RC Dart

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About 10 years ago, Frank Ehling put a Half A engine in a Delta Dart-type profile and called it the Oily Bird. It flew great. Now, using the Ace pulse-rudder radio system, our author created this distinctive fun-fly bird. ■ Bernard Shulman

The Andromeda Strain has nothing on the ubiquitous Delta Dart (sorry about that!). No wonder; it goes together almost as easily as some giant ROG. If you have yen to watch something fly, DD goes up from postage stamp.

WHAT IS IT? A big Delta Dart? No, it's the Ace-Dart. Oh! What's an Ace-Dart? An Ace-Dart is just what it means. Take the Delta Dart or better yet, the Oily Bird, change it until it's an "original," then add an Ace Pulse Commander radio and you have an Ace-Dart.

The truth is that the model is an Oily Bird with radio. It was built over the Oily Bird drawings. If you don't know, the Oily Bird is a model designed by Frank Ehling for the Cox .020 Pee Wee as an easily built free flight in the late 1960's and published in the *American Modeler*.

The Ace-Dart is easy to build and fly. Anyone with some modeling under his belt can build this little model in a very short time. It flies very well, not as fast or as tricky as I thought it would be for a small model. Also, the glide is much better than expected, but I don't think you have to worry too much about thermals.

Construction: Start with the wings. Cut out the ribs from medium hard 1/16 balsa. (Do not cut out the notches.) Cut the ribs a little oversize. Pin down the 1/8 × 1/2 hard balsa trailing edge, and the hard balsa ¼ × ⅜ leading edge. Trim the five wing ribs to size and glue in place. Cut and fit ⅜ filler at wing tip. This can be laminated from layers of scrap balsa. Do the

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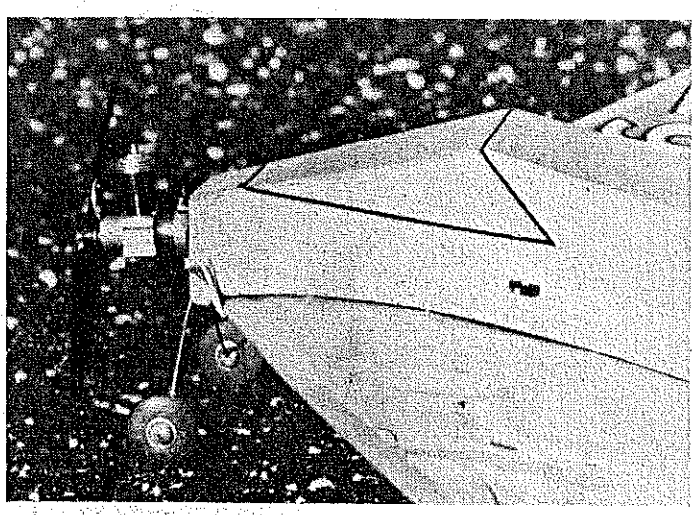
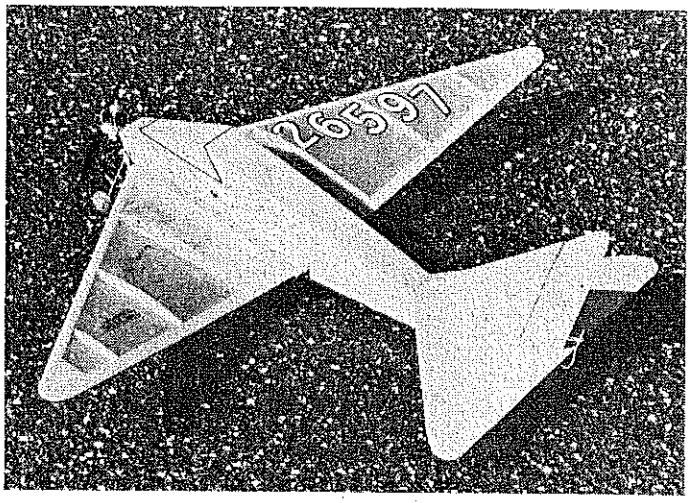
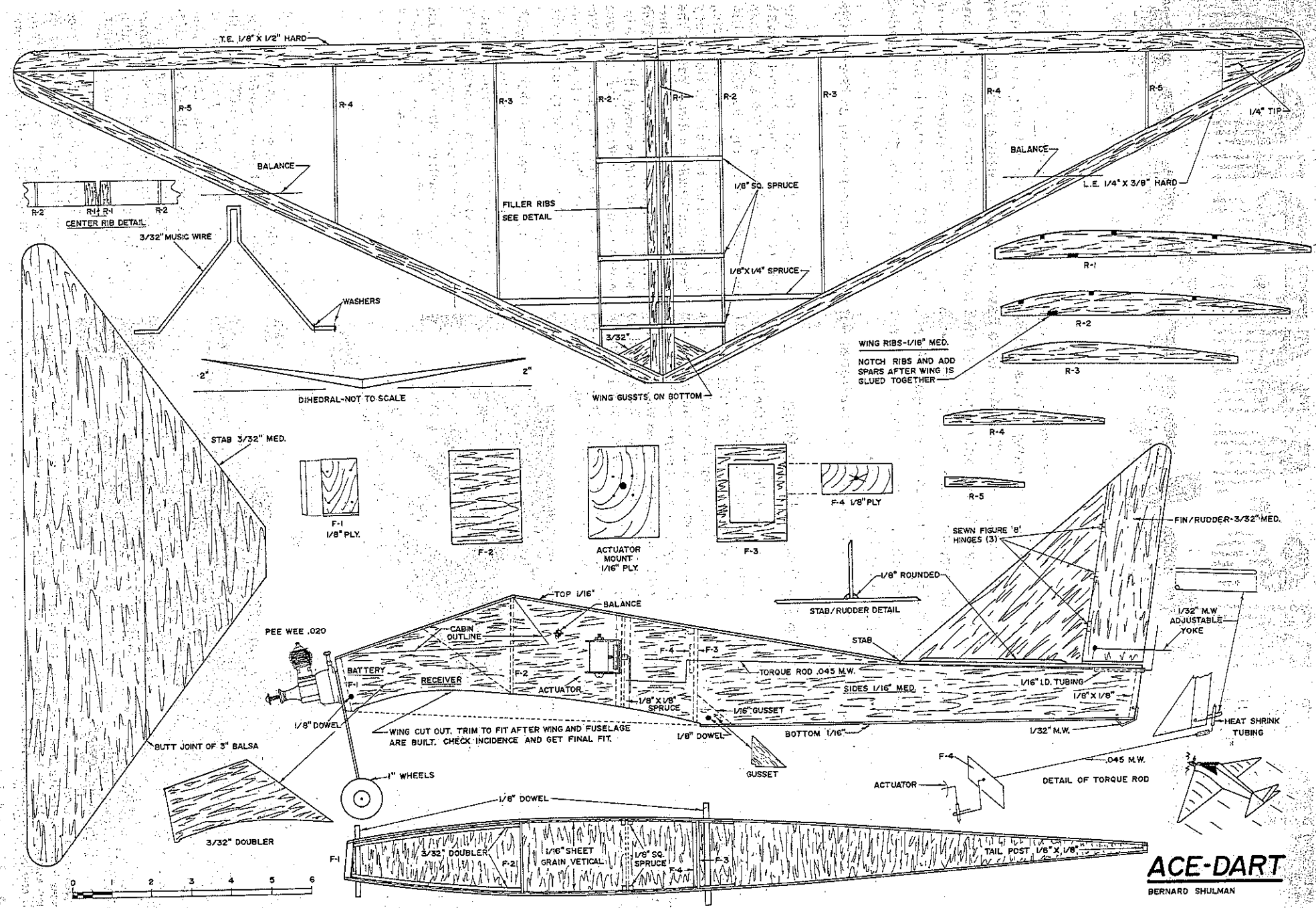
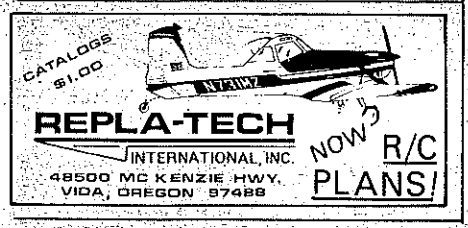




Cox Pee Wee 02 is firewalled—and do note that downthrust. When wing comes off there is access to everything, and we do mean everything. Simplest method yet devised for RC, the unaging Ace pulse rudder system gives proportional rudder control—in air you don't see wiggling rudder.



FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 120



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same for the thick center ribs, build these ribs out until they are about 3/16 thick. Allow the wings to dry. When dry, sand the root ribs to get the proper dihedral of 2 in. under each tip. Glue the dihedral joints well and let dry. When dry, notch the top of ribs for ⅛ sq. spruce spars. Notch bottom for ⅛ × ¼ spruce spars (two layers of ⅛ sq.) When dry, cut front of wing as shown and add gussets. Sand the wing smooth and it's ready to cover.

The stabilizer, fin and rudder are cut from medium 3/32 × 3 balsa. Glue the fin to the stabilizer and allow to set.

Start the fuselage by cutting two sides from 1/16 medium hard balsa. The right side is 3/32 shorter than the left, to allow for the right thrust of the engine mount. Cut the engine mount, F-1, from ⅛ plywood and drill holes for engine mounting screws. Install blind nuts on mount. Cut F-2 from 3/32 balsa. Glue F-1 and F-2 to sides.

Glue the sides together with ⅛ sq. tail post at rear. Cut out F-3 from 3/32 balsa to fit the space between the sides and glue in place. Cut 1/16 balsa (vertical grain) to fit the area between F-1 and F-2, and between F-2 and F-3, then glue in place. Cut the 3/32 balsa nose doublers and glue in place. Glue in the 1/16 sheet gussets. Plank top and bottom of fuselage with 1/16 balsa, grain across the fuselage. Trim and sand flush with side.

Cut out the actuator mounting plate from 1/16 plywood. Use ⅛ sq. spruce for the actuator rails, glued to the fuselage sides. Make a good tight fit for the actuator mount. If actuator mount is loose put some glue on the front of the mount to tighten it. Drill holes in the mount for the actuator mounting screws. I use small brass bolts and nuts, but the actuator can be mounted as per Ace instructions by sewing with button thread or copper wire. Cut the bearing plate from ⅛ plywood but do not glue it in at this time.

Notch the tail post for the torque rod bearing. I use nylon tubing. Bend the front of the torque rod from .045 music wire. Put the wire through the ⅛ plywood bearing plate and tail post tubing, then slide the actuator into the rails. Line up the torque rod bearing plate to match the actuator. Put the tubing into the notch in the tail post. When the torque rod is lined up and works freely, glue the bearing plate onto F-3, and the tubing into the notch in the tail post. Be very sure that the torque rod works absolutely free. When dry, bend up the torque rod for the rudder.

Covering and Finishing: Sand all parts smooth. Hinge the fin and rudder with left-over MonoKote strips. It must work freely. Cut and install ⅛ dowels for wing hold-downs.

Decide how you want to finish your model. Mine was covered entirely with transparent orange MonoKote. Silkspan can be used to cover the wing. If you use Silkspan (or tissue), cover just the wing. The rest of the model should not be covered in this case. Use Sig Lite-Coat, thinned down to a 50/50 solution, and give model four to five coats. I use only clear dope on most free flight and small radio models. It makes them not only a lot lighter, but much easier to repair. Dope the model until it starts to shine, then give front of the fuselage and center of wing two or three more coats.

Mask or tape the cabin area, and finish as you prefer. Bend the adjustable yoke from 1/32 wire, and bolt the yoke onto the rudder. Use heat-shrink tubing on actuator and torque rod. There should be no wire-to-wire touching in the torque rod hook up.

Wrap the batteries and receiver separately in foam rubber and install in fuselage. Use additional small pieces of foam rubber to pack batteries and receiver packs into fuselage. Do not overdo it, or the foam will be too tight to absorb vibration.

Bend the landing gear from 3/32 diameter wire and install the wheels. Bend and add tail skid. Bolt the Pee Wee, with landing gear behind, onto engine mount. Slip the actuator into place. Check out the radio operation, and correct any trouble before you fly. Install the wing and check the balance. Add weight as needed to nose or tail to balance at C.G. position on the plan.

Check the stabilizer incidence. To do so, place a straightedge on the bottom of the wing, projecting under the stabilizer, then measure the distance from the straightedge to front and rear of the stab. The back of the stab should be ⅛ higher than the front (negative incidence).

Flying: Test glide the Ace-Dart with transmitter and receiver turned on. When glide is OK, the model is ready for powered flight, after a ground check of the radio range. (Be sure to read the instruction book that came with your radio.) Start the engine and run it a little on the rich side. Turn on the transmitter and receiver and check that the rudder is working, and that right is right, and left is left. Hand launch the model and allow it to gain some altitude then try some very gentle turns. Without overcontrolling, try to keep the Ace-Dart up wind from you. After the engine cuts, try to land it as near to you as you can but don't overcontrol it when near the ground.

I hope you enjoy your Ace-Dart as much as I did mine.

TransAm/Richs

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sign but having the following limitations: wing span not over 72 inches; glow plug engine, size .35 to .61 cu. in.; total fuel capacity not more than 32 oz.; no inflight refueling capability.

These airplane requirements are designed so all teams have an equal chance. Pit stops are also a great equalizer—the reason for the fuel limit. The plane size is limited so all planes are about equal, with no big, lumbering, and possibly unsafe, designs.

Each leg team is allowed two aircraft, not necessarily the same design. But having two planes of the same design would permit parts to be interchangeable. In the event of a crash or damage to the primary plane, making it unsafe to fly, the backup plane or parts may be used. In the event both planes are damaged and unflyable the team will need to do some fast repairs.

The aircraft will have the team number plainly visible on the side of the fuselage. The backup airplane will be designated by an "A" beside the team number.

With two airplanes, a wipeout of one plane will not disqualify the leg team or put the rest of the total team out of the race. Lost time can be made up by the remaining leg teams along the way. If both planes cannot be repaired in a reasonable time to complete the flight to the next check point, the planes will be carried to the check point and a time penalty assigned. But everyone is still in the race.

The Race. The race winners will be the total team with the shortest time accrued. Time between checkpoints is what counts, not actual flying time. The checkpoints are the places the first takeoff of the day is made and the place for the final landing of the day. The clock ticks on for accidents, pit stops, comfort stops, etc.

Takeoffs from the initial starting point will be at five-minute intervals, the order chosen by drawing. At the word "go" from the race director the team will start the engine, take off and be on their way. Timing for each plane will start at the "go" signal and continue until the plane lands at the checkpoint for the overnight stop or leg change. Timing stops at touch-down within the designated landing area. The takeoffs the next morning will be in a first in, first out order from the previous day's landing.