

SHARK .60

Du-Bro Products of Wauconda, Illinois has released their newest helicopter — the Shark .60, a new version of their famous Shark now designed to use a regular .60 size R/C engine.

Designed by Dave Gray, one of the world's pioneers in R/C helicopters, this new Shark has incorporated in the kit all of the improvements that have been discovered by Du-Bro over their past years of helicopter experience. Every suggestion . . . every problem that has been encountered by a Du-Bro helicopter owner and that has been brought to the factories attention, has been considered and, whenever possible, included in the design of this new 60 powered Shark. The ruggedness and simplicity of this new machine belies the years of engineering know-how and technological advances that have gone into this design.

RCM was honored to have been selected to assemble the first two pre-production units in order to check out the step-by-step instruction manual, assembly procedures, as well as to test the flight performance of the new machine. We were asked to report to the manufacturer any discrepancies, problems, or omissions that we may have discovered in the comprehensive building manual in order that these items might be included in the manual prior to shipment of the production units.

The photographs accompanying this article are actually of two machines — one built by Grady Howard and the other by RCM's editor, Don Dewey. During the assembly of these two Shark 60's, several modelers, who had no helicopter experience at all, were asked to complete different assembly steps, in order that we might ascertain whether or not the beginner could easily follow the step-by-step building procedure. Any problems encountered by these novice helicopter builders were immediately reported to Du-Bro Products so that the instruction manual could be as complete as possible.

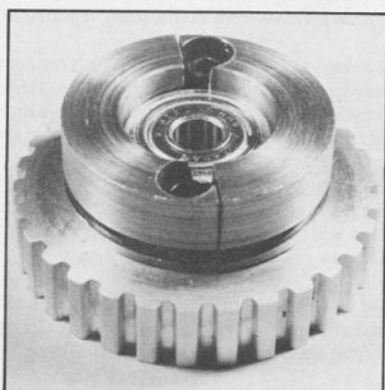
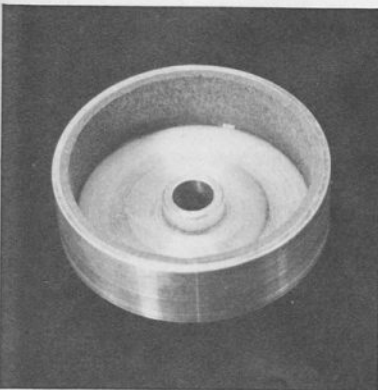
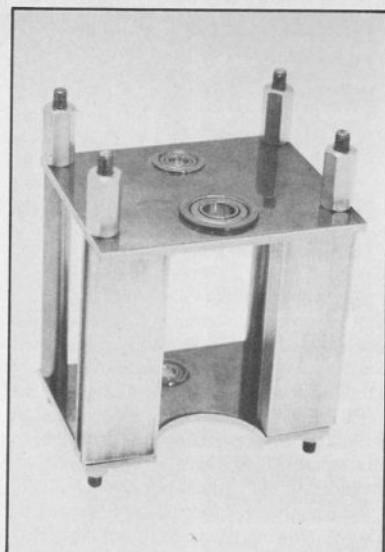
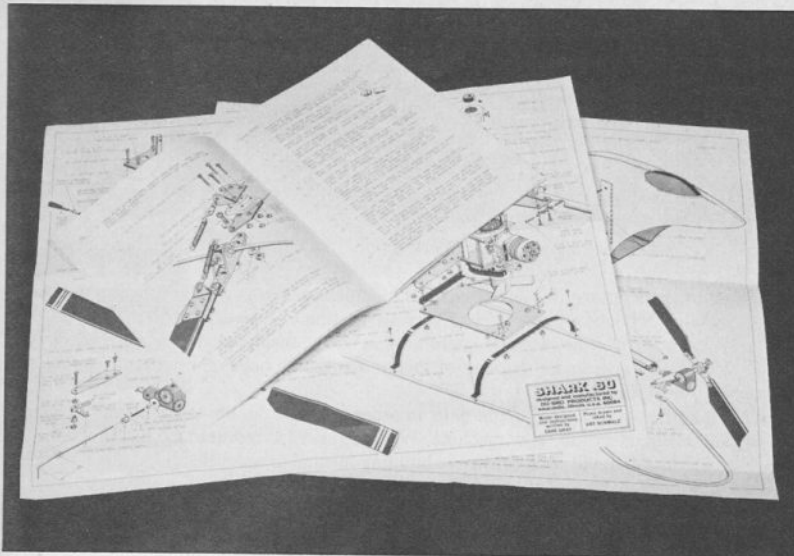
The Shark 60 actually goes together with a minimum of effort and time due to the very complete instruction manual. The latter consists of a book of step-by-step instructions with detailed drawings of various key assemblies. In addition, there are three large plan sheets of exploded views of the complete Shark 60 with all parts numbered for ease of identification. The instruction manual — the most complete that we have seen for any commercial helicopter to date — is written in a logical sequence with each step checked off as it is completed. It has been designed so that the Shark 60 can be completed with a minimum of time. The builder should, as with any kit, read the entire book and look at the exploded views for parts identification before actual construction begins.

The extensive use of the new Du-Bro Ball Links in the kit assures that there will be a minimum of slop in the control linkages. Aircraft type lock nuts are used throughout to assure that vibration will not loosen them during operation of the helicopter. The aluminum parts need only be buffed with steel wool, or a Brillo Pad, and used bare, or they can be painted with your choice of colors if desired. **text to page 160**

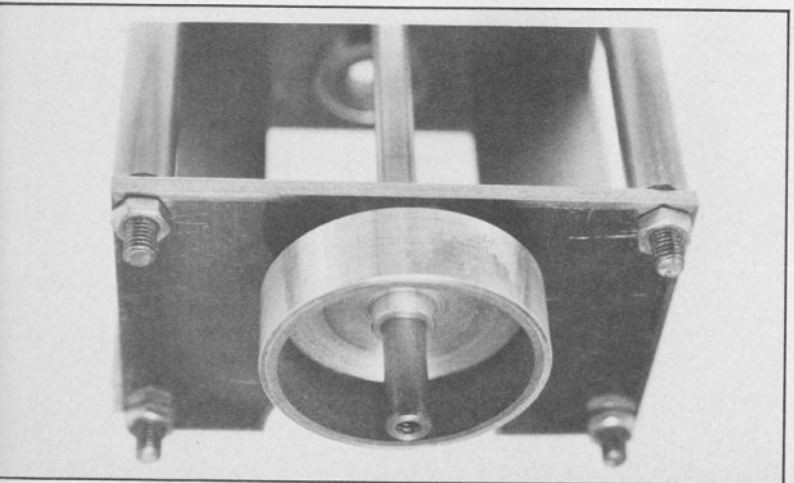
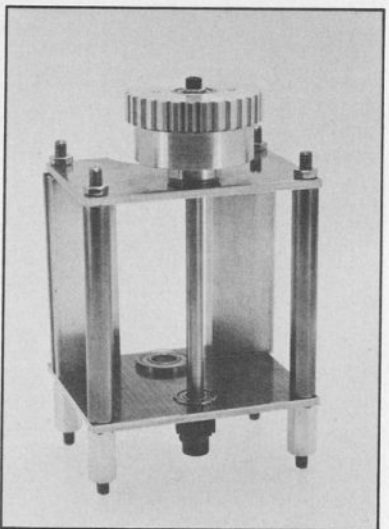
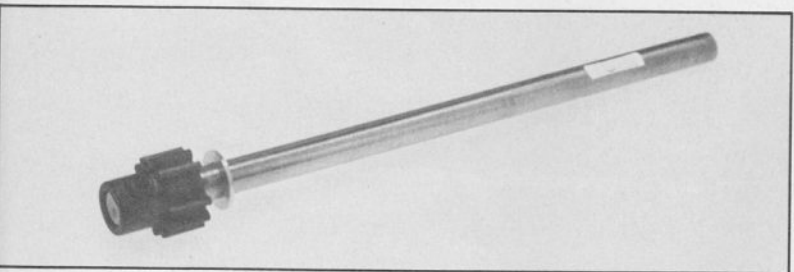
LEFT: Miss Cindy Ridenhour poses in front of the Joseph P. Hall house, erected in the early 1800's and which is now a nationally registered historic monument in Salisbury, North Carolina, with Grady Howard's Shark .60. Bicentennial theme Ektachrome by Barbara Howard. BELOW: Don Dewey's Shark .60 with Sierra Madre Police emblem. Ektachrome by Dick Tichenor.



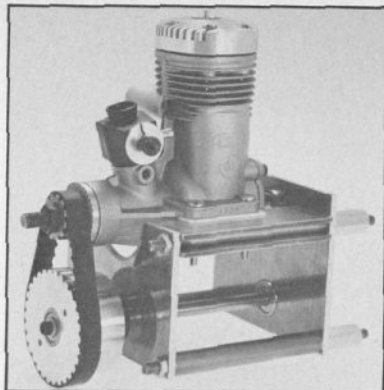




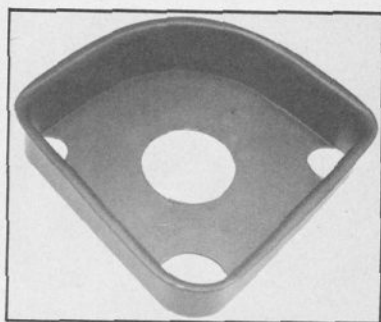
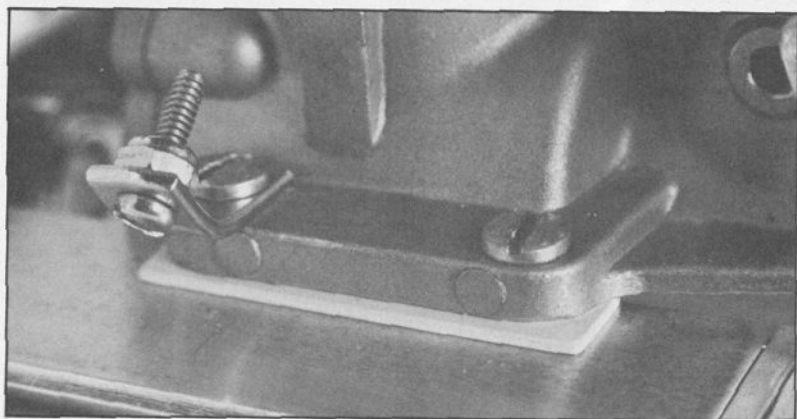
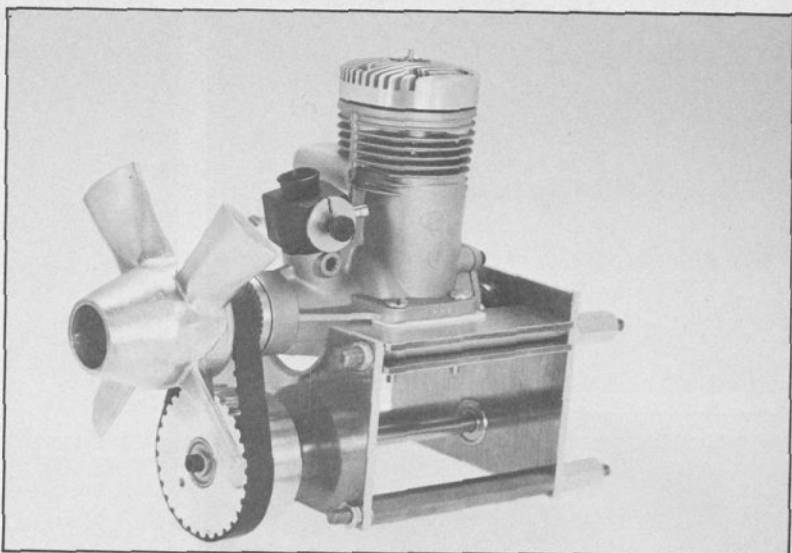
ABOVE, LEFT: It all begins with the most complete set of plans and instructions we have seen to date. ABOVE: The completed engine frame. FAR LEFT: The clutch bell housing with liner epoxied in place. LEFT: The clutch installed on the timing belt pulley. Clutch spring is installed in groove around base of clutch.



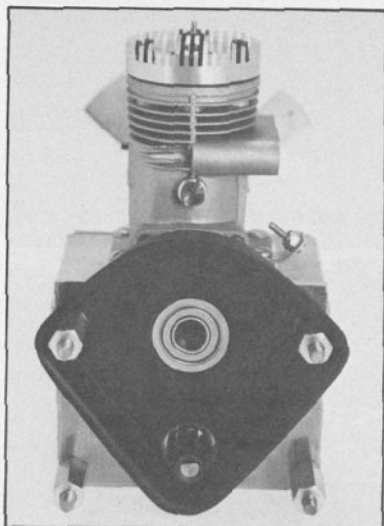
ABOVE, LEFT: Jack shaft with pinion gear and bearing washer installed. LEFT: Bell housing in place. ABOVE: Engine frame with jack shaft, pinion gear, clutch bell, and timing gear installed.



ABOVE: The K & B .61 installed on frame with belt in place. Belt should deflect 1/16" with 1 lb. pressure for proper tension. **RIGHT:** Cooling fan is installed.

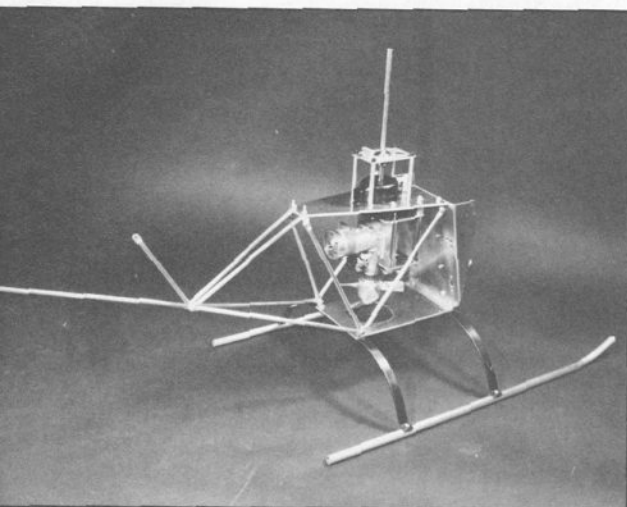
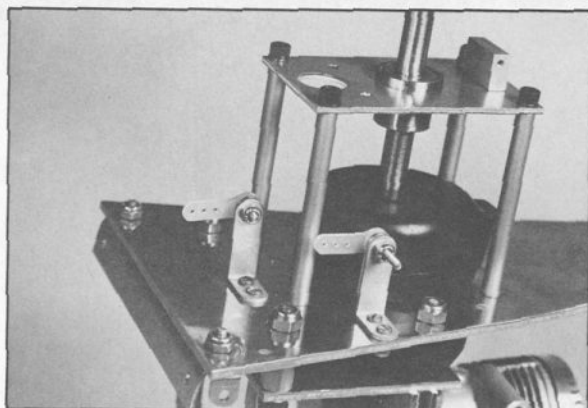
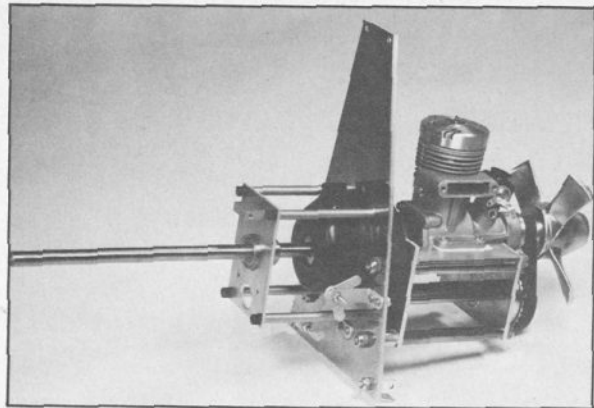


Belt tension spacer under motor lugs and throttle tube guide shown at left. Cut-outs made in gear cover above.

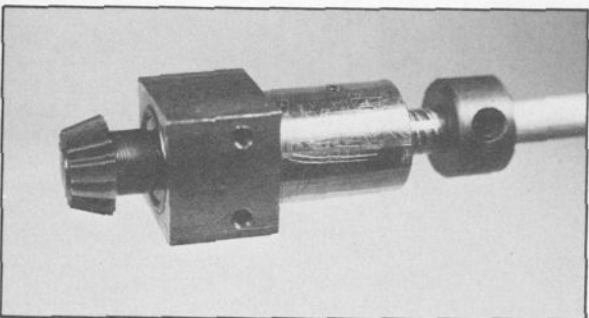
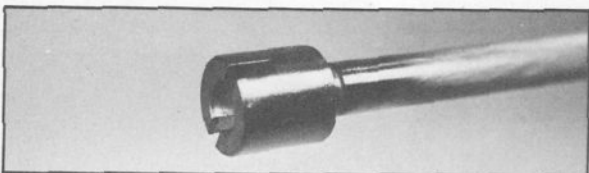
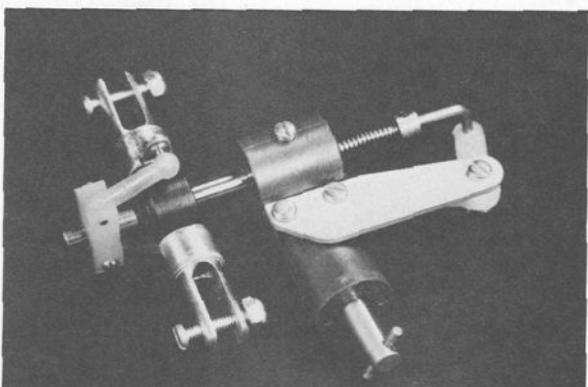


ABOVE: The gear cover is installed on engine frame. Previously drilled holes clear bearing, pinion gear, and motor mount threaded shafts. **RIGHT:** Basic frame assembly with skids and braces attached. Note positioning of hook ends.

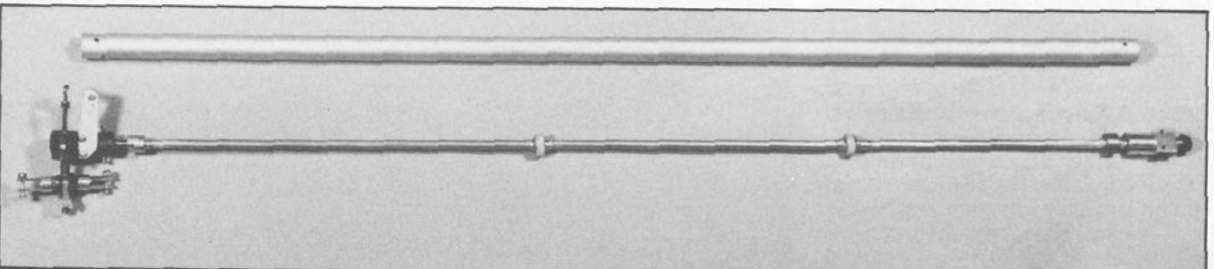


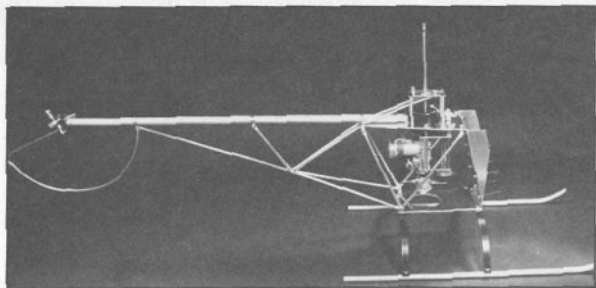


ABOVE: View of completed drive train and bellcrank installation. **LEFT:** Drive train installed in basic framework. **BELOW:** Completed tail rotor gear box and pitch change assembly.

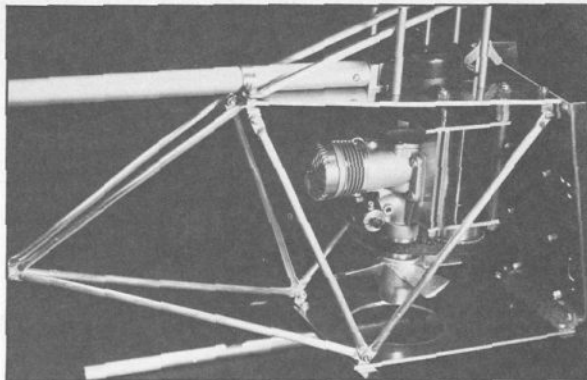


ABOVE, LEFT: Tail rotor gear box drive connector soldered to brass drive shaft. **ABOVE:** Close-up of one of two teflon bearings soldered to drive shaft. Use 1/16" thick balsa spacers on each side of teflon bearing as soldering aid. **LEFT:** Front bearing block and gear fitted to drive shaft. **BELOW:** Completed drive shaft and tail boom ready for installation.

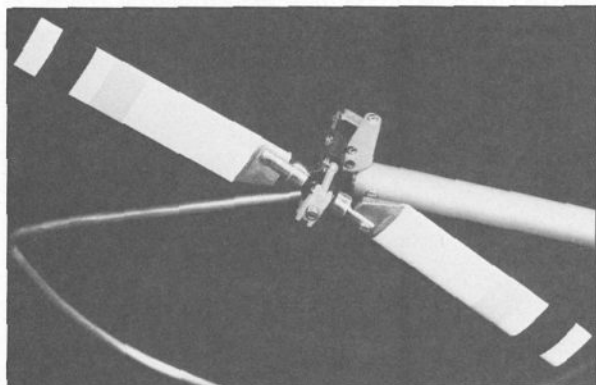




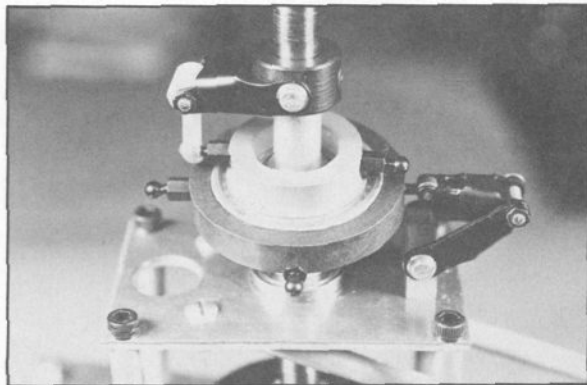
The completed helicopter mechanics ready for radio installation. Note boom attachment and bracing.



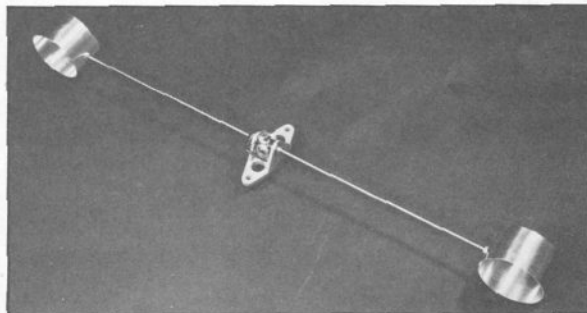
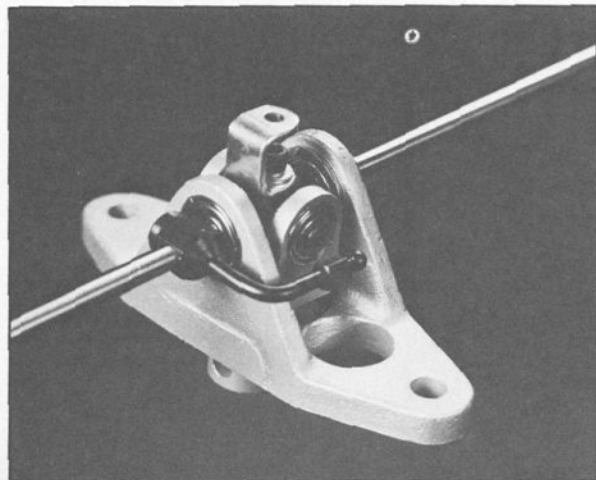
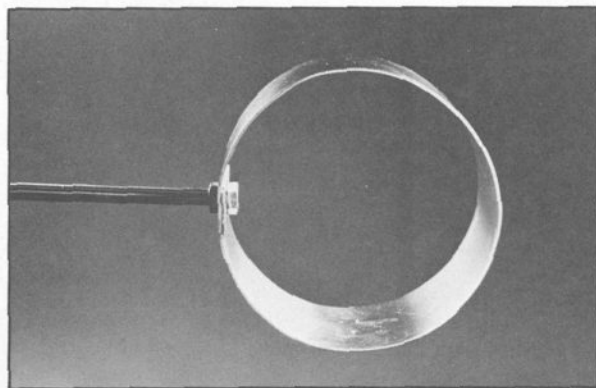
Swash plate with driver and anti-rotation scissors.



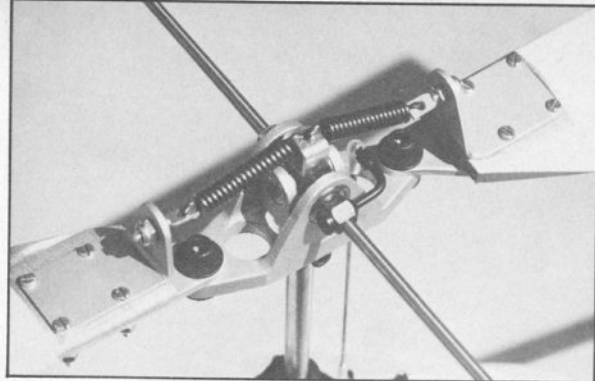
Completed tail rotor assembly attached to tail boom.



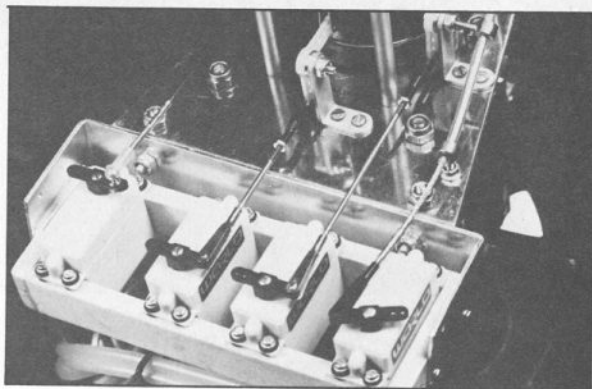
Close-up of control "can" and overall view of cans mounted to flybar.



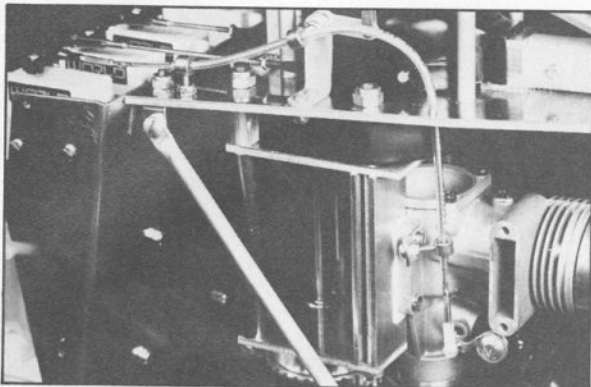
LEFT: The completed head, ready for rotor blade installation. ABOVE: World Engine's Expert servos in tray. Receiver and battery wrapped in DJ's self-adhesive Pro-Tac.



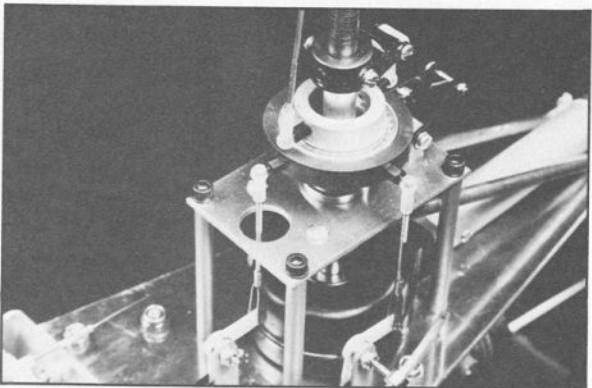
Close-up of completed head assembly.



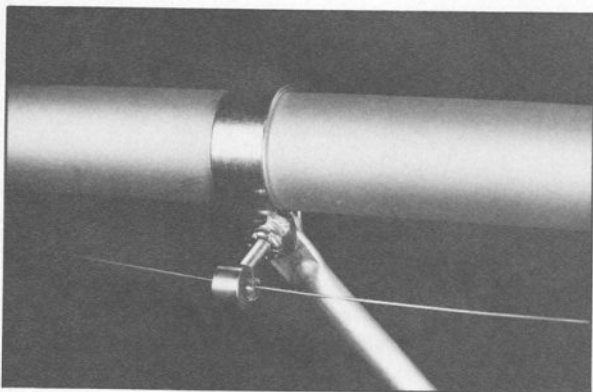
Servos connected to tail rotor, engine, and bellcranks.



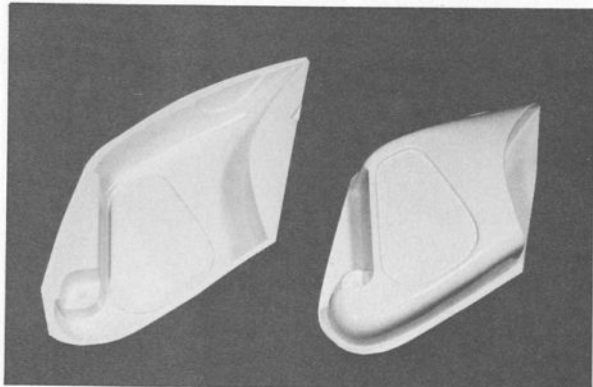
View of throttle cable routing.



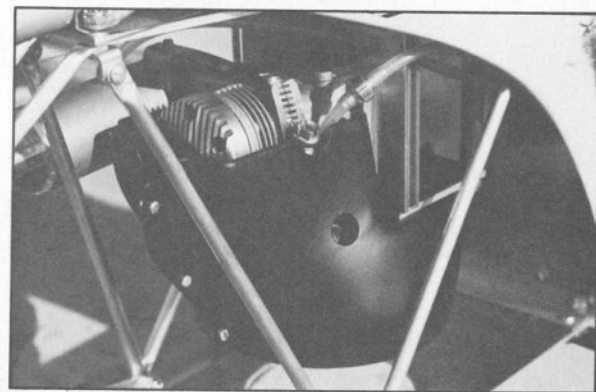
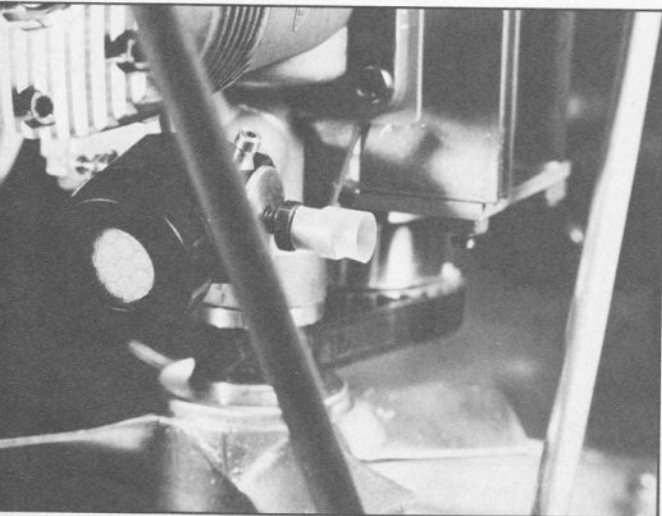
Bellcranks connected to swashplate.



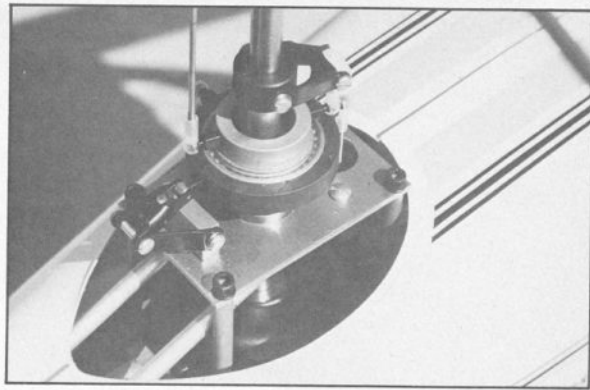
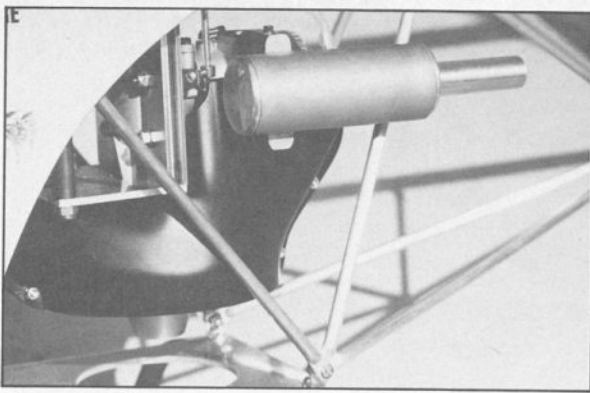
Tail rotor control wire stand-off and guide.



Plastic body shells before trimming and assembly.



LEFT: Perry Air Filter installed on K & B .61. Slotted extension soldered to needle valve with heat shrink guide for screwdriver adjust. ABOVE: Plastic cooling shroud in place.



Semco muffler installed on K & B .61.

View of body cut-out around top plate.



TOP, CENTER: One of the completed RCM Shark .60's. **LEFT AND ABOVE:** Here's what it's all about, and what the Shark .60 does best – flying! Grady Howard doing his thing with his "All American '76."



SHARK .60

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The Shark fuselage is made of plastic and is very easy to assemble. The bodies obtained with both of our kits were of white plastic, since we had requested one that could be painted in a bicentennial color scheme. The fuselage that will be provided with the production kits will be of yellow plastic for maximum visibility. The plastic fuselages can be painted with Perfect Paints, light mist coats of Aero Gloss dope, or with Superpoxy paint.

The final set-up is covered very thoroughly in the instruction manual and should be no problem for even the rank novice. When the rotor head and blades are balanced as per the instructions, the helicopter is extremely smooth with no vibration of any kind.

Flying the Shark 60 is sheer pleasure! Both RCM prototypes used a Veco/Lee Custom 61 which proved to be more than enough power. In fact, the lift-off is very smooth at a little less than half throttle. This throttle setting was with the main rotor blades set at 4 degrees pitch at 1200 feet altitude. Any more pitch and the Shark will lift off sooner but will be more difficult to get down due to the extreme amount of lift generated. The "cans" make the Shark 60 a very responsive machine with the control rods set as close as possible to 3/8" from the output shaft. We use this means of measuring because every servo arm is not the same size. For example, if we said "the third hole out," then some of you would be upset because your servo arm only had two holes. So use whatever hole comes closest to 3/8" from the center of the output shaft.

When checking your controls while the rotor is turning, be careful not to hold the right and left cyclic too long. The "cans" give enough control, even at low rotor speed, to tip the Shark over. Low level, tight, Figure Eights are possible with this very responsive control set-up. However, hovering over one spot is also quite easy. In other words, the Shark 60 combines the best of two worlds — stability in the hover with high maneuverability.

way and feel that it is a thoroughly engineered, well designed, quick building and rugged machine that can serve as a first helicopter for the novice flier, as well as provide the serious competition pilot with a machine that is capable of advanced maneuvers currently used in helicopter competition. In addition, factory pre-production prototypes utilized virtually every type of .60 engine from old worn-out and over-the-hill mills to the latest crop of Schneurle power plants, and the machine flew with each and every one of them. Due to the set-up of the motor mounts, almost any .60 engine can be used except those equipped with a Perry Pump, or an extremely long engine such as the Profi 60, which exceeds the length of the motor mounts. As a matter of record, Dave Gray, designer of the Shark 60 and an NRCHA Director, set his Grade Level IV 30 minute duration flight with a Shark 60, equipped with an engine that had so many air hours on it that Dave had to fly the helicopter in forward flight for the entire 30 minutes, since the engine was too worn out to endure the rigors of a sustained hover!

Our congratulations to Dave Gray and Du-Bro Products for producing a truly fine and versatile helicopter that is destined to become, in our opinion, one of the most popular in the world, and one which will definitely set its mark in helicopter circles in the years to come. □