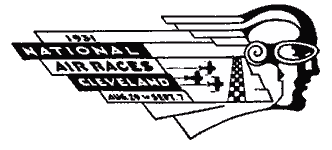
**Laird Super Solution**



The Laird "Super Solution" was designed and built for the Cleveland Speed Foundation. It was not an entirely new design as E. M. "Mattie" Laird's racers had made a fine showing at the 1930 Chicago National Air Races. This included Speed Holman winning the Thompson race in a Wasp Jr. powered Laird "Solution", and two other Laird Speedwings, Cirrus and Chevelair powered respectively.



Work began on the Super Solution LC-DW500 the 8th day of July, 1931 and was test flown on the 22nd of August, 1931. The test flight was made by "Mattie" Laird at Fishborn Field in Chicago, near the Laird Factory. Laird said that very few changes or adjustments were needed before the ship was turned over to Jimmy Doolittle. Visible changes were smaller horizontal stabilizers and elevators and the wing strut fairings. Normal struts appeared on the ship during the test (see photos) with "I" struts being added later.

The LC-DW500 (LC-for Laird Commercial; D-for series; W-for engine (Wasp); and the 500 for horsepower)  as fitted with complete instrumentation for cross country and blind flying, which made it about 200 lbs. heavier than the 1930 Laird Solution (LC-DW300). Because of the -monoxide fume trouble encountered by Holman in the "Solution", the Super Solution featured a new fresh air system. This consisted of two vents placed at the leading edge of the top wing, well outside the range of engine exhaust, which channelled fresh air into the cockpit. The streamlining was carried out more thoroughly with a completely enclosed cockpit consisting of three members. The upper member was mounted on a track and moved fore and aft to make contact with the headrest. The side members were hinged about halfway down the side of the fuselage with the upper edge forming part of the track on which the upper member moved.

The landing gear was changed considerably with the rigid aerodynamic cross member eliminated and a tension wire substituted at the top of the wheels. Two Cleveland pneumatic struts were used for each wheel permitting a maximum shock travel of 4 in. The wheels and struts were completely streamlined which increased the high speed performance considerably. The landing gear tread was 4 ft. 5 in. The ship was equipped with 650xlO Aircraft Products wheels. These wheels. were used during the Bendix race and also the Thompson race. It had been planned to use 20x4 wheels and smaller wheel pants during the Thompson but time did not permit the change.

A direct drive engine was used for the Bendix race and it was planned to install a geared engine for the Thompson, but again time did not allow this change to take place. The direct drive engine used a prop of 8 ft. 3 in., while the geared engine used a 9 ft. prop. The engine turned 2400 rpm with the direct drive as opposed to 1600 rpm with the geared drive. Later the geared engine proved to be 30 mph faster than the direct drive.

The empty plane weighed 1580 lbs. and grossed 2482 lbs. fully loaded, giving a wing loading of 27.16 lbs. for every square foot of its 112 sq. ft. of wing. The span of the upper wing was 21 ft. and 18 ft. for the lower wing. The length was 19 ft. 6 in. Fuel capacity was 112 gal. and oil capacity 11 gal.  
The fuselage of the Super Solution was painted a brilliant green with the wings and horizontal tail surfaces a bright yellow. The wheel pants were trimmed in yellow and the racing number "400" was painted on the sides of the fuselage and the under surface of the lower wing. Named the "Sky Buzzard", the plane was a picture of speed in motion and had a top speed of 265 mph.

The year 1931 marked the first running of the Bendix Trophy Race. Vincent Bendix offered the trophy to the winner of the cross-country race from Los Angeles to Cleveland, with additional prize money for a new transcontinental record. The race had been run in 1929 and 1930 but under National Air Race Management sponsorship.

On the morning of September 4, 1931, eight pilots warmed up their powerful racing planes at Burbank Airport, Los Angeles for the swift dash to Cleveland. Jimmy Doolittle was first off in his Super Solution. He hauled the tiny plane into the air after a short run of 500 ft. and roared through the early morning darkness of Cajon Pass. A quick stop at Albuquerque and Kansas City for fuel and he was screaming toward Cleveland. Landing well ahead of the second place aircraft, he hurriedly took on fuel and pointed the Sky Buzzard toward Newark. His wheels touched the ground at Newark 11 hours, 16 minutes and 10 seconds after take-off from Burbank, clipping 1 hour and 8 minutes off of Frank Hawk's record. His average speed to Cleveland was 223 mph and 217 mph for the 2450 mile coast to coast flight.

At Newark he refuelled and streaked back to Cleveland. Time did not permit the changes planned for the Thompson so the Super Solution ran with the same configuration as it had in the Bendix. Doolittle was running second to Bayles in the Gee Bee Z when a loss of power forced him from the race. Upon investigation it was found that a piston in the Wasp Jr. had been scuffed.

After the 1931 races, Jimmy Doolittle and the Shell Oil Co. decided to have the Laird Super Solution modified with a retractable landing gear. The modification was done at Wichita, Kans., and was completed in August of 1932. The plane was completely remodelled with new wings, new control surfaces, a modified fuselage and retractable gear. A new semi-bubble canopy which protruded above the top wing was installed to improve the visibility. The gear retracted vertically upward into the fuselage where the wheels were flush with the under skin surface. The fuselage aft of the canopy was much deeper in order to fair in properly with the raised canopy. The sides of the cockpit down to the upper longeron were transparent so that visibility in all directions was good except where it was blanked out by the wings

The plane was painted a bright yellow with red tail surfaces and a red nose cowl. There was a large Shell insignia on the nose cowl and a larger one on the vertical tail with the plane's license inside it. The No. 400 on the plane's sides had a jagged streak of red lightning slashing through it diagonally. Unfortunately, on the first test hop August 23, 1932 the gear failed to come down after being retracted. Jimmy made several attempts to lower the gear but finally had to belly the ship in. The landing was good but the aircraft was damaged too badly to be repaired in time for the National Air Races. Shortly after this Doolittle was chosen to fly the Gee Bee R-1 at the Nationals.

Parts of the Super Solution and the Solution appeared in an aircraft in 1937. This ship carried the license number of the Solution and still sits in a hangar in Carolina. (Parts of this article were taken from a story by Mattie Laird that appeared in the October 1931 issue of Aero Digest.)

THE SPORT OF air racing in 1931 was entering what had come to be called its Golden Age, an age short in time -it would last only a decade-but an age intensely long on memory. It was an era noted for its colour and competition, an era of the individualist when designers and pilots alike often put all they had, every dream and every dollar on one airplane.

In this era the little racer served as proving grounds for many new techniques, its wings carried the faith of the future, the 50 feet of air space between it and the pylons became the wind tunnel. The country was in the depths of a depression. Money was hard to come by and only the dedication of a few kept aviation progressing at all.

Prompted by the Laird "Solution's" triumph in the 1930 Thompson Trophy Race, the Cleveland Speed Foundation ordered from the Laird Co. a new and faster "Solution"-a "Super Solution". Thus the Foundation indicated their support of a bigger and better National Air Race in 1931. Even in mid-depression such an affair should promote a real financial stimulus.

During a trial speed run in mid-1931 the ailerons and a good sized piece of right wing tore off Jimmy Doolittle's freshly rebuilt Travel Air "Mystery S." Jimmy was saved by parachute but the plane was lost, apparently because of an overbalance of its new Frise ailerons. He had hoped to enter the "Mystery" in the National Air Races but its loss made him available to pilot some other races. The Speed Foundation immediately secured his services to fly a new Laird.

Jimmy Doolittle, then just 34 years old, was already a legend in aviation. His reputation in the field of high speed, cross-country and aerobatic flying was world renowned. He had established an enviable record during his 13 years in the Army Air Service, earned a Sc.D. degree at M.I.T. in record time, won the 1925 Schneider Trophy Race and set a world speed record in the Curtiss R3C-2 floatplane. Resigning from the Air Service in 1930 as a Major, Doolittle accepted a position with Shell Oil Co. as director of its aviation department. He was already a pioneer in blind flying techniques and precision aerobatics. There was no question the Cleveland Speed group had picked the best man to represent them at the controls of their "Super Solution".

The "Super Solution" was simply a refined and more powerful version of the 1930 "Solution". It was the contention of both Matty Laird and his chief engineer, Raoul J. Hoffman, that with refinements and added power the same basic design could be faster than any plane scheduled for entry in the forthcoming National Air Races. Moreover, acting on Doolittle's request, they became convinced they could make it suitable for both the transcontinental Bendix race and the closed course Thompson Trophy Race. Because of the entirely different flying demands, few aircraft designs were ever suitable for both competitions.

Laird's answer was to design the "Super Solution" to accept two different versions of the same engine, the Pratt & Whitney Wasp Jr., so successful in the "Solution".

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| **Manufactured by: Power: Cylinders: Displacement: Weight: First manufactured:** | Pratt and Whitney 450 h.p. @ 2300 r.p.m. 9; radial; aircooled 985 cu. in. 668 pounds 1929 |

They would use a geared Wasp for the full out power demands of the Thompson race and a direct drive version for the high altitude and steady power needed in the Bendix.

Both engines were specially modified versions of what later became well known as the standard 420/450 hp P & W R-985 Ol the civil model Wasp Jr. S2A which was then commercially rated at 375 hp. However, for racing in which engine life was not a principal factor, the popular Wasps were often over-boosted and used "doped" fuel with a high lead content. The "Super Solution's" engines differed from stock by using high compression pistons and doped fuel. Laird was willing to risk engine failure and short engine life, but in return both of the engines developed well over 500 hp.

In fact, the direct drive Wasp delivered 510 hp at 2400 rpm driving an 8 ft. 2 in. propeller, while the 3:2 geared engine, swinging a 9 ft. propeller, could develop up to 560 hp (according to Doolittle's later report. P & W rated it at 525 hp). The geared engine also ran much cooler than the direct drive model.

Work began on the "Super Solution" July 8, 1931. Construction went forward with a minimum of delay since most of the major components were identical to the previous year's "Solution" racer. Since the air races were scheduled two months later ~ over the Labour Day holidays the first weekend of September, the "Super Solution" did not undergo the 21 days crash program as had the "Solution".

Within six weeks, on August 22, the green and yellow racer was rolled out for flight tests. She looked like an entirely different plane, yet her wings, tubular fuselage framework, engine mount, and tail surfaces were all identical to the "Solution's".

Doolittle, writing later, remarked that he made the first flight "from the old Aero Club Field, south of the Chicago Municipal Airport. Laird felt or hoped that the high speed would be around 300 mph." The P & W geared Wasp Jr. had been installed for the first flight, its big 9 ft. Hamilton-Standard adjustable propeller set at 37 degrees pitch at the 42 inch station. Doolittle continued, "The airplane ran about a mile and a half before it could be pulled into the air and then flew about two miles more before it picked up sufficient speed to come under complete control. In succeeding flights the propeller pitch was reduced 5" and the take-off was satisfactory though the engine over-revved somewhat. Clearly a case where the controllable-pitch propeller would have solved everything.' There did not seem to be any appreciable torque resulting from the large propeller and geared engine except an acceleration torque when the throttle was moved quickly."

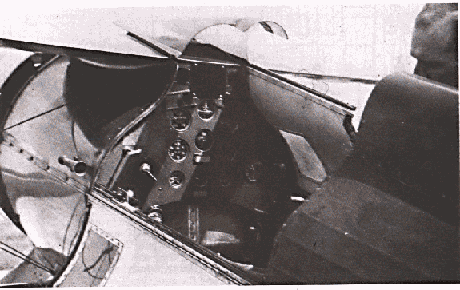
Both Jimmy Doolittle and Matty Laird made several test flights over the next few days. The plane proved stable longitudinally and laterally but extremely unstable directionally. This directional hunting increased with speed and Doolittle reported it was barely manageable at speeds in excess of 200 mph. Raoul Hoffman pinned the cause on too much "fin area" forward of the c.g., the culprits being the longer NACA cowl used on the geared engine, the large wheel pants, and the fairing fillets used between the landing gear struts. After removing the wheel pants and strut fairings she flew beautifully -but the unclothed under-carriage now caused unwanted drag. To correct the problem the fin and rudder were increased in height about 9 inches, and the wheel pants  reinstalled.



Writing in Racing Ramblings, Doolittle commented, "Although the pilot sat on 50 Ibs. of lead shot the airplane was so stable longitudinally that it was difficult to get the tail down in landing and the plane landed fast." In later tests with the direct drive engine and the 8 ft. 2 in. propeller the plane weighed about 75 lbs. less and the landing speed was nearly 5 mph slower.

The LC-DW 500, (LC-Laird Commercial, D-series, Wasp engines, and 500 horsepower) was fitted with complete blind flying instruments. Doolittle, of course, was an old hand at blind flying and would use this experience in the Bendix race.

Vincent Bendix, pioneer in the aviation and automotive industries, inventor of international prominence, and President of the Bendix Aviation Corp., sponsored the Bendix Trophy Race with a view to encouraging transcontinental air travel. The race was an open competition from Burbank, California, to Cleveland, Ohio, and stimulated developments in all-weather flying, communications, and navigation. There had been transcontinental air races in 1929 and 1930 under sponsorship of the National Air Race Association, but these were mere sporting events offering little or no prize money. The Bendix suddenly made it lucrative with a purse of $17,750 plus a gold replica of the Bendix Trophy, second, $3,750 with a silver trophy replica, third, $2,500 with a bronze replica, fourth, $1,500 and fifth, $750. An additional $2,500 would go to the pilot who on the same day completed the flight from Cleveland eastward to Newark to establish a true transcontinental speed record.



It was no surprise when eight entries showed up for the running of the first Bendix race on September 4, 1931. Flood lights rimmed the ramp and hangar area at Burbank's Union Air Terminal as the racers were groomed to start. Of the eight racers, six were Lockheed's (three Altairs, two Orions, and one Vega); the remaining two were custom built. One was a modified Travel Air "Mystery Ship," NR614K, which had won the 1929 Thompson Cup Race and the other was Laird's "Super Solution". The 193 0 "Solution" was also entered but a landing mishap en-route to the west coast prevented it from making the starting deadline. The contrast between the large Lockheeds, slower but capable of making the distance non-stop and which had dominated the earlier two cross-country races, against the two special speedsters which were just a bit more than flying engine but must refuel along the way, led to vociferous pros and cons as to which would get to Cleveland first.

It seemed as though a million stars were sparkling with excitement in the unusually clear night sky at the drama about to unfold below. Departure was timed so that arrival at Cleveland would occur at the climax of afternoon activities, and as race time approached the tempo of action increased. Large numbers of spectators began to line runway 15, and by 1:00 a.m. all pilots were in their planes with last-minute weather conditions, navigation procedures and flight plans double-checked. Tension ran high-the Bendix was big business. It shared national headlines with Sir Hubert Wilkins, who was probing under Arctic ice packs with his submarine-the Nautilus.

It was time. Lou Reichers swung his Altair onto the runway, eased the throttle forward and at 1:20 a.m. PST, Larry Therkelsen, official NAA starter, dropped the flag. Fifteen minutes later Walter Hunter responded to the starting flag and eased his 600 hp special Travel Air "Mystery Ship" into the star-studded sky. Harold Johnson bounded down the runway just three minutes later, lifting his new Continental Airlines Orion aloft, followed within five minutes by Asa Chandler's Orion which was piloted by Beeler Blevens. Doolittle would be next. The rest of the contestants would follow within the next twenty minutes.



Jimmy snapped the cockpit shut, checked the latches, pored over the glowing instruments, tightened the seat belt and pulled out to the starting position. The big engine cowl hid his view of the runway; "she was a blind airplane all right but I got used to it" was Doolittle's comment. The starter's flag raised as the Wasp beat out a symphony of power. At 1:40 a.m. PST (4:40 EST) the flag dropped and Jim pushed the throttle to the firewall. The "Super Solution" was airborne in less than 500 feet.

Doolittle climbed at a fast rate, skimming the mountains to the east and heading for a brief levelling off at 5,000 feet to check engine temperature gauges. He soon spotted the tail light of Blevens' heavily laden Orion slowly climbing at full throttle. The "Super Solution" zipped past, prompting Blevens to relate later, in his slow Southern drawl, that he figured he was flying backwards or was about to stall out when he saw Jimmy pass. Now Doolittle pointed the Wasp for 11,000 feet and better winds.

Setting a course of 075 degrees, he trimmed the racer, streaked over the Mojave desert and headed straight for Albuquerque, New Mexico. Flagstaff, Arizona passed below and the Laird was dipped into a long whistling shallow dive, planning to arrive at pattern altitude simultaneously with reaching his first fuel stop. Some of the six non-stop starters would no doubt be up at 15 or 16,000 feet taking advantage of the thinner air and stronger tail winds. Every degree of error in navigation, every change of altitude meant minutes to each contestant. For Doolittle, every mile at top speed counted and refueling stops had to be fast.

Albuquerque appeared in the distance and Jim increased his dive. Over the field he peeled into a short pattern and in just 3 hrs. 2 min. after take-off the Laird's wheels touched the ground. He had averaged 228 mph on the first 674-mile leg. Doolittle slid out of the cockpit, wiped his hands on his clean white knickers, swallowed a glass of milk, and slipped back into the pit as the fuel caps were secured. Refreshed and with a full load of fuel the ''Super Solution'' was again nosed toward Cleveland. Dawn was just breaking as Jimmy leveled off at 10.000 feet and sped toward mid western prairies and Kansas City, his next stop



Unknown to Doolittle at the time, he had gained a commanding lead, since the Lockheeds, still with heavy fuel loads didn't have their running shoes on as yet. Wait Hunter had landed his $15.000 modified Travel Air at Winslow, Arizona, fighting mechanical problems plus a painful ear block caused by a bad head cold.

Three hours, six minutes and 765 miles later Doolittle greased the ''Super Solution" onto Kansas City's airport. He only had time to stand in the cockpit and stretch-refueling was completed and Jim was off again in ten minutes.

By now the sun was high and hot, the air was choppy, and thick cumulus were building. Early afternoon thunder storms appeared, and soon it was apparent a vicious squall line stood like a stone wall guarding Cleveland. To go around or over the storms was impossible, so Jimmy was forced to go on instruments and bore straight through.

With his eyes glued to the needle-ball and airspeed, and a glance at the engine instruments, he barrelled into the fire-filled sky. Some of the other pilots were using the new aural null radio direction finder, a bit primitive and subject to static, it effectively forced time-consuming detours around the storms. After a half hour of wild bouncing Jim thankfully noticed the pounding rain was tapering off, and the "Super Solution" suddenly broke into clear sunshine. Dead ahead was the big red and white chequered home pylon with the name Bendix emblazoned on it. Doolittle had sliced through the black turbulence with less than 2 degrees error in navigation.

As he taxied the mud covered ship to the line, Jim spotted his wife, Jo, and their two children, Jim Jr. and John. Jo was waving a lunch she had prepared but Jimmy had already clambered onto the cockpit edge, grabbed a hose and begun assisting in refuelling with more Shell gasoline. He had decided to continue to Newark and attempt the full transcontinental route. The public address system was blaring his name, asking him to come to the speaker's stand, but Jim's winning smile and those characteristic movements of eagerness meant only one thing-he was impatient to be OFF. With knickers now thoroughly oil soaked, Jim slipped back into the pit, fired up the Wasp and threw sheets of muddy water as his salute to the Cleveland crowd.

Once again the "Super Solution" was airborne and soon was flashing over the infamous Hell Stretch of Allegheny Mountains where the lives of many pioneer airmail pilots were lost. The air was extremely turbulent but Jim had complete faith in the Laird/Wasp combination. Still uncertain if he had won the Bendix, he streaked into Nebraska at 3:51 p.m. His elapsed time from Burbank was 11 hrs. 16 min. 10 sec., his average speed 217 mph, beating the 2,882 mile transcontinental record set by rank Hawks in his "Mystery Ship" earlier the same year by one hour, eight minutes.

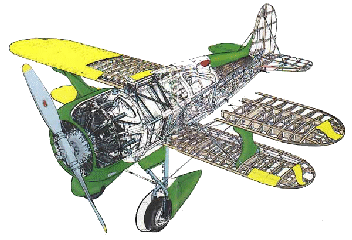
Newsmen and jubilant spectators met the plane as it rolled to a stop. Jimmy was quickly informed that he had indeed won the Bendix and had also set a new transcontinental record-and, incidentally, nice to know, he was $1O,OOO richer. After spending 30 minutes with the press he climbed back into the trusty "Super Solution" and headed back to Cleveland where he was greeted with a big kiss fiom his wife, and that beautiful prize money. Doolittle then relaxed in the Company's Bellanca executive plane while Jimmy Haizlip flew him to a Victory party in St. Louis. The "Super Solution" was left with Laird and P & W maintenance men to be readied for the Thompson race.



It was impossible to continue the Bendix, but patch repairs were made in time for him to fly into Cleveland in time to make a try at the Thompson. But even more bad luck dogged him. During speed trials prior to the Thompson a fuel line broke and the plane burst into flames. Walt bailed out at treetop level, spent six months in the hospital suffering from severe burns, but lives today to relate those wild experiences from the left-hand seat of a Boeing 707.

Doolittle returned to Cleveland and prepared for the closed-course Thompson Trophy Race. The race was established in 1930 by Charles Edwin Thompson of Thompson Products, Inc. of Cleveland and Detroit, manufacturers of aeronautical equipment, their most important being sodium cooled valves. It was an international free-for-all for men pilots only and engines of unlimited cubic inch displacement. More than 6O,000 spectators would stand enchanted as the world's fastest, most powerful racers dashed 10 times around the Thompson's 10 mile course. In 1931 time trials preceded the big event. The qualification course was a straight path in front of the grandstands with each hopeful flying two speed dashes in each direction. This would give the pilots a chance to check out their planes and by requiring at least 175 mph to qualify, would help insure keeping them in a pack during the main race.

The small group of trained personnel assigned to the "Super Solution" were busy removing the direct drive Wasp Jr. and fitting the geared engine, shipped from Laird's Chicago plant, onto the plane's mount. On Doolittle's first test run the big engine, slinging its nine foot propeller, gave the plane about eight miles per hour more speed, but she had a strong tendency to roll to the left. She was hurriedly rigged right wing heavy, and Doolittle notified the timers he was ready to make his qualification runs. He took the green and yellow bullet up and flew a couple of laps around the pylons indicating 240 mph on part throttle. Then he headed down the home stretch past the grandstand and over the qualification course. He rocked the wings as a signal for the ground timer indicating this was a timed run, but the roll was so slight that Jimmy was uncertain if the timer had noticed it. The Thompson course was an irregular pentagon and Jim came down the stretch, flipped around the first and second pylons but at the third, where the angle was sharper, the left wing would not come up. He found himself unable to recover until he had made a complete roll. As he fought the controls he barrelled to the right, attempting to get back on course. Then he had trouble getting out of the right bank. By this time, Jim reflected, the timer must think he was horsing around. At No. 4 pylon Jim banked left but again the bank increased-suddenly the controls reversed and Jim throttled back to regain control. The speed during the run had been clocked at 260 mph.



Doolittle landed the plane to have the rigging checked, but nothing appeared to be seriously wrong. Jim took her up again and made another attempt at the three kilometre straight-away Thompson qualification course. On the first pass the plane rolled to the left until almost out of control. Jim chopped the throttle and she smoothed out. Apparently the roll instability got much worse at faster speeds. So, for his second pass, Jim decided to experiment by entering the course with the right wing down about 30°. The racer had now accelerated, and as the one kilometre marker flashed she was rolling against the stick, her wings already level. By two kilometres the left wing was down some 30 degrees and depressing rapidly. Again Jim was forced to throttle back, unable to make even one satisfactory pass across the course.

It was now apparent that something was progressively loosening up. The wings were warping in flight, and rough air encountered on one of the speed runs made the rigging so flabby that Jim could actually watch a lateral wiggle along the upper wing trailing edge. He commented later, "The racer was extremely tempermental to rig. Here was an airplane that could be rigged in flight. The difficulty was that it wouldn't hold its rig.

"In this airplane," he continues, "the main wing truss was incomplete. The auxiliary wing truss had depended upon a fitting around the center of the continuous rear spar in the upper wing to take unevenly distributed wing loads. A careful inspection showed that the spar had crushed at this point and the bolt holes had elongated. As a temporary expedient an eighth-inch thick piece of sheet steel was driven between the fitting and the spar to take up the play. This corrected the trouble temporarily, but after a few hours flying it again appeared due to further crushing of the spar."

The Thompson race was scheduled the next day leaving no time to modify the wings, make new fittings or devise new rigging. The geared engine could not be used because its dynamics induced wing warping and aileron reversal as the speed approached 250 mph. Jimmy felt certain he could handle the Super Solution. with the direct drive Wasp, although now it might respond "sloppily," as he put it. The engines were changed overnight and the morning of race day was spent re-rigging the plane.

With the plane again serviceable, a test flight was made to check the Wasp Jr. engine and accomplish the qualifying runs for the Thompson. The only real competition seemed to be coming from Lowell Bayles who clocked a pre-race time trial of 267.242 mph in his radical new Gee Bee Z racer. Doolittle took the "Super Solution" over the qualification course and turned in an average of 255.354 mph, while his fastest lap was a blazing 272 mph. There was no doubt it would be a tight race. Doolittle landed, satisfied he could at least put up a scrapping good fight. Almost at once it was race time. The "Super Solution" had been rigged right wing heavy to aid left bank recoveries, and with hope overiding misgivings, it was rolled to the starting line.

As Jimmy surveyed the line of eight starters he felt fairly confident about the "Super Solution's" chances. If he could get a head start he would have a fighting chance and the racer's poor visibility wouldn't be a factor. Jim was frankly worried to be so restricted in forward view if he had to fly in the midst of several racers. As he assessed his competition, he judged Lowell Bayles his greatest threat, but the sly dark horse could be Jimmie Wedell in his own racer, No. 44.



The starters flag was raised-held five seconds-and dropped. The little racers were off. Doolittle jumped into a commanding lead and streaked for the scattering pylon. He flipped the Laird around the first marker, shaving the pylon with a mere five feet to spare, and charged well out in front as the first lap passed into history. Already the strain was beginning to show on the over-revved direct-drive engine. Jim alone knew this as temperatures- began to climb and gauges went into the red. By the second lap, everyone knew, as smoke belched from the exhaust stacks and trailed off the rudder. With each succeeding lap the Wasp became sicker. Bayles had taken the lead in the third lap, but Jim was determined and grimly hung on until the seventh lap when he finally had to pull out of the race before his engine failed completely. Bayles went on to win the Thompson that year in the Gee Bee, averaging 236.24 mph. Doolittle, despite his ailing engine, had averaged a remarkable 228 mph. Investigation disclosed the Wasp had blown or scuffed a piston.

Recalling this difficulty, Jimmy related, "The fuel used in the (Bendix ) was straight run gasoline containing three ccs of tetraethyl lead per gallon and having a knock rating of 87 octane. For full throttle operation (Thompson Race' 89 octane gasoline containing five cc of lead was used. With the 89 octane fuel there was no detonation and head temperatures were steady at about 520" F'." The fuel mixtures were carefully compounded and analyzed by Shell Oil experts and had previously been used in the Wasp engines by Doolittle during earlier tests. He had confidence the high octane fuels would not harm the engine if specific time limits were not violated during full throttle operations. Everything was running smoothly until the one piston was damaged, possibly by a speck of foreign matter. Temperatures began to rise thereafter. The direct-drive Wasp Jr. had done her duty for the Bendix, but the gruelling pressure of the Thompson was the breaking point.

In September 1931 Jimmy Doolittle, with yet another long-distance speed record in mind, flew the "Super Solution" to the Pratt & Whitney plant at Hartford, Connecticut to have its engine majored. On September 18 the racer was rolled into the P & W experimental hangar, and within three days a comprehensive report was released. This indicated the racer weighed 1752 lbs. empty, 2585 lbs. gross, and its direct-drive Wasp Jr. engine was number X-27, which the shop people had originally called the "Yellow Jacket", to continue the series of P & W nicknames, based on stinging insects. As applied to Doolittle's engine, however, the name was unofficial. It was later given officially to an experimental 20-cylinder water-cooled engine which was never produced.

Shortly after the overhaul Doolittle took the "Super Solution" to Ottawa, Canada, the jumping off place for a three capital speed record, including Ottawa (Canada), Washington ~ U.S.A.) and Mexico City ( Mexico). At about 5 a.m. on October 20, 1931, Jim lifted the stubby little biplane aloft for its first non-stop leg to Washington, D.C. After refuelling there he made a dash for Birmingham, Alabama. The pattern of operation was similar to the successful Bendix race, with Jimmy never on the ground more than 10 minutes at any of the stops. From Birmingham he bored to Corpus Christi, Texas, and after a total of 12 hrs. 36 min. he landed at Valbuena Field near Mexico City. The Doolittle/"Super-Solution" pair had established an inter-city record that challenged speed flyers for several years thereafter.

The "Super Solution" proved itself a good, all-around fast airplane suitable for both closed-course pylon races as well as long distance speed flights. Its drawback was poor pilot visibility. Jimmy Doolittle summed it up: "Had we been able to use the cooler-running; geared engine; had the wing trussing been complete or the centre cabane fitting more secure so the wings wouldn't warp; had we known as much then as we know now, none of these difficulties would have arisen-but that is experience."

In the summer of 1932 Doolittle and Shell Oil Co. officials decided to correct these deficiencies, and Doolittle suggested several considerable modifications. These included a longer, sharper nose cowl to aid engine cooling, engine adjustment to "throw" more oil, installation of an air-cooled oil tank, redesign of the wing trussing, raising the pilot seat 10 inches for visibility over the top wing, and installation of a sliding canopy and door so the pilot could stick his head and shoulders out as an aid in landing. Doolittle also believed that gas capacity should be increased, a controllable pitch propeller employed, the c.g. moved aft to correct excessive longitudinal stability, cockpit ventilation improved, and a retractable landing gear fitted to increase speed.

These modifications were discussed with the Laird Company but their bid for the work was too high. Doolittle took the job to the Christopher Bros. in Wichita, Kansas who completed all the changes he had stipulated by mid August. Doolittle made the first flight in the completely redesigned "Super Solution" at Wichita on August 24, 1932. "It seemed that we had corrected all the faults in the original design," he remarked, "until time came to land. The landing gear, in ground tests, dropped all the way out, then spread and locked into place. In actual flight the air loads and rotation of the slipstream spread the gear before it had dropped out locked it in an intermediate position and it was necessary to make the first landing on the bottom of the fuselage." The gear fault was corrected by using a rubber shock cord which held the wheels together until the telescoping struts were fully extended.

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In succeeding flights Jim discovered the plane was subject to bad tail flutter, especially when in slow flight or in landing configuration. The deficiency was attributed to the reshaped fuselage which had been made more rotund in order to accommodate a larger fuel tank located near the c.g. A number of large fillets were tried between the lower wing and the fuselage in attempts to correct this fault, but as August merged into September, trials were still unfinished, and the chance of having all the bugs worked out in time for Jimmy to fly it in the Thompson, held on September 5th seemed bleak. When Doolittle was offered the opportunity by the Granville Bros. to substitute as pilot of the Gee Bee R-1 racer, he took it, and thus set the stage for his historic 1932 Thompson win with the ill-reputed racer.

The brilliantly painted Shell "Super Solution," resplendent in red and yellow decor and looking very little like its old self, stood abandoned in the Wichita hangar for months. Finally it was crated and shipped to the Shell Oil Co. hangar in St. Louis. Here it was shoved from one corner to another slowly gathering dust and losing parts one by one to scroungers. Its ultimate fate is uncertain.











