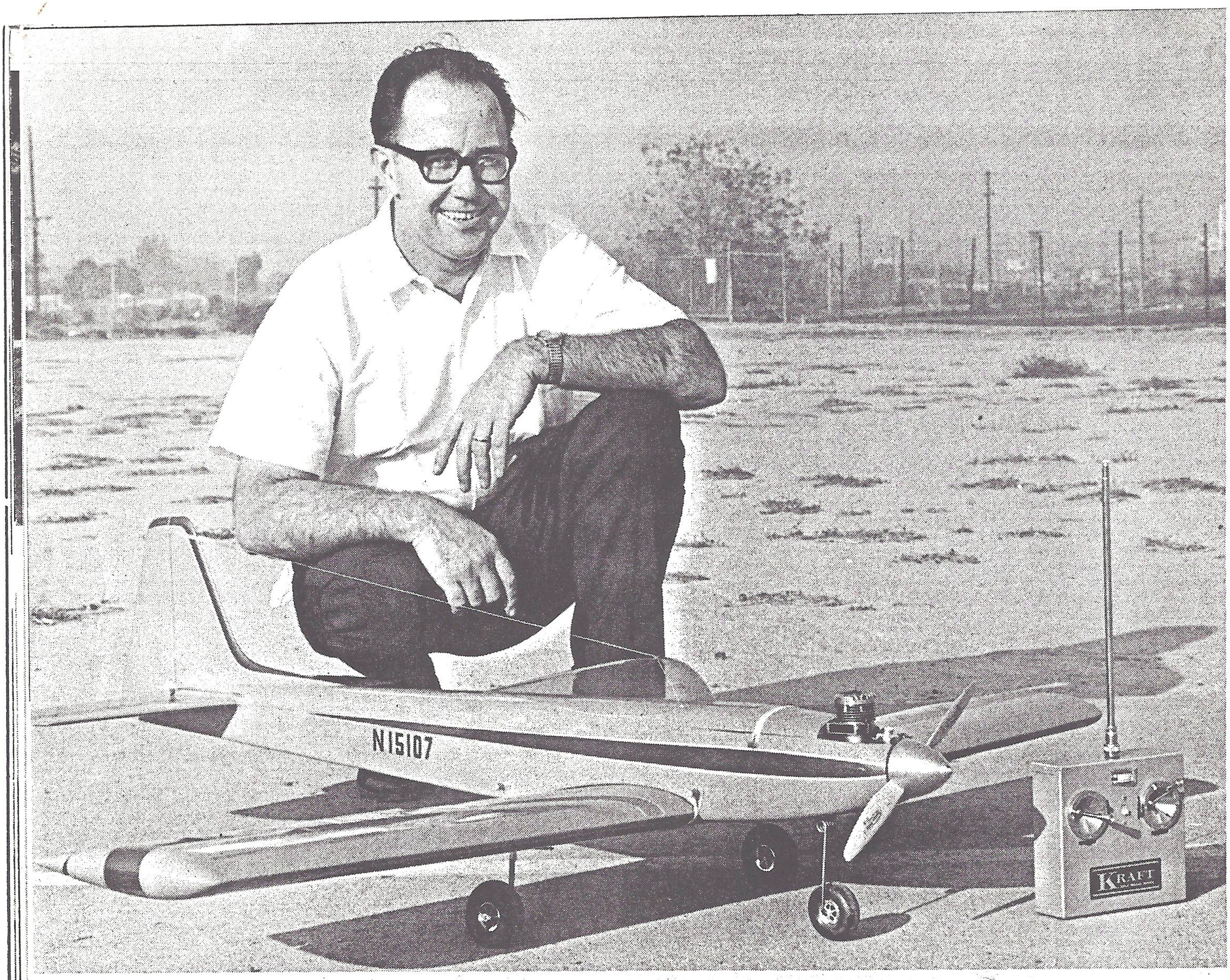
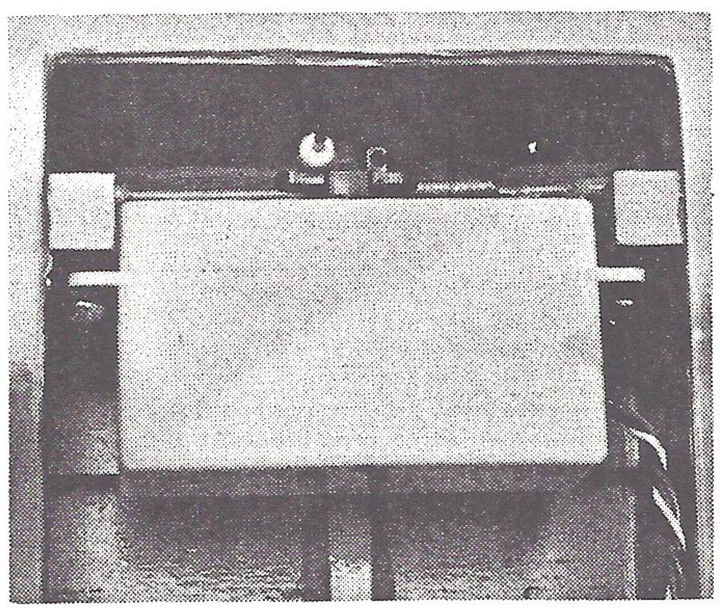


It's easy to smile when you have just finished buttoning up one of your best years of competitive flying—note new Gold Medal series transmitter. Top Flite is adding this excellent plane to their line of multi planes and their ad, this issue, indicates that kit will be available in spring.

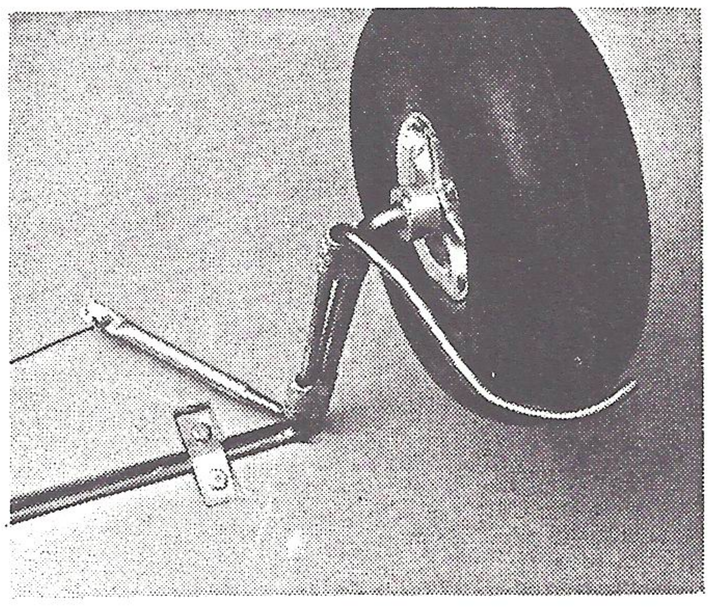
Mark III Kwik-Fli

1967's Top Multi plane can be aptly termed "Top Bird of the Time" without fear of contradiction or need of justification—winner of the '67 Nats and Internats with many other local and regional wins easily establishes merit for this claim.

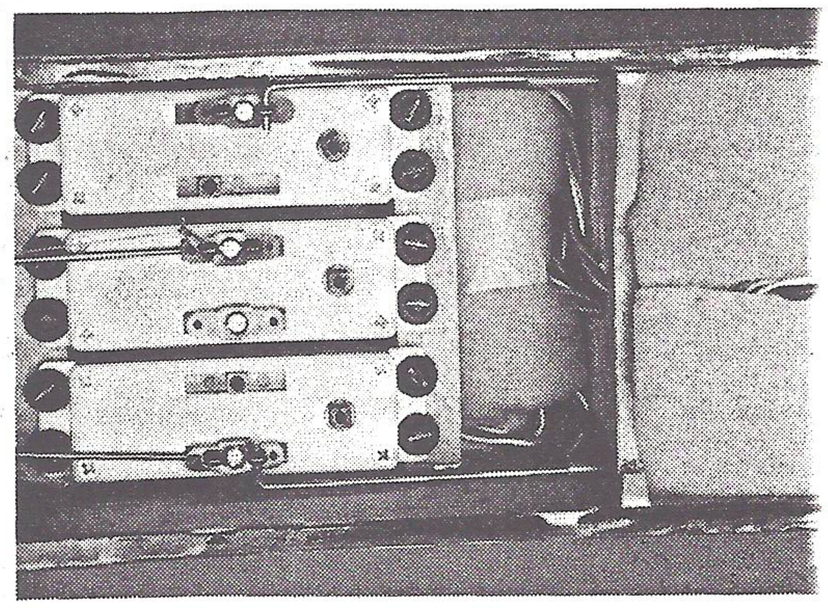
By PHIL KRAFT



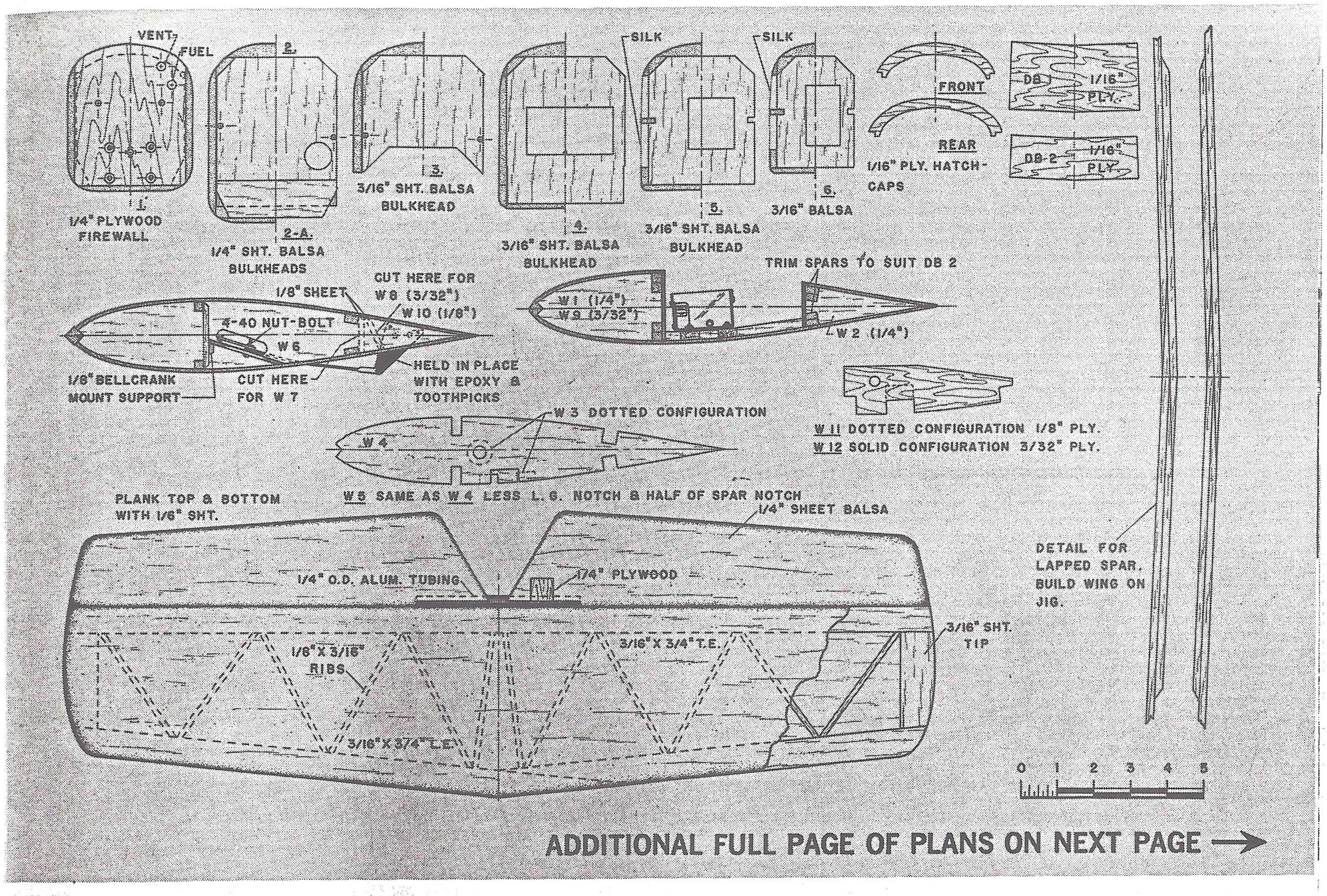
Aileron servo installation clearly shown in this photo—servo mounted on hardwood vertical rails.



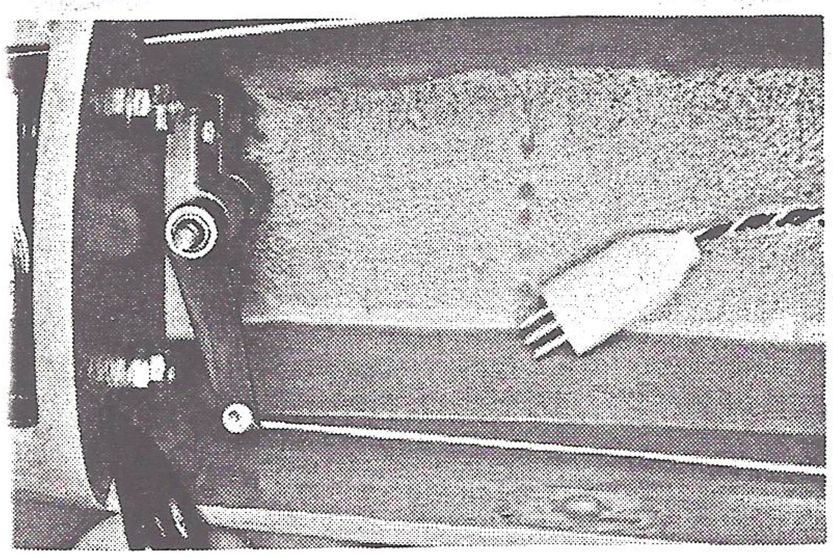
Phil's friction or drag brake very effective. Tubing for brake bearings are soldered to landing gear.



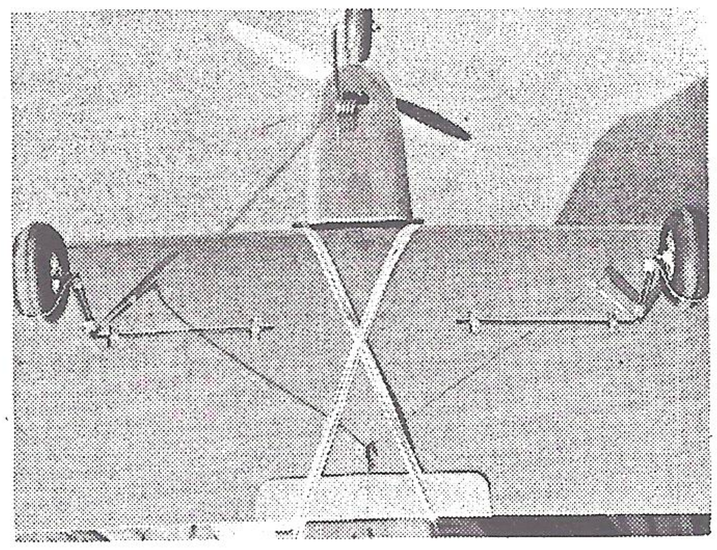
New Kraft servos just fit three abreast in the fuselage—servo plug connectors wrapped in foam.



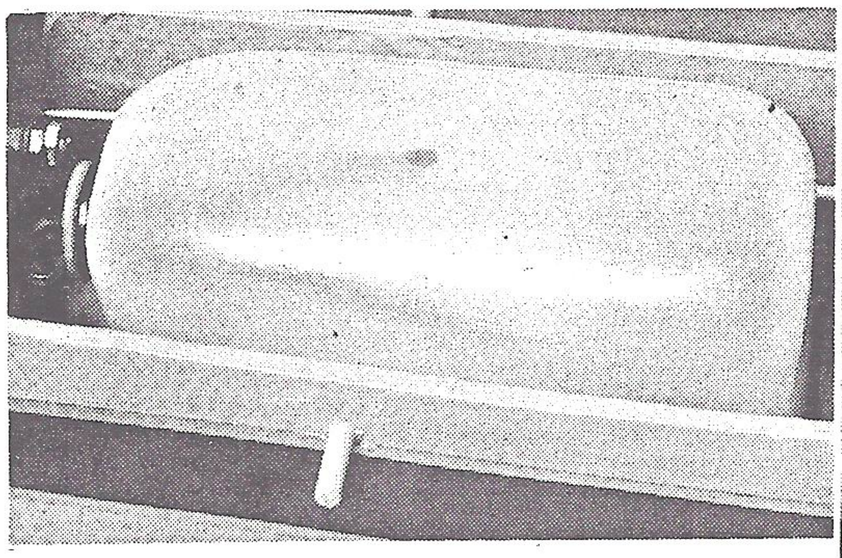
ADDITIONAL FULL PAGE OF PLANS ON NEXT PAGE →



Motor plate double nutted to firewall—easily accessible nosewheel horn in fuel tank area.



Drag brake linkage shown in this photo—note how landing gear brackets are recessed in wing.



Plenty of room for 12 oz. fuel tank—dowels protruding from side of fuse for holding hatch.

► The Kwik-Fli series of aircraft started in late 1963. At this time I was just attempting to learn to fly radio control with our early experimental prototype proportional systems. The combination of a novice pilot and experimental radios wasn't particularly easy on airplanes. Consequently, the Kwik-Fli was conceived as a simple to build and thoroughly functional design. The name had no connotation as far as the speed of the aircraft was concerned.

The Mark I Kwik-Fli had a wing area of 800 square inches and weighed approximately 7½ to 8 pounds. Performance was very satisfactory, however, the large heavy aircraft did rely on a good engine run and we felt that this detracted from the overall reliability of the aircraft system. Therefore, in late 1964 a smaller version dubbed the Mark II was completed and retained the fast building, easy, accurate alignment construction system of the Mark I but had a wing area of 630 square inches, and an all up weight of 5¾ pounds. We flew a series of the Mark II Kwik-Flis until building a new fuselage early this year. This became the Mark III. During the process of constructing several Mark II Kwik-Flis, different air foil sections were tried. One was a semi-symmetrical 60%-40% section and another a 15% fully symmetrical section. The aircraft was too fast with the thin, full symmetrical section and didn't fly quite as well in all maneuvers with the semi-symmetrical. I came to the conclusion you just can't beat the thick full symmetrical section for contest work. It absorbs lots of power and the airplane flies almost as fast straight up as it does straight down. Consequently, the maneuvers are extremely smooth because of the constant speed characteristics. There is no real need to juggle throttle to maintain consistent maneuvers.

The Mark II Kwik-Fli had one major

(Plans continued on next page)
(Text continued on page 66)

3/8" SQ. LEADING EDGE

W1 W3 W9 W4 W9 W4 W5 W6 W7 W7 W7 W7

DB 1

SPAR DOUBLER ENDS HERE

1/8" BALSA

HOLLOW TIP TO SUIT

AIL. SERVO

1/4"X 1/2" HDWD. MOUNTS

1/4" SQ. SCRAP

DB 2

L.G. DBLR. BLOCK

W11

HARDWOOD L.G. MOUNT

W12

1/16" AILERON PUSHROD

BOTTOM VIEW

3/32" PLY. BELLCRANK MOUNT

3/32" X 3/4" CAPSTRIP

CAPSTRIPS

1/8" SHEET

1/8" SHEET

W2

W8 W8 W8

W10 1/8"

1/8"

WING DIHEDRAL = 1" UNDER EACH TIP

AILERONS BUILT INTEGRALLY WITH WING & CUT APART AFTER SANDING IS COMPLETED

1/8" SHEET FOR DORSEL, RUDDER & FIN

1/4" PLY.

0° INCIDENCE

NYLON HORN

1/8"X 1/2" HARD BALSA

CUT OUT AFTER ASSEMBLY

BALSA BLOCKS

3/16" DOWEL

NOTCH TO CLEAR SERVO WIRES

COUNTER SINK BOTTOM MTR. BOLT HEAD

MOTOR

DRAIN & ACCESS HOLE

JENSEN STEERING ARM

HARD-WOOD

RUDDER

DRILL & TAP "ENYA" .60 CASE FOR 6-32 BOLTS. MAKE 1/4" ALUM. BACK-PLATE FOR RADIAL MT.

1/8" PLY.

1/16" BALSA

3/16" DOWEL

RUBBER GROMMET

ANTENNA

1/2"X 1/8"X 45° TRIANGLE

BIKE SPOKE

CARVE HATCH FROM BALSA BLOCK

2-1/2" KHP SPINNER

KPRB REC'VR.

1/4" X 1/2" RAILS

KHP SERVOS

3/16" SHT. BALSA

3/8" SHT. TOP BLOCK

1/8"X 3/8"

NYLON CLEVIS

1/16" PIANO WIRE

3/32" I.D. BRASS TUBES

1/32" PLY. DOUBLERS

3/16"X 1/2" BALSA

1/8" SHEET

3/32" PLY. RING

DOUBLE NUT ALL MOTOR MOUNTS. USE 6/32" BOLTS

1/8" SHT.

BALANCE

1/16" POSITIVE INCIDENCE

3/16" SHT.

3/8" SHT. DOUBLERS

1/8" SHT.

1/16" I.D. BRASS TUBE

CUT OUT AFTER ASSEMBLY

BRAKE CABLE

Mark III Kwik-Fli

FLYING WEIGHT : 6 LBS.

DO NOT EXCEED - 6-1/2 LBS.

DESIGNED & DRAWN BY :

PHIL KRAFT

HINED FOR M.A.E. BY :

BOB CHORONZEY

0 2 3 4 5

TOP-FLITE NOSE GEAR

1/32" PLY. DOUBLERS

CUT OUT LEFT SIDE ONLY FOR SWITCH

3/32" PLY. RING

FULL SIZE PLANS AVAILABLE—SEE PAGE 50

in), that there is only one avenue left: Change the engines if you can't change the people.

His arguments for left hand rotation are strong, and he has the hardware to back it up. A Tee Dee left hand crank is Cox part number 1715, and costs $2.25. Kirn says that there is no problem with torque when flying with this shaft (providing your airplane flys counterclockwise!) and THAT argument is so simple even I understand it. It's just plain facts.

The time-honored way of solving the problem is a great gob of lead in the outside wingtip, which has very little appeal to most of us. What is the lead doing 99% of the time? Holding a good plane down, is the answer. Then there is a fourth solution —a'la the Burke GRMZPH (MAN, 9/67). This model uses (1) no tip weight, (2) high aspect ratio wings, and (3) conventional rotation crank. The trick is to get a pilot who knows his business and runs forward like a gazelle when on the mech releases. With arm carried straight out, forward and slightly up, the pilot runs AHEAD of the plane, *straight* ahead, that is, not into the circle where he careens off those big guys in there with "UFF, sorry fellas." P.S.: Also pit with the pilot well ahead of the plane.

LANSING FLYING ACES

Lansing Flying Aces. A Michigan club. Very active, but in more than just strictly model activities. They deserve a lot of admiration for their program of collecting bellcranks, lines, handles, tanks, wheels, eyelets and the like for members of the U.S. Armed Services in Vietnam. And what do you want to bet they influence a lot more modelers, and people who might become modelers, than the biggest junior program you ever saw?

Mark III Kwik-Fli

(*Continued from page* 28)

drawback. In any type of turbulence it had a very sexy tail wiggle. All sorts of remedies were tried to eliminate this including sub-fins, wing fillets, etc., but nothing improved this basic fuselage design.

When it came time to get a new design ready for the Internationals in Corsica it was decided that we would try to eliminate the basic defects in the otherwise entirely adequate Kwik-Fli II. I believe that probably the tail wiggle and general directional instability of the Mark II was caused by the high thrust line, high fin and very low center of drag created by the thick wing.

The Mark III has the thrust line lowered almost one inch and the nose length increased one-half inch. The rear of the fuselage has been deepened and the fin moved back and increased in size with a really huge rudder. Lowering the thrust line and the rear lateral area has done wonders.

The Mark III is superior to the Mark II, in the way in which is grooves through all maneuvers and is relatively free from the previous tail wiggle. The large rudder helps a great deal in maneuvers such as the Double Stall Turn, Tail Slides, Spins, Snap-rolls, etc. Of course, the wing remains exactly the same as the Mark II.

Structurally, the fuselage now has a 1/32" plywood doubler extending aft to the servo compartment. There were weak points in the Mark II around the hatch and both of my earlier Mark II's developed cracks after long time use at the rear of the hatch line. The plywood doubler I think is actually lighter than the previous balsa doubler used, and makes an extremely strong, simple to build, fuselage.

While experimenting further with the basic Kwik-Fli design two Mark IV's were constructed with different taper wings. One utilized a 15% section constant %, the other a 20% root chord with 15% tips. The taper wing version with 15% section flew well enough, but was very unsatisfactory for contest use because the previous constant speed characteristics of the Kwik-Fli were totally lost.

The airplane was a speed demon and difficult to land because of its very flat, fast glide. The other Mark IV with the thick root section flew quite well. However, I could see no advantage to it over the straight wing version other than appearance. In fact, I don't think I liked it as well because the ailerons tended to be more responsive around neutral and yet the roll rate is relatively slow. Judging from these two taper wing Kwik-Flis the taper wing seems to constribute a lack of smoothness in aileron response.

For those of us who might like to try the taper wing version I would suggest that the standard Kwik-Fli airfoil be used all the way, and not the progressive taper. I think this combination would probably be a very good aircraft, but still no better and probably not as good as the straight wing version.

A friend has a Kwik-Fli which is the smoothest I have flown. The only real difference between this aircraft and the regular Mark III is that the wing tips are raked back at an angle of about 30°. Theoretically, this type of tip has less drag and it possibly could improve the performance of the basic wing. This is something I hope to try in the future, although this type of wing tip does look a bit awkward and out of balance with the rest of the design.

The whole concept of the Kwik-Fli is to produce a simple, and as functional aircraft as possible. The engine is radially mounted as I believe this provides less vibration transfer to the rest of the airplane and is cleaner and lighter. The hatch fastened with rubber bands provides instant access to the fuel tank and battery compartment. At contests I prefer to fuel with the hatch off, as a precaution against leaky fuel lines or tank. Certainly, the rubber band fastened hatch detracts from the appearance but greatly simplifies maintenance for reliability. Rubber bands and dowels are still used to hold on the wing. No particular reason here except that this old fashioned method has been highly reliable.

The pictures show the tank and radio gear installation in detail. Servos are mounted on ¼" x ⅜" hardwood rails and are attached with No. 4 wood screws. The wood screws are the simplest method of holding the servos and can be tightened to just the right amount to allow the rubber mounting grommets to protect servos from vibration. Nose gear and throttle push rods are 1/16" piano wire running through 3/32" I.D. brass tubing. Don't attempt to run 1/16" piano wire through 1/16" tubing as it's just too difficult to obtain free movement.

For ease of low speed throttle adjustment as well as noise prevention, an adjustable nylon clevis connects the throttle push rod to the throttle arm. Note, particularly, that the installation has the receiver loosely mounted in foam rubber with its antenna running directly out the top of the fuselage back to the fin. This keeps the antenna as far as possible from other wiring which is essential to good radio range. Also, note that the plug wiring is wrapped in foam and is tucked just ahead of the servos. None of

this wiring is allowed to bunch up near the receiver case. This is almost as important as keeping the antenna clear of the installation.

No retainers are necessary on the push rod ends because of the convenience of our new servos. The servo output arms are merely unscrewed and slipped over the wire ends as shown in the picture. The nylon slip type retainer has proven quite adequate on the nose gear and aileron hookup.

In summary, the Kwik-Fli is a very basic and simple approach to a contest aircraft. I believe that this functional type of design is largely responsible for the aircraft's success in competition. It is very important that the pilot be free from worrying about his equipment, and be able to concentrate on flying during competition. This is equally as true for sport flying.

I was subjected to a great deal of good-natured kidding at the Internationals from my teammates relative to setting back modeling 20 years with the Kwik-Fli. Jerry Nelson, our team manager, dubbed it "Orange Trash" because of its rather beat up appearance and bright orange paint job. However, I like old "Orange Trash" and will probably be flying it for some time to come. At least for my style of flying I don't think I can do much better than with the Mark III. Incidentally, it's an excellent advanced trainer as it's extremely easy to fly with no unusual or peculiar characteristics. In fact, it's probably easier to fly than many so-called trainers.

R/C News

(*Continued from page* 39)

for Germany next fall, as sponsored by Simprop.

John Burkam, 271 Mt. Alverno Rd., Media, Pa., 19063, one of Vertol's R & D engineers in Morton, Pa., would like to correspond with fellow helicopterites (?) with the idea of gathering forces to make a joint attack on the Simprop deal as well as to establish some world records.

John has a ship right now that's not too far from flying. During some preliminary tests in which we assisted, the Cox .15 powered ship was steadied by a light balsa boom and just about succeeded in hovering in one spot. The single channel system was not up to the task, so he's now in the process of installing a Bonner 4 RS. Y'oughta hear that wup, wup, wup in 1/6 scale!

Hey Professor Check Cunningham! Just read Part 1 of your series and noticed that you're concerned about left handed flyers having trouble getting two primary functions on the left stick.

What's the problem? For those who want to fly lefty, get the mode with rudder/elevator on the left stick and aileron/throttle on the right. Hook the aileron servo to the rudder output, and the rudder servo to the aileron output. Who's to know? If you don't tell the radio, I won't . . .!

Happy Harry's Horrendous Hobby Hints

If you should happen to take off with your antenna collapsed and suddenly realize it as the plane's climbing out, *don't* make a grab for the antenna to pull it out. Instead, turn the plane back toward you and go for altitude.

Circle and climb until you're higher and overhead. *Now* extend the antenna. Actually, once the plane is well up in the air and if your set is operating properly, you don't really need to extend the antenna; that is not until you are in the traffic pattern and get low and far out. This is where you are most apt to lose signal to the aircraft, just as on the take-off.

The problem is that at this weakest signal point in your flight, there is less risk in continuing to fly and gaining altitude than there is in reaching for the antenna. At this critical moment, when the plane is still close to the ground, touching the collapsed antenna with your hand will probably kill that already weakened signal and . . . SPLATT!

From the Port Arthur R/C Club news letter "Squawk Sheet" here's a suggestion for preventing those plastic fuel bottles from cracking along a seam.

Wrap at least 3 winds of copper or iron wire as tightly as possible around the neck. Twist the ends tight with a pair of pliers.. Broke, huh? Try again and don't twist quite so hard. Now, put in the stopper and tighten up the screw.

"Who says foam wings don't warp?" asks the Benton Harbor newsletter, "Whirlwinds." Actually, the foam wing doesn't warp after construction, but it's possible for a twist to develop during construction.

Believe the discussion is by Editor Andy Lukaszewski, and he goes on to point out that he experimented and found that he could stick the twisted end of a finished panel in a 250 degree oven and then twist out the warp, holding it until cool. You can judge proper heat—if it's too hot to hold in your bare hand, it's too hot!.

Andy found you don't have to over twist, as with built up frameworks. He feels the heat must have softened the 3M spray adhesive he used for bonding the sheeting to the foam. Anyhow it's worth a try and better than chucking the whole thing and starting over.

* * *

The 14th Annual Toledo R/C Conference is scheduled for February 24 and 25, again at the Lucas County Recreation