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DYNAMIC TEST OF A GUN TEST VEHICLE (U)

Organization 7300 Environmental Test Report

D. L. Preston, Org. 7344

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DYNAMIC TEST OF A
GUN TEST VEHICLE (U)

Introduction

The purpose of this test was to determine the trajectory of the flare projectiles fired from a gun with the vehicle moving at a velocity of 800 fps. Specifically, if the flare guns are functioning properly, the flare should leave the vehicle with zero velocity with respect to the ground in the direction of vehicle travel.

This test was requested by R. H. Genz, 5612, on August 9, 1965. R. A. Mikkelsen, 7331, was the Test Project Engineer, and R. B. Hedberg, 7344, was the Test Engineer. The series of three sled tests was completed December 13, 1965.

Summary

Three separate tests were conducted to determine the effectiveness of the flare guns to be used in the Beckett program. Two guns were to fire flares from a moving vehicle (800 fps) in such a manner that they would have no component of velocity parallel to the vehicle velocity.

The first two tests were characterized by the sled wake imparting a velocity to the flares parallel to the vehicle velocity.

The third test was a success with the flare from the 100 fps overcharged gun firing vertically upward.

Procedure and Results

The GTV (gun test vehicle) was mounted atop 7344's ejector sled by securing its two lugs to the sled using steel lug holders. Lateral unit motion was prevented by two sway braces of the type used on military aircraft ejection racks. The sled was accelerated by eight HVAR rocket motors yielding an average thrust of 40,880 pounds for one second and affecting a maximum acceleration of 34g's.

The two flare guns, mounted inside the GTV, were triggered by an electrical pulse from a cutter bar-screen box system placed at the proper location along the track.

The complete test series consisted of three separate sled firings. During the first two firings, the flare guns were fired horizontally at a vertical target placed fifty feet west of the track (sled moving from north to south) and the final firing was with the guns aimed vertically upward.

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Instrumentation consisted of an onboard TM pack monitoring the flare gun firing pulses, and motion picture coverage of the flare ejection area.

In the first test, conducted on November 18, 1965, the flares were fired with a vehicle velocity of 796 fps and impacted south of the target. As the flares cleared the gun barrels at the anticipated time from fire pulse and the explosive charge detonated properly, the only explanation purported for the southward velocity of the flares is that the sled wake must have imparted velocity to them. The size of the explosive charges for the first run were calculated from data obtained from static firings.

The second test, held on December 3, 1965, turned out to be an almost identical repeat of the first test, even though both guns were loaded with a 30 fps overcharge. The vehicle velocity was 800 fps, and the sled wake, again, seemed to carry the flares southward.

As an attempt at improving the turbulence around the ejecting flares, the unit was rotated 90° and the flares fired upward on the final shot. One gun was loaded with the 30 fps overcharge and the other with a 100 fps overcharge. The test, fired December 13, 1965, saw the 100 fps overcharged flare completely compensate for the vehicle's 791 fps velocity and turbulence around the vehicle and travel straight up.

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