

AUG 13 1956

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CDL No.	
ACCOUNTABILITY CARD	
FILE NO.	TX-27 3-2

Z27, 3-2
 Case No. 435.02
 Ref. Sym: 1611
 Project No. ET-3426
 Completed 6/6/56

UNCL
Classification Review
Classification Change
Contains No DDG Classification
Coordinate With
Contains UCAT
Coordinate
7/15/98
7/20/98
W.C. Payne

TO: DISTRIBUTION

Re: Nylon Pellet Test of TX-27 Contact Fuses

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Object of Test

The object of this test was to determine if the weapon could be detonated by moving through rain or hail.

Authorization for Test

This test was requested by Division 1461 in a Work Order Authorization dated June 6, 1956. Mr. G. J. Janser was the consultant.

Introduction

A prior test (Project No. ET-3337) had been conducted by Division 1611 wherein four types of piezoelectric crystals (XMC-811, 811-A, 811-B, and 565) were pellet-tested and monitored as individuals in their mountings in the nose of the weapon.

In that test a maximum voltage output of approximately 35 volts was found to result from the impact of a nylon pellet projected at a nominal 1000 fps velocity. Since a voltage of 115 to 215 volts is required to trigger the fuse, an appreciable safety factor exists.

The nose section for the current test had been modified by the addition of a spoiler ring. Two crystal networks were formed, one containing four XMC-811 crystals and one four XMC-811B's. Two of each type were mounted in a ring at the flat (forward) section of the nose, and two of each type on a circular bracket farther back on the swell of the weapon.

Procedure and Results

A pattern was shot about each of the types of crystals set in the flat section of the nose. This pattern extended vertically and horizontally six inches in each direction from the crystal (Fig. 1), a pellet being fired to strike at one-inch intervals along these lines. Another series of shots, also at one-inch spaces, was fired in a line extending along the swell of the weapon, bisecting the angle between the vertical and horizontal lines.

A pattern extending six inches from the crystal toward the center of the weapon, six inches away from the center and six inches in one direction at right angles

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CLASSIFICATION CHANGED TO: <u>U</u> <u>Emelda Selph 7/21/98</u>	AUTHORITY: <u>W.C. Payne</u>
PERSON CHANGING MARKING & DATE: <u>W.C. Payne 7/22/98</u>	RECORD ID: <u>98SN3050</u>
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to this line, was fired around each of the types at the other mounting.

All of the pellets were fired at a nominal velocity of 1000 fps, and the output of the network recorded by photographs of a calibrated cathode-ray oscillograph screen. Tables I and II present complete results of the test. Figure 1 shows the location of the impact fuse crystals and shot patterns as viewed looking aft from a position forward of the nose.

Conclusions and Results

It is evident that an adequate safety factor exists between the output of the crystals and the 115 to 215 volts necessary to trigger the firing circuit.

Test Conducted by R. G. HAMILTON - 1611-2

M. A. Richter
Approved by M. A. RICHTER - 1611-2

RGH:1611-2:dr

Encs:

Tables I and II
Fig. 1

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R. D. Wehrle, 1464
W. A. Gardner, 1610
G. C. McDonald, 2530
W. C. Kraft, 2540
D. Williams, Jr., 1611
R. E. Fisher, 1621
J. R. Hoffman, 5133
J. R. Harrison, 5522
C. L. Gmel, 5523
R. K. Smeltzer, 7222-2
K. M. Sadler, 7222-3
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TABLE I

Voltage Output of XMC-811 Crystals from Impact of
3/16-Inch Nylon Pellets at 1000 fps ±

Forward Mounting
Marked 1 on Figure

Inches from crystal	0	1	2	3	4	5	6	1	2	3	4	5	6
				Left						Right			
Peak volts	22	25	21	12	8	8	9	20	18	15	11	12	20
				Up						Down			
Peak volts	--	20	22	12	10	16	15	17	27	22	26	16	13
				45°									
Peak volts	--	11	14	12	20	9	12						

Aft Mounting
Marked 2 on Figure

				Left						Right			
Peak volts	16	14	21	6	11	15	13	26	22	22	16	4	--
				Up									
Peak volts	--	16	12	12	17	11	--						

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TABLE II

Voltage Output of XMC-811B Crystals from Impact of
3/16-Inch Nylon Pellets at 1000 fps \pm Forward Mounting
Marked 3 on Figure

Inches from Crystal	00	1	2	3	4	5	6	1	2	3	4	5	6
				Left						Right			
Peak volts	25	30	30	10	15	22	11	24	31	32	22	15	16
				Up						Down			
Peak volts	--	32	24	20	13	15	15	27	28	19	14	11	11
				45°									
Peak volts	--	30	23	25	20	15	21						

Aft Mounting
Marked 4 on Figure

Peak volts	16	10	9	8	12	11	9						
				Up						Down			
Peak volts	--	11	17	--	5	20	13	18	10	10	10	13	--

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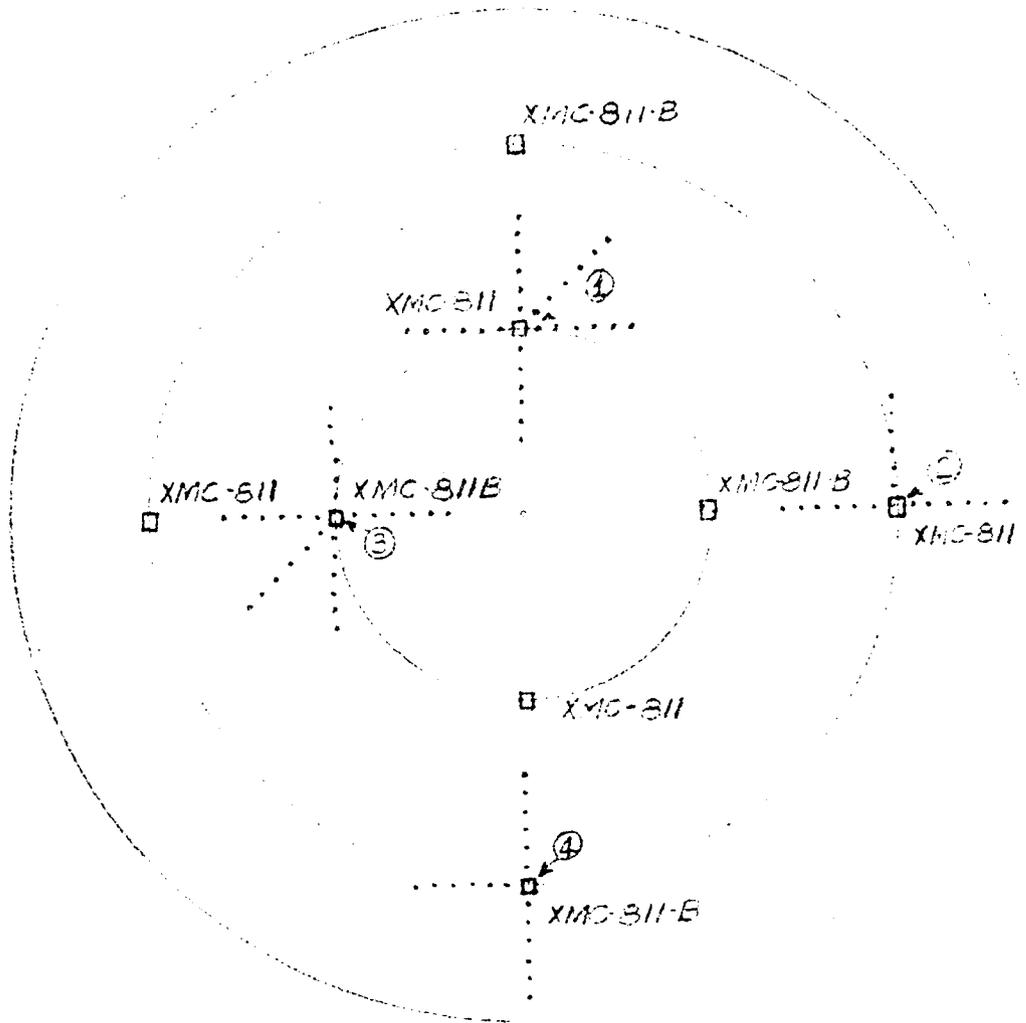


Fig1- POSITIONING AND SHOT PATTERN OF CRYSTALS

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