CRYSTAL IMPACT FUZING SYSTEM TEST ON THE XW-5/F-101 TYPE C STORE

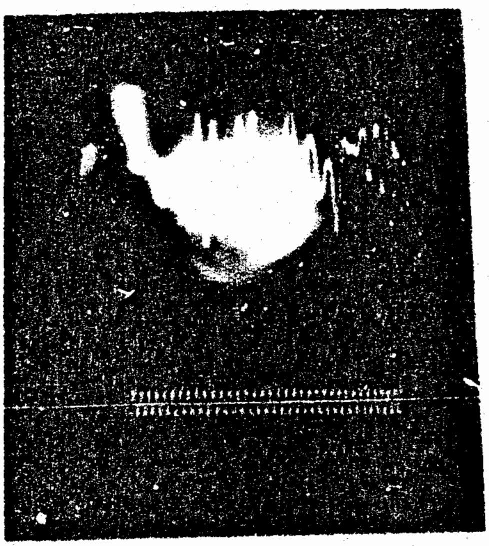
INTRODUCTION

The XW-5/F-101 weapon is designed to be carried externally by the F-101 aircraft at supersonic speeds. The weapon is 32 feet long and contains the XW-5/F-101 warhead, fuzing components, and two fuel cells. The many weapon system delivery capabilities make it possible for weapon impact at angles of 24° to 90° to be obtained. The purpose of this test was to determine the vulnerability of the weapon to spike or corner type impacts back to the major diameter of the weapon.

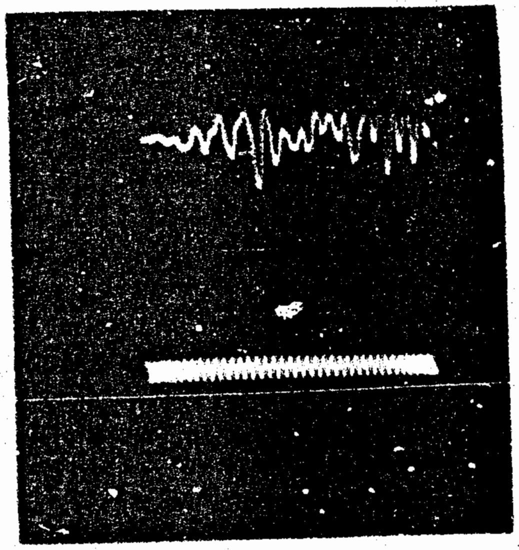
Figure 1 shows the configuration of the MC-300 crystal system used in the test. The proposed system for the weapon is identical to that tested except that it is planned to mount the two crystals at Station 30.00 diametrically opposite instead of as shown and that it is not planned to use the Channel 3 crystals. Structural interferences in the test nose section prevented the correct orientation at Station 30.00 The Channel 3 crystals mounted at Station 138.28 were so placed to determine the outputs obtainable there should the crystals mounted at Station 98.5 not give sufficient coverage. Although only two crystals were mounted in Channel 3, the network was artificially loaded with capacity to simulate a complete crystal network.

The test nose section was mounted at Station 138.28 to a vertical test stand. The nose was therefore cantilevered toward the gun. This resulted in tension in the upper skin surfaces and compression in the lower skin surfaces. Although the skin stresses should have little effect on the test results, most of the shots were placed on a side of the shape to minimize these effects.

Instrumentation was obtained by connecting two Tektronix oscilloscopes to each network. One scope of each network was set for a fast sweep and one for a slow sweep. Each channel was terminated in a 100 kilohm resistance to simulate the input impedance of the MC-134 X-unit. Capacity of each network was approximately 700 micromicrofarads. Sweep of the oscilloscopes was started by the shorting of two copper screens separated by paper insulation and taped to the skin of the weapon at the target position. Polaroid Land cameras were used to record the output waveform.

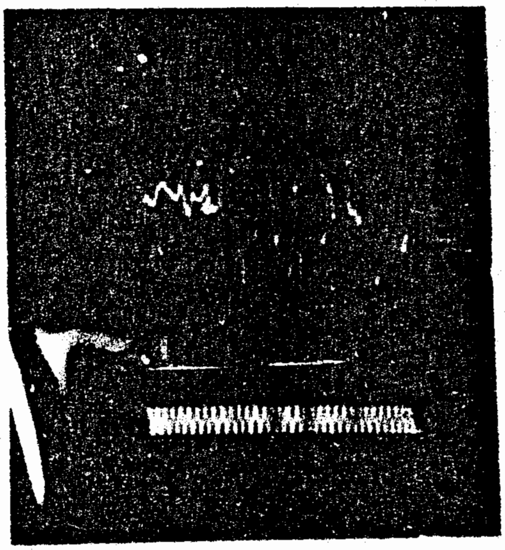


Det 1

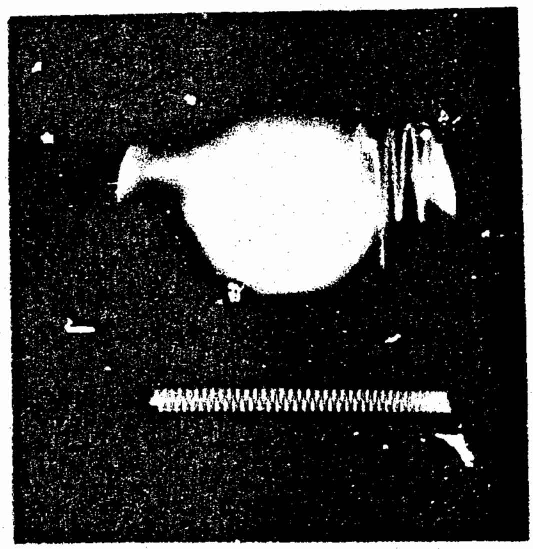


Det 2

Shot 1



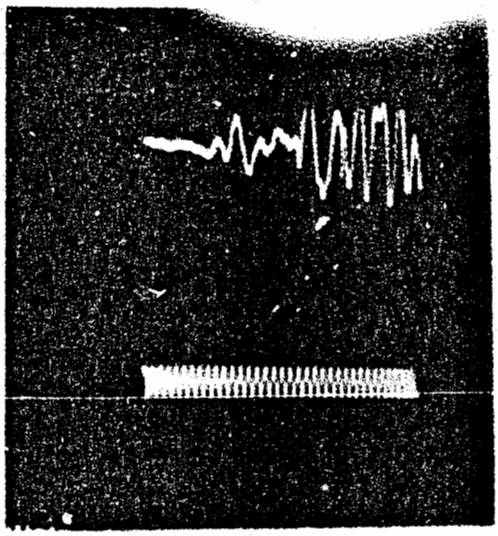
Det 1



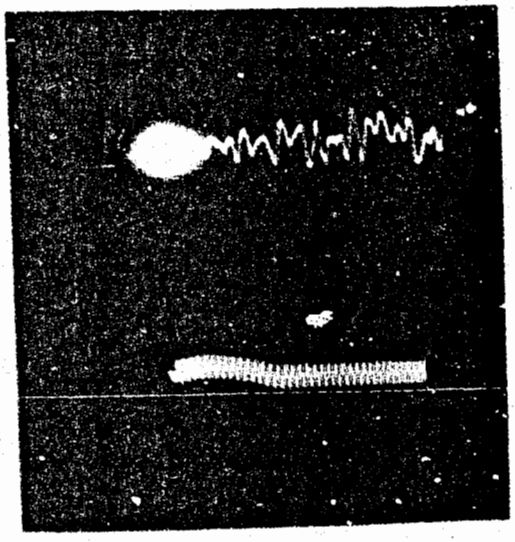
Det 2

Shot 2

Fig. 3: Calibration Freq: 10 KC
Calibration Volts: 62.5 Peak to Peak
Positive Voltage Downward

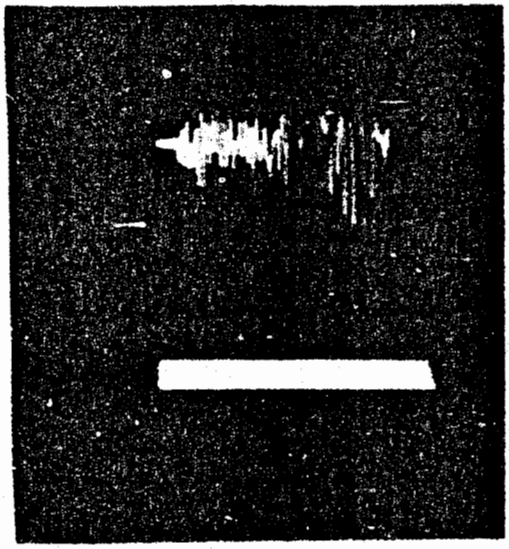


Net 1

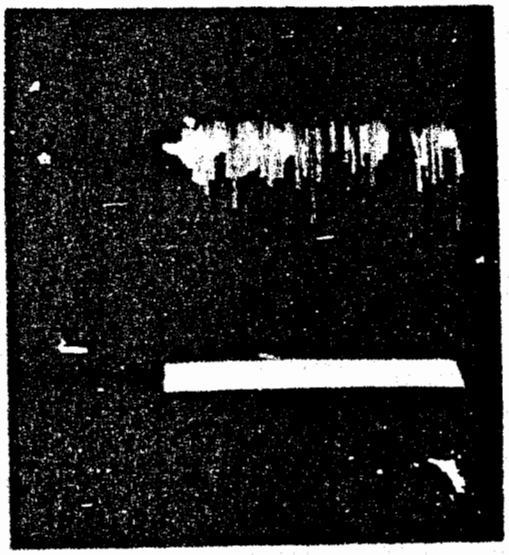


Net 2

Shot 3



Net 1



Net 2

Shot 4

Fig. 4: Calibration Freq: 10 KC
Calibration Volts: 47.5 Peak to Peak
Positive Voltage Downward