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295757

UNITED STATES ARMY ARMOR BOARD  
Fort Knox, Kentucky

STEBB-ST

6 FEB 1963

SUBJECT: Report of Project No 2163-1, Confirmatory Test of Radiacmeter, PAC-LSA

TO: The Surgeon General, Department of the Army, Washington 25, D.C.  
Commanding General, United States Army Electronics Command, Fort Monmouth, New Jersey  
Commandant, United States Marine Corps, Washington 25, D.C.  
Commandant, United States Army Chemical Corps School, Fort McClellan, Alabama  
Director, USMC Landing Force Development Center, c/o USMC Liaison Officer, US Army Armor Board, Fort Knox, Kentucky  
Commanding Officer, United States Army CBR Combat Developments Agency, Fort McClellan, Alabama  
Commanding Officer, United States Army Electronics Research and Development Laboratory, Fort Monmouth, New Jersey  
British Liaison Officer, USATECOM, c/o Director of Munitions, British Embassy, 3100 Massachusetts Avenue, N. W., Washington, D.C.  
Canadian Liaison Officer, United States Army Materiel Command, Washington 25, D.C.  
Commander, Armed Services Technical Information Agency, ATTN: TIPCR, Arlington Hall Station, Arlington 12, Virginia

The subject report and copy of Headquarters, US Army Test and Evaluation Command action letter is furnished for your information and retention.

FOR THE PRESIDENT:



L. F. CARNEY  
Lt Col, CE  
Secretary

1 Incl  
as

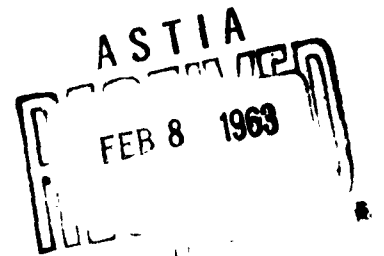
**HEADQUARTERS  
U. S. ARMY TEST AND EVALUATION COMMAND  
ABERDEEN PROVING GROUND, MARYLAND**

**AMSTE-NBC**

**30 JAN 1963**

**SUBJECT: Confirmatory Test of Radiacmeter, PAC-ISA**

**TO: Commanding General  
U.S. Army Materiel Command  
ATTN: AMCRD-DE-N  
Washington 25, D. C.**



1. Reference:
  - a. Letter ATBBG P-2163, U.S. Army Armor Board, 3 May 1962, subject: "Report of Project No. 2163, Comparative Evaluation of Plutonium/Alpha Radiac Instruments" with 1st Ind ATDEV-5 413.5 (3 May 62) HQ, USCONARC, 4 June 1962 to OCRD.
  - b. Letter STEBB-GT P-2163, U.S. Army Armor Board, 4 September 1962, subject: "Supplementary Report of Project No. 2163, Comparative Evaluation of Plutonium/Alpha Radiac Instruments.
2. Confirmatory Test of Radiacmeter, PAC-ISA has been completed. The report of test from U.S. Army Armor Board (Project No. 2163-1) is forwarded with recommendations and conclusions.
3. The report has been reviewed by this headquarters and instructions have been provided the U.S. Army Armor Board as to distribution of the report.
4. The following comment is made reference subject report. In reference 1a above USCONARC recommended that deviations noted when operating in temperature extremes be further investigated and corrective modifications made where practical. This will be confirmed in tests currently being conducted at the U.S. Army Arctic Test Board.

**AMSTE-NBC**

**SUBJECT: Confirmatory Test of Radiacmeter, PAC-ISA**

5. This headquarters approves the report and recommends that:

a. The Radiacmeter, PAC-ISA with the plutonium gamma probe Model PG-1, be adopted for Army use and type classified Standard A.

b. Shortcomings be corrected and suggested improvements be incorporated in the production instruments as noted in part B, sections III and IV, inclosure 3 of the report.

**FOR THE COMMANDER:**

**2 Incls**

1. Distribution List
2. Rpt of Project No.  
2163-1 (3 cys)

/s/Earl A. Hicks, Jr.  
/t/EARL A. HICKS, JR.  
Lt Col, Arty  
Asst Admin Officer

DISTRIBUTION LIST

AGENCY	NO OF COPIES
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3. Commandant, USMC	1
4. Director, Marine Corps Landing Force Dev Ctr	2
5. Commandant, U.S. Army Chemical Corps School	1
6. CO, U.S. Army CBR CD Agency	1
7. The Surgeon General	1
8. CO, U.S. Army Electronics Research and Development Laboratory	1
9. British Liaison Officer, USATECOM, c/o Dir. Munitions, British Embassy, 3100 Mass. Ave., N. W., Washington D. C.	6
10. Canadian Liaison Office, c/o CG, USAMC	5
11. ASTIA	10

Incl 1

UNITED STATES ARMY ARMOR BOARD  
Fort Knox, Kentucky

STEBB-GT P-2163-1

7 JAN 1963

SUBJECT: Report of Project No 2163-1, Confirmatory Test of  
Radiacmeter, PAC-1SA

TO: Commanding General  
US Army Test and Evaluation Command  
Aberdeen Proving Ground, Maryland

1. AUTHORITY.

a. Directive. Ltr, AMSTE-NBC, HQ USATECOM, 17 Oct 62,  
subject: Confirmatory Test of Radiacmeters PAC-1SA.

b. Purpose. To determine whether shortcomings previously  
noted have been eliminated and to determine whether suggested improve-  
ments have been incorporated in the test item.

2. REFERENCES.

a. Ltr, ATBBG, P-2163, USAARMBD, 3 May 62, subject:  
Report of Project No 2163, Comparative Evaluation of Plutonium/Alpha  
Radiac Instruments, with 18 incl and 1 ind.

b. US Army Armor Board Plan of Test of Project No 2163-1,  
Confirmatory Test of Radiacmeter, PAC-1SA, 5 Dec 62.

3. DESCRIPTION OF MATERIEL.

a. The test item is the Radiacmeter, PAC-1SA, differing  
from its predecessor in the following respects:

AS THE AVAILABLE INFORMATION  
Qualified requests may obtain  
copies of this report from ASTIA

(1) A battery check circuit has been added whose switch replaces the reset switch.

(2) The instrument reset switch has been relocated in the carrying handle.

(3) An aluminum carrying case and carrying strap have been added.

(4) A range doubler has been furnished.

b. Manufacturer's operation manuals were received with these instruments.

c. Photographs of the test item are at inclosures 1 and 2.

#### 4. BACKGROUND.

a. In 1962, this board completed a comparative evaluation of a number of plutonium/alpha radiacmeters under project no 2163. As a result, it was concluded that, of the instruments tested, the Radiacmeter PAC-1SA was the most satisfactory, and it was recommended that this radiacmeter together with the plutonium gamma probe Model PG-1 be adopted and type classified standard A. It was further recommended that, as practicable, shortcomings be corrected and suggested improvements be incorporated (reference 2a). These were:

(1) Reflector in the probe came loose.

(2) Provide carrying case and strap for suspension of the instrument from the operator's body to permit changing range scales more easily.

(3) Provide parallel discriminator potentiometers and switching arrangement to avoid the necessity for changing settings when using gamma and alpha probes.

(4) Provide a probe shield to double instrument range.

STEBB-GT P-2163-1

SUBJECT: Report of Project No 2163-1, Confirmatory Test of  
Radiacmeter, PAC-1SA

b. By first indorsement to reference 2a, USCONARC concurred with the recommendations of this board and recommended further that:

(1) The development and/or procurement of a suitable calibration source for the PAC-1SA with the plutonium gamma probe Model PG-1 be initiated.

(2) The gamma probe be designed with a spring retained metal shield covering the probe screen similar to the beta shield on the probe of the AN/PDR-27 (IM-63) to protect the probe screen during storage and transit.

(3) Deviations noted when operating in temperature extremes be further investigated and corrective modifications made where practicable.

(4) Radiacmeters, AN/PDR-53(IM-156) and AN/PDR-54, be reclassified standard C.

c. This board received 2 Radiacmeters, PAC-1SA, for test together with PG-1 probe, carrying case, strap, spare probe faces, patching material, and probe shield. These were manufactured by the Eberline Instrument Corporation and bear the serial numbers 5002 and 5007.

5. SUMMARY OF TESTS.

a. General. Tests were conducted by Lt Col Hyman R. Gittes, CmlC, assisted by other personnel of the General Test Division, utilizing the plan of test referenced in paragraph 2b.

b. Test No 1 - Preoperation Inspection. Upon receipt, the instruments were subjected to a technical inspection following instructions contained in the manuals. Instruments were found to be in proper operating condition.

c. Test No 2 - Durability.

(1) Instruments were placed in their aluminum carrying cases and transported unsecured on the floor of wheeled vehicles over secondary roads and cross country a total of 79.5 hours. Daily checks were made for mechanical and electronic failures and for reproducibility of calibration.

(2) No failures occurred during this testing. Reproducibility of calibration was satisfactory. In only scattered instances did the readings vary outside  $\pm 10$  percent of the initial calibration readings. The largest variation was -14 percent.

6. DISCUSSION.

a. Examination of these instruments discloses that several of the improvements suggested by reference 2a have not been, or have been incompletely, incorporated into these test instruments, namely:

(1) The test items do not have parallel discriminator potentiometers and switch.

(2) No spring retained shield has been incorporated into the PG-1 probe.

(3) The range doubler shield reduces the reading by 45 percent rather than the necessary 50 percent.

b. The aluminum carrying case provided for this instrument is satisfactory with the exception that no provision has been made in the case for the earphones and the range doubler.

7. CONCLUSIONS. The US Army Armor Board concludes that the Radiacmeter, PAC-1SA, with the plutonium gamma probe Model PG-1 is suitable for Army use.

8. RECOMMENDATIONS. US Army Armor Board recommends that:

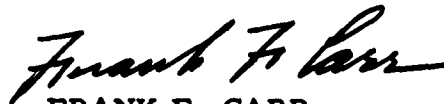
a. The Radiacmeter, PAC-1SA, with the plutonium gamma probe Model PG-1 be adopted and type classified standard A.

STEBB-GT P-2163-1

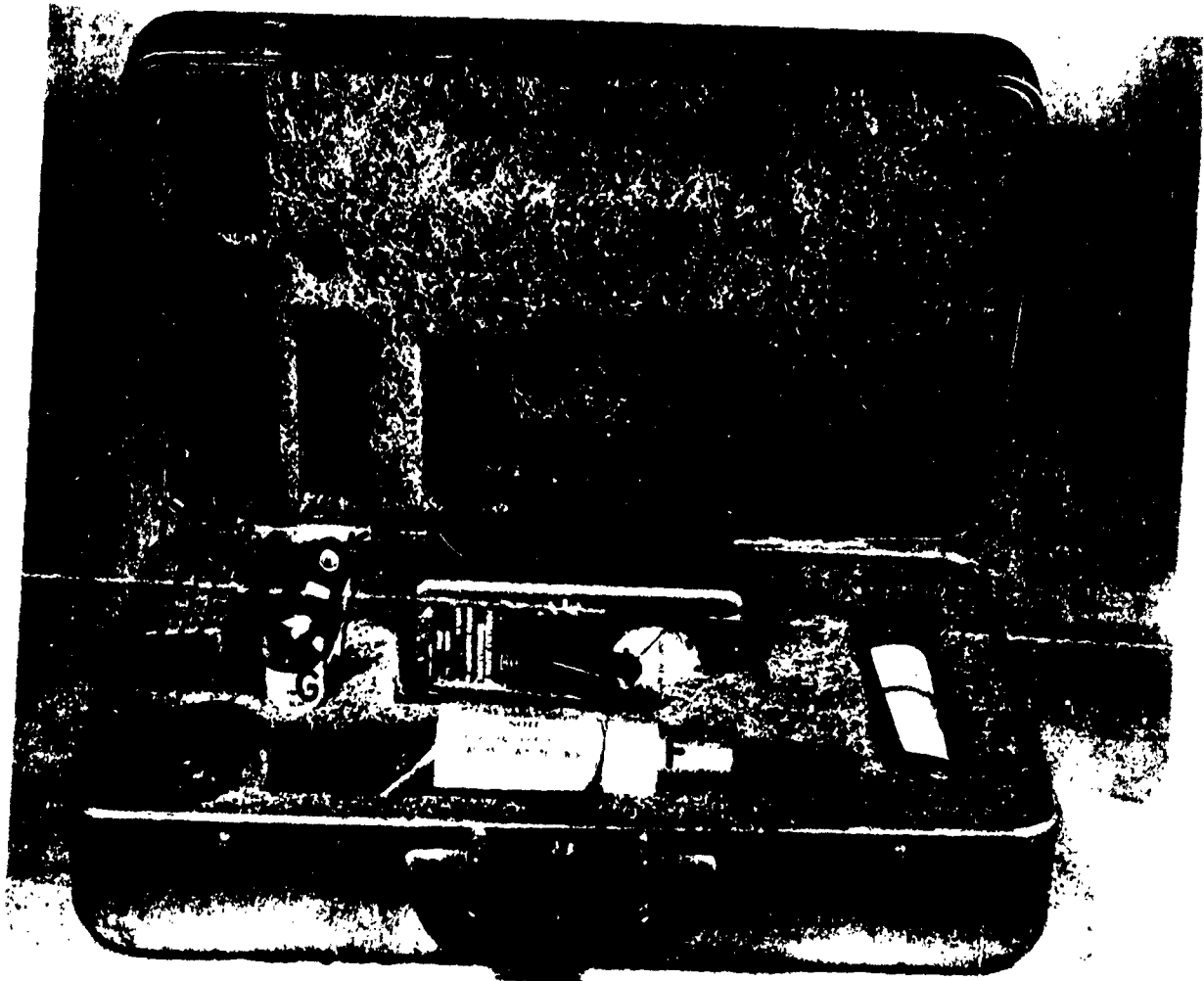
SUBJECT: Report of Project No 2163-1, Confirmatory Test of  
Radiacmeter, PAC-15A

b. Shortcomings listed in part B, section III, inclosure 3,  
be eliminated and suggested improvements in section IV, inclosure 3,  
be incorporated in production instruments.

3 Incl  
1-2 Photographs  
3 Findings



FRANK F. CARR  
Colonel, Armor  
President



UNITED STATES ARMY ARMOR BOARD P-2163-1 PHOTO NO 62-1848 FT KNOX, KY

RADIACMETER, PAC-1SA

- |                         |                  |                      |
|-------------------------|------------------|----------------------|
| A. SPARE PROBE FACES    | D. PG-1 PROBE    | G. PATCHING COMPOUND |
| B. CARRYING STRAP       | E. CARRYING CASE | H. CABLE             |
| C. RADIACMETER, PAC-1SA | F. ALPHA PROBE   |                      |

Incl 1



UNITED STATES ARMY ARMOR BOARD P-2163-1 PHOTO NO 62-1847 FT KNOX, KY

RADIACMETER PAC-1SA

- A - CARRYING STRAP
- B - RADIACMETER PAC-1SA
- C - PG1 GAMMA PROBE
- D - PROTECTIVE COVER
- E - ALPHA PROBE

Incl 2

PART A

This part contains shortcomings noted in the previous test with an indication of whether or not they have been satisfactorily corrected.

Incl 3

SHORTCOMINGS PREVIOUS TEST

FINDINGS THIS TEST

1. Reflector in the probe came loose.

Did not occur.

PART B

This part includes all additional equipment faults which are considered significant enough to warrant corrective action.

SECTION I

This section contains deficiencies requiring elimination in order to make the item acceptable for use on a minimum basis.

Not Used

SECTION II

This section lists those equipment faults of the item which were discovered during test and satisfactorily corrected prior to completion of the test. They no longer represent a defect in the item tested. The correction must be applied to the production model of this item.

Not Used

SECTION III

This section contains shortcomings which should be corrected, if it can be done, without unduly complicating the item or inducing another undesirable characteristic, either concurrent with elimination of deficiencies in section I, in production engineering or by product improvement.

<u>EQUIPMENT FAULT</u>	<u>SUGGESTED CORRECTIVE ACTION</u>	<u>REMARKS</u>
2. Range doubling shield reduces reading by 45 percent.	Redesign probe range doubling shield to reduce reading by 50 percent.	No equipment failure report submitted.
3. Carrying case has no provision for earphones and range doubler.	Provide room in the case for these items.	No equipment failure report submitted.

SECTION IV

This section lists suggested improvements which are desired to be corrected as practicable.

4. No spring retained shield for the PG-1 probe has been provided.	Provide a shield for protection of the probe screen during storage and transit.	No equipment failure report submitted.
5. In using the gamma and alpha probes, discriminator settings must be changed.	Provide parallel discriminator potentiometers and switching arrangement to avoid necessity for changing settings when using gamma and alpha probes.	No equipment failure report submitted.