NAVSHIPS 0967-000-0050

(Formerly NAVSHIPS 900,000.5)

NON-REGISTERED

ELECTRONICS INSTALLATION AND MAINTENANCE BOOK

RADIAC

DEPARTMENT OF THE NAVY
NAVAL SHIP ENGINEERING CENTER

PUBLISHED: JANUARY 1962

Change 4: October 1966 (0967-000-0054)

PREFACE

POLICY AND PURPOSE

The Electronics Installation and Maintenance Book (EIMB) has been established as the means for collecting, publishing, and distributing, in one convenient documentation source, those subordinate maintenance and repair policies, installation practices, and overall electronics equipment and material-handling procedures required to implement the major policies set forth in Chapter 9670 of the Bureau of Ships Technical Manual. All data contained within the EIMB are authoritative, and derive their authority from Chapter 9670 of the Bureau of Ships Technical Manual, as established in accordance with Article 1201, U. S. Navy Regulations.

Since its inception, however, EIMB has been expanded to include selected information items of general interest to electronics installation and maintenance personnel. These items are such as would generally be contained in text books, periodicals, or technical papers, and form (along with the information cited above) a comprehensive, single-source reference document. In application, the EIMB is to be used for information and guidance by all military and civilian personnel involved in the installation, maintenance, or repair of electronic equipment under cognizance, or technical control, of the Naval Ship Systems Command (NAVSHIPS). All information, instructions, and procedures in the EIMB supplement such instructions and data supplied in equipment technical manuals and other approved maintenance publications.

ORGANIZATION

The EIMB is organized into a series of handbooks to afford maximum flexibility and ease in handling. The handbooks are stocked and issued as separate items so that activities requiring extra copies of any handbook may obtain them with relative ease.

The handbooks fall within two categories: general information handbooks and equipment oriented handbooks. The general information handbooks contain data which are of interest to all personnel involved in installation and maintenance, regardless of their equipment specialty. The titles of the various general information handbooks give only an overall idea of their data content; a more complete description of each handbook is provided in the General and Index handbook.

The equipment handbooks are devoted to information on a particular equipment class and provide general test procedures, adjustments, general servicing information, and field change identification data.

The following table lists all handbooks of the series, together with their old and new NAVSHIPS numbers. (The old NAVSHIPS numbers are shown in parentheses in the table).

The new NAVSHIPS numbers, although not presently imprinted on all handbooks of the EIMB series, serve also as the stock numbers which are to be used on any requisitions submitted.

HANDBOOK TITLE	NAVSHIPS NUMBER
(General Information Handbooks)	
General and Index	0967-000-0100 (900,000.100)
Installation Standards	0967-000-0110 (900,000.101)
Electronic Circuits	0967-000-0120 (900,000.102)
Test Methods and Practices	0967-000-0130 (900,000.103)
Reference Data	0967-000-0140 (900,000.104)
RFI Reduction	0967-000-0150 (900,000.105)
General Maintenance	0967-000-0160
(Equipment Oriented Handbooks)	
Communications	0967-000-0010 (900,000.1)
Radar	0967-000-0020 (900,000.2)
Sonar	0967-000-0030 (900,000.3)
Test Equipment	0967-000-0040 (900,000.4)
Radiac	0967-000-0050 (900,000.5)
Countermeasures	0967-000-0070 (900,000.7)

PREFACE

INFORMATION SOURCES

Periodic revisions are made to provide the best current data in the EIMB and keep abreast of new developments. In doing this, many source documents are researched to obtain pertinent information. Some of these sources include the Electronics Information Bulletin (EIB), the Naval Ship Systems Command News, electronics and other text books, industry magazines and periodicals, and various military installation- and maintenance-related publications. In certain cases, NAVSHIPS publications have been incorporated into the EIMB in their entirety and, as a result, have been cancelled. A list of the documents which have been superseded by the EIMB and are no longer available is given in Section 1 of the General and Index handbook.

SUGGESTIONS

NAVSHIPS recognizes that users of the EIMB will have occasion to offer comments or suggestions. To encourage more active participation, a self-addressed comment sheet is provided in the back of each handbook change. Complete information should be given when preparing suggestions. It is most desirable that the suggestor include his name and mailing address on the form to facilitate direct correspondence in the event clarification is required and an immediate reply can be supplied regarding the suggestion. Any communication will be made through a personal letter to the individual concerned.

If a comment sheet is not available or correspondence is lengthy, suggestions should be directed to the following:

Commander; Naval Ship Engineering Center
Department of the Navy
Washington, D. C. 20360
Attn: Fleet Electronics Effectiveness
Branch, Code 6678

CORRECTIONS

Report all inaccuracies and deficiencies noted in all NAVSHIPS technical publications (including this manual, ship information books, equipment manuals, drawings, and such) by a "Planned Maintenance System (PMS) Feedback Report, OPNAV 4700.7 (REV. 5-65)" or superseding form. If PMS is not yet installed in this ship, report technical publication deficiencies by any convenient means.

DISTRIBUTION

The Electronics Installation and Maintenance Book is transmitted to using activities through automatic distribution procedures. Activities not already on the EIMB distribution list and those requiring changes to the list should submit correspondence to the following:

Commander; Naval Ship Engineering Center
Department of the Navy
Washington, D. C. 20360
Attn: Code 6679A2b

Activities desiring extra copies of EIMB handbooks or binders should submit requisitions directly to Naval Supply Depot, Philadelphia, Pennsylvania. Complete instructions for ordering publications are given in the Navy Stock List of Forms and Publications, NAVSANDA Publication 2002.

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT
Title Page	Change 4
ii thru v i	Change 4
v ii thru v iii	Change 3
Section 1 – General	
Title Page	Change 1
1–1 thru 1–6	Change 2
Section 2 – Circuit Applications	
Title Page	Change 1
2–1	Change 1
Section 3 – Field Change Identification Guide	
Title Page	Change 1
3i thru 3iii	Change 4
3–1	Change 2
3–2,3–3	Change 3
Section 4 – Service Notes	
Title Page	Change 1
4–1	Change 1

PAGE NUMBERS	CHANGE IN EFFECT
AN/BDQ–1:1	Change 1
AN/BDQ–3:1	Change 1
AN/PDR–18:1 thru 4	Change 4
AN/PDR–27:1	Change 1
AN/PDR–27CY:1	Change 1
AN/PDR–27G:1	Change 1
AN/PDR–27H:1	Change 1
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AN/PDR–43:1	Change 1
AN/PDR–45:1	Change 2
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AN/UDM–1A:1	Change 1
IM–134/WDQ:1	Change 1
IM–144A/WDQ:1	Change 1
IM–144A/WDQ:1	Change 1
IM–148/WDQ:1	Change 1
Section 5 – Reference Data	
Title Page	Change 1
5–1	Change 1

NOTE

The effective cut–off date for the FCIG in this change is 8 July 1966

RECORD OF CORRECTIONS MADE

CHANGE NO	DATE	CHANGES MADE	SIGNATURE

NOTES

FIELD CHANGE IDENTIFICATION GUIDE

3-1. POLICY

a. The Bureau of Ships Manual, Chapter 9670 which establishes the policy for alterations and modifications to electronic equipment, defines alterations as any change in hull, machinery, fittings, or equipment affecting design, material, number, location, or relationship of the component parts of an assembly or system.

b. Only in actual emergencies will alterations to, or modification of, electronic equipment under cognizance of the Naval Ship Systems Command be undertaken without prior approval of, or direction by, NAVSHIPS. All requests for approval shall be forwarded via chain of command; state the exact nature of the proposed alteration or modification, reason therefor (also whether for permanent or for special temporary use), and appropriation to which chargeable. Unauthorized alterations to equipment under contractual guarantee may result in the nullification or cancellation of the guarantee and financial loss to the Government, and may result in failure of the equipment to provide the service for which it was installed. If alterations are accomplished under emergency conditions, adequate consideration must be given to safety of personnel and equipment and to the basic performance requirements. The Command should be advised at the earliest practicable date of the actual changes made.

c. Field changes are the means by which approved and authorized alterations or modifications are made to the Naval Ship Systems Command electronic equipments. These changes are mandatory and shall be accomplished on equipment affected in accordance with instructions contained in the field change bulletin.

d. Certain field change bulletins include the statement that "Naval Ship Systems Command's approval is required prior to accomplishment." Such statements should be disregarded. The only restrictions on the accomplishment of official field changes are indicated in the Field Change Identification Guide (FGIC). Examples of such restrictions are as follows:

(1) Funding (funds must be cited).

(2) Field Change is equivalent to an alteration (ShipAlt must be assigned).

(3) Field Change is not applicable:

(a) Limited to specified serial numbered equipments (5-AN/SRT-14 applies only to serials 6 through 21).

(b) Limited to specific equipment configurations (1-RDR - applies only if equipment includes every type 10508 shock mount).

(c) Limited to applications requiring compatible interface (12-AN/SPA-8A to produce AN/SPA-32 for use in AN/SPS-39).

3-2. DOCUMENTATION

This guide is a revised list of field changes to electronics equipment under the technical control of the Naval Ship Systems Command. It is in effect upon receipt.

3-3. OBJECTIVE

a. The objective of the FCIG is to provide a current list of field changes together with information enabling technical personnel to determine by inspection the applicable field changes that have been accomplished.

b. This guide does not indicate availability of the field change or correction material within the supply system.

3-4. DEFINITIONS

a. FIELD CHANGE. A field change is any modification or alteration authorized by the Naval Ship Systems Command or agency concerned to be made to an electronics equipment subsequent to delivery to the government. Official field change numbers are published in the Electronics Information Bulletin (EIB) and this FCIG.

b. FIELD CHANGE KIT. A field change kit is the formal means made available to permit accomplishment of a field change. A kit may consist only of published matter or be an assembly of published matter and required material.

c. CLASSIFICATION OF FIELD CHANGE. Field changes are of the following types and classes:

(1) Types

(a) Type 1 - A Type 1 field change includes a publications package and all parts and materials required to accomplish the change to a single equipment and to revise equipment nameplates and manuals.

(b) Type 2 - A Type 2 field change consists only of publications material which pro-

vides instructions for accomplishing the change and revising the equipment nameplates and manuals. A Type 2 field change may or may not require that parts be requisitioned.

(c) Type 3 - A Type 3 field change includes a publications package and a portion of the parts and materials required to accomplish the change to a single equipment and to revise equipment nameplates and manuals.

(2) Classes (added as a hyphenated suffix to the type)

(a) Class A - Funding for installation is not required. These field changes are approved for accomplishment by forces afloat or station personnel without further reference to the Naval Ship Systems Command.

(b) Class B - Fleet or shore funding for installation is required. These field changes are approved for accomplishment by Naval shipyards, tenders, repair facilities or shore maintenance authority without further reference to the Naval Ship Systems Command.

(c) Class C - The Naval Ship Systems Command's funding for installation is required. To meet urgent operational commitments, the Command may approve accomplishment of Class C field changes subject to the Type Commander's funding. This class field change includes, but not limited to, those changes in operational improvement. Such changes are accomplished in the Material Improvement Program's order of priority. These field changes are approved for accomplishment by Naval shipyards, tenders, repair facilities, or shore maintenance activities.

3-5. INSTRUCTIONS REGARDING ACCOMPLISHMENT

a. BACKGROUND. Accomplishment of applicable field changes is essential to the proper functioning, identity, and logistic support of electronics equipments. Effective 1 October 1957, electronics field change kits were transferred from "N" to "F" cognizance. This permits the issue of field changes to ships and activities without charge to their allotments.

b. RECORDING. The completion of all official field changes, alterations, and modifications to electronic equipment shall be recorded on the Electronics Equipment History card, NAVSHIPS 536.

c. REPORTING. Except as required in Bureau of Ships Instruction 10550.1 B Series, accomplishment of field changes should not be reported to the Naval Ship Systems Command. However the performance and operational reports, required on certain equipments, should list the field changes that have not been accomplished.

3-6. HOW TO USE THIS GUIDE

a. USE. Equipment designations are arranged alphanumerically. Space has been provided on each page for pen and ink additions or corrections published in the EIB. Periodically, the Index will be updated by the issuing of revised pages.

(1) Information on each field change is given in the following sequence:

(a) The field change number

(b) The field change title

(c) Correction material - temporary corrections, and revisions to existing equipment publications, complementary technical manuals, and technical manuals accomplishing field change kits.

(d) The type - class (the type and preferred activity to accomplish the field change, i.e., Types 1, 2, and 3. Classes A, B, and C.

(e) The modifying activity (i.e., FA - forces afloat, YF - yard forces) and the number of manhours required to accomplish the field change.

(f) The bulletin NAVSHIPS number or other reference.

(g) The Federal Stock Number assigned to a particular field change. Suffixes are given to identify various categories and for record purposes. They are as follows:

SUFFIX	MEANING
C	FSN cancelled; material disposed of
C1	FSN cancelled in accordance with BUSHIPS ltr ser 880-276 of 18 April 1957
C2	FSN cancelled in accordance with BUSHIPS ltr ser 880C-285 of 22 April 1957
C3	FSN cancelled in accordance with BUSHIPS ltr ser 880C-295 of 26 April 1957
C4	FSN cancelled in accordance with BUSHIPS ltr ser 880D-398 of 22 May 1957

Where the word "None" appears, the field change is either a Type 1 kit which was not converted to a Federal Stock Number or a Type 2 kit not requiring a stock number.

(h) The serial numbers or applicable conditions of specific equipments affected by a particular field change. "NAVSHIPS" indicates that specific field changes indicated equipments are designated by the Naval Ship Systems Command. Accomplishment of these changes should be arranged for in accordance with current instructions.

(i) The identification information applicable to each field change for use in determining its accomplishment.

(2) Reference to field changes should always be by use of the assigned field change number and the equipment designation; for example, 6-AN/SPS-6C represents the 6th field change to AN/SPS-6C.

b. ABBREVIATIONS. Except for those listed below, the abbreviations used in the FCIG were taken from Standard Abbreviations (JANAP 169), Military Standard Abbreviations for Use on Drawings (MIL-STD-12A).

ACU	Antenna control unit
ATDIR	Attack director
ATF	Automatic target follower
ATR	Anti-transmit-receive
BDI	Bearing direction indicator
BKT	Bracket
CCL	Communication control link
CPLR	Coupler
DLVD	Delivered
DPLXR	Duplexer
FC	Field Change
FE	Field engineer
FS	Frequency shift
GTT	Generated target training
HYDPH	Hydrophone
IMPED	Impedance
I & S	Installation and Service Bulletin
LSTN	Listening
MAGGY	Magnetron
MCC	Maintenance close contact
MFD	Microfarad
MFI	Multiple feature
MODIF	Modification
MTB	Maintenance true bearing
MTR	Meter
NLM	Noise level monitor
NOR	Norfolk
NRTC	Naval Reserve Training Center
NS	NavShips
N.T.	Navy type
ODN	Own doppler nullifier
PERFRM	Performance
P N	Part number
P O	Part of
RA	Receiver-amplifier
RAI	Receiver-amplifier-indicator
RGC	Reverberation controlled gain
RDT	Rotational -directional transmission
RECVR	Receiver
RHI	Range height indicator
RIB	Radio Installation Bulletin
RMB	Radio Maintenance Bulletin
RNG	Range
RPPI	Remote plan position indicator
RTRB	Reliable true and relative bearing
SMB	Sonar Maintenance Bulletin
TB	Terminal board
TDC	Torpedo data computer
TDR	Time delay relay
TRB	True and relative bearing
TVG	Time variation of gain
VDS	Variable depth sonar
VSWR	Voltage standing wave ratio
WGT	Weight
XDUCER	Transducer
XFMR	Transformer
( )	Series

c. CORRECTIONS. Recommendations for correction of errors and the addition of pertinent information to this guide should be reported to the Electronics Publications Section (Code 6679A2b), Naval Ship Engineering Center, and include:

(1) Designation of affected equipment.

(2) Location of error by page and line.

(3) Description of error and indication of what change should be made.

AN/PDR-18A, MAINTENANCE AND REPAIR

The flexible leads of V-101, Ck 522AX, in Radiac Set AN/PDR-18A have a tendency to short together when the radiacmeter is placed in its case, extreme care should be exercised in placing the cable from the battery box. Sometimes several tries may be necessary.

Radiac Repair Facilities are requested to insulate the positive filament lead of V-101 with "spaghetti" tubing when Radiac Sets AN/PDR-18A are received for routine maintenance-overhaul. Insulating the positive-filament lead will prevent shorting and facilitate repair of equipments.

AN/PDR-18A PRECAUTION IN TESTING

The technical manual for Radiac Set AN/PDR-18A, NAVSHIPS 91715, lists Multimeter TS-354/U to be used when testing these equipments. Due to the high internal impedance of the Vibrator Power Supply, E-104, an electrostatic voltmeter should be used when checking this particular unit. Radiac repair facilities have been issued an Electrostatic Voltmeter, Model E.S.D., 0-1500 volt range, manufactured by Sensitive Research Instrument Corporation, for the purpose of testing this unit.

CORRECTING SEALED POWER SUPPLY FAILURES

A number of sealed power supplies utilized in Radiac Sets AN/PDR-18A cause an oscillation of sufficient magnitude on the 0.5 scale of the radiacmeter to warrant changing the power supply.

The oscillation may be eliminated by installing a 0.003-mfd 1600-volt capacitor from the -900 volt terminal on the power supply to ground. Capacitors received under FSN N5910-649-4447 or FSN M5910-845-6974 can be used with equal success.

Radiac repair facilities are authorized to utilize this procedure on Radiac Sets AN/PDR-18A exhibiting this excessive oscillation.

AN/PDR-18B DEFECTIVE RADIAC METER SUBASSEMBLY

Subassemblies, Symbol E-126, should be checked for resistance values indicated below. Several of these subassemblies were wired incorrectly and showed excessive leakage. A wide tolerance for the resistance value between pins 1-5 is necessary because there are eight, plus or minus 5 percent, 3.6-megohm resistors connected between these pins.

Resistance Values:

Pins	Resistance	Tolerance
1-5	28.8 Megohms	plus or minus
1-4	Infinity	5% or less
1-3	Infinity	
1-2	Infinity	
2-3	Infinity	
2-4	Infinity	
2-5	Infinity	
3-4	Infinity	
3-5	Infinity	
4-5	Infinity	

AN/PDR-18B CALIBRATION JIG

One of the major objectives of Field Change 1-AN/PDR-18B was to provide individual calibration for each of its four ranges. This is accomplished by means of four variable resistors.

The following suggestion, reduces the time required for adjusting these resistors and also permits a more accurate calibration. These advantages are accomplished by means of a calibration jig which permits adjustment of the resistors without repeated removal of the chassis from the case (A-104).

Essentially, the calibration jig is constructed by providing a one-inch opening in the left side of a spare case (A-104) and fabricating a light, tight cover to fit over this opening. The opening can be made by using a one-inch chassis punch. The case material, cut out together with other parts shown in the first two views of the diagram, is then used for the assembly of the cover. It is necessary to slightly bend this cover near the bottom due to the curvature near the bottom of case (A-104).

Radiac repair facilities having a spare case A-104 are requested to fabricate a calibration jig for use in calibrating Radiac Sets AN/PDR-18B. Spare cases are not available in supply and should not be requisitioned for this purpose.

AN/PDR-18B-JIG FOR CHECKING PHOTOMULTIPLIER TUBE (1P21)

The following suggestion, should be helpful to all activities concerned with maintenance of the Radiac Set AN/PDR-18B.

It has been established that the grid length of Type 1P21 tubes varies from tube to tube, and that a large quantity of these tubes are in the supply system.

Radiac Set AN/PDR-18B is a scintillation-type instrument that has a "calibrate" position. In this position the calibration aperture admits light from the luminous standard E-102 and through the light tube to the grid of the photomultiplier tube. In some instances, due to the varying lengths of the grid of the vacuum tube, the light from the luminous standard does not fall entirely on the grid, but is partially blocked by the ceramic insulator in the vacuum tube. This makes it difficult to calibrate the instrument properly.

Prior to the introduction of this jig the only means to determine the proper fit of the tube was by the trial-and-error method. This method was time consuming and usually required several trials before a tube with the proper physical characteristics was found. The use of this jig has completely eliminated other methods.

The jig is made by utilizing part A-106, tube shield with shutter 0-110, and part E-103, sawed in half so that the tube can be observed in relation to the light tube. The sketch in figure 1 of this article shows a tube (1P21) placed in the jig and the relationship of the grid with respect to the light tube. This method takes approximately 3 seconds as compared to the old method which took approximately 15 minutes.

It should be noted that tubes (1P21) which are not suitable for installation in the Radiac Set AN/PDR-18B can be used in other equipments.

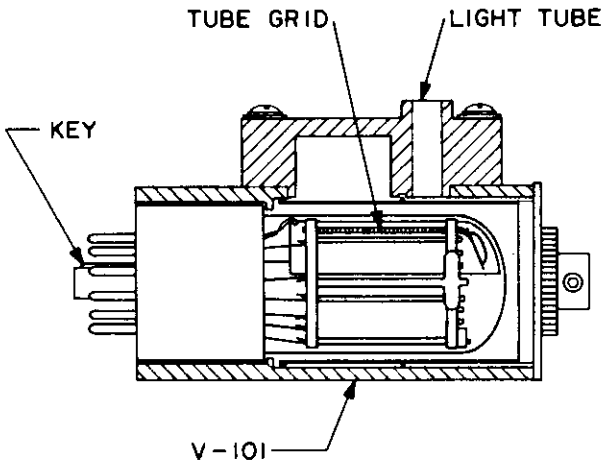


Figure 1.

NEW PROCEDURE FOR WIPE TESTING RADIAC SETS AN/PDR-18B

The following procedure is intended for use by Radiac Repair Facilities when wipe testing Radiac Sets AN/PDR-18B. Its principal advantage is the lesser degree to which these equipments have to be disassembled during the wipe test.

Radiological Hazard

Radiac Sets AN/PDR-18B contain a strontium 90 calibration source which has an activity of approximately 300 microcuries. Beta radiation is emitted from the source but, because of its position and shielding, the source does not present a serious hazard until the equipment is opened. Even then, the potential radiological hazard is predominately one of contact and by avoiding contact with suspected surfaces one may handle the interior of the equipment with a relative amount of freedom.

Investigations have revealed that contamination in this equipment is most likely to occur around the plastic window of the source and may then spread from this area to the remainder of the source, the interior surfaces of the gear housing, and the gears. It is also possible that some contaminant may spread beyond the gear box via the source shaft or openings in the gear box.

The checks specified in this article are intended to provide a means of tracing the spread of contamination. Supplemental checks may be made of other areas of the equipment at the discretion of the inspecting activity.

Tolerance Levels

Wipe tests of the sources and areas adjacent to the sources shall be capable of detecting the presence of 0.005 microcuries of removable radioactive material.

Monitoring Equipment

Radiac Computer-Indicator CP-297/UD, RIDL 49-54 or equivalent scaler.

Summary

The technique for measuring and removing the radioactive contamination arising from the use of strontium 90 in the calibration source of the AN/PDR-18B consists of the following steps:

1. Preparing the radiac set for wipe tests.
2. Performing wipe tests on the calibration source.
3. Performing wipe tests on areas adjacent to the calibration source, if the calibration source is defective (leakly).
4. Drying the contaminated filter papers under a lamp and covering them with thin pieces of plastic (Saran Wrap).
5. Measuring the activity on each filter paper with a G-M tube and computer-indicator, correcting the observed count rate for background count rate and G-M tube sensitivity, and converting corrected counts per minute to microcuries of detectable contamination.
6. Scrubbing those areas which are contaminated above permissible levels, with decontaminant moistened cheese cloth until permissible levels are no longer exceeded.

Disassembly of the Equipment in Preparation for Wipe Testing

The following disassembly procedure is intended to supplement the information contained in NAVSHIPS 91662 (Technical Manual for the AN/PDR-18B).

1. Remove the batteries from the equipment.
2. Remove the equipment chassis from the equipment housing and place the chassis, source side up and meter surface to the left, on the area of the workbench covered with a protective covering.
3. Remove the screw, retaining gear cover A-102 to the gear plate clamping bar, and place it by the set. Then remove gear cover A-102 and lay it by the set. Do not touch the gear assembly, interior of the gear housing, gear plate, calibration source, or calibration source subassembly.

Procedure for taking Wipe Samples

General wipe test procedures should be reviewed prior to taking the wipes indicated below. Gloves shall be worn when wiping any of the areas or items in the gear box.

With a swipe (consisting of a thin plastic handle with one-inch filter disc attached, see figure 1) dampened with a couple of drops of decontaminant reach into the area between the gear plate and the calibration source E-202 and wipe the plastic top of the source three times. Dry the wipe sample and determine the activity on the wipe using the CP-295/UD, RIDL 49-54 or equivalent. If the activity of the wipe is 0.005 Microcuries or greater, the gear plate, gears, springs and adjacent surfaces should be wiped to determine the spread of contamination. The defective source shall be removed from the set, placed in a plastic bag and labeled in accordance with MIL-M-19590. The plastic bag should then be sealed and stowed, preferably in a leadlined

safe or other container which will reduce external radiation to less than 2 mr/hr pending disposition instructions. A report shall be made to the local Radiac Coordinator within 48 hours requesting disposition of the defective source. Disposal request should state the isotopic content and activity of the source as well as the AN nomenclature and serial number of the radiac set.

Decontamination Procedures

1. Gloves shall be worn during decontamination.
2. Review general instructions on decontamination and determine which components or surfaces require decontamination.
3. If required, decontamination of the surfaces shall be accomplished by the wiping method.
4. After decontamination, the areas or parts shall be tested to ensure that the specified tolerance levels are not exceeded in BUSHIPS (unnumbered) Notice 9670/11, Ser 682-174 of 2 March 1961.
5. Items for which decontamination procedures were not successful shall be disposed of at AEC-licensed commercial outlets. Replacement of these parts shall be initiated without prior approval of this office or of the Naval Ship Systems Command.

Reassembly of Equipment

An equipment shall be reassembled only when the inspecting activity is satisfied that the equipment and parts thereof are radioactively clean.

Reassembly of the parts removed from the equipment will follow in reverse order the sequence indicated for their removal.

Insertion of the batteries into the equipment shall be done outside the wipe test area by persons not performing the wipe test.

Records

The results of the wipe tests performed on Radiac Sets AN/PDR-18B shall be entered in a record book or file and also shall be indicated on the equipment proper. Recording of the following data is required:

1. Data to be marked on the equipment:
   - Date
   - Activity performing test
   - Calibration source wipe in microcuries
2. Data required for entry into local log book:
   - Date
   - Name of the person performing the test
   - Nomenclature and serial of the equipment being examined
   - Type of isotope
   - Background count rate
   - Counting rate (CPM)
   - Counting rate minus background count rate
   - Net corrected count rate
   - Results of source wipe in microcuries
   - Remarks

Concluding Remarks

A "clean" set may be handled freely. Only the following precautions need be observed:

1. If removal of the source is necessary, always handle with tongs or tweezers using gloves.
2. Wash hands thoroughly with soap and water after handling those components suspected of contamination.
3. Do not smoke, eat, drink, or prepare food in an area where these sets are being repaired or while repairing them.
4. Whenever an equipment is received for maintenance, do not assume it to be radiologically safe until it is checked for contamination. Do this before attempting any internal maintenance. (660)

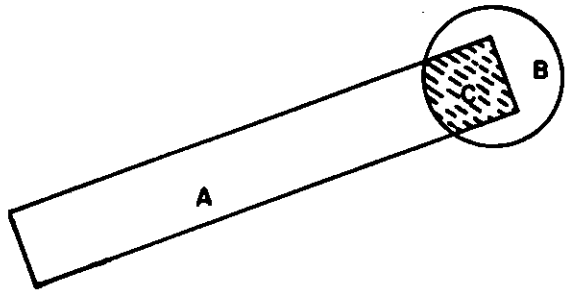


Figure 1. Swipe A: Handle; fabricate from 0.020-inch-thick Melamine; stock number HM 5970-468-5530; unit of issue, square yard. B: One-inch filter disc cut from Whatman No. 50 filter paper or equivalent. C: Cement; General Electric RTV-102 Silocone rubber adhesive sealant or equivalent.

Note: A very thin coat of cement is applied to the end of the handle. Place the one-inch disc onto the handle and press hard so that all excess cement is pressed from between the handle and the disc. If an excessive amount of cement is left between the handle and the disc, the swipe will be too thick to enter the area between the gear plate and the source. Allow several days for the thin coating of cement between the handle and the swipe to dry or set up.

USE OF BATTERY BA-2030/U AND BATTERY BA-30

The equipment technical manual inadvertently calls for the exclusive use of BA-2030/U in AN/PDR-18, 18B, TS-311A/UP and TS-804/URT.

Battery BA-2030/U is designed for use in equipments operating in ambient temperatures below 20 degrees F and therefore their application is limited.

In general BA-30 should be used for all applications requiring the D-size, 1½-volt battery and will provide better service than BA-2030/U under normal operating conditions. Type BA-30 is stocked under FSN.

Specific instructions for making the appropriate pen-and-ink corrections to the instruction books for the above equipments will be published in the EIB.

AN/PDR-27J Misfit of 5979/BS1 Tubes

The 5979/BS1 tubes manufactured by Amperex will not fit the probe of Radiac Sets AN/PDR-27J. BUSHIPS records reflect that, while Amperex is no longer manufacturing this tube type, existing stock may contain Amperex 5979/BS1 tubes.

Therefore, it is recommended that action be initiated as necessary to preclude issue of Amperex manufactured 5979/BS1 tubes for Radiac Sets AN/PDR-27J only.

AN/PDR-27J–REPAIR TO INDICATING METER M-101 IN RADIAC SET

Indicating meter, circuit symbol number M-101, of the type used in the manufacture of the AN/PDR-27J's is not available from supply. If a meter of this type fails, it can be repaired with:

1. An Indicating Meter that is obtained from another AN/PDR-27J by cannibalization.
2. An Indicating Meter, type MR36M201SPECR, Federal Stock Number (FSN) 1N6665-069-3031 and a Kit, Meter Linkage Assembly, FSN 1N6665-789-1837.

In "1" above the repair procedure outlined in the Technical Manual NAVSHIPS 93218/93218A applies. In "2" above the following repair procedure applies and is being incorporated in NAVSHIPS 93218 and 93218A as Change (3):

List of Material Required:

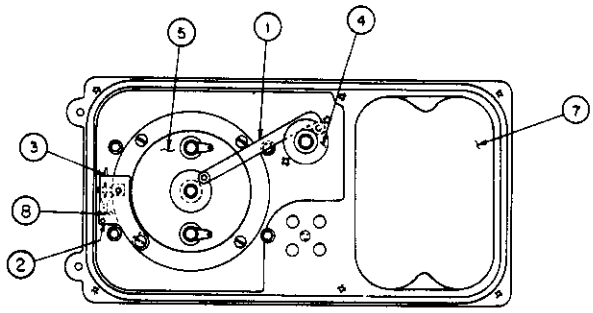
1. Indicating Meter, type MR36M201SPECR, Federal Stock Number 1N6665-069-3031.
2. Kit Meter Linage Assembly, Federal Stock Number 1N6665-789-1837, consisting of two separate subassemblies as follows:
   a. **Meter Linkage** (Bar Type) - link bar, 2 cranks, together with rivets and set-screws (see figure 1).
   b. **Lamp Holder Assembly** - Mounting board, lamp, lamp holder clip, lamp holder screw and nut (see figure 1).
   c. **Machine screws (3)** RH 4-40 thread, 1/2-inch long, (1) RH 4-40 thread, 5/8-inch long.
   d. **Lockwashers** (4) Number 4.
   e. **Flatwasher** (1) Number 4.
   f. **Solder.**

Tools Required (to be furnished by installing activity):

1. Screwdriver (1) 1/10-inch x 4 inches
2. Screwdriver (1) 1/16-inch x 8 inches
3. Soldering iron

Procedure:

1. Remove the defective meter M101 in accordance with the procedure of NAVSHIPS 93218A, paragraph 6-4h, steps 1 through 7.
2. Unsolder orange and black leads to turret terminals on neon light terminal board.
3. Salvage the following meter assembly parts on an as needed basis.
   a. Three 5/8-inch 4-40 machine screws
   b. One 7/8-inch 4-40 machine screws
   c. 0101 Sprocker Wheel
   d. 0102 Chain
   e. 0103 Sprocket
   f. 0104 Spring
   g. DS101 Lamp
   h. E103 Terminal Board
   i. A112 Post
   j. M101 Meter
4. Carefully insert the new meter and position it in place, after making sure the rubber gasket is properly positioned over the cover window.
5. Insert the three 1/2-inch 4-40 screws with No. 4 lockwashers through the three holes in the terminal board mounting bracket that are now used to mount the Lamp Holder Assembly and then into the meter mounting holes and partially tighten (refer to figure 1).



USED ON AN/PDR-27P

ITEM	PART NO.	DESCRIPTION	QTY
8	521-11453-1	RIVET, SHOULDER	2
7	521-11271	COVER, HOUSING	1
5		METER, MR 36M201SPECR	1
4	521-11453	CRANK	2
3		LAMP	1
2	521-11451	LAMP HOLDER ASSEMBLY	1
1	521-11452	LINK BAR	1

Figure 1. Meter Linkage Assembly

6. Take the 5/8-inch 4-40 screw with a No. 4 lockwasher and flatwasher and insert it into the new lamp holder assembly and then into the last meter mounting hole. Orient to assembly as shown in figure 1 and partially tighten the 5/8-inch 4-40 screw.

7. Tighten all the meter mounting screws alternately in steps to maintain an even stress on the meter during tightening.

8. Resolder the neon lamp leads to the rivet shoulders.

9. Resolder the meter leads; red wire to the positive terminal.

10. Install the new bar type meter linkage assembly but do not tighten the set screws until the linkage is properly aligned as outlined below:

a. Turn the switch knob to the OFF position. Turn the crank on the switch shaft so that the link bar takes the position shown, and tighten the setscrews on the crank.

b. Turn the meter shaft to the OFF position, and tighten the set screws on the crank.

c. Check by rotating the switch knob through all positions. The meter scale should move through 5 positions corresponding to the switch positions from 500 mr/hr through BATT. The meter scale does not move when the switch position changes from BATT to OFF.

11. Complete the reassembly as described in paragraph 6-4c of NAVSHIPS 93218/93218A. (669)

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