UNCLASSIFIED [redacted]

1188

218

JUL 3 1953
Case No. 432.0
Ref. Symbol: 1611
Project No. ET-1311
Completed 4/15/53

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
Review Date 10/22/98
Authority: RBCraner
Review Date not Req'd
Authority: per DOE memo of 5/7/97
Determination (Circle Numbers)
Classification Cancelled
Classification Changed to U
Contains No DOE Classified Information
Coordinate With
Contains UCNI No
Comments
OK for Openmet

MR. E. L. DEETER - 5432

TCG-NNT-1

Re: Vibration Tests of Two Sensitive Research Polyrangers (SA-139 and SA-140)

Object of Test

The object of this test was to determine the effects of vibration on two Sensitive Research Polyrangers when vibrated in their respective carrying cases.

Authorization for Test

This test was requested by Division 5432 in a Work Order Authorization dated March 10, 1953. Mr. R. D. Jones was the consultant.

Procedure

The two Polyrangers were first examined for any physical defects (loose screws, spools, switches, etc). They were then calibrated by Division 1613 to ascertain their accuracies and freedom from electrical defects.

The Polyranger designated SA-139 was then vibrated in its carrying case which consisted of a 20 x 14 x 14 inch modified wooden case (Fig. 1). The instrument was cushioned inside by seven rubberized horsehair pads (Fig. 2). Vibration pickups were mounted on the instruments to obtain transmissibility data in the plane of vibration.

The Polyranger designated SA-140 was then vibrated in its carrying case which consisted of a 20 x 18 x 13 inch Fiberglas carrying case (Fig. 3) manufactured according to MIL-C-4150 by H. Koch and Sons, San Francisco, California. The instrument was cushioned inside the carrying case by a rubberized horsehair filler (Fig. 4). Vibration pickups were again mounted to obtain acceleration measurements in the plane of vibration.

Vibration in each instance was an applied double amplitude of 0.064 inch (10 g at 55 cps) from 10-55-10 cps in one-minute cycles for 45 minutes in each of three mutually perpendicular planes (Figs. 1 and 3).

Vibration was performed on Sonntag No. 2 to which the carrying cases (with the instruments inside) were tightly affixed.

After vibration the instruments were again physically inspected and electrically calibrated.

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP
CLASSIFICATION CHANGED TO: U
Cornelia Holley 10/29/98
PERSON CHANGING MARKING & DATE
WC Keyne 10/30/98
PERSON VERIFYING MARKING & DATE
AUTHORITY: RBCraner
RECORD ID: 99SN0235
DATED: 10/22/98

[redacted]

CDL No.
ACCOUNTABILITY CARD SA-139
FILE No. SA-140

UNCLASSIFIED

JUL 3 1953

Ref. Symbol: 1611
Project No. ET-1311

Results

The transmissibility graphs (Figs. 5 through 7) definitely show that the SA-139 received a greater amount of vibration than the SA-140. Furthermore, the SA-139 could not be calibrated after test because of a large amount of roll (pivot friction); the SA-140 showed no appreciable change in calibration. Examination of the SA-139's pivots (Fig. 8) revealed the bottom one as being damaged. Photographs of the magnified pivots (Figs. 9 through 11) show the flattened portion of the bad bottom pivot as compared with the good top pivot. Though the good top pivot shows a slight flattening of the point, this is not enough to prevent calibration since the flattened section does not come in contact with the top jewel.

It might also be added that the tape around one resistance spool of the SA-139 showed a tendency toward becoming unwound. This did not in any way impair the function of the spool, though it is an indication of the poor fabrication of this part.

Test Conducted by J. H. NEWMAN - 1611

R. L. Wagar
Approved by R. L. WAGAR - 1611

JHN:1611:bh

Encls: Figs. 1 through 11

Copy to:
J. R. Townsend, 1600
L. E. Lamkin, 1280
A. F. Cone, 1510
T. B. Morse, 1610
K. O. Thorp, 1630
L. J. Biskner, 2530
G. M. Byrne, 1921-3 [redacted]
J. M. Ralls, 1521-4 Attn: 1500 Drawing File

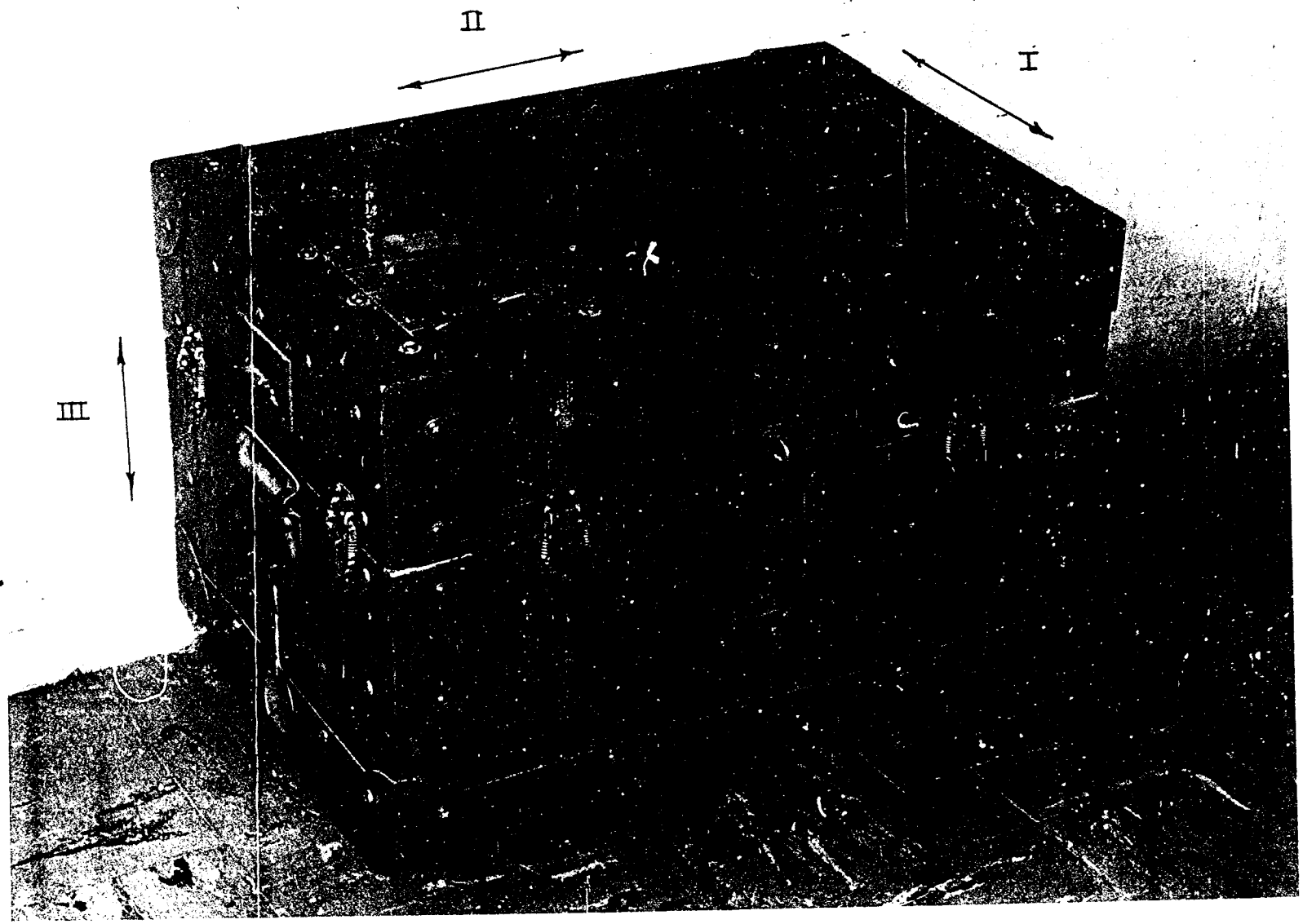

FIG. 1 - CARRYING CASE ENCLOSING SA-139 SHOWING PLANES OF VIBRATION

ET-1311
REF SYM-1611
5-27-53 JFM

#1160

#38989

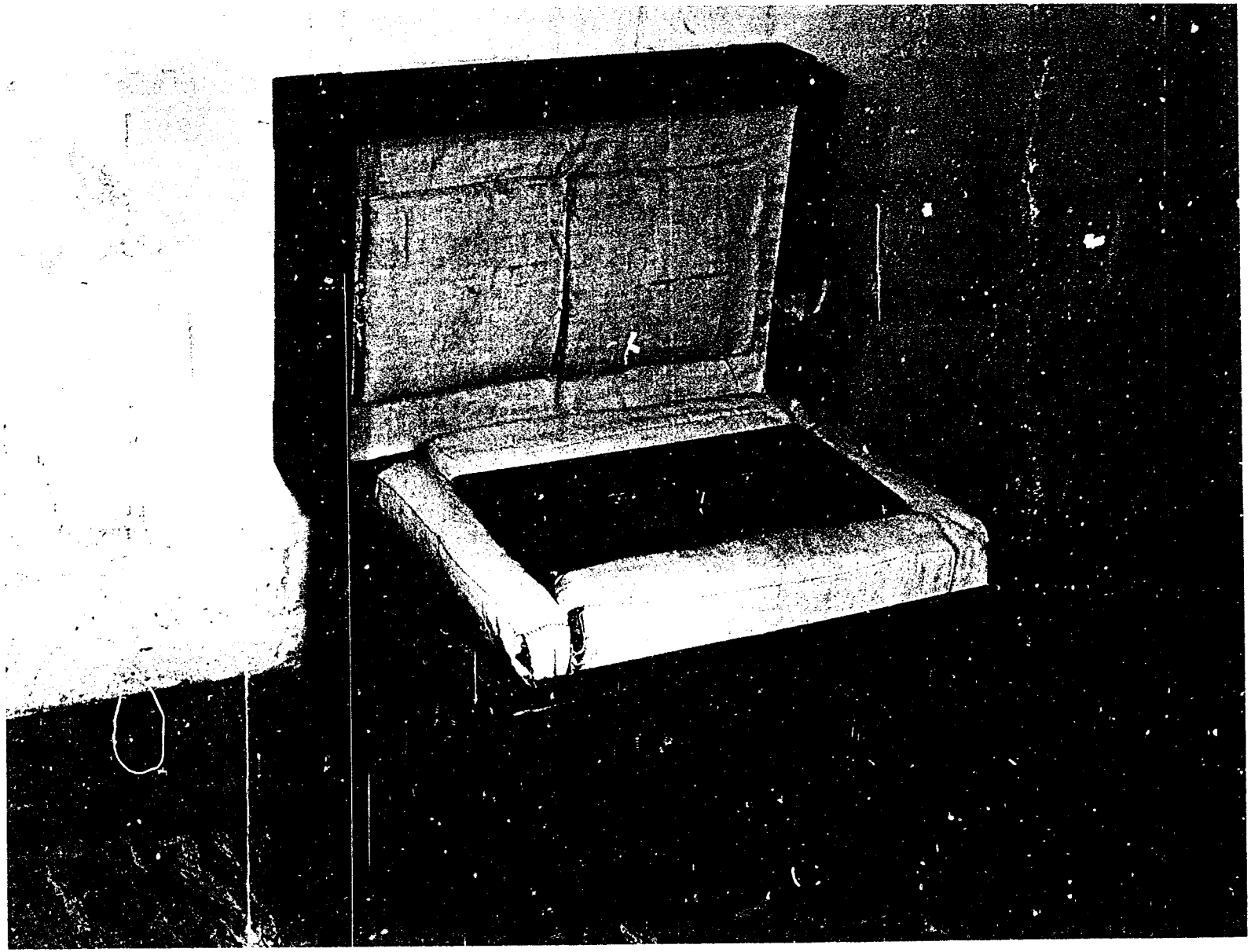

FIG. 2- CARRYING CASE SHOWING SA-139 AND METHOD OF CUSHIONING

ET-1311
REF SYM-1611
5-27-53 JFM

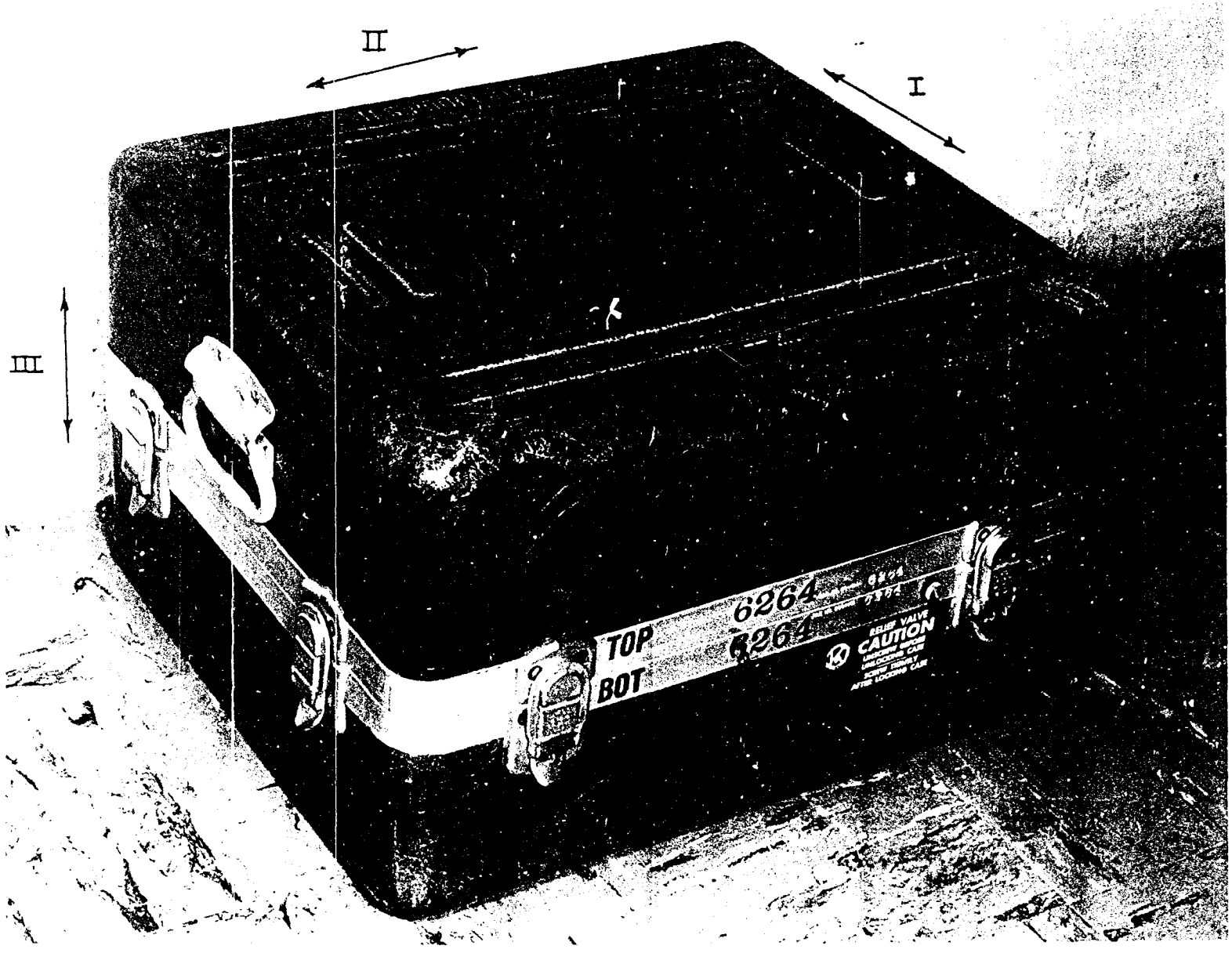

FIG. 3 – CARRYING CASE ENCLOSING SA-140 SHOWING PLANES OF VIBRATION

ET-1311
REF SYM-1611
5-27-53 JFM

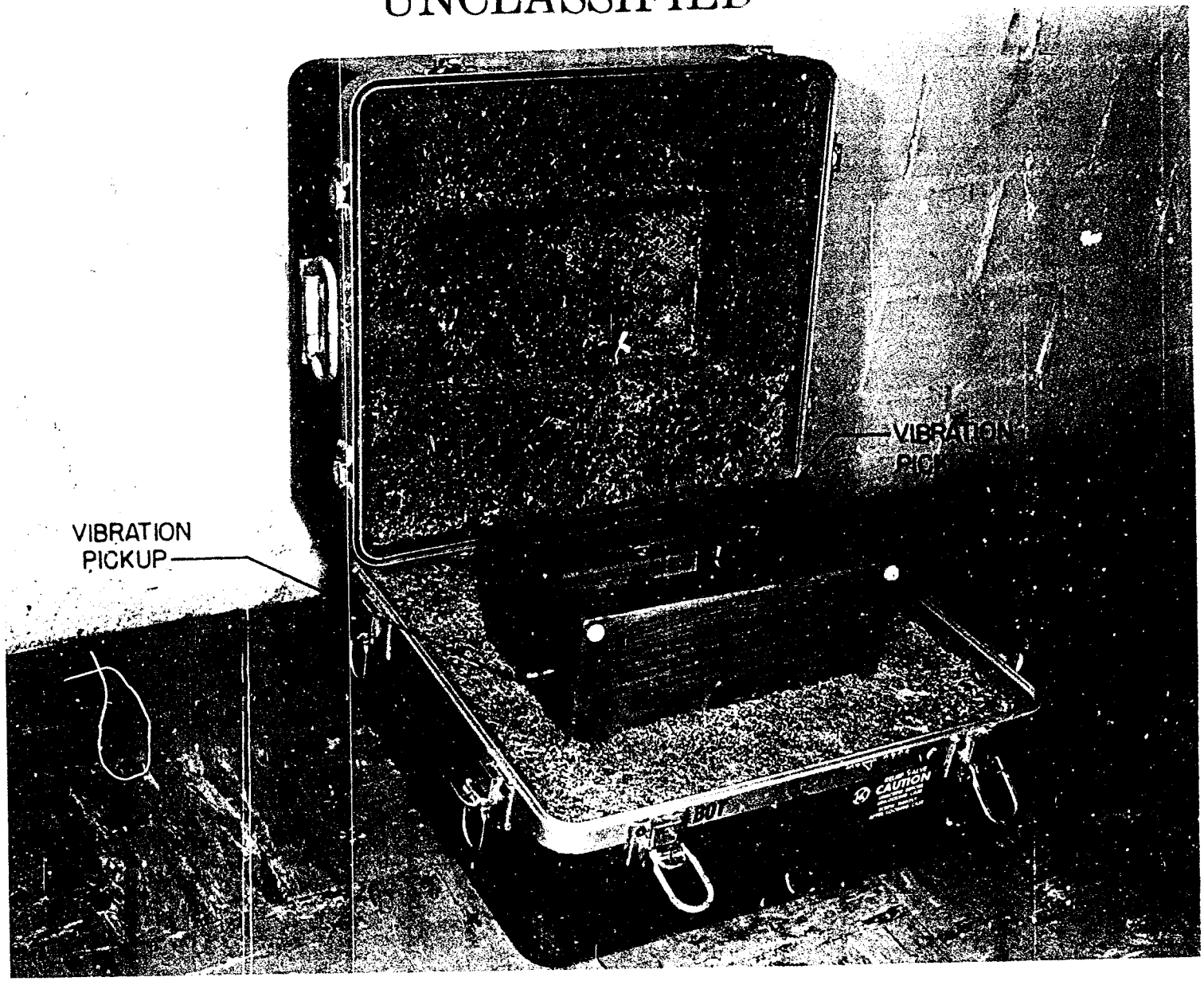

FIG. 4 - CARRYING CASE SHOWING SA-140 AND METHOD OF CUSHIONING

ET-1311
REF SYM - 1611
5-27-53 JFM

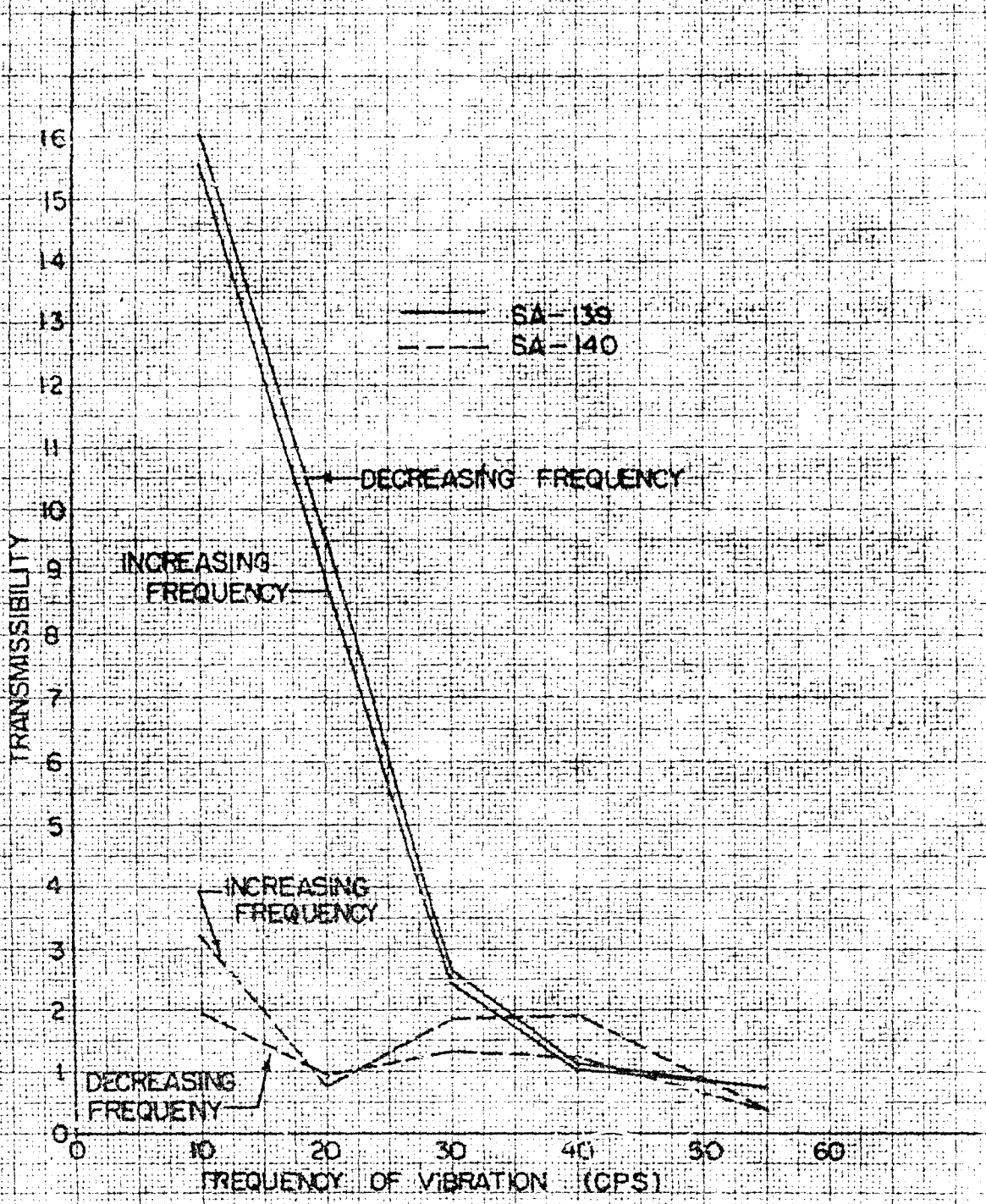

FIG. 5 – TRANSMISSIBILITY VS FREQUENCY
PLANE I

ET – 1311
REF SYM – 16.1
5-29-53 JFM

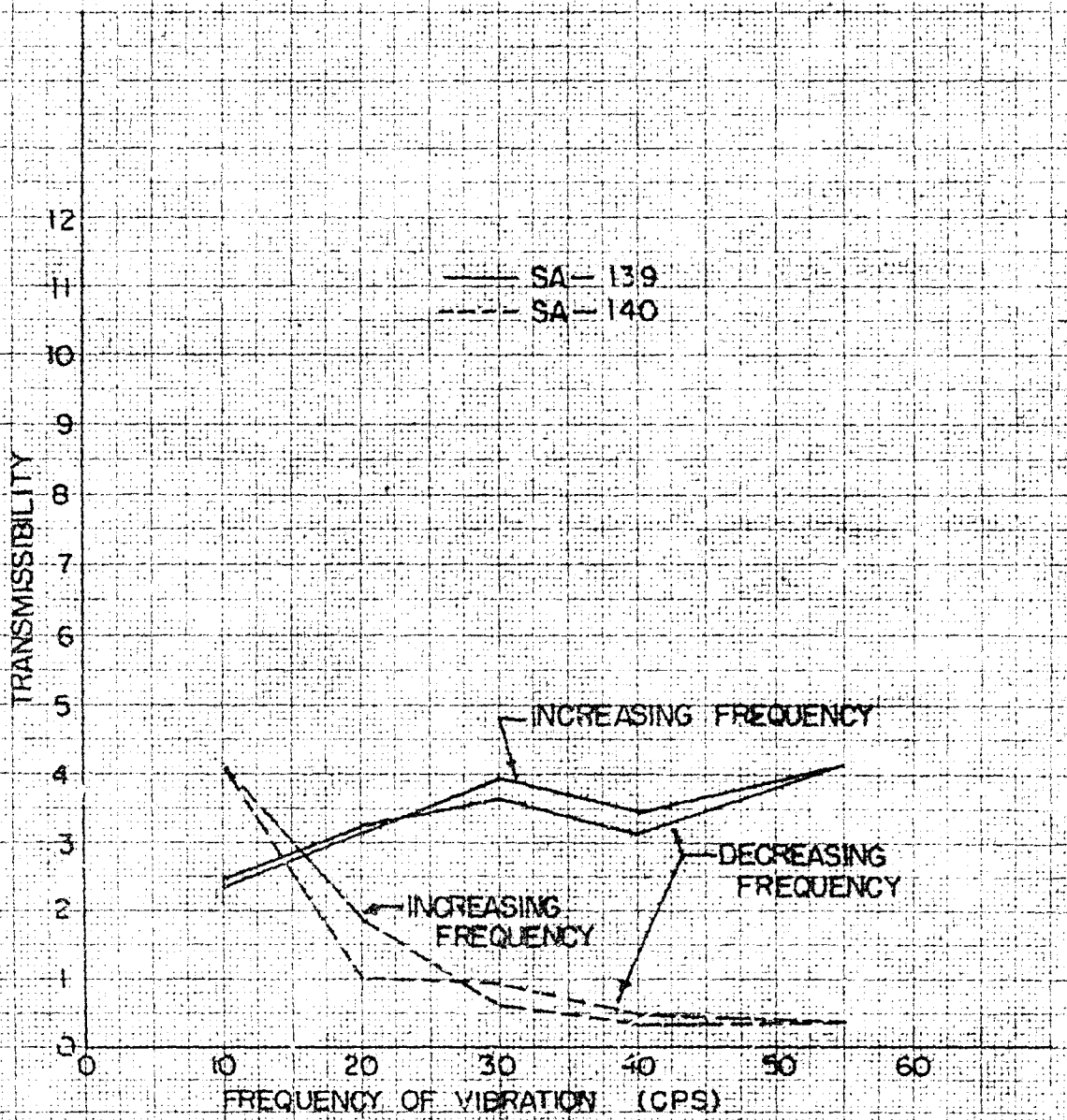

FIG. 6— TRANSMISSIBILITY VS FREQUENCY
PLANE II

ET— 1311
REF SYM— 1611
5-29-53 JFM

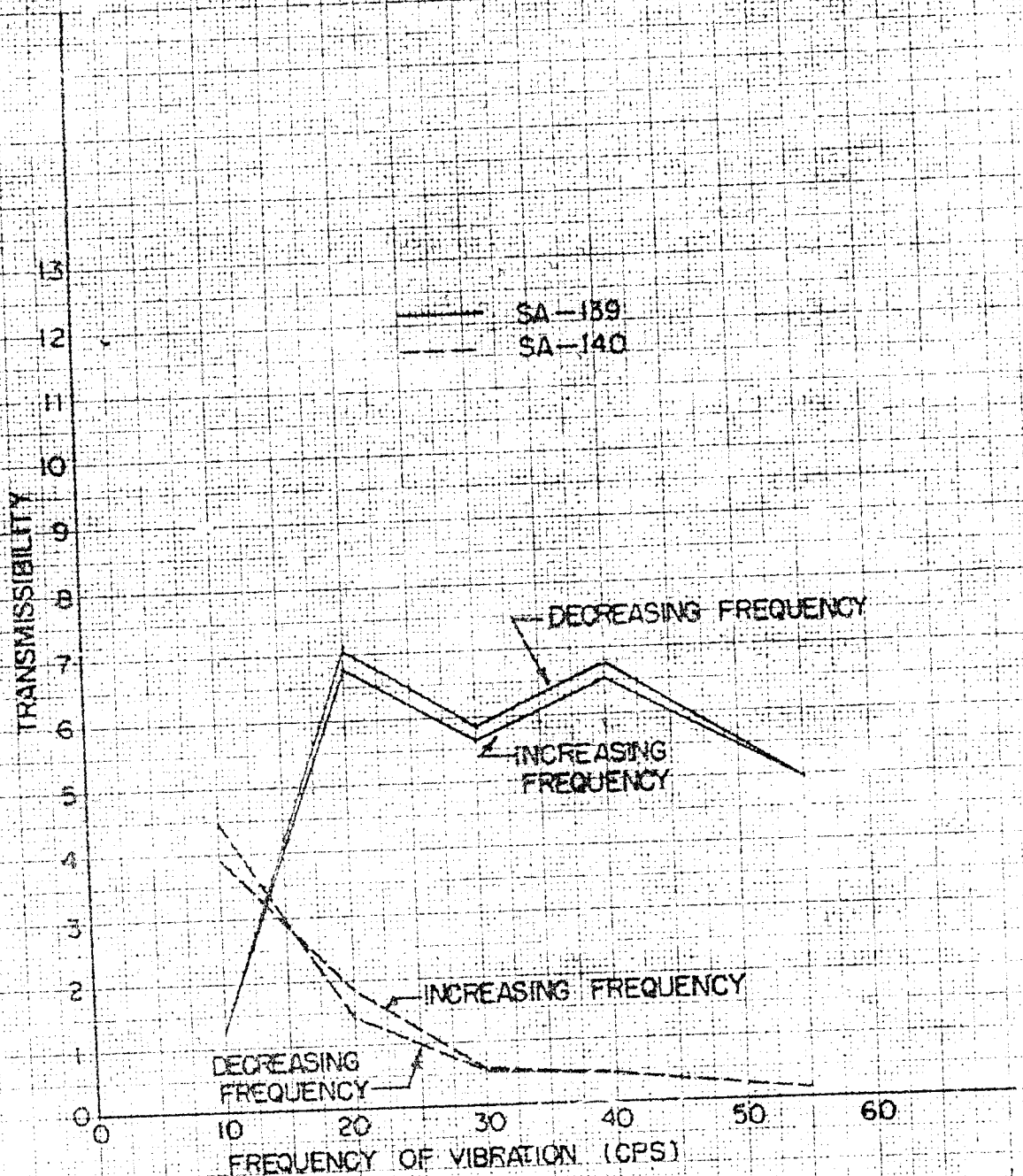

FIG. 7 — TRANSMISSIBILITY VS FREQUENCY
PLANE III

ET—1311
REF SYM.-1611
5-29-53 JFM

[redacted]

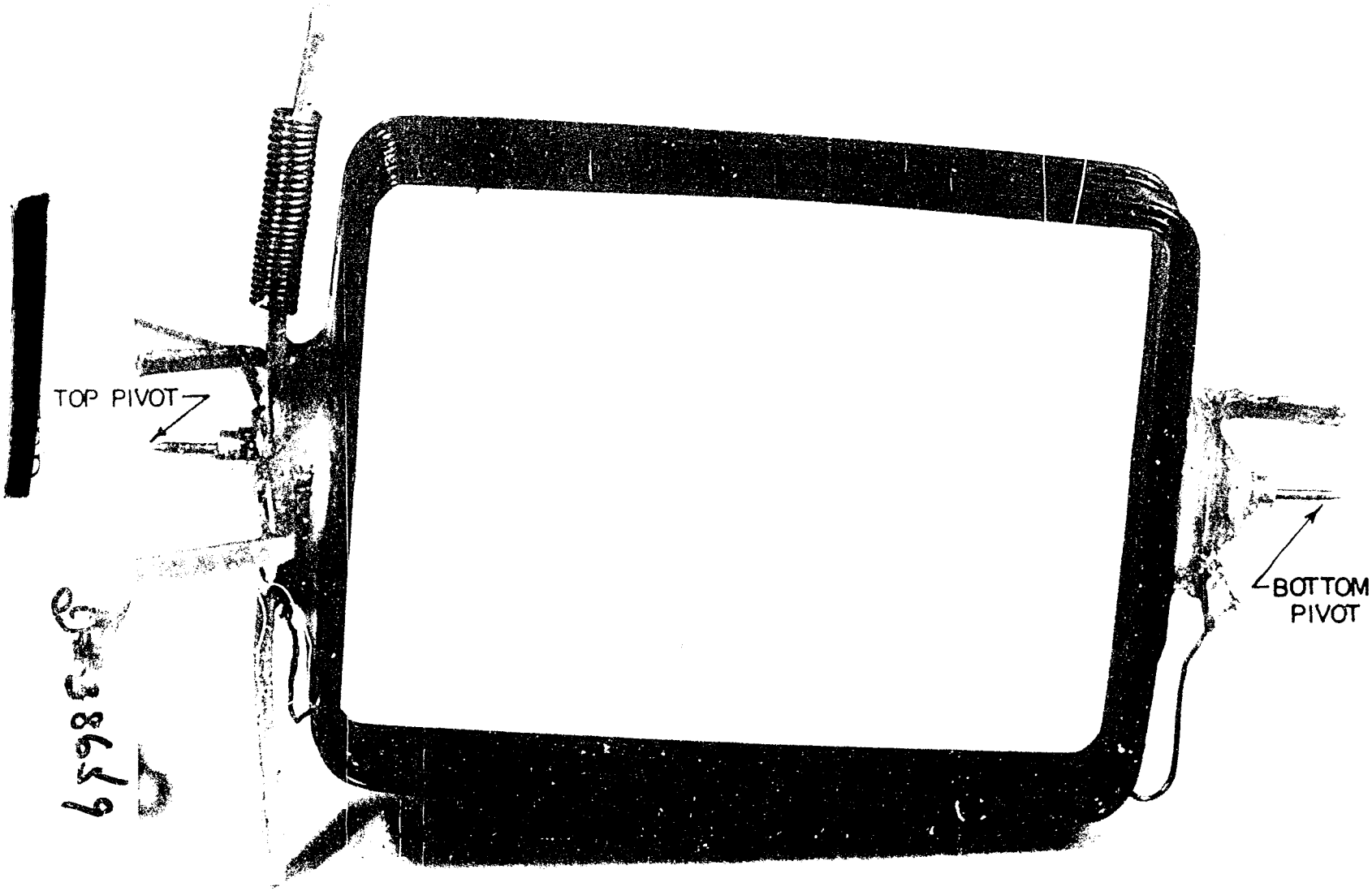

FIG. 8 – TYPICAL POLYRANGER MOVEMENT SHOWING LOCATION OF PIVOTS (MAGNIFIED APPROXIMATELY 7 TIMES

ET-1311
REF SYM-1611
5-27-53 JFM

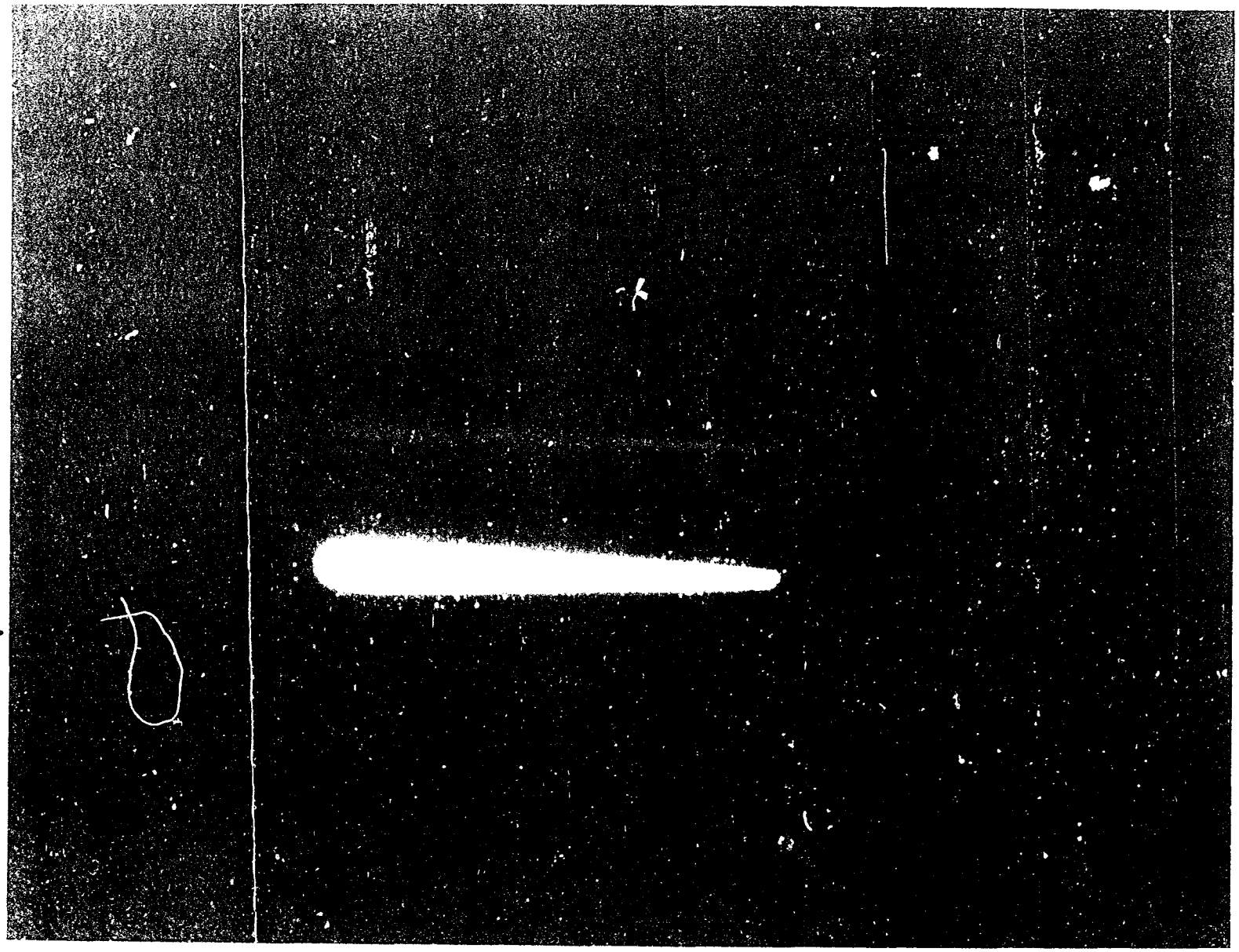

FIG. 9 - BAD BOTTOM PIVOT OF SA-139 MOVEMENT SHOWING DAMAGE (MAGNIFIED 150 TIMES) ET-1311 REF SYM-1611 5-28-53 JRM

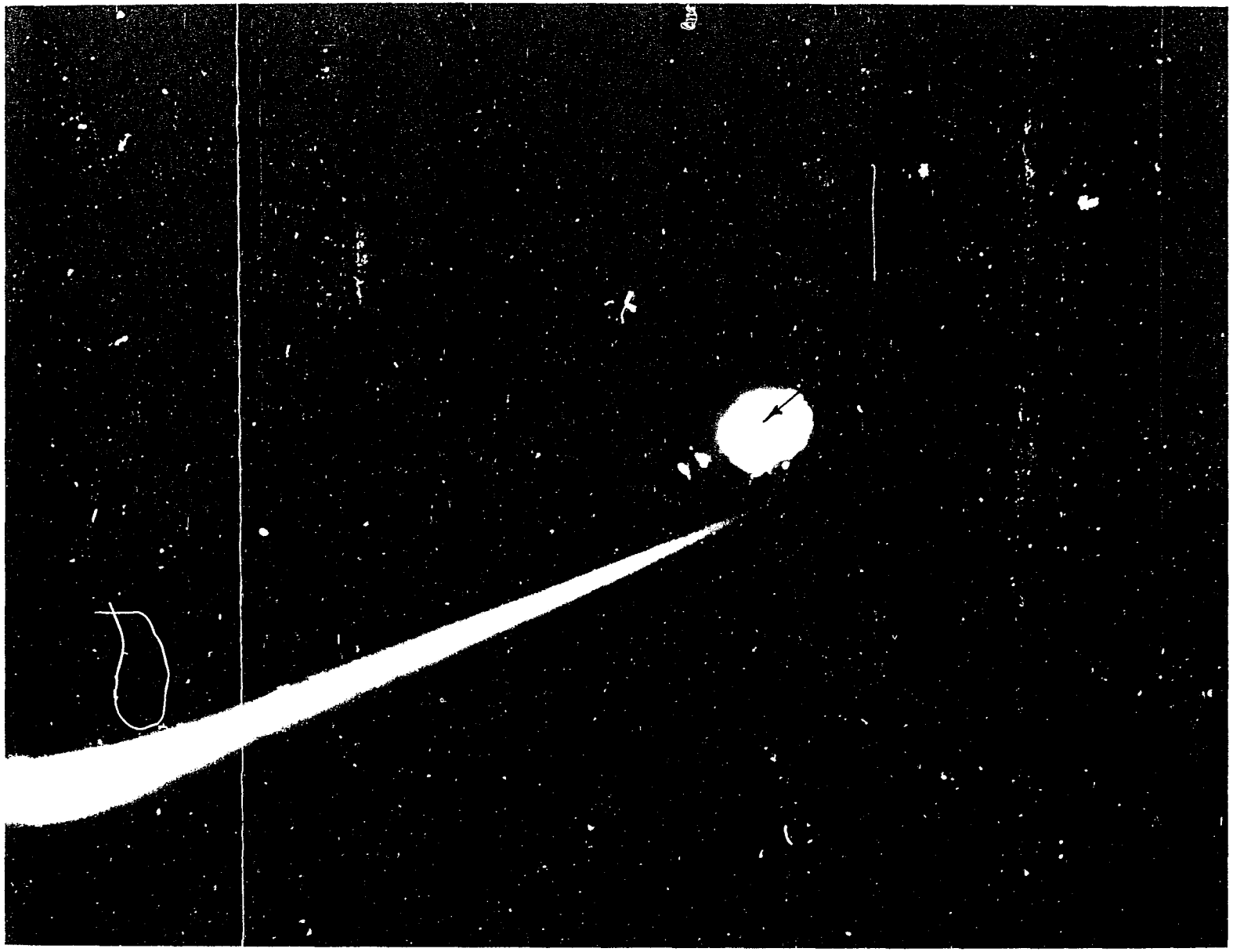

FIG. 10- BAD BOTTOM PIVOT OF SA-139 MOVEMENT (MAGNIFIED 480 TIMES)

ET-1311 · REF SYM-1611
5-28-53 JFM

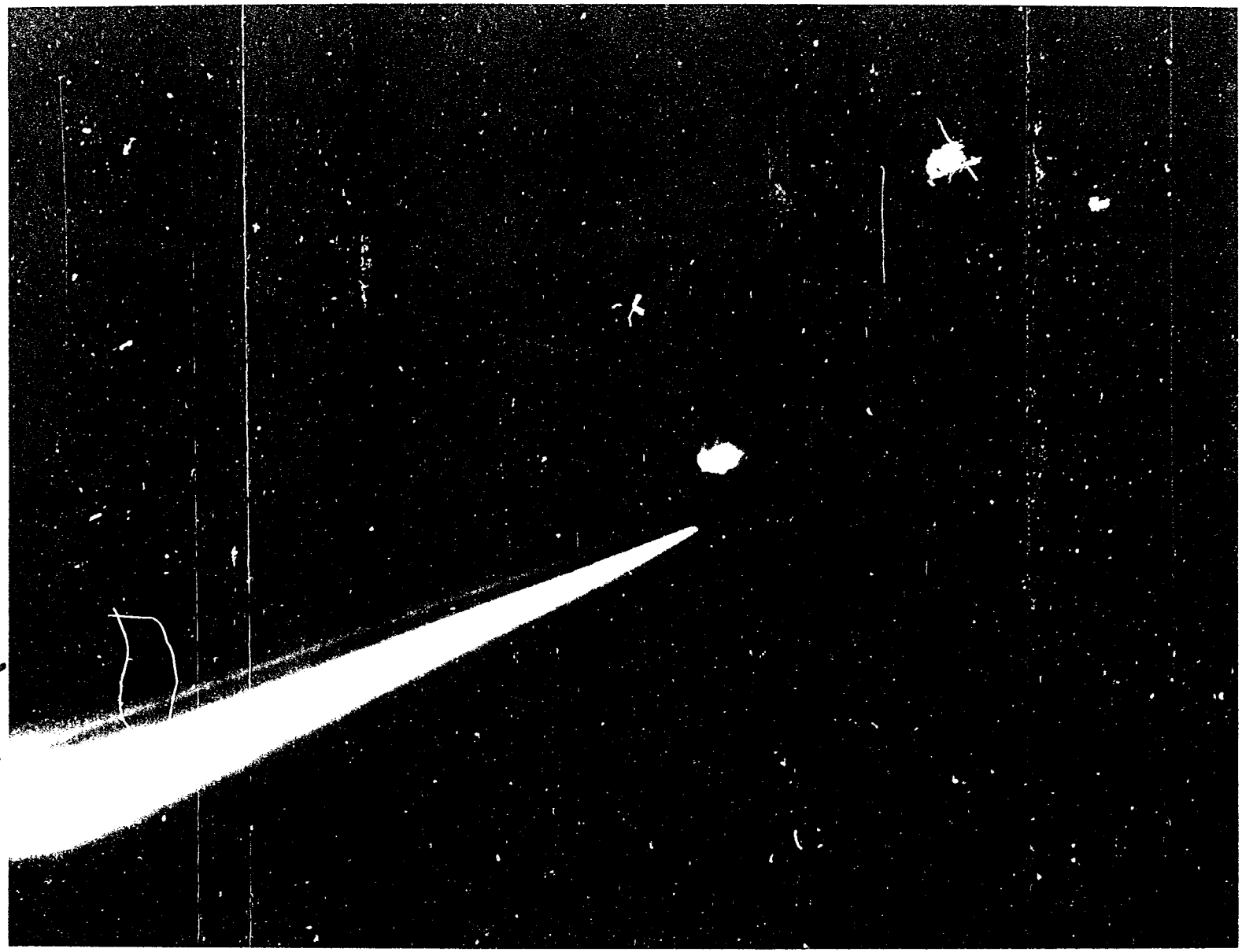

FIG. 11 - GOOD TOP PIVOT OF SA-139 MOVEMENT (MAGNIFIED 480 TIMES)

ET-1311
REF SYM-1611
5-28-53 JFM