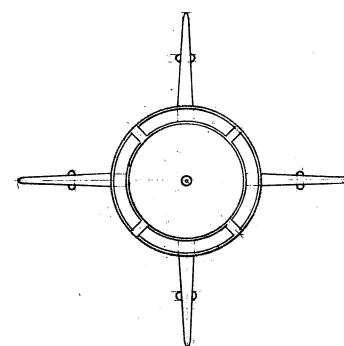
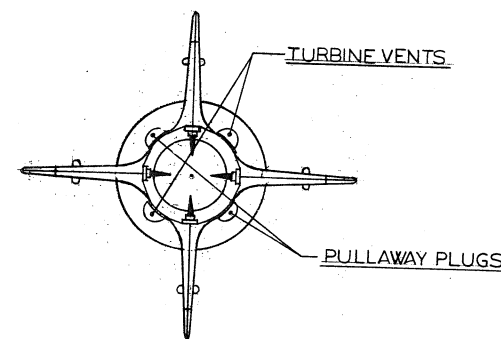


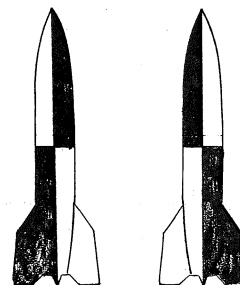
"BUMPER" CONFIGURATION
Half size



FRONT VIEW. Half size



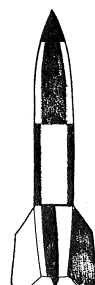
REAR VIEW
Half size



PEENEMÜNDE



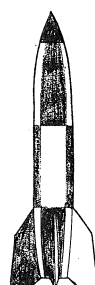
N



E



S

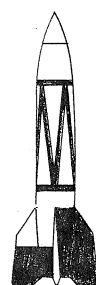


W

EARLY WHITE SANDS



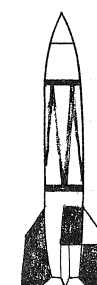
N



E



S



W

WHITE SANDS

NOTE: Details of paint patterns varied slightly from rocket to rocket at White Sands. Some did not have body stripes.

TYPICAL PAINT PATTERNS

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PROTOTYPE DETAILS. SHEET NO. 1
GERMAN V-2 (A-4)

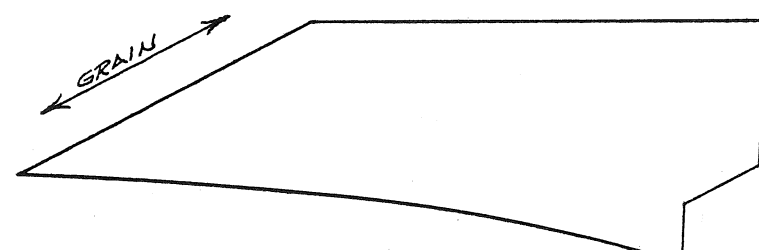
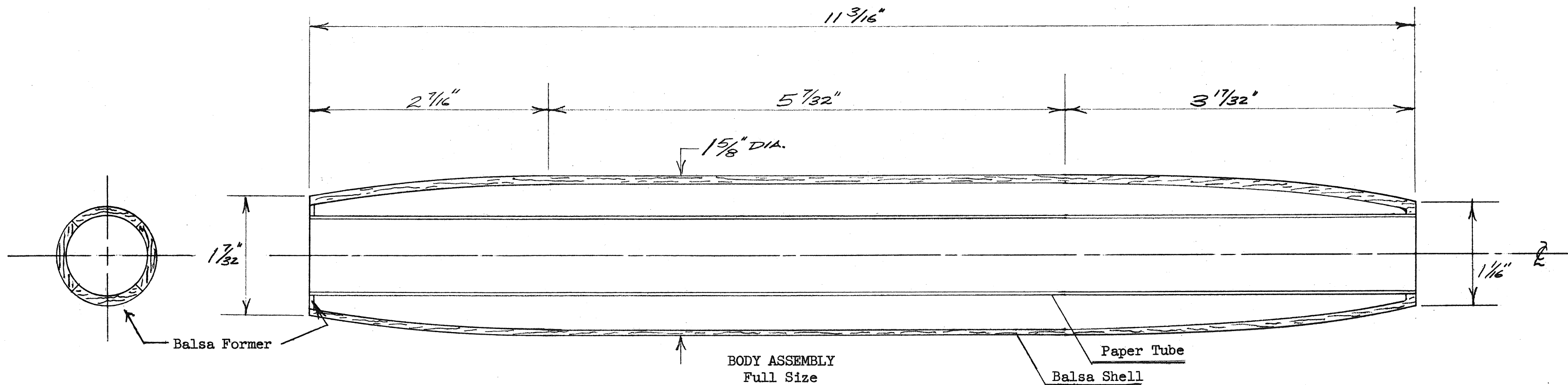
MODEL SCALE: 1 to 40 DRAWING SCALE: Not appl.

SCALE SOURCE: See Fact Sheet

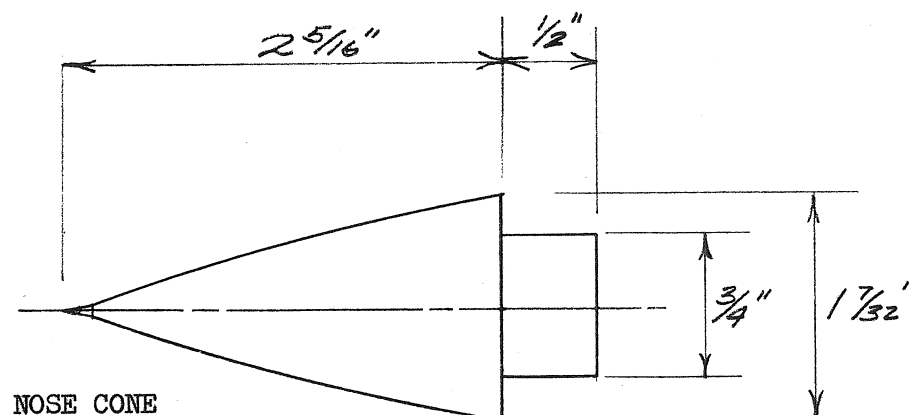
DESIGN BY: - DRAWN BY: G. Harry Stine

CHECKED BY: *W. R. Denny* RELEASED: 25 April 1961

DRAWING NUMBER: NAR- 102:1

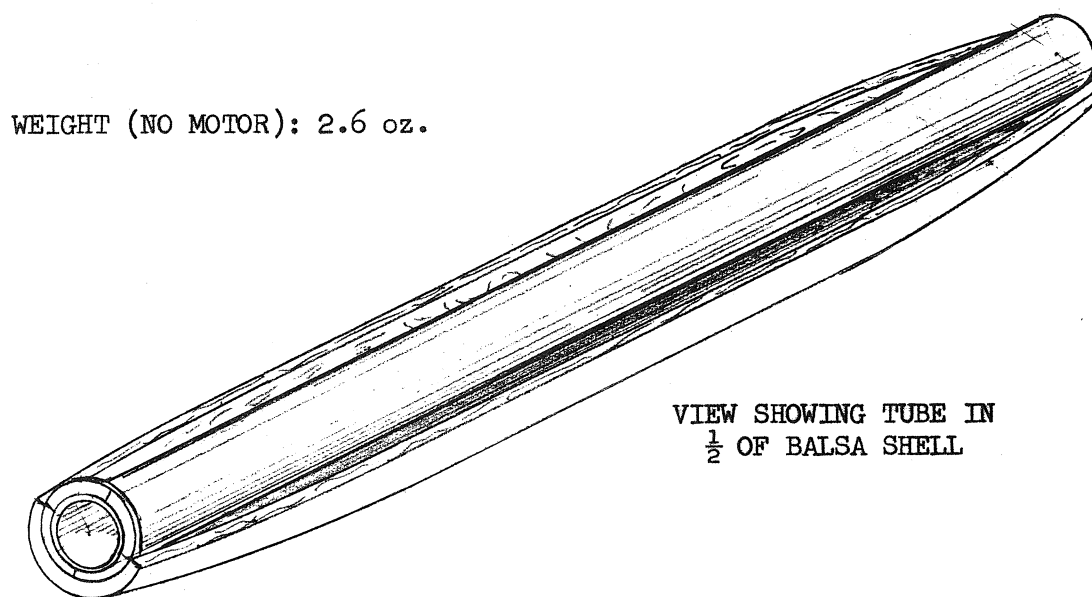


FIN PATTERN
Full size

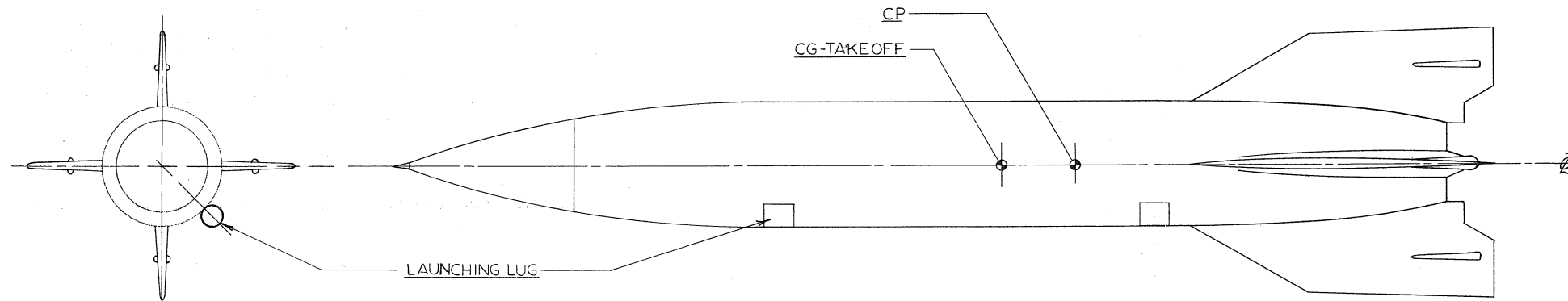


NOSE CONE
Full size

WEIGHT (NO MOTOR): 2.6 oz.



VIEW SHOWING TUBE IN
¹/₂ OF BALSA SHELL



FRONT VIEW (half-size)

SIDE VIEW (half-size)

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PLAN PROGRAM**

MODEL DETAILS. SHEET NO. 2

GERMAN V-2 (A-4)

MODEL SCALE: 1 to 40 DRAWING SCALE: As noted

SCALE SOURCE: See fact sheet

DESIGN BY: G. Harry Stine DRAWN BY: GHS

CHECKED BY: S-R RELEASED: July 1961

DRAWING NUMBER: NAR- 102: 2

National Association of Rocketry

PLAN PROGRAM FACT SHEET

Plan No. 102

Model Name GERMAN V-2

The missile body is extremely difficult to make. The balsa shell is made as follows: On a lathe, turn down a 2" x 2" x 12" balsa block to the exact external countour shown. With a jig saw, cut this in half lengthwise. With a woodcarving set, hollow out both halves of the balsa shell until the wall thickness is about 1/16" or slightly less. Make sure to leave a slightly ridge around the aft end of the shell as shown in the "body assembly" cross section. Cut the forward balsa former as shown using four sectors of 1/16" sheet balsa with the grain running as indicated by wavy lines on the former plan; glue the four sectors together to make the complete forward former. Cut a 3/4" i.d. x 13/16" o.d. paper body tube to 11-3/16" length or to fit. Glue the forward former to the front end of the tube. Attach the recovery system shock cord to the body tube. Then carefully fit the tube into the shell halves, cutting and trimming until the halves fit exactly back together with the tube inside. Make sure the tube is straight inside the shell. The forward former may require slight sanding or the aft ridge on the shell may require trimming in order to accomplish this. Once everything fits properly, glue the tube into one of the shell halves, then glue the other shell half in place. The resultant missile body will be quite strong. Carefully fill the crack caused by the shell halves fitting together. Use several coats of balsa filler to fill the grain in the balsa shell; sand between each coat.

The fins are cut from 1/16" sheet balsa with the grain running as indicated. Glue the fins to the missile body making sure they are aligned properly. The fin fairings next to the body can be built up with plastic balsa or plastic wood, or may be formed from block balsa sanded to shape. Small details can be added from balsa scraps.

Install the recovery system of your choice.

Because of the high weight of this model, it requires a long launching rod. Therefore, it should be launched from a rod made from 1/4" diameter steel at least four feet long, preferably six feet long. Launching lugs cut from model airplane aluminum tubing of a size that will easily slip over the launching rod should be glued to the side of the missile body in the positions shown.

The model will fly with NAR Type B engines. Because of its weight, it will not reach high altitudes. It is strictly a scale model. It should always be launched from a launcher built as described above; it will not fly if launched from a simple platform as the real V-2 was. The CG point should be carefully observed.

An additional nose cone may be made to convert this model into the "Bumper" configuration. Refer to the portion of Sheet #1 showing this configuration.

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National Association of Rocketry

Plan No. 102

PLAN PROGRAM FACT SHEET

Model Name GERMAN V-2

PROTOTYPE DETAILS

The German V-2 rocket was developed by Dr. Wernher von Braun and his colleagues at Peenemunde on the Baltic Coast of Germany before and during World War II. The Peenemunde designation for the rocket is *Aggregat-4 (A-4)* meaning "assembly number four." The Nazi propaganda ministry tagged the operational rocket with the name "*Vergeltungswaffe Zwei*" or "V-2", meaning "vengeance weapon number two." The rocket is known by both names. The first successful V-2 firing was made at Peenemunde on October 3, 1942. The last V-2 firing was made at White Sands Proving Ground in September 1952.

The V-2 was designed to carry about one ton of explosives to a range of 220 miles. Following WWII, approximately 100 V-2 rockets were brought to the United States. About 60 of these were fired at White Sands. Two "Bumper" two-stage versions were fired at Cape Canaveral. For the White Sands flights, the explosive warhead was replaced with scientific instruments. The maximum altitude achieved by a V-2 was 135 miles; the flight took place at White Sands on 17 August 1951. The two-staged "Bumper" configuration reached a maximum altitude of 250 miles on 24 February 1949 at White Sands.

Additional data on the V-2, its dimensions and weights, and its flight history can be found in Willy Ley's "Rockets, Missiles, and Space Travel," and Dr. Walter Dornberger's "V-2." This data is much too extensive to present here.

SCALE SOURCE:

These are the most accurate and complete drawings of the German V-2 rocket ever published. Scaling data was obtained from the two books mentioned in the preceeding section, plus many other U.S. Army Ordnance and General Electric Company reports. Additional data was gleaned from an extremely careful study of approximately 100 photographs of the V-2 rocket in the personal collection of G. Harry Stine. Details shown in Sheet #1 of the plans were carefully added with the best accuracy that could be obtained. Paint pattern data was also obtained from both color and black-and-white photographs. It should be noted that each of the White Sands V-2 rockets differ~~ed~~ slightly in small details and paint pattern. Data on the "Bumper" configuration drawing was obtained from a study of photographs. Much of the small details came from the draftsman's intimate knowledge of the rocket.

MODEL DATA:

This is not an easy model to build and should not be attempted by a beginner.

The nose cone is turned from a 1-1/2" hardwood dowel. A template should be made from the nose cone drawing to insure that the nose is shaped properly and will meet the lines of the missile body neatly.

(more)

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