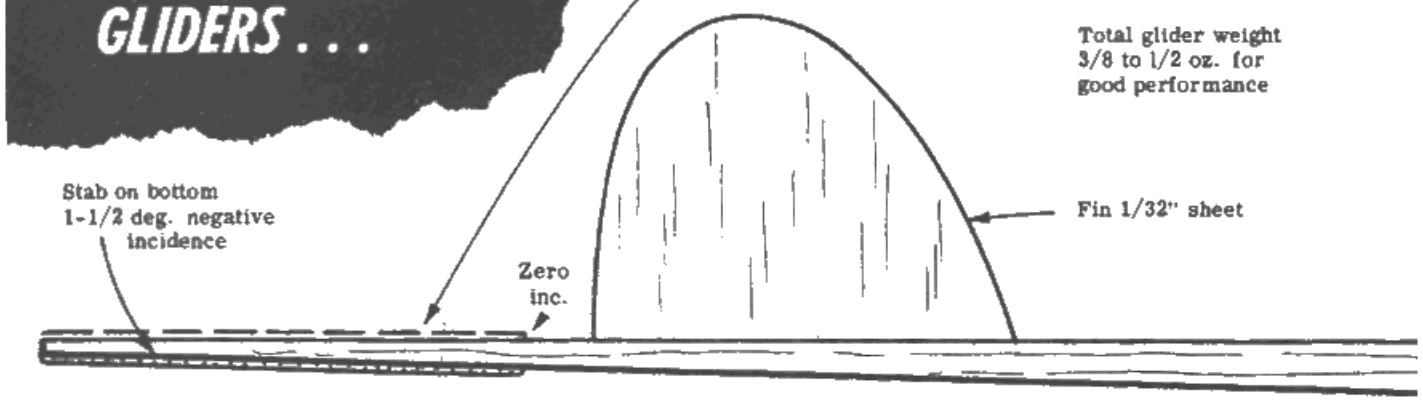
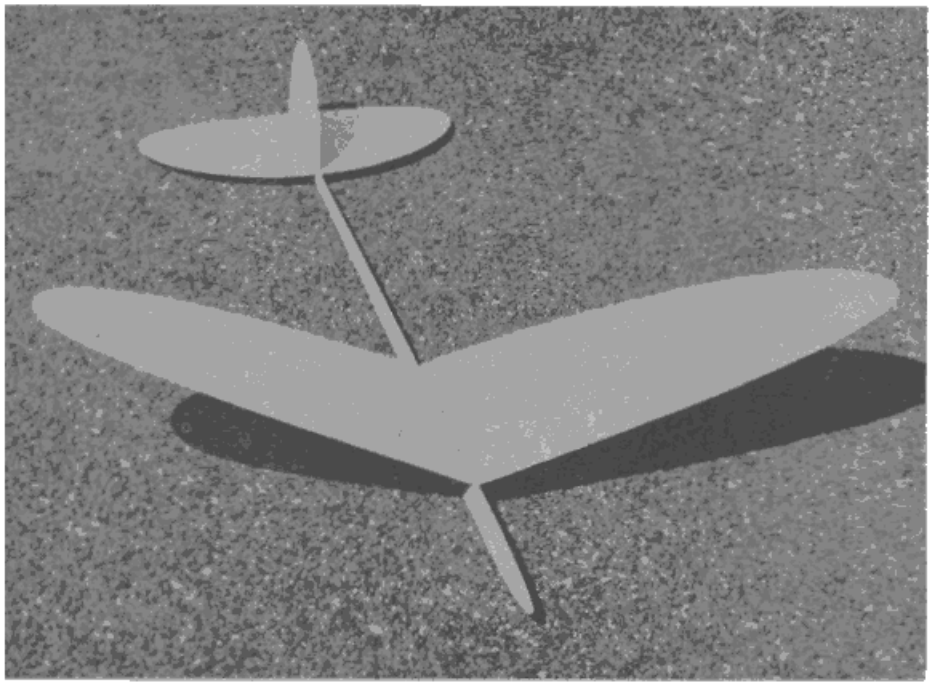
How to get started right with HAND-LAUNCHED GLIDERS . . .



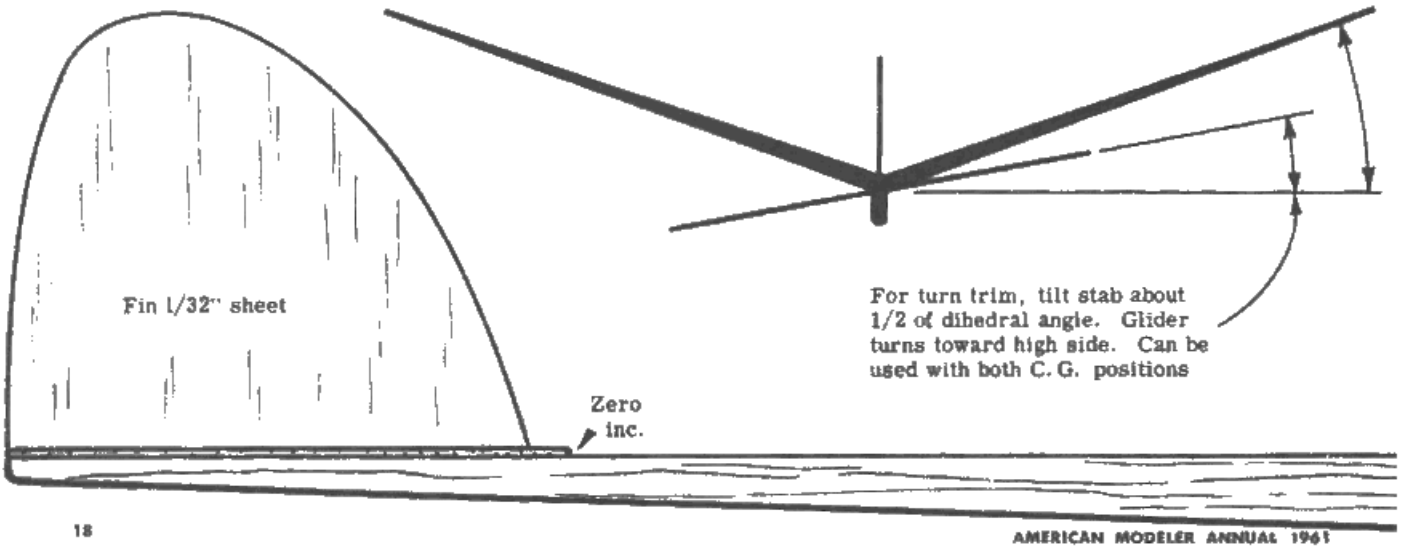


■ How often have you read: ". . . as simple to build as a hand-launched glider"? This statement can be deceiving, because there is more to a good hand-launched glider than just a slab wing, tails and stick fuselage.

The hand-launched glider represents the ultimate in refinement of a model to its basic functional elements. It must be cleanly streamlined and smoothly finished. The idea is to throw the glider as high as possible so it can glide the longest. To gain best glide performance from your muscle power, a glider must be light, yet very strong to withstand the tremendous strain of the launching "pitch."

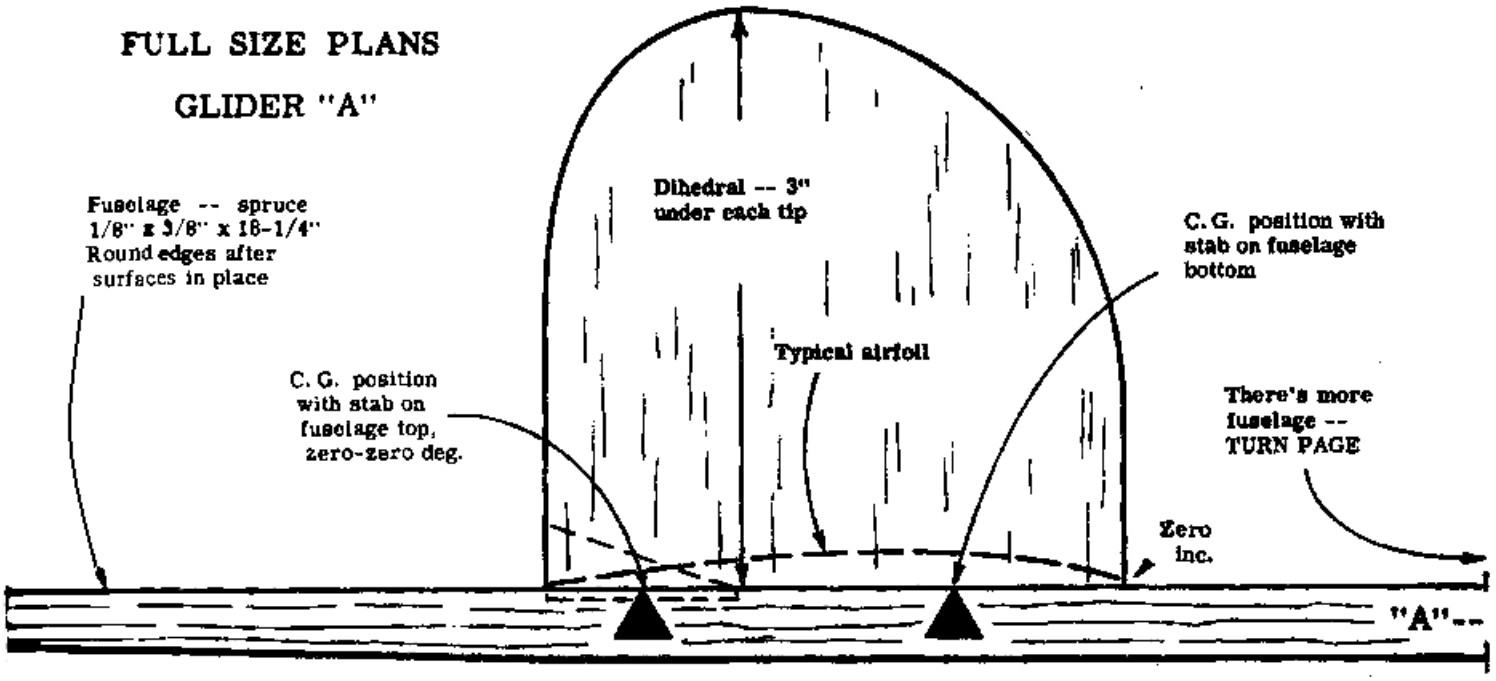
It is not difficult to slap together a glider that will fly, but to produce a really fine craft that will stay aloft one minute indoors, or five to ten minutes outdoors requires careful attention to several factors. These include: size, proper wood selection, construction, alignment, finishing and adjustment.

Glider size is largely determined by the power in your throwing arm. Juniors of slight build won't be able to heave a larger Senior or Open-size glider with the power needed to gain enough altitude. On the other hand, a small glider launched by a husky adult will gain



FULL SIZE PLANS

GLIDER "A"



plenty of altitude in the launch, but glide performance will not be as good. AMA regulations allow a maximum of 130 sq. in. area of supporting surfaces for outdoor hand-launched gliders and maximum of 100 sq. in. for indoor. The two gliders presented here are well within regulation size for those interested in contest flying.

For the beginner, the "A" glider size is well suited to Junior size flyers, while "B" glider is intended for bigger modelers with stronger pitching arms. Experiment with both size gliders to see which is best suited to your strength. This will serve as a guide in future glider building.

The proper grade of wood should be carefully selected for the glider parts. Balsa for the wing should be light and of soft or medium density. "Contest" grade is best and can be obtained from Sig Mfg. Co. Tails should be same grade balsa but thinner. Since the fuselage takes a lot of bending and shock loads it should be of sterner stuff than balsa. Spruce is recommended with bass or very hard balsa as second choice. (Spruce can also be obtained from Sig.)

Fuselage should be large enough to be easily grasped with the fingers for launching. There is no need for tricky curves or notches, it should be a straight-grained stick tapered towards the tail from the trailing edge of the wing (see full size plan fuselage profile).

The wings should taper toward the tip both in plan and thickness. This keeps wing tips light so that most of wing weight lies below the center of lift. Stability is aided by this condition, giving smoother recovery from launch and flatter turns in the glide. Adequate dihedral is also necessary to good stability and this combined with proper fin size helps glider roll out at top of launch and prevents too tight a glide turn. If turn tightens, it could become a spiral dive with excessive loss of altitude.

Fin and stab (stabilizer) should be light and small. Too much tail weight will require excessive nose weight to balance properly. Tails should be given only two or three thin coats of plasticized dope to prevent warping. If warps should develop and glider is hard to adjust and flies erratically, remove the tail surfaces and replace with new warp-free surfaces.

All glider parts should be sanded smooth with fine and very fine grit paper, preparatory to assembly and finishing. All cement joints must be strong to withstand launching forces. New gliders have been known to shed their wings when given that first mighty heave-ho. The fuselage then flew fine, just like a big dart--up, over and down! To make strong cement joints, build up at least six thin layers of cement rather than using just one thick coat. Spread cement out thin and press into wood to saturate pores well. Let each coat dry thoroughly before applying the next.

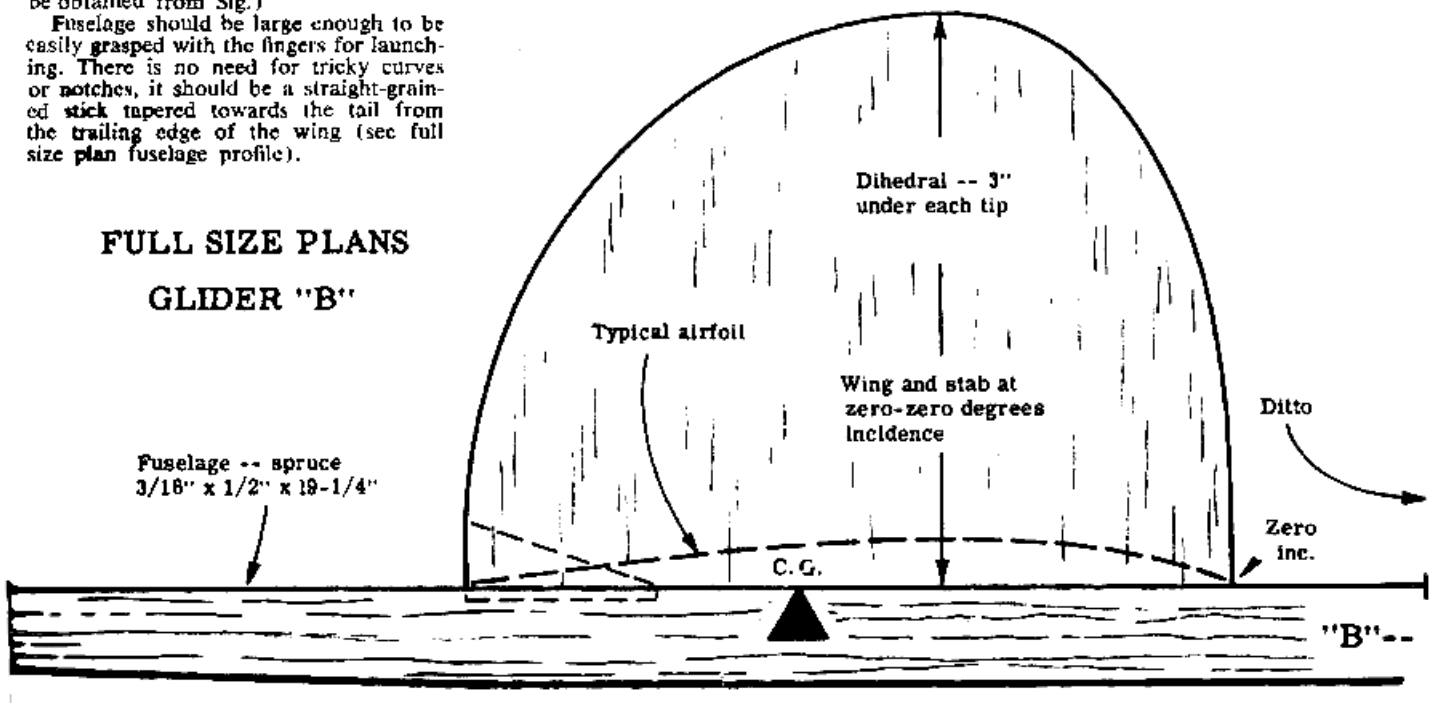
All parts should be aligned carefully during assembly. Block up, lightly clamp or pin pieces so that they will not shift during re-gluing. Additional cement coats tend to soften cement already applied. View glider from top, front and rear to check angles and squareness of surfaces.

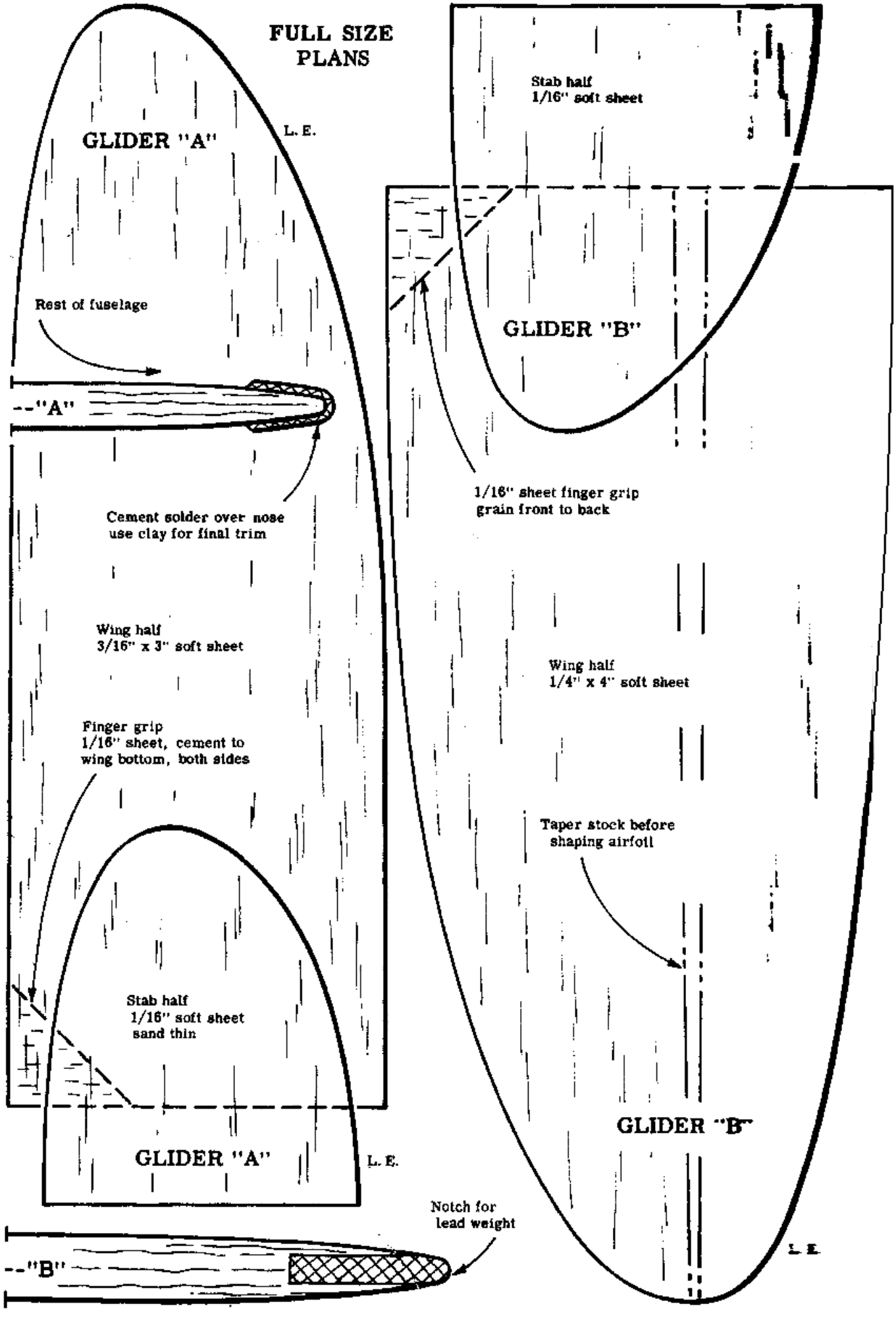
Lead nose weights should be given the multiple-cement-coat-treament so they will stay firmly in place during landing bumps. Use modeling clay (Plasticene) for final weight trim.

To gain top performance your glider should have a slick finish. Merely dab-

FULL SIZE PLANS

GLIDER "B"




FULL SIZE
PLANS
GLIDER "A"
L. E.
Rest of fuselage
--"A"
Cement solder over nose
use clay for final trim
Wing half
3/16" x 3" soft sheet
Finger grip
1/16" sheet, cement to
wing bottom, both sides
Stab half
1/16" soft sheet
sand thin
GLIDER "A"
L. E.
Notch for
lead weight
--"B"
Stab half
1/16" soft sheet
GLIDER "B"
1/16" sheet finger grip
grain front to back
Wing half
1/4" x 4" soft sheet
Taper stock before
shaping airfoil
GLIDER "B"
L. E.

bing on a couple of coats of thick dope won't do the job. You'll have to spend a little time and elbow grease to do it right. Surfaces should first be sanded smooth with very fine sandpaper. Regular nitrate dopes can be used since there is no hot-fuel problem. Dopes should be plasticized by adding two or three drops of castor oil to a 4-oz bottle. The oil makes the dope more flexible and prevents warping of thin surfaces. Glider should be given at least six coats of dope-filler or sanding sealer. To prevent weight build-up, sand each filler coat before applying the next. This will fill the wood grain and pores but remove excess from upper wood surfaces. A good home-made dope-filler can be made by adding pure talc to clear dope in ratio of ⅛ or ¼ talc to 1 of dope. Use 400 and 600 grit wet or dry paper for smoothing filler and dope coats.

When grain is well filled and surfaces are smooth, apply two or three thin coats of clear dope. This can be smoothed with auto rubbing compound for that that professional touch. Follow with a coat of auto wax (paste type) to make her really shine. This finishing process may seem like a lot of trouble, but the slick finish really pays off by reducing drag, resulting in higher climb and better glide.

There are several details that can be added as building progresses. Small triangles of 1/16" sheet should be cemented to the underside of the wing trailing edge at the junction with the fuselage. These form finger grips, or rests, that strengthen the thin trailing edge against launching-finger pressure. It might be wise to put a triangle on each side in the beginning so that you can find which side you favor for most comfortable and effective launching grip. Small patches of 220 grit wet or dry paper should be cemented to both fuselage sides under the wing to give fingers a good gripping surface. This will help you hold glider in the same way each time it is launched.

If you will be flying your glider over rough terrain, wing leading edge can be protected from nicks and gouges by cementing fine steel wire along the leading edge. Wire should be cemented in place before airfoil is shaped. This will help hold edge shape while carving and sanding. Hardwood strip, bamboo or aluminum tubing can be also used instead of steel wire.

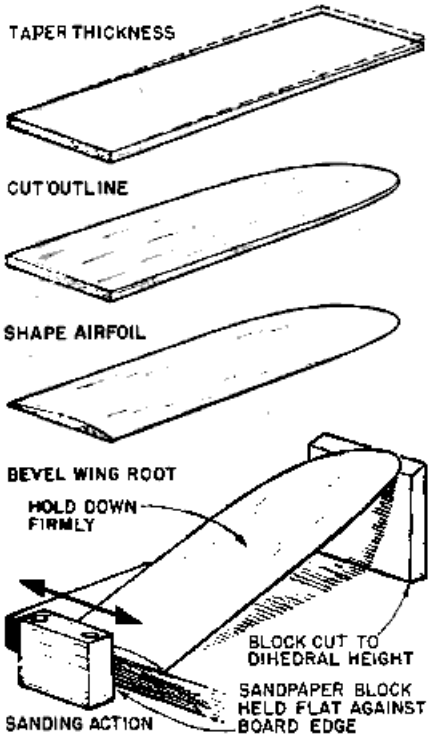
In making trim adjustments, the trailing edges of the flying surfaces will be bent to give effect of ailerons, elevators and rudder. Normally the wood is bent by breathing on surface and holding in position with fingers. To help hold these adjustments, cement 1/16" wide thin aluminum strips to the bottom of surfaces centered in aileron and elevator areas.

Now that the shop work is finished, let's get out to the flying field and see how our little gem will perform. Flying adjustment and trim is a continuing experimental process, so follow through these basic procedures and then try them over and over yourself. Procedure following applies to glider "A" with forward C.G. position.

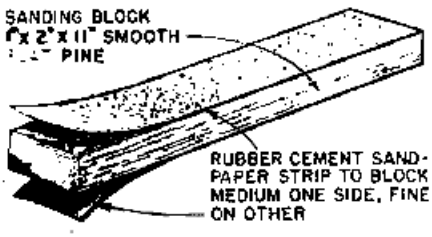
First the glider must be trimmed by gently hand gliding from shoulder height. Hold the glider level and throw smoothly straight ahead. Nose should be angled downward slightly. Do first hand glide testing in calm air if possible. Strong wind will affect flight, giving deceptive

(*Continued on page 62*)

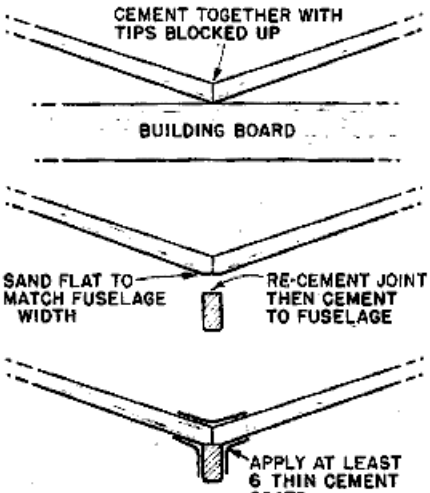
WING BUILDING STEPS



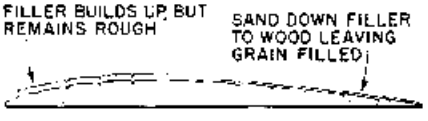
USEFUL SANDING AID



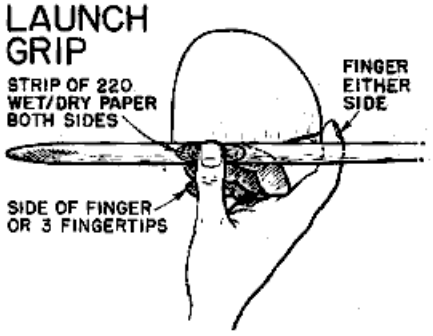
JOINING WING PANELS



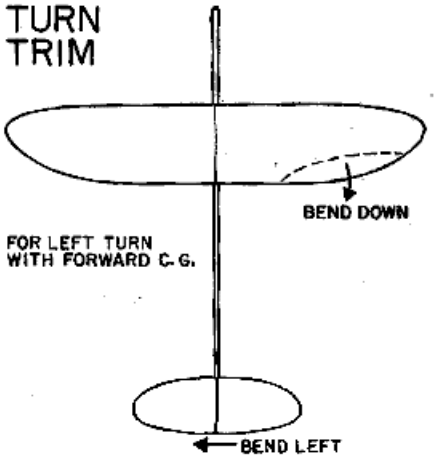
HOW TO REDUCE FINISH WEIGHT



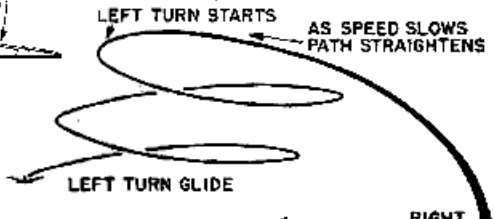
LAUNCH GRIP



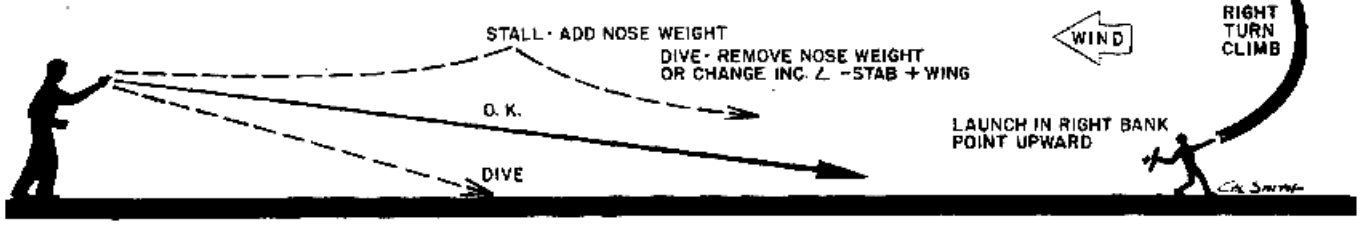
TURN TRIM



FLIGHT PATTERN



HAND GLIDE TRIM



Old Timer says . . .

This month we have some real choice finds—the **BAY RIDGE PACER**, a very popular free flight model by the nationally famous Sal Tabi, manufactured by Consolidated Model. Wing span 60", length 40". Kit includes full size plans, printed wing sheets and plenty of balsa. This Class C plane is an excellent flyer with exceptional strength. $6.00

Ever get fed up with todays landing gears—just bent wire? Well, it wasn't always that way. There was the **Davis Landing Gear**, steel struts and real shock absorbing mechanism. Control line and free flight models made "big ship" landings equipped with these. **Davis Landing Gear** less wheels $2.95 pr., for heavy duty class C ships $3.50 pr.; Props 8/12,

This month I have uncovered some famous classic model planes. Outstanding in its era was the Bay Ridge Topper A. It was a class A & B version of Gordon Murray's model that swept the Nationals and achieved world fame. With "skyscraper" wings it climbed like a rocket and leveled off into a flat, contest winning glide. What a plane!! Kit $3.50



An opportunity that will never occur again—a chance to get the famous engine that made modeling history! **Original Ohlsson & Rice** ignition .19 only $16.00.

One of the classic models of all time, the **Scientific Mercury**, Class C, 72" span, can be adapted for R/C and includes balloon type wheels. Kit $7.50.

Remember the famous dirigibles of the past? These models by C & S Models are probably the last remaining kits of this kind in existence. The dirigible Los Angeles—length 12" $1.00, 24" $1.50; Graf Zeppelin 15" $1.00; Baby Blimp—12" $1.00, 24" $1.50. These are not toys but are for the experienced modeler who wants something really different.

One of the most popular Cleveland models was the Playboy Sr. In meet after meet this giant 70" pylon monoplane free-flighter carried off prizes. One of the most astonishing performers ever developed! Playboy Jr. 54" span. Both kits include wheels and metal motor mounts. Sr. $4.50, Jr. $3.25.





Top Notcher, a model tool by Comet, turns out more accurate models quickly and easily. Makes a perfect notch for wing ribs, spars, formers and gives trouble free service with sturdy construction. Only $1.00.

Send 25¢ in coin for complete listing of old engines & kits in stock. With many new finds from our Old Timers warehouse. Add 10% of order to cover cost of handling and mailing.

We, the **OLD TIMERS OF HOBBY LAND, 390 MAIN STREET, HACKENSACK, NEW JERSEY**, cordially invite all modelers both young and old to drop in on Monday nights to review old memories and compare the present. Remember, many of the **Old Timer** models and accessories must be seen to be appreciated.

ADVERTISEMENT

H/L Gliders

(Continued from page 21)

glide path. If there is a gentle breeze blowing, launch glider directly into the wind. Proper glide path should be straight along its entire length making a shallow angle with ground. Glider should appear to sink at uniform rate. If glider noses up and stalls, tail-heaviness is indicated. Correct by adding more weight to nose. If glider dives or sinks steeply it is nose-heavy. Correct by removing some nose weight. *Slight* nose-heaviness can also be corrected by bending in up elevator on stab.

If surfaces are warp-free and in good alignment glide path should be straight. Glider should next be adjusted for turn trim. We want glider to circle at altitude rather than glide straight-away, necessitating long cross-country chases. For right handed pitchers glider is trimmed for left-hand glide circles. Launch is done with glider banked to right. Climb is then in a right turn. Launch speed and angular differences between wing and stab causes zoom, overriding left turn trim. As climb speed slows, glider straightens out at top of climb then starts into left gliding circles. *Left-handers should reverse these trim adjustments and flight pattern.* Now, back to hand gliding. Add left turn trim by bending rudder slightly to left. Add trim a little at a time, continue hand glides until glider turns in about 15 to 20' radius circle. Glide in turn will become a bit steeper than straight ahead, so remove a little nose weight, until gliding turn sink rate is close to that of straight ahead glide.

Now we're ready to tackle the full power launch. (Here again for right-handers.) Grasp the fuselage between tip of thumb and side of middle finger, under the forward part of wing. Forefinger should rest against trailing edge of right wing close to fuselage. The launch should be a side-arm swing with glider banked to the right and pointing upward at about 45 degrees. Practice this launch pitch with a moderate effort at first until you get the knack of it. Glider should spiral up to the right, then as it slows, straighten out, and glide to left. Once mastered, you can increase the power of your launch pitch by taking a few running steps approaching the pitch action. Full power launches will probably require slight trim changes because of added speed. You can develop real arm muscles launching your glider, but like baseball pitching you can overdo it, so take it easy in the beginning.

Trim and flying procedures are a bit different for glider "B" because of 0°=0° wing and stab settings. This also applies to glider "A" with stab on fuselage top and rearward C.G. position. The 0°=0° set-up makes glider more sensitive to trim adjustments. Here stab tilt is used for turn trim with less rudder adjustment needed. Stab is cemented in tilted position when building. Glider will turn towards high side. Hand glides should be flatter and longer than before. Recovery from a dive will eat up more altitude also. Check out by hand gliding as before until smooth sink and turn are achieved.

Launch should be overhand and nearly straight up with some right bank. You will have to really lean over backwards to do this properly. Glider will climb up behind and over you rolling out and going into glide turns. With this launch and 0°=0° settings, climb to glide transition is tricky and sometimes glider will not recover at top but continue over and spiral dive down. Check stab angle in relation to wing. If there is a slight positive angle this may cause poor recovery. Remove stab, cut away fuselage at leading edge and reset stab with 0°=0° or slightly negative angle. Try launching again. With new setting glider may stall. This can be corrected by tightening turn with more rudder or adding a little clay to left wing tip.

After these adjustments are proven, try launching glider straight up without any bank. Top of climb will end in front of you with smooth transition to glide path.

By trying these various combinations of trim and launch you will find the technique best suited to gain top per-



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Inaugurating 2nd annual model rocket championships Mayor William Henderson of Colorado Springs (center) presses switch to send up first rocket. Clay Banta and John Roe (rt.) look on.

came when someone pointed out that the model wasn't legal under the rules; it should have had aerodynamic stabilizing surfaces (fins). But, because the purpose of the Best Design event is to stimulate new ideas, new research, and new concepts, the rules were stretched. To keep rule-stretching out of this event in the future, Bill Roe and the NAR Contest Board are now busy closing the loop-holes in the rules for this event.

The highlight of the NARAM-2 was the flight of two model rockets equipped with radio transmitters. Gary Johnson and Jim Meek of Colorado Springs flew a bird equipped with a crystal-controlled peanut-powered transmitter weighing about 1.3 ounces; they picked up the signal on the ground with mobile receiving gear and were attempting to measure velocity by Doppler shift of the transmitter signal. John Roe's *Loudmouth* model also contained a crystal-controlled miniwatt ounce-weight transmitter plus a device for measuring rocket acceleration. Both radio birds flew well, and signals were transmitted during their entire flight paths.

As if the contestants didn't have enough to do in the evenings fixing busted fins and otherwise repairing birds and getting others ready to fly, there were three symposia scheduled, one each night. The object of these get-togethers was to pass around information, get a bull session going, and generally help model rocketeers share their knowledge.

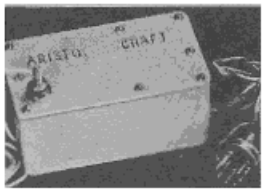
The first night's symposium was chaired by your reporter and covered the subject of model rocket design. There have been two important breakthroughs in model rocket design this year. The first was the development of a workable thrust augmenter or "wind sucker" by the NAR boys in Denver, Colorado. Using furnace asbestos paper, they have been able to build jet-pump type thrust augmenters weighing only a fraction of an ounce and contributing very little additional drag. Vern Estes ran many tests on his recording static thrust stand to determine the best diameter, length, and distance from the nozzle. The result was a configuration that adds about 50% to the thrust during the critical takeoff period. Several augmenter birds were flown by the Denver boys in the NARAM-2; and, when they took off,

(*Continued on page 94*)

This complete radio transmitter (left) weighing less than 1 ounce for operation in a model rocket was built by Gary Johnson and Jim Meek, worked successfully during flights of 500' altitude.

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SPECIFICATIONS — Size: 2" x 2" x 3½" • Weight: 8 ozs. Transistorized uses one pen-cell and one 45V hearing aid battery • Simultaneous operation: uses two controls at the same time on demand • User subminiature relays and "Tone-Master" reed bank • Simple-Touch Tuning • "Aristo-Crafted" circuit for stable operation over wide temperature and battery voltage ranges • Tunable over all new F.C.C. allotted frequencies.



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This 8-channel simultaneous transmitter is the companion unit to the Multi-Ceiver R8-D, 8 channel receiver. Super stable "Aristo-Crafted" circuitry, incorporates close tolerance toroids and component parts. This transmitter has single switches for all directional and aileron movements, and special key-switch for motor control. An indicator light gives visual output check; a permanently attached antenna telescopes into a lacquered aluminum transmitter case for protection and portability.

SPECIFICATIONS — Sizes: 6¾" x 3½" x 9½" • Simultaneous operation of controls • For use on all new allotted F.C.C. frequencies • Low battery Drain • Power Radiation Indicator • Collapsible chrome antenna.

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