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SEP 1 1953
Case No. 433.00
Ref. Symbol: 1611
Project No. ET-1326
Completed 3/17/53

MR. L. A. DUNN - 1284

Re: Leakage and Vibration Tests of H-191 Container Loaded with the MC-170 Cartridge

Object of Test

The container was a Cook Electric Company development model, Serial No. CK-AD1039-X3-B3. The object of this test was to determine its performance when subjected to internal pressures of +2.5 and -2.5 psig, and when subjected to vibration from 10 to 60 cps at a double amplitude of 0.060 inch. The vibration test was performed with and without the X-unit and inverters to simulate different shipping conditions.

Authorization for Test

This test was requested by Division 1284 in a Work Order Authorization dated March 9, 1953. Mr. G. Neun was the consultant.

Results

Performance during the leakage test was unsatisfactory. The consultant specified that leakage should not exceed one mm of Hg in 15 minutes. Actual leakage rates were 4.5 and 3.0 mm of Hg in 15 minutes for +2.5 psig and -2.5 psig internal pressure respectively. Leaks could not be readily located. Leakage curves are shown in Fig. 1.

During the vibration test, large vibration amplification factors, with respect to the container base were reached at low frequencies. For example, during vibration in Plane II with the X-unit and inverters in place, amplification factors reached 7.3 at 10 cps at the baro switch mounting surface; while during vibration in Plane II with the X-unit and inverters removed, amplification factors reached 13.5 at 11.5 cps at the baro switch mounting surface. In general at higher frequencies (25 cps and above) amplification factors were greater with the X-unit and inverters removed than with them in place. Amplification factors are shown in Figs. 2, 3, 4 and 5. Cracking of the bottom retaining collars of the vibration mounts was the only damage that occurred throughout the vibration test.

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
Determination (Circle Number(s))
1. Classification Retained
2. Classification Changed to U
3. Contains No DOE Classified Information
4. Contains Unclassified Controlled Nuclear Information (UCNI)
5. Contains UCNI
6. Contains Classified Information
Review Date 10/29/98
Authority ADD
Name
Review Date Not org'l per
Authority ADD
Name
To Approved
TCG-SAFE-15 TCG-NNSA

CDL No
ACCOUNTABILITY CARD BB
FILE No H-191
3-2

MICROFILM REEL 1442 SEP 10

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
CLASSIFICATION CHANGED TO U
Carmela Dellizo 12/14/98
PERSON CHANGING MARKING & DATE
W C Rogers 12/16/98
PERSON VERIFYING MARKING & DATE
RECORD ID 99SN0336
DATED 10/29/98

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Procedure

A. Test Conditions:

The container was subjected to +2.5 and -2.5 psig using a compressor and a vacuum pump. Pressure readings were taken with a mercury manometer at approximately 20-minute intervals.

Vibration tests were performed in two mutually perpendicular transverse planes in accordance with SCS-5, paragraph 2.1.4.3 (10-60-10 cps in 10 minutes at a double amplitude of 0.060 inch for 45 minutes in each plane). Plane I was parallel to the greatest plane area of the MC-127 and Plane II was perpendicular to the greatest plane area of the MC-127. Tests were not performed along the longitudinal axis of the container. The container was mounted on the shake table in a manner approximating aircraft shipment tie-downs. The container was placed on a plywood board bolted to the table and anchored to the table by means of chains fastened to the lugs at the top of the container and fastened to the table using turnbuckles. This allowed some slipping of the container feet on the plywood mounting board. Accelerations were recorded at 5-cps intervals at the following locations:

A_1 - Shake table
A_2 - Container base at the foot
A_3 - Edge of the X-unit
A_4 - Side of the cartridge structure directly below the MC-48 mounting surface
A_5 - MC-10 mounting surface

B. Equipment Used:

Air compressor
Vacuum pump
Mercury Manometer
Sonntag shake table No. 2
Sandia vibration analyzer, Model I
Statham accelerometer, Model A5A-100-300, Serial No. 622
Four Statham accelerometers, Model A5A-50-300, Serial Nos. 650, 654, 656, and 657

R. S. Jacobson
Test Conducted by R. S. JACOBSON - 1611

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

RSJ:1611:jf

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Encl: Figs. 1 through 5

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Copy to:
F. T. Given, 5300
[illegible] E. Lamkin, 1280
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[illegible] B. Morse, 1610
[illegible] D. Thorp, 1630
[illegible] J. Biskner, 2530
E. G. Overbury, 1312
G. M. Byrne, 1925-3 [redacted]
J. M. Ralls, 1521-4 Attn: 1500 Drawing File

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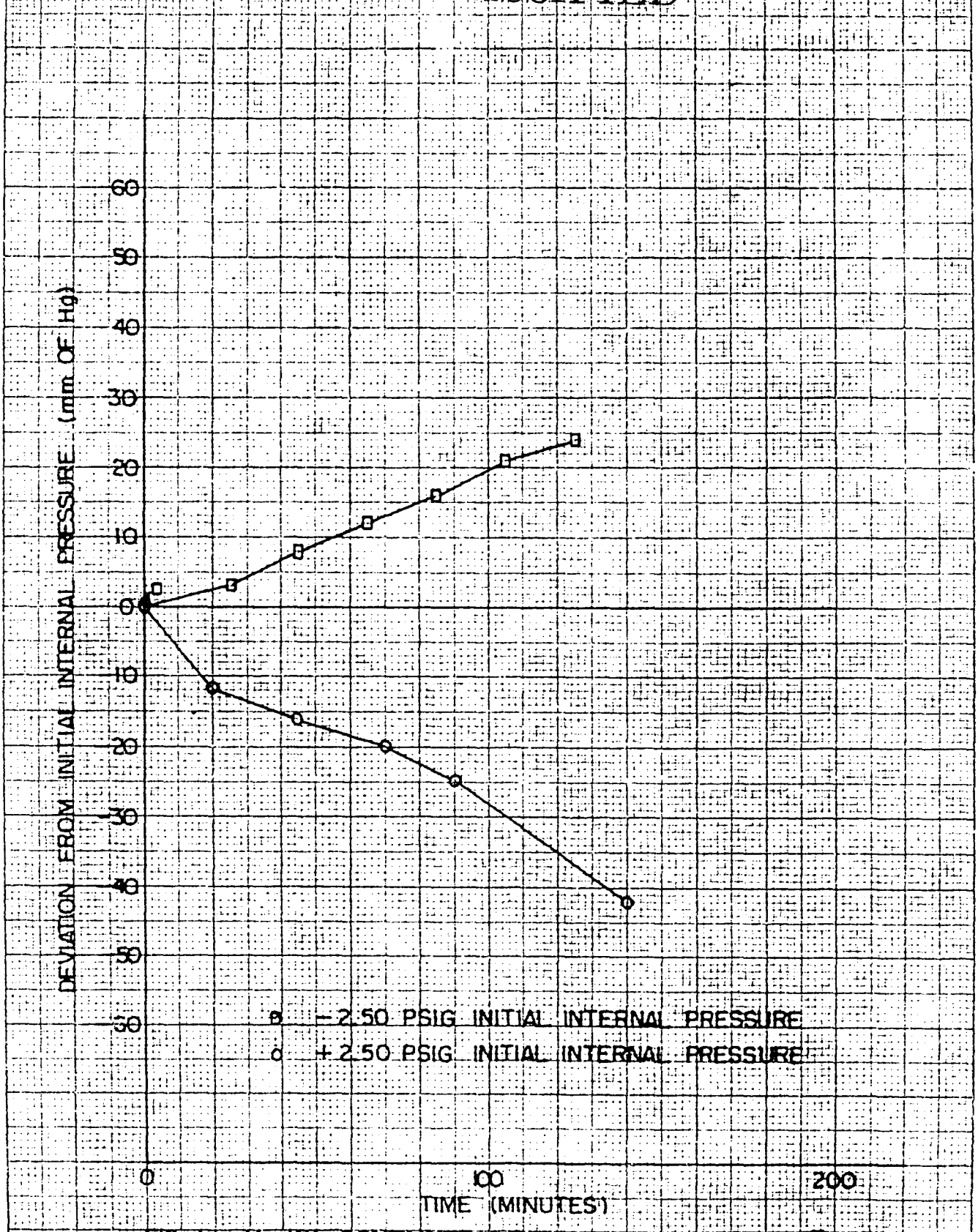

FIG. 1 — H-191 CONTAINER LEAKAGE TEST

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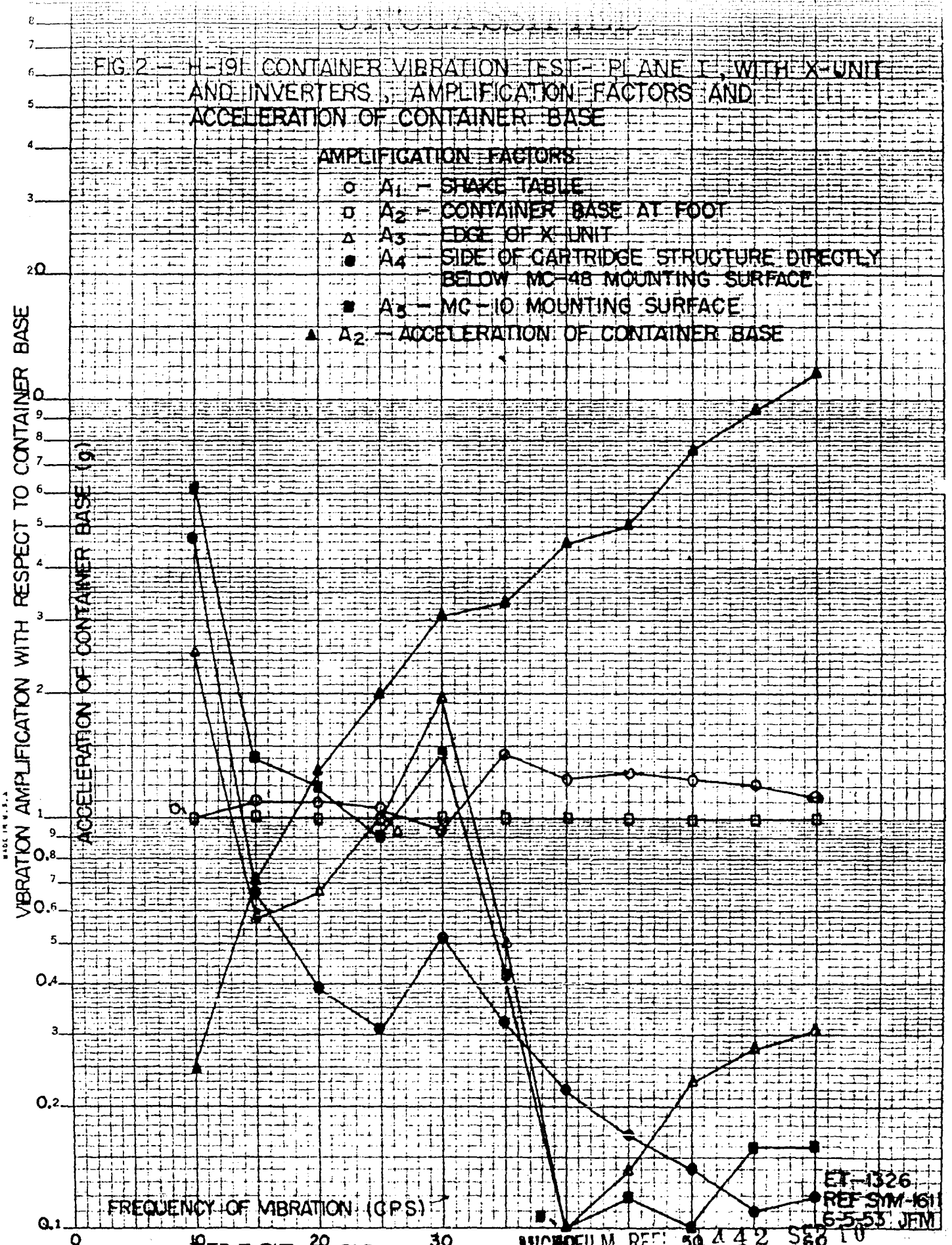

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FIG. 3 — H-191 CONTAINER VIBRATION TEST — PLANE II, WITH X-UNIT AND INVERTERS, AMPLIFICATION FACTORS AND ACCELERATION OF CONTAINER BASE

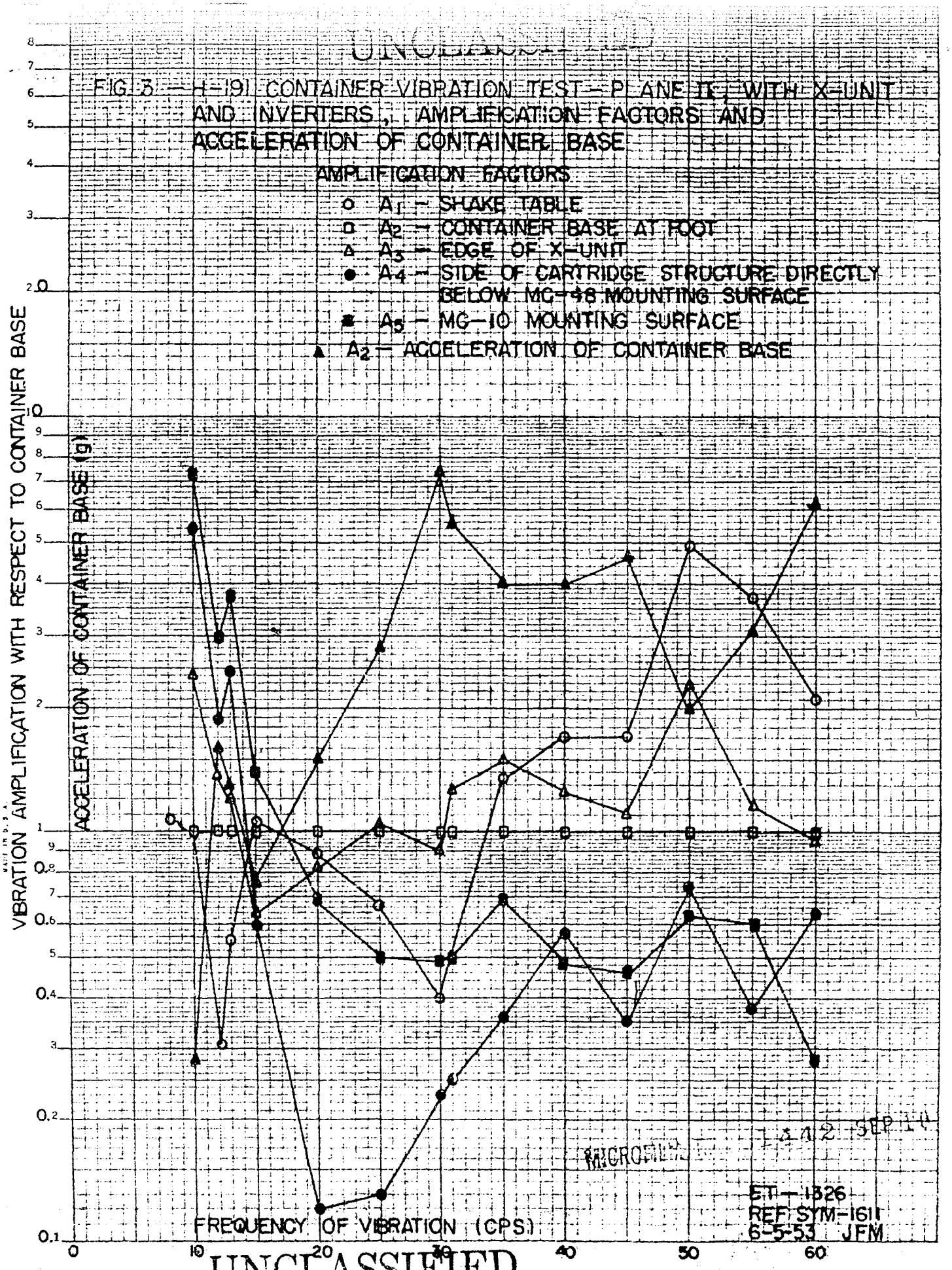

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FIG 4 — H-191 CONTAINER VIBRATION TEST — PLANE 1, WITHOUT X-UNIT AND INVERTERS; AMPLIFICATION FACTORS AND ACCELERATION OF CONTAINER BASE

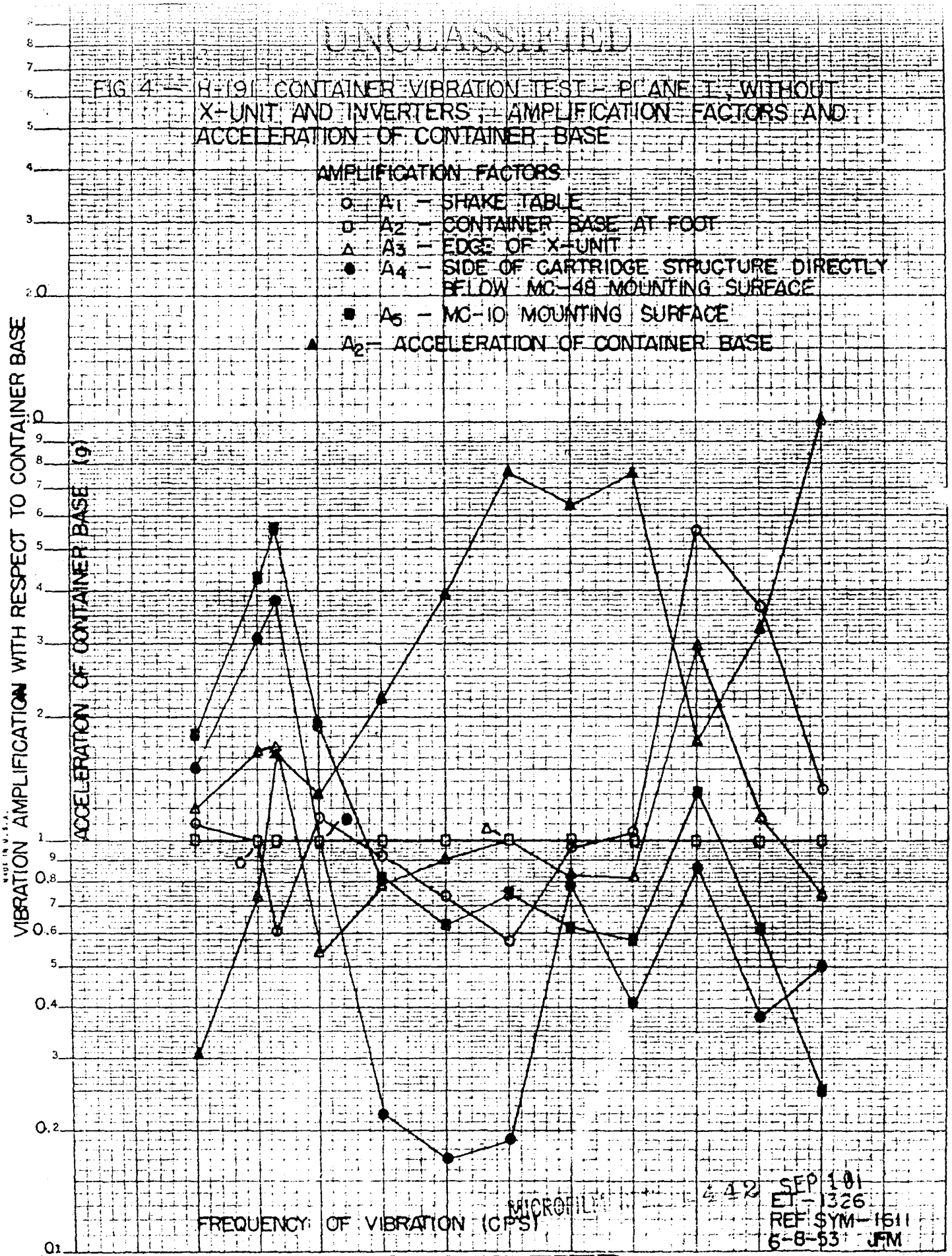

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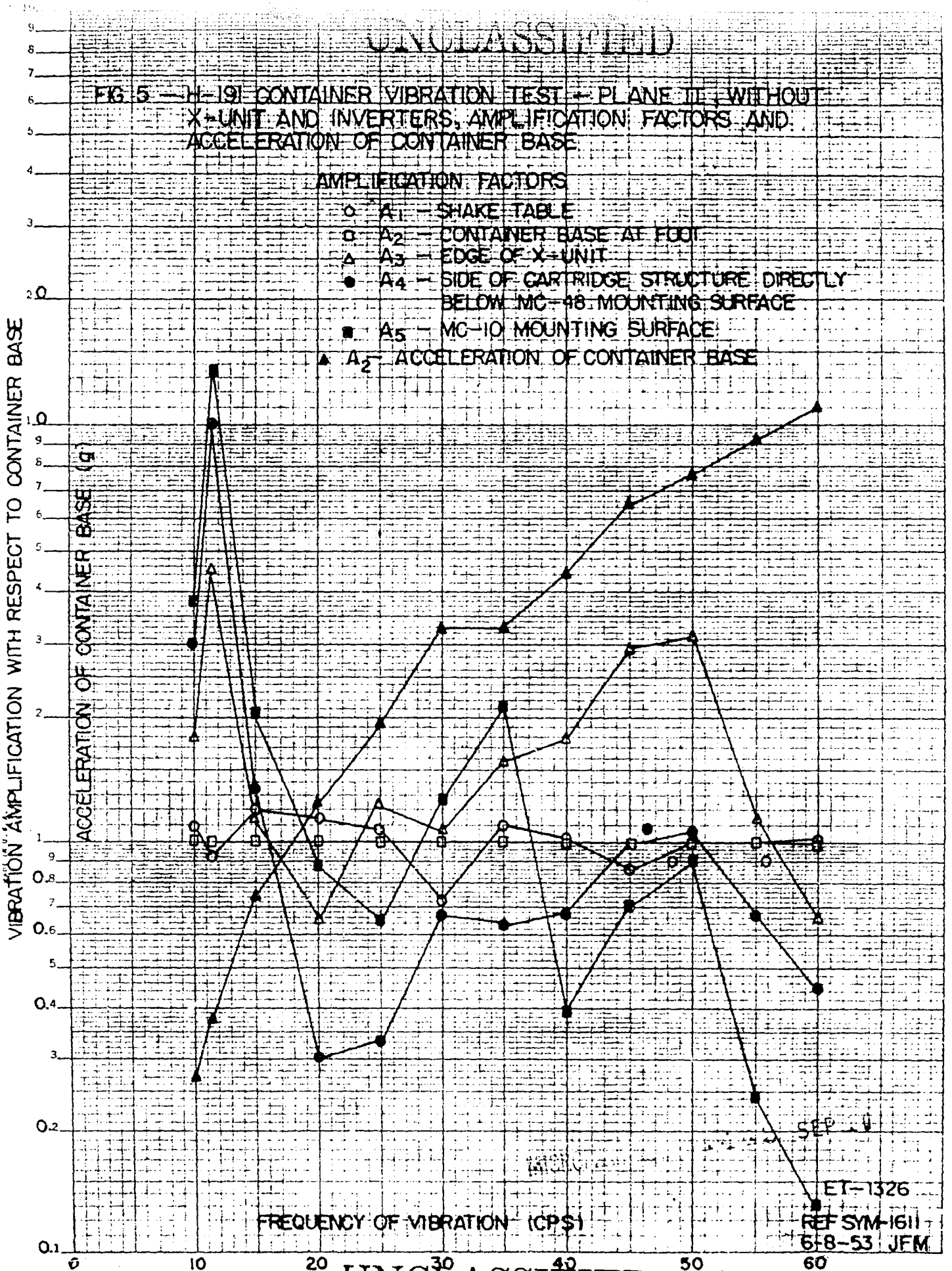
FIG. 5 — H-191 CONTAINER VIBRATION TEST — PLANE II, WITHOUT X-UNIT AND INVERTERS, AMPLIFICATION FACTORS AND ACCELERATION OF CONTAINER BASE



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