

R E S T R I C T E D
HEADQUARTERS
COMMUNICATIONS ZONE ETOUSA
OFFICE OF THE CHIEF ORDNANCE OFFICER
APO 887

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ETO ORDNANCE TECHNICAL INTELLIGENCE REPORT NO. 192

SUBJECT: 38 cm. R. Sprgr. 4581 Rocket Projectile for the Raketenwerfer 61 (RW 61) Projector.

Observations by: Maj. H.L. Karsch, Enemy Equipment Intell. Sec.,
Ord. Service, Hq. Com Z, ETOUSA.

1. General:

The 38 cm. R. Sprgr. 4581 rocket projectile is fired from the new type rocket projector Raketenwerfer 61 (RW 61) mounted on a Tiger I chassis. Information on this projector is contained in ETO Ord. Tech. Intell. Report No. 184. Although much larger in diameter, this new rocket is similar in design and appearance to the 21 cm. rocket projectile, Wgr. 42 Spr. Mit Hbgr. Z 35 K. The radical departure from the standard spin-stabilized rocket design is in the addition of insert splines at the after end of the motor body. These splines, fitting into the rifling of the liner, aid in imparting an initial spin to the projectile. Range table weight of the projectile is listed at 761 lbs. with variations in steps of 12 lbs. each to be expected. The maximum range of the rocket is listed at 6180 yds. when the rocket-propellant charge is at +14°C. The range table indicates that the rocket is sensitive to temperature. Excluding the motor body, the projectile has a charge weight ratio of 73% or an overall charge weight ratio of 35.5%.

2. Projectile:

a. General:

The rocket projectile consists of three main assemblies, namely the high explosive body, the motor body, and the nozzle assembly. (See Photos 1 & 2, Appendix "A", and Drawing 1, Appendix "B"). Following are the dimensions of the rocket:

Weight of rocket.....	761 lbs. (±12 lbs. variations)
Overall length (not including fuze)...	56.68 ins. (144 cm.)
Diameter of bourrelet.....	14.94 ins. (38 cm.)
Length of H.E. body.....	37.19 ins. (94.5 cm.)
Length of motor body.....	18.54 ins. (47.1 cm.)
Thickness of H.E. body.....	0.30 in. (.762 cm.)
Thickness of motor body.....	0.53 in. (1.346 cm.)

(1) High Explosive Body:

The H.E. body (forward section) is of two-piece welded construction and is threaded internally at its after end to receive the motor body. The booster pocket and fuze adapter assembly is welded in position at the nose of the H.E. body. A bourrelet is located just in rear of the welded junction of the ogive and the cylindrical section.

(2) Motor Body:

The motor body (rear section) is threaded externally to screw into the H.E. body and threaded internally to receive the nozzle assembly. Both the H.E. body and nozzle assembly are secured by means of two diametrically opposed set screws. Nine grooves for the splines are machined into the base of the periphery of the motor body.

R E S T R I C T E D

(a) Spacer: A spacer ring, located in the forward end of the motor body, has a dual purpose: (i) to hold the forward ignition charge in place and to position the rocket propellant charges, which vary in length; and (ii) to allow space for proper ignition of the various elements of the rocket propellant. (See Photos 1 & 2, Appendix "A", and Drawing 1, Appendix "B").

(b) Splines: Several of the nine splines fitted in the grooves in the periphery of the motor body are made in two pieces. (See spline detail shown in Drawing 1, Appendix "B"). There is no apparent reason for this two-piece construction. These splines are held in position by the shoulder on the nozzle assembly plate.

(3) Nozzle Assembly:

There are thirty-two (32) venturi holes in the nozzle plate, details of which are shown in Nozzle Detail, Drawing 1, Appendix "B". These venturi holes are set at an angle of 14° to the axis of the rocket. This angle, in addition to the splines, gives the rocket a clockwise rotation in flight as well as providing the forward impulse.

In the center of the nozzle plate there is a threaded hole to receive the igniter primer for the rocket propellant.

A rear spacer ring, welded to the nozzle plate, aids in the positioning of the outer row of propellant charges. The remaining elements of the propellant charges are positioned by the base plate of the nozzle assembly.

b. Explosive:

The high explosive body is filled with 270 lbs. of the German explosive charge No. 13A, which is amatol 50/50 poured. The H.E. charge is initiated by the sub-booster cwg. Np. 10, the same type as that used in German artillery projectiles, and a booster of six (6) P.E.T.N. pellets $1\frac{3}{4}$ ins. in diameter by $\frac{11}{16}$ inch thick. Four (4) P.E.T.N. pellets are cast in the explosive aft of the booster pocket as a secondary booster.

c. Propellant Charge:

The propellant charge, total weight $88\frac{1}{2}$ lbs., located in the motor body, consists of the following components: (See Photo 2, Appendix "A")

<u>1 ea. Center Stick:</u>	Length..... 16 ins.
	Diameter..... $4\frac{1}{16}$ ins.
	Diameter of hole. $1\frac{3}{8}$ ins.
	Weight..... $10\frac{1}{2}$ lbs.

Cemented to the central stick are four ribs which act as spacers, dimensions of which are as follows:

<u>1 ea. Intermediate</u>	Length..... $15\frac{5}{16}$ ins.
<u>Stick:</u>	Diameter..... $7\frac{1}{4}$ ins.
	Diameter of hole. $4\frac{3}{4}$ ins.
	Weight..... 20 lbs.

<u>10 ea. Outer Sticks:</u>	Length..... $12\frac{15}{16}$ ins.
	Diameter..... $3\frac{3}{16}$ ins.
	Diameter of hole. $\frac{7}{16}$ inch.
	Weight per stick. 5.6 lbs.
	Total weight..... 56 lbs.

A thin asbestos gasket covers the venturi holes to protect the propellant charge from moisture.

d. Propellant Ignition System:

The rocket propellant ignition system is composed of the following elements: (See Photo 2, Appendix "A").

(1) Igniter Primer:

This primer, located in the nozzle assembly plate, is initiated by a flash from the firing mechanism in the breech of the projector.

(2) Relay:

The relay from the igniter primer to the ignition charge is made up of three (3) bags of powder located in the hole of the center stick of the propellant charge (See Photos 1 & 2, Appendix "A").

(3) Ignition Charge:

This charge, fastened to the forward spacer ring, weighs approximately $\frac{1}{2}$ lb. and is used to ignite the rocket propellant.

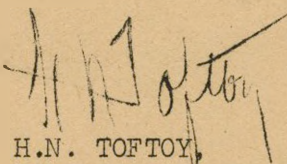
e. Color and Markings:

The projectile is painted O.D. with a 0.8 inch wide white band around the body at the center of gravity. Stencilled on the ogive is the following warning: "ACHTUNG: FEUCHTIGKEITSEMPFINDLICH. VOR REGEN UND WASSER ZU SCHUTZEN" which, translated, means "Warning: Sensitive to damp. Protect from rain and water." The German explosive code number "13A" is stencilled on the ogive in black.

f. Fuze:

A point detonating (percussion) nose fuze, designation unknown, is fitted in the forward fuze pocket. The fuze body adapter and retaining collar are made of steel, while the fuze body itself is of aluminium. During transit the fuze may be set in safe position by rotation of the fuze body. A choice of either instantaneous or short delay setting can be made prior to firing by rotation of the fuze body to the desired position. After being armed by rotation, the striker is held away from the primer cap by means of a creep spring. This fuze will be covered separately in a later report.

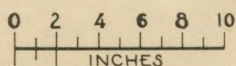
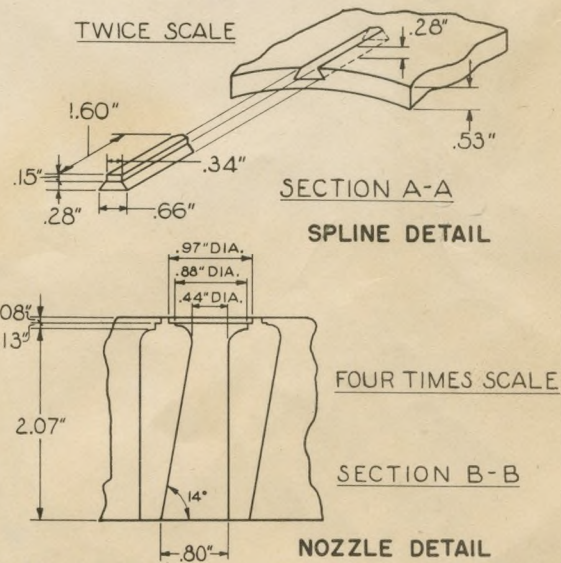
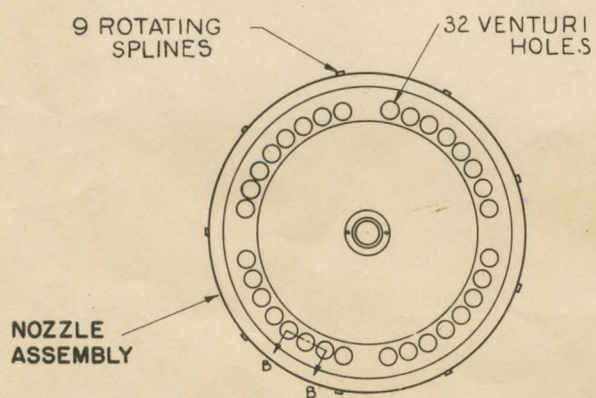
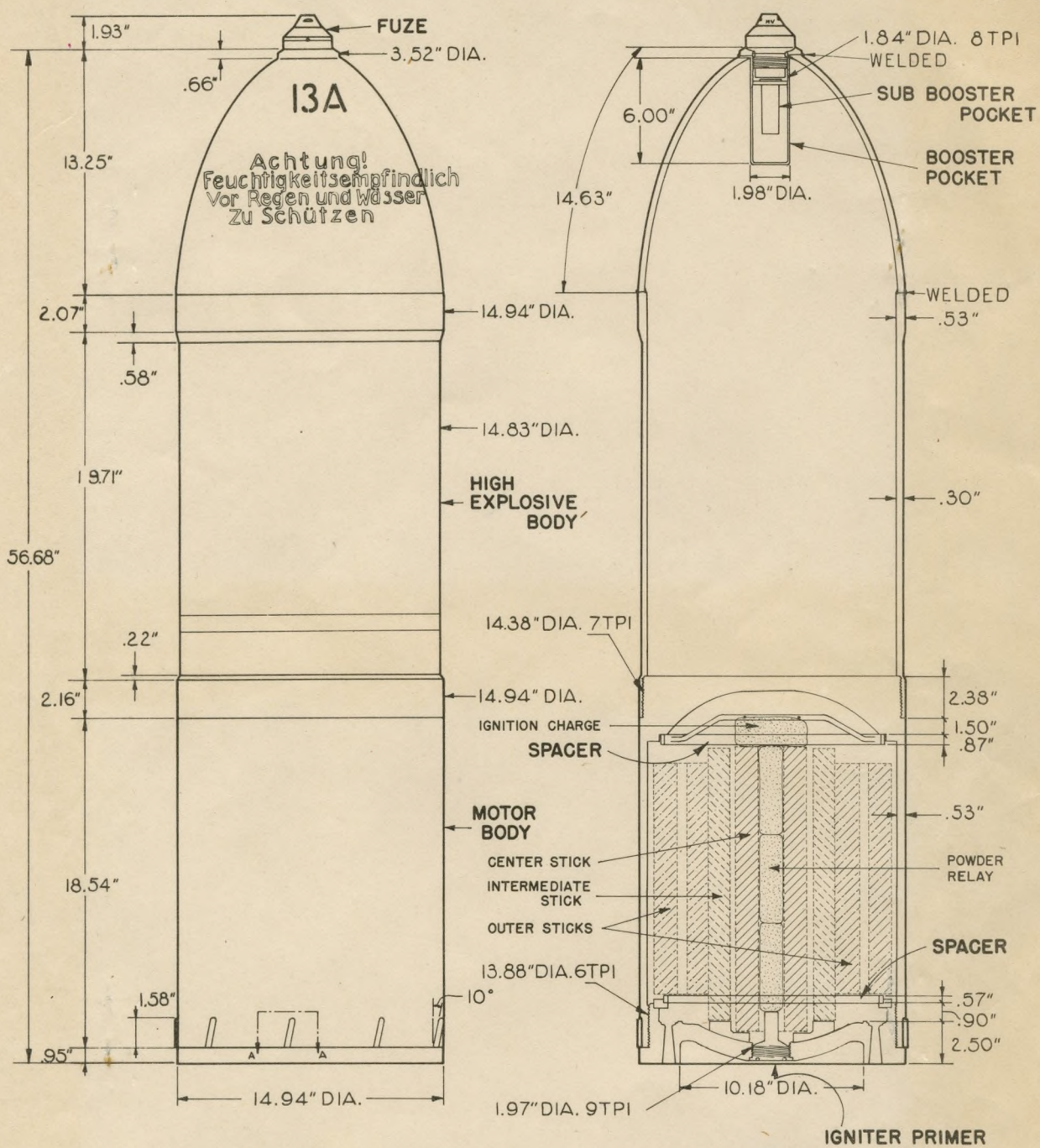
For the Chief Ordnance Officer,


H.N. TOFTOY,
Col., Ord. Dept.,
Assistant.

Inclosures:

- Appendix "A"... Photos 1 & 2.
- Appendix "B"... Drawing 1.

38 CM. ROCKET PROJECTILE



E.T.O. ORD. TECH. INTELL.

APPENDIX B.
DRAWING NO. 1

Same Size



