

NAVSHIPS 0967-000-0070

NON-REGISTERED

(Formerly NAVSHIPS 9,000,000.7)

**ELECTRONICS
INSTALLATION
AND
MAINTENANCE BOOK

COUNTERMEASURES**

**DEPARTMENT OF THE NAVY
NAVAL SHIP ENGINEERING CENTER**

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BOX SCORE
COUNTERMEASURES HANDBOOK NAVSHIPS 0967-000-0070

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Change 3	*	*		
Change 4	October 1966	0967-000-0074	684	1 July 1966
Change 5	May 1967	0967-000-0075	701	17 February 1967

*This issue has been superseded by succeeding changes.

NOTES

(1) The number listed in this column indicates that this handbook issue incorporates information from EIB issues up to and including the one shown. In addition to this column entry, effective with this change and in all succeeding changes, a source reference code will be inserted immediately following the last line of copy of pertinent articles picked up in EIMB handbooks. The following examples show the coding method used to identify origin of material used:

<u>ORIGIN</u>	<u>CODE</u>
EIB 674	(674)
EIB 13S (Shore Quarterly Supplement)	(13S)
Naval Ship Systems Command Technical News Vol 14, No. 6	(TN14-6)
CEIB 7 (Classified EIB)*	(C7)

*Only articles which have been revised to omit classified data but retain information of value and lasting interest.

(2) The entry in this column indicates that all field changes assigned up to and including the date shown have been picked up in the FCIG of this issue.

(3) Other notes to be included as applicable to the particular handbook. Such notes will call attention to issues or changes which have been superseded by later issues or changes. Examples of this can be found in EIB 698.

LIST OF EFFECTIVE PAGES

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		AN/SLR-2:1	Change 5
		AN/SLR-3:1	Change 1
		AN/SLR-10:1	Change 1
		AN/ULQ-6:1, 2	Change 5
		AN/WLR-1:1, 2	Change 5
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7	Change 2	AS-371B/S:1	Change 1
8	Original	AS-393/BLR:1	Original
9	Change 5	AS-570/SLR:1	Original
10	Original	AS-571/SLR:1, 2	Change 4
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		AS-944/BLR:1	Change 1
		AS-962/BLR:1	Change 1
Section 2 - Circuit Applications			
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		C-1608/SLR:1	Change 4
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PREFACE

POLICY AND PURPOSE

The Electronics Installation and Maintenance Book (EIMB) has been established as the medium 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, the EIMB has been expanded to include selected information of general interest to electronic installation and maintenance personnel. These items are such as would generally be contained in textbooks, 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, and 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 Handbook.

The equipment handbooks are devoted to information on a particular equipment class; they 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.) 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	0967-000-0100 (900,000.100)
Installation Standards	0967-000-0010 (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 Technical News, electronics and other textbooks, 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 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 frequently 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: Technical Data and Publications Section
(SEC 6181C)

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: Technical Data and Publications Section
(SEC 6181C)

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.

RECORD OF CORRECTIONS MADE

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NOTES

[illegible]

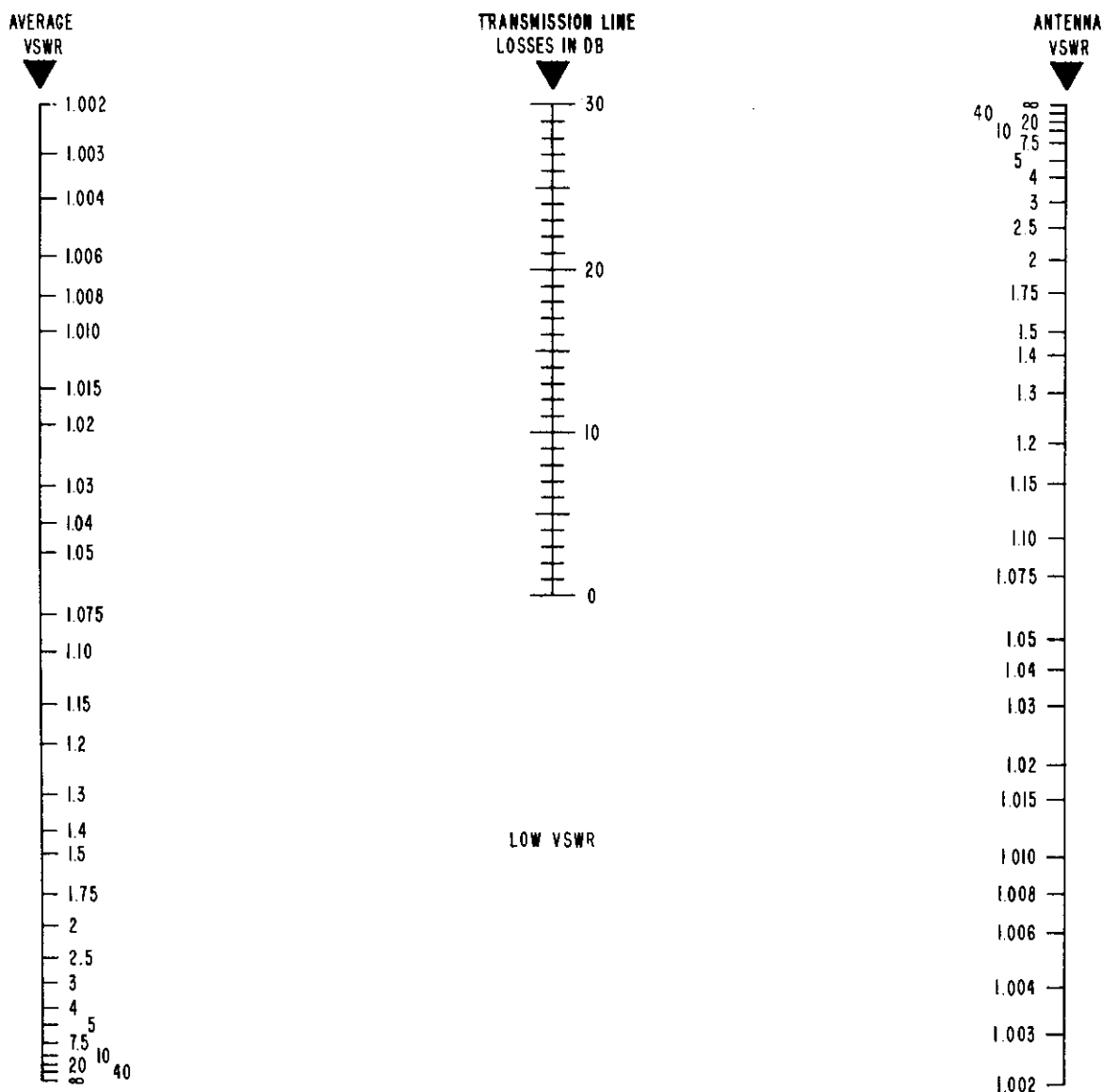


FIGURE 7-4 ALLOWANCE FOR TRANSMISSION LINE LOSS IN LOW VSWR CALCULATIONS.

line losses in db and the average VSWR of the two previous steps. Using a straightedge, draw a line between these two points and extend it to intersect the "Antenna VSWR" column. The reading at the point of intersection of this column is the antenna VSWR.

Moisture Prevention. Moisture prevention in antennas and antenna cabling cannot be overemphasized. A speci-

fic case of waterproofing countermeasures-blade antenna (NT-66132A) is described in Section 4, page NT-66132A:1 of this publication. It recommends that "----in all new antenna installations of this type, the blade edges, rivet penetration, and base connections be reinforced and waterproofed with a glass cloth and epoxy resin applications as shown This will insure trouble-free installation."

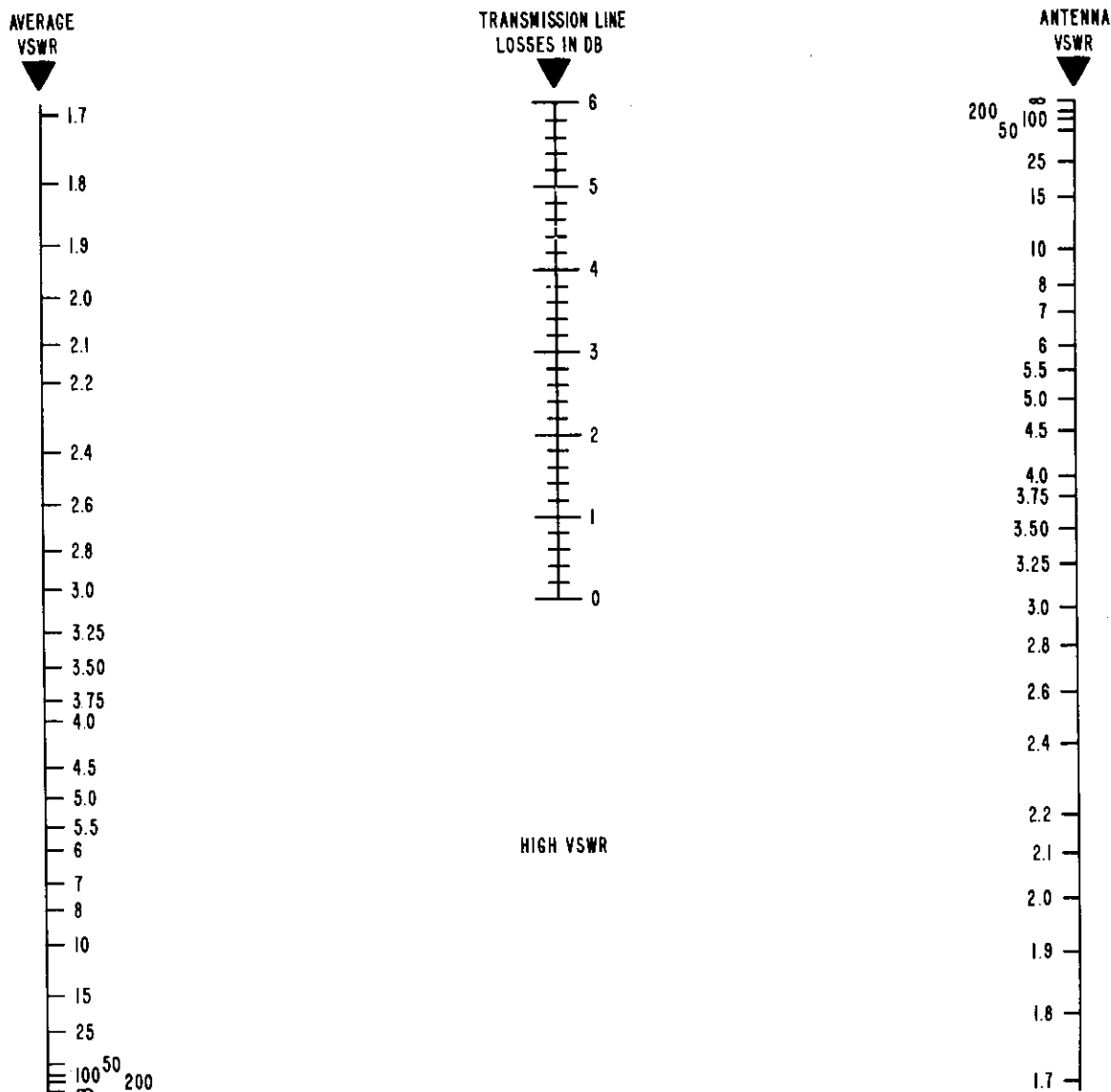


FIGURE 7-7. ALLOWANCE FOR TRANSMISSION LINE LOSS IN HIGH VSWR CALCULATIONS.

IDENTIFICATION OF CABLE CONNECTIONS BASE OF ECM MAST

It is difficult to identify cable connectors at the ECM mast base on submarines after cables are disconnected during repairs or overhaul. Marker plates should be attached to the bottom exterior surface of the baseplate to simplify identification. Each connector on the baseplate should be identified by a small nameplate showing the antenna with which it is associated. Nameplates may be black bakelite with white lettering or brass with stamped lettering. The nameplates should be mounted on the baseplate adjacent to the applicable connector and secured by noncorrosive screws. Cables leading from the mast base should be identified by cable markers, to insure connection to the proper mast base fitting. This suggestion for marking is intended to supplement rather than replace existing cable marking and identification procedures. (537)

USE OF PROPER "UG" TYPE CONNECTORS FOR ELIMINATION OF EXCESSIVE SIGNAL LOSSES IN ECM SYSTEMS

Excessive losses in ECM Systems have been experienced from the use of UG-594/U and UG-594A/U right angle connectors. Laboratory tests have verified that these connectors exhibit excessive VSWR and insertion losses at frequencies above 4 KMC.

All UG-594/U and UG-594A/U right-angle connectors should be eliminated where practical and the straight type "N" connector UG-941B/U (FSN 9N5935-683-2402) used. If equipment location requires a right-angle connector, the type "N" right-angle adaptor UG-27C/U (FSN 9N5935-204-8382) should be used. (650)

COUNTERMEASURES**NAVSHIPS****0967-000-0070****FIELD CHANGE
IDENTIFICATION GUIDE**

1-AN/BLA-1 - Make compatible with AN/WLR-1 (modifies equip. to AN/BLA-2C)

Correction material:

1-A FA-20 NS981623 F5895-987-9523

SERIAL: A1 through A100 (made only when the AN/WLR-1 is being installed)

IDENTITY: The horizontal synchro and resolver housed in a casting on the base plate is replaced by a three-tier construction containing a vertically placed synchro and resolver, a two gear assembly with slotted disc and a transistorized component board with photo-diode pickup and amplifier circuitry.

1-AN/BLA-2A - Cancelled

1-AN/BLA-2B - Cancelled

1-AN/BLA-2C - Cancelled

1-AN/BLR-1 - Crt display and if. amps, improve

Correction material: Change 3 to NS 92419(A)

1-A YF-48 NS98811 F5895-507-5603

SERIAL: 1-31

IDENTITY: V908 is 6AH6 on mixer amp. chassis CV-69/ULR.

2-AN/BLR-1 - Temp. Test adaptor to permit use of TS-907/ULR and improve oscillator stability

Correction material: T-5 to NS 91973

1-A FA-2 NS98723 F5895-501-0765

SERIAL: 1-174

IDENTITY: 0-345 added to new osc. adj-assy. of rf tuner.

3-AN/BLR-1 - Test adaptor, permits use of TS-907/ULR

Correction material: T-6 to NS 91973

1-A FA-2 NS98724 F5895-501-0797

SERIAL: 1-269

IDENTITY: Brg blk of rf tuner mtd by filler head screws.

4-AB/BLR-1 - Add sound powered telephone jacks

2-A FA-2 NS935-254-9192

SERIAL: All

IDENTITY: Presence of sound powered telephone jacks

5-AN/BLR-1 - Wiring Changes Required to Provide Delay of 115 VAC to Tuning Motor B-1701

Correction material:

2-A FA-2 NS981438 None

SERIAL: All

IDENTITY: Presence of two (2) wires on pin 6 of relay K-1702 in Indicator Control IP-10/ULR

6-AB/BLR-1 - Cancelled

7-AN/BLR-1 - Synchronization of the Sweep Generator to Improve Unstable Sawtooth Voltages

Correction material: to NS91973

2-A FA-1 None

SERIAL: All CV-69/ULR and CV-70/ULR

IDENTITY: Visually inspect the CV-69 for a 4-inch length of insulated wire connected from pin 4 of V-909 to R-949; CV-70 for a 4-inch length of insulated wire connected from pin 4 of V-1112 to R-1118

8-AN/BLR-1 - Modification to Tube Socket Caps

Correction material: to NS91973

2-A FA-2 None

SERIAL: All

IDENTITY: Presence of longer tube caps which extend and cover the base of tube 2K48 in TN-142/ULR of the subject equipment.

9-AN/BLR-1 - Use of OB2WA Tubes in the Power Supply and the RF Tuners

Correction material:

2-A FA-4 None

SERIAL: All

IDENTITY: A capacitor (0.022 mfd) connected between pins 5 & 7 of tube socket XV-405, XV-406, XV-407, XV-507, XV-508, XV-607, XV-608, XV-806, XV-807, and XV-808 respectively of RF tuners, TN-138/ULR, TN-139/ULR, TN-140/ULR, and TN-142/ULR

10-AN/BLR-1 - Relocation of F-2801 in PP-312/ULR

Power Supply

Correction material: to NS91973

2-A FA-8 None

SERIAL: All

IDENTITY: This field change has been accomplished if fuseholders are located on the front panel of PP-312/ULR Power Supply.

11-AN/BLR-1 - Substitution of Tube Type 8113 for Type 6AK5

Correction material:

2-A FA-1½ None

SERIAL: All

IDENTITY: Presence of type 8113 tubes in place of type 6AK5 tubes in tuners

12-AN/BLR-1 - Addition of Relay in AC Interlock Circuit and Fusing of Power Transformers.

Correction material: T-11, to NS0967-037-4012, to TM 0967-037-4010 (Formerly NS91973)

2-A FA-8 NS0285-080-0100 None

SERIAL: All

IDENTITY: Presence of a relay mounted on inner left cross-brace on bottom of Power Supply PP-312/ULR

COUNTERMEASURES**NAVSHIPS****0967-000-0070****FIELD CHANGE
IDENTIFICATION GUIDE**

13-AN/BL R-1 - Provides Monitor Jacks for Band 7 Klystron Anode

Correction material: T- to NS91973

2-A FA-4

SERIAL: All

IDENTITY: Presence of two new test jacks, labeled "Klystron I", in Power Supply PP-312/ULR

1-AN/FLR-7 - Cancelled

1-AN/FLR-11(V) - Modification of Magnetic Tape Recorder RO-219/F and Magnetic Tape Reproducer RP-135/F

1-A YF-4 NS981705 None

SERIAL: ALL

IDENTITY: Presence of Modified Head Shield

2-AN/FLR-11(V) - Modifies Head Cable Assemblies of

Amplex FR-114B Magnetic Tape Recorder and Reproducer

Correction Material: T- to NS

1-A YF-2 NS981780 None

SERIAL: Magnetic Tape Recorder RO-219/F, Units 1 and 2 of AN/FLR-11(V) and Magnetic Tape Reproducer RP-135/F, Unit 15 of AN/FLR-11(V)

3-AN/FLR-11(V) - RFI Reduction in CED Recorder/Reproducer (RO-247 and RP-132)

Correction material: T-1 to NS95738
NS981804

4-AN/FLR-11(V) -

Correction material: T- to NS0967-003-6000
NS94563

SERIAL: Signal Data Converter CV-1474/FLR-11(V) and Core Memory Unit MV-464(FLR-11(V)

5-AN/FLR-11(V)-Installation of Additional Test Points in Control Chassis of Signal Data Recorder/Reproducer RO-247/F and RP-132/F

Correction material: T- to NS95738

2-A FA-3 NS0967-003-6060 None

SERIAL: RO-247/F and RP-132/F Equipment

IDENTITY: Presence of vertical cable harness on right rear side of circuit board assembly of control unit chassis tray

6-AN/FLR-11(V)-Modification of Data Converter

CV-1953/FLR-11(V), Unit 8

Correction material: T- to NS

2-A FA-0.25 NS None

SERIAL: Data Converter CV-1953/FLR-11(V), Unit 8

IDENTITY:

7-AN/FLR-11(V)-Addition of Filter Capacitor in Low Voltage Power Supply of Panoramic Indicator

Correction material: T- to NS94579

2-A FA-1 NS

SERIAL: All Panoramic Indicator Units IP-682-F and SB-15a, SB-15a/R or SB-15/R-50 used in development models of AN/FLR-7 and AN/FRA-44 equipments

IDENTITY: Presence of a 450 VDC, 80 microfarad, electrolytic capacitor C-136 in parallel with R-105 and R-107 in low-voltage power supply circuit.

8-AN/FLR-11(V)-Flywheel Replacement in RO-247/F and RP-132/F

Correction material: T- to NS95738

2-A FA-2 NS

SERIAL: All

9-AN/FLR-11(V) - Installation Test Points in Rear Panel of R-1171/FLR-11(V)

Correction material: T-1, NS0967-221-6012 to NS0967-221-6010 (Formerly NS94562)

2-A FA-1½ NS0967-046-3150

SERIAL: R-1171/FLR-11(V) in Off-Line AN/FLR-11(V) equipment

IDENTITY: Presence of three additional test point connectors on rear chassis of Receiver R-1171/FLR-11(V) marked "+200", "-150" and "GROUND".

10-FLR-11(V) - Modification of Countermeasures Receiver, R-1344/FLR-11(V) and Signal Generator O-1286/LFR-11(V) to provide DC Power Interlock

Correction material: T-2, 0967-046-3032, 0967-046-3052 to 0967-046-3030, 0967-046-3050

1-A YF-1(per chassis) NS0967-046-3110

SERIAL: R-1344/FLR-11(V), all serial numbers;

O-1286/FLR-11(V), all serial numbers

IDENTITY: Relay assembly present in chassis

11-AN/FLR-11(V) - Modification of Receiver-Recorder display Group OA-4412/FLR-11(V) and Receiver-Recorder Group OA-4443/FRA-54(V)

Correction material: Change 2, 0967-046-3013 to NS 0967-046-3010 (formerly NS94581A)

1-A FA-200 NS0967-046-3120

SERIAL: AN/FLR-11 (Phase 1) and AN/FRA-54 (Phase 1)

IDENTITY:

12-AN/FLR-11(V) - Modification of Countermeasures Receiver R-1125/FLR

Correction material: Change 2, 0967-046-3013 to NS-0967-046-3010 (formerly 94581A)

1-A FA-12 NS0967-046-3130

SERIAL: All Countermeasures Receivers R-1125/FLR

IDENTITY:

13-AN/FLR-11(V) - Modification of Oscillator-Power Supply O-928/FLR

Correction material: Change 2, 0967-046-3013 to NS-0967-046-3010 (formerly NS94581A)

1-A FA-12 NS0967-046-3140

SERIAL: All Oscillator-Power Supply O-928/FLR

IDENTITY:

1-AN/FRA-44 - Cancelled

1-AN/FRA-54(V) - Same as 1-AN/FLR-11(V)

2-AN/FRA-54(V) - Modifies Head Cable Assemblies of Ampex FR-114B Magnetic Tape Recorder and Reproducer.

Correction material: T- to NS

1-A YF-2 NS981780

SERIAL: Magnetic Recorder RO-219/F, Units 1 and 2 of AN/FRA-54(V); and Magnetic Tape Reproducer RP-135/F, unit of AN/FRA-54(V)

3-AN/FRA-54(V) - To Prevent Frequency Multiplier Board Breaking into Self Oscillation.

Correction material: T- to NS

NS981800

SERIAL: CP-699/FRA-54(V) and CP-756/FRA-54(V)

4-AN/FRA-54(V) - To Provide a Continuous Bearing Tone Signal.

Correction material: T- to NS

NS981801

SERIAL: TD-620/FRA-54(V) and TD-705/FRA-54(V)

5-AN/FRA-54(V) - RFI Reduction in CEC Recorder/Reproducer RO-247 and RP-132)

Correction material: T- 1 to NS95738

NS981804

6-AN/FRA-54(V)-Same as 5-AN/FLR-11(V)

7-AN/FRA-54(V)-Same as 7-AN/FLR-11(V)

8-AN/FRA-54(V)-Same as 8-AN/FLR-11(V)

9-AN/FRA-54(V) - Same as 11-AN/FLR-11(V)

10-AN/FRA-54(V) - Same as 12-AN/FLR-11(V)

11-AN/FRA-54(V) - Same as 13-AN/FLR-11(V)

3-AN/FRD-10(XN-2)-Adds Signal Extinguish Switch in Automatic Azimuth Indicator

Correction material: T- to NS94593

2-A FA-1 NS None

SERIAL: Unit 19

IDENTITY: Presence of pushbutton switch located midway between on-off switch and pilot light at lower right-hand corner of azimuth indicator.

3-AN/FRD-10(V)-Adds Signal Extinguisher Switch in Automatic Azimuth Indicator

Correction material: T- to NS94555

2-A FA-1 NS None

SERIAL: IP-693/FRD-10(V)

IDENTITY: Presence of pushbutton switch located midway between on-off switch and pilot light at lower right-hand corner of azimuth indicator.

1-AN/FSA-17 - Improvement of the fault alarm system.

Correction material: Change 1 to NS93207(A)

1-C FA-37 NS981498 None

SERIAL: 1 through 11

IDENTITY: Designation plate: "Fault Alarm" on panel of Power Transfer Unit is change to "AUX EQUIPMENT ALARM" and connector J1207 is added. Diode CR 1803 is added to relay K1209 in each of the detector units, Change No. 1 is indicated on the title page of NAVSHIPS 93207(A).

1-AN/FSH-1 - Increase in record time.

Correction material: T-1 to NS94143

1-C FA-5 NS981376 None

SERIAL: A1 through A18. All other sets were corrected by an identical production change

IDENTITY: The new carriage drive shaft has 26 threads per inch, as compared to 18 threads per inch on the shaft originally supplied with the equipment.

1-AN/SLA-1 - Cathode-ray socket, modification

Correction material: None

A FA-1 NS98241 None

SERIAL: 1-6

IDENTITY: C/R tube socket, X-250A, drilled in pin 1 with #29 drill for oversize pin #1 of new type K-1052-P-2 C/R tube.

2-AN/SLA-1 - Cathode-ray protective circuit

Correction material: None

A FA-4 NS98260 F5895-346-4650

SERIAL: 3-12

IDENTITY: Addition of 2 NE-2 neon tubes of TB-20A of the clamping diode chassis

3-AN/SLA-1 - Circuit chg

Correction material: None

A FA-4 NS98262 None

SERIAL: 3, 4, 5

IDENTITY: C-303 (470 mmf), is added in parallel with R-215 on TB-203.

4-AN/SLA-1 - Resistor values, chg

Correction material: None

A FA-4 NS98264 F5895-301-9181

SERIAL: 3-12

IDENTITY: 4 resistors added: three 82K 10% 1 watt and one 220K 10% in C/R circuit. R-220, R-222 on TB- 203 are now 82K. R-252, R-254 on TB-206 are now 82K.

1-AN/SLA-2 - Stability improvement of AN/SLA-2 to make it equal to AN/SLA-2A.

Correction material: T-3 to NS92005

1-A FA-6 NS98821 None

SERIAL: 1-51

IDENTITY: New nameplates; IP-210/SLA-2A immediately below old plate IP-210/SLA-2, and IP-214/SLA-2A immediately below old plate IP-214/SLA-2.

2-AN/SLA-2 - Video output, addition

Correction material: See T-1 to NS92005

2-A FA-1 NS981133 None

SERIAL: All

IDENTITY: Coaxial connector on front end of panel

3-AN/SLA-2 - Stability Improvement of AN/SLA-2

Correction material: T- to 92005

2-A FA-1 None

SERIAL: All

IDENTITY:

4-AN/SLA-2 - Replacement of Selenium Rectifier CR-101 with Silicon Diodes in +28 Volt Supply of PP-874/SLA-2 and PP-874/SLA-2A

Correction material: T-4 to NS92005

2-A FA-8 NS981588 None

SERIAL: All

IDENTITY: Absence of selenium rectifier stack CR-101, capacitor C-116 and by the presence of a sub-chassis mounting four 1N248 silicon diodes in PP-874 of AN/SLA-2 and AN/SLA-2A.

3-AN/SLA-2A - Stability Improvement of AN/SLA-2A

Correction material: T-3 to NS92005

2-A FA-1 NS981291 None

SERIAL: All

IDENTITY: R101 between pins 1 and 2 of V103 is 120K. Inside metal panel marked Test Points A and B, Neon lamp E101 is replaced by a 33K resistor. In pulse analyzer inductor: R-633(820K) is removed from TB-206; orange and violet wire is connected to TB-206-11; blue wire runs from R-634-1 to R-722-1; black wire run from J-203-2 to V-805-10, and white wire runs from R634-3 to pin 1 of V805A.

4-AN/SLA-2A - Same as 4-AN/SLA-2**1-AN/SLA-10--Replacement of Switch Matrix Assemblies**

Correction material: Ch 2 to NS96146

1-A FA-0.5 NS0967-169-2040

SERIAL: All

IDENTITY: New Switch Matrix Assembly 2A17 is stamped R357650-2 on wiring side of board; new Switch Matrix Assembly 2A19 is stamped R357650-4 on wiring side of board.

1-AN/SLR-2 - Cathode-ray display, improve

Correction material: Change 3 to NS 92419(A)

1-A YF-150 NS98811 F5895-507-5603

SERIAL: 1-291

IDENTITY: R120 "meter zero" added on main chassis

2-AN/SLR-2 - Test adaptor and osc temp comp

Correction material: T-5 to NS 91973

1-A FA-2 NS98723 F5895-501-0765

SERIAL: 1-174

IDENTITY: Add temp comp. 0-345, to rf tuner tn-137/ULR

3-AN/SLR-2 - Test adaptor

Correction material: T-6 to NS 91973

1-A FA-2 NS98724 F5895-501-0797

SERIAL: 1-269

IDENTITY: Brg block of RF tuner TN-137/ULR mtd by fillister-head screws.

4-AN/SLR-2--R.F. Shield for Band 5 & 6

Correction material: None

1-A YF-4 NS981025 F5895-543-1510

SERIAL: All

IDENTITY: Installation of metal divider in CY-1273/ULR between TN-139/ULR and TN-140/ULR

5 - AN/SLR-2, - Same as 4-AN/BLR-1

6-AN/SLR-2 - Wiring Changes Required to Provide Delay
115 VAC to Tuning Motor B-1701

Correction material:

2-A FA-2 NS981438 None

SERIAL: All

IDENTITY: Presence of two (2) wires on pin 6 of relay
K-1702 in Indicator Control IP-10/ULR

7-AN/SLR-2 - Same as 7-AN/BLR-1

8-AN/SLR-2 - Same as 8-AN/BLR-1

9-AN/SLR-2 - Same as 9-AN/BLR-1

10-AN/SLR-2 - Same as 10-AN/BLR-1

11-AN/SLR-2 - Same as 11-AN/BLR-1

12-AN/SLR-2 - Same as 12-AN/BLR-1

13-AN/SLR-2 - Same as 13-AN/BLR-1

1-AN/SLR-9 - Increase of Audio Level

Correction material:

NS981577

SERIAL: A1 through A4, A6 through A14

IDENTITY:

1-AN/SLR-10 - Modification to True Relative Switching

Correction material: T- to NS0967-120-5030, T- NS-
0967-125-5040 (formerly
NS94162, Vol. 3 and 4)

2-A FA-1

SERIAL: All

IDENTITY: Resistor R215 connected between pins A and B
of Relay K204, and R216 connected between pins A and B of
Relay K214.

1-AN/SLR-12 - True Bearing Circuit Modification

Correction material: T- to NS0967-010-6000

2-A FA-4 NS

SERIAL: Equipments where it is impractical to inter-
connect the system as described in the technical manual
IDENTITY: Presence of new wires between terminals 1,
2, 10, 11 and 12 of Terminal Board ITB4 and terminals 12
and 14 of relays 1A14K2 and 1A14K3, in the True Bearing
Circuit.

1-AN/SLT-1 - Ant cont, add

Correction material: Change 1 to NS 91258

A FA-10 NS981438 F5895-301-9043

SERIAL: 2-40

IDENTITY: One antenna cont. unit, C-805/SLT-1, is
mounted on the right side of the xmtr cont. C-584/SLT-1.
The other antenna cont. unit is mounted on the right side
of the cont. indicator modulator group, OA-125/SLT-1.

2-AN/SLT-1 - Pump filter in cooling sys, repl

Correction material: T-2 to NS 91258

A FA-1/2 NS98229 F5895-301-9046

SERIAL: 1-32

IDENTITY: New type filter mfr-12 #1013-CT-1

3-AN/SLT-1 - S604, duct O-824, repl: fuse covers, add

Correction material: None

A FA-4 NS98230 F5820-301-9094

SERIAL: 1-18

IDENTITY: Addition of fuse panel

4-AN/SLT-1 - Lead in PP-452/SLT-1, add

Correction Material: T-2 to NS 91258

A FA-1 NS98232 F5895-508-7592

SERIAL: 1-39

IDENTITY: An additional or larger wire is installed be-
tween K-102-11 and TB-111-5 in top left section of con-
trol power supply unit. This new lead is #10 wire, black,
and is laced to existing cabling.

5-AN/SLT-1 - Modulator meter kit

A FA-3 NS98270 F5895-346-4651

SERIAL: 2-40

IDENTITY: New terminal board installed near meter,
M-302, containing C-322 and R-355.

6-AN/SLT-1 - AN-301/SLT-1, Modif

Correction material: Change 2 to NS 91258

A FA-4 NS98297 F5895-301-9650

SERIAL: 1-40

IDENTITY: One additional stuffing tube is mounted,
making a total of 6. The new tube is mounted seven inches
from the side of the chassis.

7-AN/SLT-1 - Osc #1 output meter, modif

Correction material: Change 2 to NS 91258

A FA-2 NS98323 F5895-325-6319

SERIAL: 1-40

IDENTITY: In control power supply #20 black wire added
from K-601-8 to TB-618-6. Buss jumper wire added from
K-601-2 to K-601-8. A #20 red wire added from TB-618-8
to K-601-6.

1-AN/ULA-3 - Circuit Modification

Correction material: T- to NS95674

2-A FA-1/4

SERIAL: Units up through #74

1-AN/ULA-4 - Same as 1-AN/ULA-3 except -

Correction material: T- to NS96067

1-AN/ULQ-5 - Replacement of Electron Tube 7270 and its separate associated Filament Transformer, TE-9554 with Electron Tube 7271 and its associated Filament Transformer TE-12247.

Correction material: T- to NS94080

2-A FA-1 NS None

SERIAL: All when maintenance to subassembly 1A1 is required when tube 7270 (1A1V8) and its separate associated filament transformer (1A1T2) in subassembly 1A1 have been replaced by tube 7271 and its separate associated filament transformer.

1-AN/ULQ-6 - Replacement of High Level Traveling Wave Tube 2V1

Correction material: T-8 to NS93825 (0280-672-3009)

2-A FA-3 NS 0285-079-0900

SERIAL: All

IDENTITY: The new high level traveling wave tube, type D2048 has a round 6-pin miniature connector plug with a lock ring.

2-AN/ULQ-6 - Installation of AN/ULQ-6 TWT Data Nameplate

Correction material: T- to NS93825

2-A FA-1/2

SERIAL: All

IDENTITY: AN/ULQ-6() TWT nameplate adhered to top of unit 1

3-AN/ULQ-6 - Replacement of High Level TWT 2V1

Correction material: T- to NS93852

SERIAL: All shipboard installations

IDENTITY:

1-AN/ULQ-6A - Elimination of Antenna Hunting

Correction material: T- to NS94551

2-A FA-1/2

SERIAL: All (AN-ULQ-6A and AM-3562/ULQ-6 (Unit 7)

IDENTITY: Determining that resistor R4 in unit 7 of the Electronic Control Amplifier is 10,000 ohms, 1/2 watt in lieu of 47,000 ohms, 1/2 watt.

2-AN/ULQ-6A - Replacement of High Level TWT 2V1

Correction material: T-1 to NS94551. 42 (NS0280-796-3601

T-1 to NS94551 (NS0280-796-3002)

1-A FA-8 NS0285-078-0800 FSN5895-909-7547

SERIAL: All

IDENTITY: Tube 2V1 and focus coil replaced by new permanent periodic magnet TWT type QKW-1132C1.

3-AN/ULQ-6A - Elimination of 28V Power Supply Failures

Correction material: T- to NS94551

2-A FA-1 NS None

SERIAL: All

IDENTITY: Diodes 1CR8, 1CR9 (unit 1) are JAN 1N1202 in lieu of 1N1614

4-AN/ULQ-6A - Prevention of Diode Rectifier 2A3CR3 and 2A3CR4 Failures

Correction material: T- to NS94551

2-A FA-1 NS None

SERIAL: All

IDENTITY: A 100-ohm, 5-watt resistor R59 is installed between diode CR4 and thermal stud E71 in subassembly 2A3 Radio Frequency Amplifier AM-3561/ULQ-6A (unit 2).

1-AN/ULQ-6B - Incorporation of Factory Field Change Service Orders as a Unit Field Change

Correction material: None

2-A FA-2 NS0967-050-9050

SERIAL: AN/ULQ-6B Serials 1A thru 8A, 13A thru 16A; 39A thru 42A; 47A thru 55A; 69A thru 77A; 86A and 87A

IDENTITY: Proper recording on Unit 1 that modification has been accomplished on the equipment

2-AN/ULQ-6B - Addition of Teflon Bushing and Lubricant to Connector for Waveguide Air Line

Correction material: None

2-A FA-2 1/2 NS0967-050-9060

SERIAL: Serials 1A thru 8A; 13A thru 16A; 39A thru 42A

IDENTITY: Tag on Unit 2, indicating modification has been accomplished.

3-AN/ULQ-6B - Addition of Air Pressure Shield for Unit No. 1

Correction material: None

2-A FA-1/2 NS0967-050-9070

SERIAL: 1A thru 8A; 13A thru 16A; 23A thru 32A; 39A thru 42A

IDENTITY: Tag on Unit 1 indicating modification has been accomplished.

4-AN/ULQ-6B - Assemblies 1A2 and 2A2 Tube Cap Replacement

Correction material: None

2-A FA-3/4 NS0967-050-9080

SERIAL: 1A thru 8A; 13A thru 16A; 49A thru 51A; 53A; 69A; 71A; 73A and 74A; 77A

IDENTITY: Tags on Unit 1 and 2 indicating modification has been accomplished

5-AN/ULQ-6B – Incorporation of Factory Field Change Service Orders as a Unit Field Change

Correction material: None

2-A FA-7½ NS0967-050-9090

SERIAL: 1A thru 8A; 13A thru 16A; 39A thru 42A; 47A thru 55A; 69A thru 77A; 86A and 87A

IDENTITY: Tag on unit 1 indicating modification has been accomplished

6-AN/ULQ-6B – Modifications to Assemblies 1A3, 2A1, and 2A2

Correction material: None

2-A FA-2½ NS0967-050-9100

SERIAL: 1A thru 8A; 13A thru 16A

IDENTITY: Tag on Unit 1 indicating modification has been accomplished

7-AN/ULQ-6B – Audio Oscillator 1A3 Modification

Correction material: None

2-A FA-9 NS0967-050-9110

SERIAL: A17; A23 thru A38; A46 thru A60; A62; A64 thru A66; A68 thru A81; A86 thru A88; B76 thru B80; B82 thru B110; B112 thru B166; B186 thru B202; and B204

IDENTITY: Tag on Unit 1 indicating modification has been accomplished on the equipment.

8-AN/ULQ-6B Audio Oscillator 1A3 Modification

Correction material:

2-A FA-9 NS0967-050-9120

SERIAL: 1A thru 16A; 21A and 22A; 40A thru 42A

IDENTITY: Tag on Unit 1 indicating modification has been accomplished

1-AN/UNQ-7 – Cancelled

1-AN/UNQ-7A – Cancelled

1-AN/UNQ-7B – Cancelled

1-AN/UNQ-7C – Cancelled

1-AN/WLA-3 – Wiring Change to Improve Reliability

Correction Material: T- to NS0967-034-3000

2-A FA-24

SERIAL: All Airborne Instruments Laboratory equipments

IDENTITY: Absence of the AGC chassis in the AM-4075/WLA-3

1-AN/WLR-1 – Replacement of Capacitors 14A1C22, 14A1C23 and 14A1C24

Correction material: T-2 to NS93422

2-A FA-2 NS981305 F5895-086-6675

SERIAL: A1 through A16 (RF-89/WLR-1)

IDENTITY: Both side covers from sub-assembly A1 of Electrical Frequency Discriminator RE-89/WLR-1 have been removed and capacitors C-22, C-23, and C-24 are of the fixed type with a rating of 1000 uuf.

2-AN/WLR-1 – Cancelled

3-AN/WLR-1 – Production Changes to improve operation and Maintainability

Correction material: Change 1 to NS93422

3-B FA-33 NS981397 F5895-991
0516

SERIAL: A1 through A16

IDENTITY: See bulletin

4-AN/WLR-1 – Same as 3-AN/WLR-1 except SERIAL A17 through A56 and Type 3, Class A – F5895-991-2177

5-AN/WLR-1 – Same as 3-AN/WLR-1 except SERIAL: A57 through A106 and Type 2, Class A – F5895-991-0517

6-AN/WLR-1 – Addition of an External Audio and Video Connection to Tape Recorder

Correction material: *T-7 to NS0967-037-2010

2-A FA-10 NS0967-037-2150

SERIAL: All Collins and Sylvania

IDENTITY: Presence of a shielded cable connected to tip lug of Audio Jack J-17 of IP-480/WLR-1 and a parallel shielded cable from standoff E83, through feed-through hole between C13 and C14.

*Order No. 0967-037-2018

7-AN/WLR-1 – Install Filters to Protect Mixer Crystal Diodes. Applicable only to Sylvania equipment. Refer to 7-AN/WLR-1A

Correction material:

1-A FA-14 NS981649 F5895-956-8984

SERIAL: S/N B-2 thru B-29 and S/N B-31 thru B-51

IDENTITY: The filters are clearly visible on tuners CV-732 through CV-740. The presence of screws in the two holes on the side apron of the wired chassis, directly under the SERVO potentiometers, indicates that the filter has been installed in the CV-736.

8-AN/WLR-1 – Substitution of Non-Locking Variable Resistor:

RA20LASA252A for RA20A25A252AK

Correction material: T- to NS93422

2-A FA-6 None

SERIAL: All Collins and Sylvania

IDENTITY: Presence of locking type potentiometers for R-1 and R-3 of each tuner in place of the non-locking type presently used.

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9-AN/WLR-1 - Installation of Improvements in CV-739 and CV-740 Preselectors. Applicable only to Sylvania equipment. Refer to 9-AN/WLR-1A

Correction material:

-A FA-4 NS981666 F5895-050-9000

SERIAL: AN/WLR-1 S/N B-2 - S/N B-109. All others have this production change

IDENTITY: See bulletin

10-AN/WLR-1 - Installation of New Preselector Can Screws to all Cam Dials. Applicable only to Sylvania equipment. Refer to 10-AN/WLR-1A

Correction material: None

1-A JA-1 NS981704 F5895-066-4446

SERIAL: S/N B-2 - B-89, B91-B135, B137-B151

IDENTITY: Examination of the spring on CV-736 in question when related to the sketch will easily identify accomplishment.

11-AN/WLR-1 - Corrects nomenclature of equipments manufactured by Sylvania an NObsr-81365 (Modifies equipment to AN/WLR-1A)

Correction material: None required

2-A FA-2

SERIAL: All equipments manufactured by Sylvania under NObsr-81365

IDENTITY: All units and all literature will be marked "AN/WLR-1A" instead of "AN/WLR-1".

12-AN/WLR-1 - Relocation of High Voltage Receptacle 6J2 in CV-737/WLR-1 and 7J2 in CV-738/WLR-1 Tuners.

Correction material: None

2-A FA-1 None

SERIAL: All

IDENTITY: The CV-737/WLR-1 and CV-738/WLR-1 high voltage receptacles being located forward of the filament transformer T1 instead of aft of it.

13-AN/WLR-1 - Modification of IP-480/WLR-1 to permit analysis and scan scopes to function simultaneously.

Correction material: T- to NS93422 (Vol. I)

2-A FA-2 NS None

SERIAL: All

IDENTITY: Presence of DPST in lieu of SPST as Photo-Normal Switch on IP-480/WLR-1.

14-AN/WLR-1 - Addition of a New AC line interlock circuit relay to eliminate voltage drop in klystron power supply.

Correction material: T-5 to NS93422; T-1 to NS94932;

T-1 to NS93422.61

2-A FA-4 NS0285-077-9000 None

SERIAL: All

IDENTITY: Presence of relay 15K5 mounted on a bracket at bottom, left side of power supply PP-2156/WLR-1 chassis

15-AN/WLR-1 - Addition of Monitor Jacks for Band 8 Klystron Anode Current

Correction material: T- to NS93422

2-A FA-4 NS None

SERIAL: All

IDENTITY: Presence of two new test jacks, labelled "KLYSTRON I," in Power Supply PP-2156/WLR-1.

16-AN/WLR-1 - Provides Standby Mode of Operation

Correction material: T-6 to NS93422 (0967-037-2019)

3-A FA-4 NS0967-037-2230

SERIAL: All

IDENTITY: Presence of a three-position (ON, OFF, STDBY) POWER switch on IP-480/WLR-1

17-AN/WLR-1 - Access Hole Arrangement for CV-732/WLR-1, CV-733/WLR-1, and CV-734/WLR-1

Correction material: None

2-A FA- NS None

SERIAL: All

IDENTITY: Presence of holes in the oscillator and pre-selector covers.

*** 18-AN/WLR-1** - Replacing Frequency Converter-Tuned Cavities With Electronic Frequency Converters and the Addition of Power Supply Assembly.

Correction material: T- to NS93422

3-A FA-2 NS0967-037-2250

SERIAL: All

IDENTITY: Presence of nameplates on the new RF tuners and an additional power supply.

19-AN/WLR-1 - Cancelled

1-AN/WLR-1A - Same as 12-AN/WLR-1

2-AN/WLR-1A - Same as 13-AN/WLR-1

3-AN/WLR-1A - Same as 14-AN/WLR-1

4-AN/WLR-1A - Same as 15-AN/WLR-1

5-AN/WLR-1A - Same as 16-AN/WLR-1

6-AN/WLR-1A - Same as 6-AN/WLR-1

7-AN/WLR-1A - Same as 7-AN/WLR-1

8-AN/WLR-1A - Same as 8-AN/WLR-1

9-AN/WLR-1A - Same as 9-AN/WLR-1

10-AN/WLR-1A - Same as 10-AN/WLR-1

11-AN/WLR-1A - Same as 17-AN/WLR-1

COUNTERMEASURES**NAVSHIPS****0967-000-0070****FIELD CHANGE
IDENTIFICATION GUIDE**

* **12-AN/WLR-1A** - Same as 18-AN/WLR-1

* This Field Change Eliminates Requirement For FC 12, 14, and 15-AN/WLR-1; FC 1, 3, and 4-AN/WLR-1A

13-AN/WLR-1A - Cancelled

1-AN/WLR-1B - Improves High Frequency Performance

Correction material: T- to NS94932

3-C FA- NS981766

SERIAL: Gen. Instrument Corp. 1 thru 9 (Part A) - 19 thru 21 (Part B)

IDENTITY: There are three items which indicate that the field change described herein has been accomplished. All three are visible on the secondary capacitor A2 (54 of figure 3-9) in Overhaul and Repair Manual (NAVSHIPS 94932.61). A spacer (8 of figure 1), has been installed between the casting and the forward bearing retainer. One elastic clinch nut (14 of figure 1) has been removed from the spring plate. The drive shaft is metal clad for 1-15/32" from the front surface instead of 1-31/32".

2-AN/WLR-1B - Same as 12-AN/WLR-1

3-AN/WLR-1B - Same as 13-AN/WLR-1, except correction material is: T- to NS94932 (Vol. I & II).

4-AN/WLR-1B - Same as 14-AN/WLR-1, except correction material is: T-1 to NS94932.

5-AN/WLR-1B - Same as 15-AN/WLR-1, except correction material is: T- to NS94932 (Vol. I & II).

6-AN/WLR-1B - Same as 16-AN/WLR-1, except correction material is: T-2 to NS94932 (0967-065-2012)

7-AN/WLR-1B - Same as 17-AN/WLR-1

* **8-AN/WLR-1B** - Same as 18-AN/WLR-1, except correction material is: T- to NS94932.

9-AN/WLR-1B - Same as 6-AN/WLR-1, except correction material is: T-3 to NS 0967-065-2010 (order 0967-065-2013)

1-AN/WLR-3 - F.C. Kit modifies the Detector Switching Unit RF-81/WLR-3 to Detector Switching Unit RF-134/WLR-3A and modifies the Amplifier Control AM-1936/WLR-3 to AM-2996/WLR-3A for operation with the AN/BLR-1 equipment.

Correction material: Change 1 to NS0967-037-3010

(formerly NS93139(A))

1-A YF-24 NS981299 F5895-973-3246

SERIAL: For submarine installations only.

IDENTITY: Equipment nomenclature changed to AN/WLR-3A

1A-AN/WLR-3 - Supplement Information to Field Change

1-AN/WLR-3 for operation with AN/WLR-1 equipment

Correction material: T-1 to NS0967-037-3010 (formerly NS93139(A))

1-A FA-30 NS981299 None

SERIAL: For submarine installations only

IDENTITY: Equipment nomenclature changed to AN/WLR-3A

2-AN/WLR-3 - Cancelled

* This Field Change Eliminates Requirement for FC

5-AN/WLR-1B

1-AS-570/SLR - Reflector counter wgt replace: refl size reduce; breather holes, install

Correction material: T-2 to NS 91997(A)

B YF-5 NS98533 F5985-324-2067

SERIAL: 1-130

IDENTITY: New counterweight is cylindrical; mounted on threaded bolt attached to the antenna mounting ring.

Note: FC 1-OA-473/SLR must be accomplished prior to this FC.

2-AS-570/SLR - Freq coverage of AS-570/SLR, extend (changes to AS-605/SLR)

A YF-8 NS98619 F5985-324-9933

SERIAL: SHIPS w/AN/SLR-2 having AS-570/SLR and AS-571/SLR (50)

IDENTITY: Ant nameplate changed to AS-605/SLR.

3-AS-570/SLR - Maintenance improvements

Correction material: T-1 to NS 92366

B YF-1 NS98701 None

SERIAL: 1-209

IDENTITY: Access hole drilled on side of rate generator, 1/2" in dia. 2-1/2" from top. (Rate generator housing)

1-AS-571/SLR - Radome assy on CW-456/SLR, add

Correction material: T-1 to NS 92388

1-B YF-8 NS98998 F5985-543-1478

SERIAL: All

IDENTITY: Addition of radome assy.

2-AS-571/SLR - Prevention of Antenna Rotation During Maintenance

Correction material: To NS92388 - T-3 and T-3 to NS92085 (A)

2-A FA-1 NS981386 None

SERIAL: When FC-1 (Addition of Radomes) is completed

IDENTITY: Presence of watertight switch mounted at the base of the antenna.

3-AS-571/SLR - Cancelled.

1-AS-605/SLR - Maintenance improvements

Correction material: T-4 to NS 91997(A)

2-A FA-1 NS98701 None

SERIAL: 1-209

IDENTITY: Safety wire installed on the four 6-32 x 7/16" long fillister-head screws of servo motor shaft adapter.

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IDENTIFICATION GUIDE****1-AS-616/SLR - Mechanical improvements**

Correction material: None

2-A FA-3 NS981082 None

SERIAL: 1-363

IDENTITY: Lower main shaft oil seal KZ-5330-291-7140 installed (symbol 0-410).

2-AS-616/SLR - Radome assy CW-456/SLR, add

Correction material: T-2 to NS 92085(A)

1-B YF-8 NS98998 F5985-543-1478

SERIAL: All

IDENTITY: Addition of radome assy

3-AS-616/SLR - Same as 2-AS-571/SLR except Serial:

When F.C. 2 has been completed.

Correction material: To NS92085 (A)

IDENTITY:

4-AS-616/SLR - Cancelled.**1-AS-899/SLR - Antenna Direction Indicator**

Correction material: None

2-A FA-12 None

SERIAL: All

IDENTITY: Aluminum arrow located on antenna reflector assembly and extended over and below antenna main bearing.

2-AS-899/SLR - Filter Bandpass 120 Cycle

Correction material: T-1 to NS94272(A)

1-A FA-1 NS981797 F5895-763-1375

SERIAL: Numbers Unknown

IDENTITY: Filter, when installed, lies behind C1201 in base of antenna.

3-AS-899/SLR - Wiring Change required for Compatible

Operation with the AN/WLR-1 ECM equipment and Antenna Control unit

Correction material: T-1 to NS93409(0967-080-7011)

2-C FA-1 NS0967-080-7040 None

SERIAL: All

IDENTITY: This Field Change can be identified by viewing from above the antenna and noting the clockwise rotation of the AS-899/SLR or AS-899A/SLR antenna when the Antenna Control-Indicator unit is in the "Automatic" operation mode.

1-AS-899A/SLR - Same as 2-AS-899/SLR**2-AS-899A/SLR - Replacement for Motor Coupling**

Correction material: T-2 to NS0280-768-2003 (formerly NS94272A)

1-A FA- NS0285-076-4200

SERIAL: All

IDENTITY: Refer to Technical Manual NS94272(A) tables 7-1 and 7-2

3-AS-899A/SLR - Same as 3-AS-899/SLR**3-C-1068/SLR - Change of Nomenclature**

2-A FA-1/2

SERIAL: All equipments to which the MK-483/SLR modification has been installed.

IDENTITY: When the letter A has been added to the equipment designation on the nameplate of each applicable equipment

1-C-1213/SLR - Same as 3-C-1608/SLR**1-C-1608/SLR - Polarization sw. wiring, chg**

Correction material: Change 1 to NS 92490

1-A FA-2 NS98924 F5895-536-2412

SERIAL: When using AS-605/SLR

IDENTITY: Instruction decal affixed to left of polarization sw. on front panel.

2-C-1608/SLR - Cancelled - Superseded by F.C.

4-C-1608/SLR

3-C-1608/SLR - Change of Nomenclature

Correction material: T- to NS

2-A FA-1/2

SERIAL: All equipments to which the MK-483/SLR modification Kit has been installed.

IDENTITY: When the letter "A" has been added to the equipment designation on the name plate of each applicable equipment.

4-C-1608/SLR - Installation of Control Relay to Remove 115VAC from D.F. Antenna Motors and Magnetic Amplifier Reactors (Cancels and supersedes FC 2-C-1608/SLR)

Correction material: T-2 to NS92490

2-A FA-2 NS0967-892-5040

SERIAL: All

IDENTITY: Presence of relay installed at bottom of chassis, between TB-207 and TB-208

1-C-1608A/SLR - Installation of a Safety Cover to Protect Video Scanner

Correction material: T- to NS

2-A FA-2

SERIAL: All C-1608A/SLR

IDENTITY: Aluminum shield installed to protect photoelectric scanner assembly of MK-483/SLR kit.

1-C-1609/SLR - Wiring chg

Correction material: T-1 to NS 92595

A FA-2 NS98598 None

SERIAL: 1-11, 31 360

IDENTITY: A jumper is added from term P of TB-605 to term P of TB-606 and to term F of TB-607 (located under-side of chassis).

COUNTERMEASURES

NAVSHIPS

0967-000-0070

FIELD CHANGE
IDENTIFICATION GUIDE**2-C-1609/SLR** - Synchro mount insert, add

Correction material: None

1-A FA-2 NS98858 F5895-699-5500

SERIAL: 1-360

IDENTITY: Housing of synchro B-603 counterbored to accept a granite cup.

3-C-1609/SLR - Antenna Control Change

Correction material: T-2 to NS 92595

2-A FA-1 NS981091 None

SERIAL: 1-448

IDENTITY: New conductor running from term #2 to TB-602 to term "B" of switch S-604.

4-C-1609/SLR - Polarization sw wiring, chg

Correction material: Change 1 to NS 92595

1-A FA-2 NS98924 F5895-526-2412

SERIAL: When using AS-605/SLR

IDENTITY: Instruction decal affixed to left of polarization sw. on front panel.

5-C-1609/SLR - Modifies to C-3118/WLR

Correction material: 92595 (C-1609/SLR); 93505 (C-3118/WLR)

1-B FA-4 NS981493

SERIAL: All used with AN/WLR-1() equipment

IDENTITY: Installs a MK-483/WLR or MK-483B/WLR transistorized calibrating assembly for use with AN/WLR-1(). Nomenclature change to C-3118/WLR or C-3118B/WLR

6-C-1609/SLR - Control Indicator Protector Plate for Time

Delay Relay K-601

Correction material:

2-A FA-1 None

SERIAL: All

IDENTITY: Phenolic cover plate installed over K-601.

7-C-1609/SLR - Modification of Control Indicator C-1609/

SLR for use with Countermeasures Receiver AN/WLR-1 (Modifies equipment to C-3118A/WLR)

Correction material: None required

1-A FA-4 NS981656 FSN F5895-961-9604

NOTE: Field Change 5-C-1609/SLR and 7-C-1609/SLR accomplish the same result, hence, one or the other is applicable.

SERIAL: C-1609/SLR equipments when operated with AN/WLR-1

IDENTITY: Modified units will have a modification plate mounted in the vicinity of the original nameplate indicating a change in nomenclature from C-1609/SLR to C-3118A/WLR.

8-C-1609/SLR - Addition of Protective Circuit for D.F. Antennas

Correction material: Incorporated in revised Technical Manuals

2-A FA-6 NS 0285-081-1200 None

SERIAL: All C-1609/SLR serial numbers

IDENTITY: Automatic speed control potentiometer incorporates "ON-OFF" switch to preclude switching DF antennas while automatic speed control is in maximum speed position.

1-C-3118/WLR - Same as 8-C-1609/SLR**1-C-3118A/WLR** - Same as 8-C-1609/SLR**1-C-3118B/WLR** - Same as 8-C-1609/SLR**1-DAK** - Not applicable**1-DBM-1** - S107, chg wiring

A FA-6 FC-2-45 F5825-301-8440C1

SERIAL: 1-100

IDENTITY: If oscillation of the true bearing dial occurs while the selector switch is in the relative bearing position the field change is not accomplished.

2-DBM-1 - Scanning cap, coupling, chg

A FA-½ FC-10-45 F5840-311-2475C1

SERIAL: 1-100

IDENTITY: The rubber scanning capacitor coupling is replaced by metal.

3-DBM-1 - Bullet in ant. R.F. rotary joint, chg

A FA-1 FC-26-45 F5840-311-2473C1

SERIAL: 1-252

IDENTITY: In the antenna new pins are silver plated soft brass.

4-DBM-1 - Equalizer for 1f ant., install

B YF-1 FC-49-46 F5840-311-2474C1

SERIAL: 1-289

IDENTITY: A 20 mfd capacitor is placed in series with the vertical antenna and relay K-201; from the junction of capacitor and relay is inductor L-203 in series with a 47 ohm resistor to ground.

1-DUUG-1B - Addition of New Interlock Micro-Switch

Correction material: TM for DUUG-1B and 1C - T-1 to NS93717

2-A FA or YF-8 NS981589 None

SERIAL: All

IDENTITY: Presence of a red and white wire running to the interlocks of the upper and lower units of the DUUG-1.

COUNTERMEASURES**NAVSHIPS****0967-000-0070****FIELD CHANGE
IDENTIFICATION GUIDE****2-DUUG-1B** - Replacement of Primary Power Fuses

Correction material: T-2 to NS93717

2-A FA-2 None

SERIAL: All

IDENTITY: Fuse identification plate attached to the lower chassis front panel under the primary fuse holders.

1-DUUG-1C - Same as 1-DUUG-1B**2-DUUG-1C** - Same as 2-DUUG-1B**3-DUUG-1C** - Replacement of Resistor

Correction material: None required

2-A FA-1 NS None

SERIAL: All

IDENTITY: Proper recording of field change number on Field Changes Accomplished plate.

1-OA-473/SLR - Nom chg OA-473/SLR to 9A-570/SLR cont-ind C-1213/SLR; ampl cont AM-825/SLR

Correction material: T-2 to NS 91997(A)

1-A FA-3 NS98532 F5985-324-2066

SERIAL: 1-160

IDENTITY: New nameplates appear on AS-570 & C-1213.

1-OA-532/BLR-1 - Install dual rotary joint

1-A YF-20 NS98997 F5985-626-2319

SERIAL: Concurrent with installation of AN/WLR-3

IDENTITY: Modifies equip designation to OA-1903/BLR-1

1-OA-1903/BLR-1 - Replacement of Servo Amplifier with IF Synchro in C-1164/BLR-1

Correction material: T-3 to NS91974 (0967-961-5010)

2-A FA-12 NS981387 None

SERIAL: All

IDENTITY: Noting the Absence of the servo amplifier and the presence of an IF synchro in C-1164/BLR-1.

2-OA-1903/BLR-1 - Replacing Non-Polarized Connectors with Polarized Connectors

Correction material: T-2 to 91974 (0967-961-5010)

2-A FA-1½ NS981579 None

SERIAL: AM-793/BLR-1, C-1164/BLR-1 in the OA-532/BLR-1 Antenna Group

IDENTITY: Presence of polarized connectors for J-4103 and J-4109

1-OA-6416/FRD-10A (V) - Change in Cabling for OA-6416/FRD-10A, used with Directoion Finder Set AN/FRD-10A (V)

Correction material T-1, NS0967-080-0041 to 0967-080-0040 (formerly NS95744, Vol. IV)

2-A FA-1/4 NS0967-080-0100 EIB 661

SERIAL: Applies only to OA-6416/FRD-10A(V), Channel Watcher Position 1. Other Channek Watcher Positions are not affected.

IDENTITY: This field change can be identified by turning OFF the Power Supply, PP-3950/FRD-10A, for the Azimuth Indicator and the Control Indicator and observing that this does not render the Angle Counter Inoperative

2-OA-6416/FRD-10A(V) - Addition of Connector in Leads to Airflyte Monitor Beam Selector Switch

Correction material: T-1 to NS0967-080-0040 (Vol. 4)

2-A FA-2 NS0967-080-3010

SERIAL: All used with AN/FRD-10A(V)

IDENTITY: Slide Report Control Unit forward and observe connector installed in the leads to the Airflyte Monitor Beam Selector Switch.

3-OA-6416/FRD-10A(V) - Provides Fabrication and Installation Instructions for Mounting Transistor Specialties, Inc. (TSI) Digital Frequency Readout Module

Correction material: T- to NS

1-A FA-4 NS0967-080-3020

SERIAL: All

IDENTITY:

1-PP-1092/U - Installation of thermal time delay relay in primary circuit of T-2.

Correction material:

2-A FA-2 NS None

SERIAL: Equipments when installed for use with AN/ARC-1, -1A

IDENTITY: Presence of a thermal time delay relay installed on the bottom of the power supply chassis adjacent to C-4.

1-PU-383/M - Improved Engine Speed Control and Shutdown

Correction material:

1-A YF-8 NS981492

SERIAL: 100 Navy owned equipments

IDENTITY: New solenoid valve attached to governor Output and the Audio Level

COUNTERMEASURES**NAVSHIPS****0967-000-0070****FIELD CHANGE
IDENTIFICATION GUIDE****1-R-839/FLR-2** - Minimizing Interaction Between the Video

Correction material: NS93148

2-A FA-1 NS981308 None

SERIAL: All

IDENTITY: Substitution of resistor R-124 (47K) with a 22K and a 16K resistor connected in series to the plate pin 6 of V-106.

1-R-839A/FLR-2 - Same as 1-R-839/FLR-2**1-R-839B/FLR-2** - Same as 1-R-839/FLR-2**1-R-839C/FLR-2** - Same as 1-R-839/FLR-2**1-X-RDJ** - Pulse Analyzer Operation, Improve

A FA-3 NS98876 None

SERIAL: 1-25

IDENTITY: R-201, 1.2 meg between hi side of horiz positioning cont R194A and R194B.

1-RDJ - Pulse analyzer operation, improve

A FA-2 NS98876 None

SERIAL: 1-250

IDENTITY: Ser 1-67 only, R-201, 1.2 meg, connected between R-194A and R-194B; high side of R-194A and R-192B connected to 150V DC unregulated supply. Ser 1-216 only: C-147 (between pin 5 of V-11) and position 2 & 3 of S-104B connected to pin 5 of V-111 and R-178. R-128 and R-129 replaced with 6800 ohm 2 watt resistors each. (All ser. nos. 1-250).

1-RDP - Sweep osc shaft extension

Correction material: See NS 98734

2-A FA- NS98734 None

SERIAL: All

IDENTITY: Allows adjust of osc-tuning slug thru access hole.

2-RDP - through **3-RDP** - Cancelled**4-RDP** - Reverse capacitor connections

Correction material: None

2-A FA-1 NS98258 F5820-321-2821

SERIAL: All

IDENTITY: Leads connecting C-105 to V-104 run parallel and connect to pins 3 & 6.

1-SA-1136/FRD-10A(V) - Corrects Excessive Cable and Connector Protrusion.

Correction material: None

2-A FA-4 NS0285-077- None
8000

SERIAL: All

2-SA-1136/FRD-10A(V) - Replaces Switch S1 in Beam Sector with Four-Position SwitchCorrection material: T-1 to NS0967-080-0020 (Vol. 2),
T-1 to NS0967-080-0050 (Vol. 5),
T-1 to NS0967-080-0060 (Vol. 6)

1-A YF-1 NS0967-080-1100 None

SERIAL: All

IDENTITY: The new switch is rotary rather than toggle.

1-SA-1137/FRD-10A(V) - Same as 1-SA-1136/FRD-10A(V)**1-66132(CAGW)** - Improved stub repl (makes 66132-A)

Correction material: None

A FA-1/2 NS98570 F5985-324-2065

SERIAL: All

IDENTITY: Base for new stub is approx. 7-1/2" wide. Old one is 3-1/2" approx. New stub is fibre glass and old one is wood.

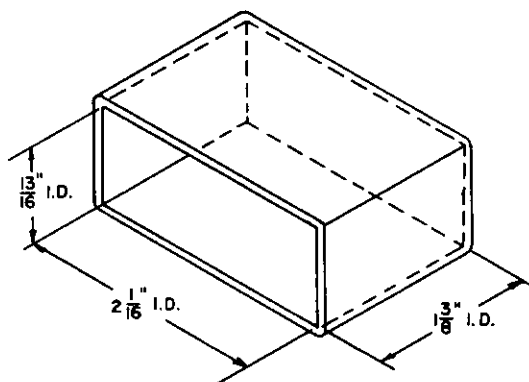
CONNECTOR PROTECTION OF AN/BLR-1 AND AN/SLR-2 TUNERS AND MIXER AMPLIFIERS

The use of plug covers to protect the connectors on the tuners and mixer amplifiers of the AN/BLR-1 and AN/SLR-2 Countermeasures Receiving Sets has been suggested by Walter C. Hanke of the San Francisco Naval Shipyard.

These plug covers eliminate breakage during transit to and from the shop and the ship. The covers can be made

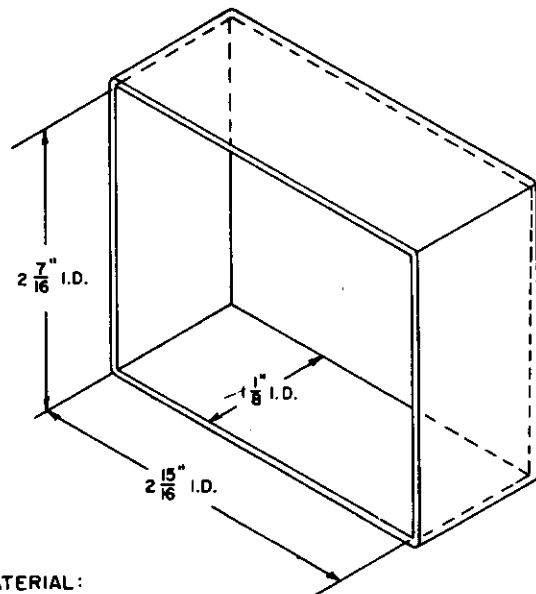
from 1/16-inch aluminum stock. Fabricate the three different sized covers, as shown in figures 1, 2, and 3, to protect the plugs in the tuners and mixer-amplifiers.

By using the figures shown as guidance plans, covers also can be manufactured for the AN/WLR-1. The dimensions of the covers will have to be changed, in some instances, to fit the plugs on the AN/WLR-1. (607)



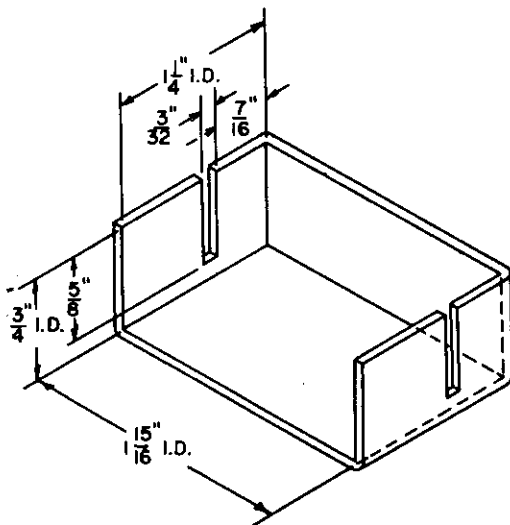
MATERIAL:
1/16" TK. ALUMINUM

Figures 1 and 2



MATERIAL:
1/16" TK. ALUMINUM

Figure 3



MATERIAL:
1/16" TK. ALUMINUM

AN/FLR-11(V) AND AN/FRA-54(V) EQUIPMENTS – Safety Improvements FOR

Operation and safety have been enhanced by maintenance personnel of the Naval Communication Station, Honolulu, by the installation of a screen over the blower fan assembly in the base of the RO-247/F and RP-132/F units of the AN/FLR-11(V) and AN/FRA-54(V) equipments. Not only has the blower screen installation eliminated a personnel safety hazard from exposed fan blades, but damage from cable connectors, tools, or other items accidentally dropped during maintenance has been avoided. This desirable equipment improvement is described here for implementation by all activities utilizing the RO-247/F and RP-132/F record/reproduce machines.

Materials Required by Installing Activity:

1. One $\frac{1}{4}$ inch mesh metal screen $12\frac{1}{2}$ inches long and $10\frac{1}{4}$ inches wide
2. Four hexagonal head screws $1\frac{1}{4}$ inch by 8/32 thread
3. Eight 8/32 nuts and lock washers
4. Four $\frac{1}{2}$ inch stand-off spacers

Procedure:

1. Clip two of the screen corners at 45 degree angles.
2. Bend edge of screen all around to a 90 degree angle to form $\frac{1}{4}$ inch lip.
3. Secure power to blower unit.
4. Install screws and stand-off spacers in screen and top cover of blower unit (see figure 1 detail).
5. Place screen over the four installed screws and secure with 8/32 nuts. Should it be necessary to remove the screen, only the four nuts need be removed. (17S)

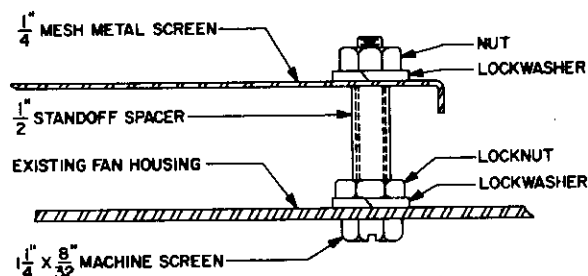


Figure 1. Method of Installing Protective Screen

**ANTENNA GROUP AN/SLA-12 AND ANTENNA AS-1750/
SL-PRESSURIZATION OF**

Radomes on Antenna Group AN/SLA-12 and Antenna AS-1750/SL burst from small amounts of overpressure.

BUSHIPS installation drawings RE 67D2407 Rev. B and RE 67D2408 Rev. A specify two (2) PSI maximum pressurization for these antennas.

Extreme care must be exercised to insure that the pressurization never exceeds the two (2) PSI maximum in order that rupturing of the antenna radomes may be averted. (691)

AN/SLR ALINEMENT AND CALIBRATION

Checks, of the power-supply voltage (PP-312/ULR) of AN/SLR equipment, are not being made as frequently as they should. Tuners and mixers have been repaired and calibrated; yet reported unsatisfactory when returned to the ship. Checks of the power supply in these cases have shown that the voltages were low. After adjustment of voltages, satisfactory operation was achieved. A ships test check of power-supply voltage variations gave the following results with tuning head TN-138:

- a. A decrease of 10v in the - 105v supply decreased the sensitivity by 20 microvolts.
- b. A decrease of 15v in the 150v supply decreased the band-width by 20%.
- c. A change of 10% in the - 150v and - 105v supplies caused the second detector current to change up to 30%.
- d. An increase in -150v and - 105v increased the second detector noise but not sensitivity.

All ships having AN/SLR equipment should insure that that the power-supply voltages are correct before making a visual check for proper operation of the tuners and mixers; otherwise, a false assumption of misaligned tuners and mixers may result. A frequency check should be made of power-supply voltages, using AN/PSM-4A or equivalent, as set forth on page 7-123 of NAVSHIPS 91973.

COUNTERMEASURES RECEIVING SET AN/SLR-2

Refer to article under AN/BLR-1 on installation of these equipments.

AN/SLR-2 - SHOCK HAZARD

There exists a shock hazard in some AN/SLR-2 installations and the cause is due to a wiring error between Power Supply PP-312/ULR and Switch Assembly SA-187/ULR.

BUSHIPS plan RE8H2763B shows the lead from terminal 23 of TB-2802 in the PP-312/ULR connected incorrectly to terminal 25 of TB-1608 in SA-187/ULR. The correct terminal is 23 on TB-1608 which provides a ground return for the supply voltage and eliminates the shock hazard. Activities holding copies of RE8H2763B should correct the plan accordingly.

Although most AN/SLR-2 installations have been corrected, all AN/SLR-2 installations should be checked by ships maintenance personnel to ensure that the correct terminal connection has been used. (562)

AN/BLR-1 AND AN/SLR-2 LIGHT FILTER

See article in AN/BLR-1 section under the same title. (607)

WAVEGUIDE AND ADAPTERS AVAILABLE FOR COUNTERMEASURES RECEIVING SETS AN/BLR-1, AN/SLR-2 AND AN/SLR-3

See article in AN/BLR-1 section under the same title. (607)

COUNTERMEASURES SERVICE NOTE - AN/BLR-1 AND AN/SLR-2

See article in AN/BLR-1 section under the same title. (566)

AN/BLR-1, AN/SLR-2, AND AN/WLR-1, REPLACEMENT OF REFLECTOR AND SERVO POTENTIOMETERS - MAINTENANCE HINT

See article in AN/BLR-1 section under the same title. (620)

AN/BLR-1 AND AN/SLR-2 - MEASURING ANALYSIS SWEEP GENERATOR OUTPUT WAVEFORM IN COUNTERMEASURES RECEIVING SETS

See article in AN/BLR-1 section under the same title. (601)

AN/BLR-1, AN/SLR-2 - RF Tuner Plunger Bearing Assemblies

See article in AN/BLR-1 section under the same title. (648)

AN/BLR-1 and AN/SLR-2 RF Tuner Synchro Motor Interference Source

Refer to article in AN/BLR-1 section under the same title. (644)

ECM Remote Panoramic Presentation

Refer to article in AN/BLR-1 section under the same title. (646)

AN/BLR-1, AN/SLR-2, and AN/WLR-1 () - ECM TUNER FAILURES

See article in AN/BLR-1 section under the same title. (656)

AN/BLR-1, AN/SLR-2, AN/WLR-1, -1A, -1B - 5721 KLYSTRON FAILURES - MAINTENANCE HINT

See article in AN/BLR-1 section under the same title. (675)

SURFACE SHIP ECM ANTENNAS

See article in AN/WLR-1 Section under the same title. (593)

CONNECTOR PROTECTION OF AN/BLR-1 AND AN/SLR-2 TUNERS AND MIXER AMPLIFIERS

See article in AN/BLR-1 section under the same title. (607)

AN/ULQ-6A- INSTALLATION AND MAINTENANCE HINT

The purpose of this article is to notify installing activities and maintenance personnel of the critical length of RCA-furnished cable W-11.

Design parameters of the AN/ULQ-6A dictates that RCA-furnished cable W-11, RCA Dwg. No.2140930-501, be five feet or less in length. Accordingly, installing activities shall ascertain that the AN/ULQ-6A equipment arrangement is such that longer cable is not required.

Maintenance personnel replacing this cable shall fabricate the new cable the same length as the one removed. (647) (652)

AN/ULQ-6A, ADJUSTING HIGH VOLTAGE POTENTIOMETERS

High voltage potentiometers R16, R17, R20, R37, R45, and R47, located in the Low Level TWT Power Supply, 1A2, are adjusted through insulated high voltage coupling shafts. Care should be exercised when adjustments are required, since failure to loosen the locking nut, and/or the use of excessive torque, will cause the coupling shaft to break. (674)

AN/ULQ-6, AN/ULQ-6A, and AN/ULQ-6B-HIGH LEVEL TRAVELING WAVE TUBE "BAKE-IN" PROCEDURE

When the high level traveling wave tube is initially installed in Electronic Countermeasures Sets AN/ULQ-6, 6A, 6B, internal arcing may result when helix voltage is first applied, if a "Bake-In" procedure is not followed. "Bake-In" consists of operating the tube for a minimum period of one hour with filament voltage and, simultaneously, without helix and collector voltages. This can be accomplished by keeping the equipment in STBY & OVLD RESET for one hour before advancing the EQUIPMENT READINESS switch to ALERT.

The "Bake-In" procedure should be followed each time a new high level traveling wave tube is installed. Likewise, when a tube has been inoperative for a period of one month or more, "Bake-In" will be helpful.

It is essential that internal arcing be prevented, if the expected life of the tube is to be attained. (676)

AN/ULQ-6A WAVEGUIDE SWITCH ASSEMBLIES-REPAIR OF

Failures of AN/ULQ-6A waveguide switch assemblies (W/G SW ASSY) 1A4S1 and 1A4S2, in most cases, can be corrected by replacement of a micro-switch internal to the W/G SW ASSY.

The microswitch is located in the head of the actuating coil assembly. During momentary actuation, the purpose of the microswitch is to provide a bypass across a 150-ohm current limiting resistor, which is in series with the actuat-

ing coil of the W/G SW ASSY. A malfunction is readily identified by first removing external control wires from one of the two control terminals of the W-G SW ASSY, and then checking the resistance between the terminals. One of the following symptoms can be expected:

- a. A resistance of approximately 30-ohms, indicating normal condition.
- b. A higher resistance between approximately 30 and 180-ohms, strongly indicating malfunction of the internal microswitch.

When the higher resistance is measured, replace the microswitch before procuring and replacing the entire W-G SW ASSY. The microswitch costs \$2.50, as compared with \$261.98 for the complete W/G SW ASSY.

The microswitch is listed under FSN TX9N 5930-803-4570 and is listed on the COSAL of some ships for other equipments. The microswitch does not have an ULQ-6A circuit symbol number assigned.

When remounting the actuating coil on the W/G SW ASSY, assure that the actuating coil key pin (bottom of unit) is inserted into the slotted hole of the actuating arm in the W/G SW ASSY. (691)

AN/ULQ-6A COUNTERMEASURES SET-ANTENNA LUBRICATION PROCEDURE FOR**A. GENERAL:**

1. Many antennas, Unit 6 of Countermeasures Set AN/ULQ-6A, have been found overdue for cleaning and lubrication. It is recommended that ships' companies inspect the units and perform the necessary maintenance at an early date.

2. The antenna should be lubricated annually with aircraft and instrument grease MIL-G-3278. Federal stock numbers and procurement quantities are listed in EIB 646.

B. DISASSEMBLY

NOTE: Part numbers are identified in NAVSHIPS 94551, Technical Manual for Countermeasures Set AN/ULQ-6A, page 6-19, figure 6-7.

1. Set antenna heater power switch to OFF.
2. Set equipment MN PWR CKT BKR to OFF.
3. Close air pressure valves to waveguides.
4. Secure drop cloth on platform below the antenna group to catch dropped hardware.
5. Remove 2 access doors (54) and gaskets (55) by loosening 16 captive screws (53).
6. Remove 2 cover retaining chains (52) by removing screw (94) and well nut (93) from housing (62).
7. Remove 2 covers (26) by removing 2 vee bands (21) and 2 shock absorbers (20).
8. Remove 2 preformed gaskets (19).
9. Remove 2 external waveguide sections that mate with 2 waveguide sections (13) by removing 8 screws and 16 washers.

10. Remove 2 preformed gaskets (12).
11. Remove 2 waveguide supports (8) by removing 8 screws (10), 8 washers (11), and 8 flat head screws (9).
12. Remove 2 preformed gaskets (6).
13. Disassemble 2 waveguide sections (29) from 2 rotary joints (42) by removing 8 screws (48) and 8 washers (47).
14. Remove 2 waveguide clamps (37) by removing 4 screws (38) and 4 washers (39).
15. Remove 2 shims (43).

CAUTION: Do not attempt to disassemble the rotary joint. This is a replaceable item which requires laboratory equipment for service and alignment.

16. Remove 2 rotary joint assemblies (42) and 2 waveguide flex sections (13) by removing 6 screws (40) and 6 washers (41). Maneuver rotary joints and waveguide flex sections out the back of antenna housing.
17. Remove 2 heaters (63) (107). Heater power cables can remain connected.
18. Remove 2 antenna housings (69) by removing 8 screws (24), 8 washers (22) and 8 lockwashers (23). Antenna housings (69) fit snug over bearing gear assemblies (106) and may require prying antenna housing from bearing gear assembly on some antennas.
19. Remove motor (56) by removing 4 screws (58) and 4 washers (57).
20. Remove synchro (83) and gear assembly (84) by removing 3 screws (76) and synchro clamps (77).

NOTE: Bearings and gears to be lubricated are now accessible.

C. LUBRICATION:

1. Clean all parts that show signs of dirt and/or corrosion especially around outer edge of antenna housing (69).
2. Apply grease to bearing gear assemblies (106).
3. Apply a layer of grease along preformed gaskets (18) which are seated along outer edge of antenna housing (69) (this area is susceptible to corrosion).
4. Apply grease to gears and pinions (3), (97) and (98). These are accessible through openings where motor (56) and synchro (83) were mounted.

NOTE: The remaining bearings are grease-sealed and should require no lubrication.

D. REASSEMBLY:

1. Reassemble the antenna group in the reverse order of disassembly.

CAUTION: When installing motor (56) and synchro (83) make certain that gears mesh properly before tightening screws.

2. Realign synchro (83) after assembly of antenna and before securing access covers (54). (689)

SURFACE SHIP ECM ANTENNAS

This article designates the various ECM antennas to use in band 6 of the AN/WLR-1 and band 5 of the AN/SLR-2 when either is used with ECM antennas AS-571/SLR, AS-616/SLR, or AS-899/SLR.

At the present time, when the above bands are in use on the above equipment, two different D/F antennas can be used, the AS-899/SKR and the AS-616/SLR. When using the AS-616/SLR in these bands, the antenna selector switch on control storer C-2697/SLR-1 must be in the "special" position. The polarization switch on antenna control unit C-1609/SLR can be in the vertical or horizontal position. When using the AS-899/SLR on the same bands, the antenna selector switch on the control storer must be in the "DF" position. The polarization switch on the antenna control unit C-1609/SLR must be in the horizontal position. The following table can be used to determine which D/F antenna to use with the AN/WLR-1.

Antenna	Band	Antenna Selector Position	Antenna Selector	Polarization
		C-1609/SLR	C-2697/WLR	C-1609/SLR
AS-571	4	A	DF	H or V
AS-616	5	B	DF	H or V
AS-616	6	B	Special	H or V
AS-899	6	C	DF	H
AS-899	7	C	DF	H
AS-899	8	C	DF	V
AS-899	9	C	DF	V

The table can be used with the AN/SLR-2 by subtracting 1 from the band number; for example, band 4 on the AN/WLR-1 is equivalent to band 3 on the AN/SLR-2.

The table should be kept in a convenient place for each reference. (593)

AN/WLR-1-FREQUENCY INDICATOR SERVO ASSEMBLY FAILURES: MAINTENANCE HINT

The purpose of this service note is to provide a maintenance hint for repair and maintenance of Frequency Indicator Servo Assembly 12A13. Frequency Indicator Servo Motors, (12A13B1) FSN 1N6105-706-9468, in all models of AN/WLR-1, are frequently the cause of reduced ECM intercept capability. Whenever failure of the servo motor occurs, maintenance personnel should determine whether or not bearing replacement will restore the motor to optimum operating condition before replacing the entire motor. The bearing used in the servo motor is not listed in the Allowance Parts List (APL) nomenclature code 58981700 as an

individual part, however the same type bearing is listed in the APL as 12A13A1MP5 and 13MP105. The Federal Stock Number (FSN) for the bearing is KZ3110-198-2923.

Sluggish operation of Frequency Counter 12A13M1 also is a contributing factor to the failure of the servo motor. Before attempting replacement, maintenance personnel should check the counter for smoothness of operation by turning the gear assembly by hand through several revolutions. If any binding is noted the counter should be cleaned and very lightly oiled. Extreme caution should be exercised when oiling the counter to prevent the lubricant from reaching the plates of Clutch 12A13A1. The recommended type oil to be used to lubricate the counter is Instrument Oil, Mil-G-6085, FSN 9W9150-664-6581.

It is further recommended that the plates of Clutch 12A13A1 be cleaned after lubrication of the counter. A cleaning solvent which leaves no oily film, such as inhibited methyl chloroform, should be used for cleaning the counter and clutch plates. Refer to NAVSHIPS 900,000,100, Electronics Installation and Maintenance Book, pages 3-8 and 3-9, for procedures and special precautions to be exercised when using the recommended cleaning solvent. (664)

AN/WLR-1 TUNERS CV-1159/WLR-1 THRU CV-1162/WLR-1

It has been noted in two sets of the subject tuners that, when installed and operated in the "Scan" mode, the tuners would scan up in frequency when they were supposed to be going down. The tuners will usually go to one end of the band, jam there and stop scanning. The reason for this is that some of the tuner motors were wired backwards.

To correct the situation, the following should be accomplished:

1. Remove the panel mounting screws.
2. Interchange the wires on terminals 2 and 4 of the tuning servo motor.
3. Replace the tuner front panel.

This action will reverse the direction of rotation of the tuning servo motor and permit satisfactory servo operation and alignment. (657)

AN/WLR-1() MAINTENANCE HINT-REPLACEMENT PROCEDURE FOR RESISTOR A8R5

Radio Frequency Tuners CV-1160/WLR-1, CV-1161/WLR-1 and CV-1162/WLR-1 employ a 10-ohm beam current metering resistor A8R5 which frequently fails when the local oscillator klystron draws excessive current. On equipments which have A8R5 mounted on the backside of component board A8, the following procedure will permit replacement without disturbing tuner alignment:

1. Remove the four Phillips head screws securing the front panel to the main frame. Swing front panel to left side taking care not to break off leads.

2. Remove the seven Phillips head screws securing the high voltage helipot shield assembly to the main frame. It may be necessary to lift drawer from drawer slide to remove the shield.

3. Remove the four Phillips head screws securing component board A8 to main frame. Resistor A8R5 is located on the backside of the board.

4. Replace A8R5.

5. Reassemble equipment using steps 1 thru 3 in reverse order.

A manufacturer's production change has been initiated to relocate this resistor for greater accessibility. (691)

AN/BLR-1, AN/SLR-2, AND AN/WLR-1, REPLACE- MENT OF REFLECTOR AND SERVO POTENTIOMETERS - MAINTENANCE HINT

See article in AN/BLR-1 section under the same title.

AN/WLR-1 COUNTERMEASURES RECEIVER, PREVEN- TIVE MAINTENANCE HINT

It has been reported that tubes have "jumped" from their sockets on the AN/WLR-1 due to shock or vibration, causing an equipment failure. The tubes involved in these cases were equipped with locking shields. It is quite important therefore in installing the tube shield to insure that they seat and lock properly to avoid unnecessary equipment failure.

AN/WLR-1 - SAFETY HAZARD IN J-1008/WLR, -1a, AND -1b

TB-8 in J-1008/WLR-1 is provided by all manufacturers with a protective cover to protect maintenance personnel from the high voltages on the terminal board. The protective cover operates an interlock switch to turn off the high voltages when the cover is removed. Because the switch can also be closed with the cover removed, many technicians have not been replacing the board cover after maintenance.

This is a very dangerous practice since voltages as high as 2,500 volts dc are present on the terminal board. It is mandatory that the protective cover be installed on TB-8 of J-1008/WLR-1 at all times except when maintenance involving this terminal board is sufficiently crowded with other components that the slightest carelessness can result in a serious electrical shock.

The cover for TB-8 has no symbol or federal stock number at this time. Electronic Supply Office will assign stock numbers and procure the covers for replacement and Bureau of Ships will provide technical manual changes when the stock numbers become available.

In the meantime, if the cover for the high-voltage terminal board has been damaged, it is recommended that a temporary cover, similar to that shown in figure 1, be manufactured for temporary use until Electronic Supply Office can stock the replacements.

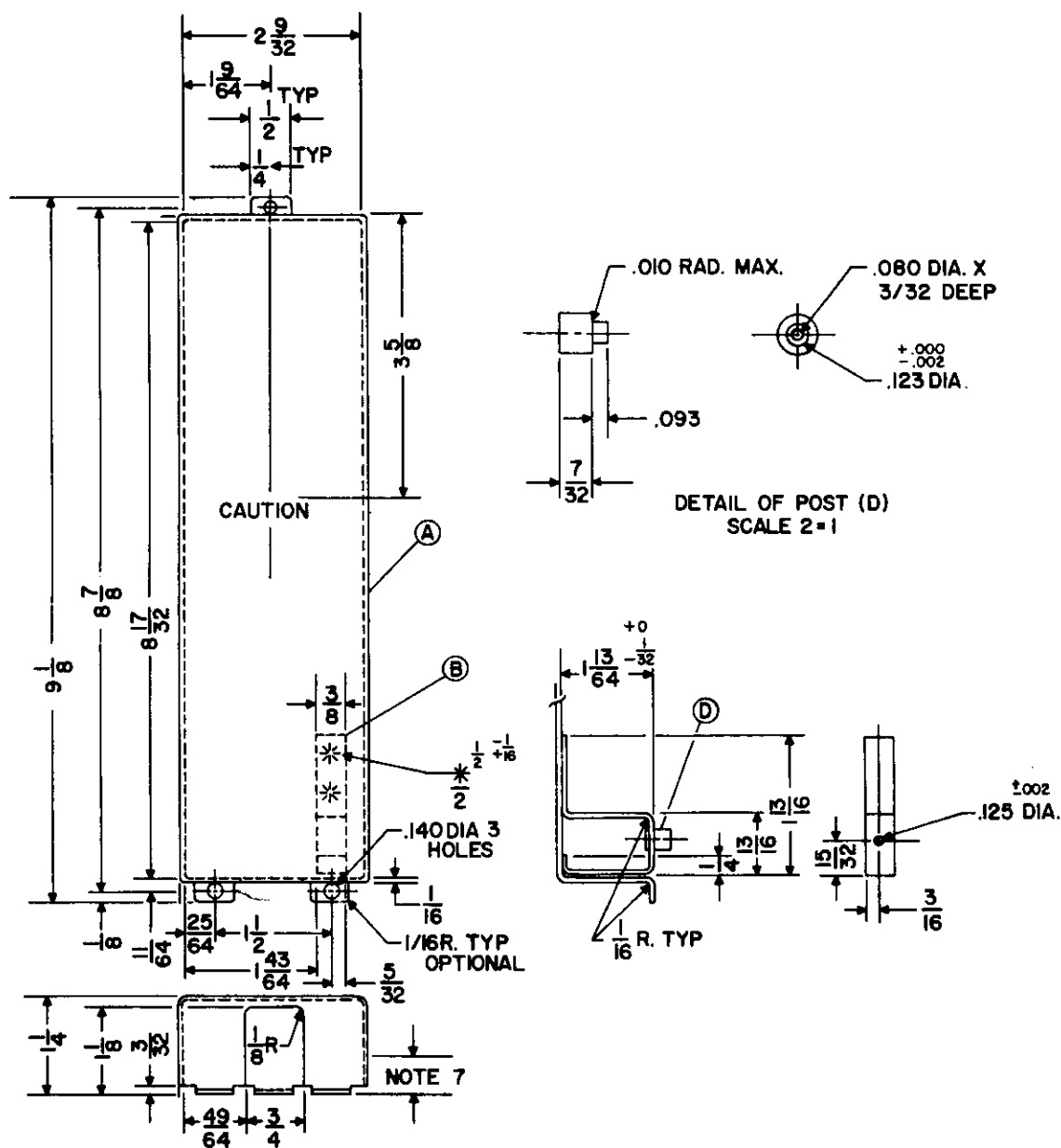


Figure 1.

Notes:

1. Spotweld item (B) to item (A).
2. All inside bend radii to be 1/8 unless otherwise noted.
3. Silk screening to be green, located as shown $\pm 1/32$ and in accordance with Collins Spec. 580 009600.
4. Spotwelding symbols shown in accordance with JAN-STD-19; welding per MIL-W-6860.
5. Material: Cover (A) and actuator (B) to be 5052-H34 aluminum .040 \pm .0025 thick, per QQ-A-318, Cond 1/2M. Post (D) 2017-T4 aluminum rod, 1/4 .0015 diameter per QQ-A-351, Cond T.
6. Roll post (D) to actuator (B) as shown.
7. Corners may be welded. Refinish and maintain inside radius for 3/8 from bottom (see end view).

AN/WLR-1- CAMERA SCALES FOR USE WITH

All AN/WLR-1 series equipments are equipped to accommodate KD-2 cameras for the purpose of photographing incoming signals. The calibrated scales within the camera are for use with pulse analyzer AN/SLA-2 however.

The Bureau of Ships has produced camera scales to make the KD-2 camera compatible for use with the AN/WLR-1, -1a, -1b or -1c. These are in stock at either Naval Supply Center Oakland or Naval Supply Center Norfolk. The scales should be requisitioned from the Bureau of Ships under the nomenclature Scales, Camera Analyzer, BM-44A and FSN F6760-759-5647. (645)

AN/WLR-1() - D. F. CALIBRATOR TESTER

In AN/WLR-1() installations, the associated antenna control units, C-3118()/WLR and modified C-1608/SLR, contain an MK-483/WLR transistorized D. F. Calibrator. This calibrator generates pulses that are used for calibrating the IP-480/WLR Indicator Unit D. F. presentation.

A simple tester can be fabricated for testing the calibrator module when the ECM antenna system has been secured or the D. F. calibrator module has been removed from the control unit. The tester, shown in figure 1, will provide 6.3 VAC power for the transistorized unit and simulated antenna synchro information for rotating the slotted disk. (646)

AN/WLR-1 VERTICAL SCAN DRIVE MOTOR BRUSH REPLACEMENT

The vertical scan drive motor, symbol 12A12B1, employed in the IP-480/WLR-1 Indicator Unit, is a costly component to replace. Frequently, replacement is necessary because the motor brushes are worn and spare brushes have not been provisioned.

Until replacement brushes are available in the Naval Supply System, substitute brushes can easily be made from standard pencil lead procured under Federal Stock Number GSA 7510-285-5848.

Procedure:

1. Clean carbon dust from motor brush assembly.
2. Cut pencil lead to 5/16-inch length.
3. Install brushes in motor. (646)

ECM REMOTE PANORAMIC PRESENTATION

Refer to article in AN/BLR-1 section under the same title. (646)

AN/BLR-1, AN/SLR-2, AND AN/WLR-1() - ECM TUNER FAILURES

See article in AN/BLR-1 section under the same title. (656)

AN/BLR-1, AN/SLR-2, AN/WLR-1, -1A, -1B- 5721 KLYSTRON FAILURE-MAINTENANCE HINT

See article in AN/BLR-1 section under the same title. (675)

AN/WLR-1, AN/WLR-1a, AN/WLR-1b-TUNING SHAFT COUPLING

Quite a number of failure reports have been received stating that although technical manuals for ECM Receivers AN/WLR-1 and AN/WLR-1a list the identical description for part 13MP16 (tuning shaft coupling), replacements from ESO may not fit either model of AN/WLR-1. In addition, it has been found that component mounting differs from one equipment to another sufficiently so that the rubber is overstressed. An Oldham type coupling is used in the AN/WLR-1b equipments and has been found to be more satisfactory for use in the AN/WLR-1 and AN/WLR-1a than the rubber coupling.

When part 13MP16 fails in either an AN/WLR-1 or AN/WLR-1a, the replacement should be ordered as FSN 2RS 3010-954-6779. (685)

AN/WLR-1-MAINTENANCE OF SERVO MOTOR

Recent reports of failures of Servo Motors, circuit symbol number 12A13B1, in the AN/WLR-1 indicator indicates the possibility of inadequate maintenance. Attention is invited to EIB 664, dated 20 September 1965, for proper maintenance procedures.

Replacement for Frequency Indicator Servo Motor 12A13B1, supplied under FSN 1N6105-706-9468, may be physically larger than the original motor. The larger motor can be installed by turning the mounting 180 degrees to make the leads accessible and to allow sufficient clearance to close the indicator cabinet. (687)

**RADOME SECURED WITH CLAMP WHEN REMOVED
ABOARD SHIP**

A device to secure protective domes of DBM radar antennas when they are removed aboard ship has been suggested.

A chain and a modified C clamp hold the dome when it is removed from the antenna. The clamp is attached to the rim of the antenna dome, and the end of the chain opposite the clamp, which is equipped with a safety hook, is attached to a structural part of the ship.

This suggestion provides a safer means of retaining domes when they are removed for zeroing or repairing radars. It prevents hazards not only to the employees doing the work, but also the personnel below who are exposed if the dome is dropped or pulled loose by the wind.

USER ACTIVITY TECHNICAL MANUAL COMMENT SHEET

TITLE _____

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VOLUME NO. _____

(Fold on dotted line on reverse side, staple, and mail to NAVAL SHIP ENGINEERING CENTER)

PROBLEM, QUESTION, SUGGESTION, COMMENT:

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