AN/SRC-10( ), -11( ), -12( ), -13( ), -14( ), -15( ) REMOVAL OF AUDIO RECEPTACLE WATERPROOF CAPS

In a recent Bureau of Ships Inspection of completed installations, it was noted that waterproof caps for the AUDIO receptacles were installed on many of the Receiver-Transmitters and Auxiliary Receivers. At the discretion of the Electronics Officer, these caps may be removed from these equipments and used to accomplish Field Change 1-AN/URC-16( ), -17( ), -18( ). (See EIB 415, dated 12 September 1955, for the complete field change.) These caps were provided to prevent water accumulation in the receptacle when the equipment is exposed to the weather. Since the AN/SRC-( ) equipment is normally installed in weather-protected spaces, these caps are not required.

AN/SRC-10( ) THRU -15( ) AN/SRC-16( ) THRU -18( ) MISLEADING RF OUTPUT INDICATIONS

When the front panel meter switch in Receiver-Transmitter RT-66/GRC, RT-67/GRC and RT-68/GRC is in the RF position, a high reading will result when no antenna or a poor antenna is used (possibly due to broken or damaged co-ax feeder). This indication is misleading, since operators may interpret it to mean superior performance, when actual performance is unsatisfactory.

The circuitry is such that the meter indication is proportional to voltage induced across the inductance of a tuned circuit. This voltage will be high when the output circuit is unloaded and will be relatively low when the output circuit is loaded into an antenna. If an unloaded condition, such as that described, is allowed to persist, the germanium crystal in the meter circuit may be damaged.

Include the following warning note in the Technical Manual for the Receiver-Transmitters (TM11-289):

WARNING

DO NOT OPERATE EQUIPMENT WITHOUT AN ANTENNA OR DUMMY ..... ANTENNA LOAD CONNECTED TO THE "ANT" CONNECTOR WITH THE METER SELECTOR SWITCH IN THE "RF" POSITION.

The Signal Corps Engineering Labrotary is investigating a new design of the antenna circuit which will prevent germanium crystal burn-out under no load conditions. Based on excerpts from Signal Corps Maintenance Symposium Report date 1 April 1955.

AN/SRC-10, -10X, -11, -11X, -12, -12X, -13, -13X, -14, -14X, -15, -15X INSTALLATION IMPROVEMENT

The Assistant Industrial Manager, USN, San Francisco has forwarded a recommendation to provide an 8-inch x 10-inch access hole in the foundations for Radio Sets AN/SRC-10, -10X, -11, -11X, -12, -12X, -13, -13X, -14, -14X, -15, -15X. This hole will provide access to the terminal box, located on mounting MT-299/GR or MT-327/GR, which contains the supply line fuse.

AN/SRC-10 through 15 and AN/URC-16 through 18 Series Radio Sets—Possible Wiring Discrepancy

All repair personnel responsible for maintaining the subject equipments should check their sets for a possible wiring discrepancy. New York Naval Shipyard reported that the audio output of an AN/URC-17 was greatly increased when a connection between terminal 14 of terminal board E-1 in Mounting MT-299/GR and terminal 13 of terminal board E-2 in Control Box C-375/VRC was removed. No such connection should exist. Correct equipment interconnections are shown on the applicable diagrams contained in NAVSHIPS 92807.

For Radio Sets AN/SRC-13 through 15, a different mounting (MT-327/GR) is used. When these sets are used with Control Box C-375/VRC, there is a connection from terminal 14 of TB E-1, Mounting MT-327/GR to terminal 8 of TB E2 and Control Box C-375/VRC.

AN/SRC-10Y THROUGH-15Y SERIES–AVAILABILITY OF IMPROVED CONTROL ADAPTER MX-1986A/SRC

Control Adapter MX-1986/SRC, installed by Field Change 2-AN/SRC-10Y through 2-AN/SRC-15Y, has been replaced by Control Adapter MX-1986A/SRC. The improved adapter is available from supply under Federal Stock Number 2F5820-884-2185.

Installation instructions for the MX-1986A/SRC are the same as for the MX-1986/SRC, as provided in Field Change Bulletin NAVSHIPS 98762, and supplemented by the technical manual for Control Adapter MX-1986A/SRC, NAVSHIPS, 0967-069-1010. The field Change bulletin can be obtained from the Naval Supply Depot, Philadelphia, Pa. 19120, using stock number 0282-073-7000. The technical manual is supplied with the MX-1986A/SRC. EIB 722

AN/SRC-10 THROUGH -15 AND AN/URC-16 THROUGH -18 SERIES RADIO SETS – POSSIBLE WIRING DISCREPANCY

See article in AN/SRC-10 section under the same title.

AN/SRC-10 THROUGH -15 AND AN/URC-16 THROUGH -18 SERIES RADIO SETS – POSSIBLE WIRING DISCREPANCY

See article in AN/SRC-10 section under the same title.

AN/SRC-10 THROUGH -15 AND AN/URC-16 THROUGH - 18 SERIES RADIO SETS – POSSIBLE WIRING DISCREPANCY

See article in AN/SRC-10 section under the same title.

AN/SRC-10 THROUGH -15 AND AN/URC-16 THROUGH -18 SERIES RADIO SETS – POSSIBLE WIRING DISCREPANCY

See article in AN/SRC-10 section under the same title.

AN/SRC-10 THROUGH -15 AND AN/URC-16 THROUGH - 18 SERIES RADIO SETS – POSSIBLE WIRING DISCREPANCY

See article in AN/SRC-10 section under the same title.

AN/SRC-16 COMMUNICATION CENTRAL—INTERMODULATION DISTORTION MEASUREMENTS

The following is to provide operating and maintenance personnel with information relative to the method and means of making Intermodulation Distortion tests on the AN/SRC-16 Transmitter and the use of these tests as a means of evaluating the performance of the transmitter. In many cases the conditions which cause excessive distortion may also cause spurious and harmonic outputs resulting in the generation of unwanted sidebands causing interference at frequencies outside the prescribed bandwidth, and an increased error rate in data transmission. The overall result being degradation and breakdown of communications.

Intermodulation Distortion measurements can be made by utilizing the built-in Radio Test Set TS-1913/SRC-16. This test set is capable of measuring third-order distortion products generated in the transmitter and receiver by feeding test tones into the transmitter and measuring the output of the receiver using the following procedure: Two equal tones, F1 and F2, are fed into one sideband of the transmitter at a +4DBM level each. This produces 125 watts average power per tone out of the 500-watt transmitter which is equal to 500 watts of Peak Envelope Power (PEP). At the output of the receiver the test set is calibrated to indicate 0 VU for the level of one tone. The distortion products 2F1-F2 and 2F2-F1 are read as DB below the level of a single tone.

The maximum allowable distortion products of the transmitter must be no greater than 35 DB below PEP. Since the test set is indicating distortion below the level of a single tone and since the level of a single tone is one-fourth, or 6DB, less than PEP, then the maximum allowable 2F1-F2 and 2F2-F1 readings on the test set must be no greater than -29DB.

The limitation of this type of test is that the distortion measured can be no better than the combined distortion being generated in the transmitter and receiver. If the distortion measured is greater than the minimum allowable, there is no indication of whether the transmitter, the receiver, or both are at fault. It is desirable that the distortion at the output of the transmitter be measured. This can be accomplished by using a spectrum analyzer such as the Panoramic Panalyzor Model SB-12B. In addition, this instrument can be used to measure sideband output levels, carrier suppression, harmonic suppression, spurious suppression, and opposite sideband rejection. A note of interest is that AN/SRC-16 installations are slated toreceive spectrum analyzer TS-1379/U in the latter part of 1965 or early 1966.

The following discussion may be used as a guide for performing spectrum analyzer tests and for interpreting the results to establish the operating condition of a transmitter. The 500-watt PEP transmitter is used as the example. More specific step by step procedures will be written at such time as the spectrum analyzer TS-1379/U instruction manual becomes available.

The spectrum analyzer should be located near the transmitter dummy load. A means of coupling the rf signal to the analyzer is to attach one end of a wire to the analyzer input probe and loop the other end of the wire near the exposed T-connector output at the input to the dummy load.

Adjust the F1 and F2 tones from Radio Test Set TS-1913/SRC-16 separately to +4DBM into one sideband. Then position the TONE SELECT switch to BOTH so that both tones are fed into one sideband. Under these conditions the 500-watt transmitter output should be 125 watts average per tone, 250 watts average total output, and 500 watts of Peak Envelope Power (PEP). Do not rely on the rf Power Meter to read the total average power output. True average power is indicated only in the case of a single tone. A further word of caution, do not feed both tones into both sidebands at these levels because the PEP and average power ratings of the transmitter will be exceeded.

Referring to the instruction manual for the spectrum analyzer, adjust for a full-scale presentation of the two tones on the analyzer display. The amplitude of the individual tones displayed is representative of the power contained in each tone. To calibrate the display to PEP, switch in 6DB of input attenuation or reduce the gain by an equal amount. The amplitude of the individual tones will be reduced by 6DB. Any signals on the display can now be read in DB below PEP. Adjust the bandwidth of the display to a convenient presentation which will include the frequencies to be measured.

Intermodulation distortion products will appear as sidebands on either side of the two tones separated by the difference frequency of the two tones. Third-order distortion products generally ore the worst and will appear as the first sidebands on each side of the two tones. This distortion must not be any greater than 35DB below PEP. However, an optimum operating transmitter may have distortion products as low as 45DB below PEP or lower. Generally, distortion is likely to be worse at the higher frequencies because of reduced gain of the Power Amplifier necessitating a greater output from the tuner to maintain the transmitter gain.

Intermodulation distortion may result from various conditions such as power supply voltages which are too high or too low, marginal tubes in the PA or tuner which can no longer operate as linear amplifiers, improper adjustment of the PA statics, or simply just overdriving the transmitter. In this regard, the careful adjustment of the PA statics is of utmost importance.

Harmonic suppression can be read on the display at twice the operating frequency. It must be no greater than 50DB below PEP. Excessive harmonic output would most likely accompany excessive distortion and may be attributed to the same causes.

Spurious outputs must be no greater than 45DB below PEP. Excessive spurious outputs may be caused by such things as high ripple or erratic power-supply voltages or

microphonic tubes. Normally, spurious outputs are much lower than [illegible] PEP.

Residual carrier output must be no greater than 45DB below PEP. In most [illegible], it [illegible] as low as [illegible] below PEP. A high residual carrier output indicates a fault or improper adjustment in the [illegible], or [illegible] balanced modulators.

Opposite sideband rejection may be monitored by feeding a tone into one sideband and looking for its complement in the other sideband on the analyzer display. The level must be no greater than 50 DB below the level of a single tone. A problem in this area is likely to be caused by a fault in the balanced modulator or [illegible].

The relative output of each sideband can be readily observed on the display by feeding a single tone into both sidebands. Unequal levels indicate that the balanced modulator outputs are not adjusted equally or that there exists a problem in the audio lines prior to the modulator. (659)

AN/SRC-16 COMMUNICATIONS CENTRAL—OVERDRIVING THE AN/SRC-16(U) TRANSMITTER

The purpose of this article is to provide operating and maintenance personnel with a method of determining the average power out of the AN/SRC-16 transmitter in order to avoid overdriving the transmitter during NTDS operation.

With the AN/SRC-16 Transmitter and AN/SSQ-29 Terminal Equipment adjusted correctly, the NTDS composite Peak Envelope Power (PEP) will be at the correct range for the 500-watt PEP or 5000-watt PEP transmitter used. The average power output as indicated by the rf POWER meter located on the front panel of cabinet 1 of the AN/SRC-16 will read relatively low. Do not be alarmed by this reading or attempt to increase it in an effort to obtain a greater range. This will only result in overdriving the transmitter and consequent distortion of the output. This distortion will result in data errors and the generation of sidebands and harmonics outside the prescribed bandwidth. The generated sidebands and harmonics will cause increased interference at other frequencies.

The low average power indication can be explained as follows:

The AN/SSQ-29 has a nominal output of .178 Vrms per data tone per sideband and a Doppler tone level of .356 Vrms per sideband. Adding the average power in each of the tones results in very nearly 1 milliwatt or 0 DBM of average power per sideband. The composite level can be read as 0 VU on the OUTPUT METER of the AN/SSQ-29. The level into each sideband can be read on the AUDIO LEVEL meter on the front panel of cabinet 1 of the AN/SRC-16.

The total power input into the transmitter is the sum of both sideband inputs or nearly 2 milliwatts. The 500-watt PEP transmitter when properly adjusted has a power gain of 47 DB or 50,000. Therefore a 2-milliwatt average power input will produce 100 watts of average power.

The rf POWER meter is a device which responds to the average of a rectified waveform. In the case of a single tone, or sinewave, the ratio of the effective (RMS) to the average is a fixed value. The meter can then be readily calibrated to indicate average power. In the case of a complex waveform, as in NTDS operation, the ratio of the effective to the average value differs; therefore, a true average power is not indicated.

Typical readings taken of a 500-watt PEP transmitter in NTDS operation are −2 DBM input per sideband on the AUDIO LEVEL meter and 60 watts output on the rf POWER meter.

As a follow-up to this article, the EMEC will publish an article in a future edition of EIB under the DATA SYSTEMS heading, on the causes of distortion in the AN/SRC-16 transmitter and the means of measuring it. (659)

Link 11 Transmitter-Tone Multiplexing

The purpose of this article is to call to the attention of the NTDS Maintenance Officers, EMOs and the Operating and Maintenance personnel, information that was published in EIB #727, dated 27 February 1968, and is currently in the communication EIMB, NAVSHIPS 0967-000-0010 service notes section 4, pages AN/WRT-2:3-7, relative to transmitter-tone multiplexing.

This information is also applicable to the AN/SRC-16, AN/SRC-16A, AN/SRC-23(V) and AN/SRC-23A(V) transmitters.

The information mentioned above is very important concerning transmitters that are modulated with tone multiplex equipment, such as the AN/SSQ-29 and AN/USQ-36 data terminal sets. Care must be exercised to insure that the transmitter's Peak Envelope Power (PEP) rating is not exceeded in multitone operation. The level of the intermodulation distortion will become excessive and result in a deterioration of the radiated signal.

Personnel involved with NTDS data transmission should familiarize themselves with the information promulgated in the EIB and EIMBs relative to their cognizant equipments. *(EIB 863)*

AN/SRC-20 Radio Sets—Power Leakage Problem

It has been brought to the attention of the Bureau that the "carrier-on" light of C-1138/UR radio set controls, when used with the AN/SRC-20 radio sets, may light dimly even when the radio set is not on transmit. The current to light the "carrier-on" indicator is coming from the AC power line via the line filter. Corrective action is now under investigation by EMEC. In order to avoid a possible electrical shock, personnel are reminded to completely disconnect the equipment from the AC power line when any trouble-shooting or repairs are attempted on the interior of either the AN/SRC-20 or C-1138/UR.

AN/SRC-20 - HIGH VOLTAGE HAZARD

This article is to advise operating and maintenance personnel of the existence of a high voltage hazard in the AM-1565/URC RF Amplifier of the AN/SRC-20 Radio Set.

Personnel are cautioned to exercise extreme care when inserting a dummy load (RF Wattmeter) into Jack J-205. Adjacent to J-205 is Jack J-3, an identical type jack, which is used to furnish 1800 VDC to the plates of the 4CX250K tubes.

AN/SRC-20, AN/SRC-21—MECHANICAL ALINEMENT OF REPAIRED RF AND PA ASSEMBLY FROM NAVAL SHIPYARDS

Philadelphia Naval Shipyard has experienced slippage in a small number of frequency selector coupling half shafts. Therefore, some AN/SRC-21 sets have a slight mechanical difference between the RF and PA coupling half shaft, page 5-32, figure 5-29, symbol number 0121, of NAVSHIPS 94695A, and the frequency selector, page 5-54, figure 5-63, 01295.

This difference, however slight, will necessitate adjustment (touch up) at 399.9 MC. After installation, dial a high, a medium, and a low frequency while checking for at least 16 watts. If this cannot be accomplished, re-set dial to 399.9 MC, loosen set screw on the half shaft of frequency selector, figure 5-63, 01295, and adjust coupling shaft 0121 for maximum RF output. Tighten set screw. RF and PA unit will then be alined to track from 225 MC to 399.9 MC. (699)

AN/SRC-20, AN/SRC-21—ALIGNMENT HINTS FOR RF AND PA UNITS

Indications are that ships are having difficulty in initial adjustment of RF and PA units.

NAVSHIPS 94695A, page 5-7, step 7, shows the tuning procedure for variable capacitors C107 and C115. The transmitter must be keyed and the capacitors tuned to provide a peak negative d.-c. grid bias at J-105. These two variable capacitors can be detuned from each other and the corresponding voltage peak is so small that adjusting for a peak voltage at J-105 is very difficult or next to impossible.

A method of overcoming this tuning problem is as follows:

With the frequency dial set for 399.9 mc:

1. Tune C-107, C-115, and C-122 counterclockwise (CCW) to the stop which produces minimum capacitance.
2. Place the AN/USM-116 to the negative one-volt d-c scale and connect to J-104.
3. Key the transmitter and tune C-107 clockwise (CW) until the first voltage peak is observed on the AN/USM-116.

NOTE: The voltage peak is very small (.03 volt increase) depending on the condition of the tubes and the tracking in the frequency multiplier oscillator and the first IF amplifier.

4. Keeping the AN/USM-116 on the negative one-volt d-c scale, connect it to J-105.
5. Key the transmitter and tune C-115 CW until the first voltage peak is observed on the AN/USM-116.

NOTE: The level of this voltage reading is partially dependent on the setting of C-122 and will be in the range of -.03 to -.5 volts d-c. If unable to locate the first peak, tune C-122 CW two turns and then repeat Step 5.

6. Key the transmitter and tune C-122 CW until the first voltage peak is observed on the AN/USM-116.
7. Key the transmitter and readjust C-107, C-115, and C-122 for maximum reading on the AN/USM-116.
8. To determine that C-107, C-115, and C-122 are tuned to the correct frequency, key the transmitter and then disconnect P-302 which connects to J-101 (see NAVSHIPS 94695A, page 5-28, figure 5-22). With P-302 disconnected, the reading on the AN/USM-116 should fall approximately to zero if C-107, C-115, and C-122 are correctly alined.
9. Continue the alinement procedure as given in NAVSHIPS 94695A, page 5-9, para. i, without changing the setting of C-107, C-115, and C-122 other than for minor adjustment. (660)

AN/SRC-20 AND AN/SRC-21; VENTILATION OF

There are indications that in some AN/SRC-21 installations the ventilation covers have not been removed from the lower left and right sides of the cabinet case (CY-2959) (see figure 1-2, page 1-3, of NAVSHIPS 94695). After removal of the covers, louvered vents will be disclosed (see figure 1-1, page 1-2, of NAVSHIPS 94695A). The covers should then be mounted on the upper left and right sides of the cabinet case (CY-2959) for future use.

The intake port of the AN/SRC-20 (AM-1565) will have a sealed plate to be removed on the inside bottom of the air-filter unit and placed on the lower left hand side of the cabinet (figure 1-1, page 1-2 of NAVSHIPS 94695A).

The exhaust port is located at the top rear of the cabinet and will be turned 180° with the exhaust in a downward position. (660)

AN/SRC-20, -21—RADIO SET; SPEED INCREASER, SYMBOL NO. 0-1052, HIGH FAILURE OF

The purpose of this article is to advise maintenance technicians of the high failure rate of the Speed Increaser, Symbol No. 0-1052 in the AN/SRC-20, -21 Radio Set and

provide maintenance actions that should be taken in order to reduce failures to a minimum.

Results of an investigation conducted by the Electronics Maintenance Engineering Center reveal that the original lubricant used by the manufacturer in packing the bearing of the Speed Increaser wipes away from the bearing resulting in excessive heat, binding of the speed increaser, and eventual failure.

The Bureau of Ships is conducting tests in a group of blower motors in order to provide a suitable replacement motor which will eliminate such failures. However until such time as these replacement motors are made available the following maintenance actions must be taken to reduce failures to a minimum:

1. Speed Increaser couplers manufactured of brass, or preferably bronze stock, have proven more efficient than presently procured steel couplers. Brass or bronze couplers (regardless of how finely honed) seat with the bearing surfaces more readily; however, excessive heat and wear requires a higher-temperature MIL-G-3545 grease. A residue of particles are retained in the grease due to wear of coupler and will require a grease change after 10 days of use. At this time, thoroughly clean and fully repack coupler using MIL-G-3278 grease cleaning and repacking every 30 days thereafter.

2. Two new Speed Increasers should be obtained and held on board as operating spares.

NOTE: Prior to installing a new speed increaser, it should be cleaned of its original lubricant and fully repacked using procedure in paragraph 1. The Speed Increasers and Grease can be obtained through normal supply channels using the following Federal Stock Numbers:

Item	Fed. Stock No.	Unit of Issue
Speed Increaser	1N3030-201-6906	1 each
MIL-G-3545	9W-9150-273-2390	8 oz. tube
MIL-G-3278	9W-9150-261-8297	8 oz. tube

(656-666)

AN/SRC-20 and AN/SRC-21 Radio Sets – Maintenance Hint

Tuning Capacitors, C107, C115, C122, and C127 in the RF and PA unit of the RT-581/URC-9 have a tendency to vibrate loose. This is caused by the repeated alinements causing wear on the threads of the soft, silver-plated, brass clamps.

These capacitors can be repaired by removing the RF and PA unit and disassembling the bottom and side covers, exposing the capacitors.

CAUTION

THESE CAPACITORS HAVE A GLASS SHELL AND MUST BE HANDLED VERY CAREFULLY.

Using a jeweler's screwdriver, remove the tuning slug. Use a pair of long nose pliers and lightly pinch the two silver-plated, brass, threaded clamps. Install the tuning slug to its original position, noting the firmness of the tuning slug. If the capacitor is not tight enough, continue the above process until satisfactory results are obtained. Proceed to each successive capacitor, using the same procedure. The above procedure can be used to repair the Tuning Capacitors, C215, C221, C227, and C233 of the RT-581/URC-9 Frequency Multiplier Oscillator. (678)

AN/SRC-20 and AN/SRC-21–Maintenance Hint

Activities having the AN/SRC-20, AN/SRC-21 installed are advised that possible wiring errors exist in the squelch circuits of the subject equipment manufactured by Stewart-Warner under Contract NObsr-91068. The contract requires factory settings of each set to be wired for S+N/N. Usually, the squelch settings for this S+N/N is too slow for communication purposes and should be set for carrier squelch.

In either case, if difficulty is experienced, R-716 may be wired improperly, figure 5-103, page 109, NAVSHIPS 0967-032-5000, and /or pins 1,2, or 3 for the audio amplifier and modulator assembly may be wired incorrectly from J8 (P801) connector, figure 5-100, page 5-105. Continuity checks should be performed and corrective action taken to restore proper operation. (685)

AN/SRC-20, AN/SRC-21, and AN/URC-9( )–Maintenance Hint

The directional coupler located in Receiver-Transmitter RT-581/URC contains a soldered joint which has become defective in several equipments and has caused ineffective performance.

This joint is located on the bottom of the coupler assembly and is not visible unless the coupler is removed; it therefore represents a trouble spot nearly always overlooked in any normal inspection procedure. To insure the quantity of this joint, disconnect P1301 and P9 from their respective jacks, then remove the two Phillips head screws which fasten the coupler to the equipment frame. The coupler may then be turned bottom side up and the solder joint will be clearly visible through the hole in the coupler body. The small coaxial cable attached to P1301 should be flexed slightly while observing the solder joint. The center lead of this cable should be firmly soldered to the terminal projecting from the coupler unit. Any evidence of a cold, broken or low resistance joint can be corrected by resoldering using a low wattage pencil type soldering iron.

Before replacing the coupler in its normal position, the end seal which secures the coaxial cable to the coupler should be inspected to insure that it is firmly securing the cable and grounding the cable braid. It should be noted that the more frequently P1301 is removed, the greater the probability of breakage or loosening of the subject joint.

NAVSHIPS 0967-032-5000, figure 5-17, refers. (685)

AN/SRC-20 and AN/SRC-21 Radio Sets–Blower Motor B1051 Maintenance Hint

The down time of the B1051 Blower Motor can be reduced by introducing an improved method of lubricating the drive

bearing which will increase the life of the speed increaser.

This unit utilizes the ratio of the circumference of the inner and outer races for an increase of speed as the driven balls roll between the two races. The torque output is dependent on the radial preload manufactured into the bearing and in order to maintain this feature, it is most important that drive bearing wear be minimized by adequate lubrication.

The speed of the blower centrifugal fan should be checked with a stroboscope. If the speed is 7000 rpm or above, the useful life and dependability can be increased by simple modification to the speed increaser. If the speed is appreciably below 7000 rpm, the speed increase should be replaced with a new unit which can be ordered under FSN 1N3020-201-6906; however, it will also be necessary to modify the new unit.

The modification to the speed increaser consists of removing the drive bearing retainer ring, carefully knocking the drive bearing grease seal plate out with a small pin punch, and sliding the shaft assembly out in order to expose the seal plate which can be cut with a pair of diagonal pliers. The housing space between the bearings should be liberally packed with high and low temperature Aircraft and Instrument Grease MIL-G3278 (as explained in EIB 656) and the bearing retainer ring reinstalled. The motor drive coupling should be installed and covered with a liberal supply of grease and the motor should be mounted to the speed increaser using a 15/16" I.D. x 1-1/4" O.D. paper gasket between the motor mounting surface and the speed increaser in order to prevent grease leakage. (685)

AN/SRA-33 MULTICOUPLER KEY LINE-PROTECTION OF CU-1131 THROUGH CU-1134/SRA-33 CAVITIES.

See article under AN/SRA-33 with the same title (EIB 714)

AN/SRC-20, AN/SRC/21 RADIO SET-INCOMPATIBILITY OF BLOWER MOTOR B1051

Servicing personnel should be aware of the incompatibility of Blower Motor B1051 in certain Radio Sets AN/SRC-20, -21.

Activities that have Radio Sets AN/SRC-20,-21 manufactured by Stewart Warner under contract number NObsr 91068, are alerted that Blower Motor B1051 of RT-581/URC-9 was specifically designed for that contract by Rotron Inc. The blower motor is **not** compatible with any of the RT-581/URC-9 units manufactured by any other company, nor is it compatible with Stewart Warner RT-581/URC-9 units manufactured under any other contract.

It is mandatory that the RT-581/URC-9 and the PP-2702/URC-9 delivered under contract number NObsr 91068 be used together.

Although the Rotron Inc., Blower Motor B1051 is not compatible with any other equipment, any of the Blower Motors B1051, from RT-581/URC-9 equipments manufactured by Stewart Warner, Teledyne Inc. (DUBROW)' or Collins Radio are compatible to all equipments, provided the procedure for installation outlined at the end of this article is followed.

A guide to Blower Motor B1051 particulars is provided in the following table:

Manufacturer	Contract Number	Type Blower Motor	Fail Safe Switch
Collins	NObsr 87290	Air Marine-Mechanical Speed Increaser	No
Collins	NObsr 89509	Air Marine-Mechanical Speed Increaser	No
Stewart Warner	NObsr 91068	Rotron 26.5 VDC Electronic Speed Increaser	Yes (None on Ser 1 through 180)
Stewart Warner	NObsr 95140	Globe 117 VAC Electronic Speed Increaser	Yes
Stewart Warner	NObsr 95327	Globe 117 VAC Electronic Speed Increaser	Yes
Teledyne Inc. (Dubrow)	NObsr 91149	Dubrow 117 VAC Electronic Speed Increaser	Yes
Teledyne Inc. (Dubrow)	NObsr 91284	Dubrow 117 VAC Electronic Speed Increaser	Yes
Teledyne Inc. (Dubrow)	NObsr 93164	Dubrow 117 VAC Electronic Speed Increaser	Yes

Installation Procedure:

To install a blower motor with a fail safe switch, connect the AC leads to pins C and E and the fail safe leads to pins A and D of P-1051 of the blower motor. Refer to NAVSHIPS 0967-125-6010; page 6-131, 6-132; figure 6-111; Notes 4 and 5.

To install a blower motor without a fail safe switch, connect the AC leads to pins C and E, and connect a jumper between pins A and D of P-1051 of the blower motor. See NAVSHIPS 0967-125-6010; page 6-131, 6-132; figure 6-111; Note 4. (EIB 722)

(See article on page AN/SRC 20:6 concerning "Fail Safe" Switches.)

AN/SRC-20, AN/SRC-21 AND AN/URC-9 UHF MAINTENANCE HINT –CORRECT FREQUENCY ALIGNMENT OF RF AND PA AMPLIFIER IN THE RT-581/URC-9

NAVSHIPS 0967-125-6010 has three methods of aligning the RF and PA amplifiers. Each one has its own merits and all are good procedures to help the technician. The following procedure is another excellent method to accomplish the task:

Equipment Required:

AN/USM-207 (Frequency Counter) or
CAQI 524D (Frequency Counter)
CAQI 525C (Frequency Converter, Plug in for 524D)
CAQI 410B (VTVM)
ME-11B/U (Dummy Load, Power Meter)

Equipment Primary Settings:

CAQI 524D (Frequency Counter) Place in OPERATE
CAQI 525C (Frequency Converter, Plug in) Input Frequency to 100MC–500MC POSITION Dial to 390MC and add counter reading or dial 410MC and subtract counter reading
AN/URC-9 Channel Select to MANUAL Manual frequency to 399.9MC Mode to NORMAL

Procedure:

1. Connect ME-11B/U to AN/URC-9 Antenna Jack.
2. Set ME-11B/U to 60 watt range.
3. Connect insulated test probe to input jack on CAQI 525C.
4. Key AN/URC-9 to transmit.
5. Hold probe in slot for Z101 and adjust C-107 for max. reading on meter of CAQI 525C (Reading shall be within ± kHz of 399.9 MHz.)
6. Hold probe in slot for Z103 and adjust C-115 for max. reading on meter of CAQI 525C.
7. Hold probe in slot for Z105 and adjust C-122 for max. reading on meter of CAQI 525C.
8. Set CAQI 410B to – 10V and place DC probe in J-114.
9. Adjust C-127 for max. reading on CAQI 410B.
10. Peak up C-107, C-115, C-122 and C-127.
11. Set CAQI 410B to – 30V scale and place in J-111.
12. Adjust C-141 for max. reading on CAQI 410B.
13. Adjust C-132 for max. reading on ME-11B/U.

NOTE

(1) Capacitors C-107, C-115, C-122, C-127 and C-141 should be all fairly close to top.

(2) Frequency multiplier amplifier can be checked on each channel for calibration by insertion of insulated probe at Z208. The correct injection frequency can be determined by table 4-1 (Frequency Multiplier Oscillator UHF Injection Chart) on page 4-9 (NAVSHIPS 0967-125-6010).

FIELD CHANGE 5-AN/SRC-20, 5-AN/SRC-21, and 1-AN/URC-9 ( )-AVAILABILITY OF REPLACEMENT PARTS

Individual piece parts for the subject field changes have been placed in stock at Naval Supply Centers, Oakland, California and Norfolk, Virginia. Equipment holders requiring parts to replace lost or damaged pieces may identify them in the following list.

Circuit Symbol	FSN	Item Name
	Unit 1	
H32	1N5820-089-4235	Connector
H33	1N5820-089-4236	Connector
H401, 402	1N5820-089-4237	Knob
H403,404	1N5820-089-4238	Set Screw
H405, 406	1N5820-089-4239	Spacer
H407	1N5820-089-4240	Key
H408	1N5820-089-4241	Key
	Unit 2	
H1	1N5820-089-4228	Cover Plate
H2	1N5820-089-4229	Cover Plate
H3	1N5820-089-4230	Cover Plate
H4	1N5820-089-4231	Cover Plate
H5	1N5820-089-4232	Cover Plate
H1444	1N5820-089-4233	Bed Plate Assembly
	Unit 4	
H2007, 2008	1N5820-089-4234	Guide Pin Assembly

If complete field change kits are required, they should be ordered under the following stock numbers.

Field Change	FSN
5-AN/SRC/20	2N5820-986-7729
5-AN/SRC-21	2N5820-986-7746
1-AN/URC-9( )	2N5820-986-7728

(EIB 724)

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

Improper techniques of dialing the C-3868/SRC to select a preset channel on Radio Sets AN/SRC-20 and AN/SRC-21 will produce failures in Radio Set Control Unit C-3866/SRC.

One problem results from dialing Remote Control Unit C-3868/SRC too fast. The index finger dialing the number should hold the dialed number against the stop for two seconds before releasing. This allows stepping relay K-206 in Radio Set control unit C-3866/SRC ro reach the correct homing position prior to accepting the stepping impulses. Fast dialing will cause Radio Sets AN/SRC-20 and AN/SRC 21 to come up on the wrong channel.

Another problem results when the dialing sequence for channels 11 through 19 is not completed. As an example, to dial channel 15, an operator must dial the letter "A" to step relay K-206 to the correct homing position. Then the operator dials the number "5" and K-206 steps to the correct position for channel 15. Failure to dial the number "5" would leave stepping relay K-206 in an energized condition and could cause eventual component failures. (EIB 725)

AN/SRC-20, AN/SRC-21 AND AN/URC-9( ) RADIO SETS–BLOWER ASSEMBLY B-1051, SUPPORT INFORMATION

Activities having AN/SRC-20 and AN/SRC-21 equipments installed are advised that five (5) different types of Blower Assemblies (B-1051) may be encountered. Of the five types, only one can be repaired by the user.

Any failure in these assemblies will require replacement of the entire unit unless the assembly is of the type manufactured by Singer Co., Diehl Division (formerly Air Marine Inc.). The Mechanical Speed Increaser, Symbol 0-1052, FSN 1N3020-201-6906, is available for this unit.

Request for assistance in solution of specific problems relative to these blower assemblies may be submitted direct to the Naval Ship Engineering Center, Norfolk Division, Naval Station, Norfolk, Virginia 23511, Attention Code 6621B. (EIB 714)

AN/SRC-20, -21, –ADJUSTMENT OF V-106 (4X-150A) TO ACHIEVE LINEAR AMPLIFICATION IN RF AND PA AMPLIFIER OF RT-581/URC-9 AND REDUCE FAILURE RATE

Replacement of V-106 (4X-150A) and/or the RF and PA amplifier requires adjustment in the operating condition for greater reliability. This is an area which is usually overlooked, but is rather critical.

NAVSHIPS 0967-125-6010, page 6-17, paragraph 6-4d(1) (x) through (ab), should be followed. Adjustment beyond the limitation in the caution note will drive V-106 into distortion and shorten the life of the tube. (EIB 720)

AN/SRC-20 AND AN/SRC-21 –NON-PARTICIPATION IN THE RETURN OF DEFECTIVE RF AND PA SUBASSEMBLIES

There has been in the past a severe shortage of the RF and PA subassembly, FSN 2NH5820-981-1598, in the supply system. ESO has made great efforts to procure sufficient quantities to supply the demand, but has succeeded only in supplying the most urgently needed requirements.

Statistics from ESO show that out of 22 subassemblies issued per quarter, only a portion has been returned for repair. The authority to draw these subassemblies is ESO NOTICE 4440.38J, which simply states "Draw an assembly and return one." These assemblies will be repaired at Philadelphia or Long Beach Naval Shipyard; therefore, turn-in of defective units in mandatory if this "round robin" is ever to be achieved.

Surveys by the Naval Ship Engineering Center, Norfolk Division, show that the ships have not returned their defective subassemblies and are responsible for holding up repairs on other ships which require them. It is urgently requested that all ships, upon requisitioning a new RF and PA subassembly, turn-in the defective unit immediately, regardless of its condition. (EIB 705,727)

AN/SRC-20. 21 RADIO SETS–AVAILABILITY OF BLOWER MOTOR ASSEMBLY B-1051/URC-9 WITH "FAIL-SAFE" SWITCHES

This article advises fleet maintenance personnel of the serial numbers of those Radio Sets AN/SRC-20 and 21 which have a Blower Motor Assembly B-1051/URC-9 without "Fail-Safe" switches that protect the equipment in case of blower motor failure. Blower motor assemblies containing the "Fail-Safe" switch are available for immediate replacement in those sets with serial numbers outlined in the following paragraph.

Holders of Radio Sets AN/SRC-20 with serial numbers E-1 through E-15 and Radio Sets AN/SRC-21 with serial numbers D-1 through D-48, and E-1 through E-16, shall take action to replace the blower motor assemblies as soon as practicable. All other Radio Sets AN/SRC-20 and 21 with serial numbers above those listed are equipped with blower motor assemblies containing the "Fail-Safe" switches and do not need replacement.

The procedure for obtaining the replacement blower motor assembly is as follows:

1. Blower Motor Assembly B-1051/URC-9 shall be requisitioned direct from the Naval Electronic Systems Command (Code 05212A), Washington, D. C., citing EIB 728 authority.

2. Upon receipt of the new blower motor assembly, and after installation and check-out is completed, the replaced blower motor assembly shall be shipped on a Government Bill of Lading to the following corporation:

Teledyne Systems Corporation
Dubrow Electronic Industries
235 Penn Street
Burlington, New Jersey

Copies of all documents and bills of lading shall be forwarded to the Naval Electronic Systems Command (ATTN: Code 05212A) and to the Naval Ship Engineering Center Norfolk Division, Norfolk, Virginia, for administrative purposes.

See article on page AN/SRC-20:3 concerning Blower Motor B1051. (EIB 728)

AN/SRC-20, AN/SRC-21 AND AN/URC-9 ( ) RADIO SETS—MAINTENANCE HINT

Maintenance personnel who service the subject radio sets should be alerted to possible damage which can occur to Cable W502 when Receiver-Transmitter RT-581/URC-9 is removed from, or replaced in, its case. If Cable W502 has excess slack, it can become damaged or severed during routine servicing operations.

The potential for damage W502 may be eliminated by the addition of a plastic or nylon 3/16" cable clamp. Burndy Corp. No. H3PN or H. H. Smith No. 832 are representative of the type clamp required. A suitable clamp is usually available under FSN 9Z5340-619-7754.

Locate the 3rd IF Assembly in RT-581; refer to Figure 6-32 in Technical Manual NAVSHIPS 0967-125-6010 and slide the clamp over Cable W502. Remove the Phillips screw nearest V501 (green head retaining screw). Place the screw through the clamp mounting hole and replace the screw in its usual position. Cable W502 will then be held securely in place and protected from damage. (EIB 731)

AN/SRC-20/21 RELAY FILTER CABLE ASSEMBLY CY-8521/URC-9—INFORMATION CONCERNING

The purpose of this cable is to allow extending the relay filter assembly from the transceiver for testing. Without the cable, testing of the relay filter cannot be performed.

For those installations which do not have the CY-8521/URC-9, it can be procured under FSN 2N5995-911-2492. (735)

AN/SRC-20, AN/SRC-21—Maintenance Hint

The guess work of tab bending direction in the RF, PA and FMO electronic assemblies can be eliminated by substitute tuning of the trimmer capacitor of each tank circuit.

As an example of rotation versus capacity, tune the sample trimmer capacitor C107 in figure 1 clockwise. The capacity increases as plate 2 moves closer to plate 1. Tune the capacitor counterclockwise and the capacity decreases as plate 2 moves away from plate 1.

This procedure also applies to the frequency multiplier oscillator assembly, except that the meter reading at J106 should be observed in the receive condition.

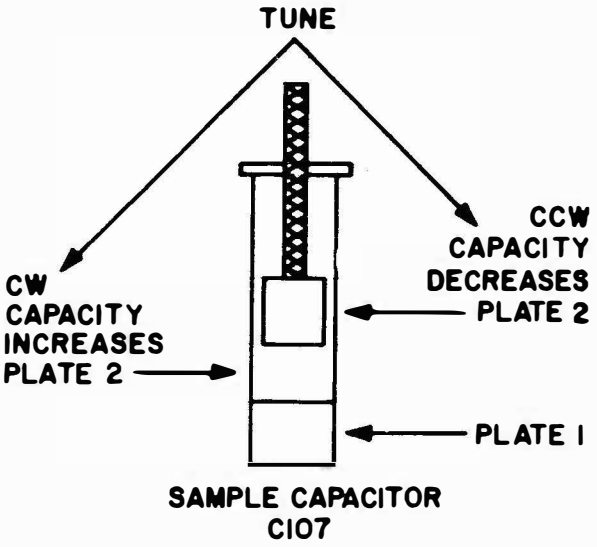


Figure 1. Principle of Rotation vs. Capacitance in Trimmer Capacitor

Procedure:

a. Align the RF and PA assembly at 399.9 MH_z in the transmit condition.

b. Pencil mark the position of the trimmer capacitors (see C127 in figure 2).

c. Decrease the frequency by 10 MH_z

d. Tune the trimmer capacitors and note the direction of rotation versus the up/down direction of PAig on the front panel meter.

e. Return the trimmer capacitors to the pencil marks.

f. Bend the tabs of Z101, etc., indicated as follows, based on results of foregoing step d.

Trimmer	PAig	Result
CW	Increase	more capacity required; bend tab in.
CCW	Increase	less capacity required; bend tab out.
CW & CCW	Decrease	optimum capacity do not bend tab.

g. Repeat steps c through f until tracking is completed. (754)

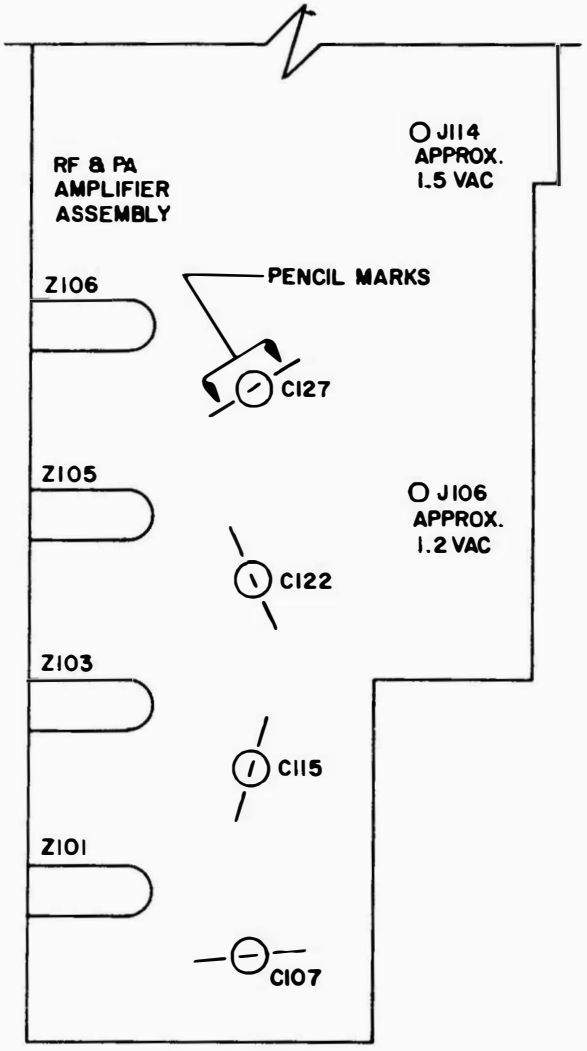


Figure 2. Method of Marking Trimmer Capacitor Positions Before Tuning (754)

AN/SRC-20, AN/SRC-21—Improper Squelch Light Operation

The purpose of this article is to alert holders of the AN/SRC-20, AN/SRC-21 and AN/URC-9 ( ) of a possible quality control problem. Reports from the Fleet indicate that some equipments have their squelch light on constantly, even though the squelch control is in the maximum clockwise position.

This symptom appears to be caused by the shield of L503 (3rd IF) shorting to the bare wire connected to the terminal of C528. If uncorrected, T501 may burn out.

Correct this problem by dressing the shield in question away from the exposed lead to C528. (763)

AN/SRC-20, AN/SRC-21—Mechonical Fail Safe Switch; bypassing of

The purpose of this article is to inform holders of AN/SRC-20, AN/SRC-21 and AN/URC-9 ( ) equipments that the mechanical fail safe switch on B-1051 is no longer required after Field Change 10 to AN/SRC-20, Field Change 9 to AN/SRC-21 and Field Change 4 to AN/URC-9 ( ) is installed.

The mechanical fail safe switch was developed as an interim solution and installed on most transistorized blower motors. This caused intermittent operation in some sets due to improper mechanical adjustments.

The user has the option of leaving the mechanical fail safe switch in the circuit (which is in series with the thermal switch), or of bypassing it.

If intermittent operation or difficulty is experienced within this area, bypass the fail safe at pins A and D of P-1051 as shown on page 6-131, 6-132, NOTE 4, of NAVSHIPS 0967-125-6010. (763)

AN/SRC-20, AN/SRC-21—Reduction of Electronic Assembly Attrition Rate

The purpose of this article is to inform holders of the AN/SRC-20, AN/SRC-21 and AN/URC-9 ( ) of steps to be taken when turning in defective electronic assemblies to reduce attrition rate. A high percentage of the electronic assemblies returned to Long Beach and Philadelphia Naval Shipyards for repair have been cannibalized due to the condition of the units received.

In most cases these units could be saved had the following steps been taken:

a. All the covers, electronic parts, and numerous pieces of hardware should be left on the electronic assembly.

b. Avoid handling which produces bent shafts, dented chassis and cutting of cables.

c. Pre-pack the unit with plastic bubble wrap and cardboard box before shipment.

d. Mark the box with the proper identification, FSN, MFR Part Number and Designated Overhaul Point (DOP). (763)

AN/SRC-20, AN/SRC-21, AN/URC-9( )—Replaceable RF Cable Assemblies Information

The RT-581/URC-9 receiver transmitter unit in subject equipment contains a number of RF cable assemblies which can become damaged during normal use, or which are inadvertently turned in with replaceable subassemblies. Since new or repaired subassemblies are not supplied with RF cables, holders of subject radio sets are reminded to remove and retain the RF cables before the sub-assemblies are turned in.

When replacement cable assemblies are required, due to loss or damage, the Federal Stock Numbers listed as follows may be used in requisitioning.

Circuit Symbol	FSN
2W4	9G5995-729-9206
2W5	9G5995-729-9265
2W7	9G5995-494-8277
2W8	9G5995-494-8279
2W101	9G5995-729-9211
2W302	9G5995-729-9212
2W303	9G5995-729-9204
2W304	9G5995-812-1992
2W502	9G5995-494-8278

(771)

AN/SRC-20, AN/SRC-21 and AN/URC-9 ( ) Blower Assembly B-1051—Maintenance and Ordering Information

Blower assembly B-1051 continues to present a maintenance problem to many units of the Fleet. This article is aimed at clarifying misunderstandings and reducing equipment downtime.

Although several types of blower assemblies have been supplied in the past, currently only one type is available through normal supply channels. The universal replacement blower is available under FSN 1N4140-689-6541. Present stock levels permit ordering only for equipment casualty repairs. The following FSN's have been used to supply this item at various times:

4140-567-5109
4140-805-0666
4140-055-0827
4140-203-1193

Navy requisitions cannot be satisfied by these stock numbers and their continued use can result in delay or non-receipt of material.

All universal replacements are maintainable and repairable on board ship. Lubrication and speed measuring procedures are indicated by decal on the fan housing. When damage due to prolonged usage occurs in the mechanical speed increaser, the motor and frame should not be discarded. A replacement speed increaser for Singer-Diehl (formerly Air-Marine) blower assemblies is available under FSN 1N3020-201-6906. Repair parts for transistorized converters or mechanical increasers, other than aforementioned, are not available.

Centrifugal or "fail-safe" switches are not required on fan assemblies when Field Change 10-AN/SRC-20, 9-AN/SRC-21 or 4-AN/URC-9 is installed. (774)

AN/SRC-20, AN/SRC-21 and AN/URC-9( )—Electronic Assembly Maintenance Philosophy

The purpose of this article is to explain the degree of repair expected by Ships Force before turning in a repairable electronic assembly for repair ashore.

Standard troubleshooting procedures should be used to localize the trouble within a defective repairable electronic assembly down to a part(s) if possible. Once this has been done, however, a judgment must be made by the Technician to determine if the defective part(s) should be replaced/repaired, or if the entire assembly should be turned in for repair ashore.

It is the maintenance philosophy of this equipment, that when accessible parts can be diagnosed as defective and replaced by the Technician without damage to the assembly, the Technician should make the judgment that such repair is within his capabilities and proceed accordingly. This would cover such obvious items as tubes, relays, some resistors and capacitors, and other items on an individual case basis.

If the Technician should judge that diagnosis or repair is outside his capabilities, however, he should turn the defective assembly in for repair ashore. Complexity, required tools and/or fixtures, or specific instructions may contribute to such a decision.

Shipboard repairable assemblies which may be turned in for shore repair, as specified above, are listed as follows. All other AN/SRC-20/21 repair is to be accomplished aboard ship.

1. Radio Frequency Amplifier AM-1565/URC
   a. Power Amplifier Assembly, FSN 4G5820-861-3550
2. Receiver/Transmitter RT-581/URC-9
   a. RF & PA Amplifier Assembly, FSN 4G5820-981-1598
   b. Frequency Multiplier Oscillator Assembly FSN 4G5820-760-8922

c. First IF Amplifier Assembly, FSN 4G5820-075-0493

d. Frequency Selector Assembly, FSN 4G5820-075-0495 (774)

AN/SRC-20, AN/SRC-21, AN/URC-9 Radio Sets--Maintenance Hint

Recent User Activity Comment Sheets indicate that some replacement Frequency Multiplier Oscillators (FMO) assemblies have been received with interconnecting power cable W201 too short to connect P201 to J2 on the main frame assembly of the RT-581 for subject radio sets.

Refer to subject Radio Sets Technical Procedures, NAVELEX 0967-125-6200, illustration 53, figure 6-18.

The effective cable length can be extended as follows:

1. Locate cable clamp (next to R212) that secures cable W201 to FMO assembly.
2. Loosen cable clamp screw.
3. Carefully pull cable through clamp for maximum extension of cable length.
4. Rotate cable clamp to a position parallel to coupler 0220.
5. Tighten cable clamp screw.

The manufacturer of the FMO assemblies have been alerted to this problem. (743)

AN/SRC-20, Directional Coupler DC-201 Repair/Adjustment Procedure–Maintenance Hint

A number of directional couplers DC-201 in the AM-1565 (Linear Amplifier, AN/SRC-20 Radio Set) appear to be defective and are often replaced ($46.00 new cost) when adjustment may restore the unit to satisfactory operating condition. If the front panel meter of the AM-1565 indicates high SWR and/or low power out when a wattmeter at the antenna indicates satisfactory operation, DC-201 is suspect of being defective. The following procedure should be used to restore the coupler if possible.

NOTE

Prior to performing the following procedure, insure that the proper adjustment range cannot be achieved by adjusting R531 and R532 (see figures 4-15 and 6-69, pages 4-57 and 6-86, of T/M 0967-125-6010)

Observing standard care and safety precautions, remove the four mounting screws, input and output coaxial cables and diode caps from directional coupler DC-201. Loosen the three locking screws and remove the diodes and diode holders.

Carefully bend each resistor lead straight down (out of holder) so that it will be about 1/32 inch closer to the wire running through the coupler. Replace the diode holders, diodes, caps and coaxial cables. Do not tighten the locking screws.

NOTE

All instruments used during this calibration must bear current calibration servicing identification tabs.

Connect Wattmeter AN/URM-96A with dummy load capable of dissipating 500 watts to Antenna Jack AM-1565. Select 399.9 MHz, high-low power switch to high, manual-auto excitation switch to auto and key the AN/SRC-20.

Turn the input diode holder until the front panel meter reads the same power out as the AN/URM-96A. Release key. Set the AN/URM-96A to read reflected power. Key the equipment and adjust the output diode until the front panel meter SWR equals the AN/URM-96A reflected power.

De-energize the equipment, carefully lock the diode holders (3 locking screws), and replace DC-201 with the mounting screws. To insure proper adjustment, recheck forward and reflected power. (779)

AN/SRC-20, AN/SRC-21 Radio Sets–Maintenance Hint

The purpose of this article is to alert users of the AN/SRC-20/21 equipments that some set screws in coupler 0-139, between shafts 0-125 and 0-132 of new RF and PA FSN 4G5820-981-1598 contract N00126-70-C-0905 (FBM), have been found to be loose upon installation in the equipment.

To check this condition it will be necessary to hold Z108 rotor capacitor lightly and try to rotate shafts 0-125 and 0-132 at oldham coupler in both directions, noting if there is any play in the coupler 0-139. Caution must be exercised not to distort Z108 rotor capacitor tabs by holding too firmly or complete alignment of Z108 may be in order.

Investigation of Long Beach Module Repair Facility has shown that 95% of the set screws of coupler 0-139 have been destroyed whenever work has been done in this area.

This problem can be relieved by selecting the proper spline tool. Most manufacturers of the RF and PA Amplifiers have used a 1/16 inch or .062 inch 6 bladed spline tool to tighten the 4-48 set screws.

The manufacturer has also used a staking compound (usually varnish) to permanently set the 4-48 screws.

Applying heat in the form a soldering iron tip to O-139 will melt the staking compound sufficiently to relieve the excessive torque that may cause the set screw splines to strip.

The same method can be used to reset capacitor O-139 (P/O Z-108) which uses the same type of set screws and staking compound. *(804)*

AN/SRC-20, AN/SRC-21, and AN/URC-9; Alignment of Capacitor C132 After Installation of Field Changes 10-AN/SRC-20, 9-AN/SRC-21 and 4-AN/URC-9—Maintenance Hint

The purpose of this article is to alert users of the AN/SRC-20, AN/SRC-21 and AN/URC-9 equipment that capacitor C132 may need to be adjusted for maximum output when thermal switch is installed on the 4X150 tube V106 of the RF and PA amplifier.

Installation of the thermal switch in the RF and PA amplifier cavity very seldom affects the output of the amplifier, however, it does occur on some units.

Technicians should be advised that maximum output can be restored by adjusting C132 at 399.9 MHz position and observing output every 10 MHz increments adjusting Z108 rotor tabs if necessary. *(806)*

AN/SRC-20, AN/SRC-21 and AN/URC-9—Maintenance Hint

The purpose of this article is to alert users of the AN/SRC-20, AN/SRC-21 and AN/URC-9 equipment that excessive air loss at Z107 alignment opening can increase heat in the RF and PA cavity if Z107 cover is not replaced after alignment.

The ease with which the air flows out of Z107 opening limits the air flow to the RF and PA amplifier cavity and/or the driver tube V105 and mixer tube V104 through the vent holes.

Technicians should be advised that Z107 cover can be removed during the alignment of Z107 with minimum heat rise to the components in that area. It is advisable, however, to replace Z107 cover after alignment. *(806)*

AN/SRC-20, AN/SRC-21, and AN/URC-9—Personnel Safety Hazard

The purpose of this article is to alert users of the AN/SRC-20, AN/SRC-21, and AN/URC-9 equipments of a possible safety hazard existing at C-1 mounted on mainframe of transceiver of RT-581/URC-9.

The positive side of C-1 is presently insulated by a piece of plastic tubing tied to the soldered lead of C-1, which has approximately 300 volts applied.

The preferred method of insulating C-1 is to apply RTV-102 compound FSN 8040-225-4548 around terminal and plastic tubing. It is recommended that this insulation of C-1 be accomplished immediately. *(836)*

AN/SRC-20 Radio Set—Maintenance Hint

This article will alert users of the AN/SRC-20 that the AM-1565/URC power amplifier sub-assenbly, FSN 4G5820-861-3550, may by supplied with inadequate lubrication.

As reported by Chief GREENLEE, ET "C" School, San Diego, two such units were received by his activity. Both of the units were sluggish in gear train operation and both units were restored to normal operation simply by applying lubrication to the gear train mechanism.

Fleet users are urged to observe proper gear train operation of new units received, immediately after installation. If abnormal or sluggish operation is observed, apply lubrication as indicated in MR Card C-193 Q1.

The foregoing procedure will insure against early binding of the gear train and subsequent failure of tachometer MG-201. *(834)*

AN/SRC-20( ), AN/SRC-21( ), and AN/URC-9—Maintenance Hint

The purpose of this article is to prevent cable W-4 from being destroyed while inserting AN/URC-9 into cabinet case.

Cable W-4 has a tendency to bow outward and unless tucked in while inserting into case the cable will be damaged at the exposed portion.

Cable clamp FSN 9G5340-619-7754 can be installed by clamping to middle of W-4 (shown connected to P4 and J205 of illustraction 44 figure 6-6 NAVELEX Manual 0967-125-6200) and locked to either of two closely spaced screws shown in illustration J. *(835)*

AN/SRC-20 Radio Set—Maintenance Hint

An article in EIB 834 emphasized the importance of periodic lubrication as a means of prolonging the bearing life in motor-tachometer MG-201 in Amplifier AM-1565/SRC. One of the two bearings in MG-201 is not accessible for periodic lubrication and after prolonged usage a more extensive maintenance procedure is in order. Electronic technicians of USS ORISKANY (CVA 34) have suggested such a procedure involving disassembly of the motor-tachometer.

If failure of MG-201 is due to open, shorted or burned windings, repair is not normally possible and a new part must be ordered. When bearing failure only is suspected, the following procedure is recommended.

NOTE

Several different manufacturer's models of MG-201 are known. All are electrically and physically interchangeable but minor construction differences (number of screws, placement of screws, etc.) are apparent between different models.

1. Remove MG-201 from AM-1565/SRC and proceed to disassemble with care to avoid damage to windings and wire leads.
2. Remove connector cap from end of motor-tachometer.
3. Observe circular removable cover under connector cap. Scribe a mark on this cover and motor case to determine exact position for re-assembly.
4. Remove screws retaining the cover. Remove cover and internally attached coil windings. Observe rotatable cylinder inside motor case. Grasp opposite shaft end of rotor and remove screw holding cylinder to shaft.
5. On opposite end of motor, remove retaining ring which retains bearing. Note quantity of shim washers if present.
6. Invert motor to end from which cylinder was removed. Select a rigid round rod (hardwood, plastic or metal) of appropriate diameter to be used as a punch. Insert punch and tap on shaft end until rotor is released through end of motor case.
7. Remove rotor from case and observe shim washers on or near the bearing which was previously concealed.
8. Remove both bearings from shaft. Replace with new bearings FSN 9Z3110-809-3009. Note that the bearings have metal shields but are not sealed. Apply two drops of MIL-L-6085 oil (FSN 9G9150-664-6518) or an equivalent quantity of very light grease (FSN 9G9150-223-4019) to each bearing.

NOTE

Installation of new bearings is preferred over attempts to reuse the original bearings.

9. Reassemble the rotor, retaining ring, cylinder, coil and cover-plate and connector cap. Pause during reassembly to observe the following: Proper placement of bearing shim washers, unrestricted rotation of rotor with cylinder attached and precise alignment of coil cover with scribe marks.

(8 50)

AN/SRC-20(V), AN/SRC-21( ), AN/URC-9 Radio Set—Maintenance Hint

When performing alignment and certain maintenance on Receiver-Transmitter RT-581/URC-9, maintenance cable CX-7260/URC-9 is used to connect the RT unit to case and power supply. Because of space limitations, more than one maintenance cable may be required. When line voltage is at or near standard (117 VAC), two maintenance cables may be utilized in series.

Technicians are reminded that the use of more than one cable in series results in loss of filament voltage to the RT unit with subsequent difficulty in attaining performance standards. The use of more than two cables is not recommended. When power supply cable CX-7300/URC-9 is used, the above guidelines also apply. *(EIB 875)*

AN/SRC-20( ), AN/SRC-21( ) and AN/URC-9( )—Maintenance Hint

Fleet comments received by NAVSECNORDIV indicate a need for information on the best approach to installing replacement assemblies.

First IF, FMO, and RF and PA assemblies. The following approaches should be utilized:

1. First IF Assembly

a. Remove assembly from packing container and inspect visually for shipping damage. Repair as necessary.

b. Install assembly in RT-581/URC-9 as per paragraph 1-7c (5) of AN/SRC-20, 21 and AN/URC-9 Technical Manual NAVELEX 0967-125-6200.

c. With equipment keyed to transmit into a dummy load, verify proper operation of second IF assembly by measuring a minimum of 0.5 VAC at pin 1 of V304 for each

position of the tenths switch (S708). If level is inadequate, repair second IF as per paragraph 1-4a of NAVELEX 0967-125-6200.

d. Evaluate output of first IF by observing a minimum of 5 VAC at J103, with equipment keyed to transmit into a dummy load, for each position of the units switch (S707). If level is inadequate, evaluate crystal oscillator performance by measuring a minimum of 1 VDC at J305 for each position of the units switch (S707).

e. If level at J305 is inadequate, align C-340 and L310 as per paragraph 1-4b (4) of NAVELEX 0967-125-6200.

f. If level at J305 is satisfactory and the level at J103 is below minimum, align the assembly as per paragraphs 1-4b (2) and 1-4b (4) of NAVELEX 0967-125-6200.

2. FMO Assembly

a. Remove assembly from packing container and inspect visually for shipping damage. Repair as necessary.

b. Install assembly in RT-581/URC-9 as per paragraph 1-7e (5) of NAVELEX 0967-125-6200.

c. With equipment in receive mode, measure a minimum of -1VDC at J106 for each position of the frequency tens switch (S706). If level is inadequate, return frequency select to 399.9 MHz and with utmost caution grasp the FMO oldham coupler with thumb and index finger and gently rock the coupler first clockwise and then counter-clockwise while observing the reading at J-106. If increase step d, no increase step e.

d. If an increase in level at J-106 is observed, loosen the oldham coupler and as viewed from the rear of the RT-581/URC-9, turn the shaft first counter-clockwise and then slowly clockwise to a peak indication at J-106. Tighten oldham coupler and repeat step c.

e. If no increase in level at J-106 is observed, align the FMO as per paragraphs 1-4c of NAVELEX 0967-125-6200.

3. RF and PA Assembly

a. Remove assembly from packing container and inspect visually for shipping damage. Repair as necessary.

b. Install assembly in RT-581/URC-9 as per paragraph 1-7f(4) of NAVELEX 0967-125-6200.

c. With the equipment keyed to transmit into a dummy load, verify proper operation of second and first IF assemblies by measuring a minimum of 5 VAC at J-103 for each position of the tenths (S708) and units (S707) switches. If indication is inadequate, repair second or first IF amplifiers as per paragraph 1-4 of NAVELEX 0967-125-6200.

d. With equipment in the receive mode, verify proper operation of the FMO assembly by measuring a minimum of -1VDC at J-106 for each position of the tens switch (S706). If indication is inadequate, repair the FMO as per paragraph 1-4c of NAVELEX 0967-125-6200.

e. With equipment keyed to transmit into a dummy load, verify proper operation by measuring a minimum of 16 watts output for each position of the frequency tens switch (S706). If level is inadequate, return frequency select switch to 399.9 MHz and with utmost caution grasp the RF and PA oldham coupler with thumb and index finger and gently rock the coupler first clockwise and then counter clockwise while observing the power output reading. If increase step f, no increase step g.

f. If an increase in output level is observed, loosen the oldham coupler and as viewed from the rear of the RT-581/URC-9, turn the shaft first clockwise and then slowly counter-clockwise to a peak power output indication. Tighten oldham coupler and repeat step e.

g. If no increase in power output is observed, align the RF and PA as per paragraph 1-4d of NAVELEX 0967-125-6200. *(EIB 878)*

AN/URC-9, AN/SRC-20, -21, RF/PA Module, NSN 4G5820-00-981-1598—Repair of

Repair records at Naval Electronic Systems Engineering Center, San Diego indicate that some repair misconceptions exist concerning the spring contact wiper arms which are mounted on the main tuning shaft 0-125, NSN 9G3020-00-991-7160, in the RF/PA module.

Records indicate that approximately 15% of these spring contact assemblies are being soldered, in an apparent repair effort, at the junction of the wiper arms. This reduces the spring tension, spreads the contacts and results in poor contact between the wiper arm and its associated wiping surface. There are four sets of spring contact wiper arms located in Z101, Z103, Z105 and Z106. All contacts must have good contact with the wiping surface for proper RF/PA operation.

When modules are received with soldered spring contact junctions, the solder must be removed and an attempt made to retension the wiper arms to provide good electrical contact. This attempt is successful in approximately 50% of the modules. In the event the retensioning is unsatisfactory, the main tuning shaft assembly 0-125 must be replaced at a cost in excess of $100.00 per unit.

It is recommended that the addition of solder at the contact junction of these wiper arms be discontinued, since it offers no

benefit and results in reduced RF/PA efficiency. If retensioning of the contacts is required, the slotted end of a standard soldering aid may be introduced over each side of the contact and a slight inward pressure may be exerted toward the associated contact, with a resultant increase in tension and more satisfactory wiping action.

(EIB 900)

AN/SRC-20( ) Automatic Drive Control — Maintenance Hint

The purpose of this article is to alert users of the AN/SRC-20( ) to replace diode V203 in the AM-1565/SRC when the output power cannot be controlled by the automatic drive control.

There is circuitry in four (4) separate sub-assemblies making up the automatic and/or manual drive control system and it is sometimes difficult to trace the symptom to diode V203.

For removal of diode V203 refer to NAVELEX 0967-438-9010 paragraph 5-204; for troubleshooting and alignment refer to paragraphs 5-110, 5-111 and table 5-33.

(EIB 932)

AN/SRC-20( ), AN/SRC-21( ) and AN/URC-9( ) Radio Set — Maintenance Hint

The squelch circuit in the AN/SRC-20( ), AN/SRC-21( ), and AN/URC-9( ) radio sets is located in three sub-assemblies: the front panel; third intermediate amplifier; and the modulator. It is sometimes difficult to trace a malfunction through the squelch circuits of these sub-assemblies.

Due to this difficulty many sets have been found operating in a marginal condition with receiver sensitivity being the major impairment.

The following steps will help in finding the troubles within the squelch system:

1. To isolate problems to the front panel, remove P501 from J-5 at the third intermediate amplifier. A variable voltage of 0 to 6 VDC can be measured at Pin F of J-5 when varying R702 and R716. Adjust R716 for - 2 VDC with R702 set clockwise. This is a coarse squelch adjustment. Replace P501 and measure - 2 volts at J504, J503, J301 and J302. This checks AVC connections to the first and third intermediate amplifiers.

2. To isolate problems to the modulator, measure approximately +1 VDC at J801 when R702 is set clockwise (squelch on). Slowly rotate R702 counter-clockwise to the off position. The +1 VDC at J801 will reverse to approximately -1 VDC. If proper operation is indicated at J801, the problem is probably with the squelch tube V801 and/or squelch relay K801.

3. Refer to NAVELEX 0967-438-9010 paragraph 5-83 and perform the squelch adjustments.

(EIB 932)

AN/URC-9( ), AN/SRC-20( ), AN/SRC-21( ) Radio Sets--Maintenance Hint

See article in AN/URC-9 Section under the same title. (EIB 938)

AN/SGC-1 and/or CV-2460/SGC Send Inputs to the AN/SRC-20( )-- Proper Level of

See article in AN/SGC-1 Section under the same title. (EIB 946)

AN/SRC-20 UHF Radio Set—Maintenance Hint

This article provides a maintenance hint for the AN/SRC-20.

The plunger shaft of loading solenoid L-209 can sometimes stick because of excess grease and dirt at the base of the shaft.

Although not required on a scheduled basis, occasional cleaning and lubrication of the shaft with a light oil can prevent shaft sticking and subsequent constant running of the auto-positioning motor B-501.

(EIB 952)

AS-390/SRC and AT-150/SRC Antennas—Maintenance Hint

The purpose of this article is to alert technicians and/or radiomen who have performed PMS on the AS-390/SRC and AT-150/SRC antennas that the matching section of the antenna is subject to failure and may not have been observed in routine PMS.

If difficulties are experienced on the AN/SRC-20/21( ) and AN/URC-9( ) equipment either in transmit or receive mode and the equipment has been proven functional, the trouble could be the Series AS-390/SRC or AT-150/SRC antennas even though previous PMS checks have shown otherwise. The design of the antenna matching section has a natural short to ground. A visual check of the antenna may reveal high moisture content, arcing or the matching element could be shorted through the coax section.

(EIB 967)

AN/SRC-20( ), AN/SRC-21( ) and AN/URC-9( ) Radio Sets—Potential Safety Hazard

The purpose of this article is to advise equipment users of a possible wiring error in the RT-581( )/URC-9 and give required corrective action.

It has been discovered that a manufacturers wiring error exists in some RT-581( )/URC-9 Audio Amplifier and Modulator Assemblies. The wiring error consists of a connection from P801 pin j to R-850 (91 ohms) vice R-842 (39k ohms). During channel changes, this wiring error allows 125 VDC to be applied to R-850 which will eventually burn and fail. In failing, R-850 will either open, allowing full 125 VDC application to the broadband receive audio line, or short, causing the 125 VDC fuse to blow each time the channel is changed.

All activities using these equipments should check all modulator assemblies (including those drawn from supply) to ensure that the green, brown and white wire from P801 pin j goes to R-842 and not R-850. If necessary, this wire should be moved to R-842 as shown in the schematic diagram for the audio amplifier and modulator assembly using standard working

(EIB 969)

AN/SRC-20 AND AN/SRC-21 RADIO SETS–MAINTENANCE HINT
See article in AN/SRC-20 section under the same title (678)

AN/SRC-20 AND AN/SRC-21–MAINTENANCE HINT
See article in AN/SRC-20 section under the same title.

AN/SRC-20, AN/SRC-21, AND AN/URC-9( )–MAINTENANCE HINT
See article in AN/SRC-20 section under the same title. (685)

AN/SRA-33 MULTICOUPLER KEY LINE–PROTECTION OF CU-1131 THROUGH CU-1134/SRA-33 CAVITIES
See article under AN/SRA-33 with the same title. (EIB 714)

AN/SRC-20, AN/SRC-21 RADIO SET–INCOMPATIBILITY of BLOWER MOTOR B1051
See article under AN/SRC-20 with the same title. (EIB 722)

AN/SRC-20, AN/SRC-21 AND AN/URC-9 UHF MAINTENANCE HINT–CORRECT FREQUENCY ALIGNMENT OF RF AND PA AMPLIFIER IN THE RT-581/URC-9
See article under AN/SRC-20 with the same title. (EIB 722)

FIELD CHANGE 5-AN/SRC-20, 5-AN/SRC-21, AND 1-AN/URC-9( )–AVAILABILITY OF REPLACEMENT PARTS
See article under AN/SRC-20 with the same title. (EIB 724)

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)

AN/SRC-20, AN/SRC-21 AND AN/URC-9( ) RADIO SETS-BLOWER ASSEMBLY B-1051, SUPPORT INFORMATION
See article under AN/SRC-20 with the same title. (EIB 714)

AN/SRC-20, –21, –ADJUSTMENT OF V-106 (4X - 150A) TO ACHIEVE LINEAR AMPLIFICATION IN RF AND PA AMPLIFIER OF RT-581/URC-9 AND REDUCE FAILURE RATE
See article under AN/SRC-20 with the same title. (EIB 720)

AN/SRC-20 AND AN/SRC-21 – NON–PARTICIPATION IN THE RETURN OF DEFECTIVE RF AND PA SUBASSEMBLIES
See article under AN/SRC-20 with same title. (EIB 705,727)

AN/SRC-20, AN/SRC-21, AND AN/URC-9 RADIO SETS – MAINTENANCE HINT
See article under AN/SRC-20 with the same title. (EIB 731)

AN/SRC-20, AN/SRC-21, AND AN/URC-9 RELAY FILTER CABLE ASSEMBLY CY-8521/URC-9–INFORMATION CONCERNING
See article under AN/SRC-20 with same title. (735)

AN/SRC-20, AN/SRC-21–MAINTENANCE HINT
See article under AN/SRC-20 with same title. (754)

AN/SRC-20, AN/SRC-21–IMPROPER SQUELCH LIGHT OPERATION
See article under AN/SRC-20 with same title. (763)

AN/SRC-20, AN/SRC-21–MECHANICAL FAIL SAFE SWITCH; BYPASSING OF
See article under AN/SRC-20 with same title. (763)

AN/SRC-20, AN/SRC-21–REDUCTION OF ELECTRONIC ASSEMBLY ATTRITION RATE
See article under AN/SRC-20 with same title. (763)

AN/SRC-20, AN/SRC-21, AN/URC-9( )–REPLACEABLE RF CABLE ASSEMBLIES INFORMATION
See article under AN/SRC-20 with same title. (771)

AN/SRC-20, AN/SRC-21 and AN/URC-9( ) Blower Assembly B-1051 – Maintenance and Ordering Information.

See Article under AN/SRC-20 with the same title. (EIB 774)

AN/SRC-20, AN/SRC-21, and AN/URC-9( ) – Electronic Assembly Maintenance Philosophy.

See Article under AN/SRC-20 with same title. (EIB 774)

AN/SRC-20, AN/SRC-21, and AN/URC-9 Radio Sets – Maintenance Hint.

See Article under AN/SRC-20 with same title. (EIB 793)

AN/SRC-20, AN/SRC-21 Radio Sets—Maintenance Hint

See Article under AN/SRC-20 with same title. (804)

AN/SRC-20, AN/SRC-21, and AN/URC-9; Alignment of Capacitor C132 After Installation of Field Changes 10-AN/SRC-20, 9-AN/SRC-21 and 4-AN/URC-9—Maintenance Hint

See Article under AN/SRC-20 with same title. (806)

AN/SRC-20, AN/SRC-21 and AN/URC-9—Maintenance Hint

See Article under AN/SRC-20 with same title. (806)

AN/SRC-20( ), AN/SRC-21( ), and AN/URC-9--Maintenance Hint

See article under AN/SRC-20( ) with same title. (835)

AN/SRC-20,AN/SRC-21,and AN/URC-9--Personnel Safety Hazard

See article under AN/SRC-20 with same title. (836)

AN/SRC-20(), AN/SRC-21(), AN/URC-9 Radio Set--Maintenance Hint

Refer to article in AN/SRC-20 section under same title. *(EIB 875)*

AN/SRC-20(), AN/SRC-21(), and AN/URC-9()--Maintenance Hint

Refer to article in AN/SRC-20 section under same title. *(EIB 878)*

AN/URC-9,AN/SRC-20, -21, RF/PA Module, NSN 4G5820-00-981-1598—Repair of

See article under AN/SRC-20 with same title. (EIB 900)

AN/SRC-20( ), AN/SRC-21( ), and AN/URC-9( ) Radio Set--Maintenance Hint

See article in AN/SRC-20 Section under the same title. (EIB 932)

AN/URC-9( ), AN/SRC-20( ), AN/SRC-21( ) Radio Sets--Maintenance Hint

See article in AN/URC-9 Section under the same title. (EIB 938)

AS-390/SRC and AT-150/SRC Antennas--Maintenance Hint

See article in AN/SRC-20 Section under the same title. (EIB 967)

AN/SRC-20( ), AN/SRC-21( ), and AN/URC-9( ) Radio Sets--Potential Safety Hazard

See article in AN/SRC-20 Section under the same title. (EIB 969)

AN/SRC-22(V) Flight Deck Communications Systems—Maintenance Hint

This article provides an improved method of sealing the antenna connector of AN/PRC-56 headset (Part of AN/SRC-22(V)) to prevent corrosive damage from harsh atmospheric conditions. Where this problem exists, improved sealing may be accomplished by the application of RTV-102 adhesive sealant (FSN 8040-225-4548) to all four corners of the installed antenna connector.

This method provides a more effective sealant, does not hamper normal servicing (since RTV-102 is easily removed), and the material is readily available. Successful use of this method has been reported from the Fleet. (807)

Link 11 Communication, Intermodulation Distortion Measurements and Over-Driving of Transmitters

The purpose of this article is to call the attention of the NTDS Maintenance Officers, EMOs and the Operating and Maintenance personnel, information that was published in EIB #659 dated 12 July 1965, and is currently in the communication EIMB, NAVSHIPS 0967-000-0010 service notes section 4, pages AN/SRC-16:1 and 2, relative to the method and means of making intermodulation distortion test, the use of these tests as a means of evaluating the performance of the transmitter. This information is also applicable to the AN/SRC-16A, AN/SRC-23(V) and AN/SRC-23A(V) transmitters.

The information mentioned above is very important, due to the inability of the equipment RF power meters to read true average power with multiple-tone modulation. With data terminal and transmitting equipments adjusted correctly the Composite Peak Envelope Power (PEP) will be in the correct range to prevent overdriving of the power amplifiers used. The average power output as indicated by the equipments RF power meter will read relatively low. Do not be alarmed by this reading or attempt to increase it in an effort to obtain a greater range. This will only result in overdriving the transmitter and consequent distortion of the output.

Personnel involved with NTDS data transmission should familiarize themselves with the information promulgated in the EIB and EIMBs relative to their cognizant equipments. *(EIB 863)*

Link 11 Transmitter-Tone Multiplexing

The purpose of this article is to call to the attention of the NTDS Maintenance Officers, EMOs and the Operating and Maintenance personnel, information that was published in EIB #727, dated 27 February 1968, and is currently in the communication EIMB, NAVSHIPS 0967-000-0010 service notes section 4, pages AN/WRT-2:3-7, relative to transmitter-tone multiplexing.

This information is also applicable to the AN/SRC-16, AN/SRC-16A, AN/SRC-23(V) and AN/SRC-23A(V) transmitters.

The information mentioned above is very important concerning transmitters that are modulated with tone multiplex equipment, such as the AN/SSQ-29 and AN/USQ-26 data terminal sets. Care must be exercised to insure that the transmitter's Peak Envelope Power (PEP) rating is not exceeded in multitone operation. The level of the intermodulation distortion will become excessive and result in a deterioration of the radiated signal.

Personnel involved with NTDS data transmission should familiarize themselves with the information promulgated in the EIB and EIMBs relative to their cognizant equipments. *(EIB 863)*

AN/SRC-31( ) UHF Radio Set—Maintenance Hint

This article provides procedures for checking proper mating of connectors 1A4A5P7 and 1A4J8 on the radio frequency amplifier (1A4) without removing the unit. Improper mating of 1A4A5P7 and 1A4J8 may result in an indication of no power output. If this occurs, check for an indication of cathode current in the power amplifier as outlined in step 5 of this maintenance hint. If the cathode current (PA-IK) is approximately zero, perform steps 1 through 6 of this maintenance hint. This check is to be used during troubleshooting and not as a planned or preventive maintenance procedure.

NOTE:

OBSERVE ALL SAFETY PRECAUTIONS

( ) 1. De-energize and secure all power to the AN/SRC-31( ).

( ) 2. On the AN/SRC-31( ), ensure LOCAL/REMOTE/OFF switch 1A7S11 is in the OFF position.

( ) 3. Remove the access plate on the front of the radio frequency amplifier 1A4 and disconnect 1A4A5P7 from 1A4J8. Check the contact surfaces of both connectors and clean them if necessary.

( ) 4. Compress the fingers on 1A4J8 to increase contact pressure on the mating pin of 1A4A5P7.

( ) 5. Connect 1A4A5P7 to 1A4J8, reinstall the access plate, and return the AN/SRC-31( ) to its normal operating condition. Wait for the high voltage READY indicator on power supply 1A6 to illuminate.

( ) 6. Turn on the high voltage without keying the radio set, and monitor the cathode current for the power amplifier. This can be accomplished by setting METER SELECT switch 1A6S3 on power supply 1A6 to the PA-IK position. The meter should indicate between 180-200 mA (adjustable by 1A4R1).

( ) 7. If no indication can be obtained, continue normal troubleshooting techniques.

(EIB 960)

AN/SRC-40 Radio Set—CAINS Radio Transmitter, Maintenance Hint

This article disseminates information regarding the replacement of RF relays 1A5K2, 1A5K3 and 1A5K4.

When received from supply, the above relays all have a suitable length of RF cable preinstalled on all three of the RF cable terminations. However, RF connectors are not installed on the loose end of these cable assemblies. Therefore, it should be noted that when replacing any of the above relays, the old RF connectors from the faulty relay should be retained for installation on the new relay. If one or more of the connectors is damaged, a new connector should be ordered concurrent with the replacement relay (refer to APL #4711 3130 for the appropriate stock number).

(EIB 97?)

R-623/SRD-7 DIRECTION FINDER RECEIVER MODIFICATION TO PIVOT PLATE AND SUPPORT LUG OF UPPER DRAWER

To prevent the upper drawer of R-623/SRD17 from slipping from its pivot plate when the drawer is extended, the following modification is recommended. Drill, tap, and counter sink support lug as shown in figure 1. Assemble unit as shown in figure 2.

Even with this modification installed, excessive weight should not be put on the upper drawer of R-623/SRD-7.

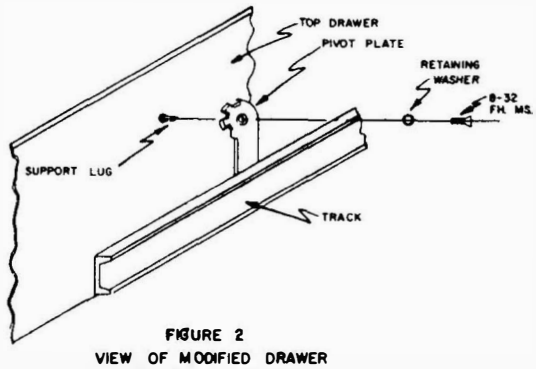


FIGURE 2
VIEW OF MODIFIED DRAWER ASSEMBLY (R.H. SIDE)

AN/SRD-7 Submarine Installations: Performance and Operational Report

The Bureau has received verbal reports of failure of AN/SRD-7 equipment aboard submarines. Additional information regarding equipment deficiencies is required to make a thorough study.

Performance and operational reports, NAVSHIPS 3878, shall be submitted for all AN/SRD-7 submarine installations.

It is requested that special installation problems of antenna and cable leakage be included under "remarks."

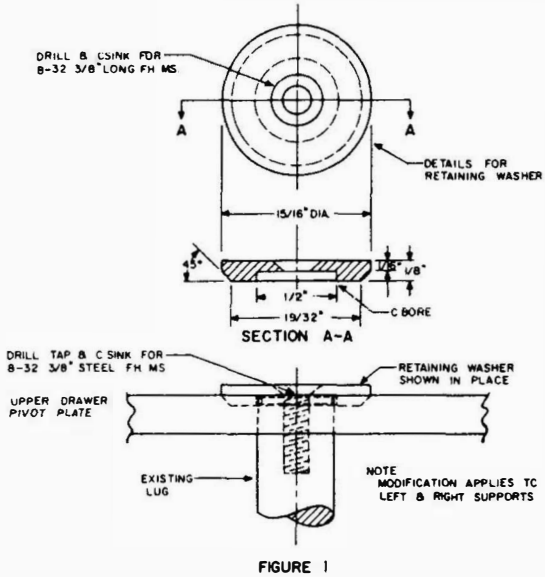


FIGURE 1
MODIFICATION TO PIVOT PLATE & LUG OF UPPER DRAWER OF AN/SRD-7 RECEIVER

Antennas AN/SRD-7 and AS-714/SRD-7– Replacement Parts

The synchro (Part B-4003) in Unit C-1164/BLR-1 of Antenna Control Group OA-532/BLR-1 and OA-1903/BLR-1, can be substituted for Part G-1201 in Antenna AS-714/SRD-7. This substitution was accomplished at Submarine Base, Pearl Harbor when Part G-1201 to repair Antenna AS-714/SRD-7 was not available. This information is passed on to other activities which may encounter the same problem in obtaining the repair part. However, since the AN/SRD-7 is assigned support code category "A" for full support, recurring difficulty in obtaining any properly requisitioned part listed in the Allowance Parts List (APL) should be reported to the Bureau of Ships if the problem cannot be resolved with the Electronics Supply Office. Stock numbers for the interchangeable synchros listed in the applicable APL are:

APL for AN/SRD-7–Part G-1201–
FSN N5950-648-1281
APL for OA-532/BLR-1–Part B-4003–
FSN N 5990-049-8949

Efforts should be made to obtain the "goniometer" listed for the AN/SRD-7 prior to requisitioning the subsitute part. (602)

AN/SRN-6 TACAN-UNDESIRABLE OSCILLATIONS IN FREQUENCY MULTIPLIER OSCILLATOR CV-589/URN

On three occasions, MOTU NINE personnel detected intermittent self-excited oscillations in the tripler stage of the subject equipment. The frequency of oscillation is near, but slightly off, the frequency of normal tripler output and, therefore, renders the equipment inoperative for the period of the unwanted oscillations. In each case, the above trouble was characterized by the following:

a. With switch S-1401 in position 6, M-1401 indicated very high tripler grid current (V-1501).

b. Transmitter power output, as monitored on integral test equipment, was excessive.

c. Tripler V-1501 continued to oscillate with crystal oscillator V-1507, second doubler V-1508, and third doubler V-1509 removed from their sockets.

d. Entire chassis was "tender" to starting and stopping oscillations by trapping, grounding and proximity, but neither the started nor stopped condition could be sustained, and intermittent oscillation continued.

In each of the three equipments, the trouble was corrected by separating the V-1501 filament leads comprising Z-1513 and Z-1514 as far as possible without grounding them to the shell of tripler cavity Z-1504.

It is recommended that repair personnel be cautioned to maintain proper spacing between the V-1501 filament leads when performing repairs in or around tripler cavity Z-1504, and to be aware of the symptoms and corrective measures required should this trouble occur.

TUBE TYPE USN-SAL-89 – DETERMINATION OF RESTORATION FEASIBILITY

See article in AN/GRN-9 section under same title.

AN/URN-20(V)1, AN/URN-20(V)2, AN/GRN-9B, AN/SRN-6A, and AN/URN-3A – Goses for Tacan Spectrum Filters Applicable to Pressurized Filters.

See Article under AN/URN-20(V)1 with same title. (EIB 788)

AN/URN-3A, AN/GRN-9, and AN/SRN-6( ) Requisitioning of 2C39WA Tubes.

See Article under AN/URN-3A with same title. (EIB 791)

AN/SRN-6, -6A Radio Set—TACAN Crystal List

This article provides a list of crystals for the AN/SRN-6, 6A TACAN. This list should be referenced when ordering TACAN crystals for future requirements. Additional inquiries concerning TACAN crystals should be directed to Naval Electronic Systems Command, Washington, DC 20360, Attn: Code 5203.

This article was prepared by NAVELEX-SYSENGCEN Vallejo, the equipment Field Maintenance Agent (FMA).

LIST OF TACAN CRYSTALS

CRYSTAL TYPE: CR-65/U

CHANNEL NUMBER	CRYSTAL FREQUENCY	NSN
1	40.083330 MHz	9N5955-00-617-4329
2	40.125000 MHz	9N5955-00-617-4335
3	40.166660 MHz	9N5955-00-617-4331
4	40.208330 MHz	9N5955-00-617-4328
5	40.250000 MHz	9N5955-00-617-4333
6	40.291660 MHz	9N5955-00-617-4332
7	40.333330 MHz	9N5955-00-617-4334
8	40.375000 MHz	9N5955-00-617-4973
9	40.416660 MHz	9N5955-00-617-4967
10	40.458330 MHz	9N5955-00-617-4968
11	40.500000 MHz	9N5955-00-617-4969
12	40.541667 MHz	9N5955-00-617-4976
13	40.583330 MHz	9N5955-00-617-4975
14	40.625000 MHz	9N5955-00-617-4633
15	40.666667 MHz	9N5955-00-577-7834
16	40.708330 MHz	9N5955-00-617-4643
17	40.750000 MHz	9N5955-00-617-4644
18	40.791660 MHz	9N5955-00-617-4645
19	40.833330 MHz	9N5955-00-617-4630
20	40.875000 MHz	9N5955-00-617-4624
21	40.916660 MHz	9N5955-00-617-4631
22	40.958333 MHz	9N5955-00-583-0762
23	41.000000 MHz	9N5955-00-617-4966
24	41.041660 MHz	9N5955-00-617-4974
25	41.083330 MHz	9N5955-00-617-4970
26	41.125000 MHz	9N5955-00-577-6244
27	41.166660 MHz	9N5955-00-577-6245
28	41.208330 MHz	9N5955-00-577-6246
29	41.250000 MHz	9N5955-00-577-6228
30	41.291660 MHz	9N5955-00-577-6229
31	41.333330 MHz	9N5955-00-617-4632
32	41.375000 MHz	9N5955-00-577-6230
33	41.416660 MHz	9N5955-00-617-8854
34	41.458330 MHz	9N5955-00-617-8855
35	41.500000 MHz	9N5955-00-617-8850
36	41.541660 MHz	9N5955-00-617-3870
37	41.583330 MHz	9N5955-00-617-8853
38	41.625000 MHz	9N5955-00-617-8849
39	41.666660 MHz	9N5955-00-577-6906
40	41.708330 MHz	9N5955-00-577-6907
41	41.750000 MHz	9N5955-00-577-6908
42	41.791660 MHz	9N5955-00-577-6254

CHANNEL NUMBER	CRYSTAL FREQUENCY	NSN
43	41.833330 MHz	9N5855-00-577-6262
44	41.875000 MHz	9N5955-00-577-6263
45	41.916660 MHz	9N5955-00-577-6264
46	41.958330 MHz	9N5955-00-577-6265
47	42.000000 MHz	9N5955-00-577-6266
48	42.041660 MHz	9N5955-00-577-6267
49	42.083330 MHz	9N5955-00-577-6268
50	42.125000 MHz	9N5955-00-577-6269
51	42.166660 MHz	9N5955-00-577-6909
52	42.208330 MHz	9N5995-00-577-6890
53	42.250000 MHz	9N5955-00-577-6910
54	42.291660 MHz	9N5955-00-577-6911
55	42.333330 MHz	9N5955-00-577-6279
56	42.375000 MHz	9N5955-00-577-6280
57	42.416660 MHz	9N5955-00-952-5489
58	42.458330 MHz	9N5955-00-577-6913
59	42.500000 MHz	9N5955-00-577-6914
60	42.541660 MHz	9N5955-00-577-6915
61	42.583330 MHz	9N5955-00-577-6916
62	42.625000 MHz	9N5955-00-577-6917
63	42666-660 KC	9N5955-00-577-6918
TS-890/ Crystal Set	Channel 1 thru 16	
TS-890/ Crystal Set	Channel 43 thru 58	1N5955-00-577-3279
TS-890/ Crystal Set	Channel 85 thru 100	
TS-890/ Crystal Set	Channel 17 thru 42	
TS-890/ Crystal Set	Channel 59 thru 84	1N5955-00-577-3280
TS-890/ Crystal Set	Channel 101 thru 126	
MX-1627/ Crystal Set	Channel 1 thru 16	1N5955-00-577-3276
MX-1627/ Crystal Set	Channel 17 thru 55	1N5955-00-577-3277
MX-1627/ Crystal Set	Channel 56 thru 63	1N5955-00-577-3278

(EIB 898 90 p)

New Planar Triodes for AN/URN-3A, AN/SRN-6(Series, and AN/GRN-9 (Series) TACANS--Availability of

See article in AN/URN-3 Section under the same title. (EIB 922)

TACAN Maintenance Hint for Klystron Tube, ITT Type 8493 for AN/SRN-6( ), AN/GRN-9( ) and AN/URN-3A TACANs

The ITT 8493 Klystron tube has an "apparent" high failure rate, most frequently attributed to internal arcing due to excessive amounts of gas present inside the tube.

In many cases a gassy klystron can be cleared. Although all gas is removed from the klystron when it is manufactured, gas can form if the klystron is initially operated with filament power only for excessive periods of time or if it has not been used (or on the shelf) for a long period.

The procedures outlined in the applicable technical manuals for aging a new klystron are correct and should be followed. The following are factors which influence the successful installation and operation of the ITT 8493 klystron:

"Burn-in"--Throughout the Navy a rule persisted that a new tube would be "aged" several hours with filament voltage only prior to operation. This is NOT in agreement with technical manual procedures and is HIGHLY DESTRUCTIVE to the ITT tube. Under these conditions the cathode is excessively heated and sublimation of the cathode material and outgassing of metal parts occurs. The results are grid emission and gas current (arcing) in operation.

Residual gas cleanup (aging) on newly installed tubes or tubes having prolonged inactive periods is the objective; this aging cannot be accomplished unless beam current is drawn to ionize gas molecules. Before proceeding with the technical manual aging procedures, the following initial setup conditions are emphasized:

1. Filament voltage must not exceed 4.3 VAC. If the voltage, measured at the tube terminals, exceeds 4.3 VAC the reason should be determined and corrected.
2. Filament voltage should not be applied any longer than 15 minutes without the application of high voltage.
3. Bias voltage set to -125 VDC.
4. Shaped pulse/gating pulses set to zero (no beam current).

Proceed with the technical manual aging procedure. After completion of the bake-in process, the klystron should be operated on either dummy load or the antenna for a period of at least one week.

This will insure that a hard vacuum in the tube has been achieved and satisfactory operation of the tube over its normal life cycle should be attained.

(EIB 958)

AN/SRN-9 Radio Navigation Set - Digital Processor Unit (DPU)—Modification to

During initial installation, difficulties were encountered in the interface between the I.T.T. Radio Navigation Set AN/SRN-9 and the T.I. Computer CP-967(V)/UYK due to a missing wire in the Data Processor Unit (DPU) of Radio Receiver R-1548/SRN-9 serial numbers B1 thru B49, inclusive.

To correct this condition, modify the digital processor unit as follows:

1. Open the drawer of the AN/SRN-9 only if it is bolted down as called for on the installation drawings or the equipment is in such a position as to be supported when extended.
2. Loosen the four panel screws then pull the drawer out slowly until the slide latch engages.
3. Remove the 20 cover screws to the DPU.
4. Loosen the four mounting screws inside the DPU.
5. Disconnect connector 1A23P4 and 1A23P3.
6. Lift out the DPU.
7. Remove the 18 bottom cover screws.
8. Connect a piece of 24 AWG Teflon insulated wire between pins 5 and 7 of 1A23P3 as shown in figure 1.
9. Reassemble by reversing steps 7 through 1. (786)

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

This article announces a change in the type of interface cable specified for Radio Navigation Receivers AN/SRN-9, -9A, and Digital Data Computer CP-967/UYK.

Installation and maintenance activities are advised that cable type 2U-19 complying with Military Specification Sheet MIL-C-24145/23 (SHIPS) should be used to interface the AN/SRN-9, -9A with the CP-967/UYK.

NOTE:

Cable type 2U-24 may be used once it is included in MIL-C-24145/23 (SHIPS).

With the CP-967/UYK connector plug, M81511/06E18-85S1 use a J-adapter part number M81511/43-18 - either type I, II, or III as required and cable clamp part number M81511/13-18.

For connection to the AN/SRN-9, -9A use connector plug part number MS-3116J-22-55P.

The AN/SRN-9, -9A Installation and Control Drawings are being revised to reflect this information. *(823)*

AN/SRN-9 Radio Navigation Sets, OE-49/SRN-9 Antenna Group—Procedure for Painting

The painting and overhaul of Antenna Group, OE-49/SRN-9 should be accomplished by a designated repair facility. The removal and replacement of the antenna is also only performed by a repair facility. Removal instructions will be found in NAVSHIPS 0967-306-2010, Technical Manual for Radio Navigation Set AN/SRN-9, page 76. The procedure for painting is as follows:

1. DO NOT SAND BLAST assembly, as antenna is of aluminum and fiberglass construction. Clean antenna by hand, using solvent to remove only excess foreign material.
2. Apply a primer coat of chemical film, part number PT-750, PER MIL-C-554L to all bare metal surfaces. Painted surfaces may be painted without priming.
3. Apply a finish coat of "TUF/FILM", part number PT-750 TFE, polyurethane with teflon PER MIL-P-15090.
4. Extreme care must be taken in removal, repainting, and reinstallation of the antenna group so that the RF connectors are not damaged, and that their protective foam covering is neither removed nor painted.
5. Materials used to paint the antenna assembly may be obtained from; Vendor Code 06431, Products-Techniques Inc., 12600 Daphine St., Hawthorne, CA., 90250, Telephone (213) 757-8257. Instructions for applications are furnished with the materials. *(EIB 870)*

AN/SRN-12 OMEGA Receiving Set--Battery Charging Instructions

The AN/SRN-12 OMEGA receiving set is equipped with rechargeable nickel cadmium batteries. There is a trickle charging network designed into the equipment to maintain a charged battery in a fully charged state. The batteries contained in the set prior to installation are in a discharged state and cannot be recharged by the internal trickle charging unit. After installation, and anytime the receiving set has been in a power-off state for more than 30 days, the batteries must be removed from the set and charged at the following rates using an external battery charger.

R190, 1.2 volts, C size, charge at 120 ma for 48 hours.

13V0180, 15.6, charge at 9 ma for 48 hours, polarity-red end positive (+), white end negative (-). *(795)*

AN/SRN-12 Radio Navigation Set—Elimination of Electrical Shock Hazard

A shock hazard exists in the receiver of the AN/SRN-12 radio navigation set. This hazard has been brought to the attention of the Navy by David DuBois of Puget Sound Naval Shipyard.

The top drawer (2A1) of the receiving unit contains a power socket (ZA1J2) for the oscilloscope and three filter capacitors (2A1C1, 2 and 3) with exposed terminals connected to 115 VAC. Receiver drawer (2A2) contains an elapsed time meter (2A2M2) with exposed terminals also connected to 115 VAC. Covering these terminals with Red Glpt Insulating Varnish will eliminate the hazard. *(814)*

AN/SRN-12 OMEGA Receiving Set—Maintenance Hint

This maintenance hint applies only to serial numbers A1 to A140.

A number of field reports have indicated burned low pass filter resistor, 1R1, in the antenna coupler AS-2283/SRN-12. The problem has been attributed to the installation of the OMEGA antenna/antenna coupler, AS-2283/SRN-12, in the close vicinity of high power HF antennas. If problems with proper receiving set operation are traceable to a faulty 1R1 resistor, then replace this 10,000 ohm, 1/4 watt, 5%, RC07GF103J, with a 10,000 ohm, 2 watt, 5%, RC42GF103J, FSN 9N5905-846-4362. This new 2 watt resistor can be mounted on the same terminals as was the 1/4 watt resistor.

Holders of Technical Manual for OMEGA Receiving Set AN/SRN-12 that accomplish the above maintenance should make the following pen and ink correction.

Correct NAVSHIPS 0967-344-0010, dated 15 November 1968 as follows:

Page 28, under Parts Data for Antenna/Antenna Coupler (1) - for 1R1 cross out part number "RC07GF103J" and add "RC42GF103J."

This pen and ink correction is not necessary in Technical Manual for the OMEGA Receiving Set AN/SRN-12, NAVSHIPS 0967-344-0010 dated 1 December 1971 because larger size resistor is listed. *(828)*

AN/SRN-12 OMEGA Receiving Set– Inclement Weather Interference to

Naval Electronic Systems Command (NAVELEX) has received reports of OMEGA (AN/SRN-12) receiver performance being degraded during inclement weather conditions, sometimes lasting several days.

In a NAVELEX study it was found that the ship's operators may not be familiar with two important characteristics of the AN/SRN-12 receiver, these being the installed recorders and the "Phase Lock Fail" lights on the receiver front panel. In some instances it has been reported that ship operators considered the recorders useless equipment and it was believed that lit "Phase Lock Fail" lights indicate receiver malfunction or reception of unusable signals.

This article explains the use of the recorders and the significance of the "Phase Lock Fail" lights and supplements the information contained in the AN/SRN-12 Technical Manual NAVSHIPS 0967-344-0010. The proper use of these two functions should eliminate or minimize recent problems encountered during the inclement weather.

When a signal from a station is very weak or the background noise level in the atmosphere is high, the "Phase Lock Fail" lights will blink on and off irregularly. This is not an indication that the receiver is malfunctioning nor that it has ceased tracking.

The lights are only a mild caution regarding signal reception. The best means for evaluating and validating receiver performance is by observing the track being presented on the installed recorders. This includes periods when all "Phase Lock Fail" lights are on and the oscilloscope is completely cluttered.

Periodic annotation of the recorder strip charts with LOP (Line of Position), lane number, and time can provide two valuable capabilities. The first is an easy way to check or reset the lane count on the Nixie readout. Secondly, the recording may be used to accurately reconstruct the ships movements during fleet exercises.

With regard to weather, it can be expected that severe electrical storms in the local area may render OMEGA unuseable for short periods at peak of a storm. If lane count is lost during these brief periods it can be easily reestablished or checked using the strip recorders and aided by the dead reckoning plot. Precipitation should not degrade system performance appreciably.

Comments from fleet users of OMEGA regarding improvements in operator techniques should be submitted to fleet training centers to assist in course improvements on this relatively new system. *(835)*

AN/SRN-12 OMEGA Receiving Set—Submission of "Faulted" Components

Current techniques for troubleshooting the OMEGA receiver require fault isolation only to the level of the plug-in circuit card and the discard of the "faulted" card without additional board investigation.

Consequently, the availability of historical data required for an engineering analysis of potential circuit design deficiencies is extremely limited.

In addition, the present replacement rate of the 2.0196 MHz receiver oscillator (FSN IND 5825-111-7229) is in excess of the MTBF (mean time between failure) projected for this ultra-stable unit. The primary failure mode cited for unit replacement is its out-of-tolerance frequency drift during receiver operation.

To assist the FMA (Field Maintenance Authority) in its continuing investigations directed at product improvement it is requested that all defective plug-in circuit cards and replaced oscillator units be forwarded with a brief summary of the failure symptoms to:

(N65579)
Naval Electronic Systems Command
Activity
Bldg. 537
NAVAIR ENG CEN
Phila. Pa. 19112
Attn: Code 023 *(836)*

AN/SRN-12 OMEGA Receiver—Maintenance Hint

This article provides an explanation of the problems presently being encountered with batteries 2A2BT6 and 2A2BT7 Type 13V0180 part of the AN/SRN-12 OMEGA receiver. These batteries provide a minimum of 10 minutes of stand-by power to the synchronizing circuits in the AN/SRN-12. This article also outlines interim remedial action to be taken in the event of a battery failure and awaiting receipt of replacement batteries.

In many cases, batteries 2A2BT6 and BT7 are found defective upon installation of the AN/SRN-12 or shortly thereafter. The defect in all cases is a leakage of the electrolyte which forms a low resistance path to the outer metal case and renders the battery useless.

A simple check can be made to ascertain whether the battery is good or defective; remove the two batteries (2A2BT6 and BT7) from their holding clips; remove wires attached to terminals. (Caution should be observed not to short the battery terminals to the battery case). Measure each battery terminal to battery case with a volt meter. If any reading is obtained, the battery is defective. Discard the defective battery or batteries and order a replacement, using FSN 9G6140-451-6351. A shelf stock of these batteries is not maintained by DGSA; therefore, a protracted lead time is usually encountered from time of order to time of receipt.

Make a visual inspection of the 2A2A3 power supply card. If any component appears to be discolored, replace with a new 2A2A3 card before new 2A2BT6 and/or BT7 batteries are installed.

While awaiting receipt of replacement batteries, satisfactory operation can be obtained from the AN/SRN-12 when used under normal conditions (application of an uninterrupted power source); only the sync feature which is maintained in stand-by operation (battery operation) is lost. All that is required to return the receiver to normal operation after a loss of ships power is resynchronization and the lane count be updated (if required) to compensate for ships movement or drift during the time power was off. All other functions of the AN/SRN-12 remain normal.

Thus, it can be seen that with proper resynchronization and lane count update after each power loss, the AN/SRN-12 operational capability is restored.

A permanent solution to the battery problem is presently being investigated. Results of that investigation will be disseminated upon completion. *(EIB 874)*

AN/SRN-12 OMEGA Receiving Set, Assembly Check — Maintenance Hint

This article provides the means to properly check the following assemblies of the AN/SRN-12 for proper operation to ensure optimum reliability.

Assembly	Ckt Symb
Rechargeable Batteries	(BT1 thru BT7)
Power Supply Board	(2A2A3)
Rectifier Board	(2A2A4)
Battery Charger Board	(2A2A39)

Accomplish each step in sequence; obtain satisfactory results and measurements (within limits) for each step before progressing to the next step. The only piece of test equipment required is a AN/PSM-4 multimeter or equivalent. Proceed as follows:

Check

( ) Step 1. Turn off the Main Power Switch (S1) on the AN/SRN-12. Remove all batteries from the AN/SRN-12 OMEGA set and place on a work bench with a non-metallic surface. Measure the voltage on all the batteries as follows: If they are Ckt Symb BT6 and BT7 (type 13V0180) they will read 16 VDC ± 1 VDC (the measurement taken with respect to their positive and negative battery terminals). With the meter, check the voltage of each BT6 or BT7 between each terminal and the Metal Case. If a reading is obtained, the battery is shorted to the case internally; it is defective and must be replaced. If the batteries are circuit symbol BT1 thru BT5 (type R190 or S104, size C), they will measure more than 0.5 VDC and less than 1.25 VDC each.

Each type R190 battery must have an unbroken plastic insulating sleeve around the body of the cell. Once the cell voltages measure correctly, proceed to the next step.

( ) Step 2. Remove the Power Supply Card 2A2A3, the Battery Charge Card 2A2A39 and Rectifier Card 2A2A4 from their holder. Visually inspect all these cards for discolored or burned components, especially the 2A2A3 card. If discolored, burned component or components that show signs of having sustained heat damage are found, the card must be replaced or repaired before inserting the new battery(ies) into the circuit. Once it is ascertained that the results of the visual inspection are satisfactory or that the card has been properly repaired, proceed to the next step.

( ) Step 3. Replace the three cards removed in step 2. into their respective holders. Place the batteries into their respective holders.

CAUTION

Exercise great care in connecting the wiring to type 13V0180 batteries. Insulate the screwdriver shaft so when tightening the screw and nut on the battery terminal, the screwdriver does not touch the metal case, thereby shorting the battery to ground.

( ) Step 4. With the same multimeter used in foregoing steps, measure the battery potentials at terminals 5, 8, and 11 of S1 and DC ground point (terminal 11 is the left-most terminal, center row of S1, when standing in front of the unit). The voltages should be as follows:

Terminal 5 NORMAL INDICATION +6.0VDC ±.5VDC
Terminal 8 NORMAL INDICATION +16.0 +.25VDC +1. VDC
Terminal 11 NORMAL INDICATION -16.0 -.25 VDC +1. VDC

If no voltage is measured at terminal 5, one or more of the size C batteries (BT1 thru BT5) is not making proper contact in its holder; check each battery in its holder. When indications are normal, proceed to the next step.

( ) Step 5. Turn S1 (power switch) to "ON". At the test points on the 2A2A39 card, measure the following voltages:

At 2A2A39	DC Volts
J1	+6.5 VDC
J2	+6.5 VDC
J3	+9.5 VDC (See Note)
J4	+6.5 VDC

NOTE

J3 will measure +9.5 VDC when the battery charger card 2A2A39 is supplying maximum current to the batteries (i.e., batteries are charging). J3 will measure approximately 6 VDC if any of the following occurs.

1. There is a defective battery(ies) BT1 thru BT5 OR,
2. There is a defective battery(ies) holder for batteries BT1 thru BT5 OR,
3. There is a malfunction in the 2A2A39 battery charger card OR,
4. BT6 and BT7 are fully charged (normal condition).

If indications are normal (i.e., J3 reads +9.5 VDC and the batteries BT6 and BT7 are charging), allow the batteries to charge for 24 hours of

continuous uninterrupted line voltage.

( ) Step 6. After 24 hours, check J3, 2A2A39 again to make sure it is +6.0 DC. If it is still +9.5 DC, there are problems in the BT1 thru BT5 string of batteries or the 2A2A39 card is malfunctioning.

( ) Step 7. If indications are normal, check receiver battery operation by simulating a power line failure. This can be done by removing one of the line fuses located on the front panel of the AN/SRN-12. The "Battery On" light should come on; the remainder of the set will appear dark. After approximately 2 minutes, replace the fuse. The "Line On" light should light; the "Battery On" light should go out and the receiver should still be synchronized; lane count indications should still be the same as those before the fuse was removed.

It is strongly recommended that this procedure be used to check new batteries received from supply before they are inserted in the AN/SRN-12; this will prevent destruction of the PS card 2A2A3 in the event a defective battery is received from supply.

Although some of the procedures are outlined in NAVSHIPS 0967-344-0010 Technical Manual for the AN/SRN-12, it is believed that this consolidation of power supply/battery/battery charger check procedures, together with hints as to possible problem sources will benefit forces afloat and result in ease of maintenance and increased reliability of the AN/SRN-12.

(EIB 9-10

AN/SRN-12 OMEGA Receiving Set, Defective Power Supply Repair — Maintenance Note

This article provides the means to repair a defective power supply (PS) board assembly, Ckt Symb 2A2A3, part of the AN/SRN-12 OMEGA receiving set.

Reports have been received from the Fleet and verified by SPCC Mechanicsburg that the supply stock 2A2A3 PS board has been exhausted. SPCC has initiated procurement action and stated that deliveries to fill MILSTRIP requisitions are scheduled to begin in the near future. Pending the availability of the new 2A2A3 boards in the supply system, this procedure provides the necessary information to effect repairs to the printed circuit (PC) board assembly by replacing defective discreet components which are mounted on the board. In the majority of the 2A2A3 PS board failures, the failure is caused by excessive DC current through two transistors and two resistors. The excessive current is a result of BT6 (+16 VDC) battery and/or BT7 (-16 VDC) battery internally shorting to the battery metal case which is at ground potential.

If BT6 (+16 VDC) battery has failed, transistor Q3 (2N2907) and resistor R2, 33 ohm, ±10%, 2 watts, are burned. If BT7 (-16 VDC) battery has failed, transistor Q6 (2N2222) and resistor R19, 33 ohm, ±10%, 2 watts, are burned. In many cases, the items are burned and thus are easily identified. Refer to figure 1 for component location and to figure 2 for a schematic diagram of the PS board.

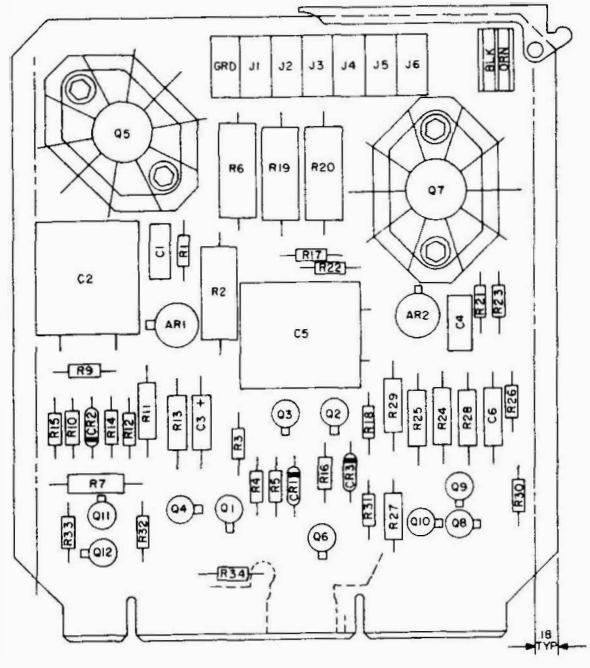


Figure 1 — Parts Location Diagram.

Table 1 lists pertinent information necessary to order items required to effect repairs to the PS board, Ckt Symb 2A2A3, P/O AN/SRN-12.

Table 2 lists items which may also be defective. They are associated with the circuits outlined and can be replaced.

Repairs to the boards can be made, employing standard electronic repair techniques with the precautionary note to use a heat sink when soldering transistor leads to PC board to prevent heat damages.

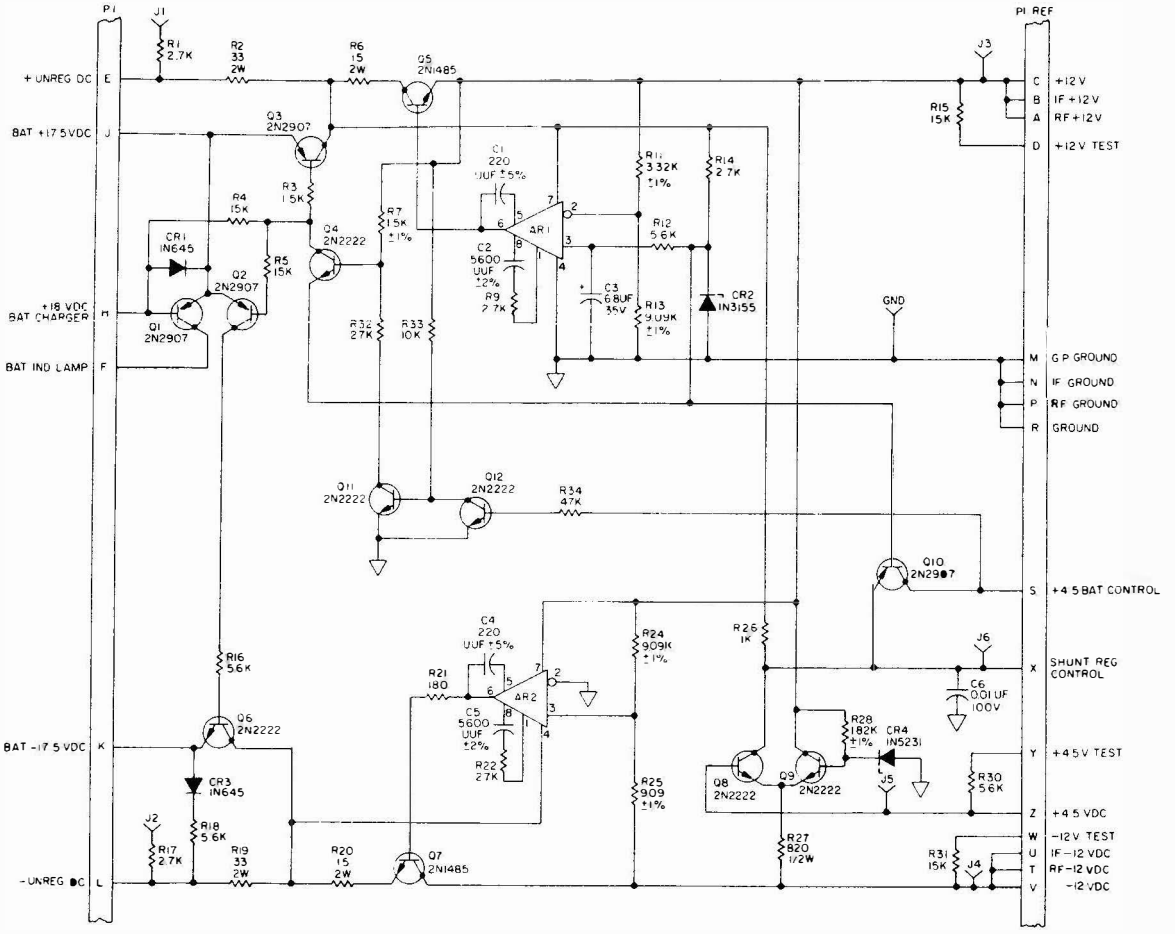
Upon completion of repairs, place the board 2A2A3 back into its proper holder and perform the power supply test outlined in steps 12, 13, 14, 15 and 16 of the Performance Check Chart, Page 23/24 NAVSHIPS 0967-344-0010 Technical Manual for the AN/SRN-12.

TABLE 1

Ckt Symb	Part No.	Nomenclature	FSN	Cost Each
Q3	2N2907A	Transistor (PNP)	9N5961-726-9598	$0.31
Q6	2N2222A	Transistor (NPN)	9N5961-951-8757	$0.21
R2	RCR42G330JS	Resistor, Carbon 33 Ohms, I 10%, 2 watt	9N5905-478-7366	$0.14
R19	RCR42G330JS	Resistor, Carbon 33 Ohms, I 10%, 2 watt	9N5905-478-7366	$0.14

TABLE 2

Ckt Symb	Part No.	Nomenclature	FSN	Cost Each
R6	RCR42G150JS	Resistor, Carbon 15 Ohms, ±10%, 2 watt	9N5905-763-7754	$0.24
R20	RCR42G150JS	Resistor, Carbon 15 Ohms, ±10%, 2 watt	9N5905-763-7754	$0.24
CR1	1N645	Semiconductor	9N5961-087-6047	$0.16
CR3	1N645	Semiconductor	9N5961-087-6047	$0.16
R18	RCR07G562JS	Resistor, Carbon 5.6K Ohms, ±10%, 1/4 watt	9N5905-141-0744	$0.03



(EIB 910)

Figure 2 — Schematic Diagram of the Power Supply Card Assembly 2A2A3.

AN/SRN-12 OMEGA Receiving Set, Potentiometer Adjustment — Maintenance Hint

This article provides the means to properly adjust the potentiometers which control the battery charging circuits, Ckt Symb 2A2A39, part of the AN/SRN-12 OMEGA receiving set.

NAVSHIPS 0967-344-0010 Technical Manual for the AN/SRN-12 does not contain a procedure for properly adjusting the battery charging circuits located on PC board 2A2A39. Information received from various sources indicates that such an adjustment procedure is needed for the Fleet.

The procedure outlined below is simple and straightforward. NOTE: The requirement for using a Fluke Differential Voltmeter, Model 873A or its equivalent for use in steps 4, 5, 6, 7 and 8.

PROCEDURE FOR THE PROPER ADJUSTMENT OF THE BATTERY CHARGER BOARD CKT SYMB 2A2A39, PART OF THE AN/SRN-12 OMEGA SET

This adjustment procedure for properly adjusting the 2A2A39 battery charger card can be performed while the card is mounted on the R-1481/SRN-12 OMEGA receiver. The following items are required to perform the adjustment.

1. Fluke Differential Voltmeter, Model 873A or equivalent.
2. Volt-Ohm-Meter AN/PSM-4 or equivalent.
3. Complete set of FULLY CHARGED OMEGA batteries (Ckt Symb BT1 thru BT5) and with BT6 and BT7 capable of being charged.
4. An operational 2A2A3 power supply card.
5. An operational 2A2A39 battery charging card.
6. An operational 2A2A4 rectifier card.
7. One each 10 OHM, ±10%, 1 watt, standard carbon resistor.

NOTE

Items 3, 4, 5, and 6 are part of an AN/SRN-12 OMEGA receiver.

Observe precaution by insulating the metal card lifting lever so that a meter probe does not inadvertently short the test point to ground.

Proceed With The Adjustment as Follows:

Check	Step	Action (All action takes place in the 2A2A39 card)
( )	1.	Set R2 fully clockwise (CW).
( )	2.	Set R1 at about 2/3 of fully CW OR set R1 to fully CW and then back CCW 7 full turns.
( )	3.	Measure voltage at J3 (9 ±0.5 VDC) with VOM (Item 2) to verify that the batteries, BT6 and BT7 are being charged. (OR J3 will read 6.0 V ±0.5 VDC if the batteries are fully charged.) Keep VOM on J3.
( )	4.	Measure voltage level at J2. Use Item 1. for all remaining measurements at J1 and J2.
( )	5.	Measure voltage level at J1 and rotate R2 CCW until J1 is +0.4 VDC HIGHER than was measured at J2 (Step 4).
( )	6.	Measure battery voltage level at the positive (+) terminal of BT1; continue to charge battery until it reaches 6.9V (if battery is already OVER 6.9V, discharge BT1 thru BT5 briefly with the 10 OHM resistor, Item 7, until it is 6.9V).
( )	7.	Rotate R1 CW until charge "TRIPS OFF" as indicated by voltage level at J3 dropping to 6 ±0.5 VDC.
( )	8.	Again discharge battery BT1 thru BT5 with the 10 OHM resistor until the charge "TRIPS ON"; battery level should be 6.4 to ±0.1 VDC. (J3 will be 6.0 ±0.5 VDC).

This Completes The Adjustment Procedure.

(EIB 910)

AN/SRN-12 OMEGA Receiving Set; New Type Ni-Cad Batteries — Announcement of Availability

The purpose of this article is to announce the availability of the new type Nickel Cadmium Battery, CKT Symb 2A2BT6 or 2A2BT7 used to provide power to synchronizing circuits in the AN/SRN-12 in the event of a main power failure.

The new type battery is identified by the composition of the outer shell, which is a polyvinyl-chloride (PVC) plastic sheath rather than the present metal (steel) sheath.

The National Stock Number (NSN) for the new type battery is 9G06140-01-005-4864; the part number is the same as before, 13V0180SC. Approximate cost of the battery is $20.00 each.

Information from Defense General Supply Agency (DGSA), Richmond, indicates that the new type battery is available from stock at the present time and that all back requisitions for the old type, NSN 9G6140-00-451-6351 will not be filled with the new type battery. The requisition must be resubmitted with the new NSN.

(EIB 932)

AN/SRN-12 OMEGA Receiving Set — Maintenance Hint

The purpose of this article is to provide adjustment procedures for the Printed Circuit Cards, Circuit Symbol 2A2A10 thru 2A2A14. This procedure should be performed to correct errors in the percent of Lane reading due to component changes in the Phase Locked Loop circuits. Do not adjust to compensate for failures in other Printed Circuit Cards.

The following items are required:

1. OSCILLOSCOPE: AN/USM-281A, SCAT CODE 4308 or equivalent.
2. BNC TEST LEADS (3 ea).

AN/SRN-12 OMEGA Receiver Circuit Cards, Reset Integrator (2A2A10) and Tracking Loop Filter (2A2A11-A14); Adjustment Procedures

1. Disconnect the antenna cable from 2J1 and place POWER ON switch and oscilloscope POWER switch to ON.
2. Press TIMER RESET button and allow 25 minutes warm up.
3. During warm up, set front panel switches as follows:
   a. STATION SELECT: CHANNEL 1 to A, CHANNEL 2 to B, CHANNEL 3 to C and CHANNEL 4 to D.
   b. TEST SIGNAL to CHANNEL 1, 2, 3 and 4.
   c. METER SELECT to OFF.
   d. TEST FUNCTION to OFF.
   e. LINE OF POSITION SELECT: LOP-1: 1-2, LOP-2: 2-3 and LOP-3: 3-4.
   f. DISPLAY SELECT to AUTO (disregard the Lane Count reading).
   g. OS-198/SRN-12 controls to view the OMEGA format.
4. Following warm up, open receiver drawer and extend to limit of stops.
5. Make the following settings and connections utilizing Oscilloscope AN/USM-281A or equivalent:
   a. HORIZONTAL SWEEP to EXT, DC input.
   b. HORIZONTAL INPUT to HORIZ INPUT jack of OS-198/SRN-12.
   c. VERTICAL CHANNEL A to DC INPUT, with VERTICAL SENSITIVITY to 0.02 V/CM.
   d. VERTICAL CHANNEL B to DC INPUT, with VERTICAL SENSITIVITY to 0.05 V/CM.
   e. Connect VERTICAL CHANNEL A to J3 of 2A2A10, RESET INTEGRATOR Card.
   f. Connect VERTICAL CHANNEL B to VERTICAL INPUT SELECTOR, INPUT A of OS-198/SRN-12.
   g. Adjust the oscilloscope to view both traces.
6. Channel A will display the tracking loop filter signals and Channel B, the Self-Test signals. The Self-Test signals will be used as a reference in locating the proper TLF channel signal.
7. Locate potentiometer R7 on 2A2A10 P.C. Card.
8. Observe TLF signal waveform and adjust R7 to position the signal at the zero DC voltage level.
   a. CW = Decreases DC Level.
   b. CCW = Increases DC Level.
9. Adjust R-11 on each TLF Card 2A2A11 thru 2A2A14 to produce a positive ramp voltage of 0.02 V/CM or less.
   a. CW = Increases negative ramp voltage, Percent of Lane increases.
   b. CCW = Increases positive ramp voltage, Percent of Lane decreases.
10. Upon completion of above adjustments, verify that the Percent of Lane is 50 ± 1 percent.
11. This completes the 2A2A10 thru 2A2A14 P.C. Card adjustments. Return equipment to normal readiness condition.

(EIB 937)

AN/SRN-12 OMEGA Receiving Set—Maintenance Hint

The purpose of this article is to provide adjustment procedures for the Printed Circuit Card, circuit symbol 2A2A35. This procedure should be performed to correct errors in the OS-198/SRN-12 oscilloscope horizontal sweep length (X1 position) and the recorder's percent of lane indication calibration. It should be determined that the 2A2A35 card is the cause of the error before adjustments are made. The following items are required:

1. OSCILLOSCOPE: AN/USM-281A, SCAT Code 4308 or equivalent.
2. OSCILLOSCOPE TEST PROBE, X1 Type.

AN/SRN-12 OSCILLOSCOPE AND RECORDER ANALOG READOUT (2A2A35); ADJUSTMENT PROCEDURES -

1. Disconnect the antenna cable from 2J1 and place POWER ON switch and Oscilloscope POWER switch to ON.
2. Press TIMER RESET button and allow 25 minutes warm up.
3. During warm up, set front panel switches as follows:
   a. STATION SELECT: CHANNEL 1 to A, CHANNEL 2 to B, CHANNEL 3 to C and CHANNEL 4 to D.
   b. TEST SIGNAL to CHANNEL 1, 2, 3, and 4.

c. METER SELECT to OFF.
d. TEST FUNCTION to OFF.
e. LINE OF POSITION SELECT:

LOP-1 : 1-3
LOP-2 : 1-3
LOP-3 : 1-3

f. DISPLAY SELECT to OFF.

4. Adjust the OS-198/SRN-12 HORIZ GAIN for a 10 division sweep and adjust remaining controls to view the OMEGA test signal format. If this step cannot be completed perform steps 5 thru 8.

5. Following warm up, open receiver drawer and extend to limit of stops.

6. Connect Oscillowcope AN/USM-281A or equivalent as follows:

a. Connect Vertical Channel A and HORIZ EXT INPUT to J1 of 2A2A35 P.C. Card.

b. Position the Vertical and HORIZ input controls to DC.

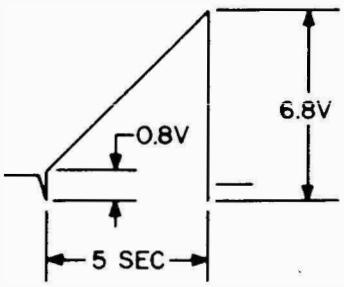
c. Set the HORIZ TIME/DIV switch to 1 SEC/DIV.

d. Adjust remaining oscilloscope controls as required to observe the signal waveform.

7. Locate potentiometer R-32 (left side of P.C. Card).

8. Adjust R-32 to produce a sawtooth waveform of a positive 6.8 volts peak amplitude and with a duration of 5 sec.

Waveform Example:



9. This completes the adjustment of R-32. Remove the oscilloscope and test probe.

10. The following procedure is provided to properly position the percent of lane displayed by the chart recorders.

11. Verify that the percent of lane indication on both recorders is 99, 00 or 01 and same as NIXIE display.

12. If step 11 is not satisfactory, the recorder stylus must be adjusted. The mechanical adjustment of the meter should be done only at 00 or 100 percent.

13. Remove the dust cover button on the face of the recorder and adjust each recorder to record 00 when displayed by NIXIES. (Replace dust cover button upon completion of adjustment.)

14. Position LOP-1, LOP-2 and LOP-3 to 3-4 and verify that the percent of lane displays 49, 50 or 51 percent.

15. Locate R-19 (right side of P.C. Card) and R-20 (left of R-19).

16. Adjust R-19 to position the stylus of Recorder No. 1 at 50 percent with a NIXIE display of 50 percent.

17. Adjust R-20 to position the stylus of Recorder No. 2 at 50 percent with a NIXIE display of 50 percent.

18. This completes the adjustment procedures for Card 2A2A35; return the receiver to normal readiness condition.

(EIB 942)

RT-1084/SRN-15 Radio Receiver-Transmitter, Protective Cover—Maintenance Hint

This article provides information on the construction of a plexiglass cover for the RT-1084/SRN-15 to prevent inadvertent manipulation of front panel controls and to preserve alignment of the receiver transmitter. This modification is applicable to DEG-1 class ships and other installations where the equipment is exposed to abuse or tampering by non-technical personnel.

Construction details are shown in figures 1 and 2. The cover is attached to the RT-1084/SRN-15 using suitcase catches similar to those used to secure covers on portable test equipment. Two holes are drilled in the front of the cover to provide access to the

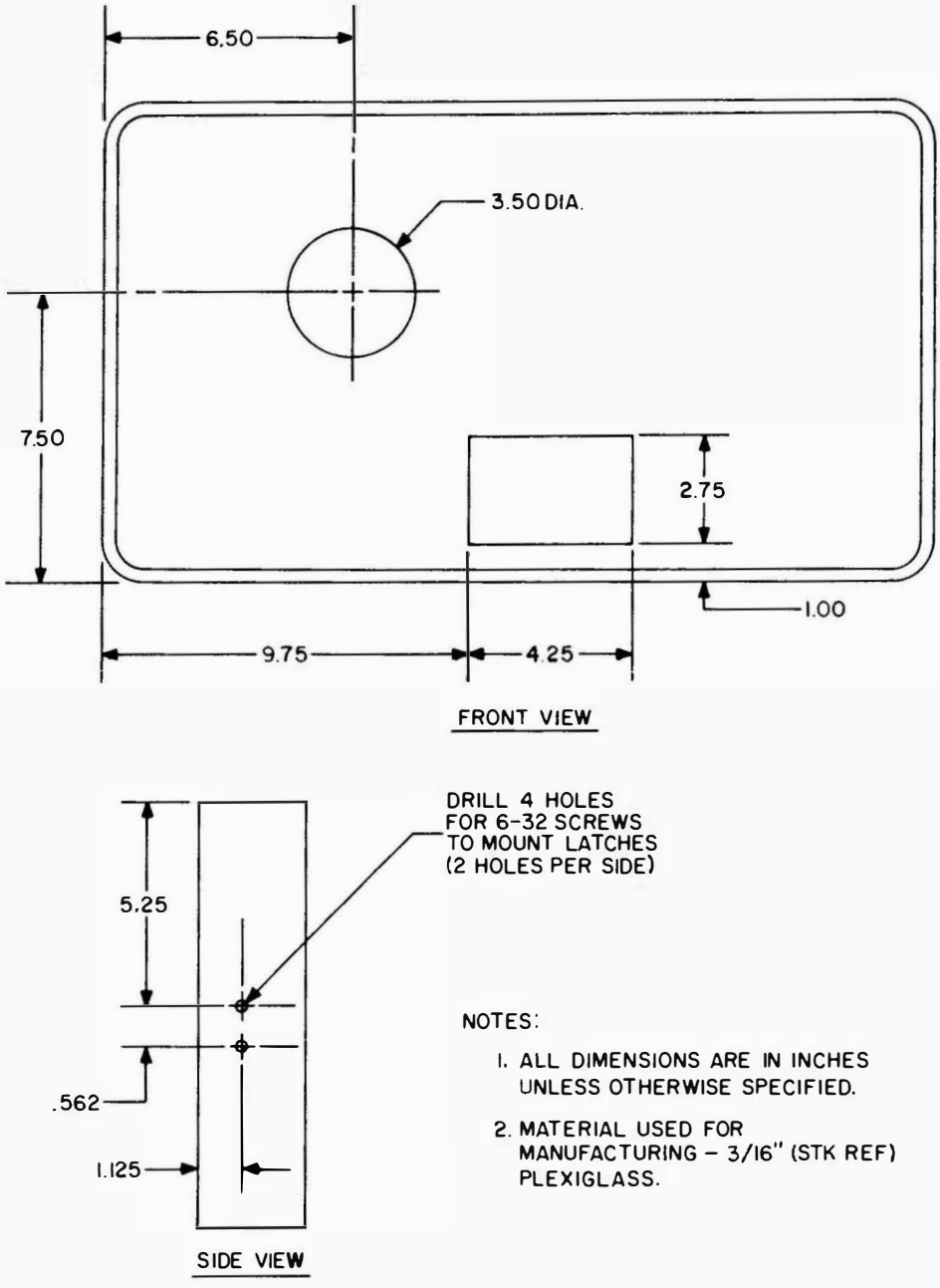


Figure 1. AN/SRN-15 Protective Cover - Front and Side.

MODE switch and the power switch. The cover is easily removed to make adjustments to the equipment.

This modification is authorized for installation by ship's force personnel when authorized and funded by the ship's Commanding Officer.

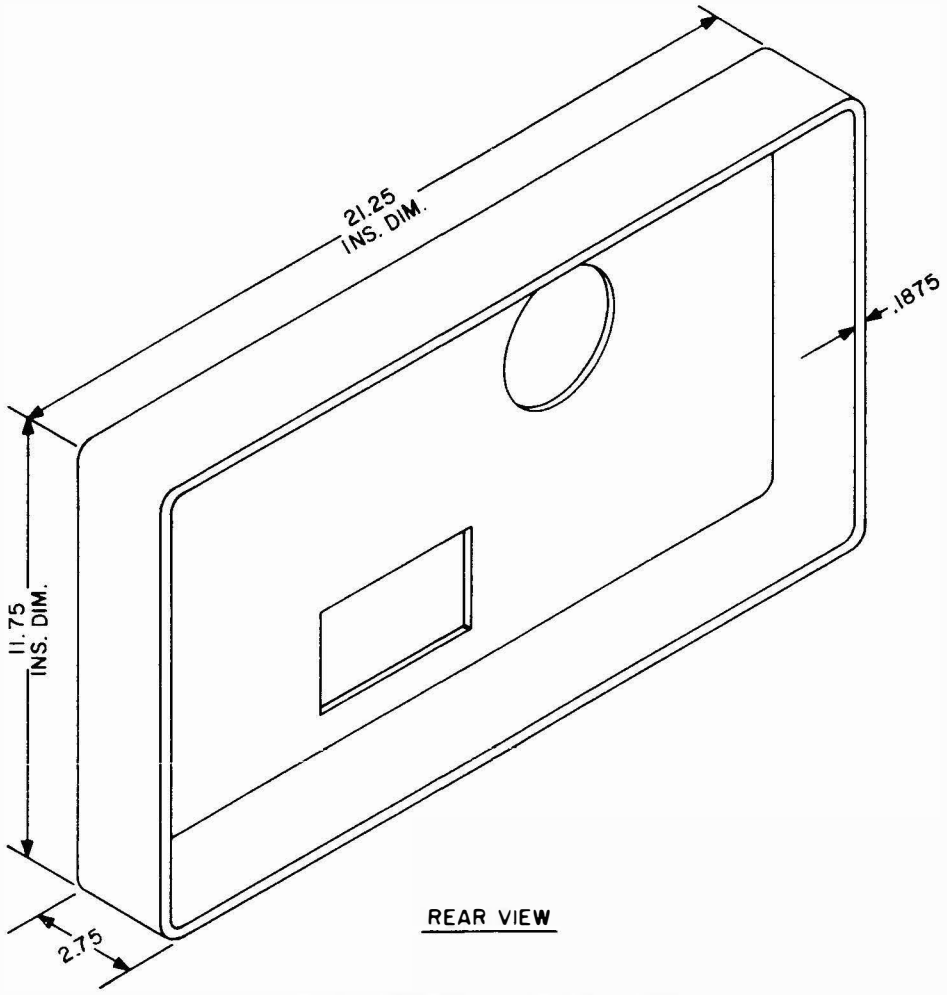


Figure 2. AN/SRN-15 Protective Cover - Rear.

(EIB 895)

AN/SRN-15 Beacon Transponder Set—Antenna Corrosion Prevention

Water intrusion has been found to cause numerous failures of the 2A1A2 antenna trigger sensor amplifier module contained within the AN/SRN-15 antenna. The following procedure outlines a method for attaining watertight seals of the AN/SRN-15 antenna during installation and overhaul.

Procedures:

1. Remove ballast weights from bottom of motor drive assembly and paint (Devron 219 #3 BLACK or equivalent) all screws and bolt heads.
2. Remount weights and seal bolts with paint. Replace rubber gasketed flat washers if damaged.
3. Paint all bolts of radome, top and mounting flange.

NOTE

Do not paint radome, seal bolt heads only.

4. Apply plastic electrical tape on all connectors and coat with Scotchkote, FSN 5970-962-3335.
5. Permatex No. 3 FSN 8030-656-1426 can be used as a temporary coating for shipboard maintenance (see EIB 854).

During repairs or overhaul, the following procedures should be added to those in the foregoing paragraph:

1. Coat threads of all screws and bolts with corrosion prevention compound, FSN 8030-286-5453 or equivalent, prior to assembly.
2. Coat all rubber gaskets and "O" rings with sealing compound DC-5 or equivalent.
3. Any sign of corrosion should be thoroughly removed. Clean, prime, and paint damaged area as indicated in the foregoing steps to prevent further corrosion.

(EIB 889)

AN/SRN-15 3A15 Amplifier-Preselector Module — Maintenance Procedures

This article provides maintenance hints for the 3A15 amplifier-preselector module of the AN/SRN-15. The depot overhaul point has found that several of the modules have been rendered inoperable due to the 3A15AR3 amplifier subassembly being dented. This condition was caused by using mounting screws of excessive length in the side mounting bracket. The correct screw length should not exceed 1-5/8 inches.

Any time the 3A15 module is removed, the old thermal compound should be cleaned off and new thermal compound (NSN 5970-00-443-1183) applied.

A major cause of failure of the 3A15 module is a high voltage short in one of the amplifier cavities caused by tuning the tuner into the stops. Operating and maintenance personnel should be careful not to use excessive force on the tuning amplifier assembly - do not tune into the stops since this will loosen the shaft lock ring, which falls off the tuning shaft and shorts the cavity.

Except for routine maintenance of replacing tubes, the 3A15 module has been classified as depot repairable. Therefore, the Amplifier Pre-selector Subassemblies 3A15AR1, 3A15AR2 and 3A15AR3 should not be removed from the 3A15 assembly by ships force.

When replacing tubes in the module, extreme care should be taken to ensure that no thermal compound is placed on the anode portion of the tube. Thermal compound should be applied to the vacuum crimp (see figure 1) and carefully applied to the threads. No excess compound should squeeze out of the threads onto the anode contact area when the tube is firmly seated in its socket.

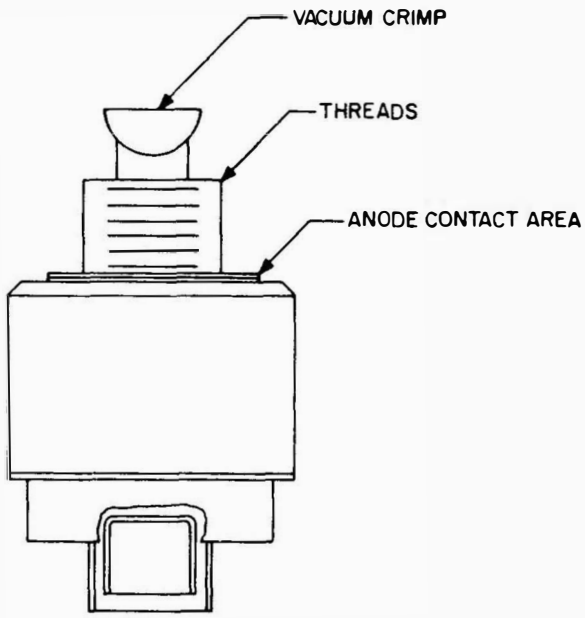


Figure 1. Outline Drawing.

(EIB 937)

AN/SRN-15 Beacon-Transponder Set, AN/SRN-15A TACAN—Antenna Motor Drive Assembly, Maintenance Information

Special instructions should be followed when replacing 1A1Q9 or similar power transistors which are mounted on a heat-sinking, grounded chassis. The mica insulating plate between the transistor and the chassis should always be replaced when failed power transistors are replaced. Old mica plates develop cracks which cause shorting of the transistor to the chassis.

A thermal compound should always be used to coat the underside of the power transistor and the chassis where the insulating plate touches the chassis. Clean cotton swabs should be used to apply the thermal compound and extreme care should be used to avoid contamination.

The National Stock Numbers for the maintenance items are as follows:

NOMENCLATURE	NSN
Insulator, Plate	5999-00-441-1688
Thermal Compound	6850-00-109-4362
Cotton Applicator	6515-00-303-8250

(EIB 975)

AN/SRN-15 Beacon-Transponder Set, AN/SRN-15A TACAN—Antenna Motor Drive Assembly, Possible Causes of Failure

The following parameters should be checked as possible causes for failures of the 1A9/1A10 Antenna Motor Drive Assemblies.

1. 1PS1 Regulated Power Supply (+5 VDC): The divide-by-900 counter will fail causing a loss of the 60-Hz reference to the antenna control assembly if the +5V supply drops below 4.5V. Failure of the +5V supply can be caused by failure of the +5V regulator or the +19V preregulator assemblies.

2. Clock 54 KHz Oscillator: Failure of the 54 KHz oscillator (1A5U22) or buffer amplifiers (1A5U17) will cause a loss of the 60-Hz reference to the motor drive assembly.

3. Divide-by-900 Counter: Failure of the divide-by-900 counter (1A6U18/U19/U20/U21/U5) will cause a loss of the 60-Hz reference to the antenna motor drive assembly.

4. Voltage Adjustment: The antenna motor drive assembly is designed to deliver 340 volts peak, 3 phase, to the antenna motor. The output transistors on the 1A9/1A10 Antenna Motor Drive Assemblies will draw excessive current if the circuit is adjusted for a low or high voltage outside the specified operating range. The voltage adjust potentiometer should be checked using the following procedures if the setting of the potentiometer is suspect.

a. Disconnect the antenna motor and the 1C2, 1C3 and 1C4 phase correction capacitors from the output of the 1T1T1 and 1T1T2 transformers at the 1TB1 terminal board (two leads each from terminals 1, 2, and 3).

b. Check the 60-Hz regulated test point E7 on the 1A1 antenna control card for a 2.7-volt peak. If necessary, adjust the 1A1R5 voltage adjust potentiometer to obtain this reading.

c. Reconnect the leads at the 1TB1 terminal board, energize the antenna and allow the antenna speed to stabilize for thirty seconds after the eight-second delay.

d. Adjust 1A1R5 for 340 volts peak, ±17 V, at the J16 Phase A test point. Recheck the voltage after one hour to allow for temperature stabilization.

5. Driver transistors: The Q5 and Q8 driver transistors should be checked for shorts when the output transistors on the 1A9/1A10 Antenna Motor Drive Assemblies are replaced. The Q5 and Q8 driver transistors should be replaced, if suspect, as a shorted driver transistor will turn the output transistor on continuously causing a failure upon application of power.

(EIB 975)

AN/SRN-15 Beacon-Transponder Set, AN/SRN-15A TACAN—1PS1 Power Supply, Maintenance Information

The 1PS1 Power Supply Assembly can cause failures of the 1A9 and 1A10 Antenna Motor Drive Assemblies if either the +19-volt preregulator or the +5-volt outputs are below the specified operating ranges. The failures result from the loss of the 60-Hz reference to the Antenna Motor Drive because the divide-by-900 circuit on the 1A6 PC card cannot operate if the +5-volt output drops below 4.5 volts.

Maintenance time will be reduced if periodic checks and adjustments are made on all voltages generated by the 1PS1 Power Supply. The 1PS1 Power Supply voltages should be within the following tolerances.

1PS1 Power Supply	Outputs
+19 volt preregulator	19 ± 1 VDC
+ 5 volt	5 ± 0.05 VDC
+15 volt	15 ± 0.15 VDC
-15 volt	-15 ± 0.15 VDC
+25 volt	25 ± 0.25 VDC

(EIB 975)

AN/SRN-15/15A Overcurrent Protection Circuit 1A9A1, 1A10A1 Functional Description

The purpose of this article is to provide information on the operation and troubleshooting of the antenna motor drive overcurrent protection circuit (OPC) 1A9A1 and 1A10A1 installed by Field Change 5-AN/SRN-15/15A.

The OPC functions to prevent damage to the output transistors on the antenna motor drive boards 1A9 and 1A10 caused by excessive current being drawn by the transistors. Some causes of excessive current in the output transistors are loss of 60 Hz input signal, shorted output, or a damaged antenna drive motor. Refer to Figure 1 for the following functional description.

Sensing transistors A1Q3, A1Q4, A1Q5 and A1Q6 measure the current drawn by each of the four output transistors Q6, Q7, Q9 and Q10 respectively by monitoring the voltage drop across the 0.1 ohm emitter resistors R14/15, R16/17, R22/23 and R24/25. When the peak current in any of the output transistors exceeds 20 amperes, the corresponding sensing transistor shuts down the affected transistor by shorting the input signal through A1CR1 or A1CR2.

At the same time, A1Q1 or A1Q2 is turned on which causes A1Q7 to conduct. This turns off the CONTROL signal to the 1A1 Antenna Control Card which resets the eight-second delay circuit. The DELAY signal removes the input signal and provides cutoff bias to the antenna motor drive 1A9 and 1A10 until the end of the eight-second delay.

If, at the end of the eight-second delay, the overload condition has been corrected, the antenna motor drive circuit will restart automatically. The SYSTEM ALARM must be manually cleared by pressing the SYSTEM RESET button on the front panel of the Control Unit. If the overload condition has not been cleared, the OPC will trip and reset the eight-second delay. The eight-second delay will recycle until the ANTENNA DRIVE POWER is turned off or the circuit breaker trips. Operation of the OPC can be observed by a momentary dimming of the Control Unit front panel indicator lights each time the eight-second delay ends. Operation of the OPC can be verified by observing a momentary negative (zero volt) pulse on the CONTROL test point on 1A1 with an oscilloscope. (The normal CONTROL signal is 15 VDC.)

The overload condition can usually be located by isolating the antenna by temporarily removing the three pairs of leads connected to pins 1, 2 and 3 of terminal board 1T1TB1. If the OPC still trips, the problem is in Control Unit. Otherwise the problem is in the antenna or the antenna control cable.

(EIB 987)

AN/BRN-7, AN/SRN-17 OMEGA Receiving Set--Maintenance Notes

See article in AN/BRN-7 Section under the same title. (EIB 925)

AN/UCC-1( ) and AN/SRR-1 Output Signal Distortion--Discussion of

See article in AN/UCC-1 Section under the same title. (EIB 959)

TESTING AN/SRR-4 ANTENNAS

The following methods for checking Model AN/SRR-4 "AEW" antennas are recommended for use.

The normal method of testing Model AN/SRR-4 equipment without an equipped plane is to feed rf from the 50-ohm output of the SG-31/U signal generator into the antenna jack of the receiver. This method checks all system components except the antenna and transmission line.

To accomplish a complete system check including antennas, the rf output from the SG-31/U was fed into an omnidirectional antenna type AS-466/SRR which was located approximately 200 yards away from the ship under test. The equipment aboard ship responded satisfactorily to the transmitted signal from the SG-31/U, however, no attempt was made by Charleston Naval Shipyard to determine signal output necessary to cause the system to track.

Another test which is similar to the one above and which can be used in diversity installations is to feed the RF signal out on one antenna and receive on the other.

AN/SRR-4, -4A ELIMINATION OF FAILURE OF ROTARY SWITCH SA-215/U

The SA-215/U rotary switch should be removed and the RG-18/U antenna cables terminated with UG-334/U coax connectors located on a mounting plate near the R-360/SRR-4 Radio Receiver. The UG-21B/U connectors on the antenna end of the RG-10/U receiver cables must be replaced by UG-59A/U coax connectors. Either receiver may be connected to either antenna by manually interchanging cables.

KY-59/SRR-4 "CROSS-TALK"

Field reports indicate that the cosine blocking oscillator is occasionally fired by the sine blocking oscillator due to "cross talk" in the cable wiring. In cases where this trouble is noted, relocate wire numbers 443 from T-501-5 to E-902-12 and wire number 258 from E-902-15 to XV-709-6. This may be accomplished by running a wire along the route of the cable. The original wire should then be clipped on the four points where it leaves the cable.

MOUNTING OF AN/SRR-11, -12, -13

The following beneficial suggestion points out that when AN/SRR-11, AN/SRR-12 and AN/SRR-13 equipments are SRR-11, AN/SRR-12 and AN/SRR-13 equipments are mounted with the edge of the front panel flush with the edge of the table or shelf, the chassis may be damaged when it is pulled out for inspection or repair.

This damage can be prevented by mounting the receivers so that the front panel will overhang the shelf or table edge by approximately 1 inch. If, in certain installations, this is not possible, the equipment should be raised approximately 1½ inches above the mounting surface. This is done by installing a spacer bar which extends the width of the cabinet (using the receiver mounting holes) to give solid support and adequate clearance.

AN/SRR AND AN/FRR EQUIPMENT SERIES SWITCH ARM COUPLING ASSEMBLIES

For the purpose of standardization and simplification of equipment support, only two of the subject switch Arm-Coupling Assemblies will be utilized in the future for all applications within the subject equipments. The two assemblies now used are of improved design which should eliminate the excessive breakage experienced in the past. The following table of application to the subject equipments applies. Maintenance Support will be obtained by requisitioning the item required by FSN indicated in table 1.

TABLE 1 **Location of Switch Arm Coupling Assemblies**

Ref. Symbol	*Associated Switch Symbol*	*Equipments affected*	*RCA Part Number*	*Federal Stock Number*
O-103	S-101	AN/SRR-11, AN/FRR-21	A-8834099-502	N5930-606-5287
O-126	S-126	" "	" "	" "
O-151	S-151	" "	" "	" "
O-201	S-201	" "	" "	" "
O-304	S-301 and S-302	AN/SRR-12	" "	" "
		"	" "	" "
O-327	S-326	AN/SRR-12	" "	" "
O-352	S-351	AN/SRR-12, AN/FRR-22	" "	" "
O-402	S-401	" "	" "	" "
O-504	S-501 and S-502	AN/SRR-13, 13A	" "	" "
		" "	" "	" "
O-527	S-526	" "	" "	" "
O-552	S-551	AN/SRR-13, 13A, AN/FRR-23	" "	" "
O-602	S-601	AN/SRR-13, 13A	" "	" "
O-701	S-701	AN/SRR-11, AN/FRR-21	" "	" "
O-801	S-801	AN/SRR-12, 13, 13A, AN/FRR-22	" "	" "
O-1007	S-1001 and S-1002	AN/SRR-11, 12, 13, 13A AN/FRR-21, 22, 23	A-8816321-501	N5930-320-8275
		" "	" "	" "
O-1008	S-1003	" "	" "	" "
O-1301	S-1301	" "	" "	" "
O-3002	S-3001	AN/FRR-22	A-8834099-502	N5930-606-5287
O-3036	S-3035 and S-3036	"	" "	" "
		"	" "	" "
O-3102	S-3101	AN/FRR-23	" "	" "
O-3136	S-3135 and S-3136	AN/FRR-23	" "	" "
		"	" "	" "
O-4402	S-4401	"	" "	" "
	S-1101	AN/SRR-11, 12, 13, 13A, AN/FRR-21, 22, 23	A-8816321-501	N5930-320-8275

MECHANICAL PARTS STOCKED FOR AN/SRR 11–13A

Due to fleet reports of failure of mechanical parts for AN/SRR-11, 12, 13, and 13A Radio-Receiver Equipments, ESO has numbered and stocked the following parts:

Symbol	Name	FSN
0-103	Arm	N5820-346-9133
0-261	Handle	N5340-303-3865
0-1007	Arm	N5930-320-8275

Normally these items are not subject to failure and will not be included in ERPAL's. Requisitions for these items should be forwarded through normal supply channels.

Radio Receiving Sets AN/SRR-11, -12, and -13A

The Bureau has received indications that some activities are discarding sub-units of AN/SRR-11, -12, and -13A when they are replaced with a new subunit due to failure of a capacitor, resistor, or electron tube. These subunits are repairable by ships' forces and should not be discarded. Do not throw away expensive assemblies when they can be returned to service by replacement of an inexpensive part or tube.

RADIO RECEIVING SETS AN/SRR-11, -11A, -12, -13A– Mounting Provisions

Radio Receiving Sets AN/SRA-11, -11A, -12, and -13A are designed for solid mounting on a table or shelf without tne use of shock mounts. The front panel flange must overhang the edge of the mounting surface, or a spacer must be used under the front of the cabinet so that the chassis assembly will not scrape on the mounting surface when the chassis is withdrawn from the cabinet for maintenance and repair. Flat washers are usually not satisfactory as spacers, because they will depress into the case under vibration. It is suggested that when a spacer is required, a flat bar, 2 inches wide, 17 inches long and 1/8-inch to 1/4-inch thick, drilled with 2 each 13/31 inch holes spaced 13-7/8 inches center to center, be used to provide clearance between the case and the mounting surface. (591)

MOUNTING PROVISIONS FOR RADIO RECEIVING SETS AN/SRR-11, -11A, -12

See article in AN/SRR-11; 2 section under same title.

The Ballast Tube, R1605, in the AN/SRR-13 has been reported as failing constantly.

The ET on the USS REAPER, MSO-467, has apparently found a way to extend the life of this ballast tube since, over a ten-month period, he has had no failures. How did he do this? Simply by switching the receiver to STANDBY condition when not in use, instead of securing the equipment completely. This ET has passed word to the ET's on other ships in his division. As a result of adoption of this suggestion, the ET's on these ships have found that the life of R-1605 has been increased considerably. It was found also that reliability of the AN/SRR-13 receiver was increased.

It is recommended that ships, having these receivers installed, place them in STANDBY instead of securing them when not in use. Better reliability will result.

Congratulations to the ET on the USS REAPER MSO-467 for his initiative in bringing these facts to the attention of shipmates.

AN/SRR-13A RADIO-RECEIVERS, AUDIO-OUTPUT CONNECTIONS

The audio output receptacles on the rear panel of the AN/SRR-13A receivers differ from those provided on the AN/SRR-13. The AN/SRR-13 receptacles were connected in paralled, whereas the AN/SRR-13A provide independent audio output. The receptacle marked AUDIO PHONE is for connections to a local jackbox, NT-49049. The PHONE LEVER control on the front panel of the receiver controls the audio level at this jackbox without affecting the AUDIO LINE receptacle. The receptacle marked AUDIO LINE is for connection to the remote control switchboard SB-82/SRR. The audio line level at the remote control switchboard is controlled by the OUTPUT and GAIN Controls. This level is controlled at the remote speaker-amplifier as desired.

MOUNTING PROVISIONS FOR RADIO RECEIVING SETS AN/SRR-13

See article in AN/SRR-11;2 section under same title.

AN/SRR-19, -19A,-19B, Elimination of Shock Hazard - Maintenance Hint

This maintenence hint applies to all Radio Receiving Sets AN/SRR-19, -19A and -19B.

The purpose of this maintenance hint is elimination of a shock hazard to maintenance personnel. The shock hazard exists when the primary power switch is turned "off" and the equipment is then disconnected from the primary power source. After this procedure a charge may be left on the capacitors in filter, FL-1. The charge is between each line and ground. Reversing the order of shutdown, i.e. disconnecting primary power first, then switching the "off-on" switch on the radio receiving set to "off" eliminates this problem. *(803)*

AN/SRR-19, AN/SRR-19A, and AN/SRR-19B Multichannel Broadcast Reception — Maintenance Hint

The purpose of this article is to provide fleet maintenance personnel with information for the correction, or improvement of poor multichannel broadcast reception.

MOTU Seven has determined on each technical assist that they have accomplished in recent months on AN/SRR-19( ) receivers reported as incapable of multichannel broadcast reception, that the problem was due to receiver tuning inaccuracies, which were being caused by faulty A1A14 power supply assemblies. MOTU Seven suggests that when maintenance personnel are notified of poor multichannel broadcast reception (or if a receiver exhibits tuning inaccuracies during PMS which are not correctable via normal adjustment) that the 36VDC and 165VDC power supply outputs and filter capacitors should be checked first as follows:

1. A1A14C1, C2, C3, and C4 should each be checked for leaked electrolyte and corroded sockets.
2. The ripple at A1A9-J1 (-24VDC) or A1A9-J3 (+12VDC) should not exceed 50 millivolts peak to peak. The DC voltage level at either jack should be within ± 5% limits.
3. The ripple on the 165VDC line at terminal 8 of A1A19-TB1 should not exceed 90 millivolts peak to peak. The DC level of the 165 volts should measure within ± 10% limits.

(EIB 923)

AN/SRT, AN/URT Tuners Nitrogen Piping

A suggested method to eliminate the problem of thread damage and loss of nitrogen from the tuner due to the softness of the aluminum end plate when the 1/8-inch IPS Schraeder valve is removed has been received.

It is suggested that a 3/8-inch by 1/8-inch IPS Monel bushing be used in place of the 1/8-inch IPS Schraeder valve, eliminating thread damage and effecting a good tight joint.

CONNECTIONS OF AN/SRT-14, -15, -16 RADIO TRANSMITTING SETS

A report was recently received from Philadelphia Naval Shipyard concerning an experience with the AN/SRT-16 Radio Transmitters installed on the USS WILLIS (DE-1027) and USS VOORHIS (DE-1028).

The shipyards experience indicated that during installation and connection of the separate units of the transmitter, proper phasing of wires on terminals 19 and 20 of TB E602 was not accomplished by the installing activity. The net result of improper phasing will cause costly damage to K3004 relay. The same action will occur if 110v is fed externally from a separate source and proper phasing is not effected between the 100-watt portion and the 500-watt portion of the AN/SRT-16 transmitter.

AN/SRT-14, -15 AND -16 WIRING ERROR

The following wiring errors have been noted in some of the Low-Voltage Power Supplies PP-1094/SRT, manufactured by Federal Telephone and Radio Company:

1. Relay K-3004-4L was wired to terminal 1 of fuse F-3009, instead of terminal 2 of F-3009.
2. Transformer T-3001 terminal 1 was wired to terminal 2 of fuse F-3009, instead of terminal 1 of F-3009, Figure 1.

The correct wiring, (Figure 2), is shown in the schematic diagram, figure 7-50 of Instruction Book NavShips 92121, for AN/SRT-14, -15, and -16.

To correct this wiring error, remove lead between relay K-3004-4L and fuse F-3009 terminal 1 from F-3009 terminal 1 and connect it to F-3009 terminal 2. Remove lead between transformer T-3001 terminal 1 and fuse F-3009 terminal 2, from F-3009 terminal 2 and connect it to F-3009 terminal 1.

AN/SRT-14, -15, -16 METHODS FOR CHECKING PERCENT MODULATION

The Preliminary Instruction Book for Radio Transmitting Sets AN/SRT-14, -15 and -16 (NAVSHIPS 92121) does not include a satisfactory method for checking the percentage of modulation. Therefore, two methods are presented herein. The first will enable the technician to make a rapid check during routine testing and the second is a precise method for checking and adjusting the transmitter for 100-percent modulation.

A rapid check of percent modulation can be made as follows using the Antenna Current Meter on the front panel of the r-f Amplifier:

1. Tune the transmitter to the desired frequency at at the 100-watt level.
2. Set the Service Selective Switch (U) to the phone position and the Microphone Switch (Y) to the proper position in accordance with type of microphone used.
3. Place the Local-Remote Switch (X) in Local and the Stand-by-Operate Switch (PP) in operate position.
4. Connect a handset in the Handset Receptacle.
5. Depress the Push-to-Talk Switch on the handset. Talk or whistle into the microphone and observe the Antenna Current Meter. With an increase in modulation, the meter will show an increase in current. When this meter shows a decrease in Antenna Current after an increase in modulation, over-modulation is generally indicated.

When this occurs, the following, more precise, method should be used in checking and setting the transmitter for 100-percent modulation:

1. Turn transmitter to desired frequency at the 100-watt level.
2. Turn transmitter power off.
3. Pull out the r-f amplifier drawer.
4. Couple the r-f output of the Transmitter (either one of the two terminals on the rear of the Antenna Current Meter) to the vertical deflection plate of the OS-8/U Oscilloscope (or equivalent).

NOTE:

A minimum amount of r-f coupling is desirable. This may be accomplished by connecting wires to both the Antenna Current Meter and to the vertical input of the oscilloscope and coupling these wires without making any direct connection between them. Capacitive coupling between these wires should be varied to the required degree to provide (as nearly as possible) a trapezoidal pattern without phase shift. The typical percent modulation patterns of Figure 1 show a trapezoidal pattern with phase shift present. Figure 2 represents an ideal trapezoidal pattern.

5. Connect the horizontal amplifier input of the oscilloscope to the modulation-output jack, J-1309, provided for test purposes on the right side of the r-f amplifier drawer.
6. Short circuit the interlock on the r-f amplifier drawer.
7. Set the Service Selector Switch (U) to the phone position and Microphone Switch (Y) to the proper position.
8. Place the Local-Remote Switch (X) in Local, and the Stand-by Operate Switch (PP) in operate position. Then, turn transmitter power on.
9. Connect a handset in the Handset receptacle. Set the Gain to Clip Control (M) to ensure proper clippings.
10. Depress the Press-to-Talk Switch on the handset and talk into the phone, observing the pattern obtained, and compare with patterns shown in Figure 1.
11. Referring to Figure 1, adjust the percent Modulation Control (N) for 100-percent modulation at audio peaks.

It is recommended that technical personnel place this article in the preliminary instruction book for ready reference until such time as the final instruction book for these equipments is available.

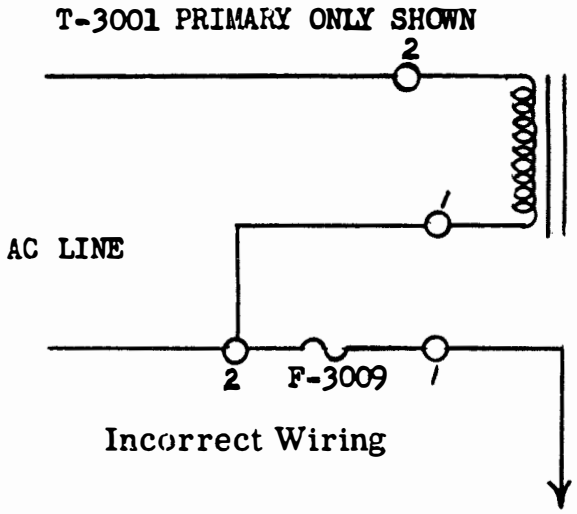


FIGURE 1

TO K-3004-4L BASE BLOWERS

The correct wiring, as shown in the schematic diagram, figure 7-50 of Instruction Book NavShips 92121, for AN/SRT-14, -15 and -16 is shown below.

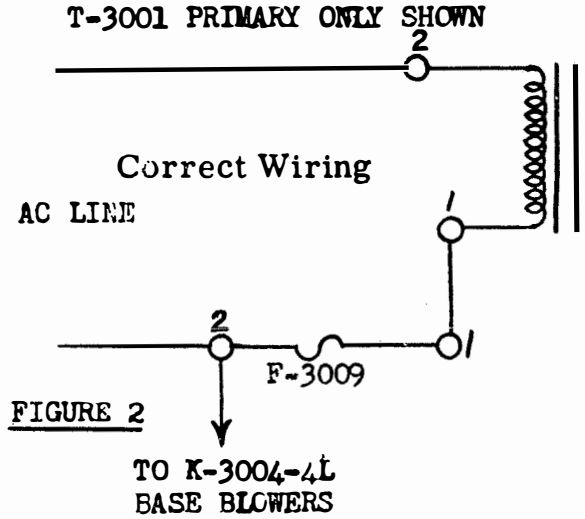


FIGURE 2

TO K-3004-4L BASE BLOWERS

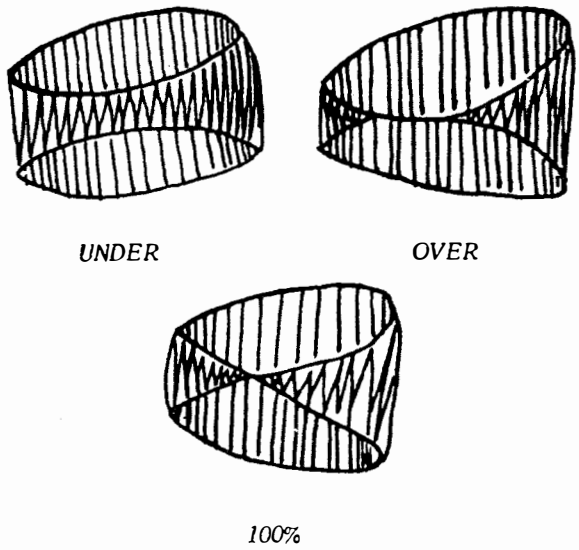


Fig. 1 Typical percent Modulation Patterns

Fig. 2 Trapezoidal Pattern

MODEL AN/SRT-14, -14A, -15, -15A, -16, -16A RADIO TRANSMITTERS; PREVENTION OF MALFUNCTION OF ANTENNA SWITCHING RELAY, K-1306 AND KEYING RELAY K-1101

The many failures of antenna changeover relay K-1306 and keying relay K-1101 in the AN/SRT-14, -15 and -16 series radio transmitter, have prompted a study of this problem by the Bureau of Ships.

The operation of the above relays is such that malfunctioning of one reflects in the operation of the other. In hand-key operation, for example, the antenna-transfer relay K-1306 must "make" before -24VDC is available for energizing K-1101 (keying relay) solenoid. The closing of K-1101, in turn, holds K-1306 in until the contacts of K-1101 are opened by unkeying the transmitter. If the above sequence of operation is proper, arcing of K-1306 contacts, due to the presence of rf, is prevented.

It is believed that the above sequence of operations causes unnecessary fatigue in the antenna switching relay, especially in the hand-key mode of operation, since this relay (K-1306) is following keying relay, K-1101.

One solution to this problem would be the incorporation of a time-delay circuit, which would "hold-in" the antenna switching relay during normal keying rates, thus reducing the relay's work load by as much as 90%.

A variable time delay (.5 to 6 secs.) is used in the AN/SRT-14, -15, -16 series transmitters to control the operation of the Antenna Tuning Group. This allows the Antenna Tuning Unit to "hold-in" during keying but permitting straight-thru operation during key-up time. This permits a receiver to be tuned to a different frequency from that of the transmitter while utilizing the same antenna.

This modification utilizes the above time-delay unit to perform the additional function of operating the antenna-switching relay as well as the Antenna Tuning Unit. In this mehod of operation, K-1306 must first close before the keying Relay K-1101 will operate, but opens only after a preset time delay. This modification has been accom-

plished on AN/SRT-16 Transmitter Serial 931. Subsequent testing indicated satisfactory operation. Modification is as follows:

I Modification of Radio Modulator MD-229/SRT (LLRM).

1. Remove the LLRM drawer from cabinet and place on bench. Removed four mounting screws and lift up the terminal assembly (located in the top rear of unit), which contains J-1101, J-1102 and J-1103, to gain access to wiring terminals on underside.

2. Disconnect the lead from terminal No. 13 of J-1102, tape the exposed wire and lay aside. (Refer to Figure 7-58, 7-114 and 7-153 of Technical Manual NAVSHIPS 92121(A).

3. Connect jumper wire from terminal No. 10 of J-1103 to terminal No. 13 of J-1102.

4. Disconnect the lead from terminal No. 9 of J-1103; connect this lead to terminal No. 5 of J-1101. Leave existing lead connected on terminal No. 5.

II Modification of Radio Frequency Amplifier AM-1108/SRT (RFA).

1. Disconnect the two leads from antenna-switching relay (K-1306) solenoid terminal No. 2C (Refer to Figure 7-114 of Technical Manual NAVSHIPS 92121(A).

2. One of these leads is a jumper between terminal No. 2C of solenoid and relay contact No. 6R. Disconnect jumper and lay aside.

3. Connect the remaining lead, which was removed from terminal No. 2C of solenoid, to contact No. 6R of relay stack.

4. Using the jumper removed in Step 2, connect relay -- solenoid terminal No. 2C to ground via ground lug found immediately under the relay.

The time-delay circuit located in the LLRM (MD-229/SRT), which is used to control the operation of the Antenna Tuning Unit, is of the Vacuum-Tube Type. It consists of V-1023A limiter and V-1023B transfer-control tube which operates K-1102. The input of the time-delay circuit is tied directly across the keying line. As a result, any spurious voltage, hum, dc transients, etc., may trigger the time-delay circuit. This, in turn, would cause erratic operation of the Antenna – Tuning Unit and, in the case of the preceding modification, also cause the antenna switching relay, K-1306, to operate sporadically without any keying signal present on the keying line.

As an example of the above, in the transmitter in which the preceding modification was installed, a 60-cycle voltage appearing on the keying line when the LOCAL-REMOTE (S-1106)switch was in REMOTE position caused erratic operation or triggering of the time-delay circuit, which in turn, operated the antenna-switching relay. This voltage was traced to leakage across the REMOTE-LOCAL switch contacts. Rotation of the switch had caused metal to be deposited on the ceramic wafer creating a resistance of approximately 20k between the contacts carrying the remote-keying line and the contacts connected to the remote START-STOP function of the transmitter. These latter contacts carry 110VAC.

Any malfunctioning of the Time-Delay circuit, such as that previously mentioned, can be identified by the use of an oscilloscope placed across the keying line while it is unkeyed.

This modification will be published as a field change in the near future.

AN/SRT-14, -15, -16 VERSUS AN/SRT-14A, -15A, -16A

Information from field activities indicate that some ambiguity exists in connection with the difference between the radio transmitters AN/SRT-14, -15, -16 and AN/SRT-14A, -15A, -16A.

The only difference is that the models AN/SRT-14A, -15A, and 16A are manufactured of nonmagnetic material. The A models are not improved versions.

AN/SRT-14, -15, -16 AN/SRA-18 REPAIR OF MAGNETIC ACTUATOR COILS

The following procedure for repairing the magnetic actuator coils in lieu of replacing the complete actuator, was submitted to the Bureau PROCEDURE:

1. Carefully remove the magnetic actuator from the Tuner or Coupler. (Refer to the Technical Manual for Radio Transmitting Set AN/SRT-14, -15, -16, NAVSHIPS 92121(A)).

2. Remove the spring-driven shaft by tapping it gently from the bushings, after removing the retainer ring. Keep all parts, as they will be used again. Slide actuating spring out of the solenoid armature, and lift out armature.

3. Carefully pry up rolled edge of tubular armature guide, and drive guide out through bottom of actuator casting. This will release burned out coil.

4. Remove and discard the burned-out coil winding. A knife facilitates this operation. Using the same coil form, and #26 AWG double-enamelled magnetic wire, rewind the coil. Approximately 990 turns, or until the dc resistance equals 15 ohms. Experiment has shown that if this resistance is exceeded, the magnerotor operates too slowly, causing it to overheat.

5. To the ends of the coil winding, solder pig-tail leads similar to the original. Wrap coil winding with cotton tape and seal with Glyptol or other electrical varnish.

6. Replace coil form in magnerotor casting, and reinsert tubular armature guide. Roll edge over to lock in place. Slide armature into position, making sure that it moves freely. Place actuator spring through hole in armature and spring guide and re-install driven shaft and retainer.

7. Replace magnetic actuator into equipment. Follow instructions in NAVSHIPS 92121(A) for installation of new actuator.

This procedure not only saves the cost of a new unit, but eliminates the necessity of drilling an accurately placed hole in the shaft of the new unit.

AN/SRT-14, -15, -16—ADJUSTING FREQUENCY CONVERTER, UNIT 9

The following suggestion should be helpful to all activities concerned with maintenance of the AN/SRT-14, -15, -16 series transmitters:

In order to properly adjust Unit 9, the position of knob HH should correspond to the position of switch S-2427, for each of the adjustments listed in both sections of table 7-20, page, 46, of NAVSHIPS 92121(A) and NAVSHIPS 92121.3. It is suggested that step 7 be modified to include knob HH in the same position as switch S-2427. Table 7-20, upper-left block, should read as follows: "Position of knob HH and Pointer on S-2427.

AN/SRT-14, -15, -16 QUICK CHECKING TUNING DIFFICULTIES ON RADIO TRANSMITTING SETS

The following maintenance information is applicable to transmitters AN/SRT-14, -15, and 16.

1. When tuning difficulties of a permanent nature occur with the AN/SRT-14, -15, and -16 series transmitters, breakdowns will be attributed to the antenna coupler and tuner, or to the transmitter coupler. Since the transmitter coupler, CU-402/SRT, is more suitable located for accessibility as well as weatherwise, a system of quick checking this unit was devised which may be of interest to those concerned.

2. A dummy load on the CU-402/SRT will check its operation below a 2:1 Standing Wave Ration (SWR) only. To check its operation for other values of SWR, a quarter wavelength of RG-8/U cable was used terminated with 208 ohms of resistance so as to give an SWR of 4:1 on a 52-ohm transmission line.

3. The line should be a quarter wavelength so that the standing wave is capable of manifesting itself; any longer length than this is unnecessary as line losses begin to accumulate and the reflection at the sending end will not be a true replica of that at the terminating end. In fact, the resistive load is changed to 220 ohms to compensate for a change of reflection coefficient due to line losses.

4. Any series or parallel combination of non-inductive resistance may be used to give 220 ohms; 30-watt total is adequate if keyed for short durations. A typical length of RG-8/U is 51¼ feet and is a quarter wavelength at 4,800 kc.

When the switch on the monitor unit is on the 8:1 position the indication should be in the green area of the monitor meter. On the 4:1 position it should indicate in the center position of the meter and in the 2:1 position, in the red area.

IMPROVED ACCESSIBILITY FOR MAINTENANCE OF TRANSMITTERS AN/SRT-14, 15, 16

The transmitter output and receiver output cables, Type RG-141/U, exit from the bottom rear of the equipment cabinet to plugs P-602 (Type UG-594/U) and P-603 (Type UG-89/U).

The following means to improve accessibility for maintenance has been suggested by Portsmouth Naval Shipyard.

Locate the two existing RG-141/U cables in the CY-1571/SRT equipment cabinet wireway. These cables of the wireway run from the top behind the RFA drawer. Re -run them toward the from of the equipment cabinet. Connect wire No. 234 to a panel jack, Type UG-1052/U, and connect wire No. 233 to a panel jack, Type UG-291B/U. The panel jacks may be installed on top of the equipment along the right side, with the UG-105B/U and UG-291/B back 4 and 6 inches, respectively, from the front.

SAFEGUARDING AND REPLACEMENT OF ALLEN TEE-WRENCH SUPPLIED WITH RADIO TRANSMITTING SETS AN/SRT-14, -15, -16

The Allen Tee-Wrench, which is supplied with AN/SRT-14, -15, -16 equipments, is used to remove socket-head screws that fasten the drawers in the mounting rack. The tool is identified as Symbol H-3005, but is a nonsupport item according to the Maintenance Parts List. Because it is considered attractive by many people, this tool is frequently missing from the equipment; a less efficient "L-shaped" Allen Key wrench must then be used.

All personnel will take necessary action to safeguard this particular tool and to avoid any future loss or misplacement. A replacement tool is obtainable in the supply system ($1.05) and is identified as Federal Stock No. GM5120-249-9568.

AN/SRT-15, -16 EQUIPMENT HV CABLE FAILURES

Failure of the high-voltage lead between the High-Level Radio Modulator MD-20/SRT and the High-Voltage Power Supply PP-1096/SRT and a method of replacing this lead was described in Electronic Information Bulletin 456.

Additional reports have been received from the field indicating further failures of high-voltage cables in AN/SRT-15, -16 Equipment. The high-voltage lead connecting the Low-Level Modulation MD-229/SRT and the Medium-Voltage Power Supply, PP-1095/SRT, has also failed.

As an emergency replacement, ignition cable can be used. A more suitable substitute, is to replace this lead with high-voltage wire N6145-635-7018 covered with 13/64-inch Belden braid, G-6145-191-8401, for shielding. The shielding should be terminated 1 inch from each end and ground by lugged-pigtail connections.

AN/SRT-15, -16, REPLACEMENT OF HV POWER SUPPLY LEAD

Failures of the HV Power Lead to the high level modulator have occured in the field. As an interim measure, it is suggested that a piece of high voltage test wire, FSN N6154-154-6969, be used as a substitute. This wire should be shielded with 1/2 inch Belden braid, FSN G6145-191-8401. In order to prevent end arc-over and heat damage, the shield should be terminated approximately 1 inch from each end of the lead and be grounded by pigtail lugged connections.

IMPROVED ACCESSIBILITY FOR MAINTENANCE OF TRANSMITTERS AN/SRT-15, -16

See article in AN/SRT-14: 4 section under the same title.

SAFEGUARDING AND REPLACEMENT OF ALLEN TEE-WRENCH SUPPLIED WITH RADIO TRANSMITTING SETS AN/SRT-15, -16

See article in AN/SRT-14: 4 section under the same title.

IMPROVED ACCESSIBILITY FOR MAINTENANCE OF TRANSMITTERS AN/SRT-16

See article in AN/SRT-14: 4 section under the same title.

SAFEGUARDING AND REPLACEMENT OF ALLEN TEE-WRENCH SUPPLIED WITH RADIO TRANSMITTING SETS AN/SRT-16

See article in AN/SRT-14: 4 section under the same title.

AN/SSQ-29(U) AND AN/SSQ-29(XN-2)–SINGLE STATION POFA TEST; THEORY OF OPERATION

The purpose of this article is to provide operating and maintenance personnel with a theory of operation so that they will have better understanding of what is being accomplished when performing a single station POFA test on the AN/SSQ-29(U) and AN/SSQ-29(XN-2) equipments. These equipments should have been modified to perform this test by Field Change 1 which was published in EIB 630 of 18 May 1964.

The action of the Single Station POFA switches allows six functions to be opened when a single station test is desired. The open will stimulate a logic one level into some of the inputs. However, due to the DN3 card design, the open line will eliminate an input function, but will not produce a logic one input. (This is because the DN3 needs a ground on the input to produce a logic one, due to the biasing arrangement utilized in circuit design.)

The AN/SSQ-29(U) has the following function affected by the Single Station POFA Switches. Refer to Volume II of NAVSHIPS 94718(A) the Technical Manual for the AN/SSQ-29(U) Data Terminal Set.

Switch S1A will open 1A3A04A16-4 (Code 440003) in the Transmit Sequence Control (Volume II page 5-49/5-50 Sheet 1 of 2). When the switch is open as for a single station test, a zero volt level (logic one) will be on the input of inverter I 12 producing a low level (logic zero) out of the inverter. The logic zero will inhibit gate G39 and a logic one will be routed to pin 6 of Toggle 10. The logic one will set the toggle and logic zero will be developed on pin 10 of gate G41, inhibiting the gate. The logic one input of gate G41 will enable gate G43. This will allow gate G43 to be controlled by the Rx **Message Level**, which will in turn allow the Rx **Message Level** to control operations of the Frame Counter Reset Enable line. Therefore the frame counter will be reset during receive data time.

Switch S1B will open 1A3A12A17-4 (Code 450006) in Control Code Recognition (Volume II, page 5-73/5-74 Sheet 2 of 4). When the switch contact is open Tx **STOP 2** will be prevented from resetting Toggle 17. This will allow a STOP SEARCH level to be maintained while a Stop Code is being transmitted.

Switch S2A will open 1A3A12A17-1 (Code 440007) in the Control Code recognition (Volume II, page 5-73/5-74 Sheet 2 of 4). When the contact is open a logic one level is produced into pin 1 of gate G91. This will not allow a CONTROL STOP (to TX Sequence Control) to be generated. In a single station test only Control Stops will be transmitted, but in a single station Round Robin Mode, a Control Stop must not be recognized; to do so would cause loss of Local Control. Therefore the switch action prevents a Control Stop from being recognized, even though one is transmitted.

Switch S2B will open 1A3A12A18-8 (Code 480017) in the Control Code Recognition (Volume II page 5-73/5-74 Sheet 2 of 4. When the switch is open pin 8 into gate G36 (DN3) is opened. Due to the design of the DN3 card this does not produce a logic one into the input. The open will eliminate the Tx MESSAGE LEVEL from the gate, therefore, a STOP LOAD will be generated during transmit time.

Switch S3A will open 1A3A12A18-1 (Code 470418) in the Control Code Recognition Unit (Volume II page 5-73/5-74 Sheet 2 of 4). When the switch is open to pin one of gate G89, the Tx ON LEVEL will be deleted. The gate (a DN3) will only be affected by the **START** level. This allows a Rx START RECOGNIZE level to be produced during transmit time.

Switch S3B will open 1A3A13A06-28 (Code 470418) in the Sideband Select Unit (Volume II, page 5-81/5-82 Sheet 1 of 3). Pin 28 of G17 (a DN3 will be opened. The Tx ON function will be removed from the gate. This allows the hamming errors, from the Hamming Detector to control gate G25 (which controls operation of the Sideband Load Pulse Counter).

The AN/SSQ-29 (XN-2) has the following functions affected by switches (S1, S2, S3). Reference is made to Technical Manual for Data Terminal Set for AN/SSQ-29 (XN-2) NAVSHIPS 94315 Volume I.

Switch S1A will open 1A3A04A16-2) Code 44003) in the Transmit Sequence Control (Volume I page 4-99/4-100 Figure 4-60). When the switch is open as for a single station test, a zero volt level (logic one) will be on the input of inverter A16-3 producing a low level (logic zone) out of the inverter. The logiz zero will inhibit gate A10-3 and a logic one will be routed to pin 3 of Toggle No. 3. The logic one will set the toggle and a logiz zero will be developed on pin 5 of gate A10-5, inhibiting the gate. The logic one output of gate A10-5 will enable gate A11-1. This will allow gate A11-1 output to be controlled by the Rx **Message Level** which will, in turn, allow the Rx **Message Level** to control operations of the Frame Counter Reset Enable line. Therefore the frame counter will be reset during receive data time.

Switch S1B will open 1A3A12A17-2 (Code 450006) in the Control Code Recognition (Volume I page 4-145/146 Figure 4-70). When the switch contact is open Tx **STOP 2** will be prevented from resetting Toggle No. 11. This allows a STOP SEARCH level to be maintained while a Stop Code is being transmitted.

Switch S2A will open 1A3A12A17-A (Code 440007) in the Control Code Recognition (Volume I page 4-145/146 Figure 4-70). When the contact is open a logic one level is produced into pin A of gate A17-7. This will not allow a CONTROL STOP (to TX Sequence Control) to be generated. In a single station test, only Control Stops will be transmitted, but in a single station Round Robin Mode a Control Stop must not be recognized; to do so would cause the loss of Local Control. Therefore the switch action prevents a Control Stop from being recognized, even though one is transmitted.

Switch S2B will open 1A3A12A18-4 (Code 480017) in the Control Code Recognition (Volume I page 4-145/146 Figure 4-70). When the switch is open, pin 4 into gate A18-7 (DN3 circuit card) is opened. Due to the design of the DN3 card, this does not produce a logic one into the input.

The open will eliminate the Tx MESSAGE LEVEL from the gate, therefore a STOP LOAD will be generated during transmit time.

Switch S3A will open 1A3A12A18-A (Code 470418) in the Control Code Recognition (Volume I page 4-145/146 Figure R-70). When the switch is open pin A of gate A18-5, the TRANSMIT LEVEL will be deleted. The gate, being a DN3, will only be affected by the **START** level. This allows a Rx START RECOGNIZE level to be produced during transmit time.

Switch S3B will open 1A3A13A06-14 (Code 470418) in the Sideband Select Unit (Volume I page 4-161/162 Figure 4-74). Pin 14 of gate A6-2 (a DN3 card) will be open. The Tx ON function will be removed from the gate. This allows the hamming errors, from the Hamming Detector to control gate A2-2 (which controls operation of the Sideband Load Pulse Counter). (662)

***AN/SSQ-65 TTY Analysis Subsystem — Routine Check Procedure for**

1. The SA-1737/SSQ-65 (line and function selection) is subject to a failure mode in which one or more reed relays of the TTY remote selector stick in the closed position. The result is that the TTY loops involved are paralleled with each other causing malfunction of those TTY circuits.

2. Detection of the occurrence of relay sticking is quite simple and, in fact, should be part of the TTY distortion analyzer set-up procedure. The checks described below should be performed once per watch to provide assurance to the user that the analyzer is measuring properly.

3. Procedure Check No. 1

a. At the "TTY A" or "TTY B" selector switches of the line and function selector, dial 00 and press the selector switch. If a selection is not made, the red light stays on. If a selection is made, the green light comes on which indicates one or more relays are stuck in the closed position in the TTY remote selector unit.

b. Open the remote selector unit, front panel.

c. Pull the relay cards (slots 6 thru 13), one at a time, until the green light goes out and the red light comes on. The last card pulled is defective. Replace all other relay cards and continue NORMAL operation. Repair bad relay card.

4. Alternate Procedure Check

a. Ensure all DT-4800 c/s controls are set to the correct pre-set positions as listed:

(1)	"Input MA"	20N
(2)	"Code Levels"	5
(3)	"Input Polarity"	+
(4)	Input Filter	OUT
(5)	Distortion Type	AVERAGE BIAS
(6)	Transition Select	ALL
(7)	Meter Reset	OFF
(8)	Auto Reset	ON
(9)	Stop Length	1.0
(10)	Percent Distortion	AS REQUIRED
(11)	Character Release	FREE RUN
(12)	Code Levels	5
(13)	Generator Speed	75 BAUD
(14)	Analyzer Speed	75 BAUD
(15)	Meter Switch	ANAL IN LOOP

(16) Those that normally stay in one position are marked with a dot on the equipment face at the normal position.

b. Place the "Meter Reset" to the "CAL 40" position, meter should read 40. There is a red line there for this purpose. If not, adjust "CAL 40 Adjust" control using small tweaker until it does. Return "Meter Reset" to NORMAL "off" position.

c. On the SA-1737 (LF SS) panel depress the push button at the intersection of the "DIG GEN" and "FAC CON." This connects the tele data generator DT-155 to the assigned miscellaneous jack on the black TTY panels. At the black TTY panels, patch the digital generator into any unused loop with a steady MARK on it. Back at the SSQ-65, call up the loop selected above and depress the push button at the intersection of "TTY A" and DT-1200, thereby, connecting it to the tele data analyzer input.

d. On the generator DT-155, switch to "MARK." With switch on power timing DT-255 in the "ANAL In" position, meter should read 20 MA if loop selected is set at 60 MA. (This is proportional and will always read 1/3 of loop current.)

e. Switch generator DT-155 to "SPACE," meter should go to zero. If it shows a small reading (2-5 MA) in this position, one or more relays in the remote unit are stuck. If this occurs, immediately take corrective action as follows:

(1) Pull all ten relay cards (slots 6 thru 13) forward to release from connectors. The equipment is so designed that this can be done without interference to operating circuits.

(2) The residual current reading at the QMS should drop to zero. Reinsert the cards, one at a time, while watching for residual reading to return. Card(s) causing the reading are defective and should be replaced/repaired. If necessary, leave affected slots vacant until card(s) can be repaired.

(3) Normal subsystem back up and use liberally as required; now being assured that the analyzer is providing correct information to you. (EIB 935)

AN/SSR-1 Satellite Signal Receiving Set — Module Replacement Warning

The purpose of this article is to point out the existence of the slide bar locks on the wiring harness connectors in the AN/SSR-1 drawer units. This slide lock is not readily apparent to those personnel not familiar with the connector. Attempts to disconnect the wiring harness during removal of modules from the MD-900/SSR-1 and the TD-1063/SSR-1 without properly releasing the slide lock may result in irrepairable damage to the J-1 connector.

Figure 1 of this article shows a typical harness connector and mating jack with the slide lock. Before removing the connector, the slide must be moved to the right to release the catch. After re-connection, moving

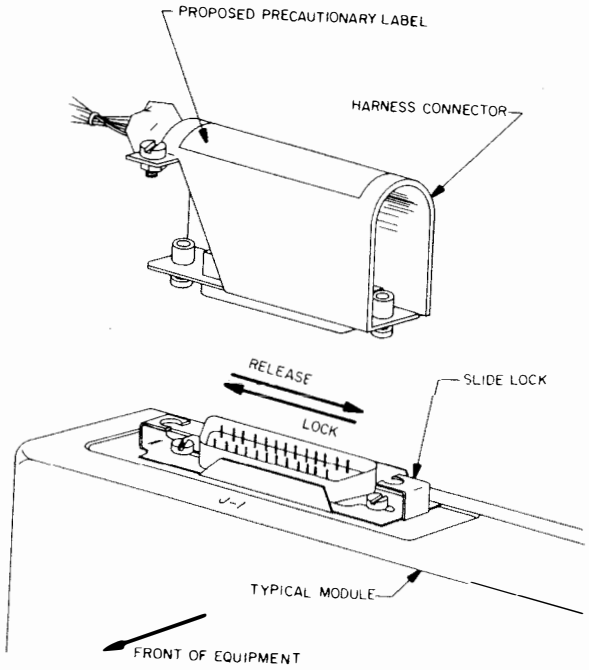


Figure 1. Typical AN/SSR-1 Module Connector

the slide to the left will lock the connector in place.

As an added reminder, precautionary labels are being manufactured for automatic distribution to the Fleet. A label will be provided for each of the nine wiring harness connectors in the units and shall be affixed as shown in figure 1. (EIB 919)

Electromagnetic Interference (EMI) due to Cable Coupling

During a recent Shipboard Electromagnetic Compatibility Improvement Program (SEMCIP) survey on a FF-1052 class of ships, it was observed that the AN/SPS-10 radar was causing interference to HF receivers. The interference, which had the characteristic sound of the AN/SPS-10 radar (625-650 PRF), as detected from approximately 19 MHz through 28 MHz and peaked around 23.5 MHz. The following information should prove helpful to ship's experiencing a similar problem.

The source of the interference was found to be the newly installed AN/SSR-1 receiver. The four RG-22/U down-converter cables run from radio central, up through the deck of the AN/SPS-10 radar room to overhead cable ways, at a point directly over the AN/SPS-10 R/T unit. Two of the cables branch off and go to the two AFTER AS-2815/SSR-1 antennas, the other two cables continue through the radar room and then go to the two FORWARD AS-2815/SSR-1 antennas.

High order harmonic energy from the AN/SPS-10 modulator was present on several of the cables in the cable way. The energy was picked up by the AN/SSR-1 down-converter cables, carried to the AS-2815/SSR-1 antennas, radiated from the AS-2815/SSR-1 antenna and associated post support and was picked up by nearby ship and broadband receive antennas.

The AN/SPS-10 modulator interference was eliminated by carefully grounding the braid of the RG-22/U cables going to the antennas. The ground was placed near the point the two cables exit the radar room to go up to the antennas. (EIB 919)

AN/UCC-1( ) and AN/SSR-1 Output Loop Circuits--Improved Performance for

See article in AN/UCC-1 Section under the same title. (EIB 959)

AN/SSR-1 Satellite Communications Receiver—General Information

This article provides general information pertinent to operation and maintenance of the AN/SSR-1.

Corrosion problems. Spotchecks of AN/SSR-1 installations in the Fleet reveal some corrosion problems in the externally mounted equipment. The antenna connectors on several installed systems examined had become exposed and were badly corroded. The female connector on the antenna is not designed to be replaced and if corrosion goes unchecked, replacement of the entire antenna will be necessary. Examination of several AM-6435 Amplifier/Down Converters showed considerable blistering of paint, often on units where the paint surface was unbroken. Closer inspection revealed large amounts of aluminum oxide under this unbroken paint. If left unchecked, this corrosion will destroy the aluminum enclosure with catastrophic results to the silver plated electronic assembly within. A study effort is being initiated to learn why the paint on certain AM-6435 units permits salt water to penetrate without an apparent break in the paint surface.

The external components of each installed system should be inspected immediately. The first sign of corrosion should be met with immediate action to clean and represerve affected areas. As a minimum, the procedures in the MRC C-777 R-1 should be followed. For severe corrosion problems, refer to Weatherproofing and Corrosion Prevention of Topside Hardware in the General Section of this handbook. Inspection of the outside units are now required by PMS on a semi-annual basis. Comments are invited on the adequacy of the periodicity code for this maintenance requirement. Recommendations may be submitted via the normal PMS Feedback Reporting System.

Back-up TTY Loop Power Supply. A large number of fleet units have had their AN/SSR-1 installed without the back-up PP-3495 TTY loop power supply because of a supply shortage. These power supplies are now available and are being sent to all ships not initially provided with a No. 2 power supply. Ship's force personnel are required to install this spare power supply in accordance with instructions provided with the unit utilizing cables and foundations previously installed.

Spares Kit Deficiency. A number of ships have received spares kits which were short of the spares components kit comprised of the items listed below. Spare component kits are available and are being forwarded automatically to those units not previously provided. It is recommended that identification of the components in this kit, along with the spare modules, be recorded by the AN/SSR-1 technician. All supply material is to be under the inventory control of the Ship's Supply Department.

Loop Current Adjustment. One important adjustment required for proper operation of the AN/SSR-1 is the correct setting of the TTY Loop Current. Improper adjustment of loop current can result in garbled teletype copy or overloading of PP-3495 and reduced life of the TTY switch driver module. The following method has proved to be the most convenient method of providing steady "marks" for proper setting of loop current:

1. While equipment is energized, carefully disconnect the harness connector from the BIT SYNCHRONIZER Module while observing current meters on the teletype patch panels. Upon disconnect, TTY channels lock on either a steady "mark" or "space" condition. The disconnect procedure may have to be repeated several times until the channel to be adjusted achieves a steady "mark" condition.
2. Loop current may now be adjusted to 60 ma using the potentiometer on the TTY patch panel.
3. After loop currents are properly set, reconnect the BIT SYNCHRONIZER Module and resume normal operation.

Because it is necessary to briefly interrupt operation of the AN/SSR-1 in order to perform the foregoing adjustment, judicious scheduling is required. Once correct loop current setting is accomplished, it is recommended that adjustment knob positions on the TTY patch panel be marked with tape or pen for easy reference.

Qty	Part Number	Part Name	NSN
1 ea.	25P14433F0001	RFI Filter	---
2 ea.	32P00233F0001	Preformed Packing	1HM5330-01-028-2761
2 ea.	45-61651	Gasket	9Z5330-01-020-9741
1 ea.	21P10979D001	Capacitor	9N5910-00-167-0223
5 ea.	TX1N4148	Semiconductor Device	9N5961-00-938-1135

(EIB 947)

AN/SSW-1C Programmer Test Message (1A2A2, 1A4A2)—Maintenance Hint

This article provides a check to make sure the AN/SSW-1C will work properly and will not be a border line operation which is dependent on a floating circuit ground.

Check programmer test message modules, (1A2A2, 1A4A2) and ensure they have the same configuration between C-6 and circuit ground (1A3) as shown on figure 7-95 test message programmer 313071 (1A2A2, 1A4A2) wiring diagram, page 7-313/314, NAVSHIPS 0967-232-8030.(785)

AN/SYA-1(V); AN/SYA-4(V); MAINTENANCE INSTRUCTION–DATA DISPLAY CONSOLES, CATHODE RAY TUBE (CRT) VARIANCE

Cathode Ray Tube FSN 1N5960 990-2309, Hughes Aircraft Company (HAC) P/N 713010-9, is the standard CRT used with all AN/SYA-4(V) Data Display Consoles and all AN/SYA-1(V) Data Display Consoles modified with the CRT resolution improvement, HAC Field Bulletin (FB) Number (AN/SYA-1(V)) 204.

Due to unavailability of the standard CRT, some AN/SYA-4(V) Data Display Consoles and some HAC FB 204 Mod. Kits used an alternate type CRT (FSN 1N5960-995-2204, HAC P/N 713010-16). This CRT differs from the standard tube in placement of the focus and astigmatism elements which required a wiring interchange. Upon eventual replacement of the alternate CRT with a standard tube, it will be necessary to exchange the interchanged connections to restore the circuit to standard configuration.

When it becomes necessary to replace a CRT, the DS technician is directed to proceed as follows:

1. Replace the tube with CRT FSN 1N5960-990-2309; this is the only type available through supply channels.
2. Determine by visual inspection the HAC P/N of the defective tube.
   a. If HAC P/N is 713010-9, the CRT is the standard type and wiring changes **are not** necessary.
   b. If HAC P/N is 713010-16, the CRT is the alternate type and wiring changes will be required as indicated in Step 3.
3. Exchange wire connections at the focus and astigmatism programmer unit 575032, area 19, cable connector P3, Contacts **C** and **E**. The following tabulation indicates connections for the two types of Data Display Tubes:

Signal	From	To	For CRT 713010-9	For CRT 713010-16
W 9528	X Deflection Amp. A16, P 61-88	F & A Pgmr. A19	P 3-C	P 3-E
W 9546	Y Deflection Amp. A22, P 61-101	F&A Pgmr. A19	P 3-E	P 3-C

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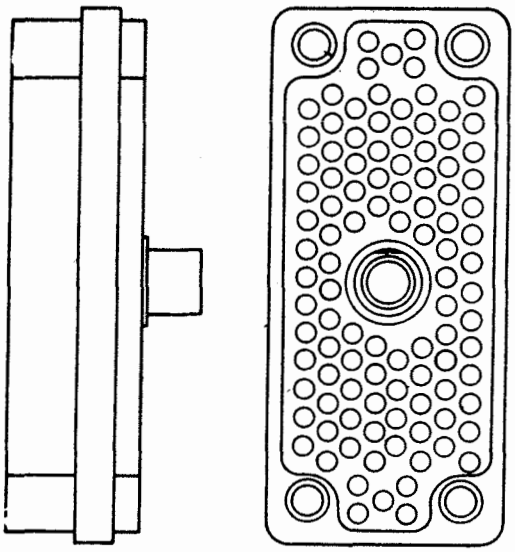
CONNECTOR REPLACEMENT IN DISPLAY GROUP AN/SYA-1(V) EQUIPMENT

Two types of connectors have been used in equipment of Data Display Group AN/SYA-1(V). The two types can be identified by the position of the mounting flange, as shown in figure 1, and the part number marking. The Burndy connector (HAC part number 712230-016) has an off-centered mounting flange; the Hughes connector (part number 712230-038) has a centered mounting flange. Should any damage occur to a Hughes connector or associated pins or sockets, replace with Burndy connector, pins, and sockets, as supplied by the Electronics Supply Office. Remove from the mating wires pins and sockets which mated in the Hughes connect and replace them with the 0.847-inch Burndy pins (stock number N5935-856-3130) and 0.690-inch Burndy sockets (stock number N5935-873-2637), respectively. Always replace a damaged Hughes connector with the Burndy connector (stock number N5935-829-7732).

BURNDY CONNECTOR BODY
(MOUNTING FLANGE OFF CENTER)



HUGHES CONNECTOR BODY
(MOUNTING FLANGE CENTERED)

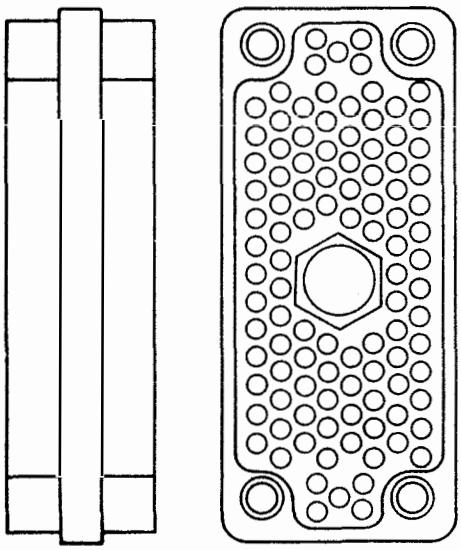


Figure 1. Burndy Connector Identification

MODIFICATION OF NTDS GAIN CONTROL KNOB ON DATA INPUT DISPLAY CONSOLE OA-3069 (V)/SYA-1(V), AND DATA UTILIZATION DISPLAY CONSOLE OA-3070(V)/ SYA-1(V) OF DATA DISPLAY GROUP AN/SYA-1(V)

To insure that the "Bull Nose" may be locked in the raised position when radar plotting board PT-453/SYA-1(V) is affixed to the PPI ring installation, the following procedure to modify the NTDS GAIN control knob (Intercommunications Panel A-10) is recommended:

1. Remove NTDS GAIN control knob from potentiometer-shaft.
2. Using a lathe with a 1/4-inch counterbore drill, increase depth of potentiometer shaft hole to 45/64 inches (figure 1). Wrap a piece of tape around drill in a position to prevent drill from counterboring beyond 45/64 inch dimension.
3. Using a cutting tool in the lathe, cut 1/4 inch off bottom of knob and remove any rough edges with a file (figure 1).
4. Place control knob on potentiometer shaft and tighten two allen-head screws.

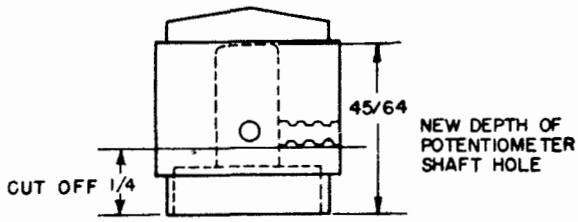


Figure 1. NTDS GAIN Control Knob, Modification

MODIFICATION OF NAVY TYPE CANG 51007 HANDSETS USED WITH DATA DISPLAY GROUP AN/SYA-1(V)

Handsets, Navy Type CANG 51007, can be modified for use with intercommunication station LS-468/S. Remove the connector from the end of the handset cable and install two connectors to the split cable end as shown in figure 1. The connector, 712201-180, is the same as that used on the NTDS console footwitches; the Bendix pygmy connector is the same as that used on the NTDS intercom headsets. (Note: Since handsets are made by several manufacturers, the color coding may vary. It may be necessary to verify connections at the handset.)

When using the modified handset with intercommunication station LS-468/S, insert connector 712201-130 into the connector on the intercommunication station labeled REMOVE TALK; and the Bendix pygmy connector into the connector labeled HEADSET MIKE. When using the handset, it will be necessary to reduce the volume for incoming calls.

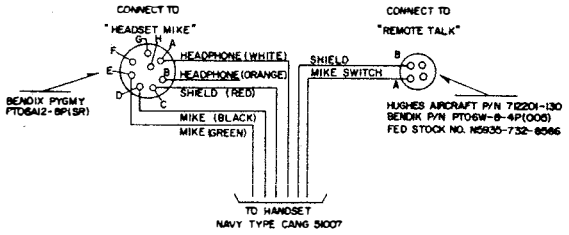


Figure 1. Handset Cable Wiring Change

DATA DISPLAY GROUP AN/SYA-1(V)–SCHEDULED REPLACEMENT OF BEARINGS IN SYNCHRO MOTOR OF ANALOG TO DIGITAL CONVERTER CY-1057/SYA-1(V)

Because of high operating temperatures, the lubricant in the bearings in the synchromotor of Analog to Digital Converter CV-1057/SYA-1(V) breaks down at fairly regular intervals. To prevent unsechuled down-time, the bearings in the synchro motor on gear train assembly 577383 should be replaced every 1,000 hours of operation. Obtain bearings (Federal Stock Number 3110-293-8856) from the Navy Supply System. Replace bearings as described below:

1. Remove gear-train assembly 577383 from synchro to digital converter 575538, area A1, in synchro RAC.
2. Remove servo motor from gear-train assembly.
3. Remove pinion gear (figure 1) from armature shaft by loosening allen-head screw on pinion-gear retainer. Pinion gear and retainer should slip off motor shaft.
4. Remove two screws which hold the end cover over tachometer. Remove end cover.
5. Remove four screws which hold tachometer in casing. Remove tachometer.
6. Remove spring-loader retaining ring from pinion gear end of casing.
7. Reach inside aluminum cup and remove single screw, lock washer, and solid washer from tachometer-end of armature shaft.
8. Remove aluminum cup. Use care not to dent or bend cup. Set cup to one side. If cup does not lift out easily, proceed with step 9.
9. Replace screw which was removed from end of armature shaft with a longer screw (1-1/2-in. to 2-in. long) with a 4-40 thread. Make sure that longer screw is screwed well into shaft.
10. Using handle end of a screwdriver, or similar tool, gently drive armature shaft, and bearing assembly out of pinion-gear end of casing. If aluminum cup was not removed in step 8, remove it as soon as it becomes loose, then reinsert screw and continue driving armature out.
11. Pull bearing off pinion-gear end of armature shaft.
12. Using a flat-ended punch, or similar tool, drive retaining pin out of hole in tachometer-end of armature shaft. Slip bearing off tachometer-end of armature shaft.
13. Place a new bearing over tachometer-end of armature shaft. Place retaining pin in hole at tachometer-end of armature shaft. If retaining pin seats tightly, use a flat-ended tool to tap it gently into place.
14. Insert end of motor armature with new bearing into pinion gear end of servo motor. If armature shaft and bearing fit tightly, use a wooden mallet to tap armature shaft gently into place.
15. Place a new bearing over the pinion-gear end of armature shaft and press firmly into place. Replace retaining ring. Reassemble servo motor by resersing the procedure given in steps 1 through 8.

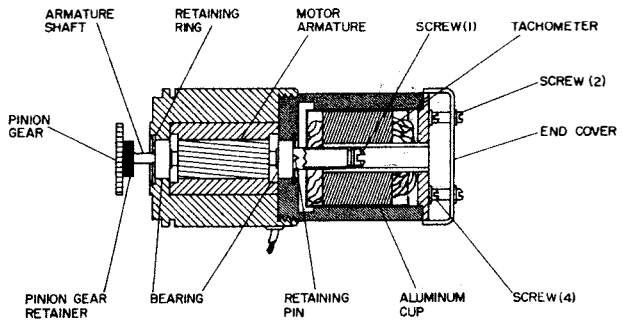


Figure 1. Servo Motor, Cutaway View

AN/SYA-1(V) AND AN/SYA-4(V) –MAINTENANCE HINT TO OBTAIN INCREASED LIFE OF THE TRACK BALL ENABLE SWITCHES (A13-S1)

Casualties have occurred on the AN/SYA-1(V) and AN/SYA-4(V) consoles as a result of (A13-S1) sticking in the down position.

There is a rubber "O" ring around the shaft of the switch which becomes rough and dry, causing the shaft to stick. This trouble can be corrected by applying a rubber lubricant (Dow & Corning, R Compound, FSN CX5970-159-1598) to the "O" ring.

The rubber lubricant should be applied to all Track Ball Enable Switch Shafts semiannually, using the following procedure:

1. De-energize the console, observe all safety precautions.
2. Crank the console open andremove A13S1 from the console.
3. Apply a very small amount of rubber lubricant to the Switch Shaft with the tip of a small screw driver.
4. Actuate the switch several times to work the lubricant around the "O" ring.
5. Remove the excess lubricant from the Switch Shaft using a lint-free cloth.
6. Replace A13S1 in the console and check the switch for proper action.

AN/SYA-1(V), AN/SYA-4(V), AND AN/UYA-1(V) COMMUNICATION HEADSETS–MAINTENANCE INFORMATION.

This information is provided to aid in the maintenance and repair of the NTDS "Split" Communication headsets.

The headsets are similar, differing only in the type of connector plugs used (see Table 1, items 10a and 10b) and the color coding of the wires in the cable assembly (Table I, items 9a and 9b). Figures 1 and 2 show the color coding and pin connections for the respective headsets.

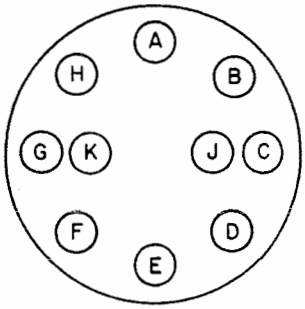
It should also be noted that items 2 through 8 of Table 1 and much of the miscellaneous hardware are the same as used on the type SA-7 series Sound Powered Headset/ Chestsets.

Table 1 is provided as an interim parts list. Missing information will be disseminated as it becomes available.

TABLE I - NTDS Communication Headset, Interim Parts List

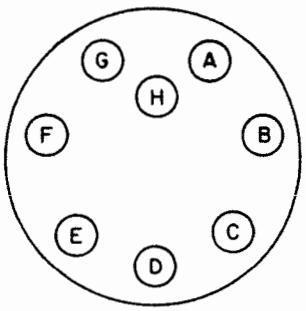
Item No.	Description	HAC P/N	Mfg Code & P/N	FSN	Ref Symbol
1a	Headset, Complete AN/SYA-1(V)	723898-952	(not available)	1N5965-976-9464	A99HT1
1b	Headset, Complete AN/SYA-4(V)*	581373-100	(Not available)	(not assigned)	A99HT1
2	Gasket	5122-002	78711-12080	1N5965-055-8011	A99HT1-07
3	Cover Assy.	5122-003	78711-126D003-1	(not available)	A99HT1-06
4	Sound Power Unit	5122-005	78711-14070-1	1N5965-677-1264	A99HT1-09
5	Ear Cushion	5122-010	78711-24128	1N5965-055-8009	A99HT1-08
6	Cover, Ear Cushion	5122-009	78711-22103	(not assigned)	A99HT1-02
7	Support Assy.	5122-006	78711-144B106-1	(not assigned)	A99HT1-04
8	Clip-Cord	5122-007	78711-144C111-1	(not assigned)	A99HT1-03
9a	Cable Assy. AN/SYA-1(V)	5122-008	78711-162D005-1	1N5995-976-9466	A99HT1-10
9b	Cable Assy. AN/SYA-4(V)*	(not avail)	(not available)	(not assigned)	A99HT1-10
10a	Connector, Plug AN/SYA-1(V)	5122-011	77820-PT06A12-8PSR	1N5935-878-8188	A99P1
10b	Connector, Plug AN/SYA-4(V)*	4118754-20	MS3126F-12-10P	1N5935-988-9656	A99P1
11	Boom, w/Microphone	5122-004	78711-128D000-2	1N5965-976-9465	A99HT1-05
11a	Boom, w/o Microphone	(not avail)	MT-521A/U	9N5965-256-8407	
11b	Microphone Unit	(not avail)	M-95A/URI	N5965-194-9773	
11c	Microphone Plug	(not avail)	U-173/U	(not assigned)	
12	Retractable Cord Extension AN/SYA-4(V)*	1507765	(not available)	(not assigned)	

*All items applicable to the AN/SYA-4(V) headset apply to the headset for AN/UYA-1(V). (EIB 720)



A – WHITE – LEFT EARPHONE
B – BLACK – LEFT EARPHONE
C – SPARE –
D – RED – MICROPHONE
E – GREEN – MICROPHONE
F – SHIELD – SHIELD
G – SPARE –
H – SPARE –
J – BLUE – RIGHT EARPHONE
K – ORANGE – RIGHT EARPHONE

Figure 1. AN/UYA-1(V), AN/SYA-4(V) Headphone Connections.



A – WHITE – LEFT EARPHONE
B – ORANGE – RIGHT EARPHONE
C – SHIELD – SHIELD
D – RED – MICROPHONE
E – GREEN – MICROPHONE
F – SPARE –
G – BLACK – LEFT EARPHONE
H – GRAY – RIGHT EARPHONE

Figure 2. AN/SYA-1(IV) Headphone Connections (E1B 720)

AN/SYA-4 Radio Channel Selector--Maintenance Information

Recurring questions concerning "loose" skirts on the RADIO CHANNEL selector switches have pointed out the need for a clearer understanding of its purpose and operation.

The RADIO CHANNEL selector switch is a specially designed, spring loaded, adjustable channel indicator.

The channel indicator portion of the RADIO CHANNEL selector switch is composed of a numbered Skirt (Fig. 1), a knob assembly (Fig. 2) and three plunger assemblies (Fig. 3) arranged on the electro-luminescent intercommunication panel as shown in Fig. 4. Only two of the three plunger assemblies (Item 3) are shown in Fig. 4.

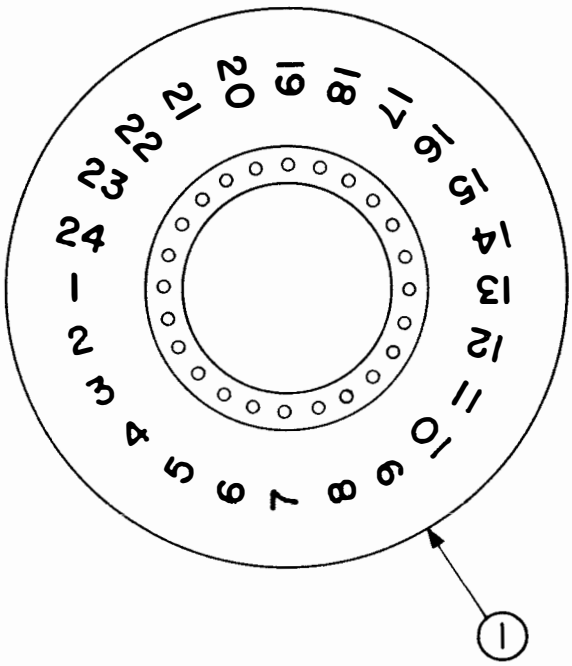


Figure 1. Skirt

The spring loaded plunger, (Fig. 3, Item 5) presses against the underside of the numbered Skirt (Fig. 4, Item 1) holding it firmly against the knob assembly (Fig. 4, Item 2). The pin on the knob assembly engages the hole corresponding to the selected channel number. Any ten consecutive numbers may be chosen to correspond with the ten channels fed to the selector switch.

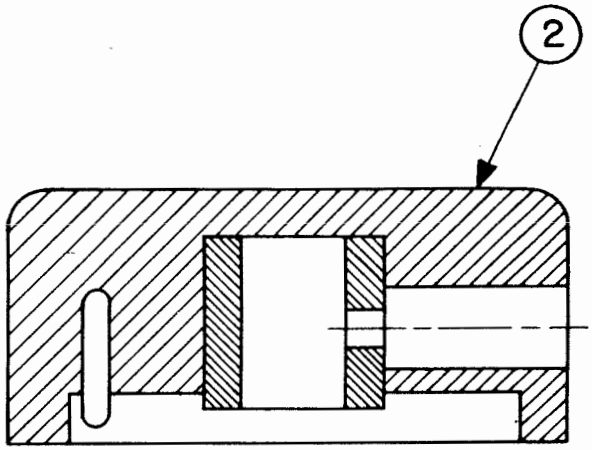


Figure 2. Knob Assembly

When a group of ten consecutive channel number assignments have been determined for a specific console or intercom station, the following procedure is used to set the channel indicator to correspond with these numbers.

1. Determine channel numbers to be used (i.e., 8 through 17).
2. Rotate selector switch to furthest counter-clockwise position.
3. Depress numbered skirt until free of guide pin on knob and rotate until firt number of group (in this case, #8) appears over lighted area. Release the Skirt, insuring the guide pin enters the corresponding hole.
4. Rotate switch through all ten channels to insure the desired numbers appear over lighted area.

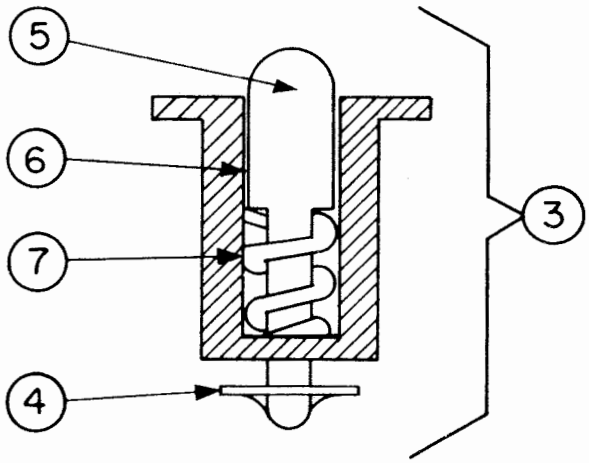


Figure 3. Plunger Assembly

TABLE 1
Component Parts of AN/SYA-(V) Radio Channel Selector

Item	Name	HAC P/N	FSN
1	SKIRT	1507486	None
2	Knob Assy.	1507487	None
3	Plunger Assy.	1507485	None
4	Retainer	71917-73	None
5	Shaft, Plunger	1507488	None
6	Housing, Plunger	1507555	None
7	Spring, Compression	1507489	None

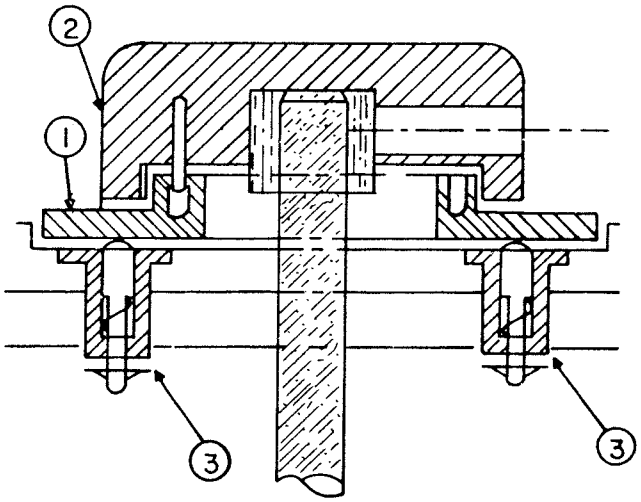


Figure 4. Relationship of Assemblies

It has been found that after the electro-luminescent panels have been dis-assembled and reassembled, the retainer clips (Fig. 3, Item 4) have been pushed too far up the shaft of the plungers, (Fig. 3, Item 5) thereby inhibiting the plunger assemblies from applying pressure to the bottom of the Skirt. When the Skirt is not held up against the knob assembly, the plunger assemblies should be examined for proper spring action. (685)

AN/SYA-4(V)—Maintenance Instruction

At several AN/SYS-4(V), Data Display Group installations, it was noted that the Display Console operators would accidentally trip a circuit breaker toggle switch with the toe of their shoe.

In most modes of operation, the few moments required to reenergize the console could be critical.

The presently installed switch guards (HAC P/N 581664) may be removed, a hole placed in the end (see Fig. 1) and reinstalled with the switch toggle through the new hole. (685)

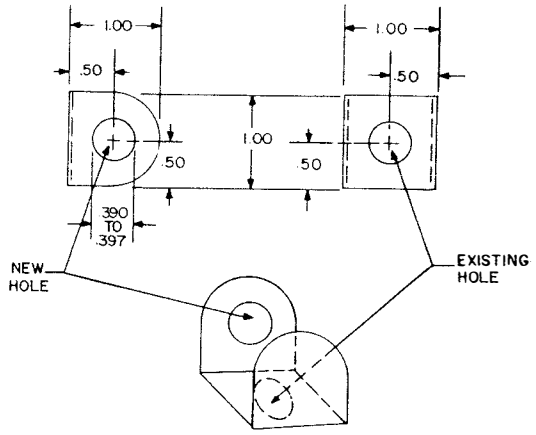


Figure 1. Switchguard (HAC P/N 581664) Modification

AN/SYA-4(V) "Torq Set" Machine Screws

The AN/SYA-4(V) equipments use "Torq Set" (offset cruciform drive) machine screws where mechanical strength is required; for example, in hinges and structural assemblies. "Torq Set" machine screws are similar in appearance to the more familiar "Phillips" (cruciform drive) machine screws (see figure 1). Because a "Phillips" driver could easily damage a "Torq Set" screw head making it difficult, if not impossible, to remove later, even if the proper tool is used, maintenance personnel should be alert to the differences.

With the rapid turnover of maintenance personnel at shore facilities, not to mention the great volume of temporarily assigned personnel and trainees involved, activities having AN/SYA-4(V) equipments installed should frequently call these differences to the attention of all maintenance personnel and continual use of the proper type and size of tool should be ensured. (55)

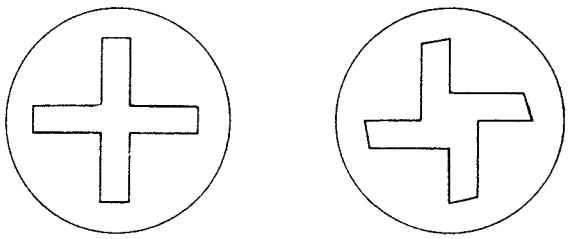


Figure 1. Comparison of Phillips and Torq Set Screw Heads

AN/SYA-4(V)–MAINTENANCE HINT TO PROVIDE IMPROVED SAFETY TO PERSONNEL WHILE OPENING AND CLOSING THE DATA DISPLAY CONSOLES

Excessive vibration occurs on some consoles while being cranked open or closed. This may cause the crankout assembly to break, allowing the console to fall.

The vibration occurs as a result of binding between the worm shaft and bronze bushings. This can be corrected by lubricating the crankout assembly semi-annually.

Using figure 1 as a reference, proceed as follows:

1. De-energize the console; observe all safety precautions.
2. Remove the display programmer drawer (A-27) and the data output data unit drawer (A-28) (refer to NAVSHIPS 94629 para. 4-4h.)
3. Crank the console open to approximately 45°.
4. Apply a few drops of oil (Note 1, figure 1) between the worm shaft and bronze bushing, while moving the console up and down the oil around the bushings.
5. Crank the console fully open to expose the sector gear. Apply a film of grease to the teeth as shown (Note 2, figure 1). Crank the console up and down a few times to work the grease in the worm.
6. Close the console, replace A-27 and A-28.
7. Energize the console and check for proper operation. (647)

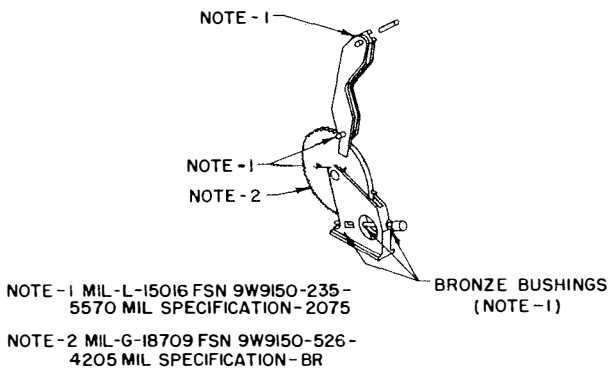


Figure 1. Crankout assembly (581443).

AN/SYA-4(V) DATA DISPLAY GROUP–INSTALLATION INSTRUCTION, UG-627/U CONNECTORS

Installing activities have reported difficulty in the attachment of UG-627/U connectors to the coax conductors of 1S75MA-8 cable. The difficulty is caused by the diameter of the coax dielectric being too large to fit the contact hole of the connector body. However, an insulating material is required in this area to hold the center contact in position during connection of the plug to the panel jack. Failure to provide the insulating material will permit the center contact to shift position, with consequent circuit malfunctions.

Because of the unusual, large diameter of the 1S75MA-8 coax dielectric, relative to the diameter of the outer sheath, there is no standard connector available which will provide both an adequate mechanical grip on the outer sheath and a contact hole which will accommodate the large dielectric size. The UG-627/U connector was selected as the best choice of available standard connectors since it provides sufficient clamping and the coax dielectric is easily adapted to the connector contact hole size.

Adaption of the 1S75MA-8 coax dielectric to the UG-627/U connector is accomplished by using a spacing washer obtained by cutting a 3/16" length of dielectric "tubing" stripped from a short length of RG-59/U or other coax cable having appropriate dimensions for the connector. During preparation of the 1S75MA-8 coax for the UG-627/U connector, follow normal steps of installing nut, flat washer and gasket, removing the jacket, and placing the clamp ring. After folding braid back over clamp ring and trimming excess, cut the dielectric even with the surface of the folded braid.

Place 3/16" spacing washer over center conductor and position against coax dielectric. Place center contact pin on center conductor, position against fabricated spacer, and solder. The remaining assembly steps are completed in normal manner. (696)

AN/SYA-1(V), AN/SYA-4(V), AND AN/UYA-1(V) COMMUNICATION HEADSETS–MAINTENANCE INFORMATION.

See article under AN/SYA-1(V) with the same title. (EIB 720)

AN/SYA-4(V), AN/UYA-1(V) and AN/UYA-4(V) Data Display Systems PC Card Repair—Maintenance Hint

The purpose of this article is to caution maintenance personnel when repairing conformal coated PC cards that an irritating gas is given off when heat is applied to remove the coating from a component on the card.

Equipments primarily affected are recent generation AN/UYA-4(V), i.e. MU-605/UYA-4(V), CV-2834/UYA-4(V); refurbished equipments and other conformal coated PC cards within any of these systems. Additionally, there are several field changes applicable to various equipments in these systems that incorporate the application of conformal coating.

The use of conformal coating to protect PC cards from fungus and moisture is becoming widespread in Data Display systems. Maintenance personnel are cautioned that an irritating gas is emitted when heat is applied to the coating and will cause irritation to eyes and lungs without proper ventilation. Therefore, performance of maintenance (component replacement) which requires heat application should be accomplished only in a well ventilated space.

(EIB 943)

AN/SYA-4(V) Data Display System—Maintenance Instruction

The purpose of this maintenance instruction is to bring to the attention of Data Systems personnel the new present day state-of-the art Configuration of the Lamp Driver Module HAC P/N 579713 and Nor Gate Module HAC P/N 579710.

Lamp Driver Module, HAC P/N 579713 and Nor Gate Module HAC P/N 579710, can no longer be produced in their present encapsulated form. Therefore, to meet fleet supply requirements, new designed modules with present state-of-the-art enhancements are now being stocked in the Naval Supply Centers.

The existing HAC Part Numbers and National Stock Numbers (NSN) are being retained: Lamp Driver Module HAC P/N 579713, NSN 7440-00-979-9061, and Nor Gate Module HAC P/N 579710, NSN 7440-00-979-9060. Figure 1 illustrates the Old and New Configuration of Lamp Driver Module HAC P/N 579713 and the Nor Gate Module HAC P/N 579710.

(EIB 945)

AN/SYQ-6(V) Message Processing and Distribution System--Installation Procedures Note for the Technipower Power Supplies

This article provides pertinent information regarding the use of a thermal conductive compound between all subject power supply modules and the chassis or heat sink.

The mounting base of the power supply module must be coated with a thin film (0,001 inch) of thermal conductive compound prior to attaching it to the chassis or heat sink. The objective, when mounting a component to a heat sink with the thermal conductive compound, is to obtain maximum metal-to-metal contact, with the thermal conductive compound only filling the voids. If the thermal conductive compound is too thick, the metal-to-metal contact is not made and a thermal barrier is set up rather than aiding in heat conduction. Excessive thermal conductive compound can also cause distortion of the power supply base resulting in damage to internal components. The use of Dow Corning Compound #340, NSN 6850-00-927-9461 or equivalent is recommended.

The old thermal conductive compound should be removed with a soft cloth and alcohol to avoid damaging the surfaces. A new thin film must be applied after every maintenance action which necessitates removal of the power supply module from the chassis or heat sink.

The affected power supply modules (Technipower) are identified in the following table.

Unit	Ref Des	Figure #	FSCM	Publication
IP-1038	2-PS1	5-2-16	13850	NAVELEX 0967-317-1010/5010
IP-1038	2-PS2	5-2-16	13850	NAVELEX 0967-317-1010/5010
IP-1038	2-PS3	5-2-16	13850	NAVELEX 0967-317-1010/5010
IP-1038	2-PS4	5-2-16	13850	NAVELEX 0967-317-1010/5010
CV-2772	1-PS1	5-2-1	13850	NAVELEX 0967-317-5010
CV-2771	1-PS1	5-2-1	13850	NAVELEX 0967-317-1010
ID-1852	1A5-PS1	5-1	13850	NAVELEX 0967-434-4220
ID-1852	1A5-PS2	5-1	13850	NAVELEX 0967-434-4220
ID-1852	1A5-PS3	5-1	13850	NAVELEX 0967-434-4220
ID-1852	1A5-PS4	5-1	13850	NAVELEX 0967-434-4220
TD-1066	1A1A2PS1	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS2	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS3	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS4	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS5	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS6	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS7	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS8	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS9	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS10	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS11	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS12	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS13	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS14	5-12	13850	NAVELEX 0967-LP-434-4590
TD-1066	1A1A2PS15	5-12	13850	NAVELEX 0967-LP-434-4590

Unit	Ref Des	Figure #	FSCM	Publication
OA-8699	1-PS1	5-1, sheet 5	13850	NAVELEX 0967-436-1010
OA-8699	1-PS2	5-1, sheet 5	13850	NAVELEX 0967-436-1010
OA-8699	1-PS3	5-1, sheet 5	13850	NAVELEX 0967-436-1010
SA-1884	1A2PS1	5-1	13850	NAVELEX-0967-434-4130
SA-1884	1A2PS2	5-1	13850	NAVELEX-0967-434-4130
SA-1884	1A2PS3	5-1	13850	NAVELEX-0967-434-4130
C-9147	1A1PS1	5-5, sheet 3	13850	NAVELEX-0967-434-4050
C-9147	1A1PS2	5-5, sheet 3	13850	NAVELEX-0967-434-4050
C-9147	1A1PS3	5-5, sheet 3	13850	NAVELEX-0967-434-4050
C-9149	1A1PS1	5-1 & 5-3	13850	NAVELEX-0967-434-4090
C-9149	1A1PS2	5-1 & 5-3	13850	NAVELEX-0967-434-4090
C-9149	1A1PS3	5-1 & 5-3	13850	NAVELEX-0967-434-4090

EIB 974)

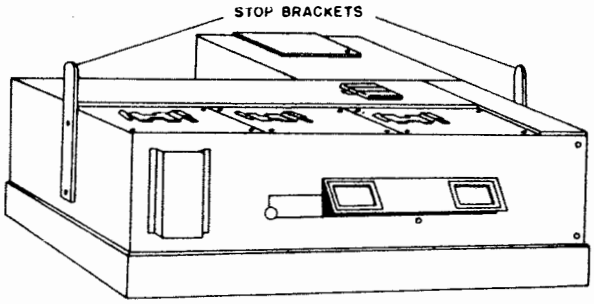
PROTECTION BRACKETS

The installation of two metal protection brackets on the Multiple Transmitter Distributor of the AN/TGC-1 equipment has been suggested. (See illustration.) The brackets are for the purpose of preventing damage to the tape retaining lids.

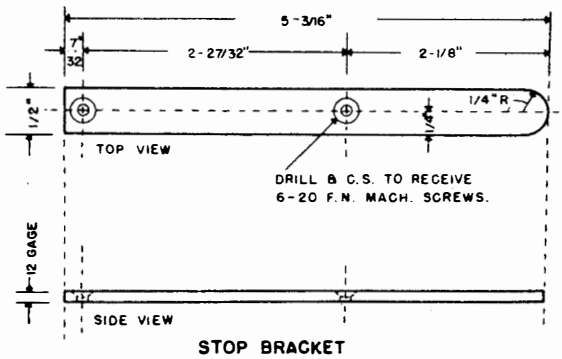
The suggested brackets (see fig. 1) allow the equipment operator to pull out the 2nd sliding tray supporting the typing reperforator without danger of damaging the open (upright) tape gates. (Damage to the tape gates throws the five code pins out of adjustment, the adjustment of these pins being critical to the operation of the AN/TGC-1 equipment). The stop brackets prevent the sliding tray from being pulled out beyond a safe distance by inexperienced personnel.

The brackets are installed by drilling two holes in each bracket, removing the two screws holding the side panels of the multiple transmitter distributor and using these screws to attach the brackets.

The suggestor points out that a bracket of other dimensions-longer or wider-of any strong metal would be suitable for protection to the equipment. This suggestion may be used at all activities where the AN/TGC-1 is in use to prevent similar damage to the equipment.



MULTIPLE TRANSMITTER DISTRIBUTOR



STOP BRACKET
MATERIAL: STEEL

FIGURE 1.

AN/TSA-11 AIR CONTROL GROUP

INDMAN, 14ND, reported difficulty encountered in attempting to disassemble the AB-471/TSA-11 tower sections due to corrosion of the fasteners. The report recommends application of DC-4 or anti-seize compound to the pins and barrels of the assembly upon initial installation and at periodic intervals to insure against corrosion and to prevent seizing.

AN/TXC-1( ), TT-41( )/TXC-1B DANGER OF ACCIDENTAL SHOCK

The following points out the danger of accidental shock from the exposed lug on the synchronous motor of the AN/TXC-1( ) and the TT-41( )/TXC-1( ) facsimile transceivers when the housing for the motor and clutch assembly is removed. During normal servicing, power should not be applied to the transceiver with the cover removed. If emergency repairs modify this safety practice, Mr. Berube suggests that insulating material be threaded over the wire lead and cupped behind the supports of the synchronous motor. The details of fabrication and installation are given in figures 1 and 2.

CAUTION: Power should be removed from the facsimile transceiver while the insulating material is being installed and removed.

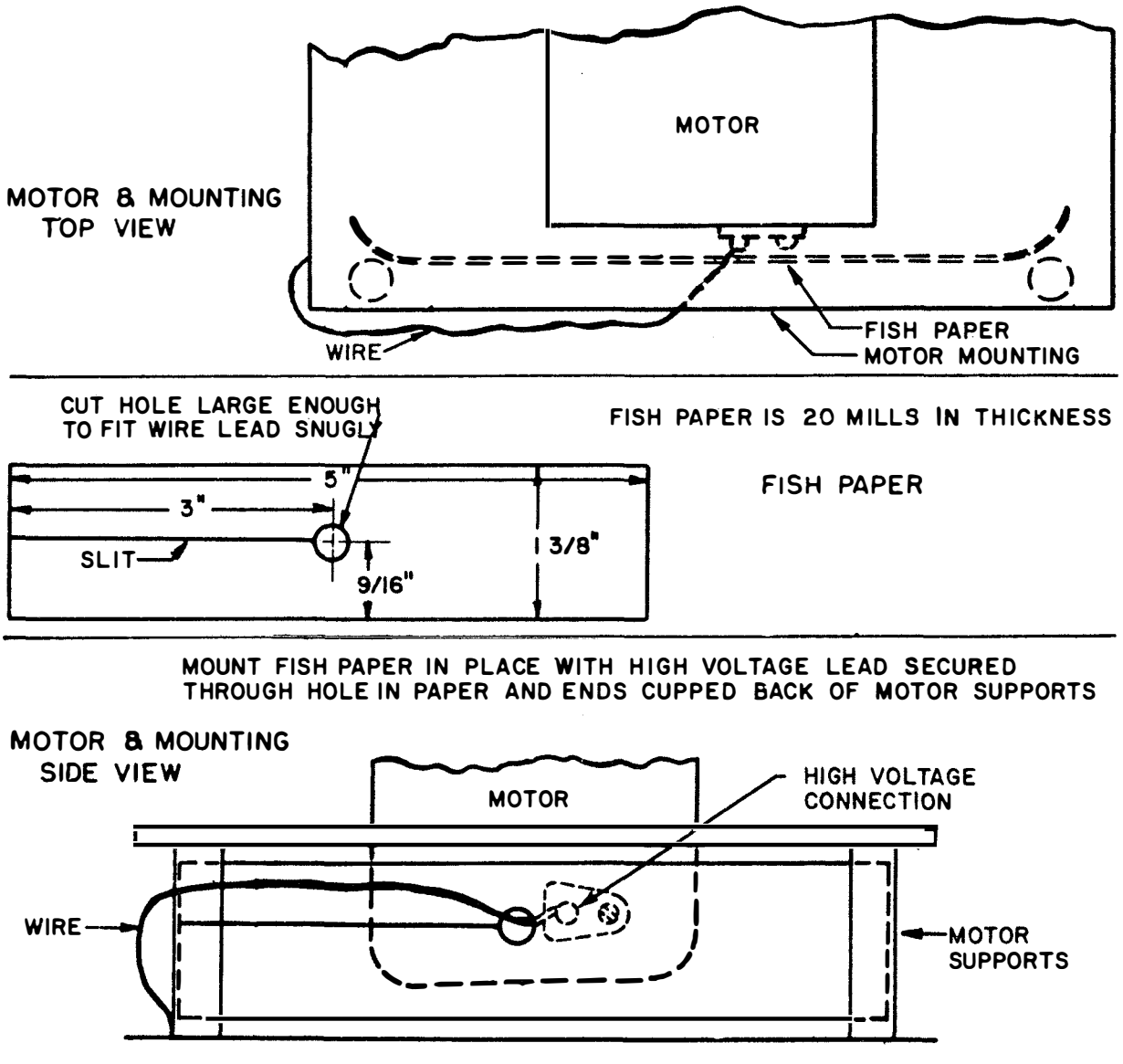
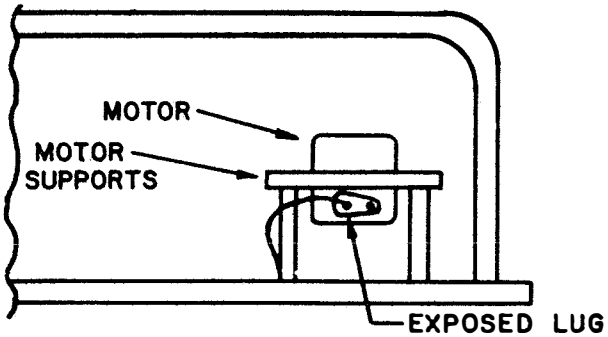


Figure 1



FACSIMILE TRANSCEIVER
LEFT SIDE VIEW

Figure 2