## AS-390/SRC, AT-150/SRC REPAIR METHODS FOR MATCHING SECTION

NAVSHIPS 91338 states that if the matching section in the AS-390/SRC or AT-150/SRC becomes damp it should be baked out for ten hours. Apparently, it is assumed that moisture will be the usual source of trouble. This is probably true; however, there will also be times when the best repair will be the replacement of the matching section.

The following two suggested methods describe methods by which a complete overhaul of the matching unit in these antennas may be accomplished.

One suggestion proposes to drill out the insulation in the matching section by means of a hollow drill. A drill 6 1/2 inches long is used in the AS-390/SRC, and a drill 10 inches long is used in the AT-150/SRC antenna matching section. These drills are both hollow so that the center conductor of the matching unit will not twist around the drill. After removing the center conductor, the insulation replacement is made with a length of RG-116/U cable from which the shield and armor have been removed.

The second suggestion proposes to replace the existing matching unit made up of suitable lengths of 3/8 -inch copper tubing and RG-118/U cable which has been stripped of its armor and double shield.

In both methods of repair, the matching unit must be sealed and tested for an infinity reading with a megohm meter before being reconnected to the antenna proper.

These suggestions describe two straight-forward methods of accomplishing repair of the matching unit in type AT-150/SRC and AS-390/SRC antennas. The choice of the method used depends on the facilities available and the number of antennas to be repaired. These factors will vary with the activity undertaking the repair.

## INSTALLATION OF DIPOLE ANTENNAS

The Bureau has received Beneficial Suggestions for improving the methods of fastening dipole antennas in place. These suggestions arise from the fact that personnel making the installation have difficulty aligning the mounting holes of clamps and base plates. Most suggestions involve either making a hinge type clamp in the shop (which is expensive), welding part of the clamp to the matching stub (which will probably damage the matching stub), the use of stainless steel (which is scarce) or a combination of two or more of these procedures.

It is recommended that dipole antennas, i.e., AT-150/SRC, 66095, 66147 be fastened to the ship structure by means of "U" bolts around the yard arm of supporting bracket. These "U" bolts can be made of 1/4 inch rod which can easily be sprung enough to match the holes in the base plate of the antenna. When a plate is welded to the yard arm or support bracket the holes should be slotted enough to align with the antenna base.

**Antennas AN/SRD-7 and AS-714/SRD-7—Replacement Parts**
See article in AN/SRD-7 section under the same title. (602)

## ANTENNA AS-768/GR MOISTURE LEAKAGE

It has been brought to the attention of the Bureau of Ships that a source of moisture leakage in the AS-768A/GR antenna is the recessed gasket (part number MS-90133-4) of the UG-21D/U connectors supplied with the RG-8/U coaxial cable used on the antenna. There are 28 subject gaskets used in each antenna.

Replacing this gasket with gasket MS-90133-4 will alleviate the moisture leakage at this point. Action is being taken to supply the recommended gasket to all activities to which this antenna has been supplied. This change applies only to the AS-768A/GR antenna. The moisture leakage problem in the AS-768/GR and the proper solution will be disseminated when studies are completed.

## FAILURES OF AS-768B/GR ANTENNAS MANUFACTURED BY AMERAC, INC.

The Commanding Officer, U.S. Naval Aviation Engineering Service Unit, Philadelphia, has reported receiving two new AS-768B/GR antennas, manufactured by Amerac, Inc., of Beverly, Massachusetts, in a defective condition. A megger check of the antennas while they were in a horizontal position and still in their shipping crates showed satisfactory results. However, when placed in the normal vertical position for installation, short circuits developed in each antenna across the insulating sleeve between the upper antenna plate and the termination of the plate feed line (Part No. W-106, page 2-2, NAVSHIPS 93137A). The apparent cause of each short was an accumulation of metal chips and oil in two of the drillings in the upper antenna plate. The shorted plate conditions were corrected locally by removing the plate feed lines to each of the antenna bays and cleaning the terminations, insulators, and upper plate sockets.

One of the antennas also had a coaxial plate feed line (W-107, page 2-2, NAVSHIPS 93137A) with the center conductor severed about four inches from the tip of the antenna feed. The break was at right angles to the conductor. This fact and the presence of the discoloration indicate that the two sections of wire had been joined by a butt weld. The defective W-107 feeder line was replaced.

It is recommended that activities receiving AS-768B/GR antennas manufactured by Amerac, Inc. inspect them for any indications that similar short circuits might eventually occur. The cleaning between plates is recommended only when necessary, not as a routine matter.

## AS-768B/GR Antennas; Failures of

**All AS-768B/GR antennas, regardless of contractor, should be inspected. Inspection of crated antennas may be delayed until the antennas are uncrated for use.**

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It is recommended that activities receiving AS-768B/GR antennas, manufactured by Amerac, Inc., inspect them for any indications that similar short circuits might eventually occur. The cleaning between plates is recommended only when necessary, not as a routine matter. (16S)

## SUBMARINE BUOYANT CABLE ANTENNAS

The item name for Floating Wire Antenna AS-1554/BRR, using RF cable RG-298/U, has been revised. The revised Joint Electronics Type Designation (JETD) is Buoyant Cable Antenna AS-1554/BRR.

The antenna using RF Cable RG-374/U (high strength) has been assigned the new Joint Electronics Type Designation, Buoyant Cable Antenna AS-2122/BRR. This antenna formerly was identified by USNUSL Unit Number 00683, and consists of: Termination Tip MX-4217/B. RF Cable RG-374/U, and Electrical Plug Connector UG-1820/U. (EIB 709)

**AS-2187/FRC Rotatable Log Periodic Antenna, Equipment and Personnel Safety Potential Hazard—Inspection for**

An AS-2187/FRC Rotatable log periodic antenna manufactured by Granger Associates recently experienced severe damage when one of its tower guy assemblies failed during erection operations. An investigation revealed that an over size preformed grip had been erroneously installed by the manufacturer during fabrication of the antenna.

To preclude a reoccurrence of this event, all units of this model antenna should be inspected to verify that the tower guy assemblies have been fabricated with the proper size preformed grips. Procedure is as follows:

Inspect the preformed grips at the upper end (tower end) of the four mid-level tower guy assemblies. These assemblies are shown on installation drawing RW66D452 Sheet #9 as Item #17. The guy cables to which the preformed grips are attached are specified to be 5/16 (0.312) inch (mean diameter) extra high strength seven strand galvanized steel wire. Each individual strand has a 0.102 inch diameter. The proper size preformed grip may be identified by its length and a color code marking. The overall length of a 5/16" preformed BIG-GRIP measured from the top of the loop to the tip of the shank should be 33 inches $\pm$ 1/2 inch. The preformed BIG-GRIP should also be marked with two black color marks (each approximately 1/2 inch wide) painted around the shank of the grip just below the point of juncture of the end loop. The individual strands of the preformed BIG-GRIP are 0.100 inch diameter "C" coat galvanized steel. Measurement of length alone is sufficient to identify the proper size of preformed grip, but identification by color code alone is not. Any preformed grip found to be of improper size should be replaced. The preformed grip may be procured locally or obtained from Granger Associates, 1360 Willow Road, Menlo Park, California 94025. Specify Granger Part No. 873-0024 (Black). If procured locally this part is a product of the Preformed Line Products Company and is designated as a galvanized steel BIG-GRIP Dead End, Catalog No. BG-2146 for use on 5/16 inch galvanized seven strand steel cable.

Repeat the above procedure for the six top level tower guy assemblies. These assemblies are shown on installation drawing RW66D452, Sheet #10 as Item #16. The guy cables to which the preformed grips are attached are specified to be 7/16 (0.435) inch (mean diameter) extra high strength seven strand galvanized steel wire. Each individual strand has a 0.140 inch diameter. The proper size preformed grip may be identified by its length and a color code marking. The overall length of the 7/16 inch preformed BIG-GRIP measured from the top of the loop to the tip of the shank should be 40 inches $\pm$ 1/2 inch. The preformed BIG-GRIP should also be marked with one green color mark (approximately 1/2 inch wide) painted around the shank of the grip just below the point of juncture of the end loop. The individual strands of the preformed BIG-GRIP are 0.138 inch diameter galvanized steel. Measurement of the length alone is sufficient to identify the proper size of preformed grip, but identification by color code alone is not. Verify that the proper grips are installed. Any preformed grip found to be of improper size should be replaced. The preformed grip may be procured locally or obtained from Granger Associates, 1360 Willow Road, Menlo Park, California 94025. Specify Granger Part No. 873-0038 (Green). If obtained locally this part is a product of the Preformed Line Products Company and is designated as a galvanized steel BIG-GRIP Dead End, Catalog No. BG-2148 for use on 7/16" galvanized 7 strand steel cable.

IMPORTANT: All rigging and climbing safety precautions should be exercised while performing this inspection. Any guy assembly that is found to be fitted with an improper guy grip should be immediately reinforced with an additional temporary guy line installed adjacent to the existing guy assembly and retained in place until the proper size preformed grip has been installed. Do not refit more than one existing guy at a time.

(834)

## AS-2410/WSC-1(V), AS-3018/WSC-1(V) Satellite Communications Antenna—Maintenance Hint

This article provides the proper procedure for abating the corrosion problem found with antenna systems OE-82A/WSC-1(V) and OE-82B/WSC-1(V). This procedure is a preventive maintenance procedure which is to supplement present PMS until updated PMS can be implemented.

1. Rotate and elevate the antenna to a position in which the ground screen may be readily examined.
2. Secure the antenna by placing the safety switch in the "SAFE" position.
3. Observe the ground screen and dipoles for any sign of corrosion. The corrosion may not be obvious but may appear as a bubble under the paint. Careful examination of the dipole around the mounting bolts and flange is required, as previous history shows many cases of complete corrosion of weld around the mounting flange.

NOTE:

Removal of the dipoles may be necessary to eliminate all corroded material. When removing the dipoles, tag each cable J1 or J2 corresponding to the connection on the dipole. J2 is the connection directly adjacent to the mounting hole on the flange.

CAUTION:

Improper connection of J1 and J2 on the dipoles will destroy the gain characteristics of the antenna.

4. Clean the affected areas with a paint scraper and wire brush. Ensure that all signs of corrosion have been eliminated.
5. Prime the bare metal with non-metallic base primer. (NSN 9Q8010-00-616-9182)
6. Paint the primed areas with non-metallic base gray paint. (NSN 9Q8010-00-721-9750)
7. If the weld on any dipole is split or cracked, clean and paint as in steps 4, 5 and 6; then coat with RTV or equivalent sealant and requisition a replacement dipole. (NSN 1H5895-00-003-8783)

(EIB 960/968)

## AS-2537/2537A 35' Fiberglass Whip Antenna and CU-938/URA-38—Coupler Installation

Many ships have substituted 35' fiberglass whip antennas (AS-2537/2537A) for 28 and 35' aluminum whips (NT-66046/66047) without relocating the CU-938( ) /URA-38 antenna coupler. Many installations have not only exceeded the allowable length of the interconnection between tuner output and antenna, but have run the interconnection through a stuffing tube penetrating the top of the antenna mounting platform. This practice decreases antenna efficiency by capacitively coupling energy into the mounting platform, and has caused arc-over between the interconnecting conductor and the stuffing tube with consequent damage to the coupler.

Installation instructions require the interconnection to be not more than 36" (preferred length is 12" or less) with a clearance of 6" in any direction. NAVSHIPS 0967-177-3020, SHIPBOARD ANTENNA SYSTEMS, VOLUME 2, INSTALLATION DETAILS, paragraph 3.2.2 requires that the antenna coupler be located above the antenna mounting platform. A recommended modification to existing mounting platforms is shown in Figure 1. To preclude the expense of running new cables, and to eliminate unnecessary adapters, the existing coaxial cable (RG-218/U or RG-219/U) may be extended by a short length of RG-214/U fitted at one end with a UG-21F/U plug and at the other end with a UG-23F/U jack. The control cable may be extended by use of a short length of MSCU-37 fitted at one end with an MS3101R28-21P receptacle and at the other end with an MS3106R28-21S plug.

Some installations have been noted where the antenna coupler was properly installed for a fiberglass whip but was feeding an aluminum whip, with the interconnecting cable going down through a stuffing tube to connect to the feed point. In this situation, it is recommended that the antenna be fed at one of the mounting bolts which connects the antenna adapter base to the base insulator.

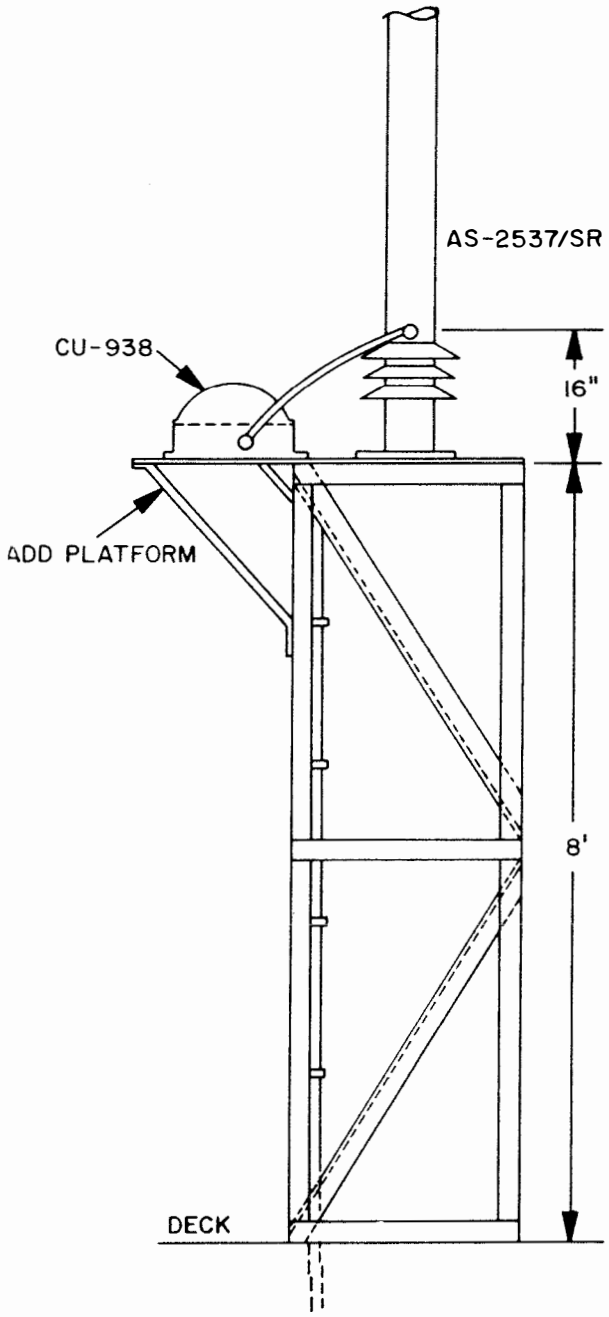



**Figure 1. Whip Antenna Platform Modification**

(EIB 938)

## AS-2822/SRN-15 TACAN Antenna—Pinning of

This article constitutes the authority for compliance with NAVELEXSYSENGCEN San Diego 131504Z March 1974. All AS-2822/SRN-15 TACAN antennas are to be pinned in the vertical position at all times, using the antenna stowage lock.

When pinning the antenna DO NOT use the older type knurled lock bolt which was supplied with some of the antennas. All ships having AS-2822/SRN-15 antennas have been supplied with a improved, hardened, lock bolt. These bolts must be used as the older type are subject to shearing. The improved bolt can be identified by the hex-head design.

A heavy duty stowage lock is being developed by NAVELEXSYSENGCEN San Diego and will be distributed as soon as it is available.

Should any difficulty arise in the compliance with this instruction to pin the antenna, contact Mr. R. M. Gray, Code 4313, NAVELEXSYSENGCEN San Diego, AUTOVON 957-4562.

(EIB 881)

## AS-2410/WSC-1(V), AS-3018/WSC-1(V) Satellite Communications Antenna-- Maintenance Hint

See article in AS-2410/WSC-1(V) Section under the same title.
(EIB 960/968)

**AS-3073/BRA-8C Auxiliary Floating Wire Antenna—Repair Kits for**

AS-3073 Auxiliary Floating Wire Antennas are designed for use with the AN/BRA-8C communications buoy. Damaged AS-3073 units were previously requested to be returned to NAVSECPHILADIV for refurbishing. However, new units now being delivered are field-repairable.

Units designed to be field-repairable are identified with the NAVSEA drawing number 4491181, plus the revision letter C, or later. This drawing also contains the necessary assembly/repair instructions with data for parts identification and ordering.

NAVSECPHILADIV has, in conjunction with the design of the AS-3073, developed a kit for use in field repairs. This kit provides only the items needed but not now available under Federal Stock Numbers. Until such time as the repair kit is assigned a Federal Stock Number, it may be procured from the Ships Parts Control Center, Mechanicsburg, PA, under the description "AS-3073/BRA-8C Auxiliary Floating Wire Repair Kit." The cost per kit is approximately $100.00.

Continue to return damaged AS-3073 units not identified as above to NAVSECPHILADIV.

(EIB 949)

**AS-4036/SRN-15A Antenna—Installation Hint**

The proper orientation of the AS-4036/SRN-15A antenna on the ship's mast is indicated by a white stripe painted on the radome. When the antenna is properly installed, this white stripe faces towards the bow of the ship. When the antenna is removed from the ship for maintenance, the white stripe is sometimes painted over or otherwise obliterated, making reinstallation of the antenna difficult.

To remedy this situation, whenever the AS-4036/SRN-15A antenna is removed from the mast, the bottom flange of the mast adaptor spool should be marked with a "BOW" reference as shown in Figure 1, using a metal alphabet stamp set. The "BOW" reference mark should be placed on the outer edge of the flange centered below the connector mounting bracket.


**Figure 1. "BOW" Reference Mark.** (EIB 94?

## AT-317/BRR LOOP INSTALLATIONS ON SUBMARINES

Recent inspections of AT-317/BRR Loop installations on submarines revealed the existence of the following deficiencies:

1. Of 10 submarines inspected, three had reversed connections from the loop to the coupler.
2. One submarine had the fore-aft link open in the coupler, thus receiving on only one loop.
3. Approximately fifty percent of the subs had units installed that did not track properly. In other words, switching from one mode to another required returning the coupler.

Most of the difficulties can be avoided or corrected by closely checking the following items for conformity with the AT-317/BRR instruction book:

1. Correct polarization of leads from loop to coupler.
2. Calibration of the coupler after installation, particularly if the length of the 75-foot transmission-line cable normally supplied has been altered.

## IMPROVED CABLE AND FITTINGS FOR AT-317/BRR ANTENNA SYSTEM

By means of a beneficial suggestion, the Bureau has been informed of salt water entering cable RG-160U during submerged operations. This cable is used in the installation of the AT-317/BRR loop antenna.

Recommendations to correct this default is contained in the following paragraphs. (See figure 1)

Cable: The preferred cable is RG-57A/U, FSN N6145-577-8423. An acceptable substitute is RG-57/U, FSN N6145-161-0905. (RG-57A/U has a jacket which retains flexibility at lower temperature.) Do NOT use any RG-57/U cable having a yellow, soft, waxy dielectric. Unfortunately, some of this still is in Navy stock. This dielectric is polyisobutylene and a directive to scrap all such cable was issued several years ago. It has a softening point of only 25°C and was used as a war emergency material until polyethylene was available.

Plug; cable to antenna: Make plugs locally as required in accordance with USN/USL drawing 42255B and associated details. One special O-ring is required. Both the drawing and the O-ring are available, until further notice, from U.S. Navy Underwater Sound Laboratory, New London, Connecticut, Code 1316. FSN N5330-585-1363 has been assigned to the O-ring by ESO but none are in stock yet. The use of this plug eliminates the need for making a flange or welding a hull fitting to the flange or to the antenna base. This plug will fit into the AT-317/BRR with no changes of the antenna.

Hull fitting: Make locally as required in accordance with USN/USL sketch SK-33216 and associated details, until available from Navy stock. This uses the same special O-ring as the plug; both drawings and O-ring are available from the source given above. FSN N5975-659-3063 has been assigned by ESO to the complete fitting.

Plug, cable to coupler: Procure from stock or purchase: FSN N5935-666-1406 applies. This plug is identified in several ways: UG-1060 U, Navy type 49188, Signal Corps type PL-295, or Amphenol 83-2SP.

Receptable: The CU-352/BRR coupler must be modified by replacing the large existing receptacle with the twinax receptacle identified as UG-1057/U, NT 49196, Signal Corps type SO-265, or Amphenol 83-2R. FSN N5935-149-2856 applies.

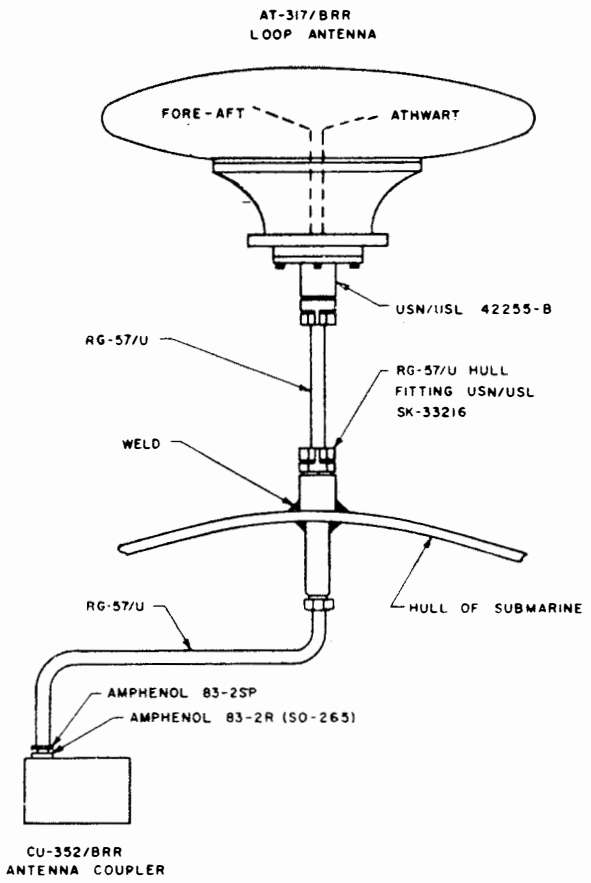



FIGURE 1

## INSULATION BREAKDOWN OF RG-264A/U IN SUBMARINE ANTENNA AT-317B/BRR

The Bureau of Ships has been informed that there is danger of insulation breakdown between shields in cable type RG-264A/U, used with subject antenna, in the course of routine maintenance. The insulation between the shields should not be subjected to more than 300 volts; therefore, it could be damaged if tested with an ordinary 500-volt megger.

The insulation resistance of cable RG-264A/U is not to be measured with a megger which has a generator voltage of over 300 volts. This measurement should be made with an ohmmeter.

### Measuring Insulation Resistance of AT-317/BRR Antennas

If sea water leaks into an AT-317/BRR antenna, the system sensitivity will be reduced. Since reception is still possible, and since each of the two loops has a very low resistance (about .1 ohm at the antenna or .3 to .5 ohm, including cable) and is grounded on one end, it is not possible to check for flooding in the usual ways. However, by removing two bolts at the antenna, the grounds are disconnected and a megger or ohm-meter can be used to check the insulation resistance from each loop to ground. (A megger may also be used for measuring loop-to-loop insulation resistance, but since the two windings are in contact, with only the varnish and a thin Teflon tape for insulation, do not use a megger which has a generator voltage of over 500 volts. It is better to use an ohm-meter for this measurement.)

Figure 1 is the bottom view of the joint between the rubber-covered antenna and the metal mounting base. Twelve 7/16 inch–28 x 1-inch long socket-head cap screws fasten them together. If the forward cap screw is considered the 12-o'clock position, the one at 4 o'clock is the ground connection for the athwartship loop, and the one at 10 o'clock is for the fore-and-aft loop.

After the two bolts are removed, the insulation resistance can be measured from the radio room. Assuming that the system is assembled properly, a low resistance reading (10,000 ohms or less) here means that the antenna is flooded. In this case the antenna must be removed from the ship. It is sometimes possible to restore the antenna to satisfactory operating condition by removing the mounting base, rinsing the antenna thoroughly to remove salt, and drying under a heat lamp (being careful not to overheat) for a period of a few days, until the insulation resistance is at least 50,000 ohms.

When replacing the bolts between antenna and base, always tighten them evenly to 30 ft.-lbs. using a torque wrench (GF5120-294-9505 is a suitable wrench and can be used by cutting off a short length of an Allen wrench, which fits the cap screws). The bolts should be retightened after 24 hours.

Since the AT-317A/BRR and AT-317B/BRR loops are not grounded at the antenna, it is unnecessary to remove bolts to check for flooding. However, the instructions on drying out the antenna and for tightening the bolts apply. In order to ensure and maintain watertightness, the bolts should be checked with the torque wrench when installed (especially on brand-new antennas), and at each upkeep period.

For installation, calibration, and periodic operational check-out, the complete instructions given in Instruction Book NAVSHIPS 92182 must still be followed. (541)

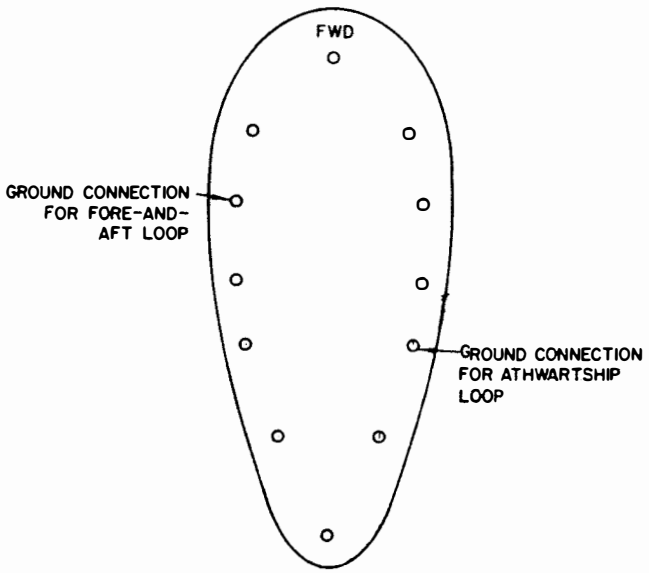



**Figure 1. Bottom view of joint between antenna subassembly & mounting base of AT-317/BRR.**

## BA-403/U AND BA-419/U FOR USE WITH MODIFICATION KIT MX-898/GR

Battery BA-403/U (1.5) Volt and Battery BA-419/U (90 Volt), dry batteries, are used with Modification Kit MX-898/GR which is required for the AN/VRC-8, -9 and -10 equipments in portable applications. These dry batteries are installed in Case CY-590/GRC, and supply voltages for operating the receiver of these equipments.

Due to the limited shelf life of dry batteries, it is recommended that the BA-403/U (FSN N6135-125-5255) and the BA-419/U (FSN N6135-125-5257) be drawn from stock only when actual use of the AN/VRC-8, -9 or -10 equipments with Modification Kit MX-898/GR is contemplated.

**AN/PRC-41 and AN/PRC-47–BB-451/U Battery Used with Radio Sets**

See article in AN/PRC-41 section under the same title. (681)

## MODIFICATION TO ADD NOISE LIMITER IN BC-639A

The noise limiter to be described is suggested for the purpose of reducing interference to communications. The limiter will be especially effective on interference of a pulsy nature as it operates by cutting off the audio signal for the duration of any large noise peak.

The parts required are: One 6H6 vacuum tube; two resistors of 1 megohm and 1/4 or 1/2 watt; one paper capacitor of 0.1 mfd.; one switch, SPDT; one octal tube socket; and, optionally, one potentiometer of 100,000 ohms.

The tube socket may be mounted on small metal brackets above the chassis to the rear of the audio output jacks, or may be flushmounted in a hole punched in the chassis itself. The toggle switch may be mounted anywhere desired on the front panel. If the switch is physically distant from the limiter circuit proper, it is advisable to sheath the leads running to it with Belden braid and ground the braid to the chassis by means of soldering.

Referring to the schematic diagram shown in Figure 1, operation is as follows: Rectified signal current flows through resistors 236-4 and 236-5 causing a voltage drop in the proportion to the incoming signal amplitude. The potential across 236-5 is the audio signal voltage delivered to the grid of the 6SQ7 through the limiter tube 6H6. The potential across 236-4 operates the limiter tube. Both of these voltages can vary with instantaeous changes in signal amplitude such as occurs with noise or modulation, but the cathode of the 6H6 is not allowed to follow instantaneous voltage variations across 236-4 due to the filtering action of R-1 and C-1.

These two potentials are negative with respect to the 6SQ7 cathode, point "A" being normally more negative than point "B", thereby permitting conduction in the 6H6. In the presence of a noise pulse, points "A" and "B" become more negativie, and the 6H6 plate becomes more negative, but the filtering action of R-1 and C-1 holds the 6H6 cathode nearly constant; cut-off occurs because the plate is more negative than the cathode and no signal is delivered through the 6H6 to potentiometer 251 and the 6SQ7 grid.

The resistor R-2 prevents the audio output from being shorted to ground via C-1. The degree of noise-limiting action is roughly proportional to the ratio of resistance 236-5 to that between "A" and "B" and is limited by the cutting-off of the peaks of voice modulation when this ratio is made too large.

Resistor 236-4 is shown as a variable potentiometer to permit control of the degree of noise limiting. It may be utilized without replacement with wire "A" connected to point "C".

Addition of this device to the receiver does not effect the i-f alignment provided the i-f circuit wiring is not tampered with. All parts except the 6H6, switch, R-1, R-2 and C-1 are in the original circuit.

Placing the switch in the OFF position eliminates the limiter action. When used the limiter will cause considerable loss in signal strength and may, therefore, have to be turned off when used with a very weak signal.

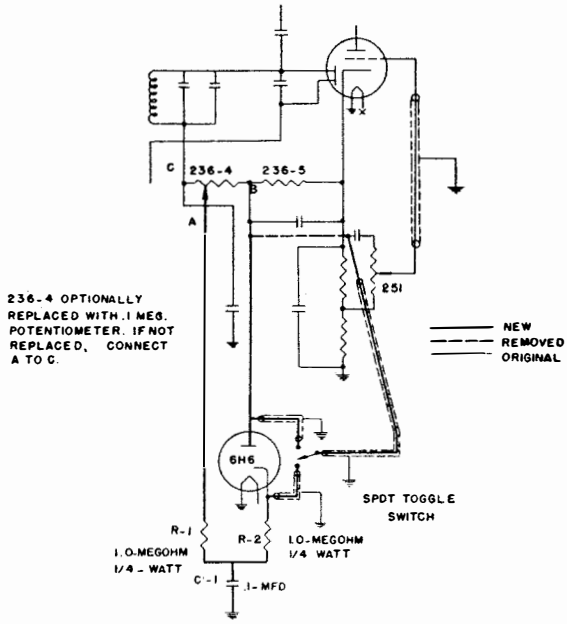


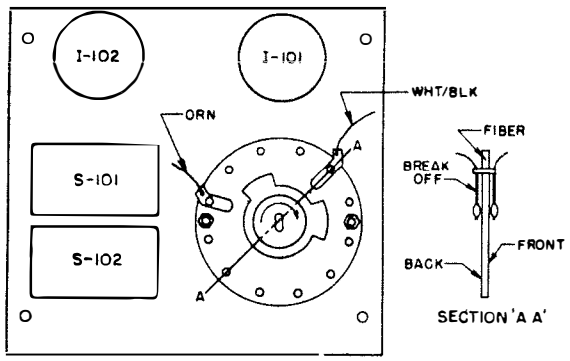

Figure 1.--Schematic diagram of noise limiter

## C-1004A/SG IMPROVED FLEXIBILITY OF OPERATION

Shorting the CFS send and tone S/R teletype circuits together, when the selector switch is in the CFS receive position, may limit the flexibility of operation of the C-1004A/SG control and associated teletypewriters.

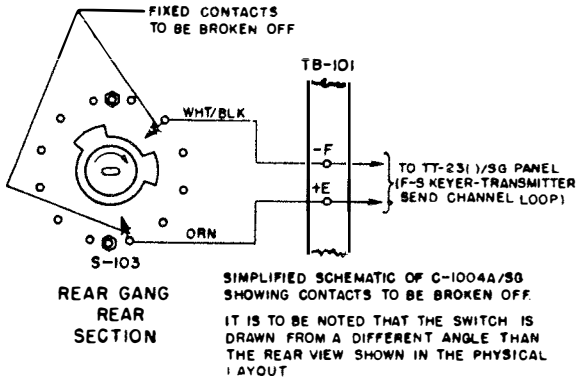
To increase the possible combinations of patching teletypewriters and terminal equipments, the Bureau recommends that two of the fixed contacts on the rear switch be broken off to prevent the two loops from being together.

The physical location of the two fixed contacts and information for changing the schematic in the instruction book are given in figures 1 and 2.




REAR VIEW OF C-1004A/SG SHOWING LOCATION OF CONTACTS TO BE BROKEN OFF

Figure 1




SIMPLIFIED SCHEMATIC OF C-1004A/SG SHOWING CONTACTS TO BE BROKEN OFF.

IT IS TO BE NOTED THAT THE SWITCH IS DRAWN FROM A DIFFERENT ANGLE THAN THE REAR VIEW SHOWN IN THE PHYSICAL LAYOUT

Figure 2

**C-2698/SRA-22 Control Unit—Reduction of Inherent Reflected Power in Units Manufactured Under Contract NObsr-87525, Serial Numbers E1 through E115**

The Charleston Naval Shipyard recommends the following modification to the subject control units. This modification consists of remaking P-12 and its associated coaxial cable.

A mismatch in present installations is caused by the extruded RG-58( )/U cable, as shown in figures 1 and 2. To reduce this mismatch, the shield of the RG-58( )/U cable should be terminnated as close as possible to switch S1, with approximately one-half extrusion of center conductor and dielectric, as shown in figures 3 and 4. (701)

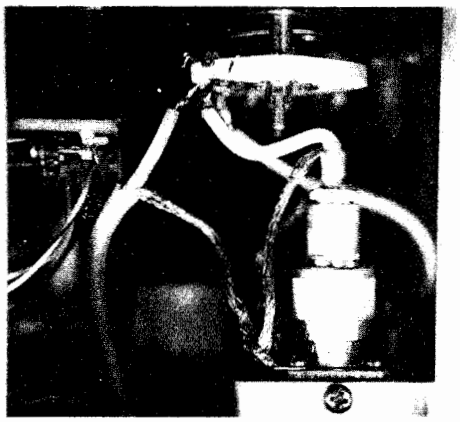


**Figure 1. Installed cable RG-58( )/U, Before Modification**

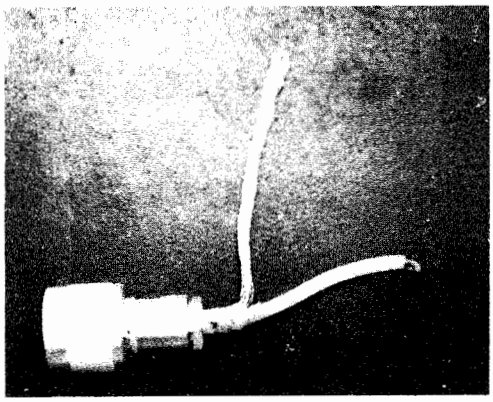


**Figure 2. Present Method of Preparing Cable RG-58( )/U.**

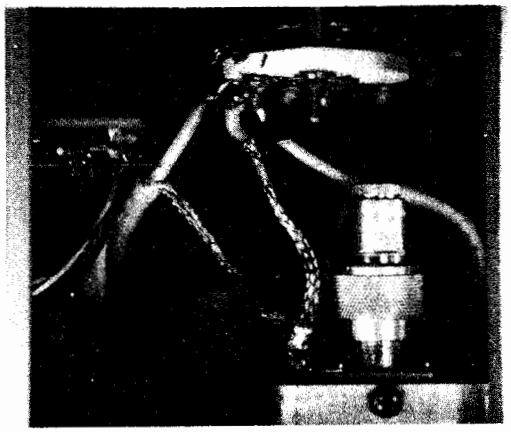


**Figure 3. Installed Cable RG-58( )/U, After Modification.**

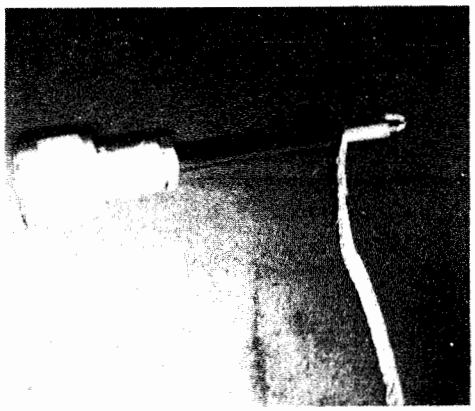


**Figure 4. Recommended Method of Preparing Cable RG-58( )/U.**

## AN/SRA-22 ANTENNA COUPLER GROUP-- REQUISITIONING AND TURN-IN PROCEDURES

See article under AN/SRA-22 with the same title. *(EIB 712)*

**AN/SRC-20, AN/SRC-21 –DIALING FAILURES CAUSED BY IMPROPER DIALING OF REMOTE CONTROL C–3868/ SRC**

See article under AN/SRC-20 with the same title.
(EIB 725)

**C-8086/U Motor Generator Controller, Voltage Regulator (VR-1A)—Adjustment of**

Although the voltage regulator settings for M-G Controller C-8086/U are adjusted at the factory, gain and/or stability may, at times, require readjustment. Below is a procedure for adjusting gain and/or stability during operation. Adjustment should be accomplished only if there is an obvious deficiency in gain or stability (i.e. voltage "runaway" or "lock-on" condition as evidenced by pegged Voltmeter on Controller).

Two resistors are provided for adjustment of the gain and stability. Registor VR-1AR7 controls frequency (400HZ) and unless properly adjusted may cause occasional spikes on the 400HZ output. Resistor VR-1AR11 controls the over-load characteristics of the controller. A low setting will not allow the M-G to produce enough output and a high setting may result in a "voltage runaway" of 240 volts.

**Adjustment Procedure:**

a. Preliminary

1. All safety precautions for work on 440v. ac live circuitry should be observed.

2. With power off, open controller cabinet and turn off load circuit breaker.

3. Remove gold colored regulator cover and clear away all tools, etc. so that the power can be turned on.

**WARNING**

Even with the M-G off, 440 volts is still present from TB-2 to the motor starter.

b. Frequency Adjustment:

1. Connect scope probe to left side of DG-1 diode in top middle of controller cabinet (Item 2 of figure 1-6 of NAVSHIPS 0967-059-5112).

2. With power off, remove the wires from terminals 5, 16 and 17 on the circuit board and put panel voltmeter selector to the neutral position.

3. Turn power on to the M-G and note the period of the 400HZ signal. It should be about 2.5 ms.

4. Adjust R-7 so the period is 2.5ms or slightly longer. If range is insufficient, R-6 may be increased to about 27K.

5. Remove power and reconnect pin 5. With power on, recheck output.

c. SCR1 Turn Off Adjustment:

1. With wires to terminals 16 and 17 removed, the controller is in a runaway condition and the voltage is R-11 sensitive.

2. Adjust R-11 for 1.0ms. pulse as measured at DG-1 diode.

3. Remove power and reconnect wires to terminals 16 and 17.

4. Turn on circuit breaker and check output as shown in figure 1. (772)

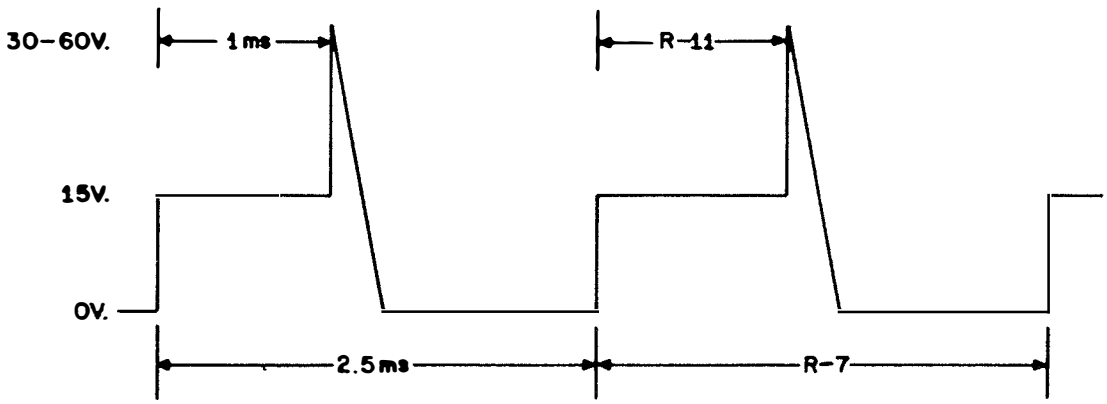



**Figure 1. DG-1 Diode Waveform**

### CP-642B/USQ-20(V) Digital Data Computer—Factory Change Information

In production testing, it was noted that when fuse F-1 on chassis A8 was changed, the voltage to the Word Current Generators often changed necessitating time consuming readjustment of -7VDC, control memory word currents, and bootstrap memory word currents. The problem is attributed to differences in dynamic resistance for the same type fuse F02A250V1/2AS.

A re-examination of the Word Current Generator circuit by Univac resulted in the decision to eliminate fuse F-1 in chassis A8. The change was incorporated in production at Univac S/N 124 and up and consists of replacing the fuse with a short circuit, removing the fuse holder and filling the hole with a nylon plug.

For the following reasons a related field change to eliminate fuse F-1 will not be issued to the Fleet.

1. No F-1 fuse failures have been reported, and if a fuse did fail, it would indicate that the fuse should not be eliminated from the circuit.
2. Removal of the fuse requires a readjustment of thin film memory, the sensitivity of which renders inadvisable the accomplishment of this change in the field.

However, the factory change to either repaired A8 chassis, or serial number 124 and up computers may be identified by observing that a nylon plug has replaced the F-1 fuse holder on chassis A8. No technical manual corrections are necessary. *(777)*

### CP-642/USQ-20(V), CP-642A/USQ-20(V), CP-642B/USQ-20(V)--Computer Memory Chassis Repair

Numerous memory chassis have been shipped to UNIVAC for other than memory stack casualties. A memory chassis will be shipped to UNIVAC only upon a proven memory stack casualty. That is, only repairs that require loosening of the memory stack torqued bolts, will not be attempted in the field.

Computer downtime, and shipping and repair costs can be significantly reduced by thoroughly analyzing a memory chassis casualty. Repairs such as replacement of faulty printed circuit (P.C.) cards, diodes on the diode end boards (CP-642 and CP-642A only), voltage and current adjustments, pinched or broken wires, should be effected in the field. *(787)*

### CP-642/USQ-20(V), CP-642A/USQ-20(V), CP-642B/USQ-20(V)—Computer Memory Failures

Some computer memory stacks have been damaged beyond economical repair by maintenance personnel. Maintenance personnel are requested not to attempt field repair of memory stacks.

When an activity experiences a proven computer memory stack casualty, they are requested to notify, via message, Naval Ship Systems Command, Technical Representative, St. Paul (NSTR ST. PAUL), with information copy to NAVSEC (6172B) and NAVSECNORDIV, of the memory stack failure and the desire to have NSTR ST. PAUL arrange for repair of the memory stack.

Upon receipt of this information, NSTR ST. PAUL will implement priority air shipment of a memory chassis, less circuit cards, and initiate a reply message. This message will contain all shipping data of the memory chassis, and instructions for return of the defective chassis for repair.

The activity will initiate return of defective chassis (less circuit cards), upon receipt of instructions from NSTR ST. PAUL, via Priority Air Freight to UNIVAC, 2750 West 7th Boulevard, St. Paul, Minnesota 55101; Attn: Naval Ship Systems Command Technical Representative. Mark all shipping documentation and shipping container "HIGH VALUE." Attach to the memory stack a narrative description of the symptoms of the suspected trouble. The activity will then advise all concerned, by message, of all shipping data for the defective chassis, including the government bill of lading (GBL) number, date, commercial carrier or COD flight number, and any amplifying data which would enhance follow up action.

When requesting a replacement CP-642B/USQ-20(V) Control Memory Chassis A8, specify the required Bootstrap Memory configuration. Give the peripheral equipment nomenclature and octal channel number for both Program I and II or if known give the Univac part number for the bootstrap assembly including the dash number (i.e. 4055027-XX).

Trans-shipment losses of emergency rotational spares has depleted the quantity of spare memory chassis, and the expeditious return of defective chassis is mandatory. If the defective chassis is delinquently returned, the next requesting activity will suffer because of your delay. YOU MAY BE NEXT.

Direct liaison between fleet activities and NAVSHIPSYSCOM TECHREP ST. PAUL is authorized whenever computer memory stacks fail.

This article supersedes and cancels the article in EIB 731 *(811)*

## CP-642/USQ-20(V), CP-642A/USQ-20(V), CP-642B/USQ-20(V)—Maintenance Hint

The purpose of this article is to identify a potential problem and recommend corrective action where needed.

Vibration and shock sensitive fuseholders have been found in several CP-642/USQ-20(V) and CP-642A/USQ-20(V) computers. Although investigation indicates the problem is not typical, the nature of the problem warrants publishing of this article. The fuseholders of concern are type FHN20G, which are in all CP-642/USQ-20(V) and CP-642A/USQ-20(V) computers and in CP-642B/USQ-20(V) serial numbers A1, 2, 3, 4, B1 through B61, and C1 through C7. The type FHN20G fuseholder is made with a lug riveted to its base and this lug/rivet connection may loosen or corrode thereby causing an intermittent connection, especially if subjected to vibration or shock.

It is recommended that computer maintenance personnel visually inspect all FHN20G fuseholders for looseness or corrosion at the lug/rivet connection. There are three to six FHN20G fuseholders on each of the thirteen computer chassis, the quantity depending on the computer type and chassis. They are in the logic voltage circuits and are located in the right-hand front corner of each chassis.

In most cases, simply soldering a poor or questionable lug/rivet connection will be adequate. If, for some reason, it is deemed necessary to replace the fuseholder do not use the FHN20G type. Use type FHN26G2, FSN 9N5920-875-4100. All memory chassis returned to Univac for repair will have the FHN20G fuseholders replaced with FHN26G2 type. *(EIB 860)*

**CP-771/UYK-3 Computer, Digital Data and MU-591/ UYK-3 Buffer - Extender Memory Unit—Hazardous Condition**

It has been pointed out that the purpose of A5CB1 is not readily apparent from the text of the applicable manuals and consequently, presents a hazardous condition. It should be noted that A1S17, the control panel ON-OFF switch does not remove all power from the system. In particular, it does not remove power from A6K1 or A6K2 which supply power to one side of the cabinet blower and to one side of the motor generator. A1S17 deactivates A6K1 and A6K2, when in the OFF position, but does not remove the 220 VAC from the contacts of these relays.

A5CB1 should be deactivated whenever access to the rear frame is necessary. A5CB1 is accessible whenever the logic (MID) frame is opened, and should be deactivated prior to removal of any of the panels which block access to any of the rear frame assemblies.

(EIB 890)

## CP-789/UYK Computer—Timed-Out Acknowledge Adjustment

This article provides an adjustment procedure for the CP-789/UYK computer output acknowledge signal. Adjustment of the output acknowledge time duration may be required wherever a CP-789/UYK is connected to the AN/UYA-4 display system. The adjustment procedure does not apply to computers used in the AN/UYK-5(V) system.

The AN/UYA-4 display POFA (with CP-789/UYK) NAVSHIPS 0967-011-4550, the DLG 6 Combat Systems Alignment Test (CSAT) NAVSHIPS 0967-014-4830 and possibly other programs will not run properly if the output acknowledge duration is greater than 14 microseconds. A longer output acknowledge duration causes the AN/UYA-4 display consoles to lose varying quantities of previously entered offset values, and the loss occurs more frequently as the display refresh rate is increased.

To determine how long the output acknowledge signal is on the line to peripheral equipment, perform the following steps 3 and 4. To adjust the output acknowledge signal duration, use the following procedure:

1. Remove the 7003480 module from A1A1J3D of the CP-789/UYK and insert a module extender (Univac P/N 7009452-00) in A1A1J3D.

2. Place the 7003480 module in the module extender.

3. Write a small program that forces out an external function on any channel. This program must cycle repeatedly so the control signal can be scoped. Example: To output on channel four:

| Address | Instruction | Notes |
|---|---|---|
| 01000 | 501304 | Ext. Function Transfer |
| 01001 | 001006 | Buffer Limits |
| 01002 | 001006 | |
| 01003 | 502704 | Function Override Step |
| 01004 | 505601 | If Key 0 Set Stop |
| 01005 | 341000 | Repeat |
| 01006 | 000000 | |

4. Observe the External Function/Output Acknowledge signal with an oscilloscope. Insert scope input probe in 1TB5-D3 and trigger on 1TB7-H1.

5. In systems with the AN/UYA-4 display system, adjust potentiometer R7 on 7003480 module for a timed-out acknowledge pulse width of 12±2 microseconds. (CW rotation of R7 decreases pulse width.) The output acknowledge and external function signals are both controlled by this one adjustment.

6. Replace 7003480 module in A1A1J3D and repeat step 4 to verify that pulse width is still 12±2 microseconds. *(819)*

## OA-7781/USQ-20(V),(SB-2622/USQ-20(V) and SB-2624/USQ-20(V)), CV-2036/USQ-20(V)(KCMX), OJ-166/UYA-4(V), and OJ-167/UYA-4(V), CP-789(V)/UYK Center Drive Shaft--Maintenance Hint

See article in OA-7781/USQ-20(V) Section under the same title. (EIB 913)

## AN/SRN-9,-9A and CP-967/UYK--Interface Cable Change

See article under AN/SRN-9 with same title. (823)

### CP-967(V)/UYK Computer Circuit Card Repair—Information on

On a recent trouble call from a Pacific fleet ship to repair a CP-967(V)/UYK computer, an engineer from NAVSECSDIEGODIV noted that malfunctioning circuit cards had been removed from the computer and returned to the repair parts set without being repaired and checked out in the test set furnished with the computer. The maintenance doctrine for this computer requires that faulty circuit cards found during troubleshooting be repaired prior to returning them to the repair parts set, so that a good circuit card of each type is on hand for subsequent troubleshooting. Circuit card repair instructions are found in the technical manual. When a circuit card is beyond capability of repair locally, discard and reorder. No shore repair depot has been established for these circuit cards, and none is planned. A recent level of repair analysis performed for NAVSEC showed that it would be uneconomical to establish such a depot. *(EIB 854)*

### CP-967/UYK Digital Data Computer—Required Miniature Component Repair Tools

All Commands which use the CP-967/UYK are advised to order the following repair tools. These tools are mandatory for repair of miniature components in the CP-967/UYK.

| Description | Federal Stock Number | Price |
|---|---|---|
| Dykes, Klein | 9Q5120-062-3639 | 2.90 |
| Scribber, Machinists 6" | 9Q5120-224-9728 | .48 |
| Pliers, Round Nose 4-1/2" | 9Q5110-239-8252 | 1.10 |
| Tweezers, Self Locking | 9Q5120-293-0149 | .74 |
| Pliers, Multiple Tongue & Groove | 9Q5120-278-0350 | 1.18 |
| Screwdriver Set, Jewelers | 9Q5120-288-8739 | 1.46 |
| Clamp, Screw Jack | 5120-875-6663 | 3.35 |
| Pliers, Chain Nose 4-1/2" | 9Q5120-293-3486 | .80 |
| Pliers, Long Round Nose | 9Q5120-541-4078 | 1.13 |
| Brush, Typewriter | 9Q7510-550-8446 | .09 |
| Knife, Craftsman | 9Q5110-595-8400 | .64 |
| Blade, Craftsman Knife | 9Q5110-765-4144 | .26 |
| Card Holder, Circuit Board | 9Q5120-875-6681 | 8.55 |
| Pliers, Flat Nose, Narrow | 9Q5120-900-0444 | 2.99 |
| Pliers, Diagonal, 4" Plain Reg. Nose | 9Q5110-935-0890 | 1.90 |
| Pliers, Diagonal, 5-1/2" Plain Nose | 9Q5110-542-1350 | 2.90 |
| Pliers, Curved Nose | 9Q5120-239-8250 | 1.20 |
| Tweezers, Curved Point Smooth | 9Q5120-288-9685 | .66 |
| Tweezer, Cutting | 9Q5120-596-1210 | 1.35 |
| Trichlorethane Solvent | 9G6810-664-0387 | 1.93 |
| Knife Set | 9G5110-679-4668 | 3.00 |
| Tray-Solder, Iron, Cleaner | 9Q3439-907-8076 | 2.00 |
| Solder Remover Syringe | 9Q5120-957-3798 | .88 |
| Roin Flux | 1544/ Kester Solder Co. Newark, N.J. | 1.80 |
| Thinner Flux | 104/ Kester Solder Co. | .90 |
| Handle, Soldering Iron | 6100/ Ungar Electric Tools Hawthorne, Calif. 90252 | 1.47 |
| Cord, Soldering Iron | 6103/ Ungar Electric Tools | 3.12 |
| Heating Element, 25W | 6202/ Ungar Electric Tools | 3.93 |
| Heating Element, 15W | 6206/ Ungar Electric Tools | 3.93 |
| Micro-Chisel Tip | 6304/Ungar Electric Tools | 1.03 |
| Micro-Spade Tip | 6305/ Ungar Electric Tools | 1.03 |
| Tip, Screwdriver | 6331/ Ungar Electric Tools | 1.03 |
| Tip, Spade | 6336/ Ungar Electric Tools | 1.03 |
| Tip, Taper Screwdriver | 6550/ Ungar Electric Tools | 1.18 |
| Tip, Stepped Spade | 6551/ Ungar Electric Tools | 1.18 |
| Tip, Stepped Chisel | 6553/ Ungar Electric Tools | 1.18 |
| Holder, Soldering Iron | 6800/ Ungar Electric Tools | 1.83 |
| Herma Seal Coating | | |
| Wicking Material 1/4 or 1/8 | | |

(EIB 872/887)

## MOUNTING OF RECTIFIER TUBE V-301 (5U4G)

Correspondence from Naval Communication Station, Pearl, points out that the rectifier tube socket XV-301 is mounted so that the tube (5U4G) pins one (1) and four (4) are in a horizontal plane.

The specification sheet for electron tube JAN-5U4G specifies that this tube may be mounted in a horizontal position provided pins number one (1) and four (4) are in a vertical plane.

Examination of failure reports indicate the average 5U-4G tube life in the CU-168/FRR is 5774 hours, which is considered acceptable. Therefore, no formal field change to the CU-168/FRR will be promulgated. However, in the interest of lessening the failure rate of tube type 5U4G in this equipment, the tube socket may be rotated 90 degrees to re-position the pins in a vertical plane. This change requires approximately one man hour to accomplish.

## REPLACEMENT OF AMPLIFIER TUBES IN ANTENNA COUPLER CU-168/FRR

A number of insulation failures in the coupler amplifier filament circuits have been reported when 5814( ) high-reliability tubes have been used in lieu of the 12AU7's prescribed in the equipment Technical Manual, NAVSHIPS 91697(A). It has been indicated that the 5814( ) tube uses 1/6 more filament current than the 12AU7, and the additional heat generated could be sufficient to cause insulation failure.

As insurance against further insulation failures, Naval Radio Station personnel are directed NOT to use the 5814( ) tube in the CU-168/FRR Antenna Coupler.

## TYPE CU-332A/UR ANTENNA COUPLER MODIFICATION

Information received from the Material Test Branch of the Norfolk Naval Supply Center indicated unsatisfactory operation of the CU332A/UR Antenna Couplers. Tests made by the Material Test Branch revealed that the Roller-Arm Tension spring, Symbol 0-749 in NAVSHIPS 91745 (A) Figure 7-27, had become dislodged at one end of the adjustable Roller Arm, Symbol 0-751, resulting in jamming the tuning mechanism.

To correct this deficiency, the Bureau approves the method suggested by the Material Test Branch which is as follows:

1. Drill a shallow 1/8-inch diameter depression in the spring keeper flange.

CAUTION: Remove all drilling chips.

2. Connect the free end of the roller-arm tension spring to depression provided.

This small modification will prevent slippage and subsequent jamming.

## CU-714/SRA-22 COUPLERS-IMPROPER HANDLING OF

The Electronics Maintenance Engineering Center (EMEC) is in receipt of reports stating that many CU-714/SRA-22 Couplers have been received at repair facilities in a damaged condition, due to their being shipped without the pressure proof case.

Activities are advised that the shipping of this unit without the case results in damage to the 1C7 vacuum capacitor, which is not repairable by either the module repair facility or the manufacturer.

The cost to replace the damage 1C7 capacitor is approximately $219.00 each, and the cost to replace the missing pressure proof case is $496.00 each.

Therefore, in order to eliminate costly replacements, those activities which have shipped these units to repair facilities without the pressure proof cases shall ship these cases to the respective repair facility at the earliest practicable date.

In addition, activities are advised that no further shipments of this unit shall be made without the pressure proof case.

When requisitioning units of the AN/SRA-22 Antenna Group, the following applies:

| Unit | FSN |
|---|---|
| 1. CU-714/SRA-22 Coupler | F5985-789-1987 |
| 2. C-2698/SRA-22 Control | F5820-897-5501 |
| 3. AN/SRA-22 Antenna Group (671) | F5985-543-1861 |

## AN/SRA-22 ANTENNA COUPLER GROUP –REQUISITIONING AND TURN-IN PROCEDURES

See article under AN/SRA-22 with the same title (EIB 712)

## TYPE CU-332A/UR ANTENNA COUPLER MODIFICATION

Information received from the Material Test Branch of the Norfolk Naval Supply Center indicated unsatisfactory operation of the CU332A/UR Antenna Couplers. Tests made by the Material Test Branch revealed that the Roller-Arm Tension spring, Symbol 0-749 in NAVSHIPS 91745 (A) Figure 7-27, had become dislodged at one end of the adjustable Roller Arm, Symbol 0-751, resulting in jamming the tuning mechanism.

To correct this deficiency, the Bureau approves the method suggested by the Material Test Branch which is as follows:

1. Drill a shallow 1/8-inch diameter depression in the spring keeper flange.

CAUTION: Remove all drilling chips.

2. Connect the free end of the roller-arm tension spring to depression provided.

This small modification will prevent slippage and subsequent jamming.

## CU-937/UR Antenna Coupler—Maintenance Information

If corrosion exists under the mounting bracket for K6 and K7, operation of drive motors B1, B2 and B3 will be impaired in that they will either run slow or not run at all. This is due to corrosion between the bracket and the chassis. The corrosion causes a resistance in the common return to the 28 VDC supply which is connected directly to and through this relay bracket. Correction of this problem is to drill out the bracket's securing rivets with a 9/64" or No. 28 drill bit, clean away all corrosion and replace the rivets with 6-32 screws 1/2" long with nuts and lockwashers. (852)

## AS-2537/2537A 35' Fiberglass Whip Antenna and CU-938/URA-38-- Coupler Installation

See article in AS-2537/2537A Section under the same title. (EIB 938)

## CU-1280/FRD-10A(V) Multicoupler Test Meter Calibration—Maintenance Hint

Considerable time can be saved in calibrating CU-1280/FRD-10A(V) test meters if a third test point is added to allow calibration from the front panel.

Modification of the CU-1280/FRD-10A(V) to allow front panel test meter calibration proceeds as follows:

1. Install a third test point (TP3-color: orange) mid way between TP1 (black) and TP2 (red) on the CU-1280/FRD-10A(V) front panel. See figure 1.

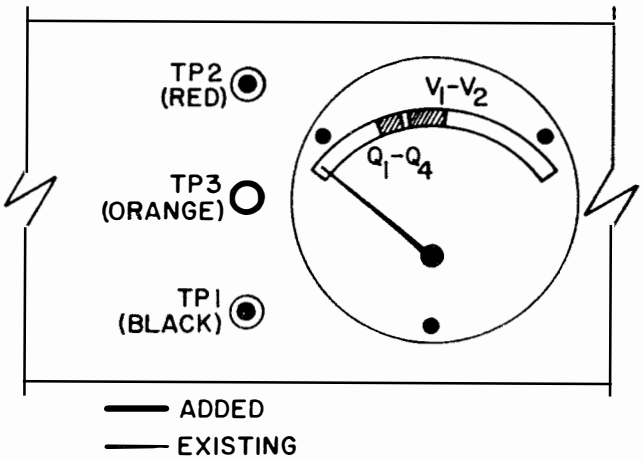



Figure 1. CU-1280/FRD-10A(V) Front Panel

2. Connect TP3 to the negative (-) side of the test meter M1. See figure 2.

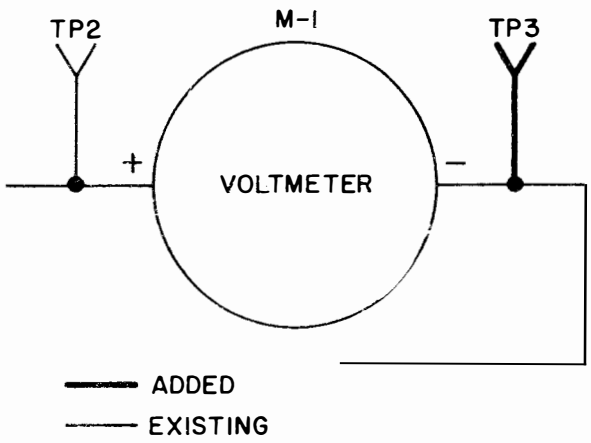



Figure 2. Voltmeter M-1

The new test meter calibration procedure is as follows:

1. Turn off power to the CU-1280/FRD-10A(V).
2. Set test meter switch to V1 ADJ.
3. Connect 0.58 ± 0.01 Volt DC power supply to TP2 and TP3, TP2 positive (+).
4. Adjust meter per paragraph 5 - 16.
5. Put multicoupler back into operation.

Activities making this modification shall ensure that suitable notation is made in associated technical documentation citing this EIB (860) as authority. *(EIB 860)*

## AS-2537/2537A 35' Fiberglass Whip Antenna and CU-938/URA-38-- Coupler Installation

See article in AS-2537/2537A Section under the same title. (EIB 938)

## CU-1457/URC-58(V) ANTENNA COUPLER –GUIDE PINS FOR COUNTER CHAINS

The following method of preventing the bead chains from coming off the brass sprockets on the fine tune and load counters has been incorporated into all new Manual Antenna Coupler CU-1457/URC-58(V) production models. The change can be installed easily in units already in the field. This change can be installed without any disassembly of the unit, except for removal of the top cover.

**Procedure:**

A metal pin (RF Communications part/number H4297) is installed in the nylon standoff which is located approximately 3/8 inch below each three digit counter drive sprocket. See figure 1 for identification. A 0-089-inch diameter hole must be drilled into the standoff 1/2 inch from the end which is flush with the front panel.

**NOTE**

The hole should be drilled at a 45° angle into the standoff to provide clearance between the top cover of the antenna coupler and the metal pin.

Insert the H4297 pin into the hole as shown in figure 2. Route the chain around the pin, as shown in figure 2,

**Material:**

RF Communications will supply the part (H4297) free of charge to any activity. Submit requirements to the following address:

RF Communications, Inc.
Field Service Department
1680 University Avenue
Rochester, New York 14610

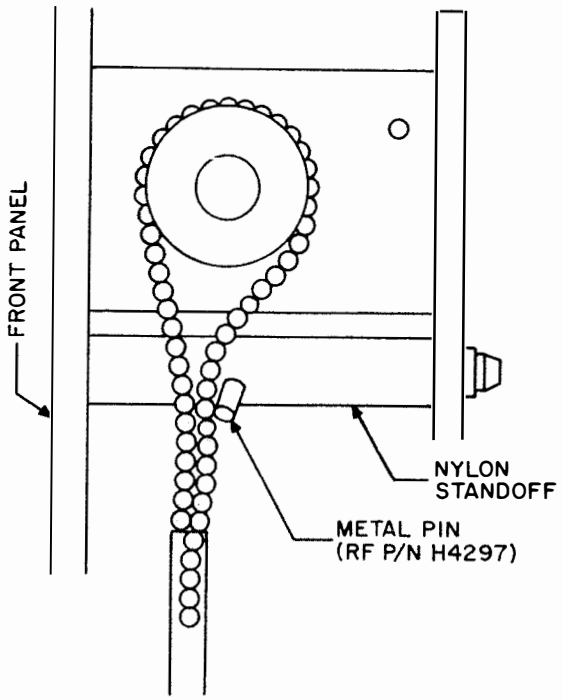



Figure 1. Top View of Coupler, Showing Location of Metal Pin.

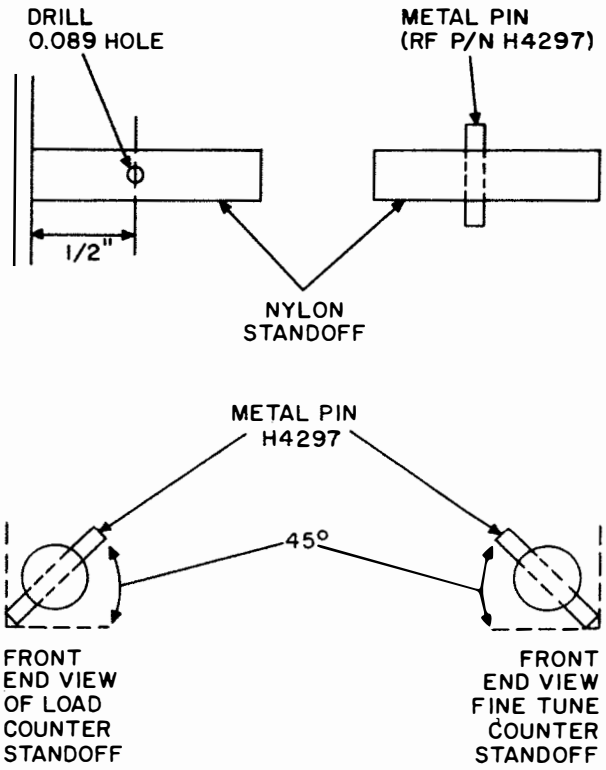



Figure 2. Drilling and Installation Details (E1B 721)

## APPLICATION OF MODIFIED RD-92/U, TT-41B/TXC-1B AND CV-172( )/U

There exists a requirement, depending on the station copied and location of ships in the Fleet, to copy meteorological facsimile transmissions at transmission speeds other than 60 LPM. The speeds of transmission other than 60 LPM are 90 and 120 LPM. The AN/UXH-2 facsimile recorder has the capability of copying facsimiles at all three speeds of transmission. There are not sufficient AN/UXH-2 recorders available at this time to meet the requirements of the Fleet; consequently, in-stock facsimile equipment has been modified to provide this capability until AN/UXH-2 equipment is available.

Out-of-stock RD-92( )/U recorders have been modified from a single speed, 60 LPM recorder to provide a 2-speed reception capability. The nomenclature has been changed in accordance with the speeds of operation. The following nomenclature and speed of recording applies to modified RD-92( )/U:

| | |
|---|---|
| RO-160 | 60 and 120 LPM |
| RO-171 | 60 and 90 LPM |
| RO-172 | 90 and 120 LPM |

Some TT-41B/TXCO-1B facsimile transceivers have been modified to operate 60 and 120 LPM in lieu of the 30-60 LPM. The nomenclature for the modified TT-41B/TXC-1B is the TT-321/UX.

The CV-172( )/U converter has been modified to accept the higher keying rate which may be encountered at the 120 LPM transmission speed. The nomenclature for the modified CV-172( )/U converter is the CV-1066/U. The operational difference between the CV-172( )/U and CV-1066/U involves only the tuning of the receiver B.F.O. In the CV-172( )/U, tuned circuits for setting the two shift limits are resonant at 1500 and 2300 cps. In the CV-1066/U, the tuned circuits are set for resonance at 2300 and 3100 cps. These higher frequencies accommodate the higher keying rate. The majority of facsimile transmissions, even at 120 LPM do not reach the keying rate that would compromise the operation of the CV-172( )/U, so it is feasible to use the CV-172( )/U as is until modification kits are available to convert them to a CV-1066/U. This modification kit can easily be installed by the ship force.

All installation, maintenance, and operational instructions that apply to the unmodified equipment, RD-92( )/U, TT-41B/TXC-1B, and CV-172, can be used for the corresponding equipment, with the exception of the operational speeds.

## SINGLE SIDEBAND CONVERTER CV-157/URR

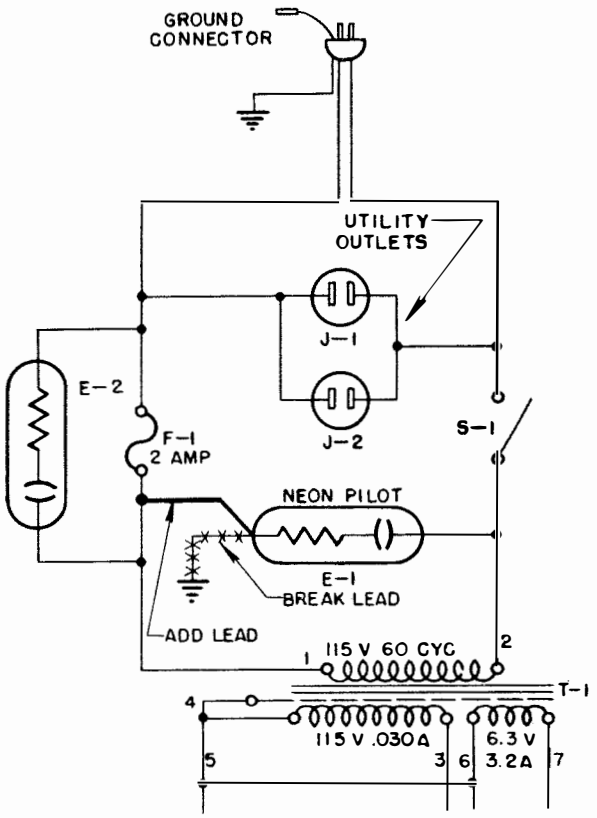
U. S. NAVCOMSTA Londonderry has reported that Single Sideband Converters CV-157/URR, manufactured by Dubrow Electronic Industries, Inc., have capacitor C-143 connected from pin 7 of V33 to the junction of resistors R-122 and R-195, placing the full power supply voltage across this capacitor which is rated at 100 volts d.c. The correct connection for this capacitor is from pin 7 of V33 to the junction of resistors R-196, R-197, and R-198, as shown in Department of the Army Technical Manual TM11-266, figures 67 and 68.

All activities using Single Sideband Converters CV-157/URR manufactured by Dubrow Electronic Industries, Inc., as shown on the nameplate, should inspect the connection of capacitor C-143 for this wiring error and correct the wiring if necessary to conform with the technical manual. (608)

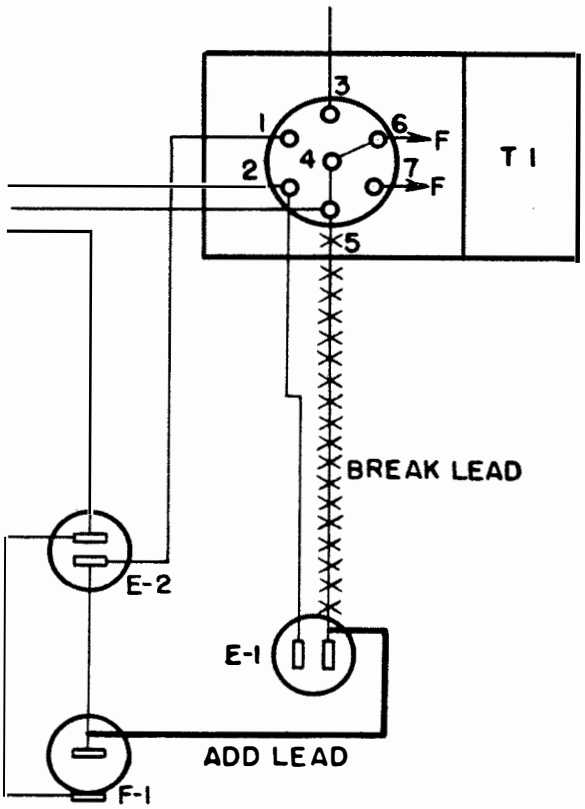
## REWIRING NEON PILOT LAMP

Field activities have reported that the on-off indication of the neon pilot lamp (E1) of Frequency Shift Converter CV--172/U is not definite when the converter is operated from an ungrounded primary power input line. For this type installation, the Bureau authorizes a rewiring of lamp E1 in accordance with accompany-illustrations.

A field change will not be issued for this minor modification; however, appropriate entries to indicate rewiring of E1 should be made in the equipment history cards and instruction books.




CORRECTIONS TO SCHEMATIC DIAGRAM
FIG. 6 OF NAVSHIPS 91394




CORRECTIONS TO WIRING DIAGRAM
FIG. 5 OF NAVSHIPS 91394

**NOTE:**
These diagrams are intended as an aid in rewiring E-1. It is not a complete drawing of the CV-172/U.

## APPLICATION OF MODIFIED RD-92/U, TT-41B/TXC-1B AND CV-172( )/U

There exists a requirement, depending on the station copied and location of ships in the Fleet, to copy meteorological facsimile transmissions at transmission speeds other than 60 LPM. The speeds of transmission other than 60 LPM are 90 and 120 LPM. The AN/UXH-2 facsimile recorder has the capability of copying facsimiles at all three speeds of transmission. There are not sufficient AN/UXH-2 recorders available at this time to meet the requirements of the Fleet; consequently, in-stock facsimile equipment has been modified to provide this capability until AN/UXH-2 equipment is available.

Out-of-stock RD-92( )/U recorders have been modified from a single speed, 60 LPM recorder to provide a 2-speed reception capability. The nomenclature has been changed in accordance with the speeds of operation. The following nomenclature and speed of recording applies to modified RD-92( )/U:

| | |
|---|---|
| RO-160 | 60 and 120 LPM |
| RO-171 | 60 and 90 LPM |
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Some TT-41B/TXCO-1B facsimile transceivers have been modified to operate 60 and 120 LPM in lieu of the 30-60 LPM. The nomenclature for the modified TT-41B/TXC-1B is the TT-321/UX.

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All installation, maintenance, and operational instructions that apply to the unmodified equipment, RD-92( )/U, TT-41B/TXC-1B, and CV-172, can be used for the corresponding equipment, with the exception of the operational speeds.

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**POSSIBLE SHOCK HAZARD ON PSP-2 POWER SUPPLY**

See article in PSP-2 section under the same title.

## CV-1123/USQ-20(V) KEYSET CENTRAL–GENERAL INFORMATION

Naval Tactical Data Systems Maintenance activities have found difficulty in attempting to cross-reference some of the more commonly used semi-conductors and transistors in the Analog to Digital Converter of the Keyset Central. Listed below is a cross-reference between these items and Federal Stock Numbers:

| Item | Symbol | Nomenclature | Federal Stock Number |
|---|---|---|---|
| 1 | 1N277 | Semi-conductor | 9N-5960-968-3858 |
| 2 | 1N746A | Semi-conductor | 9N-5960-847-5246 |
| 3 | 1N746A | Semi-conductor | 9N-5960-847-5246 |
| 4 | 1N749AM | Semi-conductor | 9N-5960-995-2312 |
| 5 | 1N759A | Semi-conductor | 1N-5960-846-9157 |
| 6 | 1N3016B | Semi-conductor | 9N-5960-833-8906 |
| 7 | 2M334 | Transistor | 9N-5960-809-9046 |
| 8 | 2N335 | Transistor | 9N-5960-552-0243 |
| 9 | 2N338 | Transistor | 9N-5960-474-6710 |
| 10 | 1N495 | Transistor | 9N-5960-754-5592 |
| 11 | 2N657 | Transistor | 9N-5960-752-6081 |
| 12 | 2N697 | Transistor | 9N-5960-964-8658 |
| 13 | 2N697 | Transistor | 9N-5960-964-8658 |
| 14 | 107-279 | | 1N-5960-884-0212 |
| 15 | 107-317 | | 1N-5960-803-5640 |
| 16 | 112-463 | | 1N-5960-884-0217 |
| 17 | 202-333 | | 1N-5960-884-0214 |
| 18 | 202-334 | | 1N-5960-884-0211 |
| 19 | 202-359 | | 9N-5960-884-0219 |
| 20 | 202-374 | | 1N-5960-884-0223 |
| 21 | 202-447 | | 1N-5960-884-0222 |

It is suggested this list be placed within the maintenance area for future reference. (673)

## CV-1123/USQ-20, Digital Data Converter (keyset Central)–Conversion Timing Problem

Reports of faulty displays and delays during Daily System Operational Test Programs (DSOT) indicate a possible conversion timing problem within Digital Data Converter (Keyset Central) CV-1123/USQ-20(V).

Logic time delay circuits require periodic checks and accurate adjustments. These procedures are contained in Section 6, paragraph 6.2c (4), of NAVSHIPS 94093(A), Technical Manual for Digital Data Converter CV-1123/USQ-20(V). Care in maintaining the Keyset Central within the specified performance standards should eliminate this problem during operational test programs, and in new programs being developed which demand high data rates and critical conversion times. (703)

**AN/FRA-501, AN/FRA-19(V), AN/FRR-502, AN/FRR-49 (V), CV-591/URR, CV-591A/URR, AND TECHNICAL MATERIAL CORPORATION COMMERCIAL MODEL MSR-5- USE OF AUTO-TRANSFORMER TO REDUCE EXCESSIVE LINE VOLTAGE**

See article in AN/FRA-19 section under the same title.

## CV-1123/USQ-20(V) KEYSET CENTRAL–GENERAL INFORMATION

Naval Tactical Data Systems Maintenance activities have found difficulty in attempting to cross-reference some of the more commonly used semi-conductors and transistors in the Analog to Digital Converter of the Keyset Central. Listed below is a cross-reference between these items and Federal Stock Numbers:

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| 3 | 1N746A | Semi-conductor | 9N-5960-847-5246 |
| 4 | 1N749AM | Semi-conductor | 9N-5960-995-2312 |
| 5 | 1N759A | Semi-conductor | 1N-5960-846-9157 |
| 6 | 1N3016B | Semi-conductor | 9N-5960-833-8906 |
| 7 | 2M334 | Transistor | 9N-5960-809-9046 |
| 8 | 2N335 | Transistor | 9N-5960-552-0243 |
| 9 | 2N338 | Transistor | 9N-5960-474-6710 |
| 10 | 1N495 | Transistor | 9N-5960-754-5592 |
| 11 | 2N657 | Transistor | 9N-5960-752-6081 |
| 12 | 2N697 | Transistor | 9N-5960-964-8658 |
| 13 | 2N697 | Transistor | 9N-5960-964-8658 |
| 14 | 107-279 | | 1N-5960-884-0212 |
| 15 | 107-317 | | 1N-5960-803-5640 |
| 16 | 112-463 | | 1N-5960-884-0217 |
| 17 | 202-333 | | 1N-5960-884-0214 |
| 18 | 202-334 | | 1N-5960-884-0211 |
| 19 | 202-359 | | 9N-5960-884-0219 |
| 20 | 202-374 | | 1N-5960-884-0223 |
| 21 | 202-447 | | 1N-5960-884-0222 |

It is suggested this list be placed within the maintenance area for future reference. (673)

## CV-1123/USQ-20, Digital Data Converter (keyset Central)–Conversion Timing Problem

Reports of faulty displays and delays during Daily System Operational Test Programs (DSOT) indicate a possible conversion timing problem within Digital Data Converter (Keyset Central) CV-1123/USQ-20(V).

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**CV-1980A/USQ-20(V), CV-1980B/USQ-20(V) AC Switch Card 101-1466-( )—Failures of**

The TRIG MODE AC SWITCH in both equipment (Q5 and Q8 respectively) can fail with no immediately noticeable symptoms. However, the reference voltage may change slightly and, after a period of time, the reed relays may fail. The failing item on this card is the 2N3738 power transistor.

Since the transistor is paralleled with an inductor, the transistor failure will result in one of the following effects. If the transistor becomes:

1. SHORTED, the reed relays will continue to operate but will be switching under load, creating a degrading effect on the relay contacts, which will eventually lead to relay failure.
2. OPEN, the reed relays will be operating with an elevated reference voltage level. This would create the possibility of erroneous data.

All activities possessing this equipment should occasionally check the 2N3738 transistor on the AC Switch cards to ascertain correct operation.

Replacement of this transistor, if found in an inoperative condition, will help to extend the life of the reed relays.

The planned maintenance system will not be changed since a design change will be promulgated to correct the deficiency. (773)

**CV-2036/USQ-20(V) Digital Data Converter (KCMX) Digital Input Channel/Digital Output Channel (DIC/DOC) Time-out Delay Adjustments—Information Concerning**

The purpose of this article is to point out the increasing need for KCMX DIC/DOC time-out delay changes and to establish a plan for supplying the appropriate delay circuit when a change from the factory installed delay circuit is necessary.

Until recently the factory installed DIC/DOC time-out delay circuits have been compatible with software and/or hardware requirements. However, recently implemented operational programs and new equipment interfacing with KCMX have created the need for either replacing delay printed circuit cards or readjusting DIC/DOC time-out delays. Time delay changes will in all probability be to longer delays. The factory installed DIC/DOC time-out delay circuit has a nominal time delay range of 150 to 1500 microseconds, which may be adjusted to any desired setting in this range by following the procedure on page 5-71 (Type 1 Time Delay Adjustments) of NAVSHIPS 0967-051-5120, Technical Manual for Digital Data Converter CV-2036/USQ-20(V). Time-out delays outside the range of 150 to 1500 microseconds are achieved by replacing the factory installed printed circuit card with the appropriate time delay circuit, after the new circuit has been adjusted to the desired time-out setting in accordance with the procedure on page 5-71 of the technical manual.

Table 1 lists the available delay circuits, the respective delays, and the applicable chassis locations.

For configuration control purposes NAVSECNORDIV will manage the distribution of all delay circuits that are to be used in conjunction with KCMX DIC/DOC time-out delay changes. Distribution will normally be automatic, however, activities establishing a need for any of the delay circuits listed in table 1 should direct requests to Naval Ship Engineering Center, Norfolk Division, Code 6623, Naval Station, Norfolk, Virginia 23511. (785)

Table 1.

| Channel | Chassis Location Computer Mode | Chassis Location Peripheral Mode | Available Delay Circuits | Delay Characteristics |
|---|---|---|---|---|
| DOC 1 | 2D31 | 2E26 | | |
| DOC 2 | 2D32 | 2E27 | | |
| DOC 3 | 2D33 | 2E28 | 7104830 | 3 usec to 15 usec |
| DOC 4 | 2D34 | 2E29 | 7104840 | 15 usec to 150 usec |
| | | | 7104850 | 150 usec to 1.5 ms |
| DIC 1 | 6E34 | 6E33 | 7104860 | 1.5 ms to 15 ms |
| DIC 2 | 6E32 | 6E31 | 7104870 | 15 ms to 150 ms |
| DIC 3 | 5D11 | 5D12 | | |
| DIC 4 | 5D13 | 5D14 | | |

## CV-2036/USQ-20(V) (KCMX) Digital Data Converter--Maintenance Hint

This article recommends a way to prevent metal particles being blown throughout the KCMXs interior. Many of these metal particles are being deposited in the power supply (PS) drawer, which could cause short circuits and equipment damage. The metal particles are caused by protruding screwheads on the bottom of the PS1 drawer dragging over the top edge of the front panel just below the drawer.

Remove the power supply drawer (PS1) in accordance with the procedure on page 5-105 of Technical Manual NAVSHIPS 0967-051-5120.

File 3/16 inch of metal off the entire top edge of the lower front panel as shown in figure 1. This will eliminate the cause of metal particles and may prevent future power supply casualties. (801)

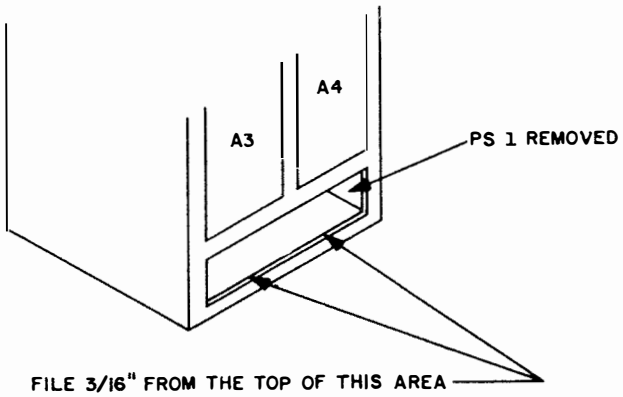



Figure 1. Modification to Lower Front Panel of Digital Data Converter.

## OA-7781/USQ-20(V), (SB-2622/USQ-20(V) and SB-2624/USQ-20(V)), CV-2036/ USQ-20(V)(KCMX), OJ-166/UYA-4(V), and OJ-167/UYA-4(V), CP-789(V)/ UYK Center Drive Shaft--Maintenance Hint

See article in OA-7781/USQ-20(V) Section under the same title.
(EIB 913)

## OU-83/UYK, CV-2953/UYK and CV-2953A/UYK, Signal Data Converter Group—Maintenance Hint

The digital-to-synchro circuits use D/A Converter (497826), Electronic Switching Amplifier (2868428), and Synchro Power Amplifier (497830) cards in its conversion chain. An out of tolerance condition in this circuit will overstress the 497830 card, causing it to fail. Failure may be caused either by distortion such as spikes or holes normally generated by faulty switching or by DC voltage offset causing ineffective amplification. Replacing this Synchro Power Amplifier card without checking for the out-of-tolerance conditions may result in damage to the new card.

Although the power amplifier circuit is being redesigned to prevent a secondary failure, a replacement is not forthcoming in the near future. This article provides an interim procedure for checking the suspected synchro output channel.

Test Equipment Required:

1. Function Generator (built into equipment)
2. Oscilloscope, CBTV-545B or equivalent
3. Differential Voltmeter (DVM), CCUH-803B/AG or equivalent

Procedures:

1. Observe all safety precautions for working on energized electronic equipment.
2. Do not install the replacement 497830 card.
3. Check reference voltages at pins 3 and 5 or 19 and 20 to common (pin 4) of the appropriate 2868434 (AC Power Supply) card. See figure 3-99 of TM, NAVSHIPS 0967-[illegible]8 -7020.
4. Using the procedure in paragraph 3-21 of TM (referenced above), generate a rotating D/S vector with the Function Generator. Set the PULSE GENERATOR switch to "FAST" for a multi-speed channel failure or "SLOW" for a single-speed channel failure.
   a. Remove the damaged 497830 card.
   b. Using the oscilloscope, observe the waveforms at pins 17 to ground and 21 to ground of the 497830 socket. The envelope of the 400-Hz carrier should be a sinusoidal modulated waveform, having no spikes, holes, or other distortion.
   c. Increase the sweep rate and verify that the carrier is also sinusoidal. If the previous results are not obtained, troubleshoot the channel to isolate defective circuitry.
5. Remove the Transfer Switching Assembly card (497852) associated with that channel.
   a. With the Function Generator still enabled, monitor pins 35 to ground and 38 to ground of the 497826 socket; also pins 12 to ground and 13 to ground of the 2868428 socket using the DVM. Verify that the DC voltage is less than ± 5 mV. If the previous results are not obtained, troubleshoot the channel to isolate defective circuitry.
   b. Repair or replace any faulty circuit cards; return the equipment to normal operation.

(EIB 958 966)

## Cord Assembly CX-1846( )/U for Handset NT-51007A & H-169/U

The Bureau of Ships has been informed that Cord Assembly CX-1846/U for use with handset NT51007A was being supplied as piece-parts for assembly at field activities. The cost of assembling the CX-1846/U greatly exceeded the cost of the completed cable assembly.

Accordingly, action has been taken to make Cord Assembly CX-1846A/U,FSN N5995-557-3654, which supersedes Cord Assembly CX-1846/U, available as a complete assembly.

## CY-4516( )/S SHIPBOARD ELECTRONIC EQUIPMENT CABINETS–REMOVAL OF RF FILTER SCREENS

One of the major complaints about the shipboard general purpose cabinets is the lack of adequate air ventilation for installed equipments. Investigation has disclosed that this problem is due primarily to clogged RF filter screens which cover the air duct openings in the cabinet inside walls. These filters are provided to reduce RF interference between equipments.

Many equipments are installed complete with their case in the CY-4516( )/S cabinets. For such installations the additional cabinet RF filters are not required, since all equipments must meet the RF interference requirements of Military Specification MIL-I-16910( ). Installation activities should remove the RF filter screens from the cabinet at the time of installation. Ships personnel should check to see that these screens are removed.

For those installations where the case is removed from the equipment, the RF filter screens in the cabinet must remain. They should be checked monthly to insure that they provide no air restriction.

The large filter covering the air intake opening at the front of the cabinet must remain. Since this filter is located close to the deck it is prone to collect more dirt than most filters. Personnel should check this filter weekly to insure free flow of air.

Maintenance Index pages and Maintenance Requirement cards, under the planned Maintenance Sub-System, will be developed and distributed to the fleet for the CY-4516( )/S. The above scheduled maintenance procedures will be included therein. (EIB 726)

## 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.

## Re-Installation of Litton EM Log Indicator Transmitter Fine Speed Dial Pointer — Maintenance Hint

The purpose of this article is to emphasize the necessity of re-installing the fine speed dial pointer on the Litton EM Log Indicator Transmitter on applicable ships.

In establishing a standard field change program for the Litton EM Log, several previously approved hardware modifications have been documented as field changes with supporting documentation (field change bulletins).

One such modification (authorized by BUSHIPS INSTRUCTION 9650.40 Ser 665-1493 dated 31 July 1962) involves a gearing change to reduce oscillation of the indicated speed of the indicator transmitter and has been designated Field Change 4 - Electromagnetic Underwater Log (Mfg Litton Industries). Field Change Bulletin, NAVSEA 0365-LP-292-0040 applies to this field change.

Those equipment holders installing this modification using the instructions originally provided with each kit were required to remove the fine speed dial pointer on the Indicator Transmitter.

The updated installation instructions of the field change bulletin do not call for the removal of the fine speed dial pointer. This pointer must be installed if any accurate speed indication is to be observed on the indicator transmitter speed dial.

Based on the foregoing the fine speed dial pointer should be re-installed on all affected indicator transmitters. (EIB 917)

## Revised Technical Manual for Litton Underwater Log Equipment, Electromagnetic Type— Announcement of Availability

The purpose of this article is to announce the availability of a revised technical manual for the Litton EM Log (vacuum tube type), NAVSEA 0365-LP-292-0000 dated 23 September 1975. This revised manual supersedes the following three Litton EM Log technical manuals:

NAVSHIPS 365-2496
NAVSHIPS 365-2623
NAVSHIPS 365-2920

Limited distribution of this technical manual has been made. Equipment holders not receiving the manual may requisition copies from Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 using the following stock number.

| Item | Stock Number |
|---|---|
| Technical Manual for Underwater Log Equipment, Electromagnetic Type for 40-Knot Equipment | 0365-LP-292-0000 |

(EIB 922)

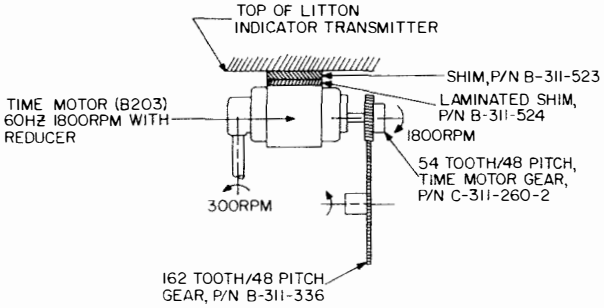
## Litton Industries Indicator Transmitter Electromagnetic Underwater Log—Maintenance Hint

Several equipment holders have indicated that a problem has been encountered in the Time Motor (B203) output gear train of the Litton Industries Indicator Transmitter. For the following discussion, refer to the Litton Industries Indicator Transmitter Technical Manual, NAVSEA 0365-LP-292-0000 (dated 23 September 1975), pages 7-56 through 7-58. Specifically, the 1800 RPM output gear (54 tooth/48 pitch), part number C-311-260-2, piece number 37 has experienced faster than normal gear wear in some installations. This gear is made from Teflon and meshes with a 162 tooth/48 pitch, Naval Brass gear.

After close evaluation it was determined that proper shimming of the Time Motor (B203) is critical and essential to ensure proper tooth engagement between the 54 tooth Time Motor gear and its mating 162 tooth gear. During the initial factory assembly of the Indicator Transmitter, the shims were installed, but through years of repair, parts replacement and overhaul of the units, it was discovered that quite often these shims were either lost or not reinstalled. Incorrect shimming will result in accelerated wear of the softer Teflon gear. Referring to page 7-34 of the technical manual, both Time Motor shims are shown (piece number 22, part number B-311-523 and piece number 23, part number B-311-524). Although the technical manual specifies shims, there are no drawings describing their physical construction, or gear alignment procedures. Additionally, the shims cannot be ordered through the supply system for they are unexpendable hardware items and are not listed on the Allowance Parts Lists (APLs 870090006 or 870090015. Thus, if the shims were lost, there wasn't any technical information concerning proper replacement.

This maintenance hint provides three drawings to aid in the correct alignment of subject gear. Figure 1 provides information for correct alignment for Time Motor Gear. Figures 2 and 3 depict the manufacture of both shims.

Correspondingly, the same philosophy exists for the shimming of the Differential Unit Assembly. Figures 4 and 5 depict the manufacture of both shims for the Differential Unit Assembly. The basic concept of the alignment procedure for the Time Motor can be applied to the Differential Unit Assembly. Any questions concerning this article, can be directed to NAVSECNORDIV, Tom K. Kamalsky, Jr. Autovon 690-9325.



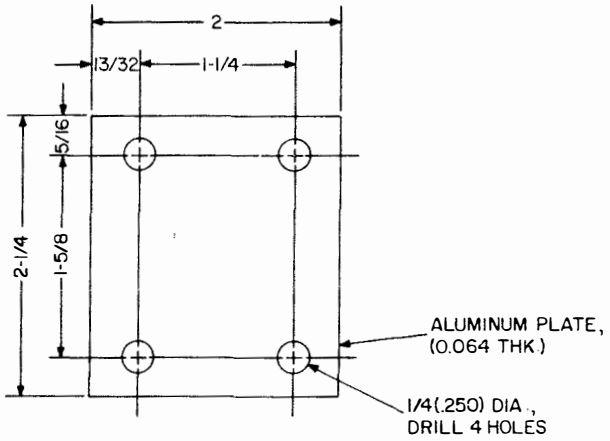

REFERENCES:

1-Litton Underwater Log Equipment Electromagnetic Type for 40 Knot Equipment, NAVSEA 0365-LP-292-0000.

**Figure 1. Litton Indicator Transmitter Time Motor Gear Alignment Procedure. (From Dwg. SK4270031, Rev. A.)**

NOTES

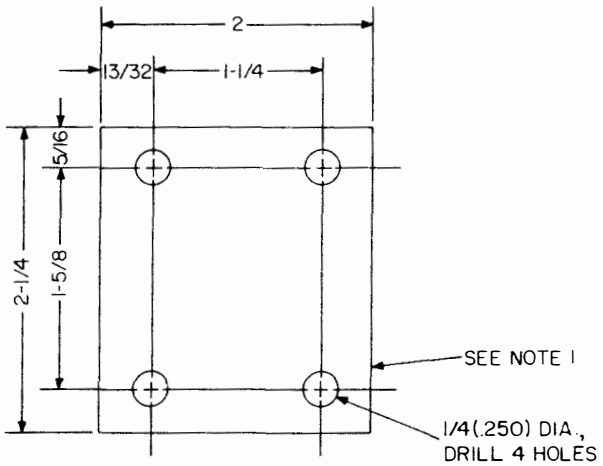
1. Install shim (P/N B-311-523) and laminated shim (P/N B-311-524) on time motor (B203) and bolt to top of indicator transmitter.
2. Check for proper tooth engagement between time motor gear (54 tooth/48 pitch), P/N C-311-260-2 and the (162 tooth/48 pitch) gear, P/N B-311-336.
3. The fit should be snug, yet free enough to allow the gear train to rotate.
4. Unbolt time motor (B203) and both shims (B-311-523 and B-311-524) and remove sufficient number of laminations from laminated shim, P/N B-311-524 to provide proper fit.
5. Repeat steps 1 through 4 until proper gear mesh is obtained.




NOTES

1. Remove all burrs and sharp edges.
2. Shim (Litton Part Number B-311-523) is utilized to provide proper alignment of time motor (B203) drive gear (54 tooth/48 pitch) with its mating gear (162 tooth/48 pitch).
3. This shim works in conjunction with laminated shim (Litton Part Number B-311-524).
4. This shim must be manufactured, not available in supply system.

**Figure 2. Litton Indicator Transmitter Shim for Litton Time Motor (B203). (From Dwg. SK4270033, Rev. A.)**




NOTES

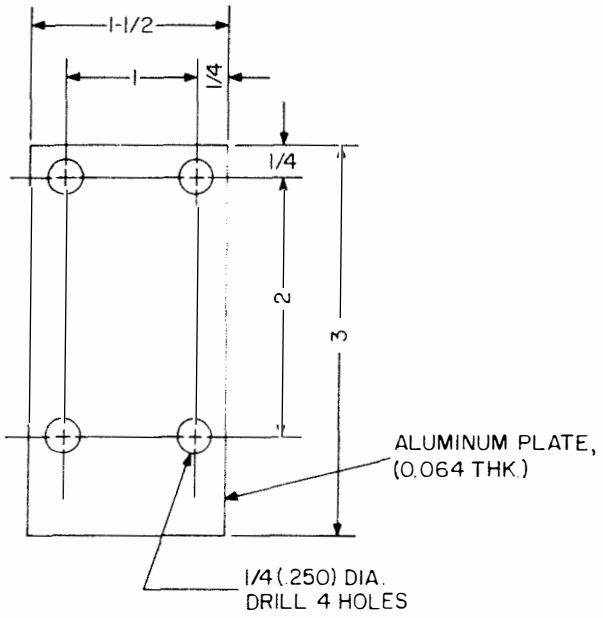
1. Material: Laminated shim 0.093 thick consisting of aluminum foil 0.003 thick.

2. Laminated shim (Litton Part Number B-311-524) is utilized to provide alignment of time motor (B203) drive gear (54 tooth/48 pitch) with its mating gear (162 tooth/48 pitch).

3. This laminated shim works in conjunction with shim (Litton Part Number B-311-523).

4. This laminated shim must be manufactured, not available in supply system.

**Figure 3. Litton Indicator Transmitter Laminated Shim for Litton Time Motor (B203). (From Dwg. SK4270034, Rev. A.)**




NOTES

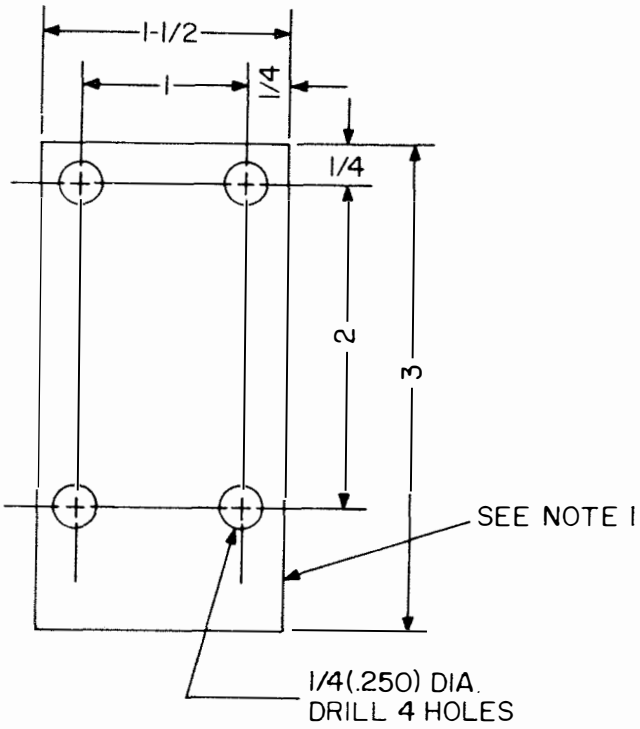
1. Remove all burrs and sharp edges.

2. Shim (Litton Part Number B-311-522) is utilized to provide alignment of the time motor (B203) gear (22 tooth/48 pitch) with its mating gear (66 tooth/48 pitch) of the differential unit assembly.

3. This shim works in conjunction with laminated shim (Litton Part Number B-311-525).

4. This shim must be manufactured, not available in supply system.

**Figure 4. Litton Indicator Transmitter Shim for Differential Unit Assembly. (From Dwg. SK4270035, Rev. A.)**




NOTES

1. Material: Laminated shim 0.093 thick consisting of aluminum foil 0.003 thick.

2. Laminated shim (Litton Part Number B-311-525) is utilized to provide alignment of the time motor (B203) gear (22 tooth/48 pitch) with its mating gear (66 tooth/48 pitch) of the differential unit assembly.

3. This laminated shim works in conjunction with shim (Litton Part Number B-311-522).

4. This laminated shim must be manufactured, not available in supply system.

**Figure 5. Litton Indicator Transmitter Laminated Shim for Differential Unit Assembly. (From Dwg. SK4270036, Rev. A.)**

(E1B 963)

## STOCK NUMBERS FOR COMPONENT PARTS IN HANDSET H-169/U, FSN N5965-679-9501

Transistorized Type Handset H-169/U, complete with cord-assembly CX-1846A/U, is now available from stock, under FSN N5965-679-9501. This handset is used with equipments AN/URC-32 and AN/WRT-2. In many equipments, it can be used as a direct substitute for Handset Navy Type 51007A.

Component parts for Handset H-169/U are available from stock, under the following stock numbers:

| Description | Part Number | FSN |
|---|---|---|
| Handset H-169/U, with cord assembly CX-1846A/U | RC-10385/C | N5965-679-9501 |
| Handset H-169/U without cord assembly | RC-10385 | N5965-803-4381 |
| Earphone element | RC-10379 | N5965-678-5305 |
| Microphone unit, with retainer ring | RC-10367 | N5965-678-5478 |
| Microphone unit, without retainer ring | RC-29020 | N5965-624-4134 |
| Microphone retainer ring | RC-15014 | N5965-624-4141 |
| Cord assembly | CX-1846A/U | N5965-803-4381 |

## SHOCK HAZARD ON HANDSETS H-169/U AND N.T. 51007A

It has been reported that a shock hazard exists on a few Navy handset types H-169/U and N.T. 51007A. This is caused by a misalignment of the leaf of spring of the switch which shorts the push-to-talk button (metal) shaft and, in turn, places the keying potential on the plate of the switch. When the switch button is engaged or released, an inductive kick-back potential is present on the switch plate. If a handset is considered to be a shock hazard, or if a continuity check indicates a short between the switch plate and the plug pins, the handset should be modified as follows:

1. Re-align the pile-up of the push-to-talk switch in order to prevent shorting to the metal shaft.
2. Reverse the green and black leads of the switch, which removes the keying voltage from the leaf spring which, in turn, shorts to the metal shaft. Figure 1 shows the modified wiring diagram of the handset switch.
3. Determine whether excess solder is causing the short.

The drawing for handset H-169/U has been modified in order that future procurement of the handsets will be manufactured to reflect this modification. The handset switch is available from stock under the Federal Stock Number N5930-678-5304.

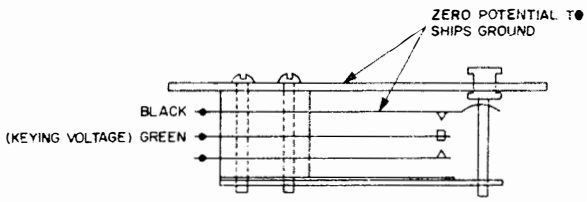



*Figure 1. Push-to-talk switch handsets H-169/U and NT-51007A.*

## H-169/U and N.T.-51007A; Modification of Handsets

It has been reported that the push-to-talk switch on some H-169/U and NT-51007A handsets bind and in some cases, break due to the guide pin coming in contact with the metallic rails directly under the switch.

It should be noted that the difficulty is not apparent upon visual inspection, but develops while the handsets are in actual use. If, upon depressing the button at a slight angle, the switch short circuits to the two brass rails, the handset should be modified by machining the rails as indicated in figure 1.

Specifications have been modified to prevent future procurement of handsets with the defects indicated above. (631)

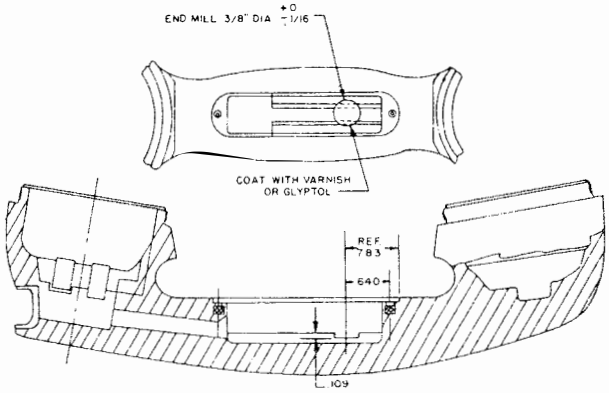



**Figure 1. Handsets H-169/U and NT-51007A, Modification Dimensions**

**H-169/U Handsets - Electromagnetic Interference in Shipboard Installations**

Electromagnetic interference in the H-169/U handset was detected during a recent survey conducted on the DE-1052 class ships. Investigation has indicated that the H-169/U handset (containing an unshielded solid state audio amplifier within the microphone transmitter element) when physically located in open or semi-open areas, such as flying bridge, bridge wings or pilot house, are vulnerable to samples of reflected electromagnetic energy from the ship's radar. Due to the reflective characteristics of the ship's structure, sufficient levels of reflected rf energy are present in the pilot house to degrade radio communications. The signals are detected and amplified within the self contained solid state circuit of the H-169/U and reproduced as a series of audio pulses, representative of the pulse repetition frequency (PRF) of the offending radar.

The capability of the handsets (located in the exposed areas) for detecting the PRF of the radar can be prevented simply and inexpensively by replacing the existing dynamic solid state amplifier transmitter element with a carbon element as used in the older Navy Type 51007A Handsets. This carbon element is in the supply system under FSN 9N5965-586-0831. The dynamic and carbon elements are directly interchangeable, however, the carbon element will slightly degrade transmitted audio fidelity.

NAVSHIPS has taken direct action to accomplish this change to SCN funded ships of the DE-1052 class. Active Fleet ships (OPN funded) should requisition the carbon elements when similar electromagnetic interference problems are encountered. *(803)*

**H-200/U Headset-Chestset, Sound Powered Telephone — Availability of Special Part**

A field report indicates that some plastic "push-to-talk" buttons on the H-200/U Headset-Chestsets are being broken when the units are accidentally dropped. A replacement metal push button assembly consisting of the push button, a plastic tip, an "O" ring and a retaining ring ("Tru-Arc") is available from:

Stromberg Carlson Co.
P.O. Box 1288
Charlottesville, VA 22902
(804) 973-2200

The package assembly No. 702020-263 costs approximately $2.25 each. Minimum order is ten (10) dollars.

(EIB 913)

### "AIMS" KIT-1A/TSEC and KIR-1A/TSEC Mount Plug Damage—Prevention of

The Mark XII AIMS IFF system is currently replacing the Mark X system in the Fleet. Part of the system includes the KIR-1A/TSEC and KIT-1A/TSEC crypto equipments which provide for a new secure mode, mode four.

During checkout and certification of the new system, a problem has been identified in the crypto equipment mount (MT-3951A) plug. It has been noted that the mount plugs are susceptible to damage of the connector pins when inserting and removing the crypto equipments.

To minimize possible damage to the connector pins, care should be taken when inserting and/or removing the units. To insert the unit, slide it into the mount plug; DO NOT lift or tilt. To remove the unit, pull it straight out; DO NOT lift or tilt. *(821)*

### KIT-1A/TSEC and KIR-1A/TSEC, AIMS MK XII—Mountings for

All future mount requirements for KIT-1A/TSEC or KIR-1A/TSEC units will be fulfilled by use of the MT-4580/U, an improved mount intended as a replacement for the MT-3951A/U. The MT-4580/U incorporates a shroud over the top rear of the KIT or KIR unit to provide mechanical alignment during installation and reduce the chance of connector damage from skewed insertion. At the present time there are no plans to retrofit the MT-4580/U into existing installations which have the MT-3951A/U.

Installation of the MT-4580/U may be made using the applicable ICD's (Transponder Set, AN/APX-72 (AIMS-SHIPS) or AIMS MK XII IFF Installation Standard Interconnection Diagram, as applicable) for reference. Revised ICD's, incorporating the MT-4580/U, will be issued as soon as possible. Overall clearance dimensions for the MT-4580/U are as shown on the current ICD's for the MT-3951A/U, except for the overall height figures which should be 8.75" including sway space and the overall front to rear dimensions (including area required for cable dress) which should be 14.5". Drilling detail for the MT-4580/U is the same as for the MT-3951A/U. To allow for locking of the security strap (discussed later in this article) following installation of the KIT-1A/TSEC or the KIR-1A/TSEC, the mount/strap assembly must be positioned such that the front of the strap is at least even with or further forward than units adjacent on either side, if such units are closer than 3" from each side.

Connections to the KIT-1A/TSEC or the KIR-1A/TSEC are to be made in accordance with applicable drawings (NAVSHIPS RE-B2696420 for KIT-1A/TSEC and NAVSHIPS 825-4435839 for KIR-1A/TSEC, except that the connector to be used is an Amphenol No. 02660 94-818-01 (98230-ON089560-1) rather than the Amphenol No. 6850 94-621 presently called for on the drawings. The 02660 94-818-01 has greater mechanical strength and will withstand repeated connect/disconnect operations better than the 6850 94-621. The 02660 94-818-01 with all necessary hardware, pins, etc., is available under FSN 9N5935-455-0417.

When using the MT-4580/U, two minor alterations must be made to assure proper seating of the KIT-1A/TSEC or KIR-1A/TSEC units in the mount. First the two rubber grommets at the top rear of the shroud must be removed. Second, the rear connector plug cover retaining cable attachment point must be relocated from the inside rear of the tray of the MT-4580/U to one of the screws of the cable restraining yoke behind the rear connector.

A security strap for use with the MT-4580/U is shown on Naval Ship Engineering Center Drawing RE-D2698862. This drawing will be issued by NAVSECNORDIV in the near future.

At the present time, NAVELEX is preparing plans for a SHIPALT producing complete "( )/TSEC" mount/security strap/cable assemblies for all future AIMS MK XII installations.

A limited quantity of TSEC mount packages will be available in the near future, upon request to NAVELEX Code 05712, for those new construction ships now in the active fleet which are receiving the KIT-1A/TSEC. *(EIB 862)*

## COLLINS RADIO SET KWM-2A; POWER SUPPLY PM-2 MODIFICATIONS

Holders of the collins model KWM-2A having the attached type power supply PM-2 are advised that a Service Bulletin is available from the Collins Radio Co., Cedar Rapids, Iowa. The Bulletin is identified as PM-2 Bulletin No. 1, dated 17 April 1963.

The bulletin provides details on equipment modifications to extend the design specifications for input voltage limits. This modification **is not** intended to allow continuous operation at higher voltages, but to allow operation under wider fluctuations of line voltage such as those encountered in installations having poorly regulated primary power sources. This modification will allow momentary primary surges up to 150 volts without subjecting components to breakdown. This modification is recommended for installations which have experienced difficulties in line voltage regulation.

To determine if the modification is installed, remove the PM-2 dust cover. If there are two 100 UF capacitors under the speaker, this change has been made; if not, this change has not been made.

Modification kits as described in the Bulletin have **not** been procured by BUSHIPS. (666)

## COLLINS KWS-1 SINGLE SIDEBAND TRANSMITTER SERVICE BULLETINS

The Collins Radio Company recently announced the availability of two Field Service Bulletins for the Model KWS-1 Single Sideband Transmitter.

Activities having Model KWS-1 Transmitter may obtain copies of these bulletins by writing the Collins Radio Company, Field Engineering Division, Dallas 2, Texas.

## KWT-6(8) RADIO SET

The Collins KWT-6(8) equipment is the commercial version of Navy Radio Set AN/URC-32.

Collins Radio has reported that all KWT-6(8) equipments procured by various Navy activities are equivalent to Radio Set AN/URC-32, Serial number 820 series. Ships and activities having the commercial KWT-6(8) equipments should ascertain that all AN/URC-32 field changes affecting the AN/URC-32, Serial 820 (and higher serials), are installed.

## ISSUE OF SUBSTITUTE KWT-6(8) FOR RADIO SET AN/URC-32

See article in AN/URC-32 section under the same title.

## MODIFICATION OF FREQUENCY-SHIFT KEYER KY-43/URT

The frequency-shift keyer KY-43/URT is used for frequency-shift keying of the TAB-5 radio transmitting equipment, and works well in most installations. In some installations, however, the desired 170-cps shift at 100 kc. is not obtained. This is due to insufficient grid excitation of the 6SA7 tube V-801. Individual differences in keyers and transmitter oscillators are enough to cause this to happen in those equipments affected.

This difficulty was corrected d the Naval Communication Station, Annapolis, Md., by changing resistor R-811 from 1,000 to 2,400 ohms. It is to be noted, however, that this alteration also changes the frequency-dial settings of the keyer. It is necessary to recalibrate these dials for all frequencies.

Personnel at the Annapolis station also report that the the fine-control potentiometer R open-circuited when set in the extreme clockwise position. This was remedied by connecting a wire between the terminals of the moving-contact arm and the lowpotential end of the potentiometer.

All KY-43/URT equipments should be checked for these troubles, and corrected if necessary.

## STELMA Model LC-3 Constant Current Rheostat—Maintenance Hint

The purpose of this article is to provide maintenance personnel with instructions for repair of the LC-3 rheostat for those stations desiring to do so. Results of an investigation conducted by NAVCOMMSTA WASH., D.C. personnel reveal that the LC-3 can be repaired on site with material and tools generally available at NAVCOMMSTA's.

Two mechanical configurations of the LC-3 rheostat are being used. The circuit, figure 1, is the same for both configurations. Figure 2 and figure 3 show the general component layout of the units. Table 1 is a description of all components in the LC-3. These components are generally available through supply channels.

**Failure Symptoms:**

1. No regulation
2. Low current
3. No adjustment possible

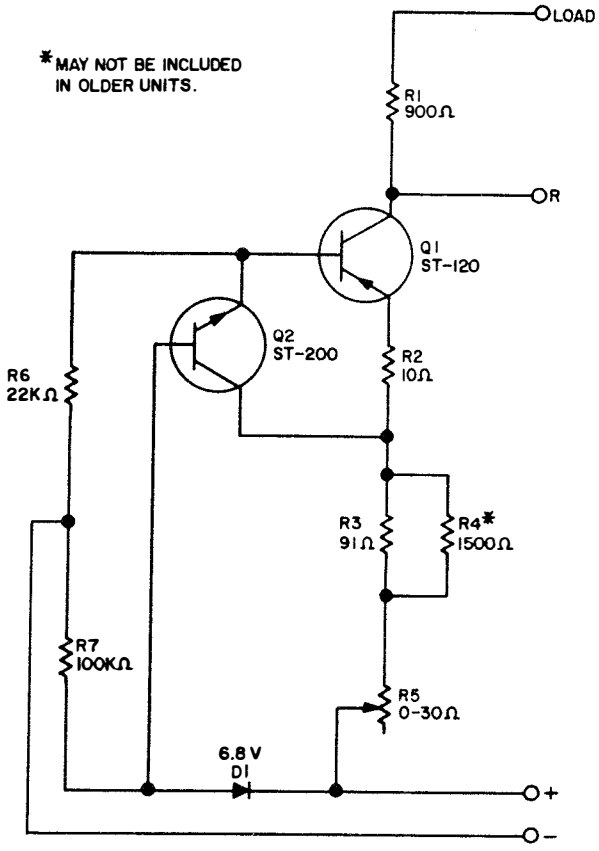



**Figure 1. STELMA Model LC-3 Constant Current Rheostat**

**Common Cause of Failure:**

1. R-3 Changing value
2. R-5 broken
3. Failure of one or both transistors

**Material Required:**

Material will be obtained from local supply channels as required.

**Tools Required:**

Common hand tools

**Repair Procedures:**

1. Remove four press fit rivets and lift cover from unit.
2. Test components for failure or change in value.
3. Remove defective component and replace with new one from stock. Resistors are all ±5% tolerance. Equivalent substitute transistors may be used if the recommended ones are not available. Upon completion of repairs, the unit shall be tested for proper operation before being re-installed.

**Constant Current Regulator Test**

**Equipment Required:**

1. Two multimeters, AN/PSM-4 or equivalent.
2. Variable voltage DC power supply 0-150 volts, 100 MA minimum.

**Test Procedure:**

1. Connect terminals L and - to the negative side of the DC supply as shown in figure 4.
2. Set up one meter to measure 0-100 MA and place it in series with a line from the LC-3 + terminal to the DC supply + terminal.
3. Connect the other meter to measure the power supply DC voltage.
4. Turn the supply on and adjust the output to 100 volts.
5. Adjust the LC-3 potentiometer for 60 MA current.
6. While observing the MA meter, vary the voltage of the power supply between 65 and 135 volts. A properly functioning LC-3 should maintain 60 MA ± 2 MA over the entire 65 to 135 volts range.

This maintenance hint was submitted by ETCS Donald J. Anderson of NAVCOMMSTA WASH., D.C.

No corrections to the technical manual are required.

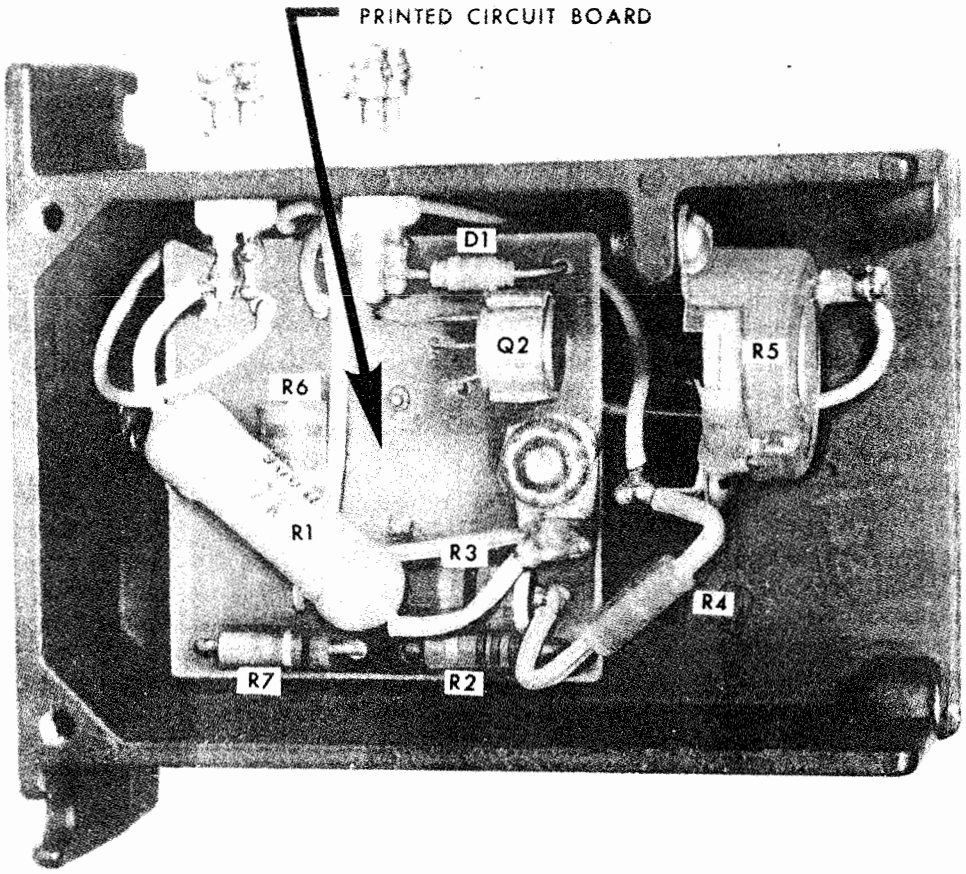



Figure 2. Component Layout (Printed Circuit Board)

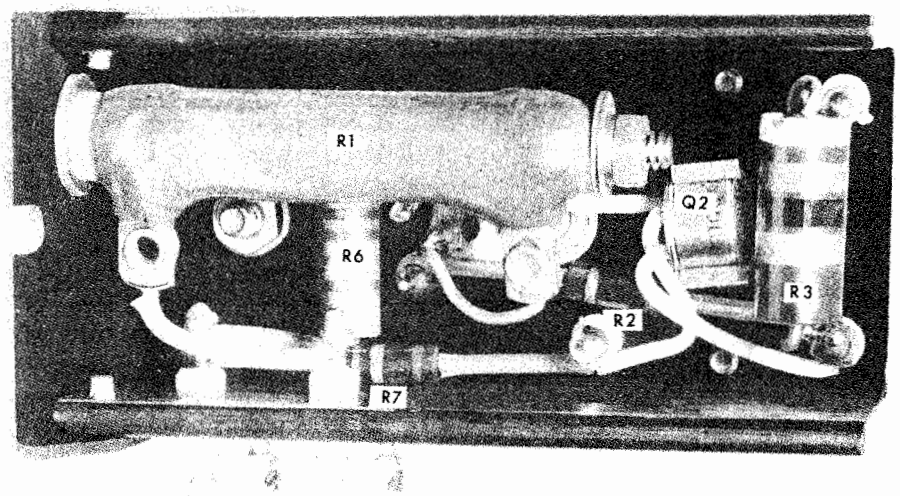



Figure 3. Component Layout

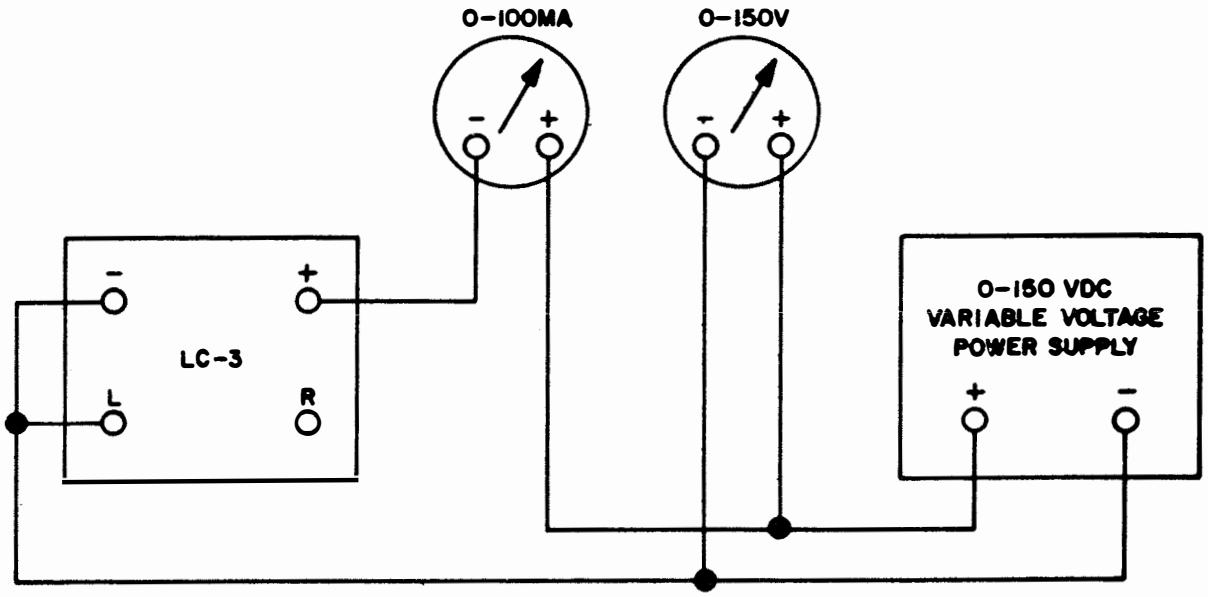



**Figure 4. Test Set Up**

**Table I**

| Ckt Symbol | Description | FSN |
|---|---|---|
| R-1 | 900 OHM 5 WATT Resistor | 5905-061-3982 |
| R-2 | 10 OHM 1/2 WATT Resistor | 5905-190-8883 |
| R-3 | 91 OHM 2 WATT Resistor | 5905-279-2631 |
| R-4 | 1500 OHM 1/2 WATT Resistor | 5905-279-1757 |
| R-5 | Mallory MR 40F 40 OHM 3 WATT WW Potentiometer | Open Purchase |
| R-6 | 22K OHM 2 WATT Resistor | 5905-279-2527 |
| R-7 | 100K OHM 1/2 WATT Resistor | 5905-767-3204 |
| Q-1 | 2N1906 Transistor | 5961-892-3890 |
| Q-2 | 2N1986 Transistor | 5961-061-2055 |
| D-1 | 1N754A 6.8 Volt Zener Diode | 5961-839-9588 |

## LM SERIES
## VOLTAGE COMPENSATION ADAPTOR

The construction of an adaptor to simplify compensation adjustments of the LM Series equipment has been suggested.

Using the adaptor, compensation adjustments can be made by simply unscrewing the power supply pilot light, screwing in the adaptor and connecting the meter leads. At present, it is necessary to remove the power supply from its case and connect the meter leads across the pilot light socket. The adaptor facilitates rapid adjustment and effectively isolates the line potential present at the socket.

The following is a general guide for constructing the adapter: (actual method of fabrication will depend upon local facilities and materials.)

Drill plastic block (about 2 x 2 x 2) for snug fit of 2 female receptacles (pin jacks); continue drilling through block with small drill (to pass leads to internal pin jack terminals). After drilling saw block in half so that both holes are halved (this will facilitate assembly), solder a pair of leads inside the lampbase. *Secure the lamp base to a hollow plastic rod, bringing the leads through the center of the rod. Solder the extended leads to the pin jacks and assemble the block with machine screws and nuts (make sure the screws do not hit the leads going through the block). Secure the block to the rod.

The suggested adaptor may be used at the discretion of any activity which has a LM Series equipment installed.

*Insert the rod into the base rather than recess the the base into the rod.

**IC/KAA (LS-346/SIC) Intercommunication Unit—Fabrication of Adapter Cable for use with LS-386/SIC Test Fixture**

This article describes an easy method of testing Intercom Unit IC/KAA(LS-346/SIC) with the test fixture of Intercom Unit LS-386/SIC. This method consists of fabricating an adapter cable which makes the Intercom Unit compatible with the test fixture. Parts required and wire connections are described in the following paragraphs:

Parts Required:

- J1 - Cannon Jack #17074 (14 Point Female)
- J2 - Same as J1
- J3 - Cannon Jack #738961-1 (20 Point Female)
- P1 - Amphenol Type 26-4301 - 16P
- P2 - Amphenol Type 26-4301-32P

J1 to P1

| | |
|---|---|
| Terminal 1 | |
| Terminal 2 | Not Used |
| Terminal 3 | Not Used |
| Terminal 4 | Not Used |
| Terminal 5 | Not Used |
| Terminal 6 | Not Used |
| Terminal 7 | to 9 |
| Terminal 8 * | |
| Terminal 9 * | to 10 |
| Terminal 10 | Not Used |
| Terminal 11 * | |
| Terminal 12 * | to 13 |
| Terminal 13 * | |
| Terminal 14 * | to 2 |

J2 to P2

| | |
|---|---|
| Terminal 1 | to 17 |
| Terminal 2 | to 2 |
| Terminal 3 | to 3 |
| Terminal 4 | to 4 |
| Terminal 5 | to 5 |
| Terminal 6 | to 6 |
| Terminal 7 | to 7 |
| Terminal 8 | to 18 |
| Terminal 9 | to 19 |
| Terminal 10 | to 20 |
| Terminal 11 | to 21 |
| Terminal 12 | to 22 |
| Terminal 13 | to 1 |
| Terminal 14 | to 23 |

J3 to P2

| | |
|---|---|
| Terminal 1 | to 8 |
| Terminal 2 | to 9 |
| Terminal 3 | to 10 |
| Terminal 4 | to 11 |
| Terminal 5 | to 12 |
| Terminal 6 | to 13 |
| Terminal 7 | to 14 |
| Terminal 8 | to 15 |
| Terminal 9 | to 16 |
| Terminal 10 | to 8 ON P1 |
| Terminal 11 | to 24 |
| Terminal 12 | to 25 |
| Terminal 13 | to 26 |
| Terminal 14 | to 27 |
| Terminal 15 | to 28 |
| Terminal 16 | to 29 |
| Terminal 17 | to 30 |
| Terminal 18 | to 31 |
| Terminal 19 | to 32 |
| Terminal 20 | to 15 ON P1 |

*Straps at J1 (757)

## LS-366/SIC INTERCOMMUNICATING EQUIPMENT

Requests have been received for plate supply filter reactor, circuit symbol L-1, FSN 2N5950-347-9932 replacement part for LS-366/SIC Intercommunicating Equipment manufactured by Ansley Radio Corporation. This reactor is unavailable and action has been taken to cancel FSN 2N5950-347-9932. Intercommunicating units having defective filter reactors can be restored to operation by means of a simple modification to the plate voltage supply circuit.

The modification consists of the installation of a 1000-ohm wirewound power resistor to be substituted into the amplifier circuit in lieu of the reactor L-1. A power resistor type RW33V102 FSN 5905-665-6340 should be obtained from the supply system for this purpose. A resistor bracket assembly should be shop manufactured for use in mounting the resistor. Since a considerable amount of heat will be radiated from the power resistor, it should not be mounted close to other circuit components that may be damaged by the heat.

**LS-385/SIC Intercommunication Stations — Wiring Errors**

Wiring discrepancies have been found in LS-385/SIC units manufactured by Audio Equipment Company under Contract N00126-70-C-111. It is possible that the same wiring errors exist in units produced by Audio Equipment Company under other contracts, although no reports of wiring errors in other units have been received. The wiring errors involve jumpers which were apparently installed during production but are not included in the equipment design and are not shown in the applicable technical manual NAVSHIPS 0365-275-0000. The units should be inspected to determine if jumpers have been installed between the following terminals and if installed they should be removed:

a. Between pin J2-17 of connector receptacle J2 and the J2 connector channel mounting screw. It should be noted that the LS-385/SIC design does include a jumper between pin J3-17 of connector receptacle J3 and the J3 connector channel mounting screw.

b. Between one side of CALL, BUSY and RELEASE indicator lamps DS1, DS2 and DS3 and the equipment chassis.

New transistorized intercom types LS-518A/SIC and LS-519A/SIC are currently being installed in lieu of obsolete LS-385/SIC and LS-386/SIC units when new stations are added to existing systems. For satisfactory operation of a system which includes both the LS-518/SIC and LS-519/SIC series of intercoms and the older LS-385/SIC and LS-386/SIC series it is imperative that the signal circuit common be isolated from ships hull ground. The jumpers discussed above must be removed to eliminate a connection between signal circuit common (terminal XX) and ships hull ground which would disable the LS-518/SIC or LS-519/SIC series of intercoms.

(EIB 937)

**LS-386/SIC and LS-385/SIC Intercoms—Test Fixture Shock Hazard**

When bench testing an LS-386/SIC or LS-385/SIC Intercom using a test fixture, the intercom mounting bolts should be used to firmly attach the intercom to the test fixture. Failure to do so may result in a shock hazard.

Some test fixtures now in the Fleet have a manufacturing defect which makes securing of intercom mounting bolts to the fixture impossible. When this is the case, the fixture may be safely used by attaching a grounding strap between the intercom chassis and fixture chassis while testing is in progress. *(817)*

## LS-458/SIC Intercom Unit - Procedure for Adapting the Case for Easy Bench Testing of other Defective Intercoms

This procedure assumes that a spare LS-458/SIC intercom (including the case) is available to the troubleshooter. If a spare unit is not available, it may be ordered from Navy Electronics Supply Office, Great Lakes, Illinois using FSN 4G5830-987-5376.

The plug-in amplifier unit of the spare intercom may be interchanged with the defective unit to solve any immediate communications problems caused by intercom malfunction.

The case of the spare unit may most easily be used to bench test the defective amplifier if the following permanent modifications are made to the spare case:

1. Remove the plug in amplifier of the spare unit from its case.
2. Remove the terminal cover from the top of the case.
3. Remove the aluminum protective cover mounted on the inside top of the case.
4. Loosen the screws holding the plate on which connector P2 is mounted (inside the case). It is now possible to plug connector P2 into the amplifier without putting the amplifier into the case.
5. Care should be taken to insure a ground connection is installed between Ship's Ground and the defective intercom's chassis, that testing is done on an insulated test bench, and that the electrical safety precautions of NAVSHIPS 0901-960-0001, Chapter 60, Section II are followed.

If terminals MC and MCC are connected to the ship's power, power-on trouble shooting of the unit may be accomplished as outlined in Section 5 of NAVSHIPS 365-2822, Technical Manual for LS-458/SIC Intercom. (791)

## MICROPHONE, CARBON, NOISE CANCELLING TYPE M-58/U

Microphone M-58/U is now available under the Federal Stock Number N5965-655-0999. This microphone may be used where speech intelligibility is hampered by high-ambient noise and in place of Navy Type 51004C and Type M-85/U microphones. However, the microphones are not physically identical (See figure 1). Microphone M-58/U has a resistance of 100 ohms, frequency range of 300 to 4,000 cps, a 4-foot cord, and a J-068-type plug (13/64-inch diameter sleeve, ring, and tip). A lever switch, mounted on the side of the microphone, will connect the microphone into the circuit when actuated. The maximum noise discrimination of this microphone is 20 db at 300 cps.

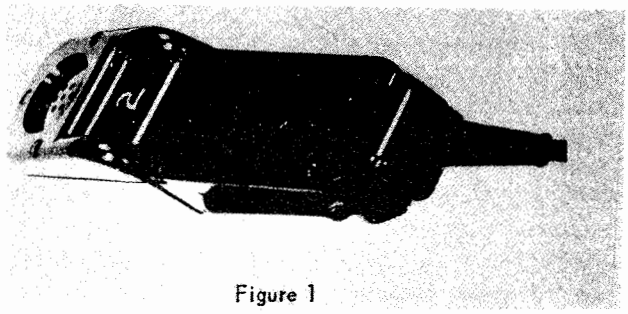


Figure 1

## MAM WHIP ANTENNA MODIFICATION

The necessity for communication with aircraft 5 and 10 miles distant from the signal officer requires more radiation than is obtainable from the whip antennas furnished with MAM equipments.

Experiments indicate that by supplanting the whip antenna furnished with a type BG-56A whip, or equivalent, the needed performance is obtained without interfering with other equipments at adjacent fields.

The photograph of Figure 1 shows a close-up of the method employed in mounting a complete type MP-37 whip assembly, including the spring base employed to prevent the whip from snapping off.

The above antenna modification may be made if it is necesssry to maintain communication over distances greater than was originally intended.

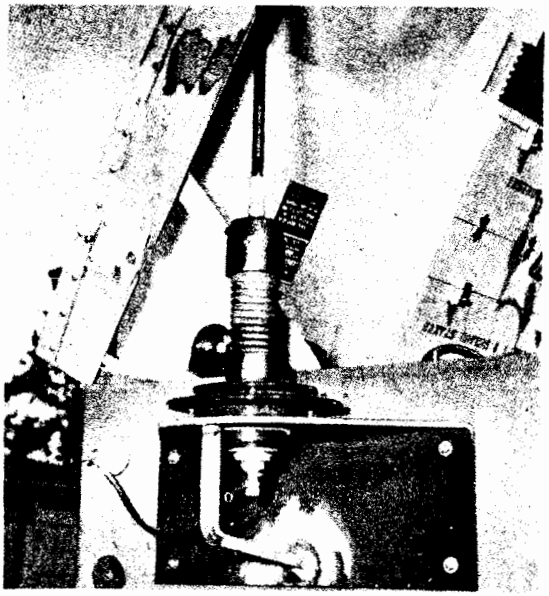


Figure 1.--Method of mounting a type MP-37 whip assembly on an MAM equipment

## MAN MODIFICATION TO PERMIT OPERATION ON 115-VOLT AC

Nypearl has devised a circuit to modify the MAN radio communication equipment for 115-volt a-c operation. This is primarily an emergency measure, and necessitates the construction of a special transformer. This modification will be known as MAN Field Change No. 1. Inasmuch as this modification will not be required by all activities, a field change kit will not be procured.

The following instructions and diagrams were prepared by NYPEARL and are presented for information in the event that the modified equipment needd servicing at some other location.

A 10-wire connection box must be mounted within 3 feet of the transmitter and receiver (see fig. 1). This connection box is to splice the leads coming from the MAN equipment and the remote head if one is used. When wiring the remote, note that the numbers attached to the wires from the equipment correspond to numbers on the terminal board in the remote control head. Do not connect wire No. 1 to pin No. 1 on the plug, that is, pins on plugs do not correspond to numbers taped on wires.

The following changes are made to the transmitter vibrator power unit, as shown in figure 2:

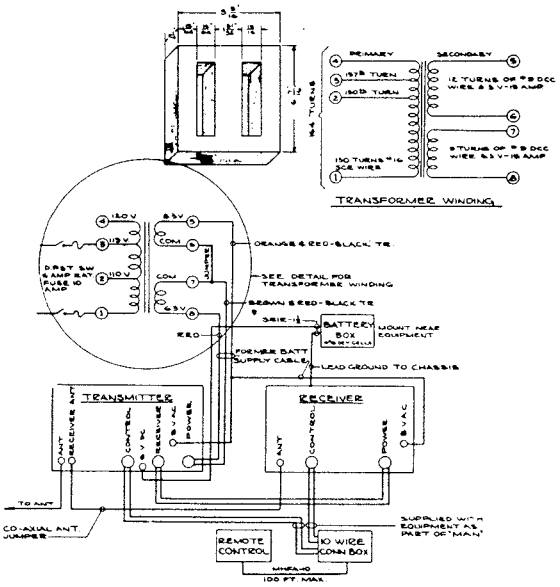



Figure 1.—Details of the transformer and interconnections needed for the modification

(1) Remove vibrators.

(2) Remove R1, R2, R3, and R4.

(3) Connect jumpers from pin No. 1 to pin No. 2, and from pin No. 3 to pin No. 4 on both vibrator sockets.

(4) Disconnect the center tap of power transformer T-1 (two solid wires in yellow spaghetti). Solder together the two wires and tape up to insulate from the chassis. This connects the two halves of the primary in series. Power transformer T-2 is modified in the same manner.

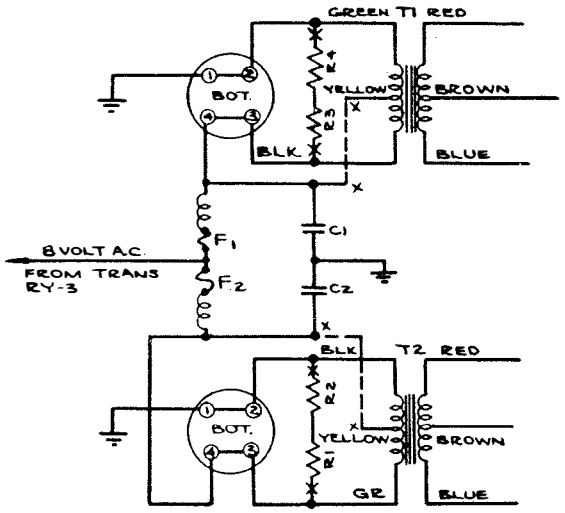



Figure 2.--FMT-25VW transmitter vibrator power unit modification

(5) Disconnect and tape six-volt power supply lead (copper rope). Run new lead from this point to 8-volt a-c supply.

(6) Replace 50-amp. main power fuse with a 15-amp. fuse.

(7) Replace 20-amp. receiver fuse with a 10-amp. fuse.

The following changes are made to the receiver vibrator power unit, as shown in figure 3:

(1) Remove vibrators.

(2) Remove R1 and R2.

(3) Disconnect and solder together center-tap leads (yellow) on primary of T1.

(4) Connect pins No. 1 and No. 2 on vibrator socket together.

(5) Remove wires as indicated by dotted lines and "X."

(6) Connect 8-volt a-c supply to F1; remove black wire coming from transformer primary from vibrator pin No. 3, and connect it to remaining side of F1.

(7) Run jumper, from the junction of pin No. 1 of 6x5 socket and yellow pin connector, to pin No. 2 of power plug.

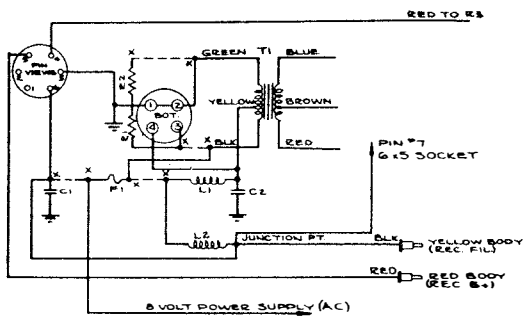



Figure 3.--FMR-13V receiver vibrator power unit modification

(8) Rec. tube 6K6 bypass condenser C-73 is changed from 0.02 to 0.002 mfd.

The following changes are made at the transmitter terminal strip, as shown in figure 4:

(1) Remove jumper between DC and 4. Connect DC to AC. Extend jumper to lug 10.

(2) Connect lug 4 to lug 2.

(3) Make up pair 24-inch leads. Connect one to lug 2, other to chassis. Connect free ends to 6-volt battery, made up of four No. 6 dry cells in series--dry cells to be placed in compartments inside equipment case.

(4) Remove jumpers between lugs DC to 3, and DC to 2.

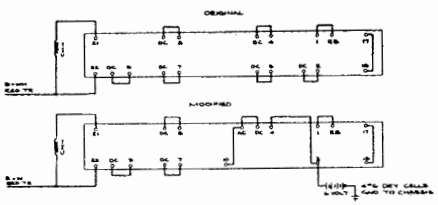


Figure 4.--Transmitter terminal strip modification

## MAN SERIES TROUBLE SHOOTING NOTES

| Difficulty Encountered | Cause and Remedy |
|---|---|
| MAN.--Reports on transmitter output always less than the customary "Strength five, modulation good". | One-half of the high voltage series type power supply had no output. Check revealed no input to transformer. Fuse No. 1 tested open. |
| MAN.--Transmitter inoperative. No plate voltage. No input to the power supply. | Found one of the relays only partially operating. A small particle of iron filing was caught between the magnet and clapper arm. |
| MAN.--No power to equipment. | Six-volt a-c supply from transformer not getting to receiver or transmitter. 50-amp. fuse holder found to be making poor connection. This type of holder in which the fuse is pushed into a hole from the front and a bakelite cap is screwed down, relies only upon a metal capped spring at the opposite end for a good connection. Both corrosion of the cap and aging of the spring contribute toward poor contact. |

## MAR RADIO EQUIPMENT PANEL METER

The scale of the meter which is mounted on the front panel of the Navy type CRV-43067 transmitter-receiver unit is calibrated in arbitrary units. The basic range of all such meters is one milliampere and although some scales are marked "DC Milliamperes" this marking should be disregarded. Some of these meter scales are marked 0- .5-1 .0, others are marked 0- 5- 10. For either calibration, the deflection referred to in the MAR Technical Manual NAVSHIPS 900,719 should be used as though the meter scale read 0-5-10.

## MAR/RDR SERVICE INFORMATION MAR

(1) Field information (resetability) indicates that it is necessary to seal the grid cathode trimmers C-117 and C-118 of the tripler and power output "cans" with Glyptol or similar cement. A small amount on the end of a toothpick is a convenient method. These trimmers usually require adjustment at the high end of the band upon changing 2C39 tubes. Adjust for maximum grid drive on meter positions 9 and 11.

(2) The following meter readings are now being used by the manufacturer for final test. These readings are for OPERATE position of the IC/TEST/OPERATE switch and not for the TEST position as previously indicated. Meter limits positions 1, 2, 4, 5, 6, and 7 in RECEIVE.

| Meter switch position | Tune for | Normal scale reading |
|---|---|---|
| 1 | ..... | 5-7. |
| 2 | Peak ... | 4.1-10. |
| 3 | ..... | 5-7. |
| 4 | Dip..... | 4.5-8.5. |
| 5 | (*) ..... | 7.7. |
| 6 | (*) ..... | 7.1 d. c. 6.8 a. c. |
| 7 | (*) ..... | 6.8 a. c. |
| 8 | Dip..... | 4.5-7.5. |
| 9 | Peak ... | 1.0-5.5. |
| 10 | Dip..... | 1.5-3.5. |
| 11 | Peak ... | 4-10. |
| 12 | Dip..... | 4.5-5. |

*Plus or minus one half scale division.

(3) The MCW oscillator in the modulator unit has in some cases broken into a spurilous high frequency oscillation (4000 cycles) key up on high (15 volts d. c.) line. Readjust R-725 as follows, viewed from the adjustment side:

Turn full clockwise, back off until oscillation starts (1200 cycles) key down. Continue rotation until H. F. oscillation occurs and will not stop if the key is released. Return control (R-725) about 30°. Check at low voltage (11) and readjust if necessary.

(4) The antenna compensator C-201 is now being adjusted at the factory at band No. 10 (highest frequency). Sets having this test adjustment will not require readjustment of this compensator (panel adjustment) when going to any lower frequency band. This permits the equipment to be operated from the remote position at practically maximum efficiency over its whole range, and well within the limits for receiver sensitivity. The following is typical:

| Channel | Ant. Adj. on No. 10 Channel UV | Ant. Adj. on each Channel UV |
|---|---|---|
| 1 ..... | 3.5 | 2.8 |
| 2 ..... | 4.9 | 4.4 |
| 3 ..... | 3.2 | 3.0 |
| 4 ..... | 3.3 | 3.0 |
| 5 ..... | 3.5 | 3.5 |
| 6 ..... | 4.6 | 4.6 |
| 7 ..... | 3.3 | 3.3 |
| 8 ..... | 2.1 | 2.2 |
| 9 ..... | 2.2 | 2.2 |
| 10 ..... | 2.3 | 2.3 |

units (MAR) having serial numbers above approximately 1200 will have had this alignment of the RF section made in the factory. Serials above 450 (RDR) also fall in this group. It will not be advisable to attempt to realign the RF unit in the field to make the early units meet specifications with the antenna compensator left at the point of maximum sensitivity on band No. 10. All RF units that have a spot of black paint on the nut that holds the antenna compensator will have been adjusted in the latest manner. Two or three hundred additional RF units were so adjusted prior to the marking of the trimmer nut, and may appear either in spares or equipments.

(5) The screws (3) holding the dynamotor in the modulator-dynamotor unit are now being staked after being securely tightened. Units found loose in the field should be so fastened. Do not open cases specifically for this check.

(6) Check for alignment, looseness, and condition of the 2C39 tube socket connections of equipments that have seen intermittent and/or continual operation and report.

(1) The following meter readings are now being used for final test of the RDR. Filament balance has been adjusted in the factory there being no way of reading same on the panel test meter. A separate meter is placed across one-half the filament at the multiplier and R-524 adjusted for one half total filament voltage.

| Meter switch position | Tune for | Normal scole reading |
|---|---|---|
| 1 ..... | ..... | 6-8.5 |
| 2 ..... | Peak ... | 4.1-10 |
| 3 ..... | Dip .... | 4.5-8.5 |
| 4 ..... | ..... | 6.5-8.5 |
| 5 ..... | ..... | 7.5-8.5 |
| 6 ..... | ..... | 8-9 |
| 7 ..... | ..... | 8-9 |

## MAR/RDR SERVICE HINTS

The great number of cases of poor resetability has been traced directly to defects found in the 2d IPA and PA "cans." Other cases, have been traced to defects in the Selector system, Multiplier section and 1st IPA.

Before making any changes in "fixed" adjustments, carefully retune the multiplier and transmitter dials for the particular frequency in question. Make **final rotation of each selector dial in the counter-clockwise** direction. Check for normal output. If poor resetability still persists carefully retune each stage to determine which is responsible for the change in power output.

A. **2nd IPA and PA Failures**--Check following:

1. Loose interelectrode capacity compensating condensers (C-117, C-118, C-112, C-120).
2. Intermittent contact of ground brushes on tuning condenser shafts.
3. Loose rotor set screws.
4. Inspect bakelite coupling shafts for cracks, splits or set screw grooving.
5. End play in rotor shaft.
6. Improper mechanical alignment of cans. (Rotor shaft of can and bakelite shaft from universal coupling must be in perfect alignment without mechanical strain. This is extremely critical.)
7. Loose set screws in tuning rotors and shaft couplings.
8. Loose 2C39 tube clamp.

B. **Selector system failure.**--Check following:

1. Dial readings--approximately same readings between all dials except ant. coupling.
2. Individual dials should return to exactly the same reading upon reselection.
3. Check dials manually for even the slightest movement (dials should be locked).
4. Check for "overshoot" on return travel of selectors (excessive motor speed by high voltage).
5. Check recessed dials for binding on panel.
6. Check latches that are touching rim for firm locking. (Clearance between latch and rim should be approximately 1/16" with selector locked.)

C. **Multiplier failure.**--Check following:

1. Loose tube clamp (vibration causing intermittent grounding of shield). Effects particularly notice on higher channels.
2. Loose slug trimmers (bad retaining clips).
3. Loose capacitor trimmers.

D. **Miscellaneous.**--If 1st IPA is at fault check:

1. Gear mesh in 829 tuning.
2. Loose connections in link couplings.

### Low Power Output

Trouble usually can be readily isolated and found by the equipment meter indications. The following are some of the possible causes for low output.

A. **Filament balance:**

| Meter position | | Meter reading |
|---|---|---|
| 5 | DC | 7.7 |
| 6 | DC | 7.1 |
| 6 | AC | 6.8 |
| 7 | AC | 6.8 |

1. Balance potentiometer R-722 should be connected and set so balance should be within ± one-half division. The closer the better. R-720 (panel adjustment) filament control should be set to the above figures. Do not allow filament voltage to get too high or tube life will be seriously affected.
2. Check for low or burned out tubes especially 2C39's.
3. Check for shorted or low resistance "flower" --2C39 socket.

B. **Multiplier section:**

| Meter position | Meter reading |
|---|---|
| 1 | 5-7. |
| 2 | 4.1 min. Receive. |
| 2 | 4.8 min. Transmit. |

1. Open choke--L-510--24 ohms d. c.
2. Weak or out-of-tune fixed oscillator V505.
3. Check converter stage V501 alignment.
4. Check alignment on low and high frequency ends of range. Readjust "C" on high, and "L" on low ends respectively.
5. Weak tubes or incorrect voltages.

C. **1st IPA Stage (829):**

| Meter position | Meter reading |
|---|---|
| 8 | 4.5-7.5 |

1. Substitute 829 tube.
2. Check stage alignment.
3. Check operational voltage and current.
4. Check grid current for minimum 4.0 mils on all channels. (No meter position provided, reading is obtained by lifting one end of R-101.)

D. **2d IPA stage:**

| Meter position | Meter reading |
|---|---|
| 9 | 1.0-5.5 |
| 10 | 1.5-10.0 |

1. Substitute 2C39 tube.
2. Check coupling of L-105.
3. Check over-all electrical alignment (with wand).

E. **P.A. stage:**

| Meter position | Meter reading |
|---|---|
| 11 | 4-9 |
| 12 | 4.5-5 |

F. **Coaxial line:**

1. Check K-101, antenna change over relay, for poor connection.
2. Check all coaxial lines and plug connections for opens and shorts.

**Intermittent Power Output**

A. Poor RF ground where shield is grounded at L-105.

B. Check for cracked Copaline permitting a short to the cable braid at L-105.

C. Loose tube clamp on converter tube (V-501).

D. Intermittent shorts in 2C39 tubes.

E. Defective rotary joint at antenna coupling loop on PA can.

F. Check all equipment connecting cables.

**Low Output--Low End of Band Normal Output--High End**

A. Check Multiplier.

1. Improper tracking—Align C for high end, L for low end.

B. Check 2d IPA and PA.

1. Improper tracking.

No compensation provided except knifing of variable condenser plates.

**Normal Output--Low End of Band Low Output--High End**

A. Check multiplier:

1. Improper tracking—Align.
2. Loose tube clamp (V-501) (critical high end).

B. Check 2d IPA and PA:

1. Improper tracking—Align.
2. Interelectrode capacity compensators (C-117 and C-118) critical at high end. (2/1/47)

## MAR V-H-F RADIO TRANSMITTING AND RECEIVING EQUIPMENT

**Notes on Component Failures**

A MAR V-H-F transmitting and receiving equipment for installation by ship's force has been issued. Before the equipment was placed in operation, several causes of possible subsequent failure were located and corrected. These are listed below with the idea that they may be of benefit to other installation personnel:

(1) One end of resistor R-914 on the mounting platform touched the chassis, causing a ground in the universal power supply.

(2) The lead connecting terminal 10 of K-901 and terminal 4 of L-901 showed 500 ohms resistance to ground when the lead was disconnected from both the relay and choke.

(3) Capacitors C-801 and C-811 in the modulator unit were breaking down within 15 minutes after the power was turned on, causing failure of F-907 in the universal power supply.

(4) The outside case of L-915 touched terminals 1 and 2 of L-901, causing a ground in the universal power supply.

Electronics personnel of all ships and installation activities are again reminded to make out failure report cards for every electronic failure. These forms are proving invaluable for the preparation of the new lists of spare component parts, the design of new equipments and components, and the dissemination of maintenance information.

## SHORTING OF CRYSTAL CONTACTS IN MAR EQUIPMENT

Severe field usage of MAR equipments may result in the shorting of the contacts of the five transmitting and receiving crystals to the end plates of the respective turret tuners.

This condition may be overcome by cementing a strip of fungi resistant insulating material on the bare metal end plates of the turret tuner closest to the crystal contacts. This applies to the wiring side of the chassis and is applicable to the five transmitter and five receiver crystals located there.

The insulator strip should be approximately 2¾ inches long, 1 inch wide and not over 1/32 inch in thickness and should be applied with a good heat resistant cement.

## MARKING OF DIAL LOCK MECHANISM

A simple method of marking the locking bars on the controls of MAR/RDR equipment to indicate a locked or unlocked condition has been suggested.

The MAR and RDR equipments have ten preset channels automatically tuned. These channels are preset by six controls on the MAR and two controls on the RDR equipment. These controls have to be unlocked and tuned, then re-locked before shifting channels. It is impossible to distinguish between the locked and unlocked condition of a dial by looking at it. The only way to determine if all the dials are locked is to try each one individually. Tuning this equipment requires considerable time and care. If one dial is left unlocked and the equipment is channelled automatically, mistuning will result. All of the controls must then be rechecked to determine which control is unlocked.

This trouble is eliminated by painting, in red, the exposed area of the locking bar in its unlocked position thereby quickly indicating an unlocked condition of the dial.

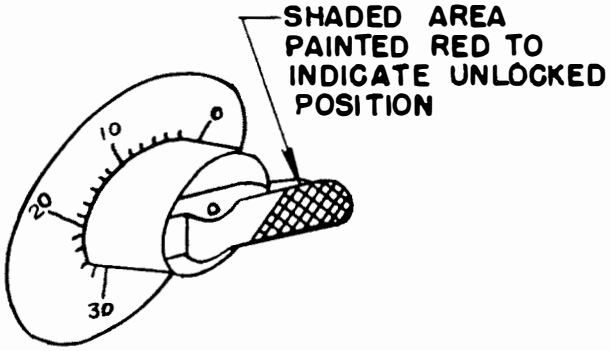



FIGURE 1. Method of marking locking bar.

## MAR SERIES TROUBLE SHOOTING NOTES

| Difficulty Encountered | Cause and Remedy |
|---|---|
| MAR.--Very little grid drive to the intermediate power amplifier V-102. | Coil L-105 coupled too tight to coil L-107. Spread coil L-105 away from coil L-107 to reduce the coupling. Retune transmitter. |

## VENTILATION OF MAY-1 PRIOR TO OPERATION TO PREVENT CASUALTIES

A potential safety hazard exists in May-1 battery-powered portable-type transceivers. An investigation of a recent explosion in this type of equipment revealed that that the explosion was caused by hydrogen gas which leaked into the electronic section of the equipment from the battery case, via a broken ceramic insulator, to an electrical terminal. The battery was in a charged condition, and a spark apparently occurred when the equipment was operated.

All commands having occasion to use these units should open the cases and ventilate them prior to placing them in operation. The separating wall between the battery box and the electronic components should also be inspected.

## HALYARD TYPE ANTENNAS OF MBF EQUIPMENTS

MBF equipments have been shipped by Collins Radio Company. These equipments contained halyard antennas and 75 feet of RG-8/U transmission line, consisting of 1 section of 50 feet and 1 section of 25 feet. The antennas, however, as determined by NRL tests, did not have the necessary broad-band characteristics. In order to tune the MBF transmitter to the antenna at the frequency of operation (in the frequency range of 60 mc. to 80 mc.) it may therefore be necessary to prune the transmission line, 3 inches at a time, until the transmitter loads properly. Collins Radio Company intends to replace these antennas later with halyard antennas of a satisfactory design.

The Magnavox Company is manufacturing antennas for permanent shipboard installation, to be used with the MBF equipment. The antennas are broad-band and the MBF will tune and load properly with these antennas without adjustment of transmission line length. These antennas (Navy type CMX-66143) will be shipped as soon as they become available.

## HANDSETS FOR MBF RADIO EQUIPMENTS

One Navy type-51064 hand telephone assembly (handset) is furnished with each MBF transmitter-receiver at the time of original issue. These handsets contain the Navy standard five-wire (green) circuit and have a 20-foot cord. These handsets are not stocked, nor intended to be stocked, as separate items and therefore, are not and will not be available for replacement purposes.

For replacement purposes, the Navy standard shipboard handset type 51081, with a 4-foot cord attached, is stocked and supplied. This handset is described further in RIB No. 103.

In exceptional cases wherein the 4-foot cord of the type 51081 handset is insufficient, the short cord can be replaced with the proper length of standard handset cable, type MMPO-5. This cable is stocked at all electronic supply activities.

## DEFICIENCIES OF MBF RADIO TRANSMITTING-RECEIVING EQUIPMENT

Some deficiencies of MBF equipment and the modifications required to correct these deficiencies are listed below for information of the field activities concerned. There are no kits furnished with any of these modifications.

(1) **Inadequate shockmounts.**--If it is determined that the shockmounts are not adequate for the particular installation, the shockmount supports should be replaced with supports of number 19 gauge stainless steel having adequate strength. This modification applies only to equipments with serial numbers 1 to 1824 inclusive.

(2) **Lack of intelligibility.**--This deficiency relates to a lack of intelligibility in using the loudspeaker as a microphone. To reduce the low frequency response of the audio amplifying system in the transmitting equipment and thus improve the intelligibility, the audio coupling condenser C-119 should be changed from 0.01 mf to 0.002 mf. This change applies only to equipments with serial numbers 1 to 1536 inclusive.

(3) **Modulation limiter ineffective.**--If it is found that the modulation limiter consisting of vacuum tube V-121 (6C4) and associated components (refer to Figure 7-1A of final instruction book) is ineffective and/or does not perform its function as required, it should be eliminated (Refer to Figure 7-1B or 7-1C of the final instruction book for proper circuit connections--Figure 7-1A shows the modulator limiter included in the equipment; Figure 7-1B or 7-1C shows the proper circuit connections after the modulator limiter has been eliminated). The modulator limiter was deleted beginning with equipment serial number 488.

(4) **Excessive hum.**--The excessive hum in the equipment can be minimized by inserting an R-C network consisting of a resistor (100,000 ohms) and two capacitors (0.1 mf each) in the plate circuit of the first audio amplifier stage. (Refer to Figure 7-1B or 7-1C of the final instruction book and make circuit connections as shown; the R-C network, as shown, consists of R-157, C-122-B, and C-122-C. Do not use these symbols unless the modulator limiter is eliminated. Note that capacitors C-122-B and C-122-C are parts of capacitor C-122 (Refer to parts list of final instruction book) and may be used in the R-C network providing the modulator limiter is eliminated). This modification is applicable only to equipments with serial numbers 1 to 479 inclusive.

(5) **Squelch sensitivity inadequate.**--The squelch sensitivity can be improved by changing the audio amplifier grid resistor R-154 from 100,000 ohms to 270,000 ohms. This change applies only to equipments with serial numbers 1 to 1536 inclusive.

(6) **"Speaker on-off" markings inaccurate.**--The speaker on-off switch does not silence the speaker when in the OFF position. This deficiency came about because of a revised control circuit for the speaker talk circuit. It was corrected beginning with equipment serial number 1537. To correct this deficiency in equipments prior to 1537, the markings should be rectified to indicate the functions performed by the switch (See "NOTE" paragraph 2 (d), section 2 of final instruction book) or, if deemed more desirable, the speaker circuits should be modified as shown in figure 7-1C of final instruction book (for the proper components used in the circuit modifications refer to the parts list of the final instruction book).

(7) **Excessive output in handset.**--This condition can be remedied by increasing the resistance of the receiver audio output limiting resistor R-107 (Individual judgment should be exercised in this modification).

(8) **Antenna pick-up loop likely to short to the power amplifier tank circuit or to ground.**--Under some conditions the antenna pick-up loop shorts to the final amplifier tank circuit or to ground. To remedy this situation, an insulating sleeve should be placed over the pick-up loop and the leads connecting to it. This modification is necessary only in the equipments with serial numbers 1 to 700 inclusive.

(9) **Light from tubes shows around speoker.--**If any light from the tubes is showing around the speaker and if this light proves objectionable, the speaker screen may be eliminated to alleviate this condition.

(10) **Plug-in electrolytics not easily removed.--**This deficiency can be corrected by replacing the present electrolytic hold-in clamps with clamps of a different type and design (individual judgment should be exercised as to what types of clamps should be employed to effect the results desired). This deficiency was corrected beginning with equipment serial number 800 by a change in design of the electrolytic hold-in clamps.

(11) **Present alignment screw driver detunes circuits.--**The alignment screw driver supplied with the equipment will, under some conditions, detune the circuits as the necessary adjustments are made to the equipment. To prevent this form happening, an insulated screw driver should be employed instead of the one supplied with the equipment.

(12) **Corrections in final instruction book.--**

(a) Page 2-6, paragraph 2 (d), NOTE, second line:--Change "700" to "1536".

(b) Page 6-4, parts list, power input lead by-pass capacitor C-157:--The rating of this capacitor should be 0.002 mf instead of 0.001 mf as shown.

## EXCESSIVE RECEIVER RADIATION IN THE MBF RADIO EQUIPMENT

Field activities employing MBF equipments having serial numbers below 1537 might experience excessive receiver radiation when the tuning meter and the power cable are plugged in. This excessive radiation can be reduced by providing the tuning meter circuits and the input power circuits with appropriate filters. The filter for the tuning meter circuits should consist of a choke coil of 2.7 micro-henrys and two capacitors of 0.002 micro-farads each; the filter for the input power circuits should consist of two capacitors of 0.002 micro-farads each. For proper connections of the filters refer to figure 7-1c of the final instruction book. (Note that the tuning meter-filter components are identified as L-127, C-177, and C-180 and the power cable filter components are identified as C-157 and C-175. These same symbol designations should be employed if the above modifications are made.) For pertinent data on the filter components refer to the parts list of the final instruction book. Winding data for the choke coil (L-127) is given in table on figure 1.

Part name: R. F. Choke Approx. wt. ---------- Number: 240 0012 00
Type: ----------
Description: Radio Frequency Choke in accordance with Navy requirements.
Inductance: 2.7 microhenries approx. Associated data: JAN-P-14 AN-QQ-S-91.
Max. Current: 300 ma.
Coil Form: 0.170" dia. x ⅝" long with molded-in leads, Speer Resistor Corp. No. CF .170 x ⅝" or equivalent. Phenolic material shall be Type MTS-E-2 in accordance with Joint Army-Navy Spec. JAN-P-14.
Leads: Hot tin dipped.
Wire: No. 30 AWG Enameled. Copper.
Number of Turns: 45 plus 0 minus 3 turns.
NOTES: 1. Materials entering into the construction of this choke shall be fungi resistant, or the choke shall be treated to render it fungi resistant.
2. The choke shall withstand a 100-hour salt-spray test in accordance with Army-Navy Aeronautical Specification AN-QQ-S-91 without impairing its operation, and no part shall show evidence of approaching failure caused by corrosion.
3. Samples must be approved by Collins Radio Co. Engineering Department.

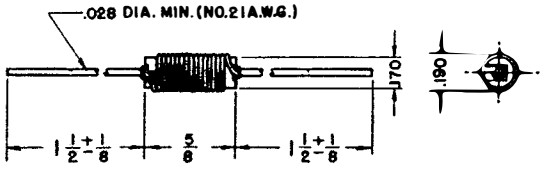



FIGURE 1.—Choke coil dimensions.

Figure 1.--Choke coil dimensions

## ALTERNATE METHOD FOR TUNING THE MBF TRANSMITTER

An alternate method may be used in tuning the MBF transmitter in addition to that outlined in the MBF instruction book, section II, paragraphs 2 (e) to 1 (t) and in the brief directions stenciled on the tuning control cover plates. With meter switch set on 6-7-8, tune # 6 for maximum drive. If meter reads backwards, leave #6 at its approximate setting and tune #7 and #8 for maximum. Stages #6, #7, and #8 should then be tuned in that order for maximum in accordance with the instruction book. In the final

stage of tuning, adjustments made to controls #9 and #11 can be accurately determined with the meter in the output r-f circuit. A state of maximum r-f absorption will occur at a point slightly below the red area on the meter scale. Maximum absorption can be determined using a pen lamp with a pick-up coil placed inside the final tank coil.

## SHORTING OF COAXIAL CABLE IN THE MBF EQUIPMENT

A source of failure in the MBF equipment has been pointed out. A coaxial cable runs from C-199 to L-113 and passes under C-126 (tuning control #4). Occasionally the shield on the coaxial cable grounds out C-126 thus preventing the tuning of the r-f amplifier V-108. All ships and stations using MBF equipment are urged to check their gear for this defect and if there is insufficient clearance between C-126 and the coaxial cable, insulate or reroute the cable.

## MBF SERIES TROUBLE SHOOTING NOTES

| Difficulty Encountered | Cause and Remedy |
|---|---|
| MBF—Transmitter section inoperative. Receiver works satisfactorily. | Antenna transfer relay out of adjustment. Adjust relay so contacts will be made when transmitter is keyed. |