



## Ace's R/C "Combo": Everything You Need

■ A "double header" is what Ace Radio Control (Box 301, Higginsville, Mo) calls its Snap Dragon R/C Combo. In one package you get about everything needed to build a single control (rudder-only) R/C model plane.

All you need to finish and fly the plane are model cement, clear dope, color dope, batteries for transmitter, receiver and escapement. Oh, yes, fuel for the Fox .09 engine that's included.

Let's look first at the plane kit (it can be purchased separately). Snap Dragon, a product of Blackwell Models (Canon City, Colo.), is an ideal project for the R/C beginner. Simple to build, it has no tricky curves or doodads. Like other Blackwell Models kits, this comes with partially assembled fuselage; cut to shape with holes made where needed, the two sides are jig-assembled at the factory with the two main formers in place. This design could be called a shoulder wing—there is no cabin and the wing sits almost on top of the fuselage. All small pieces are machine cut. This is good.

Nose can handle radial or beam mount engine. Plan shows K&B .09 on beams, Fox .09 mounted radially. Other engines of similar size can be accommodated.

Fuselage sides are  $\frac{1}{8}$ " sheet, same balsa size goes on bottom and top. With wing removed you have a compartment  $7 \times 2\frac{3}{4} \times 3$ " high for R/C installation. Forward there is more space for batteries and fuel tank, both under removable hatch.

Simple landing gear is made by fastening two pieces of  $3/32$ " music wire which come bent to shape; 2" wheels are specified, with  $\frac{3}{4}$ " tail wheel. Landing gear is held against plywood plate by rubber bands.

Wing has constant-chord with square tips and built-up I-spar at point of maximum thickness. Shaped leading and trailing edges and 20 machine-cut  $\frac{1}{8}$ " balsa ribs are ready to use.

Stab is flat with  $\frac{1}{4} \times \frac{3}{8}$ " balsa edging and diagonal ribs to prevent warping; it fits under the fuselage. Rudder and fin are of  $\frac{1}{8}$ " sheet.

Snap Dragon with 44" span, 330 sq. in. area, is meant for engines from .074 to .09 cu. in. displacement. With an average R/C installation, wing loading will be close to 10 oz. per square foot. Average building time is billed as 3 or 4 evenings, and we believe it.

The Kraft single channel receiver kit comes in a plastic case, inside is another plastic case  $1\frac{1}{4} \times 1\frac{3}{4} \times 2\frac{1}{2}$ " which houses the completed lash-up. A tube-transistor tone job, this ends up operating a tiny Deans relay.

Set assembles on printed circuit plate made of a desirable epoxy material. Holes are drilled by the builder—but the epoxy drills cleanly and the copper "printing" shows hole locations clearly.

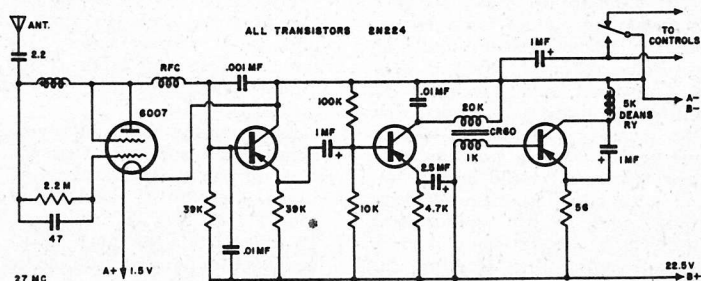
Receiver kit includes wound RF coil and choke, required resistors and condensers, AF transformer, tube and three transistors, wire, and special solder for use on P.C. board. Instructions include step-by-step assembly and wiring data, circuit diagram, top and bottom views of P.C. board with components shown and numbered. This receiver can be used for 27 or 50mc . . . a few parts must be changed for latter band. Our "27" test kit had a 6007 detector tube; 50mc rig substitutes a 1AG4 tube, a different tuning coil, plus a few resistor and condenser changes. Purchaser should specify 27 or 50mc.

Kraft single channel tone transmitter kit, like the receiver kit, is an exclusive Ace product. Basically, this is an MOPA unit, using one half of the 3A5 tube as an oscillator at one half the output frequency, the other half acts as a doubler to the desired 27 mc spot. This, too, can be for 27 or 50 mc; same oscillator-doubler arrangement is utilized, with crystal of half the desired output frequency. The same tube is employed for either frequency, but there are many coil, resistor, condenser and RF choke differences. Paired transistors provide 400 cycle audio to grid-modulate 3A5's output stage.

Tube and crystal are tested before shipment; Ace certifies that if made according to instructions, transmitter will operate within FCC rules. It is not legal for builder to tune outfit—this must be by a holder of an FCC commercial operator's license. If purchaser cannot locate a licensee, he may ship his unit when complete to Ace Service Center (837 Eastern Ave., Schenectady, N. Y.) where tuning costs \$2 plus return postage.

The transmitter is in a sturdy, lightweight anodized aluminum case, from its top projects a collapsible whip antenna. All components except key and switches mount on P.C. plate, which comes drilled. The plate bolts directly to front panel; beneath are switches, under them a heavy aluminum barrier to keep batteries from shorting out on the switch terminals.

As with most tone transmitters, this emits RF signal continuously, key button turns AF modulation on and off. This button is "snap action" type. That's good. Interesting feature is Hi-Lo power switch; most flying can be in Lo position to save battery power, but if your plane appears to be flying out of range, flip



Ace Craft Receiver from Snap Dragon set.

switch to Hi which gives stepped up output power. Lo was found adequate for matching Kraft receiver under most conditions.

Purchaser must obtain copies of FCC Form 505 for licensing, plus Part 19 of FCC rules dealing with Citizens Radio Service matters, before he can be licensed. Latter is available only from the Government Printing Office in conjunction with Parts 12 and 20, \$1.25.

What extras make this R/C Combo such a useful one to the beginner (and to his dealer)? You receive: Bonner Vari-Comp escapement, Fox .09 engine which has built-in fuel tank (can use larger external tank if you prefer), yard of covering silk, two 2" and one 3/4" wheels, Top Flite 7-6 propeller, Hillcrest type D box which carries all batteries required (four 1 1/2 volt pencils, a 22 1/2 volt B battery), switch and meter jack and plug. Also: foam rubber, rudder hinges, escape-ment rubber, bands to hold wings and landing gear, nuts and bolts.

**Ace Kraft 27 mc Single Channel Tone Transmitter.** Single 3A5 tube as oscillator and doubler, crystal at half output frequency. Two 2N224 transistors as 400 cycle multi-vibrator for grid modulation. Three section 57" antenna, 21" collapsed. Front panel on-off switch, Hi-Lo power switch-keying button. Case 3 x 5 1/2 x 8". With batteries, 4 1/4 lb.

**Transmitter Power supply:** "A" supply, 1 1/2 volts at 200 ma (Eveready #742 or equiv.); "B" supply, 67 1/2 or 135 volts (Eveready #467 or equiv.). With 67 1/2 volts, RF section draws 5.6 ma, modulator 0.5 ma; with 135 volts, these rise to 14.5 ma and 1.4 ma respectively. Modulation percentage, 100 on Lo power, 96% on Hi.

**Ace Kraft 27 mc Tone Receiver.** 6007 tube detector, three 2N224 transistors. Deans subminiature 5,000 ohm relay. Antenna length, not critical, 18" to 24" total. All parts mount on epoxy fiberglass P.C. plate 2-1/16 x 1 1/8". Receiver requires audio tone approximately 400 cycles, but not critical. Weight with plastic case, 2 1/4 oz.

**Receiver Power Supply:** "A", 1 1/2 volts at 10 ma; "B", 22 1/2 volts; with no signal input, about 1 ma; with tone signal, about 5 ma.

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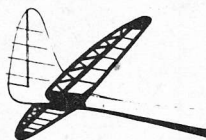
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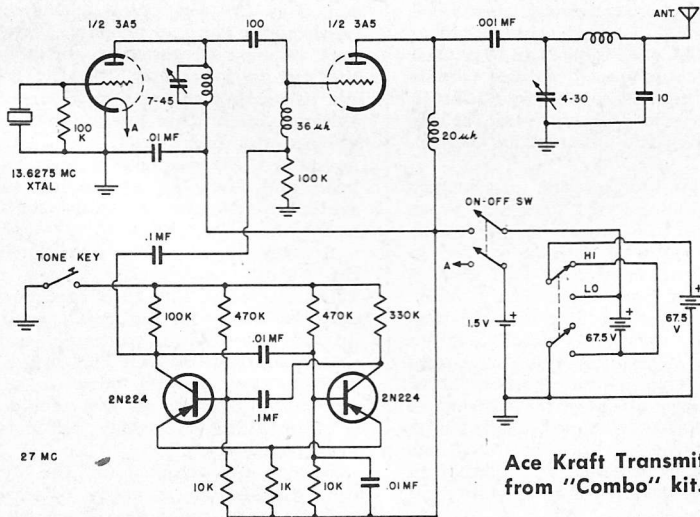
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**Ace Kraft Transmitter from "Combo" kit.**

## Air Notes . . . from page 6

Northrop's Norair Div modifying WB-66D as Laminar Flow Control test bed. Company's LFC aimed to increase range, payload or endurance of large aircraft 50% by decreasing friction drag. Compressors in under-wing pods suck air through paper-thin slots in wings to prevent turbulence in boundary layer. LFC plane will have extra large wings; B-66's normally fitted J-71 powerplants to be replaced by GE J-79's aft mounted in fuselage nacelles. Three-year, \$30,000,000 program under USAF Systems Command.

According to AIA, U.S. general aviation (all civil flying except commercial airliners) will move upward from today's 70,000 aircraft to 100,000 by 1970. Example of growth was CAA's (now FAA) 1955 estimate that business flying hours would climb to 5,700,000 annually in 1960 (46% increase over 1954). Latest figures place business flying in excess of 6,000,000 annual hours. General aviation flies nearly four times the hours of scheduled airlines; sales have grown from \$25,000,000 in 1950 to \$200,000,000 in 1960; should quadruple by 1970.

End of 1960 showed world's air transport fleet (excluding USSR, Red China, and the other few non-members of International Civil Aviation Organization—ICAO): 388 turbo-jets; 723 turbo-prop; 1,621 4-engined pistons; 2,282 2-engined piston planes. Some 659 jets are on order for delivery before end of 1962; successor to "2nd generation" jets will be supersonic transport (SST) with 1500 to 2500 mph speed range; earliest delivery seen as 1967-1970. However, there were more DC-3s (1,296) in service than any other type!