SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
Determination (Circle Number):
1. Classification Retained
2. Classification Changed to U
3. Contains No DOE Classified Information
4. Coordinate With:
5. Contains UCNI
6. Comments:
OK for Opennet
9/23/98
W Lopez 9/24/98
R B Craner

APR 12 1960

TX-57, 3-2
Project No. T-16889
Case No. 13,883.00

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TO: DISTRIBUTION

Re: Static Test to Determine Energy Required for TX-57 Parachute Deployment

PROGRAM 57800 CATEGORY 03 03 3 ORG. 3524 DATE 6 0 9 2 6

Summary of Test

The energy required to deploy a TX-57 parachute was determined by obtaining a deployment load versus distance plot for a static pull on the parachute, and taking the area under the curve as equivalent to the energy. This energy requirement was found to be 2400 foot-pounds.

Object

The object of the test was to determine the energy required to withdraw the TX-57 parachute and to sever all reefing lines, as in actual deployment. The energy required would be taken as the area under the deployment force vs. deployment distance curve.

The test unit was a Division 5144 designed parachute for the TX-57. Canopy diameter was 12 feet, with 12,000 pound tensile strength suspension lines 14 feet long. The canopy was made of graded continuous ribbons with 3000, 2000, and 1000 pound tensile strengths, spaced for variable porosity. Line ties were 90 pound strength, and canopy ties were 400 pound strength.

Authorization for Test

The test was performed in accordance with a Work Order Authorization from Organization 1224 to Division 1613. Mr. H. A. Mullin, 1224-2, was the consultant.

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Equipment and Instrumentation

The following equipment was used in the test:

Overhead hoist, 5-ton capacity.
Brown recorder, 20 ms. full range, response time of 1/4 second full scale, chart speed 1.0 inch per second, Serial No. 8-74603.
CEC power supply, type 3-132, Ser. No. 5-98698.
1/4-inch steel cable, pulleys, and miscellaneous hardware.

The following instrumentation was used:

2000 pound load cell, Serial No. 3549.

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CLASSIFICATION CHANGED TO: U
AUTHORITY: R. B. Craner
Emelda Selph 9/29/98
PERSON CHANGING MARKING & DATE
RECORD ID: 98SW4415
W Lopez 9/29/98
PERSON VERIFYING MARKING & DATE
DATED: 9/24/98

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TX-57
3-2

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Procedure

The parachute lines were tied to a lug plate mounted such that the parachute centerline was parallel to and about 8 inches above the floor. A load cell and steel cable were attached to the parachute, and the cable run through a system of pulleys to the overhead hoist. The pulley system enabled the parachute to be pulled at twice the hoist speed.

Hoist speeds had previously been determined to be 1.64 and 3.13 inches per second. The slower speed was selected, which, with the pulley system, deployed the parachute at a rate of 3.28 inches per second.

Loads developed during deployment were measured by the load cell and recorded by the Brown recorder. Recorder chart drive and the hoist were started simultaneously to provide correlation between load and deployment distance. Distance at any time was taken as the deployment speed multiplied by the time from start.

The test was interrupted about midway through when the pulley system came loose from its mounting. The system was then discarded, and the test completed by attaching the cable directly to the hoist and pulling at the "fast" speed, 3.13 inches per second.

Results

The plot of deployment load versus deployment distance is given in Fig. 1. Work done in deploying the parachute was found as the area under this curve (using the original recorder plot instead of Fig. 1). The work done, equivalent to the energy required, was 5400 foot-pounds.

W. M. Sigmon

W. M. SIGMON - 1612-1

G. M. Willson

1613 Project Engineer: G. M. WILLSON - 1613-3

Approved by: R. S. COOPER - 1613-3

WMS:1612-1:ec

Enc: Figure 1

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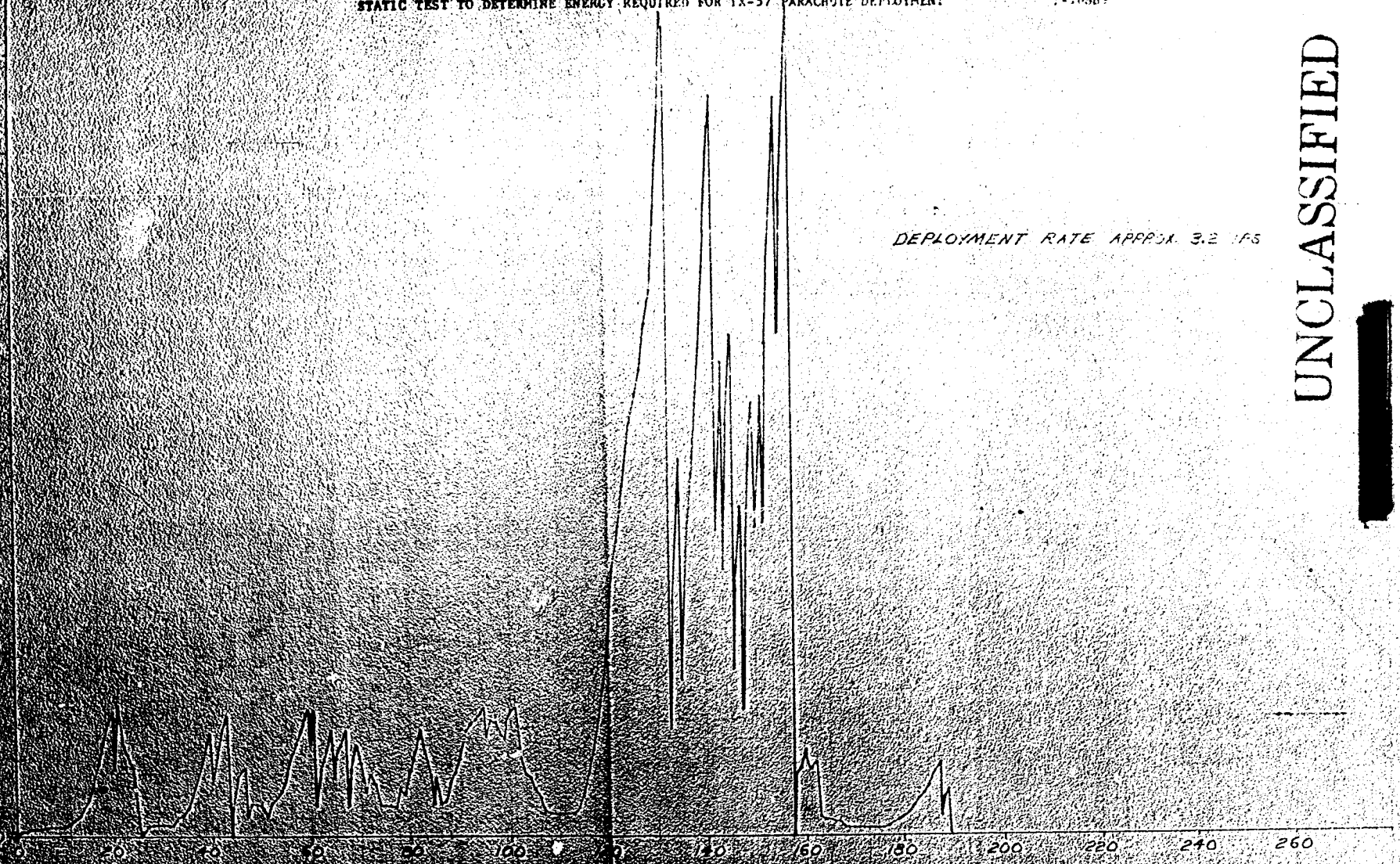
[redacted]

FIGURE 1 - PLOT OF DEPLOYMENT LOAD VERSUS DEPLOYMENT DISTANCE -
STATIC TEST TO DETERMINE ENERGY REQUIRED FOR TX-57 PARACHUTE DEPLOYMENT



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