBER 1982



(Ted Koston Photo)

MR. MULLIGAN

By Gene Chase

(Photos by the author except as noted)

Over the years at Oshkosh, and before that at Rockford, many outstanding aircraft have been admired, drooled over, photographed, and fallen in love with. From the warbirds with their brute power to the smallest of the sleek homebuilts, superlatives have been bandied about with aplomb.

If all the superlatives were rolled into one and used to describe a single aircraft, one would be hard pressed to come up with a plane other than the *Mr. Mulligan* parked in the antique/classic area at Oshkosh '82. It has the brute power of at least the T-6s on the warbird line; it's a 1933 design, and from the ground up it's a homebuilt . . . all 2,800 pounds of it.

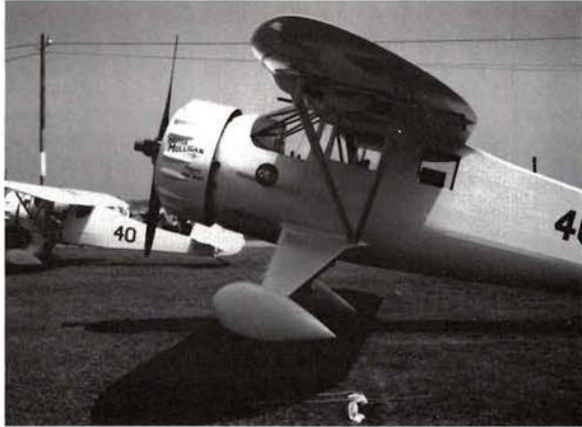
This beautiful replica of Benny Howard's famous racing aircraft of the '30s was built by the Younkin brothers, Bob and Jim of Fayetteville, Arkansas. It received one of the top honors at Oshkosh '82 when it received the Grand Champion Replica Award.

The original *Mr. Mulligan*, designated the DGA-6, was the fourth of a series of racers by Benny Howard of Kansas City. He met with good success on the racing circuit with his previous three planes, the DGA-3 *Pete*,

DGA-4 *Mike*, and DGA-5 *Ike*. But Benny wasn't satisfied with the limited use of pure racing aircraft and being a great admirer of the sprightly little *Monocoupe*, figured that a four-place version of the 'Coupe with lots of power would be a winning combination at the National Air Races and also have commercial value as a passenger plane.

His foresight is legend as in 1935 Benny won the cross country, Los Angeles to Cleveland Bendix Trophy Race in *Mr. Mulligan* and Harold Neumann flew it to first place in the closed course Thompson Trophy Race. Shortly after the races, the Howard Aircraft Company was started for the purpose of producing the commercial version of *Mr. Mulligan*. Thus spawned the line of elegant Howard airplanes of which a few DGA-11s and several DGA-15s are still flying.

The *Mulligan* was a natural for Bob and Jim Younkin to build, with Bob's love of Howards - he owns a beautiful DGA-11, and Jim's affinity for 1930's racers - he built the magnificent Travel Air Mystery Ship replica which was seen at Oshkosh in '79 and '80. However they would not have built the *Mulligan* if it hadn't been for the tragic accident of the replica *Mr. Mulligan* built by Bob Reichardt (EAA 58835) of Ojai, California. (In their words, "The world doesn't need two *Mr. Mulligans*.") Bob and his wife, Shelly were killed in the crash of their



Harold Neumann's D-145 Monocoupe "Little Mulligan" (left) and the replica Mr. Mulligan bear a striking resemblance.

(L-R) Jim Younkin, Harold Neumann and Bob Younkin moments after the arrival of the Mulligan at Oshkosh '82.



(Ted Koston Photo)

The expressions of Harold Neumann (L) and Bob Younkin say it all.

AT OSHKOSH

replica on 10/25/77 while attempting to break a world class speed record.

The Younkins started building the plane in November, 1979, after gathering as much information on the original as they possibly could. They utilized Paul Matt's "Historical Aviation Album - Volume XIV" to a great degree and determined that Paul's three-view drawings are very accurate. They also met with Eddie Fisher in Kansas City who was involved with the original *Mr. Mulligan*. Eddie, in addition to possessing a wealth of knowledge about the plane, also shared his photo collection with the Younkins. Other photos which were a great help came from the collection of Pappy Weaver in Patterson, Louisiana.

By using known dimensions and scaling photographs, Jim was able to make many drawings for later use. When he was satisfied with an authentic outline of the *Mulligan*, he began to lay out the tubular structure of the fuselage, making only minor departures from the way Howard built it. The plane is really rugged, with $\frac{7}{8}$ " .049 top longerons and lower ones of 1" .049.

Another source of information (and some parts) came from two Howard fuselages the Younkins had on hand, a DGA-8 and a DGA-15. The first commercial model Howard was the DGA-8 and the tubing sizes in that fuselage were very similar to the *Mulligan*. Jim noted that all tubing sizes in the 15 were increased, making it a

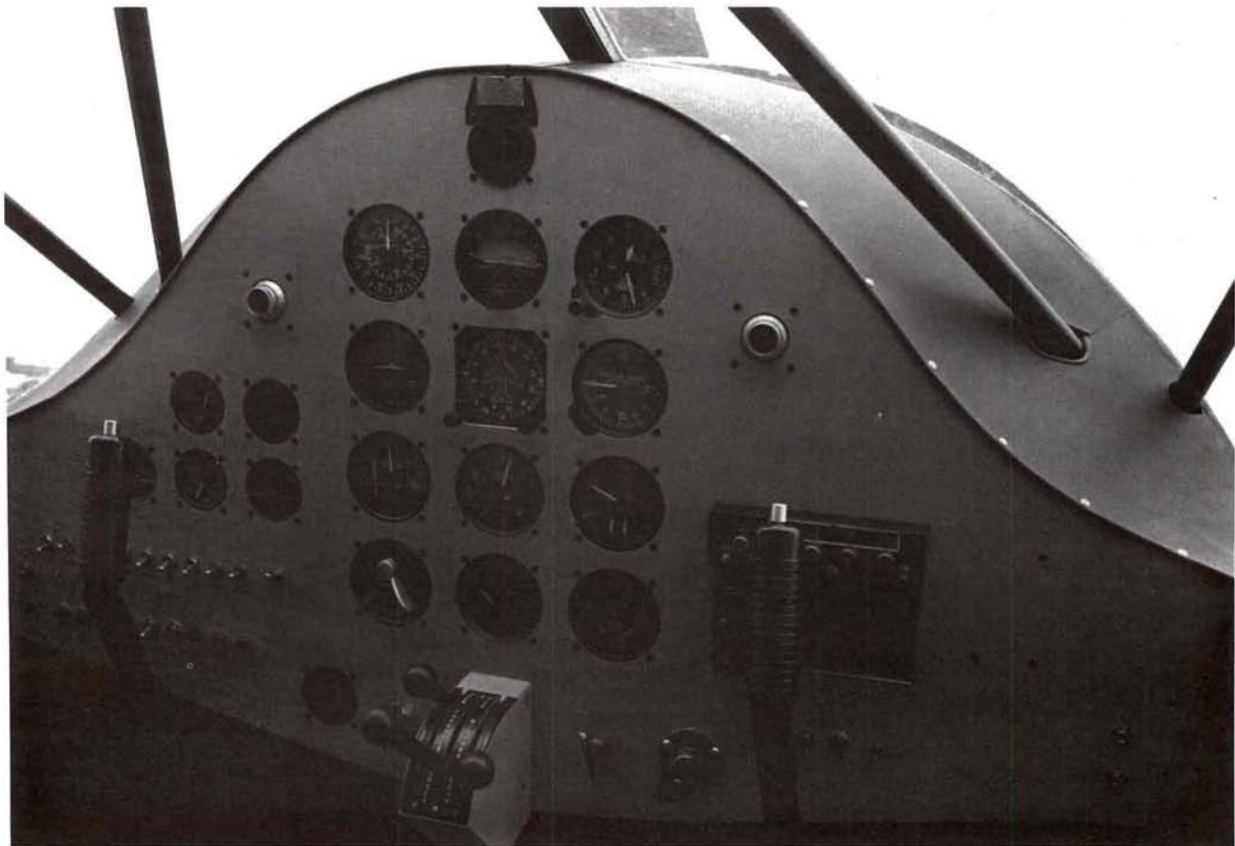
very heavy plane.

Before Bob started to weld up the fuselage he and Jim asked their friend, John Berwick, Chief Aeronautical Engineer for Cessna Aircraft Co., Pawnee Div. at Wichita, Kansas to run a stress analysis on the tubular structure. John, a longtime supporter of EAA (his membership number is 10100) determined that the required sizes could be considerably smaller . . . but for authenticity the original sizes would be used.

Some of the components used from the DGA-15 fuselage were the trim mechanism, the rudder pedals, wing attach fittings, and the carry through tube at the bottom of the fuselage which had to be shortened about six inches. All of the woodwork on the fuselage was done by Bob Bell, a protege of the Younkins. Bell's efforts would show up throughout the construction of the *Mulligan* as he gained valuable experience in both wood and metal work.

The DGA-15 wing struts were used by shortening them at the top ends. The wood wings, ailerons and flaps were built from scratch by Jim, Bob, and a friend, Howard Vetter. Many of the DGA-15 wing fittings were used, by grinding off all the welds and re-welding them to match the different dimensions of the *Mulligan* wings. The distance between the spars on this airplane is 33" compared with 36" on the -15. The wing span of the *Mulligan* is 31'8" while the -15 is 38'0", and the front spar is thicker.

Another item used out of the '15 was the lord mount. The engine mount on the original *Mr. Mulligan* was welded solidly to the fuselage, but the Younkins didn't care to be *that* authentic with their replica! This change



(Ted Koston Photo)

Mr. Mulligan instrument panel. Push to talk buttons for the radio and intercom are on the top of sticks.

assures a smoother flight and it greatly facilitates removal of the engine when necessary.

The original *Mulligan* and early commercial Howards had manual flaps with the actuator handle located near the pilot's left leg. Later on when the flaps were powered electrically the cables were not re-routed although it would have been much simpler to place the motor and cable system in the fuselage behind the cabin. The Younkins did just that because they wanted electric flaps and also wanted the additional weight aft to help keep the CG within limits. Their flap system utilizes a Howard DGA-15 bell crank but they had to make all the bracketry to mount it.

The Younkins are perplexed about the flap operation in their replica. The system incorporates the same spring as used in the '15 to keep the flaps from lowering at too great an air speed. In the new *Mulligan* this spring allows the flaps to fully lower *only* after touchdown during landing roll-out. In the commercial Howards it works normally and those flaps are even larger! The availability of only partial flap during landing approach has not been a problem, however.

The flaps on the original *Mulligan* were attached with piano hinges at the top. The leading edge was squared off and an aluminum gap seal installed at the bottom. The flaps on the replica are hinged at the bottom similar to those on the production Howards.

The ailerons on the replica are piano hinged on top per the original, but instead of being squared off at the

leading edge, these have the lower leading edge extended forward. When the aileron is raised, the leading edge protrudes below the lower wing surface making the aileron response very light rather than heavy as reported on the original.

Speaking of the flight characteristics of the original Howard DGA-6 *Mr. Mulligan*, the Younkins have enjoyed extensive conversations with Harold Neumann whose name is synonymous with that beautiful racing aircraft. Harold is also an ardent EAAer (membership no. 29004) and at age 76 he actively competes in IAC aerobatic competitions with his well known Monocoupe named "Little Mulligan" and painted to resemble the original. Harold is a retired TWA captain living in Leawood, Kansas and he vividly recalls his flights in *Mr. Mulligan* back in 1935.

Harold had an opportunity to fly the replica *Mulligan* recently with Jim Younkin and after a few minutes his emotions took over and an impromptu (but beautiful) slow roll occurred! 'Nuff said.

Getting back to the replica, the elevator trim system is an exact copy of that used in the original racer and the commercial Howards. It consists of a jack screw which raises and lowers the leading edge of the stabilizer and operated by a crank on the cabin ceiling.

Some people find it ludicrous that such a large aircraft would have a fixed, non-steerable tailwheel. The original did because of the minimum drag it created, being faired in so tightly. The replica does because it's authentic and

Jim gasses the fuselage tanks.

The complete lettering appears on the left side of the engine cowling . . . see story.



it would destroy the character of the plane to jerry-rig any type of a steerable wheel.

Harold Neumann recalls this feature created no serious ground handling problems with the original and Jim and Bob feel the same way about the replica. They turn the plane on the ground by holding differential brake pressure and increasing power very judiciously until the tailwheel skids around. They take care to not raise the wheel which could result in a damaging side load when the wheel impacts the ground. The plane handles easily on grass, but on concrete greater precautions are taken to minimize wear on the tailwheel tire. The landing shock on the tailwheel is absorbed by a shock strut from a DGA-15 whereas the original had a shock assembly of rubber discs.

The engine in Benny Howard's *Mr. Mulligan* was an experimental P&W Wasp SE with a 14:1 blower, rated at 500 hp at 1,000 feet, turning 2200 rpm and burning 87 octane fuel. The propeller was a Smith electric with controllable pitch. By altering the carburetor, using hopped up fuel and over-revving the engine, Benny was able to pull over 800 hp from the Wasp. These techniques are still used today to gain more power for racing.

The Younkins chose a dependable P&W R-1340 AN-1 with a 10:1 blower to power their *Mulligan*. It is rated a 600 hp and swings at Hamilton Standard constant speed prop. This is the same power package as used in AT-6s.

The original racer cruised at 290 mph at 17,000 feet using 75% power. The replica does a respectable 235 mph cruise at 11,000 using 25" M.P. and 1,800 rpm. Jim said their flight from home base at Springdale, Arkansas to Oshkosh was made in 2 hrs. 35 min. with not much help from the wind.

The replica is capable of well over 2,500 fpm rate of climb, but a comfortable cross country climb is 1,000 fpm indicating 160 mph. Harold Neumann recalls the original climbed over 5,000 fpm . . . not bad for a high wing cabin monoplane!

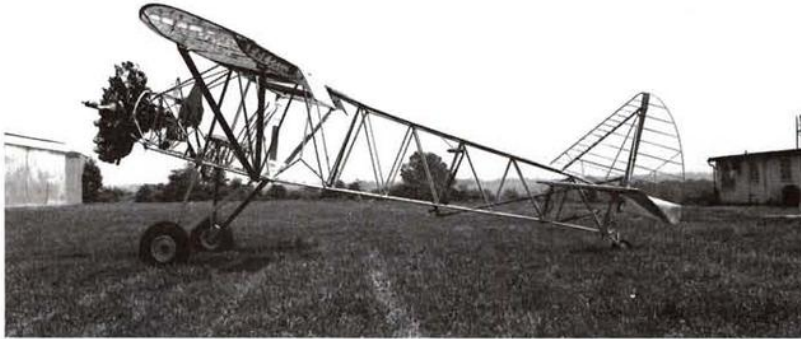
Many hours were spent re-creating the authentic look of the '35 *Mulligan* from the firewall forward. The engine mount was created from a DGA-15 mount and the nose bowl from the engine cowling of the same plane. The front four inches of curvature on the nose bowl were nearly identical with the original but that's where the similarity stopped.

After the forward section of cowling was cut off, it was step rolled so a skirt could be attached to it. Next Bob and Jim carved a wooden male pattern of one-ninth of the cowling and added two wooden streamlined bumps, filling out the radii with modeling clay. Next, a female impression of that was made in concrete.

Then nine skirt sections were cut out, with openings cut for the bumps, and vees cut in the sides. Each section was drawn together and the vees welded, resulting in the approximate curvature of one-ninth of the cowling circumference. The next step was forming the final com-



Jim (L) and Bob Younkin with their replica *Mr. Mulligan* at Bob's Razorback field at Fayetteville, AR.



The *Mulligan* stands tall.

pound curve with pressure of the wooden male pattern into the concrete. The bumps were then formed individually and welded into place.

They admit that far too much work and time went into the bump cowl. They would have been better off to have made a pattern and hydroform tooling for the nine sections. Then spare cowling pieces could easily have been made if needed in the future.

No one can deny the bump cowl is truly a work of art, and one of the outstanding characteristics of the *Mr. Mulligan*. All the fairings, which also give the plane so much character are also made of aluminum.

The only fiberglass on the plane is the wheel pants and for two good reasons: the Younkins feel it makes a better self-supporting rigid structure and repairs or replacement would be easier as the molds have been saved.

The replica is covered with Dacron fabric, finished with dope and final coats of acrylic enamel. All plywood surfaces, including the ply-covered wings are covered with 1½-ounce fiberglass cloth and polyester resin. These areas were finished with primer coats and acrylic enamel.

The brothers ran into an interesting problem in covering this airplane which they hadn't encountered before, namely the transition from fabric to the wood structures. The fabric on the fuselage is glued to the wood with an overlap of about three inches. Then the fiberglass is extended back over the fabric and covered with Featherfill to give a nice smooth transition.

A mystery that still hasn't been solved is the method

of getting in and out of the cabin door of the original plane. No photographs available to the Younkins provide the answer and Harold Neumann doesn't remember. The door sill is above Jim's waist and he's 6'1"! Anticipating this problem while the fuselage was being framed, a vertical tube, strongly supported was welded to the lower longeron, extending up flush with the bottom door sill. Then a steel tube step was welded up which plugs into the tube and can easily be lifted in or out. Authentic or not, this system works great.

The fuel capacity is 130 gallons carried in two wing and two fuselage tanks. Neither of the fuselage tanks extend below the floor for safety reasons (although there is ample space in the half round belly created by plywood formers). One tank is beneath where the rear seat would be if it were installed and the other is beneath the baggage compartment. Incidentally, the rear seat is not in place because the insurance rate on a two-place homebuilt aircraft is considerably less than on a four-place. The Younkins felt the 130-gallon capacity would be ample for their needs, while Benny Howard carried over 300 gallons in his plane in anticipation of flying non-stop in the Bendix Trophy Race from Los Angeles to Cleveland.

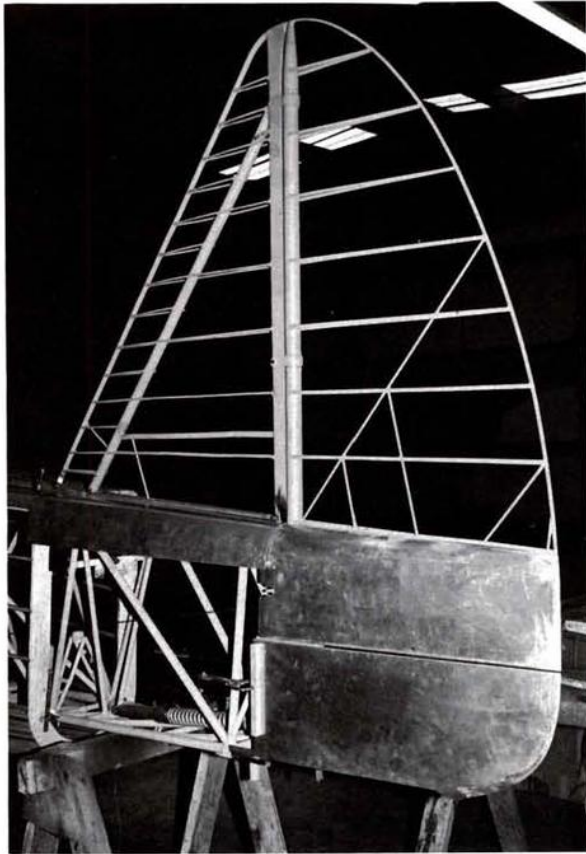
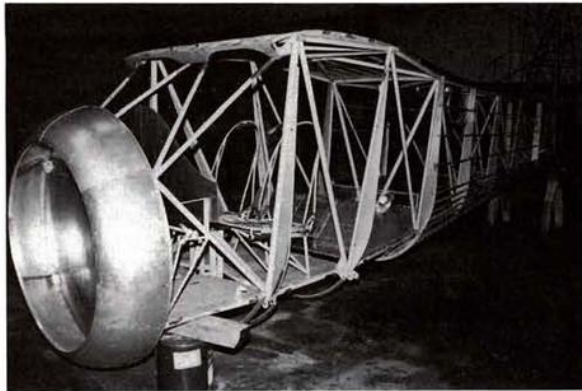
Benny's *Mulligan* had a huge 30-gallon oil tank installed as oil consumption was higher in those days. It was located above the baggage compartment area and the replica's 10-gallon oil tank is also there.

The Cleveland wheels and brakes installed on the replica necessitated a slight bulge in the inside of each



The instrument panel, cockpit controls and seats are in place.

The fuselage takes shape with wood formers and stringers in place.



Aft fuselage fairings being fitted. The bottom fairing below the rudder encloses the fixed tail wheel.

wheel pant to accommodate the brakes. That's considered a worthwhile trade-off because all parts are new and easily replaceable. The system includes a ¾" Cleveland master brake cylinder. The 7.50 x 10 tires are identical in size to the original plane.

Because they plan to use their *Mr. Mulligan* replica extensively, the Younkins installed modern instruments and electronics. Since Oshkosh '82 they have installed an auto pilot servo for the ailerons and a spring system rudder trim. Both of these devices should be helpful on long cross country flights because the rudder is extremely sensitive at cruise speed and the aileron trim requirement varies noticeably with changes in airspeed.

The big year for Benny Howard's *Mr. Mulligan* was 1935 so the paint scheme on Younkins' replica represents that period in time, except for the following: after painting "Powered by P&W Wasp" on the left side of the cowling they decided the right side which contained only "Mr. Mulligan" was much prettier so they left it that way. Also, the lettering on both landing gear legs relating to "Hill Streamliners" and "Goodrich Tires" was left off because the plane was "beginning to look like a sign board."

When asked how this beautiful airplane flies, both Bob and Jim agree, "like a dream." They say it's very responsive with light control pressures and a rapid roll rate. It easily indicates 200 mph in cruise and handles beautifully at 80 to 90 in the traffic pattern. They three-point the plane and it lands very short. With the long tail

moment and fixed tailwheel, it exhibits no bad tendencies on the ground.

Visibility is described as adequate, and the taxiway or runway centerline can be seen about 200 feet ahead while taxiing, which is better than many of the old open cockpit biplanes.

One problem they've encountered is high oil temperatures during taxiing and prolonged slow flight. Air for the oil cooler is taken from both sides of the number one cylinder through ducts, and it works great most of the time. Because of this oil temperature problem, the *Mulligan* was flown only once at Oshkosh. That flight was made in the fly-by pattern with Harold Neumann flying formation with his "Little Mulligan." That was a rare and nostalgic sight indeed!

The continuous crowd around the *Mr. Mulligan* replica at Oshkosh '82 certainly indicated its great popularity. The many photographers had a difficult time lining up a clear shot of the big white airplane. With Jim and Bob Younkin fielding questions from the constant crowd, and the "detail lookers" pressing in close, the level of activity was always high during the five days of *Mulligan's* attendance. In short, it was a star attraction.

Editor's Note: Bob Younkin (EAA 68509, A/C 1729) and Jim Younkin (EAA 93967, A/C 1647) are avid antiquers and they have quite a stable full of aircraft including: Stinson SM-8A, Travel Air D-4000, Howard DGA-11, FM-2 Wildcat, AT-6, Stearman, Travel Air Mystery Ship replica, Mr. Mulligan replica, and others.