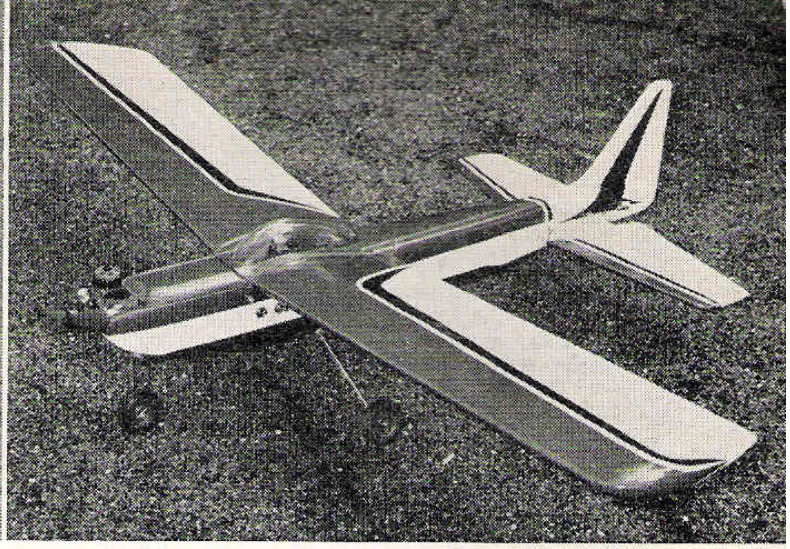




TAURI

THE WORLD FAMOUS 57 in. MULTI-CHANNEL RADIO CONTROL TRAINER BY ED KAZMIRSKI

(Produced with co-operation of Top Flite Models)

HERE'S A MODEL with a purpose. First and foremost it has been specifically designed as a *trainer* for multi-channel radio control. Through the kit issued by **Top Flite** in the U.S.A., it has already become world famous.

We learned of it first when designer (and then World Champion) Ed. Kazmirski visited our offices during his demonstration trip to S. Rhodesia. Ed's design philosophy appealed to us in its purposeful approach, and earnest effort to salvage some of the "sudden death" novice attempts to learn how to fly multi-control with contest designs. Tauri is small and therefore costs less to build than larger multi designs. It employs a relatively small engine (of 3.5 c.c.) and is therefore slower, yet no less efficient by virtue of the thick, semi-symetrical wing section. Above all, it is an easy model model both to build and fly. It is also a *fully* aerobatic aeroplane, though initially intended for six channel radio installations—rudder, elevator and engine.

For a first try at the multi game, this is about as much as one can handle. Installation capacity allows for all equipment ranging from the Super-Regen. relay Rx to the latest relayless Superhets and a typical control system is shown on the plan.

Since weight is a most important factor in a load carrying radio model, choose balsa carefully, assessing the density of the wood according to its purpose.

Construction notes on the plan explain the warp resistant self-jigging wing structure and fuselage assembly: but the builder can profit from extra tips on individual items.

Since control depends upon them, the surface hinges should be free and allow 60 deg. motion in either direction. Use the "Herringbone" stitch so well proved in control-line circles.

The engine will have a lot of work to do and will be running for long periods. Mount firmly with brass bolts (which shear in a crash) and don't forget the locknuts. Bearers must be liberally proofed against fuel seepage. Align the fuel tank with the needle valve body and keep fuel tube short. Use a fuel filter and make sure the weighted end of the syphon pipe has free movement in the tank.

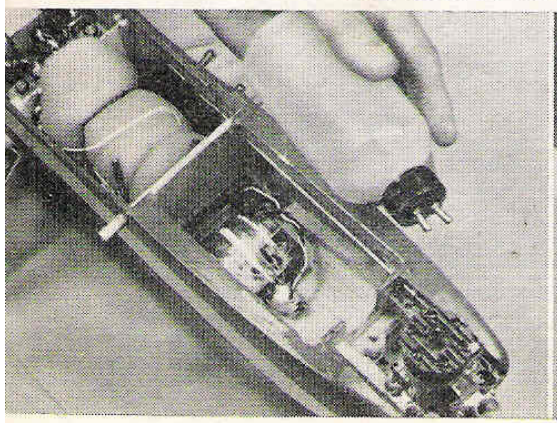
On the radio equipment, be sure to make a neat wiring job. Skin off only enough sleeving to make the solder connection and insulate every joint with Systoflex or fuel tube. That demon vibration can affect reeds in a receiver, a layer of ¼ in. – ½ in. foam rubber wrapping around the receiver case helps. Ed. Kazmirski advises to install the receiver so that the reeds hang down, where they are least affected. Modern reed banks with wider contact gaps have an amazing resistance to vibration bothers; but do not tempt fate.

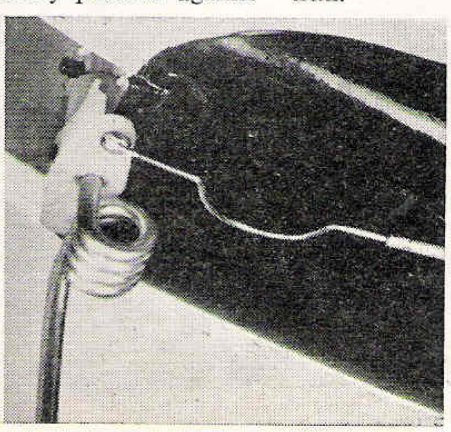
Servos should be mounted exactly as the manufacturer advises, either on grommets or foam rubber pads to minimise vibration effect on the mechanism and screws. New servos should be taken apart so that the soldered joints to the switcher plate and motor terminals may be coated with contact cement as an extra protective precaution. Incidentally, Ed. Kazmirski is emphatic that a slide switch should *never* be used but other respected authorities prefer a "knife-action" slide switch. Good quality is the essential. Pushrods are the most important links between the servos and the control horns. Ensure they and the horns are always in perfect order.

Check *every* soldered joint. Suspect joints or frayed wires should be replaced immediately. Sleeve every soldered joint and support with contact cement wherever possible, a quarter ounce of precaution saves pounds of trouble !

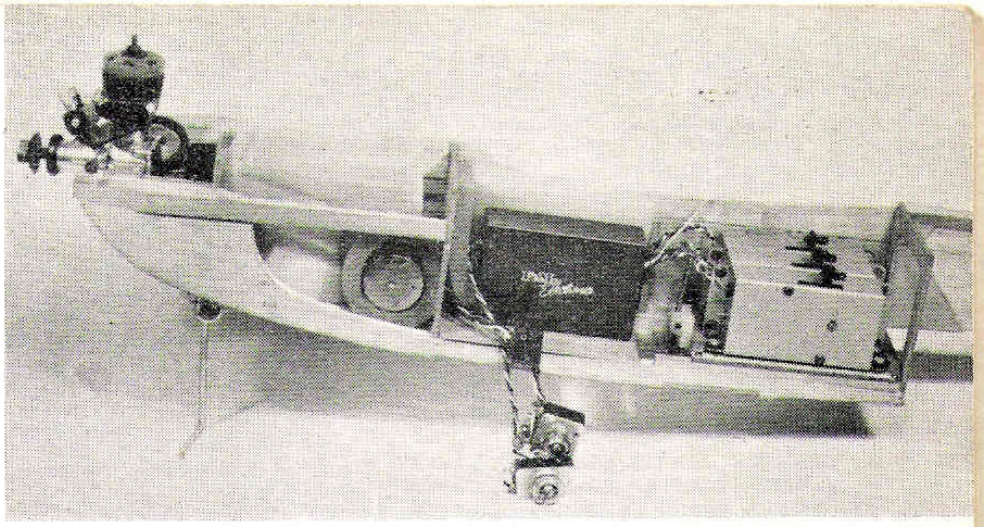
Trim

Many factors affect the correct trim of a model; weight, alignment, decalage, C.G. position, down and side thrust, wing leading edge radius, elevator settings and throw of control surfaces. Any one, or combination of elements, misaligned, may upset trim.





Framework and finished model views at top indicate the functional simplicity of the Tauri as built and tested by Tony Dowdeswell, with K & B 19 engine and at various times, F & M Matador or Orbit radio equipment and Bonner Transmite servos. At left is a view of tank access with the Deac accumulator pack below and receiver wrapped in foam rubber. Next is close up of the steerable nosegear with piano wire formed in shock absorbing "U" for direct drive from special lever shown on page 178.



Partly assembled fuselage from the American Top Flite kit for Tauri, manufacturers of which have kindly co-operated in the production of the plan reproduced below. View shows disposition of Deac cells beneath tank, Rx and toggle switches, then triple servo installation for six channel control.

Even if a wing is built without warps, it is still possible that the model will not maintain a straight heading through loops. This is because the leading edge radius of the wing varies from tip to tip, causing yaw and roll effect. The remedy is to sand the leading edge with a formed block in the first place.

Experiment with various degrees of control surface throw. The elevator has 14 deg. movement each way, or 1 in. total motion at the trailing edge and the rudder 16 deg. each way for a total of 1¾" motion.

The amount of deflection used depends on the frequency or length of the pulses on the control lever. Over-controlling is common, so fly high initially until you have the feel of the model.

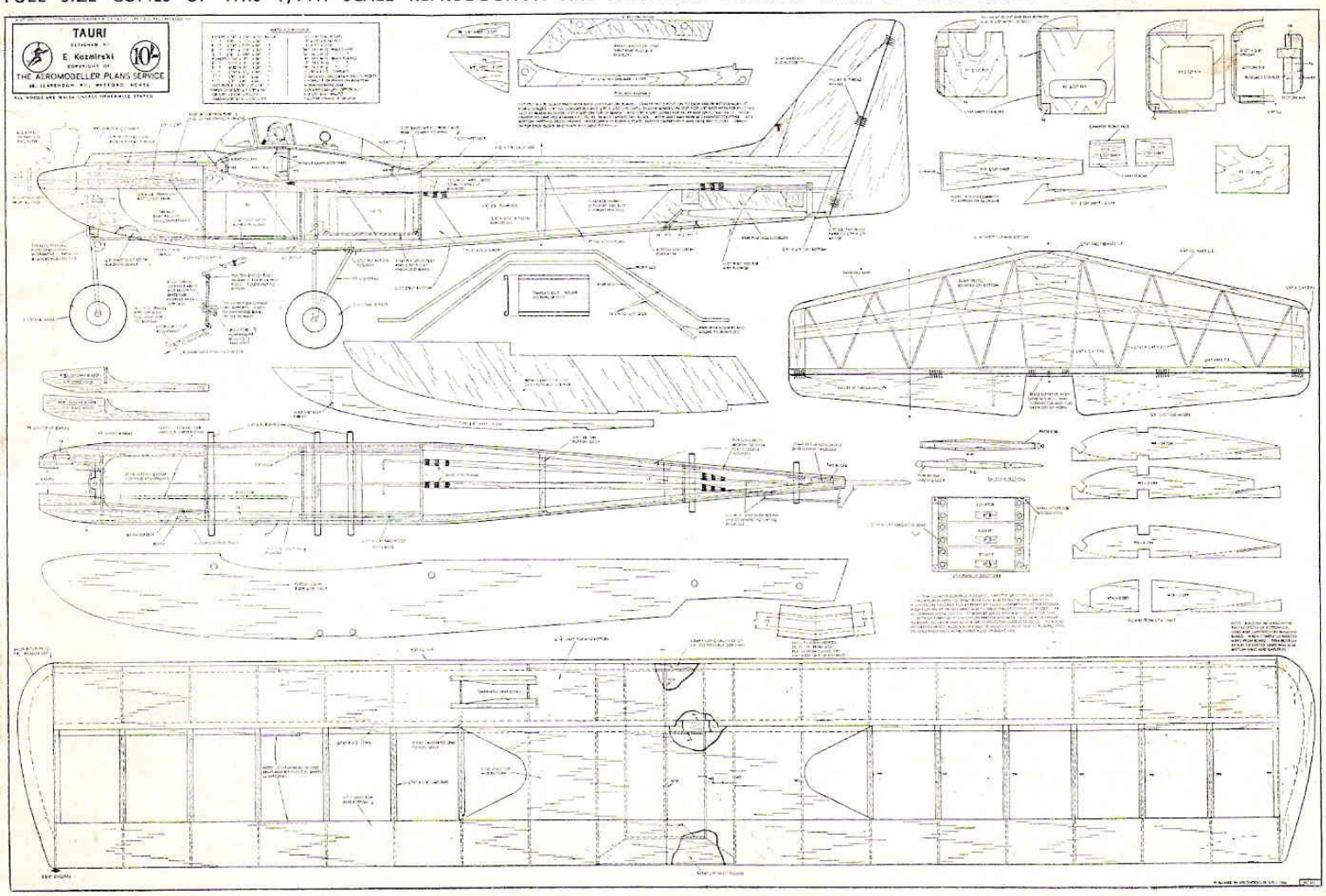
The two most important factors in trim are C.G. position and decalage (difference between angle of attack of wing and tailplane). The C.G. should fall between 30 per cent to 40 per cent of the wing chord from leading edge. If the C.G. is too far forward, the model will require more decalage (pack down the tail leading edge) which creates more drag and calls for extra power. When power is cut, the model tends to descend rapidly.

If the C.G. is too far back, the elevator becomes very sensitive and makes the model difficult to fly, especially in windy weather, so when moving the C.G. rearwards we *reduce* the decalage to compensate, preferably by increasing the angle of attack on the tailplane.

All C.G. and decalage adjustments should be made with absolute zero elevator settings to avoid tab effect. As the tail is adjusted in angle, so must the pushrod be adjusted to bring the elevator in line. Slight up or down elevator bias acts as a tab and will change the pitch attitude according to airspeed. The greater the speed, the more the effect. Warps produce the same characteristics, hence the importance of accurate surfaces. Spins are easier with a rearward C.G. position, outside loops are better, but inside loops become tighter. It's all a compromise!

Our Tauri provided us with nearly 50 long and most enjoyable flights before it met its end (*never*

FULL SIZE COPIES OF THIS 1/9TH SCALE REPRODUCTION ARE AVAILABLE THROUGH A.P.S. AS PLAN RC857, PRICE 10/- INCLUDING POST



fly in sunny weather without good sunglasses. Take them with you to the flying field even on winter days). Initially we installed an F & M Midas receiver and three Bonner servos, with a K & B 19 R/C for power.

Flying

The first things to get right are the take-off and then the turns. Take off with full power, headed into wind. A few short pulses of up elevator will lift the nose as speed builds up on the ground and once airborne, only blip sufficiently to maintain a steady climb.

Use short pulses on the rudder lever and give a few blips of "up" elevator to keep the nose up in a turn to bring Tauri back. After satisfying yourself with circling flight, switch to slow motor. Brought in on slow motor the Tauri controls easily on landing. Don't overdo the flare out, or it will stall and hit the deck nosewheel first, then you get an uncontrollable switchback, on the stalky undercarriage.

After mastering the basic flying, try flying the model towards you to get used to the reversal of directional control. Now for a few aerobatics. Loops are always best to start with. Just make sure you have plenty of altitude and forward speed and then hold full up elevator. If it tends to roll out at the top the speed loss is too great so pulse round the loops and open them out.

Stall turns are fun. With plenty of forward speed, lift the nose vertically into a climb, then give two fairly long pulses or rudder followed by full rudder signal as the model slows down, to bring the wing over. Let the Tauri drop a little and build up speed before levelling off.

Tauri performs a spectacular barrel roll with simultaneous rudder and elevator. The first one will probably leave you a little breathless, but it has plenty of automatic recovery ability, don't worry.

A natural follow on from the "snap" or barrel roll is the "Split S" or reversal, and this is the manoeuvre we like best of all. Simultaneous elevator and rudder roll the Tauri to inverted, whereupon you pull full up to half loop and recover in the reverse direction and level off. Make sure you don't overdo the roll which is very fast and easily overshoots the inverted position. For a really spectacular reversal, roll to inverted and just leave her there to recover on her own after a long curving dive. *Wow*!

Outside loops are best done from altitude. Hold full down elevator and keep it there as the nose tucks under. If the nose will not lift from the inverted up the other side, then hold full up elevator. This is where that extra altitude is beneficial. If it does not like the outside loop, consider moving the C.G. position aft.

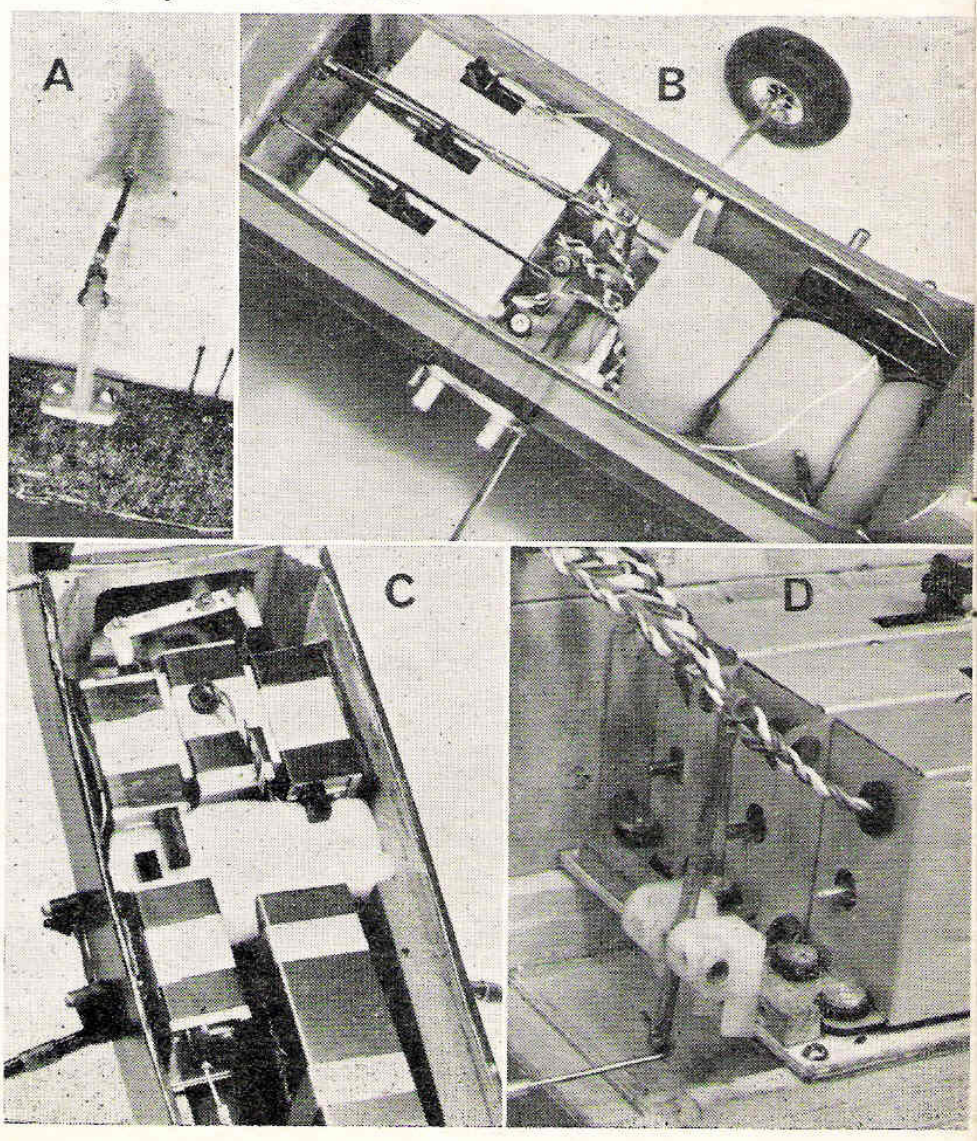
Inverted flight is for the experienced, and without trim elevator, is likely to be something of a switchback.

You will find the Tauri forgiving. Give it a chance and it will help you on the way to multi success. Later we fitted a trim servo to our test model, plus a brake on the steerable nosewheel. Those without a trim servo should adjust their elevator servo for a wide neutral. A flick of down on the elevator control lever will bring in that extra trim for smooth level flight.

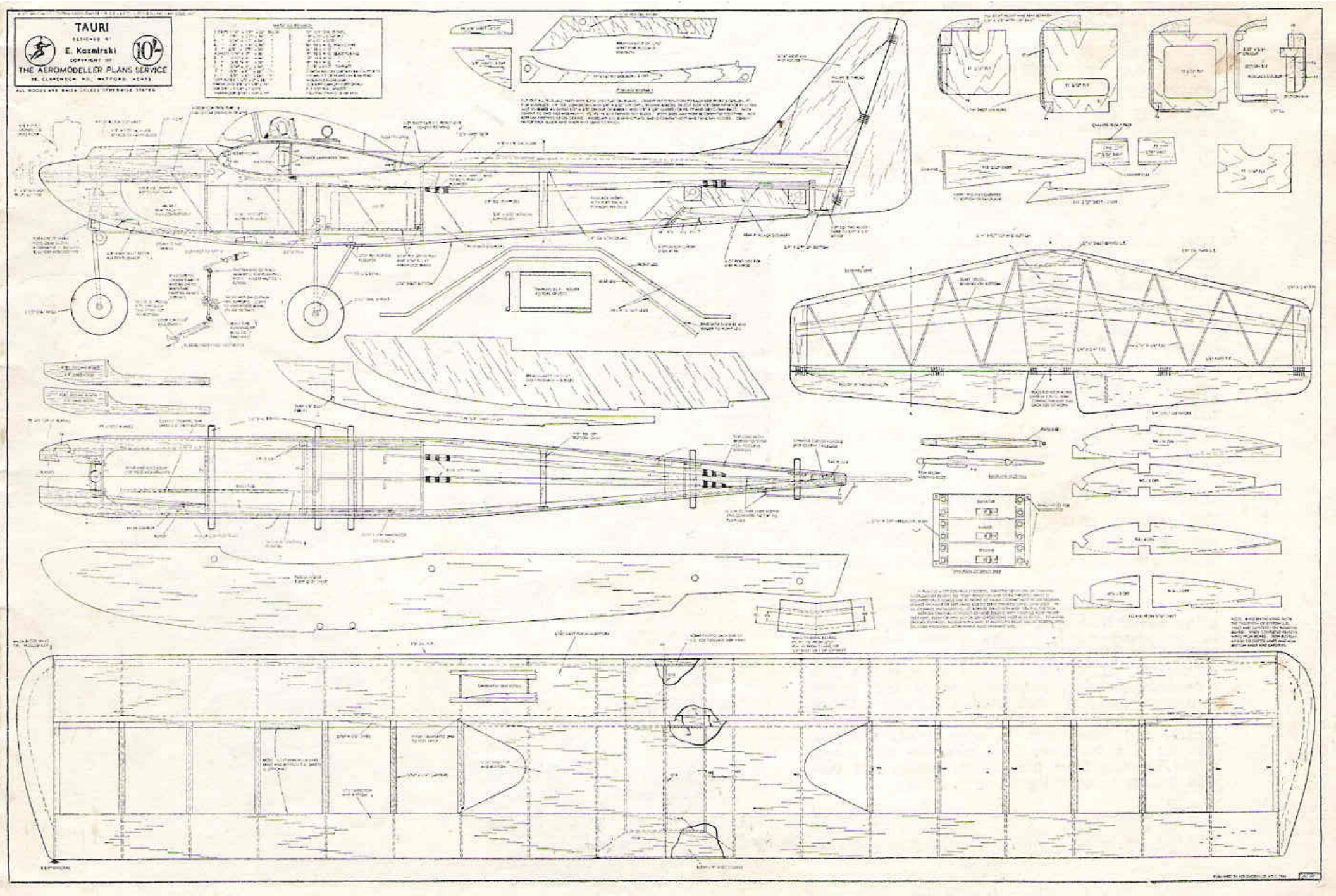
We have seen Tauri with complete 10 channel installations and .35 motors but these are not for the inexperienced. Eventually ours had all but the aileron servo installed, performing well with only a .19.

Finally, to quote the words of designer Ed. Kazmirski in his booklet "Multi R/C Flying", issued with the Top Flite Tauri kit:— *"Two of the prime requisites for successful multi flying are reliability and maintenance. These two go hand in hand and should be learned and practiced by the R/C novice and expert alike before his model ever leaves the ground. What good is a well constructed and beautifully finished airplane loaded with complex radio gear if the prospective flyer doesn't bother to take the time to insure against trouble created by out-of-tune radio gear, poor wiring, bad solder points, defective switches and plugs, poorly mounted servos, and engines improperly mounted".*

Take heed, follow the rules and Tauri will guide you to multi success.



A. Geoff Chapman has a full 10 channel Tauri using direct Bowden cable drive to strip ailerons as on pylon racers. Wire comes from servo through an arc to tube in T.E. to connect horn on surface. B. Our six channel arrangement with nosewheel steering, rudder, elevator and engine controls. Compare with picture C, where Chapman's 4 "Maxamite" servos add trim to elevator control and fifth servo in wing drives ailerons. The Rx is a Matador. D is close up of a nosewheel steering level made from tubing and curtain fittings to obtain good ratio drive.


TAURI
DESIGNED BY
E. Kazmirski
COPYRIGHT
THE AEROMODELLER PLANS SERVICE
10/-