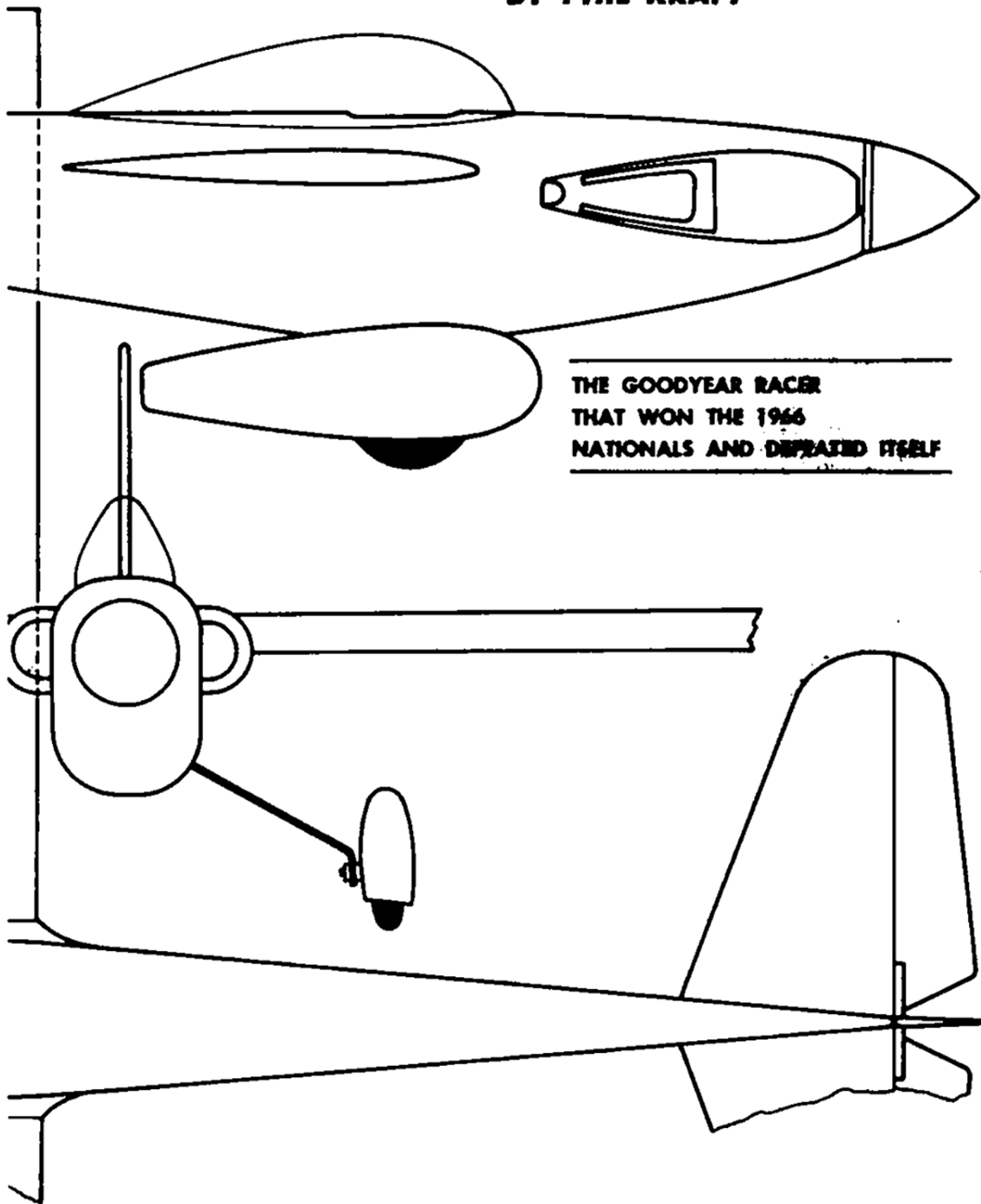
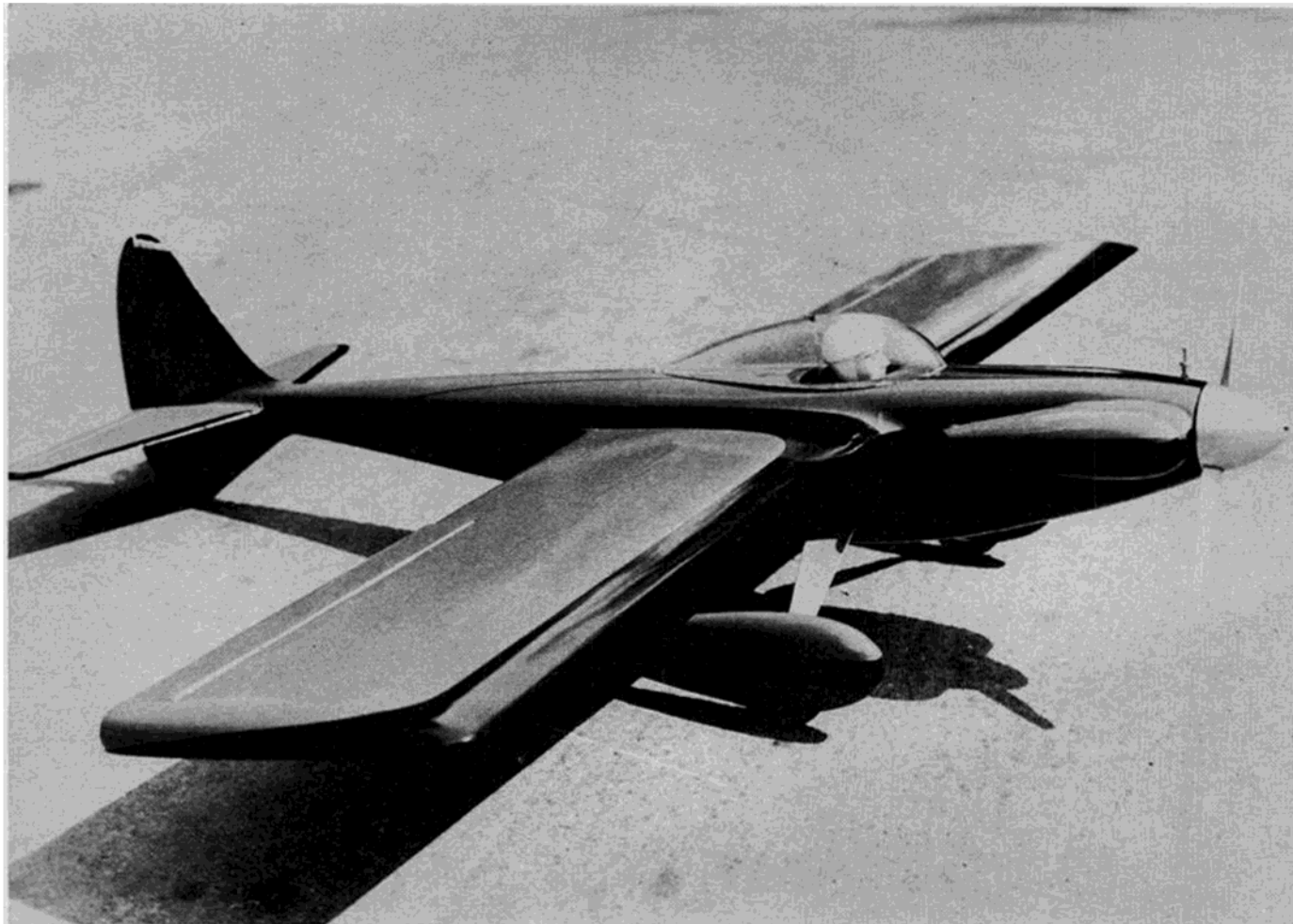


THE GO-GO FLI

BY PHIL KRAFT



THE GOODYEAR RACER
THAT WON THE 1966
NATIONALS AND DEFEATED ITSELF



The Goodyear racer that is so fast it laps its contemporaries! Although it won the Nationals, you probably won't want to build it! Phil Kraft tells why

GOODYEAR racing can achieve a popularity at least equal to Class III stunt flying. Whether or not it reaches this potential depends entirely on rules proposals now in preparation. If the rules finally selected encourage the widest possible participation from the average R/C enthusiast, we may have an event which has wide appeal to both spectators and participants.

I had watched a number of Goodyear events without a great deal of enthusiasm. It seemed to me that these little scale aircraft were too specialized and involved too much effort in construction in relation to the chance of disaster. It also was apparent that those who had originated the event were not receptive to any suggestions towards simplifying the type of aircraft used. There were mutterings from this elite about a 'Gentlemen's Event' and not wishing to appeal to the poor mundane average flyer, etc.

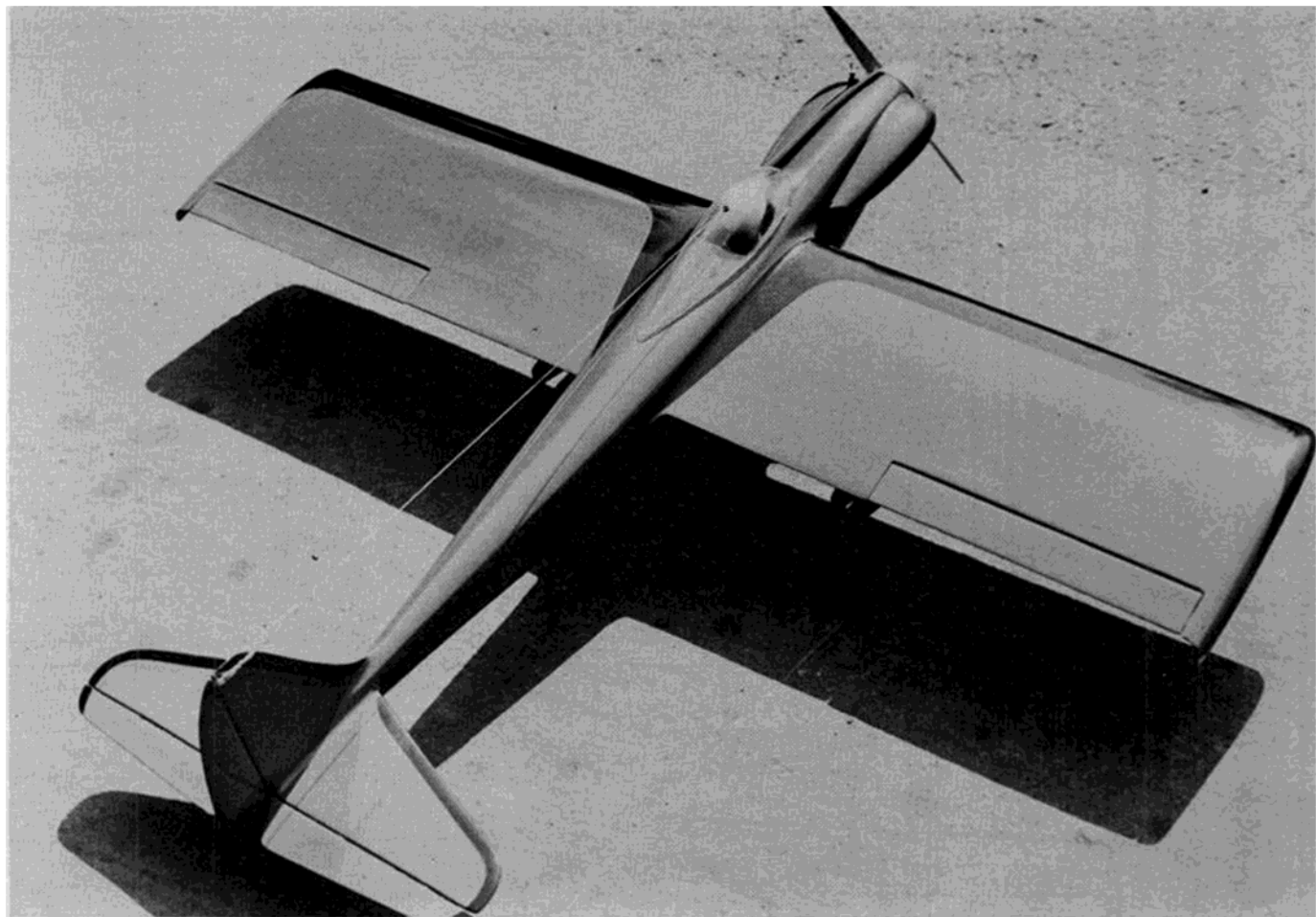
Frankly, I set out to design a racer with a bit of a chip on my shoulder and hoped to build a non-scale prototype that was fast enough to easily make up for the large scale handicap than a feature of the rules. Since I am a lazy model builder, the design was to be of sim-

ple fast construction. The GoGo Fli is the result.

From a design standpoint every effort was made to keep the ship as clean as possible. We believed that the shoulder wing configuration with the wing and stabilizer center lines close to the thrust line would produce the least drag. For simplicity, the wing and fuselage were built in one piece and fillets were used at the junction of the wing and fuselage. The first wing was semi-symmetrical with a total thickness of somewhat less than 6%. The ultra thin wing, however, proved impractical as it curled every which way after doping. The thickness was then increased to 7.5% and the rear section of the wing was made solid. The turned down wing tips were added primarily to minimize the tip vortex under high G loads and high angles of attack. It is also possible that they result in less drag. The wing also has approximately $\frac{1}{2}$ " negative dihedral. We could probably develop a scientific reason for this but the board on which the wing was built sprung loose in the center and the negative dihedral was therefore unintentional.

The ship was completed in January of this year. The first test flight with

the engine running rich was the first indication that the design was extremely fast and that we had also used far too much aileron area. When the engine stopped the airplane was brought around in a fast glide and passed by me approximately 6 or 8 feet high. I expected that it would land approximately in the center of the ample runway but it kept right on gliding until we ran *out* of runway! I wasn't worried as there was another 100 yards of grassy field ahead, however, it quickly ate up this area and still hadn't lost more than a foot in altitude when it suddenly dawned on me that it wasn't coming down! The fence at the end of the field terminated the glide pattern, and with a great deal of swearing and recrimination, we carried it back to the shop for rebuilding. The next time out the low speed characteristics of the ship were carefully checked while we had plenty of altitude and the engine was still running. Perhaps, due to the vortex tips, the airplane could be slowed down and stalled completely with no tendency to drop a wing tip or even to change heading. In fact the only way it can be brought down with anything short of a 10,000 foot runway is to pull back fully on the elevator



until it is partially stalled. It will then reach a rate of descent sufficient to get it into a reasonable area. If the ship is not partially stalled the glide is so flat it is almost unbelievable! This is a good indication of the overall cleanness of the design. Flying characteristics are actually very good but with the large ailerons, you don't dare sneeze or it will have completed about five rolls before you can say 'geshundit!' Because of its great speed it certainly isn't very relaxing to fly. I never had the opportunity to clock it on the straight of way, but before it had to be repaired again in the future and had picked up quite a bit of additional weight it was timed at 1 minute 50 over a standard pylon course. I would estimate that the flat out speed using standard type fuel was approximately 130 mph. The first contest was at the Phoenix Southwestern Regionals. Since this was my first Goodyear competition I had little idea of what it would be like racing against other ships. Because of the prototype design I naturally started last on the first pylon, I rocked it up on the wing tip and pulled in hard elevator. The ship really scooted around the turn but unfortunately the hatch wasn't up to the G loads imposed and the fuel tank, hatch, foam rubber, etc., scattered itself all over the desert. Luckily the battery pack plug was wedged underneath the landing gear mount and the wiring withstood the strain. We

landed rather sheepishly, battery pack touching down first. The rest of the afternoon was spent tramping through the sagebrush attempting to find the hatch and tank which were finally located, too late for anymore flying that day. On Sunday, with the hatch rubber banded in place, and gingerly flying a course wide enough to incorporate several counties, we still managed to win our heats and place third despite the loss of all of the Saturday heats.

The next competition was at the Wright Brothers Memorial Contest in Dayton, Ohio. We had revised the installation of the hatch and this time things stayed fairly well in place. The ship won easily almost two laps ahead of the nearest competition.

The Nationals were the next, and perhaps the final, racing event for the aircraft. The Thursday evening races proved to be a breeze as the airplane was so much faster than its competition that it wasn't even necessary to attempt to tighten up the course we were flying. It lapped all competition at least once in every heat! Friday night the engine blew something and went decidedly sick. It was still fast enough, however, to win handily, except that on the last race we were definitely pushed by Lou Penrod before he cut two pylons and had to go an extra lap. During all this racing we had done no experimenting with fuel or propellers. Only mild stunt type

fuel and a slightly trimmed down 10/8 Top Flite racing prop were used. Best time at the Nationals, even flying a rather wide course, was two minutes four seconds. I believe it was apparent to those watching that the airplane was much too fast for safety. What should have been of even more concern was that the airplane was *nowhere near its potential speed!* It had picked up over one half pound of extra weight through various repairs, the 2½" spinner was much too large for efficiency, and we were running only mild stunt type fuel; we think that the engine would have picked up much more rpm on a magnesium mount and several other modifications could easily have combined to increase speed by probably 20%. In my opinion the airplane would become even more dangerous to the extent that racing model aircraft over a closed course with thousands of spectators only a short distance away would be downright foolish. Thus, I believe the main contribution of the design has been to impress the need for more sensible Goodyear racing rules.

Now in preparation is a rules program designed to limit the speed potential of the Goodyear class racers and to make them more practical for flying out of the average available area. In general, this proposal is also designed to appeal

(Continued on Page 82)

GO-GO FLI

(Continued from Page 29)



Phil Kraft and Go-Go Fli after '66 Nat's Goodyear victory.

to the average flier while retaining the concept of simulating full scale Goodyear type racing. The aircraft must look like full scale Goodyear racers but need not be scale. Plans will be approved by a contest board to insure that the intent of the rules are not gotten around through devious loopholes. Check cowls will be required, the engine must be partially cowled, and a

minimum of a two inch spinner will be required. Scale points as such will not enter into the racing except in case of ties. In other words, construction can be relatively simple so long as the overall appearance as viewed from a reasonable distance duplicates the intent of the rule. Minimum wing area will be increased to 525 sq. inches and the minimum wing thickness will be 12%. Minimum weight 5½ pounds, minimum cross section height 7½", and minimum width 4". This should produce an aircraft capable of being flown by a flyer of average proficiency and at a far more realistic maximum speed. Also, the designs will probably be excellent for stunt applications and can be used for every day flying sessions rather than strictly racing, as is the case with current specialized Goodyear designs. The higher minimum weight will permit simplified construction and will undoubtedly encourage the use of fibreglass fuselages and foam wings to minimize construction time. A side benefit of the extra weight will be that it will encourage better finishes and, of course, more attractive, durable aircraft.

The handicap system as proposed will closely duplicate that used in automobile and motorcycle racing. The first heats will be flown strictly for qualifying time. The four fastest airplanes will then compete in a trophy dash for a prize equal to, or greater than that awarded for the main event. Handicaps for the main event will be arrived at by taking ½ of the time difference between the fastest and the slowest aircraft up to a maximum of 25 seconds. Therefore, the fastest aircraft will start last with their handicap based on qualifying times. In case of equal qualifying times, or in the case of aircraft which have been given the maximum of 25 seconds handicap, the starting order will be determined by the contest director based on overall appearance and approximate similarity to scale. Two second starting intervals will be used. It has also been suggested that existing Goodyear aircraft be allowed to compete during the following year but with the engine displacement reduced to .29 cubic inches. This is to be considered a temporary expedient so that those who now have racers won't have to relegate them to the trash can immediately. All in all, the design and testing of the Go-Go Fli has been an interesting and enlightening project.

Much of what has been learned with the present design will be applicable to the new and, hopefully, accepted rules. We haven't as yet figured out exactly what we will do with the current airplane, but believe that if it were stripped of the cheek cowls, canopy, landing gear, and with a smaller spinner, that it might very easily break the existing world R/C speed record, using the stock K&B 40 engine!