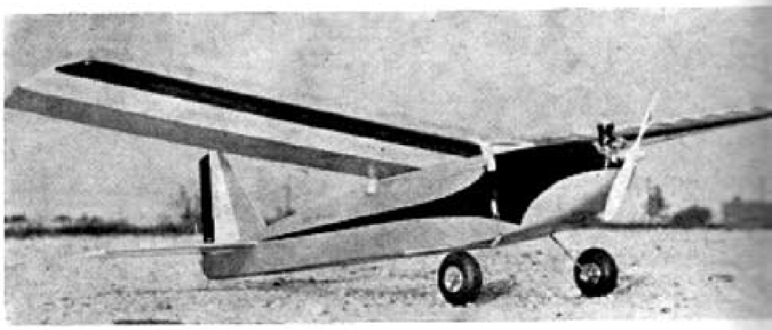
Your full-size plans . . .

Bill Winter's

PAL JOEY

42 in. sportster for single-channel radio control with .75 to 1.5 cc.



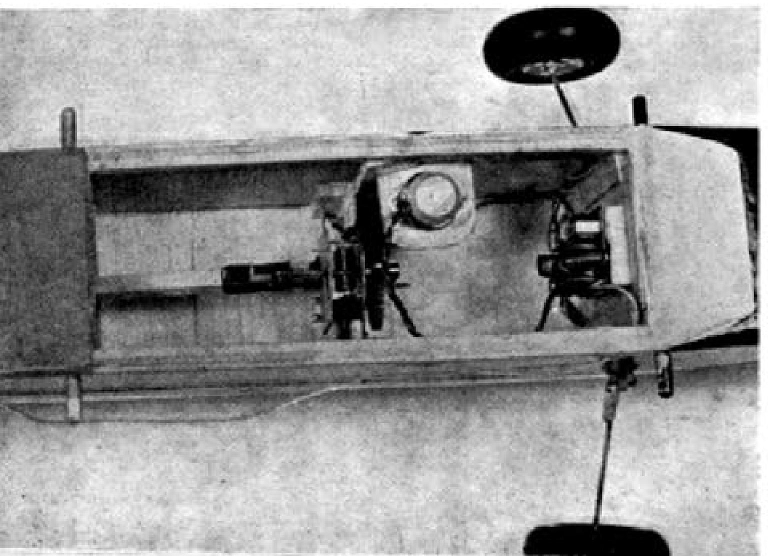
Photographer's daughter Lynn Schneider makes a friendly model even friendlier! This topnotch design by America's most experienced r/c designer was specially commissioned to match "Gemini," "Guidance System," "Minimac," "Kraft" and similar outfits. Installation, with Elmic Commander below the connection plug confirms simplicity.

EXPRESSLY DESIGNED for such engines as the Cox Medallion .049, *Pal Joey* is a rugged, rather docile and easy-to-fly sports model. Weighing 21 ounces with a relayless transistorised receiver (3 volt Kraft in picture), *Pal Joey* has 290 sq. in. of wing area for an approximate wing loading of 10½ oz./sq. ft. and a power loading of about 430 oz. per cu. in.

Pal Joey is not, and is not meant to be, a contest type machine. It does not have the requisite ballooning tendencies for so called stunts—the bane of all beginners and sport fliers in wind. The experienced flier can modify the set-up as he sees fit. Rudder control is enough to ensure turn capability when gliding straight downwind in a 10 m.p.h. breeze.

Considerable down and side thrust is used. With generous lift, downthrust is essential—in this case—to handle trim difference between power off and on airspeeds, and for into wind flight. Side thrust is usually exaggerated with shoulder wings having a high thrust line. There is not much decalage; but anyway, the model is stable. Trimming out a tail heavy condition by shimming the wing (tail being fixed) is *not* recommended in this instance—better to add weight to the nose.

Rudder movement, hence *power*, requires strict adherence to Elmic escapement instructions—and depends on CG position, weight, etc. Supply for the 3 v. receiver—common voltage for radio and actuator—is a DEAC 225-mah 3-cell pack, yielding 3.6 volts—more probably after charging. Some brands of receivers won't oscillate in every instance, or become obstinately erratic, at more than 3-and-a-fraction volts specified, so *follow manufacturers' directions.* A three pencell set-up—two on escapement, one for filament, plus a small B-battery for a relay receiver (if light) should not seriously handicap performance. If pencells are used for a relayless receiver as described above, they should be of the Manganese alkaline type (refer to feature in *Aeromodeller Annual* 1963 for more details). Running a receiver plus actuator on two dry pencells is flying in the face of disaster.



Of some importance, is the fact that long "holds" required on a marginal rudder action will exhaust batteries sooner than expected. The busy type of pilot will run down batteries sooner, too.

It is suggested that the reader experiment with $\frac{3}{16}$ in. and $\frac{1}{4}$ in. rubber for the escapement, noting how the device operates with full turns, and how many turns are left when operation grows sluggish. Leave at least 10 per cent slack. The writer lubricates the rubber and stretch winds $\frac{3}{16}$ in. which does not require really fast pulsing, but, because of the many turns, allows ample signals and consistent timing for the longest flight—even if many turns remain on the rubber (applies to this and similar aeroplanes only.)

A small model like this one definitely should be hand glided until a fast straight glide with a two-point touchdown is achieved. Avoid pretty swooping glide tests which flare out on landing—in the air, there is trouble ahead! We used rather heavy, largish wheels, but other wheels can be substituted according to trim and gross weight. (Retaining rubbers for the knock-off gear, pull the gear to the slant position shown.)

Construction

Anyone who tackles an R/C model certainly does not need to be told how to build a boxy aeroplane. Certain points require clarification. The **wing**, for example, is quite normal with the exception that the spar notches are cut extra deep, so that the spar runs through the ribs and not along the bottom surface of the wing. The notch gaps under the spar are reinforced with $\frac{1}{32}$ sq. pieces cemented to the side of the rib, extending fore and aft of the notch this is simple but strong.

It will be found that the spar can be elevated from the bench on $\frac{1}{32}$ scrap wood, and that the lower centre-section sheeting and wing tips then fit snugly *between spar and bench. The fuselage is normal*; but rather than bend sides towards the nose, the accumulated thickness of a 3/32 in. thick side, a doubler of the same material, and a ¼ in. doubler forward of the leading edge (to the firewall), allows *rough sanding to contour. Alignment is automatic* and strength extreme. The cabin doubler runs back to the trailing edge station but, actually, to mid-cabin would be sufficient.

The top and bottom of the nose is covered with sheet balsa as specified. The nose proper consists of two cheek blocks, plus a bottom block on which the mounts glue. The ⅜ in. sq. hardwood mounts extended just through F-1 holes on the original, but plan shows mounts narrowed to ⅜ in. x ¼ in. at the rear, engaging bulkhead *F-2.* They support the batteries in a crash.

Fuselage is made by cutting out sides and doublers, laminating them with contact cement. Uprights are glued on before assembly. Sides then glue to cabin bulkheads, followed by nose bulkheads. It is vital to check top view alignment—bulkheads at exact right angles to sides; lock in place with one piece of bottom sheeting (grain across model.) Install and check escapement operation—with torque rod—before adding bottom cross pieces or closing in fuselage. (Cover escapement thereafter for protection from dust.) Add ⅛ in. x ¼ in. bracing *behind* esc. former.

Two steps require precision. In drawing the sides together at the rear, the stern post position must be *exactly* on the aircraft centre line; check this by placing the fuselage directly over the top view on the plan. Measure carefully the incidence in the **tailplane** before gluing in place. **Fin** and **rudder** are *soft* balsa. Align tail assembly carefully. You may want to make glide tests with the tailplane spot-glued in place, then cement permanently and add the fillet blocks (soft, hollowed) at tailplane fin junction.

Covering: Use lightweight silk, grain lengthwise *on all surfaces, but leave fin and rudder* uncovered. These are clear doped several times, sanding between coats with wet-and-dry mix in several drops of castor oil per ounce of dope for this. Original was wet covered, took four (five may be needed) coats of *clear and two of coloured. Go easy on aft-end* colour doping, ours was orange, black and white.

Flying: Check for warps, balance and alignment. Remove any warps (steaming is easiest method) because any warp may make the plane erratic and accident prone. Be sure there is no twist in the fin. No surface should be cocked, however slightly, when *viewed from above, the side, and the front.* After establishing an acceptable test glide trim, make first power flight with short engine run and slightly rich setting (do not peak the engine.) Time engine run on ground, then run off all but a minute's fuel *before launching. Make the launch smooth, not* nose-high and do not heave! After glide trim has been corrected on basis of flight observations, thrust line adjustments take care of stall and/or turn tendencies under power.

Do not be afraid to fly upwind. Most modellers act as if they had 50 ft. range and panic quickly into turns which position the plane downwind—the battle is lost before it begins! Go far enough upwind so that turns leave *Pal Joey* still upwind of the launch point. Well upwind, try gentle turns—don't clamp down the control the first try! Don't panic as long as you are upwind, however high. Frantic controlling leads to disastrous speed build-ups and "hairy" flying. Even a docile model will go like blazes under such circumstances.

Critical point in any rudder-only flight comes when a spiral-down is necessary to kill altitude. Consider that the ground radio range should be at least 1,000 ft. in the air that is very, very high for a small model (a big one vanishes at about 5,000.) If well upwind, the resulting erratic recoveries and zooming about, common to the beginner after a spiral, can be dampened out before drifting back to the launch point. Behind you, the spiral is touchy, often posing an eventual choice between chasing the model, transmitter in hand, or spiralling again into the ground. *Upwind distance is insurance.*

With added confidence, more liberty can be taken. Actually, no one can tell you just how to fly. You may feel like the bird pushed out of the nest, but you do have to do it all yourself. If you have a skilled friend, let him help—even let him make the test flight. First tests should not be made in winds exceeding 5-7 m.p.h. unless you have experience, and once you have that—then *Joey* is your *Pal.*