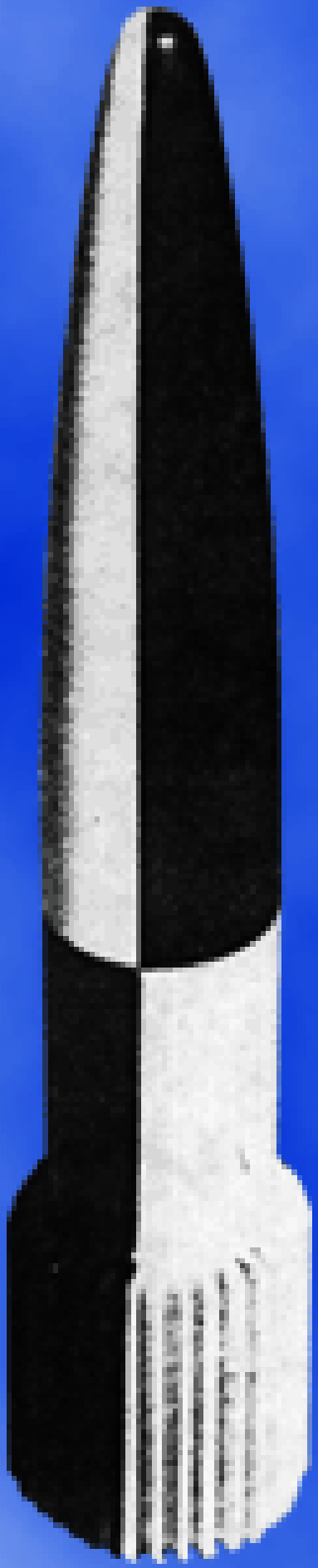
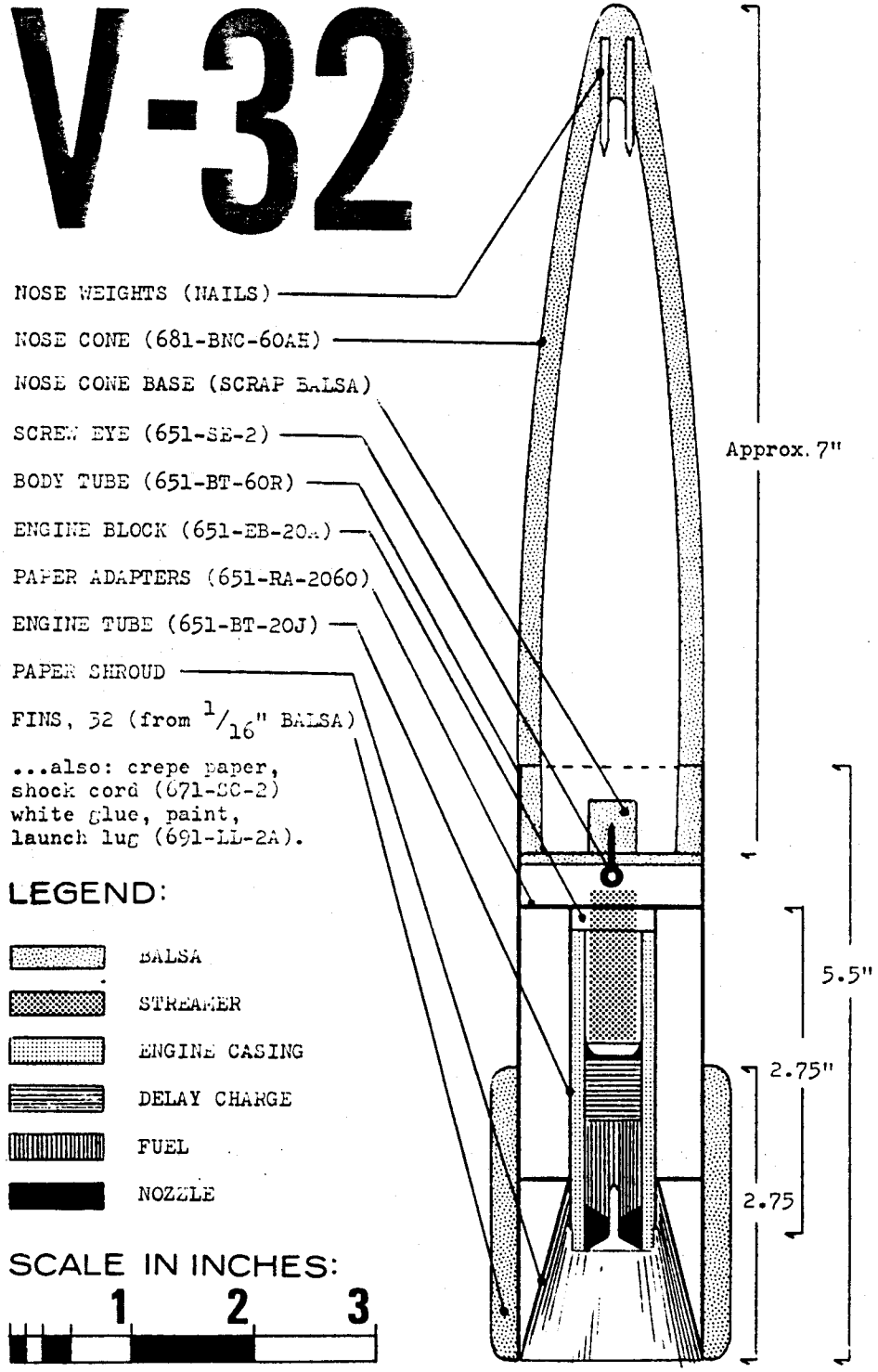
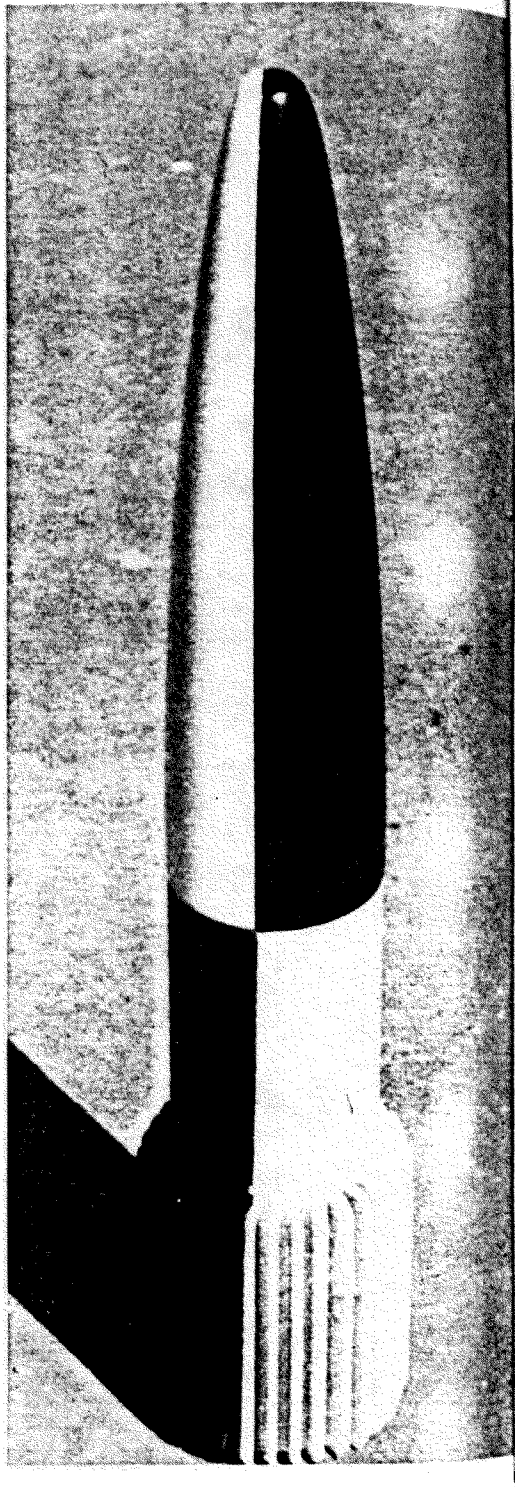


V-32





Experimental model with 32 tiny fins goes straighter and higher. It does not weathercock.

MELVILLE GRANT BOYD

photos and drawings / THE AUTHOR

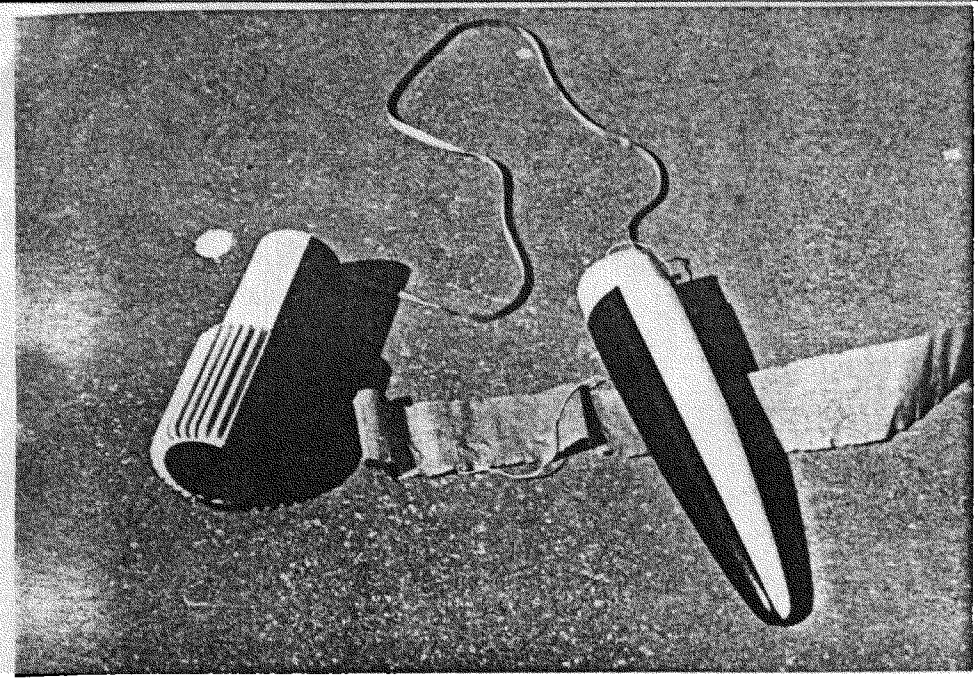
THE V-32 is an unconventional model rocket that is satisfying to construct and fly. The absence of obvious fins makes it appear unflightworthy. However, the 32 finlets are as effective as four conventional fins of much larger size. It is 11 in. long, and weighs 1.8 oz.

As in all model rockets, the stability is controlled only by the configuration of weight and surface area. The center of gravity must be somewhat ahead of the center of air pressure. The center of air pressure is defined as the central point at which all external air pressure may be assumed to be acting. The ratio of fin area to length and weight is extremely critical in a model rocket which usually has no internal stability controls such as gyroscopes.

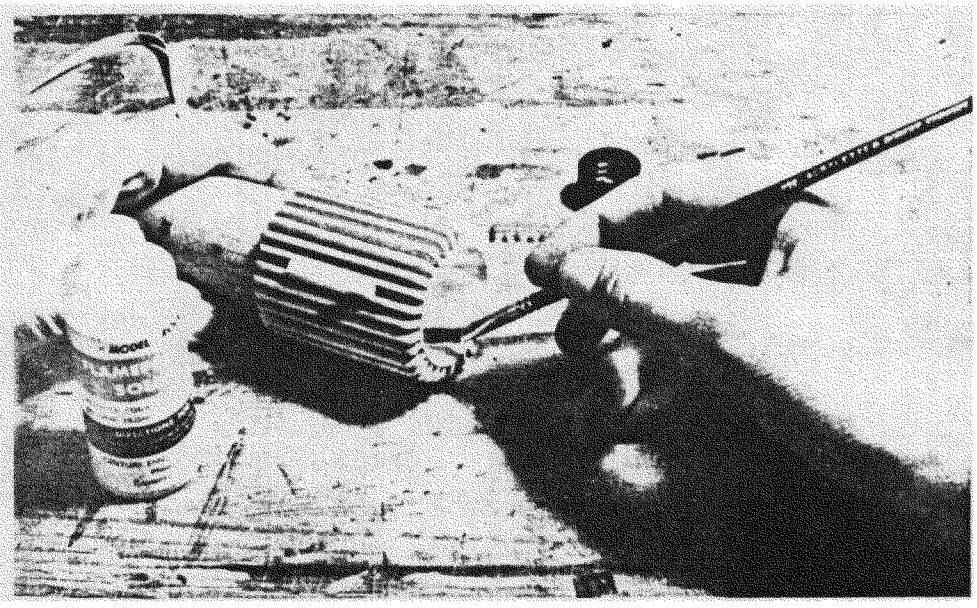
The engine assembly is recessed up into the body tube to help shift the center of gravity a few precious fractions of an inch forward. Likewise, the nose cone, hollowed and weighted at the tip, shifts it further still. The many finlets present little surface area to the wind, thus avoiding the old weathercocking tendency. Weathercocking simply means the tendency of a large-finned model rocket to head into the wind, thus decreasing the beauty and altitude of upward flight.

Although construction is rather straightforward, it is best to have had some previous building experience.

Model rocket engines are safe, reliable, inexpensive and usable only once. Available from Estes, Centuri and other major



Since there are no widely protruding fins to break in landing, recovery system is just a length of fire-proof crepe paper. It all tumbles earthward with engine retro blast.



Engine is recessed in the body, so the flame outlet must be fireproof. Author uses Centuri Flameproofer Solution. Note launching lug glued firmly between finlets.

model rocket manufacturers, the engines are certified by the National Association of Rocketry and are of standard sizes, weights and thrusts.

The main plan shows a typical engine cut lengthwise. The solid fuel is ignited electrically from a distance because engines are nearly impossible to light safely with flame. After the fuel burns out, a delay charge ignites, creating little additional thrust, but providing a white trail for tracking purposes. Then a small charge burns, creating hot expanding gases which cause a good deal of pressure. Normally this pressure is utilized to activate some simple recovery mechanism, usually a parachute or streamer. This allows the model to return safely to earth, where it can be readied for another flight. In this model the nose cone blows off, pulling out the streamer, which is rolled and inserted compactly into the unused upper end of the engine.

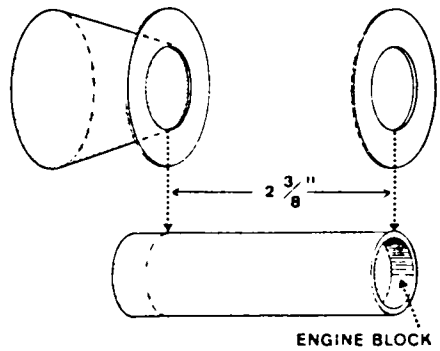
A streamer enables the most rapid and direct recovery, as parachutes tend to drift some distance. However, with a streamer, weight must be kept to a minimum to avoid damage upon impact. If a parachute is used, the model must be built with a body tube two inches longer to allow room for the parachute and its protective wadding.

Estes parts are used throughout. Similar, but not identical, Centuri parts may be substituted. White glue is used to bond all parts because it makes for a sturdier joint than airplane glue.

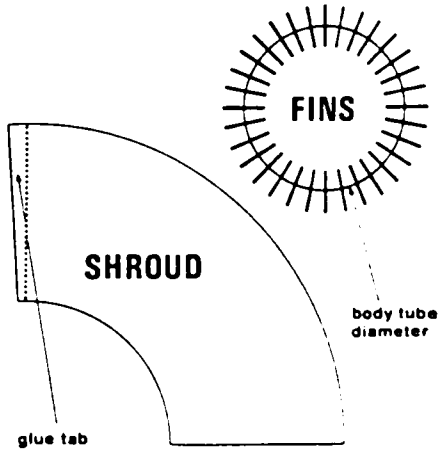
The engine assembly must have a generous fillet of glue applied at all joints to ensure that it will not rip out. The finlets are cut from balsa ($^1/_{16}$ x $^1/_4$ x 36") that has been sanding-sealed except for the side which glues to the body tube. The full-size shroud pattern is traced onto sturdy card stock, then cut, test fitted and glued together.

This particular version of the V-32 must

ENGINE ASSEMBLY



Engine is assembled with standard parts and shroud. Be sure engine block is firmly glued.



Half-size drawing for engine shroud and finlet gluing guide. Scale up with compass.

employ an engine that allows room in the forward end for tucking in the streamer. A B6-4- or B11-5-rated engine provides the necessary initial thrust and leaves room for the streamer.

Balancing the completed model is critical. The swing-test gives quick results. Tie a string around the model at its balance point and point it in the direction to be twirled. Twirl the model rapidly in a horizontal plane, observing stability. If the model tumbles, insert several nails or slivers of lead into the tip of the nose cone, slide the string forward until the model balances, and twirl again. Repeat the process until stability is achieved. The model must be twirled rapidly to simulate the several hundred miles-per-hour speed of flight. Do not add more weight than needed for stability. All testing must be done with the appropriate engine in place.

After stability is achieved, push the weights below the surface of the wood and fill with balsa putty. Give the nose cone several coats of sanding sealer or filler coat, sanding carefully after each application.

The model should be painted in highly visible colors in a distinctive pattern that will stand out against the sky, and on the ground after descent. The original V-32 was spray-painted white and allowed to dry. It was then masked lengthwise, down the middle, and one half spray-painted black. After drying, the nose cone was twisted one half revolution, producing a simple pattern reminiscent of the German V-2, its namesake.

Using standard launching equipment available from the manufacturers, this model should make many successful flights. Many improvements and variations may be developed from this basic model.