The All N

ARCON

1/6th Scale M

SOUNDING R

INTRODUCTION & BACKGROUND

A full scale Arcon, designed and built by the Atlantic Research Corporation in 1958, was a small 6 inch diameter sounding rocket having a total length of 11 feet-3 inches. Performance wise, it was capable of reaching the E region of the ionosphere, about 60 miles, carrying a 10-40 pound payload. When boosted by a Nike booster, the Nike-Arcon could reach 250 miles with a 40 pound payload. A fully instrumented Arcon would cost about $5000.

"Sounding", as applied to rockets, means to investigate or examine. A "sounding rocket" is a meteorological rocket used to gather atmospheric data such as temperature, pressure, radiation, and wind velocity. Sensitive instruments within the nose cone and payload compartment are exposed to the upper atmosphere for purposes of measuring the above mentioned objects of study. This information is sometimes recorded within the rocket itself, but is most often telemetered back to earth by means of radio transmitters within the payload compartment.

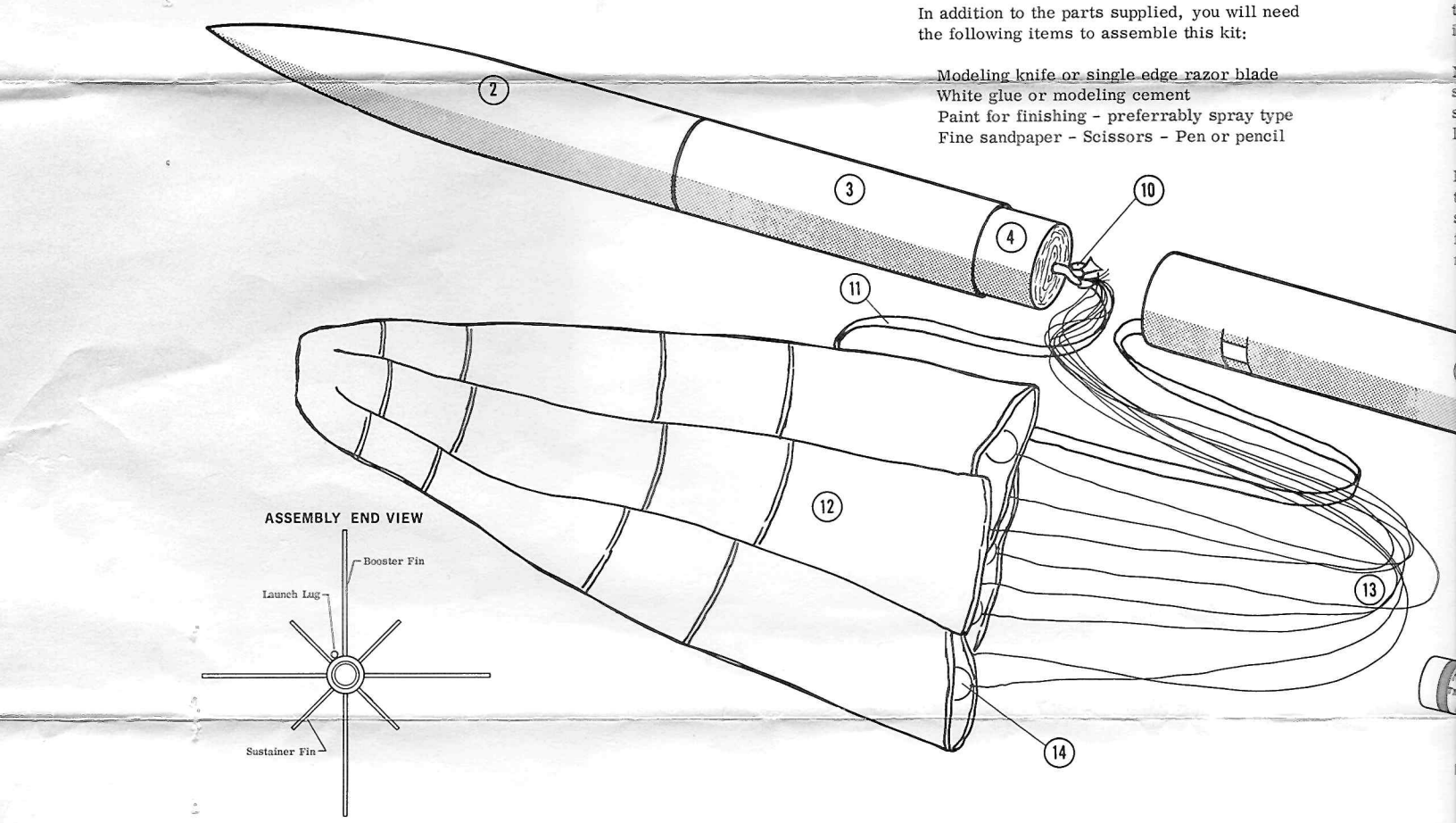
When properly assembled, the Arcon-Hi will carry your payload, in two successive stages, to its maximum altitude, eject a parachute, and return safely to be flown again.

PART NO.	PART NAME
1	Sustainer Body Tube
2	Nose Cone
3	Capsule Tube
4	Balsa Coupler
5	Stabilizer Fins
6	Mounting Tube
7	Centering Rings
8	Thrust Ring
9	Launch Lug
10	Screw Eye
11	Shock Cord
12	Chute Canopy
13	Shroud Lines
14	Tape Discs

PART NO.	PART NAME
15	Booster Body Tube
16	Stabilizer Fins
17	Mounting Tube
18	Centering Rings
19	Retainer Ring
20	Engine Coupler
21	Stage Coupler

In addition to the parts supplied, you will need the following items to assemble this kit:

Modeling knife or single edge razor blade
White glue or modeling cement
Paint for finishing - preferrably spray type
Fine sandpaper - Scissors - Pen or pencil



ASSEMBLY END VIEW

ASSEMBLY INSTRUCTIONS

The engine mounts for both the booster and sustainer stages have been installed for you. Each engine mount consists of one mounting tube, one thrust ring, and two centering rings.

ATTACH STABILIZER FINS

Assemble and attach the fins for both stages in the following manner:

From the printed balsa sheets, cut out all indicated fins. Then, cut out the enclosed Fin Positioning Guide, wrap around the body tube and mark the fin locations.

Apply white glue or modeling cement to each fin root chord edge, one at a time, and also along the body tube where fins are to be attached. When glue has just begun to set, place fins in position along the body tube. Stand the tube on its top end and allow glue to dry. With the Fin Allignment Guide, check the angle between fins before glue has completely set.

Be particularly careful not to get glue on the stage coupler or engine coupler.

RIG PARACHUTE & SHOCK CORD

Assemble the parachute as shown in the enclosed Chute Assembly Directions. Attach one end of the rubber shock cord to the body tube as shown below. Cut two slits, about 3/8" long and 3/8" apart, in the body tube one inch down from the top end. Insert one end of the rubber cord into the tube from the top end, and depress the tube paper between the slits. Bring the cord out through the first slit, and back into the body tube through the second slit. Apply glue to the connection to form a strong bond.

Thread the screw eye into the balsa connector base, and then unscrew the eye. Squirt glue into the resulting hole and re-thread the eye into the base. Now tie the shroud ends to the screw eye together with the rubber shock cord as shown in the Assembly Drawing.

Fold the chute temporarily, insert into the top of the body tube, and place capsule on tube. Glue the launch lug to the body tube in the position shown.

All New!!

DN - HI

Scale Model

NG ROCKET

BOOSTER—SUSTAINER STAGING

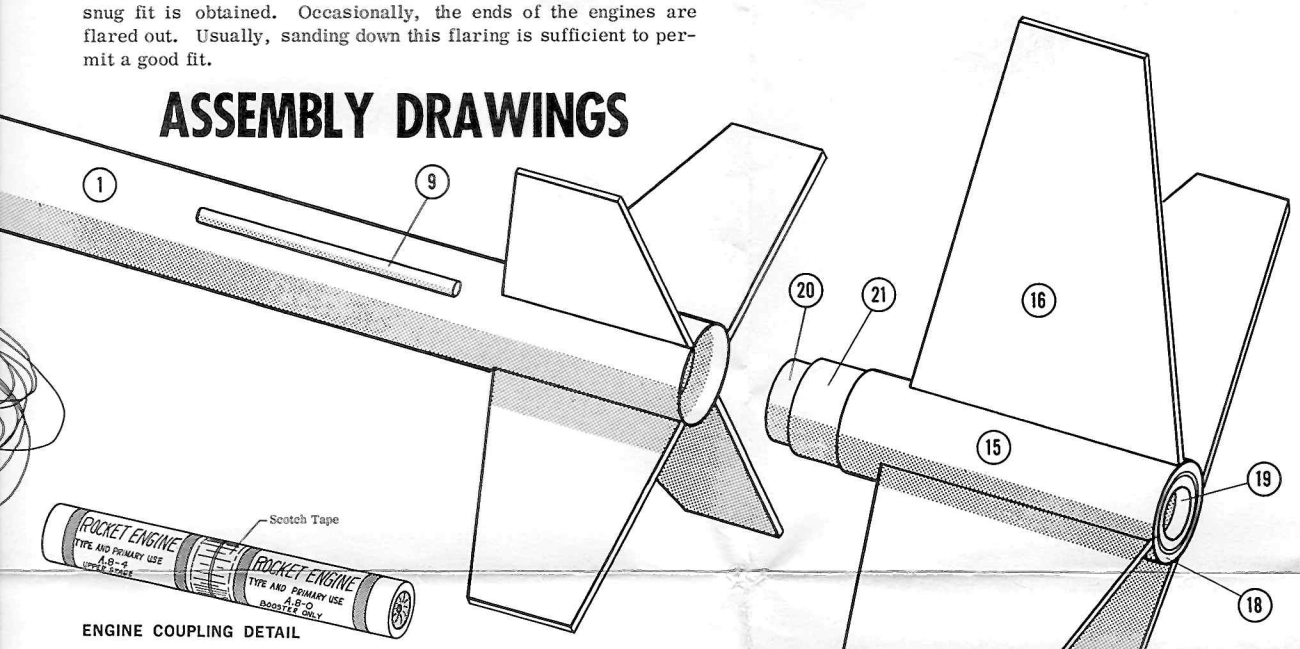
The Dual-Lock stage coupling employed in the Arcon-Hi provides reliable upper stage ignition and separation when properly joined. In principle, it uses two pairs of precision telescoping tubes. To prevent paper "swelling" and a "binding fit", keep the entire rocket in a cool dry place until ready to launch. Avoid launching on moist, or humid days.

As shown in the Engine Coupling Detail illustration, place the Booster and Upper Stage engines end to end, and tape together with one layer of thin cellophane tape (scotch tape). Make sure that the nozzle end of the Upper Stage engine is connected to the forward (opposite of nozzle) end of the Booster Stage engine. Friction fit the Upper Stage engine into the sustainer mounting tube, and push into place until it contacts the forward thrust ring.

Now, slide the booster stage over the extending engine and into the sustainer base until both body tubes contact each other. This fit should be fairly tight. If the connection fitting is loose, wrap cellophane tape around the Stage Coupler until a tight fit is obtained.

If the engines are too large to fit into the body tubes, sand down the paper engine casing slightly, before taping together, until a snug fit is obtained. Occasionally, the ends of the engines are flared out. Usually, sanding down this flaring is sufficient to permit a good fit.

ASSEMBLY DRAWINGS



ENGINE COUPLING DETAIL

PREPARING THE PAYLOAD

The Arcon-Hi is capable of carrying a maximum payload weight of 1 ounce when the initial stage is powered by engine Groups 6 or 7, and a maximum weight of ½ ounce when powered by engine Groups 1 through 5. Extremely fragile payloads should be packed in cotton or foam rubber. Caution: Do not overweight the capsule. Check your payload weight before launching. A ½A.8-4 engine, which weighs about ½ ounce, can be used to compare with your payload.

The connector end of the capsule should slip snuggly but not tightly into the body tube. If the fit is loose, build it up with tape. If the fit is tight, sand the connector down slightly until just snug.

FINISHING THE ARCON-HI

For maximum altitude flights and ideal appearance, the grain texture of all balsa parts should be filled in with several coats of balsa filler. Sand smooth between applications. The body tube does not require this special treatment. Finish with lightweight paint such as spray dope or laquerized enamel. For ease of tracking, use bright colors, such as white, yellow, orange, or red. Flourescent colors are extremely easy to spot at high altitudes.

An engine removal tool can be made by bending a right angle crook in the end of a piece of stiff piano wire. Insert the crooked end in through the nozzle of the spent engine, twist to one side, and pull. To remove the spent booster engine, push against the nozzle from the aft end with a wood dowell or pencil.

Upon burnout of the booster engine, hot gases issue forth from its forward end to auto-ignite the sustainer engine. This combination of booster burnout gases and sustainer exhaust causes the tape to break and the stages to separate. The sustainer stage continues on while the booster tumbles back to Earth.

After each flight, wipe the exhaust residue off the entire coupling region with a dry cloth. Look for frayed edges around the forward mounting tube and both coupling tubes. Trim off or glue back in place before the next launch.

LAUNCHING THE ARCON-HI

The Arcon-Hi can be launched with any of the following engine combinations:

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
A. 8-0	A. 8-0	A. 8-0	B. 8-0	B. 8-0	B 3-0	B 3-0
A. 8-4	B. 8-6	B 3-5	B. 8-6	B 3-5	B. 8-6	B 3-5

Groups 4 and 6 will provide maximum altitude flights, while Group 7 gives maximum acceleration for your payload. If your launch area is limited, do not use Groups 4 through 7, as these combinations may carry the second stage out of your recovery area.

Launch the Arcon-Hi from a 1/8" diameter x 36" long launching rod. Use electrical ignition only, as outlined in the Engine Operating Instructions. Choose a clear unobstructed launch site away from buildings, highways, and trees. Launch from the center of an open field measuring at least 500 feet on a side. Always give a short countdown to alert spectators before launching.

The Arcon sustainer can be launched by itself without the booster. Power for single stage flights can be supplied by any of the A and B type single stage engines.

For additional information concerning rocket engines, kits, ignition devices, launching equipment, or replacement parts, write to:

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